Oswego Township

2024 Mosquito Management Program
Annual Report

Submitted by:
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clarke

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Clarke Environmental Mosquito Management
2024 Annual Report

Introduction

Mosquito populations – and mosquito-borne disease – are inextricably tied to weather. Heavy rainfalls can lead to large hatch-offs of nuisance floodwater mosquitoes, and dry, hot temperatures can amplify the spread of West Nile virus, as we saw in 2023.

This year, a temperate winter and steady spring set the stage for a significant floodwater mosquito hatch in early June, but moderate late-summer temps that stretched well into October led to lower numbers of West Nile cases, down by nearly half from 2023.

It's important to remember that West Nile is endemic to northern Illinois – at any time, the right weather, precipitation and environmental factors can yield a significant year for West Nile. Variations in weather can lead to dramatic swings in cases year-over-year.

As always, Clarke is dedicated to helping residents reduce their risk of contracting mosquito-borne diseases like West Nile Virus through a comprehensive program of support, education and contracted services.

Service Contracts

Customers of Clarke receive this annual report to outline control activity and provide an overview of mosquito control challenges around the country and throughout the state. As mosquito control is always weather-dependent, we review and analyze the impact that local weather had on mosquito breeding and the responsive control undertaken by Clarke. We work closely with our municipal partners to create and execute a mosquito control program specifically tailored to their environmental challenges, risks and community needs.

Using best practices and proven industry protocols, Clarke works in close consultation with the city to conduct mosquito surveillance and interventional methods to reduce mosquito populations, especially when the risk of disease is present.

Seasonal Overview

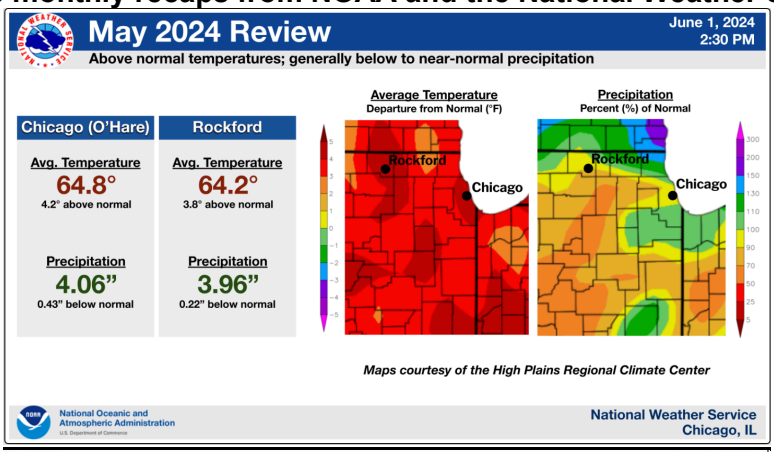
Steady Weather –

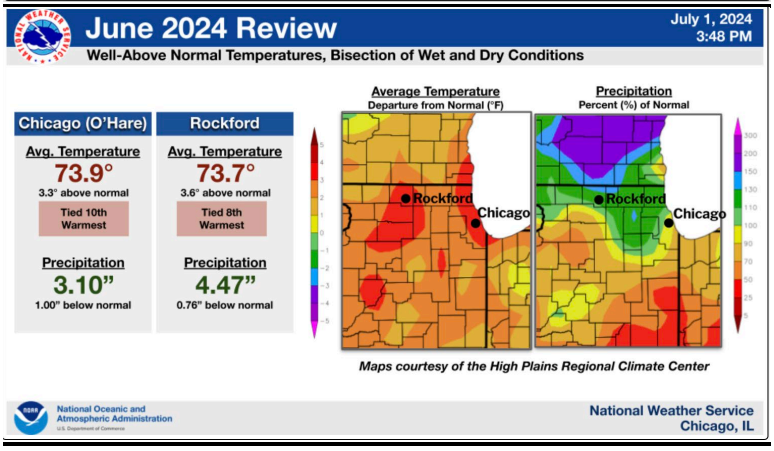
After the fifth warmest winter on record, the Chicago area moved into a warm spring with normal precipitation. Aside from a spate of storms in July including a derecho that spawned a record number of tornadoes in the area, temperatures and rainfall stayed mostly steady.

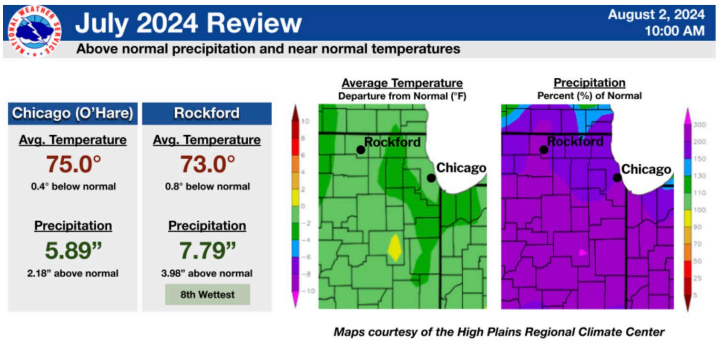
Between May 2 and June 5, six rain events triggered floodwater mosquito hatch-offs peaking the week of June 17, with a tremendous “superbrood,” as evidenced by quantities collected in New Jersey light traps around the Chicago area.

