Chapter 2. Hazard Profile

This chapter provides basic data on the natural hazards that face Kankakee County. Eight natural hazards were selected for this assessment. They were either listed in the State's Hazard Profile or identified by the Mitigation Advisory Task Force as having affected the County in recent history.

- Overbank flooding
- Local drainage problems
- Tornadoes
- Earthquakes
- Winter storms
- Thunderstorms
- Drought/extreme heat
- Wildfire

This chapter has eight sections, one for each hazard. Each section begins with a description of the hazard. This is followed by a summary of historical occurrences in the County, the frequency or likelihood of future occurrences and where they occur. Chapter 3, Vulnerability Assessment, reviews the impacts of the hazards on property, the economy, and people.

2.1. Overbank Flooding

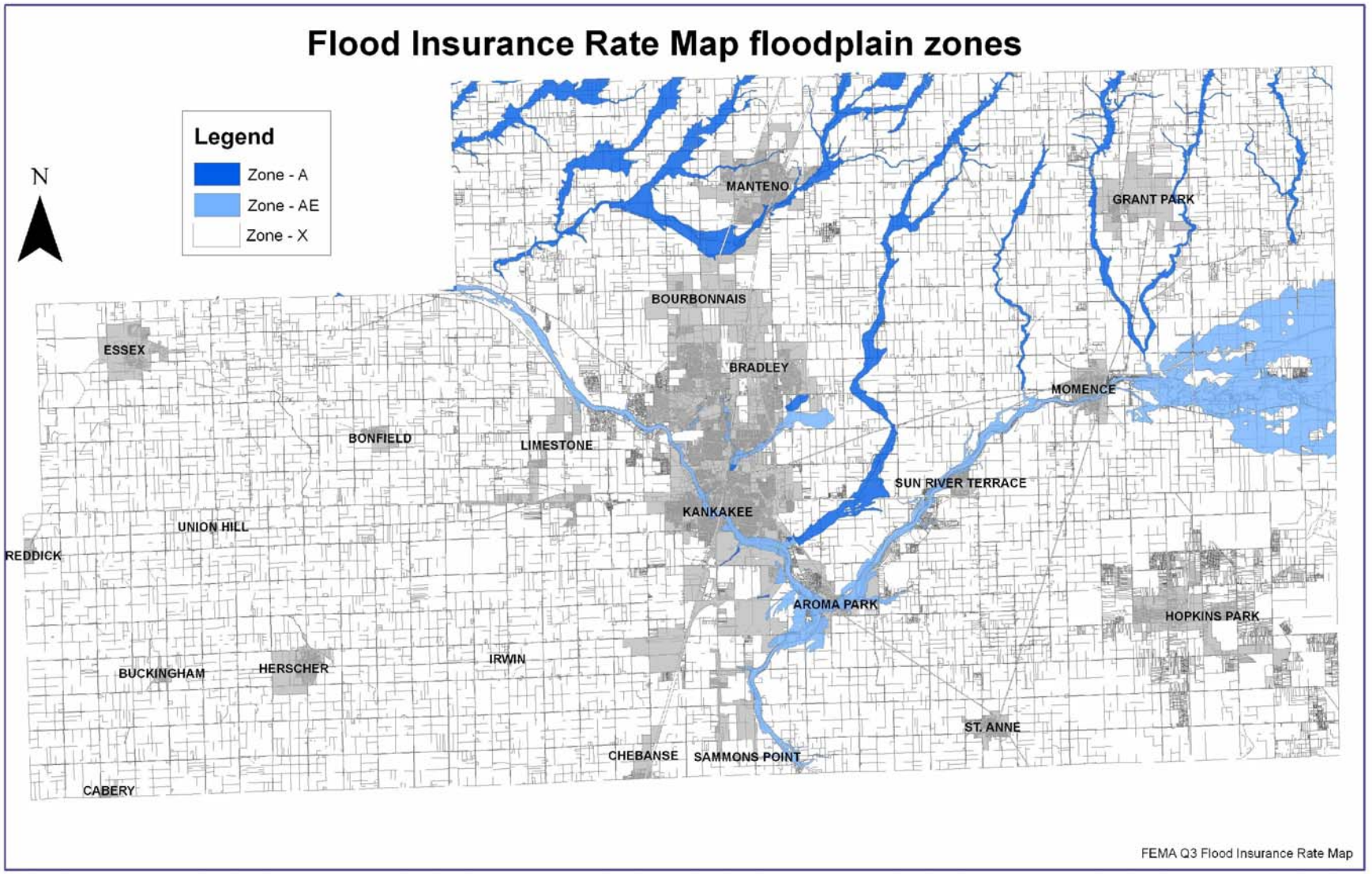
The hazard: The most damaging floods occur along rivers and streams. Runoff from rain and snowmelt flows overland to storm sewers and ditches. These flow into larger ditches and streams. Almost all of Kankakee County runoff eventually flows into the Kankakee River.

The Kankakee River flows from the east from Indiana, through the center of the County, and then northwest into Will County, where it joins the Des Plaines River to form the Illinois River. Some of the far western part of the County drains to the Mazon River, which flows into Grundy County and on to the Illinois River.

The Kankakee River's major tributaries are:

- Iroquois River, which flows from the south and joins the Kankakee at Aroma Park. The Iroquois is by far the largest tributary and accounts for 2/5 of the Kankakee River watershed.
- Baker Creek/Exline Slough, which flows from the north and into the Kankakee between Aroma Park and Kankakee
- Soldiers Creek, which flows through Bradley and Kankakee from the northeast
- Rock Creek, which drains the area around Manteno
- Horse Creek, which drains the western 1/3 of the County and flows north to join the Kankakee in Will County

Location: When a ditch or river has too much water, it overflows onto the adjacent land, i.e., the floodplain. The Kankakee River and its tributaries' floodplains are shown on the map on the next page. This map is taken from the Flood Insurance Rate Map (FIRM) prepared by FEMA.


Flood Insurance Rate Map floodplain zones
Legend
Zone - A
Zone - AE
Zone - X
N
MANTENO
GRANT PARK
BOURBONNAIS
ESSEX
BRADLEY
MOMENCE
BONFIELD
LIMESTONE
SUN RIVER TERRACE
KANKAKEE
UNION HILL
REDDICK
AROMA PARK
HOPKINS PARK
BUCKINGHAM
HERSCHER
IRWIN
ST. ANNE
CHEBANSE
SAMMONS POINT
CABERY
FEMA Q3 Flood Insurance Rate Map

The width and depth of floodplains vary depending on the local topography. The map shows the very wide floodplain on the Kankakee upstream of Momence where the channel meanders through a very flat area of Illinois and Indiana. The Kankakee's floodplain is relatively narrow where it flows through the towns of Momence, Sun River Terrace, and Kankakee.

It must be noted that FEMA did not map the smaller streams in the western third of the County. Some of these areas have flooded (see photo), but they are not even shown as approximate floodplains on the FIRM. Chapter 5, section 5.5, discusses the need for a new Flood Insurance Rate Map for the County.

Horse Creek flooding, January 2005
Kankakee County Planning Department

Causes: Overbank flooding in these floodplains is caused by one or more of three factors:

- Too much precipitation in the watershed for the channels to convey
- Obstructions in a channel, such as an ice jam or beaver dam, and
- Large release of water when a dam or other obstruction fails.

Precipitation: Kankakee County receives an average of 36 inches of rain each year, including an annual average of 22 inches of snow (generally, 7 − 10 inches of snow has the equivalent water content of one inch of rain). However, it is not spread out evenly over the year. While most of it comes in the summer, the amount of rain that falls varies from storm to storm and varies over an area.

The amount of rain that causes a flood can vary, too. A heavy local storm that dumps several inches in a small area could cause a flood on a small stream. Several days of steady rain, especially on saturated or frozen ground, can also cause a flood on a larger river.

Soldier Creek flooding, 1957
Kankakee County Planning Department, Michael Quigley

Obstructions: Obstructions can be channel obstructions, such as small bridge openings or log jams, or floodplain obstructions, such as road embankments, fill and buildings. Channel obstructions will cause smaller, more frequent floods, while floodplain obstructions impact the larger, less frequent floods where most of the flow is overbank, outside the channel.

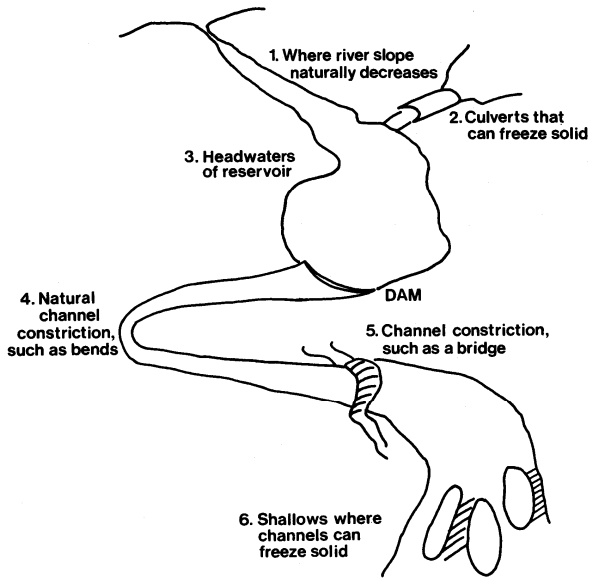
Obstructions can be natural or man made. Natural obstructions, like log jams, can be cleared out or are washed away during larger floods. The greater problem is man made obstructions, which tend to be more permanent. They are discussed in Chapter 5's section on floodplain regulations.

