Village of Bartlett

2015 Annual Report

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Clarke Environmental Mosquito Management
2015 Annual Report

Introduction

The mosquito season of 2015 continued a trend of cool, wet summers, through the effects of El Nino and Hurricane Bill. Nearly a dozen significant rainfalls in northern Illinois in June-July created significant floodwater mosquito broods and one of the heaviest floodwater mosquito seasons in recent years.

West Nile regained some of the strength it lost in 2014, with human cases rising and prevalence throughout the state increasing. As always, West Nile is endemic to the area, and annual outbreaks are weather-dependent, with temperature and precipitation directly affecting the pervasiveness and spread of the disease. Clarke remains committed to the Village of Bartlett as its partner in working to suppress West Nile infection rates for the community now and in the future.

Service Contracts

Through the creation and execution of integrated pest management programs, Clarke and the Village of Bartlett work together to improve the health and comfort of the residents This annual report provides context for the various challenges faced by mosquito control professionals in the Village of Bartlett, with detailed statistics on the weather, mosquito breeding habits and control efforts undertaken by Clarke that can be used for evaluating the program and enhancing it in the future.

Innovation, Community, Sustainability

Providing products and services that support and sustain our commitment to the environment is a pillar of our beliefs at Clarke. We work to implement green practices and minimize the impact of our products at every turn. Through our work with the Village of Bartlett, and in partnerships with research institutions and collaborators around the globe, we are committed to innovation that maintains the health and comfort of residents with a greener approach to protocols, products and technology. In October, Clarke was awarded the 2015 Illinois Governor's Sustainability Award for the second time, recognizing its advancements in environmental protection through its work with cities like the Village of Bartlett. We're grateful for the opportunity to continue our work in partnership with the Village of Bartlett to make communities more livable, safe and comfortable.

Seasonal Overview

6th Coolest Summer, Wettest June on Record

Continuing the trend from 2014, Illinois remained in a cooler, wetter cycle this year, with a confirmed El Nino weather pattern in place.

A dry spring created drought conditions, which were decidedly changed in May through July, with nearly a dozen back-to-back significant rainfall events in June and July, creating one of the heaviest floodwater mosquito outbreaks in recent years.

While the summer months were mostly cool and rainy, late August and September saw a spike in temperatures – with average temperatures in September registering 4 degrees above normal.

Some weather highlights:

- Dry spring creating drought conditions in many parts of the state
- Wettest June on record for Illinois, nearly double the average rainfall
- 10 significant rainfall events between June 1- July 30
- September temps averaged 4 degrees above normal at nearly 70 degrees

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 the majority of 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.