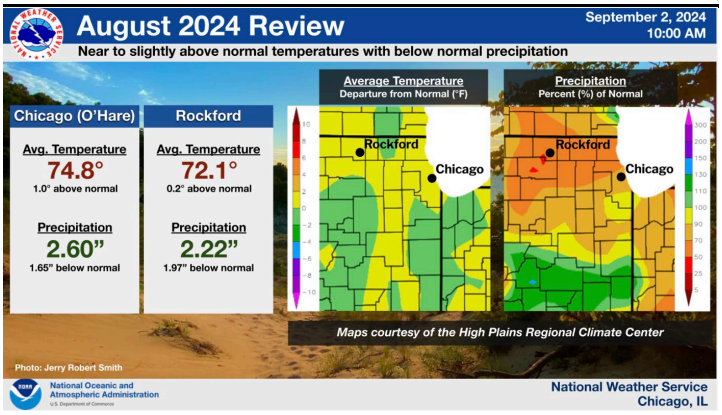
A mild spring led to the 10th warmest June, but those warm temperatures stayed consistent through July, August and even September. Overall, precipitation was near-normal throughout the summer. Both September and October continued the warm pattern, with September tied for the second warmest on record and October tied for ninth warmest.

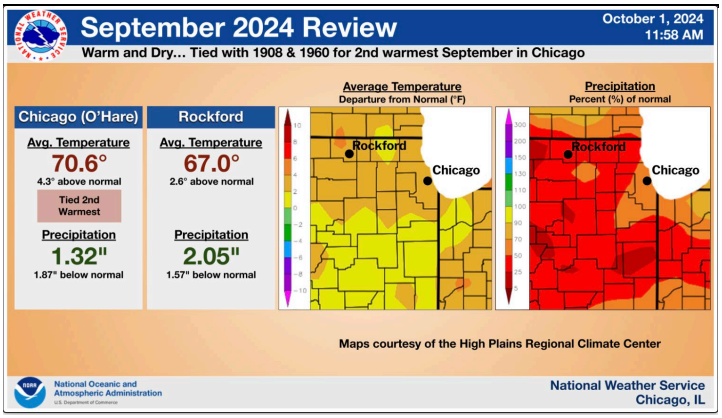
Following are the monthly recaps from NOAA and the National Weather Service:

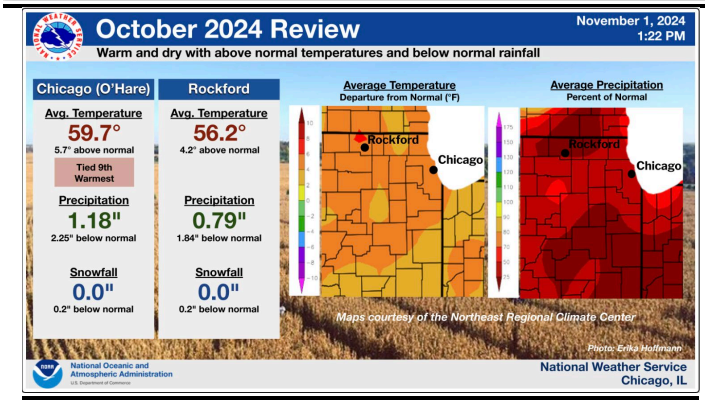





July 2024 Review
August 2, 2024
10:00 AM
Above normal precipitation and near normal temperatures
Chicago (O'Hare)
Avg. Temperature
75.0°
0.4° below normal
Precipitation
5.89"
2.18" above normal
Rockford
Avg. Temperature
73.0°
0.8° below normal
Precipitation
7.79"
3.98" above normal
8th Wettest
Average Temperature
Departure from Normal (°F)
Precipitation
Percent (%) of Normal
Rockford
Chicago
Maps courtesy of the High Plains Regional Climate Center
National Oceanic and Atmospheric Administration
National Weather Service
Chicago, IL


August 2024 Review
September 2, 2024
10:00 AM
Near to slightly above normal temperatures with below normal precipitation
Chicago (O'Hare)
Avg. Temperature
74.8°
1.0° above normal
Precipitation
2.60"
1.65" below normal
Rockford
Avg. Temperature
72.1°
0.2° above normal
Precipitation
2.22"
1.97" below normal
Average Temperature
Departure from Normal (°F)
Precipitation
Percent (%) of Normal
Rockford
Chicago
Maps courtesy of the High Plains Regional Climate Center
Photo: Jerry Robert Smith
National Oceanic and Atmospheric Administration
National Weather Service
Chicago, IL


September 2024 Review
October 1, 2024
11:58 AM
Warm and Dry... Tied with 1908 & 1960 for 2nd warmest September in Chicago
Chicago (O'Hare)
Avg. Temperature
70.6°
4.3° above normal
Tied 2nd Warmest
Precipitation
1.32"
1.87" below normal
Rockford
Avg. Temperature
67.0°
2.6° above normal
Precipitation
2.05"
1.57" below normal
Average Temperature
Departure from Normal (°F)
Precipitation
Percent (%) of normal
Rockford
Chicago
Maps courtesy of the High Plains Regional Climate Center
National Oceanic and Atmospheric Administration
National Weather Service
Chicago, IL


October 2024 Review
November 1, 2024
1:22 PM
Warm and dry with above normal temperatures and below normal rainfall
Chicago (O'Hare)
Avg. Temperature
59.7°
5.7° above normal
Tied 9th Warmest
Precipitation
1.18"
2.25" below normal
Snowfall
0.0"
0.2" below normal
Rockford
Avg. Temperature
56.2°
4.2° above normal
Precipitation
0.79"
1.84" below normal
Snowfall
0.0"
0.2" below normal
Average Temperature
Departure from Normal (°F)
Average Precipitation
Percent of Normal
Rockford
Chicago
Maps courtesy of the Northeast Regional Climate Center
Photo: Erika Hoffmann
National Oceanic and Atmospheric Administration
National Weather Service
Chicago, IL

About West Nile Virus

West Nile virus is primarily a mosquito-borne disease, which can cause West Nile encephalitis (swelling of the brain) and West Nile fever in humans. Though most humans infected will not show symptoms, those who develop West Nile virus risk debilitating effects and possibly death. While the most severe cases and the highest risk of West Nile occur traditionally in people over 50 years of age or with compromised immune systems, all people who spend time outside are at risk of contracting the virus. The disease also affects birds, horses and other animals, with higher mortality rates.