Historically, the most common cause of the largest floods on the Kankakee River has been ice jams. There are generally two types of ice jams:

- Frazil ice freezes the river and forms a dam.
- When warm weather and rain break up frozen rivers or any time there is a rapid cycle of freezing and thawing, broken ice floats downriver until it is blocked by an obstruction such as a bridge or shallow area.

In both cases, an ice dam forms, blocking the channel and causing flooding upstream. Ice jams present three hazards:

- Sudden flooding of areas upstream from the jam, often on clear days with little or no warning,
- Sudden flooding of areas downstream when an ice jam breaks. The impact is similar to a dam break, damaging or destroying buildings and structures.
- Movement of ice chunks that can push over trees and crush buildings (see photo, page 3-4).



Typical ice jam locations

Association of State Floodplain Managers

Ice jam flood on the Iroquois River, March 1979

Dam failure: Dams are made to hold back large amounts of water. If they fail or are overtopped, they can produce a dangerous flood situation because of the high velocities and large volumes of water released. A break in a dam can occur with little or no warning on clear days when people are not expecting rain, much less a flood. Breaching often occurs within hours after the first visible signs of dam failure, leaving little time for evacuation.

A dam can suffer a partial failure or a complete failure, but the potential energy of the water stored behind even a small dam can cause loss of life and great property damage downstream. In Illinois, dams are categorized in one of three classes, according to the degree of threat to life and property in the event of dam failure:

Class I – Dams located where failure has high probability for causing loss of life or substantial economic loss in excess of that which would naturally occur downstream of the dam if the dam had not failed.

Class II – Dams located where failure has moderate probability for causing loss of life or may cause substantial economic loss in excess of that which would naturally occur downstream of the dam if the dam had not failed.

Class III – Dams located where failure has low probability for causing loss of life or minimal economic loss in excess of that which would naturally occur downstream of the dam if the dam had not failed or where there are no permanent structures for human habitation.

The Illinois Department of Natural Resources (IDNR) Dam Safety Section has only two dams in Kankakee County in its inventory:

- The North Branch Soldiers Creek dam is a Class I dam because it is 13 feet high and upstream of a residential area. It is owned by the City of Bradley. IDNR inspections report that it has been well maintained.
- The low head dam in the Kankakee River in Kankakee is rated as a Class III.

Based on this information, it is concluded that the potential for damaging flooding caused by a dam failure in Kankakee County is low.

Historical events: There are three gages that record historical flood heights in Kankakee County. Each has a set "flood stage" that identifies the level that a river becomes troublesome. More information from these gages is shown on graphs on page 2-7. Here are some summary facts and figures:

Kankakee River at Momence:

- Flood stage: 5.0 or elevation 614.18.
- Records go back to 1915. Since then, the river's annual record height has exceeded flood stage in 44 years, or an average of every two years.

- Highest flood of record: 10.51 on March 6, 1979, caused by a combination of high flows and an ice jam.
- The six worst floods exceeded a stage of 7.0. All of them were in January − early March and related to ice jams.

Iroquois River near Chebanse:

- Flood stage: 16.0 or elevation 611.99.
- Records since 1924. This gage has recorded the Iroquois River exceeding flood stage in 19 years, or an average of once every four years.
- Highest flood of record: 21.68 on March 7, 1979, caused by backwater due to an ice jam on the Kankakee River.
- There were ten floods that exceeded a stage of 18.0. Half of them were related to ice jams.
- It should be noted that this gage is no longer in service, as of June 1, 2013, due to Federal budget cuts.

Kankakee River at Wilmington:

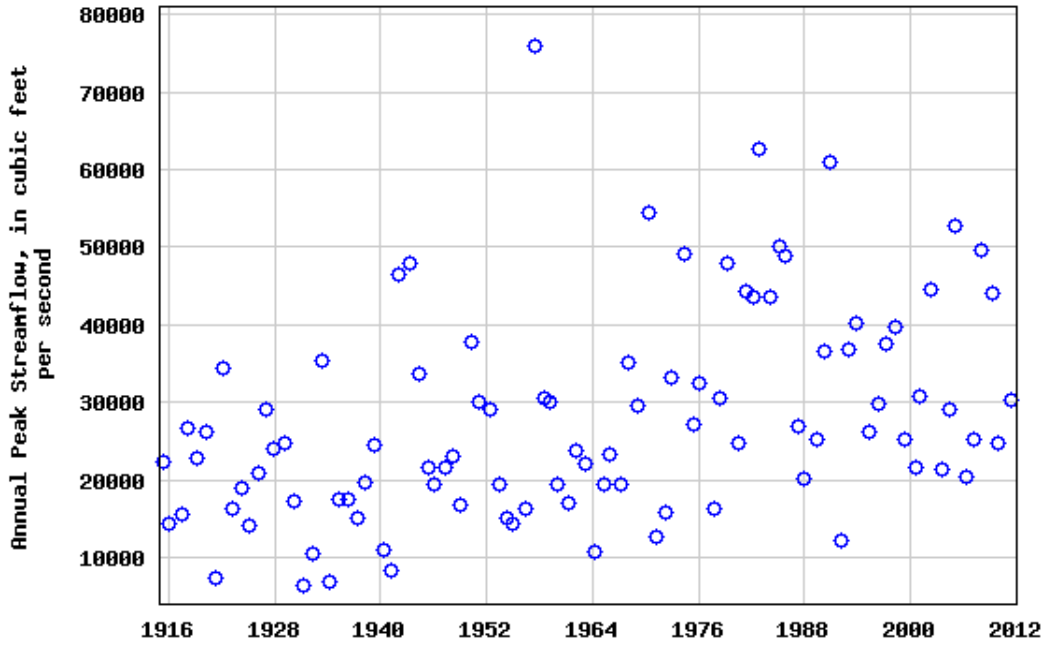
- Flood stage 5.0 or elevation 515.86.
- Records go back to 1915. Since then, the river's annual record height has exceeded flood stage in 74 years, or four years out of every five.
- Highest flood of record: 16.7 in 1883 and 1887 (date not recorded) and 15.41 on May 13, 1933.
- The eight highest floods of record exceeded a stage of 13.0. Three of them were related to ice jams.

Other streams have also flooded, but we do not have dependable gage records. According to the Flood Insurance Studies for Bradley and Bourbonnais, Soldier Creek and the North Branch Soldier Creek flooded in 1957, 1959, and 1974. A flood control project since then have greatly reduced its potential for overbank flooding (see Chapter 8).

Soldier Creek flooding, 1957

Kankakee River flooding, 2005

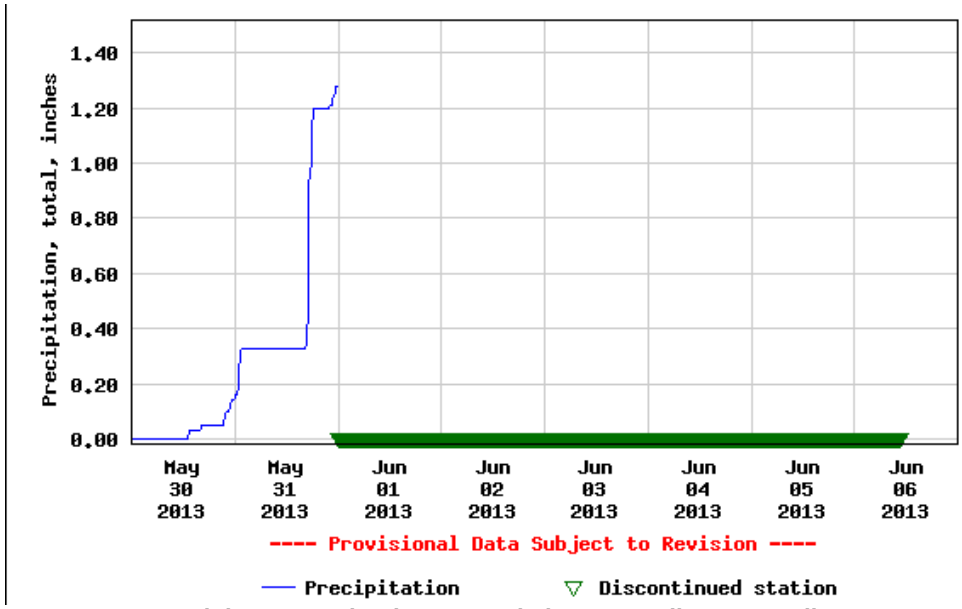
Kankakee County Planning Department, Michael Quigley



Historic Streamflow, Kankakee River at Wilmington

This graph shows the annual high flows for the Wilmington gage. This record is based on the discharge, i.e., the amount of water flowing past the gage. Therefore, backwater flooding caused by ice jams are not fully reflected on this graph. The data show that there is no pattern to flooding over the years, such as a long wet or dry spell. The flood of record on the Kankakee River was in July 1957. It was estimated at a 750-year recurrence interval.

US Geological Survey



Gage Heights, Iroquois River near Chebanse, April 2004 –April 2005

A reduction in funding due to sequestration for the U.S. Geological Survey's National Stream flow Information Program (NSIP) during the last half of FY 13 has resulted in the shutdown of the precipitation gage at this stream gage.

