Draft

# Effingham County Multi-Jurisdictional All Hazards Mitigation Plan

Effingham County, Illinois

Participants:

Beecher City, Village of
Beecher City CUSD #20
Dieterich, Village of
Effingham, City of
Effingham County
Mason, Town of
Mound Township
Shumway, Village of
Teutolpolis, Village of
Watson, Village of
Watson Township

May 2020

The five year update of this Plan must be completed on or before (date).

# EFFINGHAM COUNTY MULTI-JURISDICTIONAL ALL HAZARDS MITIGATION PLAN

# EFFINGHAM COUNTY, ILLINOIS

## TABLE OF CONTENTS


1.0 INTRODUCTION ..... 1
- 1.1 PARTICIPATING JURISDICTIONS ..... 2
- 1.2 COUNTY PROFILE ..... 2
- 1.3 LAND USE AND DEVELOPMENT TRENDS ..... 6

2.0 PLANNING PROCESS ..... 8
- 2.1 PLANNING COMMITTEE ..... 9
- 2.2 PUBLIC INVOLVEMENT ..... 13
- 2.3 PARTICIPATION OPPORTUNITIES FOR INTERESTED PARTIES ..... 15
- 2.4 INCORPORATING EXISTING PLANNING DOCUMENTS ..... 16

3.0 RISK ASSESSMENT ..... 19
- 3.1 SEVERE STORMS (THUNDERSTORMS, HAIL, LIGHTNING & HEAVY RAIN) ..... 26
- 3.2 SEVERE WINTER STORMS & EXTREME COLD ..... 40
- 3.3 FLOODS ..... 51
- 3.4 EXCESSIVE HEAT ..... 72
- 3.5 TORNADOES ..... 80
- 3.6 DROUGHTS ..... 102
- 3.7 EARTHQUAKES ..... 109
- 3.8 DAMS ..... 123
- 3.9 MAN-MADE HAZARDS ..... 131
  - 3.12.1 Hazardous Substances ..... 131
    - 3.12.1.1 Generation ..... 132
    - 3.12.1.2 Transportation ..... 132
    - 3.12.1.3 Storage/Handling ..... 136
  - 3.12.2 Waste Disposal ..... 137
    - 3.12.2.1 Solid Waste ..... 138
    - 3.12.2.2 Potentially- Infectious Medical Waste ..... 138
    - 3.12.2.3 Hazardous Waste ..... 138
  - 3.12.3 Hazardous Material Incidents ..... 138
  - 3.12.4 Waste Remediation ..... 139
  - 3.12.5 Terrorism ..... 141

4.0 MITIGATION STRATEGY ..... 143
- 4.1 MITIGATION GOALS REVIEW ..... 143
- 4.2 MITIGATION ACTION IDENTIFICATION ..... 144
- 4.3 MITIGATION ACTION ANALYSIS ..... 144

4.4 MITIGATION ACTION PRIORITIZATION METHODOLOGY ....145
4.5 MITIGATION ACTION IMPLEMENTATION, ADMINISTRATION & COST/BENEFIT ANALYSIS ....145
4.6 RESULTS OF MITIGATION STRATEGY ....147

5.0 PLAN MAINTENANCE ....174
5.1 MONITORING, EVALUATING & UPDATING THE PLAN ....174
5.1.1 Monitoring and Evaluating the Plan ....174
5.1.2 Updating the Plan ....175
5.2 INCORPORATING THE MITIGATION STRATEGY INTO EXISTING PLANNING MECHANISMS ....175
5.3 CONTINUED PUBLIC INVOLVEMENT ....176

6.0 PLAN ADOPTION ....177
6.1 PLAN ADOPTION PROCESS ....177

## APPENDICES

Planning Committee Meeting Attendance Sheets ....APPENDIX A
Planning Committee Meeting Minutes ....APPENDIX B
Citizen Questionnaire ....APPENDIX C
Frequently Asked Questions Fact Sheet ....APPENDIX D
Media Outlets Serving the County ....APPENDIX E
Press Releases and News Articles Published ....APPENDIX F
Public Forum – Planning Process Summary Handout ....APPENDIX G
Public Forum – Plan Comment Sheet ....APPENDIX H
Hazard Mitigation Planning Memo Sent to Adjacent Counties ....APPENDIX I
Hazard Event Risk Assessment Tables ....APPENDIX J
FIRMs for Participating Jurisdictions ....APPENDIX K
Plan Adoption Resolutions ....APPENDIX L

## LIST OF FIGURES

Figure I-1 Federal Disaster Declarations: Effingham County ....1
Figure I-2 Participating Jurisdictions Represented in the Plan ....2
Figure I-3 Location Map ....3
Figure I-4 Township Boundary Map ....4
Figure I-5 Beecher City Community Unit School District #20 Boundary Map ....5
Figure I-6 Demographic Data by Participating Jurisdiction ....7
Figure PP-1 Description of Planning Process ....8
Figure PP-2 Effingham County Planning Committee Member Attendance Record ....10
Figure PP-3 Existing Planning Documents by Participating Jurisdiction ....18
Figure R-1 Risk Priority Index Scoring System ....22
Figure R-2 Risk Priority Index Scores by Hazard by County & Participating Municipalities ....23
Figure R-3 Risk Priority Index Scores by Hazard by Participating Special District ....24
Figure R-4 Critical Facilities & Infrastructure by Jurisdiction ....25
Figure SS-1 Wind Speed Conversions ....27
Figure SS-2 Hail Size Descriptions ....28

Figure SS-3 TORRO Hailstorm Intensity Scale ....29
Figure SS-4 Thunderstorms with Damaging Winds by Month ....31
Figure SS-5 Thunderstorms with Damaging Winds by Hour....31
Figure SS-6 Hail Events by Month....32
Figure SS-7 Hail Events by Hour ....33
Figure SS-8 Cloud-to-Ground Lightning Flash Density: Continental United States ....33
Figure SS-9 Heavy Rain Events by Month....34
Figure SS-10 Heavy Rain Events by Hour ....34
Figure SS-11 Verified Severe Storm Events by Participating Municipality ....36
Figure SS-12 Verified Severe Storm Events in Unincorporated Effingham County ....36
Figure SS-13 Severe Weather Crash Data for Effingham County....38
Figure SWS-1 Wind Chill Chart....41
Figure SWS-2 Severe Winter Storms by Month ....44
Figure SWS-3 Severe Winter Storms by Hour....45
Figure SWS-4 Coldest Days Recorded at Effingham Observation Station....46
Figure SWS-5 Designated Warming Centers by Participating Jurisdiction....46
Figure SWS-6 Severe Winter Weather Crash Data for Effingham County ....49
Figure F-1 Floodplain Illustration ....53
Figure F-2 Example of a Flood Insurance Rate Map (FIRM) ....54
Figure F-3 Flood Events by Month ....58
Figure F-4 Flash Flood Events by Hour ....59
Figure F-5 Bodies of Water Subject to Flooding in Effingham County....60
Figure F-6 NFIP Participating Jurisdictions ....60
Figure F-7 NFIP Participating Jurisdictions ....61
Figure F-8 Verified Flash Flood Events by Participating Jurisdiction ....62
Figure F-9 Existing Residential Structures Located within a Floodplain by Participating Jurisdiction....65
Figure F-10 Sample Calculation of Average Assessed Value & Average Market Value – Effingham ....68
Figure F-11 Average Market Value of Housing Units by Jurisdiction ....69
Figure F-12 FEMA Flood Loss Estimation Tables ....69
Figure F-13 *Structure:* Potential Dollar Loss Sample Calculation – Effingham....70
Figure F-14 *Content:* Potential Dollar Loss Sample Calculation – Effingham....70
Figure F-15 Estimated Potential Dollar Losses to Potentially-Damaged Housing Units from a Riverine Flood Event by Participating Jurisdiction ....71
Figure EH-1 Heat Index....73
Figure EH-2 Relationship between Heat Index and Heat Disorders ....74
Figure EH-3 Excessive Heat Events by Month ....75
Figure EH-4 Hottest Days....76
Figure EH-5 Designated Warming Centers by Participating Jurisdiction....76
Figure EH-5 Sensitive Populations by Participating Jurisdictions ....78
Figure T-1 Fujita & Enhanced Fujita Tornado Measurement Scales ....81
Figure T-2 Tornadoes by Magnitude ....82
Figure T-3 Tornadoes by Month....83
Figure T-4 Tornadoes by Hour ....83
Figure T-5 Tornado Pathways in Effingham County ....85

Figure T-6 Verified Tornadoes in or Near Participating Municipalities .....86
Figure T-7 Verified Tornadoes in or near Unincorporated Areas of Effingham County .....86
Figure T-8 Calculation of Average Housing Unit Density – Effingham County .....90
Figure T-9 Average Housing Unit Density by Participating Jurisdiction.....90
Figure T-10 Township Boundaries Effingham County .....91
Figure T-11 Average Housing Unit Density by Township.....92
Figure T-12 Refined Land Area Figures for Participating Municipalities with Large Tracts of Undeveloped Land .....93
Figure T-13 Sample Calculation of Potentially-Damaged Housing Units – Effingham County .....93
Figure T-14 Sample Calculation of Potentially-Damaged Housing Units for Municipalities Covering Less Than One Square Mile –Watson.....93
Figure T-15 Estimated Number of Housing Units by Participating Jurisdiction Potentially Damaged by a Tornado .....94
Figure T-16 Estimated Number of Housing Units by Township Potentially Damaged by a Tornado .....95
Figure T-17 Sample Calculation of Average Assessed Value & Average Market Value – Watson .....97
Figure T-18 Average Market Value of Housing Units by Municipality.....97
Figure T-19 Average Market Value of Housing Units by Township .....98
Figure T-20 *Structure:* Potential Dollar Loss Sample Calculation – Watson .....98
Figure T-21 *Content:* Potential Dollar Loss Sample Calculation – Watson.....99
Figure T-22 Estimated Potential Dollar Losses to Potentially-Damaged Housing Units from a Tornado by Participating Jurisdiction .....99
Figure T-23 Estimated Potential Dollar Losses to Potentially-Damaged Housing Units from a Tornado by Township .....100
Figure DR-1 U.S. Drought Monitor – Drought Severity Classifications.....104
Figure DR-2 U. S. Drought Monitor.....104
Figure DR-3 Crop Yield Reductions Due to Drought – Effingham County .....107
Figure EQ-1 Fault Illustration.....110
Figure EQ-2 Earthquake Magnitude Classes.....111
Figure EQ-3 Comparison of Richter Scale and Modified Mercalli Intensity Scale .....112
Figure EQ-4 Approximate Number of Earthquakes Recorded Annually.....113
Figure EQ-5 Geological Structures in Central and Southern Illinois .....114
Figure EQ-6 Earthquakes Originating in Effingham County .....115
Figure EQ-7 Earthquakes Originating in Southern Illinois .....116
Figure EQ-8 Frequency of Damaging Earthquake Shaking Around the U.S. .....117
Figure EQ-9 Potential Earthquake Impacts .....120
Figure EQ-10 Number of Unreinforced Masonry Buildings Serving as Critical Facilities by Jurisdiction.....121
Figure DF-1 Dam Hazard Classification System .....124
Figure DF-2 Classified Dams Located in Effingham County .....126
Figure DF-3 Location of Classified Dams of Significance in Effingham County .....128
Figure DF-4 Buildings, Infrastructure & Critical Facilities Vulnerable to a Dam Failure ...130
Figure MMH-1 Generators of Solid & Liquid Hazardous Substances – 2017 .....132

Figure MMH-2 ICC Hazardous Substances Railroad Accident/Incidents Classification Categories....133
Figure MMH-3 ICC Recorded Railway Accidents/Incidents Involving Hazardous Substances: 2009 – 2018....134
Figure MMH-4 IEMA Recorded Railway Accidents/Incidents Involving Hazardous Substances: 2010 – 2019....135
Figure MMH-5 Extremely Hazardous Substances by Facility – 2017....137
Figure MIT-1 Mitigation Goals....144
Figure MIT-2 Types of Mitigation Activities....145
Figure MIT-3 Mitigation Action Prioritization Methodology....146
Figure MIT-4 Effingham County Hazard Mitigation Actions....148
Figure MIT-5 Beecher City Hazard Mitigation Actions....155
Figure MIT-6 Beecher City Community Unit School District #20 Hazard Mitigation Actions....157
Figure MIT-7 Dieterich Hazard Mitigation Actions....158
Figure MIT-8 Effingham Hazard Mitigation Actions....164
Figure MIT-9 Mason Hazard Mitigation Actions....166
Figure MIT-10 Mound Township Hazard Mitigation Actions....168
Figure MIT-12 Teutopolis Hazard Mitigation Actions....171
Figure MIT-13 Watson Hazard Mitigation Actions....172
Figure MIT-14 Watson Township Hazard Mitigation Actions....173
Figure PA-1 Plan Adoption Dates....177

*Researched and written for the Effingham County Multi-Jurisdictional*
*All Hazards Mitigation Planning Committee*
*by American Environmental Corporation*

# 1.0 INTRODUCTION

Each year natural hazards (i.e., severe thunderstorms, tornadoes, severe winter storms, flooding, etc.) cause damage to property and threaten the lives and health of the residents of Effingham County. Since 1996, Effingham County has been included in three federally-declared disasters. **Figure I-1** identifies each declaration including the year the disaster was declared and the type of natural hazard that triggered the declaration. The natural hazard(s) recognized as contributing to the declaration for Effingham County is identified in bold.

**Figure I-1**
**Federal Disaster Declarations: Effingham County**

| Declaration # | Year | Natural Hazard(s) Covered by Declaration |
|---|---|---|
| 1112 | 1996 | ***severe storms; flooding*** |
| 1416 | 2002 | ***severe storms***; tornadoes; ***flooding*** |
| 1960 | 2011 | ***severe winter storm***; snowstorm |

In the last 10 years alone (2010-2019), there have been 68 heavy rain events, 57 thunderstorms with damaging winds, 22 flash flood events, 21 excessive heat events, 16 severe winter storms, 10 severe storms with hail one inch in diameter or greater, six riverine flood events, four tornadoes, two droughts, two extreme cold events, and one lightning strike verified in the County.

While natural hazards cannot be avoided, their impacts can be reduced through effective hazard mitigation planning. This prevention-related concept of emergency management often receives the least amount of attention, yet it is one of the most important steps in creating a hazard-resistant community.

**What is hazard mitigation planning?**

Hazard mitigation planning is the process of determining how to reduce or eliminate the loss of life and property damage resulting from natural and man-made hazards. This process helps the County and participating jurisdictions reduce their risk from these hazards by identifying vulnerabilities and developing mitigation actions to lessen and sometimes even eliminate the effects of a hazard. The results of this process are documented in an all hazards mitigation plan.

**Why develop an all hazards mitigation plan?**

By developing and adopting an all hazards mitigation plan, participating jurisdictions become eligible to apply for and receive federal hazard mitigation funds to implement mitigation actions identified in the plan. These funds can help provide local government entities with the opportunity to complete mitigation projects and activities that would not otherwise be financially possible.

The federal hazard mitigation funds are made available through the Disaster Mitigation Act of 2000, an amendment to the Robert T. Stafford Disaster Relief and Emergency Assistance Act, which provides federal aid for mitigation projects, but only if the local government entity has a Federal Emergency Management Agency (FEMA) approved hazard mitigation plan.

**How is this plan different from other emergency plans?**

An all hazards mitigation plan is aimed at identifying projects and activities that can be conducted prior to a natural or man-made disaster, unlike other emergency plans which provide direction on how to respond to a disaster after it occurs. This is the first time that Effingham County has developed a hazard mitigation plan. This update describes in detail the actions that can be taken to help reduce or eliminate damages caused by specific types of natural and man-made hazards.

## 1.1 PARTICIPATING JURISDICTIONS

Recognizing the benefits of having an all hazards mitigation plan, the Effingham County Board authorized the development of the Effingham County Multi-Jurisdictional All Hazards Mitigation Plan (hereto referred to as the Plan). The County then invited all the local government entities within Effingham County to participate. **Figure I-2** identifies the participating jurisdictions that are represented in the Plan update.

**Figure I-2**
**Participating Jurisdictions Represented in the Plan**

- Beecher City, Village of
- Beecher City CUSD #20
- Dieterich, Village of
- Effingham, City of
- Effingham County
- Mason, Town of
- Mound Township
- Shumway, Village of
- Teutopolis, Village of
- Watson Township
- Watson, Village of

## 1.2 COUNTY PROFILE

(Name) County is located in (region) Illinois and covers approximately (number) square miles. **Figure I-3** provides a location map of the County and the participating municipalities while **Figures I-4** and **I-5** identify the township boundaries and the Beecher City Community Unit School District #20 boundaries. The topography is described as a nearly level till plain dissected with gently sloping, shallow drainage ways and sand deposits along the East side of the Little Wabash River. The County is bounded on the north by Shelby and Cumberland Counties, to the east by Jasper County, to the south by Clay and Fayette Counties and to the west by Fayette County. The City of Effingham is the county seat.

**Figure I-3**
**Location Map**

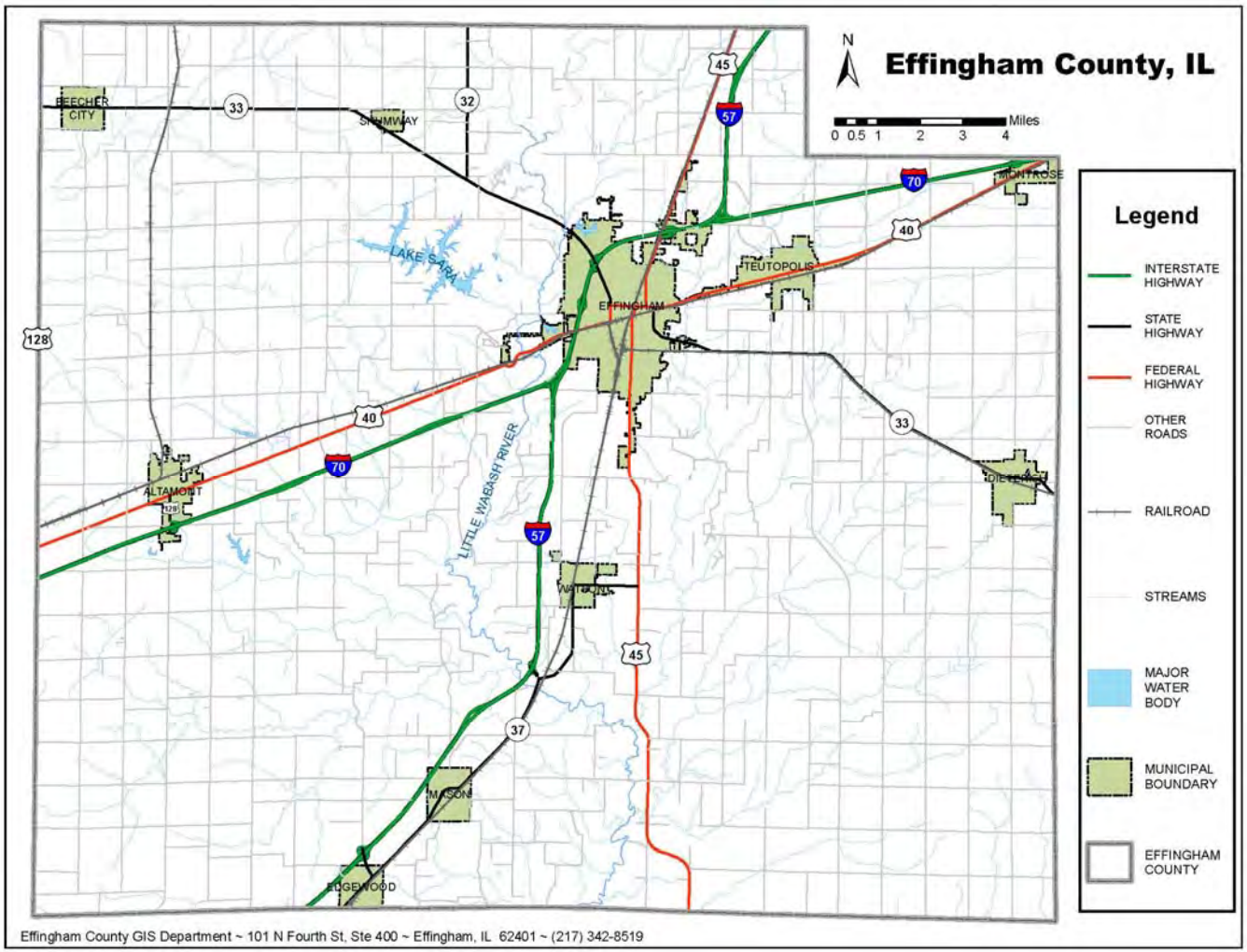


**Figure I-4**
**Township Boundary Map**

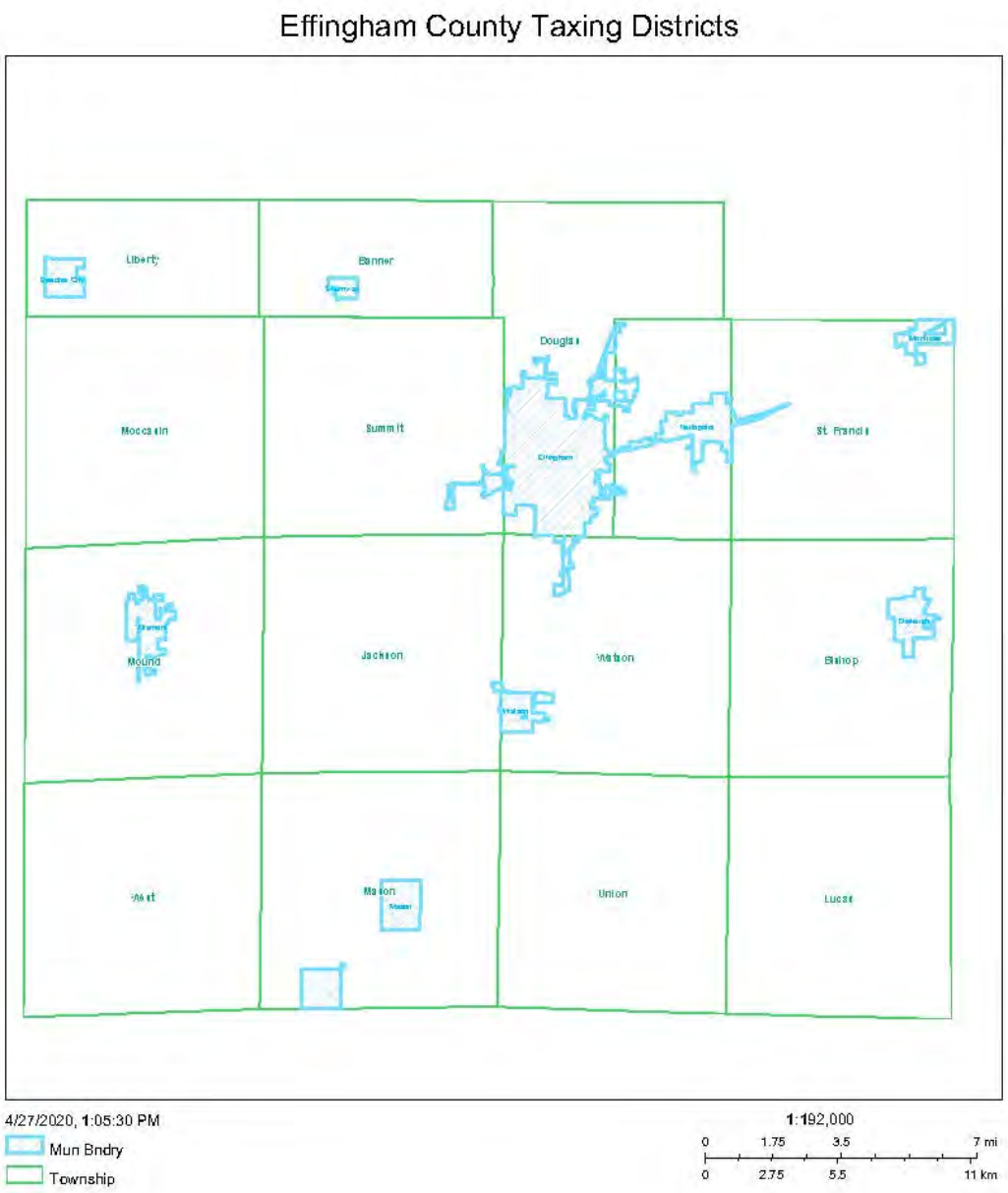
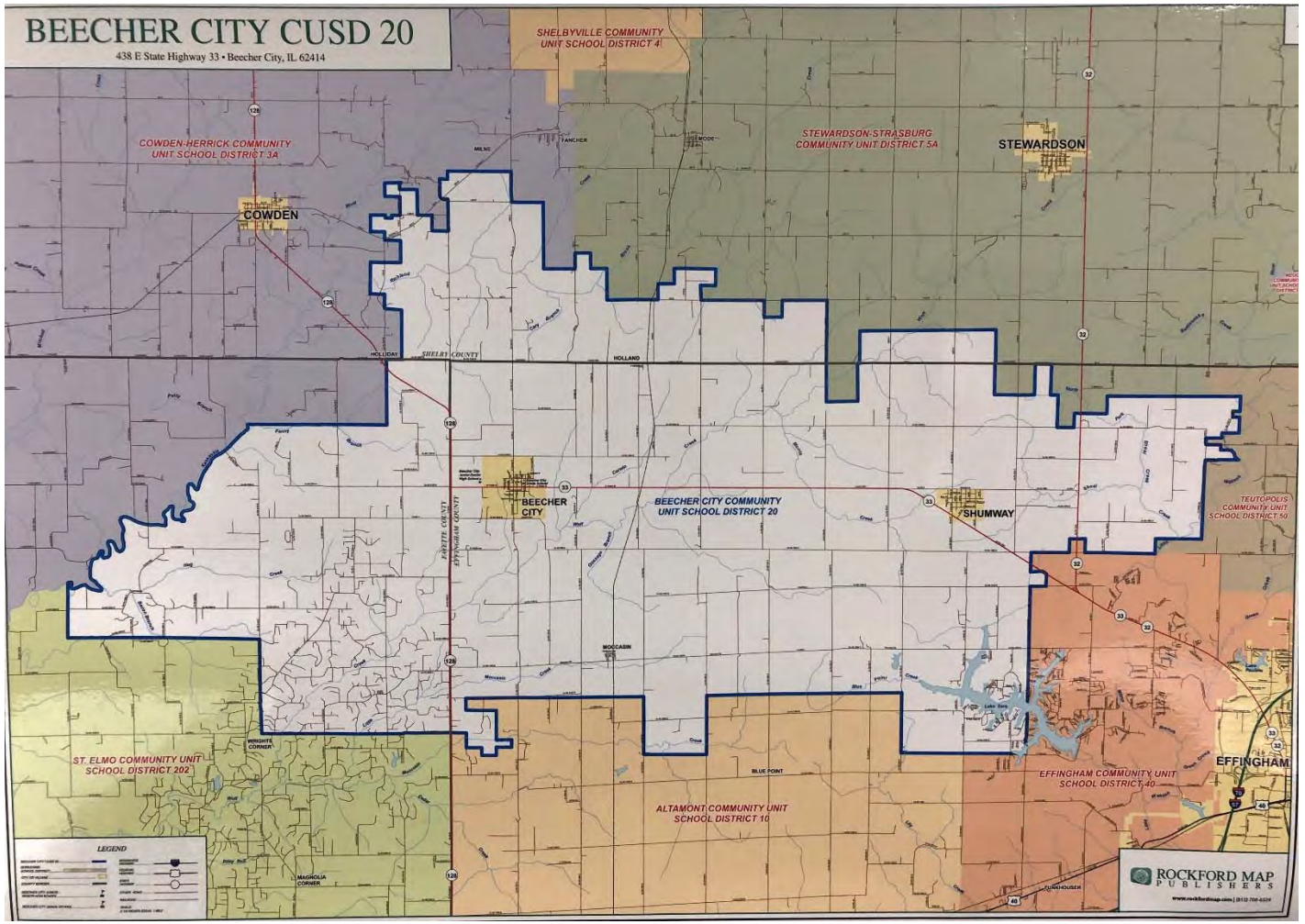


**Figure I-5**
**Beecher City Community Unit School District #20 Boundary Map**



Agriculture is the major enterprise in Effingham County. According to the 2017 Census of Agriculture, there were 1,193 farms in Effingham County occupying approximately 97.7% (299,389 acres) of the total land area in the County. The major crops include soybeans and corn while the major livestock includes hogs and cattle. The County ranks 9th in the State for livestock cash receipts and 50th for crop cash receipts.

Manufacturing in the County is primarily located in the City of Effingham. Effingham's unique location and transportation system has been the calling card for numerous industrial and commercial companies which have located in its business park and retail areas. In fact, the City's daytime population doubles because of this vast amount of development.

The largest employment sectors in Effingham County is healthcare and social assistance followed by manufacturing and then retail trade according to the Illinois Department of Commerce and Economic Opportunity. HSHS St. Anthony Hospital and Heartland Dental are the top two employers in the County.

Economic growth is hopeful for Effingham County. The City of Effingham was awarded a new Enterprise Zone on January 1, 2018. The Effingham Enterprise Zone has an initial life of 15 years, with the possibility of a 10-year extension. The original Enterprise Zone was in effect from 1988 to 2017 and resulted in over 475 projects, &700 million in investment, 4,000 new jobs and 2,500 jobs retained.

In 2017 an Opportunity Zone was also passed for Effingham County. The Tax Cuts and Jobs Act passed at the end of December 2017 allows Governors in each state to designate certain census tracts as Opportunity Zones. The Opportunity Zone program was enacted to spur economic development by providing tax benefits to investors encouraging long-term private sector investments in low-income communities.

**Figure I-6** provides demographic data on the County and each of the participating municipalities and townships along with information on housing units and assessed values. The assessed values are for all residential structures and associated buildings (including farm homes and buildings associated with the main residence.) The assessed value of a residence in Effingham County is approximately one-third of the market value.

## 1.3 LAND USE AND DEVELOPMENT TRENDS

Population growth and economic development are two major factors that trigger changes in land use. Effingham County is a rural community with a population that has seen a steady incline between 1900 and 2000 from 20,465 to 34,264. Between 2000 and 2010 the population decreased negligibly by 0.1% from 34,264 to 34,242. All the participating municipalities, with the exception of Dieterich and Watson, experienced a decrease in their populations between 2000 and 2010.

Land use in Effingham County is primarily agricultural. As discussed in the previous section, approximately 97.7% of the land within the County is used for farming practices. Agriculture is and will continue to be a major industry within the County and a vital part of the County's economy.

**Figure I-6**
**Demographic Data by Participating Jurisdiction**

| Participating Jurisdiction | Population (2010) | Projected Population (2025) | Total Area (Sq. Miles) (2010) | Number of Housing Units (2010) | Total Assessed Value of Housing Units (2018) |
|---|---|---|---|---|---|
| Effingham County (unincorporated) | 15,043 | 14,576 | 465.600 | 5,979 | $258,917,601 |
| Beecher City | 463 | 449 | 0.902 | 215 | $2,896,400 |
| Dietrich | 617 | 598 | 1.160 | 249 | $11,075,620 |
| Effingham (city) | 12,328 | 11,945 | 9.925 | 5,696 | $184,304,811 |
| Mason | 345 | 334 | 1.292 | 155 | $2,667,670 |
| Shumway | 202 | 196 | 0.332 | 91 | $1,849,350 |
| Teutopolis | 1,530 | 1,483 | 1.629 | 590 | $35,481,680 |
| Watson | 754 | 731 | 1.119 | 281 | $7,177,770 |
| Mound Township | 3,648 | --- | 37.098 | 1,263 | $44,880,650 |
| Watson Township | 3,193 | --- | 35.831 | 1,494 | $41,216,580 |

Sources: Pam Braun, Effingham County Supervisor of Assessments.
Illinois Department Public Health, Population Projects for Illinois Counties 2010 to 2025.
U. S. Census Bureau, 2010 Census U.S. Gazetteer Files.
U.S. Census Bureau, American FactFinder.

According to the Effingham County Emergency Management Agency Emergency Manager, no substantial development and economic initiatives are planned in the participating jurisdictions in the next five years.

There are no other large-scale economic development initiatives underway in the County. Substantial changes in land use (from forested and agricultural land to residential, commercial and industrial) are not anticipated within the County in the immediate future. No sizeable increases in commercial or industrial developments are expected within the next five years.

# 2.0 PLANNING PROCESS

The Effingham County Multi-Jurisdictional Natural Hazards Mitigation Plan (the Plan) was developed through the Effingham County Multi-Jurisdictional Natural Hazards Mitigation Planning Committee (Planning Committee). The Plan was prepared to comply with the Disaster Mitigation Act of 2000 and incorporates the Federal Emergency Management Agency's (FEMA) 10-step planning process approach. **Figure PP-1** provides a brief description of the process utilized to prepare this Plan.

**Figure PP-1**
**Description of Planning Process**

| Tasks | Description |
|---|---|
| Task One: Organize | The Planning Committee was formed with broad representation and specific expertise to assist the County and the Consultant in updating the Plan. |
| Task Two: Public Involvement | Early and ongoing public involvement activities were conducted throughout the Plan's development to ensure the public was given every opportunity to participate and provide input. |
| Task Three: Coordination | Agencies and organizations were contacted to identify plans and activities currently being implemented that impact or might potentially impact hazard mitigation activities. |
| Task Four: Risk Assessment | The Consultant identified and profiled the natural hazards that have impacted the County and conducted a vulnerability assessment to evaluate the risk to each participating jurisdiction. |
| Task Five: Goal Setting | After reviewing existing plans and completing the risk assessment, the Consultant assisted the Planning Committee in updating the goals and objectives for the Plan. |
| Task Six: Mitigation Activities | The participating jurisdictions were asked to identify mitigation actions that had been started and/or completed since the original Plan was adopted. In addition, they were also asked to identify any new mitigation actions based on the results of the risk assessment. The new mitigation actions were then analyzed, categorized and prioritized. |
| Task Seven: Draft Plan | The draft Plan summarized the results of Tasks One through Six. In addition, it described the responsibilities to monitor, evaluate and update the Plan. The draft Plan was reviewed by the participants and a public forum was held to give the public an additional opportunity to provide input. Comments received were incorporated into the draft Plan and submitted to the Illinois Emergency Management Agency (IEMA) and FEMA for review and approval. |
| Task Eight: Final Plan | Comments received from IEMA and FEMA were incorporated in to the final Plan. The final Plan was then submitted to the County and participating jurisdictions for adoption. The Plan will be reviewed periodically and updated again in five years. |

The normal planning process generally takes 12 to 14 months to complete. Due to changes in the funding mechanism, the process was compressed and accelerated to ensure the draft Plan was completed and submitted to IEMA no later than May 31, 2020. To accommodate this schedule, three Planning Committee meetings instead of five were conducted and additional coordination was handled via verbal and written correspondence.

The accelerated schedule was further complicated by the Covid-19 outbreak in the winter/spring of 2020. Executive orders 2020-10, 2020-18 and 2020-32 issued and extended stay-at-home order and prohibited any gatherings of more than 10 people from Saturday March 21 through Sunday, May 31, 2020. As a result the third Planning Committee meeting was not conducted in the traditional manner and was instead handled as a teleconference.

The Plan and development was led at the staff level by Pamela Jacobs, the Effingham County Emergency Management Agency (EMA) Emergency Manager. American Environmental Corp. (AEC), an environmental consulting firm, with experience in hazard mitigation, risk assessment and public involvement, was employed to guide the County and participating jurisdictions through the planning process.

Participation in the planning process, especially by the County and local government representatives, was crucial to the development of the Plan. To ensure that all participating jurisdictions took part in the planning process, participation requirements were established. Each participating jurisdiction agreed to satisfy the following requirements in order to be included in the Plan. All of the participating jurisdictions met the participation requirements.

- Attend at least one of the three Planning Committee meetings.
- Identify/submit a list of documents (i.e., plans, studies, reports, maps, etc.) relevant to the natural hazard mitigation planning process.
- Identify/submit a list of critical infrastructure and facilities.
- Review the risk assessment and provide additional information on events and damages when available.
- Participate in the of the mitigation goals.
- Submit a list of mitigation actions started and/or completed since the adoption of the original Plan.
- Identify and submit a list of new mitigation actions.
- Review and comment on the draft Plan.
- Formally adopt the Plan.
- Where applicable, incorporate the Plan into existing planning efforts.
- Participate in the Plan maintenance.

## 2.1 PLANNING COMMITTEE

As previously mentioned, at the start of the planning process, the Effingham County Multi-Jurisdictional Natural Mitigation Planning Committee was formed to develop the hazard mitigation plan. The Planning Committee included representatives from each participating jurisdiction, as well as emergency services (American Red Cross, fire and law enforcement), business, education and healthcare.

**Figure PP-2** details the entities represented on the Planning Committee and the individuals who attended on their behalf. The Planning Committee was chaired by the Effingham County EMA.

## Figure PP-2
## Effingham County Planning Committee Member Attendance Record

| Representing | Name | Title | 11/18/2019 | 2/27/2020 | 5/19/2020 |
|---|---|---|---|---|---|
| Altamont, City of | Milleville, Dan | Commissioner | X | | |
| Altamont, City of | Rippetoe, Jason | Mayor | X | | |
| American Environmental Corp. | Bostwick, Andrea | Senior Project Manager | X | X | |
| American Environmental Corp. | Krug, Zachary | Environmental Specialist | X | X | |
| American Red Cross | Bryant, Brad | Disaster Relief | | X | |
| American Red Cross | Goodwin, Valerie | Disaster Program Manager | X | | |
| Beecher City CUSD #20 | Lark, Philip | Superintendent | X | | |
| Beecher City, Village of | Felty, Rita | Village President | X | | |
| Beecher City, Village of | Wood, Leslie | Trustee | | X | |
| Dieterich Fire Protection District | Martin, Ross | Fire Chief | | X | |
| Dieterich, Village of | Hardiek, Brad | President | | X | |
| Effingham County - Board | Campbell, David | Vice Chairman | X | | |
| Effingham County - Board | McCain, Doug | Board Member | X | | |
| Effingham County - Board | Mumma, Heather | Board Member | X | | |
| Effingham County - Board | Niemann, James | Board Chairman | X | X | |
| Effingham County - Board | Arnold, Rob | Board Member | X | X | |
| Effingham County - Coroner's Office | Hoene, Karen | Deputy Coroner | | X | |
| Effingham County - Coroner's Office | Rhodes, Kim | Coroner | X | X | |
| Effingham County - EMA | Boone, Jill | Volunteer | | X | |
| Effingham County - EMA | Bullard, Kevin | Commander | X | | |
| Effingham County - EMA | Jacobs, Pam | Emergency Manager | X | X | |
| Effingham County - EMA | Wright, Jim | Volunteer Coordinator | X | | |
| Effingham County - GIS | Zerrusen, Jill | Manager | X | X | |
| Effingham County - Health Department | Feldkamp, Karen | Emergency Preparedness Coordinator | X | X | |
| Effingham County - Highway Department | Hoene, Trent | Highway Maintenance | X | X | |
| Effingham County - Highway Department | Koester, Greg | County Engineer | X | | |
| Effingham County - LEPC | Toops, Phil | Public Transportation - Compliance & Oversight | X | X | |
| Effingham County - Sheriff's Office | Mahon, David | Sheriff | X | X | |
| Effingham County - Supervisor of Assessment's Office | Braun, Pam | Supervisor of Assessments | X | | |
| Effingham Daily News | Mills, Charles | Reporter / Videographer | | X | |
| Effingham, City of | Miller, Steve | City Administrator | X | X | |
| Effingham, City of | Tegeler, Kim | EMA Coordinator | X | | |
| Effingham, City of | Tutko, Bob | Fire Chief | X | X | |
| Fayette County Health Department | Craig, Kendra | Health Educator / PHEP | X | | |
| HSHS St. Anthony | Murbarger, Deb | ER Director | | X | |
| Illinois Department of Agriculture | Ballman, Mark | Field Veterinarian | X | | |
| Illinois Emergency Management Agency | Croy, Adam | Regional Coordinator, Region 9 | | X | |
| MABAS 54 | Agney, Troy | President | | X | |
| Mason, Town of | Flowers, Don | Mayor | X | X | |
| Mound Township | Schultz, Rodney | Highway Commissioner | X | X | |
| Mound Township | Simpson, Jeffrey | Board Member | X | | |
| National Trails Radio | Cordes, Byron | Representative | | X | |
| Servpro of Effingham | Remm, Chuck | Marketer | X | | |
| Shumway, Village of | Helmbacher, Derrick | Clerk | X | X | |
| Teutopolis Township | Rauch, Tom | Highway Commissioner | X | | |
| Teutopolis Township | Semple, Charles | Trustee | | X | |
| Teutopolis, Village of | Hess, Greg | Village President | | X | |
| Tri-County Fire Protection District | Lorton, Janet | Member | X | | |
| Tri-County Fire Protection District | Niccum, Angie | Executive Assistant | X | X | |
| Watson Fire Protection District | Percival, Darren | Fire Chief | | X | |
| Watson Township | Arnold, Rob | Clerk | X | X | |
| Watson Township | Bergfeld, Stephen | Highway Commissioner | X | X | |
| Watson, Village of | Freeman, Tom | Village Clerk | X | X | |

Additional technical expertise was provided by the staff at the Illinois Emergency Management Agency, Illinois Emergency Management Agency Region 9, Illinois Department of Natural Resources Office of Water Resources, Illinois Environmental Protection Agency and MABAS 54.

***Mission Statement***

Based on early communications with Planning Committee members, a draft mission statement was developed that described their objectives for the Plan and distributed electronically for review. The Planning Committee then reviewed the mission statement at the first meeting and approved it with no changes.

*"The mission of the Effingham County Multi-Jurisdictional All Hazards Mitigation Planning Committee is to develop a mitigation plan that documents projects and activities to reduce the negative impacts of natural and man-made hazards on citizens, infrastructure, private property and critical facilities."*

***Planning Committee Meetings***

The Planning Committee met three times between November 2019 and May 2020. **Figure PP-2** identifies the representatives present at each meeting. **Appendices A** and **B** contain copies of the attendance sheets and meeting minutes for each meeting. The purpose of each meeting, including the topics discussed, is provided below.

As mentioned previously, the process was compressed and accelerated to ensure the draft Plan was completed and submitted to IEMA no later than May 31, 2020. To accommodate this schedule, three Planning Committee meetings instead of five were conducted and additional coordination was handled via verbal and written correspondence.

As a result of the Covid-19 outbreak in the Winter/Spring 2020, the third Planning Committee meeting was not conducted in the traditional manner. Instead it was handled via teleconference to comply with the stay-at-home order and gathering restrictions.

*First Planning Committee Meeting – 11/18/2019*

At this meeting the planning process was explained to the Planning Committee members, including a brief overview of what a natural hazards mitigation plan is, why it needs to be developed, and the benefits. As part of the plan development, representatives for the County and the participating jurisdictions were asked to complete the forms entitled "List of Existing Planning Documents," "Critical Facilities" and "Identification of Severe Weather Shelters" and return them before the next meeting. Copies of a "Hazard Events Questionnaire," "Damages to Critical Facilities Damage Questionnaire" and "Citizen Questionnaire" were also distributed.

Committee members were asked to identify any natural hazard events that have occurred within the County. A discussion regarding the hazards to be included in the Plan was conducted and Committee members chose not to include landslides or mine subsidence due to their limited impact on the people and infrastructure within the County. Portions of the draft natural hazard risk assessment section were then presented for review.

Following the review of risk assessment, the Planning Committee members participated in an exercise to help calculate the Risk Priority Index which can assist participants in determining hazards present the highest risks and therefore which ones to focus on when formulating mitigation projects and activities.

Next, mitigation actions were defined and examples were discussed. As part of the plan development, individual mitigation action lists will be created for each participating jurisdiction. Ideas for potential mitigation projects and activities were presented. Representatives for the County and the participating jurisdictions were asked to complete the form entitled "Hazard Mitigation Projects" and return them before the next meeting.

Drafts of the mission statement and mitigation goals were presented for review. After a discussion, the Planning Committee chose to finalize both with no revisions.

Finally, community participation was discussed. The County and participating jurisdictions were asked to make information available on the planning process at their offices and in their communities.

*Second Planning Committee Meeting – 02/27/2020*

At this meeting a summary of the County's man-made hazards risk assessment was presented for review. The Planning Committee members then discussed vulnerable community assets and completed the form entitled "Critical Facilities Vulnerability Survey" which will be used in the vulnerability analyses. The results of the Risk Priority Index exercise conducted at the previous meeting were presented. Thunderstorms with damaging winds scored the highest followed by severe winter storms, heavy rains and tornadoes.

Next, an explanation of what a mitigation actions prioritization methodology is was provided. The various ways that mitigation actions can be prioritized and example methodologies were discussed. The Planning Committee chose to use a methodology based on hazard frequency and degree of mitigation.

A presentation on how the mitigation projects and activities identified by the participating jurisdictions would be presented in the Plan was provided. Then, the Planning Committee members reviewed the draft jurisdiction-specific mitigation action tables which identified and prioritized the new mitigation projects and activities submitted by the participants. Members were given the opportunity to add additional projects and activities to their tables.

The sections outlining the mitigation strategy and plan maintenance were also reviewed. The participating jurisdictions will meet annually to monitor the status of the mitigation projects and activities, evaluate the effectiveness of the Plan and provide information on the events that have occurred since the committee met previously. The Plan must be reviewed, revised and resubmitted to IEMA and FEMA at least once every five years. The public forum and adoption process were then discussed, and a date for the public forum was set.

*Third Planning Committee Meeting – 05/19/2020*
At this Planning Committee meeting the public was provided the opportunity to participate in a teleconference and given the opportunity to ask questions about the draft Plan which was made available online.

## 2.2 PUBLIC INVOLVEMENT

To engage the public in the planning process, a comprehensive public involvement strategy was developed. The strategy was structured to engage the public in a two-way dialogue, encouraging the exchange of information throughout the planning process. A mix of public involvement techniques and practices were utilized to:

- disseminate information;
- identify additional useful information about natural hazard occurrences and impacts;
- assure that interested residents would be involved throughout the Plan's development; and
- cultivate ownership of the Plan, thus increasing the likelihood of adoption by the participating jurisdictions.

The dialogue with the public followed proven risk communication principles to help assure clarity and avoid overstating or understating the impacts posed by the natural hazards identified in the Plan. The following public involvement techniques and practices were applied to give the public an opportunity to access information and participate in the dialogue at their level of interest and availability.

***Citizen Questionnaire***
A citizen questionnaire was developed to gather facts and gauge public perceptions about natural hazards that affect Effingham County. The questionnaire was distributed to the Planning Committee members who were encouraged to make it to their residents. A copy of the questionnaire is contained in **Appendix C**.

A total of twenty-three (23) questionnaires were completed and returned to the Planning Committee. Questionnaires were completed by residents in each participating jurisdiction, with the exception of Shumway. These responses provide useful information to decision makers as they determine how best to disseminate information on natural hazards and safeguard the public. Additionally, these responses identify the types of projects and activities the public is most likely to support. The following provides a summary of the results.

- Respondents felt that severe summer weather was the most frequently encountered natural hazard in Effingham County followed by severe winter storms, flooding, and extreme heat. These results are consistent with the weather records compiled for the County and as described in this Plan.
- The most effective means of communication identified by respondents to disseminate information about natural hazards were social media (Facebook, Twitter, etc.) and the internet followed closely by radio and the Municipal / County Government. Information disseminated via the mail and fact sheets/ brochures also received strong support among respondents.

- ❖ In terms of the most needed mitigation projects and activities, the following four categories received the strongest support:
  - ➢ install/maintain sirens and other alert systems (70%);
  - ➢ maintain power during storms by burying power lines, trimming trees and/or purchasing backup generators (65%);
  - ➢ maintain roadway passages during snow storms and heavy rains (55%);
  - ➢ retrofit critical infrastructure (50%).

***FAQ Fact Sheet***

A "Frequently Asked Questions" fact sheet was created and disseminated to help explain what a natural hazards mitigation plan is and briefly described the planning process. The fact sheet was made available at the participating jurisdictions. A copy of the fact sheet is contained in **Appendix D**.

***Press Releases***

Press releases were prepared and submitted to local media outlets prior to each Planning Committee meeting. The releases announced the purpose of the meetings and how the public could become involved in the Plan's development. **Appendix E** contains a list of the media outlets that received the press releases while copies of the releases and any news articles published can be found in **Appendix F**.

***Planning Committee Meetings***

All of the meetings conducted by the Planning Committee were open to the public and publicized in advance to encourage public participation. At the end of each meeting, time was set aside for public comment. In addition, Committee members were available throughout the planning process to talk with residents and local government officials and were responsible for relaying any concerns and questions voiced by the public to the Planning Committee.

***Public Forum***

Due to the Covid-19 outbreak, the final meeting of the Planning Committee which was to be held as an open house public forum on Tuesday, April 14, 2020 was cancelled. Executive Orders 2020-10, 2020-18 and 2020-32 issued and extended a stay-at-home order and prohibited any gatherings of more than 10 people from Saturday, March 21 through Sunday, May 31, 2020. Given the May 31 plan submission deadline and the extension of the stay-at-home order, IEMA and FEMA agreed to allow the County to conduct the public forum via teleconference and place the draft Plan for review and comment.

At the public forum teleconference, held on Tuesday, May 19, a brief summary of the planning process was provided; the Plan's availability was discussed and individuals were given the opportunity to ask questions or provide comments. Individuals participating in the public forum were provided a two-page handout summarizing the planning process and directed to an online comment survey that could be used to provide feedback on the draft Plan. **Appendices G** and **H** contain copies of these materials.

***Public Comment Period***

The draft Plan was made available for public review and comment on the County's website from May 19 through May 26, 2020. Those unable to access the Plan via the website were directed to contact the Effingham County EMA Emergency Manager to view a paper copy of the Plan. Individuals were encouraged to submit their comments electronically.

***Results of Public Involvement***

The public involvement strategy implemented during the planning process created a dialogue among participants and interested residents, which resulted in many benefits, a few of which are highlighted below.

- *Acquired additional information about natural hazards.* Verifiable hazard event and damage information was obtained from participants that presents a clearer assessment of the extent and magnitude of natural hazards that have impacted the County.
- *Obtained critical facilities damage information*. Data collection surveys soliciting information about critical facilities damaged by natural hazards were used to supplement information obtained from government databases. This information was vital to the preparation of the vulnerability analysis.
- *Increased awareness of the impacts associated with natural hazard events within the County*. Understanding how mitigation actions can reduce risk to life and property helped generate over ***120 mitigation projects and activities*** at the local level that had not been previously identified in any other planning process. In addition, two townships, seven municipalities and one school district chose to participate in the Plan's development.

## 2.3 PARTICIPATION OPPORTUNITIES FOR INTERESTED PARTIES

Businesses, schools, not-for-profit organizations, neighboring counties, and other interested parties were provided multiple opportunities to participate in the planning process. Wide-reaching applications were combined with direct, person-to-person contacts to identify anyone who might have an interest or possess information which could be helpful in developing the Plan.

***Business/ Community Organizations***

Input was sought from the business community to provide balance and context for discussions on property damages, not only to business, but also to residences. A representative from Servpro of Effingham and National Trails Radio served on the Planning Committee.

***Schools***

In Superintendent from Beecher City CUSD #20 served on the Planning Committee. He coordinated with other members of the district in considering what types of mitigation projects and activities would be most beneficial.

***Healthcare***

Input was sought from the healthcare community. Representatives from HSHS St. Anthony's and the Effingham County Health Department attended all the Planning Committee meetings and provided input into the planning process.

***Neighboring Counties***
A memo was sent to EMA/ESDA/OEM Emergency Managers in the neighboring counties inviting them to participate in the mitigation planning process. The counties contacted included Clay, Cumberland, Fayette, Jasper and Shelby. **Appendix I** contains a copy of the invitation memo.

## 2.4 INCORPORATING EXISTING PLANNING DOCUMENTS

As part of the planning process, the County and each participating municipality was asked to identify and provide existing documents (plans, studies, reports and technical information) relevant to the Plan update. **Figure PP-3** summarizes the availability of existing planning documents by participating jurisdiction. These documents were reviewed and incorporated into the Plan update whenever applicable.

Effingham County and most of the participating jurisdictions have limited resources and abilities to expand on and improve the existing policies and programs identified in Figure PP-3. This conclusion is based on an examination of their capabilities related to: staff and organization; technical capability; fiscal situation; policies and programs; present legal authority; and political resolve.

The lack of legal authority and policies/programs currently in place, especially with regards to building and zoning ordinances, hamper the participating jurisdictions' abilities to expand and strengthen existing policies and programs. Only two the participating jurisdictions have comprehensive plan in place. While four of the municipalities have building codes in place, the County and the remaining municipalities do not. A general resistance from many residents towards these types of regulations has resulted in an unwillingness by county and municipal officials to implement such policies. In addition, the fiscal and staffing situations of many of the participating jurisdictions are extremely limited, bordering on inadequate in some cases. Many local government officials are part-time and lack the technical expertise and funds to expand or implement new programs and policies.

Overcoming these limitations will require time and a range of actions including, but not limited to: improved general awareness of natural hazards and the potential benefits that may come from the development of new standards in terms of hazard loss prevention and the identification of resources available to expand and improve existing policies and programs should the opportunity arise. These actions have been initiated through the planning process, and some of the initial results are noted below.

- ***Awareness***. Participants in the Plan development process now have more information that they are sharing with residents about the damages caused by natural hazards. Before the development of the AHMP in Effingham County, knowledge about natural hazard damages was largely anecdotal and stored piecemeal in files not accessible by the general public. This shared information can help change attitudes and foster a collective understanding of the need to work on loss prevention.
- ***Planning & Economic Support***. Effingham County is a member of the South Central Illinois Regional Planning and Development Commission. This Commission provides planning support and assists members in obtaining grants and loans. Participants were made aware of the services offered by the Commission and encouraged to contact them.

- ***State Government Support***. During the Plan development process, the Planning Committee was told repeatedly how support for existing programs as well as funding for mitigation actions can come from sources other than IEMA and FEMA. Specific examples were provided to all participants. The Illinois Department of Agriculture (IDOA) and the Illinois Environmental Protection Agency (IEPA), and the Illinois Department of Natural Resources (IDNR), have helped other counties and municipalities with improving existing programs by filling the gaps when ordinances and funding is non-existent.

## Figure PP-3
## Existing Planning Documents by Participating Jurisdiction

| Existing Planning Documents | Participating Jurisdiction | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Effingham County | Beecher City | Dieterich | Effingham | Mason | Shumway | Teutopolis | Watson | Mound Township | Watson Township | Beecher City CUSD |
| **PLANS** | | | | | | | | | | | |
| **Municipal/County** | | | | | | | | | | | |
| Comprehensive Plan | | | X | | | | X | | | | |
| Emergency Management Plan | X | X | | X | | | | | | | |
| Land Use Plan | | | X | | | | X | X | | | |
| **Townships** | | | | | | | | | | | |
| Road/Bridge Improvement Plan | | | | | | | | | X | | |
| Park/Recreational Area Shelter Plan | | | | | | | | | | | |
| **School Districts** | | | | | | | | | | | |
| Strategic Plan | | | | | | | | | | | |
| Capital Improvement Plan | | | | | | | | | | | |
| Crisis Plan | | | | | | | | | | | X |
| **CODES & ORDINANCES** | | | | | | | | | | | |
| **Municipal/County** | | | | | | | | | | | |
| Building Codes | | X | | X | | | X | X | | | |
| Drainage Ordinances | | X | | X | | | X | X | | | |
| Historic Preservation Ordinance | | | | | | | | | | | |
| Subdivision Ordinance(s) | X | | X | X | | | X | X | | | |
| Zoning Ordinances | | | X | X | | | X | X | | | |
| **Townships** | | | | | | | | | | | |
| Building Codes | | | | | | | | | | | |
| Septic Ordinance/Sewage Disposal Plan | | | | | | | | | | | |
| **MAPS** | | | | | | | | | | | |
| **Municipal/County** | | | | | | | | | | | |
| Existing Land Use Map | | | X | X | | | X | X | | | |
| Infrastructure Map | X | | X | X | X | | X | | | | |
| Zoning Map | | | X | X | | | X | | | | |
| **Townships** | | | | | | | | | | | |
| Road/Bridge Map | | | | | | | | | X | | |
| Park/Recreation Map | | | | | | | | | | | |
| Zoning Map | | | | | | | | | | | |
| Transit System Route Map | | | | | | | | | | | |
| Food Pantry Location Map | | | | | | | | | | | |
| **School Districts** | | | | | | | | | | | |
| District Boundary Map | | | | | | | | | | | X |
| Floor Plan Map | | | | | | | | | | | X |
| **OTHER TECHNICAL DOCUMENTS** | | | | | | | | | | | |
| **Municipal/County** | | | | | | | | | | | |
| Flood Ordinance(s) | | | X | X | | | X | | | | |
| Flood Insurance Rate Maps | | | | X | | | X | | | | |
| Repetitive Flood Loss List | | | | | | | | | | | |
| Elevation Certificates for Buildings | | | | | | | X | | | | |
| **Townships** | | | | | | | | | | | |
| Property Tax Assessments | | | | | | | | | | | |
| Treasurer's Report | | | | | | | | | X | | |
| Food Pantry Location/User Report | | | | | | | | | | | |

# 3.0 RISK ASSESSMENT

Risk assessment is the process of evaluating the vulnerability of people, buildings and infrastructure in order to estimate the potential loss of life, personal injury, economic injury and property damage resulting from natural and man-made hazards. This section summarizes the results of the risk assessment conducted on the natural and man-made hazards in Effingham County. The information contained in this section was gathered by evaluating local, state and federal records from the last 30 to 70 years.

This risk assessment identifies the natural and man-made hazards deemed most important to the Planning Committee and includes a profile of each hazard that identifies past occurrences, the severity or extent of the events, and the likelihood of future occurrences. It also provides a vulnerability analysis which identifies the impacts to public health and property, evaluates the assets of the participating jurisdictions (i.e., residential buildings, critical facilities and infrastructure) and estimates the potential impacts each natural hazard would have on the health and safety of the residents as well as buildings, critical facilities and infrastructure. Where applicable, the differences in vulnerability between participating jurisdictions are described.

The subsequent sections provide detailed information on each of the selected natural hazards. The sections are color coded and ordered by the frequency with which the natural hazard has previously occurred within the County. Each natural hazard section contains three subsections: hazard identification, hazard profile and hazard vulnerability.

***Hazard Selection***

One of the responsibilities of the Planning Committee was to determine which hazards to include in the Plan. Over the course of the first two meetings, the Planning Committee members discussed their experiences with natural and man-made hazard events and reviewed information on various hazards. After much discussion, the Planning Committee chose to include the following hazards in this Plan:

- severe storms (thunderstorms, hail, lighting & heavy rain)
- severe winter storms (snow, ice & extreme cold)
- floods
- excessive heat
- tornadoes
- drought
- earthquakes
- dam failures
- man-made hazards including:
  - hazardous substances (generation, transportation & storage/handling)
  - waste disposal
  - hazardous materials incidents
  - waste remediation
  - terrorism

The Planning Committee chose not to include the following hazards in the Plan: levee failures, mine subsidence and landslides. According to the US Army Corps of Engineers, there are no levees located in Effingham County or any adjoining counties that have the potential to cause adverse impacts. A review of the USGS Landslide Susceptibility Viewer indicates that all of the County has a low incidence of landslides. The Illinois State Geological Survey's *Landslide*

*Inventory of Illinois* do not contain any instances of landslide in Effingham County and discussions with the Planning Committee did not reveal any isolated problems.

Sinkholes commonly occur in areas where carbonate rock formations characteristic of karst geology are present. Mapping prepared by the Illinois State Geological Survey (ISGS) shows that there are no karst geologic characteristics present in Effingham County. In Illinois land subsidence general occurs in areas where coal mining has been conducted. ISGS's *Coal Mines and Underground Industrial Mines* map shows that virtual no underground or surface mining has occurred previously in Effingham County.

***Risk Priority Index***

After reviewing the preliminary results of the risk assessment at the second meeting, Planning Committee members and the participating jurisdictions were asked to complete a Risk Priority Index (RPI) exercise for the hazards that have the potential to impact the County and participating jurisdictions. The RPI provides quantitative guidance for ranking the hazards and offers participants with another tool to determine which hazards present the highest risk and therefore which ones to focus on when formulating mitigation actions.

Each hazard was scored on three categories: 1) frequency, 2) impacts on life and health and 3) impacts on property and infrastructure. A scoring system was developed that assigned specific factors to point values ranging from 1 to 4 for each category. The higher the point value, the greater the risk associated with that hazard. **Figure R-1**, located at the end of this section, identifies the factors and point values associated with each category. Participants were asked to score the selected hazards based on the perspective of the entity they represented on the Planning Committee.

The Consultant took the point values assigned to each category and averaged the remaining results and came up with an overall value for each category. The values for each category were then added together to calculate a RPI score for each hazard. A ranking was then assigned to each hazard based on the RPI score. **Figures R-2** and **R-3**, located at the end of this section, provides the RPI scores and rankings for the County and participating municipalities while **Figure R-3** provides the scores and rankings for the participating special districts (townships and CUSD #20.)

***Critical Facilities & Infrastructure***

Critical facilities and infrastructure are structures, institutions and systems that are critical for life safety and economic viability and necessary for a community's response to and recovery from emergencies. The loss of function of any of these assets can intensify the severity of the impacts and speed of recovery associated a hazard event. Critical facilities and infrastructure may include, but are not limited to the following:

- ***Essential Facilities***: Facilities essential to the health and welfare of the whole population including hospitals and other medical facilities, police and fire stations, emergency operations centers, evacuation shelters and schools.
- ***Government Facilities***: Facilities associated with the continued operations of government services such as courthouses, city/village halls, township buildings and highway/maintenance centers.

- ***Infrastructure Systems***: Infrastructure associated with drinking water, wastewater, transportation (roads, railways, waterways), communication systems, electric power, natural gas and oil.
- ***Housing Facilities***: Facilities that serve populations that have access and function needs such as nursing homes, skilled and memory care facilities, residential group homes and day care centers.
- ***High Potential Loss Facilities***: Facilities that would have an impact or high loss associated with them if their functionality is compromised such as nuclear power plants, dams, levees, military installations and facilities housing industrial or hazardous materials.
- ***Gathering Places***: Facilities such as parks, libraries, community centers and churches.

As part of the planning process each participating jurisdiction completed a questionnaire identifying the critical facilities and infrastructure located within their jurisdiction, both publicly and privately-owned. **Figure R-4**, located at the end of this section, identifies the number of critical facilities and infrastructure located in each participating jurisdiction for select categories. Identifying these assets makes local leaders more aware of the critical facilities and infrastructure located within their jurisdictions and helps them make informed choices on how to better protect these key resources.

While considered "local government entities" for planning purposes, neither the townships or Beecher City Community Unit School District #20 (CUSD) have an extensive inventory of assets in which to consider when conducting the risk assessment. Beech City CUSD's critical facilities are all located within a participating municipality (Beecher City). Since the assets of the CUSD are located within a participating municipality and are a subset of this municipality's critical facilities, their risk is considered to be the same or similar to the risk experienced by the municipalities for those hazards that either impact the entire planning area or can occur at any location within the planning area (i.e., severe storms, severe winter storms, etc.) The same is true for the Mound and Watson Township buildings which are located in Altamont and Watson. For those hazards where the risk to the CUSD and the Mound and Watson Township buildings varies from the risk facing the municipalities, a separate narrative assessment will be provided under the appropriate hazard's vulnerability subsection.

Both townships also have critical facilities in unincorporated Effingham County. Their risk is considered to be the same or similar to the risk experienced by the County for those hazards that either impact the entire planning area or can occur at any location within the planning area (i.e., severe storms, severe winter storms, etc.) For those hazards where the risk to township critical facilities varies from the risk facing the planning area (i.e., County), a separate narrative assessment will be provided under the appropriate hazard's vulnerability subsection.

### *Critical Facilities Vulnerability Survey*

The participating jurisdictions were also asked to complete a Critical Facilities Vulnerability Survey at the second meeting to assist in the preparation of an overall summary of each jurisdiction's vulnerability to the studied hazards. The Survey asked participants to describe their jurisdiction's greatest vulnerability. This information is summarized under the appropriate hazard's vulnerability subsection.

**Figure R-1**
**Risk Priority Index Scoring System**

| Category | Factors | Point Value |
|---|---|---|
| Hazard Frequency | An event is anticipated to occur within the next year.<br>Based on previous history, at least one event is expected to occur in any given year. | 4 |
| | An event is likely to occur in the next 1 to 3 years.<br>Based on previous history, an event has at least a 33% chance of occurring in any given year. | 3 |
| | An event is possible in the next 3 to 10 years.<br>Based on previous history, an event has a 10% to 33% chance of occurring in any given year. | 2 |
| | An event is unlikely to occur within the next 10 years.<br>These events occur infrequently and based on previous history have a less than 10% chance of occurring in any given year. | 1 |
| Impacts on Life & Health | Fatalities are expected to occur during the event. | 4 |
| | While fatalities are unlikely, injuries, some requiring hospitalization, may occur during the event. | 3 |
| | Minor injuries not requiring hospitalization may occur during the event. | 2 |
| | Injuries or fatalities are unlikely to occur during the event. | 1 |
| Impacts on Property & Infrastructure | - Substantial property damage is likely to occur including damage to infrastructure and critical facilities.<br>AND/OR<br>- Loss of access/operations at multiple infrastructure and critical facilities (i.e., road & school closures, loss of power to drinking water/wastewater treatment facilities, municipal buildings, etc.) is anticipated for an extended period of time (i.e., a day or more). | 4 |
| | - Property damage is expected to occur including superficial damage to infrastructure and critical facilities.<br>AND/OR<br>- Loss of access/operations at multiple infrastructure and critical facilities is anticipated for a period of time (i.e., a day or less). | 3 |
| | - Some minor property damage is anticipated (i.e., shingles & siding torn off homes, windows broken, etc.) but no damage to infrastructure or critical facilities is anticipated.<br>AND/OR<br>- Loss of access/operations to infrastructure and critical facilities is anticipated but only for a short period of time (i.e. up to a couple hours). | 2 |
| | Property damage is likely to be negligible and no loss of access/operations is anticipated at any infrastructure/critical facilities during the event. | 1 |

## Figure R-2
## Risk Priority Index Scores by Hazard by County & Participating Municipalities

| Hazard | Participating Jurisdictions | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Effingham County | | Beecher City | | Dietrich | | Effingham (City) | | Mason | | Shumway | | Teutopolis | | Watson | |
| | RPI Score | Hazard Ranking | RPI Score | Hazard Ranking | RPI Score | Hazard Ranking | RPI Score | Hazard Ranking | RPI Score | Hazard Ranking | RPI Score | Hazard Ranking | RPI Score | Hazard Ranking | RPI Score | Hazard Ranking |
| Dam Failures | 5.0 | 15 | 3.0 | 14/15/16/17 | 3.0 | 13/14/15/16/17 | 5.7 | 13 | 5.0 | 11/12/13 | 3.0 | 12/13/14/15/16/17 | 3.0 | 13/14/15/16/17 | 3.0 | 17 |
| Drought | 5.6 | 12 | 5.0 | 10/11/12/13 | 4.0 | 11/12 | 5.3 | 14 | 7.0 | 5/6/7/8/9 | **10.0** | **1/2** | 5.0 | 9/10/11 | 5.0 | 11/12/13/14/15 |
| Earthquakes | 0.7 | 11 | 5.0 | 10/11/12/13 | **9.0** | **1/2/3** | 7.3 | 9/10 | 5.0 | 11/12/13 | 4.0 | 11 | 5.0 | 9/10/11 | 7.0 | 3/4/5 |
| Excessive Heat | 6.8 | 7 | 5.0 | 10/11/12/13 | 5.0 | 8/9/10 | 8.0 | 7/8 | 7.0 | 5/6/7/8/9 | 8.0 | 6 | **10.0** | **1** | 6.0 | 6/7/8/9/10 |
| Extreme Cold | 6.9 | 6 | 3.0 | 14/15/16/17 | 5.0 | 8/9/10 | 8.0 | 7/8 | 7.0 | 5/6/7/8/9 | 6.0 | 10 | 6.0 | 5/6/7/8 | 7.0 | 3/4/5 |
| Floods | 7.2 | 5 | 6.0 | 8/9 | 7.0 | 5/6 | 7.0 | 11/12 | **9.0** | **1/2/3/4** | 3.0 | 12/13/14/15/16/17 | 4.0 | 12 | 7.0 | 3/4/5 |
| Hail | 6.5 | 8/9 | 7.0 | 3/4 | 6.0 | 7 | 7.0 | 11/12 | 5.0 | 11/12/13 | 7.0 | 7/8/9 | 7.0 | 3/4 | 6.0 | 6/7/8/9/10 |
| HazMat Incidents: Transportation | 6.5 | 8/9 | **7.5** | **1/2** | 4.0 | 11/12 | 8.3 | 5/6 | 6.0 | 10 | 3.0 | 12/13/14/15/16/17 | 3.0 | 13/14/15/16/17 | 5.0 | 11/12/13/14/15 |
| HazMat Incidents: Fixed Facility | 5.3 | 13/14 | **7.5** | **1/2** | 3.0 | 13/14/15/16/17 | 8.3 | 5/6 | 4.0 | 14 | 8.0 | 7/8/9 | 6.0 | 5/6/7/8 | 4.0 | 16 |
| Heavy Rain | 7.7 | 3/4 | 6.5 | 5/6/7 | 8.0 | 4 | 7.3 | 9/10 | **9.0** | **1/2/3/4** | 9.0 | 3/4/5 | 7.0 | 3/4 | **8.0** | **2** |
| Levee Failures | 3.3 | 16 | 3.0 | 14/15/16/17 | 3.0 | 13/14/15/16/17 | 3.0 | 16/17 | 3.0 | 15/16/17 | 3.0 | 12/13/14/15/16/17 | 3.0 | 13/14/15/16/17 | 5.0 | 11/12/13/14/15 |
| Lightning | 6.4 | 5 | 6.0 | 8/9 | **9.0** | **1/2/3** | **8.7** | **2/3/4** | 3.0 | 15/16/17 | 7.0 | 7/8/9 | 6.0 | 5/6/7/8 | 6.0 | 6/7/8/9/10 |
| Mine Subsidence | 3.2 | 17 | 3.0 | 14/15/16/17 | 3.0 | 13/14/15/16/17 | 3.0 | 16/17 | 3.0 | 15/16/17 | 3.0 | 12/13/14/15/16/17 | 3.0 | 13/14/15/16/17 | 5.0 | 11/12/13/14/15 |
| Terrorism | 5.3 | 13/14 | 5.0 | 10/11/12/13 | 3.0 | 13/14/15/16/17 | 4.7 | 15 | 7.0 | 5/6/7/8/9 | 3.0 | 12/13/14/15/16/17 | 3.0 | 13/14/15/16/17 | 5.0 | 11/12/13/14/15 |
| Thunderstorms | **8.3** | **1** | 6.5 | 5/6/7 | 7.0 | 5/6 | **8.7** | **2/3/4** | **9.0** | **1/2/3/4** | 9.0 | 3/4/5 | **8.0** | **2** | 6.0 | 6/7/8/9/10 |
| Tornadoes | 7.7 | 3/4 | 7.0 | 3/4 | **9.0** | **1/2/3** | **9.0** | **1** | 7.0 | 5/6/7/8/9 | **10.0** | **1/2** | 6.0 | 5/6/7/8 | **10.0** | **1** |
| Winter Storms | **7.8** | **2** | 6.5 | 5/6/7 | 5.0 | 8/9/10 | **8.7** | **2/3/4** | **9.0** | **1/2/3/4** | 9.0 | 3/4/5 | 5.0 | 9/10/11 | 6.0 | 6/7/8/9/10 |

**Figure R-3**
**Risk Priority Index Scores by Hazard by Participating Special District**

| Hazard | Participating Jurisdictions | | | |
|---|---|---|---|---|
| | Mound Township | | Beecher City CUSD | |
| | RPI Score | Hazard Ranking | RPI Score | Hazard Ranking |
| Dam Failures | 4.0 | 13/14 | … | … |
| Drought | 4.0 | 13/14 | … | … |
| Earthquakes | 5.0 | 9/10/11/12 | 5.0 | 9/10 |
| Excessive Heat | 5.0 | 9/10/11/12 | 6.0 | 5/6/7/8 |
| Extreme Cold | 5.0 | 9/10/11/12 | 6.0 | 5/6/7/8 |
| Floods | **9.0** | **2/3** | 6.0 | 5/6/7/8 |
| HazMat Incidents: Transportation | 7.0 | 5/6/7 | n/a | n/a |
| HazMat Incidents: Fixed Facility | 7.0 | 5/6/7 | n/a | n/a |
| Hail | 7.0 | 5/6/7 | 6.0 | 5/6/7/8 |
| Heavy Rain | **9.0** | **2/3** | **7.0** | **1/2/3/4** |
| Levee Failures | 3.0 | 15/16/17 | n/a | n/a |
| Lightning | 5.0 | 9/10/11/12 | **7.0** | **1/2/3/4** |
| Mine Subsidence | 3.0 | 15/16/17 | … | … |
| Thunderstorms | 3.0 | 15/16/17 | **7.0** | **1/2/3/4** |
| Terrorism | **10.0** | **1** | n/a | n/a |
| Tornadoes | 8.0 | 4 | **7.0** | **1/2/3/4** |
| Winter Storms | 6.0 | 8 | 5.0 | 9/10 |

**Figure R-4**
**Critical Facilities & Infrastructure by Jurisdiction**

| Participating Jurisdiction | Critical Facilities | | | | Critical Infrastructure | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Government[1] | Emergency Protection[2] | Medical & Healthcare[3] | Schools | Drinking Water[4] | Wastewater Treatment[5] | Rail Lines | Bridges | Interstates US/State Routes & Key Roads | Power Plants | Comm. Systems |
| Effingham County | 4 | 3 | 1 | --- | --- | --- | 3 | --- | 8 | --- | 1 |
| Beecher City | 2 | 1 | --- | 2 | --- | 2 | --- | --- | 1 | --- | 1 |
| Dietrich | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | --- | 1 |
| Effingham | 1 | 5 | 22 | 7 | 6 | 2 | 2 | 5 | 9 | --- | 0 |
| Mason | 2 | 1 | 0 | 0 | 0 | 2 | 1 | 2 | 2 | --- | 1 |
| Shumway | 2 | 1 | 0 | 0 | 1 | 3 | 0 | 0 | 1 | --- | 1 |
| Teutopolis | 1 | 2 | 3 | 3 | 5 | 6 | 0 | 0 | 4 | --- | 0 |
| Watson | 2 | 1 | 0 | 0 | 1 | 3 | 1 | 0 | 3 | --- | 0 |
| Beecher City CUSD | --- | --- | --- | 2 | --- | --- | --- | --- | --- | --- | --- |
| Mound Township | 2 | --- | --- | --- | --- | --- | 2 | --- | 4 | --- | --- |
| Watson Township | | | | | | | | | | | |

[1] Government includes: courthouses, city/village halls, township buildings, highway/road maintenance centers, libraries, etc.
[2] Emergency Protection includes: sheriff's department, police, fire, ambulance, emergency operations centers, jail/correctional facilities and evacuation shelters.
[3] Medical & Healthcare includes: public health departments, hospitals, urgent/prompt care and medical clinics, nursing homes, skilled nursing facilities, memory care facilities, residential group homes, etc.
[4] Drinking Water includes: drinking water treatment plants, drinking water wells and water storage towers/tanks.
[5] Wastewater Treatment includes: wastewater treatment plants and lift stations.
--- Indicates the jurisdiction does not own/maintain any critical facilities within that category.

## 3.1 SEVERE STORMS (THUNDERSTORMS, HAIL, LIGHTNING & HEAVY RAIN)

### HAZARD IDENTIFICATION

**What is the definition of a severe storm?**

The National Oceanic and Atmospheric Administration's (NOAA) National Weather Service (NWS) defines a "severe storm" as any thunderstorm that produces one or more of the following:

- winds with gust of 50 knots (58 mph) or greater;
- hail that is at least one inch in diameter (quarter size) or larger; and/or
- a tornado.

While severe storms are capable of producing deadly lightning and heavy rain that may lead to flash flooding, the NWS does not use either to define a severe storm. However, a discussion of both lightning and heavy rain is included in this section because both are capable of causing extensive damage. For the purposes of this report, tornadoes and flooding are categorized as separate hazards and are not discussed under severe storms.

**What is a thunderstorm?**

A thunderstorm is a rain shower accompanied by lightning and thunder. An average thunderstorm is approximately 15 miles in diameter, affecting a relatively small area when compared to winter storms or hurricanes, and lasts an average of 30 minutes. Thunderstorms can bring heavy rain, damaging winds, hail, lightning and tornadoes.

There are four basic types of thunderstorms: single-cell, multi-cell, squall line, and supercell. The following provides a brief description of each.

*Single-cell Thunderstorm*

Single cell storms are small, weak storms that only last about ½ hour to an hour and are not usually considered severe. They are typically driven by heating on a summer afternoon. Occasionally a single cell storm will become severe, but only briefly. When this happens, it is called a pulse severe storm.

*Multi-cell Thunderstorm*

Multi-cell storms are the most common type of thunderstorms. A multi-cell storm is organized in clusters of at least two to four short-lived cells. Each cell usually lasts 30 to 60 minutes while the system as whole may persist for many hours. Multi-cell storms may produce hail, strong winds, brief tornadoes, and/or flooding.

*Squall Line*

A Squall line is a group of storms arranged in a line, often accompanied by "squalls" of high wind and heavy rain. The line of storms can be continuous or there can be gaps and breaks in the line. Squall lines tend to pass quickly and can be hundreds of miles long but are typically only 10 to 20 miles wide. A "bow echo" is a radar signature of a squall line that "bows out" as winds fall behind the line and circulation develops on either end.

*Supercell Thunderstorm*

Supercell storms are long-lived (greater than one hour) and highly organized storms that feed off a rising current of air (an updraft). The main characteristic that sets a supercell storm apart from other thunderstorm types is the presence of rotation in the updraft. The rotating updraft of a supercell (called a mesocyclone when visible on radar) helps a supercell storm produce extreme weather events. Supercell storms are potentially the most dangerous storm type and have been observed to generate the vast majority of large and violet tornadoes, as well as downburst winds and large hail.

Despite their size, all thunderstorms are dangerous and capable of threatening life and property. Of the estimated 100,000 thunderstorms that occur each year in the United States, roughly 10% are classified as severe.

**What kinds of damaging winds are produced by a thunderstorm?**

Aside from tornadoes, thunderstorms can produce straight-line winds. A straight-line wind is defined as any wind produced by a thunderstorm that is not associated with rotation. There are several types of straight-line winds including downdrafts, downbursts, microbursts, gust fronts and derechos.

Damage from straight-line winds is more common than damage from tornadoes and accounts for most thunderstorm wind damage. Straight-line wind speeds can exceed 87 knots (100 mph), produce a damage pathway extending for hundreds of miles and can cause damage equivalent to a strong tornado.

The NWS measures a storm's wind speed in knots or nautical miles. A wind speed of one knot is equal to approximately 1.15 miles per hour. **Figure SS-1** shows conversions from knots to miles per hour for various wind speeds.

**Figure SS-1**
**Wind Speed Conversions**

| Knots (kts) | Miles Per Hour (mph) | Knots (kts) | Miles Per Hour (mph) |
|---|---|---|---|
| 50 kts | 58 mph | 60 kts | 69 mph |
| 52 kts | 60 mph | 65 kts | 75 mph |
| 55 kts | 63 mph | 70 kts | 81 mph |
| 58 kts | 67 mph | 80 kts | 92 mph |

**What is hail?**

Hail is precipitation in the form of spherical or irregular-shaped pellets of ice that occur within a thunderstorm when strong rising currents of air (updrafts) carry raindrops upward into extremely cold areas of the atmosphere where they freeze into ice.

Hailstones grow by colliding with supercooled water drops. The supercooled water drops freeze on contact with ice crystals, frozen rain drops, dust, etc. Thunderstorms with strong updrafts continue lifting the hailstones to the top of the cloud where they encounter more supercooled

water and continue to grow. Eventually the updraft can no longer support the weight of the hail or the updraft weakens and the hail falls to the ground.

In the United States, hail causes more than $1 billion in damages to property and crops annually. Hail has been known to cause injuries, although it rarely causes fatalities or serious injury.

**How is the severity of a hail event measured?**

The severity or magnitude of a hail event is measured in terms of the size (diameter) of the hailstones. The hail size is estimated by comparing it to known objects. **Figure SS-2** provides descriptions for various hail sizes.

**Figure SS-2**
**Hail Size Descriptions**

| Hail Diameter (inches) | Description | Hail Diameter (inches) | Description |
|---|---|---|---|
| 0.25 in. | pea | 1.75 in. | golf ball |
| 0.50 in. | marble/mothball | 2.50 in. | tennis ball |
| 0.75 in. | penny | 2.75 in. | baseball |
| 0.88 in. | nickel | 3.00 in. | tea cup |
| 1.00 in. | quarter | 4.00 in. | grapefruit |
| 1.50 in. | ping pong ball | 4.50 in. | softball |

Source: NOAA, National Severe Storm Laboratory.

Hail size can vary widely. Hailstones may be as small as 0.25 inches in diameter (pea-sized) or, under extreme circumstances, as large as 4.50 inches in diameter (softball-sized). Typically hail that is one (1) inch in diameter (quarter-sized) or larger is considered severe.

The severity of a hail event can also be measured or rated using the TORRO Hailstorm Intensity Scale. This scale was developed in 1986 by the Tornado and Storm Research Organisation of the United Kingdom. It measures the intensity or damage potential of a hail event based on several factors including: maximum hailstone size, distribution, shape and texture, numbers, fall speed and strength of the accompanying winds.

The Hailstorm Intensity Scale identifies ten different categories of hail intensity, H0 through H10. **Figure SS-3** gives a brief description of each category. This scale is unique because it recognizes that, while the maximum hailstone size is the most important parameter relating to structural damage, size alone is insufficient to accurately categorize the intensity and damage potential of a hail event.

It should be noted that the typical damage impacts associated with each intensity category reflect the building materials predominately used in the United Kingdom. These descriptions may need to be modified for use in other countries to take into account the differences in building materials typically used (i.e., whether roofing materials are predominately shingle, slate or concrete, etc.).

**Figure SS-3**
**TORRO Hailstorm Intensity Scale**

| Intensity Category | | Typical Hail Diameter | | Description | Typical Damage Impacts |
|---|---|---|---|---|---|
| | | millimeters (approx.)* | inches (approx.)* | | |
| H0 | Hard Hail | 5 mm | 0.2” | pea | no damage |
| H1 | Potentially Damaging | 5-15 mm | 0.2” – 0.6” | pea / mothball | slight general damage to plants, crops |
| H2 | Significant | 10-20 mm | 0.4” – 0.8” | dime / penny | significant damage to fruit, crops, vegetation |
| H3 | Severe | 20-30 mm | 0.8” – 1.2” | nickel / quarter | severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored |
| H4 | Severe | 25-40 mm | 1.0” – 1.6” | half dollar / ping pong ball | widespread glass damage, vehicle bodywork damage |
| H5 | Destructive | 30-50 mm | 1.2” – 2.0” | golf ball | wholesale destruction of glass, damage to tiled roofs, significant risk of injuries |
| H6 | Destructive | 40-60 mm | 1.6” – 2.4” | golf ball / egg | bodywork of grounded aircraft dented, brick walls pitted |
| H7 | Destructive | 50-75 mm | 2.0” – 3.0” | egg / tennis ball | severe roof damage, risk of serious injuries |
| H8 | Destructive | 60-90 mm | 2.4” – 3.5” | tennis ball / tea cup | severe damage to aircraft bodywork |
| H9 | Super Hailstorms | 75-100 mm | 3.0” – 4.0” | tea cup / grapefruit | extensive structural damage, risk of severe or even fatal injuries to persons caught in the open |
| H10 | Super Hailstorms | > 100 mm | > 4.0” | softball | extensive structural damage, risk of severe or even fatal injuries to persons caught in the open |

* Approximate range since other factors (i.e., number and density of hailstones, hail fall speed and surface wind speed) affect severity.

Source: Tornado and Storm Research Organisation, TORRO Hailstorm Intensity Scale Table.

**What is lightning?**

Lightning, a component of all thunderstorms, is a visible electrical discharge that results from the buildup of charged particles within storm clouds. It can occur from cloud-to-ground, cloud-to-cloud, within a cloud or cloud-to-air. The air near a lightning strike is heated to approximately 50,000°F (hotter than the surface of the sun). The rapid heating and cooling of the air near the lightning strike causes a shock wave that produces thunder.

Lightning on average causes 60 fatalities and 400 injuries annually in the United States. Most fatalities and injuries occur when people are caught outdoors in the summer months during the afternoons and evenings. In addition, lightning can cause structure and forest fires. Many of the wildfires in the western United States and Alaska are started by lightning. According to the NWS lightning strikes cost more than $1 billion in insured losses each year.

**Are alerts issued for severe storms?**

Yes. The NWS Weather Forecast Office in Lincoln, Illinois is responsible for issuing ***severe thunderstorm watches*** and ***warnings*** for Effingham County depending on the weather conditions. The following provides a brief description of each type of alert.

- **Watch.** A severe thunderstorm watch is issued when severe thunderstorms are possible in or near the watch area. Individuals should stay alert for the latest weather information and be prepared to take shelter.
- **Warning.** A severe thunderstorm warning is issued when severe weather have been reported by spotters or indicated by radar. Warnings indicate imminent danger to life and property for those who are in the path of the storm and individuals should seek safe shelter.

## HAZARD PROFILE

The following identifies past occurrences of severe storms; details the severity or extent of each event (if known); identifies the locations potentially affected; and estimates the likelihood of future occurrences.

**When have severe storms occurred previously? What is the extent of these previous severe storms?**

**Tables 1, 2, 3 and 4**, located in **Appendix J,** summarize the previous occurrences as well as the extent or magnitude of severe storm events recorded in Effingham County. Severe storm events are separated into four categories: thunderstorms with damaging winds, hail, lightning and heavy rain. In Effingham County, severe storms are the most frequently occurring natural hazard.

**Severe Storms Fast Facts – Occurrences**

Number of recorded Thunderstorms with Damaging Winds (1973 - 2019): ***137***

Number of recorded Severe Hail Events (1955- 2019): ***36***

Number recorded of Lightning Strike Events (2017): ***1***

Number of Heavy Rain Events (1990 – 2019): ***181***

Highest Recorded Wind Speed: ***70 knots (February 5, 2008)***

Largest Hail Recorded: ***3.00 inches (May 6, 1971)***

Most Likely Month for Thunderstorms with Damaging Winds to Occur: ***June***

Most Likely Month for Severe Hail to Occur: ***April***

Most Likely Month for Heavy Rain to Occur: ***June***

Most Likely Time for Thunderstorms with Damaging Winds to Occur: ***Late Afternoon/Early Evening***

Most Likely Time for Severe Hail to Occur: ***Evening***

*Thunderstorms with Damaging Winds*

NOAA's Storm Events Database was used to document 137 reported occurrences of thunderstorms with damaging winds in Effingham County between 1973 and 2019. Of the 137 occurrences, 100 had reported wind speeds of 50 knots or greater. There were 37 occurrences, however, where the wind speed was not recorded.

The highest wind speed recorded in Effingham County occurred in Watson on February 5, 2008 when winds reached 70 knots (81 mph) during a thunderstorm event. Thunderstorms with damaging winds have been *recorded* in every participating jurisdiction within the County on multiple occasions.

**Figure SS-4** charts the reported occurrences of thunderstorms with damaging winds in Effingham County by month. Of the 137 events, 90 (66%) took place in May, June, and July making this the peak period for thunderstorms with damaging winds in Effingham County. Of the 137 events, 38 (28%) occurred during June, making this the peak month for thunderstorms with damaging winds.

**Figure SS-4**
**Thunderstorms with Damaging Winds by Month**
**1973 - 2019**

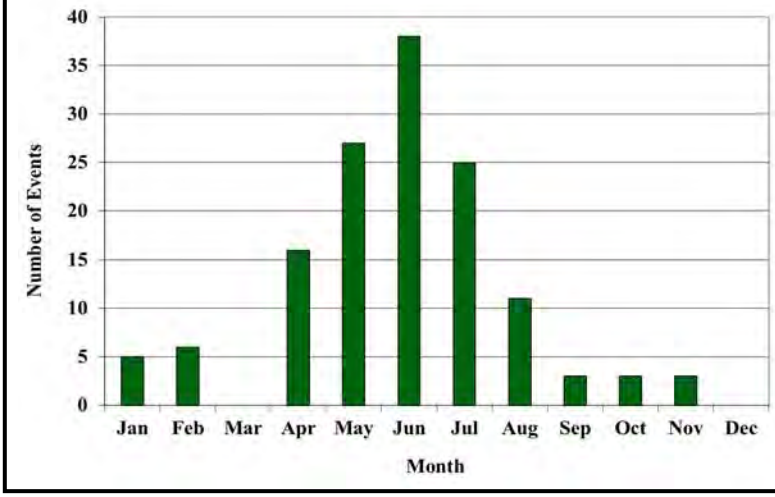
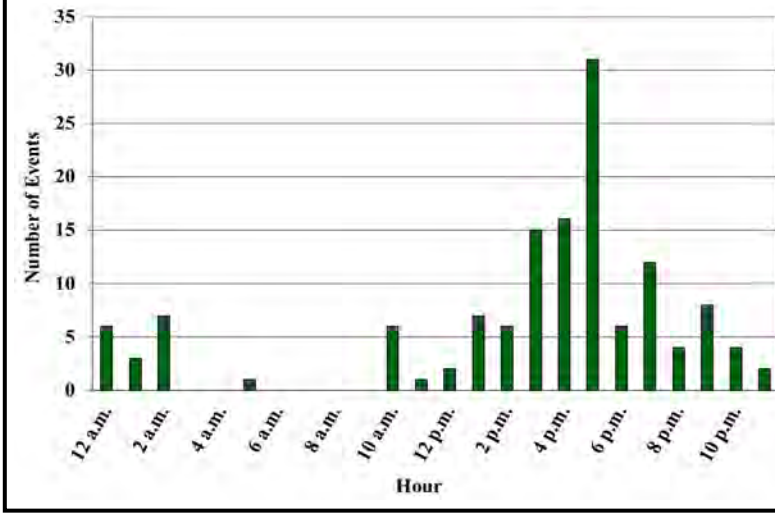



**Figure SS-5** charts the reported occurrences of thunderstorms with damaging winds by hour. Of the 137 occurrences, approximately 82% of all thunderstorms with damaging winds occurred during the p.m. hours, with 80 of the events (58%) taking place between 3 p.m. and 8 p.m.

**Figure SS-5**
**Thunderstorms with Damaging Winds by Hour**
**1973 - 2019**




*Hail*

NOAA's Storm Events Database was used to document 36 reported occurrences of severe storms with hail one (1) inch in diameter or greater in Effingham County between 1955 and 2019. Of the 36 occurrences, 16 produced hailstones 1.50 inches or larger in diameter.

The largest hail stones documented in Effingham County measured 3 inches in diameter (tennis ball sized) and fell on May 6, 1971 near Shumway. Hail one (1) inch in diameter or greater has been *recorded* in every participating jurisdction on at least one occasion.

**Figure SS-6** charts the reported occurrences of hail by month. Of the 36 occurrences, 25 (69%) took place in April, May, and June making this the peak period for hail in Effingham County. Of the 36 events, 14 (39%) occurred during April, making this the peak month for hail events.

**Figure SS-6**
**Hail Events by Month**
**1955 - 2019**

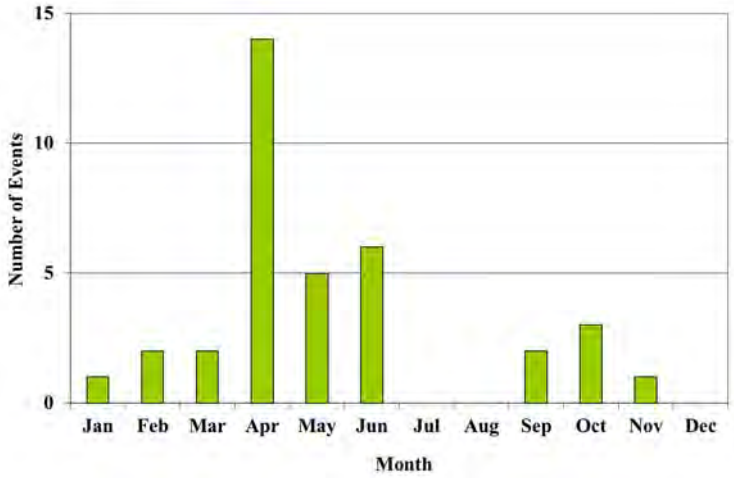



**Figure SS-7** charts the reported occurrences of hail by hour. Approximately 81% of all the hail events occurred during the p.m. hours, with 11 of the events (31%) taking place between 6 p.m. and 8 p.m.

*Lightning*

While lightning strike events occur regularly across east central Illinois, Planning Committee member records could only verify one *recorded* lightning strike event for Effingham County. This is almost certainly due to the rural nature of the County. This does not mean that lightning strike events aren't occurring, it simply means that they aren't being recorded.

According to data from Vaisala's National Lightning Detection Network, Effingham County averaged close to 12 to 20 cloud-to-ground lightning flashes per square mile annually between 2009 and 2018. **Figure SS-8** illustrates the cloud-to-ground lightning flash density (number of cloud-to-ground flashes per square mile per year) by county for the continental United States. In comparison, Illinois averaged 12.7 cloud-to-ground lightning flashes per square mile from 2009 to 2018, ranking it eighth in the Country for lightning flash density.

