NEW JERSEY ADULT MOSQUITO SURVEILLANCE

Report 17 June to 23 June 2018, CDC Week 25

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Center for Vector Biology

This New Jersey Agricultural Experiment Station report is supported by Rutgers University, Hatch funds,
funding from the NJ State Mosquito Control Commission and with the participation of the 21 county mosquito control agencies of New Jersey.

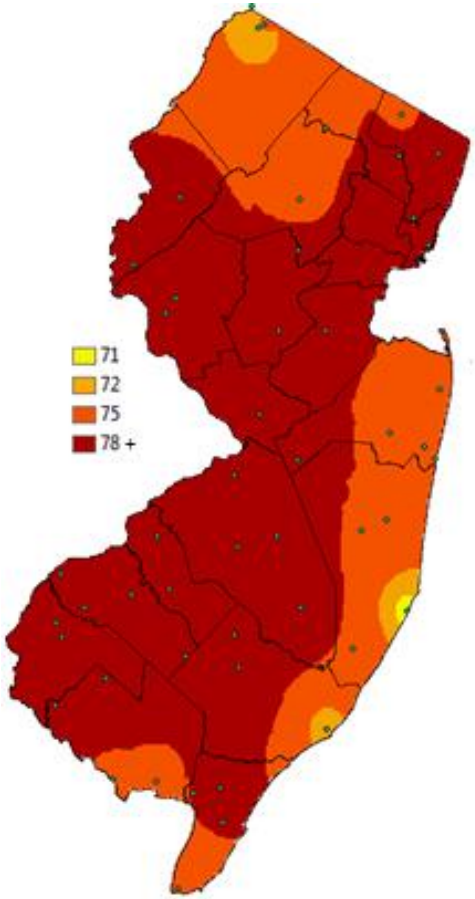
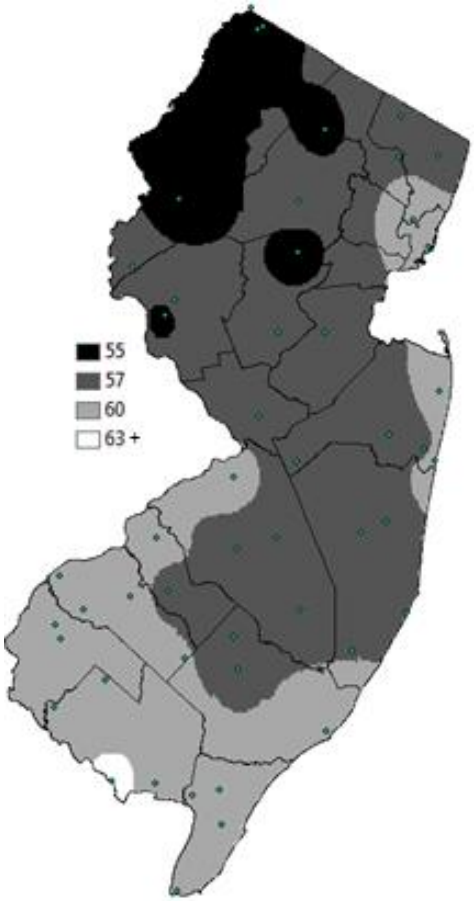
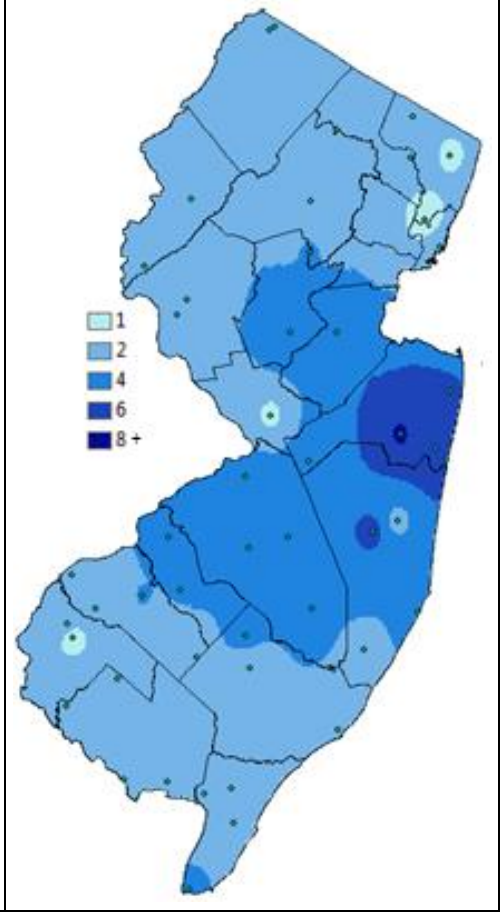
Summary Table – Week 25

	Aedes vexans			***Culex* Mix**			***Coquillettidia perturbans***			***Aedes sollicitans***		
Region	This Week	Average*	Increase	This Week	Average*	Increase	This Week	Average*	Increase	This Week	Average*	Increase
Agricultural	**11.24**	**1.45**	**4**	**13.86**	**2.03**	**4**	**0.14**	**0.35**	**0**	**8.60**	**0.08**	**4**
Coastal	**0.32**	**1.84**	**0**	**0.35**	**5.87**	**0**	**0.00**	**0.62**	**0**	**0.02**	**3.22**	**0**
Delaware Bayshore	**5.26**	**3.03**	**2**	**12.00**	**14.27**	**0**	**0.57**	**3.30**	**0**	**1.37**	**1.18**	**1**
Delaware River Basin	**16.93**	**6.26**	**4**	**11.64**	**2.03**	**4**	**2.50**	**0.49**	**4**	**0.00**	**0.09**	**0**
New York Metro	**3.51**	**2.21**	**2**	**5.34**	**4.72**	**1**	**0.27**	**0.04**	**4**	**0.09**	**0.13**	**0**
North Central Rural	**0.00**	**0.18**	**0**	**0.32**	**0.50**	**0**	**0.39**	**0.05**	**4**	**0.00**	**0.00**	**0**
Northwest Rural	**0.00**	**1.61**	**0**	**0.00**	**2.27**	**0**	**0.00**	**0.15**	**0**	**0.00**	**0.00**	**0**
Philadelphia Metro	**0.00**	**3.50**	**0**	**0.00**	**3.00**	**0**	**0.00**	**0.30**	**0**	**0.00**	**0.00**	**0**
Pinelands	**0.58**	**0.31**	**2**	**0.35**	**0.90**	**0**	**0.00**	**0.44**	**0**	**0.00**	**<0.01**	**0**
Suburban Corridor	**1.16**	**1.70**	**0**	**2.45**	**0.89**	**4**	**0.03**	**0.77**	**0**	**0.00**	**0.00**	**0**