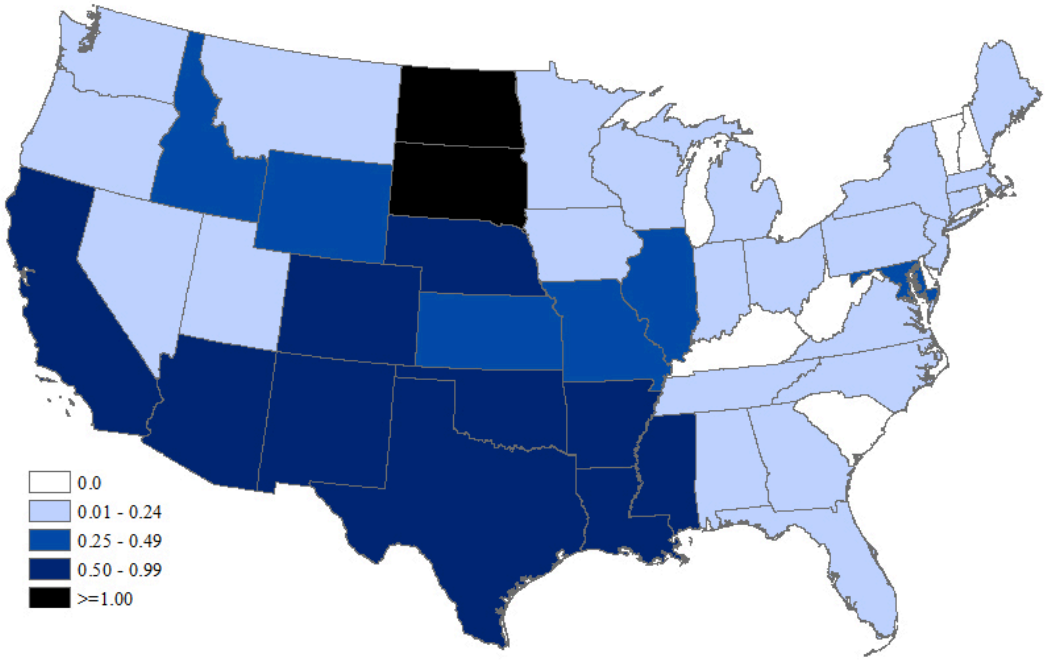
West Nile in the United States 2015

West Nile rose sharply in 2015, with 1,650 cases reported in the U.S. – a demonstrable increase over national human case reports in 2014 (1,177) and 2013 (1,135).

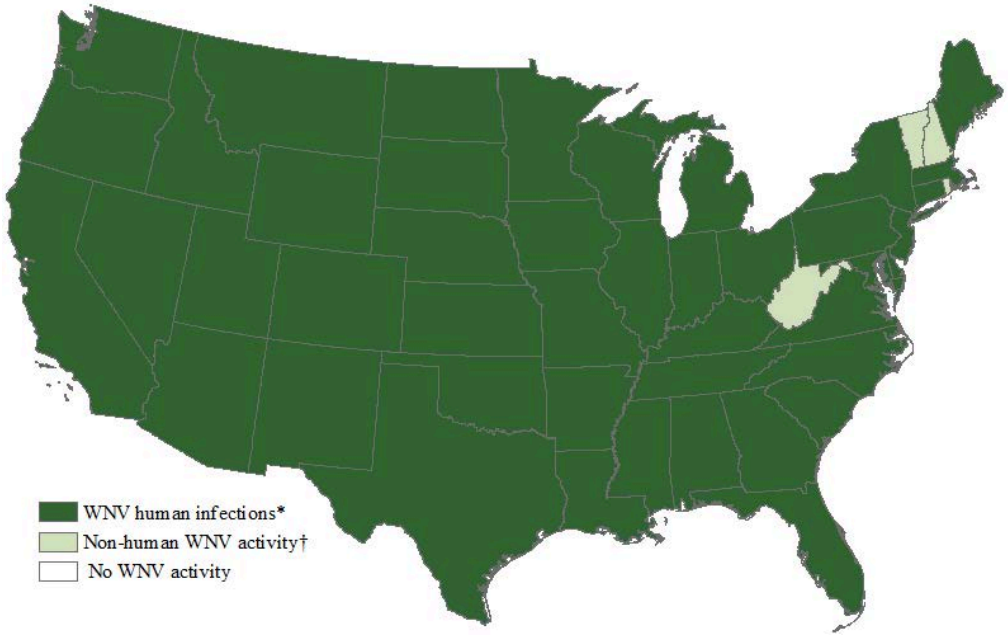
As of November 3, 2015, Illinois reported 67 cases of West Nile in 2015 – an increase over the reported 44 cases of West Nile in 2014.

West Nile in the United States 2015

West Nile Virus (WNV) Neuroinvasive Disease Incidence reported to ArboNET, by state, United States, 2015 (as of November 3, 2015):