West Nile Virus has spread rapidly across North America since it was discovered in the Western hemisphere, reports the U.S. Geological Survey. West Nile Virus swept from the New York City region in 1999 to almost all of the continental U.S., seven Canadian provinces and throughout Mexico and parts of the Caribbean by 2004. Of those infected, one in five will develop symptoms.

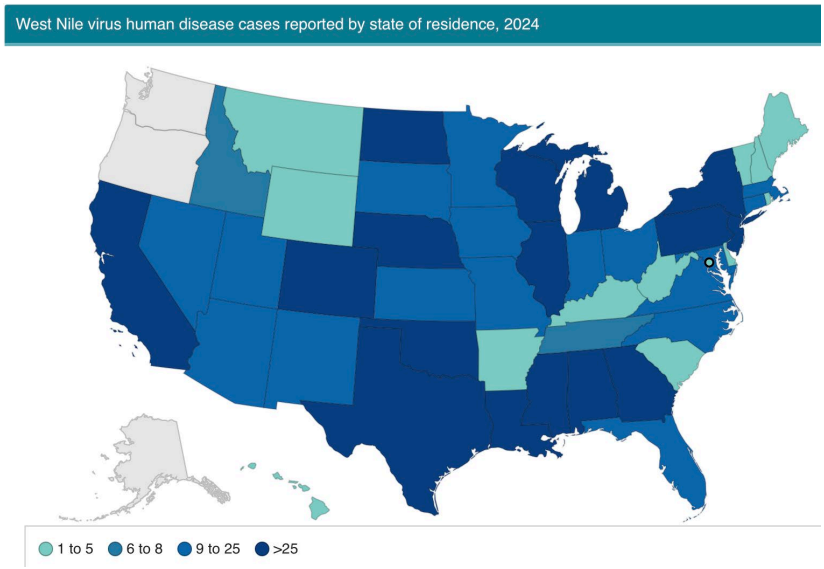
As of November 5, 2024, a total of 1,240 cases of West Nile virus disease have been reported to the CDC – returning to 2022 levels after a significant spike in 2023.[1] To date, 47 states have reported West Nile virus infections in people, birds or mosquitoes.

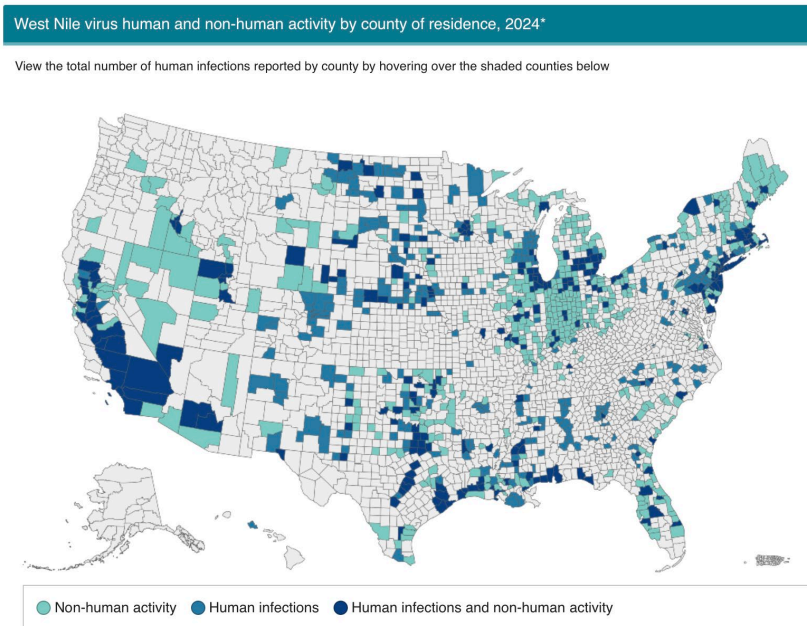
West Nile in the United States 2024

- 2020: 664 cases
- 2021: 2,695 cases
- 2022: 1,132 cases
- 2023: 2,566 cases
- 2024: 1,240 cases (as of November 5, 2024)

[1]https://www.cdc.gov/west-nile-virus/data-maps/current-year-data.html, Retrieved Nov. 11, 2024

West Nile in the United States 2024





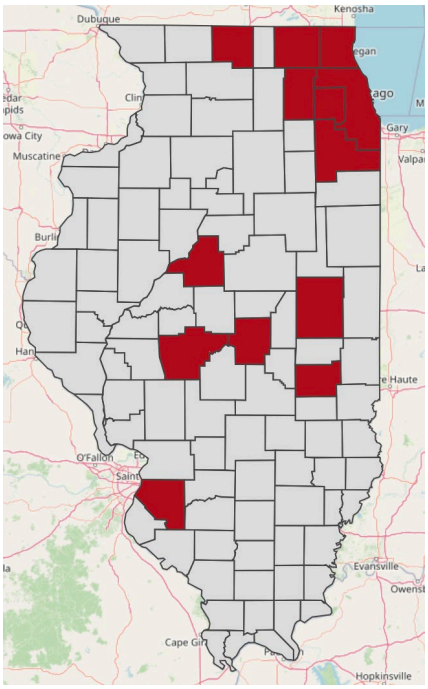
[4] https://www.cdc.gov/westnile/statsmaps/current-season-data.html , Retrieved Nov. 11, 2024