**Figure SS-7**
**Hail Events by Hour**
**1955 - 2019**

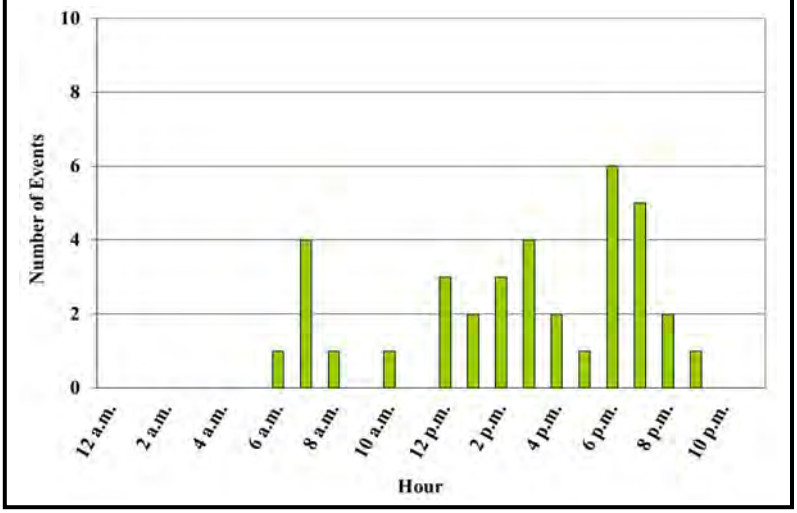
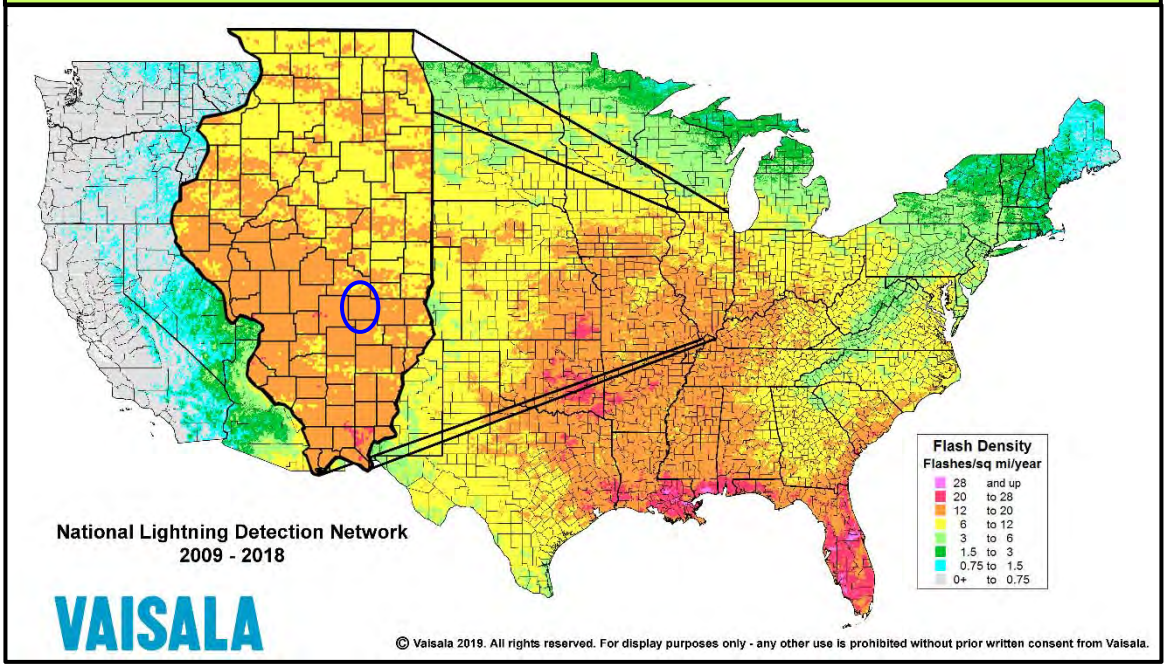



**Figure SS-8**
**Cloud-to-Ground Lightning Flash Density: Continental United States**




*Heavy Rain*

National Weather Service's COOP data records have documented 181 reported occurrences of heavy rain in Effingham County between 1990 and 2019. Of the 181 occurrences, 52 events (29%) produced three inches or more of rain.

**Figure SS-9** charts the reported occurrences of heavy rain by month. Of the 181 events, 71 (39%) took place in May, June, and July making this the peak period for heavy rain in Jo Daviess County. Of the 181 events, 26 (14%) occurred during June, making this the peak month for heavy rains.

**Figure SS-9**
**Heavy Rain Events by Month**
**1990 - 2019**

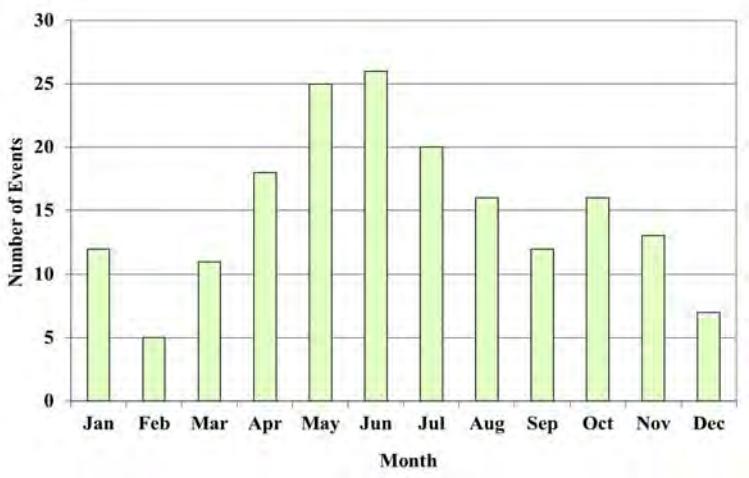
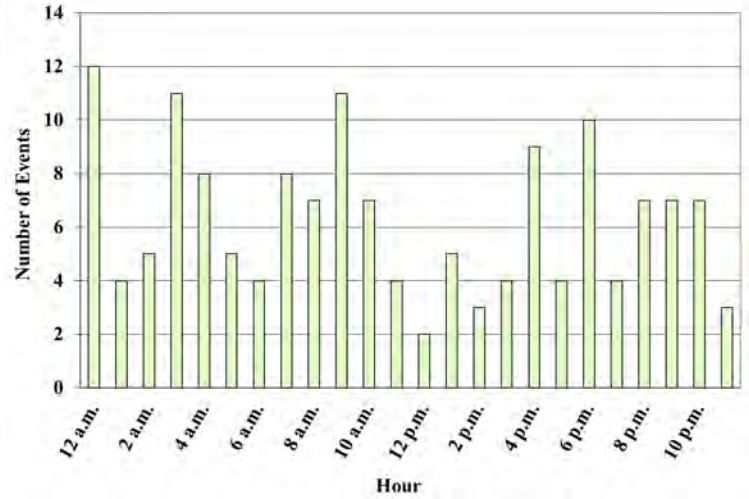



**Figure SS-10** charts the reported occurrences of heavy rain by hour. Of the 181 occurrences, start times were unavailable for 30 events. Of the remaining 151 events with recorded times, approximately 57% occurred during the a.m. hours. Forty of the events (26%) took place between 12 a.m. and 5 a.m.

**Figure SS-10**
**Heavy Rain Events by Hour**
**1990 - 2019**



**What locations are affected by severe storms?**

Severe storms affect the entire County. A single severe storm event will generally extend across the entire County and affect multiple locations. The *2018 Illinois Natural Hazard Mitigation Plan* prepared by the Illinois Emergency Management Agency (IEMA) classifies Effingham County's hazard rating for severe storms as "severe." (IEMA's overall hazard rating system has five levels: very low, low, medium, high and severe.)

**What is the probability of future severe storm events occurring?**

*Thunderstorms with Damaging Winds*

Effingham County has had 137 verified occurrences of thunderstorms with damaging winds between 1973 and 2019. With 137 occurrences over the past 47 years, Effingham County should expect to experience approximate three thunderstorms with damaging winds each year. There were 23 years over the last 36 years where multiple (three or more) thunderstorms with damaging winds occurred. This indicates that the probability that multiple thunderstorms with damaging winds may occur during any given year within the County is 49%.

*Hail*

There have been 36 verified occurrences of hail one (1) inch in diameter or greater between 1955 and 2019. With 36 occurrences over the past 65 years, the probability or likelihood that a severe storm with hail will occur in the County in any given year is 55%. There were 8 years over the last 65 years where two or more hail events occurred. This indicates that the probability that more than one severe storm with hail may occur during any given year within the County is 12%.

*Heavy Rain*

Effingham County has had 181 reported occurrences of heavy rain between 1990 and 2019. With 181 occurrences over the past 30 years, Effingham County should expect to experience at least eight heavy rain events each year.

## HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from severe storms.

**Are the participating jurisdictions vulnerable to severe storms?**

Yes. All of Effingham County is vulnerable to the dangers presented by severe storms due to the topography of the region and its location in relation to the movement of weather fronts across east central Illinois. Since 2010, Effingham County has recorded 68 heavy rain events, 57 thunderstorms with damaging winds, 10 severe storms with hail one (1) inch in diameter or greater and one verified lightning strike.

**Figure SS-11** details the number thunderstorms with damaging winds and hail events that were recorded in or near each participating municipality while **Figure SS-12** details the number of thunderstorms with damaging winds and hail events that were recorded in or near unincorporated areas of Effingham County. The one verified lightning strike occurred in Shumway.

**Figure SS-11**
**Verified Severe Storm Events by Participating Municipality**

| Participating Municipality | Number of Events | |
|---|---|---|
| | Thunderstorm & High Wind | Severe Hail |
| Beecher City | 2 | 5 |
| Dietrich | 15 | 4 |
| Effingham | 49 | 17 |
| Mason | 9 | 1 |
| Shumway | 8 | 1 |
| Teutopolis | 7 | 1 |
| Watson | 11 | 1 |

**Figure SS-12**
**Verified Severe Storm Events in Unincorporated Effingham County**

| Unincorporated Area | Number of Events | |
|---|---|---|
| | Thunderstorm & High Wind | Severe Hail |
| Elliotstown | 1 | 1 |
| Funkhouser | 5 | 1 |
| Gilmore | 3 | 1 |
| Green Creek | 1 | 2 |
| Lake Sara | 1 | 3 |
| Memorial Airport | 5 | 1 |
| Moccasin | 2 | 1 |
| Reservoir | 1 | 1 |

Of the participating municipalities, Effingham has had more recorded occurrences of thunderstorms with damaging winds and the greatest number of recorded hail events than any of the other municipalities. The difference in the number of recorded events may be due in part to the size of the municipalities as well as the fact that there is a long-term NWS COOP Observation Station located in the Effingham area.

**Do Any of the participating jurisdictions consider severe storms to be among their community's greatest vulnerabilities?**

Yes. Based on responses to a Critical Facilities Vulnerability Survey distributed to the participating jurisdictions, the following respondents considered severe storms to be among their jurisdiction's greatest vulnerabilities.

- *Beecher City*: Loss of electrical power during thunderstorm and heavy rain events causes backups into homes and businesses from the wastewater facility.
- *Shumway*: Damaging winds can cause loss of electrical power and the lift stations do not have backup generators which can impact service to residents.
- *Mound Township*: Heavy rains cause many roads to flood.

**What impacts resulted from the recorded severe storms?**

Severe storms as a whole have caused an estimated $1.7 million in recorded property damages. The following provides a breakdown of impacts by category.

*Thunderstorms with Damaging Winds*

Data obtained from NOAA's Storm Events Database indicates that between 1973 and 2019, 61 of the 137 thunderstorms with damaging winds caused $1,725,100 in property damages Damage information was either unavailable or none was recorded for the remaining 76 reported occurrences.

NOAA's Storm Events Database documented two injuries as the result of two separate thunderstorm with damaging wind events. The following provides a brief description of each event.

- On April 19, 1996, a woman in Teutopolis sustained minor injuries when a thunderstorm with damaging winds blew a tree onto her while in a parked car.
- The driver of a semi-truck was injured on June 11, 2002 when a thunderstorm with damaging winds blew his semi over on Interstate-57.

**Severe Storms Fast Facts – Impacts/Risk**

Thunderstorms with Damaging Winds Impacts:
- Total Property Damage (61 events): ***$1,725,100***
- Total Crop Damage: ***n/a***
- Injuries (2 events): ***2***
- Fatalities: ***n/a***

Severe Hail Impacts:
- Total Property Damage (1 event): ***$2,500***
- Total Crop Damage (1 event): ***$2,500***
- Injuries: ***n/a***
- Fatalities: ***n/a***

Lightning Strike Impacts:
- Total Property Damage (1 event): ***$7,000***
- Total Crop Damage: ***n/a***
- Injuries: ***n/a***
- Fatalities: ***n/a***

Severe Storms Risk/Vulnerability:
- Public Health & Safety: ***Low***
- Buildings/Infrastructure/Critical Facilities: ***Medium/High***

*Hail*

Data obtained from NOAA's Storm Events Database indicates that between 1955 and 2019, one of the 36 hail events caused $2,500 in property damage and $2,500 in crop damage. Damage information was either unavailable or none was recorded for the remaining 35 reported occurrences.

No injuries or fatalities were reported as a result of any of the recorded hail events.

***Lightning***

Data obtained from Planning Committee member records indicates that in 2017, a lightning strike event caused $7,000 in property damage. The property damage figure is composed entirely of infrastructure and critical facilities damage sustained in Shumway. Lightning struck the Bland Lift Station and damaged an electrical control panel and one pump. No injuries or fatalities were reported as a result of this event.

**What other impacts can result from severe storms?**

In Effingham County, the greatest risk to health and safety from severe storms is vehicle accidents. Hazardous driving conditions resulting from severe storms (i.e., wet pavement, poor visibility, high winds, etc.) can contribute to accidents that result in injuries and fatalities. Traffic accident data assembled by the Illinois Department of Transportation from 2013 through 2017 indicates that wet road surface conditions were present for 10.6% to 15.1% of all crashes recorded annually in the County.

While other circumstances cause wet road surface conditions (i.e., melting snow, condensation, light showers, etc.), law enforcement officials agree that hazardous driving conditions caused by severe storms add to the number of crashes. **Figure SS-13** provides a breakdown by year of the number of crashes and corresponding injuries and fatalities that occurred when wet road surface conditions were present.

**What is the level of risk/vulnerability to public health and safety from severe storms?**

For Effingham County the level of risk or vulnerability posed by severe storms to public health and safety is considered to be ***low***. This assessment is based on the fact that despite their relative frequency, the number of injuries and fatalities is low. In addition, HSHS St. Anthony's Hospital

in Effingham as well as hospitals in the region are equipped to provide care to persons injured during a severe storm.

**Figure SS-13**
**Severe Weather Crash Data for Effingham County**

| Year | Total # of Crashes | Presence of Wet Road Surface Conditions | | |
|---|---|---|---|---|
| | | # of Crashes | # of Injuries | # of Fatalities |
| 2013 | 916 | 121 | 34 | 0 |
| 2014 | 1,070 | 138 | 25 | 2 |
| 2015 | 1,117 | 169 | 52 | 1 |
| 2016 | 1,020 | 108 | 29 | 0 |
| 2017 | 1,009 | 132 | 34 | 0 |
| **Total:** | **5,132** | **662** | **174** | **3** |

Source: Illinois Department of Transportation.

**Are existing buildings, infrastructure and critical facilities vulnerable to severe storms?**

Yes. All existing buildings, infrastructure and critical facilities located in Effingham County and the participating jurisdictions are vulnerable to damage from severe storms. Structural damage to buildings is a relatively common occurrence with severe storms. Damage to roofs, siding, awnings and windows can occur from hail, flying and falling debris and high winds. Lightning strikes can damage electrical components and equipment (i.e., appliances, computers etc.) and can cause fires that consume buildings. If the roof is compromised or windows are broken, rain can cause additional damage to the structure and contents of a building.

Infrastructure and critical facilities tend to be just as vulnerable to severe storm damage as buildings. The infrastructure and critical facilities that are the most vulnerable to severe storms are related to power distribution and communications. High winds, lightning and flying and falling debris have the potential to cause damage to communication and power lines; power substations; transformers and poles; and communication antennas and towers.

The damage inflicted by severe storms often leads to disruptions in communication and creates power outages. Depending on the damage, it can take anywhere from several hours to several days to restore service. Power outages and disruptions in communications can impair vital services, particularly when backup power generators are not available.

In addition to affecting power distribution and communications, debris and flooding from severe storms can block state and local roads hampering travel. When transportation is disrupted, emergency and medical services are delayed, rescue efforts are hindered and government services can be affected.

Based on the frequency with which severe storms occur in Effingham County, the amount of property damage previously reported and the potential for disruptions to power distribution and communication; the risk or vulnerability to buildings, infrastructure and critical facilities from severe storms is ***medium to high***.

**Are future buildings, infrastructure and critical facilities vulnerable to severe storms?**

Yes and No. While four of the participating municipalities have building codes in place that will likely help lessen the vulnerability of new buildings and critical facilities to damage from severe storms, the County and the remaining participating municipalities/townships do not.

In addition, infrastructure such as new communication and power lines will continue to be vulnerable to severe storms as long as they are located above ground. High winds, lightning and flying and falling debris can disrupt power and communication. Steps to bury all new lines would eliminate the vulnerability, but this action would be cost prohibitive in most areas.

**What are the potential dollar losses to vulnerable structures from severe storms?**

Unlike other natural hazards, such as tornadoes, there are no standard loss estimation models or methodologies for severe storms. With only 63 of the 355 recorded events listing property damage numbers for all categories of severe storms, there is no way to accurately estimate future potential dollar losses. Since all existing structures within Effingham County are vulnerable to damage, it is highly probable that there will be future dollar losses from severe storms.

## 3.2 SEVERE WINTER STORMS & EXTREME COLD

### HAZARD IDENTIFICATION

**What is the definition of a severe winter storm?**

A severe winter storm can range from moderate snow over a few hours to significant accumulations of sleet and/or ice to blizzard conditions with blinding, wind-driven snow that last several days. The amount of snow or ice, air temperature, wind speed and event duration all influence the severity and type of severe winter storm that results. In general, there are three types of severe winter storms: blizzards, heavy snow storms and ice storms. The following provides a brief description of each type as defined by the National Weather Service (NWS).

- **Blizzards.** Blizzards are characterized by strong winds of at least 35 miles per hour and are accompanied by considerable falling and/or blowing snow that reduces visibility to ¼ mile or less. Blizzards are the most dangerous of all winter storms.
- **Heavy Snow Storms.** Heavy snow storms are generally defined as producing snowfall accumulations of four inches or more in 12 hours or less or six inches or more in 24 hours or less.
- **Ice Storms.** An ice storm occurs when substantial accumulations of ice, generally ¼ inch or more, build up on the ground, trees and utility lines as a result of freezing rain.

While extreme cold (i.e., dangerously low temperatures and wind chill values) often accompanies or is left in the wake of a severe winter storm, the NWS does not use it to define a severe winter storm. However, a discussion of extreme cold is included in this section since it has the ability to cause property damage, injuries and even fatalities (whether or not it is accompanied by freezing rain, ice or snow).

**What is snow?**

Snow is precipitation in the form of ice crystals. These ice crystals are formed directly from the freezing of water vapor in wintertime clouds. As the ice crystals fall toward the ground, they cling to each other creating snowflakes. Snow will only fall if the temperature remains at or below 32°F from the cloud base to the ground.

**What is sleet?**

Sleet is precipitation in the form of ice pellets. These ice pellets are composed of frozen or partially frozen rain drops or refrozen partially melted snowflakes. Sleet typically forms in winter storms when snowflakes partially melt while falling through a thin layer of warm air. The partially melted snowflakes then refreeze and form ice pellets as they fall through the colder air mass closer to the ground. Sleet usually bounces after hitting the ground or other hard surfaces and does not stick to objects.

**What is freezing rain?**

Freezing rain is precipitation that falls in the form of a liquid (i.e., rain drops), but freezes into a glaze of ice upon contact with the ground or other hard surfaces. This occurs when snowflakes descend into a warmer layer of air and melt completely. When the rain drops that result from

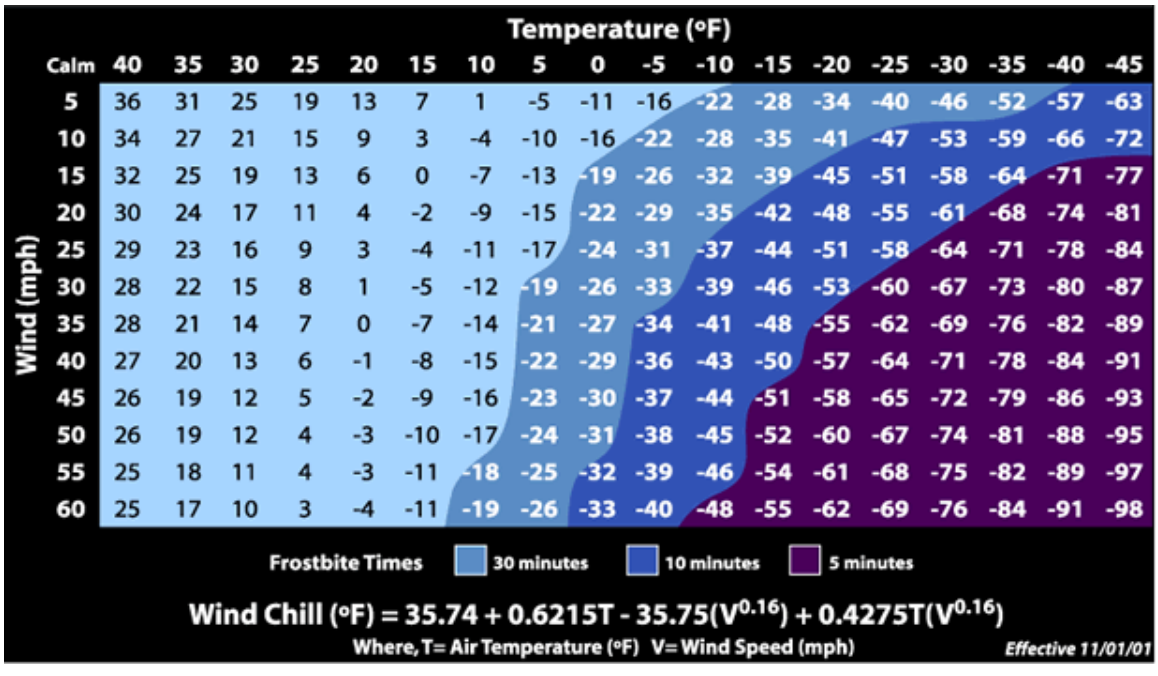
this melting fall through another thin layer of freezing air just above the surface they become "supercooled", but they do not have time to refreeze before reaching the ground. However, because the rain drops are "supercooled", they instantly refreeze upon contact with anything that is at or below 32°F (i.e., the ground, trees, utility lines, etc.).

**What is wind chill?**

Wind chill, or wind chill factor, is a measure of the rate of heat loss from exposed skin resulting from the combined effects of wind and temperature. As the wind increases, heat is carried away from the body at a faster rate, driving down both the skin temperature and eventually the internal body temperature.

The unit of measurement used to describe the wind chill factor is known as the wind chill temperature. The wind chill temperature is calculated using a formula. **Figure SWS-1** identifies the formula and calculates the wind chill temperatures for certain air temperatures and wind speeds.

**Figure SWS-1**
**Wind Chill Chart**




Source: NOAA, National Weather Service.

As an example, if the air temperature is 5°F and the wind speed is 20 miles per hour, then the wind chill temperature would be -15°F. The wind chill temperature is only defined for air temperatures at or below 50°F and wind speeds above three miles per hour. In addition, the wind chill temperature does not take into consideration the effects of bright sunlight which may increase the wind chill temperature by 10°F to 18°F.

Use of the current Wind Chill Temperature (WCT) index was implemented by the NWS on November 1, 2001. The new WCT index was designed to more accurately calculate how cold air feels on human skin. The new index uses advances in science, technology and computer modeling to provide an accurate, understandable and useful formula for calculating the dangers from winter winds and freezing temperatures. The former index was based on research done in 1945 by Antarctic researchers Siple and Passel.

Exposure to extreme wind chills can be life threatening. As wind chills edge toward -19°F and below, there is an increased likelihood that exposure will lead to individuals developing cold-related illnesses.

**What cold-related illnesses are associated with severe winter storms?**

Frostbite and hypothermia are both cold-related illnesses that can result when individuals are exposed to dangerously low temperatures and wind chills that can accompany severe winter storms. The following provides a brief description of the symptoms associated with each.

- **Frostbite.** During exposure to extremely cold weather the body reduces circulation to the extremities (i.e., feet, hands, nose, cheeks, ears, etc.) in order to maintain its core temperature. If the extremities are exposed, then this reduction in circulation coupled with the cold temperatures can cause the tissue to freeze.

  Frostbite is characterized by a loss of feeling and a white or pale appearance. At a wind chill of -19°F, exposed skin can freeze in as little as 30 minutes. Seek medical attention immediately if frostbite is suspected. It can permanently damage tissue and in severe cases can lead to amputation.

- **Hypothermia.** Hypothermia occurs when the body's temperature begins to fall because it is losing heat faster than it can produce it. If an individual's body temperature falls below 95°F, then hypothermia has set in and immediate medical attention should be sought.

  Hypothermia is characterized by uncontrollable shivering, memory loss, disorientation, incoherence, slurred speech, drowsiness and exhaustion. Left untreated, hypothermia will lead to death. Hypothermia occurs most commonly at very cold temperatures, but can occur at cool temperatures (above 40°F) if an individual isn't properly clothed or becomes chilled.

**Are alerts issued for severe winter storms?**

Yes. The NWS Weather Forecast Office in Lincoln, Illinois is responsible for issuing ***winter storm watches*** and ***warnings*** for Effingham County depending on the weather conditions. The following provides a brief description of each type of alert.

- **Watch.** The following watches are issued in advance of a storm and indicate the potential for significant winter weather within the next day or two.
  - **Winter Storm Watch**. A winter storm watch is issued when conditions are favorable for the development of a hazardous winter weather event which has the potential to threaten life or property.

- ❖ **Blizzard Watch**. A blizzard watch is issued when conditions are favorable for the development of blizzard conditions:
  - ❑ sustained winds or at least 35 mph and
  - ❑ reduced visibility of ¼ mile or less.

➢ **Advisories.** Winter advisories are issued for winter weather events that pose a significant inconvenience, especially to motorist, but should not be life-threatening if caution is exercised. The following advisories are generally issued 12 to 36 hours prior to an event.

- ❖ **Freezing Rain Advisory.** A freezing rain advisory is issued when ice accumulations of up to ¼ inch are expected.
- ❖ **Winter Weather Advisory.** A winter weather advisory is issued for one or more of the following:
  - ❑ snow accumulations of 3 to 5 inches in 12 hours or less;
  - ❑ sleet accumulations up to ¼ inch;
  - ❑ freezing rain in combination with sleet and/or snow; or
  - ❑ blowing and/or drifting snow.
- ❖ **Wind Chill Advisory.** A wind chill advisory is issued when wind chill values are expected to be between -15°F and -24°F.

➢ **Warnings.** The following winter weather warnings are issued when severe winter weather conditions are expected to cause a significant impact to life or property and make travel difficult to impossible. Individuals are advised to avoid travel and stay indoors.

- ❖ **Blizzard Warning.** A blizzard warning is issued when reduced visibility of less than ¼ mile due to falling and/or blowing snow and strong winds of at least 35 mph or greater are expected for at least three hours.
- ❖ **Ice Storm Warning.** An ice storm warning is issued when ice accumulations of ¼ inch or greater are expected, resulting in hazardous travel conditions, tree damage and extended power outages.
- ❖ **Winter Storm Warning.** A winter storm warning is issued when there is one or more of the following expected:
  - ❑ heavy snow accumulations of at least 6 inches in 12 hours or at least 8 inches in 24 hours; or
  - ❑ sleet accumulations of at least ½ inch.
- ❖ **Wind Chill Warning.** A wind chill warning is issued when wind chill values are expected to be -25°F or below.

## HAZARD PROFILE

The following identifies past occurrences of severe winter storms and extreme cold; details the severity or extent of each event (if known); identifies the locations potentially affected; and estimates the likelihood of future occurrences.

**When have severe winter storms and extreme cold occurred previously? What is the extent of these previous severe winter storms and extreme cold events?**

**Tables 5** and **6**, located in **Appendix J**, summarize the previous occurrences as well as the extent or magnitude of severe winter storms (snow & ice) and extreme cold events recorded in Effingham County.

*Severe Winter Storms*

NOAA's Storm Events Database and NWS's COOP Data records were used to document 85 reported occurrences of severe winter storms (snow, ice and/or a combination of both) in Effingham County between 1950 and 2019. Of the 85 recorded occurrences there were:

- 57 heavy snow storms or blizzards;
- 22 combination events (freezing rain, sleet, ice and/or snow); and
- 6 ice or sleet storms.

**Severe Winter Storm Fast Facts – Occurrences**

Number of Severe Winter Storm Events Reported (1950 -2019): ***85***
Number of Extreme Cold Events Reported (1996 - 2019): ***4***
Maximum 24-Hour Snow Accumulation: ***14.5 inches (December 19 & 20, 1973)***
Coldest Temperature Recorded in the County: ***-29°F (January 24, 1915)***
Most Likely Month for Severe Winter Storms to Occur: ***January***
Most Likely Time for Severe Winter Storms to Occur: ***Early Morning/Early Evening***
Most Likely Months for Extreme Cold Events to Occur: ***January and February***

**Figure SWS-2** charts the reported occurrences of severe winter storms by month. Of the 85 events, 68 (80%) took place in December, January, and February. Of the 85 events, 27 (32%) occurred during January, making this the peak month for severe winter storms. There were two events that spanned two months; however, for illustration purposes only the month when the event started is graphed.

**Figure SWS-2**
**Severe Winter Storms by Month**
**1950 - 2019**

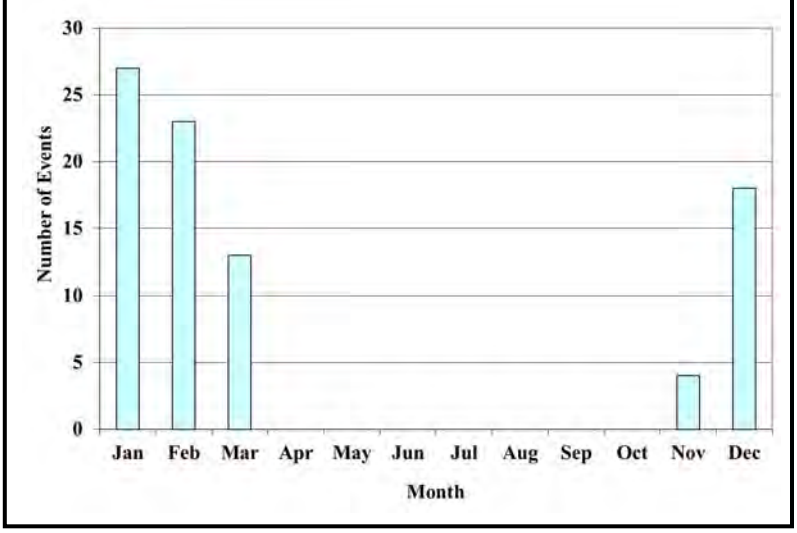
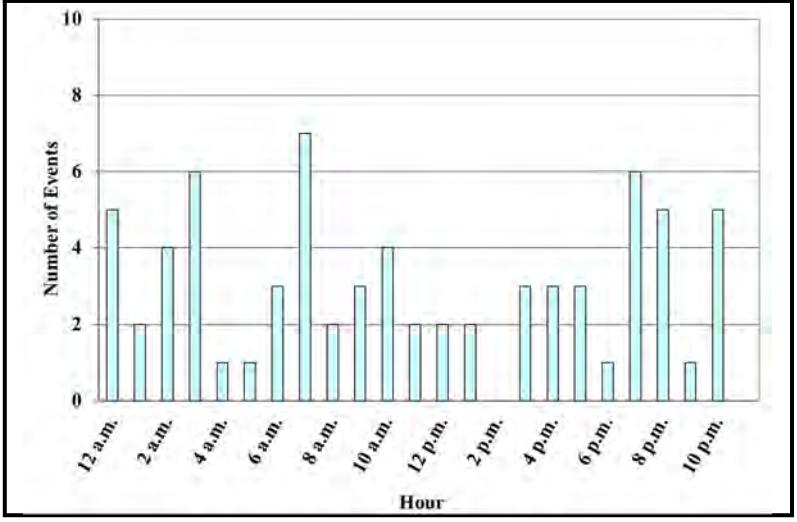


**Figure SW-3** charts the reported occurrences of severe winter storms by hour. Of the 85 occurrences, start times were unavailable for 14 events. Of the remaining 71 severe winter storm events with recorded times, approximately 56% began during the a.m. hours, with 17 (24%) beginning between 12 a.m. and 4 a.m.

**Figure SWS-3**
**Severe Winter Storms by Hour**
**1950 - 2019**




According to the NWS's COOP data records, the maximum 24-hour snow accumulation in Effingham County is 14.5 inches, which occurred on December 19 and 20, 1973 at Effingham.

*Extreme Cold*

While extreme cold events occur on a fairly regular basis across east central Illinois, NOAA's Storm Events Database has only four *recorded* occurrences of extreme cold (dangerously low temperatures and wind chill values) in Effingham County between 1996 and 2019. These represent the ***reported occurrences*** of extreme cold. The NWS acknowledges that extreme cold events are not well recorded. Only those events with impacts are reported. As a result, extreme cold events often go unreported and therefore, more events have almost certainly occurred than are documented in this section.

Two of the four events (50%) took place in January, and two of the four events (50%) took place in February, making these the peak months for extreme cold events. Three of the four extreme cold events began during the a.m. hours.

According to the Midwestern Regional Climate Center, nearly continuous temperature records for Effingham County have been kept from 1892 to present by the Effingham NWS COOP Observer Station.

Based on the available records, the coldest temperature recorded in Effingham County was -29°F on January 24, 1915. **Figure SWS-4** lists the coldest days recorded at the Effingham observation station.

**Figure SWS-4**
**Coldest Days Recorded at Effingham Observation Station**

| | Date | Temperature | | Date | Temperature |
|---|---|---|---|---|---|
| 1 | 1/24/1915 | -29°F | 7 | 1/19/1994 | -22°F |
| 2 | 1/7/1912 | -25°F | 8 | 2/13/1905 | -21°F |
| 3 | 1/18/1930 | -24°F | 9 | 1/18/1994 | -21°F |
| 4 | 1/18/1977 | -24°F | 10 | 1/11/1977 | -20°F |
| 5 | 1/17/1977 | -22°F | 11 | 12/21/1989 | -20°F |
| 6 | 1/20/1985 | -22°F | | | |

Source: Midwest Regional Climate Center cli-MATE

**What locations are affected by severe winter storms and extreme cold?**
Severe winter storms and extreme cold affect the entire County. All communities in Effingham County have been affected by severe winter storms and extreme cold. Severe winter storms and extreme cold generally extend across the entire County and affect multiple locations. The *2018 Illinois Natural Hazard Mitigation Plan* prepared by IEMA classifies Effingham County's hazard rating for severe winter storms as "high."

**Do any of the participating jurisdictions have designated warming centers?**
Yes. Three of the nine participating municipalities/townships have designated warming centers. A "designated" warming center is identified as any facility that has been *formally* identified by the jurisdiction (through emergency planning, resolution, Memorandum of Agreement, etc.) as a location available for use by residents during severe winter storms and extreme cold events. **Figure SW-5** identifies the location of each warming center by jurisdiction. At this time Effingham, Mason, Shumway, Watson, Mound Township and Watson Township do not have any warming centers designated within their jurisdictions. In addition, there are no State of Illinois-designated warming centers in Effingham County.

**Figure SWS-5**
**Designated Warming Centers by Participating Jurisdiction**

| Name/Address | Name/Address |
|---|---|
| *Beecher City* | *Teutopolis* |
| Tri-County Fire Protection District, 101 E. Poplar St. | Teutopolis Fire Department |
| *Dieterich* | 215 West Main St., Teutopolis, IL 62467 |
| Dieterich Civic Center, 102 W. Virginia Street | |

**What is the probability of future severe winter storms occurring?**

*Severe Winter Storms*

Effingham County has had 85 verified occurrences of severe winter storms between 1950 and 2019. With 85 occurrences over the past 70 years, Effingham County should expect at least one severe winter storm each year. There were 26 years over the past 70 years where two or more

severe winter storms occurred. This indicates the probability that more than one severe winter storm may occur during any given year within the County is 37%.

*Extreme Cold Events*

Given the limited amount of data available for extreme cold events, it is difficult to establish a precise probability; however, Effingham County should expect to experience additional extreme cold events in the future.

## HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from severe winter storms and extreme cold.

**Are the participating jurisdictions vulnerable to severe winter storms and extreme cold?**

Yes. All of Effingham County, including the participating jurisdictions, is vulnerable to the dangers presented by severe winter storms and extreme cold. Severe winter storms are among the more frequently occurring natural hazards in Illinois. Since 2010, Effingham County has experienced 16 severe winter storms and two extreme cold events.

Severe winter storms have immobilized portions of the County, blocking roads; downing power lines, trees and branches; causing power outages and property damage; and contributing to vehicle accidents. In addition, the County and jurisdictions must budget for snow removal and de-icing of roads and bridges as well as for roadway repairs.

**Do Any of the participating jurisdictions consider severe winter storms to be among their community's greatest vulnerabilities?**

Yes. Based on responses to a Critical Facilities Vulnerability Survey distributed to the participating jurisdictions, Shumway consider severe winter storms to be among their community's greatest vulnerabilities. Ice can cause loss of electrical power and the lift stations do not have backup generators which can impact service to residents.

**What impacts resulted from the recorded severe winter storms and extreme cold?**

The following summarize the impacts of severe winter storms and extreme cold events recorded in Effingham County.

*Severe Winter Storms*

Data obtained from NOAA's Storm Events Database and Planning Committee member records indicates that between 1950 and 2019, one of the 85 severe winter storms caused $900,000 in property damages. Property damage information was either unavailable or none was recorded for the remaining 84 reported occurrences.

In comparison, the State of Illinois has averaged $102 million annually in winter storm losses according to the Illinois State Water Survey's Climate Atlas of Illinois, ranking winter storms second only to flooding in terms of economic loss in the State. While behind floods in terms of

the amount of property damage caused, severe winter storms have a greater ability to immobilize larger areas, with rural areas being particularly vulnerable.
Included in the property damage total is $900,000 in verified property damages and emergency protective measures sustained during the winter storm that began on February 1, 2011 and led to downed powerlines and outages across the county.

NOAA's Storm Events Database documented six injuries and one fatality as a result of three separate severe winter storms. Detailed information on the injuries and fatalities sustained were only available for one of the events.

- During the December 30, 1997 storm, one Effingham County fatality resulted from slick area roadways.

**Severe Winter Storms & Extreme Cold Events**
**Fast Facts – Impacts/Risk**

Severe Winter Storm (Snow & Ice) Impacts:
- Total Property Damage (1 event): ***$900,000***
- Injuries (2 events): ***6***
- Fatalities (1 events): ***1***

Extreme Cold Impacts:
- Total Property Damage (0 events): ***n/a***
- Injuries: ***n/a***
- Fatalities (1 events): ***1***

Severe Winter Storm Risk/Vulnerability:
- Public Health & Safety: ***Low to Medium***
- Buildings/Infrastructure/Critical Facilities: ***Medium***

*Extreme Cold*
Damage information was either unavailable or none was recorded for any of the four reported extreme cold events between 1996 and 2019. NOAA's Storm Events Database documented one fatality as the result of one extreme cold event. A Dieterich man died of hypothermia during the February 2011 extreme cold event.

In comparison, the State of Illinois averages 18 cold-related fatalities annually according to the Illinois State Water Survey's Climate Atlas of Illinois.

**What other impacts can result from severe winter storms?**
In Effingham County, vehicle accidents are the largest risk to health and safety from severe winter storms. Hazardous driving conditions (i.e., reduced visibility, icy road conditions, strong winds, etc.) contribute to the increase in accidents that result in injuries and fatalities. A majority of all severe winter storm injuries result from vehicle accidents.

Traffic accident data assembled by the Illinois Department of Transportation from 2013 through 2017 indicates that treacherous road conditions caused by snow/slush and ice were present for 2.9% to 14.4% of all crashes recorded annually in the County. **Figure SWS-6** provides a breakdown by year of the number of crashes and corresponding injuries and fatalities that occurred when treacherous road conditions caused by snow and ice were present.

Persons who are outdoors during and immediately following severe winter storms and extreme cold events can experience other health and safety problems. Frostbite to hands, feet, ears and nose and hypothermia are common injuries. Treacherous walking conditions also lead to falls which can result in serious injuries, including fractures and broken bones, especially in the elderly. Over exertion from shoveling driveways and walks can lead to life-threatening conditions such as heart attacks in middle-aged and older adults who are susceptible.

| Figure SWS-6<br>Severe Winter Weather Crash Data for Effingham County | | | | |
|---|---|---|---|---|
| **Year** | **Total # of Crashes** | **Presence of Treacherous Road Conditions caused by Snow/slush and Ice** | | |
| | | **# of Crashes** | **# of Injuries** | **# of Fatalities** |
| 2013 | 916 | 63 | 16 | 0 |
| 2014 | 1,070 | 154 | 30 | 0 |
| 2015 | 1,117 | 81 | 17 | 0 |
| 2016 | 1,020 | 86 | 5 | 0 |
| 2017 | 1,009 | 29 | 10 | 0 |
| **Total:** | **5,132** | **413** | **78** | **0** |

Source: Illinois Department of Transportation.

**What is the level of risk/vulnerability to public health and safety from severe winter storms and extreme cold?**

While severe winter storms and extreme cold occur regularly in Effingham County, the number of injuries and fatalities is relatively low. Taking into consideration the potential for hazardous driving conditions; snow-removal related injuries; and power outages that could leave individuals vulnerable to hypothermia, the risk to public health and safety from severe winter storms is seen as ***low to medium***.

**Are existing buildings, infrastructure and critical facilities vulnerable to severe winter storms and extreme cold?**

Yes. All existing buildings, infrastructure and critical facilities located in Effingham County and the participating municipalities are vulnerable to damage from severe winter storms and extreme cold. The following summarize the vulnerabilities by severe winter storms and extreme cold events.

Based on the frequency with which severe winter storms and extreme cold events have occurred in Effingham County; the damages described; the amount of property damage previously reported; and the potential for disruptions to power distribution and communication; the risk or vulnerability to buildings, infrastructure and critical facilities from severe winter storms is ***medium***.

*Winter Storm*

Structural damage to buildings caused by severe winter storms (snow and ice) is very rare, but can occur particularly to flat rooftops. Information gathered from Effingham County residents indicates that snow and ice accumulations on communication and power lines as well as key roads presents the greatest vulnerability to infrastructure and critical facilities within the County. Snow and ice accumulations on lines often lead to disruptions in communications and create power outages. Depending on the damage, it can take anywhere from several hours to several days to restore service.

In addition to affecting communication and power lines, snow and ice accumulations on state and local roads hampers travel and can cause dangerous driving conditions. Blowing and drifting snow can lead to road closures and increases the risk of automobile accidents. Even small accumulations

of ice can be extremely dangerous to motorists since bridges and overpasses freeze before other surfaces.

When transportation is disrupted, schools close, emergency and medical services are delayed, some businesses close and government services can be affected. When a severe winter storm hits there is also an increase in cost to the County and jurisdictions for snow removal and de-icing. Road resurfacing and pothole repairs are additional costs incurred each year as a result of severe winter storms.

*Extreme Cold*

Extreme cold events can also have a detrimental impact on buildings, infrastructure and critical facilities. Pipes and water mains are especially susceptible to freezing during extreme cold events. This freezing can lead to cracks or ruptures in the pipes in buildings as well as in buried service lines and mains. As a result, flooding can occur as well as disruptions in service. Since most buried service lines and water mains are located under local streets and roads, fixing a break requires portions of the street or road to be blocked off, excavated and eventually repaired. These activities can be costly and must be carried out under less than ideal working conditions.

**Are future buildings, infrastructure and critical facilities vulnerable to severe winter storms and extreme cold?**

Yes and No. While four of the participating municipalities have building codes in place that will likely help lessen the vulnerability of new buildings and critical facilities to damage from severe winter storms, the County and the remaining participating municipalities/townships do not.

In addition, infrastructure such as new communication and power lines will continue to be vulnerable to severe winter storms, especially to ice accumulations, as long as they are located above ground. Rural areas of Effingham County have experienced extended periods without power due to severe winter storms. Steps to bury all new lines would eliminate the vulnerability, but this action would be cost prohibitive in most areas. In terms of new roads and bridges, there is very little that can be done to reduce or eliminate their vulnerability to severe winter storms.

**What are the potential dollar losses to vulnerable structures from severe winter storms and extreme cold?**

Unlike other natural hazards, such as tornadoes, there are no standard loss estimation models or methodologies for severe winter storms and extreme cold events. With only one of the 89 recorded events listing property damage numbers for severe winter storms and extreme cold, there is no way to accurately estimate future potential dollar losses. Since all existing structures within Effingham County are vulnerable to damage, it is likely that there will be future dollar losses from severe winter storms and extreme cold.

## 3.3 FLOODS

### HAZARD IDENTIFICATION

**What is the definition of a flood?**

The Federal Emergency Management Agency (FEMA) defines a "flood" as a general or temporary condition where two or more acres of normally dry land or two or more properties are inundated by:

- overflow of inland or tidal waters;
- unusual and rapid accumulation or runoff of surface waters from any source;
- mudflows; or
- a sudden collapse or subsidence of shoreline land.

The severity of a flooding event is determined by a combination of topography and physiography, ground cover, precipitation and weather patterns and recent soil moisture conditions. On average, flooding causes more than $5 billion in damages each year in the United States. Floods cause utility damage and outages, infrastructure damage (both to transportation and communication systems), structural damage to buildings, crop loss, decreased land values and impede travel.

**What types of flooding occur in the County?**

There are two main types of flooding that affect Effingham County: general flooding and flash flooding. General flooding can be broken down into two categories: riverine flooding and shallow flooding. The following provides a brief description of each type.

*General Flooding – Riverine Flooding*

Riverine flooding occurs when the water in a river or stream gradually rises and overflows its banks. This type of flooding affects low lying areas near rivers, streams, lakes and reservoirs and generally occurs when:

- persistent storm systems enter the area and remain for extended periods of time,
- winter and spring rains combine with melting snow to fill river basins with more water than the river or stream can handle,
- ice jams create natural dams which block normal water flow, and
- torrential rains from tropical systems make landfall.

*General Flooding – Shallow Flooding*

Shallow flooding occurs in flat areas where there are no clearly defined channels (i.e., rivers and streams) and water cannot easily drain away. There two main types of shallow flooding: sheet flow and ponding. If the surface runoff cannot find a channel, it may flow out over a large area at a somewhat uniform depth in what's called sheet flow. In other cases, the runoff may collect in depressions and low-lying areas where it cannot drain out, creating a ponding effect. Ponding floodwaters do not move or flow away, they remain in the temporary ponds until the water can infiltrate the soil, evaporate or are pumped out.

*Flash Floods*

Flash flooding occurs when there is a rapid rise of water along a stream or low-lying area. This type of flooding generally occurs within six hours of a significant rain event and is usually produced when heavy localized precipitation falls over an area in a short amount of time. Considered the most dangerous type of flood event, flash floods happen quickly with little or no warning. Typically, there is no time for the excess water to soak into the ground nor are the storm sewers able to handle the sheer volume of water. As a result, streams overflow their banks and low-lying (such as underpasses, basements etc.) areas can rapidly fill with water.

Flash floods are very strong and can tear out trees, destroy buildings and bridges and roll boulders the size of cars. Flash flood-producing rains can also weaken soil and trigger debris flows that damage homes, roads and property. A vehicle caught in swiftly moving water can be swept away in a matter of seconds. Twelve inches of water can float a car or small SUV and 18 inches of water can carry away large vehicles.

**What is a base flood?**

A base flood refers to any flood having a 1% chance of occurring in any given year. It is also known as the 100-year flood or the one percent annual chance flood. The base flood is the national standard used by the National Flood Insurance Program (NFIP) and the State of Illinois for the purposes of requiring the purchase of flood insurance and regulating new development.

Many individuals misinterpret the term "100-year flood". This term is used to describe the risk of future flooding; it does not mean that it will occur once every 100 years. Statistically speaking, a 100-year flood has a 1/100 (1%) chance of occurring in any given year. In reality, a 100-year flood could occur two times in the same year or two years in a row, especially if there are other contributing factors such as unusual changes in weather conditions, stream channelization or changes in land use (i.e., open space land developed for housing or paved parking lots). It is also possible not to have a 100-year flood event over the course of 100 years.

While the base flood is the standard most commonly used for floodplain management and regulatory purposes in the United States, the 500-year flood is the national standard for protecting critical facilities, such as hospitals and power plants. A 500-year flood has a 1/500 (0.2%) chance of occurring in any given year.

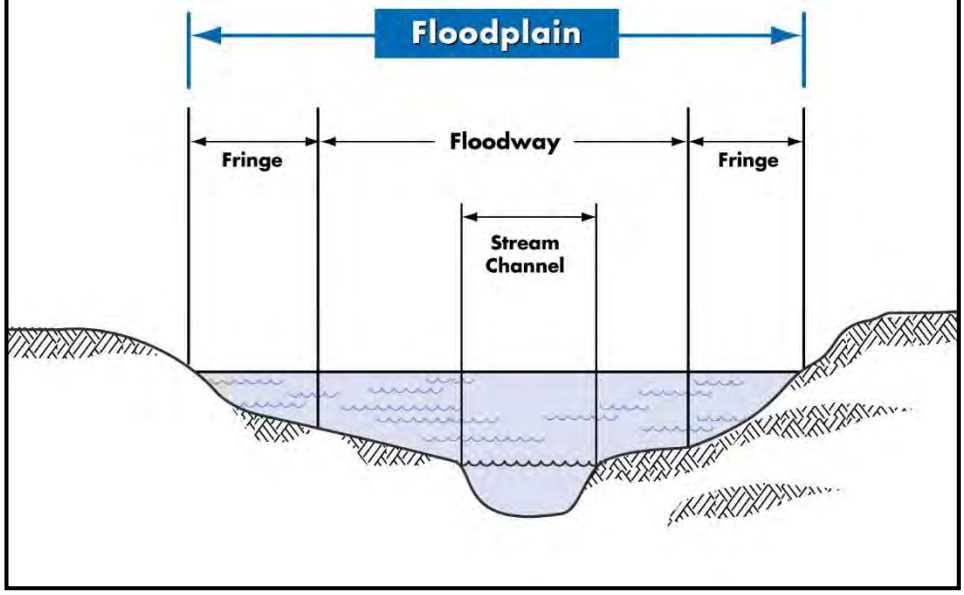
**What is a floodplain?**

The general definition of a floodplain is any land area susceptible to being inundated or flooded by water from any source (i.e., river, stream, lake, estuary, etc.). This general definition differs slightly from the regulatory definition of a floodplain.

A regulatory or base floodplain is defined as the land area that is covered by the floodwaters of the base flood. This land area is subject to a 1% chance of flooding in any given year. The base floodplain is also known as the 100-year floodplain or a Special Flood Hazard Area (SFHA). It is this second definition that is generally most familiar to people and the one that is used by the NFIP and the State of Illinois.

A base floodplain is divided into two parts: the floodway and the flood fringe. **Figure F-1** illustrates the various components of a base floodplain.

**Figure F-1**
**Floodplain Illustration**




Source: Illinois Department of Natural Resources, Quick Guide to Floodplain Management.

The floodway is the channel of a river or stream and the adjacent floodplain that is required to store and convey the base flood without increasing the water surface elevation. Typically, the floodway is the most hazardous portion of the floodplain because it carries the bulk of the base flood downstream and is usually the area where water is deepest and is moving the fastest. Floodplain regulations prohibit construction within the floodway that results in an increase in the floodwater's depth and velocity.

The flood fringe is the remaining area of the base floodplain, outside of the floodway, that is subject to shallow inundation and low velocity flows. In general, the flood fringe plays a relatively insignificant role in storing and discharging floodwaters. The flood fringe can be quite wide on large streams and quite small or nonexistent on small streams. Development within the flood fringe is typically allowed via permit if it will not significantly increase the floodwater's depth or velocity and the development is elevated above or otherwise protected to the base flood elevation.

**What is a Special Flood Hazard Area?**

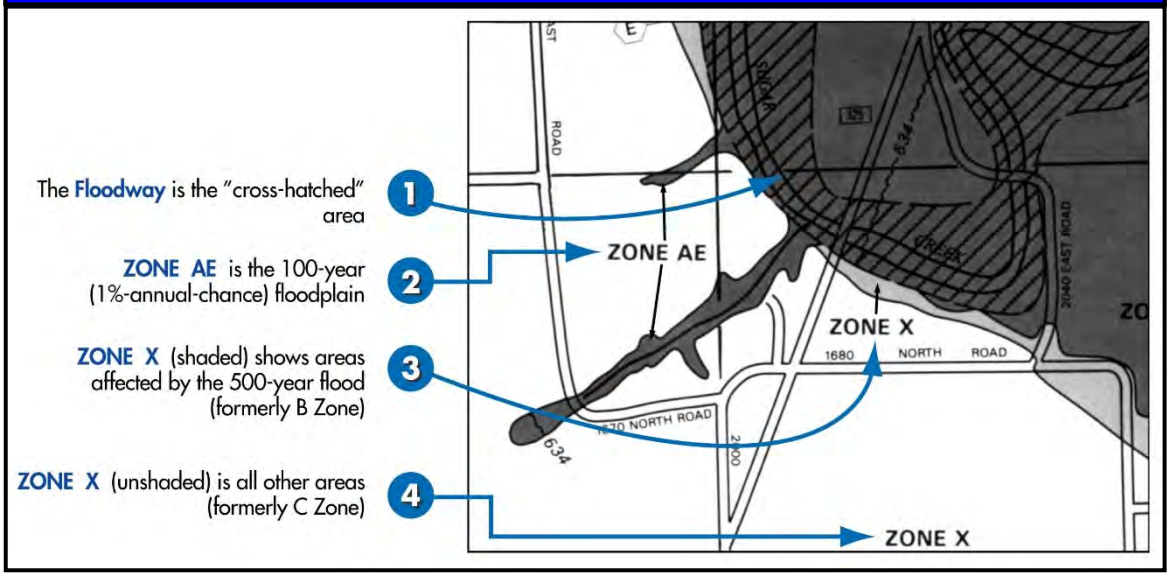
A Special Flood Hazard Area (SFHA) is the base floodplain. As discussed previously, this is the land area that is covered by the floodwaters of the base flood and has a 1% chance of flooding in any given year. The term SFHA is most commonly used when referring to the based floodplain on the Flood Insurance Rate Maps (FIRM) produced by FEMA. The SFHA is the area where floodplain regulations must be enforced by a community as a condition of participation in the NFIP and the area where mandatory flood insurance purchase requirements apply. SFHA are delineated

on the FIRMs and may be designated as Zones A, AE, A1-30, AO, AH, AR, and A99 depending on the amount of flood data available, the severity of the flood hazard or the age of the flood map.

**What are Flood Insurance Rate Maps?**

Flood Insurance Rate Maps (FIRMs) are maps that identify both the SFHA and the risk premium zones applicable to a community. These maps are produced by FEMA in association with the NFIP for floodplain management and insurance purposes. Digital versions of these maps are referred to as DFIRMs. **Figure F-2** shows an example of a FIRM.

**Figure F-2**
**Example of a Flood Insurance Rate Map (FIRM)**




Source: Illinois Department of Natural Resources, Quick Guide to Floodplain Management.

A FIRM will generally shows a community's base flood elevations, flood zones and floodplain boundaries. The information presented on a FIRM is based on historic, meteorological, hydrologic and hydraulic data as well as open-space conditions, flood-control projects and development. ***These maps only define flooding that occurs when a creek or river becomes overwhelmed. They do not define overland flooding that occurs when an area receives extraordinarily intense rainfall and storm sewers and roadside ditches are unable to handle the surface runoff.***

**What are flood zones?**

Flood zones are geographic areas that FEMA has defined according to varying levels of flood risk and type of flooding. These zones are depicted on a community's FIRM. The following provides a brief description of each flood zone.

- **Zone A.** Zone A, also known as the Special Flood Hazard Area (SFHA) or base floodplain, is defined as the floodplain area that has a 1% chance of flooding in any given year. There are multiple Zone A designations, including Zones A, AO, AH, A1-30, AE, AR or A99. Land areas located within Zone A are considered high-risk flood areas.

During a 30-year period, the length of many mortgages, there is at least a 1 in 4 chance that flooding will occur in a SFHA. The purchase of flood insurance is mandatory for all buildings in SFHAs receiving federal or federally-related financial assistance.

- **Zone X (shaded).** Zone X (shaded), formerly known as Zone B, is defined as the floodplain area between the limits of the base flood (Zone A) and the 500-year flood. Land areas located within Zone X (shaded) are affected by the 500-year flood and are considered at a moderate risk for flooding.

  Zone X (shaded) is also used to designate base floodplains of lesser hazards, such as areas protected by levees from 100-year flood, shallow flooding areas with average depths of less than one foot or drainage areas less than one square mile. While flood insurance is not federally required in Zone X (shaded), it is recommended for all property owners and renters.

- **Zone X (unshaded).** Zone X (unshaded), formerly known as Zone C, is defined as all other land areas outside of Zone A and Zone X (shaded). Land areas located in Zone X (unshaded) are considered to have a low or minimal risk of flooding. While flood insurance is not federally required in Zone X (unshaded), it is recommended for all property owners and renters.

**What is a Repetitive Loss Structure or Property?**

FEMA defines a "repetitive loss structure" as a National Flood Insurance Program-insured structure that has received two or more flood insurance claim payments of more than $1,000 each within any 10-year period since 1978. These structures/properties account for approximately one-fourth of all National Flood Insurance Program (NFIP) insurance claim payments since 1978.

Currently, repetitive loss properties make up about 2% of all NFIP policies, and account for approximately $9 billion in claims or approximately 16% of the total claims paid over the history of the Program. These structures not only increase the NFIP's annual losses, they drain funds needed to prepare for catastrophic events. As a result, FEMA and the NFIP are working with states and local governments to mitigate these properties.

**What is floodplain management?**

Floodplain management is the administration of an overall community program of corrective and preventative measures to reduce flood damage. These measures take a variety of forms and generally include zoning, subdivision or building requirements, special-purpose floodplain ordinances, flood control projects, education and planning. Where floodplain development is permitted, floodplain management provides a framework that minimizes the risk to life and property from floods by maintaining a floodplain's natural function. Floodplain management is a key component of the National Flood Insurance Program.

**What is the National Flood Insurance Program?**

The National Flood Insurance Program (NFIP) is a federal program, administered by FEMA, that:

- mitigates future flood losses nationwide through community-enforced building and zoning ordinances; and

- provides access to affordable, federally-backed insurance protection against losses from flooding to property owners in participating communities.

It is designed to provide an insurance alternative to disaster assistance to meet escalating costs of repairing damage to buildings and their contents due to flooding. The U.S. Congress established the NFIP on August 1, 1968 with the passage of the National Flood Insurance Act of 1968. This Program has been broadened and modified several times over the years, most recently with the passage of the Flood Insurance Reform Act of 2004.

Prior to the creation of the NFIP, the national response to flood disasters was generally limited to constructing flood-control projects such as dams, levees, sea-walls, etc. and providing disaster relief to flood victims. While flood-control projects were able to initially reduce losses, their gains were offset by unwise and uncontrolled development practices within floodplains. In light of the continued increase in flood losses and the escalating costs of disaster relief to taxpayers, the U.S. Congress created the NFIP. The intent was to reduce future flood damage through community floodplain management ordinances and provide protection for property owners against potential losses through an insurance mechanism that requires a premium to be paid for protection.

Participation in the NFIP is voluntary and based on an agreement between local communities and the federal government. If a community agrees to adopt and enforce a floodplain management ordinance to reduce future flood risks to new construction in a SFHA (base floodplain), then the government will make flood insurance available within the community as a financial protection against flood losses.

If a community chooses not to participate in the NFIP or a participating community decides not to adopt new floodplain management regulations or amend its existing regulations to reference new flood hazard data provided by FEMA, then the following sanctions will apply.

- Property owners will not be able to purchase NFIP flood insurance policies and existing policies will not be renewed.
- Federal disaster assistance will not be provided to repair or reconstruct insurable buildings located in identified flood hazard areas for presidentially-declared disasters that occur as a result of flooding.
- Federal mortgage insurance and loan guarantees, such as those written by the Federal Housing Administration and the Department of Veteran Affairs, will not be provided for acquisition or construction purposes within an identified flood hazard area. Federally-insured or regulated lending institutions, such as banks and credit unions, are allowed to make conventional loans for insurable buildings in identified flood hazard areas of non-participating communities. However, the lender must notify applicants that the property is in an identified flood hazard area and that it is not eligible for federal disaster assistance.
- Federal grants or loans for development will not be available in identified flood hazard areas under programs administered by federal agencies such as the Environmental Protection Agency, Small Business Administration and the Department of Housing and Urban Development.

**What is the NFIP's Community Rating System?**

The NFIP's Community Rating System (CRS) is a voluntary program developed by FEMA to provide incentives (in the form of flood insurance premium discounts) for NFIP participating communities that have gone beyond the minimum NFIP floodplain management requirements to develop extra measures to provide protection from flooding. CRS discounts on flood insurance premiums range from 5% up to 45%. The discounts provide an incentive for communities to implement new flood protection activities that can help save lives and property when a flood occurs.

**Are alerts issued for flooding?**

Yes. The National Weather Service Weather Forecast Office in Lincoln, Illinois is responsible for issuing ***flood watches*** and ***warnings*** for Effingham County depending on the weather conditions. The following provides a brief description of each type of alert.

- **Flood Watches.** A flood watch is issued when flooding or flash flooding is possible. It does not mean that flooding will occur, just that conditions are favorable. Individuals need to be prepared.
- **Flood Advisories.** A flood advisory is issued when flooding may cause significant inconvenience but is not expected to be to pose an immediate threat to life and/or property. Individuals need to be aware.
- **Warnings.** Warnings indicate a serious threat to life and/or property.
  - **Flood Warning**. A flood warning is issued when flooding is occurring or will occur soon and is expected to last for several days or weeks.
  - **Flash Flood Warning.** A flash flood warning is issued when flash flooding is occurring or is imminent. Flash flooding occurs very quickly so individuals are advised to take action immediately.

## HAZARD PROFILE

The following identifies past occurrences of floods; details the severity or extent of each event (if known); identifies the locations potentially affected; and estimates the likelihood of future occurrences.

**When has flooding occurred previously? What is the extent of these previous floods?**

**Tables 7** and **8** located in **Appendix J,** summarize the previous occurrences as well as the extent or magnitude of flood events recorded in Effingham County. The flood events are separated into two categories: general floods (riverine and shallow/overland) and flash floods.

*General Floods*

NOAA's Storm Events Database, NOAA's Storm Data Publications, NWS's River Observations and the U.S. Army Corps of Engineers' river gauge data have documented 38 occurrences of general flooding in Effingham County between 1990 and 2019. Included in the 38 general flood events are two events that contributed to one federally-declared disasters in Effingham County.

Based on historical gauge data, the record setting Little Wabash River flood in this area occurred on May 12, 2002 when the Little Wabash River crested at 24.27 feet near Effingham. The second and third highest crest at this location occurred in May 8, 1996 and July 5, 2000 respectively.

**Flood Fast Facts – Occurrences**

Number of General Floods Reported (1990 – 2019): ***38***

Number of Flash Floods Reported (1996 – 2019): ***41***

Most Likely Month for General Floods to Occur: ***May***

Most Likely Month for Flash Floods to Occur: ***May***

Most Likely Time for Flash Floods to Occur: ***Afternoon***

Number of Federal Disaster Declarations Related to General and Flash Flooding: ***1***

*Flash Floods*

NOAA's Storm Events Database documented 41 reported occurrences of flash flooding in Effingham County between 1996 and 2019. Included in the 41 flash flood events are four events that contributed to two separate federally-declared disasters in Effingham County. ***One declared disaster, Declaration #1416, included both flash flood and general flood events.***

**Figure F-3** charts the reported occurrences of flooding by month. Of the 38 general flood events, 21 (55%) began in April, May, and June making this the peak period for general floods in Effingham County. Of those 38 events, eight (21%) began in May making this the peak month for general flooding. There were 10 events that spanned two or more months; however, for illustration purposes only the month the event started in is graphed.

In comparison, 30 of the 41 flash flood events (73%) took place between May and June making this the peak period for flash floods. Of the 41 events, 16 (39%) occurred in May making this the peak month for flash flooding.

**Figure F-3**
**Flood Events by Month**

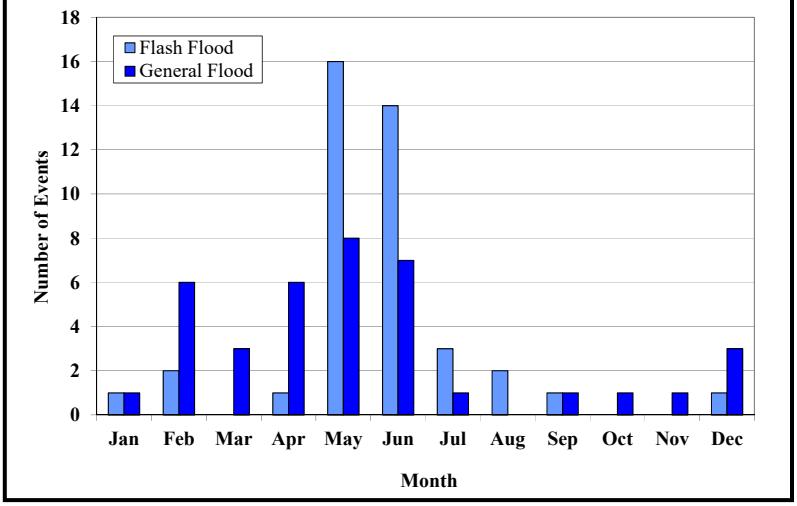
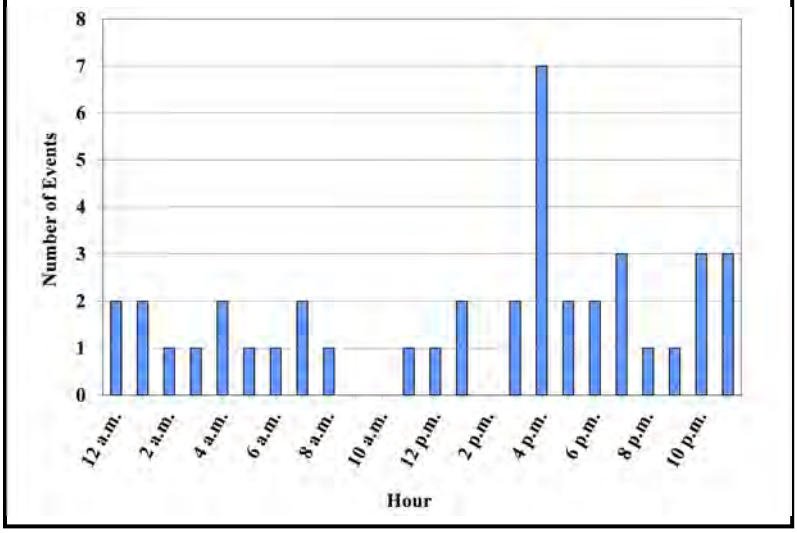


**Figure F-4** charts the reported occurrences of flash flood events by hour. Approximately 66% of the 41 flash flood events began during the p.m. hours, with 16 of the events (39%) taking place between 3 p.m. and 7 p.m. In comparison 52% of general flood events with recorded times began during the p.m. hours.

**Figure F-4**
**Flash Flood Events by Hour**




**What locations are affected by floods?**

While specific locations are affected by general flooding, most areas of the County can be impacted by overland and flash flooding because of the topography and seasonally high-water table of the area. In Effingham County approximately 6.6% of the area in County is designated as being within the base floodplain and susceptible to riverine floods. The *2018 Illinois Natural Hazard Mitigation Plan* classifies Effingham County's hazard rating for floods as "medium."

FIRMs have only been developed for only two of the participating jurisdictions within Effingham County. Effingham's maps became effective in July 18, 1985 while Teutopolis's maps became effective August 19, 1985. Copies of the FIRMs are located in **Appendix K**. While FIRMs have not been developed for the County, Flood Hazard Boundary Maps (FHBMs) were developed in 1977 and became effective on December 23, 1977. Copies of the County FHBMs are located in **Appendix K.**

No other FIRMs or FHBMs have been developed for any of the municipalities in Effingham County. According to the Illinois State Water Survey's Countywide Digital FIRM Status Map updates the FIRMs are in progress.

**Figure F-5** identifies the bodies of water within or immediately adjacent to participating jurisdictions that are known to cause flooding or have the potential to flood. Water bodies with Special Flood Hazard Areas are identified in bold.

| Figure F-5<br>Bodies of Water Subject to Flooding in Effingham County | |
|---|---|
| **Participating Jurisdiction** | **Water Bodies** |
| Beecher City | --- |
| Dietrich | --- |
| Effingham | **Salt Creek** |
| Mason | --- |
| Shumway | --- |
| Teutopolis | **Salt Creek** |
| Watson | Intermittent Tributary of Salt Creek |
| Effingham County (Unincorporated) | **Altamont Reservoir, Beech Creek, Big Creek, Bishop Creek**, Blue Creek, Brockett Creek, **Brush Creek, Cips Lake, Coon Creek, Corwin Branch, Dietrich Cree**k, Dismal Creek, **East Branch**, First Salt Creek, **Fulfer Creek, Gossage Branch, Green Creek, Henry Creek, Lily Creek, Limestone Creek, Little Bishop Creek**, Little Moccasin Creek, **Little Salt Creek, Little Wabash River**, Lucas Creek, **Mocassin Creek, Milton Branch, Morris Creek, North Fork**, Pauline Lake, **Ramsey Creek**, Rock Creek, **Salt Creek, Sara Lake, Second Creek, Second Salt Creek, Shoal Creek, Sugar Fork, Wolf Creek** |

Source: FEMA FIRMs/FHBMs.

Municipal, township and County officials have reported overland flood issues outside of the base floodplain in most of the participating municipalities and many unincorporated portions of the County. This overland flooding is known to impair travel.

**What jurisdictions within the County take part in the NFIP?**

*Participating Jurisdictions*

Dieterich, Effingham, and Teutopolis all participate in the NFIP. **Figure F-6** ***provides information on each NFIP-participating jurisdiction,*** including the date each participant joined, the date of their current effective FIRM and the year of their most recently adopted floodplain zoning ordinance.

| Figure F-6<br>NFIP Participating Jurisdictions | | | | |
|---|---|---|---|---|
| **Participating Jurisdictions** | **Participation Date** | **Current Effective FIRM Date** | **CRS Participation** | **Most Recently Adopted Floodplain Zoning Ordinance** |
| Dieterich | 11/6/2013 | n/a | No | 2013 |
| Effingham | 7/18/1985 | 7/8/1985 | No | 1985 |
| Teutopolis | 8/19/1985 | 8/19/1985 | No | 1985 |

Source: FEMA, Community Status Book Report: Illinois.

Beecher City, Edgewood, Mason and Shumway have no identified flood hazard boundaries within their corporate limits and are not required to participate in the NFIP. While the current effective FHBMs for Effingham County and Watson identify SFHAs within their limits, neither has adopted floodplain regulations and both have chosen not to participate in the NFIP. As a result, Effingham County and Watson are presently sanctioned by the Program.

*Non-Participating Jurisdictions*

**Figure F-7** provides information on those incorporated municipalities within the County that chose not to participate in the planning process, but also take part in the NFIP.

**Figure F-7**
**NFIP Participating Jurisdictions**

| Participating Jurisdictions | Participation Date | Current Effective FIRM Date | CRS Participation |
|---|---|---|---|
| Altamont | 9/4/1985 | 9/4/1985 | No |
| Montrose | 2/11/2009 | 2/4/2011 (NSFHA) | No |

Source: FEMA, Community Status Book Report: Illinois.

Jurisdictions that participate in the NFIP are expected to adopt and enforce floodplain management regulations. In Effingham County, all the NFIP participating jurisdictions have adopted the State of Illinois model floodplain ordinance. As a result, all of the NFIP participating jurisdictions are in compliance with NFIP requirements.

Participating jurisdictions will continue to comply with the NFIP by implementing mitigation projects and activities that enforce this ordinance to reduce future flood risks to new construction within the SFHA. At this time no new construction is planned within the base floodplain. Continued compliance with NFIP requirements is addressed in the Mitigation Action Tables of the participating jurisdictions found in Section 4.6.

**What is the probability of future flood events occurring?**

*General Floods*

Effingham County has had 38 verified occurrences of general flooding between 1990 and 2019. With 38 occurrences over the past 30 years, the County should expect at least one general flood event each year. There was 10 years over the past 30 years where two or more general flood events occurred. This indicates that the probability or likelihood that more than one general flood event may occur during any given year within the County 33%.

*Flash Floods*

There have been 41 verified flash flood events between 1996 and 2019. With 41 occurrences over the past 24 years, Effingham County should expect at least one flash flood event each year. There were 10 years over the past 24 years where two or more flash flood events occurred. This indicates that the probability that more than one flash flood event may occur during any given year within the County is approximately 42%.

## HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from floods.

Several factors including topography, precipitation and an abundance of rivers and streams make Illinois especially vulnerable to flooding. According to the Illinois State Water Survey's Climate

Atlas of Illinois, since the 1940s Illinois climate records have shown an increase in heavy precipitation which has led to increased flood peaks on Illinois rivers.

**Are the participating jurisdictions vulnerable to flooding?**

Yes. Effingham County and the participating jurisdictions are vulnerable to the dangers presented by flooding. Precipitation levels and topography are factors that cumulatively make virtually the entire County susceptible to some form of flooding. Flooding occurs along the floodplains of all the rivers, streams and creeks within the County as well as outside of the floodplains in low-lying areas where drainage problems occur. Since 2010, Effingham County has experienced 22 flash flood events and six general flood events.

**Figure F-8** details the number of *recorded* flash flood events by participating jurisdiction. Thirty-seven of the 38 general flood events impacted the entire County or a large portion of it and were not location specific. The remaining event took place near Lake Sara.

**Figure F-8**
**Verified Flash Flood Events by Participating Jurisdiction**

| Participating Municipality | Number | Year |
|---|---|---|
| Beecher City | 0 | --- |
| Dietrich | 1 | 2008 |
| Effingham | 5 | 2001, 2004, 2008, 2009 |
| Mason | 0 | --- |
| Shumway | 1 | 2004 |
| Teutoplis | 1 | 2008 |
| Waston | 0 | --- |
| Central portion of the county | 1 | 2012 |
| Countywide | 22 | 1996, 2000, 2001,2002, 2003, 2004, 2005, 2009, 2010, 2011, 2013, 2015, 2017 |
| Northern portion of the county | 2 | 2018, 2019 |
| Northwestern portion of the county | 2 | 2015 |
| Southern portion of the county | 5 | 2009, 2011, 2013, 2014, 2017 |
| Southeastern portion of the county | 1 | 2009 |
| West central portion of the county | 1 | 2015 |

Vulnerability to flooding can change depending on several factors, including land use. As land used primarily for agricultural and open space purposes is converted for residential and commercial/industrial uses, the number of buildings and impervious surfaces (i.e., parking lots, roads, sidewalks, etc.) increases. As the number of buildings and impervious surfaces increases, so too does the potential for flash flooding. Rather than infiltrating the ground slowly, rain and snowmelt that falls on impervious surfaces runs off and fills ditches and storm drains quickly creating drainage problems and flooding.

As described in Section 1.3 Land Use and Development Trends, substantial changes in land use (from forested, open and agricultural land to residential, commercial and industrial) are not anticipated within the County in the immediate future. No substantial increases in residential or commercial/industrial developments are expected within the next five years.

**Do any of the participating jurisdictions consider flooding to be among their community's greatest vulnerabilities?**

Yes. Based on responses to a Critical Facilities Vulnerability Survey distributed to the participating jurisdictions, the following respondents considered flooding to be among their jurisdiction's greatest vulnerabilities.

- *Beecher City*: Flooding causes the wastewater treatment facility to backup into homes and businesses if the Village loses power.
- *Dieterich:* Flooding adversely impacts streets, homes and lift stations within the Village.
- *Teutopolis*: A drainage ditch runs the full length of the Village on its south side and occasionally floods during heavy rain events.
- *Watson*: The wastewater treatment plant experiences flooding during heavy rain events.
- *Effingham County Highway Department*: Many of the roadways in the County flood.
- *Mound Township*: Many roads flood during heavy rain events due to poor drainage.
- *Watson Township*: Some of the main roads in the township flood adversely impacting travel, especially for emergency response vehicles like a fire truck.

**What impacts resulted from the recorded floods?**

Floods as a whole have caused a *minimum* of $505,000 in property damages. The following provides a breakdown by category.

In comparison, the State of Illinois has averaged an estimated $257 million annually in property damage losses, making flooding the single most financially damaging natural hazard in Illinois.

**Flood Fast Facts – Impacts/Risk**

General Flood Impacts:
- Total Property Damage (1 event): ***$300,000***
- Total Crop Damage: ***n/a***
- Injuries: ***n/a***
- Fatalities: ***n/a***

Flash Flood Impacts:
- Total Property Damage (2 events): ***$205,000***
- Total Crop Damage: ***n/a***
- Injuries (2 events): ***3***
- Fatalities: ***n/a***

Flood Risk/Vulnerability to:
- Public Health & Safety – General Flooding: ***Low***
- Public Health & Safety – Flash Flooding: ***Medium***
- Buildings/Infrastructure/Critical Facilities: ***Medium***

*General Floods*

Data obtained from NOAA's Storm Events Database indicates that between 1990 and 2019, one of the 38 general flood events caused over $300,000 in property damages. Damage information was either unavailable or none was recorded for the remaining 37 reported occurrences.

No injuries or fatalities were reported as a result of any of the recorded events.

*Flash Floods*

Data obtained from NOAA's Storm Events Database indicates that between 1996 and 2019, two of the 41 flash flood events caused approximately $205,000 in property damages. Damage information was either unavailable or none was recorded for the remaining 39 reported occurrences.

NOAA's Storm Events Database documented three injuries as the result of two separate flash flood events. The following provides a brief description of each event.

- On May 7, 2002, a vehicle traveling northbound on Interstate 57 hydroplaned on wet pavement injuring the driver and passenger.
- S man trying to cross a flooded creek on an ATV had to be rescued after he was swept downstream into a group of trees on May 12, 2002. He was treated and released from the hospital.

**What other impacts can result from flooding?**

One of the primary threats from flooding is drowning. Nearly half of all flash flood fatalities occur in vehicles as they are swept downstream. Most of these fatalities take place when people drive into flooded roadway dips and low drainage areas. It only takes two feet of water to carry away most vehicles.

Floodwaters also pose biological and chemical risks to public health. Flooding can force untreated sewage to mix with floodwaters. The polluted floodwaters then transport the biological contaminants into buildings and basements and onto streets and public areas. If left untreated, the floodwaters can serve as breeding grounds for bacteria and other disease-causing agents. Even if floodwaters are not contaminated with biological material, basements and buildings that are not properly cleaned can grow mold and mildew, which can pose a health hazard, especially for small children, the elderly and those with specific allergies.

Flooding can also cause chemical contaminants such as gasoline and oil to enter the floodwaters if underground storage tanks or pipelines crack and begin leaking during a flood event. Depending on the time of year, floodwaters also may carry away agricultural chemicals that have been applied to farm fields.

Structural damage, such as cracks forming in a foundation, can also result from flooding. In most cases, however, the structural damage sustained during a flood occurs to the flooring, drywall and wood framing. In addition to structural damage, a flood can also cause serious damage to a building's content.

Infrastructure and critical facilities are also vulnerable to flooding. Roadways, culverts and bridges can be weakened by floodwaters and have been known to collapse under the weight of a vehicle. Buried power and communication lines are also vulnerable to flooding. Water can infiltrate lines and cause disruptions in power and communication.

**What is the level of vulnerability to public health and safety from floods?**

While both general and flash floods occur on a fairly regular basis within the County, the number of injuries and fatalities is very low. In terms of the risk or vulnerability to public health and safety from *general floods*, the risk is seen as ***low***. However, over half of the recorded flood events were the result of flash flooding. Since there is very little warning associated with flash flooding the risk to public health and safety from *flash floods* is elevated to ***medium***.

**Are there any repetitive loss structures/properties within Effingham County?**

No. According to information obtained from FEMA, there are no repetitive or severe repetitive loss properties located in Effingham County.

**Are existing buildings, infrastructure and critical facilities vulnerable to flooding?**

Yes. **Figure F-9** identifies the number of existing residential structures by participating jurisdiction located within a base floodplain. These counts were prepared by the Consultant and are based on a review of the limited number of current FIRMs and FHBMs.

**Figure F-9**
**Existing Residential Structures Located within a Floodplain by Participating Jurisdiction**

| Participating Jurisdiction | Number of Residential Structures | Participating Jurisdiction | Number of Residential Structures |
|---|---|---|---|
| Beecher | 0 | Shumway | 0 |
| Dietrich | 0 | Teutopolis | 0 |
| Effingham | 6 | Watson | 0 |
| Mason | 0 | Unincorp. County | 4 |

Source: FEMA FIRMs/FHBMs

Aside from key roads and bridges and buried power and communication lines, Teutopolis is the only participating jurisdiction that has specific infrastructure/critical facilities located within or adjacent to a floodplain. The wastewater lagoon for the Village are located in the Salt Creek base floodplain.

Only two of the participating jurisdictions (Effingham and Teutopolis) within Effingham County have current effective FIRMs. These FIRMs were prepared in 1984 and 1985. While Flood Hazard Boundary Maps (FHBMs) were developed in 1981 for the unincorporated portions of Effingham County, FIRMs have yet to be developed.

While 6.6% of the land area in Effingham County lies within the base floodplain and is susceptible to riverine flooding, almost the entire County is vulnerable to flash flooding. As a result, a majority of the buildings, infrastructure and critical facilities that may be impacted by flooding are located outside of the base floodplain and are not easily identifiable.

The risk or vulnerability of existing buildings, infrastructure and critical facilities to all forms of flooding is considered to be ***medium*** based on: (a) the frequency and severity of recorded flood events within the County; (b) the County's proximity to Salt Creek and the Little Wabash River and its tributaries; (c) the fact that most of the County is vulnerable to flash flooding; and (d) a majority of the buildings, infrastructure and critical facilities that may be impacted are located outside of the base floodplain.

**Are future buildings, infrastructure and critical facilities vulnerable to flooding?**

The answer to this question depends on the type of flooding being discussed.

*Riverine Flooding*

In terms of riverine flooding, the vulnerability of future buildings, infrastructure and critical facilities located within NFIP-participating jurisdictions is low as long as the existing floodplain ordinances are enforced. Enforcement of the floodplain ordinance is the mechanism that ensures that new structures either are not built in flood-prone areas or are elevated or protected to the base flood elevation.

*Flash Flooding*

In terms of flash flooding, all future buildings, infrastructure and critical facilities are still vulnerable depending on the amount of precipitation that is received, the topography and any land use changes undertaken within the participating jurisdictions.

**What are the potential dollar losses to vulnerable structures from flooding?**

An estimate of the potential dollar losses to vulnerable *residential structures* located within the *participating jurisdictions* can be calculated if several assumptions are made. These assumptions represent a probable scenario based on the reported occurrences of flooding in Effingham County.

The purpose of providing an estimate is to help residents and municipal and county officials make informed decisions about how they can better protect themselves and their communities. These estimates are meant to provide a ***general idea*** of the magnitude of the potential damage that could occur from a flood event.

*Assumptions*

To calculate the overall potential dollar losses to vulnerable residential structures from a flood, a set of decisions/assumptions must be made regarding:

- type of flood event;
- scope of the flood event;
- number of potentially-damaged housing units;
- value of the potentially-damaged housing units; and
- percent damage sustained by the potentially-damaged housing units (i.e., damage scenario.)

The following provides a detailed discussion of each decision/assumption.

***Type of Flood Event.*** The first step towards calculating the potential dollar losses to vulnerable residential structures is to determine the type of flood event that will be used for this scenario. While flash flooding accounts have occurred more frequently, riverine floods have caused more recorded damages in the County. In addition, identifying residential structures vulnerable to flash flooding is problematic because most are located outside of the base floodplain and the number of structures impacted can change with each

**Assumption #1**

A riverine flood event will impact vulnerable residential structures.

event depending on the amount of precipitation received, the topography and the land use of the area.

Therefore, a riverine flood event will be used since it is (a) relatively easy to identify vulnerable residential structures within each jurisdiction (i.e., those structures located within the base floodplain or Special Flood Hazard Areas of any river, stream or creek); and (b) the number of structures impacted is generally the same from event to event.

***Scope of the Flood Event.*** To establish the number of vulnerable residential structures (potentially-damaged housing units), the scope of the riverine flood event within each jurisdiction must first be determined. In this scenario, the scope refers to the number of rivers, streams and creeks that overflow their banks and the degree of flooding experienced along base floodplains for each river, stream and creek.

**Assumption #2**

All base floodplains will flood and experience the same degree of flooding.

Generally speaking, a riverine flood event only affects one or two rivers or streams at a time depending on the cause of the event (i.e., precipitation, snow melt, ice jam, etc.) and usually does not produce the same degree of flooding along the entire length of the river, stream or creek. However, for this scenario, it was decided that:

- ❖ all rivers, streams and creeks with base floodplains would overflow their banks, and
- ❖ the base floodplains of each river, stream and/or creek would experience the same degree of flooding.

This assumption results in the following conditions for jurisdiction:

- ➢ Beecher City, Dietrich, Mason, Shumway and Watson would not experience any residential flooding since there are *no mapped* river, stream or creek base floodplains located within their municipal limits;
- ➢ *Effingham:* Salt Creek would overflow its banks and flood a portion of the Village;
- ➢ *Teutopolis*: Salt Creek would overflow its banks and flood a portion of the Village;
- ➢ *Unincorporated Effingham County*: All the rivers, streams and creeks would overflow their banks and flood unincorporated portions of the County.

***Number of Potentially-Damaged Housing Units.*** Since this scenario assumes that all the base floodplains will experience the same degree of flooding, the number of existing residential structures located within the base floodplain(s) can be used to determine the number of potentially-damaged housing units. **Figure F-9** identifies the total number of existing residential structures located within the base floodplains(s). While base floodplains are present in Teutopolis, there are no residential structures located within their limits.

**Assumption #3**

The number of existing residential structures located within the base floodplain(s) will be used to determine the number of potentially-damaged housing units.

***Value of Potentially-Damaged Housing Units.*** Now that the number of potentially-damaged housing units has been determined, the monetary value of the units must be calculated. Typically, when damage estimates are prepared after a natural disaster such as a flood, they are based on the market value of the structure. Since it would be impractical to determine the individual market value of each potentially-damaged housing unit, the average market value for a residential structure will be used.

**Assumption #4**

The average market value for a residential structure will be used to determine the value of potentially-damaged housing units.

To determine the average market value, the average assessed value must first be calculated. The average assessed value is determined by taking the total assessed value of residential buildings within a jurisdiction and dividing that number by the total number of housing units within the jurisdiction. The average market value is then determined by taking the averaged assessed value and multiplying that number by three (the assessed value of a structure in Effingham County is approximately one-third of the market value). **Figure F-10** provides a sample calculation. The total assessed value is based on 2018 tax assessment information provided by the Effingham County Supervisor of Assessments. **Figure F-11** provides the average assessed value and average market value for each jurisdiction.

**Figure F-10**
**Sample Calculation of Average Assessed Value & Average Market Value – Effingham**

**Average Assessed Value**

Total Assessed Value of Residential Buildings in the Jurisdiction÷ Total Housing Units in the Jurisdiction = Average Assessed Value

Effingham: $184,304,811 ÷ 5,696 housing units = $32,356.88

**Average Market Value**

Average Assessed Value x 3 = Average Market Value
(Rounded to the Nearest Dollar)

Effingham: $32,356.88 x 3 = $97,070.64
**($97,071)**

***Damage Scenario.*** The final decision that must be made to calculate potential dollar losses is to determine the percent damage sustained by the structure and the structure's contents during the flood event. In order to determine the percent damage using FEMA's flood loss estimation tables, assumptions must be made regarding (a) the type of residential structure flooded (i.e., manufactured home, one story home without a basement, one- or two-story home with a basement, etc.) and (b) the flood depth. **Figure F-12** calculates the percent loss to a structure and its contents for different scenarios based on flood depth and structure type.

**Assumption #5**

The potentially-damaged housing units are one or two-story homes with basements and the flood depth is two foot.
Structural Damage = 20%
Content Damage = 30%

**Figure F-11**
**Average Market Value of Housing Units by Jurisdiction**

| Participating Jurisdiction | Total Assessed Value of Residential Buildings (2018) | Total Housing Units (2010) | Average Assessed Values | Average Market Value |
|---|---|---|---|---|
| Beecher City | $2,896,400 | 215 | $13,472 | $40,415 |
| Dieterich | $11,075,620 | 249 | $44,480 | $133,441 |
| Effingham | $184,304,811 | 5,696 | $32,357 | $97,071 |
| Mason | $2,667,670 | 155 | $17,211 | $51,632 |
| Shumway | $1,849,350 | 91 | $20,323 | $60,968 |
| Teutopolis | $35,481,680 | 590 | $60,138 | $180,415 |
| Watson | $7,177,770 | 281 | $25,544 | $76,631 |
| Unincorp. Effingham County | $258,917,601 | 5,979 | $43,304 | $129,913 |

Source: Effingham County Supervisor of Assessments.

**Figure F-12**
**FEMA Flood Loss Estimation Tables**

**Flood Building Loss Estimation Table**

| Flood Depth (feet) | One Story No Basement (% Building Damage) | Two Story No Basement (% Building damage) | One or Two Story With Basement (% Building damage) | Manufactured Home (% Building damage) |
|---|---|---|---|---|
| -2 | 0 | 0 | 4 | 0 |
| -1 | 0 | 0 | 8 | 0 |
| 0 | 9 | 5 | 11 | 8 |
| 1 | 14 | 9 | 15 | 44 |
| 2 | 22 | 13 | 20 | 63 |
| 3 | 27 | 18 | 23 | 73 |
| 4 | 29 | 20 | 28 | 78 |
| 5 | 30 | 22 | 33 | 80 |
| 6 | 40 | 24 | 38 | 81 |
| 7 | 43 | 26 | 44 | 82 |
| 8 | 44 | 29 | 49 | 82 |
| >8 | 45 | 33 | 51 | 82 |

**Flood Content Loss Estimation Table**

| Flood Depth (feet) | One Story No Basement (% Contents Damage) | Two Story No Basement (% Contents damage) | One or Two Story With Basement (% Contents damage) | Manufactured Home (% Contents damage) |
|---|---|---|---|---|
| -2 | 0 | 0 | 6 | 0 |
| -1 | 0 | 0 | 12 | 0 |
| 0 | 13.5 | 7.5 | 16.5 | 12 |
| 1 | 21 | 13.5 | 22.5 | 66 |
| 2 | 33 | 19.5 | 30 | 90 |
| 3 | 40.5 | 27 | 34.5 | 90 |
| 4 | 43.5 | 30 | 42 | 90 |
| 5 | 45 | 33 | 49.5 | 90 |
| 6 | 60 | 36 | 57 | 90 |
| 7 | 64.5 | 39 | 66 | 90 |
| 8 | 66 | 43.5 | 73.5 | 90 |
| >8 | 67.5 | 49.5 | 76.5 | 90 |

Source: FEMA, Understanding Your Risks: Identifying Hazards and Estimating Losses

For this scenario it is assumed that the potentially-damaged housing units are one or two-story homes with basements and the flood depth is two feet. With these assumptions the expected percent damage sustained by the ***structure*** is estimated to be 20% and the expected percent damage sustained by the structure's ***contents*** is estimated to be 30%.

*Potential Dollar Losses*

Now that all of the decisions/assumptions have been made, the potential dollar losses can be calculated. First the potential dollar losses to the ***structure*** of the potentially-damaged housing units must be determined. This is done by taking the average market value for a residential structure and multiplying that by the percent damage (20%) to get the average structural damage

per unit. Next the average structural damage per unit is multiplied by the number of potentially-damaged housing units. **Figure F-13** provides a sample calculation.

**Figure F-13**
***Structure:* Potential Dollar Loss Sample Calculation – Effingham**

Average Market Value of a Housing Unit with the Jurisdiction x Percent Damage = Average Structural Damage per Housing Unit

Effingham: $97,071 x 20% = $19,414.20 per housing unit

Average Structural Damage x Number of Potentially-Damaged Housing Units within the Jurisdiction = *Structure* Potential Dollar Losses (Rounded to the Nearest Dollar)

Effingham: $19,414.20 per housing unit x 6 housing unit = $116,485.20

**($116,485)**

Next the potential dollar losses to the ***content*** of the potentially-damaged housing units must be determined. Based on FEMA guidance, the value of a residential housing unit's content is approximately 50% of its market value. Therefore, start by taking one-half the average market value for a residential structure and multiply that by the percent damage (30%) to get the average content damage per unit. Then take the average content damage per unit and multiply that by the number of potentially-damaged housing units. **Figure F-14** provides a sample calculation.

**Figure F-14**
***Content:* Potential Dollar Loss Sample Calculation – Effingham**

½ (Average Market Value of a Housing Unit with the Jurisdiction) x Percent Damage = Average Content Damage per Housing Unit

Effingham: ½ ($97,071) x 30% = $14,560.65 per housing unit

Average Content Damage per Housing Unit x Number of Potentially-Damaged Housing Units within the Jurisdiction = *Content* Potential Dollar Losses (Rounded to the Nearest Dollar)

Effingham: $14,560.65 per housing unit x 6 housing unit = $87,363.90

**($87,364)**

Finally, the ***total potential dollar losses*** may be calculated by adding together the potential dollar losses to the structure and the content. **Figure F-15** provides a breakdown of the total potential dollar losses by jurisdiction.

This assessment illustrates the *potential residential dollar losses* that should be considered when jurisdictions are deciding which mitigation projects to pursue. Potential dollar losses caused by riverine flooding to vulnerable residences within Effingham would be expected to exceed $203,849. Six of the seven participating municipalities in this scenario do not have any residences considered vulnerable to riverine flooding. Potential dollar losses to vulnerable structures in unincorporated Effingham County would be expected to exceed $181,878.

**Figure F-15**
**Estimated Potential Dollar Losses to Potentially-Damaged Housing Units from a Riverine Flood Event by Participating Jurisdiction**

| Participating Jurisdiction | Average Market Value (2018) | Potentially-Damaged Housing Units | Potential Dollar Losses | | Total Potential Dollar Losses (Rounded to the Nearest Dollar) |
|---|---|---|---|---|---|
| | | | Structure | Content | |
| Beecher City | $40,415 | 0 | $ 0 | $ 0 | $ 0 |
| Dieterich | $133,441 | 0 | $ 0 | $ 0 | $ 0 |
| Effingham | $97,071 | 6 | $116,485 | $87,364 | $203,849 |
| Mason | $51,632 | 0 | $ 0 | $ 0 | $ 0 |
| Shumway | $60,968 | 0 | $ 0 | $ 0 | $ 0 |
| Teutopolis | $180,415 | 0 | $ 0 | $ 0 | $ 0 |
| Watson | $76,631 | 0 | $ 0 | $ 0 | $ 0 |
| Unincorp. Effingham County | $129,913 | 4 | $103,930 | $77,948 | $181,878 |

*Vulnerability of Infrastructure/Critical Facilities*

The calculations presented above are meant to provide the reader with a sense of the scope or magnitude of a large riverine flood event in dollars. These calculations do not include the physical damages sustained by businesses or other infrastructure and critical facilities.

In terms of businesses, the impacts from a flood event can be physical and/or monetary. Monetary impacts can include loss of sales revenue either through temporary closure or loss of critical services (i.e., power, drinking water and sewer). Depending on the magnitude of the flood event, the damage sustained by infrastructure and critical facilities can be extensive in nature and expensive to repair. As a result, the cumulative monetary impacts to businesses and infrastructure can exceed the cumulative monetary impacts to residences. While average dollar amounts cannot be supplied for these items at this time, they should be taken into account when discussing the overall impacts that a large-scale riverine flood event could have on the participating jurisdictions.

In terms of specific infrastructure vulnerability, Teutopolis's wastewater treatment lagoon is located in the base floodplain of Salt Creek. No other above-ground infrastructure within the participating jurisdictions, other than key roads and bridges, were identified as being vulnerable to riverine flooding.

*Considerations*

While the potential dollar loss scenario was only for a riverine flood event, the participating jurisdictions have been made aware through the planning process of the impacts that can result from flash flood events. Effingham County has experienced multiple events over the last 20 years as have adjoining and nearby counties. These events illustrate the need for officials to consider the overall monetary impacts of all forms of flooding on their communities. All participants should carefully consider the types of activities and projects that can be taken to minimize their vulnerability.

## 3.4 EXCESSIVE HEAT

### HAZARD IDENTIFICATION

**What is the definition of excessive heat?**

Excessive heat is generally characterized by a prolonged period of summertime weather that is substantially hotter and more humid than the average for a location at that time of year. Excessive heat criteria typically shift by location and time of year. As a result, reliable fixed absolute criteria are not generally specified (i.e., a summer day with a maximum temperature of at least 90°F).