US Geological Survey

Frequency: Past floods are indications of what can happen in the future, but flood studies and mitigation plans are based on the *risk* of future flooding. Flood studies extrapolate from historical records to determine the statistical potential that storms and floods of certain magnitude will recur. Such events are measured by their "recurrence interval," i.e., a 10-year storm or a 50-year flood.

These terms are often misconstrued. Commonly, people interpret the 50-year flood definition to mean "once every 50 years." This is incorrect. Statistically speaking, a 50-year flood has a 1/50 (2%) chance of occurring in any given year. In reality, a 50-year flood could occur two times in the same year, two years in a row, or four times over the course of 50 years. It is possible to not have a 50-year flood over the course of 100 years.

Kankakee County has had several different flood studies. The official floodplain study for insurance and regulatory purposes is the *Flood Insurance Study* by the Federal Emergency Management Agency (FEMA).

What are the odds of a flood?

The term "100-year flood" has caused much confusion for people not familiar with statistics. Another way of looking at it is to think of the odds that a base flood will happen sometime during the life of a 30-year mortgage (26% chance).

Chance of Flooding over a Period of Years

Time Period	Flood Size 10-year	25-year	50-year	100-year
1 year	10%	4%	2%	1%
10 years	65%	34%	18%	10%
20 years	88%	56%	33%	18%
30 years	96%	71%	45%	26%
50 years	99%	87%	64%	39%

Even these numbers do not convey the true flood risk because they focus on the larger, less frequent, floods. If a house is low enough, it may be subject to the 10- or 25-year flood. During the proverbial 30-year mortgage, it may have a 26% chance of being hit by the 100-year flood, but the odds are 96% (nearly guaranteed) that a 10-year flood will occur during the 30 year period. Compare those odds to the only 5% chance that the house will catch fire during the same 30-year mortgage.

FEMA uses the "base" flood as the basis for its regulatory requirements and flood insurance rate setting. This *Plan* uses the base flood, too. The base flood is the one percent chance flood, i.e., the flood that has a one percent (one out of 100) chance of occurring in any given year. The one percent chance flood has also been called the 100-year flood. FEMA maps (called Flood Insurance Rate Maps, or FIRMs) the floodplain covered by the base flood the Special Flood Hazard Area or A Zone. The A Zones for Kankakee County are shown on the map on page 2-2.

Floodway: The central part of the floodplain is called the "floodway." The floodway is the channel and that portion of the adjacent floodplain which must remain open to permit passage of the base flood. Floodwaters generally are deepest and swiftest in the floodway, and anything in this area is in the greatest danger during a flood. The remainder of the floodplain is called the "fringe," where water may be shallower and slower. Floodways are also subject to special development regulations, as explained in Chapter 5.

Velocity: The speed of moving water, or velocity, is measured in feet per second. Flood velocity is important to mitigation because the faster water moves, the more pressure it puts on a structure and the more it will erode stream banks and scour the earth around a building's foundation.

The FEMA Flood Insurance Study includes the "average floodway velocity" for those streams that were studied in detail. This figure is helpful in determining the relative hazard of an area, but is not an accurate indication of the velocity of a flood at any individual site. Sites close to the channel will probably have higher velocities than this figure and sites at the fringe of the floodplain will be subject to lower velocities.

The average floodway velocities for the Kankakee and Iroquois Rivers and Soldier Creek generally range from less than one foot per second to 6 feet per second. Velocities are highest at the downstream end of the Kankakee, especially downstream of Rock Creek where the base flood drops at a rate of 8 feet per mile. At one point, the average floodway velocity is 12.2 feet.

At the upstream end of the Kankakee and on the Iroquois, the land is flatter and velocities are lower. Upstream of Momence, the river drops less than one foot per mile and the average floodway velocities are less than one foot per second.

Velocities of less than five feet per second are not considered a problem for construction of buildings and facilities. While buildings may be easy to protect in areas of low velocities, people are not always safe. The total impact of moving water is related to the depth of the flooding. Studies have shown that deep water and low velocities can cause as much damage as shallow water and high velocities.

The Kankakee River at the Route 17 bridge, normal flow, October 2004

The Kankakee River at the Route 17 bridge, flood flow, January 2005

Kankakee County Planning Department

2.2. Local Drainage Problems

The hazard: Flooding can also occur in yards and streets when rainwater can't flow into a ditch or storm sewer. These problems are usually caused by heavy local rains and are often not related to overbank flooding or floodplain locations.

Local drainage flooding is shallow with little or no velocity, so it is not as life threatening or destructive as overbank flooding. However, because it occurs more frequently, can affect many areas of the County, and can disrupt traffic, it often gets more attention.

East of Kankakee, January 2005

Kankakee County Planning Department

Location: There are three general types of areas with local drainage problems:

- Flat terrain with few or no natural drainage outlets. After a rain or snowmelt, water stands until it can drain or evaporate. The southeast corner of Kankakee County has such terrain as noted by the "X500" zone designations on the map on page 2-2. Areas of 100 acres or more are wet in the spring and fall.
- Built up areas where the drainage system has been disrupted. For example, basements can flood when regrading sends rainwater toward the house instead of away from it.
- Urbanized areas where the manmade system of storm sewers and ditches are inadequate to carry the increased amounts of runoff that results when fields and farms are replaced with impervious surfaces. In some cases, the sanitary sewers take on stormwater and back up into basements.

Historical events: The National Climatic Data Center lists 90 thunderstorms worth reporting in Kankakee County since 1950. However, detailed data on such storms is not available from a national database. In response to the call for input to this planning effort, some residents submitted "hazard data collection forms" that told of their experiences. Examples include:

- In April 1996, a local storm caused sewer backup to a home in Bradley.
- A homeowner in Bourbonnais reports chronic water problems, including seepage and sewer backup, since the house was purchased in June 2004.
- A homeowner in Aroma Park, on Bridge Street, reports yearly flooding of their property.
- A homeowner in Bourbonnais reports localized drainage problems including below grade habitable space flooding in 2008.

Frequency: Local drainage problems can be caused by small storms and therefore occur more frequently than overbank flooding. With 90 reported thunderstorms over 55 years, it is concluded that storms severe enough to cause local drainage problems occur at least once each year.

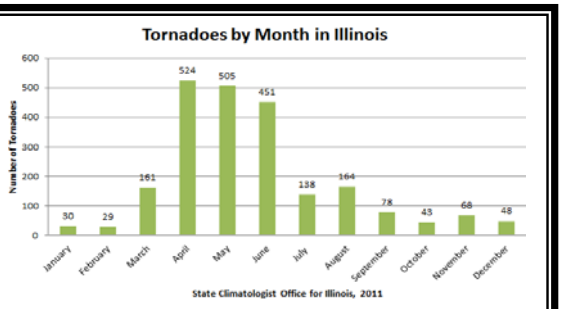
2.3. Tornadoes

The hazard: A tornado is a swirling column of air extending from a thunderstorm to the ground. Tornadoes can have wind speeds from 40 mph to over 300 mph. A majority of tornadoes have wind speeds of 112 mph or less.

Debris hurled by the wind can hit with enough force to penetrate walls. Tornadoes create localized low-pressure areas that can make a building explode. Windows, chimneys and roofs are the most vulnerable parts of buildings to tornado damage.

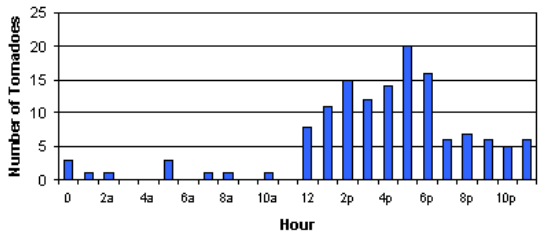
Tornadoes can move forward at up to 70 miles per hour, pause, slow down and change directions. Most have a narrow path, less than a 100 yards wide and couple of miles long. However, damage paths can be more than 1 mile wide and 50 miles long.

Late spring-early summer is the peak of tornado activity in the year. As seen in the chart below left, April, May, and June have the most frequent occurrences of tornadoes in the northeastern Illinois area. Tornadoes peak in the afternoon, when convectional heating is at a maximum. As shown in the chart below right, the peak time for tornadoes is at 5:00 in the afternoon.



Northeastern Illinois Tornadoes by Month

Illinois State Water Survey



Northeastern Illinois Tornadoes by Hour

Illinois State Water Survey

Fujita Tornado Scale

F0 Gale tornado 40-72 mph, chimney damage, tree branches broken

F1 Moderate tornado 73-112 mph, mobile homes pushed off foundations or overturned

F2 Significant tornado 113-157 mph, considerable damage, mobile homes demolished, trees uprooted

F3 Severe tornado 158-206 mph, roofs and walls torn down, trains overturned, cars thrown around

F4 Devastating tornado 207-260 mph, well-constructed walls leveled

F5 Incredible tornado 261-318 mph, homes lifted off foundation and carried considerable distances, autos carried as far as 100 meters

Tornadoes are classified as F0 through F5, based on wind speed and damage levels using the Fujita Tornado Scale

Historical events: In the past fifty five years, Kankakee County has had 34 recorded tornadoes. These are listed in the table below. The table shows that Kankakee County has not had a killer tornado since 1963. The events over the last 22 years have caused relatively little property damage. However, that does not mean the area is safe, as can be attested to by two more recent and deadly tornadoes in northeastern Illinois.