*Averages represent data from, at most, the previous 5 years. Increase is a scale of current values from historical values where no difference or a decrease is represented by 0 (blue), up to 50% greater difference by 1 (green), up to 100% greater difference by 2 (yellow), up to 150% greater difference by 3 (orange) and greater than 150% increase by 4 (red). White cells in the increase column denote increases from an historic zero and thus no value can be appropriately given. nd=no data reported.

State Summary: *Aedes vexans* and *Culex* continue to be in significant numbers in the Agricultural and Delaware River Basin. *Coquillettidia* abundances were up in the Delaware River Basin, the New York Metropolitan and the North Central Rural regions while *Aedes sollicitans* were significantly higher in the Agricultural region.

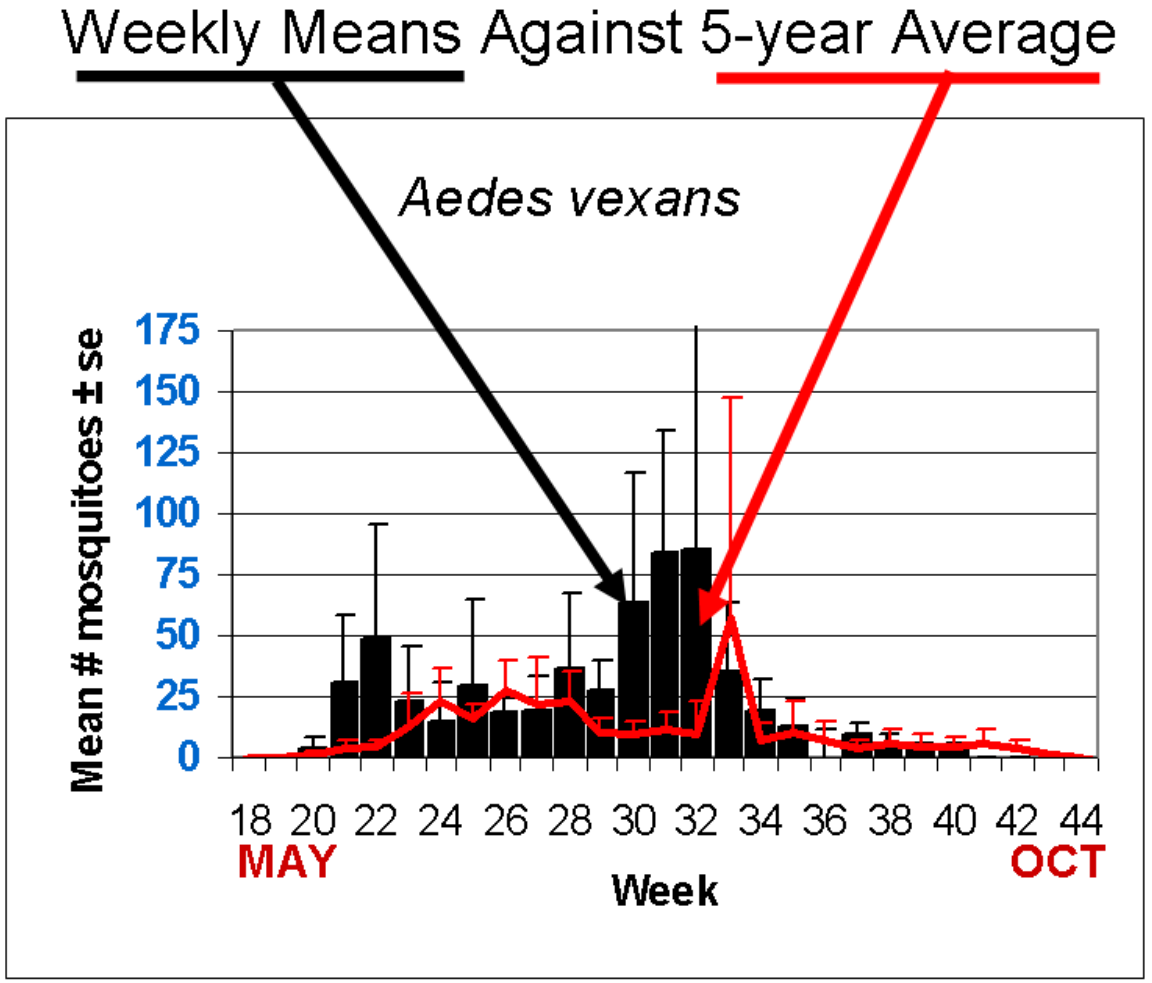
Climate Factors

Average High Temperature	Average Low Temperature	Total Precipitation
		

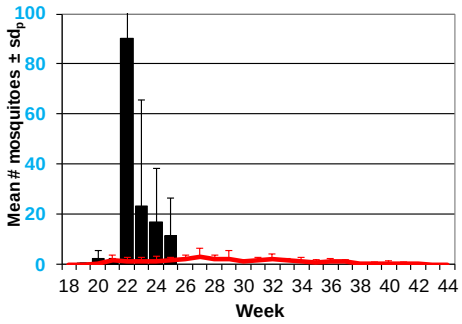
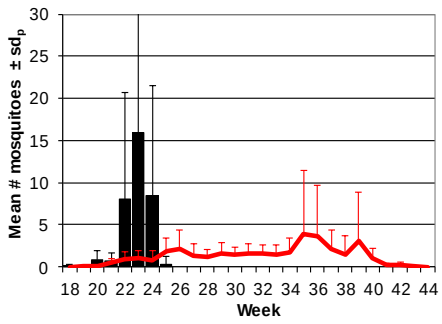
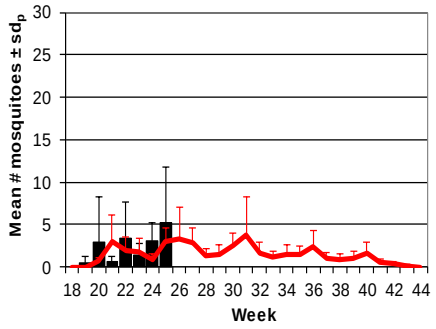
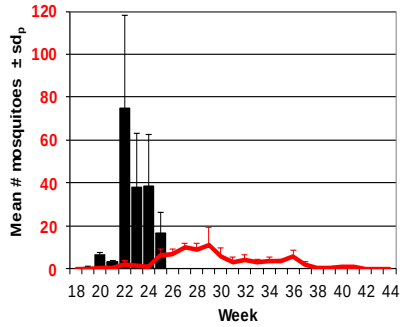
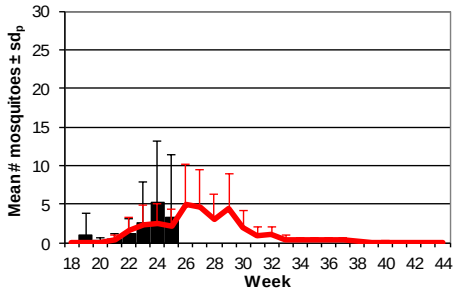
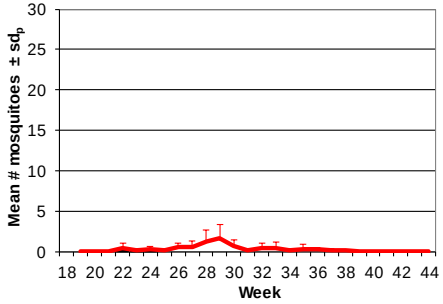
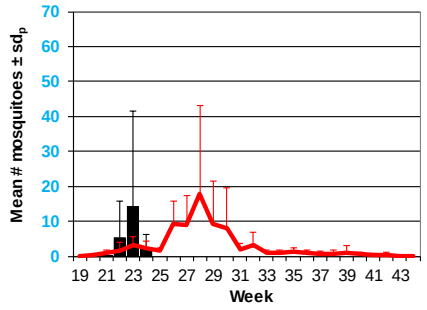
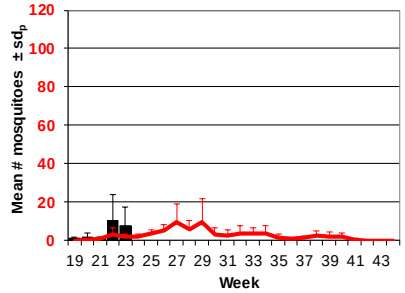
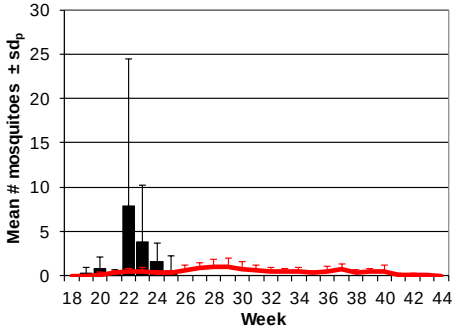
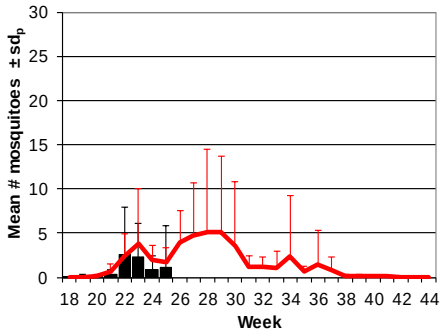
The three figures show the interpolation of average maximum (°F) and minimum temperature (°F) and total precipitation (inches) for 30 days prior to 25 June 2018 in New Jersey. Data points are from about 54 weather stations maintained through the New Jersey Weather & Climate Network and the State Climatologist. Interpolation between points was performed using ArcMap 10.1.

ONJSC at Rutgers University NJ Weather & Climate NETWORK

The Species Graphs: The species graph pages include a graph with two plots for each of the ten regions defined on the first page (Agricultural, Coastal, Delaware Bayshore, Delaware River, New York Metro, North-Central, Northwestern, Philadelphia Metro, Pinelands, and Suburban Corridor). Below is an example of one graph from one species within one region. The bar plot show the average number of mosquitoes per trap within the region (weekly means) and line plots show the historical trend as the average number of mosquitoes from the previous 5 years (5-year average). In general, historical data are running means from the previous 5 years, but on occasion, will include data from fewer years. Adjustments are made to account for year discrepancies. Data for this week are from Cumberland, Essex, Hunterdon, Monmouth, Salem, Somerset, and Union counties. Data for the previous week are from Atlantic, Bergen, Cape May, Cumberland, Essex, Hudson, Hunterdon, Middlesex, Monmouth, Morris, Ocean, Passaic, Salem, Somerset, Union and Warren counties.