Excessive heat events are usually a result of both high temperatures and high relative humidity. (Relative humidity refers to the amount of moisture in the air.) The higher the relative humidity or the more moisture in the air, the less likely that evaporation will take place. This becomes significant when high relative humidity is coupled with soaring temperatures.

On hot days the human body relies on the evaporation of perspiration or sweat to cool and regulate the body's internal temperature. Sweating does nothing to cool the body unless the water is removed by evaporation. When the relative humidity is high, then the evaporation process is hindered, robbing the body of its ability to cool itself.

Excessive heat is a leading cause of weather-related fatalities in the United States. According to the Centers for Disease Control and Prevention, a total of 7,415 people died from heat-related illnesses between 1999 and 2010, an average of 618 fatalities a year.

**What is the Heat Index?**

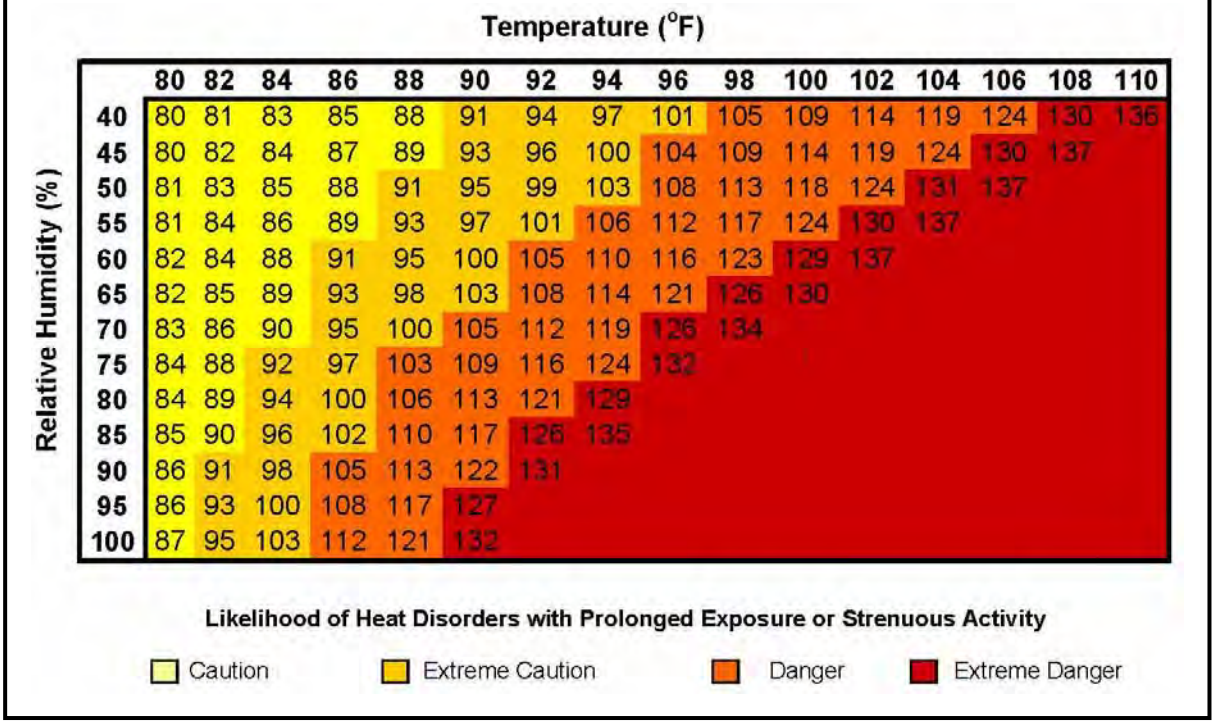
In an effort to raise the public's awareness of the hazards of excessive heat, the National Weather Service (NWS) devised the "Heat Index". The Heat Index, sometimes referred to as the "apparent temperature", is a measure of how hot it feels when relative humidity is added to the actual air temperature. **Figure EH-1** shows the Heat Index as it corresponds to various air temperatures and relative humidity.

As an example, if the air temperature is 96°F and the relative humidity is 65%, then the Heat Index would be 121°F. It should be noted that the Heat Index values were devised for shady, light wind conditions. Exposure to full sunshine can increase Heat Index values by up to 15°F. Also, strong winds, particularly with very hot, very dry air, can be extremely hazardous. When the Heat Index reaches 105°F or greater, there is an increased likelihood that continued exposure and/or physical activity will lead to individuals developing severe heat disorders.

**What are heat disorders?**

Heat disorders are a group of illnesses caused by prolonged exposure to hot temperatures and are characterized by the body's inability to shed excess heat. These disorders develop when the heat gain exceeds the level the body can remove or if the body cannot compensate for fluids and salt lost through perspiration. In either case the body loses its ability to regulate its internal temperature. All heat disorders share one common feature: the individual has been overexposed to heat, or over exercised for their age and physical condition on a hot day. The following describes the symptoms associated with the different heat disorders.

**Figure EH-1**
**Heat Index**




Source: NOAA, National Weather Service.

- **Heat Rash.** Heat rash is a skin irritation caused by excessive sweating during hot, humid weather and is characterized by red clusters of small blisters on the skin. It usually occurs on the neck, chest, groin or in elbow creases.
- **Sunburn.** Sunburn is characterized by redness and pain of skin exposed too long to the sun without proper protection. In severe cases it can cause swelling, blisters, fever and headaches and can significantly retard the skin's ability to shed excess heat.
- **Heat Cramps.** Heat cramps are characterized by heavy sweating and muscle pains or spasms, usually in the abdomen, arms or legs that during intense exercise. The loss of fluid through perspiration leaves the body dehydrated resulting in muscle cramps. This is usually the first sign that the body is experiencing trouble dealing with heat.
- **Heat Exhaustion.** Heat exhaustion is characterized by heavy sweating, muscle cramps, tiredness, weakness, dizziness, headache, nausea or vomiting and faintness. Breathing may become rapid and shallow and the pulse thready (weak). The skin may appear cool, moist and pale. If not treated, heat exhaustion may progress to heat stroke.
- **Heat Stroke (Sunstroke).** Heat stroke is a life-threatening condition characterized by a high body temperature (106°F or higher). The skin appears to be red, hot and dry with very little perspiration present. Other symptoms include a rapid and strong pulse, throbbing headache, dizziness, nausea and confusion. There is a possibility that the individual will become unconsciousness. If the body is not cooled quickly, then brain damage and death may result.

Studies indicate that, all things being equal, the severity of heat disorders tend to increase with age. Heat cramps in a 17-year-old may be heat exhaustion in someone 40 and heat stroke in a person over 60. Elderly persons, small children, chronic invalids, those on certain medications and persons with weight or alcohol problems are particularly susceptible to heat reactions.

**Figure EH-2** below indicates the heat index at which individuals, particularly those in higher risk groups, might experience heat-related disorders. Generally, when the heat index is expected to exceed 105°F, the NWS will initiate excessive heat alert procedures.

**Figure EH-2**
**Relationship between Heat Index and Heat Disorders**

| Heat Index (°F) | Heat Disorders |
|---|---|
| 80°F – 90°F | Fatigue is possible with prolonged exposure and/or physical activity |
| 90°F – 105°F | Heat cramps, heat exhaustion and heat stroke possible with prolonged exposure and/or physical activity |
| 105°F – 130°F | Heat cramps, heat exhaustion and heat stroke likely; heat stroke possible with prolonged exposure and/or physical activity |
| 130°F or Higher | Heat stroke highly likely with continued exposure |

Source: NOAA, Heat Wave: A Major Summer Killer.

**What is an excessive heat alert?**

An excessive heat alert is an advisory or warning issued by the NWS when the Heat Index is expected to have a significant impact on public safety. The expected severity of the heat determines the type of alert issued. There are four types of alerts that can be issued for an excessive heat events. The following provides a brief description of each type of alert based on the ***excessive heat advisory/warning criteria*** established by NWS Weather Forecast Office in Lincoln, Illinois. The Lincoln Office is responsible for issuing alerts for Effingham County.

- **Outlook.** An excessive heat outlook is issued when the potential exists for an excessive heat event to develop over the next three (3) to seven (7) days.
- **Watch.** An excessive heat watch is issued when conditions are favorable for an excessive heat event to occur within the next 24 to 72 hours.
- **Advisory.** An excessive heat advisory is issued within 12 hours of the onset of extremely dangerous heat conditions when the maximum heat index temperature is expected to be 100°F or higher for at least two (2) days and the night time air temperatures will not drop below 75°F.
- **Warning.** An excessive heat warning is issued within 12 hours of the onset of extremely dangerous heat conditions when the maximum heat index temperature is expected to be 105°F or higher for at least two (2) days and the night time air temperatures will not drop below 75°F.

## HAZARD PROFILE

The following identifies past occurrences of excessive heat, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

**When have excessive heat events occurred previously? What is the extent of these events?**

**Table 9**, located in **Appendix J**, summarizes the previous occurrences as well as the extent or magnitude of excessive heat events recorded in Effingham County. NOAA's Storm Events Database and NWS's COOP Data records were used to document 44 occurrences of excessive heat in Effingham County between 1994 and 2019.

**Excessive Heat Fast Facts – Occurrences**

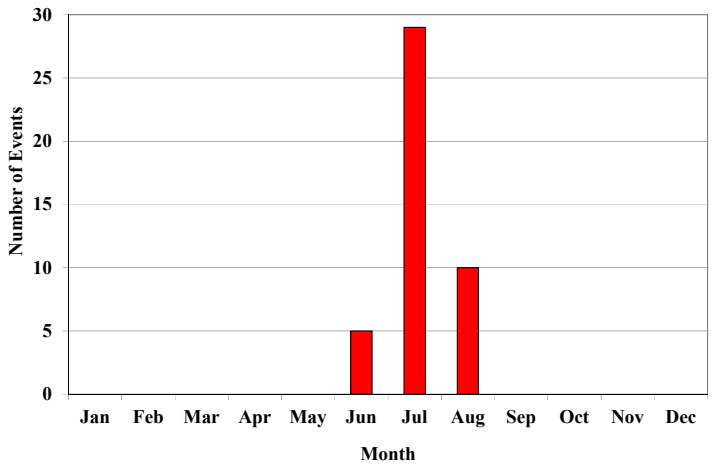
Number of Excessive Heat Events Reported (1994 – 2019): ***44***

Hottest Temperature Recorded in the County: ***111°F (July 15, 1936 & July 14, 1954)***

Most Likely Month for Excessive Heat Events to Occur: ***July***

**Figure EH-3** charts the reported occurrences of excessive heat events by month. Of the 44 events, 29 (66%) either began or took place in (July) making this the peak month for excessive heat events in Effingham County. There were nine events that spanned two months; however, for illustration purposes only the month the event started in is graphed. Of the 44 occurrences, 55% began during the p.m. hours, with 22 of the events (92%) beginning at 12:00 p.m.

**Figure EH-3**
**Excessive Heat Events by Month**
**1994 – 2019**




According to the Midwestern Regional Climate Center, continuous temperature records for Effingham County have been kept from 1892 to present by the Effingham NWS COOP Observer Station. Based on the available records, the hottest temperature recorded in Effingham County was

111°F at the Effingham COOP Station on July 15, 1936 and July 14, 1954. **Figure EH-4** lists the hottest days recorded at the Effingham observation station.

**Figure EH-4**
**Hottest Days Recorded at Effingham NWS COOP Observer Station**

| | Date | Temperature | | Date | Temperature |
|---|---|---|---|---|---|
| 1 | 7/15/1936 | 111°F | 6 | 7/22/1901 | 109°F |
| 2 | 7/14/1954 | 111°F | 7 | 7/24/1934 | 109°F |
| 3 | 8/4/1918 | 110°F | 8 | 7/12/1936 | 108°F |
| 4 | 7/13/1936 | 110°F | 9 | 7/8/2012 | 108°F |
| 5 | 7/14/1936 | 110°F | | | |

Source: Midwest Regional Climate Center cli-MATE

**What locations are affected by excessive heat?**

Excessive heat affects the entire County. Excessive heat events, like drought and severe winter storms, generally extend across an entire region and affecting multiple counties. The *2018 Illinois Natural Hazard Mitigation Plan* classifies Effingham County's hazard rating for excessive heat as "medium."

**Do any of the participating jurisdictions have designated cooling centers?**

Yes. Three of the nine participating municipalities/townships have designated cooling centers. A "designated" cooling center is identified as any facility that has been *formally* identified by the jurisdiction (through emergency planning, resolution, Memorandum of Agreement, etc.) as a location available for use by residents during excessive heat events. **Figure EH-5** identifies the location of each cooling center by jurisdiction. At this time Effingham, Mason, Shumway, Watson, Mound Township and Watson Township do not have any warming centers designated within their jurisdictions. In addition, there are no State of Illinois-designated warming centers in Effingham County.

**Figure EH-5**
**Designated Warming Centers by Participating Jurisdiction**

| Name/Address | Name/Address |
|---|---|
| *Beecher City* | *Teutopolis* |
| Tri-County Fire Protection District, 101 E. Poplar St. | Teutopolis Fire Department |
| *Dieterich* | 215 West Main St., Teutopolis, IL 62467 |
| Dieterich Civic Center, 102 W. Virginia Street | |

**What is the probability of future excessive heat events occurring?**

Effingham County has experienced 44 verified occurrences of excessive heat between 1994 and 2019. With 44 occurrences over the past 26 years, Effingham County should expect to experience at least one excessive heat event a year. There were nine years over the 26 years were two or more excessive heat events occurred. This indicates that the probability that more than one excessive heat event may occur during any given year within the County is (35%).

## HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from excessive heat.

**Are the participating jurisdictions vulnerable to excessive heat?**

Yes. All of Effingham County, including the participating jurisdictions, is vulnerable to the dangers presented by excessive heat. Since 2010, Effingham County has experienced 21 excessive heat events.

**Do any of the participating jurisdictions consider excessive heat to be among their community's greatest vulnerabilities?**

No. Based on responses to a Critical Facilities Vulnerability Survey distributed to the participating jurisdictions, none of the participating jurisdictions considered excessive heat to be among their community's greatest vulnerabilities. In addition, none of the jurisdictions identified any critical facilities or infrastructure within their communities as having a specific vulnerability to excessive heat.

**What impacts resulted from the recorded excessive heat events?**

Damage information was either unavailable or none was recorded for any of the excessive heat events. NOAA's Storm Events Database documented a total of one heat-related fatality as a result of 44 excessive heat events in Effingham County. A 78-year-old woman died of heatstroke after falling into a ravine for eight hours on the July 13, 2015.

**Excessive Heat Fast Facts – Impacts/Risk**

Excessive Heat Impacts:

- Total Property Damage: ***n/a***
- Total Crop Damage: ***n/a***
- Fatalities (44 events): ***1***
- Injuries: ***n/a***

Excessive Heat Risk/Vulnerability:

- Public Health & Safety – General Population: ***Low***
- Public Health & Safety – Sensitive Populations: ***Medium***
- Buildings/Infrastructure/Critical Facilities: ***Low***

In comparison, Illinois averages 74 heat-related fatalities annually according the Illinois State Water Survey's Climate Atlas of Illinois. Excessive heat has triggered more fatalities than any other natural hazard in Illinois. More fatalities are attributed to excessive heat than the combined number of fatalities attributed to floods, tornadoes, lightning and extreme cold.

No other injuries or fatalities were reported as a result of excessive heat in Effingham County. This does not mean however that none occurred; it simply means that excessive heat was not identified as the primary cause. This is especially true for fatalities. Usually heat is not listed as the primary cause of death, but rather an underlying cause. The heat indices were sufficiently high for most of the excessive heat events to produce heat cramps or heat exhaustion with the possibility of heat stroke in cases of prolonged exposure or physical activity.

**What other impacts can result from excessive heat events?**

Other impacts of excessive heat include road buckling, power outages, stress on livestock, early school dismissals and school closings. In addition, excessive heat events can also lead to an increase in water usage and may result in municipalities imposing water use restrictions. In Effingham County, excessive heat has the ability to impact the drinking water supplies of several the participating municipalities. Dietrich, Effingham, Mason, Shumway, Teutopolis and Watson rely on surface water sources for their drinking water supplies.

**What is the level of vulnerability to public health and safety from excessive heat?**

Even if injuries and fatalities due to excessive heat were under reported in Effingham County, the level of risk or vulnerability posed by excessive heat to the public health and safety of the *general population* is considered to be ***low***. This assessment is based on the absence of designated cooling centers in some of the participating municipalities/townships tempered by the fact that Effingham County does not have any large urban areas where living conditions (such as older, poorly-ventilated high rise buildings and low-income neighborhoods) tend to contribute to heat-related injuries and fatalities.

The level of risk or vulnerability posed by excessive heat to the public health and safety of *sensitive populations* is considered to be ***medium***. Sensitive populations such as older adults (those 70 years of age and older) and small children (those 5 years of age and younger) are more susceptible to heat-related reactions and therefore their risk is elevated. **Figure EH-5** identifies the percent of sensitive populations by participating jurisdiction based on 2010 census data.

**Figure EH-5**
**Sensitive Populations by Participating Jurisdictions**

| Participating Jurisdiction | % of Population 70 year of age & Older | % of Population 5 years age & Younger | Total % of Sensitive Population |
|---|---|---|---|
| Altamont city | 14.5 | 6.7 | 21.2 |
| Beecher City village | 12.5 | 10.6 | 23.1 |
| Dietrich village | 10.7 | 9.2 | 19.9 |
| Effingham city | 13.7 | 6.9 | 20.5 |
| Mason town | 10.4 | 6.4 | 16.8 |
| Montrose village | 13.4 | 5.5 | 18.9 |
| Shumway village | 6.9 | 5.0 | 11.9 |
| Teutopolis village | 11.6 | 6.9 | 18.6 |
| Watson village | 4.1 | 9.2 | 13.3 |
| Unincorp. Effingham County | 8.4 | 6.0 | 14.4 |
| Effingham County | 11.0 | 6.6 | 17.5 |
| State of Illinois | 8.8 | 6.5 | 15.3 |

Source: U. S. Census Bureau.

In addition, individuals with chronic conditions, those on certain medications, and persons with weight or alcohol problems are also considered sensitive populations. However, demographic information is not available for these segments of the population.

**Are existing buildings, infrastructure and critical facilities vulnerable to excessive heat?**

No. In general, existing buildings, infrastructure and critical facilities located in the County and the participating jurisdictions are not vulnerable to excessive heat. The primary concern is for the health and safety of those living in the County (including all of the jurisdictions).

While buildings do not typically sustain damage from excessive heat, in rare cases infrastructure and critical facilities may be directly or indirectly damaged. While uncommon, excessive heat has been known to contribute to damage caused to roadways within Effingham County. The combination of excessive heat and vehicle loads has caused pavement cracking and buckling.

Excessive heat has also been known to indirectly contribute to disruptions in the electrical grid. When the temperatures rise, the demand for energy also rises in order to operate air conditioners, fans and other devices. This increase in demand places stress on the electrical grid components, increasing the likelihood of power outages. While not common in Effingham County, there is the potential for this to occur. The potential may increase over the next two decades if new power plants are not built to replace the state's aging nuclear power facilities that are expected to be decommissioned.

In general, the risk or vulnerability to buildings, infrastructure and critical facilities from excessive heat is considered ***low***, even taking into consideration the potential for damage to roadways and disruptions to the electrical grid.

**Are future buildings, infrastructure and critical facilities vulnerable to excessive heat?**

No. Future buildings, infrastructure and critical facilities within the County and participating jurisdictions are no more vulnerable to excessive heat events than the existing building, infrastructure and critical facilities. As discussed above, buildings do not typically sustain damage from excessive heat. Infrastructure and critical facilities may, in rare cases, be damaged by excessive heat, but very little can be done to prevent this.

**What are the potential dollar losses to vulnerable structures from excessive heat?**

Unlike other natural hazards there are no standard loss estimation models or methodologies for excessive heat. With none of the recorded events listing property damage figures, there is no way to accurately estimate future potential dollar losses from excessive heat.

## 3.5 TORNADOES

### HAZARD IDENTIFICATION

**What is the definition of a tornado?**

A tornado is a narrow violently rotating column of air, often visible as a funnel-shaped cloud that extends from the base of a thunderstorm cloud formation to the ground. The most violent tornadoes can have wind speeds of more than 300 miles per hour and can create damage paths in excess of one mile wide and 50 miles long.

Not all tornadoes have a visible funnel cloud. Some may appear nearly transparent until dust and debris are picked up or a cloud forms within the funnel. Generally, tornadoes move from southwest to northeast, but they have been known to travel in any direction, even backtracking. A typical tornado travels at around 10 to 20 mile per hour, but this may vary from almost stationary to 60 miles per hour. Tornadoes can occur at any time of the year and happen at any time of the day or night, although most occur between 4 p.m. and 9 p.m.

About 1,200 tornadoes hit the United States yearly, with an average 52 tornadoes occurring annually in Illinois. The destruction caused by a tornado may range from light to catastrophic depending on the intensity, size and duration of the storm. Tornadoes cause crop and property damage, power outages, environmental degradation, injuries and fatalities. Tornadoes are known to blow roofs off buildings, flip vehicles and demolish homes. Typically, tornadoes cause the greatest damage to structures of light construction, such as residential homes. On average, tornadoes cause 60 to 65 facilities and 1,500 injuries in the United States annually.

**How are tornadoes rated?**

Originally tornadoes were rated using the Fujita Scale (F-Scale), which related the degree of damage caused by a tornado to the intensity of the tornado's wind speed. The Scale identified six categories of damage, F0 through F5. **Figure T-1** gives a brief description of each category.

Use of the original Fujita Scale was discontinued on February 1, 2007 in favor of the Enhanced Fujita Scale. The original scale had several flaws including basing a tornado's intensity and damages on wind speeds that were never scientifically tested and proven. It also did not take into consideration that a multitude of factors (i.e. structure construction, wind direction and duration, flying debris, etc.) affect the damage caused by a tornado. In addition, the process of rating the damage itself was based on the judgment of the damage assessor. In many cases, meteorologists and engineers highly experienced in damage survey techniques often came up with different F-scale ratings for the same damage.

The Enhanced Fujita Scale (EF-Scale) was created to remedy the flaws in the original scale. It continues to use the F0 through F5 categories, but it incorporates 28 different damage indicators (mainly various building types, towers/poles and trees) as calibrated by engineers and meteorologists. For each damage indicator there are eight degrees of damage ranging from barely visible damage to complete destruction of the damage indicator. The wind speeds assigned to each category are estimates, not measurements, based on the damage assessment. **Figure T-1** identifies the Enhanced Fujita Scale.

| Figure T-1<br>Fujita & Enhanced Fujita Tornado Measurement Scales | | | | |
|---|---|---|---|---|
| **F-Scale** | | **EF-Scale** | | **Description** |
| **Category** | **Wind Speed (mph)** | **Category** | **Wind Speed (mph)** | |
| F0 | 40 – 72 | EF0 | 65 – 85 | Light damage – some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; damage to sign boards |
| F1 | 73 – 112 | EF1 | 86 – 110 | Moderate damage – peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads |
| F2 | 113 – 157 | EF2 | 111 – 135 | Considerable damage – roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground |
| F3 | 158 – 207 | EF3 | 136 – 165 | Severe damage – roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off ground and thrown |
| F4 | 208 – 260 | EF4 | 166 – 200 | Devastating damage – well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown and large missiles generated |
| F5 | 261 – 318 | EF5 | Over 200 | Incredible damage – strong frame houses lifted off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 yards; trees debarked; incredible phenomena will occur |

Source: NOAA, Storm Prediction Center.

The idea behind the EF-Scale is that a tornado scale needs to take into account the typical strengths and weaknesses of different types of construction, instead of applying a "one size fits all" approach. This is due to the fact that the same wind speed can cause different degrees of damage to different kinds of structures. In a real-life application, the degree of damage to each of the 28 indicators can be mapped together to create a comprehensive damage analysis. As with the original scale, the EF-Scale rates the tornado as a whole based on the most intense damage within the tornado's path.

While the EF-Scale is currently in use, ***the historical data presented in this report is based on the original F-Scale***. None of the tornadoes rated before February 1, 2007 will be re-evaluated using the EF-Scale.

**Are alerts issued for tornadoes?**

Yes. The National Weather Service Weather Forecast Office in Lincoln, Illinois is responsible for issuing ***tornado watches*** and ***warnings*** for Effingham County depending on the weather conditions. The following provides a brief description of each type of alert.

- **Watch.** A tornado watch is issued when tornadoes are possible in the area. Individuals need to be alert and prepared. Watches are typically large, covering numerous counties or even states.

- **Warning.** A tornado warning is issued when a tornado has been sighted or indicated by weather radar. Warnings indicate imminent danger to life and property for those who are in the path of the tornado. Individuals should see shelter immediately. Typically warnings encompass a much smaller area, such as a city or small county.

## HAZARD PROFILE

The following identifies past occurrences of tornadoes; details the severity or extent of each event (if known); identifies the locations potentially affected; and estimates the likelihood of future occurrences.

**When have tornadoes occurred previously? What is the extent of these previous tornadoes?**

**Table 10,** located in **Appendix J,** summarize the previous occurrences as well as the extent or magnitude of tornado events recorded in Effingham County. NOAA's Storm Events Database and the NWS Weather Forecast Office in Lincoln have documented 22 occurrences of tornadoes in Effingham County between 1950 and 2019. In comparison, there have been 2,443 tornadoes statewide between 1950 and 2017 according to NOAA's Storm Prediction Center.

**Tornado Fast Facts – Occurrences**

Number of Tornadoes Reported (1959 - 2019): ***22***
Highest F-Scale Rating Recorded: ***F3 (March 6, 1961)***
Most Likely Month for Tornadoes to Occur: ***April***
Most Likely Time for Tornadoes to Occur: ***Eventing***
Average Length of a Tornado: ***3.0 miles***
Average Width of a Tornado: ***53 yards***
Average Damage Pathway of a Tornado: ***0.09 sq. mi.***
Longest Tornado Path in the County: ***19.3 miles (F2 on April 17, 1960)***
Widest Tornado Path in the County: ***200 yards (F2 on April 17, 1960 and F2 on April 16, 2006)***

**Figure T-2** charts the reported occurrences of tornadoes by magnitude. Of the 22 reported occurrences there was: 1 – F3s, 5 – F2s, 5 – F1s, 7 – F0s, 3 – EF1s, and 1 – EF0s.

**Figure T-2**
**Tornadoes by Magnitude**
**1950 - 2019**

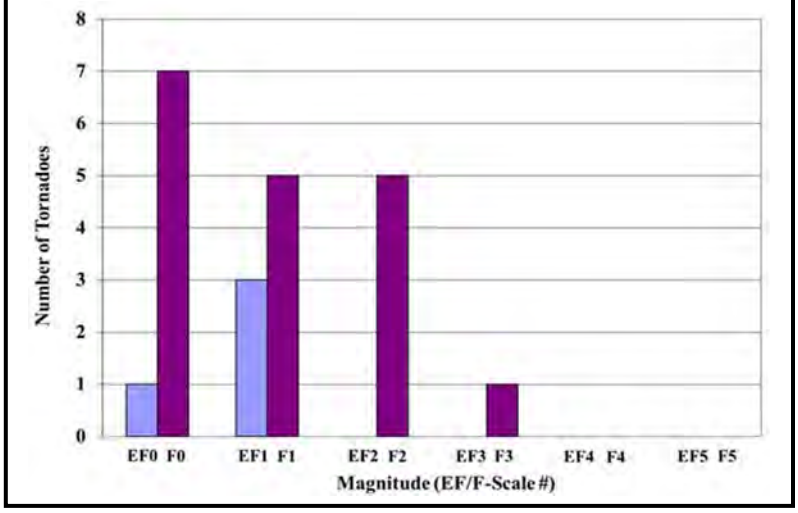


**Figure T-3** charts the reported tornadoes by month. Of the 22 events, 12 (55%) took place in April and May making this the peak period for tornadoes in Effingham County. Of the 22 events, 7 (32%) occurred during April making this the peak month for tornadoes. In comparison, 1,584 of the 2,443 tornadoes (65%) recorded in Illinois from 1950 through 2017 took place in April, May and June.

**Figure T-3**
**Tornadoes by Month**
**1950 - 2019**

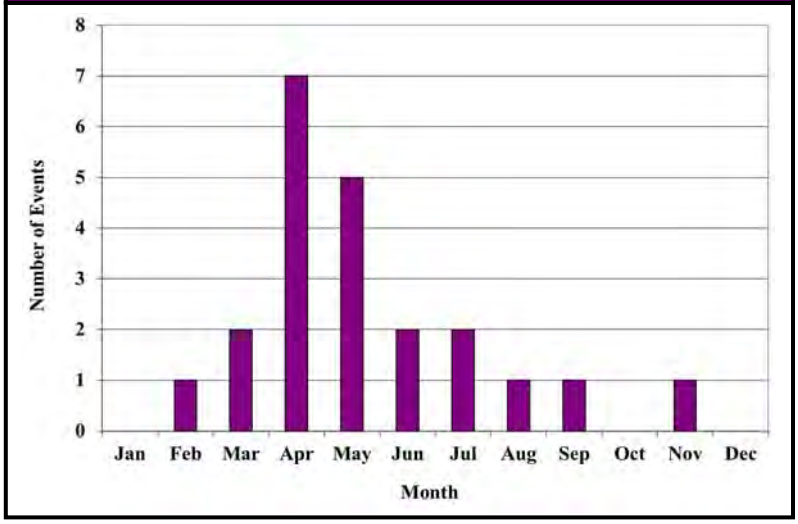
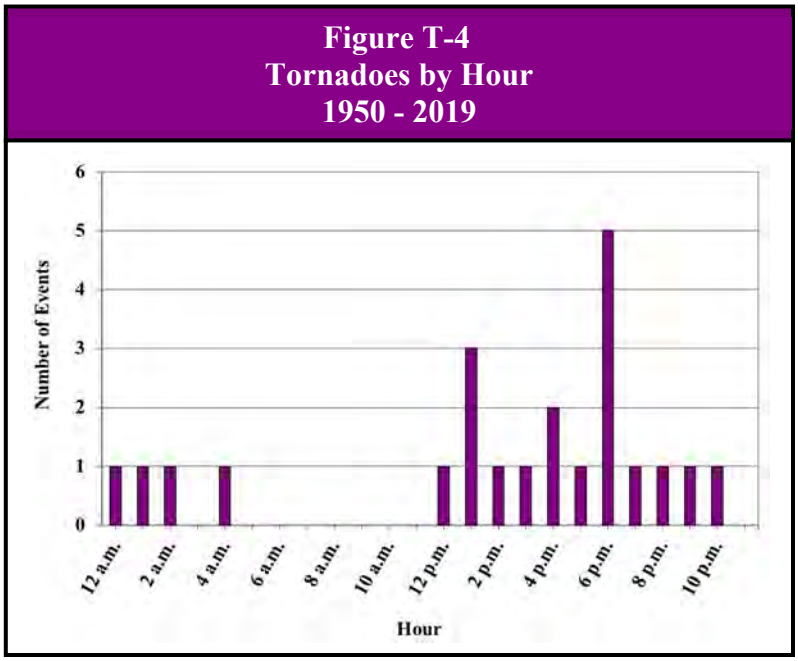



**Figure T-4** charts the reported tornadoes by hour. Approximately 82% of all tornadoes occurred during the p.m. hours, with 8 of the events (36%) taking place between 4 p.m. and 7 p.m. In comparison, more than half of all Illinois tornadoes occur between 2 p.m. and 8 p.m.

**Figure T-4**
**Tornadoes by Hour**
**1950 - 2019**



The tornadoes that have impacted Effingham County have varied from 0.05 miles to 19.3 miles in length and from 10 yards to 200 yards in width. The average length of a tornado in Effingham County is 3.0 miles and the average width is 53 yards (0.03 miles).

**Figure T-5** shows the pathway of each reported tornado. The numbers by each tornado correspond with the tornado description in **Table 10**. Records indicate that most of these tornadoes generally moved from southwest to northeast across the County. Unlike other natural hazards (i.e., severe winter storms, drought and excessive heat), tornadoes impact a relatively small area. Typically, the area impacted by a tornado is less than four square miles. In Effingham County, the average damage pathway or area impacted by a tornado is 0.09 square miles.

The longest and widest tornado recorded in Effingham County occurred on April 17, 1960. This F2 tornado, measuring 21.9 miles in length and 200 yards in width, touched down in Edgewood and traveled northeast through Dieterich before lifting off north of Wheeler in Jasper County. The tornado was on the ground in Effingham County for approximately 19.3 miles. The damage pathway of this tornado covered approximately 2.49 square miles, with 2.19square miles occurring in Effingham County.

### What locations are affected by tornadoes?

Tornadoes have the potential to affect the entire County. Of the seven participating municipalities, five have had reported occurrences of tornadoes within their corporate limits. The *2018 Illinois Natural Hazard Mitigation Plan* prepared by IEMA classifies Effingham County's hazard rating for tornadoes as "medium."

### What is the probability of future tornadoes occurring?

Effingham County has had 22 verified occurrences of tornadoes between 1950 and 2019. With 22 tornadoes over the past 70 years, the probability or likelihood that a tornado will touchdown somewhere in the County in any given year is 31%. There were 3 years over the last 70 years where more than one tornado occurred. This indicates that the probability that more than one tornado may occur during any given year within the County is 4%.

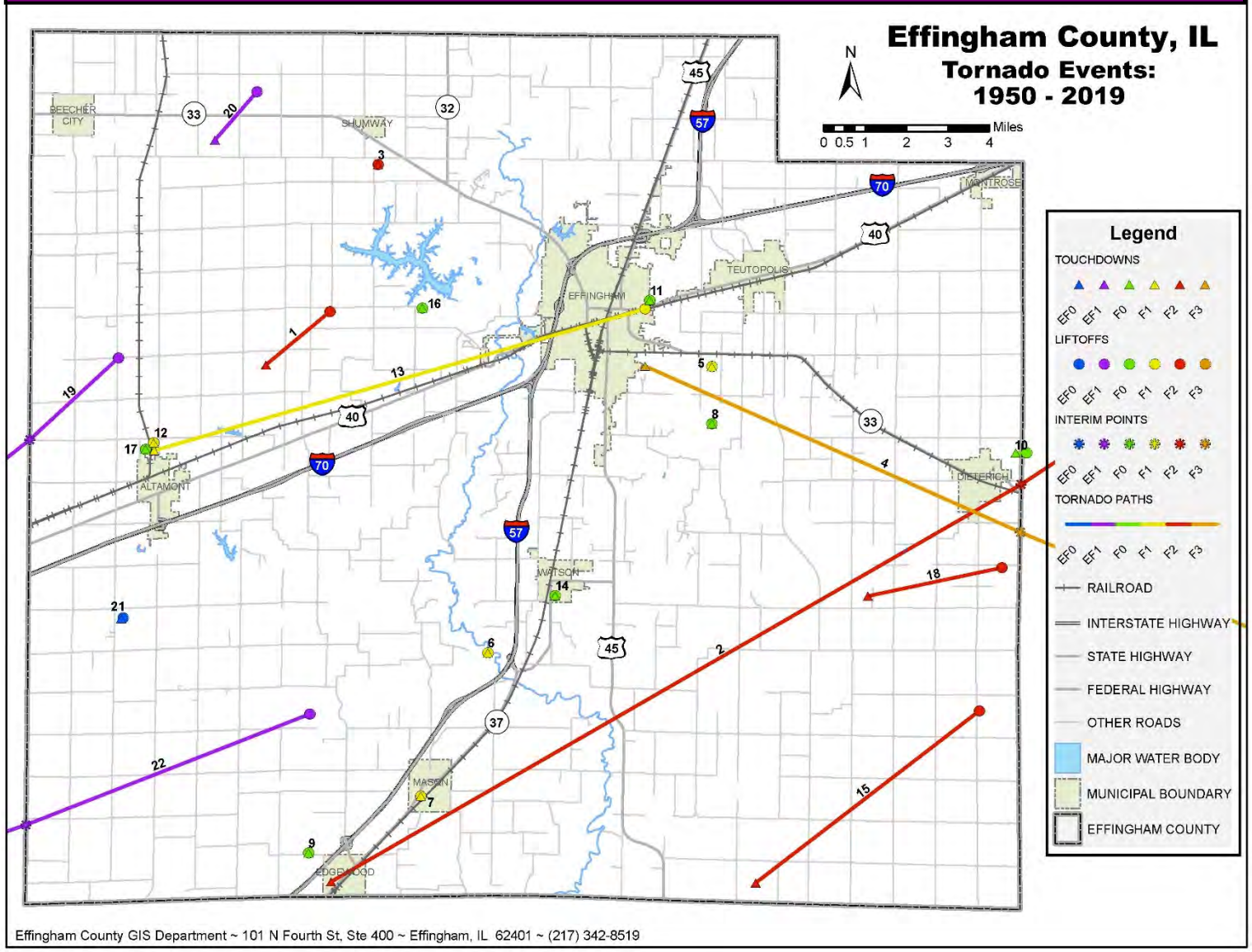
## HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from tornadoes.

### Are the participating jurisdictions vulnerable to tornadoes?

Yes. All of Effingham County, including the participating jurisdictions, is vulnerable to the dangers presented by tornadoes. Since 2010, four tornadoes have been recorded in Effingham County.

**Figure T-5**
**Tornado Pathways in Effingham County**



Of the participating municipalities, Dietrich, Effingham, Mason, Shumway, and Watson have had a tornado touch down or pass through their municipal boundaries. **Figure T-6** lists the verified tornadoes that have touched down in or near or passed through each participating municipality.

**Figure T-6**
**Verified Tornadoes in or Near Participating Municipalities**

| Participating Municipality | Number of Verified Tornadoes | Year | |
|---|---|---|---|
| | | Touched Down/Passed Through Municipality | Touched Down/Passed Near Municipality |
| Beecher City | 1 | 0 | 2014 |
| Dietrich | 4 | 1960 | 1961, 1984, 2006 |
| Effingham | 5 | 1961, 1984, 1990 | 1961, 1974 |
| Mason | 3 | 1960 | 1973, 2018 |
| Shumway | 2 | 1960 | 2014 |
| Teutopolis | 0 | --- | --- |
| Watson | 2 | 1993 | 1967 |

In terms of unincorporated areas vulnerable to tornadoes Eberle, Elliotstown and Lake Sara have each had two tornadoes touch down in or near their vicinity. **Figure T-7** details the verified tornadoes that have touched down in or near unincorporated areas of Effingham County.

**Figure T-7**
**Verified Tornadoes in or near Unincorporated Areas of Effingham County**

| Unincorporated Area | Number of Verified Tornadoes | Year | |
|---|---|---|---|
| | | Touched Down/Passed ***Through*** Unincorporated Area | Touched Down/Passed ***Near*** Unincorporated Area |
| Eberle | 1 | --- | 1994 |
| Elliotstown | 2 | --- | 1960, 2006 |
| Funkhouser | 1 | 1990 | --- |
| Lake Sara | 2 | 1990 | 1998 |

**Do Any of the participating jurisdictions consider tornadoes to be among their community's greatest vulnerabilities?**

No. Based on responses to a Critical Facilities Vulnerability Survey distributed to the participating jurisdictions, none of the participating jurisdictions consider tornadoes to be among their community's greatest vulnerabilities.

**What impacts resulted from the recorded tornadoes?**

Data obtained from NOAA's Storm Events Database, NOAAs Storm Data Publications, NOAA's Storm Prediction Center and the NWS Weather Forecast Office in Lincoln indicates that between 1950 and 2019, 16 of the 22 tornadoes approximately $2.1 million in property. Six of the 22 tornadoes have property damage totals of at least $250,000. Property damage information was either unavailable or none was recorded for the remaining six reported occurrences.

NOAA's Storm Events Database documented 2 fatalities and 5 injuries as a result of three tornado events. Detailed information on the injuries and fatalities sustained was only available for two of the events. The following provides a brief description of each.

- Two individuals were killed in their mobile home when an F0 tornado struck on May 1, 1983.
- Two children and their father were injured by flying debris, including glass pieces, from an F2 tornado on April 26, 1994.

**Tornado Fast Facts – Impacts/Risk**

Tornado Impacts:
- Total Property Damage (16 events): ***$2,088,100***
- Total Crop Damage: ***n/at***
- Injuries (2 events): ***5***
- Fatalities (1 event): ***2***

Tornado Risk/Vulnerability:
- Public Health & Safety – Rural Areas: ***Low***
- Public Health & Safety – Municipalities: ***High***
- Buildings/Infrastructure/Critical Facilities – Rural Areas: ***Low***
- Buildings/Infrastructure/Critical Facilities – Municipalities/Populated Unincorp. Areas: ***High***

In comparison, Illinois averages roughly four tornado fatalities annually; however, this number varies widely from year to year.

**What other impacts can result from tornadoes?**

In addition to causing damage to buildings and properties, tornadoes can damage infrastructure and critical facilities such as roads, bridges, railroad tracks, drinking water treatment facilities, water towers, communication towers, antennae, power substations, transformers and poles. Depending on the damage done to the infrastructure and critical facilities, indirect impacts on individuals could range from inconvenient (i.e., adverse travel) to life-altering (i.e., loss of utilities for extended periods of time).

**What is the level of risk/vulnerability to public health and safety from tornadoes?**

According to the 2018 Illinois Natural Hazard Mitigation Plan, Effingham County ***ranks in the top half of all counties in Illinois in terms of tornado frequency***. This fact alone suggests that the overall risk posed by tornadoes to public health and safety low. While frequency is important, other factors must be examined when assessing vulnerability including population distribution and density, the ratings and pathways of previously recorded tornadoes, the presence of high-risk living accommodations (such as high-rise buildings, mobile homes, etc.) and adequate access to health care for those injured following a tornado.

*Effingham County*

For Effingham County the level of risk or vulnerability posed by tornadoes to public health and safety is considered to be ***low***. This assessment is based on the fact that tornadoes do not occur frequently in the County and a large majority of the tornadoes that have impacted the County have touched down in rural areas away from concentrated populations. This has contributed to a low number of injuries and fatalities. In addition, the County is not densely populated and there is not a large number of high-risk living accommodations present.

In terms of adequate access to health care, HSHS St. Anthony's Hospital in Effingham is equipped to provide continuous care to persons injured by a tornado assuming that it is not directly impacted.

*Participating Municipalities*

In general, if a tornado were to touchdown or pass through any of the participating municipalities the risk to the public health and safety would be considered ***high***. This is based on the fact that a majority of the participating jurisdictions are small in size and have relatively dense and evenly distributed populations within their municipal boundaries. As a result, if a tornado were to touch down anywhere within the corporate limits of these municipalities it will have a greater likelihood of causing injuries or even fatalities.

**Do any participating jurisdictions have community safe rooms?**

Yes. Teutopolis has a community safe room at Fire Station. None of the participating jurisdictions, including the townships or CUSD have community safe rooms. As a result, if a tornado were to touch down or pass through any of the population centers in the County, then there would be a greater likelihood of injuries and fatalities due to the lack of structures specifically designed and constructed to provide life-safety protection. Each jurisdiction should consider whether the potential impacts to public health and safety from a tornado are considered great enough to warrant the consideration of community safe rooms as a mitigation action.

**Are existing buildings, infrastructure, and critical facilities vulnerable to tornadoes?**

Yes. All existing buildings, infrastructure, and critical facilities located within the County and participating jurisdictions are vulnerable to tornado damage. Buildings, infrastructure, and critical facilities located in the path of a tornado usually suffer extensive damage, if not complete destruction.

While some buildings adjacent to a tornado's path may remain standing with little or no damage, all are vulnerable to damage from flying debris. It is common for flying debris to cause damage to roofs, siding, and windows. In addition, mobile homes, homes on crawlspaces, and buildings with large spans (i.e., schools, barns, airport hangers, factories, etc.) are more likely to suffer damage. Most workplaces and many residential units do not provide sufficient protection from tornadoes.

The damages sustained by infrastructure and critical facilities during a tornado are similar to those experienced during a severe storm. There is a high probability that power, communication and transportation will be disrupted in and around the affected area.

*Assessing the Vulnerability of Existing Residential Structures*

One way to assess the vulnerability of existing residential structures is to estimate the number of housing units that may be potentially damaged if a tornado were to touch down or pass through any of the participating municipalities or the County. In order to accomplish this, a set of decisions/assumptions must be made regarding:

- the size (area impacted) by the tornado;
- the method used to estimate the area impacted by the tornado within each jurisdiction; and
- the method used to estimate the number of potentially-damaged housing units.

The following provides a brief discussion of each decision/assumption.

***Assumption #1: Size of Tornado.*** To calculate the number of existing residential structures vulnerable to a tornado, the size (area impacted) by the tornado must first be determined. There are several scenarios that can be used to calculate the size, including the worst case and the average. For this analysis the area impacted by an average-sized tornado in Effingham County will be used since it has a higher probability of recurring. In Effingham County the area impacted by an average-sized tornado is 0.09 square miles. This average is based on more than 65 years of data.

**Assumption #1**

Size of Tornado = 0.09 sq. miles

***Assumption #2: Method for Estimating the Area Impacted.*** Next, a method for determining the area within each jurisdiction impacted by the average-sized tornado needs to be chosen. There are several methods that can be used including creating an outline of the area impacted by the average-sized tornado and overlaying it on a map of each jurisdiction (most notably the municipalities) to see if any portion of the area falls outside of the corporate limits (which would require additional calculations) or just assume that the entire area of the average-sized tornado falls within the limits of each jurisdiction. For this discussion, it is assumed that the entire area of the average-sized tornado will fall within the limits of the participating jurisdictions.

**Assumption #2**

The entire area impacted by the average-sized tornado falls within the limits of each participating jurisdiction.

This method is quicker, easier and more likely to produce consistent results when the Plan is updated again. There is, however, a greater likelihood that the number of potentially-damaged housing units will be overestimated for those municipalities that have irregular shaped boundaries or occupy less than one square mile.

***Assumption #3: Method for Estimating Potentially-Damaged Housing Units.*** With the size of the tornado selected and a method for estimating the area impacted chosen, a decision must be made on an approach for estimating the number of potentially-damaged housing units. There are several methods that can be used including overlaying the average-sized tornado on a map of each jurisdiction and counting the impacted housing units or calculating the average housing unit density to estimate the number of potentially-damaged housing units.

**Assumption #3**

The average housing unit density for each municipality will be used to determine the number of potentially-damaged housing units.

For this analysis, the average housing unit density will be used since it provides a realistic perspective on potential residential damages without conducting extensive counts. Using the average housing unit density also allows future updates to the Plan to be easily recalculated and provides an exact comparison to previous estimates.

*Calculating Average Housing Unit Density*

The average housing unit density can be calculated by taking the number of housing units in a jurisdiction and dividing that by the land area within the jurisdiction. **Figure T-8** provides a sample calculation.

**Figure T-8**
**Calculation of Average Housing Unit Density – Effingham County**

Total Housing Units in the Jurisdiction ÷ Land Area within the Jurisdiction = Average Housing Unit Density
(Rounded Up to the Nearest Whole Number)

Effingham County: 14,570 housing units ÷ 478.777 sq. miles = 30.432 housing units/sq. mile
**(31 housing units)**

**Figure T-9** provides a breakdown of housing unit densities by participating municipality as well as for the unincorporated areas of the County and the County as a whole.

**Figure T-9**
**Average Housing Unit Density by Participating Jurisdiction**

| Participating Jurisdiction | Total Housing Units (2010) | Mobile Homes (2013-2017)* | Land Area (Sq. Miles) (2010) | Average Housing Unit Density (Units/Sq. Mi.) (Raw) |
|---|---|---|---|---|
| Beecher City | 215 | 29 | 0.902 | 238.359 |
| Dieterich | 249 | 28 | 1.160 | 214.655 |
| Effingham | 5,696 | 286 | 9.864 | 577.453 |
| Mason | 155 | 24 | 1.287 | 120.435 |
| Shumway | 91 | 21 | 0.332 | 274.096 |
| Teutopolis | 590 | 10 | 1.629 | 362.185 |
| Watson | 281 | 34 | 1.119 | 251.117 |
| Unincorp. County | 5,979 | 576 | 459.386 | 13.015 |
| County | 14,570 | 1,196 | 478.777 | 30.432 |

* Information on additional housing characteristics, such as mobile homes, was not covered by the 2010 Census. Instead the U.S. Census Bureau has chosen to generate 5-year estimates from American Community Survey data. The 2013-2017 5-year estimate is the most recent year for which estimates were available.

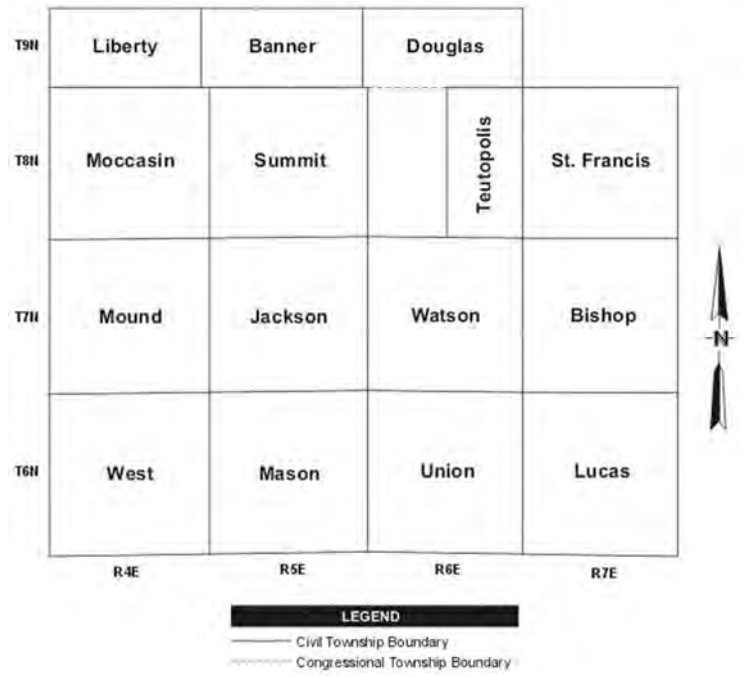
Source: U. S. Census Bureau.

While the average housing unit density provides an adequate assessment of the number of housing units in areas where the housing density is fairly constant, such as municipalities, it does not provide a realistic assessment for those counties with large, sparsely populated rural areas such as Effingham County.

In Effingham County, as well as many other central Illinois counties, there are pronounced differences in housing unit densities. Approximately 76% of all housing units are located in five of the County's 15 townships (Douglas, Mound, Summit, Teutopolis, and Watson) while approximately 74% of all mobile homes are located in six of the County's 15 townships (Douglas, Jackson, Mound, Summit, Union, and Watson). **Figure T-10** identifies the township boundaries. Tornado damage to buildings (especially mobile homes), infrastructure and critical facilities in these more densely populated townships is likely to be greater than in the rest of the County. While

Effingham has an ordinance that requires anchoring systems for mobile home that should help limit the damage from lower rated tornadoes the County does not.

**Figure T-10**
**Township Boundaries Effingham County**




Source: Illinois Secretary of State

This substantial difference in density skews the average *county* housing unit density in Effingham County and is readily apparent when compared to the average housing unit densities for each of the townships within the County. **Figure T-11** provides a breakdown of housing unit densities by township and illustrates the differences between the various townships and the County as a whole.

For 10 of the 15 townships, the *average county* housing unit density is greater (in some cases considerably greater) than the *average township* housing unit densities. However, the *average county* housing unit density is considerably less than the housing unit densities for four of the five most populated townships.

*Estimating the Number of Potentially-Damaged Housing Units*

Before an estimate of the number of potentially-damaged housing units can be calculated for the participating municipalities, an additional factor needs to be taken into consideration: the presence of commercial/industrial developments and/or large tracts of undeveloped land. Occasionally villages and cities will annex large tracts of undeveloped land or have commercial/industrial parks/developments located within their corporate limits. In many cases these large tracts of land include very few residential structures. Consequently, including these tracts of land in the calculations to determine the number of potentially-damaged housing units skews the results, especially for very small municipalities. Therefore, to provide a more realistic assessment of the

number of potentially-damaged housing units, these undeveloped areas need to be subtracted from the land area figures obtained from the U.S. Census Bureau.

**Figure T-11**
**Average Housing Unit Density by Township**

| Township | Total Housing Units (2010) | Mobile Homes (2013-2017)* | Land Area (Sq. Miles) (2010) | Average Housing Unit Density (Units/Sq. Mi.) (Raw) |
|---|---|---|---|---|
| Banner | 199 | 38 | 18.030 | 11.037 |
| Bishop | 503 | 46 | 34.941 | 14.396 |
| Douglas | 5,740 | 226 | 33.582 | 170.925 |
| Jackson | 486 | 90 | 37.463 | 12.973 |
| Liberty | 350 | 50 | 17.970 | 19.477 |
| Lucas | 174 | 16 | 35.489 | 4.903 |
| Mason | 598 | 65 | 37.182 | 16.083 |
| Moccasin | 219 | 47 | 35.587 | 6.154 |
| Mound | 1,494 | 177 | 36.967 | 40.414 |
| St. Francis | 453 | 13 | 32.356 | 14.000 |
| Summit | 1,654 | 75 | 33.636 | 49.174 |
| Teutopolis | 965 | 10 | 17.036 | 56.645 |
| Union | 297 | 88 | 35.797 | 8.297 |
| Watson | 1,263 | 234 | 35.831 | 35.249 |
| West | 175 | 21 | 36.911 | 4.741 |
| Townships - 5 most populated | 11,116 | 722 | 157 | 70.779 |
| Townships - 10 least populated | 3,454 | 474 | 322 | 10.736 |

* Information on additional housing characteristics, such as mobile homes, was not covered by the 2010 Census. Instead the U.S. Census Bureau has chosen to generate 5-year estimates from American Community Survey data. The 2013-2017 5-year estimate is the most recent year for which estimates were available.

Source: U.S. Census Bureau.

In Effingham County, all of the participating municipalities have large, sparsely-populated open areas within their municipal boundaries. These areas account for approximately 20% to 67% of the land area in these municipalities. If these areas are subtracted from the U.S. Census Bureau land area figures, then the remaining land areas have fairly consistent housing unit densities and contain a majority of the housing units. **Figure T-12** provides a breakdown of the refined land area figures for select municipalities. These refined land area figures will be used to update the average housing unit density calculations for these municipalities.

With updated average housing unit densities calculated it is relatively simple to provide an estimate of the number of existing potentially-damaged housing units. This can be done by multiplying the average housing unit density by the area impacted by the average-sized Effingham County tornado. **Figure T-13** provides a sample calculation.

**Figure T-12**
**Refined Land Area Figures for Participating Municipalities with Large Tracts of Undeveloped Land**

| Participating Jurisdiction | Land Area (Sq. Miles) (2010) | Estimated Open Land Area & Commercial/ Industrial Tracts (Sq. Miles) | Refined Land Area (Sq. Miles) |
|---|---|---|---|
| Beecher City | 0.902 | 0.600 | 0.302 |
| Dieterich | 1.160 | 0.540 | 0.620 |
| Effingham | 9.864 | 2.740 | 7.124 |
| Mason | 1.287 | 0.770 | 0.517 |
| Shumway | 0.332 | 0.190 | 0.142 |
| Teutopolis | 1.629 | 0.550 | 1.079 |
| Watson | 1.119 | 0.420 | 0.699 |

**Figure T-13**
**Sample Calculation of Potentially-Damaged Housing Units – Effingham County**

Average Housing Unit Density x Area Impacted by the Average-Sized Effingham County Tornado = Potentially-Damaged Housing Units
(Rounded Up to the Nearest Whole Number)

Effingham County: 30.432 housing units/sq. mile x 0.09 sq. miles = 2.74 housing units
**(3 housing units)**

For those municipalities that cover less than one square mile, the average housing unit density cannot be used to calculate the number of potentially-damaged housing units. The average housing unit density assumes that the land area within the municipality is at least one square mile and as a result distorts the number of potentially-damaged housing units for very small municipalities.

To calculate the number of potentially-damaged housing units for these municipalities, the area impacted by the averaged-sized Effingham County tornado is divided by the land area within the municipality to get the impacted land area. The impacted land area is then multiplied by the total number of housing units within the municipality to get the number of potentially-damaged housing units. **Figure T-14** provides a sample calculation.

**Figure T-14**
**Sample Calculation of Potentially-Damaged Housing Units for Municipalities Covering Less Than One Square Mile –Watson**

Area Impacted by the Average-Sized Effingham County Tornado ÷ Land Area within the Jurisdiction x Total Housing Units in the Jurisdiction = Potentially-Damaged Housing Units
(Rounded Up to the Nearest Whole Number)

Watson: 0.09 sq. mile ÷ 0.699 sq. miles x 281 housing units = 36.18
**(37 housing units)**

**Figures T-15** and **T-16** provide a breakdown of the number of potentially-damaged housing units by participating municipality as well as by township and for the unincorporated areas of the County and the County as a whole. It is important to note that for the five most densely populated townships, the estimated number of potentially-damaged housing units would only be reached if a tornado's pathway included the major municipality within the township. If the tornado remained in the rural portion of the township, then the number of potentially-damaged housing units would be considerably lower.

**Figure T-15**
**Estimated Number of Housing Units by Participating Jurisdiction Potentially Damaged by a Tornado**

| Participating Jurisdiction | Total Housing Units (2010) | Land Area/Refined Land Area (Sq. Miles) (2010) | Average Housing Unit Density (Units/Sq. Mi.) (Raw) | Potentially-Damaged Housing Units (Units/0.09 Sq. Mi.) (Raw) | Potentially-Damaged Housing Units (Units/0.09 Sq. Mi.) (Rounded Up) |
|---|---|---|---|---|---|
| Beecher City | 215 | 0.302 | --- | 64.07 | 65 |
| Dieterich | 249 | 0.620 | 401.613 | 36.15 | 37 |
| Effingham | 5,696 | 7.124 | 799.551 | 71.96 | 72 |
| Mason | 155 | 0.517 | --- | 26.98 | 27 |
| Shumway | 91 | 0.142 | --- | 57.68 | 58 |
| Teutopolis | 590 | 1.079 | 546.803 | 49.21 | 50 |
| Watson | 281 | 0.699 | --- | 36.18 | 37 |
| Unincorp. County | 5,979 | 459.386 | 13.015 | 1.17 | 2 |
| County | 14,570 | 478.777 | 30.432 | 2.74 | 3 |

**What is the level of risk/vulnerability to existing buildings, infrastructure and critical facilities vulnerable from tornadoes?**

There are several factors that must be examined when assessing the vulnerability of existing buildings, infrastructure and critical facilities to tornadoes. These factors include tornado frequency, population distribution and density, the ratings and pathways of previously recorded tornadoes, and the presence of high-risk living accommodations (such as high-rise buildings, mobile homes, etc.)

*Effingham County/Townships*

For Effingham County, including the townships, the level of risk or vulnerability posed by tornadoes to existing buildings, infrastructure and critical facilities is considered to be ***low***. This assessment is based on the frequency with which tornadoes have occurred in the County as well as the amount of damage that has been sustained tempered by the low population density throughout most the County and the relative absence of high-risk living accommodations. While previously recorded tornadoes have followed largely rural pathways, they have caused significant damage on several occasions.

**Figure T-16**
**Estimated Number of Housing Units by Township Potentially Damaged by a Tornado**

| Township | Total Housing Units (2010) | Land Area (Sq. Miles) (2010) | Average Housing Unit Density (Units/Sq. Mi.) (Raw) | Potentially-Damaged Housing Units (Units/0.09 Sq. Mi.) (Raw) | Potentially-Damaged Housing Units (Units/0.09 Sq. Mi.) (Rounded Up) |
|---|---|---|---|---|---|
| Banner | 199 | 18.030 | 11.037 | 0.99 | 1 |
| Bishop | 503 | 34.941 | 14.396 | 1.30 | 2 |
| Douglas | 5,740 | 33.582 | 170.925 | 15.38 | 16 |
| Jackson | 486 | 37.463 | 12.973 | 1.17 | 2 |
| Liberty | 350 | 17.970 | 19.477 | 1.75 | 2 |
| Lucas | 174 | 35.489 | 4.903 | 0.44 | 1 |
| Mason | 598 | 37.182 | 16.083 | 1.45 | 2 |
| Moccasin | 219 | 35.587 | 6.154 | 0.55 | 1 |
| Mound | 1,494 | 36.967 | 40.414 | 3.64 | 4 |
| St. Francis | 453 | 32.356 | 14.000 | 1.26 | 2 |
| Summit | 1,654 | 33.636 | 49.174 | 4.43 | 5 |
| Teutopolis | 965 | 17.036 | 56.645 | 5.10 | 6 |
| Union | 297 | 35.797 | 8.297 | 0.75 | 1 |
| Watson | 1,263 | 35.831 | 35.249 | 3.17 | 4 |
| West | 175 | 36.911 | 4.741 | 0.43 | 1 |
| Townships - 5 most populated | 11,116 | 157.052 | 70.779 | 6.37 | 7 |
| Townships - 10 least populated | 3,454 | 321.726 | 10.736 | 0.97 | 1 |

*Participating Municipalities*

In general, if a tornado were to touch down or pass through any of the participating municipalities the risk to existing buildings, infrastructure, and critical facilities would be considered ***high***. This assessment is based on the population and housing unit distribution within the municipalities where wide expanses of open spaces do not generally exist. As a result, if a tornado were to touch down within any of the municipalities it will have a greater likelihood of causing substantial property damage.

**Are future buildings, infrastructure and critical facilities vulnerable to tornadoes?**

Yes. While four of the participating municipalities have building codes in place that will likely help lessen the vulnerability of new buildings and critical facilities to damage from tornadoes, the County and five municipalities/townships do not.

Infrastructure such as new communication and power lines will continue to be vulnerable to tornadoes as long as they are located above ground. Flying debris can disrupt power and communication lines even if they are not directly in the path of the tornado. Steps to bury all new lines would eliminate the vulnerability, but this action would be cost prohibitive in most areas.

**What are the potential dollar losses to vulnerable structures from tornadoes?**

Unlike other hazards, such as flooding, there are no standard loss estimation models or methodologies for tornadoes. However, a rough estimate of potential dollar losses to the *potentially-damaged housing units* determined previously can be calculated if several additional decisions/assumptions are made regarding:

- the value of the potentially-damaged housing units; and
- the percent damage sustained by the potentially-damaged housing units (i.e., damage scenario).

These assumptions represent a ***probable scenario*** based on the reported historical occurrences of tornadoes in Effingham County. The purpose of providing a rough estimate is to help residents and municipal/county officials make informed decisions to better protect themselves and their communities. These estimates are meant to provide a ***general idea*** of the magnitude of the potential damage that could occur. The following provides a brief discussion of each decision/assumption.

***Assumption #4: Value of Potentially-Damaged Housing Units.*** In order to determine the potential dollar losses to the potentially-damaged housing units, the monetary value of the units must first be calculated. Typically, when damage estimates are prepared after a natural disaster such as a tornado, they are based on the market value of the structure. Since it would be impractical to determine the individual market value of each potentially-damaged housing unit, the average market value of residential structures in each municipality will be used.

**Assumption #4**

The average market value for residential structures in each participating jurisdiction will be used to determine the value of potentially-damaged housing units.

To determine the average market value, the average assessed value must first be calculated. The average assessed value is calculated by taking the total assessed value of residential buildings within a jurisdiction and dividing that number by the total number of housing units within the jurisdiction. The average market value is then determined by taking the average assessed value and multiplying that number by three (the assessed value of a structure in Effingham County is approximately one-third of the market value). **Figure T-17** provides a sample calculation. The total assessed value is based on 2018 tax assessment information provided by the Effingham County Supervisor of Assessments.

***Assumption #5: Damage Scenario.*** Finally, a decision must be made regarding the percent damage sustained by the potentially-damaged housing units and their contents. For this scenario, the expected percent damage sustained by the structure and its contents is 100%; in other words, all of the potentially-damaged housing units would be completely destroyed. While it is highly unlikely that each and every housing unit would sustain the maximum percent damage, identifying and calculating different degrees of damage within the average area impacted is complex and provides an additional complication when updating the Plan.

**Assumption #5**

The tornado would completely destroy the potentially-damaged housing units.

Structural Damage = 100%
Content Damage = 100%

**Figure T-17**
**Sample Calculation of Average Assessed Value & Average Market Value – Watson**

**Average Assessed Value**

Total Assessed Value of Residential Buildings in the Jurisdiction÷ Total Housing Units in the Jurisdiction = Average Assessed Value

Watson: $7,177,770 ÷ 281 housing units = $25,543.67

**Average Market Value**

Average Assessed Value x 3 = Average Market Value
(Rounded to the Nearest Dollar)

Watson: $25,543.67 x 3 = $76,631.01
**($76,631)**

**Figures T-18** and **T-19** provide the average assessed value and average market value for each participating municipality as well as by township and for the unincorporated areas of the County and the County as a whole.

**Figure T-18**
**Average Market Value of Housing Units by Municipality**

| Participating Jurisdiction | Total Assessed Value of Residential Buildings (2018) | Total Housing Units (2010) | Average Assessed Values | Average Market Value |
|---|---|---|---|---|
| Beecher City | $2,896,400 | 215 | $13,472 | $40,415 |
| Dieterich | $11,075,620 | 249 | $44,480 | $133,441 |
| Effingham | $184,304,811 | 5,696 | $32,357 | $97,071 |
| Mason | $2,667,670 | 155 | $17,211 | $51,632 |
| Shumway | $1,849,350 | 91 | $20,323 | $60,968 |
| Teutopolis | $35,481,680 | 590 | $60,138 | $180,415 |
| Watson | $7,177,770 | 281 | $25,544 | $76,631 |
| Unincorp. County | $258,917,601 | 5,979 | $43,304 | $129,913 |
| County | $537,381,022 | 14,570 | $36,883 | $110,648 |

Source: Effingham County Supervisor of Assessments.

**Figure T-19**
**Average Market Value of Housing Units by Township**

| Township | Total Assessed Value of Residential Buildings (2018) | Total Housing Units (2010) | Average Assessed Values | Average Market Value |
|---|---|---|---|---|
| Banner | $3,929,410 | 199 | $19,746 | $59,237 |
| Bishop | $19,364,670 | 503 | $38,498 | $115,495 |
| Douglas | $186,080,320 | 5,740 | $32,418 | $97,255 |
| Jackson | $12,280,540 | 486 | $25,269 | $75,806 |
| Liberty | $5,300,340 | 350 | $15,144 | $45,431 |
| Lucas | $2,817,680 | 174 | $16,194 | $48,581 |
| Mason | $10,078,110 | 598 | $16,853 | $50,559 |
| Moccasin | $3,523,680 | 219 | $16,090 | $48,270 |
| Mound | $44,880,650 | 1,494 | $30,041 | $90,122 |
| St. Francis | $15,460,510 | 453 | $34,129 | $102,387 |
| Summit | $125,172,571 | 1,654 | $75,679 | $227,036 |
| Teutopolis | $58,004,951 | 965 | $60,109 | $180,326 |
| Union | $5,861,750 | 297 | $19,737 | $59,210 |
| Watson | $41,216,580 | 1,263 | $32,634 | $97,902 |
| West | $3,409,240 | 175 | $19,481 | $58,444 |
| Townships - 5 most populated | $455,355,072 | 11,116 | $40,964 | $122,892 |
| Townships - 10 least populated | $82,025,930 | 3,454 | $23,748 | $71,244 |

Source: Effingham County Supervisor of Assessments.

*Calculating Potential Dollar Losses*

With all the decisions and assumptions made, the potential dollar losses can now be calculated. First, the potential dollar losses to the ***structure*** of a potentially-damaged housing unit must be determined. This is done by taking the average market value for a residential structure and multiplying it by the percent damage (100%) to get the average structural damage per unit. Next the average structural damage per unit is multiplied by the number of potentially-damaged housing units. **Figure T-20** provides a sample calculation.

**Figure T-20**
***Structure:* Potential Dollar Loss Sample Calculation – Watson**

Average Market Value of a Housing Unit with the Jurisdiction x Percent Damage = Average Structural Damage per Housing Unit

Watson: $76,631 x 100% = $76,631 per housing unit

Average Structural Damage per Housing Unit x Number of Potentially-Damaged Housing Units within the Jurisdiction = *Structure* Potential Dollar Losses (Rounded to the Nearest Dollar)

Watson: $76,631 per housing unit x 37 housing units = $4,253,021

**($4,253,021)**

Next, the potential dollar losses to the ***content*** of a potentially-damaged housing unit must be determined. Based on FEMA guidance, the value of a residential housing unit's content is approximately 50% of its market value. Therefore, start by taking one-half the average market value for a residential structure and multiply by the percent damage (100%) to get the average content damage per unit. Next the average content damage per unit is multiplied by the number of potentially-damaged housing units. **Figure T-21** provides a sample calculation.

**Figure T-21**
***Content:* Potential Dollar Loss Sample Calculation – Watson**

½ (Average Market Value of a Housing Unit) with the Jurisdiction x Percent Damage = Average Content Damage per Housing Unit

Watson: ½ ($76,631) x 100% = $38,315.50 per housing unit

Average Content Damage per Housing Unit x Number of Potentially-Damaged Housing Units within the Jurisdiction = *Content* Potential Dollar Losses (Rounded to the Nearest Dollar)

Watson: $38,315.50 per housing unit x 37 housing units = $1,417,674

**($1,417,674)**

Finally, the ***total potential dollar losses*** may be calculated by adding together the potential dollar losses to the structure and content. **Figures T-22** and **T-23** give a breakdown of the total potential dollar losses by municipality and township.

**Figure T-22**
**Estimated Potential Dollar Losses to Potentially-Damaged Housing Units from a Tornado by Participating Jurisdiction**

| Participating Jurisdiction | Average Market Value (2018) | Potentially-Damaged Housing Units (Rounded Up) | Potential Dollar Losses | | Total Potential Dollar Losses |
|---|---|---|---|---|---|
| | | | Structure | Content | |
| Beecher City | $ 40,415 | 65 | $2,626,975 | $1,313,488 | $3,940,463 |
| Dieterich | $ 133,441 | 37 | $4,937,317 | $2,468,659 | $7,405,976 |
| Effingham | $ 97,071 | 72 | $6,989,112 | $3,494,556 | $10,483,668 |
| Mason | $ 51,632 | 27 | $1,394,064 | $697,032 | $2,091,096 |
| Shumway | $ 60,968 | 58 | $3,536,144 | $1,768,072 | $5,304,216 |
| Teutopolis | $ 180,415 | 50 | $9,020,750 | $4,510,375 | $13,531,125 |
| Watson | $ 76,631 | 37 | $2,835,347 | $1,417,674 | $4,253,021 |
| Unincorp. County | $ 129,913 | 2 | $259,826 | $129,913 | $389,739 |
| County | $ 110,648 | 3 | $331,944 | $165,972 | $497,916 |

**Figure T-23**
**Estimated Potential Dollar Losses to Potentially-Damaged Housing Units from a Tornado by Township**

| Township | Average Market Value (2018) | Potentially-Damaged Housing Units (Rounded Up) | Potential Dollar Losses | | Total Potential Dollar Losses |
|---|---|---|---|---|---|
| | | | Structure | Content | |
| Banner | $ 59,237 | 1 | $59,237 | $29,619 | $88,856 |
| Bishop | $ 115,495 | 2 | $230,990 | $115,495 | $346,485 |
| Douglas | $ 97,255 | 16 | $1,556,080 | $778,040 | $2,334,120 |
| Jackson | $ 75,806 | 2 | $151,612 | $75,806 | $227,418 |
| Liberty | $ 45,431 | 2 | $90,862 | $45,431 | $136,293 |
| Lucas | $ 48,581 | 1 | $48,581 | $24,291 | $72,872 |
| Mason | $ 50,559 | 2 | $101,118 | $50,559 | $151,677 |
| Moccasin | $ 48,270 | 1 | $48,270 | $24,135 | $72,405 |
| Mound | $ 90,122 | 4 | $360,488 | $180,244 | $540,732 |
| St. Francis | $ 102,387 | 2 | $204,774 | $102,387 | $307,161 |
| Summit | $ 227,036 | 5 | $1,135,180 | $567,590 | $1,702,770 |
| Teutopolis | $ 180,326 | 6 | $1,081,956 | $540,978 | $1,622,934 |
| Union | $ 59,210 | 1 | $59,210 | $29,605 | $88,815 |
| Watson | $ 97,902 | 4 | $391,608 | $195,804 | $587,412 |
| West | $ 58,444 | 1 | $58,444 | $29,222 | $87,666 |
| Townships - 5 most populated | $ 122,892 | 7 | 860,244 | 430,122 | 1,290,366 |
| Townships - 10 least populated | $ 71,244 | 1 | 71,244 | 35,622 | 106,866 |

This assessment illustrates why potential residential dollar losses should be considered when jurisdictions are deciding which mitigation projects to pursue. ***Potential dollar losses caused by an average tornado in Effingham County would be expected to exceed at least $3.9 million in any of the participating municipalities***.

For comparison, an estimate of potential dollar losses was calculated for the entire County, the unincorporated portions of the County, the five most populated townships and the 10 least populated townships. As discussed previously, the estimate for the entire County is skewed because it does not take into consideration the differences in the housing density.

*Vulnerability of Commercial/Industrial Businesses and Infrastructure/Critical Facilities*

The calculations presented above are meant to provide the reader with a sense of the scope or magnitude of an average-sized tornado in term of residential dollar losses. These calculations do not include damages sustained by businesses or other infrastructure and critical facilities within the participating jurisdictions.

In terms of businesses, the impacts from an average-sized tornado event can be physical and/or monetary. Monetary impacts can include loss of sales revenue either through temporary closure or loss of critical services (i.e., power, drinking water, and sewer). Depending on the magnitude of the event, the damage sustained by infrastructure and critical facilities can be extensive in nature

and expensive to repair. As a result, the cumulative monetary impacts to businesses and infrastructure can exceed the cumulative monetary impacts to residences. ***While average dollar amounts cannot be supplied for these items at this time, they should be taken into account*** when discussing the impacts that an average-sized tornado could have on the participating jurisdictions.

## 3.6 DROUGHTS

### HAZARD IDENTIFICATION

**What is the definition of a drought?**

While difficult to define, the National Drought Mitigation Center (NDMC) considers "drought" in its most general sense to be a deficiency of precipitation over an extended period of time, usually a season or more, resulting in a water shortage.

Drought is a normal and recurrent feature of climate and can occur in all climate zones, though its characteristics and impacts vary significantly from one region to another. Unlike other natural hazards, drought does not have a clearly defined beginning or end. Droughts can be short, lasting just a few months, or they can persist for several years. There have been 26 drought events with losses exceeding $1 billion each (CPI-Adjusted) across the United States between 1980 and 2018. This is due in part to the sheer size of the areas affected.

**What types of drought occur?**

There are four main types of drought that occur: meteorological, agricultural, hydrological and socioeconomic. They are differentiated based on the use and need for water. The following provides a brief description of each type.

- **Meteorological Drought.** Meteorological drought is defined by the degree of dryness or rainfall deficit and the duration of the dry period. Due to climate differences, what might be considered a drought in one location of the country may not be in another location.
- **Agricultural Drought.** An agricultural drought refers to a period when rainfall deficits, soil moisture deficits, reduced ground water or reservoir levels needed for irrigation impact crop development and yields.
- **Hydrological Drought.** Hydrological drought refers to a period when precipitation deficits (including snowfall) impact surface (stream flow, reservoir and lake levels) and subsurface (aquifers) water supply levels.
- **Socioeconomic Drought.** Socioeconomic drought refers to a period when the demand for an economic good (fruit, vegetables, grains, etc.) exceeds the supply as a result of weather-related shortfall in the water supply.

**How are droughts measured?**

There are numerous quantitative measures (indicators and indices) that have been developed to measure drought. How these indicators and indices measure drought depends on the discipline affected (i.e., agriculture, hydrology, meteorology, etc.) and the region being considered. There is no single index or indicator that can account for and be applied to all types of drought.

Although none of the major indices are inherently superior to the rest, some are better suited than others for certain uses. The first comprehensive drought index developed in the United States was the Palmer Drought Severity Index (PDSI). The PDSI is calculated based on precipitation and temperature data, as well as the local Available Water Content of the soil. It is most effective

measuring drought impacts on agriculture. For many years it was the only operational drought index and it is still very popular around the world.

The Standardized Precipitation Index (SPI), developed in 1993, uses precipitation records for any location to develop a probability of precipitation for any time scale in order to reflect the impact of drought on the availability of different water resources (groundwater, reservoir storage, streamflow, snowpack, etc.) In 2009 the World Meteorological Organization recommended SPI as the main meteorological drought index that countries should use to monitor and follow drought conditions.

The first operational 'composite' approach applied in the United States was the U.S. Drought Monitor (USDM). The USDM utilizes five key indicators, numerous supplementary indicators and local reports from expert observers around the country to produce a drought intensity rating that is ideal for monitoring droughts that have many impacts, especially on agriculture and water resources during all seasons over all climate types. NOAA's Storm Events Database records include USDM ratings and utilized them along with additional weather information to describe the severity of the drought conditions impacting affected counties. Therefore, this Plan will utilize USDM ratings to identify and describe previous drought events recorded within the County. The following provides a more detailed discussion of the USDM to aid the Plan's developers and the general public in understanding how droughts are identified and categorized.

*U.S. Drought Monitor (USDM)*

Established in 1999, the USDM is a relatively new index that combines quantitative measures with input from experts in the field. It is designed to provide the general public, media, government officials and others with an easily understandable "big picture" overview of drought conditions across the United States. It is unique in that it combines a variety of numeric-based drought indices and indicators with local expert input to create a single composite drought indicator, the results of which are illustrated via a weekly map that depicts the current drought conditions across the United States. The USDM is jointly produced by the National Drought Mitigation Center at the University of Nebraska-Lincoln, the U.S. Department of Agriculture, and the National Oceanic and Atmospheric Administration.

The USDM has a scale of five intensity categories, D0 through D4, that are utilized to identify areas of drought. **Figure DR-1** provides a brief description of each category.

Because the ranges of the various indicators often don't coincide, the final drought category tends to be based on what a majority of the indictors show and on local observations. The authors also weight the indices according to how well they perform in various parts of the country and at different times of the year. It is the combination of the best available data, location observations and experts' best judgment that make the U.S. Drought Monitor more versatile than other drought indices.

In addition to identifying and categorizing general areas of drought, the USDM also identifies whether a drought's impacts are short-term (typically less than 6 months – agriculture, grasslands) or long-term (typically more than 6 months – hydrology, ecology). **Figure DR-2** shows an example of the USDM weekly map. The USDM is designed to provide a consistent big-picture

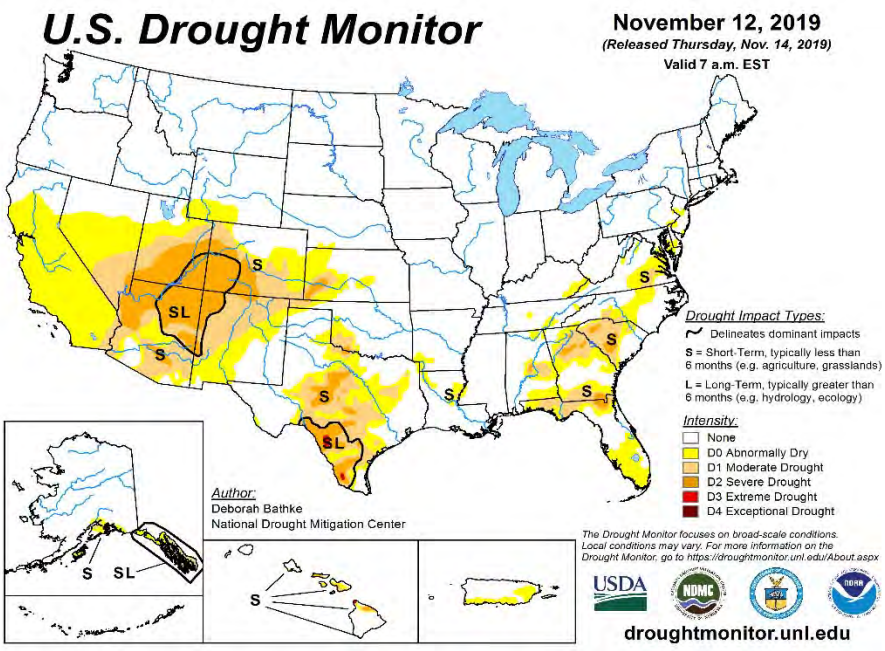
look at drought conditions in the United States. It is not designed to infer specifics about local conditions.

**Figure DR-1**
**U.S. Drought Monitor – Drought Severity Classifications**

| Category | Possible Impacts |
|---|---|
| D0 (Abnormally Dry) | • Going into drought:<br>- short-term dryness slowing planting, growth of crops or pastures.<br>• Coming out of drought:<br>- some lingering water deficits<br>- pastures or crops not fully recovered |
| D1 (Moderate Drought) | • Some damage to crops, pastures<br>• Streams, reservoirs, or wells low; some water shortages developing or imminent<br>• Voluntary water-use restrictions requested |
| D2 (Severe Drought) | • Crop or pasture losses likely<br>• Water shortages common<br>• Water restrictions imposed |
| D3 (Extreme Drought) | • Major crop/pasture losses<br>• Widespread water shortages or restrictions |
| D4 (Exceptional Drought) | • Exceptional and widespread crop/pasture losses<br>• Shortages of water in reservoirs, streams, and wells creating water emergencies |

Source: U.S. Drought Monitor.

**Figure DR-2**
**U. S. Drought Monitor**




The U.S. Drought Monitor is jointly produced by the National Drought Mitigation Center at the University of Nebraska-Lincoln, the United States Department of Agriculture, and the National Oceanic and Atmospheric Administration. Map Courtesy of NDMC.

## HAZARD PROFILE

The following identifies past occurrences of drought, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

**When have droughts occurred previously? What is the extent of these previous droughts?**

**Drought Fast Facts – Occurrences**

Number of Drought Events Reported (1980 – 2019): ***6***

**Table 11**, located in **Appendix J**, summarizes the previous occurrences as well as the extent or magnitude of the drought events recorded in Effingham County. NOAA's Storm Events Database, the Illinois State Water Survey, the Illinois Emergency Management Agency (IEMA) and the USDA documented six official droughts for Effingham County between 1908 and 2019.

The State of Illinois Drought Preparedness and Response Plan identified seven outstanding statewide droughts since 1900 based on statewide summer values of the PDSI provided by NOAA's National Center for Environmental Information. Those seven droughts occurred in 1902, 1915, 1931, 1934, 1936, 1954 and 1964; however, the extent to which Effingham County was impacted was unavailable.

**What locations are affected by drought?**

Drought events affect the entire County. Droughts, like excessive heat and severe winter storms, tend to impact large areas, extending across an entire region and affecting multiple counties. The *2018 Illinois Natural Hazard Mitigation Plan* classifies Effingham County's hazard rating for drought as "medium."

**What is the probability of future drought events occurring?**

Effingham County has experienced six droughts between 1980 and 2019. With six occurrences over 40 years, the probability or likelihood that the County may experience a drought in any given year is 15%. However, if earlier recorded droughts are factored in, then the probability that Effingham County may experience a drought in any given year decreases to 11%.

## HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from drought.

**Are the participating jurisdictions vulnerable to drought?**

Yes. All of Effingham County, including the municipalities, is vulnerable to drought. Neither the amount nor the distribution of precipitation; soil types; topography; or water table conditions provides protection for any area within the County. Since 2010, Effingham County has experienced two droughts.

**Do any of the participating jurisdictions consider drought to be among their community's greatest vulnerabilities?**

No. Based on responses to a Critical Facilities Vulnerability Survey distributed to the participating jurisdictions, none of the participating jurisdictions considered drought to be among their community's greatest vulnerabilities. In addition, none of the jurisdictions identified any critical facilities or infrastructure within their communities as having a specific vulnerability to drought.

**What impacts resulted from the recorded drought events?**

Damage information was only available for one of the six drought events experienced between 1980 and 2019. According to NOAA's Storm Events Database, the 2012 drought caused an estimated $32.8 million in damages to the corn crop in Effingham County. Damage information was either unavailable or none was recorded for the remaining four reported occurrences.

Of the six drought events, disaster relief payment information was only available for one of the events. In 1988, landowners and farmers in Illinois were paid in excess of $382 million in relief payments; however, a breakdown by county was unavailable.

**Drought Fast Facts – Impacts/Risk**

Drought Impacts:
- Total Property Damage: ***n/a***
- Total Crop Damage: ***$32.8 million (corn crop damage only – 2012 drought)***

Drought Risk/Vulnerability:
- Public Health & Safety: ***Low***
- Buildings/Infrastructure/Critical Facilities: ***Low***

**What other impacts can result from drought events?**

Based on statewide drought records available from the Illinois State Water Survey, the most common impacts that result from drought events in Illinois include reductions in crop yields and drinking water shortages.

*Crop Yield Reductions*

Agriculture is the principal enterprise in Effingham County. Farmland accounts for approximately 97.7% of all the land in the County. According to the 2017 Census of Agriculture, there were 1,193 farms in in the County occupying 299,389 acres. Of the land in farms, approximately 87% or 260,693 acres is in crop production. Less than 1% of the land in crop production is irrigated.

According to the 2017 Census of Agriculture, crop sales accounted for $126.3 million in revenue while livestock sales accounted for $68.8 million. Effingham County ranks 9$^{th}$ in Illinois for livestock cash receipts and 50$^{th}$ for crop cash receipts. A severe drought would have a major financial impact on the large agricultural community, particularly if it occurred during the growing season. Dry weather conditions, particularly when accompanied by excessive heat, can result in diminished crop yields and place stress on livestock.

A reduction in crop yields was seen as a result of the 1983, 1988, 2005, 2007, 2011 and 2012 droughts. **Figure DR-3** illustrates the reduction yields seen for corn and soybeans during the six recorded drought events. The USDA's National Agricultural Statistics Service records show that the yield reductions for corn were most severe for the 2012 drought when there was a 72.1% reduction and soybean yield reductions were most severe for the 1983 drought when there was a 57.1% reduction.

**Figure DR-3**
**Crop Yield Reductions Due to Drought – Effingham County**

| Year | Corn | | Soybeans | |
|---|---|---|---|---|
| | Yield (bushel) | % Reduction Previous Year | Yield (bushel) | % Reduction Previous Year |
| 1982 | 115 | --- | 35 | --- |
| **1983** | **36** | **68.7%** | **15** | **57.1%** |
| 1984 | 68 | --- | 21.5 | --- |
| 1987 | 136 | --- | 33.5 | --- |
| **1988** | **73** | **46.3%** | **22** | **34.3%** |
| 1989 | 118 | --- | 33.5 | --- |
| 2004 | 171 | --- | 50 | --- |
| **2005** | **119** | **30.4%** | **39** | **22.0%** |
| 2006 | 145 | --- | 48 | --- |
| **2007** | 153 | --- | **36** | **25.0%** |
| 2008 | 171 | --- | 46 | --- |
| 2010 | 157.9 | --- | 49.8 | --- |
| **2011** | **153.7** | **2.7%** | **43.8** | **12.0%** |
| **2012** | **42.9** | **72.1%** | **42** | **4.1%** |
| 2013 | 172.4 | --- | 46 | --- |

Source: USDA, National Agricultural Statistics Service.

*Drinking Water Shortages*

Municipalities that rely on surface water sources for their drinking water supplies are more vulnerable to shortages as a result of drought. In Effingham County ***six of the seven participating municipality relies on a surface water source*** for their drinking water supply. Dietrich, Mason, Shumway and Watson purchase their water from EJ Water Coop. The City of Effingham gets its water from Lake Sara and the Little Wabash River while Teutopolis purchases its water from Effingham.

Because these municipalities receive their drinking water supply from a surface water source, they are more vulnerable to shortages as a result of a prolonged drought or a series of droughts in close succession. Those participants that obtain water from wells are less vulnerable to drinking water shortages, although a prolonged drought or a series of droughts in close succession do have the potential to impact water levels in aquifers used for individual drinking water wells in rural areas. This is because individual (private) water wells tend to be shallower than municipal (public) water wells.

**What is the level of vulnerability to public health and safety from drought?**

Unlike other natural hazards that affect the County, drought events do not typically cause injuries or fatalities. The primary concern centers on the financial impacts that result from loss of crop yields and livestock and potential drinking water shortages. Even taking into consideration the potential impacts that a water shortage may have on the general public, the risk or vulnerability to public health and safety from drought is ***low***.

**Are existing buildings, infrastructure and critical facilities vulnerable to drought?**
No. In general, existing buildings, infrastructure and critical facilities located in Effingham County and the participating municipalities are not vulnerable to drought. The primary concern centers on the financial impacts that result from loss of crop yields and livestock.

While buildings do not typically sustain damage from drought events, in rare cases infrastructure and critical facilities may be directly or indirectly impacted. While uncommon, droughts can contribute to roadway damage. Severe soil shrinkage can compromise the foundation of a roadway and lead to cracking and buckling.

Prolonged heat associated with drought can also increase the demand for energy to operate air conditioners, fans and other devices. This increase in demand places stress on the electrical grid, which increases the likelihood of power outages.

Additionally, droughts have impacted drinking water supplies. Reductions in aquifer water levels can cause water shortages that jeopardize the supply of water needed to provide drinking water and fight fires. While water use restrictions can be enacted in an effort to maintain a sufficient supply of water, they are only temporary and do not address long-term viability issues. Drinking water supplies vulnerable to drought, such as those that rely solely on surface water or shallow wells, need to consider mitigation measures that will provide long-term stability before a severe drought or a series of droughts occur. Effective mitigation measures include drilling additional wells, preferably deep wells, securing agreements with alternative water sources and constructing water lines to provide a backup water supply.

In general, the risk or vulnerability to buildings, infrastructure and critical facilities from drought is ***low***, even taking into consideration the potential impact a drought may have on drinking water supplies and the stress that prolonged heat may place on the electrical grid.

**Are future buildings, infrastructure and critical facilities vulnerable to drought?**
No. Future buildings, infrastructure and critical facilities within the County are no more vulnerable to drought than the existing building, infrastructure and critical facilities. As discussed above, buildings do not typically sustain damage from drought. Infrastructure and critical facilities may, in rare cases, be damaged by drought, but very little can be done to prevent this damage.

**What are the potential dollar losses to vulnerable structures from drought?**
Unlike other natural hazards there are no standard loss estimation models or methodologies for drought. Since drought typically does not cause structure damage, it is unlikely that future property damage dollar losses will be excessive. The primary concern associated with drought is the financial impacts that result from loss of crop yields and the potential impacts to drinking water supplies. Since a large majority of the County is involved in farming activities, it is likely that there will be future crop damage dollar losses to drought. In addition, reduced water levels and the water conservation measures that typically accompany a drought will most likely impact consumers as well as businesses and industries that are water-dependent (i.e., car washes, landscapers etc.).

## 3.7 EARTHQUAKES

### HAZARD IDENTIFICATION

**What is the definition of an earthquake?**

An earthquake is a sudden shaking of the ground caused when rocks forming the earth's crust slip or move past each other along a fault (a fracture in the rocks). Most earthquakes occur along the boundaries of the earth's tectonic plates. These slow-moving plates are being pulled and dragged in different directions, sliding over, under and past each other. Occasionally, as the plates move past each other, their jagged edges will catch or stick causing a gradual buildup of pressure (energy).

Eventually, the force exerted by the moving plates overcomes the resistance at the edges and the plates snap into a new position. This abrupt shift releases the pent-up energy, producing vibrations or seismic waves that travel outward from the earthquake's point of origin. The location below the earth's surface where the earthquake starts is known as the hypocenter or focus. The point on the earth's surface directly above the focus is the epicenter.

The destruction caused by an earthquake may range from light to catastrophic depending on a number of factors including the magnitude of the earthquake, the distance from the epicenter, the local geologic conditions as well as construction standards and time of day (i.e., rush hour). Earthquake damage may include power outages, general property damage, road and bridge failure, collapsed buildings and utility damage (ruptured gas lines, broken water mains, etc.).

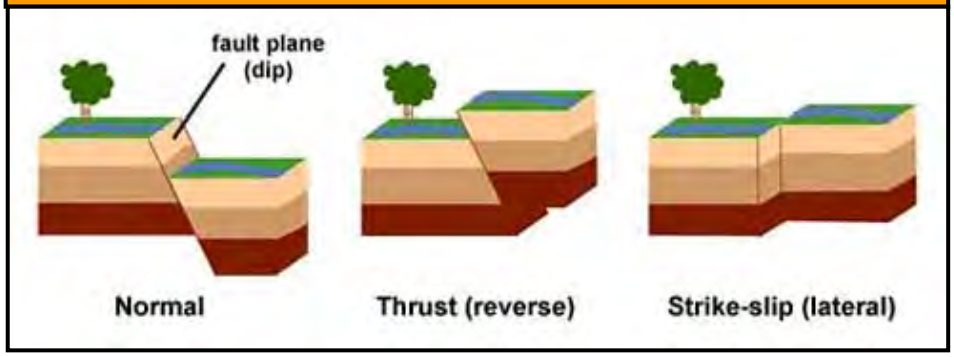
Most of the damage done by an earthquake is caused by its secondary or indirect effects. These secondary effects result from the seismic waves released by the earthquake and include ground shaking, surface faulting, liquefaction, landslides and, in rare cases, tsunamis.

According to the U.S. Geological Survey, more than 143 million Americans in the contiguous United States are exposed to potentially damaging ground shaking from earthquakes. Over 44 million of those Americans, located in 18 states, are exposed to very strong ground shaking from earthquakes. Illinois ranks 10$^{th}$ in terms of the number of individuals exposed to very strong ground shaking. The Federal Emergency Management Agency's Hazus analysis indicates that the annualized earthquake losses to the national building stock is $6.1 billion per year. A majority of the average annual loss is concentrated in California ($3.7 million). The central United States (including Illinois) ranks third in annualized earthquake losses at $480 billion, behind the pacific northwest (Washington and Oregon) with annualized earthquake losses at $710 billion.

**What is a fault?**

A fault is a fracture or zone of fractures in the earth's crust between two blocks of rock. They may range in length from a few millimeters to thousands of kilometers. Many faults form along tectonic plate boundaries. Faults are classified based on the angle of the fault with respect to the surface (known as the dip) and the direction of slip or movement along the fault. There are three main groups of faults: normal, thrust (reverse) and strike-slip (lateral). **Figure EQ-1** provides an illustration of each type of fault.

**Figure EQ-1**
**Fault Illustration**




Source: U. S. Geological Survey.

Normal faults occur in response to pulling or tension along the two blocks of rock causing the overlying block to move down the dip of the fault plane. Most of the faults in Illinois are normal faults. Thrust or reverse faults occur in response to squeezing or compression of the two blocks of rock causing the overlying block to move up the dip of the fault plane. Strike-slip or lateral faults can occur in response to either pulling/tension or squeezing/compression causing the blocks to move horizontally past each other.

Geologists have found that earthquakes tend to recur along faults, which reflect zones of weakness in the earth's crust. Even if a fault zone has recently experienced an earthquake, there is no guarantee that all the stress has been relieved. Another earthquake could still occur.

**What are tectonic plates?**

Tectonic plates are large, irregularly-shaped, relatively rigid sections of the earth's crust that float on the top, fluid layer of the earth's mantle. There are about a dozen tectonic plates that make up the surface of the planet. These plates are approximately 50 to 60 miles thick and the largest are millions of square miles in size.

**How are earthquakes measured?**

The severity of an earthquake is measured in terms of its magnitude and intensity. A brief description of both terms and the scales used to measure each are provided below.

*Magnitude*

Magnitude refers to the amount of seismic energy released at the hypocenter of an earthquake. The magnitude of an earthquake is determined from measurements of ground vibrations recorded by seismographs. As a result, magnitude is represented as a single, instrumentally determined value. A loose network of seismographs has been installed all over the world to help record and verify earthquake events.