West Nile in Illinois 2024

Human cases are down by half in 2024 as compared to the previous year. As of November 6, 2024, Illinois has reported 60 human cases of West Nile virus and 10 deaths.[5]

- 2020 – 42 human cases
- 2021 – 64 human cases
- 2022 – 33 human cases
- 2023 – 119 human cases
- 2024 – 60 human cases (as of November 6, 2024)

2024 Illinois Human Case Data



Illinois West Nile Virus statistics in 2024 (as of November 6, 2024) are:

- 60 human cases (down nearly half from 119 in 2023)
- 10 fatalities (higher fatality rate than 2023 with pace with 6 death)
- 70 counties reporting West Nile activity (up from 67 in 2023)
- 54 positive birds (up from 45 in 2023)
- 3,108 positive mosquito batches (moderately lower from 3,388 in 2023)

Illinois identified the first human West Nile virus case for the year on June 4, 2024 – much earlier than the first 2023 human case which was announced on August 23, 2023.

[5] https://idph.illinois.gov/wnvpublic/wnvglance.aspx?year=2024 Retrieved Nov. 11, 2024

2024 Positive Birds, Mosquitoes, Horses, Other Animals (as of 11/6/24)

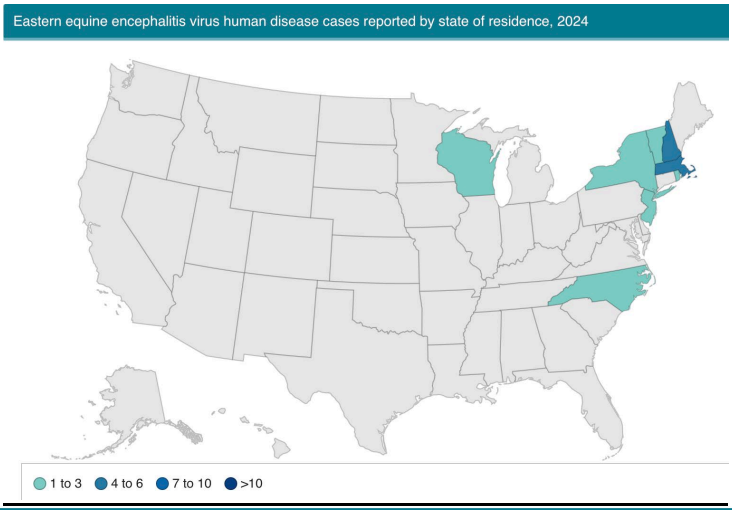
County	American Crow	Blue Jay	Other Birds	Mosquito Batches	Horse	Other Mammals
ALEXANDER	0	0	0	1	0	0
BOONE	0	0	0	2	0	0
BUREAU	0	0	0	1	0	0
CARROLL	1	0	0	4	0	0
CHAMPAIGN	2	0	1	9	0	0
CHRISTIAN	0	0	0	7	0	0
CLAY	0	0	1	1	0	0
CLINTON	0	0	0	14	0	0
COOK	0	0	0	2421	0	0
DEKALB	0	0	0	10	0	0
DOUGLAS	2	0	1	0	4	0
DUPAGE	0	0	2	157	0	0
FAYETTE	0	0	0	1	0	0
FORD	3	0	0	12	0	0
FRANKLIN	0	0	0	1	0	0
FULTON	0	0	0	2	0	0
GALLATIN	0	0	0	6	0	0
GREENE	0	0	0	4	0	0
GRUNDY	0	0	0	11	0	0
HANCOCK	0	0	1	4	0	0
HARDIN	0	0	0	2	0	0
JACKSON	0	0	0	4	0	0
JOHNSON	0	0	0	2	0	0
KANE	0	0	1	19	1	0
KANKAKEE	1	0	0	22	0	0
KENDALL	0	0	0	9	0	0
KNOX	0	0	1	1	0	0
LAKE	0	0	1	151	0	0
LASALLE	0	0	1	1	0	0
LAWRENCE	1	0	0	0	0	0
LEE	1	0	1	4	0	0
LIVINGSTON	1	0	1	0	0	0
LOGAN	1	0	0	2	0	0