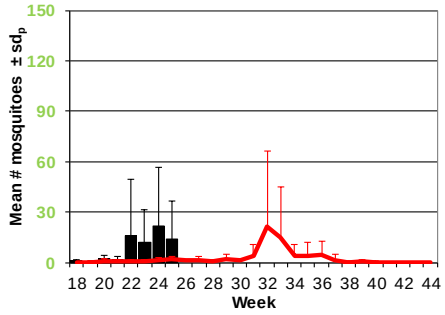


Aedes vexans - Fresh Floodwater Species
Multivoltine Aedine (*Ae. vexans* Type)

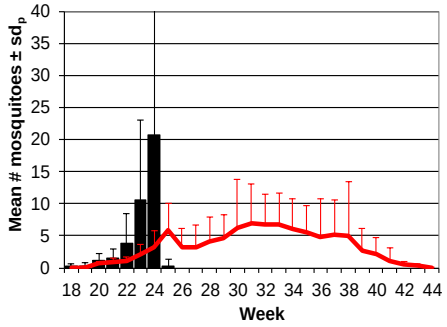
Agricultural	Coastal	Delaware Bayshore	Delaware River Basin
			
New York Metro	**North Central Rural**	**Northwestern Rural**	**Philadelphia Metro**
			
Pinelands	**Suburban Corridor**	**Comments**	
		*Aedes vexans* is the model for fresh floodwater species. With abundant precipitation, this species can emerge in very significant numbers. This floodwater species continues to show high numbers in the Agricultural and Delaware River Basin regions, with minor elevations also in the Delaware Bayshore, the New York Metropolitan and the Pinelands regions.	

Culex Mix – Permanent Water Species
Multivoltine *Culex/Anopheles* (*Cx. pipiens* Type)