There are several scales that measure the magnitude of an earthquake. The most well-known is the Richter Scale. This logarithmic scale provides a numeric representation of the magnitude of an earthquake through the use of whole numbers and decimal fractions. Because of the logarithmic basis of the scale, each whole number increase in magnitude represents a tenfold increase in ground

vibrations measured. In addition, each whole number increase corresponds to the release of about 31 times more energy than the amount associated with the preceding whole number. It is important to note that the Richter Scale is used only to determine the magnitude of an earthquake, it does not assess the damage that results.

Once an earthquake's magnitude has been confirmed, it can be classified. **Figure EQ-2** categorizes earthquakes by class based on their magnitude (i.e., Richter Scale value). Any earthquake with a magnitude less than 3.0 on the Richter Scale is classified as a micro earthquake while any earthquake with a magnitude of 8.0 or greater on the Richter Scale is considered a "great" earthquake. Earthquakes with a magnitude of 2.0 or less are not commonly felt by individuals. The largest earthquake to occur in the United States since 1900 took place off the coast of Alaska in Prince William Sound on March 28, 1964 and registered a 9.2 on the Richter Scale.

**Figure EQ-2**
**Earthquake Magnitude Classes**

| Class | Magnitude (Richter Scale) |
|---|---|
| micro | smaller than 3.0 |
| minor | 3.0 – 3.9 |
| light | 4.0 – 4.9 |
| moderate | 5.0 – 5.9 |
| strong | 6.0 – 6.9 |
| major | 7.0 – 7.9 |
| great | 8.0 or larger |

Source: Michigan Technological University, Department of Geological and Mining Engineering and Sciences, UPSeis

*Intensity*

Intensity refers to the effect an earthquake has on a particular location. The intensity of an earthquake is determined from observations made of the damage inflicted on individuals, structures and the environment. As a result, intensity does not have a mathematical basis; instead it is an arbitrary ranking of observed effects. In addition, intensity generally diminishes with distance. There may be multiple intensity recordings for a region depending on a location's distance from the epicenter.

Although numerous intensity scales have been developed over the years, the one currently used in the United States is the Modified Mercalli Intensity Scale. This scale, composed of 12 increasing levels of intensity that range from imperceptible shaking to catastrophic destruction, is designated by Roman numerals. The lower numbers of the intensity scale are based on human observations (i.e., felt only by a few people at rest, felt quite noticeably by persons indoors, etc.).

The higher numbers of the scale are based on observed structural damage (i.e., broken windows, general damage to foundations etc.). Structural engineers usually contribute information when assigning intensity values of VIII or greater. **Figure EQ-3** provides a description of the damages associated with each level of intensity as well as comparing Richter Scales values to Modified Mercalli Intensity Scale values.

Generally, the Modified Mercalli Intensity value assigned to a specific site after an earthquake is a more meaningful measure of severity to the general public than magnitude because intensity refers to the effects actually experienced at that location.

**Figure EQ-3**
**Comparison of Richter Scale and Modified Mercalli Intensity Scale**

| Richter Scale | Modified Mercalli Scale | Observations |
|---|---|---|
| 1.0 – 1.9 | I | Felt by very few people; barely noticeable. No damage. |
| 2.0 – 2.9 | II | Felt by a few people, especially on the upper floors of buildings. No damage. |
| 3.0 – 3.9 | III | Noticeable indoors, especially on the upper floors of buildings, but may not be recognized as an earthquake. Standing cars may rock slightly; vibrations similar to the passing of a truck. No damage. |
| 4.0 | IV | Felt by many indoors and a few outdoors. Dishes, windows, and doors disturbed. Standing cars rocked noticeably. No damage. |
| 4.1 – 4.9 | V | Felt by nearly everyone. Small, unstable objects displaced or upset; some dishes and glassware broken. Negligible damage. |
| 5.0 – 5.9 | VI | Felt by everyone. Difficult to stand. Some heavy furniture moved. Weak plaster may fall and some masonry, such as chimneys, may be slightly damaged. Slight damage. |
| 6.0 | VII | Slight to moderate damage to well-built ordinary structures. Considerable damage to poorly-built structures. Some chimneys may break. Some walls may fall. |
| 6.1 – 6.9 | VIII | Considerable damage to ordinary buildings. Severe damage to poorly built buildings. Some walls collapse. Chimneys, monuments, factory stacks, columns fall. |
| 7.0 | IX | Severe structural damage in substantial buildings, with partial collapses. Buildings shifted off foundations. Ground cracks noticeable. |
| 7.1 – 7.9 | X | Most masonry and frame structures and their foundations destroyed. Some well-built wooden structures destroyed. Train tracks bent. Ground badly cracked. Landslides. |
| 8.0 | XI | Few, if any structures remain standing. Bridges destroyed. Wide cracks in ground. Train tracks bent greatly. Wholesale destruction. |
| > 8.0 | XII | Total damage. Lines of sight and level are distorted. Waves seen on the ground. Objects thrown up into the air. |

Sources: Michigan Technological University, Department of Geological and Mining Engineering and Sciences, UPSeis.
U.S. Geological Survey.

**When and where do earthquakes occur?**

Earthquakes can strike any location at any time. However, history has shown that most earthquakes occur in the same general areas year after year, principally in three large zones around the globe. The world's greatest earthquake belt, the circum-Pacific seismic belt (nicknamed the "Ring of Fire"), is found along the rim of the Pacific Ocean, where about 81 percent of the world's largest earthquakes occur.

The second prominent belt is the Alpide, which extends from Java to Sumatra and through the Himalayan Mountains, the Mediterranean Sea and out into the Atlantic Ocean. It accounts for about 17 percent of the world's largest earthquakes, including those in Iran, Turkey and Pakistan. The third belt follows the submerged mid-Atlantic Ridge, the longest mountain range in the world, nearly splitting the entire Atlantic Ocean north to south.

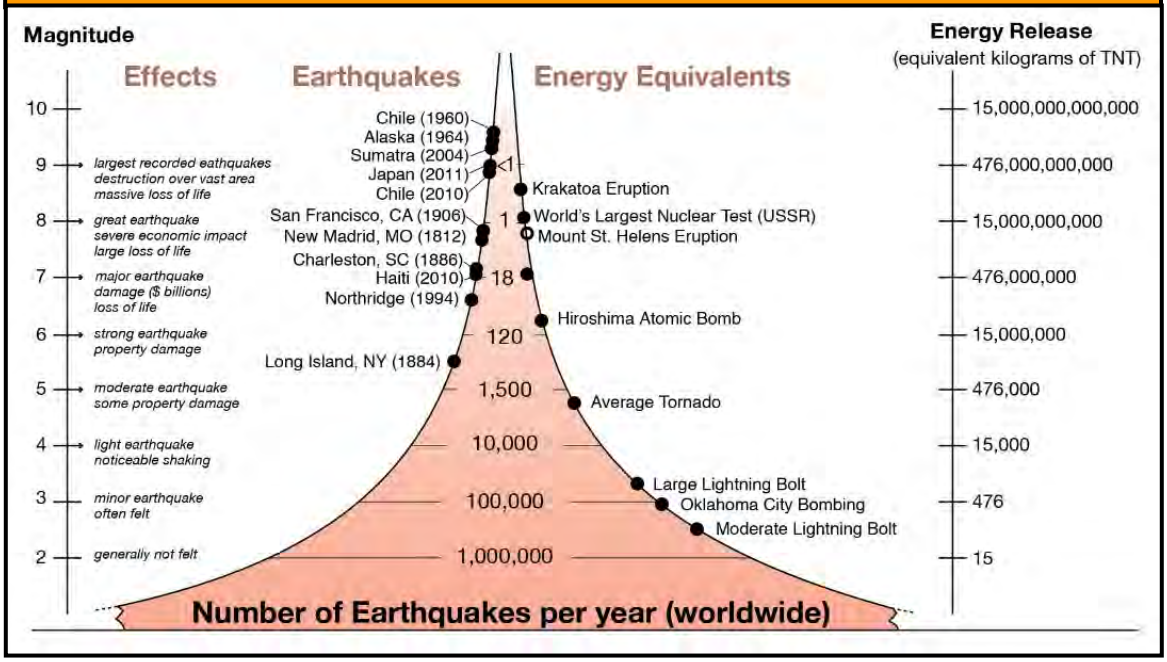
While most earthquakes occur along plate boundaries some are known to occur within the interior of a plate. (As the plates continue to move and plate boundaries change over time, weakened

boundary regions become part of the interiors of the plates.) Earthquakes can occur along zones of weakness within a plate in response to stresses that originate at the edges of the plate or from deep within the earth's crust. The New Madrid earthquakes of 1811 and 1812 occurred within the North American plate.

**How often do earthquakes occur?**

Earthquakes occur every day. Magnitude 2 and smaller earthquakes occur several hundred times a day worldwide. These earthquakes are known as micro earthquakes and are generally not felt by humans. Major earthquakes, greater than magnitude 7, generally occur at least once a month. **Figure EQ-4** illustrates the approximate number of earthquakes that occur worldwide per year based on magnitude. This figure also identifies manmade and natural events that release approximately the same amount of energy for comparison.

**Figure EQ-4**
**Approximate Number of Earthquakes Recorded Annually**




Source: Incorporated Research Institutions for Seismology, Education and Outreach Series, "How Often Do Earthquakes Occur?"

## HAZARD PROFILE

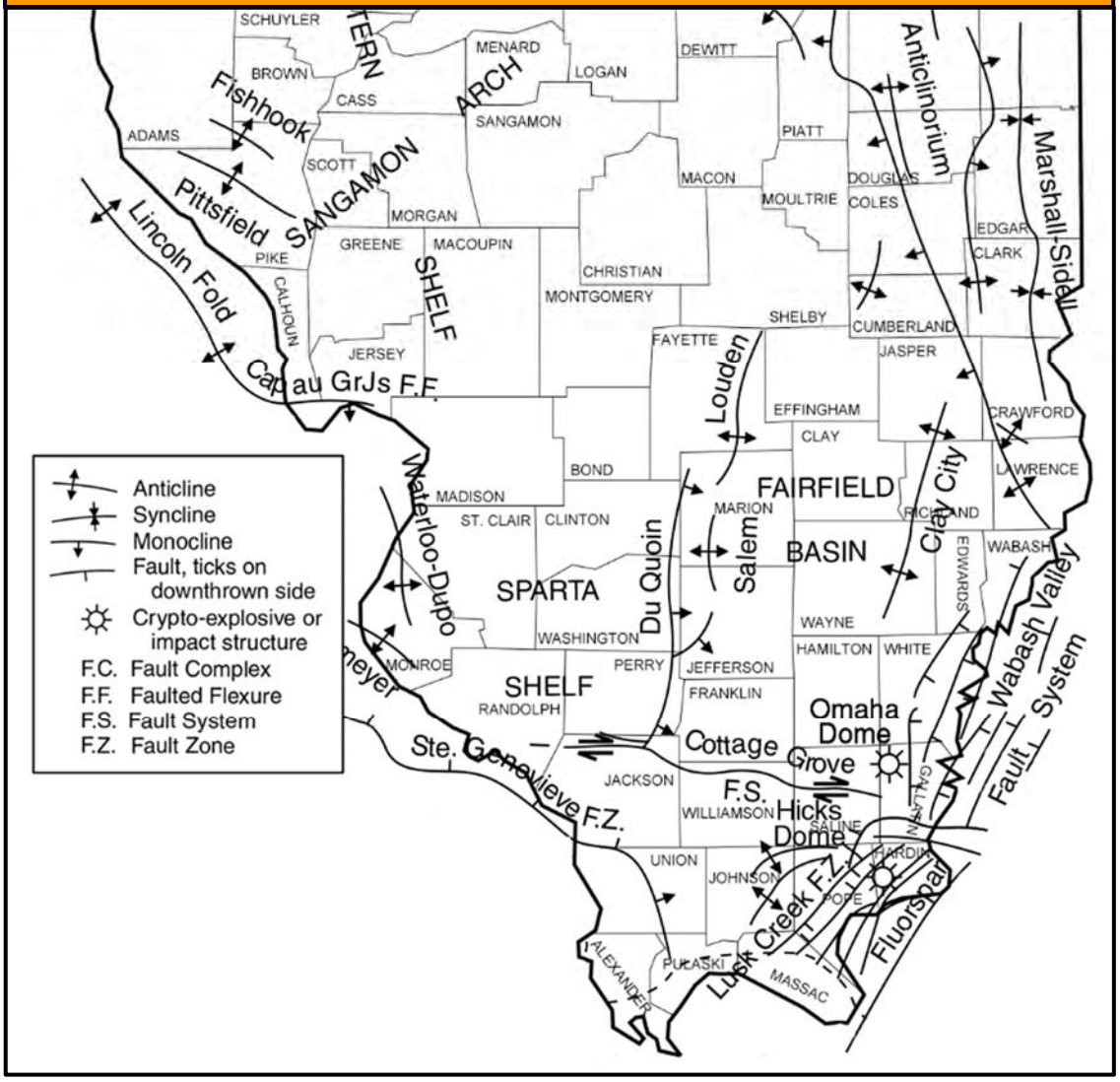
The following details the location of known fault zones and geologic structures, identifies past occurrences of earthquakes, details the severity or extent of future potential events (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

**Are there any faults located within the County?**

No. There are no geological structures of significance, including faults, located in Effingham County. However, there are several well-known faults in the immediate region: the Wabash Valley Fault

System, the Cottage Grove Fault System and the Rough Creek-Shawneetown Fault System. **Figure EQ-5** illustrates the location of these structures.

**Figure EQ-5**
**Geological Structures in Central and Southern Illinois**




Source: Illinois State Geological Survey.

- ***Wabash Valley Fault System***: The Wabash Valley Fault System straddles the southern Illinois-Indiana border and is about 55 miles long and as wide as 30 miles. This broad fracture system experiences moderate earthquake activity presently and there is evidence that strong earthquakes have occurred here within 10,000 years.
- ***Cottage Grove Fault System***: The Cottage Grove Fault System is a complex fracture zone comprised of a "master fault", subsidiary faults, and a belt of anticlines mostly to the south. The zone is approximately 70 miles long and greater than 10 miles wide in some areas, that trends slightly north of west across southern Illinois from Gallatin County to Jackson County.

- *Rough Creek-Shawneetown Fault System*: The Rough Creek-Shawneetown Fault System is one of the largest fault systems in the Midwest. This braided fracture system is about 130 miles long and more than 5 miles wide in some places trending from northeastern Pope County, Illinois to Grayson County, Kentucky.

**When have earthquakes occurred previously? What is the extent of these previous quakes?**

**Earthquake Fast Facts – Occurrences**

Earthquakes Originating in the County (1795 – 2019): ***2***

Fault Zones Located within the County: ***None***

Fault Zones Located in Nearby Counties: ***3***

According to Illinois State Geological Survey, US Geological Survey and the U.S. Geological Survey and the Center for Earthquake Research and Information (CERI) at the University of Memphis, two earthquakes have originated in Effingham County during the last 200 years. . **Figure EQ-6** provides basic details on each event while **Figure EQ-7** illustrates the epicenter of these earthquake.

**Figure EQ-6**
**Earthquakes Originating in Effingham County**

| Date | Magnitude | Intensity | Location |
|---|---|---|---|
| 11/12/1903 | 2.0-2.9 | II | near Teutopolis |
| 2/28/1977 | 2.9 | --- | 4 ½ miles east-northeast of Teutopolis |

Effingham County residents, including those in the participating jurisdictions, have also felt ground shaking caused by earthquakes that have originated outside of the County. The following provides a brief description by region, of these events.

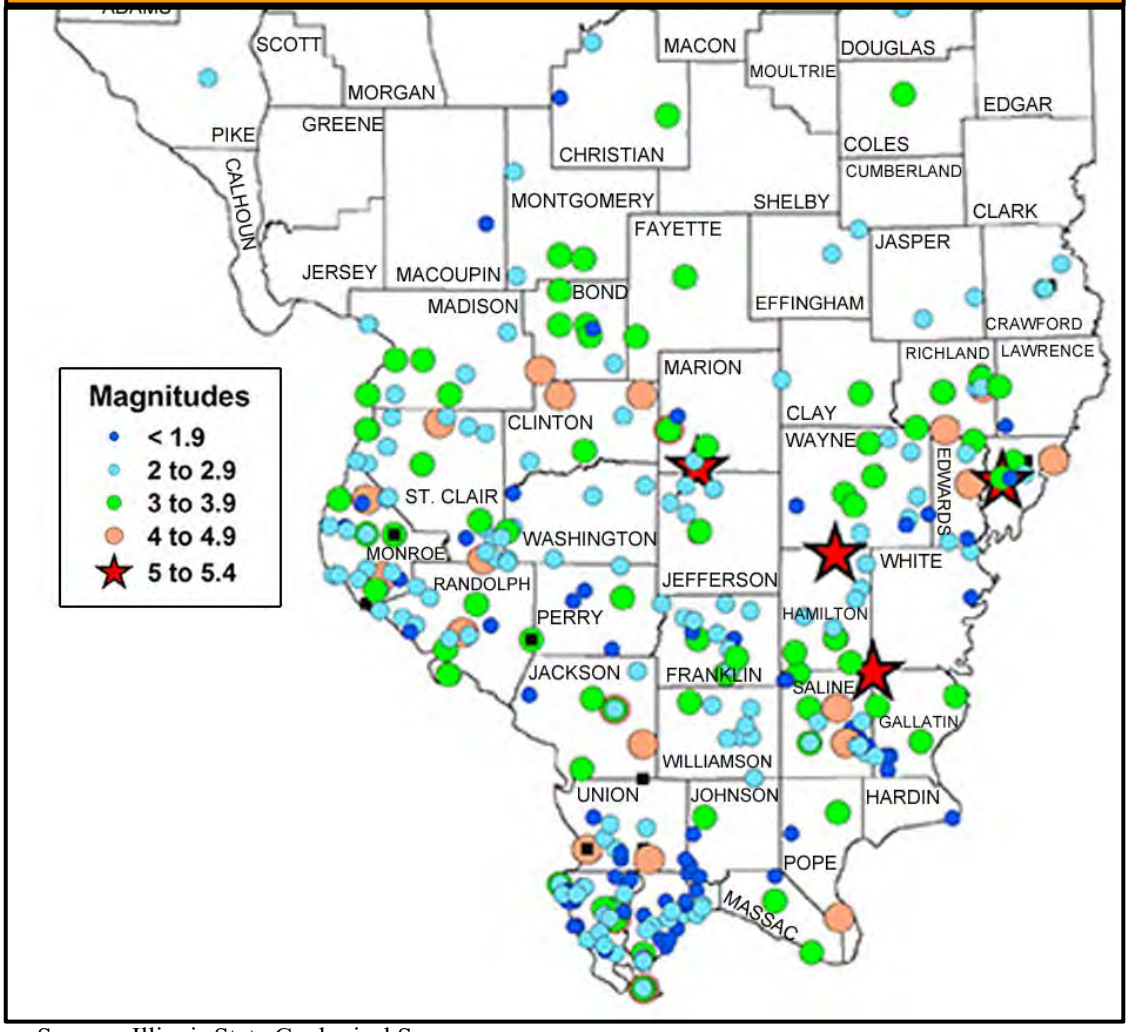
*Southern Illinois*

Effingham County residents also felt ground shaking caused by several earthquakes that have originated in southern Illinois. The following provides a brief description of a few of the larger events that have occurred.

- On April 18, 2008, a magnitude 5.2 earthquake was reported in southeastern Illinois near Bellmont in Wabash County. The earthquake was located along the Wabash Valley seismic zone. Minor structural damage was reported in several towns in Illinois and Kentucky. Ground shaking was felt over all or parts of 18 states in the central United States and southern Ontario, Canada.
- A magnitude 5.2 earthquake took place on June 10, 1987 in southeastern Illinois near Olney in Richland County. This earthquake was also located along the Wabash Valley seismic zone. Only minor structural damage was reported in several towns in Illinois and Indiana. Ground shaking was felt over all or parts of 17 states in the central and eastern United States and southern Ontario, Canada.
- The strongest earthquake in the central United States during the 20th century occurred along the Wabash Valley seismic zone in southeastern Illinois near Dale in Hamilton County. This magnitude 5.4 earthquake occurred on November 9, 1968 with an intensity estimated at VII for the area surrounding the epicenter. Moderate structural damage was reported in several towns in south-central Illinois, southwest Indiana and northwest Kentucky. Ground shaking

was felt over all or parts of 23 states in the central and eastern United States and southern Ontario, Canada.

**Figure EQ-7**
**Earthquakes Originating in Southern Illinois**




Source: Illinois State Geological Survey.

Three of the ten largest earthquakes ever recorded within the continental United States took place in 1811 and 1812 along the New Madrid seismic zone. This zone lies within the central Mississippi Valley and extends from northeast Arkansas through southeast Missouri, western Tennessee, western Kentucky and southern Illinois. These magnitude 7.5 and 7.3 major earthquakes were centered near the town of New Madrid, Missouri and caused widespread devastation to the surrounding region and were felt by people in cities as far away as Pittsburgh, Pennsylvania and Norfolk, Virginia.

The quakes locally changed the course of the Mississippi River creating Reelfoot Lake in northwestern Tennessee. These earthquakes were not an isolated incident. The New Madrid Seismic Zone is one of the most seismically active areas of the United States east of the Rockies.

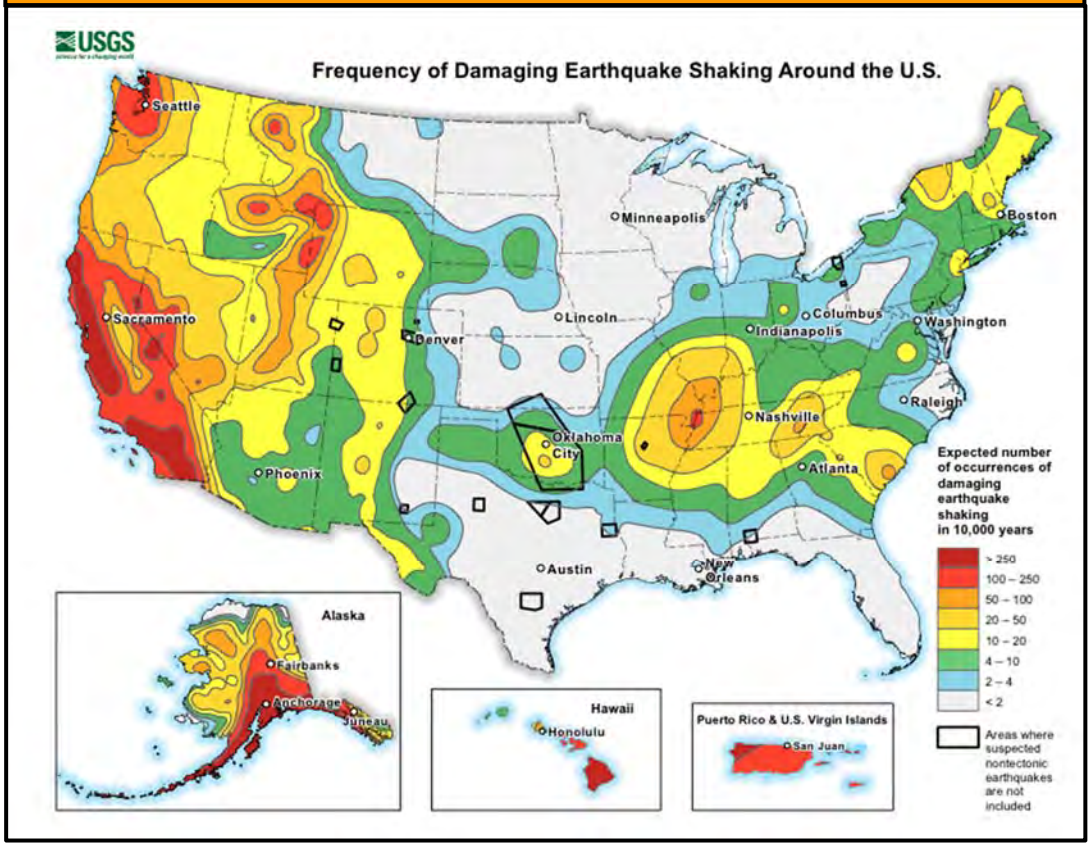
Since 1974 more than 4,000 earthquakes have been recorded within this seismic zone, most of which were too small to be felt.

**What locations are affected by earthquakes? What is the extent of future potential earthquakes?**

Earthquake events generally affect the entire County. Earthquakes, like drought and excessive heat, impact large areas extending across an entire region and affecting multiple counties. Effingham County's proximity to the Wabash Valley Fault System, the Cottage Grove Fault System, the Rough Creek-Shawneetown Fault System, and the New Madrid Seismic Zone makes the entire area likely to be affected by an earthquake if these faults become seismically active. The *2018 Illinois Natural Hazard Mitigation Plan* classifies Effingham County's hazard rating for earthquakes as "Medium."

According to the USGS, Effingham County can expect 10 to 50 occurrences of damaging earthquake shaking over a 10,000-year period. **Figure EQ-8** illustrates the frequency of damaging earthquake shaking around the U.S.

**Figure EQ-8**
**Frequency of Damaging Earthquake Shaking Around the U.S.**




Source: United State Geological Survey.

**What is the probability of future earthquake events occurring?**

As with flooding, calculating the probability of future earthquakes changes depending on the magnitude of the event. According to the ISGS, Illinois is expected to experience a magnitude 3.0 earthquake every year, a magnitude 4.0 earthquake every four years and a magnitude 5.0 earthquake every 20 years. The likelihood of an earthquake with a magnitude of 6.3 or greater occurring somewhere in the central United States within the next 50 years is between 86% and 97%.

While the major earthquakes of 1811 and 1812 do not occur often along the New Madrid fault, they are not isolated events. In recent decades, scientists have collected evidence that earthquakes similar in size and location to those felt in 1811 and 1812 have occurred several times before within the central Mississippi Valley around 1450 A.D., 900 A.D. and 2350 B.C.

The general consensus among scientists is that earthquakes similar to the 1811-1812 earthquakes are expected to recur on average every 500 years. The U.S. Geological Survey and the Center for Earthquake Research and Information (CERI) at the University of Memphis estimates that for a 50-year period the probability of a repeat of the 1811-1812 earthquakes is between 7% and 10% and the probability of an earthquake with a magnitude of 6.0 or larger is between 25% and 40%.

## HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from earthquakes.

**Are the participating jurisdictions vulnerable to earthquakes?**

Yes. All of Effingham County is vulnerable to earthquakes. The unique geological formations topped with glacial drift soils found in the central United States conduct an earthquake's energy farther than in other parts of the Nation. Consequently, earthquakes that originate in the Midwest tend to be felt at greater distances than earthquakes with similar magnitudes that originate on the West Coast.

**Earthquake Fast Facts – Impacts/Risk**

Earthquake Risk/Vulnerability:

- Public Health & Safety – Light/Moderate Quake within the County or immediate region: ***Low***
- Public Health & Safety – Major Quake Wabash Valley/New Madrid seismic zone: ***Medium***
- Buildings/Infrastructure/Critical Facilities – Light/ Moderate Quake within the County or immediate region: ***Low***
- Buildings/Infrastructure/Critical Facilities – Major Quake in the region: ***Medium***

This vulnerability, found throughout most of Illinois and all of Effingham County, is compounded by relatively high water tables within the region. When earthquake shaking mixes the groundwater and soil, ground support is further weakened thus adding to the potential structural damages experienced by buildings, roads, bridges, electrical lines and natural gas pipelines.

The *Projected Earthquake Intensities Map* prepared by the Missouri State Emergency Management Agency predicts that if a magnitude 6.7 earthquake were to take place anywhere along the New Madrid seismic zone, then the highest projected intensity felt in Effingham County

would be a V on the Modified Mercalli Intensity Scale. If a magnitude 8.6 earthquake were to occur, then the highest projected intensity felt would be a VII.

The infrequency of major earthquakes, coupled with relatively low magnitude/intensity of past events, has led the public to perceive that Effingham County is not vulnerable to damaging earthquakes. This perception has allowed the County and participating jurisdictions to develop largely without regard to earthquake safety.

**Do any of the participating jurisdictions consider earthquakes to be among their community's greatest vulnerabilities?**

No. Based on responses to a Critical Facilities Vulnerability Survey distributed to the participating jurisdictions, none of the participating jurisdictions considered earthquakes to be among their community's greatest vulnerabilities. In addition, none of the jurisdictions identified any critical facilities or infrastructure within their communities as having a specific vulnerability to earthquakes.

**What impacts resulted from the recorded earthquake events?**

Property damage information was either unavailable or none was recorded for the two documented earthquake that occurred in Effingham County. While Effingham County residents felt the earthquakes that occurred in central and southern Illinois, no damages were reported as a result of these events. Given the magnitude of the great earthquakes of 1811 and 1812, it is almost certain that individuals in what is now Effingham County felt those quakes; however historical records do not indicate the intensity or impacts that these quakes had on the County.

**What other impacts can result from earthquakes?**

Earthquakes can impact human life, health and public safety. **Figure EQ-9** details the potential impacts that may be experienced by the County should a magnitude 6.0 or greater earthquake occur in the region.

**What is the level of vulnerability to public health and safety from earthquakes?**

The risk or vulnerability to public health and safety from an earthquake is dependent on the intensity and location of the event. Since there are no known faults in Effingham County, the likelihood that an earthquake will originate in the County is very small, decreasing the changes for catastrophic damages. However, if a light earthquake originates within the County or from the faults in the immediate region, the risk or vulnerability to public health and safety is considered ***low***. This risk is elevated from ***medium*** for a major earthquake originating along the Wabash Valley or New Madrid seismic zones.

**Are existing buildings, infrastructure and critical facilities vulnerable to earthquakes?**

Yes. All existing buildings, infrastructure and critical facilities located in Effingham County and the participating jurisdictions are vulnerable to damage from earthquakes. Given the County's size (just over 34,380 individuals), it's population density and the fact that there are only a few buildings higher than two stories (with the exception of grain elevators and a few multi-story buildings in Effingham) tempered by the potential for magnitude 5.0 and above earthquakes to

occur in the immediate region, the damage is anticipated to range from slight to considerable for well-built ordinary structures and considerable to severe for poorly-built structures.

**Figure EQ-9**
**Potential Earthquake Impacts**

| Direct | Indirect |
|---|---|
| *Buildings*<br>• Temporary displacement of businesses, households, schools and other critical services where heat, water and power are disrupted<br>• Long-term displacement of businesses, households, schools and other critical services due to structural damage or fires<br>*Transportation*<br>• Damages to bridges (i.e., cracking of abutments, subsidence of piers/supports, etc.)<br>• Cracks in the pavement of critical roadways<br>• Increased traffic on Interstate, US and State Routes (especially if the quake originates along the New Madrid seismic zone) as residents move out of the area to seek shelter and medical care and as emergency response, support services and supplies move south to aid in recovery<br>• Misalignment of rail lines due to landslides (most likely near stream crossings), fissures and/or heaving<br>*Utilities*<br>• Downed power and communication lines<br>• Breaks in drinking water and sanitary sewer lines resulting in the temporary loss of service<br>• Disruptions in the supply of natural gas due to cracking and breaking of pipelines<br>*Health*<br>• Injuries/deaths due to falling debris and fires<br>*Other*<br>• Cracks in the earthen dams of the lakes and reservoirs within the County which could lead to dam failures | *Health*<br>• Use of County health facilities to treat individuals injured closer to the epicenter<br>• Emergency services (ambulance, fire, law enforcement) may be needed to provide aid in areas where damage was greater<br>*Other*<br>• Disruptions in land line telephone service throughout an entire region<br>• Depending on the seasonal conditions present, more displacements may be expected as those who may not have enough water and food supplies seek alternate shelter due to temperature extremes that make their current housing uninhabitable |

If a strong earthquake (6.0 – 6.9) were to occur in the region then unreinforced masonry buildings are most at risk during an earthquake because the walls are prone to collapse outward. Steel and wood buildings have more ability to absorb the energy from an earthquake while wood buildings with proper foundation ties have rarely collapsed in earthquakes. **Figure EQ-10** identifies the number of unreinforced masonry buildings that serve as critical facilities within the participating jurisdictions.

**Figure EQ-10**
**Number of Unreinforced Masonry Buildings Serving as Critical Facilities by Jurisdiction**

| Participating Jurisdiction | Government[1] | Law Enforcement | Fire Stations | Ambulance Service | Schools | Drinking Water | Wastewater Treatment | Medical[2] | Healthcare Facilities[3] |
|---|---|---|---|---|---|---|---|---|---|
| Effingham County | 1 | 1 | --- | 0 | --- | --- | --- | 1 | 1 |
| Beecher City | 0 | --- | 0 | --- | --- | --- | 0 | --- | --- |
| Dieterich | 1 | --- | 0 | --- | 4 | --- | 1 | 0 | 0 |
| Effingham | 1 | 2 | 0 | 0 | 4 | --- | 1 | 1 | 0 |
| Mason | 1 | --- | 0 | --- | --- | --- | --- | --- | --- |
| Shumway | 1 | --- | 0 | --- | --- | --- | 0 | --- | --- |
| Teutopolis | 1 | 1 | 0 | --- | 3 | 1 | 1 | 1 | 0 |
| Watson | 0 | --- | 0 | --- | --- | --- | 0 | --- | --- |
| Beecher City CUSD #20 | --- | --- | --- | --- | 3 | --- | --- | --- | --- |
| Mound Township | 1 | --- | --- | --- | --- | --- | --- | --- | --- |
| Watson Township | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a |

[1] Government includes: courthouses, city/village halls, township buildings, highway/road maintenance centers, etc.
[2] Medical includes: public health departments, hospitals, urgent/prompt care and medical clinics.
[3] Healthcare Facilities include: nursing homes, skilled care facilities, memory care facilities, residential group homes, etc.
--- Indicates jurisdiction does not own/maintain any critical facilities within that category.

If the epicenter of a magnitude 7.6 earthquake were to originate anywhere along the New Madrid seismic zone, the highest projected Modified Mercalli intensity felt in Effingham County would be a VI according to the *Projected Earthquake Intensities Map* prepared by the Missouri State Emergency Management Agency.

An earthquake also has the ability to damage critical infrastructure such as roads and utilities. In the event of a major earthquake, bridges are expected to experience moderate damage such as cracking in the abutments and subsidence of piers and supports. The structural integrity may be compromised to the degree where safe passage is not possible, resulting in adverse travel times as alternate routes are taken. Some rural families may become isolated where alternate paved routes do not exist. In addition, cracks may form in the pavement of key roadways. **Figure R-4** lists the number of each type of critical infrastructure by jurisdiction.

An earthquake may also down overhead power and communication lines causing power outages and disruptions in communications. Cracks or breaks may form in natural gas pipelines and drinking water and sewage lines resulting in temporary loss of service. In addition, an earthquake could cause cracks to form in the earthen dams located within the County, increasing the likelihood of a dam failure.

As with public health and safety, the risk or vulnerability to buildings, infrastructure and critical facilities is dependent on the intensity and location of the event. The risk to buildings, infrastructure and critical facilities is considered to be ***low*** for a light to moderate earthquake that originates within the County or immediate region. This risk is considered ***medium*** for a strong earthquake originating in the region.

**Are future buildings, infrastructure and critical facilities vulnerable to earthquakes?**

Yes. All future buildings, infrastructure and critical facilities located in Effingham County and the participating jurisdictions are vulnerable to damage from earthquakes. Only four of the municipalities have building codes in place and these codes do not contain seismic provisions that address structural vulnerability for earthquakes. As a result, there is the potential for future buildings, infrastructure and critical facilities to face the same vulnerabilities as those of existing buildings, infrastructure and critical facilities described previously.

**What are the potential dollar losses to vulnerable structures from earthquakes?**

Since property damage information was either unavailable or none was recorded for the documented earthquakes that impacted Effingham County, there is no way to accurately estimate future potential dollar losses to vulnerable structures. However, according to the Effingham County Supervisor of Assessments the total equalized assessed values of the properties in the planning area is $941,806,666. Since all of the structures in the planning area are susceptible to earthquake impacts to varying degrees, this total represents the countywide property exposure to earthquake events.

Given Effingham County's proximity to geologic structures and fault zones, both large and small, and the fact that all structures within the County are vulnerable to damage, it is likely that there will be future dollar losses from any earthquake ranging from strong to great. As a result, participating jurisdictions were asked to consider mitigation projects that could provide wide ranging benefits for reducing the impacts or damages associated with earthquakes.

## 3.8 DAMS

### HAZARD IDENTIFICATION

**What is the definition of a dam?**

A dam is an artificial barrier constructed across a stream channel or a man-made basin for the purpose of storing, controlling or diverting water. Dams typically are constructed of earth, rock, concrete or mine tailings. The area directly behind the dam where water is impounded or stored is referred to as a reservoir.

According to the U.S. Army Corps of Engineers' National Inventory of Dams (NID), there are approximately 91,468 dams in the United States and Puerto Rico, with 1,662 dams located in Illinois. (The NID is maintained by the U.S. Army Corps of Engineers and is updated approximately every two years.) Of the 1,662 dams in Illinois, approximately 93% are constructed of earth.

**What is the definition of a dam failure?**

A dam failure is the partial or total collapse, breach or other failure of a dam that causes flooding downstream. In the event of a dam failure, the people, property and infrastructure downstream could be subject to devastating damages. The potential severity of a full or partial dam failure is influenced by two factors:

- the capacity of the reservoir and
- the density, type and value of development/infrastructure located downstream.

There are two categories of dam failures, "flood" or "rainy day" failures and "sunny day" failures. A "flood" or "rainy day" failure usually results when excess precipitation and runoff cause overtopping or a buildup of pressure behind a dam which leads to a breach. Even normal storm events can lead to "flood" failures if debris plugs the water outlets. Given the conditions that lead to a "flood" failure (i.e., rainfall over a period of hours or days), there is usually a sufficient amount of time to warn and evacuate residents downstream.

Unlike a "flood" failure, there is generally no warning associated with a "sunny day" failure. A "sunny day" failure is usually the result of improper or poor dam maintenance, internal erosion, vandalism or an earthquake. This unexpected failure can be catastrophic because it may not allow enough time to warn and evacuate residents downstream.

No one knows precisely how many dam failures have occurred in the United States; however, it's estimated that hundreds have taken place over the last century. Some of the worst failures have caused catastrophic property and environmental damage and have taken hundreds of lives. The worst dam failure in the last 50 years occurred on February 26, 1972 in Buffalo Creek, West Virginia. A tailings dam owned by the Buffalo Mining Company failed, taking 125 lives, injuring 1,000 individuals, destroying 507 homes and causing property damage in excess of $50 million (approximately $298.6 million in 2017 based on the Bureau of Labor Statistics Consumer Price Index Inflation Calculator.)

Dam failures have been documented in every state, including Illinois. According to the Dam Incident Database compiled by the National Performance of Dams Program, there have been 10 reported dam failures with uncontrolled releases of the reservoir in Illinois since 1950.

**What causes a dam failure?**

Dam failures can result from one or more of the following:

- ***prolonged periods of rainfall and flooding*** (the cause of most failures);
- ***inadequate spillway capacity*** resulting in excess flow overtopping the dam;
- ***internal erosion*** caused by embankment or foundation leakage;
- ***improper maintenance*** (including failure to remove trees, repair internal seepage problems, maintain gates, valves and other operational components, etc.);
- ***improper design*** (including use of improper construction materials and practices);
- ***negligent operation*** (including failure to remove or open gates or valves during high flow periods);
- ***failure of an upstream dam on the same waterway***;
- ***landslides into reservoirs*** which cause surges that result in overtopping of the dam;
- ***high winds*** which can cause significant wave action and result in substantial erosion; and
- ***earthquakes*** which can cause longitudinal cracks at the tops of embankments that can weaken entire structures.

**How are dams classified?**

Each dam listed on the National Inventory of Dams is assigned a hazard potential classification rating per the "Federal Guidelines for Dam Safety: Hazard Potential Classification System for Dams." The classification system is based on the potential for loss of life and damage to property in the event of a dam failure. There are three classifications: High, Significant and Low. **Figure DF-1** provides a brief description of each hazard potential classification. It is important to note that the hazard potential classification assigned is not an indicator of the adequacy of the dam or its physical integrity and in no way reflects the current condition of the dam.

**Figure DF-1**
**Dam Hazard Classification System**

| Hazard Potential Classification | Description |
|---|---|
| High | Those dams where failure or mis-operation result in probable loss of human life, regardless of the magnitude of other losses. The probable loss of human life is defined to signify one or more lives lost. |
| Significant | Those dams where failure or mis-operation result in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities or can impact other concerns. Significant hazard potential classification dams are often located in predominately rural or agricultural areas but could be located in areas with population and significant infrastructure. |
| Low | Those dams where failure or mis-operation results in no probable loss of human life and low economic and/or or environmental losses. Losses are principally limited to the dam owner's property. |

Sources: Federal Emergency Management Agency
U.S. Army Corps of Engineers

## HAZARD PROFILE

According to the USACE National Inventory of Dams, there are 10 classified dams located in Effingham County. Of those 10 dams, only three are considered to be dams of significance. Dams of significance include: a) dams that have a hazard potential classification of "High"; b) dams with reservoirs of considerable storage capacity; c) dams located in densely populated areas that have the potential to impact a considerable number of structures and/or individuals; or d) those dams identified as having special importance to the participating jurisdictions. Due to the limited impacts on the population, land use and infrastructure associated with a majority of the classified dams, only the dams of significance will be analyzed as part of this Plan update.

The following details the dams of significance located in the county; identifies the location of dams of significance; details past occurrences of dam failures associated with the dams of significance studied; describes the severity or extent of future potential failures (if known); identifies the locations potential affected and estimates the likelihood of future occurrences of dam failures.

**Do any of the participating jurisdictions own classified dams of significance?**

Yes. There are two classified dams of significance owned by the City of Effingham. **Figure DF-2** provides a brief description of each dam.

**Dam Failure Fast Facts – Occurrences**

Number of Classified Dams of Significance Located in the County: ***3***

Number of Classified Dams owned by Participating Jurisdictions: ***2***

Number of Dam Failures Reported: ***0***

Probability of Future Dam Failure Events: ***Low***

**Are there any other publicly or privately-owned classified dams of significance within the County?**

Yes. There are two other publicly-owned classified dam of significance in Effingham County, one is owned by the Village of Altamont and the other is owned by the Effingham Water Authority. **Figure DF-2** provides a brief description of each dam.

**When have dam failures occurred previously? What is the extent of these previous dam failures?**

According to data from Stanford University's National Performance of Dams Incident Database and discussions with Planning Committee members, there are no known recorded dam failures associated with the classified dams of significance in Effingham County.

**What is the extent of future potential dam failures?**

According to the National Inventory of Dams (NID), Emergency Action Plans (EAPs) defining the extent or magnitude of potential dam failures (water depth, speed of onset and warning times) were developed for all three of the classified dams of significance. The EAPs for the Altamont Reservoir Dam, Central Illinois Public Service Company Lake Dam, Lake Sara Dam and Little Wabash River Dam were not made available to the Effingham County Emergency Management Agency. As a result, a data deficiency exists for these dams.

**Figure DF-2**
**Classified Dams Located in Effingham County**

| Dam Name | Hazard Classification | Associated Waterway | Owner | Type | Primary Purpose | Completion Year | Height (feet) | Length (feet) | Storage (acre-feet) | Impoundment Surface Area (acres) | Drainage Area (square miles) | Emergency Action Plan |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Publicly-Owned** | | | | | | | | | | | | |
| Altamont Reservoir Dam | Significant | Tributary Big Creek | City of Altamont | Earth | Water Supply | 1972 | 42 | 506 | 1,255 acre-feet | 62 acres | 1.1 square miles | Yes |
| Central Illinois Public Service Company Lake Dam | Significant | Tributary Little Wabash River | City of Effingham | Earth | Water Supply | 1930 | 35 ft. | 419 ft. | 341 ac.-ft. | 12 ac. | 0.6 sq. mi. | Yes |
| Lake Sara Dam | Significant | Blue Point Creek | Effingham Water Authority | Earth | Recreation | 1957 | 65 ft. | 1,625 ft. | 20,392 ac.-ft. | 586 ac. | 12.3 sq. mi. | Yes |
| Little Wabash River Dam | Low | Little Wabash River | City of Effingham | Gravity | Water Supply | 1900 | 13ft. | 103 ft. | 560 ac.-ft. | 6 ac. | 240 sq. mi. | Yes |

Sources: U.S. Army Corps of Engineers, National Inventory of Dams Interactive Report.

**What locations are affected by dam failure?**

**Figure DF-3** shows the locations of ***classified dams of Significance*** in Effingham County. Dam failures have the potential to impact the following municipalities/unincorporated areas:

- City of Effingham (north of US Route 40 and west of Interstate 70);
- residential area approximately one and one-half miles west of the City of Effingham (north of East Park Avenue and west of Sportsman's Drive);
- residential and agricultural approximately one-quarter miles west of the City of Effingham (south of US Route 40 and east of Country Club road); and
- undeveloped and agricultural land approximately one and three-quarter miles southeast of Altamont (north of E 700th Avenue west of County Road 500 E).

**What is the probability of future dam failure events occurring?**

Since none of the classified dams of significance have experienced a dam failure, it is difficult to specifically establish the probability of a future failure. However, based on the capacity of the reservoirs and the scope and type of development and infrastructure located downstream, the probability is estimated to be ***low***. For the purposes of this analysis "low" is defined as having a less than 10% chance of occurring in any given year.

## HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from dam failures.

**Are the participating jurisdictions vulnerable to dam failures?**

Yes. The City of Effingham and portions of unincorporated Effingham County are vulnerable to the dangers presented by dam failures. However, most residents would not be impacted by a dam failure. None of the other participating municipalities or the remainder of the County are considered vulnerable.

**Do any of the participating jurisdictions consider dam failures to be among their community's greatest vulnerabilities?**

No. Based on responses to a Critical Facilities Vulnerability Survey distributed to the participating jurisdictions, none of the participating jurisdictions considered dam failures to be among their community's greatest vulnerability. In addition, none of the jurisdictions identified any critical facilities or infrastructure within their communities as having a specific vulnerability to dam failures.

**What impacts resulted from the recorded dam failures?**

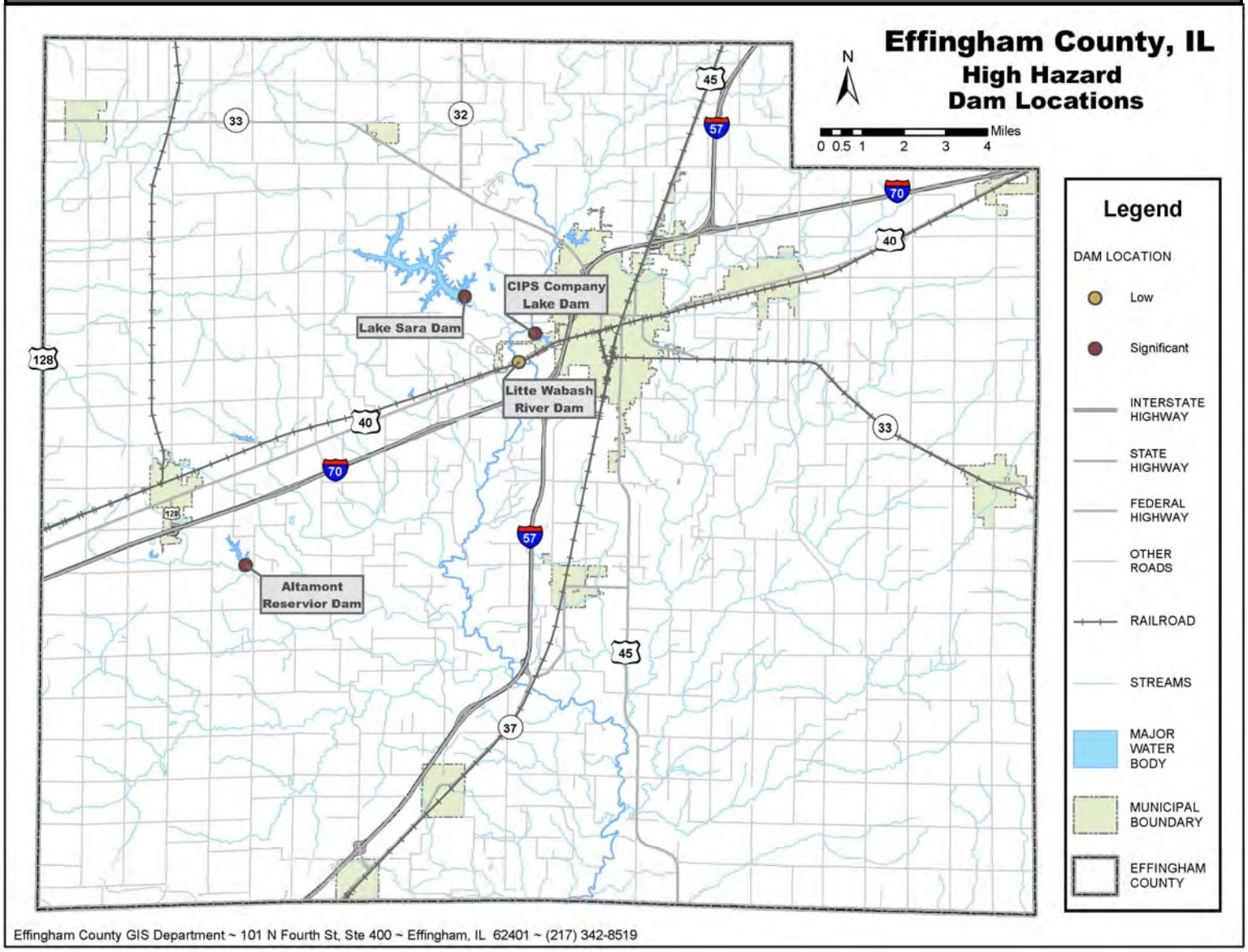
Since there have been no *recorded* dam failures associated with the classified dams of significance in Effingham County, there are no recorded impacts to report.

**Dam Failure Fast Facts – Risk**

Dam Failure Risk/Vulnerability:

- Public Health & Safety: "Significant" Hazard Classification Dams – ***Low***
- Buildings/Infrastructure/Critical Facilities: "Significant" Hazard Classification Dams – ***Low***

**Figure DF-3**
**Location of Classified Dams of Significance in Effingham County**



**What other impacts can result from dam failures?**

The impacts from a dam failure are similar to those of a flood. There is the potential for injuries, loss of life, property damage and crop damage. Depending on the type of dam failure, there may be little, if any warning that an event is about to occur, similar to flash flooding. As a result, one of the primary threats to individuals is from drowning. Motorists who choose to drive over flooded roadways run the risk of having their vehicles swept off the road and downstream. Flooding of roadways is also a major concern for emergency response personnel who would have to find alternative routes around any section of road that becomes flooded due to a dam failure.

In addition to concerns about injuries and death, the water released by a dam failure poses the same biological and chemical risks to public health as floodwaters. The flooding that results from a dam failure has the potential to force untreated sewage to mix with floodwaters. The polluted floodwaters then transport the biological contaminants into buildings and basements and onto roads and public areas. If left untreated, the floodwaters can serve as breeding grounds for bacteria and other disease-causing agents. Even if floodwaters are not contaminated with biological material, basements and buildings that are not properly cleaned can grow mold and mildew, which can pose a health hazard, especially for small children, the elderly and those with specific allergies.

Flooding from dam failures can also cause chemical contaminants such as gasoline and oil to enter floodwaters if underground storage tanks or pipelines crack and begin leaking during a dam failure event. Depending on the time of year, the water released by a dam failure may also carry away agricultural chemicals that have been applied to farm fields and cause damage to or loss of crops.

**What is the level of vulnerability to public health and safety from dam failures?**

In terms of the risk or vulnerability to public health and safety from a dam failure, there are several factors that must be taken into consideration including the severity of the event, the capacity of the reservoir and the extent and type of development and infrastructure located downstream. When these factors are taken into consideration, the overall risk to public health and safety posed a dam failure from the dams of significance studied in Effingham County is considered to be ***low***.

**Are existing buildings, infrastructure and critical facilities vulnerable to dam failures?**

As discussed previously, EAPs detailing the existing buildings, infrastructure and critical facilities vulnerable to a dam failure were not developed or were not required to be developed for developed for all four of the classified dams of significance. The EAPs for the Altamont Reservoir Dam, Central Illinois Public Service Company Lake Dam, Lake Sara Dam, and Little Wabash River Dam were not made available to the Effingham County Emergency Management Agency. As a result a data deficiency exists in terms of comprehensively identifying existing buildings, infrastructure and critical facilities vulnerable to dam failures.

While detailed information was not available, a visual inspection of the areas surrounding the classified dams indicates that there are buildings, infrastructure and critical facilities that are vulnerable to dam failures. **Figure DF-4** provides a ***rough estimate*** of the buildings, infrastructure and critical facilities by dam vulnerable to a dam failure.

Depending on whether there is a full or partial dam failure, all of the vulnerable buildings, infrastructure and critical facilities may be inundated by water and structural damage may result.

Because none of the reservoirs within the County are immense in size, the damage sustained from dam failure flooding may not be to the structure, but to the contents of the buildings or nearby infrastructure and critical facilities.

**Figure DF-4**
**Buildings, Infrastructure & Critical Facilities Vulnerable to a Dam Failure**

| Dam Name | Location | Number of Vulnerable Buildings/Infrastructure | | | |
|---|---|---|---|---|---|
| | | Residential | Commercial | Infrastructure | Critical Facilities |
| Central Illinois Public Service Company Lake Dam | Effingham | 0-1 | --- | --- | --- |
| Lake Sara Dam | 1 ½ miles west of Effingham | 0-3 | 1 | - Park Ave<br>- Sportsmans Dr<br>- E 1410th Ave<br>- CR 1375 N<br>- CR 1375 N<br>- Fayette Rd | --- |
| Altamont Reservoir Dam | 1 ¾ miles southeast of Altamont | 0-1 | --- | - CR 500 E | --- |
| Little Wabash River Dam | ¼ miles west of Effingham | --- | --- | --- | --- |

In addition to impacting structures, a dam failure can damage roads and utilities. Roadways, culverts and bridges can be weakened by dam failure floodwaters and may collapse under the weight of a vehicle. Power and communication lines, both above and below ground, are also vulnerable to dam failure flooding. Depending on their location and the velocity of the water as it escapes the dam, power poles may be snapped causing disruptions to power and communication. Water may also get into any buried lines causing damage and disruptions.

As with public health and safety, the risk or vulnerability to buildings, infrastructure and critical facilities is dependent on several factors including the severity of the event, the capacity of the reservoir and the extent and type of development and infrastructure located downstream. When these factors are taken into consideration, the overall risk posed by a dam failure in Effingham County is considered to be ***low*** for any of the classified dams of significance.

**Are future buildings, infrastructure and critical facilities vulnerable to dam failures?**

Yes. Any future buildings, infrastructure and critical facilities located within the flood path of a classified dam are vulnerable to damage from a dam failure. As a result, future buildings, infrastructure and critical facilities face the same vulnerabilities as those of existing buildings, infrastructure and critical facilities described previously.

**What are the potential dollar losses to vulnerable structures from dam failures?**

Unlike other hazards, there are no standard loss estimation models or methodologies for dam failures. Given that there have been no recorded dam failures in Effingham County, sufficient information was not available to prepare a reasonable estimate of future potential dollar losses to vulnerable structure from dam failures.

## 3.9 MAN-MADE HAZARDS

While the focus of this Plan update is on natural hazards, an ***overview of selected man-made hazards*** has been included. The Planning Committee recognizes that man-made hazards can also pose risks to public health and property. The extent and magnitude of the impacts that result from man-made hazard events can be influenced by natural hazard events. For example, severe winter storms can cause accidents involving trucks transporting hazardous substances. These accidents may lead to the release of these substances which can result in injury and potential contamination of the natural environment.

Consequently, the Planning Committee decided to summarize the more prominent man-made hazards in Effingham County. The man-made hazards profiled in this Plan update include:

- Hazardous Substances
  - Generation
  - Transportation
  - Storage/Handling
- Waste Disposal
  - Solid Waste
  - Medical Waste
  - Hazardous Waste
- Hazardous Material Incidents
- Hazardous Waste Remediation
- Terrorism

While the man-made hazards risk assessment does not have the same depth as the natural hazards risk assessment, it does provide useful information that places the various man-made hazards in perspective.

### 3.12.1 Hazardous Substances

Hazardous substances broadly include any flammable, explosive, biological, chemical, or physical material that has the potential to harm public health or the environment. For the purposes of this Plan, the term hazardous substance includes hazardous product and hazardous waste. A hazardous waste is defined as the byproduct of a manufacturing process that is either listed or has the characteristics of ignitability, corrosivity, reactivity or toxicity and cannot be reused. A hazardous product is all other hazardous material.

Hazardous substances can pose a public health threat to individuals at their workplace and where they reside. The type and quantity of the substance, the pathway of exposure (inhalation, ingestion, dermal, etc.), and the frequency of exposure are factors that will determine the degree of adverse health effects experienced by individuals. Impacts can range from minor, short-term health issues to chronic, long-term illnesses.

In addition to impacting public health, hazardous substances can also cause damage to buildings, infrastructure and the environment. Incidents involving hazardous substances can range from minor (scarring on building floors and walls) to catastrophic (i.e., destruction of entire buildings, structural damage to roadways, etc.) and lead to injuries and fatalities. The number of incidents involving hazardous substances in Illinois and across the Nation every year underscores the need for trained and equipped emergency responders to minimize damages.

Since 1970, significant changes have occurred in regards to how hazardous substances are transported and disposed. Comprehensive regulations and improved safety and industrial hygiene

practices have reduced the frequency of incidents involving hazardous substances. Based on the small number of facilities in Effingham County that generate and use hazardous substances, the population size, transportation patterns, and land use, the probability of a release occurring in Effingham County should remain relatively low compared to other counties in Illinois. The relatively low numbers of transportation incidents should not diminish municipal or county commitment to emergency management.

## HAZARD PROFILE – HAZARDOUS SUBSTANCES

The following subsections identify the general pathways – generation, transportation and storage/handling – by which hazardous substances pose a risk to public health and the environment in Effingham County.

**Hazardous Substances Fast Facts - Occurrences**

*Generation*

Number of Facilities that Generate Reportable Quantities of Hazardous Substances (2017): ***2***

*Transportation*

Number of Roadway Incidents Involving Hazardous Substance Shipments (2010-2019): ***45***

Number of Railway Accidents/Incidents Involving Hazardous Substance Shipments (2009-2018): ***3***

Number of Pipeline Incidents Involving Hazardous Substances (2010 - 2019): ***None***

*Storage/Handling*

Number of Facilities that Store/Handle Hazardous Substances (2017): ***46***

Number of Facilities that Store/Handle Extremely Hazardous Substances (2017): ***14***

### *3.12.1.1 Generation*

Effingham County has two (2) facilities that generate reportable quantities of hazardous substances as a result of their operations according to the U.S. Environmental Protection Agency (USEPA) Toxic Release Inventory. **Figure MMH-1** identifies the hazardous substance generators located in Madison County and summarizes the substances generated.

**Figure MMH-1**
**Generators of Solid & Liquid Hazardous Substances – 2017**

| Name | Hazardous Substances Generated | Amount Generated (Pounds) |
|---|---|---|
| ***Effingham*** | | |
| ADM Animal Nutrition | Copper Compounds | - |
| | Manganese Compounds | - |
| | Zinc Compounds | 500 |
| | *Total:* | *500* |
| ***Teutopolis*** | | |
| Siemer Milling Co. | Chlorine | 1 |
| | *Total:* | *1* |

### *3.12.1.2 Transportation*

*Roadways*

Illinois has the nation's third largest interstate system and third largest inventory of bridges. According to the Illinois Department of Transportation, there were just over 147,000 miles of highways and streets in Illinois in 2018. Most of the truck traffic in Effingham County is carried

on Interstate 57 and Interstate 70. Interstate 57 traverses across the middle of the County connecting Sikeston, MO to Chicago, IL, while Interstate 70 bisects the County connecting St. Louis, MO to Baltimore, MA. Other major roadways that carry truck traffic include US-45, US-40, IL Rte. 33 and IL Rte. 45. While this modern roadway system provides convenience and efficiency for commuters, it also aids in-state and intra-state commerce which includes the transportation of hazardous substances. A Commodity Flow Study to gauge chemical transport has not yet been conducted for Effingham County.

For the purposes of this report a roadway incident is generally defined as an accident/incident that occurs while in the process of transporting a hazardous substance(s) on a highway, roadway, access drive, field entrance, rest area or parking lot. Vehicles that experience a release while refueling are not considered roadway incidents, but are instead considered fixed facility incidents.

According to records obtained from the Illinois Emergency Management Agency (IEMA), there were forty-five (45) recorded roadway incidents involving the shipment of hazardous waste and/or products in Effingham County from 2010 through 2019. **Table 12** in **Appendix J** provides information on these incidents.

*Railways*

Illinois' rail system is the country's second largest, with the East St. Louis and Chicago terminals being two of the nation's busiest. In Effingham County there are three rail lines operated by three major carriers: Amtrak (ATK), Canadian National Railways(CN), and CSX Transportation (CSXT). CN operates two rail lines. One line runs through the center of the County and is shared with ATK. CN operates a line that runs from Effingham north into Indiana. CSXT runs and east-west line through the middle of Effingham County.

According to the Association of American Railroads, 4,028,000 carloads (122.1 tons) of freight originated in Illinois in 2017 (the latest year for which data is available). Hazardous substances accounted for 318,275 carloads (approximately 9.6 million tons) or 7.9% of the total freight handled. In comparison, 29,261,000 carloads of freight originated in the United States in 2017 with approximately 2,300,000 carloads (7.9%) involved in the transport of hazardous substances.

The Illinois Commerce Commission (ICC) is required to maintain records on railway accidents/incidents which involve hazardous substances. Their records are divided into three categories. These three categories are described in **Figure MMH-2**.

**Figure MMH-2**
**ICC Hazardous Substances Railroad Accident/Incidents Classification Categories**

| Category | Description |
|---|---|
| A | railroad derailments resulting in the release of the hazards substance(s) being transported |
| B | railroad derailments where hazards substance(s) were being transported but no release occurred |
| C | releases of hazardous substance(s)s from railroad equipment occurred, however no railroad derailment was involved |

Since 2009, there have been three accidents involving hazardous substances in Effingham County according to the ICC. In comparison, ICC records indicate that since 2009 the annual number of

railway accidents in Illinois involving hazardous substances has ranged between 35 and 122. **Figure MMH-3** provides a breakdown by category of the ICC-recorded railway accidents/incidents involving hazardous substances. Included is a comparison of the number of accidents/incidents in Effingham County to those in Cook and the Collar Counties as well as the rest of Illinois.

**Figure MMH-3**
**ICC Recorded Railway Accidents/Incidents Involving Hazardous Substances: 2009 – 2018**

| Year | Category | Accident/Incident Location | | | |
|---|---|---|---|---|---|
| | | Illinois | Effingham County | Cook & Collar Counties | All Other Counties |
| 2010 | A | 3 | 0 | 2 | 1 |
| | B | 20 | 0 | 17 | 3 |
| | C | 80 | 0 | 42 | 38 |
| 2011 | A | 8 | 1 | 1 | 6 |
| | B | 10 | 0 | 9 | 1 |
| | C | 60 | 0 | 33 | 27 |
| 2012 | A | 4 | 0 | 2 | 2 |
| | B | 13 | 0 | 11 | 2 |
| | C | 73 | 0 | 42 | 31 |
| 2013 | A | 5 | 0 | 3 | 2 |
| | B | 23 | 0 | 16 | 7 |
| | C | 82 | 0 | 51 | 31 |
| 2014 | A | 2 | 0 | 2 | 0 |
| | B | 36 | 0 | 21 | 15 |
| | C | 84 | 0 | 40 | 44 |
| 2015 | A | 4 | 0 | 3 | 1 |
| | B | 27 | 0 | 15 | 12 |
| | C | 69 | 0 | 36 | 33 |
| 2016 | A | 4 | 0 | 1 | 3 |
| | B | 14 | 0 | 6 | 8 |
| | C | 65 | 0 | 33 | 32 |
| 2017 | A | 2 | 0 | 1 | 1 |
| | B | 14 | 0 | 9 | 5 |
| | C | 69 | 1 | 34 | 34 |
| 2018 | A | 1 | 0 | 0 | 1 |
| | B | 8 | 0 | 4 | 4 |
| | C | 55 | 0 | 24 | 31 |

Source: Illinois Commerce Commission.

According IEMA's hazardous materials incident records for the sample time periods of 2010- 2019, there were two (2) rail accidents/incidents involving the release of hazardous substances. **Figure MMH-4** provides information on these incidents by rail line. One derailments were associated with one of these accidents/incidents.

**Figure MMH-4**
**IEMA Recorded Railway Accidents/Incidents Involving Hazardous Substances: 2010 – 2019**

| Date | Area | Location | Hazardous Substance Released | Quantity Released |
|---|---|---|---|---|
| **Canadian National** | | | | |
| 4/8/2011 | Effingham | Canadian National Spur Line between S. Wabash Ave. and Banker St. | Methyl methacrylate monomer | 5 gallons |
| **CSX Transportation** | | | | |
| 9/28/2011 | Effingham | Willow St. RR Crossing | Diesel fuel | Unknown |

Source: Illinois Emergency Management Agency, Hazardous Materials Incident Reports.

The top 20 hazardous substances moved by rail through Illinois include: sodium hydroxide, petroleum gases (liquefied), sulfuric acid, anhydrous ammonia, chlorine, sulfur, vinyl chloride, propane, fuel oil, denatured alcohol, methanol, gasoline, phosphoric acid, hydrochloric acid, styrene monomer, carbon dioxide (refrigerated liquid), ammonium nitrate, sodium chlorate, and diesel fuel.

*Pipelines*

Energy gases (natural gas and liquefied petroleum gas), petroleum liquids (crude oil and gasoline) and liquid and gas products used in industrial processes are carried in above-ground and buried pipelines across Illinois. According to the U.S. Department of Transportation's National Pipeline Mapping System, there are three interstate hazardous liquids pipeline, two interstate natural gas pipeline system, and one intrastate hazardous liquids pipeline system in Effingham County. The hazardous liquids pipelines are owned by Buckeye Partners LP. And Marathon Pipeline LLC. The two interstate natural gas pipeline system are owned by Natural Gas Pipeline Co. of America and Truckline Gas Co. The one intrastate natural gas pipeline system is owned by Marathon Pipeline LLC.

***No pipeline releases occurred in Effingham County during a ten year period from 2010 through 2019.***

There have been several high-profile incidents across the Nation, including one in Illinois, which have raised public concerns about our aging pipeline infrastructure. The following provides a brief description of each incident.

- On July 26, 2010 a 30-inch liquid product pipeline rupture near Marshall, Michigan and released at least 840,000 gallons of oil into a creek that led to the Kalamazoo River, a tributary of Lake Michigan.
- Soon afterward on September 9, 2010, another pipeline release received national attention. A 34-inch liquid product pipeline in the Chicago Suburb of Romeoville, Illinois released over 360,000 gallons of crude oil that flowed through sewers and into a retention pond narrowly avoiding the Des Plaines River. This release triggered numerous odor complaints from residents in the adjacent municipalities of Lemont and Bolingbrook. The property damage/cleanup costs were estimated at $46.6 million.

- Also, on September 9, 2010, a 30-inch high pressure natural gas pipeline ruptured in the San Francisco suburb of San Bruno, California that resulted in an explosion that killed eight people, injured 51, destroyed over 30 homes and damaged an entire neighborhood. The property damage was estimated at around $55 million.
- On March 12, 2014 a gas main rupture in Manhattan, New York that resulted in an explosion that killed eight people and leveled two multi-use, five story buildings.
- On May 19, 2015, a 24-inch liquid product pipeline ruptured near Refugio State Beach in Santa Barbara County, California and released approximately 100,000 gallons of crude oil. The release occurred along a rustic stretch of coastline that forms the northern boundary of the Santa Barbara Channel, home to a rich array of sea life. Oil ran down a ravine and entered the Pacific Ocean, blackening area beaches, creating a 9-mile oil slick and impacting birds, marine mammals, fish and coastal and subtidal habitats.

Continual monitoring and maintenance of these pipelines is necessary to prevent malfunctions from corrosion, aging, or other factors that could lead to a release. In addition, to normal wear and tear experienced by pipelines, the possibility of sabotage and seismic activity triggering a release must be considered when contemplating emergency response scenarios.

#### *3.12.1.3 Storage/Handling*

Beyond knowing where hazardous substances are generated and the methods and routes used to transport them, it is important to identify where hazardous substances are handled and stored. This information will help government officials and emergency management professionals make informed choices on how to better protect human health, property and the environment and what resources are needed should an incident take place.

Records obtained from IEMA's Tier II database were used to gather information on the facilities that generate, use and store chemicals in excess of reportable threshold quantities within Effingham County. The Tier II information was then compared with USEPA's Toxic Release Inventory (TRI) and information from IEPA's databases. This review identified forty-six (46) facilities within Effingham County in 2017 that store and handle hazardous substances.

Of these forty-six facilities, fourteen (14) reported the presence of Extremely Hazardous Substances (EHSs) at their facilities. An "Extremely Hazardous Substance" is any USEPA-identified chemical that could cause serious, irreversible health effects from an accidental release. There are approximately 400 chemicals identified as EHSs. Stationary sources who possess one or more of these substances at or above threshold reporting quantities are required to notify IEMA.

**Figure MMH-5** identifies the types of EHSs and the facilities that store and handle them. Aside from EHSs, there are other chemicals, such as water reactives, that can pose risks that are equal to or greater than the risks posed by EHSs. These risks can be identified through a Threat and Hazard Identification and Risk Assessment (THIRA).

**Figure MMH-5**
**Extremely Hazardous Substances by Facility – 2017**

| Facility Name | Extremely Hazardous Substance(s) |
|---|---|
| ***Altamont*** | |
| Effingham Equity – Altamont | Parazone 3SL<br>Gramoxone SL |
| Effingham Equity – Altamont NH3 | Anhydrous ammonia |
| South Central FS, Inc. / Altamont | Paraquat dichloride |
| ***Dieterich*** | |
| Effingham Equity – Dieterich | Gramoxone SL 2.0<br>Anhydrous ammonia |
| ***Edgewood*** | |
| Crop Production Services, 700 | Gramoxone SL 2.0<br>Anhydrous ammonia |
| ***Effingham*** | |
| Consolidated Communications – Effingham Central Office | Sulfuric acid |
| Continental Mills, Effingham, IL | Sulfuric acid |
| Pinnacle Foods Group LLC | Sulfuric acid |
| Quad/ Graphics Marketing, LLC | Sulfuric acid |
| Quad/ Graphics Marketing, LLC | Sulfuric acid |
| Sherwin-Williams Company | Solvent based coatings<br>Lead acid batteries<br>Aerosol |
| South Central FS, Inc. / Effingham | Paraquat dichloride |
| ***Montrose*** | |
| Effingham Equity – Montrose | Gramoxone SL 2.0<br>Anhydrous ammonia |
| ***Teutopolis*** | |
| Siemer Milling Company | Chlorine |

Sources: Illinois Emergency Management Agency, Tier II Hazardous Chemical Reports.
U.S. Environmental Protection Agency, TRI Explorer.

### 3.12.2 Waste Disposal

Waste disposal has caused surface water and ground water contamination in Illinois and across the Nation. Beginning in the late 1970s substantial regulatory changes strengthened the design, operating and monitoring requirements for landfills where the majority of waste is disposed. These regulatory changes have helped reduce the public health threat posed by landfills.

**HAZARD PROFILE – WASTE DISPOSAL**

The following subsections identify the general pathways – solid, medical and hazardous – by which waste disposal poses a risk to public health and the environment in Effingham County.

#### *3.12.2.1 Solid Waste*

While recycling activities have reduced the amount of solid waste (waste generated in households), the majority continues to be disposed of in landfills. As of 2018, there were thirty-eight (38) landfills operating in Illinois.

According IEPA's Annual Landfill Capacity Report issued in September, 2019 there is one commercial landfill currently operating in Effingham County. Landfill #33 LTD operates within the County.

There is currently one Illinois landfill that serves Effingham and the adjacent counties. Wayne County Landfill Inc. operates out of Wayne County, Illinois.

#### *3.12.2.2 Potentially- Infectious Medical Waste*

Potentially-Infectious Medical Waste (PIMW) is generated in connection with medical research; biological testing; and the diagnosis, treatment or immunization of human beings or animals. PIMW is typically generated at hospitals, nursing homes, medical or veterinary clinics, dental offices, clinical or pharmaceutical laboratories and research facilities.

According to IEPA's list of permitted PIMW Facilities, there are no facilities permitted to accept medical waste for disposal in Effingham County.

#### *3.12.2.3 Hazardous Waste*

A hazardous waste is defined as the byproduct of a manufacturing process that is either listed or has the characteristics of ignitability, corrosivity, reactivity or toxicity and cannot be reused.

**Waste Disposal Fast Facts - Occurrences**

*Solid Waste*
Number of Solid Waste Landfills Operating in Effingham County (2018): ***1***

Number of Landfills Serving Effingham and adjacent counties (2018): ***1***

*Potentially-Infectious Medical Waste (PIMW)*
Number of Facilities within the County Permitted to Handle PIMW: ***None***

*Hazardous Waste*
Number of Commercial Off-Site Hazardous Waste Treatment or Disposal Facilities located in the County: ***None***

According to IEPA's Storage, Treatment, Recycling, Incinerating, Transfer Stations and Processing list, there are currently no off-site hazardous waste treatment or disposal facilities located in Effingham County.

### 3.12.3 Hazardous Material Incidents

A hazardous material or hazmat incident refers to any accident involving the release of hazardous substances which broadly include any flammable, explosive, biological, chemical, or physical material that has the potential to harm public health or the environment. These incidents can take place where the substances are used, generated or stored or while they are being transported. In addition, hazmat incidents also include the release of hazardous substances, such as fuel, used to operate vehicles. These releases can be the result of an accident or a leak.

**HAZARD PROFILE – HAZARDOUS MATERIALS INCIDENTS**

From 2010 through 2019, there were 103 hazmat incidents recorded in Effingham County. **Table 13** in **Appendix J** provides information on the hazmat incidents recorded in Effingham County. Of these incidents, ***forty-eight (48) (47%) involved transportation incidents/accidents while one fifty-five (53%) occurred at fixed facilities***. Forty-three (43) of the forty-eight (48) transportation incidents/accidents (90%) involved petroleum-based products.

Based on the recorded incidents, ***Effingham County experienced an average of 10 hazmat incidents annually over the last 10 years***. The types of existing industries; the major transportation corridors through the County which include interstate and Illinois highways, rail and pipeline; and chemical use within and adjacent to the County suggest that hazmat incidents are likely to continue to take place at the rate reflected in the 10-year study period. Constant vigilance, proper training and equipment, and prompt response are needed to minimize the potential impacts of each incident.

**Hazmat Incident Fast Facts - Occurrences**

Number of Hazardous Material Incidents in Effingham County (2010-2019): ***103***

Number of Transportation-Related Incidents/Accidents: ***48***

Number of Fixed Facility-Related Incidents/Accidents: ***55***

Average Number of Hazardous Material Incidents Experienced Annually: ***10***

### 3.12.4 Waste Remediation

The improper disposal or containment of special and hazardous waste through the years has led to soil, groundwater and surface water contamination of sites across the United States. In order to safeguard human health and the environment, these contaminants must be removed or neutralized so they cannot cause harm. This process is known as waste remediation.

**HAZARD PROFILE – WASTE REMEDIATION**

In Illinois, waste remediation is handled through several programs including the federal Superfund program, the State Response Action Program, the state Site Remediation Program and the Leaking Underground Storage Tanks Program. The following provides a brief description of each.

*Superfund (CERLCA) Program/National Priorities List*

Superfund is a USEPA-led program to clean up sites within the United States contaminated by hazardous waste that has been dumped, left out in the open or otherwise improperly managed and which pose a risk to human health and/or the environment. Sites of national priority among the known or threatened releases of hazardous substances, pollutants or contaminants throughout the United

**Waste Remediation Fast Facts - Occurrences**

*Superfund*

Number of Superfund Sites in the County: ***None***

*Illinois Site Response Action Program*

Number of SRAP Sites in the County: ***1***

*Illinois Site Remediation Program*

Number of SRP Sites in the County: ***5***

Number of SRP Sites with NFR Letters: ***4***

*Illinois Leaking Underground Storage Tanks Program*

Number of LUST Sites in County: ***182***

Number of LUST Sites with NFR/Non-Lust/4Y Letters: ***136 (75%)***

States and it territories are identified on the National Priorities List (NPL). Those sites that pose the largest threat to public health and the environment are typically found on the NPL.

According to NPL database, there are 45 Superfund sites in Illinois. However, there are ***no sites*** in Effingham County being ***managed through the Superfund program***.

*State Response Action Program (SRAP)*
The main objective of the State Response Action Program (SRAP) is to clean up hazardous substances at sites that present an imminent and substantial threat to human health and the environment, but which may not be addressed by other federal or state cleanup programs. The sites handled by the SRAP include abandoned landfills, old manufacturing plants, former waste oil recycling operations, contaminated agrichemical facilities and other areas where surface water, groundwater, soil and air may be contaminated with hazardous substances. Since the mid-1980s, cleanup activities have been conducted at over 500 sites in Illinois through this Program. Once the threat to human health and the environment has been mitigated, some sites are transferred to other state cleanup programs to complete remediation activities.

There is ***one (1) SRAP sites*** in Effingham County. The site has completed the Program.

*Illinois Site Remediation Program (SRP)*
The Site Remediation Program (SRP) is a voluntary cleanup program that provides applicants the opportunity to receive technical assistance in determining what course of action is needed to remediate sites where hazardous substances, pesticides or petroleum may be present. The goal of the SRP is to receive a no further remediation determination from IEPA. Most site remediation in Illinois is handled through this Program. Since the mid-1980s, remediation activities have been conducted and monitored at approximately 5,800 sites in Illinois. Applicants who successfully demonstrate, through proper investigation and, when warranted, remedial action, that environmental conditions at their remediation site do not present a significant risk to human health or the environment receive a No Further Remediation (NFR) letter from IEPA. The NRF letter signifies a release from further responsibilities under the Illinois Environmental Protection Act for a portion

There are ***five (5) SRP sites*** in Effingham County. Four of the five SRP sites have received NFR letters.

*Leaking Underground Storage Tank Program (LUST)*
The Leaking Underground Storage Tanks Program (LUST) oversees remedial activities associated with petroleum product releases from underground storage tanks (UST). This Program began in the late 1980s as a result of the threats posed by vapors in homes and businesses, contaminated groundwater, and contaminated soil. In Illinois over 14,500 acres of soil contaminated by leaking underground tanks have been remediated between 1988 and 2010 (the most recent year for which data was available).

In Effingham County there are one hundred and eighty-two (182) ***sites involving the remediation of petroleum product releases*** from underground storage tanks. One hundred and thirty-six of the

one hundred and eighty-two LUST sites (approximately 75%) have received NFR, Non-Lust or 4Y Letters or remediation is virtually complete.

### 3.12.5 Terrorism

Terrorism has different definitions across the globe. For the purpose of this Plan, terrorism will be defined as any event that includes ***violent acts*** which ***threaten or harm lives, health or property*** conducted by ***domestic or foreign*** individuals or groups ***aimed at civilians, the federal government or symbolic locations*** intended to ***cause widespread fear***.

**HAZARD PROFILE – TERRORISM**

The attack on the World Trade Center and the Pentagon on September 11, 2001 by foreign terrorists galvanized national action against terrorism and resulted in the creation of the United States Department of Homeland Security. While the number of terrorist activities garnering national attention in the U.S. has been relatively small, approximately 181,691 terrorist events have occurred worldwide between 1970 and 2017, according to the National Consortium for the Study of Terrorism and Responses to Terrorism (the Consortium). During this same time span, the Consortium documented 2,836 terrorist events within the U.S.

**Terrorism Fast Facts – Occurrences***

Number of Recorded Terrorism Events Worldwide (1970 – 2017): ***181,691***

Number of Recorded Terrorism Events in the United States (1970 – 2017): ***2,836***

Number of Recorded Terrorism Events in Illinois (1970 – 2017): ***113***

* Based on data from the National Consortium for the Study of Terrorism and Responses to Terrorism (START) Global Terrorism Database.

Acts of terrorism have resulted in fatalities and injuries as a result of kidnappings, hijackings, bombings, and the use of chemical and biological weapons. The Global Terrorism Database has documented 3,516 American fatalities in the United States between 1995 and 2017 from terrorist attacks. The attacks on September 11, 2001 account for 3,001of the 3,516 fatalities. A search of the Global Terrorism Database identified 113 incidents of terrorism in Illinois between 1970 and 2017. These incidents resulted in six fatalities and 37 injuries.

The Federal Bureau of Investigation's (FBI) provides supporting documentation on domestic terrorist attacks in a series of reports on terrorism. These reports provide a chronological summary of terrorist incidents in the United States with detailed information on attacks between 1980 and 2005. During this time period, 192 incidents were documented within the United States. Six of these incidents occurred in Illinois; five in the Chicago area and one downstate.

On September 24, 2009, a single individual from Macon County sought to carry out his anger at the federal government by detonating a van filled with explosive outside of the Federal Courthouse in Springfield. This attempt was thwarted by the FBI.

More recently an active shooter incident occurred at the High School in Dixon. On May 16, 2018 at around 8:00 a.m. in the morning approximately 180 students were in the school's gymnasium practicing for graduation when a 19-year-old boy, armed with a 9mm semi-automatic rifle, fired several shots near the gymnasium. The school's resource officer confronted the shooter, who fled

from the school on foot. The shooter fired several shots at the resource officer, who returned fire, wounding the shooter in the shoulder. The gunman suffered non-life threatening injuries. No students or staff were injured in the incident. Faculty and staff barricaded doors and took cover as the incident unfolded.

It is impossible to predict with any reasonable degree of accuracy how many terrorism events might be expected to occur in Effingham County or elsewhere in Illinois. Although targets for terrorist activity are more likely centered in larger urban areas, recruitment, training and other support activities, such as the ones described above, have occurred in rural areas.
The economic resources available to some terrorist groups coupled with the combination of global tensions, economic uncertainty and frustration towards government appear to have recently raised the frequency of attempts. Enhanced efforts by law enforcement officials and civilian vigilance for unusual activity or behavior will be needed to repel terrorists whether they are domestic or foreign in origin.

# 4.0 MITIGATION STRATEGY

The mitigation strategy identifies how participating jurisdictions are going to reduce the potential loss of life and property damage that results from the natural and man-made hazards identified in the Risk Assessment section of this Plan. The strategy includes:

- Developing mitigation goals. Mitigation goals describe the objective(s) or desired outcome(s) that the participants would like to accomplish in term of hazard and loss prevention. These goals are intended to reduce or eliminate long-term vulnerabilities to natural and man-made hazards.
- Identifying a comprehensive range of jurisdiction-specific mitigation actions including those related to continued compliance with the National Flood Insurance Program (NFIP). Mitigation actions are projects, plans, activities or programs that achieve at least one of the mitigation goals identified.
- Analyzing the mitigation actions identified for each jurisdiction. This analysis ensures each action will reduce or eliminate future losses associated with the hazards identified in the Risk Assessment section.
- Developing the mitigation actions prioritization methodology. The prioritization methodology outlines the approach used to prioritize the implementation of each identified mitigation action.
- Identifying the entity(s) responsible for implementation and administration. For each mitigation action, the entity(s) responsible for implementing and administering that action is identified as well as the timeframes for completing the actions and potential funding sources.
- Conducting a preliminary cost/benefit analysis of each mitigation action. The qualitative cost/benefit analysis provides participants a general idea which actions are likely to provide the greatest benefit based on the financial cost and staffing efforts needed.

A detailed discussion of each aspect of the mitigation strategy is provided below.

## 4.1 MITIGATION GOALS REVIEW

Developing mitigation goals was the first step in creating the mitigation strategy. Based on early communications with the Planning Committee members, the consultant developed a preliminary list of eight hazard mitigation goals. This list of goals was distributed electronically to Committee members who were asked to review the list before the first meeting and consider whether any changes needed to be made or if additional goals should be included. At the Planning Committee's November 18, 2019 meeting, the group discussed the preliminary list of goals and approved them with no changes or additions. **Figure MIT-1** lists the approved mitigation goals.

| **Figure MIT-1<br>Mitigation Goals** | |
|---|---|
| Goal 1 | Educate people about the hazards (natural and man-made) they face and the ways they can protect themselves, their homes, and their businesses from those hazards. |
| Goal 2 | Protect the lives, health, and safety of the individuals living in the County from the dangers of natural and man-made hazards. |
| Goal 3 | Protect existing infrastructure and design new infrastructure (buildings, roads, bridges, utilities, water supplies, sanitary sewer systems, etc.) to be resilient to the impacts of natural and man-made hazards. |
| Goal 4 | Incorporate natural and man-made hazard mitigation into existing as well as new community plans and regulations. |
| Goal 5 | Place a priority on protecting public services, including critical facilities, utilities, roads and schools. |
| Goal 6 | Preserve and protect the rivers, creeks and floodplains in our County. |
| Goal 7 | Ensure that new developments do not create new exposures to damage from natural and man-made hazards. |
| Goal 8 | Protect historic, cultural, and natural resources from the effects of natural and man-made hazards. |

## 4.2 MITIGATION ACTION IDENTIFICATION

Following the development of the mitigation goals, the Planning Committee members were asked to consult with their respective jurisdictions to identify a comprehensive range of ***jurisdiction-specific mitigation actions***. Representatives from Dieterich, Effingham and Teutopolis were also asked to identify mitigation actions that would ensure their continued compliance with the National Flood Insurance Program.

The compiled lists of new mitigation actions were then reviewed to assure the appropriateness and suitability of each action. Those actions that were not deemed appropriate and/or suitable were either reworded or eliminated.

## 4.3 MITIGATION ACTION ANALYSIS

The mitigation actions identified were then assigned to one of four broad mitigation action categories which allowed Planning Committee members to compare and consolidate similar actions. **Figure MIT-2** identifies each mitigation action category and provides a brief description.

Each mitigation action was then analyzed to determine:

- the hazard or hazards being mitigated;
- the general size of the population affected (i.e., small, medium or large);
- the goal or goals fulfilled;
- whether the action would reduce the effects on new or existing buildings and infrastructure; and
- whether the action would ensure continued compliance with the National Flood Insurance Program.

| **Figure MIT-2<br>Types of Mitigation Activities** | |
|---|---|
| **Category** | **Description** |
| Local Plans & Regulations (LP&R) | Local Plans & Regulations include actions that influence the way land and buildings are being developed and built. Examples include: stormwater management plans, floodplain regulations, capital improvement projects, participation in the NFIP Community Rating System, comprehensive plans, and local ordinances (i.e., building codes, etc.) |
| Structure & Infrastructure Projects (S&IP) | Structure & Infrastructure Projects include actions that protect infrastructure and structures from a hazard or remove them from a hazard area. Examples include: acquisition and elevation of structures in flood prone areas, burying utility lines to critical facilities, construction of community safe rooms, install "hardening" materials (i.e., impact resistant window film, hail resistant shingles/doors, etc.) and detention/retention structures. |
| Natural System Protection (NSP) | Natural System Protection includes actions that minimize damage and losses and also preserve or restore natural systems. Examples include: sediment and erosion control, stream restoration and watershed management. |
| Education & Awareness Programs (E&A) | Education & Awareness Programs include actions to inform and educate citizens, elected officials and property owners about hazards and the potential ways to mitigate them. Examples include: outreach/school programs, brochures and handout materials, becoming a StormReady community, evacuation planning and drills, and volunteer activities (i.e., culvert cleanout days, initiatives to check in on the elderly/disabled during hazard events such as storms and extreme heat events, etc.) |

## 4.4 MITIGATION ACTION PRIORITIZATION METHODOLOGY

Next, the Planning Committee worked with the Consultant to develop a method to prioritize mitigation actions. Various methodologies were discussed with the Committee members at the second meeting held on February 27, 2020. **Figure MIT-3** identifies and describes the four-tiered prioritization methodology adopted by the Planning Committee.

This methodology is based on two key factors: 1) the frequency of the hazard and 2) the degree of mitigation attained. The methodology developed provides a means of objectively determining which actions have a greater likelihood of reducing the long-term vulnerabilities associated with the most frequently-occurring natural hazards.

While prioritizing the actions is useful and provides participants with additional information, it is important to keep in mind that implementing any the mitigation actions is desirable regardless of which prioritization category an action falls under.

## 4.5 MITIGATION ACTION IMPLEMENTATION, ADMINISTRATION & COST/BENEFIT ANALYSIS

Finally, each participating jurisdiction was asked to identify how the mitigation actions will be implemented and administered. This included:

- Identifying the party or parties responsible for oversight and administration.
- Determining what funding source(s) are available or will be pursued.

- Describing the time frame for completion.
- Conducting a preliminary cost/benefit analysis.

**Figure MIT-3**
**Mitigation Action Prioritization Methodology**

| | | Hazard | |
|---|---|---|---|
| | | Most Frequent Hazard **(M)** (i.e., severe storms, severe winter storms/extreme cold, floods, excessive heat) | Less Frequent Hazard **(L)** (i.e., tornadoes, drought, earthquakes, dam failures) |
| **Mitigation Action** | Mitigation Action with the Potential to Virtually Eliminate or Significantly Reduce Impacts **(H)** | **HM** mitigation action will virtually eliminate damages and/or significantly reduce the probability of injuries and fatalities from the most frequently-occurring hazards | **HL** mitigation action will virtually eliminate damages and/or significantly reduce the probability of injuries and fatalities from the less frequently-occurring hazards |
| | Mitigation Action with the Potential to Reduce Impacts **(L)** | **LM** mitigation action has the potential to reduce damages, injuries and/or fatalities from the most frequently-occurring hazards | **LL** mitigation action has the potential to reduce damages, injuries and/or fatalities from the less frequently-occurring hazards |

*Oversight & Administration*

It is important to keep in mind that most of the participating municipalities have extremely limited capabilities related to organization and staffing for oversight and administration of the identified mitigation actions. Five of the nine participating municipalities/townships are very small in size with less than 750 individuals. In most cases these municipalities have minimal staff who are only employed part-time. Their organizational structure is such that most have very few offices and/or departments, generally limited to public works. Those in charge of the offices/departments often lack the technical expertise needed to individually oversee and administer the identified mitigation actions. As a result, most of the participating jurisdictions identified their governing body (i.e., village board, city council or board) as the entity responsible for oversight and administration simply because it is the only practical option given their organizational constraints. Other participants felt that oversight and administration falls under the purview of the entity's governing body (board/council) and not individual departments.

*Funding Sources*

While the South Central Illinois Regional Planning and Development Commission has the ability to provide grant writing services to Effingham County, many of the participating jurisdictions do not have administrators with grant writing capabilities. As a result, assistance was needed in identifying possible funding sources for the identified mitigation actions. The consultant provided written information to the participants about FEMA and non-FEMA funding opportunities that have been used previously to finance mitigation actions. In addition, funding information was

discussed with participants during planning committee meetings and in one-on-one contacts so that an appropriate funding source could be identified for each mitigation action.

A handout was prepared and distributed that provided specific information on the non-FEMA grant sources available including the grant name, the government agency responsible for administering the grant, grant ceiling, contact person and application period among other key points. Specific grants from the following agencies were identified: United State Department of Agricultural – Rural Development (USDA – RD), Illinois Department of Agriculture (IDOA), Illinois Department of Commerce and Economic Opportunity (DCEO), Illinois Environmental Protection Agency (IEPA), Illinois Department of Natural Resources (IDNR) and Illinois Department of Transportation (IDOT).

The funding source identified for each action is the most likely source to be pursued. However, if grant funding is unavailable through the most likely or other suggested sources, then implementation of medium and large-scale projects and activities is unlikely due to the budgetary constraints experienced by all of the participants due to their size, projected population growth and limited revenue streams. It is important to remember that the population for the entire County is just over 34,000 individuals. Five of the nine participating municipalities/townships have populations of less than 750 individuals. Most of the jurisdictions struggle to maintain and provide the most critical of services to their residents. Additional funding is necessary if implementation is to be achieved.

*Time Frame for Completion*

The time frame for completion identified for each action is the timespan in which participants would like to see the action successfully completed. In many cases, however, the time frame identified is dependent on obtaining the necessary funding. As a result, a time range has been identified for many of the mitigation actions to allow for unpredictability in securing funds.

*Cost/Benefit Analysis*

A preliminary qualitative cost/benefit analysis was conducted on each mitigation action. The costs and benefits were analyzed in terms of the general overall cost to complete an action as well as the action's likelihood of permanently eliminating or reducing the risk associated with a specific hazard. The general descriptors of high, medium and low were used. These terms are not meant to translate into a specific dollar amount, but rather to provide a relative comparison between the actions identified by each jurisdiction.

This analysis is only meant to give the participants a starting point to compare which actions are likely to provide the greatest benefit based on the financial cost and staffing effort needed. It was repeatedly communicated to the Planning Committee members that when a grant application is submitted to IEMA/FEMA for a specific action, a detailed cost/benefit analysis will be required to receive funding.

## 4.6 RESULTS OF MITIGATION STRATEGY

**Figures MIT-4** through **MIT-14**, located at the end of this section, summarize the results of the mitigation strategy. The mitigation actions are arranged alphabetically by participating jurisdiction following the County and include both existing and new actions.