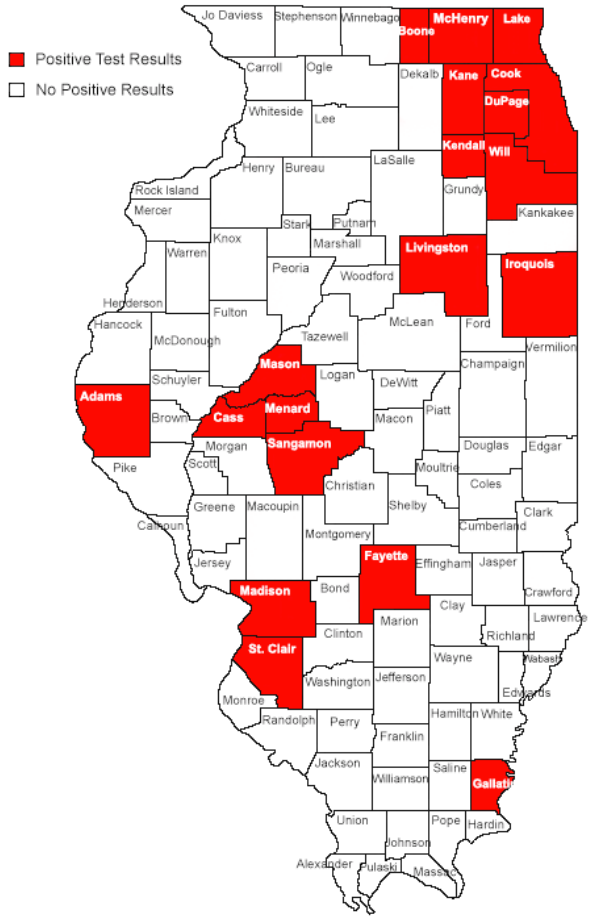


West Nile virus (WNV) activity reported to ArboNET, by state, United States, 2015 (as of November 3, 2015)



West Nile in Illinois 2015

West Nile Virus was identified in two-thirds of the counties in Illinois in 2015, with human cases exceeding 2014 numbers.



Illinois West Nile Virus statistics in 2015 (reported to-date) are:

- 67 human cases (up from 44 in 2014)
- 7 fatalities (up from 4 in 2014)
- 63 counties reporting West Nile activity (up from 49 in 2014)
- 51 positive birds (up from 41 in 2014)
- 1,713 positive mosquito batches (up from 1,271 in 2014)
- 13 positive horses (1 reported in 2014)

Illinois first identified West Nile virus this year on May 29, with a positive mosquito pool in St. Clair County and a positive pool was identified in Northern Illinois (Cook County) on June 11.

On August 19, the first human case of West Nile virus was reported in St. Clair County. The first human deaths were announced on September 1 – a resident in Cook County and one in Kendall County.

Below are the specific county West Nile virus statistics as of November 3, 2015 according to the Illinois Department of Public Health[1]

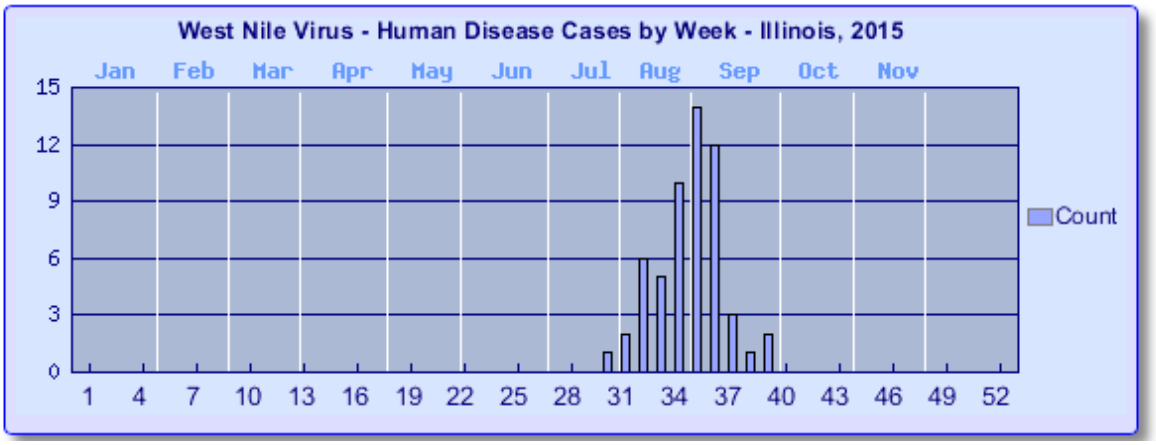
2015 Positive Birds, Mosquitoes, Horses, Human Cases and Human Fatalities