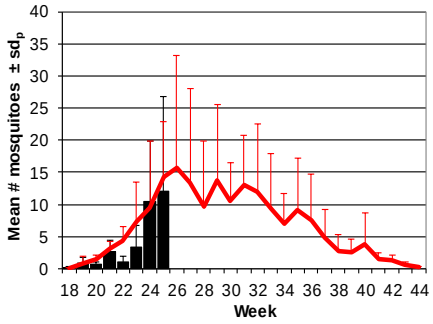
Agricultural



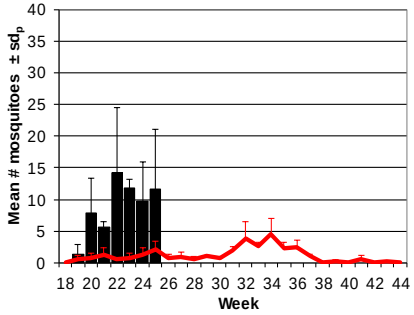
Coastal



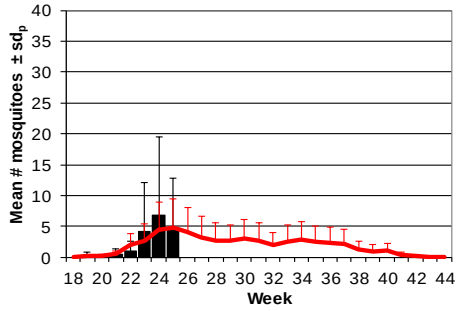
Delaware Bayshore



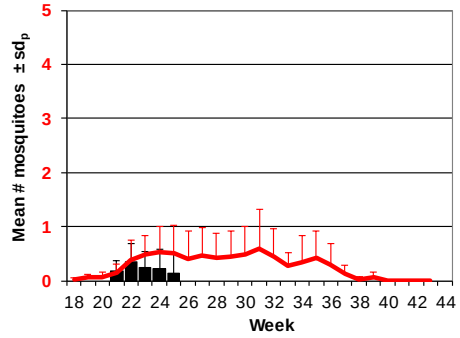
Delaware River Basin



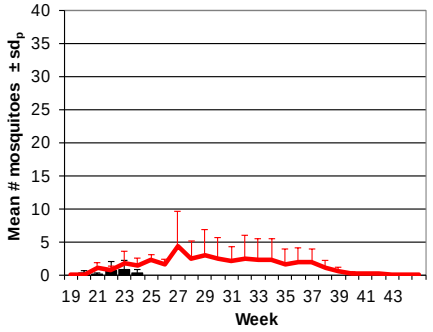
New York Metro



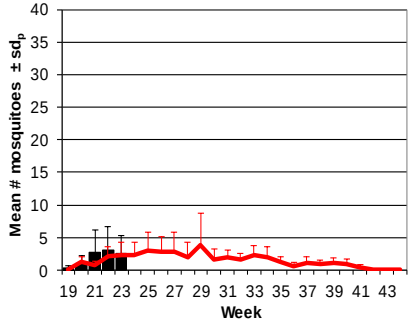
North Central Rural



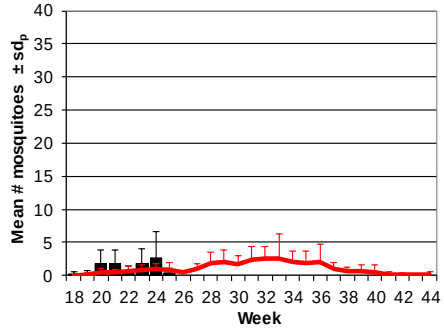
Northwestern Rural



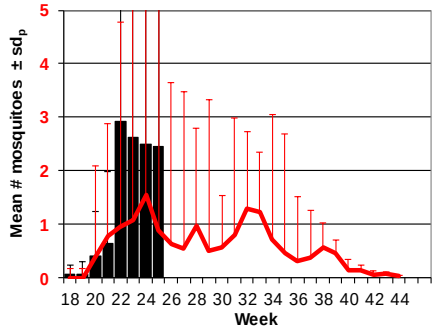
Philadelphia Metro



Pinelands



Suburban Corridor

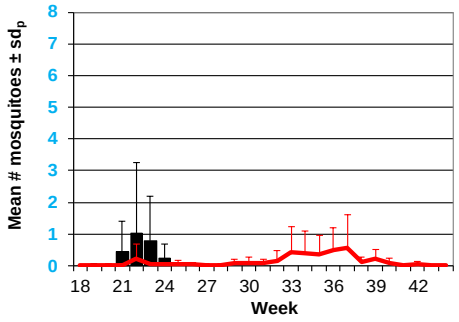


Comments

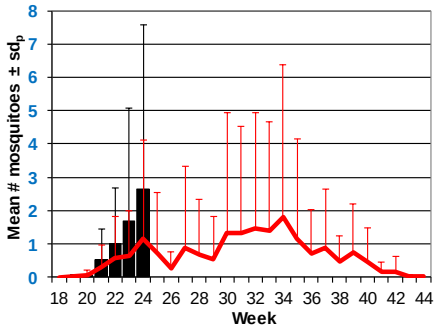
Culex Mix is composed of *Culex pipiens, Cx. restuans* and *Cx. salinarius*. These three species (especially *pipiens* and *restuans*) are often difficult to tell apart after encountering the damaging blades of the New Jersey light trap. Populations in the Agricultural, Delaware River Basin and the Suburban Corridor continue to be significantly above historical values. First positive WNV pools in *Culex* were collected the first week in June, in Warren County.

Culiseta melanura – Miscellaneous Group Unique (*Cs. melanura* Type)