On August 28, 1990, at 3:30 pm a tornado hit Plainfield and the Joliet area. The storm and high winds moved on into Indiana. The tornado had winds up to 300 miles per hour, giving it a Fujita rating of F-5. It cut a path of destruction 20 miles long and from 200 yards to half a mile wide. Its impacts are highlighted on the next page.

More than 1,200 homes and buildings in Will County and at least 50 businesses were damaged or destroyed. Damage to three schools in Plainfield left 1,600 students without classrooms. Luckily, the tornado hit after school had been let out, although there were some deaths among participants in after-school activities.

In April 20, 2004, a tornado hit the small town of Utica in LaSalle County. Older buildings in the downtown were destroyed and eight people were killed (most of them taking shelter in the older buildings). Three tornadoes touched down in Kankakee County on the same day, one causing extensive damage in an industrial area south of Kankakee (see photos, page 3-11), although there was no official report on the amount of damage.

On June 5, 2010, an EF1 tornado developed about 5 miles southwest of Kankakee or 3 miles south of Limestone. The brief tornado caused damage to a farm just north of the intersection of 5000 W Road and 3000 S Road. Several trees were up-rooted . A machine shed on the property was destroyed along with farm equipment and vehicles. A quonset building was damaged and a fence was blown over. Damage was estimated at $500,000.

Again on June 5, 2010, an EF3 tornado began 3 miles northwest of St. Anne. The tornado developed just west of 6000E Road and tracked to the east, where it produced damage to a home and a garage along the road. At this location, a single family home collapsed upon itself, leaving it inhabitable. The garage sustained damage to its roof and exterior walls. The tornado was rated EF2 with winds estimated at around 113 mph.

The tornado continued to move to the east northeast, where it increased in intensity as it encountered yet another family home at the intersection of Route 1 and 4000S Road. This home and the garage/barn next to it sustained considerable damage, leaving the home inhabitable. The damage to the home consisted of all the walls collapsing, with all remaining debris from the house tossed to the northeast. The garage walls collapsed with the contents tossed to the east. Two four-wheelers and a four-door automobile inside the garage were lifted and flipped over as the tornado passed. Further north along Route 1, there was minor structural damage to a couple of homes and several trees uprooted. Damage at this location was rated EF3 with winds estimated at around 142 mph and a path width of 175 yards.

As this tornado continued to the northeast, it lost its intensity as it came across another

residence at the intersection of 4000S Road and 8500E Road. Here, a house sustained partial damage to its roof with several surrounding trees having limbs sheared at the top. The tornado weakened at this point, and damage was rated EF1 with winds estimated at around 97 mph and a path width of 50 yards.

The tornado moved to the northeast through a wooded area, causing damage to many trees along its way. The more significant damage occurred near the intersection of 13000E Road and Gamble Road in the Hopkins Park area, where several healthy large hardwood tree tops were sheared or broken. Some homes were damaged by falling trees. The tornado continued to weaken and damage was rated EF1, with winds estimated at around 88 mph, and a path width of 50 yards. It was along 13000E Road where the tornado appeared to lift, with no other damage evident beyond this point.

Kankakee County Tornado Events

Date	Time	Magnitude	Number of Deaths	Number Of Injuries	Property Damage
1/25/1950	9:00 p.m.	F2	0	0	$250,000
4/07/1954	3:16 p.m.	F3	1	13	$250,000
5/26/1955	4:30 p.m.	F1	0	0	$250,000
6/14/1957	3:00 p.m.	F1	0	0	$25,000
6/16/1960	3:00 p.m.	F1	0	0	$3,000
4/17/1963	3:55 p.m.	F4	1	50	$2,500,000
9/04/1969	5:20 p.m.	F2	0	0	$25,000
6/16/1973	5:30 p.m.	F0	0	0	0
6/09/1974	7:44 p.m.	F1	0	0	0
3/12/1976	1:35 p.m.	F3	0	0	$250,000
6/25/1978	12:15 p.m.	F1	0	0	0
4/02/1982	11:40 p.m.	F3	0	15	$25,000,000
6/22/1990	5:25 p.m.	F2	0	0	$250,000
3/22/1991	10:53 p.m.	F1	0	0	$2,500,000
3/27/1991	4:10 p.m.	F1	0	0	0
5/10/1995	1:07 p.m.	F0	0	0	0
4/19/1996	5:25 p.m.	F0	0	0	0
4/19/1996	6:01 p.m.	F0	0	0	0
5/18/2000	5:10 p.m.	F0	0	0	0
5/18/2000	5:10 p.m.	F0	0	0	0
5/30/2003	7:34 p.m.	F0	0	0	0
4/20/2004	6:18 p.m.	F2	0	0	0
4/20/2004	6:35 p.m.	F1	0	0	0
4/20/2004	7:03 p.m.	F0	0	0	0
5/24/2006	4:20 p.m.	F1	0	0	$75,000
6/03/2007	11:47 a.m.	EF0	0	0	0
6/07/2008	4:18 p.m.	EF1	0	0	0
3/08/2009	12:56 p.m.	EF1	0	0	$40,000
3/08/2009	1:00 p.m.	EF1	0	0	$30,000
6/05/2010	9:02 p.m.	EF1	0	0	$500,000
6/05/2010	9:18 p.m.	EF3	0	1	$600,000
6/05/2010	9:19 p.m.	EF1	0	0	$75,000
5/25/2011	8:04 a.m.	EF1	0	0	$250,000
6/20/2011	5:14 a.m.	EF0	0	0	$100,000

National Climatic Data Center (NCDC) Storm Events Database

A trail of death and destruction

The final death toll from the storm was 27.

Federal, state, county and municipal officials still are tallying the damages from the devastation.

But the latest estimate puts the totals at more than $165 million, excluding cleanup costs, said Don Gould, director of the Will County Emergency Services and Disaster Agency.

One insurance company also expects to receive about 100 damage claims from crops ruined by hail and debris from the storm, said Robert Muehling, manager of the Will County Farm Bureau.

WHEATLAND PLAINS
Destroyed: 12 homes
Damaged: 50 homes
Estimated damage: More than $9.2 million

PLAINFIELD
Destroyed: 55 homes
Major damage: 55 homes
Minor damage: 150 homes
Estimated damage: More than $9.5 million
Deaths (on U.S. 30): 3

ALONG ILLINOIS 59
Damaged: Several strip malls
Estimated damage: $3.5 million

PEERLESS ESTATES
Destroyed: 75 homes
Major damage: 26 homes
Minor damage: 122 homes
Estimated damage: $15.4 million

LILY CACHE
Destroyed: 55 homes
Major damage: 52 homes
Minor damage: 75 homes
Estimated damage: $11.5 million
Death: 1

PLAINFIELD SCHOOLS
Destroyed: High School, Grand Prairie Elementary School and district administration center
Estimated damage: $60 million
Deaths: 3

ST. MARY IMMACULATE
Damaged: grade school, church, rectory and convent
Estimated damage $6 million
Deaths: 3

BRIDALWREATH
Destroyed: 3 homes
Major damage: 14 homes
Minor damage: 74 homes
Estimated damage: $2.7 million

CRYSTAL LAWNS
Destroyed: 69 homes
Major damage: 104 homes
Minor damage: 220 homes
Estimated damage: Over $15 million
Deaths: 2

WARWICK ESTATES
Destroyed: 50 homes
Major damage: 26 homes
Minor damage: 5 homes
Estimated damage: More than $6 million
Deaths: 2

Died later from injuries related to the tornado: 3

These areas sustained scattered damage. No damage estimates have been released.

CRESTHILL LAKES
Destroyed: 3 buildings (more than 100 apartments)
Estimated damage: $5 million
Deaths: 8

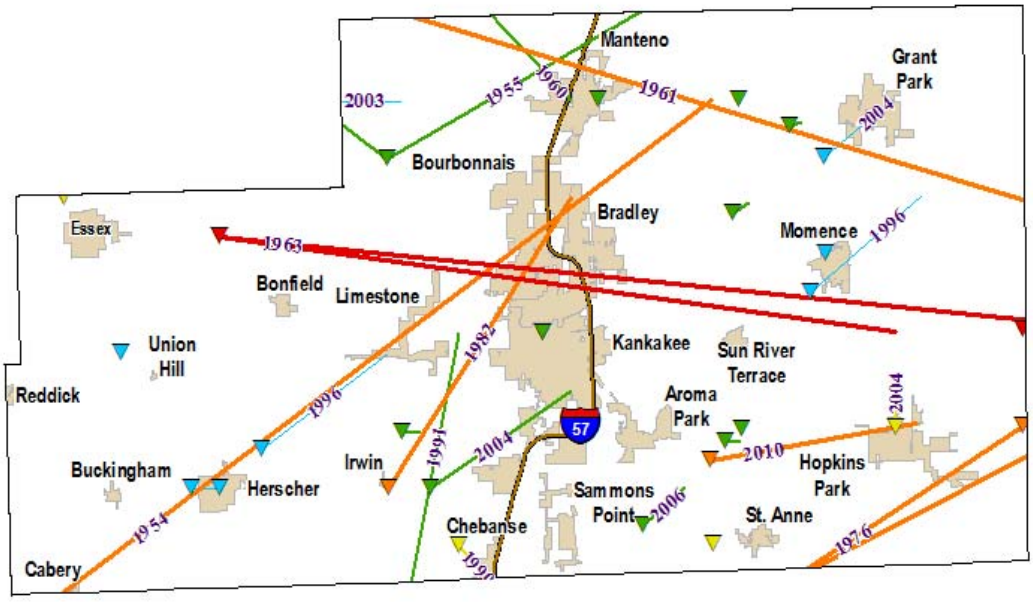
COLONY WEST
Destroyed: 12 townhomes
Estimated damage: $2.2 million

ELIZABETH COURT
Destroyed: 3 apartment buildings
Estimated damage: $300,000

CEDARWOOD DRIVE
Deaths: 2

Chicago Tribune, August 28,1990

Location: The tornadoes listed in the table on page 2-13 are plotted on the map below. This shows that a tornado can strike anywhere in the County. No area is safe.