## Figure MIT-4
## Effingham County Hazard Mitigation Actions
## (Sheet 1 of 7)

| Priority | Activity/Project Description | Hazard(s) to be Mitigated | Type of Mitigation Activity | Size of Population Affected | Goal(s) Met | Reduce Effects of Hazard(s) on Buildings & Infrastructure | | Organization / Department Responsible for Implementation & Administration | Time Frame to Complete Activity | Funding Source(s)† | Cost/Benefit Analysis |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | New | Existing | | | | |
| **County Board** | | | | | | | | | | | |
| HM | Bury power lines to County facilities to limit service disruptions, increase facility resilience and eliminate road blockages by downed lines during natural and man-made hazard events. | MMH, SS, SWS, T | S&IP | Medium | 2, 3, 5 | n/a | Yes | Chairman / County Board | 5-10 years | County / FEMA Pre-Disaster Mitigation | Medium/High |
| **Emergency Management Agency / County Board** | | | | | | | | | | | |
| LM | Research participation in the National Flood Insurance Program to explore the benefits and costs. | F | LP&R | Small | 2, 4, 6, 7 | Yes | Yes | EMA Emergency Manager / Chairman County Board | 1-2 years | County | Low/Medium |
| **Emergency Management Agency** | | | | | | | | | | | |
| HM | Purchase and install an automatic emergency backup generator at the County Emergency Operations Center to provide uninterrupted power and maintain continuity of government and operations during power outages. | EH, F, SS, SWS, T | S&IP | Large | 2, 3, 5 | n/a | Yes | EMA Emergency Manager / Chairman County Board | 2-3 years | County / FEMA Pre-Disaster Mitigation | Medium/High |
| HM | Purchase portable emergency backup generators for use at designated critical facilities (i.e., nursing homes, American Red Cross-designated shelters, etc.) to maintain operations during prolonged power outages. | EH, F, SS, SWS, T | S&IP | Small | 2, 3, 5 | n/a | Yes | EMA Emergency Manager / Chairman County Board | 3-5 years | County / Illinois DCEO | Medium/High |
| LM | Secure Memorandums of Agreement with designated critical facilities (i.e., nursing homes, American Red Cross-designated shelters, etc.) to install electrical hookups (pigtails) for use with portable emergency backup generators to maintain operations during prolonged power outages. | EH, F, SS, SWS, T | LP&R | Small | 2, 3, 5 | n/a | Yes | EMA Emergency Manager / Chairman County Board | 3-5 years | County | Low/Medium |

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the County's size (just over 34,000 individuals), projected population growth and budgetary constraints. The County works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

**Acronyms**

Priority

| | |
|---|---|
| HM | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards |
| LM | Mitigation action with the potential to reduce impacts from the most frequent hazards |
| HL | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards |
| LL | Mitigation action with the potential to reduce impacts from the less frequent hazards |

Hazard(s) to be Mitigated:

| | | | |
|---|---|---|---|
| DF | Dam Failure | F | Flood |
| DR | Drought | MMH | Man-Made Hazard |
| EC | Extreme Cold | SS | Severe Storm |
| EH | Excessive Heat | SWS | Severe Winter Storm |
| EQ | Earthquake | T | Tornado |

Type of Mitigation Activity:

| | | | |
|---|---|---|---|
| E&A | Education & Awareness | NSP | Natural Systems Protection |
| LP&R | Local Plans & Regulations | S&IP | Structure & Infrastructure Projects |

## Figure MIT-4
## Effingham County Hazard Mitigation Actions
## (Sheet 2 of 7)

| Priority | Activity/Project Description | Hazard(s) to be Mitigated | Type of Mitigation Activity | Size of Population Affected | Goal(s) Met | Reduce Effects of Hazard(s) on Buildings & Infrastructure | | Organization / Department Responsible for Implementation & Administration | Time Frame to Complete Activity | Funding Source(s)† | Cost/Benefit Analysis |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | New | Existing | | | | |
| **Emergency Management Agency Continued…** | | | | | | | | | | | |
| HM | Purchase and install electrical hookups (pigtails) at designated critical facilities (i.e., nursing homes, American Red Cross-designated shelters, etc.) for use with portable emergency backup generators to maintain operations during prolonged power outages. | EH, F, SS, SWS, T | S&IP | Small | 2, 3, 5 | n/a | Yes | EMA Emergency Manager / Chairman County Board | 3-5 years | County / Illinois DCEO | Medium/High |
| LM | Develop/distribute public information materials that inform residents about the risks to life and property associated with natural hazards and the proactive actions they can take to reduce their risk. | DF, EC, EH, EQ, F, SS, SWS, T | E&A | Large | 1, 2 | n/a | n/a | EMA Emergency Manager | 1-3 years | County | Low/High |
| LM | Secure Memorandum of Agreement with Effingham Equity to install electrical hookups (pigtails) for use with portable emergency backup generators to maintain operations during prolonged power outages. Effingham Equity provides fuel to the County for its generators and vehicles. | EH, F, SS, SWS, T | LP&R | Small | 2, 3, 5 | n/a | Yes | EMA Emergency Manager / Chairman County Board | 3-5 years | County | Low/Medium |
| HM | Purchase and install electrical hookups (pigtails) at Effingham Equity for use with portable emergency backup generator to maintain operations during prolonged power outages. Effingham Equity provides fuel to the County for its generators and vehicles. | EH, F, SS, SWS, T | S&IP | Small | 2, 3, 5 | n/a | Yes | EMA Emergency Manager | 3-5 years | County / Illinois DCEO | Low/High |
| LM | Purchase and distribute NOAA weather radios to vulnerable residents, businesses, schools and critical facilities (i.e., nursing homes, American Red Cross-designated shelters, etc.), fire protection districts, etc. | EC, EH, EQ, F, MMH, SS, SWS, T | E&A | Large | 2 | n/a | n/a | EMA Emergency Manager | 2-5 year | County / Illinois DCEO | Low/High |

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the County's size (just over 34,000 individuals), projected population growth and budgetary constraints. The County works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

**Acronyms**

Priority

| | |
|---|---|
| HM | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards |
| LM | Mitigation action with the potential to reduce impacts from the most frequent hazards |
| HL | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards |
| LL | Mitigation action with the potential to reduce impacts from the less frequent hazards |

Hazard(s) to be Mitigated:

| | | | |
|---|---|---|---|
| DF | Dam Failure | F | Flood |
| DR | Drought | MMH | Man-Made Hazard |
| EC | Extreme Cold | SS | Severe Storm |
| EH | Excessive Heat | SWS | Severe Winter Storm |
| EQ | Earthquake | T | Tornado |

Type of Mitigation Activity:

| | | | |
|---|---|---|---|
| E&A | Education & Awareness | NSP | Natural Systems Protection |
| LP&R | Local Plans & Regulations | S&IP | Structure & Infrastructure Projects |

## Figure MIT-4
## Effingham County Hazard Mitigation Actions
## (Sheet 3 of 7)

| Priority | Activity/Project Description | Hazard(s) to be Mitigated | Type of Mitigation Activity | Size of Population Affected | Goal(s) Met | Reduce Effects of Hazard(s) on Buildings & Infrastructure | | Organization / Department Responsible for Implementation & Administration | Time Frame to Complete Activity | Funding Source(s)† | Cost/Benefit Analysis |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | New | Existing | | | | |
| **Emergency Management Agency Continued…** | | | | | | | | | | | |
| LL | Partner with classified dam owners to develop Emergency Action Plans (EAPs) that identify the extent (water depth, speed of onset, warning times, etc.) and location (inundation area) of potential dam failures to address data deficiencies. | DF | E&A | Small | 2, 3, 5 | Yes | Yes | EMA Emergency Manager | 5 years | County / Classified Dam Owners | Low/Low |
| **Emergency Management Agency / 911** | | | | | | | | | | | |
| HM | Purchase/subscribe to an automated emergency notification system (i.e., reverse 911) to notify residents/responders of natural and man-made hazard event information. | DF, EC, EH, EQ, F, MMH, SS, SWS, T | E&A | Large | 2 | n/a | n/a | EMA Emergency Manager / 911 Coordinator | 2-5 years | County / FEMA Emergency Management Performance Grant | Medium/High |
| HM | Purchase and install storm warning sirens in unincorporated communities and subdivisions in the County, including but not limited to: Moccasin, Eberle, Winterrowd, Elliot's Town and Green Creek (St. Mary's Church). | SS, T | S&IP | Medium | 2 | n/a | n/a | EMA Emergency Manager / 911 Coordinator | 2-5 years | County / Illinois DCEO | Medium/High |
| LM | Secure Memorandums of Agreement with townships to purchase and install storm warning sirens at their buildings, including but not limited to: Bishop Township, Jackson Township, Mound Township, Watson Township and West Township. | SS, T | LP&R | Medium | 2 | n/a | n/a | EMA Emergency Manager / 911 Coordinator | 1 year | County | Low/Medium |
| HM | Purchase and install new storm warning sirens at select township buildings including but not limited to: Bishop Township, Jackson Township polling place, Mound Township, Watson Township and West Township. | SS, T | S&IP | Medium | 2 | n/a | n/a | EMA Emergency Manager / 911 Coordinator | 2-5 years | County / Illinois DCEO | Medium/High |

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the County's size (just over 34,000 individuals), projected population growth and budgetary constraints. The County works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

**Acronyms**

Priority

| | |
|---|---|
| HM | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards |
| LM | Mitigation action with the potential to reduce impacts from the most frequent hazards |
| HL | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards |
| LL | Mitigation action with the potential to reduce impacts from the less frequent hazards |

Hazard(s) to be Mitigated:

| | | | |
|---|---|---|---|
| DF | Dam Failure | F | Flood |
| DR | Drought | MMH | Man-Made Hazard |
| EC | Extreme Cold | SS | Severe Storm |
| EH | Excessive Heat | SWS | Severe Winter Storm |
| EQ | Earthquake | T | Tornado |

Type of Mitigation Activity:

| | | | |
|---|---|---|---|
| E&A | Education & Awareness | NSP | Natural Systems Protection |
| LP&R | Local Plans & Regulations | S&IP | Structure & Infrastructure Projects |

## Figure MIT-4
## Effingham County Hazard Mitigation Actions
## (Sheet 4 of 7)

| Priority | Activity/Project Description | Hazard(s) to be Mitigated | Type of Mitigation Activity | Size of Population Affected | Goal(s) Met | Reduce Effects of Hazard(s) on Buildings & Infrastructure | | Organization / Department Responsible for Implementation & Administration | Time Frame to Complete Activity | Funding Source(s)† | Cost/Benefit Analysis |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | New | Existing | | | | |
| **Emergency Management Agency / 911 Continued…** | | | | | | | | | | | |
| HM | Purchase and install a storm warning siren on County Highway Building. | SS, T | S&IP | Small | 2 | n/a | n/a | EMA Emergency Manager / 911 Coordinator | 2-5 years | County / Illinois DCEO | Medium/High |
| **Emergency Management Agency / Sheriff's Office** | | | | | | | | | | | |
| HL | Install "hardening" materials such as shatter-glass at County facilities to make the buildings resistant to natural and man-made hazard events. | EQ, MMH, SS, T | S&IP | Medium | 2, 3, 5, 8 | n/a | Yes | EMA Emergency Manager / Sheriff | 5 years | County / FEMA Pre-Disaster Mitigation | High/High |
| **Sheriff's Office** | | | | | | | | | | | |
| HM | Purchase and install an automatic emergency backup generator at the Effingham County Sheriff's Office to provide uninterrupted power and maintain continuity of government and operations during power outages. The Sheriff's Office includes the County government offices, GIS, the Jail and 911 dispatch center. | EH, F, SS, SWS, T | S&IP | Large | 2, 3, 5 | n/a | Yes | Sheriff / Chairman County Board | 2-3 years | County / FEMA Pre-Disaster Mitigation | Medium/High |
| **Health Department** | | | | | | | | | | | |
| HM | Purchase and install an automatic emergency backup generator at the Effingham County Health Department's Emergency Operations Center to provide uninterrupted power and maintain continuity of government and operations during power outages. | EH, F, SS, SWS, T | S&IP | Large | 2, 3, 5 | n/a | Yes | Administrator / Chairman County Board | 2-3 years | County / FEMA Pre-Disaster Mitigation / Illinois DCEO | Medium/High |

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the County's size (just over 34,000 individuals), projected population growth and budgetary constraints. The County works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

**Acronyms**

Priority

| | |
|---|---|
| HM | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards |
| LM | Mitigation action with the potential to reduce impacts from the most frequent hazards |
| HL | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards |
| LL | Mitigation action with the potential to reduce impacts from the less frequent hazards |

Hazard(s) to be Mitigated:

| | | | |
|---|---|---|---|
| DF | Dam Failure | F | Flood |
| DR | Drought | MMH | Man-Made Hazard |
| EC | Extreme Cold | SS | Severe Storm |
| EH | Excessive Heat | SWS | Severe Winter Storm |
| EQ | Earthquake | T | Tornado |

Type of Mitigation Activity:

| | | | |
|---|---|---|---|
| E&A | Education & Awareness | NSP | Natural Systems Protection |
| LP&R | Local Plans & Regulations | S&IP | Structure & Infrastructure Projects |

## Figure MIT-4
## Effingham County Hazard Mitigation Actions
## (Sheet 5 of 7)

| Priority | Activity/Project Description | Hazard(s) to be Mitigated | Type of Mitigation Activity | Size of Population Affected | Goal(s) Met | Reduce Effects of Hazard(s) on Buildings & Infrastructure | | Organization / Department Responsible for Implementation & Administration | Time Frame to Complete Activity | Funding Source(s)† | Cost/Benefit Analysis |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | New | Existing | | | | |
| **Highway Department** | | | | | | | | | | | |
| HM | Purchase and install an automatic emergency backup generator at the Effingham County Highway Department maintenance building to provide uninterrupted power and maintain continuity of operations during power outages. | EH, F, SS, SWS, T | S&IP | Medium | 2, 3, 5 | n/a | Yes | Highway Engineer / Chairman County Board | 2-3 years | County / FEMA Pre-Disaster Mitigation / Illinois DCEO | Medium/High |
| HM | Purchase portable, trailer-mounted LED emergency message boards to alert the public of hazardous conditions associated with natural and man-made hazard events. | DF, EH, EQ, F, MMH, SS, SWS, T | E&A | Small | 2 | n/a | n/a | Highway Engineer / Sheriff / EMA Emergency Manager | 2-5 years | County | Medium/Medium |
| LM | Conduct hydrologic/hydraulic analysis to determine the cause of and identify design solutions to address recurring roadway flooding at Brady Bridge on County Highway 12 (300th Avenue) west of US Route 45 over the Little Wabash River. | F, SS | E&A | Small | 2, 3, 5 | n/a | Yes | Highway Engineer | 2-5 years | County / IDOT Local Roads | Medium/Medium |
| HM | Construct the identified design solutions to address recurring roadway flooding at Brady on County Highway 12 (300th Avenue) west of US Route 45 over the Little Wabash River. | F, SS | S&IP | Small | 2, 3, 5 | n/a | Yes | Highway Engineer | 5 years | County / IDOT Local Roads | High/Medium |
| HM | Purchase additional right-of-way and install living snow fences on the north side of 1600th Avenue between 300th Street and 600th street to limit blowing and drifting of snow, maintain access and ease hazardous driving conditions. | SWS | NSP | Small | 2, 3, 5 | n/a | Yes | Highway Engineer | 1-3 years | County / FEMA Pre-Disaster Mitigation | Medium/Medium |

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the County's size (just over 34,000 individuals), projected population growth and budgetary constraints. The County works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

**Acronyms**

Priority

| | |
|---|---|
| HM | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards |
| LM | Mitigation action with the potential to reduce impacts from the most frequent hazards |
| HL | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards |
| LL | Mitigation action with the potential to reduce impacts from the less frequent hazards |

Hazard(s) to be Mitigated:

| | | | |
|---|---|---|---|
| DF | Dam Failure | F | Flood |
| DR | Drought | MMH | Man-Made Hazard |
| EC | Extreme Cold | SS | Severe Storm |
| EH | Excessive Heat | SWS | Severe Winter Storm |
| EQ | Earthquake | T | Tornado |

Type of Mitigation Activity:

| | | | |
|---|---|---|---|
| E&A | Education & Awareness | NSP | Natural Systems Protection |
| LP&R | Local Plans & Regulations | S&IP | Structure & Infrastructure Projects |

## Figure MIT-4
## Effingham County Hazard Mitigation Actions
## (Sheet 6 of 7)

| Priority | Activity/Project Description | Hazard(s) to be Mitigated | Type of Mitigation Activity | Size of Population Affected | Goal(s) Met | Reduce Effects of Hazard(s) on Buildings & Infrastructure | | Organization / Department Responsible for Implementation & Administration | Time Frame to Complete Activity | Funding Source(s)† | Cost/Benefit Analysis |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | New | Existing | | | | |
| **Highway Department Continued…** | | | | | | | | | | | |
| LM | Conduct hydrologic/hydraulic analysis to determine the cause of and identify design solutions to address recurring roadway flooding at the County Highway 9 (1800th Avenue) bridge over Green Creek. | F, SS | E&A | Small | 2, 3, 5 | n/a | Yes | Highway Engineer | 2-5 years | County / IDOT Local Roads | Medium/Medium |
| HM | Construct the identified design solutions to address recurring roadway flooding at the County Highway 9 (1800th Avenue) bridge over Green Creek. | F, SS | S&IP | Small | 2, 3, 5 | n/a | Yes | Highway Engineer | 5 years | County / IDOT Local Roads | High/Medium |
| LM | Conduct hydrologic/hydraulic analysis to determine the cause of and identify design solutions to address recurring roadway flooding at the County Highway 23 (1000th Road) bridge north of 800th Avenue over the Little Wabash River. | F, SS | E&A | Small | 2, 3, 5 | n/a | Yes | Highway Engineer | 2-5 years | County / IDOT Local Roads | Medium/Medium |
| HM | Construct the identified design solutions to address recurring roadway flooding at the County Highway 23 (1000th Road) bridge north of 800th Avenue over the Little Wabash River. | F, SS | S&IP | Small | 2, 3, 5 | n/a | Yes | Highway Engineer | 5 years | County / IDOT Local Roads | High/Medium |
| HM | Retrofit/add to existing township buildings or construct new standalone structures to serve as a community safe room equipped with emergency backup generator and HVAC units that can also serve as a warming/cooling center for township residents. | EC, EH, SS, T | S&IP | Small | 2 | Yes | Yes | Highway Engineer / Township Supervisors | 5 years | County / FEMA Pre-Disaster Mitigation / USDA – RD Community Facilities Programs | High/High |

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the County's size (just over 34,000 individuals), projected population growth and budgetary constraints. The County works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

**Acronyms**

Priority

| | |
|---|---|
| HM | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards |
| LM | Mitigation action with the potential to reduce impacts from the most frequent hazards |
| HL | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards |
| LL | Mitigation action with the potential to reduce impacts from the less frequent hazards |

Hazard(s) to be Mitigated:

| | | | |
|---|---|---|---|
| DF | Dam Failure | F | Flood |
| DR | Drought | MMH | Man-Made Hazard |
| EC | Extreme Cold | SS | Severe Storm |
| EH | Excessive Heat | SWS | Severe Winter Storm |
| EQ | Earthquake | T | Tornado |

Type of Mitigation Activity:

| | | | |
|---|---|---|---|
| E&A | Education & Awareness | NSP | Natural Systems Protection |
| LP&R | Local Plans & Regulations | S&IP | Structure & Infrastructure Projects |

## Figure MIT-4
## Effingham County Hazard Mitigation Actions
## (Sheet 7 of 7)

| Priority | Activity/Project Description | Hazard(s) to be Mitigated | Type of Mitigation Activity | Size of Population Affected | Goal(s) Met | Reduce Effects of Hazard(s) on Buildings & Infrastructure | | Organization / Department Responsible for Implementation & Administration | Time Frame to Complete Activity | Funding Source(s)† | Cost/Benefit Analysis |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | New | Existing | | | | |
| **Highway Department Continued…** | | | | | | | | | | | |
| HM | Purchase additional road signage and barricades to alert the public of hazardous conditions, detours, etc. associated with natural and man-made hazard events. | DF, EH, EQ, F, MMH, SS, SWS, T | E&A | Medium | 2 | n/a | n/a | Highway Engineer | 1-3 years | County / IDOT Local Roads | Medium/High |
| HM | Purchase additional right-of-way as needed to reshape ditch back slopes and create wider, deeper ditches to alleviate drainage problems at various locations in the County. | F, SS | S&IP | Small | 2, 3, 5 | n/a | Yes | Highway Engineer | 3-5 years | County / IDOT Local Roads | Medium/High |

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the County's size (just over 34,000 individuals), projected population growth and budgetary constraints. The County works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

**Acronyms**

Priority

| | |
|---|---|
| HM | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards |
| LM | Mitigation action with the potential to reduce impacts from the most frequent hazards |
| HL | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards |
| LL | Mitigation action with the potential to reduce impacts from the less frequent hazards |

Hazard(s) to be Mitigated:

| | | | |
|---|---|---|---|
| DF | Dam Failure | F | Flood |
| DR | Drought | MMH | Man-Made Hazard |
| EC | Extreme Cold | SS | Severe Storm |
| EH | Excessive Heat | SWS | Severe Winter Storm |
| EQ | Earthquake | T | Tornado |

Type of Mitigation Activity:

| | | | |
|---|---|---|---|
| E&A | Education & Awareness | NSP | Natural Systems Protection |
| LP&R | Local Plans & Regulations | S&IP | Structure & Infrastructure Projects |

## Figure MIT-5
## Beecher City Hazard Mitigation Actions
## (Sheet 1 of 2)

| Priority | Activity/Project Description | Hazard(s) to be Mitigated | Type of Mitigation Activity | Size of Population Affected | Goal(s) Met | Reduce Effects of Hazard(s) on Buildings & Infrastructure | | Organization / Department Responsible for Implementation & Administration | Time Frame to Complete Activity | Funding Source(s)† | Cost/Benefit Analysis |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | New | Existing | | | | |
| LM | Conduct sewer line reconnaissance study to identify locations where storm water infiltrates the lines. | F, SS | S&IP | Medium | 2, 3, 5 | Yes | Yes | President / Village Board | 1 year | Village | Medium/High |
| HM | Repair/reline sewer line sections/mains where storm water infiltration is occurring to prevent sewage backups. Currently our schools, businesses and residents are experiencing sewer backups due to storm water infiltrating the sewer lines. | F, SS | S&IP | Small | 2, 3, 5 | Yes | Yes | President / Village Board | 2-3 years | Village / USDA – RD Water & Waste Disposal Program | High/High |
| HM | Purchase and install an automatic emergency backup generator at sewer lift station to increase system resilience and maintain operations during extended power outages. | EH, F, SS, SWS, T | S&IP | Medium | 2, 3, 5 | n/a | Yes | President / Village Board | 2-3 years | Village / USDA – RD Critical Facilities Programs | Medium/High |
| HM | Upgrade pumps at sanitary lift stations to maximize pumping capacity, increase system resilience and alleviate recurring drainage problems and sewer backups. | F, SS | S&IP | Medium | 2, 3, 5 | Yes | Yes | President / Village Board | 2-3 years | Village / USDA – RD Water & Waste Disposal Program | Medium/High |
| LM | Designate the Kluthe Center as a warming/cooling center for Village residents. | EC, EH | E&A | Medium | 2 | n/a | n/a | President / Village Board | 1-2 years | Village | Low/High |

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a village of this size (less than. 500 individuals). The Village works hard to maintain critical services to its residents but it's a struggle. Additional funding is necessary if implementation is to be achieved within the time frames specified.

**Acronyms**

Priority

| | |
|---|---|
| HM | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards |
| LM | Mitigation action with the potential to reduce impacts from the most frequent hazards |
| HL | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards |
| LL | Mitigation action with the potential to reduce impacts from the less frequent hazards |

Hazard(s) to be Mitigated:

| | | | |
|---|---|---|---|
| DF | Dam Failure | F | Flood |
| DR | Drought | MMH | Man-Made Hazard |
| EC | Extreme Cold | SS | Severe Storm |
| EH | Excessive Heat | SWS | Severe Winter Storm |
| EQ | Earthquake | T | Tornado |

Type of Mitigation Activity:

| | | | |
|---|---|---|---|
| E&A | Education & Awareness | NSP | Natural Systems Protection |
| LP&R | Local Plans & Regulations | S&IP | Structure & Infrastructure Projects |

## Figure MIT-5
## Beecher City Hazard Mitigation Actions
## (Sheet 2 of 2)

| Priority | Activity/Project Description | Hazard(s) to be Mitigated | Type of Mitigation Activity | Size of Population Affected | Goal(s) Met | Reduce Effects of Hazard(s) on Buildings & Infrastructure | | Organization / Department Responsible for Implementation & Administration | Time Frame to Complete Activity | Funding Source(s)† | Cost/Benefit Analysis |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | New | Existing | | | | |
| HM | Purchase and install an emergency backup generator at the Kluthe Center, a designated warming/cooling center, to provide uninterrupted power during power outages. | EH, F, SS, SWS, T | S&IP | Medium | 2, 3, 5 | n/a | Yes | President Village Board / Kluthe Center Board | 2-3 years | Village / USDA – RD Community Facilities Programs | Medium/High |
| HM | Remove debris, vegetative overgrowth, snags and drifts from streams and creeks within the Village to maintain/ increase carrying capacity, better manage stormwater runoff and reduce/prevent drainage problems. | F, SS | S&IP | Medium | 2, 3, 5, 6 | n/a | Yes | President / Village Board | 2-3 years | Village | Low/Medium |
| LM | Purchase and distribute NOAA weather radios to Village residents. | EC, EH, EQ, F, MMH, SS, SWS, T | E&A | Large | 2 | n/a | n/a | President / Village Board | 1 year | Village / FEMA Hazard Mitigation Grant Program | Low/High |

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a village of this size (less than. 500 individuals). The Village works hard to maintain critical services to its residents but it's a struggle. Additional funding is necessary if implementation is to be achieved within the time frames specified.

**Acronyms**

Priority

| | |
|---|---|
| HM | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards |
| LM | Mitigation action with the potential to reduce impacts from the most frequent hazards |
| HL | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards |
| LL | Mitigation action with the potential to reduce impacts from the less frequent hazards |

Hazard(s) to be Mitigated:

| | | | |
|---|---|---|---|
| DF | Dam Failure | F | Flood |
| DR | Drought | MMH | Man-Made Hazard |
| EC | Extreme Cold | SS | Severe Storm |
| EH | Excessive Heat | SWS | Severe Winter Storm |
| EQ | Earthquake | T | Tornado |

Type of Mitigation Activity:

| | | | |
|---|---|---|---|
| E&A | Education & Awareness | NSP | Natural Systems Protection |
| LP&R | Local Plans & Regulations | S&IP | Structure & Infrastructure Projects |

## Figure MIT-6
## Beecher City Community Unit School District #20 Hazard Mitigation Actions

| Priority | Activity/Project Description | Hazard(s) to be Mitigated | Type of Mitigation Activity | Size of Population Affected | Goal(s) Met | Reduce Effects of Hazard(s) on Buildings & Infrastructure | | Organization / Department Responsible for Implementation & Administration | Time Frame to Complete Activity | Funding Source(s)† | Cost/Benefit Analysis |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | New | Existing | | | | |
| HM | Purchase and install emergency backup generators at the High School to provide uninterrupted power to critical systems and maintain continuity of operations during prolonged power outages | EH, F, SS, SWS, T | S&IP | Medium | 2, 3, 5 | n/a | Yes | Superintendent / Beecher City School Board | 2-3 years | School Board / USDA – RD Community Facilities Programs | Medium/High |
| HM | Purchase and install emergency backup generator at the Grade School to provide uninterrupted power to critical systems and maintain continuity of operations during prolonged power outages | EH, F, SS, SWS, T | S&IP | Medium | 2, 3, 5 | n/a | Yes | Superintendent / Beecher City School Board | 2-3 years | School Board / USDA – RD Community Facilities Programs | Medium/High |

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by small, rural school districts. Additional funding is necessary if implementation is to be achieved within the time frames specified.

**Acronyms**

Priority

| | |
|---|---|
| HM | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards |
| LM | Mitigation action with the potential to reduce impacts from the most frequent hazards |
| HL | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards |
| LL | Mitigation action with the potential to reduce impacts from the less frequent hazards |

Hazard(s) to be Mitigated:

| | | | |
|---|---|---|---|
| DF | Dam Failure | F | Flood |
| DR | Drought | MMH | Man-Made Hazard |
| EC | Extreme Cold | SS | Severe Storm |
| EH | Excessive Heat | SWS | Severe Winter Storm |
| EQ | Earthquake | T | Tornado |

Type of Mitigation Activity:

| | | | |
|---|---|---|---|
| E&A | Education & Awareness | NSP | Natural Systems Protection |
| LP&R | Local Plans & Regulations | S&IP | Structure & Infrastructure Projects |

## Figure MIT-7
## Dieterich Hazard Mitigation Actions
## (Sheet 1 of 6)

| Priority | Activity/Project Description | Hazard(s) to be Mitigated | Type of Mitigation Activity | Size of Population Affected | Goal(s) Met | Reduce Effects of Hazard(s) on Buildings & Infrastructure | | Organization / Department Responsible for Implementation & Administration | Time Frame to Complete Activity | Funding Source(s)† | Cost/Benefit Analysis |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | New | Existing | | | | |
| LM | Conduct a hydraulic analysis to determine the cause and identify design solutions to address potential flood problems associated with the creeks in the Village. | F, SS | E&A | Small | 2, 3, 5 | Yes | Yes | President Village Board | 2-5 years | Village / IDOT Local Roads | Medium/Medium |
| HM | Upgrade/retrofit the Village's existing storm sewer system and/or construct additions to the storm sewer system to better manager stormwater runoff in an effort to alleviate flooding/drainage problems. | F, SS | S&IP | Medium | 2, 3, 5 | Yes | Yes | President Village Board | 5-10 years | Village / USDA – RD Water & Waste Disposal | High/High |
| HM | Remove debris/obstructions from culverts to maximize carrying capacity and reduce/prevent drainage problems. | F, SS | S&IP | Medium | 2, 3, 5 | Yes | Yes | President Village Board | 2-5 years | Village | Low/Medium |
| HM | Replace/upsize culverts and bridges as needed to increase carrying capacity and alleviate recurring flooding/drainage problems. | F, SS | S&IP | Small | 2, 3, 5 | n/a | Yes | President Village Board | 5-10 years | Village / IDOT Local Roads | High/High |
| HM | Remove debris, vegetative overgrowth, snags and drifts from streams and creeks within the Village to maintain/ increase carrying capacity, better manage stormwater runoff and reduce/prevent drainage problems. | F, SS | S&IP | Medium | 2, 3, 5, 6 | n/a | Yes | President / Village Board | 2-5 years | Village | Low/Medium |
| LM | Conduct sewer line reconnaissance study to identify locations where storm water infiltrates the lines. | F, SS | S&IP | Medium | 2, 3, 5 | Yes | Yes | President Village Board | 5-10 years | Village | Medium/High |
| HM | Repair/reline sewer line sections/mains where storm water infiltration is occurring to prevent sewage backups. | F, SS | S&IP | Small | 2, 3, 5 | Yes | Yes | President Village Board | 5-10 years | Village / USDA – RD Water & Waste Disposal Program | High/High |

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a village of this size (approximately 600 individuals). The Village struggles to provide even the most critical of services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

**Acronyms**

Priority

| | |
|---|---|
| HM | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards |
| LM | Mitigation action with the potential to reduce impacts from the most frequent hazards |
| HL | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards |
| LL | Mitigation action with the potential to reduce impacts from the less frequent hazards |

Hazard(s) to be Mitigated:

| | | | |
|---|---|---|---|
| DF | Dam Failure | F | Flood |
| DR | Drought | MMH | Man-Made Hazard |
| EC | Extreme Cold | SS | Severe Storm |
| EH | Excessive Heat | SWS | Severe Winter Storm |
| EQ | Earthquake | T | Tornado |

Type of Mitigation Activity:

| | | | |
|---|---|---|---|
| E&A | Education & Awareness | NSP | Natural Systems Protection |
| LP&R | Local Plans & Regulations | S&IP | Structure & Infrastructure Projects |

## Figure MIT-7
## Dieterich Hazard Mitigation Actions
## (Sheet 2 of 6)

| Priority | Activity/Project Description | Hazard(s) to be Mitigated | Type of Mitigation Activity | Size of Population Affected | Goal(s) Met | Reduce Effects of Hazard(s) on Buildings & Infrastructure | | Organization / Department Responsible for Implementation & Administration | Time Frame to Complete Activity | Funding Source(s)† | Cost/Benefit Analysis |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | New | Existing | | | | |
| HM | Upgrade/replace undersized lift stations, lift station pumps and force mains as needed to increase system resilience and prevent sewage backups | F, SS | S&IP | Small | 2, 3, 5 | Yes | Yes | President Village Board | 5-10 years | Village / USDA – RD Water & Waste Disposal Program | High/High |
| HM | Purchase and install automatic emergency backup generators at all lift station pumps and the sewer lagoon blowers to increase system resilience and maintain operations during prolonged power outages. | EH, F, SS, SWS, T | S&IP | Medium | 2, 3, 5 | Yes | Yes | President / Village Board | 2-5 years | City / Illinois DCEO / USDA – RD Community Facilities Programs | Medium/High |
| HM | Upgrade/retrofit drinking water system (lines, water mains, fire hydrants, pumping system, etc.) to ensure a constant supply of water for residents and aid in fire suppression during natural hazard events. | DR, EH, EQ, F, SS, SWS, T | S&IP | Medium | 2, 3, 5 | Yes | Yes | President Village Board | 5-10 years | Village / USDA – RD Water & Waste Disposal Program | High/High |
| LM | Purchase and distribute NOAA weather radios to every household in Village to notify residents of information related to natural and man-made hazard events. | EC, EH, EQ, F, MMH, SS, SWS, T | E&A | Large | 2 | n/a | n/a | President Village Board | 2-5 years | Village / FEMA Hazard Mitigation Grant Program | Low/High |

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a village of this size (approximately 600 individuals). The Village struggles to provide even the most critical of services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

**Acronyms**

Priority

| | |
|---|---|
| HM | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards |
| LM | Mitigation action with the potential to reduce impacts from the most frequent hazards |
| HL | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards |
| LL | Mitigation action with the potential to reduce impacts from the less frequent hazards |

Hazard(s) to be Mitigated:

| | | | |
|---|---|---|---|
| DF | Dam Failure | F | Flood |
| DR | Drought | MMH | Man-Made Hazard |
| EC | Extreme Cold | SS | Severe Storm |
| EH | Excessive Heat | SWS | Severe Winter Storm |
| EQ | Earthquake | T | Tornado |

Type of Mitigation Activity:

| | | | |
|---|---|---|---|
| E&A | Education & Awareness | NSP | Natural Systems Protection |
| LP&R | Local Plans & Regulations | S&IP | Structure & Infrastructure Projects |

## Figure MIT-7
## Dieterich Hazard Mitigation Actions
## (Sheet 3 of 6)

| Priority | Activity/Project Description | Hazard(s) to be Mitigated | Type of Mitigation Activity | Size of Population Affected | Goal(s) Met | Reduce Effects of Hazard(s) on Buildings & Infrastructure | | Organization / Department Responsible for Implementation & Administration | Time Frame to Complete Activity | Funding Source(s)† | Cost/Benefit Analysis |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | New | Existing | | | | |
| LM | Create volunteer networks to check on/assist access and functional needs residents during natural hazard events. | EC, EQ, EH, F, MMH, SS, SWS, T | E&A | Small | 2 | n/a | n/a | President Village Board | 2-5 years | Village | Low/High |
| HM | Replace existing storm warning siren and purchase/install additional storm warning sirens to improve coverage. | SS, T | E&A | Large | 2 | n/a | n/a | President Village Board | 2-5 years | Village / USDA – RD Critical Facilities Programs | Medium/High |
| HM | Bury power lines to critical facilities to limit service disruptions during natural hazard events. | SS, SWS, T | S&IP | Large | 2, 3, 5 | Yes | Yes | President Village Board | 5-10 years | Village / USDA – RD Critical Facilities Programs | High/High |
| HL | Seismically retrofit the bridges within the Village to improve resilience and prevent earthquake damage. | EQ | S&IP | Small | 3, 5 | n/a | Yes | President Village Board | 5-10 years | Village / IDOT Local Roads / USDA – RD Critical Facilities Program | High/Medium |

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a village of this size (approximately 600 individuals). The Village struggles to provide even the most critical of services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

**Acronyms**

Priority

| | |
|---|---|
| HM | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards |
| LM | Mitigation action with the potential to reduce impacts from the most frequent hazards |
| HL | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards |
| LL | Mitigation action with the potential to reduce impacts from the less frequent hazards |

Hazard(s) to be Mitigated:

| | | | |
|---|---|---|---|
| DF | Dam Failure | F | Flood |
| DR | Drought | MMH | Man-Made Hazard |
| EC | Extreme Cold | SS | Severe Storm |
| EH | Excessive Heat | SWS | Severe Winter Storm |
| EQ | Earthquake | T | Tornado |

Type of Mitigation Activity:

| | | | |
|---|---|---|---|
| E&A | Education & Awareness | NSP | Natural Systems Protection |
| LP&R | Local Plans & Regulations | S&IP | Structure & Infrastructure Projects |

## Figure MIT-7
## Dieterich Hazard Mitigation Actions
## (Sheet 4 of 6)

| Priority | Activity/Project Description | Hazard(s) to be Mitigated | Type of Mitigation Activity | Size of Population Affected | Goal(s) Met | Reduce Effects of Hazard(s) on Buildings & Infrastructure | | Organization / Department Responsible for Implementation & Administration | Time Frame to Complete Activity | Funding Source(s)† | Cost/Benefit Analysis |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | New | Existing | | | | |
| HL | Identify and install "hardening" materials (shatter-resistant window film, hail resistant shingles/doors etc.) at the Village Maintenance building, Village Hall, Dieterich Civic Center, Dieterich Community School and Fire Station to make the buildings resistant to the effects of natural hazard events. | EQ, MMH, SS, T | S&IP | Small | 2, 3, 5 | n/a | Yes | President Village Board | 2-5 years | County / FEMA Pre-Disaster Mitigation | High/High |
| HM | Purchase and install emergency backup generators at the Village Maintenance building, Village Hall, Dieterich Civic Center, Dieterich Community School and Fire Station to provide uninterrupted power during power outages. | EH, F, SS, SWS, T | S&IP | Medium | 2, 3, 5 | n/a | Yes | President / Village Board | 2-5 years | Village / USDA – RD Community Facilities Programs | Medium/High |
| LM | Improve coordination between the Village, township and County in an effort to help implement hazard prevention projects and cleanup activities. | EH, EQ, F, SS, SWS, T | E&A | Large | 2, 3, 5 | Yes | Yes | President / Village Board | 2-5 years | Village | Low/Medium |
| LM | Develop and implement an outreach program that works with local businesses to identify the risks to their employees and properties from natural hazard events, the actions they can take to reduce or eliminate those risks and the steps they can take to maintain operations after a natural hazard event. | EQ, F, SS, SWS, T | E&A | Small | 1, 2 | n/a | n/a | President / Village Board | 2-5 years | Village | Low/High |

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a village of this size (approximately 600 individuals). The Village struggles to provide even the most critical of services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

**Acronyms**

Priority

| | |
|---|---|
| HM | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards |
| LM | Mitigation action with the potential to reduce impacts from the most frequent hazards |
| HL | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards |
| LL | Mitigation action with the potential to reduce impacts from the less frequent hazards |

Hazard(s) to be Mitigated:

| | | | |
|---|---|---|---|
| DF | Dam Failure | F | Flood |
| DR | Drought | MMH | Man-Made Hazard |
| EC | Extreme Cold | SS | Severe Storm |
| EH | Excessive Heat | SWS | Severe Winter Storm |
| EQ | Earthquake | T | Tornado |

Type of Mitigation Activity:

| | | | |
|---|---|---|---|
| E&A | Education & Awareness | NSP | Natural Systems Protection |
| LP&R | Local Plans & Regulations | S&IP | Structure & Infrastructure Projects |

## Figure MIT-7
## Dieterich Hazard Mitigation Actions
## (Sheet 5 of 6)

| Priority | Activity/Project Description | Hazard(s) to be Mitigated | Type of Mitigation Activity | Size of Population Affected | Goal(s) Met | Reduce Effects of Hazard(s) on Buildings & Infrastructure | | Organization / Department Responsible for Implementation & Administration | Time Frame to Complete Activity | Funding Source(s)† | Cost/Benefit Analysis |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | New | Existing | | | | |
| LM | Develop information materials for schools that describe the risks associated with natural hazards, the protective measures that students should follow and procedures in place in case of an evacuation. Drills should be conducted at each school to practice the evacuation procedures outlined. | EC, EH, EQ, F, SS, SWS, T | E&A | Medium | 1, 2 | n/a | n/a | President / Village Board | 2-5 years | Village | Low/High |
| LM | Develop/distribute public information materials that inform residents about the risks to life and property associated with natural hazards and the proactive actions they can take to reduce or eliminate their risk. | EC, EH, EQ, F, SS, SWS, T | E&A | Large | 1, 2 | n/a | n/a | President / Village Board | 2-5 years | Village | Low/High |
| LM | Provide workshops on structural and non-structural low cost adjustments that can be made to critical facilities to project against natural hazard damage. | EH, EQ, F, SS, SWS, T | E&A | Small | 3, 5 | n/a | Yes | President / Village Board | 2-5 years | Village | Low/High |
| HM | Straighten Dieterich Creek (take out the oxbow at East Virginia Street) and reconstruct the bridge over the newly realigned stream. | F, SS | S&IP | Small | 2, 3, 5 | n/a | Yes | President / Village Board | 2-5 years | Village / IDOT Local Roads | High/Medium |
| HM | Elevate flood-prone structures out of the floodplain. * | F | S&IP | Small | 2, 6 | n/a | Yes | President Village Board | 5-10 years | Village / FEMA Flood Mitigation Assistance | High/Medium |

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a village of this size (approximately 600 individuals). The Village struggles to provide even the most critical of services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

**Acronyms**

Priority

| | |
|---|---|
| HM | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards |
| LM | Mitigation action with the potential to reduce impacts from the most frequent hazards |
| HL | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards |
| LL | Mitigation action with the potential to reduce impacts from the less frequent hazards |

Hazard(s) to be Mitigated:

| | | | |
|---|---|---|---|
| DF | Dam Failure | F | Flood |
| DR | Drought | MMH | Man-Made Hazard |
| EC | Extreme Cold | SS | Severe Storm |
| EH | Excessive Heat | SWS | Severe Winter Storm |
| EQ | Earthquake | T | Tornado |

Type of Mitigation Activity:

| | | | |
|---|---|---|---|
| E&A | Education & Awareness | NSP | Natural Systems Protection |
| LP&R | Local Plans & Regulations | S&IP | Structure & Infrastructure Projects |

## Figure MIT-7
## Dieterich Hazard Mitigation Actions
## (Sheet 6 of 6)

| Priority | Activity/Project Description | Hazard(s) to be Mitigated | Type of Mitigation Activity | Size of Population Affected | Goal(s) Met | Reduce Effects of Hazard(s) on Buildings & Infrastructure | | Organization / Department Responsible for Implementation & Administration | Time Frame to Complete Activity | Funding Source(s)† | Cost/Benefit Analysis |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | New | Existing | | | | |
| HM | Acquire properties in flood-prone areas and remove any existing structures. | F | S&IP | Small | 2, 6 | n/a | Yes | President Village Board | 5-10 years | Village / IDNR Flood Damaged Property Buyout | High/High |
| HM | Review the updated Flood Insurance Rate Maps (FIRMs) when they become available. Update the flood ordinance to reflect the revised FIRMs and present both for adoption. * | F | LP&R | Small | 1, 2, 4 6, 7 | Yes | Yes | President Village Board | 2-5 years | Village | Low/High |
| HM | Make the most recent Flood Insurance Rate Maps available to assist the public in considering where to construct new buildings. * | F | LP&R | Small | 1, 2, 6, 7 | Yes | Yes | President Village Board | 2-5 years | Village | Low/Medium |
| LM | Make Village officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in a floodplain. * | F | LP&R | Small | 1, 2, 6, 7 | Yes | Yes | President Village Board | 2-5 years | Village | Low/Medium |
| LM | Evaluate the feasibility of participating in the National Flood Insurance Program's voluntary Community Rating System to reduce flood insurance premiums. * | F | LP&R | Small | 1, 2 4, 6 | Yes | Yes | President Village Board | 2-5 years | Village | Low/Medium |
| LM | Participate in the National Flood Insurance Program's Community Rating System to reduce flood insurance premiums. * | F | LP&R | Small | 1, 2 4, 6 | Yes | Yes | President Village Board | 2-5 years | Village | Low/Medium |
| LM | Make informational materials available to the public about the National Flood Insurance Program's voluntary Community Rating System. | F | LP&R | Small | 1, 2, 6, 7 | Yes | Yes | President Village Board | 2-5 years | Village | Low/Medium |

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a village of this size (approximately 600 individuals). The Village struggles to provide even the most critical of services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

**Acronyms**

Priority

| | |
|---|---|
| HM | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards |
| LM | Mitigation action with the potential to reduce impacts from the most frequent hazards |
| HL | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards |
| LL | Mitigation action with the potential to reduce impacts from the less frequent hazards |

Hazard(s) to be Mitigated:

| | | | |
|---|---|---|---|
| DF | Dam Failure | F | Flood |
| DR | Drought | MMH | Man-Made Hazard |
| EC | Extreme Cold | SS | Severe Storm |
| EH | Excessive Heat | SWS | Severe Winter Storm |
| EQ | Earthquake | T | Tornado |

Type of Mitigation Activity:

| | | | |
|---|---|---|---|
| E&A | Education & Awareness | NSP | Natural Systems Protection |
| LP&R | Local Plans & Regulations | S&IP | Structure & Infrastructure Projects |

## Figure MIT-8
## Effingham Hazard Mitigation Actions
## (Sheet 1 of 2)

| Priority | Activity/Project Description | Hazard(s) to be Mitigated | Type of Mitigation Activity | Size of Population Affected | Goal(s) Met | Reduce Effects of Hazard(s) on Buildings & Infrastructure | | Organization / Department Responsible for Implementation & Administration | Time Frame to Complete Activity | Funding Source(s)† | Cost/Benefit Analysis |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | New | Existing | | | | |
| HM | Purchase and install automatic emergency backup generators at the wastewater treatment plant to increase system resilience and maintain operations during prolonged power outages. | EH, F, SS, SWS, T | S&IP | Large | 2, 3, 5 | n/a | Yes | Public Works Director | 1-3 years | City / Illinois DCEO / USDA – RD Community Facilities Programs | Medium/High |
| HM | Purchase portable emergency backup generators for use at the sewer lift stations to maintain operations during prolonged power outages. | EH, F, SS, SWS, T | S&IP | Medium | 2, 3, 5 | n/a | Yes | Public Works Director | 1-3 years | City / Illinois DCEO / USDA – RD Community Facilities Programs | Medium/High |
| HM | Replace existing storm warning sirens and purchase and install additional storm warning sirens to improve coverage. | SS, T | E&A | Medium | 2 | n/a | n/a | City Administrator / EMA Coordinator | 1-5 years | City / USDA – RD Critical Facilities Programs | Medium/High |

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a city of this size (approximately 12,300 individuals). The City works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

**Acronyms**

Priority

| | |
|---|---|
| HM | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards |
| LM | Mitigation action with the potential to reduce impacts from the most frequent hazards |
| HL | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards |
| LL | Mitigation action with the potential to reduce impacts from the less frequent hazards |

Hazard(s) to be Mitigated:

| | | | |
|---|---|---|---|
| DF | Dam Failure | F | Flood |
| DR | Drought | MMH | Man-Made Hazard |
| EC | Extreme Cold | SS | Severe Storm |
| EH | Excessive Heat | SWS | Severe Winter Storm |
| EQ | Earthquake | T | Tornado |

Type of Mitigation Activity:

| | | | |
|---|---|---|---|
| E&A | Education & Awareness | NSP | Natural Systems Protection |
| LP&R | Local Plans & Regulations | S&IP | Structure & Infrastructure Projects |

## Figure MIT-8
## Effingham Hazard Mitigation Actions
## (Sheet 2 of 2)

| Priority | Activity/Project Description | Hazard(s) to be Mitigated | Type of Mitigation Activity | Size of Population Affected | Goal(s) Met | Reduce Effects of Hazard(s) on Buildings & Infrastructure | | Organization / Department Responsible for Implementation & Administration | Time Frame to Complete Activity | Funding Source(s)† | Cost/Benefit Analysis |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | New | Existing | | | | |
| HM | Upgrade the City's storm sewer lines to alleviate flooding problems, increase carrying capacity and better manage stormwater runoff. | F, SS | S&IP | Small | 2, 3, 5 | n/a | Yes | Public Works Director | 1-3 years | City / Illinois EPA State Revolving Load Fund / Clean Water Initiative | High/High |
| LM | Conduct a hydraulic analysis to determine the cause and identify design solutions to address potential flood problems associated with the creeks in the City. | F, SS | E&A | Small | 2, 3, 5 | Yes | Yes | Public Works Director | 1-5 years | City / IDOT Local Roads | Medium/Medium |
| HM | Review the updated Flood Insurance Rate Maps (FIRMs) when they become available. Update the flood ordinance to reflect the revised FIRMs and present both for adoption. * | F | LP&R | Small | 1, 2, 4 6, 7 | Yes | Yes | Mayor City Council | 1-5 years | City | Low/High |
| HM | Make the most recent Flood Insurance Rate Maps available to assist the public in considering where to construct new buildings. * | F | LP&R | Small | 1, 2, 6, 7 | Yes | Yes | Mayor City Council | 1-5 years | City | Low/Medium |
| LM | Make City officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in a floodplain. * | F | LP&R | Small | 1, 2, 6, 7 | Yes | Yes | Mayor City Council | 1-5 years | City | Low/Medium |

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a city of this size (approximately 12,300 individuals). The City works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

**Acronyms**

Priority

| | |
|---|---|
| HM | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards |
| LM | Mitigation action with the potential to reduce impacts from the most frequent hazards |
| HL | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards |
| LL | Mitigation action with the potential to reduce impacts from the less frequent hazards |

Hazard(s) to be Mitigated:

| | | | |
|---|---|---|---|
| DF | Dam Failure | F | Flood |
| DR | Drought | MMH | Man-Made Hazard |
| EC | Extreme Cold | SS | Severe Storm |
| EH | Excessive Heat | SWS | Severe Winter Storm |
| EQ | Earthquake | T | Tornado |

Type of Mitigation Activity:

| | | | |
|---|---|---|---|
| E&A | Education & Awareness | NSP | Natural Systems Protection |
| LP&R | Local Plans & Regulations | S&IP | Structure & Infrastructure Projects |

## Figure MIT-9
## Mason Hazard Mitigation Actions
## (Sheet 1 of 2)

| Priority | Activity/Project Description | Hazard(s) to be Mitigated | Type of Mitigation Activity | Size of Population Affected | Goal(s) Met | Reduce Effects of Hazard(s) on Buildings & Infrastructure | | Organization / Department Responsible for Implementation & Administration | Time Frame to Complete Activity | Funding Source(s)† | Cost/Benefit Analysis |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | New | Existing | | | | |
| HM | Purchase and install storm warning sirens. | SS, T | E&A | Large | 2 | n/a | n/a | Mayor / Town Board | 1-2 years | Town / USDA – RD Critical Facilities Programs | Medium/High |
| LM | Designate the Community Center as a warming/cooling center for Village residents. | EC, EH | E&A | Medium | 2 | n/a | n/a | Mayor / Town Board | 1 year | Village | Low/High |
| HM | Purchase and install automatic emergency backup generator(s) at sewer lift station locations to increase system resilience and maintain operations during extended power outages. | EH, F, SS, SWS, T | S&IP | Medium | 2, 3, 5 | n/a | Yes | Mayor / Town Board | 1-2 years | Town / USDA – RD Critical Facilities Programs | Medium/High |
| HM | Purchase and install automatic emergency backup generator(s) at communication towers to increase system resilience and maintain operations during extended power outages. | EH, F, SS, SWS, T | S&IP | Medium | 2, 3, 5 | n/a | Yes | Mayor / Town Board | 1-2 years | Town / USDA – RD Critical Facilities Programs | Medium/High |
| HM | Purchase and install automatic emergency backup generator(s) at water towers to increase system resilience and maintain operations during extended power outages. | EH, F, SS, SWS, T | S&IP | Medium | 2, 3, 5 | n/a | Yes | Mayor / Town Board | 1-2 years | Town / USDA – RD Critical Facilities Programs | Medium/High |

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a village of this size (approximately 350 individuals). The Village struggles to provide even the most critical of services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

**Acronyms**

Priority

| | |
|---|---|
| HM | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards |
| LM | Mitigation action with the potential to reduce impacts from the most frequent hazards |
| HL | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards |
| LL | Mitigation action with the potential to reduce impacts from the less frequent hazards |

Hazard(s) to be Mitigated:

| | | | |
|---|---|---|---|
| DF | Dam Failure | F | Flood |
| DR | Drought | MMH | Man-Made Hazard |
| EC | Extreme Cold | SS | Severe Storm |
| EH | Excessive Heat | SWS | Severe Winter Storm |
| EQ | Earthquake | T | Tornado |

Type of Mitigation Activity:

| | | | |
|---|---|---|---|
| E&A | Education & Awareness | NSP | Natural Systems Protection |
| LP&R | Local Plans & Regulations | S&IP | Structure & Infrastructure Projects |

## Figure MIT-9
## Mason Hazard Mitigation Actions
## (Sheet 2 of 2)

| Priority | Activity/Project Description | Hazard(s) to be Mitigated | Type of Mitigation Activity | Size of Population Affected | Goal(s) Met | Reduce Effects of Hazard(s) on Buildings & Infrastructure | | Organization / Department Responsible for Implementation & Administration | Time Frame to Complete Activity | Funding Source(s)† | Cost/Benefit Analysis |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | New | Existing | | | | |
| HM | Purchase and install automatic emergency backup generator(s) at emergency shelters to maintain operations during prolonged power outages. | EH, F, SS, SWS, T | S&IP | Medium | 2, 3, 5 | n/a | Yes | Mayor / Town Board | 1-2 years | Town / USDA – RD Critical Facilities Programs | Medium/High |
| LM | Purchase and distribute NOAA weather radios to each household in Town to notify residents of information related to natural and man-made hazard events. | EC, EH, EQ, F, MMH, SS, SWS, T | E&A | Large | 2 | n/a | n/a | Mayor / Town Board | 1-2 years | Town / FEMA Hazard Mitigation Grant Program | Low/High |
| LM | Develop and implement a community outreach program, with public workshops and informational materials, to educate residents about risks to life and property associated with natural hazards and the proactive actions that at they can take to reduce their risk | EC, EH, EQ, F, SS, SWS, T | E&A | Large | 1, 2 | n/a | n/a | Mayor / Town Board | 1-2 years | Town | Low/High |
| HM | Purchase/subscribe to an automated emergency notification system (i.e., reverse 911) to notify residents/responders of natural hazard event information. | EC, EH, EQ, F, SS, SWS, T | E&A | Large | 2 | n/a | n/a | Mayor / Town Board | 1-2 years | Town / County / FEMA Emergency Management Performance Grant | Medium/High |
| HM | Replace/upsize culverts as needed to increase carrying capacity and alleviate drainage problems. | F, SS | S&IP | Small | 2, 3, 5 | n/a | Yes | Mayor / Town Board | 1-2 years | Town / IDOT Local Roads | Medium/Medium |

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a village of this size (approximately 350 individuals). The Village struggles to provide even the most critical of services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

**Acronyms**

Priority

| | |
|---|---|
| HM | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards |
| LM | Mitigation action with the potential to reduce impacts from the most frequent hazards |
| HL | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards |
| LL | Mitigation action with the potential to reduce impacts from the less frequent hazards |

Hazard(s) to be Mitigated:

| | | | |
|---|---|---|---|
| DF | Dam Failure | F | Flood |
| DR | Drought | MMH | Man-Made Hazard |
| EC | Extreme Cold | SS | Severe Storm |
| EH | Excessive Heat | SWS | Severe Winter Storm |
| EQ | Earthquake | T | Tornado |

Type of Mitigation Activity:

| | | | |
|---|---|---|---|
| E&A | Education & Awareness | NSP | Natural Systems Protection |
| LP&R | Local Plans & Regulations | S&IP | Structure & Infrastructure Projects |

## Figure MIT-10
## Mound Township Hazard Mitigation Actions
## (Sheet 1 of 2)

| Priority | Activity/Project Description | Hazard(s) to be Mitigated | Type of Mitigation Activity | Size of Population Affected | Goal(s) Met | Reduce Effects of Hazard(s) on Buildings & Infrastructure | | Organization / Department Responsible for Implementation & Administration | Time Frame to Complete Activity | Funding Source(s)† | Cost/Benefit Analysis |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | New | Existing | | | | |
| HM | Replace structure on 800th Avenue between 100th Street and 200th Street to increase carrying capacity and alleviate recurring drainage/flooding problems. | F, SS | S&IP | Small | 2, 3, 5 | n/a | Yes | Township Commissioner / County Highway Engineer | 10 years | Township / County / IDOT Local Roads | High/Medium |
| HM | Replace bridge on 400th Street just north of 600th Avenue to increase carrying capacity and alleviate recurring drainage problems. | F, SS | S&IP | Small | 2, 3, 5 | n/a | Yes | Township Commissioner / County Highway Engineer | 10 years | Township / County / IDOT Local Roads | High/Medium |
| HM | Replace bridge on 500th Street north of 1100th Avenue to increase carrying capacity and alleviate recurring drainage problems. | F, SS | S&IP | Small | 2, 3, 5 | n/a | Yes | Township Commissioner / County Highway Engineer | 10 years | Township / County / IDOT Local Roads | High/Medium |
| HM | Remove trees and brush from drainage ditches along 1100th Avenue east of 500th Street to maintain/increase carrying capacity, better manage stormwater runoff and improve drainage. | F, SS | S&IP | Small | 2, 3, 5 | n/a | Yes | Highway Commissioner / Road District | 2 years | Township | Low/Medium |
| HM | Remove trees and brush along 900th Avenue east of 500th Street to improve drainage, better manage stormwater runoff, increase visibility and minimize the number and duration of power outages. | F, SS | S&IP | Small | 2, 3, 5 | n/a | Yes | Highway Commissioner / Road District | 2 years | Township | Low/Medium |
| HM | Replace culverts with a bridge on 1100th Avenue west of 100th Street to increase carrying capacity and alleviate recurring flooding problems. | F, SS | S&IP | Small | 2, 3, 5 | n/a | Yes | Township Commissioner / County Highway Engineer | 5 years | Township / County / IDOT Local Roads | High/Medium |

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by small, rural townships of this size (just under 3,700 individuals). The Township works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

**Acronyms**

Priority

| | |
|---|---|
| HM | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards |
| LM | Mitigation action with the potential to reduce impacts from the most frequent hazards |
| HL | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards |
| LL | Mitigation action with the potential to reduce impacts from the less frequent hazards |

Hazard(s) to be Mitigated:

| | | | |
|---|---|---|---|
| DF | Dam Failure | F | Flood |
| DR | Drought | MMH | Man-Made Hazard |
| EC | Extreme Cold | SS | Severe Storm |
| EH | Excessive Heat | SWS | Severe Winter Storm |
| EQ | Earthquake | T | Tornado |

Type of Mitigation Activity:

| | | | |
|---|---|---|---|
| E&A | Education & Awareness | NSP | Natural Systems Protection |
| LP&R | Local Plans & Regulations | S&IP | Structure & Infrastructure Projects |

## Figure MIT-10
## Mound Township Hazard Mitigation Actions
## (Sheet 2 of 2)

| Priority | Activity/Project Description | Hazard(s) to be Mitigated | Type of Mitigation Activity | Size of Population Affected | Goal(s) Met | Reduce Effects of Hazard(s) on Buildings & Infrastructure | | Organization / Department Responsible for Implementation & Administration | Time Frame to Complete Activity | Funding Source(s)† | Cost/Benefit Analysis |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | New | Existing | | | | |
| HM | Replace culverts with a bridge on 600th Avenue west of 600th Street to increase carrying capacity and alleviate recurring drainage problems. | F, SS | S&IP | Small | 2, 3, 5 | n/a | Yes | Township Commissioner / County Highway Engineer | 5 years | Township / County / IDOT Local Roads | High/Medium |
| HM | Replace culvert with a bridge on 800th Avenue west of the Township Building to increase carrying capacity and alleviate recurring flooding problems. | F, SS | S&IP | Small | 2, 3, 5 | n/a | Yes | Township Commissioner / County Highway Engineer | 5 years | Township / County / IDOT Local Roads | High/Medium |
| HM | Install riprap along 100th Street north and south of 1100th Avenue to protect the drainage ditch from erosion. | F, SS | S&IP | Small | 2, 3, 5 | n/a | Yes | Highway Commissioner / Road District | 5 years | Township / County / IDOT Local Roads | Medium/High |
| HM | Remove trees and brush along Interstate 70 overpasses 001, 200 & 450 to prevent slope erosion and minimize the number and duration of power outages. | F, SS | S&IP | Small | 2, 3, 5 | n/a | Yes | Highway Commissioner / Road District | 5 years | Township | Low/Medium |
| LM | Purchase NOAA weather radios for township employees. | EC, EH, EQ, F, MMH, SS, SWS, T | E&A | Small | 2 | n/a | n/a | Highway Commissioner / Road District | 1 year | Township / County | Low/High |

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by small, rural townships of this size (just under 3,700 individuals). The Township works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

**Acronyms**

Priority

| | |
|---|---|
| HM | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards |
| LM | Mitigation action with the potential to reduce impacts from the most frequent hazards |
| HL | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards |
| LL | Mitigation action with the potential to reduce impacts from the less frequent hazards |

Hazard(s) to be Mitigated:

| | | | |
|---|---|---|---|
| DF | Dam Failure | F | Flood |
| DR | Drought | MMH | Man-Made Hazard |
| EC | Extreme Cold | SS | Severe Storm |
| EH | Excessive Heat | SWS | Severe Winter Storm |
| EQ | Earthquake | T | Tornado |

Type of Mitigation Activity:

| | | | |
|---|---|---|---|
| E&A | Education & Awareness | NSP | Natural Systems Protection |
| LP&R | Local Plans & Regulations | S&IP | Structure & Infrastructure Projects |

## Figure MIT-11
## Shumway Hazard Mitigation Actions

| Priority | Activity/Project Description | Hazard(s) to be Mitigated | Type of Mitigation Activity | Size of Population Affected | Goal(s) Met | Reduce Effects of Hazard(s) on Buildings & Infrastructure | | Organization / Department Responsible for Implementation & Administration | Time Frame to Complete Activity | Funding Source(s)† | Cost/Benefit Analysis |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | New | Existing | | | | |
| HM | Purchase and install an automatic emergency backup generator at the Main Street sewer lift station to increase system resilience and maintain operations during extended power outages. | EH, F, SS, SWS, T | S&IP | Medium | 2, 3, 5 | n/a | Yes | President / Village Board | 2-5 years | Village / USDA – RD Community Facilities Programs | Medium/High |
| HM | Purchase and install an automatic emergency backup generator at the Bland Street sewer lift station to increase system resilience and maintain operations during extended power outages. | EH, F, SS, SWS, T | S&IP | Medium | 2, 3, 5 | n/a | Yes | President / Village Board | 2-5 years | Village / USDA – RD Community Facilities Programs | Medium/High |
| LM | Designate the Shumway Kluthe Community building as a warming/cooling center for Village residents. | EC, EH | E&A | Medium | 2 | n/a | n/a | President / Village Board | 1 year | Village | Low/High |
| HM | Purchase and install an emergency backup generator at the Shumway Kluthe Community building, a designated warming/cooling center, to provide uninterrupted power during power outages. | EH, F, SS, SWS, T | S&IP | Medium | 2, 3, 5 | n/a | Yes | President / Village Board | 2-3 years | Village / USDA – RD Community Facilities Programs | Medium/High |

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a village of this size (approximately 200 individuals). The Village struggles to provide even the most critical of services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

**Acronyms**

Priority

| | |
|---|---|
| HM | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards |
| LM | Mitigation action with the potential to reduce impacts from the most frequent hazards |
| HL | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards |
| LL | Mitigation action with the potential to reduce impacts from the less frequent hazards |

Hazard(s) to be Mitigated:

| | | | |
|---|---|---|---|
| DF | Dam Failure | F | Flood |
| DR | Drought | MMH | Man-Made Hazard |
| EC | Extreme Cold | SS | Severe Storm |
| EH | Excessive Heat | SWS | Severe Winter Storm |
| EQ | Earthquake | T | Tornado |

Type of Mitigation Activity:

| | | | |
|---|---|---|---|
| E&A | Education & Awareness | NSP | Natural Systems Protection |
| LP&R | Local Plans & Regulations | S&IP | Structure & Infrastructure Projects |

## Figure MIT-12
## Teutopolis Hazard Mitigation Actions

| Priority | Activity/Project Description | Hazard(s) to be Mitigated | Type of Mitigation Activity | Size of Population Affected | Goal(s) Met | Reduce Effects of Hazard(s) on Buildings & Infrastructure | | Organization / Department Responsible for Implementation & Administration | Time Frame to Complete Activity | Funding Source(s)† | Cost/Benefit Analysis |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | New | Existing | | | | |
| HM | Repair/line intermediate depth sanitary sewer lines to "harden" the pipes and prevent storm water infiltration from occurring. | F, SS | S&IP | Medium | 2, 3, 5 | Yes | Yes | Maintenance Department / President Village Board | 1-5 years | Village / USDA – RD Water & Waste Disposal | High/High |
| HM | Continue to upgrade/retrofit the Village's stormwater system, especially on the south side of the Village, to better manager stormwater runoff to alleviate flooding/drainage problems. | F, SS | S&IP | Medium | 2, 3, 5 | Yes | Yes | Maintenance Department / President Village Board | 1-5 years | Village / USDA – RD Water & Waste Disposal | High/High |
| HM | Purchase 3-phase portable emergency backup generator for use at sewer lift stations to maintain operations during prolonged power outages. | EH, F, SS, SWS, T | S&IP | Medium | 2, 3, 5 | n/a | Yes | Maintenance Department / President Village Board | 1-3 years | City / USDA – RD Community Facilities Programs | Medium/High |
| HM | Review the updated Flood Insurance Rate Maps (FIRMs) when they become available. Update the flood ordinance to reflect the revised FIRMs and present both for adoption. * | F | LP&R | Small | 1, 2, 4 6, 7 | Yes | Yes | President Village Board | 1-5 years | Village | Low/High |
| HM | Make the most recent Flood Insurance Rate Maps available to assist the public in considering where to construct new buildings. * | F | LP&R | Small | 1, 2, 6, 7 | Yes | Yes | President Village Board | 1-5 years | Village | Low/Medium |
| LM | Make Village officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in a floodplain. * | F | LP&R | Small | 1, 2, 6, 7 | Yes | Yes | President Village Board | 1-5 years | Village | Low/Medium |

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a village of this size (approximately 1,500 individuals). The Village works hard to maintain critical services to its residents but it's a struggle. Additional funding is necessary if implementation is to be achieved within the time frames specified.

**Acronyms**

Priority

| | |
|---|---|
| HM | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards |
| LM | Mitigation action with the potential to reduce impacts from the most frequent hazards |
| HL | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards |
| LL | Mitigation action with the potential to reduce impacts from the less frequent hazards |

Hazard(s) to be Mitigated:

| | | | |
|---|---|---|---|
| DF | Dam Failure | F | Flood |
| DR | Drought | MMH | Man-Made Hazard |
| EC | Extreme Cold | SS | Severe Storm |
| EH | Excessive Heat | SWS | Severe Winter Storm |
| EQ | Earthquake | T | Tornado |

Type of Mitigation Activity:

| | | | |
|---|---|---|---|
| E&A | Education & Awareness | NSP | Natural Systems Protection |
| LP&R | Local Plans & Regulations | S&IP | Structure & Infrastructure Projects |

## Figure MIT-13
## Watson Hazard Mitigation Actions

| Priority | Activity/Project Description | Hazard(s) to be Mitigated | Type of Mitigation Activity | Size of Population Affected | Goal(s) Met | Reduce Effects of Hazard(s) on Buildings & Infrastructure | | Organization / Department Responsible for Implementation & Administration | Time Frame to Complete Activity | Funding Source(s)† | Cost/Benefit Analysis |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | New | Existing | | | | |
| HM | Purchase and install a storm warning sirens. | SS, T | E&A | Large | 2 | n/a | n/a | President / Village Board | 1 year | Village / USDA – RD Critical Facilities Programs | Medium/High |
| LM | Designate the Watson Civic Center as a warming/cooling center for Village residents. | EC, EH | E&A | Large | 2 | n/a | n/a | President / Village Board | 1 year | Village | Low/High |
| HM | Purchase a portable emergency backup generator for use at critical facilities including the Watson Civic Center (a designated emergency shelter) to maintain operations during prolonged power outages. | EH, F, SS, SWS, T | S&IP | Medium | 2, 3, 5 | n/a | Yes | President / Village Board | 1-3 years | Village / USDA – RD Critical Facilities Programs | Medium/High |
| HM | Purchase and install electrical hookups (pigtails) at designated critical facilities including the Watson Civic Center (a designated emergency shelter) within the Village for use with portable emergency backup generator to maintain operations during prolonged power outages. | EH, F, SS, SWS, T | S&IP | Medium | 2, 3, 5 | n/a | Yes | President / Village Board | 1-3 years | Village / USDA – RD Critical Facilities Programs | Medium/High |
| HM | Retrofit the Watson Civic Center (updated electrical, HVAC & bathrooms as well as structural upgrades to roof and floor) to serve as a warming/cooling center and emergency shelter for Village residents. | EC, EH, F, SS, SWS, T | S&IP | Medium | 2, 3, 5 | n/a | Yes | President Village Board / Civic Center Board | 1-3 years | Village / USDA – RD Critical Facilities Programs | High/High |

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a village of this size (less than 750 individuals). The Ville works hard to maintain critical services to its residents but it's a struggle. Additional funding is necessary if implementation is to be achieved within the time frames specified.

**Acronyms**

Priority

| | |
|---|---|
| HM | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards |
| LM | Mitigation action with the potential to reduce impacts from the most frequent hazards |
| HL | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards |
| LL | Mitigation action with the potential to reduce impacts from the less frequent hazards |

Hazard(s) to be Mitigated:

| | | | |
|---|---|---|---|
| DF | Dam Failure | F | Flood |
| DR | Drought | MMH | Man-Made Hazard |
| EC | Extreme Cold | SS | Severe Storm |
| EH | Excessive Heat | SWS | Severe Winter Storm |
| EQ | Earthquake | T | Tornado |

Type of Mitigation Activity:

| | | | |
|---|---|---|---|
| E&A | Education & Awareness | NSP | Natural Systems Protection |
| LP&R | Local Plans & Regulations | S&IP | Structure & Infrastructure Projects |

## Figure MIT-14
## Watson Township Hazard Mitigation Actions

| Priority | Activity/Project Description | Hazard(s) to be Mitigated | Type of Mitigation Activity | Size of Population Affected | Goal(s) Met | Reduce Effects of Hazard(s) on Buildings & Infrastructure | | Organization / Department Responsible for Implementation & Administration | Time Frame to Complete Activity | Funding Source(s)† | Cost/Benefit Analysis |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | New | Existing | | | | |
| HM | Purchase and install storm warning sirens. | SS, T | E&A | Large | 2 | n/a | n/a | Highway Commissioner / Road District | 2-5 years | Township / USDA – RD Critical Facilities Programs | Medium/High |
| HM | Purchase and install electrical hookups (pigtails) at the Township building for use with portable emergency backup generators to maintain operations during prolonged power outages. | EH, F, SS, SWS, T | S&IP | Small | 2, 3, 5 | n/a | Yes | Highway Commissioner / Road District | 3-5 years | Township / USDA – RD Critical Facilities Programs | Medium/High |
| HM | Purchase and install an automatic emergency backup generator at the Township building to provide uninterrupted power and maintain continuity of government and operations during power outages. | EH, F, SS, SWS, T | S&IP | Large | 2, 3, 5 | n/a | Yes | Highway Commissioner / Road District | 2-3 years | Township / USDA – RD Critical Facilities Programs | Medium/High |

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by small, rural townships of this size (just under 3,200 individuals). The Township works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

**Acronyms**

Priority

| | |
|---|---|
| HM | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards |
| LM | Mitigation action with the potential to reduce impacts from the most frequent hazards |
| HL | Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards |
| LL | Mitigation action with the potential to reduce impacts from the less frequent hazards |

Hazard(s) to be Mitigated:

| | | | |
|---|---|---|---|
| DF | Dam Failure | F | Flood |
| DR | Drought | MMH | Man-Made Hazard |
| EC | Extreme Cold | SS | Severe Storm |
| EH | Excessive Heat | SWS | Severe Winter Storm |
| EQ | Earthquake | T | Tornado |

Type of Mitigation Activity:

| | | | |
|---|---|---|---|
| E&A | Education & Awareness | NSP | Natural Systems Protection |
| LP&R | Local Plans & Regulations | S&IP | Structure & Infrastructure Projects |

# 5.0 PLAN MAINTENANCE

This section focuses on the Federal Emergency Management Agency (FEMA) requirements for maintaining and updating the Plan once it has been approved by FEMA and adopted by the participating jurisdictions. These requirements include:

- establishing the method and schedule for monitoring, evaluating and updating the Plan;
- describing how the mitigation strategy will be incorporated into existing planning processes; and
- detailing how continued public input will be obtained.

These requirements ensure that the Plan remains an effective and relevant document. The following provides a detailed discussion of each requirement.

## 5.1 MONITORING, EVALUATING & UPDATING THE PLAN

Outlined below is a method and schedule for monitoring, evaluating and updating the Plan. This method allows the participating jurisdictions to review and adjust the planning process as needed, make necessary changes and updates to the Plan and track the implementation and results of the mitigation actions that have been undertaken.

### 5.1.1 Monitoring and Evaluating the Plan

The Plan will be monitored and evaluated by a Plan Maintenance Subcommittee on an annual basis. The Plan Maintenance Subcommittee will be composed of key members from the Planning Committee, including representatives from all of the participating jurisdictions. The Subcommittee will be chaired by the Effingham County Emergency Management Agency (EMA). All meetings held by the Subcommittee will be open to the public. The information gathered at each Subcommittee meeting will be documented and provided to all participating jurisdictions for their review and use in the Plan update.

The Effingham County EMA will be responsible for monitoring the status of the mitigation actions identified in the Plan and providing the Illinois Emergency Management Agency (IEMA) with an annual progress report. It will be the responsibility of each participating jurisdiction to provide a progress report on the status of their mitigation actions at each Subcommittee meeting.

**Monitoring & Evaluating**

- A Plan Maintenance Subcommittee will be formed to monitor and evaluate the Plan.
- The ***Plan will be monitored and evaluated*** on an ***annual basis***.
- Each participating jurisdiction will be responsible for providing an annual progress report on the status of their mitigation actions.
- ***New mitigation actions can be added*** by participating jurisdictions ***during the annual evaluation.***

The Plan Maintenance Subcommittee will also evaluate the Plan on an annual basis to determine the effectiveness of the planning process and identify any implemented mitigation actions. In addition, the Subcommittee will decide whether any changes need to be made. As part of the evaluation of the planning process, the Subcommittee will review the goals to determine whether they are still relevant or if new goals need to be added; assess whether other natural or man-made hazards need to be addressed or included in the Plan; and

review any new hazard data that may affect the Risk Assessment portion of the Plan. The Subcommittee will also evaluate whether other County departments should be invited to participate.

In terms of evaluating the effectiveness of the mitigation actions that have been implemented, the Subcommittee will assess whether a project is on time, in line with the budget and moving ahead as planned; whether the project achieved the goals outlined and had the intended result; and whether losses were avoided as a result of the project. In addition, each of the participating jurisdictions will be given an opportunity to add new mitigation actions to the Plan and modify or discontinue mitigation actions already identified. In some cases a project may need to be removed from the list of mitigation actions because of unforeseen problems with implementation.

### 5.1.2 Updating the Plan

The Plan must be updated within five years of the Plan approval date indicated on the signed FEMA final approval letter. (This date can be found in Section 6, Plan Adoption.) This ensures that all the participating jurisdictions will remain eligible to receive federal grant money to implement those mitigation actions identified in this Plan.

The Effingham County EMA, with assistance from the Plan Maintenance Subcommittee, will be responsible for updating the Plan. The update will incorporate all of the information gathered and changes proposed at the previous annual monitoring and evaluation meetings. In addition, any jurisdictions that did not take part in the previous planning process may do so at this time. It will be the responsibility of these jurisdictions to provide all of the information needed to be integrated into the Plan update.

**Updating the Plan**

- The Effingham County EMA, with assistance from the Plan Maintenance Subcommittee, will be responsible for updating the Plan.
- The Plan ***must be updated within 5 years of the Plan approval date indicated on the signed FEMA final approval letter***.
- Any jurisdictions that did not take part in the previous planning process who now wish to participate may do so.
- Once the Plan update has received FEMA/IEMA approval, each participating jurisdiction ***must re-adopt the Plan to remain eligible to receive federal monies.***

A public forum will be held to present the Plan update to the public for review and comment. The comments received at the public forum will be reviewed and incorporated into the Plan update. The Plan update will then be submitted to IEMA and FEMA for review and approval. ***Once the Plan update has received state and federal approval, FEMA requires that each of the participating jurisdictions re-adopt the Plan to remain eligible to receive federal monies to implement identified mitigation actions.***

## 5.2 Incorporating the Mitigation Strategy into Existing Planning Mechanisms

As part of the planning process, the Planning Committee identified current plans, policies/ordinances and maps that supplement or help support mitigation planning efforts. **Figure PP-3** identifies the existing planning mechanism available by jurisdiction. It will be the

responsibility of each participating jurisdiction to incorporate, where applicable, the mitigation strategy and other information contained in the Plan into the planning mechanisms identified for their jurisdiction.

Adoption of this Plan will trigger each participating jurisdiction to review and, where appropriate, integrate the Plan into other available planning mechanisms. The Plan Maintenance Subcommittee's annual review will help maintain awareness of the Plan among the participating jurisdictions and encourage them to actively integrate it into their day-to-day operations and planning mechanisms. Any time a mitigation action is slated for implementation by a participating jurisdiction, it will be integrated into their capital improvement plan/budget.

Several of the participating jurisdictions have limited capabilities to integrate the mitigation strategy and other information contained in the Plan into existing planning mechanisms. Five of the nine participating municipalities/townships are very small in size (less than 750 residents) and do not have the financial resources or trained personnel to develop planning mechanisms such as comprehensive plans. Only Dietrich and Teutopolis have comprehensive plans in place and only four of the participating municipalities have building codes. While the South Central Illinois Regional Planning and Development Commission is available to assist participating jurisdictions with planning and community development, a general reluctance by the participants to implement such policies may hinder implementation.

## 5.3 CONTINUED PUBLIC INVOLVEMENT

The County and participating jurisdictions understand the importance of continued public involvement and will seek public input on the Plan throughout the plan maintenance process. A copy of the approved Plan will be maintained and available for review at the Effingham County EMA Office. Individuals will be encouraged to provide feedback and submit comments for the next Plan update to the Effingham County EMA.

The comments received will be compiled and presented at the annual Plan Maintenance Subcommittee meetings where members will consider them for incorporation into the next Plan update. All meetings held by the Plan Maintenance Subcommittee will be noticed and open to the public. A separate public forum will be held prior to the Plan update submittal to provide the public an opportunity to comment on the proposed revision to the Plan.

# 6.0 PLAN ADOPTION

The final step in the planning process is the adoption of the approved Plan by each participating jurisdiction. Each jurisdiction must formally adopt the Plan to remain eligible for federal grant monies to implement mitigation actions identified in this Plan.

## 6.1 PLAN ADOPTION PROCESS

Before the Plan could be adopted by the participating jurisdictions, it was made available for public review and comment through a public forum and comment period. Comments received were incorporated into the draft Plan and the Plan was then submitted to the Illinois Emergency Management Agency (IEMA) and the Federal Emergency Management Agency (FEMA) for their review and approval.

Upon review and approval by IEMA and FEMA, the Plan was presented to the County and participating jurisdictions for adoption. ***Each participating jurisdiction was required to formally adopt*** the Plan to become eligible to receive federal grant monies to implement the mitigation actions identified in this Plan. Any jurisdiction that chose not to adopt the Plan did not affect the eligibility of those who did.

**Figure PA-1** identifies the participating jurisdictions and the date each formally adopted the Plan. Signed copies of the adoption resolutions are located in **Appendix L**. FEMA signed the final approval letter on (date) which began the five-year approval period and set the an expiration date of (date) for the Plan.

**Figure PA-1**
**Plan Adoption Dates**

| Participating Jurisdiction | Plan Adoption Date |
|---|---|
| Effingham County | |
| Beecher City, Village of | |
| Beecher City CUSD #20 | |
| Dieterich, Village of | |
| Effingham, City of | |
| Mason, Town of | |
| Mound Township | |
| Shumway, Village of | |
| Teutopolis, Village of | |
| Watson, Village of | |
| Watson Township | |

# 6.0 PLAN ADOPTION

The final step in the planning process is the adoption of the approved Plan by each participating jurisdiction. Each jurisdiction must formally adopt the Plan to remain eligible for federal grant monies to implement mitigation actions identified in this Plan.

## 6.1 PLAN ADOPTION PROCESS

Before the Plan could be adopted by the participating jurisdictions, it was made available for public review and comment through a public forum and comment period. Comments received were incorporated into the draft Plan and the Plan was then submitted to the Illinois Emergency Management Agency (IEMA) and the Federal Emergency Management Agency (FEMA) for their review and approval.

Upon review and approval by IEMA and FEMA, the Plan was presented to the County and participating jurisdictions for adoption. ***Each participating jurisdiction was required to formally adopt*** the Plan to become eligible to receive federal grant monies to implement the mitigation actions identified in this Plan. Any jurisdiction that chose not to adopt the Plan did not affect the eligibility of those who did.

**Figure PA-1** identifies the participating jurisdictions and the date each formally adopted the Plan. Signed copies of the adoption resolutions are located in **Appendix L**. FEMA signed the final approval letter on (date) which began the five-year approval period and set the an expiration date of (date) for the Plan.

**Figure PA-1**
**Plan Adoption Dates**

| Participating Jurisdiction | Plan Adoption Date |
|---|---|
| Effingham County | |
| Beecher City, Village of | |
| Beecher City CUSD #20 | |
| Dieterich, Village of | |
| Effingham, City of | |
| Mason, Town of | |
| Mound Township | |
| Shumway, Village of | |
| Teutopolis, Village of | |
| Watson, Village of | |
| Watson Township | |

# PLANNING COMMITTEE MEETING
# ATTENDANCE SHEETS

## APPENDIX A

## Attendance Sheet

## Effingham County Multi-Jurisdictional
## All Hazards Mitigation Planning Committee Meeting

## November 18, 2019

| | Name (Please Print) | Representing (Jurisdiction/Organization) | Title |
|---|---|---|---|
| 1. | Zachary King | American Environmental | Specialist |
| 2. | Andrea Bostwick | American Environmental | Sr. project manager |
| 3. | Stephen Bergfeld | Watson | Highway Comm. |
| 4. | Jim WRIGHT | EMA Effingham Co | Volunteer Coordinator |
| 5. | Tom Rauch | TEUTOPOLIS TWP | Highway Commis. |
| 6. | Pam Braun | Eff County Supervisor of Assessment | |
| 7. | Dodd Canfield | Effi. Co Board | |
| 8. | DAVID MAHON | EFF. CO. SHERIFF | SHERIFF |
| 9. | Karen Feld Kamp | Eff. Co. Health Dept. | Emergency Prep. Coord. |
| 10. | Steve Miller | City of Effingham | City Administrator |
| 11. | Phil Toops | LEPC | |
| 12. | Don Flowers | Town of Mason | Mayor |
| 13. | Jill Zerrusen | Effingham Co. GIS | GIS Mngr |
| 14. | Kim Tegeler | City of Effingham EMA | EMA |
| 15. | Derrick Helmbacher | Village of Shumway | Clerk |
| 16. | Bob TUTEN | CITY of EFFINGHAM - FD | FIRE CHIEF |

## Attendance Sheet

## Effingham County Multi-Jurisdictional
## All Hazards Mitigation Planning Committee Meeting

## November 18, 2019

| | Name (Please Print) | Representing (Jurisdiction/Organization) | Title |
|---|---|---|---|
| 1. | Pamela Jacobs | Effingham Co EMA | Emergency Manager |
| 2. | Angie Niccum | Tri-County FPD EOC ~~Resource Officer~~ | Executive Assistant Resource Manager |
| 3. | Rita Felty | Beecher City Village | ~~Trustee~~ Village President |
| 4. | Valerie Goodwin | Red Cross | Prog Mgr |
| 5. | Philip Lark | Beecher City CUSD #20 | Supt |
| 6. | Trent Hoene | Eff Co Highway Dept | Floater tech & highway maint |
| 7. | Rob Arnold | Eff. County Board | Board Member |
| 8. | Doug McCain | Eff County Board | |
| 9. | Tom Freeman | Watson | Village Clerk |
| 10. | Jeffrey L Simpson | Mound Twp Co. Board | Board Member |
| 11. | James Niemann | Effingham Co. BD | Chairman |
| 12. | Jason Ripstra | City of Altamont | Mayor |
| 13. | Dan Milleville | City of Altamont | Commissioner |
| 14. | Kendra Craig | Faycite C.H.D. | Health Edu / PHEP |
| 15. | | | |
| 16. | | | |

## Attendance Sheet

## Effingham County Multi-Jurisdictional
## All Hazards Mitigation Planning Committee Meeting

## November 18, 2019

| | Name (Please Print) | Representing (Jurisdiction/Organization) | Title |
|---|---|---|---|
| 1. | MARK BALLMAN | IL DEPT of AGRICULTURE | FIELD VETERINARIAN |
| 2. | Heather Mumma | Effingham County Board | member |
| 3. | GREG A. KOESTER | Co. Engineer | |
| 4. | Kim Rhodes | CORONER | |
| 5. | Rodney Schultz | LEPC, The Equity, Mound Twp Road Dist. | Member |
| 6. | Janet Lorton | TRI-CO FIRE Dept Beecher City | Member |
| 7. | Kevin Boland | EFF CO. EMA | |
| 8. | Chuck Remm | SERVPRO OF EFFINGHAM | MARKETOR |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| 13. | | | |
| 14. | | | |
| 15. | | | |
| 16. | | | |

## Attendance Sheet

## Effingham County Multi-Jurisdictional
## All Hazards Mitigation Planning Committee Meeting

## February 27, 2020

| | Name (Please Print) | Representing (Jurisdiction/Organization) | Title |
|---|---|---|---|
| 1. | Pamela Jacobs | Effingham Co. EMA | Em |
| 2. | Jill Boone | Effingham Co EMA | Volunteer |
| 3. | Karen Feldkamp | Eff. Co. Health Dept. | Em. Hyp. Coordinat. |
| 4. | Angie Niccum | Tri-County Fire Dept | Execu Assistant |
| 5. | Darren Percival | Watson Fire Pro. Dist | chief |
| 6. | Rodney Schultz | LEPC Mound Twp | Member Hwy Comm. |
| 7. | Ross Martin | Dieterich Fire Pro Dist | chief |
| 8. | Phil Toops | LEPC | |
| 9. | Greg Hess | Village of Teutopolis | Village President |
| 10. | Deb Murbarger | HSHS St. Anthony | Director ER |
| 11. | Troy L. Agney | MABAS 54 | President |
| 12. | Don Flowers | Town of Mason | Mayor |
| 13. | BRAD HARDIEK | VILLAGE OF DIETERICH | PRESIDENT |
| 14. | Adam Cody | IEMA | Regional Coordinator |
| 15. | Tom Freeman | Watson Village | Clerk |
| 16. | Derrick Helmbacher | Village of Shumway | Village Clerk |

## Attendance Sheet

## Effingham County Multi-Jurisdictional
## All Hazards Mitigation Planning Committee Meeting

## February 27, 2020

| | Name (Please Print) | Representing (Jurisdiction/Organization) | Title |
|---|---|---|---|
| 1. | Zachary Krug | American Environmental Corp | specialist |
| 2. | Leslie Wood | Beecher City | Village Trustee |
| 3. | Bob TUTKO | EFFINGHAM FD | FIRE CHIEF |
| 4. | DAVID MAHON | EFF. CO SHERIFF | SHERIFF |
| 5. | Stephen Bergfeld | EFF. | Highway Comm. |
| 6. | Rob Arnold II | ~~Watson Township Clerk~~ County Board & Watson Township Clerk | Clerk. |
| 7. | Steve Miller | City of Effingham | City Administrator |
| 8. | Jim Niemann | Eff. Co. | C Chairman |
| 9. | Trent Hoene | Effingham County Highway | Highway |
| 10. | Byron Coddes | NTR NATIONAL TRAILS Radio | |
| 11. | Jill Zerrusen | Eff Co GIS | GIS Mngr |
| 12. | | | |
| 13. | | | |
| 14. | | | |
| 15. | | | |
| 16. | | | |

## Attendance Sheet

## Effingham County Multi-Jurisdictional
## All Hazards Mitigation Planning Committee Meeting

## February 27, 2020

| | Name (Please Print) | Representing (Jurisdiction/Organization) | Title |
|---|---|---|---|
| 1. | KAREN HOGUE | CORONER'S OFFICE | DEPUTY CORONER |
| 2. | CHARLES MILLS | EFFINGHAM DAILY NEWS | REPORTER/Videographer |
| 3. | Charles Semple | Teutopolis Twp | Trustee |
| 4. | KIM RHODES | CORONER'S OFFICE | CORONER |
| 5. | Brad Bryant | Red Cross | Disaster Relief |
| 6. | Andrea Bostwick | American Environmental | EMS Manager |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| 13. | | | |
| 14. | | | |
| 15. | | | |
| 16. | | | |

# PLANNING COMMITTEE MEETING MINUTES

# APPENDIX B

# Meeting Minutes

## Effingham County Multi-Jurisdictional
## All Hazards Mitigation Planning Committee

## November 18, 2019
## 6 P.M.
## Effingham County Emergency Operations Center
## 311 Miracle Drive, Effingham

**Committee Members**

Altamont, City of
American Red Cross
Beecher City CUSD #20
Beecher City, Village of
Effingham County Offices:
- County Board
- Coroner
- EMA
- GIS
- Health Department
- Highway Department
- LEPC
- Sheriff's Office
- Supervisor of Assessments

Effingham, City of
Fayette County Health Department
Illinois Department of Agriculture
Mason, Town of
Mound Township
Servpro of Effingham
Shumway, Village of
Teutopolis Township
Tri-County Fire Protection District
Watson Township
Watson, Village of
American Environmental Corp.

**Welcome and Introductions**

Pam Jacobs, Chairman of the Effingham County Multi-Jurisdictional All Hazards Mitigation Planning Committee, welcomed attendees. She indicated that the purpose of this Committee is to develop the Effingham County All Hazards Mitigation Plan.

Handout materials were distributed to each member, including a Citizen Questionnaire. The questionnaire will help gauge residents and committee member understanding of the Natural Hazards that impact the County and also identifies communication preferences.

**What is an All Hazards Mitigation Plan?**

Andrea Bostwick, American Environmental Corporation (AEC) explained that an All Hazards mitigation plan details the natural and man-made hazard events that have previously impacted the County and identifies activities and projects that reduce the risk to people and property from these hazards before an event occurs. The natural and man-made hazards include floods; tornadoes; severe summer storms (including thunderstorms, hail and lightning events); severe winter storms (including ice and snow storms); extreme cold; excessive heat; heat; drought; earthquakes; dam failures;

transportation, generation and storage/handling of hazardous substances; hazardous materials incidents; waste disposal and waste remediation.

## Why Should We Develop Our All Hazards Mitigation Plan?

Andrea, described why mitigation planning is needed and how participating jurisdictions can benefit. In addition, she detailed the AHMP process.

Since the early 1990s damages caused by weather extremes have risen substantially. In 2018 the United States experienced $90.7 billion in severe storm damages from fourteen (14) severe weather and natural hazard events. The losses experienced in 2018 were the 4th highest only behind 2017, 2015, and 2012. Consequently, the Federal Emergency Management Agency (FEMA) is encouraging counties throughout the United States to prepare and update natural hazard mitigation plans because what they found is that for every dollar spent on mitigation, $6 dollars can be reaped in savings.

Developing this plan provides several major benefits, including:

1.) Specific projects and recommendations will be developed through the planning process to help each participating jurisdiction reduce damages. By including these projects in this Plan, the participating jurisdictions will have an opportunity to receive state and federal funds to complete the projects.

2.) Verifiable information about the natural hazards that occur in Effingham County will be gathered to help participants in municipal and county meetings make decisions about how to better protect citizens and property from storm damages.

## The Planning Process

The goal of the Committee meetings is to develop a Plan to meet state and federal criteria so that it can be approved by the Illinois Emergency Management Agency (IEMA) and FEMA. Andrea explained that the schedule for this Plan development has been compressed and accelerated due to changes in the grant funding mechanisms. Instead of conducting five meetings, a three meeting process has been developed that will satisfy FEMA's criteria and still provide a draft plan to IEMA by May 1, 2020. Specific activities for the Committee meetings include:

| | |
|---|---|
| 1st Committee meeting | Orientation to the Planning Process<br>Complete Critical Facilities & Existing Planning Documents<br>Complete the Severe Weather Shelter Survey<br>Discuss the Risk Assessment<br>Approve Mission Statement & Goals |
| 2nd Committee meeting | Complete Critical Facilities Vulnerability Survey<br>Discuss Mitigation Projects and Activities<br>Approve Mitigation Strategy<br>Committee discusses approval/adoption of the Plan |
| 3rd Committee meeting (Public Forum) | Present the Plan for public review<br>Committee helps answer questions from the public |

## Information Needed from the Committee

Andrea explained that as part of the Plan development process, AEC would need information from each of the participating jurisdictions to help meet the state and federal criteria. Zachary Krug, AEC, distributed the following forms to each participating jurisdiction to complete:

***Critical Facilities.*** Completed lists of Critical Facilities will be used to identify facilities vulnerable to natural hazards and will be provided to IEMA and FEMA as a separate supplement. Copies of the Plan made available to the public will not include these lists for security reasons.

***List of Existing Planning Documents***. This list identifies planning documents (Land Use Plans, Flood Ordinances, and related documents) a jurisdiction already has in place.

***Shelter Surveys***. Identifies locations designated as severe weather shelters.

***Contact Information***. Committee members should provide contact information about themselves to help AEC staff during this planning process.

Andrea asked participants to return the completed forms before the next meeting and to let her know if anyone would like electronic copies of the forms.

## Severe Weather Events

Committee members were asked to share their memories of severe weather events that have occurred in the County including any damages to critical infrastructure and facilities. Flooding, hail and lightning strikes were mentioned. Other hazard events related include:

- Committee Members talked about a fire at St. Anthony's Hospital on April 4, 1949 that killed 77 individuals and prompted a review of fire safety and building standards at hospitals nationwide. Fire codes implemented as a result of the fire included requirements for smoke and fire barriers as well as fire-resistant enclosed stairways.
- A snow storm on March 18, 1978 caused the Interstate to close.
- May 1989 hail storms, affected two-thirds of the County, leading to lots of crop and property damage.
- There was an ice storm in 2011 that knocked out power in southwest portions of the County for a week.
- There was an ice storm in 2014.
- Communication towers and equipment in the City of Effingham was knocked out, causing $11,000 in damages in June 2019.
- In August 2019, there was flooding in the City of Effingham.

Andrea asked participants to identify any hazard events that have impacted their jurisdiction by completing the forms titled "***Hazard Event Questionnaire and Critical***

***Facilities Damage Questionnaire."*** The information provided will help supplement the information included in the risk assessment.

Andrea then asked the Committee about whether any instances of mine subsidence or landslides had occurred in the County. Andrea asked the Committee if they would like to include mine subsidence and/or landslides in the Plan and after a brief discussion the Committee decided that neither should be included.

**Risk Assessment**

Andrea began the risk assessment presentation by noting that there have been three (3) federally-declared disasters in Effingham County since 1996. Approximately 594 natural hazard events have been verified over approximately 50 years in Effingham County. There have been a minimum of 16 injuries and 5 fatalities recorded from 12 natural hazard events. A minimum of $5.2 million in property damages and $32.8 million in crop damages have resulted from approximately 85 documented natural hazard events verified in Effingham County. The actual damage amounts are actually much higher based on several facts:

1.) damage descriptions for many of the flood and thunderstorms event did not include dollar amounts;
2.) damages to roads from heat and freeze/thaws conditions were not included; and
3.) crop damage figures were unavailable for a majority of the events.

The frequency, magnitude and property damages for each category of natural hazard were described.

Severe Storms

Severe storms are the most frequently occurring natural hazard in Effingham County with 354 events verified since 1955. Two of the three federal disaster declarations included severe storms. Approximately $1.7 million in property damages and $2,500 in crop damages have resulted from 61 severe storm events. All of the crop damage is the result of a 1964 hail event. At least 2 injuries can be attributed to two separate thunderstorm with damaging wind events.

The highest wind speed recorded in the County, not associated with a tornado, is 70 knots (81 mph) on February 5, 2008 between Altamont and Watson. The largest hail recorded in the County is 3.00 inches northeast of Shumway on May 6, 1971.

Severe Winter Storms

At least 88 verified severe winter storms (snow, ice, or extreme cold) have occurred since 1950. Once of the three federal disaster declarations included severe winter storms. Approximately $900,000 in property damages resulted from the February 2011 ice storm. At least 6 injuries and 1 fatality can be attributed to three separate events.