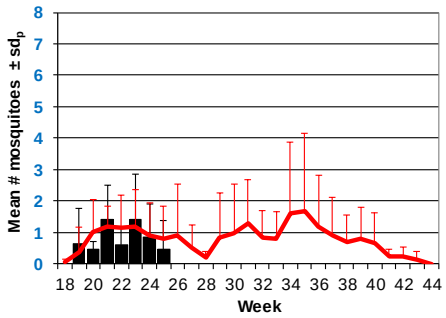
Agricultural



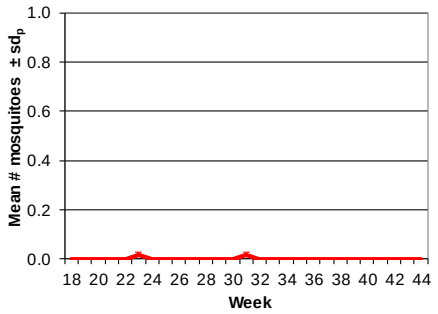
Coastal



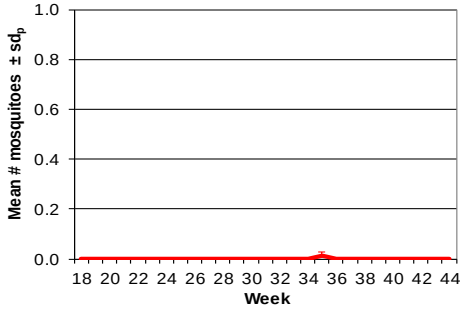
Delaware Bayshore



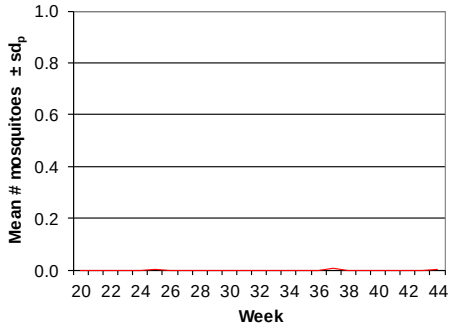
Delaware River Basin



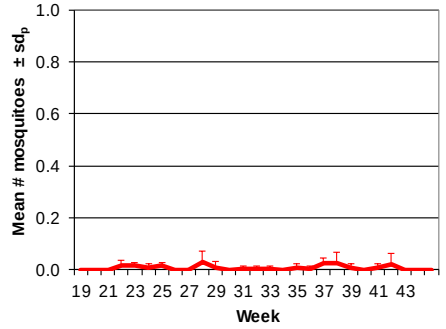
New York Metro



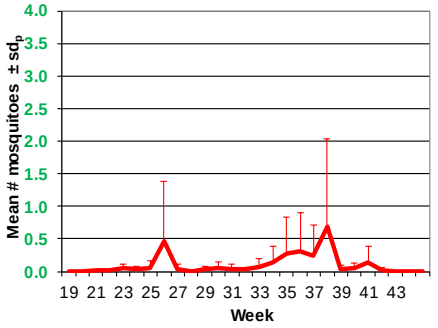
North Central Rural



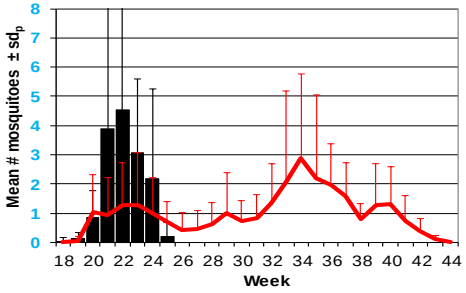
Northwestern Rural



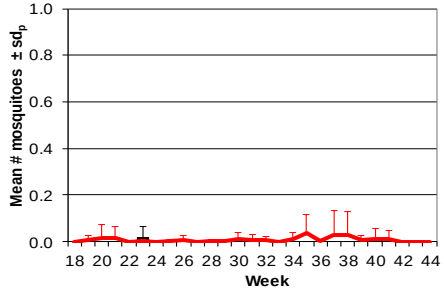
Philadelphia Metro



Pinelands



Suburban Corridor



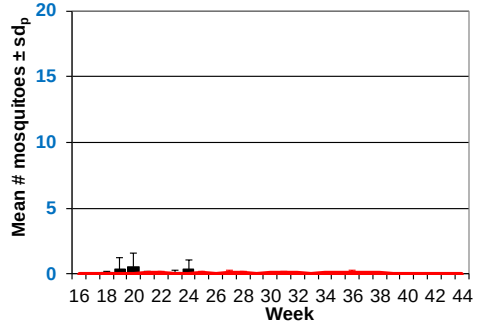
Comments

Culiseta melanura is the enzootic ornithophilic vector of eastern equine encephalitis. With New Jersey getting out of drought conditions, an abundance of water likely increases the survival of overwintering larvae in red maple or Atlantic cedar swamps. Abundance numbers continue to track historical values for the Agricultural and Delaware Bayshore. The Pinelands region appears to have a dip in the populations, but not all counties have reported their numbers here or for the Coastal region. No positive EEE has yet been detected in the state.