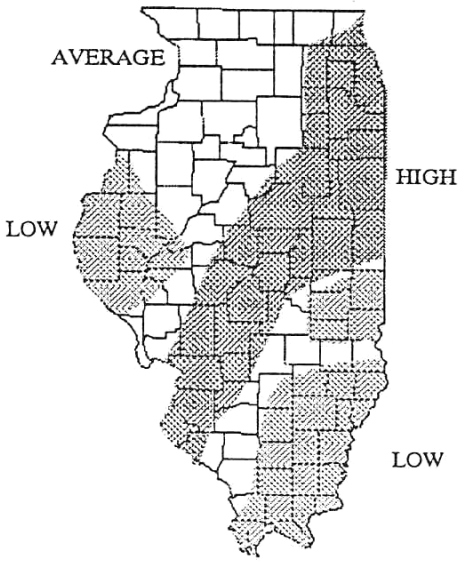


Locations and tracks of historical tornadoes, 1950 – 2010

National Climatic Data Center (NCDC) Storm Events Database

Frequency: Illinois sees an average of 26 tornadoes each year, but there are no official recurrence intervals calculated for tornadoes. Kankakee County has had 34 of the 1,944 tornadoes recorded in Illinois between 1950 and 2013. Kankakee County is classified as having a high tornado risk based on historic tornado wind speeds and the number of recorded tornadoes per 1,000 square miles.

With 34 occurrences over 60 years, the likelihood of a tornado hitting somewhere in the county is 0.566 (56.6%) in any given year. Assuming a tornado affects one square mile and there are 680 square miles in Kankakee County, the odds of a tornado hitting any particular square mile in the County is 0.566 in 680 (1 in 1,201) each year or a .0008% annual chance.



Tornado Frequency

Illinois Emergency Management Agency

2.4. Earthquakes

The hazard: Earthquakes are caused by the release of strain between or within the Earth's tectonic plates. The severity of an earthquake depends on the amount of strain, or energy, that is released along a fault of an earthquake. The energy released by an earthquake is sent through the earth to the ground surface.

There are several common measures of earthquakes, including the Richter Scale and the Modified Mercalli Intensity (MMI) scale. The Richter Scale is a measurement of the magnitude, or the amount of energy released by an earthquake. Magnitude is measured by seismographs. The Modified Mercalli Intensity is an observed measurement of the earthquake's intensity felt at the earth's surface. The MMI varies, depending on the observer's location to the earthquake's epicenter.

An earthquake's Intensity (MMI) depends on the geologic makeup of the area and the stability of underlying soils. The effects of earthquakes can be localized near its epicenter or felt significant distances away. For example, a 6.8-magnitude earthquake in the New Madrid Fault in Missouri would have a much wider impact than a comparable event on the California Coast.

Earthquake Measurement Scales

Mercalli	Richter	Felt Intensity
I	0-4.3	Not felt except by a very few people under special conditions. Detected mostly by instruments
II		Felt by a few people, especially those on upper floors of buildings. Suspended objects may swing.
III		Felt noticeably indoors. Standing automobiles may rock slightly.
IV	4.3-4.8	Felt by many people indoors, by a few outdoors. At night, some people are awakened. Dishes, windows, and doors rattle.
V		Felt by nearly everyone. Many People are awakened. Some dishes and windows are broken. Unstable objects are overturned.
VI	4.8-6.2	Felt by everyone. Many people become frightened and run outdoors. Some heavy furniture is moved. Some plaster falls.
VII		Most people are alarmed and run outside. Damage is negligible in buildings of good construction, considerable in buildings of poor construction,
VIII	6.0-7.3	Damage is slight in specially designed structures, considerable in ordinary buildings, great in poorly built structures. Heavy furniture is overturned.
IX		Damage is considerable in specially designed buildings. Buildings shift from their foundations and partly collapse. Underground pipes are broken.
X		Some well-built wooden structures are destroyed. Most masonry structures are destroyed. The ground is badly cracked. Landslides occur on steep slopes.
XI	7.3-8.9	Few, if any, masonry structures remain standing. Rails are bent. Broad fissures appear in the ground.
XII		Virtually total destruction. Waves are seen on the ground surface. Objects are thrown in the air.

Multi-Hazard Identification and Risk Assessment

The old flat-lying, intact bedrock of the central United States behaves as a good "transmitter" of the earthquake's energy, and tremors can be felt hundreds of miles away. By contrast, the young, broken up bedrock of the West Coast allows the energy to dissipate quickly, which keeps the effects of the earthquake more localized.

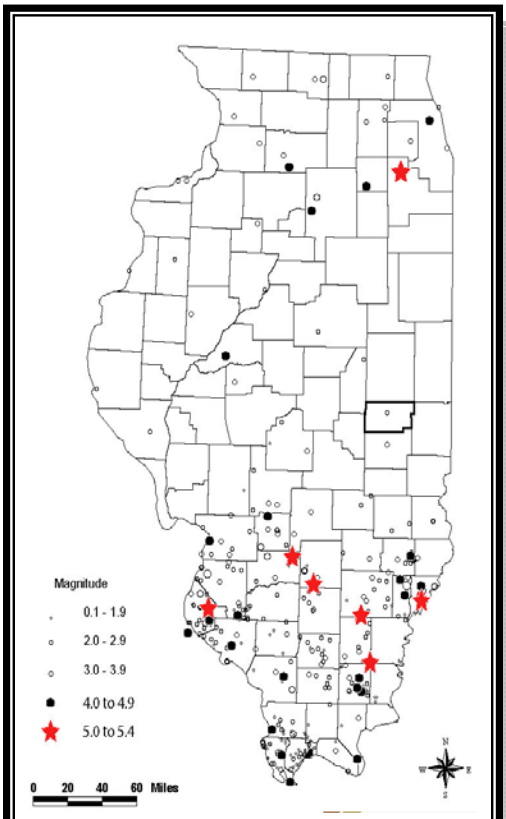
Earthquakes can trigger other types of ground failures which could contribute to the damage, such as landslides and liquefaction. In the latter situation, shaking can mix groundwater and soil, liquefying and weakening the ground that supports buildings and severing utility lines. This is a special problem in floodplains where the water table is relatively high and the soils are more susceptible to liquefaction.

The Modified Mercalli and Richter Scales are compared in the table on the previous page. It is important to note that the Mercalli Intensity varies based on the observer's proximity to the epicenter. Using the example of a 6.8-magnitude earthquake event at the New Madrid Fault, the Intensity in St. Louis may be "XI", but in Kankakee County the Intensity may be observed as a "IV."

Historical events: In the United States, the most frequent reports of earthquakes come from the West coast, but the largest earthquakes in the lower 48 states occurred in Missouri in 1811 and 1812 along the New Madrid Faults. The Great New Madrid Earthquakes are the benchmarks from which all earthquakes in the Midwest are measured. An important fact is that the earthquakes of 1811 and 1812 were not single events. Rather the earthquakes were a series of over 2,000 shocks in five months.

Six of these quakes were larger than a magnitude of 7 on the Richter Scale and two were near magnitude 8. They totally destroyed the town of New Madrid and caused the land to roll in visible waves. They raised and sank land as much as 20 feet. The tremors of these earthquakes were no doubt felt throughout all of Illinois, since the quakes are said to have rung church bells in New England.

Earthquakes have occurred throughout Illinois. There was a report of a quake at Fort Dearborn (Chicago) in August 1804.