Between 2000 and 2009 at least 12 severe winter storms took place. There has been 15 events in the current decade. The record maximum 24-hour snowfall in the County is 14.5 inches at the Effingham COOP Station on December 19 & 20, 1973.

The coldest recorded temperature is -29°F at Effingham COOP Station on January 24, 1915.

Floods

Two of the three federal disaster declarations for Effingham County are related to flooding. There have been a least 78 verified flood events in Effingham County, 37 riverine/shallow flood events since 1990 and 41 flash food events since 1996. Approximately $505,000 in property damages was recorded for one general and four flash flood events. Three injuries were recorded for 2 flash flood events in 2002.

Excessive Heat

There have been 44 *recorded* excessive heat events reported in Effingham County since 1994. No damages were recorded for any of the excessive heat events. One fatality was reported as a result of the July 2015 excessive heat event.

The hottest temperature recorded in Effingham County was 111°F at the Effingham COOP Station on July 14, 1954.

Drought

Six major droughts have occurred during the last four decades – 1983, 1988, 2005, 2007, 2011 and 2012. The County has been designated a Primary Natural Disaster Area by the USDA for three most recent drought events. Corn yield reductions were most severe for the 2012 drought when there was a 72.1% reduction in corn yields. Soybean yield reductions were most severe for the 1983 drought when there was a 57.1% reduction in soybean yields.

| Year | Corn | Soybeans |
|---|---|---|
| 1983 | 68.7% | 57.1% |
| 1988 | 46.3% | 34.3% |
| 2005 | 30.4% | 22.0% |
| 2007 | ----- | 25.0% |
| 2011 | 2.7% | 12.0% |
| 2012 | 72.1% | 4.1% |

Tornadoes

Since 1950, 22 tornadoes have been verified in Effingham County. A minimum of $2.1 million in property damages has resulted from 16 tornadoes. Six of the tornadoes have recorded property damages of at least $250,000 per event. Five injuries and two fatalities can be attributed to three separate tornado events in the County.

The average tornado in Effingham County is approximately 3.0 miles long and 53 yards wide. The average area covered by a tornado in Effingham County is 0.09 square miles.

The highest recorded F-Scale rating for a tornado in the County since 1950 is an F3 which occurred on March 6, 1961. The longest and widest recorded tornado in the County was an F2 tornado that occurred on April 17, 1960 and was 200 yards wide and 19.3 miles long.

Earthquakes

In the previous 200 years, two (2) earthquakes have originated in Effingham County. The largest was a 2.9 magnitude earthquake that occurred on February 28, 1977. Damage information was not available for any of the events and no injuries or fatalities were reported. While no fault zones or systems are located in Effingham County, there is one geologic structure, the Iola Anticline. There are also three known fault systems located in the immediate region: the Wabash Valley, the Cottage Grove and the Rough Creek-Shawneetown.

Dams

There are 10 classified (permitted) dams located in Effingham County, according to the U.S. Army Corp of Engineers. Four (4) of these dams are publicly-owned: Effingham owns two (Central Illinois Public Service Company Lake Dam & Little Wabash River Dam), Effingham Water Authority owns one (Lake Sara Dam) and Altamont owns one (Altamont Reservoir Dam). The 6 remaining dams are privately-owned. None of the dams has a "high" hazard classification rating. Five dams have a hazard classification of "significant". The remaining 5 dams have a hazard classification of "low" or "undetermined". There are no known dam failures recorded in the County.

## Risk Priority Index Exercise

Following the risk assessment, Andrea led the Committee through an exercise that will help calculate the Risk Priority Index for the hazards that have the potential to impact the participating jurisdictions. She explained that the Risk Priority Index is a quantitative means of providing guidance for ranking the hazards. This ranking can assist participants in determining which hazards present the highest risks and therefore which ones to focus on when formulating mitigation projects and activities.

## Mitigation

Mitigation actions include activities and projects that reduce the long-term risk to people and property from the natural hazards discussed in the risk assessment. The purpose of the next meeting is to develop a list of mitigation projects for each participating jurisdiction.

The form titled **"Hazard Mitigation Projects"** was distributed and Andrea indicated this form should be used to submit projects and activities for the Plan. To help the jurisdictions think about and assemble their lists, a 2-page list of potential mitigation projects was included in the handout material along with mitigation project lists from jurisdictions in other counties and excerpts from a FEMA publication on mitigation ideas. A 1-page list of required projects for NFIP-participating jurisdictions was also handed out. These examples can be used to help Committee members when they prepare their list.

She emphasized that submitting a project does not obligate any jurisdiction to complete the project. FEMA is trying to stimulate mitigation to reduce the extraordinary amount of money being expended on storm damages.

Mitigation projects can include studies, structural projects, and information/education activities. She provided advice for completing the mitigation project list including providing a detailed description of the project, the jurisdiction responsible for the project and the time frame to complete the project.

Committee members were encouraged to contact Andrea if questions arise before they return to the next Committee meeting.

**Mission Statement & Goals**

Zak asked Committee members to review the draft mission statement and goals provided in the meeting materials. Both are necessary to satisfy required elements of the Plan. Zak asked if any revisions need to be made or if additional goals need to be added.

The draft mission statement was reviewed and no revisions were made to the wording.

Zak indicated that the mitigation goals are intended to reduce long-term vulnerabilities to All Hazards and that each action included in the Plan should be aimed at one or more of the goals developed by the committee. These goals were drafted in such a way that they covered all the mitigation projects and activities that were submitted.

The goals were reviewed and no revisions were made to the wording.

The mission statement and goals will be added to the Plan.

**Community Participation**

Zak stressed the importance of attending each committee meeting and indicated that member participation helps the County meet its 25% match for this grant in addition to assuring that member jurisdictions are eligible for IEMA/FEMA funds. He indicated that tag-teaming and designating substitute representatives is permissible when other obligations arise. Zak pointed out that a designated substitute representative does not have be an official or employee of the jurisdiction.

Providing the public with opportunities to have input is an important part of the planning process. Zak requested that each jurisdiction consider making the **"Frequently Asked Questions"** handout in the meeting packet available for public review within your jurisdiction as well as the **"Citizen Questionnaire"** passed out at the beginning of the meeting.

**What Happens Next?**

The mitigation project tables will be the main topic of the next committee meeting. Andrea also indicated that the project prioritization methodology would be discussed.

The second meeting of the Committee was scheduled for:

**Thursday, February 27, 2020**
**6:00 P.M.**
**Effingham County EOC**
**311 Miracle Drive, Effingham**

With no further questions the meeting was adjourned.

# Meeting Minutes

## Effingham County's Multi-Jurisdictional All Hazards Mitigation Planning Committee

## February 27, 2020
## 6:00 p.m.
## Effingham County Emergency Operations Center
## 311 Miracle Drive, Effingham

**Committee Members**

American Red Cross
Beecher City, Village of
Effingham County Offices:
- County Board
- Coroner
- EMA
- GIS
- Health Department
- Highway Department
- LEPC
- Sheriff's Office
- Supervisor of Assessments

Effingham, City of
HSHS St. Anthony's Hospital
IEMA Region 9
MABAS 54
Mason, Town of
Mound Township
National Trails Radio
Shumway, Village of
Teutopolis, Village of
Teutopolis Township
Tri-County Fire Protection District
Watson, Village of
Watson Fire Protection District
Watson Township
American Environmental Corp.
.

**Welcome**

Pamela Jacobs, the Effingham County EMA Emergency Manager, welcomed attendees. She indicated that the purpose of this Committee is to develop the Effingham County's All Hazards Mitigation Plan.

Handout materials, including the draft mitigation project tables, were distributed to each Committee member.

Andrea Bostwick, American Environment Corp. (AEC), provided a brief recap to reorient Committee Members as to what has been accomplished. She noted that the Committee has accomplished all of its objectives up to this point and is on schedule. She then turned the meeting over to Zachary Krug, AEC, for a presentation on the man-made hazards risk assessment.

**Man-Made Hazards Risk Assessment**

Zachary began the presentation by reminding Committee members that at a previous meeting we identified the most frequently occurring natural hazards in Effingham County. While the focus of this planning effort is directed at natural hazards, FEMA allows a small portion of the planning process to be devoted to an overview of select man-made hazards.

Although this overview does not have the same depth as the assessment of natural hazards, it provides useful information to place various man-made hazards in perspective. Some of this information should be helpful to first responders so that they can take necessary safety precautions to protect themselves and others.

This assessment focused on the following categories of man-made hazards:
- generation and storage/handling of hazardous substances;
- waste disposal;
- hazardous materials (hazmat) incidents (both transportation and fixed facility); and
- waste remediation.

Hazardous substances broadly include flammable, explosive, biological, chemical or physical material that has the potential to harm public health or the environment. For the purposes of this Plan, the term includes both hazardous product and hazardous waste.

Generation and Storage/Handling of Hazardous Substances

In 2017 there were two (2) companies in Effingham County who generated reportable quantities of hazardous substances according to the USEPA.

Based on records obtained from IEMA's Tier II database, there were 48 stationary facilities within Effingham County that stored and/or handled hazardous substances. Fifteen (15) of these facilities stored and/or handled chemicals identified as "Extremely Hazardous Substances".

Waste Disposal

There is one active commercial solid waste (household) landfills operating in Effingham County, Landfill #33 LTD. There are no facilities within the county permitted to handle Potentially Infectious Medical Waste and no commercial off-site hazardous waste treatment or disposal facilities.

Hazardous Materials (Hazmat) Incidents

A hazardous materials (hazmat) incident refers to any incident involving the release of hazardous substances. Incidents can take place at fixed facilities or as they are being transported. Between 2010 and 2019, there were one hundred and four (104) hazmat incidents recorded in Effingham County. Of the 104 incidents, 60 occurred at fixed facilities, while the remaining 48 occurred during transport.

Of the 48 transportation incidents, there were forty-five (45) roadway accidents/incidents, two (2) rail accidents/incidents and one (1) waterway accidents/incidents.

Waste Remediation

Waste remediation in Illinois is primarily conducted through three programs: the federal Superfund Program (for sites posing the largest threat to public health and the environment), the Illinois Site Remediation Program (SRP) and the Illinois Leaking Underground Storage Tank (LUST) Program.

Superfund: There are no Superfund sites in Effingham County.

Illinois SRP: There are five (5) SRP sites located in Effingham County. Four of the sites have received "No Further Remediation" (NFR) letters.

Illinois LUST: There are 182 LUST sites located in Effingham County. Approximately 75% of these sites have received NFR, Non-Lust Determination or Section 4(y) letters or remediation is virtually complete.

**Critical Facilities Vulnerability**

Andrea discussed critical facilities vulnerability and asked the Committee Members to complete a survey to help identify:

1.) What each jurisdiction's greatest vulnerabilities are and why; and
2.) Each jurisdiction's most vulnerable assets.

She also asked each participating jurisdiction to provide a list of permanent backup generators associated with critical infrastructure. Andrea explained this information would be used as part of the vulnerability analyses.

**Risk Priority Index Exercise Results**

Andrea then presented the results of the Risk Priority Index Exercise which was conducted at the November 18, 2019 meeting. She provided the Committee with a brief recap on what the Risk Priority Index is and how it can help participants determine which hazards present the highest risk and therefore which ones to focus on when formulating mitigation projects and activities.

Based on the Committee's responses, thunderstorms with damaging winds scored the highest, followed by severe winter storms, heavy rain and tornadoes. The hazards that scored the lowest included mine subsidence, levee failures and dam failures.

**Mitigation Actions Prioritization Methodology**

The Mitigation Actions Prioritization Methodology outlines the approach used to classify each mitigation action identified by the participating jurisdictions and is a required element of the Plan's mitigation strategy. As part of the Plan development process, a methodology needs to be selected.

Andrea explained that mitigation actions can be prioritized in a number of ways and provided information on two different methodologies. The Committee asked questions and after discussing the pros and cons of both options, the Committee chose the methodology based on two key factors:

1) Frequency of hazard—severe storms occur more frequently than earthquakes.
2) Degree of mitigation—some projects will ***significantly reduce*** damages while other projects only have the potential to reduce damages.

This methodology helps objectively identify which projects and activities have a greater likelihood to significantly reduce the long-term vulnerabilities associated with the most frequently-occurring natural hazards.

Andrea acknowledged that while this methodology does not take cost or politics into consideration, these factors may affect the order in which projects are implemented. She also noted that it is important to keep in mind that implementing all of the mitigation projects is desirable regardless of which prioritization category they fall under.

**Mitigation Projects**

Andrea reminded the Committee Members that mitigation actions are those projects and activities that reduce the long-term risk to people and property from the natural and man-made hazards that impact the County. She then described how the lists of mitigation actions provided by each jurisdiction, the Mitigation Actions Prioritization Methodology, the goals and other information were used to complete the Mitigation Actions Tables handout.

Andrea using a frequently requested project – a community safe room – to walk the Committee through how a typical project is prioritized and entered into the mitigation action tables. She described how each column in the Mitigation Action Table would be completed for this example project.

Andrea explained that the information in the Mitigation Action Tables handout was prepared by AEC. Andrea thanked the Committee Members for assembling their lists of mitigation projects and activities. The participants did a wonderful job preparing their lists. Committee members were then asked to review the Action Tables containing the descriptions of the mitigation projects and activities. Andrea moved throughout the room to discuss questions with each member. Some additional mitigation projects were provided and will be added to these tables. Andrea advised Committee Members who wished to add additional to provide them to her as soon as possible.

Participants were reminded that this is a list of projects and activities they would like to see accomplished if the money becomes available. Also, for a jurisdiction to be eligible for a project, it must be on its list.

Since this is a mitigation plan, some projects were either removed or not included if they were now consider mitigation. Projects associated emergency preparedness/response, recovery, and maintenance will not be included in the Plan.

**Public Forum and Adoption**

The final Committee meeting will be conducted as an open-house style public forum to present the draft Plan for review and comment. A paper copy of the draft Plan will be available for review at the meeting and posted online on the County's website. There will be a one-week public comment period following the public forum.

Unless otherwise specified, Committee members will receive an electronic copy of the draft plan to make available for public comment.

Once the comment period is over any comments received will be incorporated into the Plan and submit it to IEMA/FEMA. Following IEMA and FEMA review, any edits requested will be made and then FEMA will issue an Approval Pending Adoption (APA) letter. At this point an email will be issued to all the participating jurisdictions with a

copy of a model adoption resolution attached asking them to formally adopt the Plan by resolution and provide a copy of the signed resolution to Andrea or Ms. Jacobs.

**Plan Maintenance and Update**

Zak then described the Plan maintenance and update commitments that are detailed in the Plan. A subgroup of the Planning Committee will meet annually, under the direction of the Effingham County EMA, to report on the progress of their projects, make any additions or edits to their project lists, evaluate the effectiveness of the Plan and provide information on any events that have occurred since the Committee met previously. The information gathered at these annual meetings will be provided to IEMA and will make the five year Plan update process easier.

Every five years, the Plan must be reviewed, revised and resubmitted to IEMA/FEMA to remain eligible for mitigation project funds. At the five year update, any jurisdiction that did not take part in the previous update but who now wished to become part of the Plan may do so. Any new jurisdiction must supply the same information that all of the current jurisdictions supplied.

**What Happens Next?**

The public forum will be held on:

**Tuesday, April 14, 2020**
**Effingham County Emergency Operations Center**
**311 Miracle Drive**
**6 P.M. – 8 P.M.**

**Public Comment**

With no additional questions or comments raised, Ms. Jacobs adjourned the meeting.

After conversations between AEC and the Effingham County EMA, the public forum scheduled for Tuesday, April 14th was cancelled due to the COVID-19 outbreak and Executive Orders 2020-10, 2020-18 and 2020-32 which extends the stay-at-home order and prohibits any gathering of more than ten people through Sunday, May 31st. Given the May 31st Plan submission deadline and the extension of the stay-at-home order, IEMA and FEMA agreed to allow the County to place the draft Plan online for review and comment and conduct the Public Forum via teleconference. The Plan will be made available on the County's website from May 19 through May 26, 2020. The Public Forum will be held on May 19 at 6:00 P.M. The Committee members and public were notified of the change.

# CITIZEN QUESTIONNAIRE

# APPENDIX C

# QUESTIONNAIRE

## Effingham County Multi-Jurisdictional All Hazards Mitigation Plan

You can help protect lives and property from natural hazard events in the County by taking a few moments to complete this questionnaire.

1. Please indicate where you live in the County:

   ☐ Altamont
   ☐ Beecher City
   ☐ Dieterich
   ☐ Edgewood
   ☐ Effingham
   ☐ Mason
   ☐ Montrose
   ☐ Shumway
   ☐ Teutopolis
   ☐ Watson
   ☐ Unincorporated Effingham County
   ☐ Other (please specify): _____

2. Please place a check mark next to each of the natural hazards listed below that you have experienced in the County. (Please check all that apply.)

   ☐ Severe Summer Storms (thunderstorms, hail and/or lightning strikes)
   ☐ Floods
   ☐ Severe Winter Storms (snow, sleet, ice and/or extreme cold)
   ☐ Excessive Heat
   ☐ Tornadoes
   ☐ Drought
   ☐ Earthquakes
   ☐ Other (please specify): _____

3. Which of the natural hazards above have you encountered most frequently?

   _____

   _____

4. Rank the natural hazards listed below in order from 1 to 7 based on which hazard ***you feel*** poses the greatest threat. (1 = greatest threat and 7 = least threat).
   ***Each number should only be used once.***

   _____ Severe Summer Storms
   _____ Floods
   _____ Severe Winter Storms
   _____ Excessive Heat
   _____ Tornadoes
   _____ Drought
   _____ Earthquakes

5. What types of mitigation projects or activities are most needed in the County? (***Please check the five*** you feel are most important.)

- ☐ Public information fact sheets and brochures describing actions residents can take to protect themselves and their property against natural hazard impacts
- ☐ Floodplain Ordinances
- ☐ Building Codes and Enforcement
- ☐ Sirens or other Alert Systems
- ☐ Flood or Drainage Protection (If selected, please check the type(s) of flood or drainage activity that is needed below.)
    - ☐ Culvert and drainage ditch maintenance
    - ☐ Retention pond construction
    - ☐ Dam or levee construction/maintenance
    - ☐ Hydraulic studies to determine cause of drainage problems
- ☐ Maintain power during storms by burying power lines, trimming trees and/or purchasing a back-up generator
- ☐ Tornado Safe Shelters
- ☐ Maintain roadway passage during snow storms and heavy rains
- ☐ Provide sufficient water supply during drought
- ☐ Identify residents with special needs in order to provide assistance during a natural hazard event
- ☐ Retrofit critical infrastructure (public water supplies, schools, sewage treatment facilities, bridges, hospitals and other important services) to reduce potential damages
- ☐ Other (please specify): _____

6. What are the most effective ways ***for you*** to receive information about how to make your household and property safer from natural disasters? (Please check all that apply.)

- ☐ Newspapers
- ☐ Television
- ☐ Radio
- ☐ Internet
- ☐ Schools
- ☐ Social Media (Facebook, Twitter, etc.)
- ☐ Mail
- ☐ Fact Sheet/Brochure
- ☐ Extension Service
- ☐ Public Workshops/Meetings
- ☐ Fire Department/Law Enforcement
- ☐ Public Health Department
- ☐ Municipal/County Government
- ☐ Other (please specify): _____

*Thank you for your time in assisting with the development of the County's Hazards Mitigation Plan.*

**Effingham County Multi-Jurisdictional All Hazards Mitigation Planning Committee**

# FREQUENTLY ASKED QUESTIONS FACT SHEET

# APPENDIX D

# Frequently Asked Questions

## Effingham County Multi-Jurisdictional All Hazards Mitigation Plan

**1) What is the Effingham County All Hazards Mitigation Plan?**

The Effingham County Multi-Jurisdictional All Hazards Mitigation Plan evaluates damage to life and property from natural and man-made hazards in the County and identifies projects and activities that can reduce these damages. The Plan is considered to be multi-jurisdictional because it includes municipalities and other jurisdictions (fire protection districts, schools, etc.) who want to participate.

**2) What is hazard mitigation?**

Hazard mitigation is any action taken to ***reduce*** the long-term risk to life and property from a natural or man-made hazard.

**3) Why is this Plan being developed?**

The Plan fulfills federal planning requirements of Section 104 of the Disaster Mitigation Act of 2000 and the Stafford Act. Developing this Plan fulfills federal requirements that provide these benefits:

- Funding ***following*** declared disasters.
- Funding for mitigation projects and activities ***before*** disasters occur.
- Increased awareness about natural hazards and closer cooperation among the various organizations and political jurisdictions involved in emergency planning and response.

**4) Who is developing this Plan?**

The Effingham County Multi-Jurisdictional All Hazards Mitigation Planning Committee is developing the Plan with assistance from technical experts in emergency planning, environmental matters, and infrastructure. The Committee includes members from agriculture, education, emergency services, municipal, township and county government, health care, and law enforcement.

**5) How can I participate?**

You are invited to attend public meetings of the Effingham County All Hazards Mitigation Planning Committee. In addition, you are encouraged to provide photographs, other documentation, and anecdotal information about damages you experienced from natural and man-made hazards in Effingham County. Surveys will be available at participating municipalities and through Effingham County to help gather specific information from residents. All of this information will be used to develop the Plan. The draft Plan will be presented at a public forum for further public input.

More information can be obtained by contacting:

Pam Jacobs, Emergency Manager
Effingham County Emergency Management Agency
311 Miracle Avenue
Effingham, Illinois 62401
(217) 540-1669

# MEDIA OUTLETS SERVING THE COUNTY

# APPENDIX E

# Media Outlets Serving Effingham County

**Effingham Daily News (daily)**
201 N. Banker St.
Effingham, IL 62401
217-347-7151
https//www.effinghamdailynews.com

**Beecher City Journal (weekly)**
104 S. Charles St.
Beecher City, IL 62414
618-487-5634

**The Altamont News (weekly)**
7 Do It Drive
Altamont, IL 62411
618-483-6176
https//www.altnewsban.com

**Effingham & Teutopolis News Report (weekly)**
1901 S. Fourth St., Suite 223
Effingham, IL 62401
217-342-5583
https://etnewsreport.com

# PRESS RELEASES AND NEWS ARTICLES PUBLISHED

# APPENDIX F

# Effingham County
## Emergency Management Agency
### 311 Miracle Avenue, Effingham IL 62401

Contact: Pamela Jacobs
(217)-540-1669

Reducing Damages Caused By Severe Weather

Effingham, IL (11/06/2019) — The Effingham County Hazard Mitigation Planning Committee will hold its first meeting on Monday, November 18th, 2019 at 6 P.M. at the Effingham County Emergency Operations Center, 311 Miracle Avenue, in Effingham. This Committee, comprised of County and municipal representatives as well as technical partners and stakeholders, will meet over the next several months to develop the County's All Hazards Mitigation Plan to reduce the damages caused by natural hazards, such as, floods, thunderstorms, ice storms, tornadoes, and excessive heat. Interested residents are invited to attend and can ask questions at these meetings.

"This Plan will identify projects and activities that reduce the harm to people and property before severe weather strikes", said Pamela Jacobs, Effingham County Emergency Management Agency Emergency Manager. "In addition, having this Plan helps us become eligible for federal funds to construct the projects identified in the plan," added Jacobs.

The process to develop this Plan as well as the frequency and damages caused by severe storms and other natural disasters in Effingham County will be discussed at this first meeting. "The purpose of this meeting is to identify how often severe weather events occur within the County and what kinds of damages have resulted. Based on this information we will begin to develop each participant's list of activities and projects," said Jacobs.

After a draft of the Plan is prepared, a public forum will be held to present the Plan for review and comment. The Plan will be revised based on comments from the public and the state and federal government agencies. Following these revisions, the Plan will be presented for adoption at public meetings held by the County and at each of the participating municipalities.

XXXXXXXXXXXXXX

# Effingham County
## Emergency Management Agency
### 311 Miracle Avenue, Effingham IL 62401

CONTACT: Pamela Jacobs
(217)-540-1669

Projects to Reduce Damages Caused By Storms

Effingham, IL (February 10, 2020)—Projects and activities to prevent injuries and fatalities while maintaining vital services for Effingham County residents during severe storms and other natural hazards will be the main topic of discussion at the Effingham County All Hazards Mitigation Planning Committee meeting on Thursday, February 27, 2020 at 6:00 p.m. The meeting will be held at the Effingham County Emergency Operations Center, 311 Miracle Avenue, in Effingham. The meeting is open to the public.

“Severe storms frequently damage buildings, crops, roads, and other critical infrastructure in this area. Since 1996 the County has been a part of 3 federal disaster declarations. In addition, there has been at least $5.2 million in verified property damages and $32.8 million in crop damages caused by 85 natural hazard events. Identifying preventative steps that can be taken to reduce the dollar damages as well as protect public health before sever weather occurs in the goal of this planning process.,” according to Pamela Jacobs, Emergency Manager of the Effingham County Emergency Management Agency.

The municipalities of Altamont, Beecher City, Effingham, Mason, Shumway, and Watson, in addition to the County, Mound Township, Teutopolis Township, Watson Township, Effingham Fire Department, Tri-County Fire Protection District, Beecher City CUSD #20, American Red Cross and the Illinois Department of Agriculture have been participating in the planning process.

The Committee began work in November 2019 to develop the County’s All Hazards Mitigation Plan. This Plan identifies projects and activities that can protect Effingham County residents and property from storms and other natural and man-made disasters.

Building storm shelters, retrofitting critical facilities to better withstand natural disasters, providing back-up power supplies, developing public information materials and conducting drainage studies are a few of the more frequent examples of projects and activities that might be included in the Plan. Unlike all other emergency plans, this Plan is aimed at identifying projects and activities that can be taken before these disasters occur.

“A public forum will be conducted later this spring for residents to review the plan and ask questions of Committee members. A public comment period will be held after the public forum to accommodate interested persons who are unable to attend. We want to provide anybody who is interested an opportunity to review and comment on the draft Plan,” said Jacobs.

Interested persons can submit questions and comments to the Committee members or directly to the Effingham County Emergency Management Agency.

XXXXXXXXXXXXXXXXX

https://www.effinghamdailynews.com/community/hazard-mitigation-planning-committee-meeting-monday/article_ef39333c-064d-11ea-990b-fb38b194d421.html

# Hazard Mitigation Planning Committee meeting Monday

Nov 13, 2019

The Effingham County Hazard Mitigation Planning Committee will hold its first meeting Monday, Nov. 18, at 6 p.m. at the Effingham County Emergency Operations Center, 311 Miracle Avenue, in Effingham.

This Committee, comprised of county and municipal representatives as well as technical partners and stakeholders, will meet over the next several months to develop the county's All Hazards Mitigation Plan to reduce the damages caused by natural hazards, such as floods, thunderstorms, ice storms, tornadoes and excessive heat. Interested residents are invited to attend and can ask questions at these meetings.

"This plan will identify projects and activities that reduce the harm to people and property before severe weather strikes," said Pamela Jacobs, Effingham County Emergency Management Agency Emergency manager. "In addition, having this plan helps us become eligible for federal funds to construct the projects identified in the plan."

The process to develop this plan, as well as the frequency and damages caused by severe storms and other natural disasters in Effingham County, will be discussed at this first meeting.

"The purpose of this meeting is to identify how often severe weather events occur within the county and what kinds of damages have resulted. Based on this information, we will begin to develop each participant's list of activities and projects," said Jacobs.

After a draft of the plan is prepared, a public forum will be held to present the plan for review and comment. The plan will be revised based on comments from the public and the state and federal government agencies. Following these revisions, the plan will be presented for adoption at public meetings held by the county and at each of the participating municipalities.

*Charles Mills can be reached at charles.mills@effinghamdailynews.com or by phone at 217-347-7151 ext. 126.*

https://www.shelbyvilledailyunion.com/community/projects-to-reduce-damages-caused-by-storms/article_487a3000-544a-11ea-a7ba-834a465a1def.html

# Projects to reduce damages caused by storms

Feb 20, 2020

Projects and activities to prevent injuries and fatalities while maintaining vital services for Effingham County residents during severe storms and other natural hazards will be the main topic of discussion at the Effingham County All Hazards Mitigation Planning Committee meeting Thursday, Feb. 27, at 6 p.m.

The meeting will be held at the Effingham County Emergency Operations Center, 311 Miracle Avenue, in Effingham. The meeting is open to the public.

“Severe storms frequently damage buildings, crops, roads and other critical infrastructure in this area. Since 1996, the county has been a part of three federal disaster declarations. In addition, there has been at least $5.2 million in verified property damages and $32.8 million in crop damages caused by 85 natural hazard events. Identifying preventative steps that can be taken to reduce the dollar damages, as well as protect public health before sever weather occurs, is the goal of this planning process.,” said Pamela Jacobs, Emergency Manager of the Effingham County Emergency Management Agency.

The municipalities of Altamont, Beecher City, Effingham, Mason, Shumway and Watson, in addition to the county, Mound Township, Teutopolis Township, Watson Township, Effingham Fire Department, Tri-County Fire Protection District, Beecher City CUSD 20, American Red Cross and the Illinois Department of Agriculture have been participating in the planning process.

The Committee began work in November 2019 to develop the county’s All Hazards Mitigation Plan. This plan identifies projects and activities that can protect Effingham County residents and property from storms and other natural and man-made disasters.

Building storm shelters, retrofitting critical facilities to better withstand natural disasters, providing back-up power supplies, developing public information materials and conducting drainage studies are a few of the more frequent examples of projects and activities that might be included in the plan. Unlike all other emergency plans, this plan is aimed at identifying projects and activities that can be taken before these disasters occur.

“A public forum will be conducted later this spring for residents to review the plan and ask questions of committee members. A public comment period will be held after the public forum to accommodate interested persons who are unable to attend. We want to provide anybody who is interested an opportunity to review and comment on the draft Plan,” said Jacobs.

Interested persons can submit questions and comments to the committee members or directly to the Effingham County Emergency Management Agency.



## THIS WEEK'S CIRCULARS

https://www.effinghamdailynews.com/news/local_news/meeting-planned-to-prepare-for-disasters/article_8612acee-5756-11ea-bc5e-9365920c9a37.html

EDITOR'S PICK

# Meeting planned to prepare for disasters

Charles Mills Daily News
Feb 24, 2020

Effingham County Emergency Manangement Agency Emergency Manager Pamela Jacobs prepares for the Effingham County All Hazards Mitigation Plan meeting to be held Thursday evening at 6 p.m. at the Effingham County Emergency Operations Center in Effingham.

Charles Mills/Daily News

Community and agency officials from across Effingham County will meet Thursday to discuss ways to lessen the impact of severe storms and other hazards. The public is invited.

The meeting of the Effingham County Multi-Jurisdictional All Hazards Mitigation Planning Committee is scheduled for Feb. 27 at the Effingham County Emergency Operations Center in Effingham at 6 p.m.

Participating municipalities include Altamont, Beecher City, Effingham, Mason, Shumway and Watson. Also participating is Mound Township, Teutopolis Township, Watson Township, Effingham Fire Department, Tri-County Fire Protection District, Beecher City CUSD 20, American Red Cross and Illinois Department of Agriculture.

Effingham County Emergency Management Agency Emergency Manager Pamela Jacobs hosts the Effingham County All Hazards Mitigation Plan meetings. Jacobs said American Environmental Corp. is helping develop the plan and conducts the meetings. American Environmental is a environmental consulting firm with offices in Springfield and corporate headquarters in Indianapolis.

Jacobs said American Environmental was contracted to assist with the mitigation plan through a grant received by Effingham County in July of last year. The final plan is developed by the planning committee members, with technical expert assistance from American Environmental Corp.

“The committee members are going above and beyond to help out with this project,” Jacobs said. “This is a whole county project with all of the municipalities working together to create this plan.”

“American Environmental Corporation is gathering all of the information from the participating municipalities to help put our plan together,” Jacobs said.

American Environmental collects natural disaster statistical data committee members can use as a tool for making their final mitigation plan.

American Environmental’s research shows Effingham County has experienced three federal disaster declarations since 1996; a drought in 2012 resulting in $32.8 million in corn crop damages; and 22 tornadoes have touched down in Effingham County since 1950.

“Severe storms frequently damage buildings, crops, roads and other critical infrastructure in this area,” Jacobs said.

Committee members started work in November of last year developing an Effingham County All Hazards Mitigation Plan to protect Effingham County residents and property from storms and man-made disasters.

Jacobs said the main purpose of the plan is to identify steps that can be taken before a disaster occurs, including building storm shelters, retrofitting critical facilities to better withstand natural disasters, providing back-up power resources, developing public information materials and conducting drainage studies.

“Identifying preventative steps that can be taken to reduce the dollar damages as well as protect public health before severe weather occurs is the goal of this planning process,” Jacobs said.

Jacobs said the agency wants to provide anybody who is interested an opportunity to review and comment on the draft plan.

“A public forum will be conducted later this spring for residents to review the plan and ask questions,” Jacobs said. “A public comment period will be held after the public forum to accommodate interested persons who are unable to attend.”

Questions can be submitted to the Effingham County Emergency Management Agency, located at 311 Miracle Avenue in Effingham.

**Charles Mills** can be reached at charles.mills@effinghamdailynews.com or by phone at 217-347-7151 ext. 126.

**Charles Mills** can be reached at charles.mills@effinghamdailynews.com or by phone at 217-347-7151 ext. 126.



Appendix F

https://www.effinghamdailynews.com/news/local_news/finding-ways-to-ease-county-hazards/article_eb77cdf6-5cb7-11ea-a700-e7b1f9c682d1.html

EDITOR'S PICK

# Finding ways to ease county hazards

Charles Mills Daily News
Mar 2, 2020


Andrea Bostwick, representing American Environmental Corporation of Springfield, reviews data collected from municipalitie participating in the Effingham County Multi-Jurisdictional All Hazards Mitigation Planning Committee meeting. The meeting v held at the Effingham County Emergency Operations Center.

Charles Mills Daily News

With March 1-7 designated Severe Weather and Preparedness Week in Illinois, the Effingham County Multi-Jurisdictional All Hazards Mitigation Planning Committee is looking for ways to lessen the impact of severe storms and other hazards in the county.

American Environmental Corporation, Springfield, is helping the committee develop a plan and met with members last week, as well as members of public.

City of Effingham Administrator Steve Miller is impressed with the efforts of the countywide mitigation committee so far.

“I think it will help all of us,” Miller said. “It shows our weaknesses and identifies areas where we need improvements.”

“We are ranking those and prioritizing what needs to be done,” he added. “I think it’s a good process and glad to be a part of it, along with the county and our neighbors.”

Miller said each community in Effingham County has different needs.

“Those needs are being identified and reflected in the charts and the plans,” Miller said. “When we have discussions, we bounce ideas off of each other and become aware of projects we’ve never considered before.”

“It’s always good to have the dialog,” Miller said. “In the end, I think we’ll have a document that we can look at and start planning long term.”

Charles Semple, a Teutopolis Township trustee, said his township is already working on ways to minimize storm damage.

“We’ve been working on trimming trees to prevent power outages in the winter,” Semple said. “We are trying to be proactive rather than reactive.”

Beecher City Village Board member Leslie Wood, who represented both the village and Tri-County Fire Protection District at the meeting, offered some ideas.

“Getting the Kluthe center set up as an official cooling and heating center would be good, along with emergency generators,” said Woods.

When it comes to stormwater, the village is hoping to find a grant opportunity to fix a lift station problem in Beecher City.

“I know we’ve got to do something,” Woods said.

“Sometimes communities feel like they are out there on their own. It lets us know what resources are out there,” she said of the meeting.

Angie Niccum, who represented the Tri-County Fire Protection District, also found the meeting helpful.

“I think this will be good for the communities,” Niccum said. “Just getting the help we need and can’t any other way.”

“I’m excited about this,” she added.

Zachary Krug of the American Environmental Corporation, Springfield, gave a presentation on the risk assessment of man-made hazards, including generation, transportation, storage and handling of hazardous substances. Krug said man-made hazards additionally include waste disposal, hazardous substance incidents and waste remediation.

Krug said 48 facilities in Effingham County generate/handle hazardous substances, but noted there are two facilities in the county currently generating reportable quantities of hazardous substances, according to the U.S. EPA’s Toxic Release Inventory.

He emphasized there are no facilities permitted to accept medical waste for disposal or commercial hazardous waste treatment or disposal in Effingham County.

Between 2010 and 2019, he said there were 104 hazardous material incidents in Effingham County. That averages to about 10 hazardous material incidents annually of which 46 percent involved transportation accidents.

Andrea Bostwick of American Environmental Corporation, Springfield, reviewed the Effingham County Risk Priority Index results with committee members based on data American Environment collected from the committee members at the first meeting.

“Ranking can help participants determine which hazards present the highest risks and, therefore, which ones to focus on when we are talking about mitigation projects,” Bostwick said.

Bostwick said thunderstorms with damaging winds is the No. 1 risk priority in Effingham County followed by winter storms. Third and Fourth place was tied with heavy rain and tornadoes. Additional impacts were No. 5 floods, No. 6 extreme cold and No. 7 excessive heat.

She said the highest scoring man-made hazards were hazardous material transportation incidents, which tied with hail. The lowest risk priority was levee failure and mine subsidence.

The committee will present their plans to the public for comment in April. Krug said a tentative date has been set for Tuesday, April 14, from 6 to 8 p.m. He said after the April meeting there will be a time period for more public comment.

“Once that period is over, we’ll take all of the comments from the individuals, incorporate them into the plan and will ship it off to IEMA and FEMA,” Krug said. “IEMA and FEMA have agreed to an expedited review.”

“Our goal is to get this plan finished by May 1,” said Bostwick.

A few of the representatives attending the meeting last week were from the Village of Shumway, Village of Watson, Effingham County Emergency Management Agency, The National Trail Amateur Radio Club, Effingham County Highway Department, Effingham County GIS, Teutopolis Township, Effingham County Coroner’s Office, Village of Beecher City, Village of Teutopolis, Effingham Fire Department, City of Effingham, Town of Mason, Village of Dieterich, Dietrich Fire Protection District, Effingham County Health Department, Effingham County Board, Effingham County LEPC, Watson Fire Protection District, Effingham County Sheriff’s Office, Watson Township and Tri-County Fire Protection District.

---

*Charles Mills can be reached at charles.mills@effinghamdailynews.com or by phone at 217-347-7151 ext. 126.*

*Charles Mills can be reached at charles.mills@effinghamdailynews.com or by phone at 217-347-7151 ext. 126.*

Effingham Daily News

@effinghamdailynews



1d 8

3 Replies

View 24 more comments

**Effingham Daily News**
February 25 at 2:50 PM ·

Community and agency officials from across Effingham County will meet Thursday to discuss ways to lessen the impact of severe storms and other hazards. The public is invited.

EFFINGHAMDAILYNEWS.COM

**Meeting planned to prepare for disasters**

Community and agency officials from across Effingham County will meet…

3 3 Shares

Like Comment Share

**Effingham Daily News**
Newsstand in Effingham, Illinois
Open Now

**Community** See All

13,748 people like this

13,921 people follow this

**About** See All

(217) 347-7151

Contact Effingham Daily News on Messenger

www.effinghamdailynews.com

Newsstand · Newspaper · Broadcasting & Media Production Company

Price Range $$

Hours 8:00 AM - 5:00 PM
Open Now

**Page Transparency** See More

Facebook is showing information to help you better understand the purpose of a Page. See actions taken by the people who manage and post content.

Page created - April 26, 2011

**People** >

# Effingham County
## Emergency Management Agency
### 311 Miracle Avenue, Effingham IL 62401

Contact: Pamela Jacobs
(217)-540-1669

FOR IMMEDIATE RELEASE

Effingham County's Mitigation Plan Ready for Public Review

May 6, 2020—The Effingham County Multi-Jurisdictional All Hazards Mitigation Plan outlining projects and activities to reduce damages to people and property from natural hazard events will be available for public review and comment from May 19 through May 26, 2020. The Plan, along with a summary sheet and a comment survey, can be viewed on the Emergency Management page of the Effingham County website. If you are unable to access the Plan via the website, please contact the Emergency Manager for Effingham County, Pamela Jacobs at (217) 540-1669 to view a paper copy of the Plan. The comment period will remain open through Tuesday, May 28, 2020. Comments will be used to make any revisions needed prior to submitting the Plan to the Illinois Emergency Management Agency and FEMA.

The Effingham County All Hazards Mitigation Planning Committee began meeting last fall to prepare this Plan. Unlike other emergency plans, this Plan is aimed at identifying projects and activities that can be taken before a natural disaster occurs. Representatives from various County departments in addition to Altamont, Beecher City, Dieterich, Effingham, Mason, Montrose, Shumway, Teutopolis, Watson, Beecher City CUSD #20, Mound Township and Watson Township participated in the planning process.

"Committee members helped identify projects that reflect the specific needs of each participating jurisdiction. Storm damage information was used to develop specific recommendations for potential projects and activities to reduce harm to people and property within the County," according to Ms. Jacobs.

A public forum will also be conducted on May 19 at 6 P.M. Due to the COVID-19 crisis which prohibits any gatherings of more than ten people, the public forum will be conducted via teleconference. Persons interested in participating in the public forum should contact Zachary Krug, American Environmental Corp. at (217) 585-9517 Ext. 8 or zkrug@aecspfld.com. Individuals can still review this Plan and comment without participating in the public forum.

XXXXXXXXXXXXXX

# PUBLIC FORUM – PLANNING PROCESS
# SUMMARY HANDOUT

## APPENDIX G

# EFFINGHAM COUNTY MULTI-JURISDICTIONAL ALL HAZARDS MITIGATION PLAN PUBLIC FORUM TELECONFERENCE

## MAY 19, 2020
## 2:00 P.M.

Each year natural hazards (i.e., severe thunderstorms, tornadoes, severe winter storms, flooding, etc.) cause damage to property and threaten the lives and health of Effingham County residents. Since 1996, Effingham County has been included in three federally-declared disasters and experienced at least $5.2 million in verified property and $32.8 million in crop damage within the County.

In the last 10 years alone (2010-2019), there have been 68 heavy rain events, 57 thunderstorms with damaging winds, 22 flash flood events, 21 excessive heat events, 16 severe winter storms, 10 severe storms with hail one inch in diameter or greater, six riverine flood events, four tornadoes, two droughts, two extreme cold events, and one lightning strike verified in the County. While natural hazards cannot be avoided, their impacts can be reduced through effective hazard mitigation planning.

**What is hazard mitigation planning?**

Hazard mitigation planning is the process of determining how to reduce or eliminate property damage and loss of life from natural and man-made hazards. This process helps the County and participating municipalities reduce their risk by identifying vulnerabilities and developing mitigation actions to lessen and sometimes even eliminate the effects of a hazard. The results of this process are documented in an all hazards mitigation plan.

**Why prepare an all hazards mitigation plan?**

By preparing and adopting an all hazards mitigation plan, participating jurisdictions become eligible to apply for and receive federal hazard mitigation funds to implement mitigation actions identified in the Plan. These funds, made available through the Disaster Mitigation Act of 2000, can help provide local government entities with the opportunity to complete mitigation projects that would not otherwise be financially possible.

**Who participated in the development of the Effingham County Multi-Jurisdiction All Hazards Mitigation Plan?**

Recognizing the benefits that could be gained from preparing an all hazards mitigation plan, Effingham County invited all the local government entities within the County to participate. The following jurisdictions chose to participate in the Plan development:

- Beecher City, Village of
- Beecher City CUSD #20
- Dieterich, Village of
- Effingham, City of
- Mason, Town of
- Mound Township
- Shumway, Village of
- Teutopolis, Village of
- Watson, Village of
- Watson Township

# EFFINGHAM COUNTY MULTI-JURISDICTIONAL ALL HAZARDS MITIGATION PLAN

**How was the Plan developed?**

The Effingham County Multi-Jurisdictional All Hazards Mitigation Plan was developed through the Effingham County Multi-Jurisdictional All Hazards Mitigation Planning Committee. The Planning Committee included representatives from each participating jurisdiction, as well as emergency services (American Red Cross, fire and law enforcement), business, education and healthcare. The Planning Committee met three times between November 2019 and May 2020.

**Which natural and man-made hazards are included in the Plan?**

After reviewing the risk assessment, the Planning Committee chose to include the following natural and man-made hazards in the Plan:

*Natural Hazards:*

- severe storms (thunderstorms, hail, lighting & heavy rain)
- severe winter storms (snow, ice & extreme cold)
- floods
- excessive heat
- tornadoes
- earthquakes
- droughts
- dam failures

*Man-Made Hazards:*

- hazardous substances (generation, transportation and storage/handling)
- waste disposal
- hazardous material incidents
- waste remediation
- terrorism

**What is included in the Plan?**

The Plan is divided into sections that cover the planning process; the risk assessment; the mitigation strategy, including lists of mitigation actions identified for each participating jurisdiction; and plan maintenance and adoption. Much of the Plan is devoted to the risk assessment and mitigation strategy.

This risk assessment identifies the natural and man-made hazards that pose a threat to the County and includes a profile of each natural hazard which describes the location and severity of past occurrences, reported damages to public health and property, and the likelihood of future occurrences. It also provides a vulnerability assessment that estimates the potential impacts each natural and man-made hazard would have on the health and safety of the residents of Effingham County as well as the buildings, critical facilities and infrastructure in the County.

The key component of the mitigation strategy is a list of the projects and activities developed by each participating jurisdiction to reduce the potential loss of life and property damage that results from the natural and man-made hazards identified in the risk assessment. These projects and activities are intended to be implement *before* a hazard event occurs.

**What happens next?**

Any comments received during the public comment period will be incorporated into the draft Plan before it is submitted to the Illinois Emergency Management Agency (IEMA) and the Federal Emergency Management Agency (FEMA) for review. Once IEMA and FEMA have reviewed and approved the Plan, it will be presented to the County and each participating jurisdiction for formal adoption. After adopting the Plan, each participating jurisdiction can apply for federal mitigation funds and begin implementation of the mitigation actions identified in the Plan.

# PUBLIC FORUM – PLAN COMMENT SURVEY

# APPENDIX H

# Effingham County All Hazard Mitigation Plan Comment Survey

The Effingham County Multi-Jurisdictional All Hazards Mitigation Plan evaluates damage to life and property from natural and man-made hazards that occur in the County. This Plan also identifies projects and activities submitted by the County and each participating jurisdiction that will help reduce these damages. This comment survey should be used to provide feedback on the draft Plan.

* 1. What comments, concerns or questions do you have regarding the draft Plan?

2. If you would like a follow-up to your comment, please provide your contact information below:

Name

Address

City/Town

State/Province

ZIP/Postal Code

Email Address

Phone Number

DONE



0 of 2 answered

# HAZARD MITIGATION PLANNING MEMO SENT ADJACENT COUNTIES

# APPENDIX I

# Effingham County
## Emergency Management Agency
### 311 Miracle Avenue, Effingham IL 62401

To: Clay County ESDA, Steve Lewis (floraesda@florail.us)
Cumberland County EMA, Joe Vogt (ema@cumberlandco.org)
Fayette County EMA, Kendra Craig (Fcesda@yahoo.com)
Jasper County EMA, Ed Francis (edfrancis20@hotmail.com)
Shelby County EMA, Jared Rowcliffe (Shelbyema@shelbycounty-il.com)

From: Pamela Jacobs, Effingham County Emergency Management Agency Emergency Manager

Subject: Hazard Mitigation Plan

Date: 5/6/2020

The purpose of this memorandum is to let you know that Effingham County is developing its countywide All Hazards Mitigation Plan. Since we share common boundaries, you are invited to review this draft Plan and provide comments during the public comment period which runs from May 19th through May 26th, 2020. The Plan along with a summary sheet and a comment survey can be viewed on the Effingham County Website.

The public forum has been scheduled for Tuesday, May 19 at 6 p.m. Due to the COVID-19 crisis, the public forum will be conducted via teleconference. You will receive a separate email invitation with the phone number and access code for the teleconference in the next couple of days.

If you have any questions, you can reach my office at 217-540-1669 or ema@co.effingham.il.us.

American Environmental Corp., an emergency management and environmental consulting firm experienced in preparing these plans, is leading our planning process. If you have specific questions about the Plan update, please contact Zachary Krug, our planning consultant at (217) 585-9517 Ext. 8 or zkrug@aecspfld.com

## Bostwick, Andrea

**From:** EMA <ema@co.effingham.il.us>
**Sent:** Wednesday, May 06, 2020 1:25 PM
**To:** floraesda@florail.us; ema@cumberlandco.org; Kendra Craig EMA (fcesda@yahoo.com); edfrancis20@hotmail.com; Shelby County EMA
**Cc:** Croy, Adam; Bostwick, Andrea; Krug. Zak
**Subject:** All Hazards Mitigation Planning in Effingham County
**Attachments:** Adjacent Counties Memo-Effingham County.docx

Good afternoon,

Please find attached the invitation to review the draft of the Effingham County All Hazards Mitigation Plan. Feel free to provide comments during the public comment period which runs from May 19th through May 26th, 2020.

Have a great day!

Pamela Jacobs
Emergency Manager
Effingham County Emergency Management Agency
311 Miracle Avenue, Effingham IL 62401
Office: (217) 540-1669 Cell: (217) 343-3062
http://www.co.effingham.il.us/emergency-management

# HAZARD EVENT RISK ASSESSMENT TABLES

# APPENDIX J

**Table 1**
**Severe Storms – Thunderstorms with Damaging Winds Reported in Effingham County**
**1973 – 2019**
**(Sheet 1 of 15)**

| Date(s) | Start Time | Location(s) | Maximum Magnitude (Knots) | Injuries | Fatalities | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|
| 6/4/1973 | 5:00 p.m. | Effingham | n/a | n/a | n/a | n/a | n/a | winds blew power lines down resulting in numerous power outages lasting several hours |
| 6/18/1973 | 7:30 p.m. | Effingham | n/a | n/a | n/a | n/a | n/a | |
| 11/30/1975 | 2:00 a.m. | Effingham County Memorial Airport | n/a | n/a | n/a | n/a | n/a | |
| 4/4/1981 | 1:00 a.m. | Effingham | n/a | n/a | n/a | n/a | n/a | widespread damage to trees, homes and out-buildings was reported throughout the State |
| 6/7/1982 | 10:35 a.m. | Effingham | 52 kts. | n/a | n/a | n/a | n/a | |
| 8/5/1982 | 3:10 p.m. | Effingham | n/a | n/a | n/a | n/a | n/a | |
| 4/12/1984 | 6:09 p.m. | Montrose | n/a | n/a | n/a | n/a | n/a | |
| 8/8/1984 | 2:25 p.m. | Altamont | n/a | n/a | n/a | n/a | n/a | |
| 8/8/1984 | 2:45 p.m. | Altamont | n/a | n/a | n/a | n/a | n/a | |
| 7/4/1985 | 10:00 p.m. | Effingham Lake Sara[A] Funkhouser[A] | n/a | n/a | n/a | $2,500 | n/a | - strong thunderstorm winds toppled many trees<br>- numerous power outages also resulted from falling trees which pulled down utility wires |
| 4/7/1986 | 5:30 p.m. | Effingham | 52 kts. | n/a | n/a | n/a | n/a | |
| 7/25/1986 | 5:10 p.m. | Teutopolis | n/a | n/a | n/a | n/a | n/a | |
| 7/25/1986 | 5:30 p.m. | Shumway | n/a | n/a | n/a | n/a | n/a | |
| 7/6/1987 | 5:10 p.m. | Effingham | 52 kts. | n/a | n/a | n/a | n/a | |
| 11/16/1988 | 12:10 a.m. | Altamont | n/a | n/a | n/a | n/a | n/a | |
| **Subtotal:** | | | | **0** | **0** | **$2,500** | **$0** | |

[A] Thunderstorm with damaging winds verified in the vicinity of this location(s).

**Table 1**
**Severe Storms – Thunderstorms with Damaging Winds Reported in Effingham County**
**1956 – 2019**
**(Sheet 2 of 15)**

| Date(s) | Start Time | Location(s) | Maximum Magnitude (Knots) | Injuries | Fatalities | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|
| 5/9/1990 | 7:40 p.m. | Edgewood[^] | n/a | n/a | n/a | $250,000 | n/a | winds caused heavy damage to 2 mobile homes near the Village |
| 5/12/1990 | 5:30 p.m. | Shumway | n/a | n/a | n/a | n/a | n/a | |
| 5/16/1990 | 2:00 a.m. | Effingham County Memorial Airport | 52 kts. | n/a | n/a | n/a | n/a | |
| 5/16/1990 | 2:15 a.m. | Elliottstown[^] | n/a | n/a | n/a | $50,000 | n/a | - 2 tractor-semitrailers were blown over<br>- numerous trees and power lines were reportedly down<br>- partial roof damage to 2 homes 3 miles south of the City |
| 4/15/1994 | 5:30 a.m. | Effingham Effingham[^] | n/a | n/a | n/a | n/a | n/a | |
| 6/23/1995 | 2:08 p.m. | Watson | 50 kts. | n/a | n/a | n/a | n/a | many smaller trees were bent over |
| 8/9/1995 | 7:35 p.m. | Altamont | n/a | n/a | n/a | $200 | n/a | large trees were down |
| 1/18/1996 | 11:10 a.m. | Montrose[^] | n/a | n/a | n/a | n/a | n/a | - winds blew down one cinder block wall of a barn 1-mile East of the Village<br>- a gasoline tank was blown over 100 feet<br>- on another nearby farm a metal shed was destroyed |
| **Subtotal:** | | | | **0** | **0** | **$300,200** | **$0** | |

[^] Thunderstorm with damaging winds verified in the vicinity of this location(s).

**Table 1**
**Severe Storms – Thunderstorms with Damaging Winds Reported in Effingham County**
**1956 – 2019**
**(Sheet 3 of 15)**

| Date(s) | Start Time | Location(s) | Maximum Magnitude (Knots) | Injuries | Fatalities | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|
| 4/19/1996 | 7:58 p.m. | countywide | n/a | 1 | n/a | n/a | n/a | - winds blew down numerous trees and power lines throughout the County<br>*Teutopolis*<br>- winds blew down a tree onto a parked car; a woman in the car sustained minor injuries |
| 6/17/1996 | 5:28 p.m. | Montrose[^] Dieterich[^] | n/a | n/a | n/a | n/a | n/a | winds blew down several large trees between Montrose and Dieterich |
| 7/19/1996 | 3:25 p.m. | Effingham | n/a | n/a | n/a | n/a | n/a | winds blew down 3 large trees in the City; one tree was 3.5 feet in diameter and 120 feet tall |
| 10/17/1996 | 5:29 p.m. | Effingham | n/a | n/a | n/a | n/a | n/a | winds uprooted and blew over a large tree in the City |
| 7/14/1997 | 2:46 p.m. | Altamont | n/a | n/a | n/a | n/a | n/a | winds blew down several large trees |
| 6/12/1998 | 5:15 p.m. | Altamont | n/a | n/a | n/a | n/a | n/a | - winds blew down several trees, numerous tree limbs and power lines<br>- some minor structural damage was reported |
| 6/14/1998 | 7:13 p.m. | Effingham | n/a | n/a | n/a | n/a | n/a | numerous large tree limbs were blown down throughout the City |
| 6/18/1998 | 9:18 p.m. | Effingham | n/a | n/a | n/a | $400 | n/a | - numerous trees, tree limbs and power lines were blown down<br>- one small tree landed on a car causing minor damage |
| **Subtotal:** | | | | **1** | **0** | **$400** | **$0** | |

[^] Thunderstorm with damaging winds verified in the vicinity of this location(s).

**Table 1**
**Severe Storms – Thunderstorms with Damaging Winds Reported in Effingham County**
**1956 – 2019**
**(Sheet 4 of 15)**

| Date(s) | Start Time | Location(s) | Maximum Magnitude (Knots) | Injuries | Fatalities | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|
| 6/28/1998 | 8:30 p.m. | Moccasin | n/a | n/a | n/a | $1,000 | n/a | winds blew down numerous large tree limbs; the limbs caused minor damage to one home, mainly guttering and siding damage, and severely damaged a pick-up truck |
| 6/29/1998 | 5:36 p.m. | countywide | 69 kts. | n/a | n/a | n/a | n/a | - widespread wind damage was reported, blowing down or uprooting thousands of trees, tree limbs, power poles and power lines<br>- homes and vehicles sustained damage from fallen trees and limbs |
| 7/7/1998 | 12:50 p.m. | Moccasin[^] Effingham | n/a | n/a | n/a | n/a | n/a | - numerous trees were blown down, some of which fell across roadways in the area<br>*Effingham*<br>- one tree fell onto an unoccupied mobile home causing moderate damage |
| 7/22/1998 | 4:58 p.m. | countywide | n/a | n/a | n/a | n/a | n/a | numerous trees and power lines were blown down throughout the County |
| 4/8/1999 | 10:28 p.m. | Teutopolis[^] | n/a | n/a | n/a | n/a | n/a | a large tree was blown down across the road 3.5 miles south of the Village |
| 6/1/1999 | 7:35 p.m. | Shumway | n/a | n/a | n/a | n/a | n/a | - winds blew down several trees and power lines<br>- a couple of sheds were damaged |
| **Subtotal:** | | | | **0** | **0** | **$1,000** | **$0** | |

[^] Thunderstorm with damaging winds verified in the vicinity of this location(s).

**Table 1**
**Severe Storms – Thunderstorms with Damaging Winds Reported in Effingham County**
**1956 – 2019**
**(Sheet 5 of 15)**

| Date(s) | Start Time | Location(s) | Maximum Magnitude (Knots) | Injuries | Fatalities | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|
| 6/4/1999 | 5:34 p.m. | countywide | n/a | n/a | n/a | n/a | n/a | numerous trees, tree limbs, and power lines were blown down across the County; some trees fell onto a few homes causing minor damage |
| 4/20/2000 | 10:05 a.m. | Effingham | n/a | n/a | n/a | n/a | n/a | a couple of road signs were blown over as well as several large tree limbs in the City |
| 6/14/2000 | 12:45 p.m. | Beecher City[A]<br>Lake Sara<br>Effingham | 52 kts. | n/a | n/a | n/a | n/a | *Beecher City Area*<br>several trees were blown down |
| 6/20/2000 | 10:13 p.m. | Altamont<br>Funkhouser<br>Effingham<br>Teutopolis | n/a | n/a | n/a | n/a | n/a | - several trees, tree limbs and power lines were blown down<br>*Altamont*<br>- a care center sustained minor damage with a couple of windows broken, an air conditioning unit was blown off concrete blocks, a TV antenna wrapped around the mast, and numerous shingles were blown off<br>- a suspended ceiling in a large assembly room fell, and several garage doors were damaged |
| 7/5/2000 | 5:46 p.m. | Altamont | n/a | n/a | n/a | n/a | n/a | several power lines were blown down in the Village |
| 8/2/2000 | 7:30 p.m. | Altamont<br>Funkhouser<br>Effingham | n/a | n/a | n/a | n/a | n/a | several power lines were blown down in Altamont and Effingham, mainly due to fallen tree limbs |
| **Subtotal:** | | | | **0** | **0** | **$0** | **$0** | |

[A] Thunderstorm with damaging winds verified in the vicinity of this location(s).

**Table 1**
**Severe Storms – Thunderstorms with Damaging Winds Reported in Effingham County**
**1956 – 2019**
**(Sheet 6 of 15)**

| Date(s) | Start Time | Location(s) | Maximum Magnitude (Knots) | Injuries | Fatalities | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|
| 8/6/2000 | 9:15 p.m. | countywide | n/a | n/a | n/a | n/a | n/a | - tree limbs were blown down countywide<br>*Altamont*<br>- several power lines were blown down |
| 5/23/2001 | 3:10 p.m. | Dieterich | 50 kts. | n/a | n/a | n/a | n/a | several trees and numerous tree limbs were blown down throughout the Village |
| 7/4/2001 | 11:32 p.m. | Beecher City<br>Altamont<br>Edgewood | 50 kts. | n/a | n/a | n/a | n/a | several trees and power lines were blown down |
| 8/18/2001 | 5:00 p.m. | Effingham | 50 kts. | n/a | n/a | n/a | n/a | winds blew down several large tree limbs and power lines |
| 5/1/2002 | 3:20 p.m. | Green Creek[^]<br>Montrose[^] | 55 kts. | n/a | n/a | n/a | n/a | ***This event is part of a federally-declared disaster (Declaration #1416)***<br>- winds destroyed an unoccupied mobile home<br>- winds blew another unoccupied home over, as well as 2 semis on I-70 near Montrose<br>- numerous trees and tree limbs were blown down |
| 5/9/2002 | 1:40 a.m. | Watson | 50 kts. | n/a | n/a | n/a | n/a | ***This event is part of a federally-declared disaster (Declaration #1416)*** several power lines were blown down around the Village |
| **Subtotal:** | | | | **0** | **0** | **$0** | **$0** | |

[^] Thunderstorm with damaging winds verified in the vicinity of this location(s).

**Table 1**
**Severe Storms – Thunderstorms with Damaging Winds Reported in Effingham County**
**1956 – 2019**
**(Sheet 7 of 15)**

| Date(s) | Start Time | Location(s) | Maximum Magnitude (Knots) | Injuries | Fatalities | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|
| 6/11/2002 | 4:20 p.m. | Altamont<br>Funkhouser<br>Effingham<br>Teutopolis | 55 kts. | 1 | n/a | n/a | n/a | - numerous trees, tree limbs and power lines were blown down<br>*Effingham*<br>- some homes sustained siding damage and a small shed was destroyed by a fallen tree<br>- a semi was blown over on southbound I-57; the driver sustained minor injuries<br>*Teutopolis*<br>- The roof of the junior high school sustained minor damage |
| 5/14/2003 | 10:25 p.m. | Effingham | 50 kts. | n/a | n/a | n/a | n/a | several power lines were blown down |
| 7/11/2003 | 9:10 p.m. | Effingham | 55 kts. | n/a | n/a | n/a | n/a | winds blew over a tree, knocked some shingles and siding off of a house and destroyed a section of fencing |
| 7/28/2003 | 2:50 a.m. | Effingham County Memorial Airport<br>Watson[^]<br>Mason | 52 kts. | n/a | n/a | n/a | n/a | - several trees were blown down<br>*Mason*<br>- a tree fell onto an unoccupied car damaging it |
| **Subtotal:** | | | | **1** | **0** | **$0** | **$0** | |

[^] Thunderstorm with damaging winds verified in the vicinity of this location(s).

**Table 1**
**Severe Storms – Thunderstorms with Damaging Winds Reported in Effingham County**
**1956 – 2019**
**(Sheet 8 of 15)**

| Date(s) | Start Time | Location(s) | Maximum Magnitude (Knots) | Injuries | Fatalities | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|
| 5/27/2004 | 4:00 p.m. | countywide | 60 kts. | n/a | n/a | n/a | n/a | *Event Description Provided Below* |
| - numerous trees, tree limbs and power lines were blown down across the County<br>*Altamont*<br>- a greenhouse was destroyed<br>*Effingham*<br>- some of the fallen trees caused minor damage to a couple of homes<br>- a semi was blown over just south of the City on I-57<br>*Mason Area*<br>- a large tree fell onto a pole barn damaging a large section of its roof<br>*Heartville*<br>- the Emergency Operations Center had roof damage when the winds peeled back part of the roof | | | | | | | | |
| 5/30/2004 | 4:36 p.m. | Shumway[^] | 55 kts. | n/a | n/a | n/a | n/a | - numerous trees were blown down, as well as tree limbs; 1 large tree limb landed on a truck and damaged it<br>- the front porch on 1 house sustained minor damage |
| 5/31/2004 | 8:30 p.m. | Effingham | 56 kts. | n/a | n/a | n/a | n/a | |
| 7/4/2004 | 1:00 p.m. | Altamont | 50 kts. | n/a | n/a | n/a | n/a | a tree was blown down onto a power line |
| 7/4/2004 | 1:43 p.m. | Mason[^] | 50 kts. | n/a | n/a | n/a | n/a | a tree was blown down onto IL Rte. 37 northeast of the Village |
| 1/13/2005 | 1:05 a.m. | Effingham | 60 kts. | n/a | n/a | n/a | n/a | wind gusts tore an awning off a gas station and caused roof damage to a couple of buildings in the City |
| 5/13/2005 | 5:20 p.m. | Altamont | 50 kts. | n/a | n/a | n/a | n/a | trees and power lines were blown down |
| 5/13/2005 | 6:00 p.m. | Dieterich[^] | 50 kts. | n/a | n/a | n/a | n/a | trees and power lines were blown down |
| 6/8/2005 | 4:40 p.m. | Altamont[^] | 60 kts. | n/a | n/a | n/a | n/a | an empty silo was blown down |
| **Subtotal:** | | | | **0** | **0** | **$0** | **$0** | |

[^] Thunderstorm with damaging winds verified in the vicinity of this location(s).

**Table 1**
**Severe Storms – Thunderstorms with Damaging Winds Reported in Effingham County**
**1956 – 2019**
**(Sheet 9 of 15)**

| Date(s) | Start Time | Location(s) | Maximum Magnitude (Knots) | Injuries | Fatalities | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|
| 6/8/2005 | 4:50 p.m. | Effingham | 50 kts. | n/a | n/a | n/a | n/a | several tree limbs and power lines were blown down |
| 7/26/2005 | 7:40 p.m. | Effingham | 50 kts. | n/a | n/a | n/a | n/a | a tree was blown down across a County Rd. |
| 7/26/2005 | 8:20 p.m. | Effingham County Memorial Airport | 50 kts. | n/a | n/a | n/a | n/a | a large maple tree was blown down |
| 4/2/2006 | 5:33 p.m. | Altamont | 55 kts. | n/a | n/a | n/a | n/a | 2 small homes destroyed by trees falling on them |
| 4/2/2006 | 5:40 p.m. | Effingham | 56 kts. | n/a | n/a | n/a | n/a | minor roof and siding damage |
| 5/24/2006 | 5:07 p.m. | Altamont Effingham[A] Dieterich | 52 kts. | n/a | n/a | n/a | n/a | numerous trees and power lines were blown down |
| 7/20/2006 | 11:00 p.m. | Effingham | 52 kts. | n/a | n/a | n/a | n/a | several limbs were blown down |
| 7/30/2006 | 5:05 p.m. | Dieterich | 65 kts. | n/a | n/a | $40,000 | n/a | the roof was ripped off a breezeway at Dieterich High School; the roof contained a water pipe that broke and flooded the adjacent gym floor |
| 7/17/2007 | 10:42 a.m. | Effingham | 50 kts. | n/a | n/a | n/a | n/a | a few tree limbs and power lines were blown down in the City |
| 8/24/2007 | 3:40 p.m. | Edgewood | 50 kts. | n/a | n/a | n/a | n/a | tree limbs were blown down |
| 8/24/2007 | 4:05 p.m. | Dieterich | 52 kts. | n/a | n/a | n/a | n/a | a power pole was snapped |
| 10/18/2007 | 2:40 a.m. | Altamont Funkhouser Effingham | 61 kts. | n/a | n/a | $12,000 | n/a | numerous trees were blown down |
| **Subtotal:** | | | | **0** | **0** | **$52,000** | **$0** | |

[A] Thunderstorm with damaging winds verified in the vicinity of this location(s).

**Table 1**
**Severe Storms – Thunderstorms with Damaging Winds Reported in Effingham County**
**1956 – 2019**
**(Sheet 10 of 15)**

| Date(s) | Start Time | Location(s) | Maximum Magnitude (Knots) | Injuries | Fatalities | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|
| 2/5/2008 | 6:30 p.m. | Gilmore[^] Watson | 70 kts. | n/a | n/a | $45,000 | n/a | - numerous trees and power lines were blown down<br>*Gilmore Area*<br>- a mobile home was destroyed |
| 6/6/2008 | 3:10 p.m. | Shumway | 52 kts. | n/a | n/a | $10,000 | n/a | a semi-trailer was blown over on IL Rte. 33 |
| 6/6/2008 | 3:25 p.m. | Effingham | 56 kts. | n/a | n/a | n/a | n/a | a large tree was blown down |
| 6/6/2008 | 4:35 p.m. | Effingham | 61 kts. | n/a | n/a | $25,000 | n/a | numerous trees and tree limbs were blown down; 1 large tree fell onto a house causing minor damage |
| 6/27/2008 | 3:50 p.m. | Altamont | 56 kts. | n/a | n/a | $20,000 | n/a | several trees and tree limbs were blown down |
| 8/5/2008 | 7:01 p.m. | Mason | 52 kts. | n/a | n/a | $3,000 | n/a | a tree limb was blown down onto a power line |
| 6/12/2010 | 4:45 p.m. | Teutopolis | 52 kts. | n/a | n/a | $10,000 | n/a | power lines were blown down |
| 6/13/2010 | 6:45 p.m. | Dieterich | 52 kts. | n/a | n/a | $2,000 | n/a | a large portion of a tree was blown down |
| 6/15/2010 | 2:30 p.m. | Watson[^] | 50 kts. | n/a | n/a | $3,000 | n/a | a large tree limb was blown down along US Hwy 45 taking down a power line |
| 6/15/2010 | 3:15 p.m. | Effingham | 52 kts. | n/a | n/a | $25,000 | n/a | several trees and tree limbs were blown down; some falling trees and tree limbs also downed power lines |
| 6/27/2010 | 5:42 p.m. | Altamont | 52 kts. | n/a | n/a | $4,000 | n/a | a large tree was blown down onto power lines along US Hwy 40 |
| 6/27/2010 | 5:45 p.m. | Effingham | 52 kts. | n/a | n/a | $20,000 | n/a | numerous tree limbs were blown down; spotty power outages were also reported around the City |
| **Subtotal:** | | | | **0** | **0** | **$167,000** | **$0** | |

[^] Thunderstorm with damaging winds verified in the vicinity of this location(s).

**Table 1**
**Severe Storms – Thunderstorms with Damaging Winds Reported in Effingham County**
**1956 – 2019**
**(Sheet 11 of 15)**

| Date(s) | Start Time | Location(s) | Maximum Magnitude (Knots) | Injuries | Fatalities | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|
| 6/27/2010 | 5:50 p.m. | Watson[A] | 52 kts. | n/a | n/a | $2,000 | n/a | a tree was blown down across IL Rte. 37 |
| 6/27/2010 | 5:56 p.m. | Effingham | 52 kts. | n/a | n/a | $12,000 | n/a | several tree limbs were blown down and a tent collapsed at a church picnic |
| 7/19/2010 | 1:20 p.m. | Teutopolis | 61 kts. | n/a | n/a | $12,000 | n/a | a large oak tree was blown over onto a shed |
| 2/28/2011 | 12:33 a.m. | Altamont[A] | 52 kts. | n/a | n/a | $30,000 | n/a | power poles were bent over, and a pole barn suffered minor damage |
| 2/28/2011 | 12:35 a.m. | Altamont | 52 kts. | n/a | n/a | $25,000 | n/a | power poles were bent over, and numerous tree limbs were blown down |
| 2/28/2011 | 12:36 a.m. | Altamont Reservoir[A] | 52 kts. | n/a | n/a | $30,000 | n/a | a lean-to shed was destroyed, and minor roof damage occurred to a house |
| 2/28/2011 | 12:45 a.m. | Watson | 52 kts. | n/a | n/a | $25,000 | n/a | a small utility shed roof and porch roof were blown off |
| 2/28/2011 | 12:55 a.m. | Dieterich[A] | 52 kts. | n/a | n/a | $40,000 | n/a | part of the roof was blown off a church north of the Village |
| 5/23/2011 | 1:04 p.m. | Gilmore[A] | 52 kts. | n/a | n/a | $20,000 | n/a | several power lines were blown down |
| 5/23/2011 | 1:05 p.m. | Dieterich | 52 kts. | n/a | n/a | $85,000 | n/a | - numerous trees and power lines were blown down<br>- a 157-foot wireless internet tower was blown down<br>- the roofs of a few homes lost shingles |
| 5/23/2011 | 1:10 p.m. | Mason | 52 kts. | n/a | n/a | $15,000 | n/a | numerous large tree limbs were blown down |
| **Subtotal:** | | | | **0** | **0** | **$296,000** | **$0** | |

[A] Thunderstorm with damaging winds verified in the vicinity of this location(s).

**Table 1**
**Severe Storms – Thunderstorms with Damaging Winds Reported in Effingham County**
**1956 – 2019**
**(Sheet 12 of 15)**

| Date(s) | Start Time | Location(s) | Maximum Magnitude (Knots) | Injuries | Fatalities | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|
| 5/25/2011 | 5:30 p.m. | Effingham | 52 kts. | n/a | n/a | n/a | n/a | a few tree branches and power lines were blown down in the City |
| 6/21/2011 | 4:15 p.m. | Watson | 52 kts. | n/a | n/a | $1,000 | n/a | a 7-inch diameter tree branch was blown down |
| 6/21/2011 | 4:30 p.m. | Effingham | 52 kts. | n/a | n/a | $30,000 | n/a | a large tree was blown onto a house, causing significant damage to the roof |
| 6/27/2011 | 3:27 a.m. | Effingham[A] | 52 kts. | n/a | n/a | n/a | n/a | a tree was blown down near the intersection of US Hwy 40 and County Rd. 1000E |
| 8/16/2012 | 3:08 p.m. | countywide | 61 kts. | n/a | n/a | $30,000 | n/a | several trees were blown down on various locations throughout the County |
| 9/7/2012 | 5:31 p.m. | Altamont | 52 kts. | n/a | n/a | $12,000 | n/a | - railroad crossing gates were torn off at 10th and Division Streets<br>- several trees and tree branches were blown down |
| 9/7/2012 | 5:37 p.m. | Shumway | 52 kts. | n/a | n/a | $2,000 | n/a | a large tree was blown down on IL Rte. 33 |
| 9/7/2012 | 6:25 p.m. | Teutopolis | 52 kts. | n/a | n/a | $6,000 | n/a | power lines were blown down |
| 1/29/2013 | 9:15 p.m. | Altamont | 61 kts. | n/a | n/a | $20,000 | n/a | - a large overhead door was blown out at the ADM plant<br>- a tree was blown down onto a house, doing damage to its roof<br>- numerous tree branches were knocked down around town |
| 1/29/2013 | 9:30 p.m. | Mason | 61 kts. | n/a | n/a | $24,000 | n/a | numerous power lines were blown down |
| **Subtotal:** | | | | **0** | **0** | **$125,000** | **$0** | |

[A] Thunderstorm with damaging winds verified in the vicinity of this location(s).

**Table 1**
**Severe Storms – Thunderstorms with Damaging Winds Reported in Effingham County**
**1956 – 2019**
**(Sheet 13 of 15)**

| Date(s) | Start Time | Location(s) | Maximum Magnitude (Knots) | Injuries | Fatalities | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|
| 1/29/2013 | 9:33 p.m. | Effingham[A] | 61 kts. | n/a | n/a | $10,000 | n/a | a semi-trailer was blown over on I-57 at mile marker 165 northeast of the City |
| 5/30/2013 | 9:05 p.m. | Dieterich | 52 kts. | n/a | n/a | $12,000 | n/a | a semi-truck was blown over on IL Rte. 33 |
| 5/31/2013 | 9:30 p.m. | Dieterich | 61 kts. | n/a | n/a | $45,000 | n/a | - a grain bin was toppled over onto another grain bin<br>- a storage building lost its roof<br>- numerous trees were blown down |
| 6/1/2014 | 2:45 p.m. | Mason[A] | 52 kts. | n/a | n/a | $25,000 | n/a | 4 power poles were broken at the top and several others were leaning along US Hwy 45 just north of the Clay-Effingham County line |
| 10/13/2014 | 4:10 p.m. | Dieterich | 52 kts. | n/a | n/a | $30,000 | n/a | a few trees were blown onto houses and power lines were knocked down |
| 4/9/2015 | 7:45 p.m. | Altamont[A] | 52 kts. | n/a | n/a | $12,000 | n/a | several large tree branches were blown down across County Rd 1200N 2 miles northwest of the Village |
| 4/9/2015 | 7:54 p.m. | Effingham[A] | 52 kts. | n/a | n/a | $12,000 | n/a | several large tree branches were blown down across IL Rte. 9 about 3 miles north of the City |
| 4/9/2015 | 8:55 p.m. | Dieterich | 52 kts. | n/a | n/a | $5,000 | n/a | a shed was damaged |
| 5/30/2015 | 3:45 p.m. | Effingham | 52 kts. | n/a | n/a | $3,000 | n/a | 2 large healthy trees were snapped |
| 4/27/2016 | 6:04 p.m. | Altamont | 61 kts. | n/a | n/a | $18,000 | n/a | a power pole was blown down and a semi-truck was knocked over on I-70 |
| 4/27/2016 | 7:33 p.m. | Montrose | 52 kts. | n/a | n/a | $40,000 | n/a | a gas station awning was blown down and damaged two cars |
| **Subtotal:** | | | | **0** | **0** | **$212,000** | **$0** | |

[A] Thunderstorm with damaging winds verified in the vicinity of this location(s).

**Table 1**
**Severe Storms – Thunderstorms with Damaging Winds Reported in Effingham County**
**1956 – 2019**
**(Sheet 14 of 15)**

| Date(s) | Start Time | Location(s) | Maximum Magnitude (Knots) | Injuries | Fatalities | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|
| 5/11/2016 | 3:25 p.m. | Watson[^]<br>Mason[^] | 61 kts. | n/a | n/a | $85,000 | n/a | *Watson Area*<br>- several trees were bent and hanging over the road at IL Rte. 37<br>*Mason Area*<br>- numerous trees and power lines were blown down along the Mason Eberle Rd. |
| 5/11/2016 | 3:30 p.m. | Effingham County Memorial Airport[^] | 61 kts. | n/a | n/a | $8,000 | n/a | power lines were blown down 1 mile south of the Airport |
| 7/13/2016 | 4:06 p.m. | Altamont | 61 kts. | n/a | n/a | $60,000 | n/a | numerous large tree branches were blown down; some of the branches fell onto homes, causing minor damage |
| 7/13/2016 | 4:08 p.m. | Shumway | 61 kts. | n/a | n/a | $60,000 | n/a | several trees were blown into power lines and 1 house was damaged |
| 7/13/2016 | 4:09 p.m. | Lake Sara | 61 kts. | n/a | n/a | $50,000 | n/a | several trees were blown down and a few buildings were damaged |
| 7/13/2016 | 4:19 p.m. | Dieterich | 61 kts. | n/a | n/a | $100,000 | n/a | - 2 farm buildings were destroyed<br>- a house was damaged<br>- a silo was blown over<br>- a large tree was blown down |
| 4/29/2017 | 5:20 p.m. | Edgewood | 52 kts. | n/a | n/a | $15,000 | n/a | a semi was blown over on I-57 |
| 4/29/2017 | 5:40 p.m. | Dieterich | 52 kts. | n/a | n/a | $75,000 | n/a | - shingles were blown off several houses<br>- a large tree was blown down<br>- 2 empty semis were tipped over |
| **Subtotal:** | | | | **0** | **0** | **$453,000** | **$0** | |

[^] Thunderstorm with damaging winds verified in the vicinity of this location(s).

**Table 1**
**Severe Storms – Thunderstorms with Damaging Winds Reported in Effingham County**
**1956 – 2019**
**(Sheet 15 of 15)**

| Date(s) | Start Time | Location(s) | Maximum Magnitude (Knots) | Injuries | Fatalities | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|
| 6/18/2017 | 2:04 a.m. | Mason | 61 kts. | n/a | n/a | n/a | n/a | - numerous tree limbs and power lines were blown down<br>- 2 semi-trailers were blown over |
| 6/18/2017 | 2:06 a.m. | Watson | 61 kts. | n/a | n/a | n/a | n/a | a large tree was blown across train tracks, stopping rail traffic |
| 11/5/2017 | 3:40 p.m. | Shumway | 52 kts. | n/a | n/a | $20,000 | n/a | a power pole, power lines, and several tree branches were blown down |
| 5/31/2018 | 10:15 a.m. | Gilmore[^] | 61 kts. | n/a | n/a | n/a | n/a | an 8-inch diameter limb was ripped off a tree |
| 5/31/2018 | 10:20 a.m. | Edgewood | 61 kts. | n/a | n/a | n/a | n/a | numerous small tree branches were blown down |
| 5/31/2018 | 10:23 a.m. | Altamont[^] | 61 kts. | n/a | n/a | n/a | n/a | a 2-inch diameter tree branch approximately 10 to 12 inches long was blown down |
| 6/28/2018 | 5:05 p.m. | Altamont[^] | 52 kts. | n/a | n/a | $6,000 | n/a | several tree limbs were blown down along IL Rte. 128 west of the Village |
| 6/28/2018 | 5:20 p.m. | Watson[^] | 52 kts. | n/a | n/a | n/a | n/a | several tree limbs were blown down near the I-57 exit 151 |
| 6/28/2018 | 5:25 p.m. | Mason | 52 kts. | n/a | n/a | n/a | n/a | a tree limb was blown down across IL Rte. 37 |
| 7/14/2018 | 1:00 p.m. | Altamont | 52 kts. | n/a | n/a | $90,000 | n/a | |
| 5/29/2019 | 5:54 p.m. | Effingham | 52 kts. | n/a | n/a | n/a | n/a | several power poles were snapped or leaning on Rickleman Avenue |
| **Subtotal:** | | | | **0** | **0** | **$116,000** | **$0** | |
| **GRAND TOTAL:** | | | | **2** | **0** | **$1,725,100** | **$0** | |

[^] Thunderstorm with damaging winds verified in the vicinity of this location(s).

Sources: NOAA, National Environmental Satellite, Data & Information Service, National Climatic Data Center, Storm Events Database.

**Table 2**
**Severe Storms – Lightning Events Reported in Effingham County**
**2017**
**(Sheet 1 of 1)**

| Date(s) | Start Time | Location(s) | Injuries | Fatalities | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|
| 2017 | n/a | Shumway | n/a | n/a | $7,000 | n/a | Derek Helmbacher reported that lightning struck the Bland Life Station damaging electronics and a pump |
| **Subtotal:** | | | **0** | **0** | **$7,000** | **0** | |

Source: Effingham County Multi-Jurisdictional All Hazards Mitigation Planning Committee Member responses to Natural Hazard Events Questionnaire.

**Table 3**
**Severe Storms – Hail Events Reported in Effingham County**
**1955 – 2019**
**(Sheet 1 of 2)**

| Date(s) | Start Time | Location(s) | Magnitude (Diameter) | Injuries | Fatalities | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|
| 11/15/1955 | 4:30 p.m. | Shumway^ | 2.75 in. | n/a | n/a | n/a | n/a | |
| 4/25/1961 | 10:30 a.m. | Effingham^ | 1.75 in. | n/a | n/a | n/a | n/a | |
| 1/19/1964 | 7:45 a.m. | Altamont^ | 1.75 in. | n/a | n/a | n/a | n/a | |
| 5/6/1971 | 7:30 a.m. | Shumway^ | 3.00 in. | n/a | n/a | $2,500 | $2,500 | |
| 4/1/1974 | 2:15 p.m. | Beecher City | 1.75 in. | n/a | n/a | n/a | n/a | |
| 9/30/1977 | 6:15 p.m. | Effingham | 1.75 in. | n/a | n/a | n/a | n/a | |
| 9/30/1977 | 6:45 p.m. | Beecher City | 2.00 in. | n/a | n/a | n/a | n/a | |
| 6/7/1982 | 7:20 p.m. | Effingham | 1.00 in. | n/a | n/a | n/a | n/a | |
| 4/22/1988 | 6:30 p.m. | Beecher City^ | 1.75 in. | n/a | n/a | n/a | n/a | |
| 6/6/1997 | 6:20 p.m. | Lake Sara | 1.00 in. | n/a | n/a | n/a | n/a | |
| 4/7/1998 | 8:05 p.m. | Effingham | 1.75 in. | n/a | n/a | n/a | n/a | |
| 4/7/1998 | 8:38 p.m. | Effingham | 1.75 in. | n/a | n/a | n/a | n/a | |
| 2/27/1999 | 1:37 p.m. | Effingham | 1.00 in. | n/a | n/a | n/a | n/a | |
| 2/27/1999 | 2:07 p.m. | Watson | 1.75 in. | n/a | n/a | n/a | n/a | |
| 4/7/2000 | 8:20 a.m. | Effingham^ | 1.00 in. | n/a | n/a | n/a | n/a | |
| 4/10/2001 | 7:28 a.m. | Effingham | 1.75 in. | n/a | n/a | n/a | n/a | |
| 4/10/2001 | 12:15 p.m. | Altamont<br>Funkhouser<br>Effingham | 1.00 in. | n/a | n/a | n/a | n/a | |
| 5/17/2001 | 6:40 a.m. | Lake Sara<br>Effingham | 1.75 in. | n/a | n/a | n/a | n/a | |
| 4/24/2002 | 2:35 p.m. | countywide | 1.00 in. | n/a | n/a | n/a | n/a | ***This event is part of a federally-declared disaster (Declaration #1416)*** |
| 5/28/2003 | 4:27 p.m. | Beecher City<br>Lake Sara^ | 1.00 in. | n/a | n/a | n/a | n/a | |
| 5/27/2004 | 3:33 p.m. | Dieterich | 1.75 in. | n/a | n/a | n/a | n/a | |
| 4/16/2006 | 3:49 p.m. | Effingham | 1.00 in. | n/a | n/a | n/a | n/a | |
| **Subtotal:** | | | | **0** | **0** | **$2,500** | **$2,500** | |

^ Hail event verified in the vicinity of this location(s).

**Table 3**
**Severe Storms – Hail Events Reported in Effingham County**
**1955 – 2019**
**(Sheet 2 of 2)**

| Date(s) | Start Time | Location(s) | Magnitude (Diameter) | Injuries | Fatalities | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|
| 4/16/2006 | 5:00 p.m. | Montrose | 1.00 in. | n/a | n/a | n/a | n/a | |
| 4/18/2006 | 9:38 p.m. | Dieterich[^] Dieterich | 1.25 in. | n/a | n/a | n/a | n/a | |
| 6/22/2006 | 3:13 p.m. | Gilmore[^] | 1.00 in. | n/a | n/a | n/a | n/a | |
| 6/4/2008 | 1:00 p.m. | Effingham | 1.00 in. | n/a | n/a | n/a | n/a | |
| 6/13/2010 | 6:30 p.m. | Effingham | 1.25 in. | n/a | n/a | n/a | n/a | |
| 4/19/2011 | 7:53 a.m. | Mason | 1.00 in. | n/a | n/a | n/a | n/a | |
| 3/23/2012 | 12:09 p.m. | Effingham | 1.75 in. | n/a | n/a | n/a | n/a | |
| 3/23/2012 | 12:10 p.m. | Effingham | 1.00 in. | n/a | n/a | n/a | n/a | |
| 4/9/2015 | 7:40 p.m. | Beecher City[^] | 1.00 in. | n/a | n/a | n/a | n/a | |
| 10/19/2016 | 7:30 p.m. | Altamont | 1.00 in. | n/a | n/a | n/a | n/a | |
| 10/19/2016 | 7:34 p.m. | Altamont[^] | 1.00 in. | n/a | n/a | n/a | n/a | |
| 10/19/2016 | 7:40 p.m. | Effingham | 1.00 in. | n/a | n/a | n/a | n/a | |
| 5/27/2018 | 3:35 p.m. | Effingham | 1.50 in. | n/a | n/a | n/a | n/a | |
| 6/11/2018 | 6:37 p.m. | Dieterich | 1.00 in. | n/a | n/a | n/a | n/a | |
| **Subtotal:** | | | | **0** | **0** | **$0** | **$0** | |

| **GRAND TOTAL:** | | | | **0** | **0** | **$2,500** | **$2,500** | |
|---|---|---|---|---|---|---|---|---|

[^] Hail event verified in the vicinity of this location(s).

Source: NOAA, National Environmental Satellite, Data & Information Service, National Climatic Data Center, Storm Events Database.