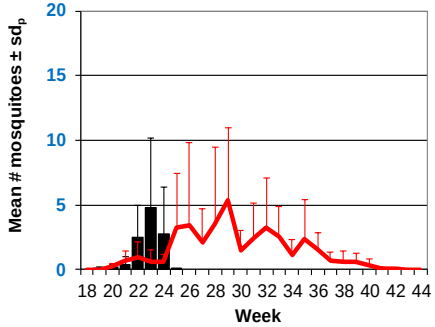
All horse owners should make sure their horses are up to date on the vaccination schedules: http://www.aaep.org/custdocs/adultvaccinationchart.pdf

Aedes sollicitans - Salt Floodwater Species
Multivoltine Aedine (*Ae. sollicitans* Type)

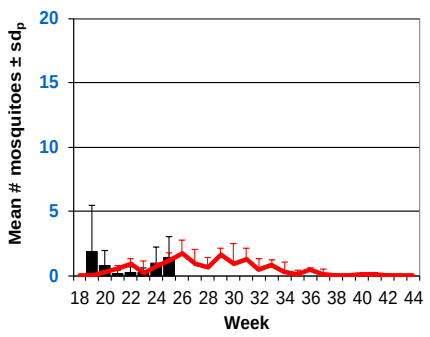
Agricultural



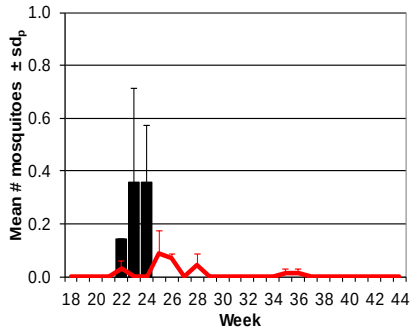
Coastal



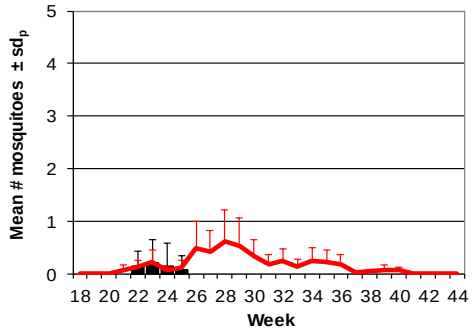
Delaware Bayshore



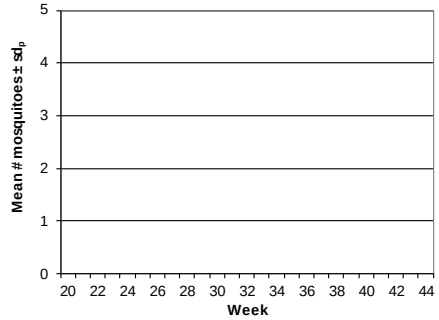
Delaware River Basin



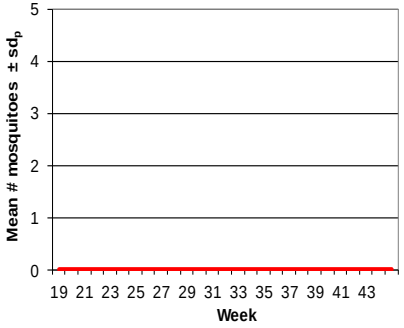
New York Metro



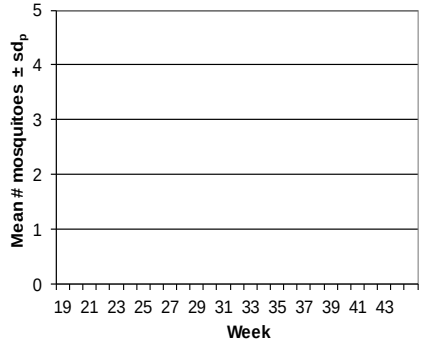
North Central Rural



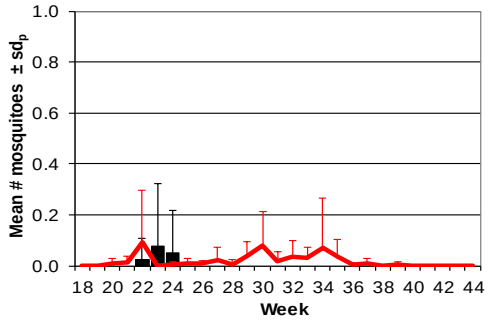
Northwestern Rural



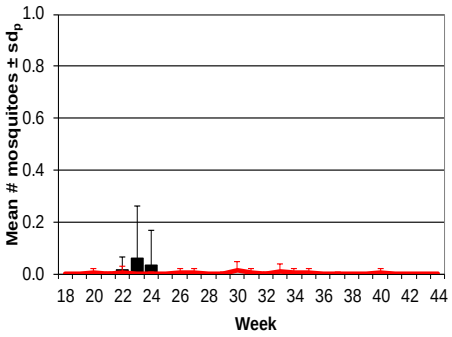
Philadelphia Metro



Pinelands



Suburban Corridor



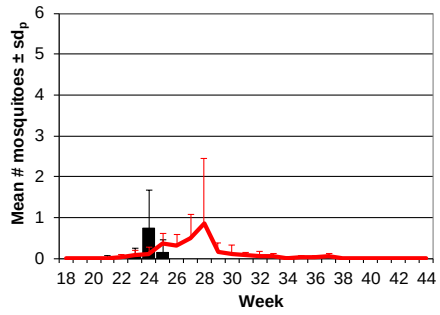
Comments

Aedes sollicitans is a salt floodwater species and responds to both lunar tidal patterns as well as rainfall. Numbers for this species has been in decline for the past several years, although there have been small increases lately. This past week, populations in the Agricultural region were higher than historical averages, with minor increases in the Delaware Bayshore region.