County	American Crow	Blue Jay	Other Birds	Mosquito Batches	Horse	Other Mammals
ADAMS	0	0	0	3	0	0
BOND	1	0	0	1	0	0
BOONE	0	0	0	3	0	0
CALHOUN	0	0	0	3	0	0
CARROLL	0	0	0	1	0	0
CASS	0	0	0	4	0	0
CHAMPAIGN	0	0	0	8	0	0
CLINTON	0	0	0	0	1	0
COLES	2	0	0	0	0	0
COOK	1	1	0	894	0	0
DEKALB	0	0	1	26	0	0
DOUGLAS	1	0	0	0	5	0
DUPAGE	0	0	0	171	0	0
FAYETTE	0	0	0	3	0	0
FULTON	0	0	1	2	0	0
GALLATIN	0	0	0	3	0	0
GREENE	0	0	1	4	0	0
GRUNDY	0	0	0	27	0	0
HENRY	0	0	1	0	0	0
JACKSON	0	0	0	3	0	0
JEFFERSON	0	0	0	0	1	0
JERSEY	0	1	0	3	0	0
JOHNSON	0	0	0	1	0	0
KANE	0	0	1	66	1	0
KANKAKEE	1	0	0	33	0	0
KENDALL	0	0	0	26	0	0
LAKE	0	1	0	68	0	0
LASALLE	2	0	1	3	0	0
LEE	1	0	0	11	0	0
LIVINGSTON	2	0	0	6	0	0
LOGAN	0	0	1	0	0	0
MACON	0	0	0	51	0	0
MACOUPIN	0	0	0	24	0	0
MADISON	0	0	0	38	2	0
MARSHALL	0	0	0	2	0	0
MASSAC	0	0	0	1	0	0
MCDONOUGH	0	0	0	7	0	0
MCHENRY	4	0	0	13	0	0
MCLEAN	3	0	0	12	0	0
MENARD	0	0	0	4	0	0
MERCER	0	0	2	10	1	0
MONROE	0	0	0	6	1	0
MONTGOMERY	0	0	0	1	0	0
OGLE	0	0	1	0	0	0
County	American	Blue	Other	Mosquito	Horse	Other

[1] Illinois Department of Public Health, November 3, 2015

	Crow	Jay	Birds	Batches		Mammals
PEORIA	1	0	1	2	1	0
PUTNAM	0	0	0	1	0	0
ROCK ISLAND	0	0	0	12	0	0
SAINT CLAIR	0	0	0	30	0	0
SANGAMON	0	0	0	5	0	0
SCHUYLER	0	0	0	2	0	0
STEPHENSON	3	1	0	0	0	0
TAZEWELL	2	0	1	5	0	0
UNION	0	0	0	1	0	0
VERMILION	1	0	0	0	0	0
WARREN	0	0	0	13	0	0
WHITE	0	0	0	1	0	0
WHITESIDE	2	0	0	3	0	0
WILL	0	0	0	87	0	0
WILLIAMSON	0	0	0	1	0	0
WINNEBAGO	3	1	2	6	0	0
WOODFORD	0	2	0	0	0	0
TOTAL	**30**	**7**	**14**	**1711**	**13**	**0**

2015 West Nile Virus Illinois Human Disease Cases By Week
(Reported to CDC as of November 3, 2015)



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 storms 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.

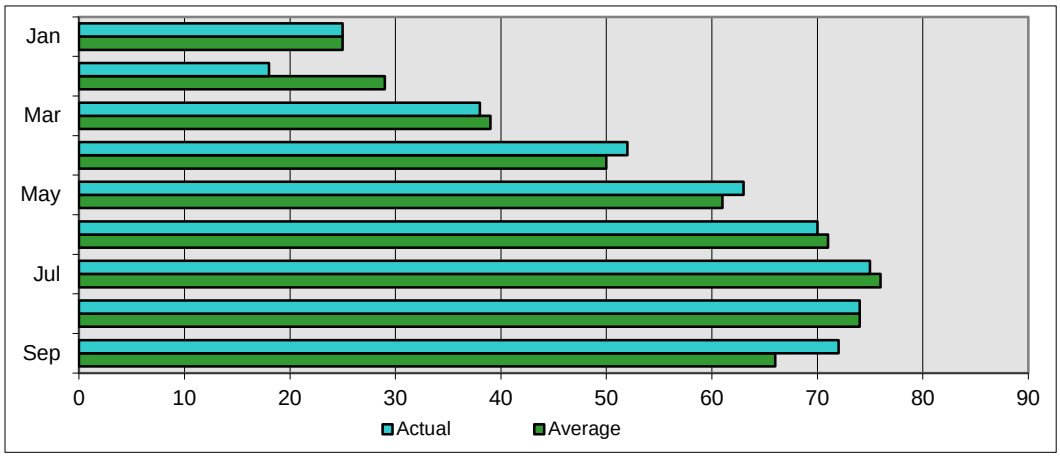
2015 weather highlights:

- April: Dry weather, drought conditions
- May: Above average rainfall, 4 significant rain events
- June: Wettest June on record for Illinois, inconsistent temps
- July: Above average rain, below normal temps
- August: Above average temps in latter part of month
- September: Above average temps, 4 degrees above normal

2015 O'Hare International Airport (Chicago) Weather Survey

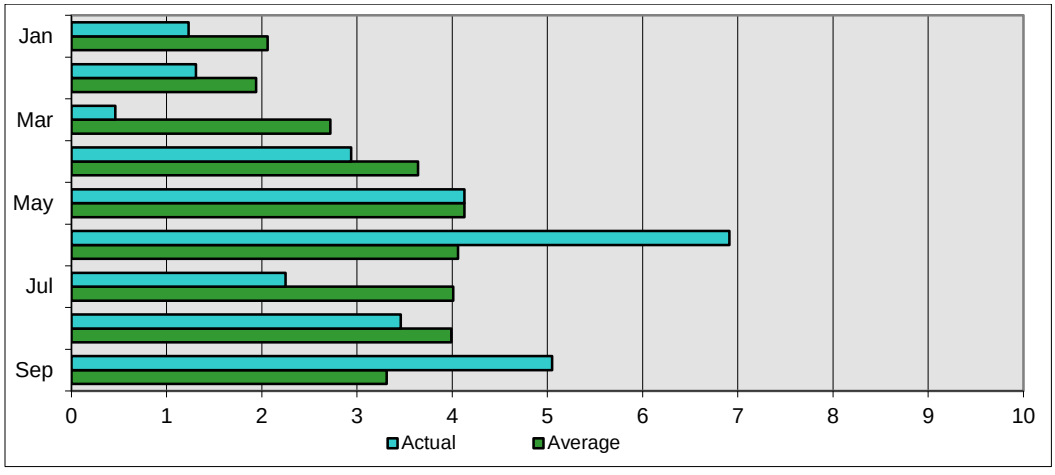
Temperature (degrees Fahrenheit)

	Sep	Aug	Jul	Jun	May	Apr	Mar	Feb	Jan
Actual	72	74	75	70	63	52	38	18	25
Average	66	74	76	71	61	50	39	29	25



Precipitation (inches)

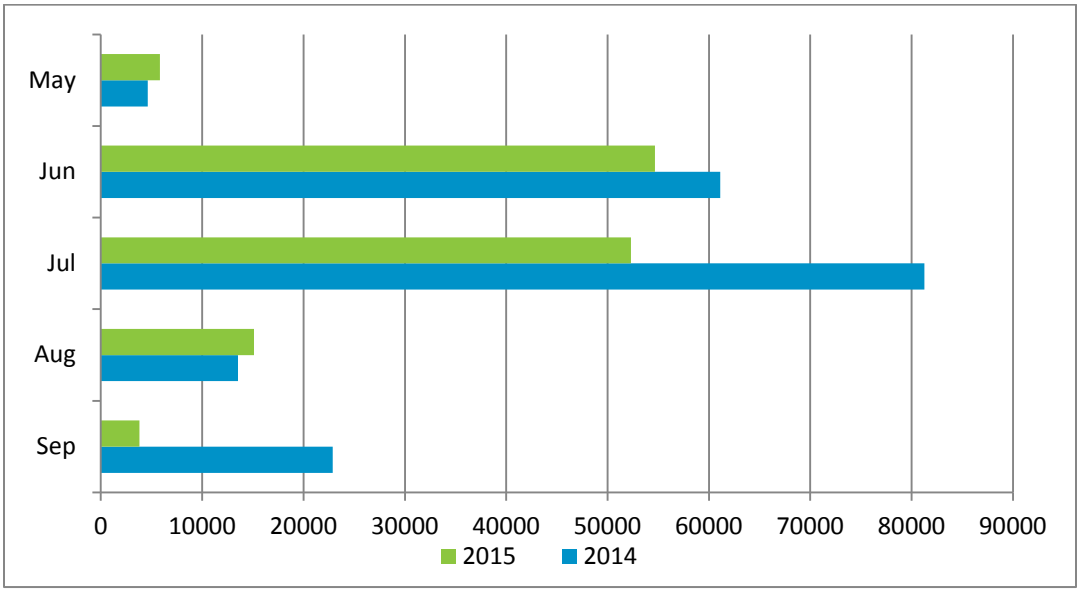
	Sep	Aug	Jul	Jun	May	Apr	Mar	Feb	Jan
Actual	5.05	3.46	2.25	6.91	4.13	2.94	0.46	1.31	1.23
Average	3.31	3.99	4.01	4.06	4.13	3.64	2.72	1.94	2.06