**Table 4**
**Severe Storms – Heavy Rain Events Reported in Effingham County**
**1990 – 2019**
**(Sheet 1 of 18)**

| Date(s) | Start Time | Location(s) | Maximum Magnitude (inches) | Injuries | Fatalities | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|
| 5/11/1990 thru 5/13/1990 | 9:00 a.m. | Effingham | 2.20 in. | n/a | n/a | n/a | n/a | |
| 5/15/1990 thru 5/17/1990 | 3:30 a.m. | Effingham | 3.68 in. | n/a | n/a | n/a | n/a | |
| 6/6/1990 thru 6/7/1990 | 9:30 a.m. | Effingham | 2.62 in. | n/a | n/a | n/a | n/a | |
| 6/20/1990 | 3:30 a.m. | Effingham | 2.34 in. | n/a | n/a | n/a | n/a | |
| 7/11/1990 thru 7/12/1990 | 3:30 a.m. | Effingham | 2.04 in. | n/a | n/a | n/a | n/a | |
| 10/7/1990 thru 10/10/1990 | 3:00 a.m. | Effingham | 3.00 in. | n/a | n/a | n/a | n/a | |
| 11/27/1990 thru 11/28/1990 | 2:00 p.m. | Effingham | 1.74 in. | n/a | n/a | n/a | n/a | |
| 5/29/1991 | 1:30 p.m. | Effingham | 2.26 in. | n/a | n/a | n/a | n/a | |
| 8/6/1991 | 5:00 a.m. | Effingham | 2.71 in. | n/a | n/a | n/a | n/a | |
| 10/25/1991 thru 10/27/1991 | 12:30 a.m. | Effingham | 3.42 in. | n/a | n/a | n/a | n/a | |
| 4/16/1992 thru 4/17/1992 | 12:00 a.m. | Effingham | 3.18 in. | n/a | n/a | n/a | n/a | |
| **SUBTOTAL:** | | | | **0** | **0** | **$0** | **$0** | |

**Table 4**
**Severe Storms – Heavy Rain Events Reported in Effingham County**
**1990 – 2019**
**(Sheet 2 of 18)**

| Date(s) | Start Time | Location(s) | Maximum Magnitude (inches) | Injuries | Fatalities | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|
| 8/26/1992 thru 8/27/1992 | 6:30 p.m. | Beecher City Effingham | 2.24 in. | n/a | n/a | n/a | n/a | |
| 11/1/1992 thru 11/2/1992 | 12:00 a.m. | Effingham | 1.74 in. | n/a | n/a | n/a | n/a | |
| 11/9/1992 thru 11/12/1992 | 12:00 a.m. | Beecher City Effingham | 5.44 in. | n/a | n/a | n/a | n/a | |
| 1/3/1993 thru 1/5/1993 | 1:00 a.m. | Effingham | 2.76 in. | n/a | n/a | n/a | n/a | |
| 1/20/1993 thru 1/21/1993 | 10:00 a.m. | Effingham | 1.67 in. | n/a | n/a | n/a | n/a | |
| 7/15/1993 | 5:30 a.m. | Effingham | 2.39 in. | n/a | n/a | n/a | n/a | |
| 8/1/1993 | 12:00 a.m. | Effingham | 1.53 in. | n/a | n/a | n/a | n/a | |
| 9/2/1993 thru 9/3/1993 | 2:00 p.m. | Effingham Beecher City | 2.41 in. | n/a | n/a | n/a | n/a | |
| 9/22/1993 thru 9/23/1993 | 9:30 a.m. | Effingham Beecher City | 3.00 in. | n/a | n/a | n/a | n/a | |
| 10/8/1993 thru 10/9/1993 | 9:00 p.m. | Effingham | 1.80 in. | n/a | n/a | n/a | n/a | |
| **SUBTOTAL:** | | | | **0** | **0** | **$0** | **$0** | |

**Table 4**
**Severe Storms – Heavy Rain Events Reported in Effingham County**
**1990 – 2019**
**(Sheet 3 of 18)**

| Date(s) | Start Time | Location(s) | Maximum Magnitude (inches) | Injuries | Fatalities | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|
| 11/13/1993 thru 11/15/1993 | 6:00 p.m. | Effingham | 4.59 in. | n/a | n/a | n/a | n/a | |
| 4/9/1994 thru 4/12/1994 | 5:30 p.m. | Effingham | 4.05 in. | n/a | n/a | n/a | n/a | |
| 4/27/1994 thru 4/29/1994 | 6:30 p.m. | Effingham | 2.52 in. | n/a | n/a | n/a | n/a | |
| 6/2/1994 | 12:30 a.m. | Effingham | 2.20 in. | n/a | n/a | n/a | n/a | |
| 6/23/1994 thru 6/24/1994 | 8:30 a.m. | Effingham Beecher City | 3.40 in. | n/a | n/a | n/a | n/a | |
| 3/6/1995 thru 3/7/1995 | 8:30 p.m. | Effingham Beecher City | 2.54 in. | n/a | n/a | n/a | n/a | |
| 5/9/1995 thru 5/10/1995 | 9:00 p.m. | Effingham Beecher City | 3.51 in. | n/a | n/a | n/a | n/a | |
| 5/16/1995 thru 5/18/1995 | 4:30 a.m. | Effingham Beecher City | 3.81 in. | n/a | n/a | n/a | n/a | |
| 6/20/1995 | n/a | Beecher City | 1.65 in. | n/a | n/a | n/a | n/a | |
| 6/23/1995 | n/a | Beecher City | 2.73 in. | n/a | n/a | n/a | n/a | |
| 7/25/1995 | n/a | Beecher City | 3.41 in. | n/a | n/a | n/a | n/a | |
| 8/1/1995 | n/a | Beecher City | 2.10 in. | n/a | n/a | n/a | n/a | |
| **SUBTOTAL:** | | | | **0** | **0** | **$0** | **$0** | |

**Table 4**
**Severe Storms – Heavy Rain Events Reported in Effingham County**
**1990 – 2019**
**(Sheet 4 of 18)**

| Date(s) | Start Time | Location(s) | Maximum Magnitude (inches) | Injuries | Fatalities | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|
| 4/22/1996 thru 4/22/1996 | 12:00 a.m. | Effingham Beecher City | 3.57 in. | n/a | n/a | n/a | n/a | |
| 4/27/1996 thru 4/29/1996 | 7:00 p.m. | Effingham Beecher City | 3.58 in. | n/a | n/a | n/a | n/a | ***This event is part of a federally-declared disaster (Declaration #1112)*** |
| 5/7/1996 thru 5/8/1996 | 3:30 a.m. | Effingham | 4.56 in. | n/a | n/a | n/a | n/a | ***This event is part of a federally-declared disaster (Declaration #1112)*** COOP observer noted that the Little Wabash River was out of its banks |
| 9/26/1996 thru 9/27/1996 | 9:00 a.m. | Effingham | 1.72 in. | n/a | n/a | n/a | n/a | |
| 11/24/1996 thru 11/25/1996 | 12:00 a.m.. | Effingham | 2.22 in. | n/a | n/a | n/a | n/a | |
| 2/26/1997 | 5:00 a.m. | Effingham Beecher City | 2.74 in. | n/a | n/a | n/a | n/a | |
| 3/13/1997 thru 3/14/1997 | 8:00 a.m. | Effingham | 1.68 in. | n/a | n/a | n/a | n/a | |
| 6/6/1997 | 3:30 p.m. | Effingham | 4.43 in. | n/a | n/a | n/a | n/a | |
| 7/1/1997 | n/a | Effingham | 2.16 in. | n/a | n/a | n/a | n/a | |
| 3/19/1998 thru 3/20/1998 | 2:00 p.m. | Beecher City Effingham | 1.80 in. | n/a | n/a | n/a | n/a | |
| **SUBTOTAL:** | | | | **0** | **0** | **$0** | **$0** | |

**Table 4**
**Severe Storms – Heavy Rain Events Reported in Effingham County**
**1990 – 2019**
**(Sheet 5 of 18)**

| Date(s) | Start Time | Location(s) | Maximum Magnitude (inches) | Injuries | Fatalities | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|
| 3/27/1998 thru 3/28/1998 | 8:00 p.m. | Effingham Beecher City | 1.60 in. | n/a | n/a | n/a | n/a | |
| 4/15/1998 thru 4/16/1998 | 3:30 a.m. | Effingham | 1.64 in. | n/a | n/a | n/a | n/a | |
| 5/3/1998 thru 5/4/1998 | 2:00 a.m. | Effingham | 1.78 in. | n/a | n/a | n/a | n/a | |
| 5/7/1998 thru 5/8/1998 | 2:00 a.m. | Effingham | 1.78 in. | n/a | n/a | n/a | n/a | |
| 11/2/1998 thru 11/3/1998 | 6:30 a.m. | Effingham Beecher City | 1.80 in. | n/a | n/a | n/a | n/a | |
| 1/1/1999 thru 1/2/1999 | 9:00 a.m. | Effingham Beecher City | 2.06 in. | n/a | n/a | n/a | n/a | |
| 1/21/1999 thru 1/22/1999 | 1:00 a.m. | Effingham | 2.51 in. | n/a | n/a | n/a | n/a | |
| 2/6/1999 thru 2/7/1999 | 11:00 p.m. | Effingham Beecher City | 2.91 in. | n/a | n/a | n/a | n/a | |
| 5/12/1999 | n/a | Beecher City | 2.37 in. | n/a | n/a | n/a | n/a | |
| 6/13/1999 | 9:00 a.m. | Effingham Beecher City | 2.24 in. | n/a | n/a | n/a | n/a | |
| 7/6/1999 | 3:30 p.m. | Effingham | 1.56 in. | n/a | n/a | n/a | n/a | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 11/1/1999 thru 11/2/1999 | 7:00 p.m. | Effingham | 2.00 in. | n/a | n/a | n/a | n/a | |
| 5/26/2000 thru 5/27/2000 | 10:00 a.m. | Effingham | 1.99 in. | n/a | n/a | n/a | n/a | |
| **SUBTOTAL:** | | | | **0** | **0** | **$0** | **$0** | |

**Table 4**
**Severe Storms – Heavy Rain Events Reported in Effingham County**
**1990 – 2019**
**(Sheet 6 of 18)**

| Date(s) | Start Time | Location(s) | Maximum Magnitude (inches) | Injuries | Fatalities | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|
| 6/16/2000 thru 6/17/2000 | 6:30 a.m. | Effingham Beecher City | 4.35 in. | n/a | n/a | n/a | n/a | |
| 6/23/2000 thru 6/24/2000 | 9:00 p.m. | Effingham Beecher City | 3.20 in. | n/a | n/a | n/a | n/a | |
| 7/4/2000 thru 7/5/2000 | 8:30 p.m. | Effingham Beecher City | 7.56 in. | n/a | n/a | n/a | n/a | |
| 7/18/2000 thru 7/19/2000 | 8:30 p.m. | Effingham | 1.95 in. | n/a | n/a | n/a | n/a | |
| 9/10/2000 | 3:30 a.m. | Effingham Beecher City | 2.85 in. | n/a | n/a | n/a | n/a | |
| 10/4/2000 thru 10/5/2000 | 8:00 a.m. | Effingham Beecher City | 3.19 in. | n/a | n/a | n/a | n/a | |
| 2/9/2001 | 7:00 a.m. | Effingham | 1.74 in. | n/a | n/a | n/a | n/a | COOP observer noted some flash flooding |
| **SUBTOTAL:** | | | | **0** | **0** | **$0** | **$0** | |

**Table 4**
**Severe Storms – Heavy Rain Events Reported in Effingham County**
**1990 – 2019**
**(Sheet 7 of 18)**

| Date(s) | Start Time | Location(s) | Maximum Magnitude (inches) | Injuries | Fatalities | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|
| 5/17/2001 thru 5/18/2001 | 10:30 p.m. | Effingham | 1.90 in. | n/a | n/a | n/a | n/a | |
| 10/10/2001 thru 10/12/2001 | 3:30 a.m. | Effingham Beecher City | 2.74 in. | n/a | n/a | n/a | n/a | |
| 10/13/2001 thru 10/14/2001 | 5:30 a.m. | Effingham Beecher City | 3.95 in. | n/a | n/a | n/a | n/a | |
| 12/16/2001 thru 12/17/2001 | 2:30 a.m. | Effingham | 1.82 in. | n/a | n/a | n/a | n/a | |
| 4/19/2002 thru 4/20/2002 | 8:30 p.m. | Effingham Beecher City | 2.36 in. | n/a | n/a | n/a | n/a | |
| 4/27/2002 thru 4/28/2002 | 7:00 a.m. | Effingham | 1.70 in. | n/a | n/a | n/a | n/a | ***This event is part of a federally-declared disaster (Declaration #1416)*** |
| 5/6/2002 thru 5/8/2002 | 4:30 a.m. | Effingham Beecher City | 5.27 in. | n/a | n/a | n/a | n/a | ***This event is part of a federally-declared disaster (Declaration #1416)*** |
| 5/12/2002 thru 5/13/2002 | 4:30 p.m. | Effingham Beecher City | 4.28 in. | n/a | n/a | n/a | n/a | ***This event is part of a federally-declared disaster (Declaration #1416)*** |
| **SUBTOTAL:** | | | | **0** | **0** | **$0** | **$0** | |

**Table 4**
**Severe Storms – Heavy Rain Events Reported in Effingham County**
**1990 – 2019**
**(Sheet 8 of 18)**

| Date(s) | Start Time | Location(s) | Maximum Magnitude (inches) | Injuries | Fatalities | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|
| 5/10/2003 | 9:00 a.m. | Effingham | 1.74 in. | n/a | n/a | n/a | n/a | |
| 7/9/2003 thru 7/10/2003 | 1:00 a.m. | Effingham | 2.62 in. | n/a | n/a | n/a | n/a | |
| 8/2/2003 thru 8/3/2003 | 11:00 a.m. | Effingham | 1.53 in. | n/a | n/a | n/a | n/a | |
| 9/1/2003 thru 9/2/2003 | 3:00 a.m. | Effingham Beecher City | 3.31 in. | n/a | n/a | n/a | n/a | |
| 11/17/2003 thru 11/18/2003 | 4:30 a.m. | Effingham | 2.71 in. | n/a | n/a | n/a | n/a | |
| 1/3/2004 thru 1/4/2004 | 4:00 p.m. | Effingham | 2.86 in. | n/a | n/a | n/a | n/a | |
| 3/3/2004 thru 3/4/2004 | 7:30 a.m. | Effingham | 1.55 in. | n/a | n/a | n/a | n/a | |
| 3/25/2004 thru 3/27/2004 | 6:00 p.m. | Effingham | 2.29 in. | n/a | n/a | n/a | n/a | |
| 5/26/2004 thru 5/27/2004 | 12:00 a.m. | Effingham Beecher City | 3.94 in. | n/a | n/a | n/a | n/a | |
| **SUBTOTAL:** | | | | **0** | **0** | **$0** | **$0** | |

**Table 4**
**Severe Storms – Heavy Rain Events Reported in Effingham County**
**1990 – 2019**
**(Sheet 9 of 18)**

| Date(s) | Start Time | Location(s) | Maximum Magnitude (inches) | Injuries | Fatalities | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|
| 5/30/2004 thru 5/31/2004 | 12:00 a.m. | Effingham Beecher City | 2.55 in. | n/a | n/a | n/a | n/a | |
| 8/25/2004 thru 8/26/2004 | 8:00 p.m. | Effingham | 2.94 in. | n/a | n/a | n/a | n/a | |
| 10/18/2004 thru 10/19/2004 | 3:00 a.m. | Effingham | 2.67 in. | n/a | n/a | n/a | n/a | |
| 1/3/2005 thru 1/4/2005 | 5:00 p.m. | Effingham Beecher City | 2.73 in. | n/a | n/a | n/a | n/a | |
| 1/5/2005 thru 1/6/2005 | 1:00 p.m. | Effingham Beecher City | 3.30 in. | n/a | n/a | n/a | n/a | |
| 8/13/2005 thru 8/14/2005 | 6:30 p.m. | Effingham | 2.21 in. | n/a | n/a | n/a | n/a | |
| 9/25/2005 | 5:30 a.m. | Effingham | 1.83 in. | n/a | n/a | n/a | n/a | |
| 3/9/2006 thru 3/10/2006 | 6:00 a.m. | Effingham | 1.62 in. | n/a | n/a | n/a | n/a | |
| 10/16/2006 thru 10/17/2006 | 9:30 a.m. | Effingham | 1.79 in. | n/a | n/a | n/a | n/a | |
| **SUBTOTAL:** | | | | **0** | **0** | **$0** | **$0** | |

**Table 4**
**Severe Storms – Heavy Rain Events Reported in Effingham County**
**1990 – 2019**
**(Sheet 10 of 18)**

| Date(s) | Start Time | Location(s) | Maximum Magnitude (inches) | Injuries | Fatalities | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|
| 11/15/2006 thru 11/26/2006 | 8:00 a.m. | Effingham | 2.02 in. | n/a | n/a | n/a | n/a | |
| 1/12/2007 thru 1/13/2007 | 5:00 p.m. | Effingham | 1.97 in. | n/a | n/a | n/a | n/a | |
| 6/21/2007 | n/a | Beecher City | 1.81 in. | n/a | n/a | n/a | n/a | |
| 6/26/2007 | n/a | Beecher City | 1.86 in. | n/a | n/a | n/a | n/a | |
| 10/17/2007 thru 10/18/2007 | 12:30 p.m. | Effingham | 1.97 in. | n/a | n/a | n/a | n/a | |
| 1/8/2008 | 4:00 a.m. | Effingham | 1.97 in. | n/a | n/a | n/a | n/a | |
| 2/5/2008 thru 2/6/2008 | 12:30 a.m. | Effingham Beecher City | 2.21 in. | n/a | n/a | n/a | n/a | |
| 3/17/2008 thru 3/19/2008 | 11:00 a.m. | Effingham Beecher City | 3.70 in. | n/a | n/a | n/a | n/a | |
| 3/26/2008 thru 3/28/2008 | 4:30 p.m. | Effingham Beecher City | 2.22 in. | n/a | n/a | n/a | n/a | |
| 3/31/2008 thru 4/1/2008 | 3:00 p.m. | Effingham | 1.65 in. | n/a | n/a | n/a | n/a | |
| 4/10/2008 | 4:00 a.m. | Effingham | 1.91 in. | n/a | n/a | n/a | n/a | |
| **SUBTOTAL:** | | | | **0** | **0** | **$0** | **$0** | |

**Table 4**
**Severe Storms – Heavy Rain Events Reported in Effingham County**
**1990 – 2019**
**(Sheet 11 of 18)**

| Date(s) | Start Time | Location(s) | Maximum Magnitude (inches) | Injuries | Fatalities | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|
| 5/7/2008 thru 5/8/2008 | 7:30 a.m. | Effingham | 3.34 in. | n/a | n/a | n/a | n/a | |
| 5/10/2008 thru 5/11/2008 | 7:00 p.m. | Effingham | 1.73 in. | n/a | n/a | n/a | n/a | |
| 6/6/2008 thru 6/7/2008 | 4:00 p.m. | Effingham Beecher City | 5.74 in. | n/a | n/a | n/a | n/a | |
| 6/27/2008 thru 6/28/2008 | 4:30 p.m. | Effingham Beecher City | 1.81 in. | n/a | n/a | n/a | n/a | |
| 7/3/2008 thru 7/4/2008 | 1:00 a.m. | Effingham | 3.15 in. | n/a | n/a | n/a | n/a | |
| 7/29/2008 thru 7/30/2008 | 9:00 p.m. | Effingham Beecher City | 2.37 in. | n/a | n/a | n/a | n/a | |
| 10/23/2008 thru 10/24/2008 | 1:00 p.m. | Effingham | 1.96 in. | n/a | n/a | n/a | n/a | |
| 12/27/2008 | 8:30 a.m. | Effingham | 1.74 in. | n/a | n/a | n/a | n/a | |
| 2/10/2009 thru 2/11/2009 | 9:00 p.m. | Effingham Beecher City | 3.39 in. | n/a | n/a | n/a | n/a | |
| **SUBTOTAL:** | | | | **0** | **0** | **$0** | **$0** | |

**Table 4**
**Severe Storms – Heavy Rain Events Reported in Effingham County**
**1990 – 2019**
**(Sheet 12 of 18)**

| Date(s) | Start Time | Location(s) | Maximum Magnitude (inches) | Injuries | Fatalities | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|
| 5/13/2009 thru 5/14/2009 | 6:00 a.m. | Effingham | 1.97 in. | n/a | n/a | n/a | n/a | |
| 8/19/2009 | n/a | Effingham Beecher City | 2.65 in. | n/a | n/a | n/a | n/a | |
| 10/8/2009 thru 10/9/2009 | 5:00 a.m. | Effingham Beecher City | 5.20 in. | n/a | n/a | n/a | n/a | |
| 10/22/2009 | 11:00 a.m. | Effingham Beecher City | 1.97 in. | n/a | n/a | n/a | n/a | |
| 12/24/2009 thru 12/25/2009 | 7:00 a.m. | Effingham | 2.01 in. | n/a | n/a | n/a | n/a | |
| 6/16/2010 | n/a | Effingham | 1.78 in. | n/a | n/a | n/a | n/a | |
| 6/28/2010 | n/a | Effingham | 1.78 in. | n/a | n/a | n/a | n/a | |
| 7/20/2010 | n/a | Effingham Beecher City | 2.47 in. | n/a | n/a | n/a | n/a | |
| 11/24/2010 thru 11/25/2010 | 8:00 a.m. | Effingham Beecher City | 3.42 in. | n/a | n/a | n/a | n/a | |
| 3/4/2011 thru 3/5/2011 | 7:00 p.m. | Effingham | 2.41 in. | n/a | n/a | n/a | n/a | |
| 4/26/2011 | n/a | Effingham Beecher City | 2.90 in. | n/a | n/a | n/a | n/a | |
| **SUBTOTAL:** | | | | **0** | **0** | **$0** | **$0** | |

**Table 4**
**Severe Storms – Heavy Rain Events Reported in Effingham County**
**1990 – 2019**
**(Sheet 13 of 18)**

| Date(s) | Start Time | Location(s) | Maximum Magnitude (inches) | Injuries | Fatalities | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|
| 4/28/2011 | n/a | Beecher City | 1.72 in. | n/a | n/a | n/a | n/a | |
| 6/10/2011 | 4:00 p.m. | Effingham<br>Beecher City | 2.19 in. | n/a | n/a | n/a | n/a | |
| 6/18/2011 thru 6/19/2011 | n/a | Effingham<br>Beecher City | 4.93 in. | n/a | n/a | n/a | n/a | |
| 6/25/2011 thru 6/26/2011 | 11:00 p.m. | Effingham | 1.61 in. | n/a | n/a | n/a | n/a | |
| 7/29/2011 | 8:00 p.m. | Effingham | 2.51 in. | n/a | n/a | n/a | n/a | |
| 8/20/2011 | n/a | Effingham | 2.20 in. | n/a | n/a | n/a | n/a | |
| 11/28/2011 | 5:00 p.m. | Effingham | 1.78 in. | n/a | n/a | n/a | n/a | |
| 12/14/2011 thru 12/15/2011 | 4:00 p.m. | Effingham | 1.75 in. | n/a | n/a | n/a | n/a | |
| 7/15/2012 | n/a | Effingham | 2.50 in. | n/a | n/a | n/a | n/a | |
| 8/3/2012 | n/a | Effingham<br>Beecher City | 2.88 in. | n/a | n/a | n/a | n/a | |
| 8/17/2012 | n/a | Beecher City | 1.90 in. | n/a | n/a | n/a | n/a | |
| 9/1/2012 thru 9/2/2012 | n/a | Effingham<br>Beecher City | 5.07 in. | n/a | n/a | n/a | n/a | |
| 1/13/2013 | n/a | Effingham | 1.56 in. | n/a | n/a | n/a | n/a | |
| 1/30/2013 | n/a | Effingham | 2.00 in. | n/a | n/a | n/a | n/a | |
| **SUBTOTAL:** | | | | **0** | **0** | **$0** | **$0** | |

**Table 4**
**Severe Storms – Heavy Rain Events Reported in Effingham County**
**1990 – 2019**
**(Sheet 14 of 18)**

| Date(s) | Start Time | Location(s) | Maximum Magnitude (inches) | Injuries | Fatalities | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|
| 4/18/2013 thru 4/19/2013 | 9:00 a.m. | Effingham Beecher City | 3.66 in. | n/a | n/a | n/a | n/a | |
| 4/23/2013 thru 4/24/2013 | 10:00 a.m. | Effingham | 2.64 in. | n/a | n/a | n/a | n/a | |
| 5/3/2013 | n/a | Effingham | 1.79 in. | n/a | n/a | n/a | n/a | |
| 7/22/2013 | n/a | Effingham | 1.80 in. | n/a | n/a | n/a | n/a | |
| 12/20/2013 thru 12/22/2013 | 6:00 p.m. | Effingham | 2.38 in. | n/a | n/a | n/a | n/a | |
| 4/2/2014 thru 4/4/2014 | 7:00 a.m. | Effingham | 2.90 in. | n/a | n/a | n/a | n/a | |
| 4/27/2014 thru 4/28/2014 | 1:00 p.m. | Effingham | 3.40 in. | n/a | n/a | n/a | n/a | |
| 8/8/2014 | n/a | Effingham | 1.55 in. | n/a | n/a | n/a | n/a | |
| 8/17/2014 | n/a | Effingham | 1.77 in. | n/a | n/a | n/a | n/a | |
| 9/1/2014 thru 9/2/2014 | 10:00 p.m. | Effingham | 1.87 in. | n/a | n/a | n/a | n/a | |
| 9/10/2014 | 6:00 p.m. | Effingham | 1.50 in. | n/a | n/a | n/a | n/a | |
| **SUBTOTAL:** | | | | **0** | **0** | **$0** | **$0** | |

**Table 4**
**Severe Storms – Heavy Rain Events Reported in Effingham County**
**1990 – 2019**
**(Sheet 15 of 18)**

| Date(s) | Start Time | Location(s) | Maximum Magnitude (inches) | Injuries | Fatalities | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|
| 10/2/2014 thru 10/3/2014 | 8:00 a.m. | Effingham | 2.08 in. | n/a | n/a | n/a | n/a | |
| 12/5/2014 thru 12/6/2014 | 4:00 a.m. | Effingham | 1.73 in. | n/a | n/a | n/a | n/a | |
| 5/31/2015 | n/a | Effingham | 3.93 in. | n/a | n/a | n/a | n/a | |
| 6/7/2015 thru 6/8/2015 | 10:00 p.m. | Effingham Beecher City | 4.67 in. | n/a | n/a | n/a | n/a | |
| 6/18/2015 thru 6/19/2015 | 10:00 a.m. | Effingham Beecher City | 2.95 in. | n/a | n/a | n/a | n/a | |
| 6/25/2015 thru 6/26/2015 | 10:00 a.m. | Effingham | 2.28 in. | n/a | n/a | n/a | n/a | |
| 8/6/2015 | n/a | Effingham | 1.77 in. | n/a | n/a | n/a | n/a | |
| 11/16/2015 thru 11/18/2015 | 10:00 p.m. | Effingham | 3.51 in. | n/a | n/a | n/a | n/a | |
| 11/27/2015 thru 11/28/2015 | 4:00 a.m. | Effingham | 1.88 in. | n/a | n/a | n/a | n/a | |
| 12/26/2015 thru 12/28/2015 | 9:00 a.m. | Effingham Beecher City | 6.87 in. | n/a | n/a | n/a | n/a | |
| **SUBTOTAL:** | | | | **0** | **0** | **$0** | **$0** | |

**Table 4**
**Severe Storms – Heavy Rain Events Reported in Effingham County**
**1990 – 2019**
**(Sheet 16 of 18)**

| Date(s) | Start Time | Location(s) | Maximum Magnitude (inches) | Injuries | Fatalities | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|
| 4/10/2016 thru 4/11/2016 | 1:00 p.m. | Effingham | 2.51 in. | n/a | n/a | n/a | n/a | |
| 4/26/2016 thru 4/27/2016 | 4:00 p.m. | Effingham | 3.81 in. | n/a | n/a | n/a | n/a | |
| 7/2/2016 thru 7/4/2016 | 10:00 p.m. | Effingham Beecher City | 3.87 in. | n/a | n/a | n/a | n/a | |
| 7/14/2016 | 2:00 a.m. | Beecher City | 1.50 in. | n/a | n/a | n/a | n/a | |
| 7/26/2016 | 3:00 a.m. | Effingham | 1.68 in. | n/a | n/a | n/a | n/a | |
| 8/14/2016 thru 8/15/2016 | 9:00 a.m. | Effingham Beecher City | 4.09 in. | n/a | n/a | n/a | n/a | |
| 9/16/2016 thru 9/17/2016 | 10:00 a.m. | Effingham | 1.91 in. | n/a | n/a | n/a | n/a | |
| 10/19/2016 thru 10/20/2016 | 11:00 a.m. | Effingham Beecher City | 4.39 in. | n/a | n/a | n/a | n/a | |
| 4/28/2017 thru 4/30/2017 | 7:00 a.m. | Effingham Beecher City | 4.14 in. | n/a | n/a | n/a | n/a | |
| 5/3/2017 thru 5/4/2017 | 7:00 a.m. | Effingham Beecher City | 4.04 in. | n/a | n/a | n/a | n/a | |
| **SUBTOTAL:** | | | | **0** | **0** | **$0** | **$0** | |

**Table 4**
**Severe Storms – Heavy Rain Events Reported in Effingham County**
**1990 – 2019**
**(Sheet 17 of 18)**

| Date(s) | Start Time | Location(s) | Maximum Magnitude (inches) | Injuries | Fatalities | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|
| 5/18/2017 thru 5/20/2017 | 9:00 p.m. | Effingham | 3.40 in. | n/a | n/a | n/a | n/a | |
| 7/27/2017 | 12:00 a.m. | Effingham | 2.50 in. | n/a | n/a | n/a | n/a | |
| 10/9/2017 thru 10/10/2017 | 10:00 p.m. | Effingham | 1.96 in. | n/a | n/a | n/a | n/a | |
| 10/22/2017 thru 10/23/2017 | 3:00 p.m. | Effingham | 1.84 in. | n/a | n/a | n/a | n/a | |
| 3/26/2018 thru 3/27/2018 | 4:00 p.m. | Effingham | 2.38 in. | n/a | n/a | n/a | n/a | |
| 6/10/2018 thru 6/12/2018 | 6:00 p.m. | Effingham Beecher City | 7.73 in. | n/a | n/a | n/a | n/a | |
| 6/19/2018 thru 6/20/2018 | 12:00 p.m. | Effingham Beecher City | 2.71 in. | n/a | n/a | n/a | n/a | |
| 7/14/2018 thru 7/15/2018 | 2:00 p.m. | Effingham Beecher City | 2.41 in. | n/a | n/a | n/a | n/a | |
| 7/29/2018 thru 7/30/2018 | 10:00 a.m. | Effingham Beecher City | 3.22 in. | n/a | n/a | n/a | n/a | |
| 9/8/2018 | 12:00 a.m. | Effingham | 4.00 in. | n/a | n/a | n/a | n/a | |
| **SUBTOTAL:** | | | | **0** | **0** | **$0** | **$0** | |

**Table 4**
**Severe Storms – Heavy Rain Events Reported in Effingham County**
**1990 – 2019**
**(Sheet 18 of 18)**

| Date(s) | Start Time | Location(s) | Maximum Magnitude (inches) | Injuries | Fatalities | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|
| 9/24/2018 thru 9/25/2018 | 9:00 p.m. | Effingham | 2.04 in. | n/a | n/a | n/a | n/a | |
| 1/23/2019 | n/a | Effingham Beecher City | 2.20 in. | n/a | n/a | n/a | n/a | |
| 5/21/2019 thru 5/23/2019 | 10:00 p.m. | Effingham Beecher City | 3.82 in. | n/a | n/a | n/a | n/a | |
| 5/29/2019 thru 5/30/2019 | 6:00 p.m. | Effingham | 2.32 in. | n/a | n/a | n/a | n/a | |
| 6/16/2019 | 2:00 a.m. | Effingham | 1.56 in. | n/a | n/a | n/a | n/a | |
| 6/21/2019 thru 6/22/2019 | 6:00 p.m. | Effingham | 2.24 in. | n/a | n/a | n/a | n/a | |
| 8/22/2019 | n/a | Effingham | 5.03 in. | n/a | n/a | n/a | n/a | |
| **SUBTOTAL:** | | | | **0** | **0** | **$0** | **$0** | |
| **GRAND TOTAL:** | | | | **0** | **0** | **$0** | **$0** | |

Source: NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Cooperative Observation Forms.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.

**Table 5**
**Severe Winter Storm Events Reported in Effingham County**
**1950 – 2019**
**(Sheet 1 of 13)**

| Date(s) | Start Time | Event Type | Magnitude (Maximum) | | | | | Data Source[2] | Injuries | Fatalities | Property Damages | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Snow | Freezing Rain[1] | Ice[1] | Sleet[1] | Strong Winds[1] | | | | | |
| 12/5/1950 thru 12/6/1950 | n/a | Heavy Snow | 10.7 in. | | | | | COOP (Effingham) | n/a | n/a | n/a | |
| 3/1/1953 thru 3/3/1953 | 1:00 p.m. | Winter Storm | 5.0 in. | X | | | X | COOP (Effingham) | n/a | n/a | n/a | |
| 11/27/1958 thru 11/28/1958 | 9:00 p.m. | Heavy Snow | 5.5 in. | | | | | COOP (Effingham) | n/a | n/a | n/a | |
| 2/25/1960 | 12:30 a.m. | Heavy Snow | 7.8 in. | | | | | COOP (Effingham) | n/a | n/a | n/a | |
| 3/8/1960 thru 3/9/1960 | 7:30 p.m. | Heavy Snow | 5.8 in. | | | | | COOP (Effingham) | n/a | n/a | n/a | |
| 12/20/1960 | 2:30 a.m. | Winter Storm | 4.2 in. | X | | X | | COOP (Effingham) | n/a | n/a | n/a | COOP observer noted blowing and drifting snow |
| 1/14/1962 thru 1/15/1962 | 7:30 a.m. | Winter Storm | 3.6 in. | X | | X | | COOP (Effingham) | n/a | n/a | n/a | |
| **Subtotal:** | | | | | | | | | **0** | **0** | **$0** | |

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

**Acronyms:**
COOP NWS COOP Observation Station Records SED NOAA's Storm Events Database

**Table 5**
**Severe Winter Storm Events Reported in Effingham County**
**1950 – 2019**
**(Sheet 2 of 13)**

| Date(s) | Start Time | Event Type | Magnitude (Maximum) | | | | | Data Source[2] | Injuries | Fatalities | Property Damages | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Snow | Freezing Rain[1] | Ice[1] | Sleet[1] | Strong Winds[1] | | | | | |
| 1/18/1962 thru 1/19/1962 | 7:30 a.m. | Heavy Snow | 6.6 in. | | | | | COOP (Effingham) | n/a | n/a | n/a | |
| 1/11/1964 thru 1/13/1964 | 4:00 p.m. | Heavy Snow | 9.3 in. | | | | | COOP (Effingham) | n/a | n/a | n/a | COOP observer noted blowing and drifting snow and that some highways were closed |
| 2/24/1965 thru 2/25/1965 | 8:30 a.m. | Heavy Snow | 6.4 in. | | | | | COOP (Effingham) | n/a | n/a | n/a | COOP observer noted blowing and drifting snow with drifts up to 4 feet |
| 3/3/1965 thru 3/4/1965 | 7:30 p.m. | Heavy Snow | 7.0 in. | | | | | COOP (Effingham) | n/a | n/a | n/a | |
| 1/31/1966 thru 2/2/1966 | 7:30 p.m. | Heavy Snow | 7.1 in. | | | | | COOP (Effingham) | n/a | n/a | n/a | COOP observer noted blowing snow and that schools were closed |
| 1/13/1968 thru 1/15/1968 | 8:30 p.m. | Heavy Snow | 9.3 in. | | | | | COOP (Effingham) | n/a | n/a | n/a | |
| 12/22/1969 thru 12/23/1969 | 10:00 p.m. | Heavy Snow | 6.0 in. | | | | | COOP (Effingham) | n/a | n/a | n/a | |
| **Subtotal:** | | | | | | | | | **0** | **0** | **$0** | |

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

**Acronyms:**
COOP NWS COOP Observation Station Records SED NOAA's Storm Events Database

**Table 5**
**Severe Winter Storm Events Reported in Effingham County**
**1950 – 2019**
**(Sheet 3 of 13)**

| Date(s) | Start Time | Event Type | Magnitude (Maximum) | | | | | Data Source[2] | Injuries | Fatalities | Property Damages | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Snow | Freezing Rain[1] | Ice[1] | Sleet[1] | Strong Winds[1] | | | | | |
| 12/30/1969 thru 12/31/1969 | 10:00 a.m. | Heavy Snow | 8.0 in. | | | | | COOP (Effingham) | n/a | n/a | n/a | |
| 2/13/1970 thru 2/14/1970 | 10:30 p.m. | Heavy Snow | 4.5 in. | | | | | COOP (Effingham) | n/a | n/a | n/a | |
| 12/18/1973 thru 12/20/1973 | n/a | Blizzard | 16.5 in. | | | | X | COOP (Effingham) | n/a | n/a | n/a | This storm stands as the record snowfall for the County; snow accumulations of 12 to 16.5 inches were reported and strong winds produced blizzard conditions |
| 12/31/1973 | 4:00 p.m. | Heavy Snow | 7.0 in. | | | | | COOP (Effingham) | n/a | n/a | n/a | COOP observer noted some drifting snow up to 3 feet |
| 12/6/1974 | n/a | Winter Storm | X | X | | X | | COOP (Effingham) | n/a | n/a | n/a | COOP observer noted ice patches on roads making travel conditions hazardous; also noted that a tractor trailer transport slid and turned on its side on I-57; and 10 - 15 vehicles off to the side or median of the road |
| **Subtotal:** | | | | | | | | | **0** | **0** | **$0** | |

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

**Acronyms:**
COOP NWS COOP Observation Station Records SED NOAA's Storm Events Database

**Table 5**
**Severe Winter Storm Events Reported in Effingham County**
**1950 – 2019**
**(Sheet 4 of 13)**

| Date(s) | Start Time | Event Type | Magnitude (Maximum) | | | | | Data Source[2] | Injuries | Fatalities | Property Damages | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Snow | Freezing Rain[1] | Ice[1] | Sleet[1] | Strong Winds[1] | | | | | |
| 2/23/1974 thru 2/24/1974 | 10:00 p.m. | Heavy Snow | 5.0 in. | | | | | COOP (Effingham) | n/a | n/a | n/a | |
| 11/26/1975 thru 11/27/1975 | 10:30 a.m. | Heavy Snow | 7.0 in. | | | | | COOP (Beecher City) (Effingham) | n/a | n/a | n/a | |
| 12/26/1975 | n/a | Heavy Snow | 7.0 in. | | | | | COOP (Beecher City) | n/a | n/a | n/a | |
| 1/16/1978 thru 1/17/1978 | 1:00 a.m. | Heavy Snow | 6.4 in. | | | | | COOP (Effingham) | n/a | n/a | n/a | |
| 1/24/1978 thru 1/25/1978 | 5:30 a.m. | Winter Storm | 4.0 in. | X | X | | 50 mph gusts | COOP (Effingham) (Beecher City) | n/a | n/a | n/a | COOP observer in Effingham noted strong winds and blowing snow |
| 3/2/1978 | 7:00 a.m. | Heavy Snow | 4.6 in. | | | | | COOP (Effingham) | n/a | n/a | n/a | |
| 3/7/1978 thru 3/8/1978 | 3:30 a.m. | Winter Storm | 11.0 in. | X | X | | | COOP (Effingham) (Beecher City) | n/a | n/a | n/a | |
| **Subtotal:** | | | | | | | | | **0** | **0** | **$0** | |

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

**Acronyms:**
COOP NWS COOP Observation Station Records SED NOAA's Storm Events Database

**Table 5**
**Severe Winter Storm Events Reported in Effingham County**
**1950 – 2019**
**(Sheet 5 of 13)**

| Date(s) | Start Time | Event Type | Magnitude (Maximum) | | | | | Data Source[2] | Injuries | Fatalities | Property Damages | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Snow | Freezing Rain[1] | Ice[1] | Sleet[1] | Strong Winds[1] | | | | | |
| 3/24/1978 thru 3/27/1978 | n/a | Ice Storm | | | 0.75 in. | | X | | | | | Widespread damage to trees and power lines was reported; the storm was accompanied by gusty winds which snapped power lines, power poles, many trees and TV antennas |
| 1/13/1979 | 3:30 a.m. | Winter Storm | 4.0 in. | X | | | | COOP (Effingham) | n/a | n/a | n/a | |
| 1/23/1979 thru 1/24/1979 | 11:00 a.m. | Heavy Snow | 5.5 in. | | | | | COOP (Effingham) | n/a | n/a | n/a | |
| 1/27/1979 thru 1/28/1979 | 4:30 a.m. | Heavy Snow | 5.7 in. | | | | | COOP (Effingham) | n/a | n/a | n/a | |
| 2/8/1979 | 7:00 a.m. | Heavy Snow | 4.5 in. | | | | | COOP (Effingham) | n/a | n/a | n/a | |
| 1/30/1980 thru 1/31/1980 | 12:00 a.m. | Heavy Snow | 7.4 in. | | | | | COOP (Effingham) (Beecher City) | n/a | n/a | n/a | |
| 2/28/1980 thru 3/1/1980 | 7:00 p.m. | Heavy Snow | 7.2 in. | | | | | COOP (Effingham) (Beecher City) | n/a | n/a | n/a | |
| **Subtotal:** | | | | | | | | | **0** | **0** | **$0** | |

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

**Acronyms:**
COOP NWS COOP Observation Station Records SED NOAA's Storm Events Database

**Table 5**
**Severe Winter Storm Events Reported in Effingham County**
**1950 – 2019**
**(Sheet 6 of 13)**

| Date(s) | Start Time | Event Type | Magnitude (Maximum) | | | | | Data Source[2] | Injuries | Fatalities | Property Damages | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Snow | Freezing Rain[1] | Ice[1] | Sleet[1] | Strong Winds[1] | | | | | |
| 3/12/1980 thru 3/13/1980 | 11:00 a.m. | Winter Storm | 3.0 in. | X | X | | | COOP (Effingham) (Beecher City) | n/a | n/a | n/a | |
| 11/26/1980 thru 11/28/1980 | 10:30 p.m. | Heavy Snow | 11.5 in. | | | | | COOP (Effingham) (Beecher City) | n/a | n/a | n/a | |
| 2/10/1981 | 12:30 a.m. | Heavy Snow | 6.0 in. | | | | | COOP (Beecher City) | n/a | n/a | n/a | |
| 1/29/1982 thru 1/31/1982 | 3:00 p.m. | Blizzard | 14.0 in. | | | | | COOP (Effingham) | n/a | n/a | n/a | - COOP observer noted blowing and drifting snow<br>- cars were stranded on roads and most highways were closed for up to two days |
| 2/8/1982 thru 2/9/1982 | 5:00 p.m. | Heavy Snow | 4.5 in. | | | | | COOP (Effingham) | n/a | n/a | n/a | |
| 2/27/1984 thru 2/28/1984 | 6:00 a.m. | Heavy Snow | 8.3 in. | | | | | COOP (Effingham) | n/a | n/a | n/a | COOP observer noted strong winds and blowing and drifting snow |
| 2/14/1986 | 1:00 a.m. | Heavy Snow | 5.0 in. | | | | | COOP (Effingham) | n/a | n/a | n/a | |
| **Subtotal:** | | | | | | | | | **0** | **0** | **$0** | |

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

**Acronyms:**
COOP NWS COOP Observation Station Records SED NOAA's Storm Events Database

**Table 5**
**Severe Winter Storm Events Reported in Effingham County**
**1950 – 2019**
**(Sheet 7 of 13)**

| Date(s) | Start Time | Event Type | Magnitude (Maximum) | | | | | Data Source[2] | Injuries | Fatalities | Property Damages | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Snow | Freezing Rain[1] | Ice[1] | Sleet[1] | Strong Winds[1] | | | | | |
| 1/9/1987 thru 1/10/1987 | 8:00 a.m. | Blizzard | 10.2 in. | | X | | | COOP (Effingham) (Beecher City) | n/a | n/a | n/a | numerous roads were closed due to the blowing and drifting snow |
| 2/16/1987 | n/a | Ice Storm | | X | | X | 50 mph gusts | COOP (Effingham) (Beecher City) | n/a | n/a | n/a | strong winds accompanied by freezing rain and sleet to produce power outages and traffic accidents in all of southeast IL |
| 12/15/1987 | n/a | Winter Storm | 5.0 in. | | X | | | COOP (Effingham) | n/a | n/a | n/a | |
| 12/27/1988 thru 12/28/1988 | 10:00 a.m. | Winter Storm | 5.0 in. | X | | | | COOP (Beecher City) | n/a | n/a | n/a | |
| 3/23/1990 thru 3/24/1990 | 3:30 a.m. | Heavy Snow | 12.0 in. | | | | | COOP (Effingham) | n/a | n/a | n/a | |
| 12/27/1990 thru 12/30/1990 | 9:30 a.m. | Winter Storm | 8.0 in. | X | X | X | | COOP (Effingham) | n/a | n/a | n/a | |
| 1/9/1993 thru 1/10/1993 | 5:00 p.m. | Winter Storm | 8.0 in. | X | X | | | COOP (Effingham) | n/a | n/a | n/a | |
| **Subtotal:** | | | | | | | | | **0** | **0** | **$0** | |

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

**Acronyms:**
COOP NWS COOP Observation Station Records SED NOAA's Storm Events Database

**Table 5**
**Severe Winter Storm Events Reported in Effingham County**
**1950 – 2019**
**(Sheet 8 of 13)**

| Date(s) | Start Time | Event Type | Magnitude (Maximum) | | | | | Data Source[2] | Injuries | Fatalities | Property Damages | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Snow | Freezing Rain[1] | Ice[1] | Sleet[1] | Strong Winds[1] | | | | | |
| 2/15/1993 thru 2/16/1993 | 3:00 p.m. | Heavy Snow | 7.0 in. | | | | | COOP (Effingham) (Beecher City) | n/a | n/a | n/a | |
| 2/25/1993 thru 2/26/1993 | 3:00 a.m. | Heavy Snow | 12.5 in. | | | | | COOP (Effingham) (Beecher City) | n/a | n/a | n/a | |
| 1/2/1996 thru 1/3/1996 | 2:00 a.m. | Blizzard | 4.8 in. | | | | 40 mph gusts | COOP (Beecher City) SED | n/a | n/a | n/a | strong winds lead to near whiteout conditions, making travel hazardous; numerous roads were closed |
| 1/18/1996 thru 1/19/1996 | 10:00 a.m. | Winter Storm | X | X | X | | 35 mph gusts | SED | n/a | n/a | n/a | numerous power outages and minor accidents were reported |
| 1/8/1997 thru 1/9/1997 | 8:30 p.m. | Heavy Snow | 7.8 in. | | | | | COOP (Effingham) (Beecher City) SED | n/a | n/a | n/a | COOP observer in Effingham noted blowing and drifting snow |
| 1/15/1997 thru 1/17/1997 | 3:00 a.m. | Winter Storm | 2.3 in. | X | X | X | 30 mph gusts | COOP (Effingham) (Beecher City) SED | 3 | n/a | n/a | numerous accidents were reported |
| 1/26/1997 thru 1/27/1997 | 3:30 a.m. | Winter Storm | 2.7 in. | X | | | | COOP (Effingham) (Beecher City) SED | 3 | n/a | n/a | numerous accidents were reported |
| **Subtotal:** | | | | | | | | | **6** | **0** | **$0** | |

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

**Acronyms:**
COOP NWS COOP Observation Station Records SED NOAA's Storm Events Database

**Table 5**
**Severe Winter Storm Events Reported in Effingham County**
**1950 – 2019**
**(Sheet 9 of 13)**

| Date(s) | Start Time | Event Type | Magnitude (Maximum) | | | | | Data Source[2] | Injuries | Fatalities | Property Damages | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Snow | Freezing Rain[1] | Ice[1] | Sleet[1] | Strong Winds[1] | | | | | |
| 11/13/1997 thru 11/14/1997 | 3:30 p.m. | Winter Storm | 3.0 in. | X | | X | | COOP (Effingham) SED | n/a | n/a | n/a | |
| 12/30/1997 | 8:00 a.m. | Winter Storm | 2.8 in. | | | | | COOP (Effingham) SED | n/a | 1 | n/a | numerous traffic accidents and 1 fatality was reported resulting from slick roadways |
| 1/1/1999 thru 1/3/1999 | 9:00 a.m. | Winter Storm | 7.0 in. | X | | | X | COOP (Effingham) (Beecher City) SED | n/a | n/a | n/a | - extensive blowing and drifting snow led to treacherous driving conditions<br>- temporary and extended power outages were reported throughout the area |
| 3/11/2000 | 7:00 a.m. | Heavy Snow | 6.3 in. | | | | | COOP (Effingham) SED | n/a | n/a | n/a | blowing and drifting snow |
| 12/13/2000 | 7:30 a.m. | Winter Storm | 7.0 in. | X | | X | | COOP (Effingham) (Beecher City) SED | n/a | n/a | n/a | |
| 12/24/2002 thru 12/25/2002 | 12:00 p.m. | Heavy Snow | 5.9 in. | | | | | COOP (Effingham) SED | n/a | n/a | n/a | numerous vehicle accidents were reported throughout the area |
| **Subtotal:** | | | | | | | | | **0** | **1** | **$0** | |

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

**Acronyms:**
COOP NWS COOP Observation Station Records SED NOAA's Storm Events Database

**Table 5**
**Severe Winter Storm Events Reported in Effingham County**
**1950 – 2019**
**(Sheet 10 of 13)**

| Date(s) | Start Time | Event Type | Magnitude (Maximum) | | | | | Data Source[2] | Injuries | Fatalities | Property Damages | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Snow | Freezing Rain[1] | Ice[1] | Sleet[1] | Strong Winds[1] | | | | | |
| 1/25/2004 | 9:00 a.m. | Ice Storm | | X | 0.25 in. | 1.0 in. | | COOP (Effingham) (Beecher City) SED | n/a | n/a | n/a | numerous reports of power outages, downed tree limbs and traffic accidents throughout the area |
| 1/7/2005 thru 1/8/2005 | 8:00 p.m. | Heavy Snow | 6.5 in. | | | | | COOP (Effingham) | n/a | n/a | n/a | |
| 3/20/2006 thru 3/21/2006 | 10:00 p.m. | Heavy Snow | 8.1 in. | | | | | COOP (Effingham) (Beecher City) | n/a | n/a | n/a | |
| 2/13/2007 thru 2/14/2007 | 5:00 p.m. | Heavy Snow | 6.2 in. | | | | | COOP (Beecher City) (Effingham) | n/a | n/a | n/a | |
| 12/15/2007 thru 12/16/2007 | 2:00 a.m. | Heavy Snow | 7.7 in. | | | | | COOP (Effingham) (Beecher City) SED | n/a | n/a | n/a | |
| 1/31/2008 thru 2/1/2008 | 7:30 p.m. | Heavy Snow | 10.5 in. | | | | | COOP (Beecher City) | n/a | n/a | n/a | |
| 2/22/2008 | 7:00 a.m. | Winter Storm | 7.2 in. | X | | X | | COOP (Effingham) (Beecher City) | n/a | n/a | n/a | |
| **Subtotal:** | | | | | | | | | **0** | **0** | **$0** | |

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

**Acronyms:**
COOP NWS COOP Observation Station Records SED NOAA's Storm Events Database

**Table 5**
**Severe Winter Storm Events Reported in Effingham County**
**1950 – 2019**
**(Sheet 11 of 13)**

| Date(s) | Start Time | Event Type | Magnitude (Maximum) | | | | | Data Source[2] | Injuries | Fatalities | Property Damages | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Snow | Freezing Rain[1] | Ice[1] | Sleet[1] | Strong Winds[1] | | | | | |
| 3/3/2008 thru 3/4/2008 | 6:00 a.m. | Ice Storm | | 0.50 in. | | X | | COOP (Effingham) (Beecher City) SED | n/a | n/a | n/a | tree and power line damage and many traffic accidents were reported |
| 1/26/2009 thru 1/28/2009 | 7:00 p.m. | Heavy Snow | 9.5 in. | | | | | COOP (Effingham) SED | n/a | n/a | n/a | |
| 2/15/2010 | n/a | Heavy Snow | 4.5 in. | | | | | COOP (Effingham) | n/a | n/a | n/a | |
| 12/12/2010 thru 12/13/2010 | n/a | Heavy Snow | 5.6 in. | | | | | COOP (Beecher City) | n/a | n/a | n/a | |
| 2/1/2011 thru 2/2/2011 | 12:00 p.m. | Ice Storm | 2.0 in. | X | 0.75 in. | 0.50 in. | | COOP (Effingham) SED | n/a | n/a | $900,000 | *Event Description Provided Below* |
| ***This event is part of a federally-declared disaster (Declaration #1960)***<br>- the heavy glaze of ice downed tree limbs, causing widespread power outages across the County<br>- snow-covered and icy roads resulted in numerous traffic accidents<br>- numerous county highways and several interstates were closed<br>- all schools in the area were closed for at least 3 days | | | | | | | | | | | | |
| 2/5/2011 | 2:00 a.m. | Heavy Snow | 5.0 in. | | | | | COOP (Effingham) | n/a | n/a | n/a | |
| **Subtotal:** | | | | | | | | | **0** | **0** | **$900,000** | |

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

**Acronyms:**
COOP NWS COOP Observation Station Records SED NOAA's Storm Events Database

**Table 5**
**Severe Winter Storm Events Reported in Effingham County**
**1950 – 2019**
**(Sheet 12 of 13)**

| Date(s) | Start Time | Event Type | Magnitude (Maximum) | | | | | Data Source[2] | Injuries | Fatalities | Property Damages | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Snow | Freezing Rain[1] | Ice[1] | Sleet[1] | Strong Winds[1] | | | | | |
| 3/24/2013 | 12:00 a.m. | Heavy Snow | 9.8 in. | | | | | COOP (Effingham) (Beecher City) SED | n/a | n/a | n/a | Heavy Snow led to the closing of many area schools and businesses and caused numerous traffic accidents across the area |
| 12/14/2013 thru 12/15/2013 | n/a | Heavy Snow | 6.5 in. | | | | | COOP (Beecher City) | n/a | n/a | n/a | |
| 1/5/2014 thru 1/6/2014 | 12:00 a.m. | Blizzard | 13.6 in. | | | | 35 mph gusts | COOP (Effingham) (Beecher City) SED | n/a | n/a | n/a | - significant blowing and drifting snow<br>- numerous road closures and traffic accidents were reported across the County<br>- numerous vehicles were stranded on I-70 and I-57 |
| 2/5/2014 | n/a | Heavy Snow | 5.2 in. | | | | | COOP (Effingham) | n/a | n/a | n/a | |
| 3/2/2014 | 6:00 a.m. | Sleet | | X | | 0.8 in. | | COOP (Effingham) SED | n/a | n/a | n/a | |
| 2/15/2015 thru 2/17/2015 | 8:00 p.m. | Heavy Snow | 9.0 in. | | | | | COOP (Effingham) (Beecher City) SED | n/a | n/a | n/a | numerous traffic accidents occurred due to snow-covered and hazardous roadways |
| 2/21/2015 | n/a | Heavy Snow | 4.7 in. | | | | | COOP (Beecher City) | n/a | n/a | n/a | |
| **Subtotal:** | | | | | | | | | **0** | **0** | **$0** | |

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

**Acronyms:**
COOP NWS COOP Observation Station Records SED NOAA's Storm Events Database

**Table 5**
**Severe Winter Storm Events Reported in Effingham County**
**1950 – 2019**
**(Sheet 13 of 13)**

| Date(s) | Start Time | Event Type | Magnitude (Maximum) | | | | | Data Source[2] | Injuries | Fatalities | Property Damages | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Snow | Freezing Rain[1] | Ice[1] | Sleet[1] | Strong Winds[1] | | | | | |
| 2/28/2015 thru 3/1/2015 | 4:30 p.m. | Heavy Snow | 8.0 in. | | | | | COOP (Effingham) (Beecher City) SED | n/a | n/a | n/a | numerous traffic accidents were reported due to snow-covered and hazardous roadways |
| 1/20/2016 | n/a | Heavy Snow | 5.6 in. | | | | | COOP (Beecher City) | n/a | n/a | n/a | |
| 2/25/2016 | n/a | Heavy Snow | 5.3 in. | | | | | COOP (Beecher City) | n/a | n/a | n/a | |
| 1/11/2019 thru 1/12/2019 | 6:00 p.m. | Heavy Snow | 7.6 in. | | | | | COOP (Effingham) (Beecher City) SED | n/a | n/a | n/a | numerous traffic accidents occurred due to snow-covered roads; the wet heavy snow made plowing roads difficult |
| 12/15/2019 thru 12/16/2019 | 1:30 p.m. | Heavy Snow | 8.1 in. | X | | | | COOP (Effingham) (Beecher City) SED | n/a | n/a | n/a | numerous traffic accidents occurred due to snow-covered and slick roads |
| **Subtotal:** | | | | | | | | | **0** | **0** | **$0** | |
| **GRAND TOTAL:** | | | | | | | | | **6** | **1** | **$900,000** | |

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

**Acronyms:**
COOP NWS COOP Observation Station Records SED NOAA's Storm Events Database

Source: NOAA, National Environmental Satellite, Data & Information Service, National Climatic Data Center, COOP Data / Record of Climatological Observations.
NOAA, National Environmental Satellite, Data & Information Service, National Climatic Data Center, Storm Events Database.

**Table 6**
**Extreme Cold Events Reported in Effingham County**
**1996 – 2019**

| Date(s) | Start Time | Event Type | Magnitude (Temperature °F) | | | Data Source[1] | Injuries | Fatalities | Property Damages | Impacts/Event Description |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Low (Min) | High (Max) | Wind Chill (Max) | | | | | |
| 2/2/1996 thru 2/4/1996 | 12:00 a.m. | Extreme Cold/ Wind Chill | n/a | n/a | n/a | SED | n/a | n/a | n/a | |
| 1/5/1999 | 5:00 a.m. | Extreme Cold/ Wind Chill | -15°F | 8°F | n/a | COOP (Effingham) SED | n/a | n/a | n/a | |
| 2/2/2011 thru 2/4/2011 | 6:00 p.m. | Extreme Cold/ Wind Chill | 2°F | 22°F | -15°F | COOP (Effingham) SED | n/a | 1 | n/a | due to an extended power outage during a period of extreme cold temperatures, a man suffering from a chronic respiratory condition died of hypothermia in rural Dieterich |
| 1/6/2014 thru 1/7/2014 | 12:00 a.m. | Extreme Cold/ Wind Chill | -15°F | 19°F | -45°F | COOP (Effingham) SED | n/a | n/a | n/a | |
| **GRAND TOTAL:** | | | | | | | **0** | **1** | **$0** | |

Source: NOAA, National Environmental Satellite, Data & Information Service, National Climatic Data Center, COOP Data / Record of Climatological Observations.
NOAA, National Environmental Satellite, Data & Information Service, National Climatic Data Center, Storm Events Database.

**Table 7**
**General Flood Events Reported in Effingham County**
**1990 - 2019**
**(Sheet 1 of 11)**

| Date(s) | Start Time | Body of Water | Location(s) Impacted | Magnitude | | | | Injuries | Fatalities | Property Damages | Crop Damages | Event Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Flood Crest Little Wabash River (Effingham)[1] | Impacts | | | | | | | |
| | | | | | Home[2] | Business[2] | Infra-structure[2] | | | | | |
| 5/17/1990 | n/a | Little Wabash River, area creeks and streams | countywide | 18.56 feet 5/17/1990 | n/a | n/a | X | n/a | n/a | n/a | n/a | |
| 12/30/1990 | n/a | Little Wabash River, area creeks and streams | countywide | 20.14 feet 12/30/1990 11th highest crest on record | n/a | n/a | X | n/a | n/a | n/a | n/a | |
| 9/23/1993 | n/a | Little Wabash River, area creeks and streams | countywide | 20.21 feet 9/23/1993 10th highest crest on record | n/a | n/a | X | n/a | n/a | n/a | n/a | |
| 11/14/1993 | n/a | Little Wabash River, area creeks and streams | countywide | 19.31 feet 11/14/1993 | n/a | n/a | X | n/a | n/a | n/a | n/a | |
| **Subtotal:** | | | | | | | | **0** | **0** | **$0** | **$0** | |

[1] Flood stage at the Little Wabash River near Effingham gauge location is 16.0 feet and moderate flood stage is 18.0 feet. At 13.0 water begins to overflow the banks at N 1000th Rd.

[2] An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Event Description column if available.

**Table 7**
**General Flood Events Reported in Effingham County**
**1990 - 2019**
**(Sheet 2 of 11)**

| Date(s) | Start Time | Body of Water | Location(s) Impacted | Magnitude | | | | Injuries | Fatalities | Property Damages | Crop Damages | Event Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Flood Crest Little Wabash River (Effingham)[1] | Impacts | | | | | | | |
| | | | | | Home[2] | Business[2] | Infra-structure[2] | | | | | |
| 3/8/1995 | n/a | Little Wabash River, area creeks and streams | countywide | 19.60 feet 3/8/1995 | n/a | n/a | X | n/a | n/a | n/a | n/a | |
| 3/8/1996 | n/a | Little Wabash River, area creeks and streams | countywide | 19.60 feet 3/8/1996 | n/a | n/a | X | n/a | n/a | n/a | n/a | |
| 5/8/1996 | n/a | Little Wabash River, area creeks and streams | countywide | 21.19 feet 5/8/1996 2nd highest crest on record | n/a | n/a | X | n/a | n/a | n/a | n/a | |
| 2/27/1997 | n/a | Little Wabash River, area creeks and streams | countywide | 19.28 feet 2/27/1997 | n/a | n/a | X | n/a | n/a | n/a | n/a | |
| **Subtotal:** | | | | | | | | **0** | **0** | **$0** | **$0** | |

[1] Flood stage at the Little Wabash River near Effingham gauge location is 16.0 feet and moderate flood stage is 18.0 feet. At 13.0 water begins to overflow the banks at N 1000th Rd.

[2] An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Event Description column if available.

**Table 7**
**General Flood Events Reported in Effingham County**
**1990 - 2019**
**(Sheet 3 of 11)**

| Date(s) | Start Time | Body of Water | Location(s) Impacted | Magnitude | | | | Injuries | Fatalities | Property Damages | Crop Damages | Event Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Flood Crest Little Wabash River (Effingham)[1] | Impacts | | | | | | | |
| | | | | | Home[2] | Business[2] | Infra-structure[2] | | | | | |
| 2/18/1998 thru 2/21/1998 | 12:00 a.m. | Little Wabash River, area creeks and streams | countywide | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | widespread heavy rainfall created flooding; river levels only crested about 2 feet above flood stage |
| 6/2/1999 | n/a | Little Wabash River, area creeks and streams | countywide | 20.47 feet 6/2/1999 8th highest crest on record | n/a | n/a | X | n/a | n/a | n/a | n/a | |
| 6/16/2000 thru 6/17/2000 | 8:00 p.m. | area creeks and streams | northwest portion of the county | n/a | n/a | n/a | X | n/a | n/a | n/a | n/a | several roads south of Beecher City were reported flooded for several hours; over 3 inches of rain fell in Beecher City during that time |
| 7/5/2000 | n/a | Little Wabash River, area creeks and streams | countywide | 21.13 feet 7/5/2000 3rd highest crest on record | n/a | n/a | X | n/a | n/a | n/a | n/a | |
| **Subtotal:** | | | | | | | | **0** | **0** | **$0** | **$0** | |

[1] Flood stage at the Little Wabash River near Effingham gauge location is 16.0 feet and moderate flood stage is 18.0 feet. At 13.0 water begins to overflow the banks at N 1000th Rd.

[2] An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Event Description column if available.

**Table 7**
**General Flood Events Reported in Effingham County**
**1990 - 2019**
**(Sheet 4 of 11)**

| Date(s) | Start Time | Body of Water | Location(s) Impacted | Magnitude | | | | Injuries | Fatalities | Property Damages | Crop Damages | Event Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Flood Crest Little Wabash River (Effingham)[1] | Impacts | | | | | | | |
| | | | | | Home[2] | Business[2] | Infra-structure[2] | | | | | |
| 10/5/2000 | n/a | Little Wabash River, area creeks and streams | countywide | 20.38 feet 10/5/2000 9th highest crest on record | n/a | n/a | X | n/a | n/a | n/a | n/a | |
| 5/7/2002 | 10:00 a.m. | area creeks and streams | countywide | n/a | n/a | n/a | X | n/a | n/a | n/a | n/a | ***This event is part of a federally-declared disaster (Declaration #1416)*** numerous county roads were flooded |
| 5/12/2002 thru 5/13/2002 | 5:00 p.m. | Little Wabash river, area creeks and streams | countywide | 24.27 feet 5/13/2002 highest crest on record | X | n/a | X | n/a | n/a | n/a | n/a | ***This event is part of a federally-declared disaster (Declaration #1416)*** - runoff from excessive rainfall caused flooding on numerous county roads and basements - several motorists drove into flooded roadways and had to be rescued |
| **Subtotal:** | | | | | | | | **0** | **0** | **$0** | **$0** | |

[1] Flood stage at the Little Wabash River near Effingham gauge location is 16.0 feet and moderate flood stage is 18.0 feet. At 13.0 water begins to overflow the banks at N 1000th Rd.

[2] An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Event Description column if available.

**Table 7**
**General Flood Events Reported in Effingham County**
**1990 - 2019**
**(Sheet 5 of 11)**

| Date(s) | Start Time | Body of Water | Location(s) Impacted | Magnitude | | | | Injuries | Fatalities | Property Damages | Crop Damages | Event Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Flood Crest Little Wabash River (Effingham)[1] | Impacts | | | | | | | |
| | | | | | Home[2] | Business[2] | Infra-structure[2] | | | | | |
| 5/31/2004 | n/a | Little Wabash River, area creeks and streams | countywide | 18.87 feet 5/31/2004 | n/a | n/a | X | n/a | n/a | n/a | n/a | |
| 1/5/2005 | n/a | Little Wabash River, area creeks and streams | countywide | 19.06 feet 1/5/2005 | n/a | n/a | X | n/a | n/a | n/a | n/a | |
| 4/7/2006 | n/a | Little Wabash River, area creeks and streams | countywide | 18.21 feet 4/7/2006 | n/a | n/a | X | n/a | n/a | n/a | n/a | |
| 2/5/2008 thru 2/7/2008 | 3:30 p.m. | Little Wabash river, area creeks and streams | countywide | 18.35 feet 2/6/2008 | n/a | n/a | X | n/a | n/a | n/a | n/a | |
| **Subtotal:** | | | | | | | | **0** | **0** | **$0** | **$0** | |

[1] Flood stage at the Little Wabash River near Effingham gauge location is 16.0 feet and moderate flood stage is 18.0 feet. At 13.0 water begins to overflow the banks at N 1000th Rd.

[2] An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Event Description column if available.

**Table 7**
**General Flood Events Reported in Effingham County**
**1990 - 2019**
**(Sheet 6 of 11)**

| Date(s) | Start Time | Body of Water | Location(s) Impacted | Magnitude | | | | Injuries | Fatalities | Property Damages | Crop Damages | Event Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Flood Crest Little Wabash River (Effingham)[1] | Impacts | | | | | | | |
| | | | | | Home[2] | Business[2] | Infra-structure[2] | | | | | |
| 2/19/2008 | n/a | Little Wabash River, area creeks and streams | countywide | 18.72 feet 2/19/2008 | n/a | n/a | X | n/a | n/a | n/a | n/a | |
| 3/18/2008 thru 3/20/2008 | 11:15 p.m. | Little Wabash River, area creeks and streams | countywide | 18.55 feet 3/19/2008 | n/a | n/a | X | n/a | n/a | n/a | n/a | |
| 6/6/2008 thru 6/7/2008 | 11:00 p.m. | Little Wabash River, area creeks and streams | countywide | 20.65 feet 6/7/2008 6th highest crest on record | n/a | n/a | X | n/a | n/a | n/a | n/a | |
| 12/27/2008 thru 12/29/2008 | 10:30 p.m. | Little Wabash river, area creeks and streams | countywide | 18.37 feet 12/28/2008 | n/a | n/a | X | n/a | n/a | n/a | n/a | |
| **Subtotal:** | | | | | | | | **0** | **0** | **$0** | **$0** | |

[1] Flood stage at the Little Wabash River near Effingham gauge location is 16.0 feet and moderate flood stage is 18.0 feet. At 13.0 water begins to overflow the banks at N 1000th Rd.

[2] An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Event Description column if available.

**Table 7**
**General Flood Events Reported in Effingham County**
**1990 - 2019**
**(Sheet 7 of 11)**

| Date(s) | Start Time | Body of Water | Location(s) Impacted | Magnitude | | | | Injuries | Fatalities | Property Damages | Crop Damages | Event Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Flood Crest Little Wabash River (Effingham)[1] | Impacts | | | | | | | |
| | | | | | Home[2] | Business[2] | Infra-structure[2] | | | | | |
| 2/11/2009 thru 2/12/2009 | 6:30 a.m. | Little Wabash River, area creeks and streams | southern portion of the county | 19.88 feet 2/12/2009 | n/a | n/a | X | n/a | n/a | n/a | n/a | - the Little Wabash River rose out of its banks<br>- numerous low-lying county roads across the County had water flowing across them |
| 4/30/2009 thru 5/1/2009 | 1:00 p.m. | Little Wabash River, area creeks and streams | Effingham Lake Sara | 17.40 feet 4/30/2009 | n/a | n/a | X | n/a | n/a | n/a | n/a | The Little Wabash River overflowed its banks and spilled across West Fayette Road between Effingham and Lake Sara |
| 4/26/2011 thru 4/29/2011 | 12:15 a.m. | Little Wabash River, area creeks and streams | countywide | 18.78 feet 4/26/2011 | n/a | n/a | X | n/a | n/a | n/a | n/a | |
| 4/18/2013 thru 4/20/2013 | 4:15 p.m. | Little Wabash river, area creeks and streams | countywide | 20.58 feet 4/19/2013 7th highest crest on record | n/a | n/a | X | n/a | n/a | n/a | n/a | |
| **Subtotal:** | | | | | | | | **0** | **0** | **$0** | **$0** | |

[1] Flood stage at the Little Wabash River near Effingham gauge location is 16.0 feet and moderate flood stage is 18.0 feet. At 13.0 water begins to overflow the banks at N 1000th Rd.

[2] An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Event Description column if available.

**Table 7**
**General Flood Events Reported in Effingham County**
**1990 - 2019**
**(Sheet 8 of 11)**

| Date(s) | Start Time | Body of Water | Location(s) Impacted | Magnitude | | | | Injuries | Fatalities | Property Damages | Crop Damages | Event Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Flood Crest Little Wabash River (Effingham)[1] | Impacts | | | | | | | |
| | | | | | Home[2] | Business[2] | Infra-structure[2] | | | | | |
| 2/21/2014 thru 2/22/2014 | 1:45 p.m. | Little Wabash river, area creeks and streams | countywide | 18.21 feet 2/21/2014 | n/a | n/a | X | n/a | n/a | n/a | n/a | |
| 6/8/2015 thru 6/9/2015 | 3:15 a.m. | Little Wabash river, area creeks and streams | countywide | 18.62 feet 6/8/2015 | n/a | n/a | X | n/a | n/a | n/a | n/a | *Event Description Provided Below* |
| - thunderstorms produced 4 to 7 inches of rainfall in a large part of the County in a short period of time<br>- flooding rapidly developed, which made many streets impassable in Effingham<br>- rural roads in the southwest corner and southeast parts of the County were impassable<br>- IL Rte. 37 southwest of Watson was closed<br>- a county bridge 4 miles southwest of Shumway was washed out when the Blue Creek flooded out of its banks<br>- additional rainfall during the early morning and the impacts of the overnight flooding caused roads to remain closed and creeks to stay in flood<br>- the flooding subsided by the late evening of June 8th | | | | | | | | | | | | |
| 6/19/2015 thru 6/21/2015 | 1:15 p.m. | Little Wabash river, area creeks and streams | countywide | 17.50 feet 6/20/2015 | n/a | n/a | X | n/a | n/a | n/a | n/a | |
| **Subtotal:** | | | | | | | | **0** | **0** | **$0** | **$0** | |

[1] Flood stage at the Little Wabash River near Effingham gauge location is 16.0 feet and moderate flood stage is 18.0 feet. At 13.0 water begins to overflow the banks at N 1000th Rd.

[2] An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Event Description column if available.

**Table 7**
**General Flood Events Reported in Effingham County**
**1990 - 2019**
**(Sheet 9 of 11)**

| Date(s) | Start Time | Body of Water | Location(s) Impacted | Magnitude | | | | Injuries | Fatalities | Property Damages | Crop Damages | Event Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Flood Crest Little Wabash River (Effingham)[1] | Impacts | | | | | | | |
| | | | | | Home[2] | Business[2] | Infra-structure[2] | | | | | |
| 12/26/2015 thru 12/30/2015 | 6:00 p.m. | Little Wabash river, area creeks and streams | northwest portion of the county | 21.06 feet 12/27/2015 4th highest crest on record | n/a | n/a | X | n/a | n/a | $300,000 | n/a | *Event Description Provided Below* |
| - an extended period of heavy rain during the late evening of December 26th combined with already saturated soils produced flooding<br>- rainfall amounts ranged from 2.75 to 4 inches in less than 6 hours<br>- most rural roads and state highways were flooded and impassable northwest of I-70<br>- Beecher City, Altamont and Shumway were the most impacted with flooded streets and basements<br>- several streets were also flooded in the City of Effingham<br>- the flooding continued through all of December 27th<br>- an additional 2.40 to 3 inches from December 28th into the 29th aggravated the flooding situation significantly and spread into the remainder of the County<br>- every rural road and most state highways were flooded for nearly 4 days<br>- the flood water finally subsided by the afternoon of December 31st | | | | | | | | | | | | |
| 4/29/2017 thru 5/1/2017 | 2:00 p.m. | Little Wabash river, area creeks and streams | countywide | 19.95 feet 4/30/2017 | n/a | n/a | X | n/a | n/a | n/a | n/a | *Event Description Provided Below* |
| - rainfall amounts of 3 to 4.5 inches in about a 2 hour period during the evening hours, on already saturated ground, resulted in flooding across much of the County<br>- several streets in the city of Effingham were impassable<br>- numerous rural roads, highways and creeks in the County were flooded, particularly from Beecher City to Shumway<br>- an additional 0.50 to 1 inches of rain occurred on April 30th, keeping many roads and creeks flooded; as a result, flooding continued until the late morning hours of May 1st | | | | | | | | | | | | |
| **Subtotal:** | | | | | | | | **0** | **0** | **$300,000** | **$0** | |

[1] Flood stage at the Little Wabash River near Effingham gauge location is 16.0 feet and moderate flood stage is 18.0 feet. At 13.0 water begins to overflow the banks at N 1000th Rd.

[2] An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Event Description column if available.

**Table 7**
**General Flood Events Reported in Effingham County**
**1990 - 2019**
**(Sheet 10 of 11)**

| Date(s) | Start Time | Body of Water | Location(s) Impacted | Magnitude | | | | Injuries | Fatalities | Property Damages | Crop Damages | Event Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Flood Crest Little Wabash River (Effingham)[1] | Impacts | | | | | | | |
| | | | | | Home[2] | Business[2] | Infra-structure[2] | | | | | |
| 5/4/2017 thru 5/6/2017 | 6:15 a.m. | Little Wabash river, area creeks and streams | countywide | 20.72 feet 5/5/2017 5th highest crest on record | n/a | n/a | X | n/a | n/a | n/a | n/a | *Event Description Provided Below* |
| - heavy rainfall of 2 to 3 inches during the early morning hours of May 4th, on already saturated ground, resulted in flooding across much of the County<br>- officials reported that most roads were impassable and numerous creeks rapidly flooded<br>- additional rainfall around 1 inch later in the day into the 5th caused creeks and roads to stay flooded for nearly 24 hours<br>- flood waters subsided by the afternoon of the 5th | | | | | | | | | | | | |
| 5/4/2017 thru 5/6/2017 | 6:15 a.m. | Little Wabash river, area creeks and streams | countywide | 20.72 feet 5/5/2017 5th highest crest on record | n/a | n/a | X | n/a | n/a | n/a | n/a | *Event Description Provided Below* |
| - heavy rainfall of 2 to 3 inches during the early morning hours of May 4th, on already saturated ground, resulted in flooding across much of the County<br>- officials reported that most roads were impassable and numerous creeks rapidly flooded<br>- additional rainfall around 1 inch later in the day into the 5th caused creeks and roads to stay flooded for nearly 24 hours | | | | | | | | | | | | |
| 5/11/2017 | 1:30 a.m. | area creeks and streams | southern portion of the county | n/a | n/a | n/a | X | n/a | n/a | n/a | n/a | *Event Description Provided Below* |
| - the 3rd heavy rain event in less than 2 weeks resulted in flooding in the southern portion of the County<br>- rainfalls ranged from 2 to 2.5 inches during the late evening of the 10th in areas were ditches were already full of water and soils were saturated<br>- numerous rural roads were closed near Mason and Edgewood, and water covered parts of US Hwy 45 south of Watson to the Clay County line<br>- and additional 0.50 to 0.75 inches of rain during the early morning hours of the 11th kept flood waters from receding until daybreak | | | | | | | | | | | | |
| **Subtotal:** | | | | | | | | **0** | **0** | **$0** | **$0** | |

[1] Flood stage at the Little Wabash River near Effingham gauge location is 16.0 feet and moderate flood stage is 18.0 feet. At 13.0 water begins to overflow the banks at N 1000th Rd.

[2] An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Event Description column if available.

**Table 7**
**General Flood Events Reported in Effingham County**
**1990 - 2019**
**(Sheet 11 of 11)**

| Date(s) | Start Time | Body of Water | Location(s) Impacted | Magnitude | | | | Injuries | Fatalities | Property Damages | Crop Damages | Event Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Flood Crest Little Wabash River (Effingham)[1] | Impacts | | | | | | | |
| | | | | | Home[2] | Business[2] | Infra-structure[2] | | | | | |
| 4/3/2018 thru 4/5/2018 | 8:15 a.m. | Little Wabash river, area creeks and streams | countywide | 20.08 feet 4/4/2018 | n/a | n/a | X | n/a | n/a | n/a | n/a | |
| 6/12/2018 thru 6/13/2018 | 4:45 a.m. | Little Wabash river, area creeks and streams | northern portion of the county | 19.72 feet 6/12/2018 | n/a | n/a | X | n/a | n/a | n/a | n/a | *Event Description Provided Below* |
| - heavy rainfall amounts of 4 to 8 inches resulted in flooding from late in the evening of the 11th through the early morning of the 12th<br>- the flooding impacted IL Rtes. 32 and 33 from Beecher City to Effingham<br>- there was also street flooding in the City of Effingham, and numerous rural roads were also flooded in the northern part of the County<br>- the flooding did not subside until the afternoon hours of the 12th | | | | | | | | | | | | |
| 6/22/2019 thru 6/23/2019 | 9:00 a.m. | Little Wabash river, area creeks and streams | countywide | 18.03 feet 6/23/2019 | n/a | n/a | X | n/a | n/a | n/a | n/a | |
| **Subtotal:** | | | | | | | | **0** | **0** | **$0** | **$0** | |
| **GRAND TOTAL:** | | | | | | | | **0** | **0** | **$300,000** | **$0** | |

[1] Flood stage at the Little Wabash River near Effingham gauge location is 16.0 feet and moderate flood stage is 18.0 feet. At 13.0 water begins to overflow the banks at N 1000th Rd.

[2] An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Event Description column if available.

Sources: NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Data.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.
NOAA, National Weather Service, River Observations, North Central River Forecast Center, Little Wabash River (Effingham)
United States Army Corps of Engineers, RiverGages.com, Data Mining.

**Table 8**
**Flash Flood Events Reported in Effingham County**
**1996 - 2019**
**(Sheet 1 of 13)**

| Date(s) | Start Time | Location(s) Impacted | Magnitude (Impacts) | | | Injuries | Fatalities | Property Damages | Crop Damages | Magnitude/Description |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Home[1] | Business[1] | Infra-structure[1] | | | | | |
| 5/8/1996 | 7:30 a.m. | countywide | X | n/a | X | n/a | n/a | n/a | n/a | ***This event is part of a federally-declared disaster (Declaration #1112)***<br>- 4 inches of rain fell in about 3 hours<br>- in Dieterich and Montrose, numerous roads were flooded, and some homes sustained minor flood damage |
| 7/4/2000 | 11:30 p.m. | countywide | n/a | n/a | X | n/a | n/a | n/a | n/a | - 5 to 6 inches of rain fell across most of the county, mainly between Midnight and 8 a.m.<br>- numerous roads were reported closed by flood waters, including IL Rtes. 33, 40 and 45 in and around Effingham, with water reported as deep as 2 feet in some locations<br>- a 2 mile stretch of US Hwy 40, west of Effingham, was closed due to a 6 foot by 10-foot hole under the road as a result of a nearby culvert flooding<br>- train tracks, running along US Hwy 40 around Effingham, had to be closed briefly when flooding under a track trestle over the Salt Creek River caused a 50-foot-deep by 100-foot-long hole under the tracks |
| 2/9/2001 | 1:30 p.m. | Effingham | n/a | n/a | X | n/a | n/a | n/a | n/a | - 1 to 3 inches of rain fell on frozen ground across the area during the late morning and early afternoon hours<br>- numerous streets in Effingham were reported flooded and IL Rte. 45 in the City was reported to be under water |
| **Subtotal:** | | | | | | **0** | **0** | **$0** | **$0** | |

[1] An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Event Description column if available.

**Table 8**
**Flash Flood Events Reported in Effingham County**
**1996 - 2019**
**(Sheet 2 of 13)**

| Date(s) | Start Time | Location(s) Impacted | Magnitude (Impacts) | | | Injuries | Fatalities | Property Damages | Crop Damages | Magnitude/Description |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Home[1] | Business[1] | Infra-structure[1] | | | | | |
| 6/5/2001 | 4:00 p.m. | countywide | n/a | n/a | X | n/a | n/a | n/a | n/a | - water was reported over roads across the County<br>- Moccasin Rd., around Effingham, was under water<br>- US Hwy 45 north of Effingham and US Hwy 40 between Montrose and Teutopolis were under water |
| 7/9/2001 | 5:00 a.m. | Altamont | n/a | n/a | X | n/a | n/a | n/a | n/a | - at 5:25 a.m., a street was reported flooded in the town of Altamont<br>- by 6:50 a.m., numerous streets were reported flooded in the town |
| 5/6/2002 | 11:30 a.m. | countywide | n/a | n/a | X | n/a | n/a | n/a | n/a | ***This event is part of a federally-declared disaster (Declaration #1416)***<br>numerous roads were flooded due to heavy rains |
| 5/7/2002 | 3:30 a.m. | countywide | n/a | X | X | 1 | n/a | n/a | n/a | ***This event is part of a federally-declared disaster (Declaration #1416)***<br>- up to 4 inches of rain fell over the County in a short amount of time<br>- numerous roads were flooded, including IL Rte. 45 north of Effingham, IL Rte. 128 near Beecher City, and IL Rte. 40 west of Effingham<br>- a school and the county courthouse sustained basement flood damage<br>- one man had to be rescued after he attempted to cross a flooded creek in his ATV and was swept 150 yards downstream into some trees<br>- he clung to the trees for 2 hours before he was rescued; he was treated and released from the hospital |
| **Subtotal:** | | | | | | **1** | **0** | **$0** | **$0** | |

[1] An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Event Description column if available.

**Table 8**
**Flash Flood Events Reported in Effingham County**
**1996 - 2019**
**(Sheet 3 of 13)**

| Date(s) | Start Time | Location(s) Impacted | Magnitude (Impacts) | | | Injuries | Fatalities | Property Damages | Crop Damages | Magnitude/Description |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Home[1] | Business[1] | Infra-structure[1] | | | | | |
| 5/12/2002 | 1:00 p.m. | countywide | n/a | n/a | X | 2 | n/a | n/a | n/a | ***This event is part of a federally-declared disaster (Declaration #1416)***<br>- 2 to 4 inches of rain fell on already saturated ground causing flash flooding<br>- IL Rte. 33 near Beecher City was flooded, as well as US Rte. 45 near Effingham<br>- 1 vehicle hydroplaned on wet pavement on northbound I-57 north of Effingham injuring the driver and a passenger |
| 5/8/2003 | 4:30 p.m. | countywide | n/a | n/a | X | n/a | n/a | n/a | n/a | - very heavy rain fell on already saturated ground throughout the County<br>- numerous roads were flooded for a time due to the heavy rain<br>- 1 motorist was stranded after driving into a flooded roadway 7 miles south of Altamont and had to be rescued |
| 5/26/2004 thru 5/27/2004 | 10:25 p.m. | Shumway | n/a | n/a | X | n/a | n/a | n/a | n/a | IL Rte. 33 was flooded near the Village due to heavy rains |
| **Subtotal:** | | | | | | **2** | **0** | **$0** | **$0** | |

[1] An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Event Description column if available.

**Table 8**
**Flash Flood Events Reported in Effingham County**
**1996 - 2019**
**(Sheet 4 of 13)**

| Date(s) | Start Time | Location(s) Impacted | Magnitude (Impacts) | | | Injuries | Fatalities | Property Damages | Crop Damages | Magnitude/Description |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Home[1] | Business[1] | Infra-structure[1] | | | | | |
| 5/27/2004 | 4:29 p.m. | countywide | X | X | X | n/a | n/a | n/a | n/a | - very heavy rain fell over a large part of the County flooding numerous roads including US Hwy 40 near Altamont<br>- In Dieterich, Dieterich Creek rose well above its banks when over 2 inches of rain fell in a 45-minute period between 5 p.m. and 6 p.m.<br>- the creek flooded a 6-unit apartment complex and several single-family homes<br>- the families in these homes had to be evacuated for the time until the flood waters receded |
| 5/30/2004 | 5:00 p.m. | countywide | n/a | n/a | X | n/a | n/a | n/a | n/a | brief heavy rains caused numerous roads to become flooded, especially in an area from Gilmore to Effingham to Teutopolis |
| 8/26/2004 | 6:15 a.m. | Effingham | n/a | n/a | X | n/a | n/a | n/a | n/a | very heavy rain caused US Hwy 40 and 45 to become flooded in the City |
| 1/13/2005 | 4:00 a.m. | countywide | n/a | n/a | X | n/a | n/a | n/a | n/a | several low-lying roads in the County were impassible due to water flowing across them |
| 2/5/2008 | 3:05 p.m. | Effingham | n/a | n/a | X | n/a | n/a | n/a | n/a | - many streets were flooded on the west side of the City<br>- 1 vehicle became stuck in high water near the Little Wabash River |
| **Subtotal:** | | | | | | **0** | **0** | **$130,000** | **$0** | |

[1] An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Event Description column if available.

**Table 8**
**Flash Flood Events Reported in Effingham County**
**1996 - 2019**
**(Sheet 5 of 13)**

| Date(s) | Start Time | Location(s) Impacted | Magnitude (Impacts) | | | Injuries | Fatalities | Property Damages | Crop Damages | Magnitude/Description |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Home[1] | Business[1] | Infra-structure[1] | | | | | |
| 6/6/2008 | 5:30 p.m. | Effingham<br>Teutopolis<br>Dieterich | n/a | n/a | X | n/a | n/a | $45,000<br>$25,000<br>$60,000 | n/a | *Event Description Provided Below* |
| *Effingham*<br>- multiple roads flooded out in the City<br>- 4 people were rescued from stranded vehicles within the City<br>*Teutopolis*<br>- 3 vehicles were submerged on St. Francis Rd., with 1 water rescue being performed<br>*Dieterich*<br>- several evacuations due to high water in the Village<br>- 6 to 8 houses experienced damage with approximately 1 foot of water in the basements | | | | | | | | | | |
| 5/13/2009 | 4:30 p.m. | southeast portion of the county | n/a | n/a | X | n/a | n/a | n/a | n/a | - 2 to 3 inches of rain fell in 2 hours, producing widespread flooding<br>- all of the roads in the impacted area were flooded and several were closed to traffic due to high water |
| 5/14/2009 | 2:00 a.m. | southern portion of the county | n/a | n/a | X | n/a | n/a | n/a | n/a | - 2 to 3 inches within 2-hours, on top of already saturated ground, produced significant flash flooding of most roads<br>- many roads were closed to traffic due to high water |
| 8/19/2009 thru 8/20/2009 | 7:26 p.m. | countywide | n/a | n/a | X | n/a | n/a | n/a | n/a | - 2 to 3 inches of rain fell in a 2-hour period, causing flash flooding across the County<br>- streets were flooded and ditches overflowed in the City of Effingham |
| **Subtotal:** | | | | | | **0** | **0** | **$0** | **$0** | |

[1] An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Event Description column if available.

**Table 8**
**Flash Flood Events Reported in Effingham County**
**1996 - 2019**
**(Sheet 6 of 13)**

| Date(s) | Start Time | Location(s) Impacted | Magnitude (Impacts) | | | Injuries | Fatalities | Property Damages | Crop Damages | Magnitude/Description |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Home[1] | Business[1] | Infra-structure[1] | | | | | |
| 6/13/2010 | 7:00 p.m. | Effingham<br>Lake Sara | n/a | n/a | X | n/a | n/a | n/a | n/a | - nearly 2.50 inches of rain was measured in 1-hour 2 miles west of Effingham<br>- numerous roads were impassable in the City of Effingham and in rural areas to the west of the City<br>- several roads in the vicinity of Lake Sara were closed due to high water |
| 6/15/2010 | 3:15 p.m. | countywide | n/a | n/a | X | n/a | n/a | n/a | n/a | *Event Description Provided Below* |
| - rainfall rates of 1.50 per hour for nearly 2-hours resulted in impassable rural roads south of Dieterich and east of Watson<br>- more than 1.50 inches of rain in 1-hour produced flash flooding along and northwest of I-70, including all of the City of Effingham for the second consecutive afternoon<br>- many streets in Effingham, as well as rural roads northwest of the city, were impassable for a short time during the evening rush hour | | | | | | | | | | |
| 6/27/2010 thru 6/28/2010 | 7:30 p.m. | countywide | n/a | n/a | X | n/a | n/a | n/a | n/a | - heavy rain with amounts ranging from 1.50 to 2.50 inches was measured within 2-hours during the evening<br>- some street flooding was observed in the City of Effingham<br>- the biggest impact was to rural roads from Altamont to Watson where flash flooding made them impassable |
| **Subtotal:** | | | | | | **0** | **0** | **$0** | **$0** | |

[1] An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Event Description column if available.

**Table 8**
**Flash Flood Events Reported in Effingham County**
**1996 - 2019**
**(Sheet 7 of 13)**

| Date(s) | Start Time | Location(s) Impacted | Magnitude (Impacts) | | | Injuries | Fatalities | Property Damages | Crop Damages | Magnitude/Description |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Home[1] | Business[1] | Infra-structure[1] | | | | | |
| 6/18/2011 | 1:50 a.m. | countywide | n/a | n/a | X | n/a | n/a | n/a | n/a | - thunderstorms produced nearly 3.50 inches of rain in about 90-minutes during the early morning hours of the 18th<br>- total rainfall amounts ranged from 3.50 to 6.0 across much of the County<br>- almost all rural roads were impassable, and significant street flooding was reported in the City of Effingham |
| 6/19/2011 | 4:00 a.m. | countywide | n/a | n/a | X | n/a | n/a | n/a | n/a | - early morning thunderstorms with very heavy rainfall produced flash flooding in much of the County for the second time in less than 24-hours<br>- 2 to 3 inches of rain fell in areas with very saturated ground and where flash flooding had just receded<br>- many streets in Effingham were flooded, and most rural roads in the County were impassable |
| 6/25/2011 thru 6/26/2011 | 11:15 p.m. | southern portion of the county | n/a | n/a | X | n/a | n/a | n/a | n/a | - thunderstorms during the late evening hours produced 3 to 4 inches of rain on extremely saturated ground<br>- this resulted in rapid flash flooding of creeks and roads<br>- Parts of I-57 and US Hwy 45 had several areas of standing water<br>- IL Rte. 37 and nearly all rural roads were water covered and impassable |
| **Subtotal:** | | | | | | **0** | **0** | **$0** | **$0** | |

[1] An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Event Description column if available.

**Table 8**
**Flash Flood Events Reported in Effingham County**
**1996 - 2019**
**(Sheet 8 of 13)**

| Date(s) | Start Time | Location(s) Impacted | Magnitude (Impacts) | | | Injuries | Fatalities | Property Damages | Crop Damages | Magnitude/Description |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Home[1] | Business[1] | Infra-structure[1] | | | | | |
| 5/20/2012 | 4:00 p.m. | central portion of the county | n/a | n/a | X | n/a | n/a | n/a | n/a | - nearly 4 inches in 2-hours during the early evening of the 20th<br>- an isolated, slow moving thunderstorm was responsible for the heavy rainfall<br>- many rural roads south of I-70 and west of I-57, between Altamont and Watson, were inundated |
| 5/31/2013 thru 6/1/2013 | 11:30 p.m. | countywide | n/a | n/a | X | n/a | n/a | n/a | n/a | - slow moving thunderstorms produced 3 to 4 inches of rain on already saturated ground from late evening through the night across much of the County<br>- this rapidly produced flash flooding which made rural roads impassable, and flooded numerous streets in the City of Effingham |
| 6/22/2013 | 4:00 p.m. | countywide | n/a | n/a | X | n/a | n/a | n/a | n/a | - slow moving thunderstorms produced 2 to 4 inches of rain in a 2-hour period during the late afternoon<br>- rural roads near the Shelby County line, as well as in eastern sections between Dieterich and the Clay County line, were impassable |
| **Subtotal:** | | | | | | **0** | **0** | **$0** | **$0** | |

[1] An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Event Description column if available.

**Table 8**
**Flash Flood Events Reported in Effingham County**
**1996 - 2019**
**(Sheet 9 of 13)**

| Date(s) | Start Time | Location(s) Impacted | Magnitude (Impacts) | | | Injuries | Fatalities | Property Damages | Crop Damages | Magnitude/Description |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Home[1] | Business[1] | Infra-structure[1] | | | | | |
| 6/23/2013 | 12:00 p.m. | southern portion of the county | n/a | n/a | X | n/a | n/a | n/a | n/a | - numerous thunderstorms produced 3 to 6 inches of rain on already saturated ground<br>- flash flooding was reported in the towns of Mason, Edgewood, and Eberle<br>- most rural roads were inundated, as were IL Rte. 37 and US Hwy 45, especially near the Clay County line |
| 9/2/2014 | 12:00 a.m. | southern portion of the county | n/a | n/a | X | n/a | n/a | n/a | n/a | - heavy downpours which produced 2 to 3 inches of rain per hour between 10 p.m. and 12 a.m.<br>- numerous rural roads were impassable, streets in the towns of Mason and Edgewood were flooded, and parts of US Hwy 45 near the Clay County line were closed<br>- several motorists had to be rescued after they drove into flooded ditches |
| 5/30/2015 | 4:00 p.m. | northwest portion of the county | n/a | n/a | X | n/a | n/a | n/a | n/a | - rainfall rates of more than 1 inch per hour for at least 2-hours during the late afternoon, resulted in flash flooding<br>- numerous rural roads were impassable<br>- in addition, rural roads around Lake Sara were inundated and the lake area was closed to traffic<br>- total rainfall was around 4 inches from just east of Altamont to the town of Shumway during the late afternoon and early evening hours |
| **Subtotal:** | | | | | | **0** | **0** | **$75,000** | **$0** | |

[1] An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Event Description column if available.

**Table 8**
**Flash Flood Events Reported in Effingham County**
**1996 - 2019**
**(Sheet 10 of 13)**

| Date(s) | Start Time | Location(s) Impacted | Magnitude (Impacts) | | | Injuries | Fatalities | Property Damages | Crop Damages | Magnitude/Description |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Home[1] | Business[1] | Infra-structure[1] | | | | | |
| 6/8/2015 | 1:00 a.m. | countywide | n/a | n/a | X | n/a | n/a | $75,000 | n/a | - thunderstorms produced 4 to 7 inches of rainfall, mainly between 11 p.m. and 2 a.m.<br>- flash flooding rapidly developed, which made many streets impassable in Effingham<br>- rural roads in the southwest corner and southeast parts of the county were impassable<br>- IL Rte. 37 southwest of Watson was closed<br>- a county bridge 4 miles southwest of Shumway was washed out when the Blue Creek flooded out of its banks |
| 6/19/2015 | 7:15 a.m. | countywide | n/a | n/a | X | n/a | n/a | n/a | n/a | - several periods of rainfall occurred as a result of the remnants of Tropical Storm Bill<br>- rainfall totals ranged from 2.5 to 5 inches on already saturated ground<br>- numerous creeks flooded out of their banks and water overtopped a few bridges<br>- most rural roads in the county were impassable |
| **Subtotal:** | | | | | | **0** | **0** | **$75,000** | **$0** | |

[1] An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Event Description column if available.

**Table 8**
**Flash Flood Events Reported in Effingham County**
**1996 - 2019**
**(Sheet 11 of 13)**

| Date(s) | Start Time | Location(s) Impacted | Magnitude (Impacts) | | | Injuries | Fatalities | Property Damages | Crop Damages | Magnitude/Description |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Home[1] | Business[1] | Infra-structure[1] | | | | | |
| 6/25/2015 thru 6/25/2015 | 10:00 p.m. | countywide | n/a | n/a | X | n/a | n/a | n/a | n/a | - persistent thunderstorms produced 2 to 4 inches of rain on extremely saturated ground<br>- in Altamont, the water was as high as automobile headlights<br>- many streets in the City of Effingham were flooded, and numerous rural roads in the northern half of the county were impassable |
| 7/1/2015 thru 7/2/2015 | 8:00 p.m. | west central portion of the county | n/a | n/a | X | n/a | n/a | n/a | n/a | - slow moving thunderstorms produced 2 to 3 inches of rain in 90-minutes during the evening of the 1st<br>- the ground was already saturated from periods of heavy rainfall, so flash flooding developed quickly<br>- most rural roads from Altamont to Gilmore were impassable through the late evening |
| 12/27/2015 | 12:00 a.m. | northwest portion of the county | X | n/a | X | n/a | n/a | n/a | n/a | - an extended period of heavy rain during the late evening of the 26th combined with an already saturated ground to produce flash flooding<br>- rainfall amounts ranged from 2.75 to 4 inches in less than 6-hours<br>- most rural roads and state highways were flooded and impassable northwest of I-70<br>- Beecher City, Altamont and Shumway were the most impacted with flooded streets and basements; several streets were also flooded in the City of Effingham |
| **Subtotal:** | | | | | | **0** | **0** | **$0** | **$0** | |

[1] An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Event Description column if available.

**Table 8**
**Flash Flood Events Reported in Effingham County**
**1996 - 2019**
**(Sheet 12 of 13)**

| Date(s) | Start Time | Location(s) Impacted | Magnitude (Impacts) | | | Injuries | Fatalities | Property Damages | Crop Damages | Magnitude/Description |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Home[1] | Business[1] | Infra-structure[1] | | | | | |
| 4/29/2017 | 6:30 p.m. | countywide | n/a | n/a | X | n/a | n/a | n/a | n/a | - rain amounts of 3 to 4.5 inches in about a 2-hour period during the evening hours, on already saturated ground, resulted in flash flooding<br>- several streets in the City of Effingham were impassable<br>- numerous rural roads, highways and creeks in the County were flooded, particularly from Beecher City to Shumway |
| 5/4/2017 | 8:30 a.m. | countywide | n/a | n/a | X | n/a | n/a | n/a | n/a | - heavy rainfall of 2 to 3 inches during the early morning hours of the 4th, on already saturated ground, resulted in flash flooding<br>- officials reported that most roads were impassable and numerous creeks rapidly flooded |
| 5/10/2017 thru 5/11/2017 | 10:30 p.m. | southern portion of the county | n/a | n/a | X | n/a | n/a | n/a | n/a | - the 3rd heavy rain event to occur in less than 2 weeks resulted in rapid flash flooding<br>- rainfall amounts ranged from 2 to 2.5 inches during the late evening of the 10th in areas where ditches were already full of water and soils were saturated<br>- numerous rural roads were closed near Mason and Edgewood, and water covered parts of US Hwy 45 south of Watson to the Clay County line |
| **Subtotal:** | | | | | | **0** | **0** | **$0** | **$0** | |

[1] An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Event Description column if available.

**Table 8**
**Flash Flood Events Reported in Effingham County**
**1996 - 2019**
**(Sheet 13 of 13)**

| Date(s) | Start Time | Location(s) Impacted | Magnitude (Impacts) | | | Injuries | Fatalities | Property Damages | Crop Damages | Magnitude/Description |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Home[1] | Business[1] | Infra-structure[1] | | | | | |
| 6/11/2018 thru 6/12/2018 | 9:30 p.m. | northern portion of the county | n/a | n/a | X | n/a | n/a | n/a | n/a | - heavy rainfall amounts of 5 to 8 inches resulted in flash flooding from late in the evening of the 11th through the early morning of the 12th<br>- the flooding impacted IL Rtes. 32 and 33 from Beecher City to Effingham<br>- there was also street flooding in Effingham, and numerous rural roads were flooded |
| 5/29/2019 | 6:15 p.m. | northern portion of the county | n/a | n/a | X | n/a | n/a | n/a | n/a | - slow moving thunderstorms produced 3.00 to 4.00 inches of rain in about 3 hours during the late afternoon and early evening of May 29th<br>- this resulted in rapid flash flooding of nearly all rural roads in northern portions of the County<br>- spotters reported 2 feet of water on streets in parts of Effingham and Teutopolis<br>- the flooding subsided in most locations before midnight |
| **Subtotal:** | | | | | | **0** | **0** | **$0** | **$0** | |
| **GRAND TOTAL:** | | | | | | **3** | **0** | **$205,000** | **$0** | |

[1] An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Event Description column if available.

Sources: NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.