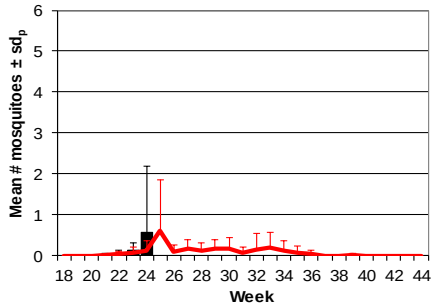
The next full moon occurs on the 28th of June.

Coquillettidia perturbans
Monotypic (*Coquillettidia perturbans* Type)

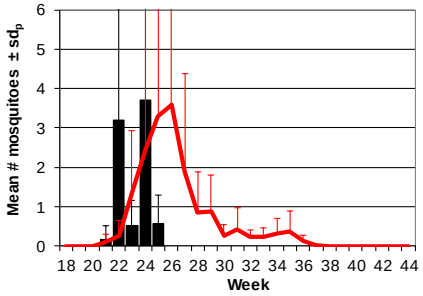
Agricultural



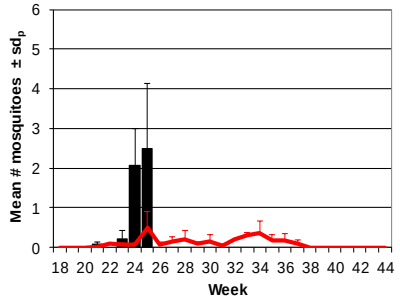
Coastal



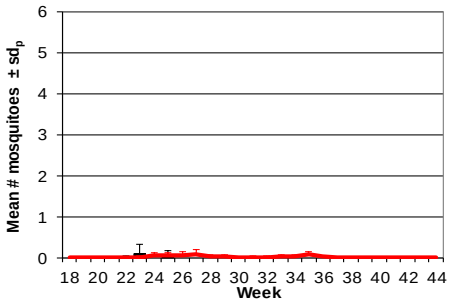
Delaware Bayshore



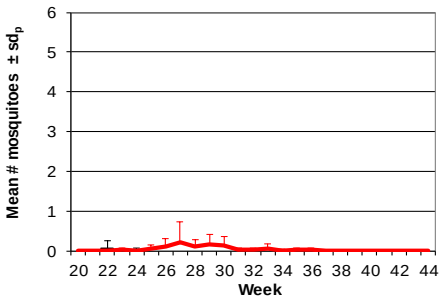
Delaware River Basin



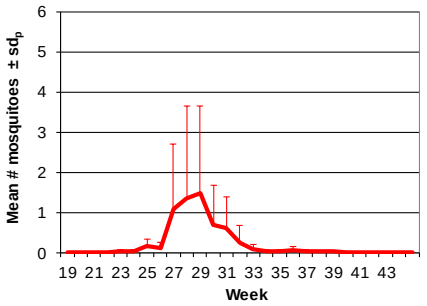
New York Metro



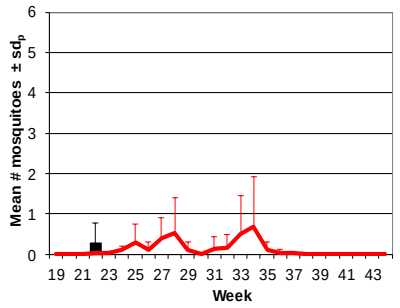
North Central Rural



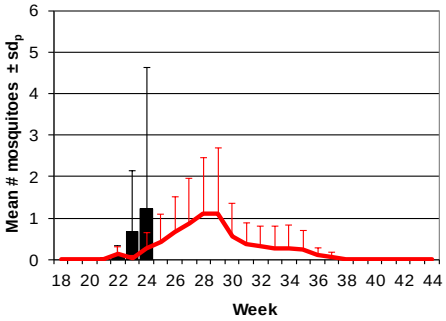
Northwestern Rural



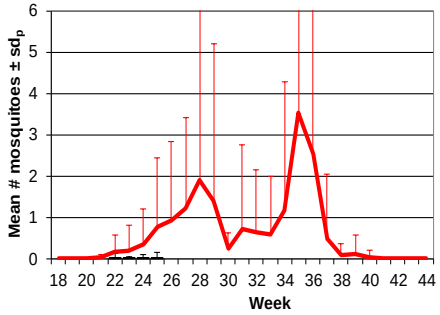
Philadelphia Metro



Pinelands



Suburban Corridor