2015 Mosquito Light Trap Network Target Species Comparison

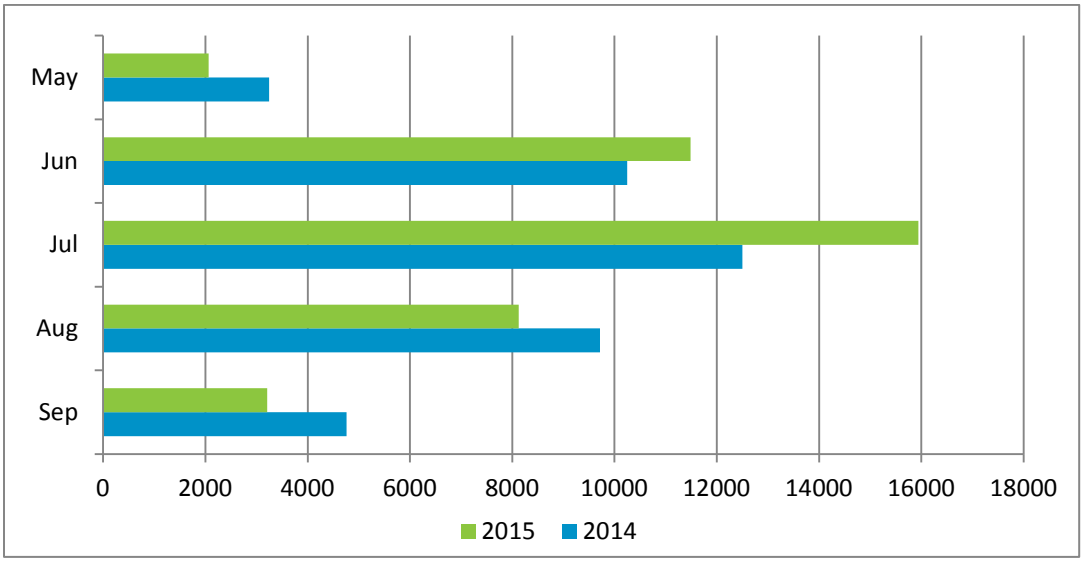
Aedes vexans

	Sep	Aug	Jul	Jun	May
2015	3820	15095	52309	54660	5822
2014	22883	13526	81264	61123	4618



Culex pipiens and *Culex restuans*

	Sep	Aug	Jul	Jun	May
2015	3211	8127	15942	11484	2061
2014	4760	9716	12501	10249	3248



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.