Earthquakes in Illinois 1795 – 2012

Illinois State Geological Survey

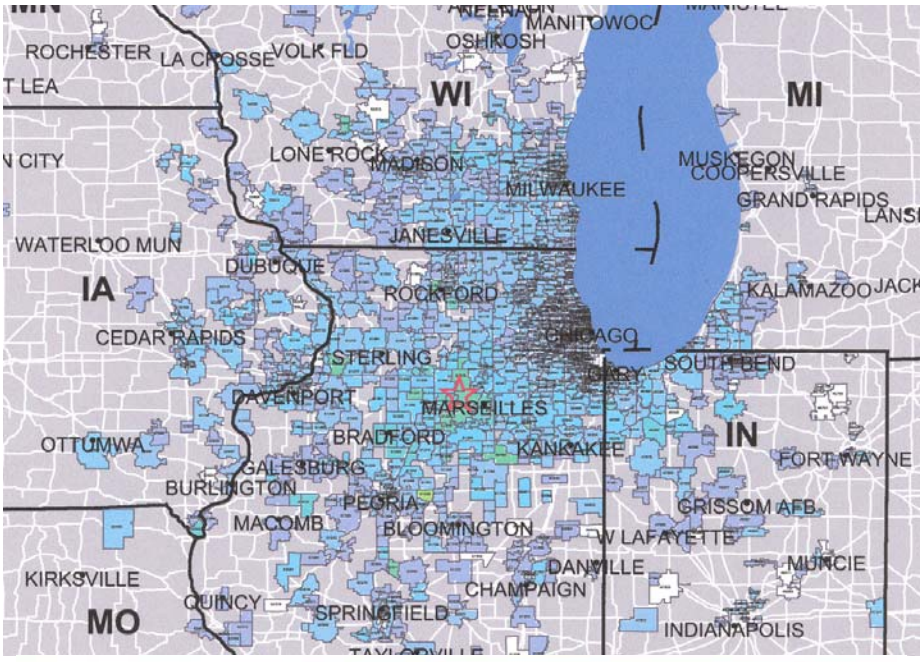
The US Geological Survey website, "Earthquake History of Illinois" provides this account of one of the largest:

> Among the largest earthquakes occurring in Illinois was the May 26, 1909, shock which knocked over many chimneys at Aurora. It was felt over 500,000 square miles and strongly felt in Iowa and Wisconsin. Buildings swayed in Chicago where there was fear that the walls would collapse. Beds moved on their casters…. [G]as line connections broke at Aurora. [The magnitude of this event is estimated at 5.1 and had a reported Intensity of VII.]

On June 28, 2004, an earthquake struck northern Illinois. It was centered near Ottawa and registered as a magnitude 4.5 on the Richter Scale. The measured Intensity is shown in the map, below. Kankakee County residents reported weak to light shaking (Mercalli scale III and IV) and no damage.

On January 2, 2006, an earthquake registering as a magnitude of 3.6 struck Illinois approximately 2 miles north / northwest of the Village of Equality.

On April 18, 2008 a magnitude 5.4 earthquake struck Illinois 20 miles south / southeast of the Village of Olney.



INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+
SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy

Intensity of the June 28, 2004 Northern Illinois earthquake

The US Geological Survey used an Internet questionnaire to collect reports on the felt Intensity of the June 28, 2004, Ottawa earthquake. The map reflects 7,866 responses from 1,045 ZIP codes.

Location: It is important to note that the level of damage is dependent on the location of the earthquake. The location of historical earthquakes in northeastern Illinois and the rest of the state, shows that earthquakes may be much closer to Kankakee County than ones associated with the New Madrid Seismic Zone. These are shown in the map on page 2-16. A smaller earthquake event closer to Kankakee may cause as much damage as a large event in the New Madrid Seismic Zone. Kankakee County felt an MMI Intensity of V − VI from the 1909 quake in Will County and less from the 2004 Ottawa earthquake.

All of Kankakee County is susceptible to earthquake damage. However, "in Illinois, structures built on thick, loose sediments of river flood plains are more likely to be damaged than structures on glacial till (stiff, pebbly clay) or bedrock. In fact, seismic Intensity may increase one or more units on the Modified Mercalli Intensity Scale, if loose sediments are present. Also, loose sandy sediments with high moisture content can turn to liquid - quick sand type state - (liquefaction) when shaken enough." *(Illinois State Geological Survey)* Therefore, the floodplain map on page 2-2 shows the areas in Kankakee County where the earthquake hazard is greatest.

Frequency: About 200 earthquakes happen each year in the New Madrid seismic zone, but most are too small to be felt by people. The larger recent earthquakes felt in Illinois over the last 20 years are listed in the table to the right. None of these caused much damage in the affected areas of the state.

Recent Earthquakes Felt in Illinois

Richter	Date	Epicenter
5.0	May 10, 1987	Near Lawrenceville IL
4.5	Sep. 28, 1989	15 miles south of Cairo, IL
4.7	Apr. 27, 1989	15 miles SW of Caruthersville, MO
4.6	Sep. 26, 1990	10 miles south of Cape Girardeau, MO
4.6	May 3, 1991	10 miles west of New Madrid, MO
4.2	Feb. 5, 1994	Lick Creek-Goreville Area
4.5	June 28, 2004	8 miles NNW of Ottawa, IL
3.6	Jan. 2, 2006	2 miles NNW of Equality, IL
5.4	April 18, 2008	20 miles SSE of Olney, IL

Illinois Hazard Mitigation Plan

Although it is estimated that the earthquakes of 1811 and 1812 are likely to occur once every 500 to 600 years, it is still likely that a damaging earthquake (6.0 to 7.6 on the Richter Scale) will occur in this lifetime.

According to the Central U.S. Earthquake Consortium, Kankakee County is in an earthquake Intensity zone of IV (MMI Scale) for a 8.0-magnitude earthquake along the New Madrid Seismic Zone. The latest forecasts by the U.S. Geological Survey and the Center for Earthquake Research and Information of the University of Memphis estimate a 7% − 10% probability over a 50 year time period of a repeat of a major earthquake like those that occurred in 1811-1812 (which likely had magnitudes of between 7.5 and 8.0).

For a magnitude 6.0 and greater earthquake, there is a 25-40% chance in 50 years. As noted in the table on page 2-15, this level of quake would be felt by many, but would cause minor damage.

Therefore, on the whole, the probability of a damaging quake hitting Kankakee County in any given year is considered at 1% (0.01) or less.

2.5 Winter Storms

The Illinois Emergency Management Agency defines a severe winter storm as a storm that meets one or more of the following criteria:

- A snowstorm that produces six inches or more of snow within 48 hours or less,
- An ice storm in which 10% of the cooperative National Weather Service stations in Illinois report glaze, and/or
- A snowstorm or ice storm in which deaths, injuries, or property damage occurs.

There are many ways for winter storms to form, but certain key ingredients are needed. First temperatures must be below freezing in the clouds and near the ground. There must be a source of moisture in the form of evaporating water. Then lift in the atmosphere causes the moisture to rise and form clouds of precipitation.

Winter storms in the Midwest are caused by Canadian and Arctic cold fronts that push snow and ice deep into the interior region of the United States. Winter storms can occur as heavy snowfalls, ice storms or extreme cold temperatures. Winter storms can occur as a single event or they can occur in combination which can make an event more severe. For example, a moderate snowfall could create severe conditions if it were followed by freezing rain and subsequent extremely cold temperatures.

Winter storm

Snow: Heavy snowfalls can range from large accumulations of snow over many hours to blizzard conditions with blowing snow that could last several days. The National Weather Service's snow classification is in the table below. In addition to the problems caused by the snow storm is the subsequent melting and possible flooding.

Snow Classifications	
Blizzard	Winds of 35 miles per hour or more with snow and blowing snow reducing visibility to less that ¼ mile for at least 3 hours.
Blowing Snow	Wind-driven snow that reduces visibility. Blowing snow may be falling snow and/or snow on the ground picked up by the wind.
Snow Squalls	Brief, intense snow showers accompanied by strong, gusty winds. Accumulation may be significant.
Snow Showers	Snow falling at varying intensities for brief periods of time. Some accumulation possible.
Snow Flurries	Light snow falling for short duration with little or no accumulation.
National Weather Service	

Ice Storms: An ice storm occurs when freezing rain falls from clouds and freezes immediately upon impact. Freezing rain is found in between sleet and rain. It occurs when the precipitation falls into a large layer of warm air and then does not have time to refreeze in a cold layer (near or below 32°F) before it comes in contact with the surface which is also near or below 32°F. Note that ice jam flooding is covered under the flood hazard. It is not related to ice storms, but the break up of frozen rivers in later winter.

Historical Events: The last eighteen years' winter storms are listed in the table to the right. Kankakee County received Presidential snow emergency declarations for the storms in January 1999 and December 2000.

One of the worst winter storms to impact the State was on January 26-27, 1967, when as much as 23 inches of snow fell on the Chicago area. Travel throughout northern Illinois was curtailed and areas to the south experienced a glaze of ice which made travel virtually impossible until January 29. Fifty deaths were directly attributed to this storm.

In 1979, a Federal snow emergency was declared when the northern third of the State received 6 inches or more of snowfall between January 12 and 14. The heaviest snowfall, between 12 and 20 inches, was recorded in the northeast quarter of the State, where traffic was paralyzed.

From December 10 through December 31, 2000, the cumulative effects of severe winter storms caused extensive road closures, school closings and hazardous road conditions and severely taxed snow removal resources. During this time period, the Chicago area received a record 41.3 inches of snow.

Kankakee County Winter Storms

Date	Type	Deaths *
2/22/1994	Heavy Snow	0
12/08/1995	Winter Storm	0
1/09/1997	Winter Storm	0
1/15/1997	Winter Storm	5
12/09/1997	Heavy Snow	0
3/09/1998	Heavy Snow	0
1/01/1999	Heavy Snow	1
3/08/1999	Heavy Snow	0
1/19/2000	Heavy Snow	0
12/11/2000	Winter Storm	0
12/13/2000	Heavy Snow	0
1/30/2002	Winter Storm	0
3/02/2002	Winter Storm	0
12/24/2002	Winter Storm	0
1/21/2005	Heavy Snow	0
2/06/2007	Winter Storm	0
2/25/2007	Winter Storm	0
12/15/2007	Heavy Snow	0
12/31/2007	Heavy Snow	0
1/29/2008	Winter Storm	0
1/31/2008	Winter Storm	0
2/01/2008	Winter Storm	0
1/14/2009	Winter Storm	0
12/11/2010	Winter Storm	0
1/20/2012	Winter Storm	0

* Note: these storms affected several counties so the deaths may not have been in Kankakee County.