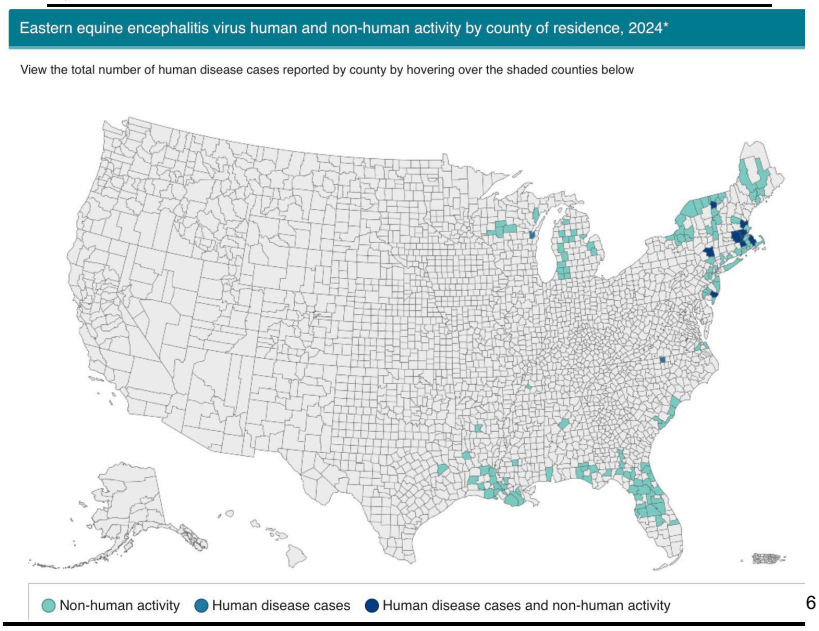
MACON	0	0	0	22	0	0
MACOUPIN	0	0	1	2	0	0
MADISON	0	0	0	13	0	0
MARION	0	0	1	0	0	0
MASSAC	0	0	0	1	0	0
MCDONOUGH	1	0	0	2	0	0
MCHENRY	0	0	1	28	0	0
MCLEAN	2	0	1	8	0	0
MERCER	0	0	1	0	0	0
MONROE	0	0	0	2	0	0
MONTGOMERY	0	0	0	7	0	0
MORGAN	0	0	0	5	0	0
MOULTRIE	0	0	0	0	1	0
OGLE	1	0	0	1	0	0
PEORIA	0	0	0	24	0	0
PERRY	0	0	0	1	0	0
PULASKI	0	0	1	3	0	0
PUTNAM	0	0	0	1	0	0
RICHLAND	0	0	0	2	0	0
ROCK ISLAND	2	0	1	3	0	0
SAINT CLAIR	0	0	0	12	0	0
SANGAMON	0	1	0	2	0	0
SCOTT	0	0	0	12	0	0
SHELBY	1	0	0	0	0	0
STEPHENSON	2	0	0	4	0	0
TAZEWELL	0	0	1	1	0	0
UNION	0	0	0	2	0	0
VERMILION	0	0	0	1	0	0
WASHINGTON	0	0	1	2	0	0
WAYNE	0	0	0	2	0	0
WHITE	0	0	0	1	0	0
WHITESIDE	1	1	1	3	0	0
WILL	0	0	2	55	0	0
WILLIAMSON	0	0	1	0	0	0
WINNEBAGO	0	2	0	1	0	0
WOODFORD	0	1	1	0	0	0
TOTAL	23	5	26	3108	6	0

About Eastern Equine Encephalitis

Eastern Equine Encephalitis is a mosquito-borne disease primarily vectored by the *Culiseta melanura* which lives in freshwater hardwood swamps, generally on the Atlantic coast and around the Great Lakes. The disease is one of the most dangerous mosquito-borne diseases; one in three patients diagnosed will die from Eastern Equine Encephalitis.

While Illinois does not have a recent history of EEE cases, the proximity of recent cases in Indiana, Michigan and Wisconsin call for continued vigilance. In 2024, 17 EEE cases were identified in the U.S., more than doubling the number from 2023.





[6]

[6] https://www.cdc.gov/eastern-equine-encephalitis/data-maps/current-year-data.html , Retrieved Nov 11, 2024

About Zika Virus

Zika virus is a mosquito-borne disease that is transmitted primarily by the *Aedes aegypti* mosquito and through sexual transmission. While Zika symptoms are generally mild in adults (fever, rash, joint pain, conjunctivitis), pregnant women who contract Zika virus can pass the virus to their unborn children, increasing the risks of serious birth defects like microencephaly.

When Zika debuted in the US, more than 5,100 travel-related cases of Zika were confirmed nationwide, including 139 locally transmitted cases of transmission in areas of south Florida in 2016. Since that time, cases have steadily decreased. The last cases of local Zika transmission by mosquitoes in the continental United States were in Florida and Texas in 2016-17.

Illinois does not have a significant population of *Aedes aegypti* mosquitoes, so local transmission risk is small.