**Table 9**
**Excessive Heat Events Reported in Effingham County**
**1994 - 2019**
**(Sheet 1 of 7)**

| Date(s) | Start Time | Magnitude (Temperature °F) | | | Data Source[1] | Injuries | Fatalities | Property Damages | Crop Damages | Impacts/Event Description |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Day (Max) | Night (Min) | Heat Index (Max) | | | | | | |
| 6/13/1994 thru 6/23/1994 | 12:00 a.m. | 98°F | 69°F | 105°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | numerous people were treated at area hospitals for heat stroke or exhaustion throughout south central and southwest Illinois |
| 7/11/1995 thru 7/17/1995 | 12:00 p.m. | 100°F | 66°F | 120°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | many roads throughout the area buckled from the extreme heat and crops withered with the dry weather |
| 7/26/1995 thru 8/3/1995 | 12:00 p.m. | 94°F | 67°F | 110°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | many heat related illnesses throughout the area |
| 8/9/1995 thru 8/20/1995 | 1:00 p.m. | 96°F | 70°F | 110°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | |
| 7/2/1997 | 12:00 p.m. | 89°F | 69°F | 110°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | |
| 7/26/1997 thru 7/27/1997 | 9:00 a.m. | 100°F | 71°F | 115°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | numerous reports of heat related injuries in most area hospitals and numerous reports of roads buckling due to high temperatures throughout the area |
| **Subtotal:** | | | | | | **0** | **0** | **$0** | **$0** | |

[1] Information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

**Acronyms:**
COOP NWS COOP Observation Station Records SED NOAA's Storm Events Database

**Table 9**
**Excessive Heat Events Reported in Effingham County**
**1994 - 2019**
**(Sheet 2 of 7)**

| Date(s) | Start Time | Magnitude (Temperature °F) | | | Data Source[1] | Injuries | Fatalities | Property Damages | Crop Damages | Impacts/Event Description |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Day (Max) | Night (Min) | Heat Index (Max) | | | | | | |
| 6/26/1998 thru 6/28/1998 | 3:00 a.m. | 96°F | 73°F | 110°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | several heat related illnesses were reported in area hospitals due to the heat; several highways in the area had sections of roadway buckle due to excessive heat |
| 7/20/1999 thru 7/26/1999 | 10:00 a.m. | 97°F | 68°F | 110°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | |
| 7/28/1999 thru 7/31/1999 | 10:00 a.m. | 100°F | 71°F | 110°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | |
| 7/8/2001 | 11:00 a.m. | 97°F | 72°F | 110°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | |
| 7/17/2001 | 11:00 a.m. | 92°F | 72°F | 115°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | |
| 7/29/2001 thru 8/2/2001 | 11:00 a.m. | 95°F | 67°F | 110°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | |
| 8/7/2001 thru 8/9/2001 | 12:00 a.m. | 97°F | 68°F | 110°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | |
| **Subtotal:** | | | | | | **0** | **0** | **$0** | **$0** | |

[1] Information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

**Acronyms:**
COOP NWS COOP Observation Station Records SED NOAA's Storm Events Database

**Table 9**
**Excessive Heat Events Reported in Effingham County**
**1994 - 2019**
**(Sheet 3 of 7)**

| Date(s) | Start Time | Magnitude (Temperature °F) | | | Data Source[1] | Injuries | Fatalities | Property Damages | Crop Damages | Impacts/Event Description |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Day (Max) | Night (Min) | Heat Index (Max) | | | | | | |
| 7/8/2002 thru 7/9/2002 | 11:00 a.m. | 99°F | 69°F | 110°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | |
| 7/20/2002 thru 7/22/2002 | 11:00 a.m. | 99°F | 72°F | 115°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | |
| 7/27/2002 thru 8/6/2002 | 11:00 a.m. | 100°F | 63°F | 115°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | |
| 8/25/2003 thru 8/29/2003 | 12:00 p.m. | 99°F | 62°F | 110°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | |
| 7/20/2004 thru 7/22/2004 | 12:00 p.m. | 96°F | 68°F | 110°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | |
| 7/22/2005 thru 7/25/2005 | 12:00 p.m. | 102°F | 66°F | 115°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | |
| 7/15/2006 thru 7/19/2006 | 12:00 p.m. | 95°F | 65°F | 110°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | |
| 7/30/2006 thru 8/2/2006 | 11:00 a.m. | 99°F | 71°F | 110°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | |
| **Subtotal:** | | | | | | **0** | **0** | **$0** | **$0** | |

[1] Information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

**Acronyms:**
COOP NWS COOP Observation Station Records SED NOAA's Storm Events Database

**Table 9**
**Excessive Heat Events Reported in Effingham County**
**1994 - 2019**
**(Sheet 4 of 7)**

| Date(s) | Start Time | Magnitude (Temperature °F) | | | Data Source[1] | Injuries | Fatalities | Property Damages | Crop Damages | Impacts/Event Description |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Day (Max) | Night (Min) | Heat Index (Max) | | | | | | |
| 8/3/2007 thru 8/16/2007 | 12:00 p.m. | 100°F | 62°F | 110°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | |
| 6/19/2009 thru 6/27/2009 | 11:00 a.m. | 95°F | 65°F | 105°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | |
| 7/13/2010 thru 7/17/2010 | 12:00 p.m. | 97°F | 70°F | 110°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | |
| 7/22/2010 thru 7/24/2010 | 12:00 p.m. | 96°F | 72°F | 110°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | |
| 8/3/2010 thru 8/4/2010 | 12:00 p.m. | 100°F | 73°F | 105°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | |
| 8/9/2010 thru 8/14/2010 | 12:00 p.m. | 99°F | 70°F | 105°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | |
| 7/1/2011 thru 7/3/2011 | 12:00 p.m. | 95°F | 69°F | 105°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | |
| **Subtotal:** | | | | | | **0** | **0** | **$0** | **$0** | |

[1] Information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

**Acronyms:**
COOP NWS COOP Observation Station Records SED NOAA's Storm Events Database

**Table 9**
**Excessive Heat Events Reported in Effingham County**
**1994 - 2019**
**(Sheet 5 of 7)**

| Date(s) | Start Time | Magnitude (Temperature °F) | | | Data Source[1] | Injuries | Fatalities | Property Damages | Crop Damages | Impacts/Event Description |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Day (Max) | Night (Min) | Heat Index (Max) | | | | | | |
| 7/10/2011 thru 7/12/2011 | 12:00 p.m. | 97°F | 69°F | 115°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | |
| 7/16/2011 thru 8/3/2011 | 12:00 p.m. | 99°F | 66°F | 115°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | |
| 8/6/2011 thru 8/7/2011 | 12:00 p.m. | 93°F | 70°F | 110°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | |
| 8/31/2011 thru 9/3/2011 | 12:00 p.m. | 100°F | 65°F | 105°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | |
| 6/29/2012 thru 7/19/2012 | 1:45 p.m. | 108°F | 67°F | 110°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | |
| 7/21/2012 thru 7/27/2012 | 12:00 p.m. | 104°F | 64°F | 110°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | |
| 7/31/2012 thru 8/2/2012 | 12:00 p.m. | 101°F | 67°F | n/a | COOP (Effingham) | n/a | n/a | n/a | n/a | |
| 8/26/2013 thru 8/31/2013 | 11:00 a.m. | 97°F | 68°F | 110°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | |
| **Subtotal:** | | | | | | **0** | **1** | **$0** | **$0** | |

[1] Information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

**Acronyms:**
COOP NWS COOP Observation Station Records SED NOAA's Storm Events Database

**Table 9**
**Excessive Heat Events Reported in Effingham County**
**1994 - 2019**
**(Sheet 6 of 7)**

| Date(s) | Start Time | Magnitude (Temperature °F) | | | Data Source[1] | Injuries | Fatalities | Property Damages | Crop Damages | Impacts/Event Description |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Day (Max) | Night (Min) | Heat Index (Max) | | | | | | |
| 8/21/2014 thru 8/29/2014 | 12:00 p.m. | 95°F | 68°F | 110°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | |
| 7/12/2015 | 11:30 a.m. | 96°F | 71°F | 105°F | COOP (Effingham) SED | n/a | 1 | n/a | n/a | a 78-year-old woman from Shumway died as a result of a heat stroke |
| 7/17/2015 thru 7/18/2015 | 11:00 a.m. | 95°F | 73°F | 110°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | |
| 7/27/2015 thru 7/28/2015 | 11:00 a.m. | 94°F | 73°F | 110°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | |
| 7/17/2016 thru 7/25/2016 | 11:00 a.m. | 96°F | 70°F | 110°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | |
| 7/17/2017 thru 7/23/2017 | 12:00 p.m. | 100°F | 65°F | 110°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | |
| **Subtotal:** | | | | | | **0** | **1** | **$0** | **$0** | |

Source: NOAA, National Environmental Satellite, Data & Information Service, National Climatic Data Center, Storm Events Database.

[1] Information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

**Acronyms:**
COOP NWS COOP Observation Station Records SED NOAA's Storm Events Database

**Table 9**
**Excessive Heat Events Reported in Effingham County**
**1994 - 2019**
**(Sheet 7 of 7)**

| Date(s) | Start Time | Magnitude (Temperature °F) | | | Data Source[1] | Injuries | Fatalities | Property Damages | Crop Damages | Impacts/Event Description |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Day (Max) | Night (Min) | Heat Index (Max) | | | | | | |
| 6/30/2018 thru 7/5/2018 | n/a | 96°F | 71°F | n/a | COOP (Effingham) | n/a | n/a | n/a | n/a | |
| 7/18/2019 thru 7/21/2019 | 12:00 p.m. | 95°F | 69°F | 105°F | COOP (Effingham) SED | n/a | n/a | n/a | n/a | |
| **Subtotal:** | | | | | | **0** | **0** | **$0** | **$0** | |
| **GRAND TOTAL:** | | | | | | **0** | **1** | **$0** | **$0** | |

Source: NOAA, National Environmental Satellite, Data & Information Service, National Climatic Data Center, Storm Events Database.

[1] Information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

**Acronyms:**

COOP NWS COOP Observation Station Records SED NOAA's Storm Events Database

**Table 10**
**Tornadoes Reported in Effingham County**
**1950 - 2019**
**(Sheet 1 of 5)**

| Map No. | Date(s) | Start Time | Location(s) | Magnitude (Fujita Scale) | Length[1] (Miles) | Width (Yards) | Injuries | Deaths | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3/15/1959 | 12:40 a.m. | Altamont[^] | F2 | 2.0 | 10 | 2 | n/a | $25,000 | n/a | 1 farmstead sustained heavy damage |
| 2 | 4/17/1960 | 2:55 a.m. | Edgewood<br>Mason<br>Elliottstown[^]<br>Dieterich | F2 | 19.3 | 200 | n/a | n/a | $25,000 | n/a | *Event Description Provided Below* |
| *Touchdown/Liftoff – Two Counties*<br>tornado touched down in Edgewood and traveled northeast through Dieterch before lifting north of Wheeler in Jasper County – total length: 21.9 miles | | | | | | | - damaged about 20 farmsteads | | | | |
| 3 | 6/22/1960 | 8:00 p.m. | Shumway | F2 | 0.1 | 10 | n/a | n/a | $250,000[§] | n/a | damaged homes, a church, the high school cafeteria and destroyed several barns |
| 4 | 3/6/1961 | 4:00 a.m. | Effingham<br>Dieterich[^] | F3 | 9.9 | 10 | n/a | n/a | $250,000 | n/a | *Event Description Provided Below* |
| *Touchdown/Liftoff - Two Counties*<br>- tornado touchdown on the southeast edge of Effingham and traveled southeast crossing into Jasper County before lifting off in Newton - total length: 21.2 miles | | | | | | | *Effingham*<br>- a concrete block service station was destroyed<br>- a drive-in theatre screen was knocked over<br>- farm buildings were damaged | | | | |
| 5 | 9/24/1961 | 1:00 p.m. | Effingham[^] | F1 | 0.25 | 50 | n/a | n/a | $2,500 | n/a | |
| 6 | 5/15/1967 | 1:45 p.m. | Watson[^] | F1 | 0.5 | 20 | n/a | n/a | $2,500 | n/a | damaged tree tops and the roof of an industrial building; debris from the roof could be seen in the departing funnel |
| **Subtotal:** | | | | | | | **2** | **0** | **$555,000** | **$0** | |

[1] The length provided is only for the portion of the tornado that occurred in Effingham County.

[^] Tornado touchdown verified in the vicinity of this location(s).

[§] Included in property damage total is crop damages sustained as a result of the tornado according to the Storm Data Publication for this event. A breakdown by damage type was unavailable.

**Table 10**
**Tornadoes Reported in Effingham County**
**1950 - 2019**
**(Sheet 2 of 5)**

| Map No. | Date(s) | Start Time | Location(s) | Magnitude (Fujita Scale) | Length[1] (Miles) | Width (Yards) | Injuries | Deaths | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 7 | 7/1/1973 | 6:30 p.m. | Mason[^] | F1 | 0.1 | 10 | n/a | n/a | $2,500 | n/a | tornado touched down at a farm and tore the roof off of a machine shed and damaged machines inside the shed |
| 8 | 8/10/1974 | 2:20 p.m. | Effingham[^] | F0 | 0.1 | 10 | n/a | n/a | $30 | n/a | several tents for a church picnic were ripped |
| 9 | 5/1/1983 | 9:45 p.m. | Edgewood[^] | F0 | 0.2 | 30 | n/a | 2 | $250,000 | n/a | two people were killed in their mobile home when it was destroyed |
| 10 | 4/12/1984 | 6:25 p.m. | Dieterich[^] | F0 | 0.15 | 10 | n/a | n/a | $25,000 | n/a | *Event Description Provided Below* |
| *Touchdown/Liftoff - Two Counties*<br>tornado touched down east of Dieterich and traveled east lifting off just over the Effingham/Jasper County Line - total length: 0.25 miles | | | | | | | - a barn and 2 grain bins were destroyed; a farm house was also damaged | | | | |
| 11 | 4/27/1984 | 6:35 p.m. | Effingham | F0 | 0.3 | 30 | n/a | n/a | $30 | n/a | |
| 12 | 5/25/1989 | 1:50 p.m. | Altamont | F1 | 0.25 | 50 | n/a | n/a | $25,000 | n/a | |
| 13 | 5/16/1990 | 1:00 a.m. | Altamont<br>Funkhouser<br>Lake Sara<br>Effingham | F1 | 10.0 | 100 | n/a | n/a | $250,000 | n/a | *Effingham*<br>- heavy roof damage occurred at the 400 Plaza and Effingham builders supply<br>- a 70-foot antenna was blown over at Finest Detail Auto Cleaning |
| **Subtotal:** | | | | | | | **0** | **2** | **$552,560** | **$0** | |

[1] The length provided is only for the portion of the tornado that occurred in Effingham County.

[^] Tornado touchdown verified in the vicinity of this location(s).

[§] Included in property damage total is crop damages sustained as a result of the tornado according to the Storm Data Publication for this event. A breakdown by damage type was unavailable.

**Table 10**
**Tornadoes Reported in Effingham County**
**1950 - 2019**
**(Sheet 3 of 5)**

| Map No. | Date(s) | Start Time | Location(s) | Magnitude (Fujita Scale) | Length[1] (Miles) | Width (Yards) | Injuries | Deaths | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 14 | 7/2/1993 | 6:50 p.m. | Watson | F0 | 0.4 | 33 | n/a | n/a | $2,500 | | tornado touched down briefly in an open field |
| 15 | 4/26/1994 | 10:30 p.m. | Eberle[^] | F2 | 6.0 | 50 | 3 | n/a | $500,000 | n/a | *Event Description Provided Below* |
| - a two-car garage was destroyed, and several trees were downed<br>- a two-story home was partially placed on its side | | | | | | | - 2 children received minor injuries while the father was significantly injured after his neck was punctured by a 2-inch piece of glass<br>- a small shed, siding of a barn, several farm buildings and grain bins were damaged | | | | |
| 16 | 5/2/1998 | 6:44 p.m. | Lake Sara[^] | F0 | 0.1 | 30 | n/a | n/a | n/a | n/a | 2 trees were blown down |
| 17 | 6/1/1999 | 7:10 p.m. | Altamont | F0 | 0.2 | 10 | n/a | n/a | n/a | n/a | |
| 18 | 4/16/2006 | 4:09 p.m. | Elliottstown[^]<br>Dieterich[^] | F2 | 4.0 | 200 | n/a | n/a | n/a | n/a | *Event Description Provided Below* |
| *Intersection of 700th Ave. & 2000th St.*<br>- a farmstead was struck, destroying a barn, 4 outbuildings and several grain bins<br>- 1 mile east, dozens of trees were snapped, and the roof of a well-built home was damaged<br>- another mile east, two homesteads were struck; considerable tree damage was noted, 3 outbuildings were destroyed, and an attached garage was destroyed when the overhead door failed, and the side wall was blown out | | | | | | | *Intersection of 2300th St.& 700th Ave.*<br>- about 1 mile north of the intersection, a well-built home had an attached garage destroyed, the front porch roof torn off, and 2 second story dormers torn off<br>*800th Ave & Effingham/Jasper County line*<br>- 2 outbuildings on the farm were completely destroyed and a small combine in one of the buildings was flipped into an adjacent pond<br>- an antenna tower was blown over next to the house and the home sustained siding, roofing and window damage | | | |
| **Subtotal:** | | | | | | | **3** | **0** | **$502,500** | **$0** | |

[1] The length provided is only for the portion of the tornado that occurred in Effingham County.

[^] Tornado touchdown verified in the vicinity of this location(s).

**Table 10**
**Tornadoes Reported in Effingham County**
**1950 - 2019**
**(Sheet 4 of 5)**

| Map No. | Date(s) | Start Time | Location(s) | Magnitude (Fujita Scale) | Length[1] (Miles) | Width (Yards) | Injuries | Deaths | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 19 | 11/17/2013 | 12:28 p.m. | Altamont[^] | EF1 | 2.9 | 100 | n/a | n/a | $400,000 | n/a | *Touchdown/Liftoff-Two Counties* tornado touched down in Fayette County east of Brownstown and traveled northeast crossing into Effingham County before lifting off 2.5 miles northwest of Altamont - total length: 11.4 miles<br>- about a dozen outbuildings were damaged and minor damage occurred to the roofs of 3 homes<br>- several power poles were blown down |
| 20 | 2/20/2014 | 4:54 p.m. | Beecher City[^]<br>Shumway[^] | EF1 | 1.54 | 100 | n/a | n/a | $80,000 | n/a | several power poles were snapped |
| **Subtotal:** | | | | | | | **0** | **0** | **$480,000** | **$0** | |

[1] The length provided is only for the portion of the tornado that occurred in Effingham County.

[^] Tornado touchdown verified in the vicinity of this location(s).

**Table 10**
**Tornadoes Reported in Effingham County**
**1950 - 2019**
**(Sheet 5 of 5)**

| Map No. | Date(s) | Start Time | Location(s) | Magnitude (Fujita Scale) | Length[1] (Miles) | Width (Yards) | Injuries | Deaths | Property Damage | Crop Damage | Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 21 | 4/27/2016 | 5:58 p.m. | Altamont[↖] | EF0 | 0.05 | 10 | n/a | n/a | n/a | n/a | |
| 22 | 4/3/2018 | 3:34 p.m. | Edgewood[↖]<br>Mason[↖] | EF1 | 7.33 | 100 | n/a | n/a | n/a | n/a | *Touchdown/Liftoff - Two Counties*<br>- tornado touched down in eastern Fayette County and traveled northeast into Effingham County before lifting off 3.4 miles northwest of Mason - total length 18.27 miles<br>- 5 outbuildings, a large grain bin, and a garage were destroyed<br>- on 3 farmsteads, 6 outbuildings, a camper, an unoccupied trailer, and numerous trees were damaged or destroyed |
| **Subtotal:** | | | | | | | **0** | **0** | **$0** | **$0** | |
| **GRAND TOTAL:** | | | | | | | **5** | **2** | **$2,090,060** | **$0** | |

[1] The length provided is only for the portion of the tornado that occurred in Effingham County.

[↖] Tornado touchdown verified in the vicinity of this location(s).

Source: NOAA, National Environmental Satellite, Data & Information Service, National Climatic Data Center, Storm Events Database.

**Table 11**
**Drought Events Reported in Effingham County**
**1980 – 2019**
**(Sheet 1 of 2)**

| Year | Date Range | Magnitude (Drought Intensity Category) | | | | | Percent Crop Yield Reduction from Previous Year | | Designated USDA Primary Natural Disaster Area | Crop Damages | Impacts/Event Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | D0 | D1 | D2 | D3 | D4 | Corn | Soybeans | | | |
| 1983 | n/a | | | | | | 68.7% | 57.1% | n/a | n/a | All 102 counties in Illinois were proclaimed state disaster areas because of high temperatures and insufficient precipitation beginning in mid-June |
| 1988 | June 1988 thru September 1989 | | | | | | 46.3% | 34.3% | n/a | n/a | Approximately half of all Illinois counties were impacted by drought conditions |
| 2005 | May 2005 thru September 2005 | X | X | | | | 30.4% | 22.0% | Yes | n/a | 93 Illinois counties were designated as agricultural disaster areas due to drought |
| 2007 | August 2007 thru December 2007 | X | X | X | | | --- | 25.0% | No | n/a | |
| 2011 | August 2011 thru October 2011 | X | X | | | | 2.7% | 12.0% | Yes | n/a | |
| **Subtotal:** | | | | | | | | | | $0 | |

[1] An "X" in a Drought Intensity Category column indicates that level of drought was reached by at least a portion of the County during the event.

**Acronyms:**

| US Drought Monitor – Drought Intensity Categories | | | |
|---|---|---|---|
| D0 | abnormally dry | D3 | extreme drought |
| D1 | moderate drought | D4 | exceptional drought |
| D2 | severe drought | | |

**Table 11**
**Drought Events Reported in Effingham County**
**1980 – 2019**
**(Sheet 2 of 2)**

| Year | Date Range | Magnitude (Drought Intensity Category) | | | | | Percent Crop Yield Reduction from Previous Year | | Designated USDA Primary Natural Disaster Area | Crop Damages | Impacts/Event Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | D0 | D1 | D2 | D3 | D4 | Corn | Soybeans | | | |
| 2012 | May 2012 thru January 2013 | X | X | X | X | | 72.1% | 4.1% | Yes | $32,800,000 | 66 counties in Illinois, were designated as primary natural disaster areas due to damage and losses caused by drought and extreme heat |
| **Subtotal:** | | | | | | | | | | $32,800,000 | |
| **GRAND TOTAL:** | | | | | | | | | | **$32,800,000** | |

[1] An "X" in a Drought Intensity Category column indicates that level of drought was reached by at least a portion of the County during the event.

Sources: Illinois State Water Survey, Illinois State Climatologist.
National Drought Mitigation Center, United States Drought Monitor.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.

**Acronyms:**

US Drought Monitor – Drought Intensity Categories

| | | | |
|---|---|---|---|
| D0 | abnormally dry | D3 | extreme drought |
| D1 | moderate drought | D4 | exceptional drought |
| D2 | severe drought | | |

**Table 12**
**Roadway Incidents* Involving Shipments of Hazardous Substances - 2010 – 2019**
**(Sheet 1 of 2)**

| Date | Area | Location | Hazardous Product Released | Quantity Released |
|---|---|---|---|---|
| 2/10/2010 | Edgewood[^] | I-57 SB, M.P. #143 | Diesel fuel | Unknown |
| 3/10/2010 | Effingham | I-57 SB | Diesel | 100 gallons |
| 5/19/2010 | Montrose | I-70 WB, M.P. 105 | Diesel fuel | 50 gallons |
| 6/1/2010 | Effingham | I-57 NB and I-70, Exit 162 | Diesel fuel | Unknown |
| 12/16/2010 | Edgewood[^] | I-57 | Diesel fuel | 90 gallons |
| 3/12/2011 | Effingham[^] | I-70 WB at the Wabash River Crossing | Diesel fuel | 87 gallons |
| 6/14/2011 | Effingham[^] | I-70 EB, M.P. 92 | Diesel | Unknown |
| 6/19/2011 | Effingham | I-70 WB, M.P. 158 | Diesel fuel | 40 gallons |
| 7/5/2011 | Effingham[^] | I-57 and I-70 split | Diesel fuel | More than 50 gallons |
| 7/28/2011 | Effingham[^] | I-70 EB, M.P. 92 | Diesel fuel | 200 gallons |
| 9/15/2011 | Effingham | I-70 WB, M.P. 93 | Diesel | "large amount" |
| 10/19/2011 | Effingham[^] | I-70 WB, M.P. 92 | Diesel fuel | Above 50 gallons |
| 10/20/2011 | Effingham[^] | I-70 WB at I-57 interchange, West of Effingham | Used motor oil | < 5 gallons |
| 1/13/2012 | Effingham | I-57 NB, ¼ mile South of M.P. 159 | Diesel fuel | Over 50 gallons |
| 1/20/2012 | Effingham | I-57 NB, M.P. 158 | Diesel fuel | 60 gallons |
| 2/20/2012 | Effingham[^] | I-57 SB near exit #163 | Diesel fuel and/or motor oil | Unknown |
| 4/9/2012 | Teutopolis | US HWY 40 and Harvester St. | Diesel fuel | 50-60 gallons |
| 4/17/2012 | Effingham[^] | I-57/I-70 split, South tri-level | Diesel fuel | Approx. 100 gallons |
| 5/14/2012 | Effingham | I-57 & I-70 WB, M.P.160 | Diesel fuel | > 50 gallons |
| 5/15/2012 | Edgewood | South of Altamont – 300th Ave. and corner of 300 St. | Acumen | Approx. 50 gallons |

* For the purposes of this report a roadway incident is generally defined as an accident/incident that occurs while in the process of transporting a hazardous substance(s) on a highway, roadway, access drive, field entrance, rest area or parking lot. Vehicles that experience a release while refueling are not considered roadway incidents, but are instead considered fixed facility incidents.

[^] Accident verified in the vicinity of this area.

**Table 12**
**Roadway Incidents* Involving Shipments of Hazardous Substances - 2010 – 2019**
**(Sheet 2 of 2)**

| Date | Area | Location | Hazardous Product Released | Quantity Released |
|---|---|---|---|---|
| 8/16/2012 | Effingham | I-70/I-57, between M.P. 159 and 162 | Diesel fuel | Unknown |
| 1/29/2013 | Effingham^ | I-57 NB, M.P. #164.5 | Diesel fuel | Unknown |
| 2/21/2013 | Effingham^ | I-70 EB | Diesel fuel | Unknown |
| 3/19/2013 | Effingham^ | I-70 EB, M.P. 90 | Diesel fuel | Approx. 200 gallons |
| 4/24/2013 | Effingham | Fayette Ave. and I-57/70 Frontage Rd. | Diesel fuel | 200-250 gallons |
| 6/14/2013 | Effingham | I-57 and I-70 interchange at Keller Dr. | Gasoline | Unknown |
| 7/8/2013 | Altamont^ | Unnamed retention pond near IL Rte. 40 at 575E | Roundup herbicide | 500 gallons |
| 5/22/2014 | Effingham | I70/57, Exit 162 | Diesel fuel | Unknown |
| 6/11/2014 | Effingham | I-70 EB, M.P. 98.5 | Diesel and unknown oil | Around 120 gallons of fuel |
| 9/25/2014 | Effingham^ | I-57 NB, M.P. 157 | Diesel fuel | <70 gallons |
| 1/3/2015 | Effingham^ | I-57 NB, M.P. 161 | Diesel fuel | Approx. 250 gallons |
| 2/12/2015 | Effingham^ | 1900 St. & US Rte. 45 | Gasoline | 20 gallons |
| 4/2/2015 | Funkhouser^ | 12614 N. 900th St. | Motor oil | Unknown |
| 4/5/2015 | Effingham^ | I-70 WB, M.P. 92 | Diesel fuel | 100 gallons |
| 5/23/2015 | Effingham^ | I-57 NB, M.P. 161 | Diesel fuel | 100-200 gallons |
| 6/11/2015 | Watson^ | I-57 NB, M.P. 154 | Diesel fuel | 1 gallon |
| 7/6/2015 | Edgewood^ | I-57 SB, M.P. 145 | Diesel fuel | 60 gallons |
| 4/26/2016 | Altamont^ | ½ mile North of 200 St. and 1100 Ave. | Anhydrous ammonia | 5,582 lbs. |
| 6/13/2016 | Teutopolis | 1.5 miles East of Teutopolis | 28% UAN fertilizer | 500 gallons |
| 9/27/2016 | Effingham^ | I-57 SB | Diesel fuel and motor oil | 10-15 gallons of diesel fuel, Approx. 5-10 gallons of motor oil |
| 7/27/2017 | Effingham^ | Junction of I-70 and I-57 | Diesel fuel | 30-60 gallons |
| 8/9/2017 | Edgewood^ | I-57 NB, Exit 145 | Diesel fuel | Unknown |
| 1/23/2019 | Teutopolis | Pearl St., 500 yards South of Elm St. | Motor oil and gasoline | 9.5 gallons of motor oil, 8-12 gallons of gasoline |
| 11/7/2019 | Effingham | I-57 SB, Exit 162 off ramp | Diesel fuel and motor oil | 50 gallons |
| 11/15/2019 | Effingham^ | I-70 EB, M.P. 98 | Diesel | 100 gallons |

* For the purposes of this report a roadway incident is generally defined as an accident/incident that occurs while in the process of transporting a hazardous substance(s) on a highway, roadway, access drive, field entrance, rest area or parking lot. Vehicles that experience a release while refueling are not considered roadway incidents, but are instead considered fixed facility incidents.

^ Accident verified in the vicinity of this area.

Source: Illinois Emergency Management Agency, Hazardous Materials Incident Reports.

**Table 13**
**Hazmat Incidents in Effingham County: 2010 – 2019**
**(Sheet 1 of 3)**

| Date | Location | Hazardous Substances Released |
|---|---|---|
| **2010** | | |
| 02/10 | Edgewood^ | Diesel fuel† |
| 03/10 | Effingham | Diesel† |
| 05/19 | Montrose | Diesel fuel† |
| 06/01 | Effingham | Diesel fuel† |
| 10/04 | Watson | Biodiesel |
| 10/20 | Effingham | Gasoline, misc. petroleum products, possible asbestos insulation, propane, solvents, unknown material |
| 12/16 | Edgewood^ | Diesel fuel† |
| **2011** | | |
| 02/09 | Effingham | Gasoline |
| 02/09 | Effingham | Diesel fuel |
| 03/12 | Effingham^ | Diesel fuel† |
| 04/08 | Effingham | Methyl methacrylate monomer§ |
| 04/19 | Edgewood | Gasoline |
| 06/14 | Effingham^ | Diesel† |
| 06/19 | Effingham | Diesel fuel† |
| 07/05 | Effingham^ | Diesel fuel† |
| 07/08 | Effingham | Resin pollution (E-coat cathoguard 500) |
| 07/28 | Effingham^ | Diesel fuel† |
| 09/15 | Effingham | Diesel† |
| 09/28 | Effingham | Diesel fuel§ |
| 10/19 | Effingham^ | Diesel fuel† |
| 10/20 | Effingham^ | Used motor oil† |
| 11/14 | Effingham | Diesel |
| **2012** | | |
| 01/13 | Effingham | Diesel fuel† |
| 01/20 | Effingham | Diesel fuel† |
| 02/20 | Effingham^ | Diesel fuel and/or motor oil† |
| 04/09 | Teutopolis | Diesel fuel† |
| 04/17 | Effingham^ | Diesel fuel† |
| 05/09 | Effingham | Water & unknown petroleum products |
| 05/14 | Effingham | Diesel fuel† |
| 05/15 | Edgewood | Acumen† |
| 08/16 | Effingham | Diesel fuel† |
| 08/20 | Effingham | Gasoline |
| 09/12 | Effingham | Diesel, gasoline, and used oil |
| 09/14 | Effingham | Salt water |
| 11/14 | Effingham | Varnish or flammable paint |
| 12/03 | Effingham | Animal fat |

^ Incident verified in the vicinity of this location.
† Incident involved the transportation of a hazardous substance by roadway.
* Incident involved the transportation for a hazardous substance by pipeline.
§ Incident involved the transportation of a hazardous substance by rail.
+ Incident involved the transportation of a hazardous substance by waterway.

**Table 13**
**Hazmat Incidents in Effingham County: 2010 – 2019**
**(Sheet 2 of 3)**

| Date | Location | Hazardous Substances Released |
|---|---|---|
| **2013** | | |
| 01/29 | Effingham^ | Diesel fuel† |
| 02/21 | Effingham^ | Diesel fuel† |
| 03/01 | Effingham | No-lead gasoline |
| 03/19 | Effingham^ | Diesel fuel† |
| 04/11 | Altamont | Gas and diesel |
| 04/24 | Dieterich | Unknown (readings for kerosene, white mineral oil, octane, petroleum, etc.) |
| 04/24 | Effingham | Diesel fuel† |
| 06/14 | Effingham | Gasoline† |
| 07/08 | Altamont^ | Roundup herbicide† |
| 07/17 | Shumway | Unleaded gasoline and diesel fuel |
| 08/13 | Effingham | Motor oil |
| 08/15 | Effingham | Gasoline |
| 09/03 | Beecher City^ | Crude oil |
| 09/06 | Effingham | Diesel fuel |
| 10/23 | Effingham | Yellow grease (animal fat used in the manufacture of animal feed) |
| **2014** | | |
| 01/23 | Effingham^ | Diesel+ |
| 04/10 | Effingham | Gasoline and heating oil |
| 05/22 | Effingham | Diesel fuel† |
| 06/13 | Effingham | Diesel and unknown oil† |
| 08/20 | Effingham | Diesel fuel |
| 10/01 | Effingham | Diesel fuel† |
| 10/16 | Effingham | No-lead plus gasoline and premium gasoline |
| 11/26 | Montrose | Gasoline and diesel fuel |
| **2015** | | |
| 01/03 | Effingham^ | Diesel fuel† |
| 01/29 | Effingham | Unleaded gasoline |
| 02/12 | Effingham^ | Gasoline† |
| 03/25 | Effingham | Diesel fuel |
| 04/02 | Funkhouser^ | Motor oil† |
| 04/05 | Effingham^ | Diesel fuel† |
| 05/23 | Effingham^ | Diesel fuel† |
| 06/11 | Watson^ | Diesel fuel and motor oil† |
| 07/06 | Edgewood^ | Diesel fuel† |
| 08/24 | Effingham^ | Salt water |
| 09/20 | Mason | Crude oil |
| 12/09 | Effingham | Gasoline |

^ Incident verified in the vicinity of this location.
† Incident involved the transportation of a hazardous substance by roadway.
* Incident involved the transportation for a hazardous substance by pipeline.
§ Incident involved the transportation of a hazardous substance by rail.
+ Incident involved the transportation of a hazardous substance by waterway.

**Table 13**
**Hazmat Incidents in Effingham County: 2010 – 2019**
**(Sheet 3 of 3)**

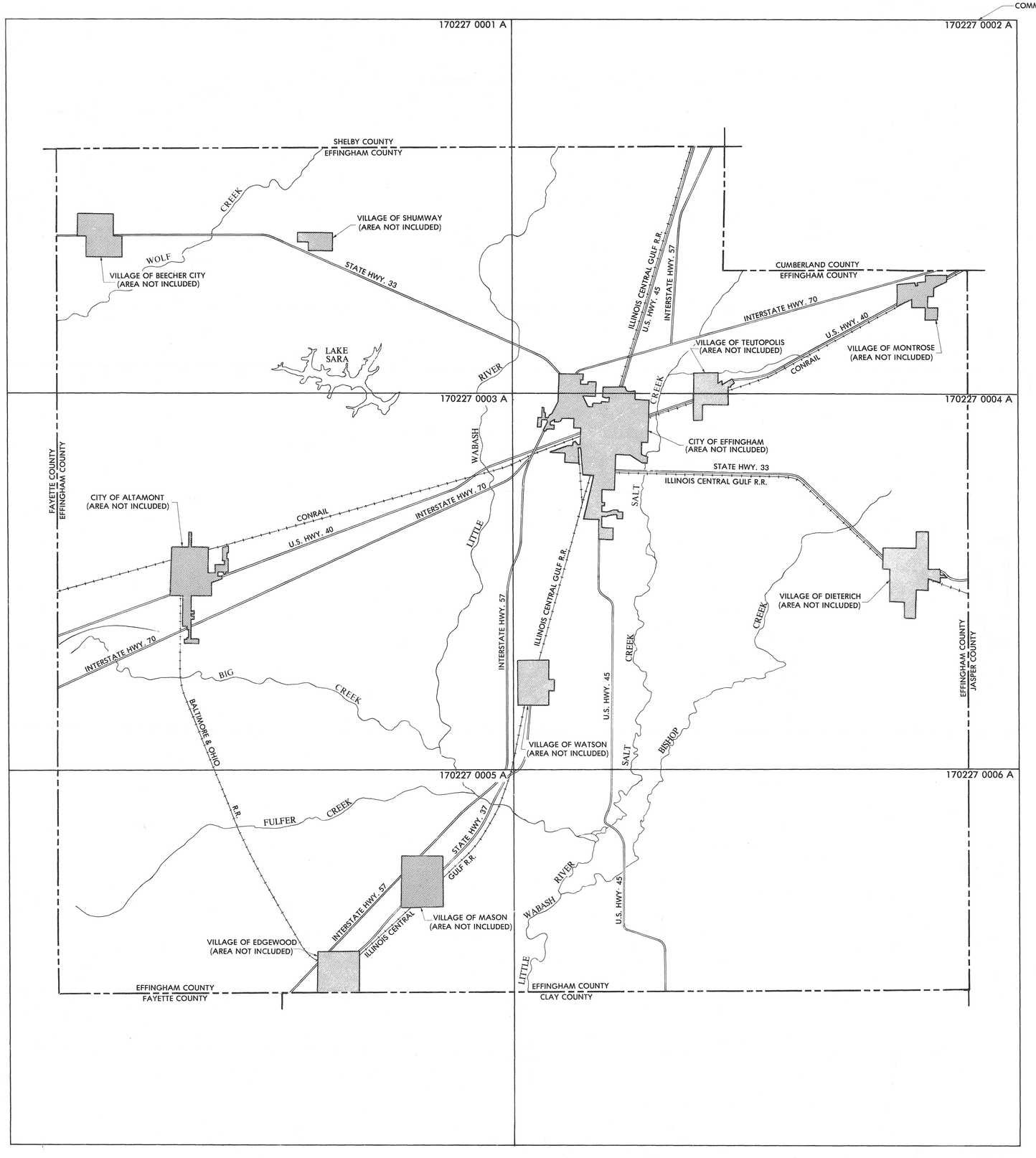
| Date | Location | Hazardous Substances Released |
|---|---|---|
| **2016** | | |
| 02/10 | Montrose | Gasoline |
| 02/10 | Effingham | Unleaded gasoline |
| 04/26 | Altamont^ | Anhydrous ammonia† |
| 05/31 | Edgewood^ | Brine |
| 06/13 | Teutopolis^ | 28% UAN fertilizer† |
| 06/23 | Effingham | Diesel fuel |
| 06/23 | Altamont^ | Diesel fuel |
| 08/01 | Teutopolis | Unleaded gasoline and diesel fuel |
| 09/27 | Effingham^ | Diesel fuel and motor oil† |
| **2017** | | |
| 06/18 | Mason^ | Crude oil |
| 06/19 | Effingham | Diesel |
| 07/27 | Effingham^ | Diesel fuel† |
| 08/09 | Edgewood^ | Diesel fuel† |
| 09/14 | Effingham | Used oil |
| 11/08 | Effingham | Gasoline, kerosene, used oil |
| 11/09 | Effingham | Gasoline and diesel |
| **2018** | | |
| 02/05 | Effingham | Diesel fuel |
| 03/16 | Effingham | Premium unleaded gasoline |
| 06/13 | Effingham | Heating oil |
| 12/20 | Effingham^ | Gasoline and diesel |
| **2019** | | |
| 01/23 | Teutopolis^ | Motor oil and gasoline† |
| 02/08 | Effingham | Diesel |
| 02/20 | Effingham | Gasoline |
| 03/22 | Altamont | Tires and railroad ties |
| 03/23 | Watson | Unknown |
| 04/07 | Effingham | Diesel fuel |
| 08/15 | Effingham | Gasoline |
| 08/29 | Effingham | Diesel fuel |
| 09/23 | Altamont | Diesel fuel |
| 11/07 | Effingham | Diesel fuel and motor oil† |
| 11/15 | Effingham^ | Diesel† |
| 12/11 | Edgewood | Gasoline |

^ Incident verified in the vicinity of this location.
† Incident involved the transportation of a hazardous substance by roadway.
* Incident involved the transportation for a hazardous substance by pipeline.
§ Incident involved the transportation of a hazardous substance by rail.
+ Incident involved the transportation of a hazardous substance by waterway.

# FIRMS FOR PARTICIPATING JURISDICTIONS

# APPENDIX K

COMMUNITY - PANEL NUMBER




## KEY TO SYMBOLS

SPECIAL FLOOD HAZARD AREA — ZONE A

Note: These maps may not include all Special Flood Hazard Areas in the community. After a more detailed study, the Special Flood Hazard Areas shown on these maps may be modified, and other areas added.

**CONSULT NFIA SERVICING COMPANY OR LOCAL INSURANCE AGENT OR BROKER TO DETERMINE IF PROPERTIES IN THIS COMMUNITY ARE ELIGIBLE FOR FLOOD INSURANCE.**

**INITIAL IDENTIFICATION DATE:**

**DECEMBER 23, 1977**

**FLOOD HAZARD BOUNDARY MAP**

# EFFINGHAM COUNTY
# ILLINOIS
## UNINC. AREAS

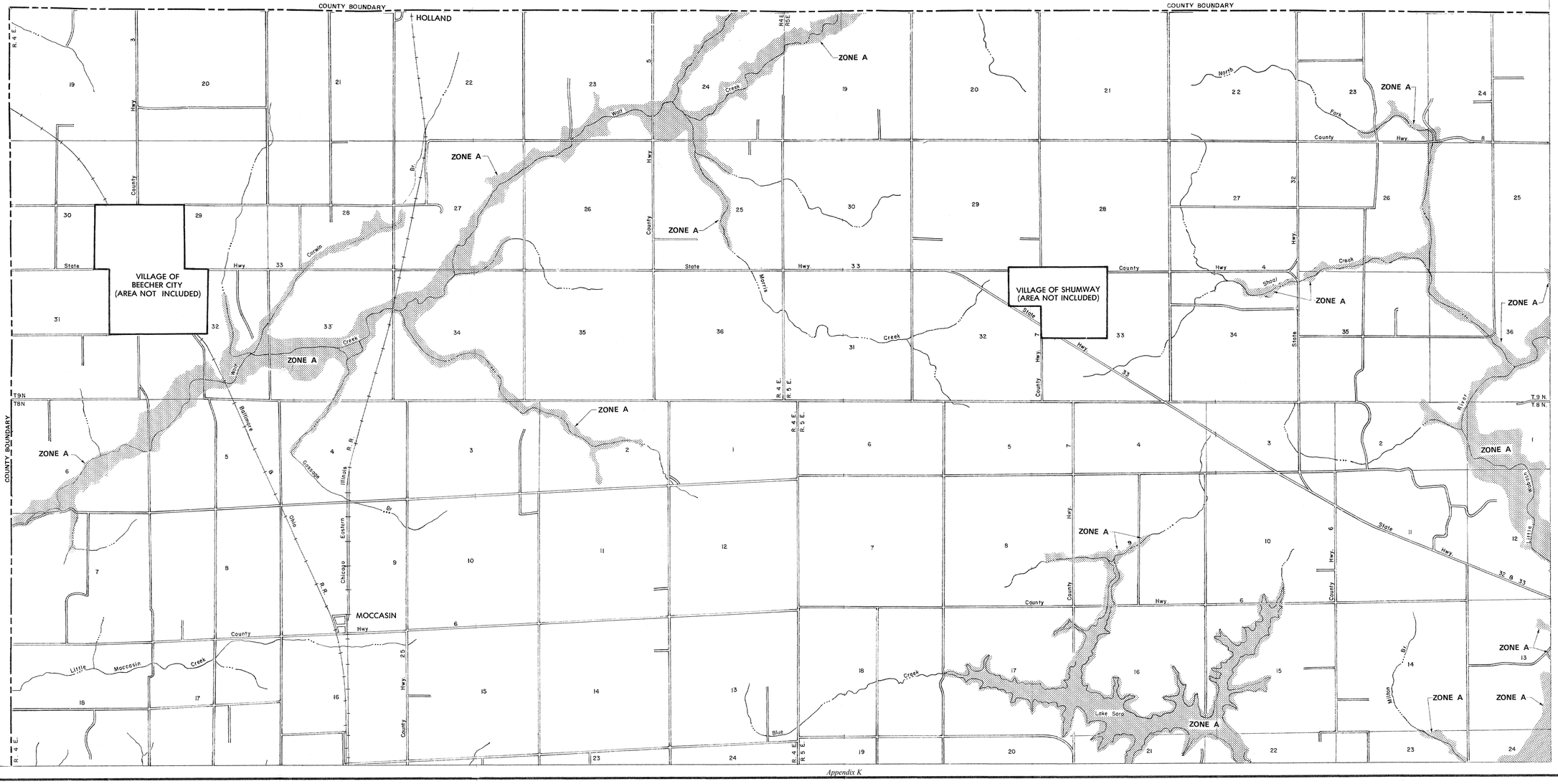
INDEX TO MAPS
PAGES 1 THRU 6
PAGES PRINTED: ALL PAGES

# MAP INDEX

DECEMBER 23, 1977

COMMUNITY–PANEL NUMBER
170227 0001 - 0006

**U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT**
FEDERAL INSURANCE ADMINISTRATION




## KEY TO SYMBOLS

SPECIAL FLOOD HAZARD AREA — ZONE A

Note: These maps may not include all Special Flood Hazard Areas in the community. After a more detailed study, the Special Flood Hazard Areas shown on these maps may be modified, and other areas added.

**CONSULT NFIA SERVICING COMPANY OR LOCAL INSURANCE AGENT OR BROKER TO DETERMINE IF PROPERTIES IN THIS COMMUNITY ARE ELIGIBLE FOR FLOOD INSURANCE.**

APPROXIMATE SCALE IN FEET:
2000 0 2000

FLOOD HAZARD BOUNDARY MAP

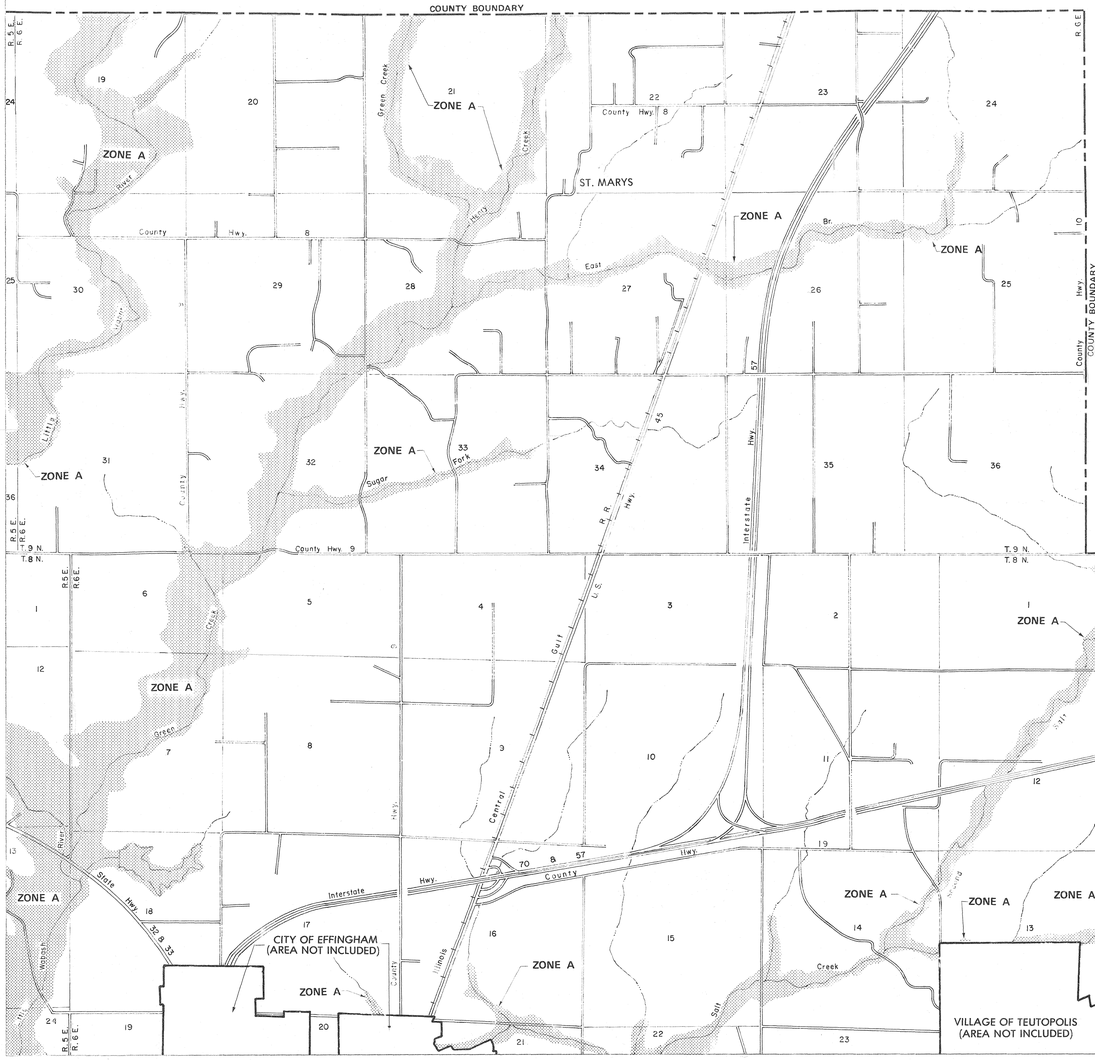
# EFFINGHAM COUNTY ILLINOIS
## UNINC. AREAS

PAGE 1 OF 6
(SEE MAP INDEX FOR PAGES NOT PRINTED)

EFFECTIVE DATE:
DECEMBER 23, 1977

COMMUNITY–PANEL NUMBER
170227 0001 A

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
FEDERAL INSURANCE ADMINISTRATION




## KEY TO SYMBOLS

SPECIAL FLOOD HAZARD AREA — ZONE A

Note: These maps may not include all Special Flood Hazard Areas in the community. After a more detailed study, the Special Flood Hazard Areas shown on these maps may be modified and other areas added.

CONSULT NFIA SERVICING COMPANY OR LOCAL INSURANCE AGENT OR BROKER TO DETERMINE IF PROPERTIES IN THIS COMMUNITY ARE ELIGIBLE FOR FLOOD INSURANCE.

APPROXIMATE SCALE IN FEET
2000 0 2000

FLOOD HAZARD BOUNDARY MAP

# EFFINGHAM COUNTY ILLINOIS

## UNINC. AREAS

PAGE 2 OF 6
(SEE MAP INDEX FOR PAGES NOT PRINTED)

EFFECTIVE DATE:
**DECEMBER 23, 1977**

COMMUNITY–PANEL NUMBER
170227 0002 A

**U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT**
FEDERAL INSURANCE ADMINISTRATION


## KEY TO SYMBOLS

SPECIAL FLOOD HAZARD AREA — ZONE A

Note: These maps may not include all Special Flood Hazard Areas in the community. After a more detailed study, the Special Flood Hazard Areas shown on these maps may be modified, and other areas added.

**CONSULT NFIA SERVICING COMPANY OR LOCAL INSURANCE AGENT OR BROKER TO DETERMINE IF PROPERTIES IN THIS COMMUNITY ARE ELIGIBLE FOR FLOOD INSURANCE.**

APPROXIMATE SCALE IN FEET:
2000 0 2000

**FLOOD HAZARD BOUNDARY MAP**

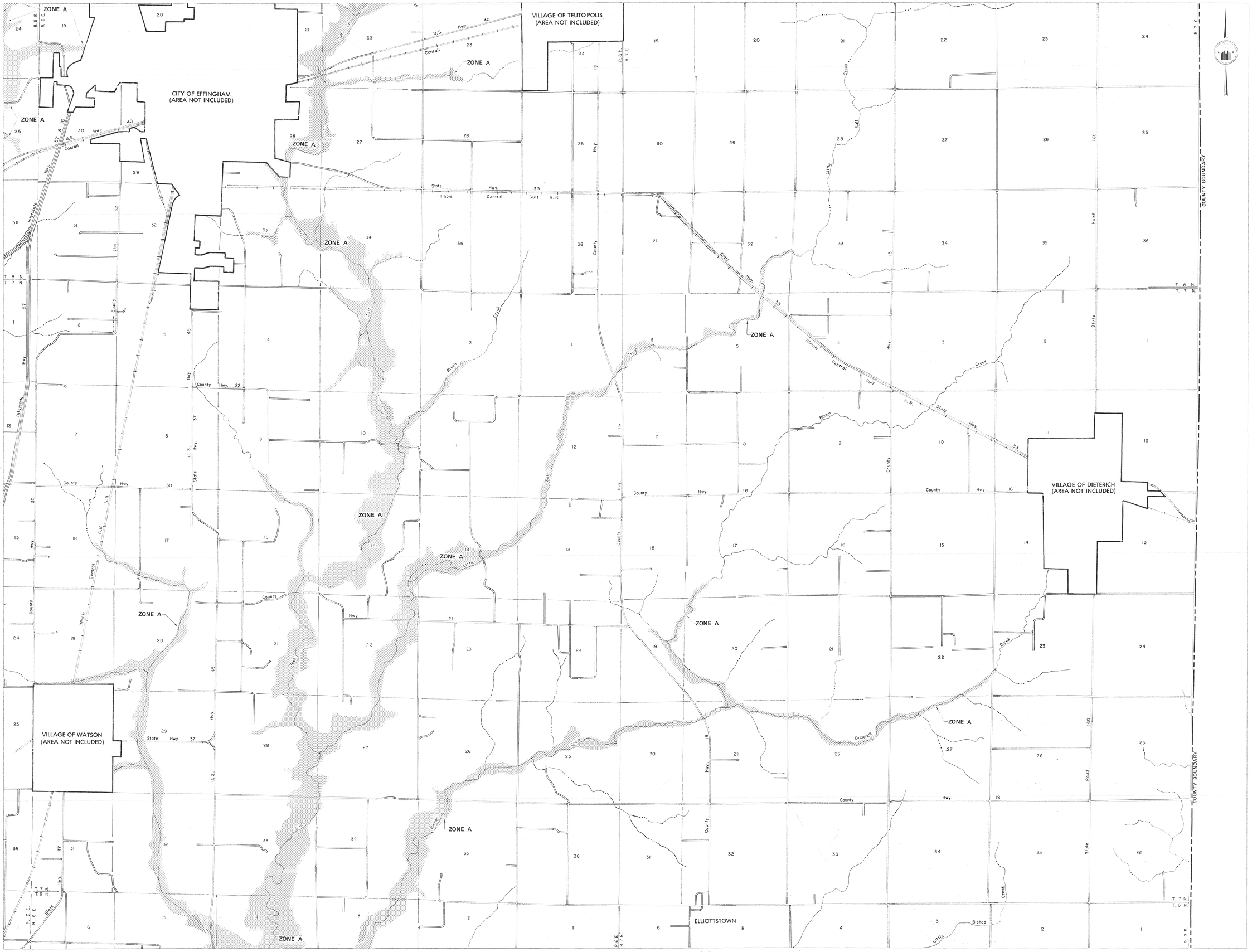
# EFFINGHAM COUNTY ILLINOIS
## UNINC. AREAS

PAGE 3 OF 6
(SEE MAP INDEX FOR PAGES NOT PRINTED)

**EFFECTIVE DATE:**
**DECEMBER 23, 1977**

**COMMUNITY–PANEL NUMBER**
**170227 0003 A**

**U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT**
FEDERAL INSURANCE ADMINISTRATION




## KEY TO SYMBOLS

SPECIAL FLOOD HAZARD AREA — ZONE A

Note: These maps may not include all Special Flood Hazard Areas in the community. After a more detailed study, the Special Flood Hazard Areas shown on these maps may be modified, and other areas added.

CONSULT NFIA SERVICING COMPANY OR LOCAL INSURANCE AGENT OR BROKER TO DETERMINE IF PROPERTIES IN THIS COMMUNITY ARE ELIGIBLE FOR FLOOD INSURANCE.

APPROXIMATE SCALE IN FEET
2000 0 2000

FLOOD HAZARD BOUNDARY MAP

# EFFINGHAM COUNTY ILLINOIS

## UNINC. AREAS

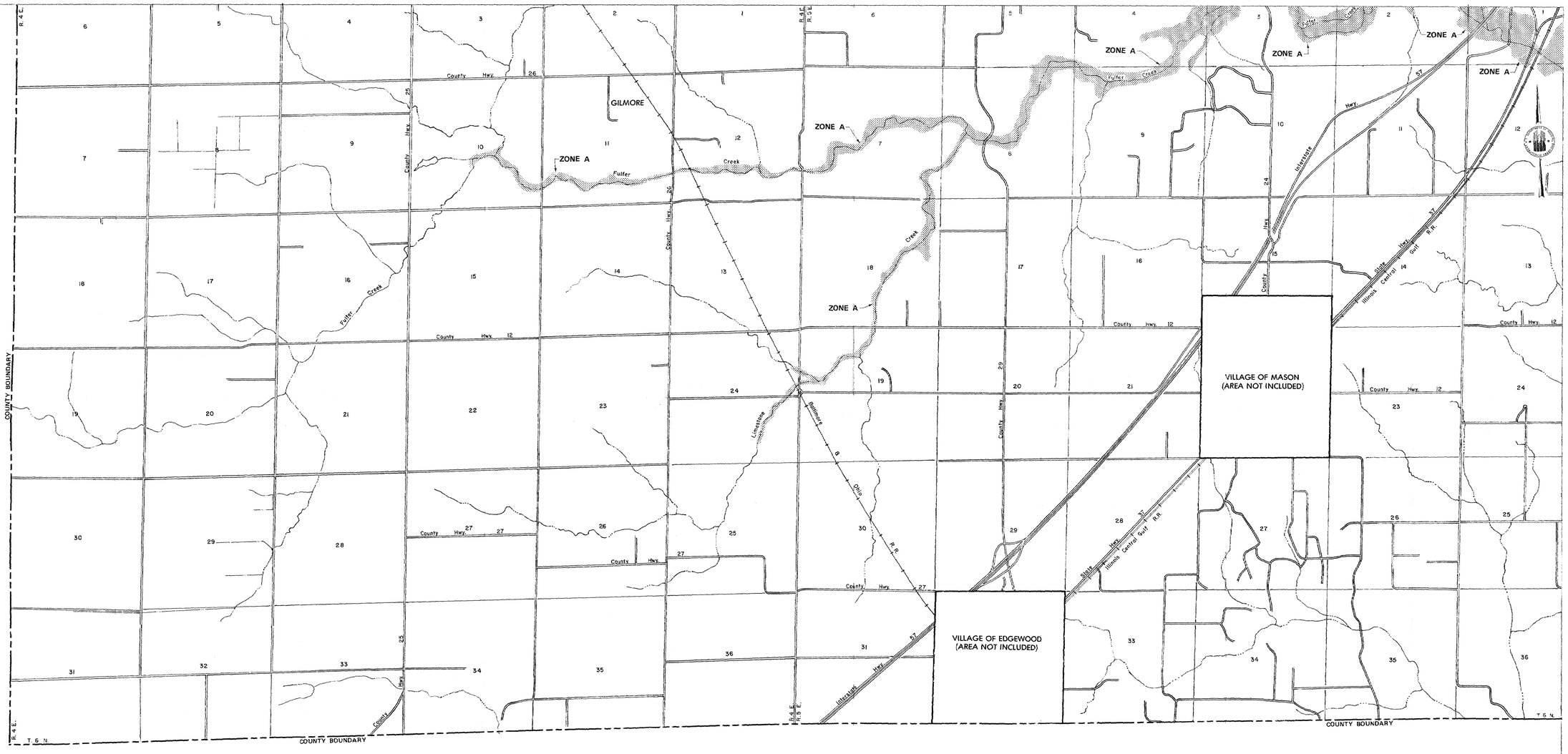
PAGE 4 OF 6

(SEE MAP INDEX FOR PAGES NOT PRINTED)

EFFECTIVE DATE:
DECEMBER 23, 1977

COMMUNITY—PANEL NUMBER
170227 0004 A

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
FEDERAL INSURANCE ADMINISTRATION




## KEY TO SYMBOLS

SPECIAL FLOOD HAZARD AREA — ZONE A

Note: These maps may not include all Special Flood Hazard Areas in the community. After a more detailed study, the Special Flood Hazard Areas shown on these maps may be modified, and other areas added.

CONSULT NFIA SERVICING COMPANY OR LOCAL INSURANCE AGENT OR BROKER TO DETERMINE IF PROPERTIES IN THIS COMMUNITY ARE ELIGIBLE FOR FLOOD INSURANCE.

APPROXIMATE SCALE IN FEET
2000 0 2000

FLOOD HAZARD BOUNDARY MAP

# EFFINGHAM COUNTY ILLINOIS

## UNINC. AREAS

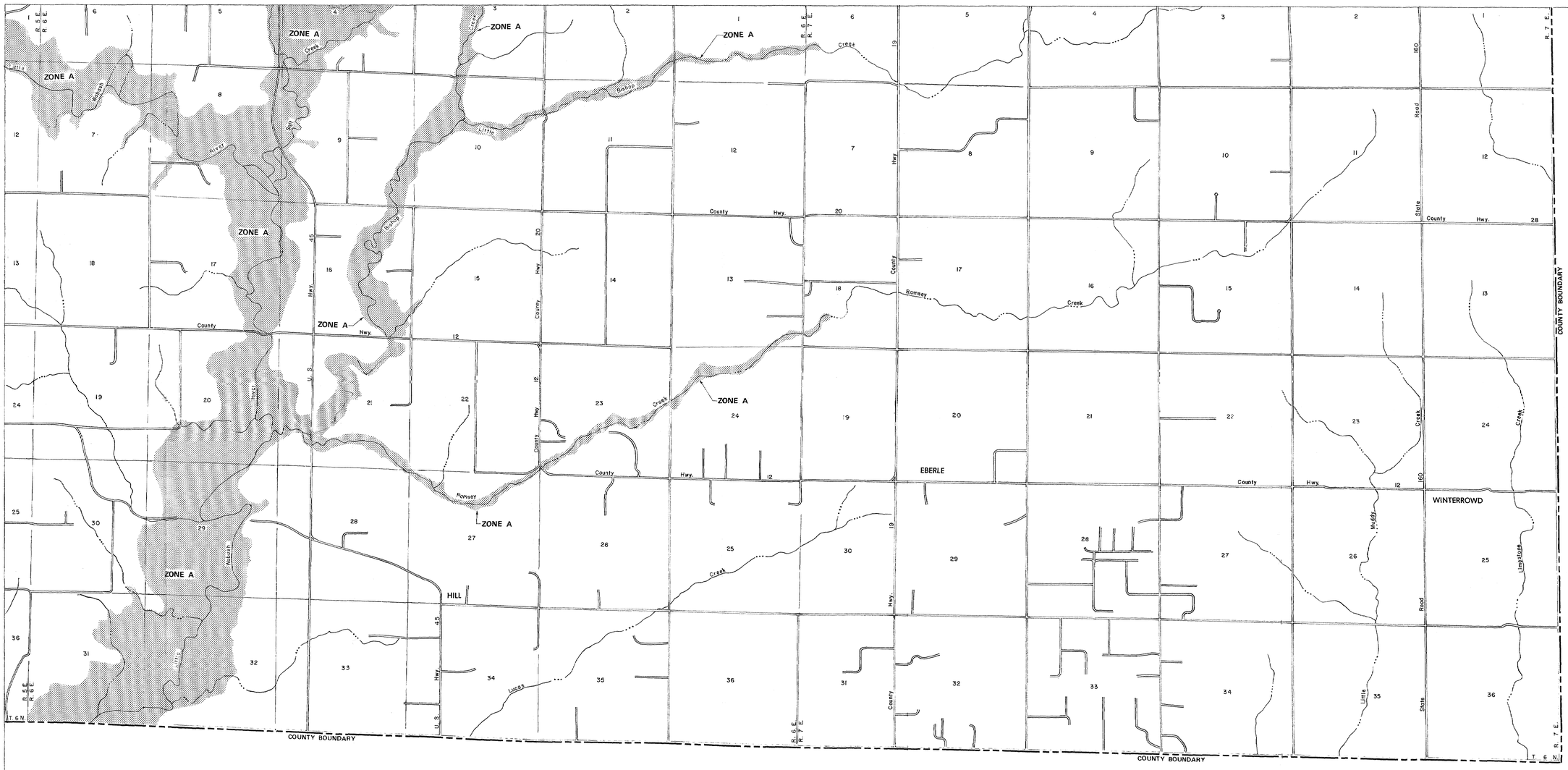
PAGE 5 OF 6

(SEE MAP INDEX FOR PAGES NOT PRINTED)

EFFECTIVE DATE:
DECEMBER 23, 1977

COMMUNITY—PANEL NUMBER
170227 0005 A

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
FEDERAL INSURANCE ADMINISTRATION




## KEY TO SYMBOLS

SPECIAL FLOOD HAZARD AREA — ZONE A

Note: These maps may not include all Special Flood Hazard Areas in the community. After a more detailed study, the Special Flood Hazard Areas shown on these maps may be modified, and other areas added.

**CONSULT NFIA SERVICING COMPANY OR LOCAL INSURANCE AGENT OR BROKER TO DETERMINE IF PROPERTIES IN THIS COMMUNITY ARE ELIGIBLE FOR FLOOD INSURANCE.**

APPROXIMATE SCALE IN FEET
2000 0 2000

FLOOD HAZARD BOUNDARY MAP

# EFFINGHAM COUNTY ILLINOIS

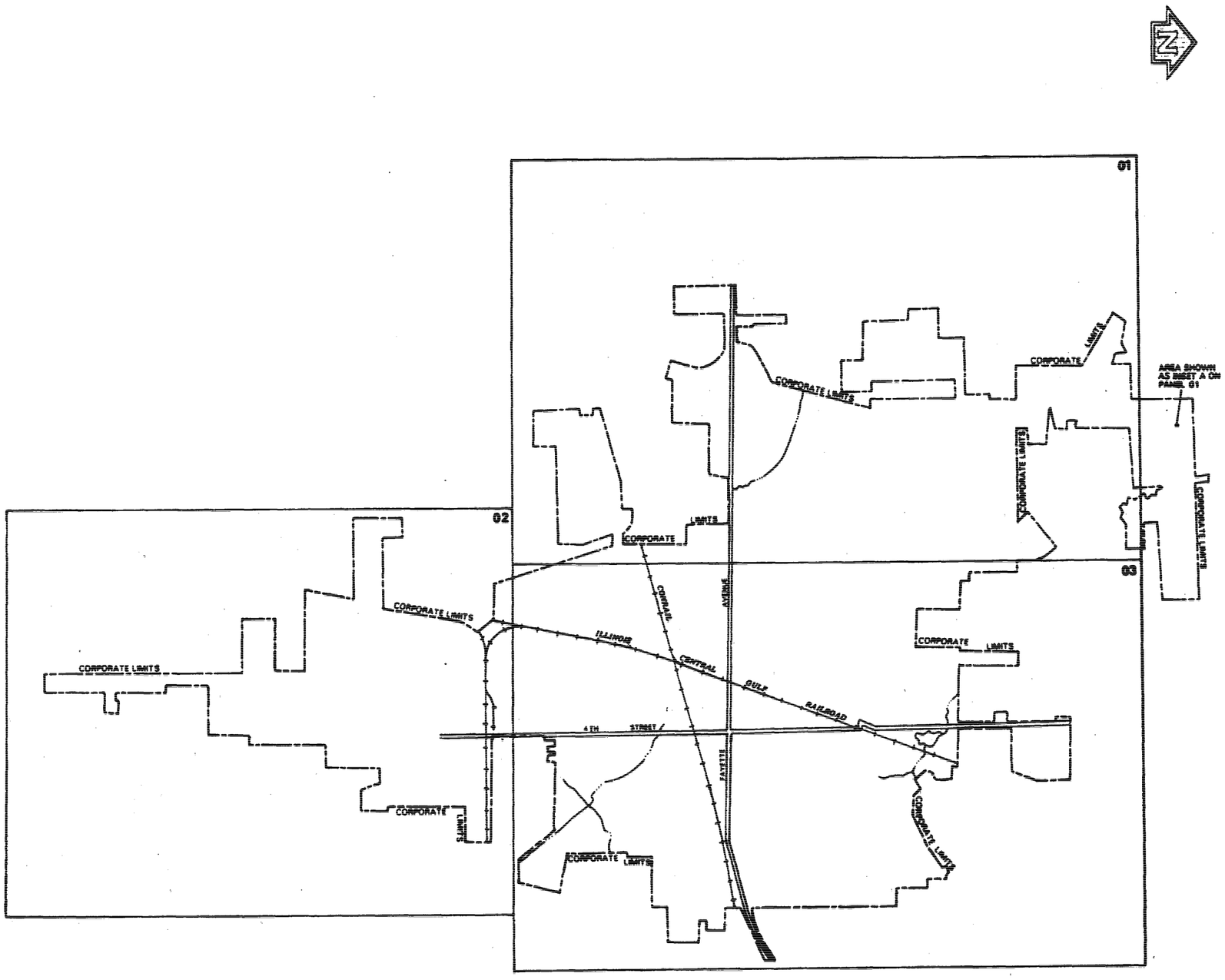
## UNINC. AREAS

PAGE 6 OF 6
(SEE MAP INDEX FOR PAGES NOT PRINTED)

EFFECTIVE DATE:
DECEMBER 23, 1977

COMMUNITY—PANEL NUMBER
170227 0006 A

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
FEDERAL INSURANCE ADMINISTRATION




**KEY TO MAP**

ZONE DESIGNATIONS*

ZONE C

ZONE A

ZONE C

| | |
|---|---|
| Base Flood Elevation Line with elevation in feet | 513 |
| Base Flood Elevation where uniform within zone | (EL 987) |
| Elevation Reference Mark | RM7$_R$ |
| River Mile | *M1.5 |

***EXPLANATION OF ZONE DESIGNATIONS**

A flood insurance map displays the zone designations for a community according to areas of designated flood hazards. The zone designations used by FEMA are

| ZONE | EXPLANATION |
|---|---|
| A | Areas of 100-year flood base flood elevations and flood hazard factors not determined |
| AO | Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet, average depths of inundation are shown, but no flood hazard factors are determined |
| AH | Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet, base flood elevations are shown, but no flood hazard factors are determined |
| A1-A30 | Areas of 100-year flood, base flood elevations and flood hazard factors determined |
| A99 | Areas of 100-year flood to be protected by flood protection system under construction, base flood elevations and flood hazard factors not determined |
| B | Areas between limits of the 100-year flood and 500-year flood, or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile, or areas protected by levees from the base flood (Medium shading) |
| C | Areas of minimal flooding (No shading) |
| D | Areas of undetermined, but possible flood hazards |
| V | Areas of 100-year coastal flood with velocity (wave action), base flood elevations and flood hazard factors not determined |
| V1-V30 | Areas of 100-year coastal flood with velocity (wave action), base flood elevations and flood hazard factors determined |

**NOTES TO USER**

Certain areas not in the special flood hazard areas (zones A and V) may be protected by flood control structures.

This map is for flood insurance purposes only, it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas.

To determine if flood insurance is available in this community contact your insurance agent or call the National Flood Insurance Program at (800) 638-6620.

INITIAL IDENTIFICATION: MARCH 22, 1974

FLOOD HAZARD BOUNDARY MAP REVISIONS: APRIL 23, 1976

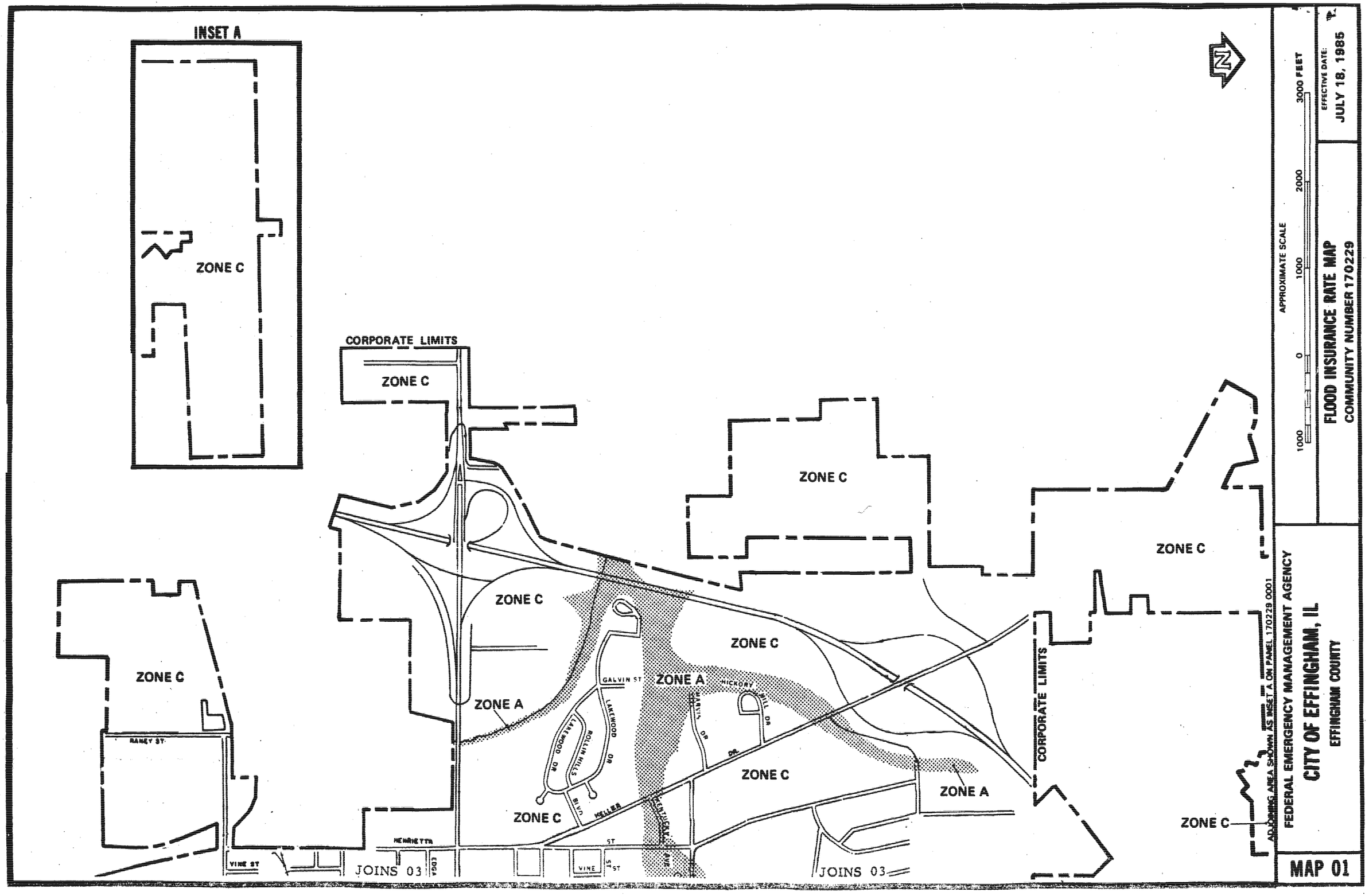
FLOOD INSURANCE RATE MAP EFFECTIVE: JULY 18, 1985

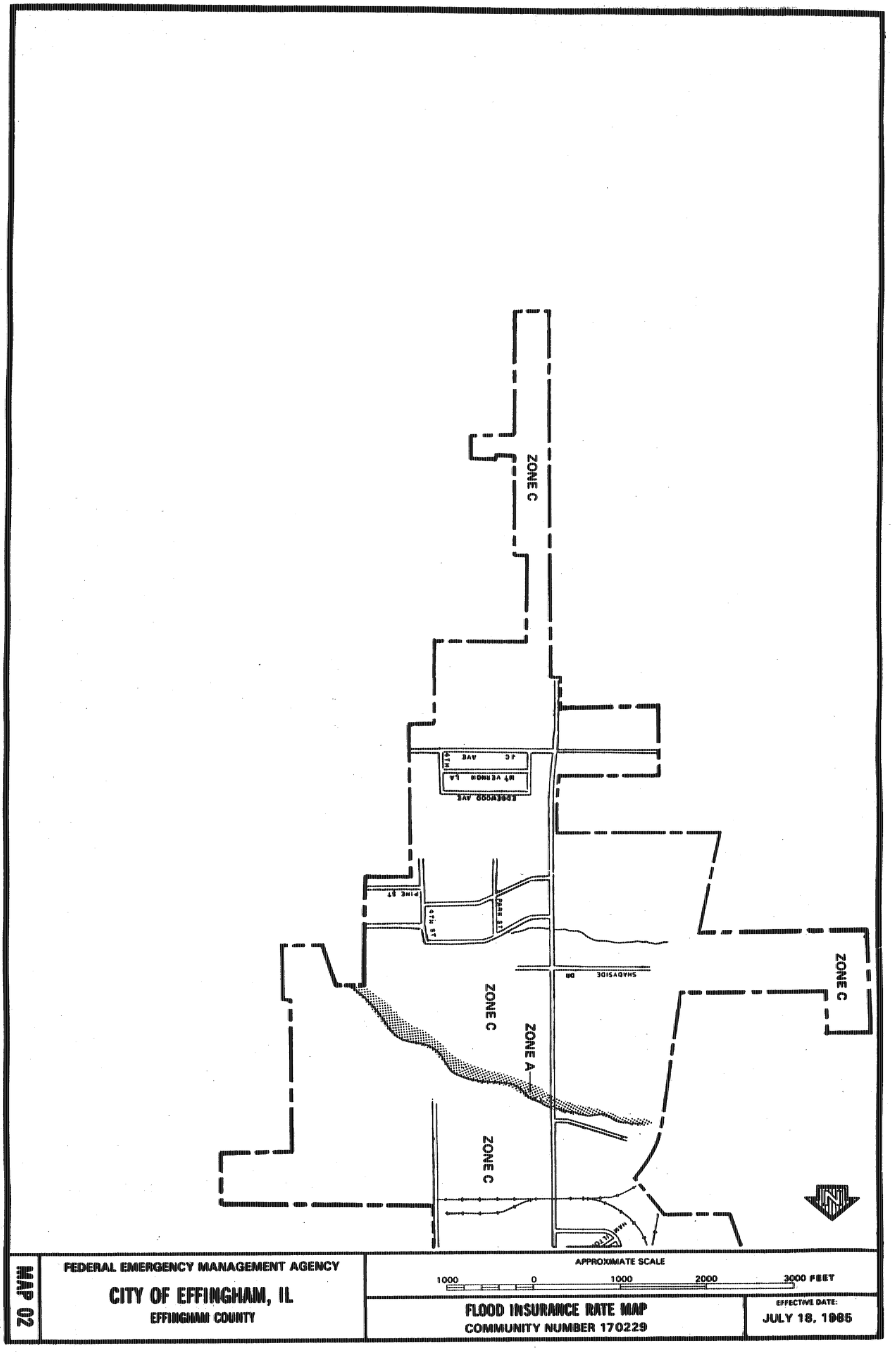
FLOOD INSURANCE RATE MAP REVISIONS:

FEDERAL EMERGENCY MANAGEMENT AGENCY

# FIRM

## FLOOD INSURANCE RATE MAP 01-03
## MAP INDEX
## CITY OF EFFINGHAM, IL
### EFFINGHAM COUNTY
### COMMUNITY NUMBER 170229 B


INSET A
ZONE C
CORPORATE LIMITS
ZONE C
ZONE C
ZONE C
ZONE C
ZONE A
ZONE C
ZONE C
ZONE A
ZONE C
ZONE C
ZONE A
ZONE C
ZONE C
CORPORATE LIMITS
ZONE C
GALVIN ST
LAKEWOOD DR
NOLLIN HILLS DR
NOLLIN HILLS BLVD
HICKORY HILL DR
MARVIN DR
HELLER
KENTUCKY AVE
RANEY ST
VINE ST
HENRIETTA
EDGAR
VINE
5TH ST
JOINS 03
JOINS 03
N
APPROXIMATE SCALE
1000 0 1000 2000 3000 FEET
EFFECTIVE DATE:
JULY 18, 1985
FLOOD INSURANCE RATE MAP
COMMUNITY NUMBER 170229
FEDERAL EMERGENCY MANAGEMENT AGENCY
CITY OF EFFINGHAM, IL
EFFINGHAM COUNTY
ADJOINING AREA SHOWN AS INSET A ON PANEL 170229 0001
MAP 01




FEDERAL EMERGENCY MANAGEMENT AGENCY

# CITY OF EFFINGHAM, IL

EFFINGHAM COUNTY

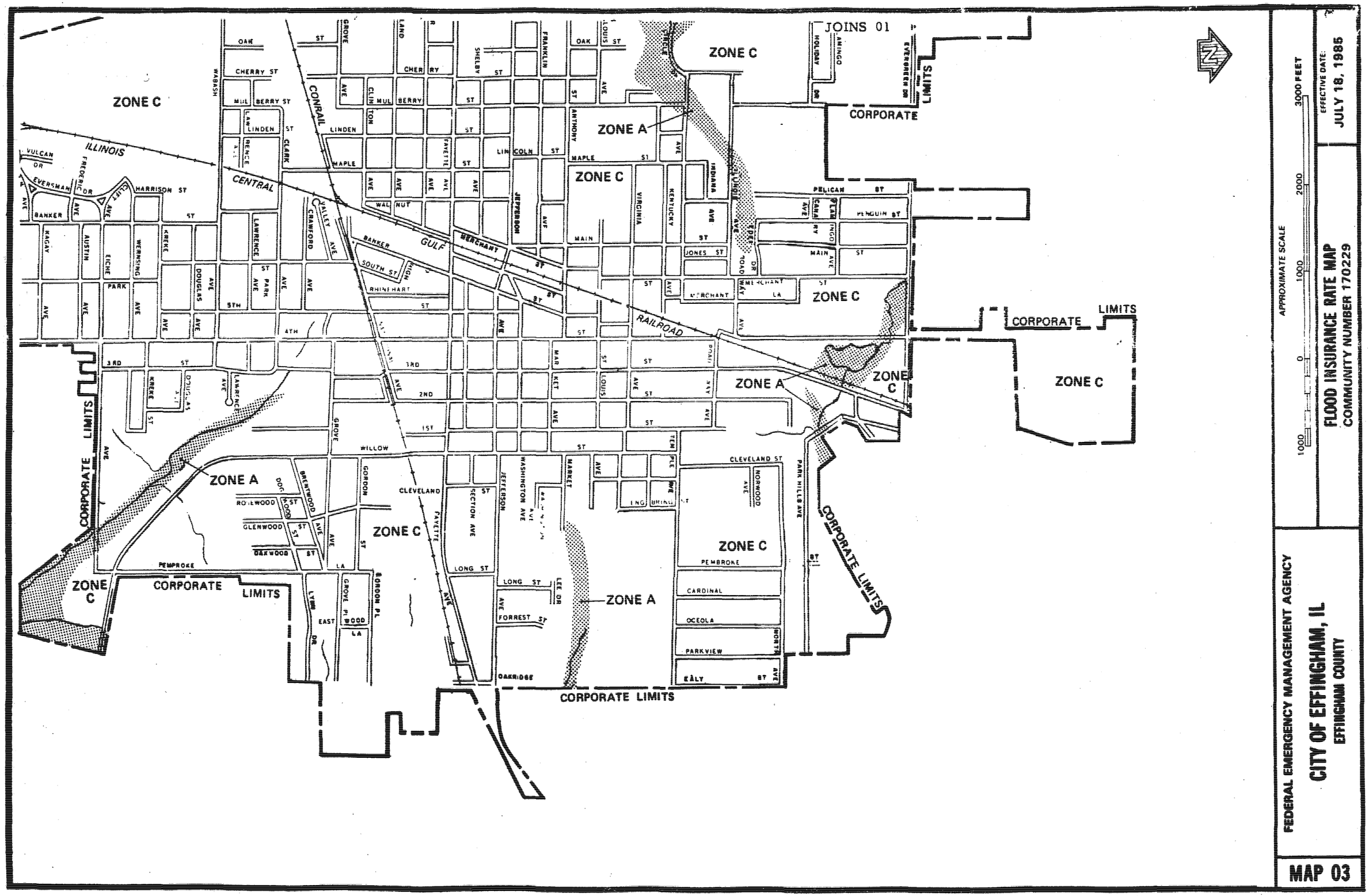
MAP 02

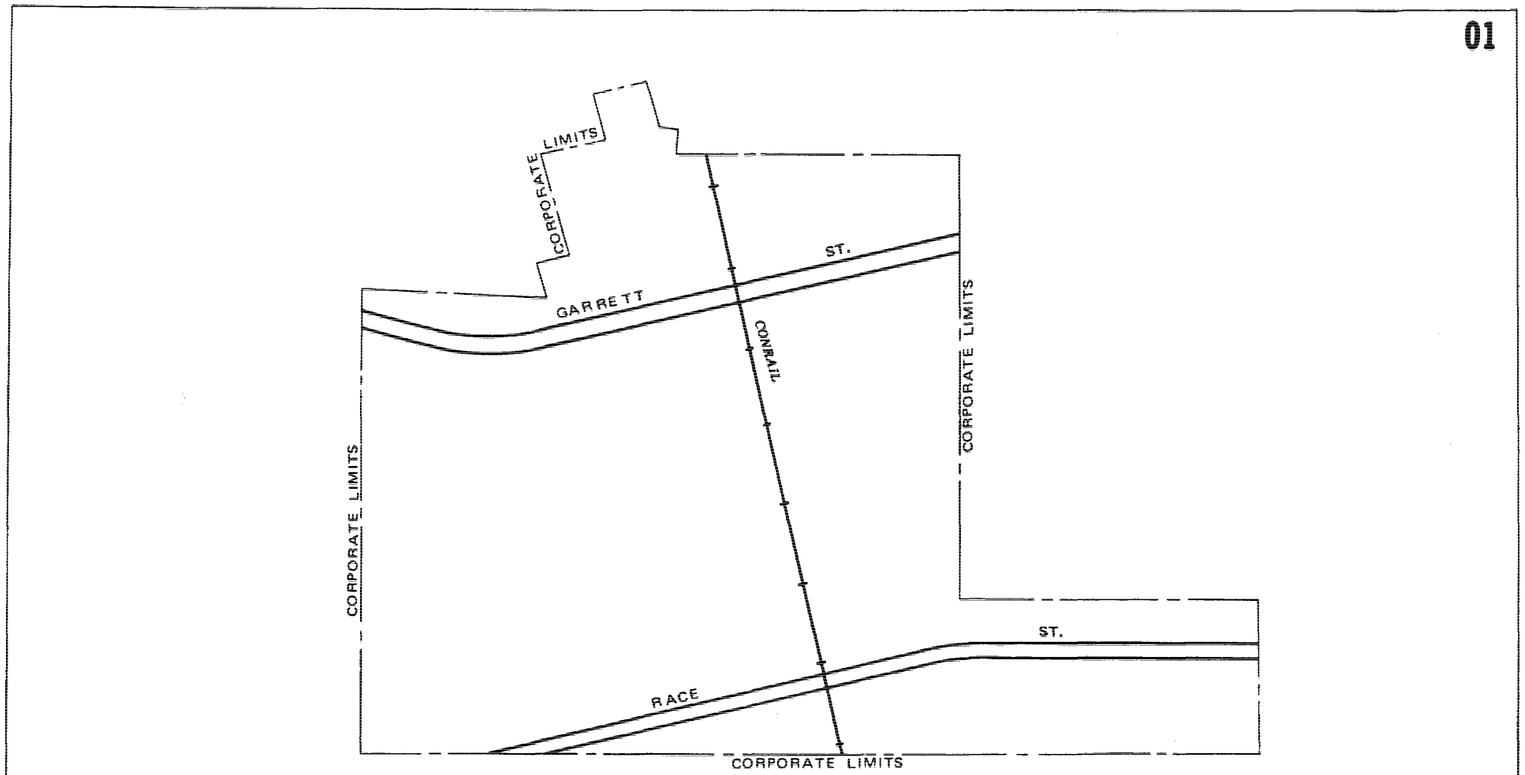
FLOOD INSURANCE RATE MAP

COMMUNITY NUMBER 170229

EFFECTIVE DATE:

JULY 18, 1985


JOINS 01
ZONE C
ZONE A
CORPORATE LIMITS
ILLINOIS CENTRAL RAILROAD
CONRAIL
GULF
RAILROAD
CORPORATE LIMITS
ZONE C
ZONE A
ZONE C
ZONE C
ZONE A
ZONE C
ZONE C
ZONE A
ZONE C
CORPORATE LIMITS
CORPORATE LIMITS
CORPORATE LIMITS
CORPORATE LIMITS
CHERRY ST
BERRY ST
LINDEN ST
MAPLE ST
MAIN ST
JONES ST
MERCHANT ST
RHINEHART ST
SOUTH ST
3RD ST
2ND ST
1ST ST
WILLOW
CLEVELAND
CLEVELAND ST
LONG ST
FORREST ST
OAKRIDGE
PEMBROKE
PELICAN ST
PENGUIN ST
CARDINAL
OCEOLA
PARKVIEW
EARLY ST
HARRISON ST
BANKER
EVERSMAN DR
VULCAN DR
FREDERICK DR
CLARK AVE
LINCOLN AVE
ARTHUR AVE
FRANKLIN AVE
JEFFERSON AVE
VIRGINIA AVE
KENTUCKY AVE
INDIANA AVE
WASHINGTON AVE
MARKET AVE
FAYETTE AVE
SECTION AVE
GORDON
BRENTWOOD
ROSEWOOD
GLENWOOD
OAKWOOD
LYNN DR
EAST WOOD LA
GROVE PL
GORDON PL
NORWOOD AVE
PARK HILL AVE
HOLIDAY DR
AMINGO DR
EVERGREEN DR
LEE DR
ENGLEWOOD
BRINGHURST
CANARY
PLEASANT
INGOLD
EDDY ROAD DR
MERCHANT LA
MERCHANT WAY
MAGAN
AUSTIN
EICHE
WERNSING
KREKE
DOUGLAS
LAWRENCE
CRAWFORD
VALLEY
PARK
HIGH
WAL NUT
ELM
MAR KET
LOUIS
TEN PILE
ENG BRING
NORTH
EARLY
APPROXIMATE SCALE
1000 0 1000 2000 3000 FEET
EFFECTIVE DATE:
JULY 18, 1985
FLOOD INSURANCE RATE MAP
COMMUNITY NUMBER 170229
FEDERAL EMERGENCY MANAGEMENT AGENCY
CITY OF EFFINGHAM, IL
EFFINGHAM COUNTY
MAP 03




KEY TO MAP

ZONE DESIGNATIONS*

ZONE C

ZONE A

ZONE C

| | |
|---|---|
| Base Flood Elevation Line with elevation in feet | 513 |
| Base Flood Elevation where uniform within zone | (EL 987) |
| Elevation Reference Mark | $RM7_X$ |
| River Mile | *M1.5 |

*EXPLANATION OF ZONE DESIGNATIONS

A flood insurance map displays the zone designations for a community according to areas of designated flood hazards. The zone designations used by FEMA are

| ZONE | EXPLANATION |
|---|---|
| A | Areas of 100-year flood base flood elevations and flood hazard factors not determined |
| AO | Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet, average depths of inundation are shown, but no flood hazard factors are determined |
| AH | Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet, base flood elevations are shown, but no flood hazard factors are determined |
| A1-A30 | Areas of 100-year flood, base flood elevations and flood hazard factors determined |
| A99 | Areas of 100-year flood to be protected by flood protection system under construction, base flood elevations and flood hazard factors not determined |
| B | Areas between limits of the 100-year flood and 500-year flood, or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile, or areas protected by levees from the base flood (Medium shading) |
| C | Areas of minimal flooding (No shading) |
| D | Areas of undetermined, but possible flood hazards |
| V | Areas of 100-year coastal flood with velocity (wave action), base flood elevations and flood hazard factors not determined |
| V1-V30 | Areas of 100-year coastal flood with velocity (wave action), base flood elevations and flood hazard factors determined |

NOTES TO USER

Certain areas not in the special flood hazard areas (zones A and V) may be protected by flood control structures.

This map is for flood insurance purposes only; it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at (800) 638-6620.

INITIAL IDENTIFICATION: FEBRUARY 22, 1974

FLOOD HAZARD BOUNDARY MAP REVISIONS: JUNE 4, 1976

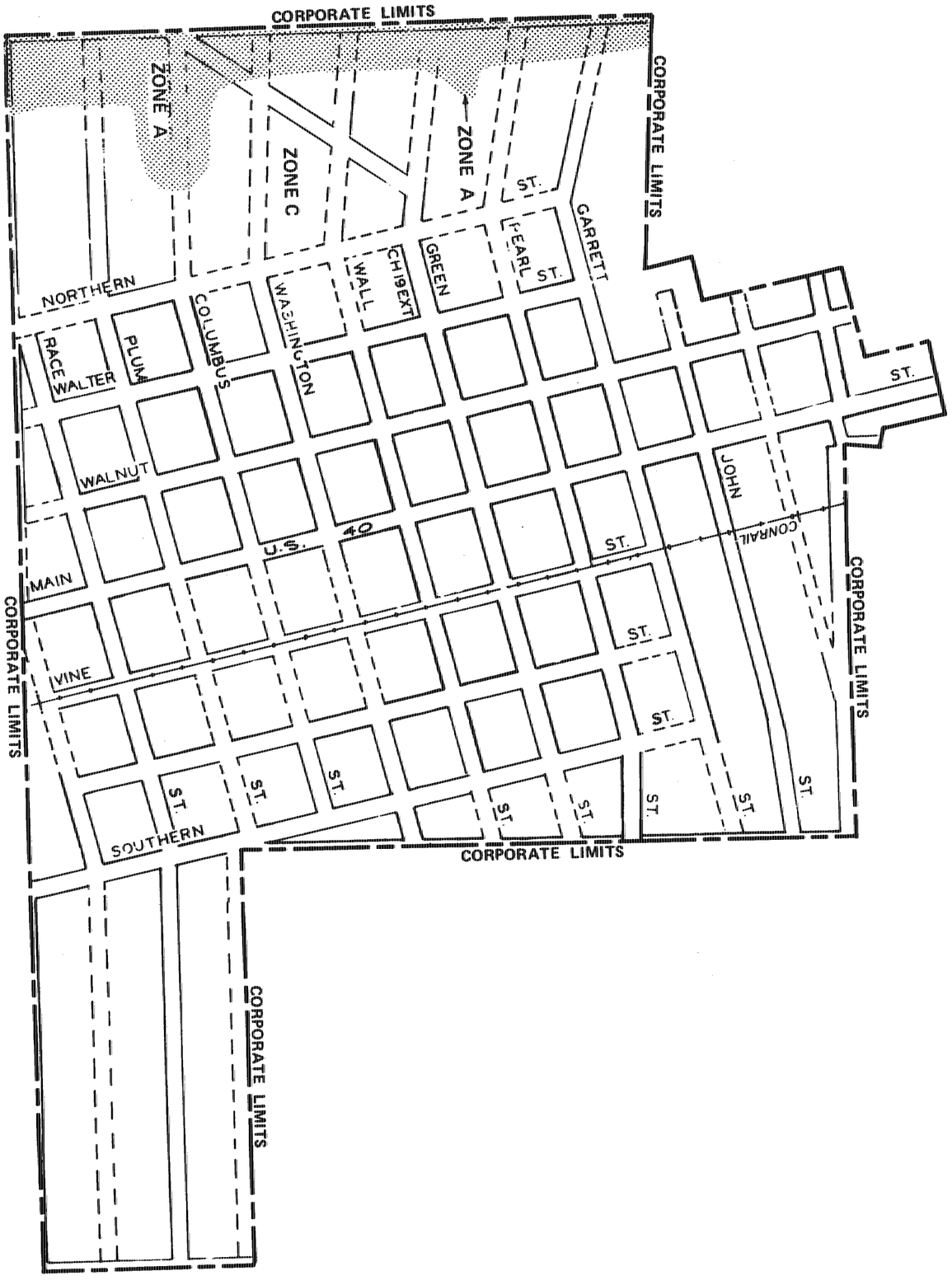
FLOOD INSURANCE RATE MAP EFFECTIVE: AUGUST 19, 1985

FLOOD INSURANCE RATE MAP REVISIONS:

FEDERAL EMERGENCY MANAGEMENT AGENCY

# FIRM

## FLOOD INSURANCE RATE MAP 01
## MAP INDEX
## VILLAGE OF TEUTOPOLIS, IL
### EFFINGHAM COUNTY
### COMMUNITY NUMBER 170231 B




MAP 01

FEDERAL EMERGENCY MANAGEMENT AGENCY

# VILLAGE OF TEUTOPOLIS, IL

EFFINGHAM COUNTY

APPROXIMATE SCALE

800 0 800 1600 2400 FEET

FLOOD INSURANCE RATE MAP

COMMUNITY NUMBER 170231

EFFECTIVE DATE

AUGUST 19, 1985

# PLAN ADOPTION RESOLUTIONS

# APPENDIX L