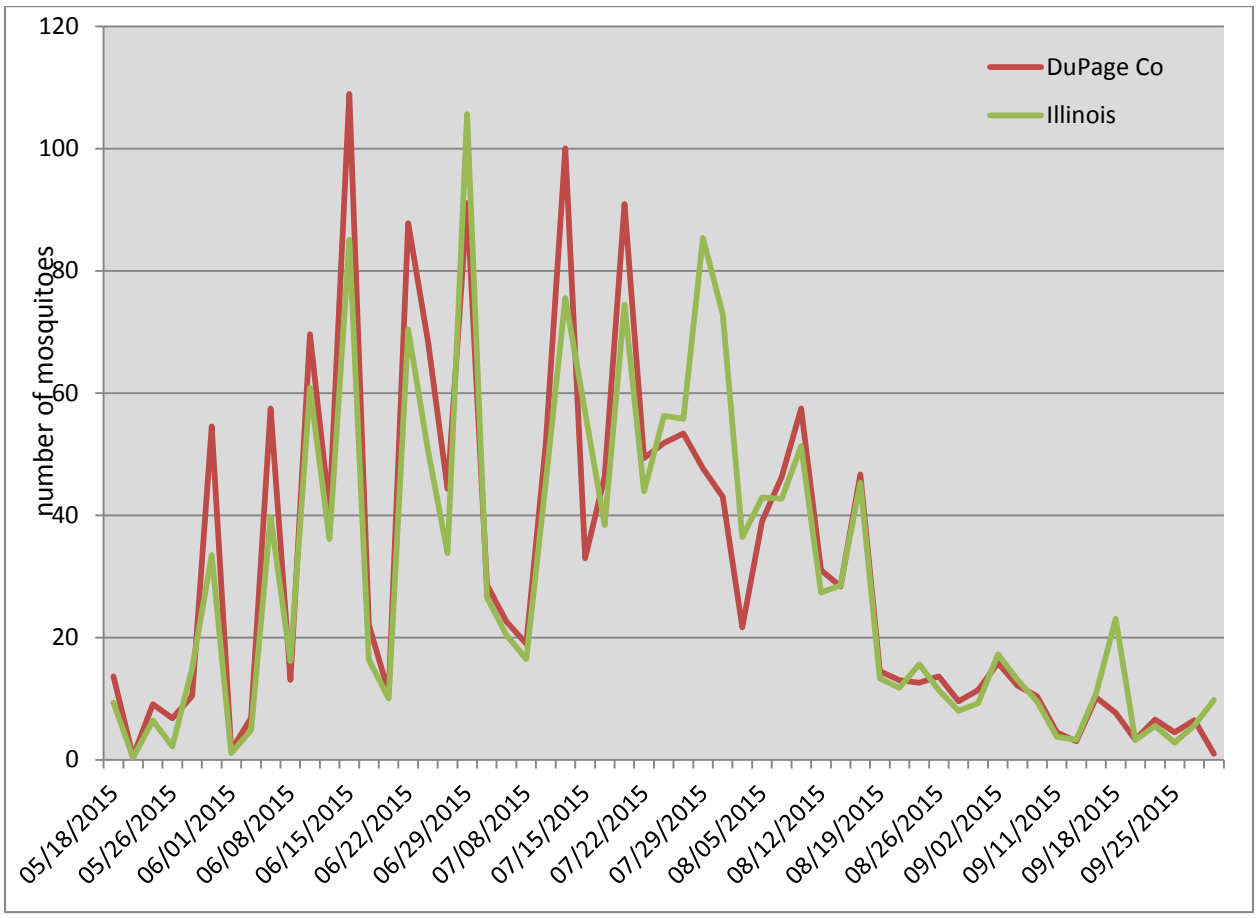
Light Trap Species Summary				
Species	*Females*	*Percent*	*Males*	*Percent*
Ae cinereus	3959	1.44%	61	0.10%
Ae vexans	126477	45.87%	18070	28.73%
Ae misc	5325	1.93%	13451	21.39%
An punctipennis	5363	1.95%	290	0.46%
An quadrimaculatus	6369	2.31%	446	0.71%
An species	315	0.11%	1064	1.69%
Cq perturbans	4328	1.57%	224	0.36%
Cx erraticus	2698	0.98%	157	0.25%
Cx pipiens	2739	0.99%	27	0.04%
Cx restuans	24612	8.93%	4606	7.32%
Cx species	13695	4.97%	21688	34.48%
Cx tarsalis	257	0.09%	0	0.00%
Cx territans	8141	2.95%	66	0.10%
Cs inornata	33	0.01%	11	0.02%
Cs species	88	0.03%	37	0.06%
Mosquito, Misc.	135	0.05%	29	0.05%
Oc excrucias	10	0.00%	15	0.02%
Oc grossbecki	6	0.00%	1	0.00%
Oc dorsalis	3	0.00%	0	0.00%
Oc japonicus	367	0.13%	152	0.24%
Oc canadensis	3	0.00%	0	0.00%
Oc stimulans	2009	0.73%	20	0.03%
Oc triseriatus	190	0.07%	69	0.11%
Oc trivittatus	63781	23.13%	339	0.54%
Oc. species	16	0.01%	1	0.00%
Or signifera	33	0.01%	4	0.01%
Ps ciliata	64	0.02%	5	0.01%
Ps ferox	1971	0.71%	19	0.03%
Ps misc	10	0.00%	0	0.00%
Ur sapphirina	2720	0.99%	2041	3.25%
Total	**275,717**	**100.00%**	**62,893**	**100.00%**