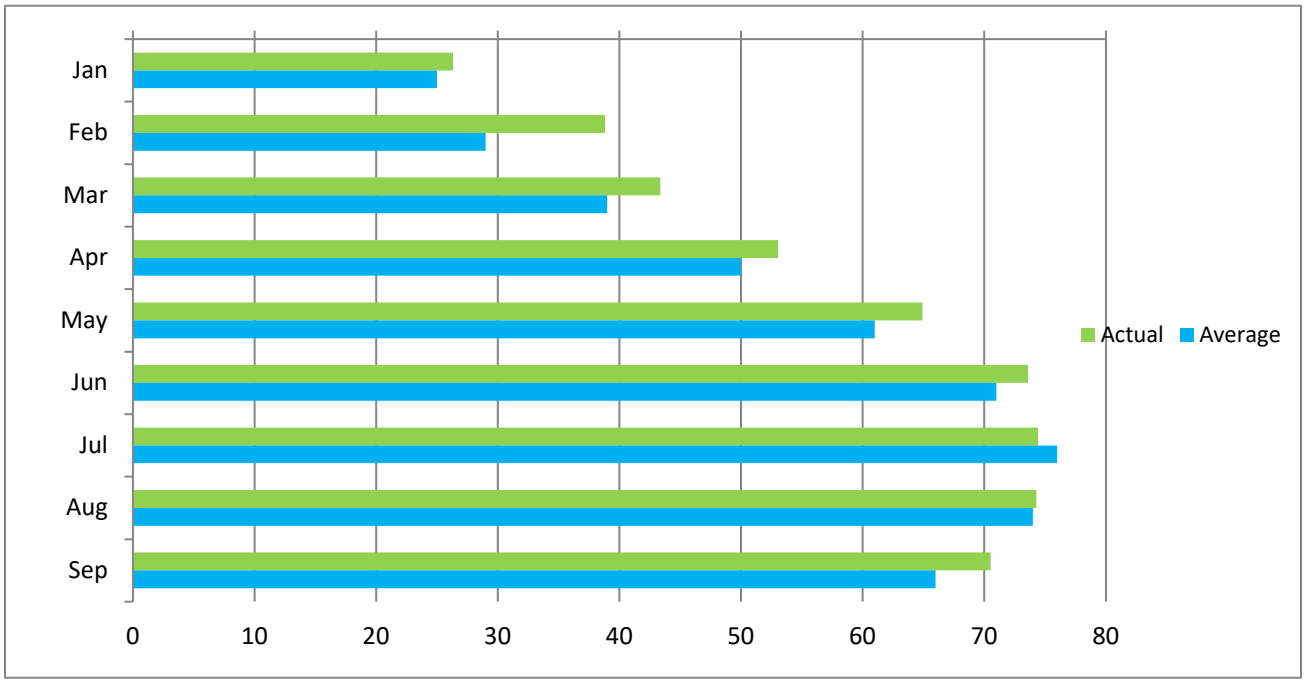
Climatology and Mosquito Overview

The weather dramatically impacts mosquito breeding and population. Special attention should be paid to weather conditions as weather has a huge impact on mosquito populations – with floodwater mosquitoes, rainfall determines if mosquito eggs will hatch, fierce storm can wash away egg rafts and variations in temperature can affect mosquito activity and larval development. In periods of hot, dry weather, water sources dwindle for vector species, and virus transmission can amplify, creating a greater percentage of infected mosquitoes.

2024 O'Hare International Airport (Chicago) Weather Survey

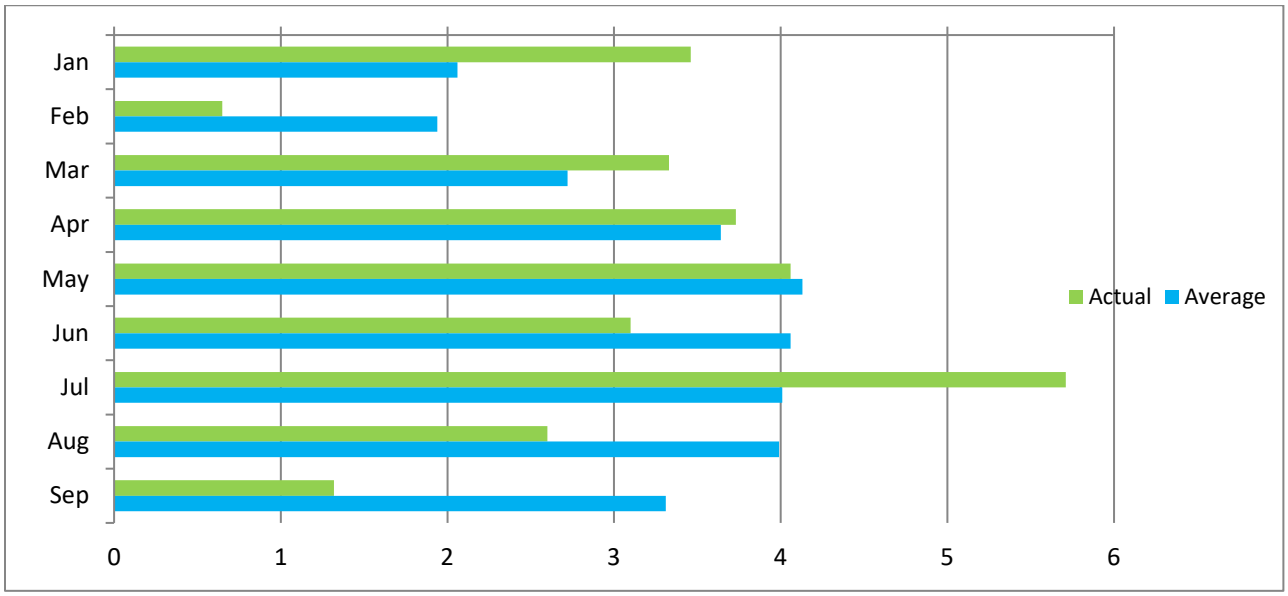
Temperature (degrees Fahrenheit)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Actual	26.31	38.81	43.37	53.04	64.92	73.59	74.4	74.28	70.52
Average	25	29	39	50	61	71	76	74	66



Precipitation (inches)

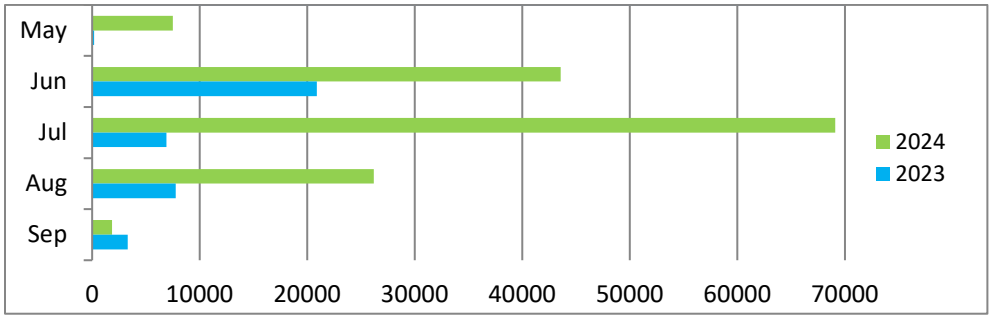
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Actual	3.46	0.65	3.33	3.73	4.06	3.1	5.71	2.6	1.32
Average	2.06	1.94	2.72	3.64	4.13	4.06	4.01	3.99	3.31