National Climatic Data Center (NCDC) Storm Events Database

Location: Winter storms affect the entire county.

Frequency: During the 20th century, there were at least two severe winter storms in Illinois each year. In an average year, five severe winter storms strike somewhere in the state. Due to the geographic latitude, most of these would hit Kankakee County, although ice storms are more common in the central part of the state, where temperatures are warmer. Therefore, the odds of a winter storm hitting Kankakee County in any given year are 1:1 or a 100% chance.

2.5. Thunderstorms

The hazard: Severe thunderstorms are most likely to happen in the spring and summer months and during the afternoon and evening hours but can occur year-round and at all hours. Thunderstorms can bring four hazards:

- Flooding
- Lightning
- High winds, tornadoes and microbursts
- Hail

The National Weather Service classifies a thunderstorm as "severe" if:

- Its winds reach or exceed 58 mph,
- It produces a tornado, or
- It drops surface hail at least 0.75 inch in diameter.

The effects of flooding caused by local storms is covered under the earlier sections on local drainage problems.

Lightning, which occurs during all thunderstorms, can strike anywhere. Generated by the buildup of charged ions in a thundercloud, the discharge of a lightning bolt interacts with the best conducting object or surface on the ground. The air in the channel of a lightning strike reaches temperatures higher than 50,000°F. The rapid heating and cooling of the air near the channel causes a shock wave which produces thunder.

Thunderstorms bring lightning

Tornadoes are discussed in a previous section. High winds include downbursts and microbursts. These are strong, concentrated, straight-line winds created by falling rain and sinking air that can reach speeds of 125 mph.

Microbursts are caused by a downward rush of cool descending air from a thunderstorm. The air rushing to the ground may look like a cloud. Once the air strikes the ground at a high speed, the air has to go somewhere which is usually in all directions. The horizontal spreading of this air along the ground is termed straight line winds. These winds may be 100-150 miles per hour which is as strong as an F1 or F2 tornado.

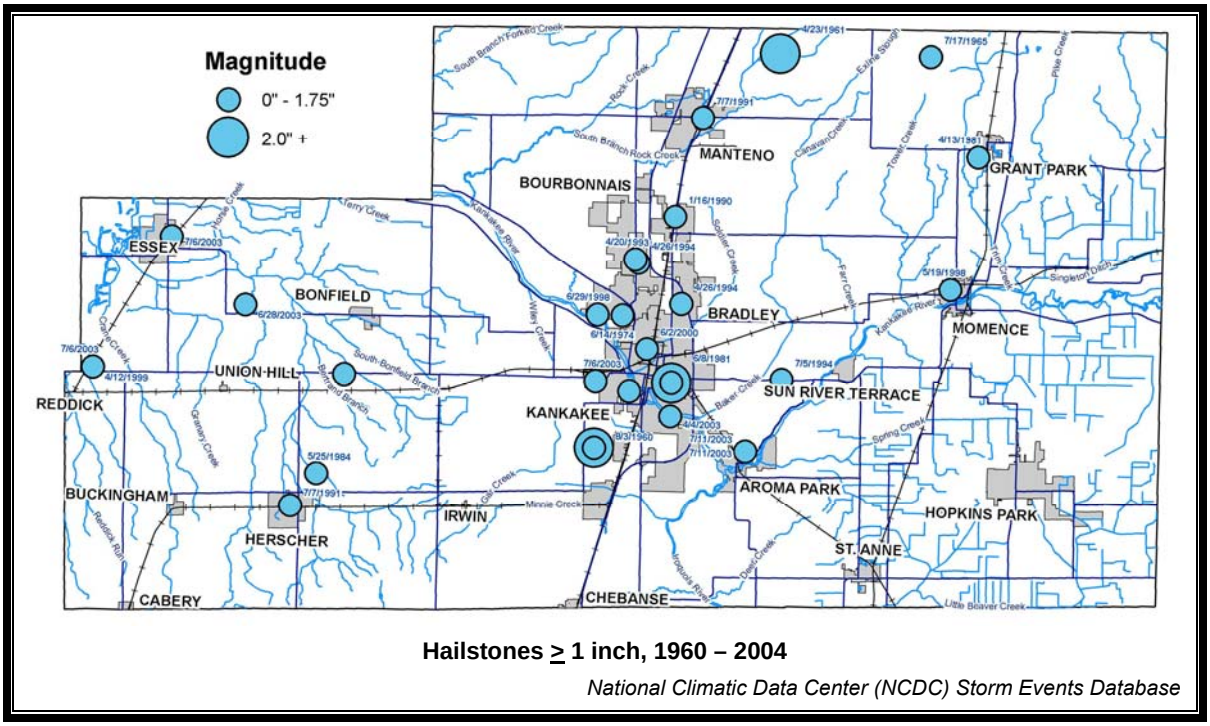
Hailstones are ice crystals that form within a low-pressure front due to warm air rising rapidly into the upper atmosphere and the subsequent cooling of the air mass. Frozen droplets gradually accumulate on the ice crystals until, having developed sufficient weight, they fall as precipitation. The size of hailstones is a direct function of the severity and size of the storm. Significant damage does not result until the stones reach 1.5 inches in diameter, which occurs in less than half of all hailstorms. In April 1961, several six inch hail stones were reported in Kankakee.

Compared with other atmospheric hazards such as tropical cyclones and winter low pressure systems, individual thunderstorms affect relatively small geographic areas. The average thunderstorm system is approximately 15 miles in diameter (75 square miles) and

typically lasts less than 30 minutes at a single location. However, weather monitoring reports indicate that coherent thunderstorm systems can travel intact for distances in excess of 600 miles.

Historical events: The National Climatic Data Center (NCDC) records show 92 reported occurrences of thunderstorms and high winds in Kankakee County since 1950, 54 with winds of 50 knots or greater.

The NCDC reports 63 hail storms in Kankakee County since 1960. Those with reported hailstones of one inch or larger are plotted on the map below.



Hailstones ≥ 1 inch, 1960 – 2004

National Climatic Data Center (NCDC) Storm Events Database

A resident in Bonfield reported lightning that damaged a building in July 2002 and hail large enough to cause damage in a storm in April 1996. Other areas of the County reported lightning, hail, and wind damage from past storms.

On May 30, 2008, hail to the size of tennis balls was reported covering the ground near Main Street and Route 50. School roofs were damaged including heating and cooling units. Two school greenhouses were also damaged. Windows were also broken on some houses and businesses.

Location: Thunderstorms and lightning can affect any location in Kankakee County. Some thunderstorms cover several counties. As noted in the map above, hail can fall anywhere. The higher density of reported hailstones in the metropolitan area is likely due to the presence of more people to witness it.

Frequency: The Kankakee County area averages 60 – 70 thunderstorm events each year (*Multi Hazard Identification and Risk Assessment*, page 31). They average an hour in duration. It is estimated that only five storms each year have the hailstorms and high winds to be considered a severe thunderstorm. Assuming the average severe storm affects 100 square miles, the odds of a severe thunderstorm hitting any particular square mile in Kankakee County are 1 to 1 or 100%.

2.6 Drought/Extreme Heat

The Hazard: Drought is a period of less than usual precipitation. Drought is often accompanied by extreme heat and the impacts of a drought are aggravated by high temperatures, so the two hazards are discussed together.

There are four classes of drought, based upon what is impacted by the shortage of water:

- Meteorological Drought: Less precipitation than an expected average or normal amount based on monthly, seasonal, or annual time scales.
- Hydrologic Drought: Less stream flows and reservoir, lake, and groundwater levels.
- Agricultural Drought: A reduction in soil moisture enough to affect plant life, usually crops.
- Socioeconomic Drought: A reduction in water supply to the extent that demand exceeds the supply.

The Palmer Drought Severity Index (PDSI) is an attempt to compare weekly temperature and precipitation readings over a defined climatic region in order to identify periods of abnormally dry (or wet) weather. These PDSI readings reflect the relative disparity between moisture supply (precipitation and soil moisture) and demand (evapotranspiration, soil recharge and runoff needs) for a particular region based upon what is considered normal for the area.

The index is used to evaluate scope, severity, and duration of abnormal weather. Based on the PDSI, the State's *Hazard Mitigation Plan* designates Kankakee County and most of central and northern Illinois as having a "guarded" hazard level for drought. Southern Illinois is generally more vulnerable to drought due having to soils that hold less water.

Extreme heat for a region is temperatures that hover 10 degrees or more above the average high temperature for several weeks. Kankakee County has an "elevated" hazard rating for extreme heat in the State's *Hazard Mitigation Plan*.

The major impact of drought is to farmland

Historical events: In September 1983, all 102 Illinois counties were proclaimed State

disaster areas as a result of high temperatures and insufficient precipitation beginning in mid-June. The most severe drought in recent years was 1988, when rainfall was 88 percent of normal (less than 50 percent of the April through August normal rainfall).

A smaller drought occurred in the northern two-thirds of the State in May 1992. Although it only lasted through the month of May, Chicago, Moline and Rockford recorded the driest May on record, and Springfield and Peoria their second driest.