Total Number of Trap: 118 Average Number of Females/Trap Night: 22.91
Total Number of Trap Nights:102 Number of Trap Malfunctions: *17*

Total Number of Mosquitoes: 338,610

Light Trap Counts by Region, County and Community

Light Trap Comparison Chart



Services Performed Year-to-Date

Service Item	Service Item Description	Start Date
ROS1302 - Targeted Site Larval Insp Serv	Inspection of all targeted larval development sites.	05/20/2015
ROS2019 - Altosid XR CB Bike - 150 day	Treatment of catch basins with Altosid XR's for larval control	05/21/2015
ROS1352 - Larval Site Service Call	Special inspection of standing water for mosquito breeding per hot line request.	06/03/2015
ROS2888 - Biomist 3+15 Truck ULV	ULV application insecticide for adult mosquito control.	06/17/2015
ROS1302 - Targeted Site Larval Insp Serv	Inspection of all targeted larval development sites.	06/19/2015
ROS2888 - Biomist 3+15 Truck ULV	ULV application insecticide for adult mosquito control.	06/27/2015
ROS1252 - Complete Site Larval Insp Serv	Inspection service of all potential mosquito larvae development sites.	06/29/2015
ROS2752 - Anvil Truck ULV Service Call	ULV “touch-up” application for control of mosquito annoyance per citizen hotline request.	07/01/2015
ROS2752 - Anvil Truck ULV Service Call	ULV “touch-up” application for control of mosquito annoyance per citizen hotline request.	07/02/2015
ROS2754 - Anvil 4th of July ULV Special	ULV “touch-up” application for 4th of July special event for adult mosquito control.	07/03/2015
ROS2888 - Biomist 3+15 Truck ULV	ULV application insecticide for adult mosquito control.	07/08/2015
ROS1302 - Targeted Site Larval Insp Serv	Inspection of all targeted larval development sites.	07/09/2015
ROS2888 - Biomist 3+15 Truck ULV	ULV application insecticide for adult mosquito control.	07/19/2015
ROS1252 - Complete Site Larval Insp Serv	Inspection service of all potential mosquito larvae development sites.	07/27/2015
ROS2888 - Biomist 3+15 Truck ULV	ULV application insecticide for adult mosquito control.	07/27/2015
ROS2752 - Anvil Truck ULV Service Call	ULV “touch-up” application for control of mosquito annoyance per citizen hotline request.	08/03/2015
ROS1852 - Mosquitofish (G. Affinis) Stck	Stocking of mosquitofish for biological larval control.	08/07/2015
ROS1852 - Mosquitofish (G. Affinis) Stck	Stocking of mosquitofish for biological larval control.	08/07/2015
ROS2888 - Biomist 3+15 Truck ULV	ULV application insecticide for adult mosquito control.	08/11/2015
ROS1302 - Targeted Site Larval Insp Serv	Inspection of all targeted larval development sites.	08/13/2015
ROS2888 - Biomist 3+15 Truck ULV	ULV application insecticide for adult mosquito control.	08/24/2015

Service Item	Service Item Description	Start Date
ROS1252 - Complete Site Larval Insp Serv	Inspection service of all potential mosquito larvae development sites.	08/26/2015
ROS2402 - Vectobac G Heli Larviciding	Helicopter larvicide application for biological control of mosquito larvae.	08/28/2015
ROS2888 - Biomist 3+15 Truck ULV	ULV application insecticide for adult mosquito control.	09/08/2015
ROS1302 - Targeted Site Larval Insp Serv	Inspection of all targeted larval development sites.	09/14/2015
ROS1302 - Targeted Site Larval Insp Serv	Inspection of all targeted larval development sites.	09/23/2015
ROS2018 - Vectolex WSP CB Bike - 30 day	Treatment of catch basins with Vectolex WSP for larval control.	09/25/2015

Services Invoiced Per Contract:

Services Invoiced Year-to-Date: $74,000.00