2024 Mosquito Light Trap Network Target Species Comparison

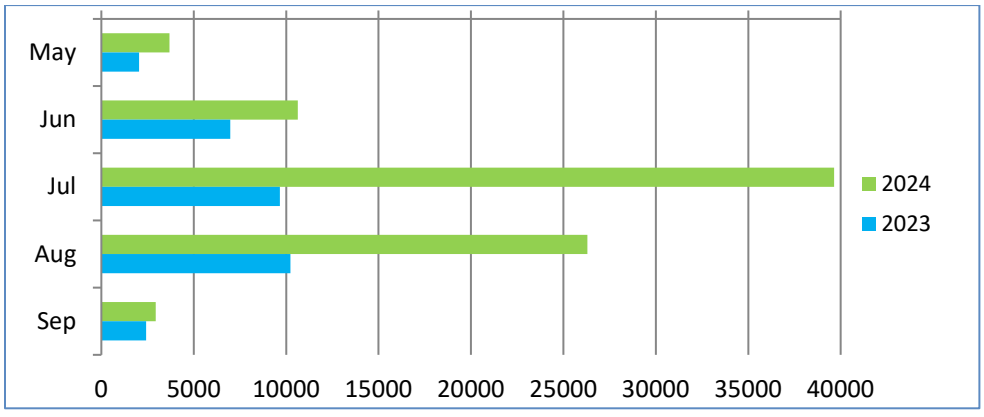
Aedes vexans

	May	Jun	Jul	Aug	Sep
2023	187	20893	6921	7765	3300
2024	7508	43572	69082	26192	1862



Culex pipiens and *Culex restuans*

	May	Jun	Jul	Aug	Sep
2023	2049	6978	9665	10238	2425
2024	3689	10621	39645	26301	2937



Surveillance Network

New Jersey Light Trap Network

An important supplement to any mosquito control program is a New Jersey Light Trap. Developed in the 1930s, the trap helps determine species diversity and monitors mosquito populations. These traps are located in residential areas and are operated between dusk and dawn (the peak activity period for many species) and should be maintained each year to identify historic and habitual mosquito sites.

A 25-watt bulb in the trap attracts mosquitoes, which are drawn into the trap via an electric fan. Data generated by the trap catches serve several purposes: it confirms the arrival of predicted floodwater mosquito migrations, reflects the effectiveness of mosquito control efforts and identifies fluctuations in adult mosquito populations.

West Nile Virus Surveillance Trap

A vital tool in adult mosquito and arbovirus surveillance is the West Nile virus, or gravid, trap. Developed by the Centers for Disease Control and Surveillance, the trap primarily collects gravid (*Culex)* mosquitoes (principal vectors of West Nile virus), which makes it particularly effective in tracking the disease. A gravid female mosquito has taken a blood meal and is ready to lay her eggs. Typically, (*Culex)* mosquitoes search for water rich in organic material to lay their eggs. If they've obtained their blood meal from an infected animal, they can transmit the virus to their eggs. The mosquitoes are captured live, which allows us to test them for arboviruses and get an early indicator that the virus is present in the area.

Centers for Disease Control and Prevention (CDC) Trap

Mosquitoes looking for a blood meal are mainly attracted by carbon dioxide, exhaled by humans and animals. The CDC trap provides carbon dioxide as bait, though dry ice (frozen carbon dioxide), and a light source to attract female mosquitoes. This trap is set out at prime activity hours for the species targeted. A fan draws mosquitoes into a net and the live mosquitoes are trapped for arbovirus testing. CDC traps often show a very high species diversity and large overall mosquito numbers, indicating the presence of a mosquito-borne virus and relative indices of adult mosquito species.