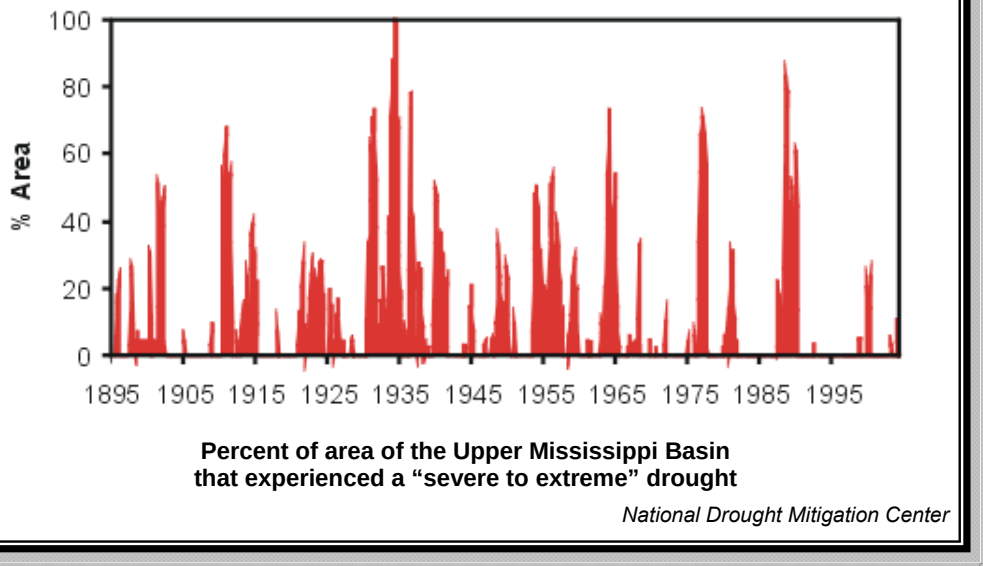
The summer of 1995 saw a heat wave that caused a record number of deaths and injuries in northeastern Illinois from such a phenomenon. This time, there was no accompanying drought, but high humidity that, combined with the high temperatures, created severe hardships on those with breathing and heart troubles.

In 1999, Cook County experienced another heat wave that closely matched the 1995 event, but the death toll was greatly reduced. A paper written by the State Water Survey, attributes much of the reduction in deaths to mitigation efforts, such as education by the news media and monitoring procedures for the urban elderly. (*Illinois Natural Hazard Mitigation Plan*, page III-66)

During the months of June, July, August, and September of 2012, Kankakee County experienced drought conditions along with much of the rest of northern Illinois. This drought was the 4th driest on record at Chicago's Ohare Airport.

Location: Droughts and heat waves occur throughout the County.

Frequency: The State's *Hazard Mitigation Plan* reports that droughts like the one in 1988 "occur about once every 21 years." The graph below shows the amount of the Upper Mississippi Basin that experienced a drought over the last 110 years. The worst period was the 1930's, when the Dust Bowl hit the central United States. This graph shows a frequency of drought every 10 – 20 years.



Percent of area of the Upper Mississippi Basin that experienced a "severe to extreme" drought

National Drought Mitigation Center

"The time we have until the next heat wave is unknown, but all of the major reports on global warming indicate that an increase in severe heat waves is likely." (*Illinois Natural Hazard Mitigation Plan*, page III-66).

This plan uses 15 years as the frequency for recurrence of a drought or extreme heat. This is an annual recurrence rate of 0.067.

2.6. Wildfire

The Hazard: Wildfires are uncontrolled fires that spread through vegetation, such as forests or grasslands. They often begin unnoticed and spread quickly and are usually signaled by dense smoke that fills the area for miles around. Wildfires are a natural process, vital to restoring appropriate vegetation to an area. They are a natural hazard when they threaten built up areas.

Grass wildfire

Northwest Indiana Times

People start more than four out of every five wildfires, usually as debris burns, arson, or carelessness. Lightning strikes are the next leading cause of wildfires.

Wildfire behavior is based on three primary factors, fuel, topography, and weather. The type, and amount of fuel, as well as its burning qualities and level of moisture affect wildfire potential and behavior. Topography affects the movement of air (and thus the

fire) over the ground surface. The slope and shape of terrain can change the rate of speed at which the fire travels. Fire moves faster in hilly areas and up steep slopes.

Weather affects the probability of wildfire and has a significant effect on its behavior. Areas that have experienced prolonged droughts are at the highest risk of wildfires. Temperature, humidity and wind (both short and long term) affect the severity and duration of a fire.

Historical events: The State's Hazard Mitigation Plan does not identify wildfires as a hazard severe enough to address. The National Climatic Data Center has no reports of wildfires in Kankakee County since 1950. Other databases report only major fires of national significance.

The table to the right lists the number of reported fire district calls that responded to wildfires in recent years. Local reports note that there have been wildfires in the southeastern part of the County, especially in Pembroke and St. Anne Townships.

Wildfire Calls

Year	Pembroke	St. Anne
2000	30	20
2001	29	15
2002	18	9
2003	20	6
2004	29	10
	126	60

St. Anne Fire Protection District

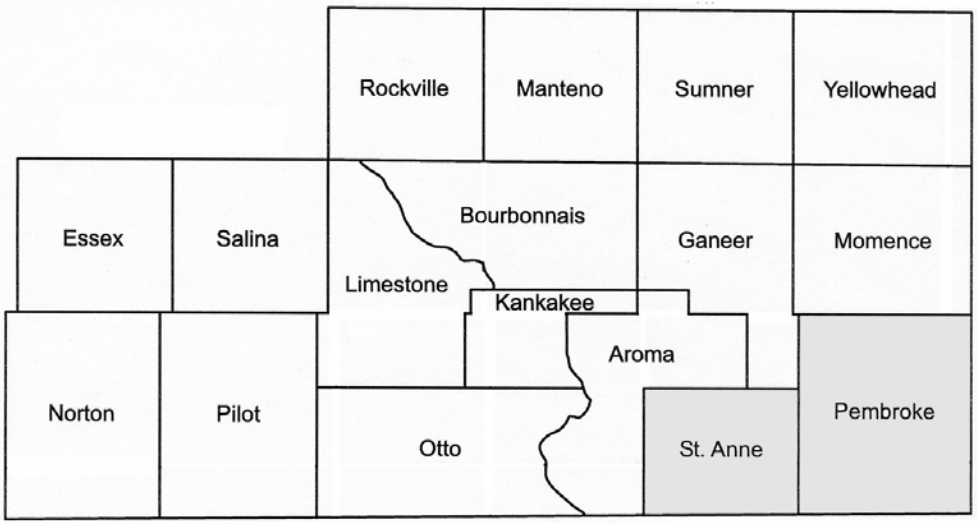
The Illinois State Fire Marshall's office reviewed reported statistics from the wildfires of 2004. It noted that where the causes could be determined, they were almost all of human origin, such as smoking and outdoor burning of vegetation or debris.

Since 2005, Kankakee County has had 3460 brush fires. Of these 483 have been in Pembroke Township and 219 have been in St. Anne Township.

A typical fire is reported here:

> Brush fires whipped by shifting winds raged across a square mile of Pembroke Township TuEMAy afternoon, threatening buildings and challenging fire departments from a three-county area.
>
> No injuries resulted in the blaze which began around 11:30 a.m. Fire crews continued to engage the spreading conflagration until around 6:30 p.m., said Momence Fire Chief Dave Horn.
>
> Horn's department was among the host of fire units responding to the scene. Others included Pembroke, Essex, Beecher, Limestone, Bradley-Bourbonnais, Chebanse, St. Anne, Aroma Park, Grant Park and Papineau.
>
> Horn said the fire swept across a weed and grass choked area extending from 3000S to 2000S and from 15000E to 14000E roads….
>
> Cause of the fire remains under investigation. In past springs, brush fires have often been sparked by open trash burning on windy days. No one was injured and Horn said no buildings were thought to have been lost.
>
> *– Kankakee Daily Journal, April 6, 2005*

Location: By definition, wildfires occur outside urban areas, although they may threaten developed properties on the urban/rural fringe. In Kankakee County, most events have been in Pembroke and St. Anne Townships, highlighted in the township map, below.



Kankakee County townships, showing the area most susceptible to wildfires

Frequency: Based on the figures in the table on the previous page, Pembroke Township can expect an average of 60 wildfires each year and an average of 27 will hit St. Anne Township. These are the fires that will be large enough to call the fire department.

While many of the fires were extinguished before they damaged homes, businesses or vehicles, at least 20 homes have been reported destroyed by fire between 2000 and 2005. These two townships should expect a fire severe enough to damage or destroy one home each year.

2.7. References

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   - City of Kankakee, May 5, 2003
   - Kankakee County (unincorporated areas), December 20, 2002
   - Village of Bourbonnais, March 29, 1978
   - Village of Bradley, May 5, 2003
   - Village of Momence, November 20, 1996
   - Village of Sun River Terrace, April 16, 1997
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4. *Illinois Natural Hazard Mitigation Plan,* Illinois Emergency Management Agency, 2004.
5. Interview with Illinois Department of Natural Resources, Dam Safety Office
6. Kankakee Daily Journal articles
7. *Multi-Hazard Identification and Risk Assessment*, Federal Emergency Management Agency, 1997.
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