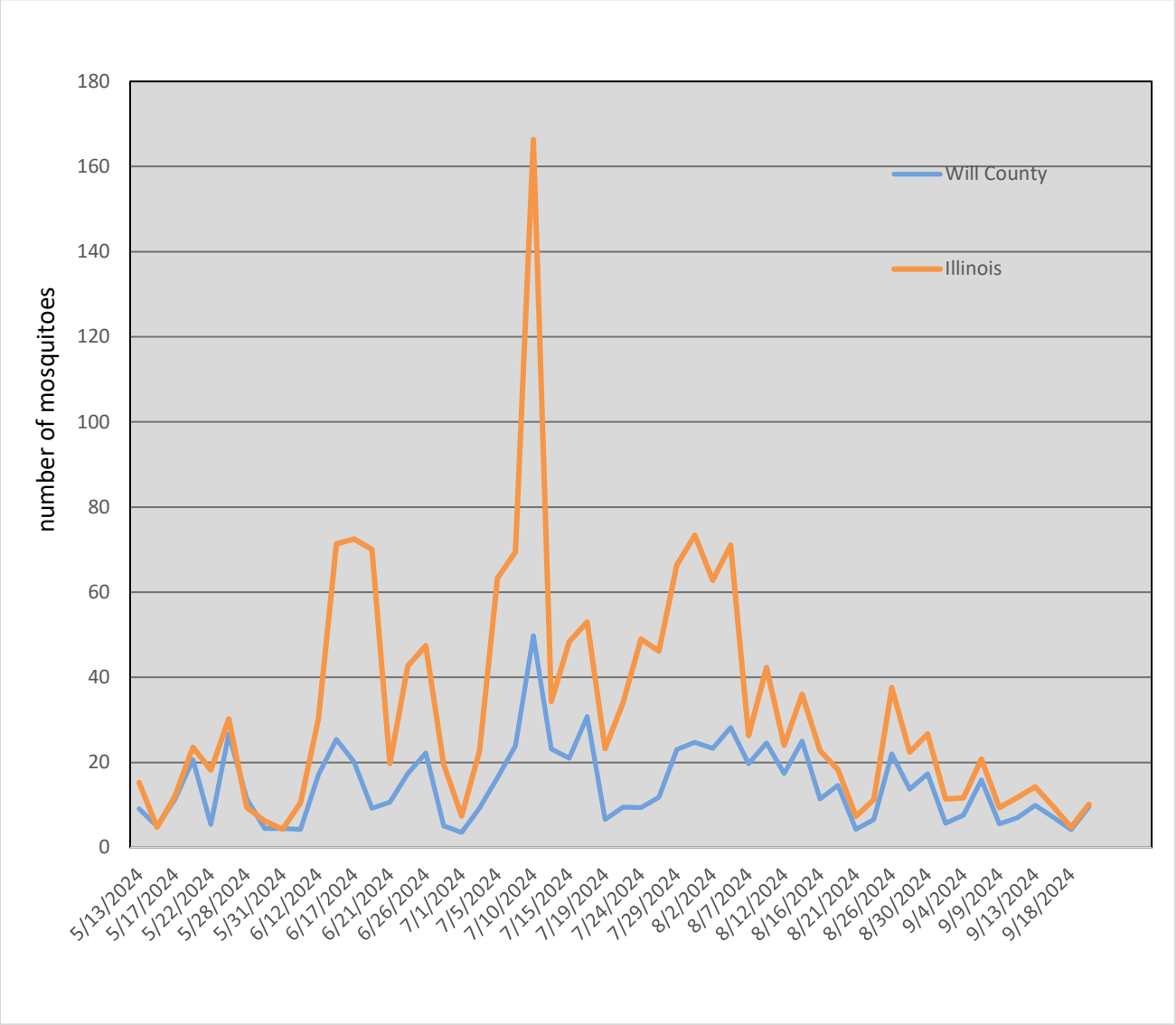
Light Trap Species Summary

The following table summarizes the species composition from the light trap network operating in Northern Illinois.

Light Trap Species Summary				
Species	*Females*	*Percent*	*Males*	*Percent*
Ae cinereus	2447	0.89%	377	0.74%
Ae vexans	138803	50.67%	23069	45.43%
Ae misc	1394	0.51%	733	1.44%
An punctipennis	8037	2.93%	622	1.22%
An quadrimaculatus	13604	4.97%	933	1.84%
An walkeri	40	0.01%	0	0.00%
An species	86	0.03%	12	0.02%
Cq perturbans	2633	0.96%	213	0.42%
Cx erraticus	6128	2.24%	461	0.91%
Cx pipiens	10569	3.86%	3233	6.37%
Cx restuans	7028	2.57%	2509	4.94%
Cx species	66494	24.27%	16383	32.26%
Cx tarsalis	63	0.02%	4	0.01%
Cx territans	935	0.34%	377	0.74%
Cs inornata	1010	0.37%	355	0.70%
Cs minnesotae	1036	0.38%	1	0.00%
Cs species	30	0.01%	70	0.14%
Mosquito, Misc.	179	0.07%	104	0.20%
Oc fitchii	603	0.22%	226	0.45%
Oc grossbecki	100	0.04%	20	0.04%
Oc japonicus	360	0.13%	189	0.37%
Oc canadensis	158	0.06%	24	0.05%
Oc triseriatus	204	0.07%	103	0.20%
Oc trivittatus	10651	3.89%	130	0.26%
Oc. species	75	0.03%	2	0.00%
Or signifera	81	0.03%	16	0.03%
Ps ciliata	25	0.01%	5	0.01%
Ps ferox	294	0.11%	10	0.02%
Ps howardii	6	0.00%	1	0.00%
Ps columbiae	4	0.00%	0	0.00%
Ps misc	5	0.00%	1	0.00%
Ur sapphirina	851	0.31%	596	1.17%
Total	**273,933**	**100.00%**	**50,779**	**100.00%**

Total Number of Mosquitoes: 324,712

Light Trap Counts



Operations and Surveillance Reports

Attached is a report outlining all services performed year-to-date. These services may include the following:

- **N J Light Trap Service** Seasonal New Jersey Light Trap service for adult mosquito population monitoring.
- **WNV Gravid Trap Service** Seasonal West Nile Virus monitoring trap service.
- **Complete Site Larval Inspection Service:** Inspection service of all potential mosquito larvae development sites.
- **Targeted Site Larval Inspection:** Inspection of all targeted larval development sites.
- **Culex Site Inspection Service:** Inspection of culex mosquito larval development sites for the prevention of West Nile Virus and other mosquito-borne diseases.
- **Larval Site Service Call:** Special inspection of standing water for mosquito breeding per hot line request
- **Hand Larvicide:** Hand equipment application for control of mosquito larvae
- **Backpack Larvicide Treatment.:** Backpack application for control of mosquito larvae
- **Vectolex FG Heli Larviciding:** Helicopter larvicide application for biological control of mosquito larvae.
- **NatularG30 Helicopter Prehatch:** Helicopter prehatch application for larval control.
- **Catch Basin Treatment:** Catch basin treatment with a sustained-release biological insecticide for larval control
- **Natular XRT BYCB Bike:** Backyard catch basin treatment for larval control.
- **Natular XRT CB Bike:** Catch Basin treatment for larval control.
- **Vectolex WSP CB Bike – 30 day:** Treatment of catch basins with Vectolex WSP for larval control.

Services Performed Year-to-Date

Service Item	Start Date
Biomist 3+15 Truck ULV	07/16/2024
Natular XRT CB Bike	07/17/2024
Biomist 3+15 Truck ULV	07/29/2024

Services Invoiced Per Contract:

Services Invoiced Year-to-Date: $47,330.00