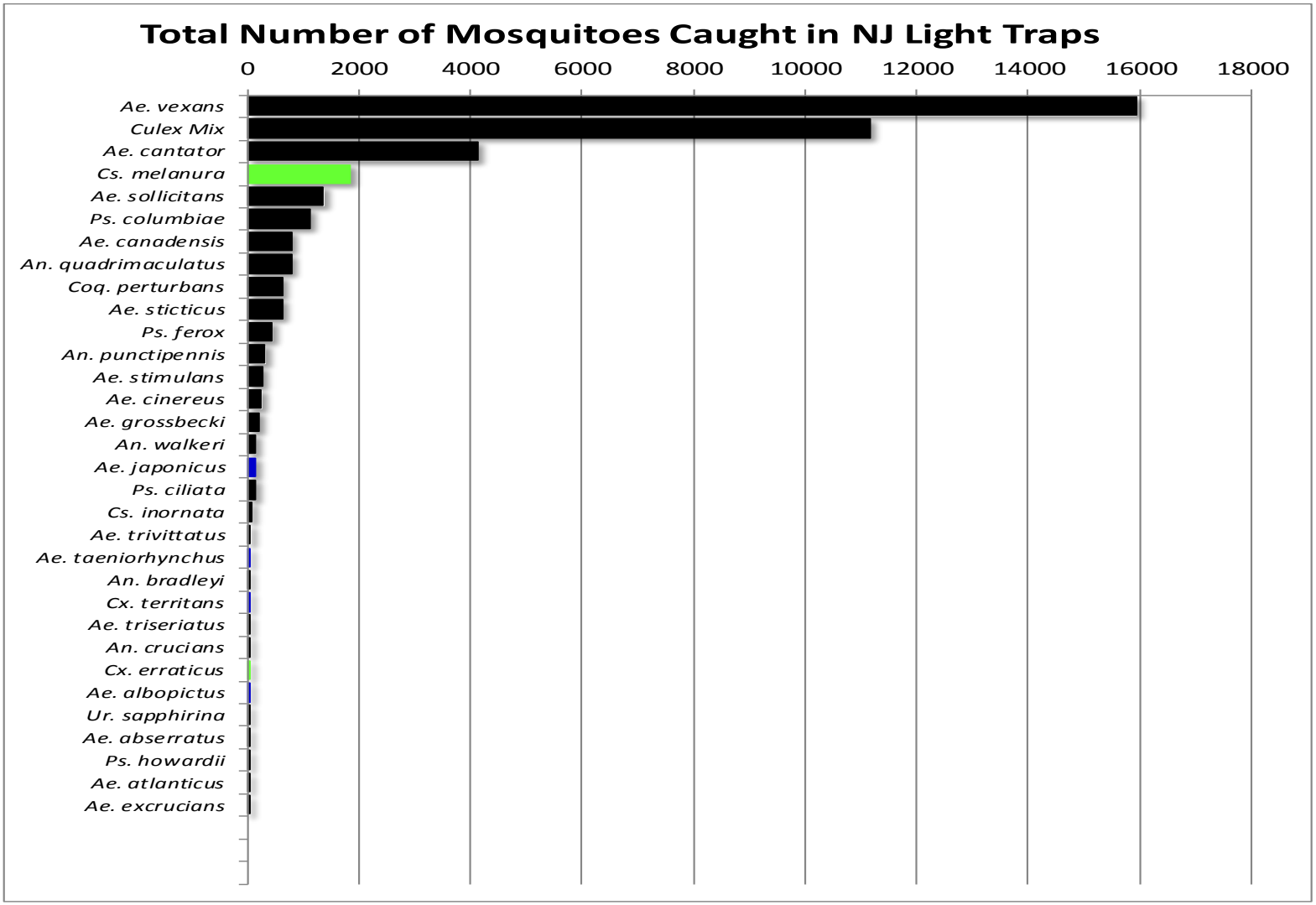
Comments

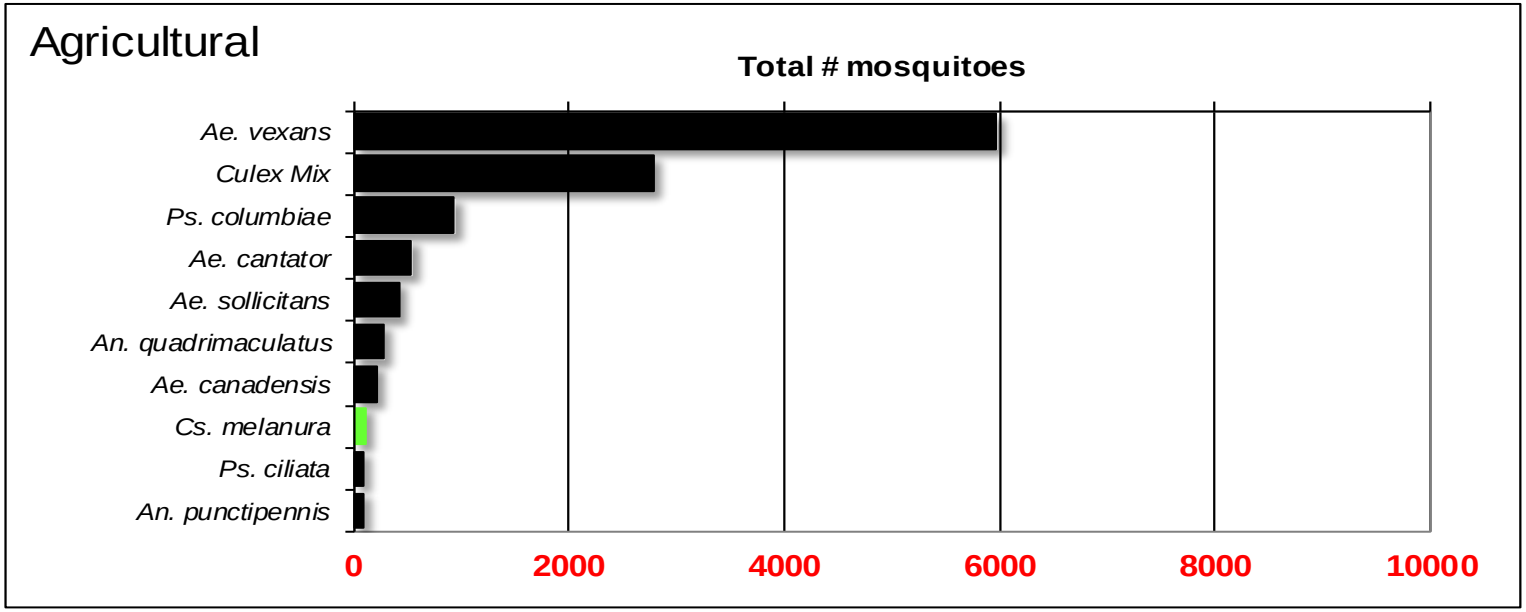
Coquillettidia perturbans populations are located in cattail swamps and other wetlands with emergent vegetation, often making control of their numbers dependent on controlling water depth. This mid-season species is a potential inland vector of EEE and should be monitored closely when the arbovirus is present. *Coq. perturbans* populations in the Delaware River Basin, the New York Metropolitan and North Central Rural regions are significantly higher than recent historical values. Currently EEE detection has not yet occurred in New Jersey, but when it does, this species should be monitored.

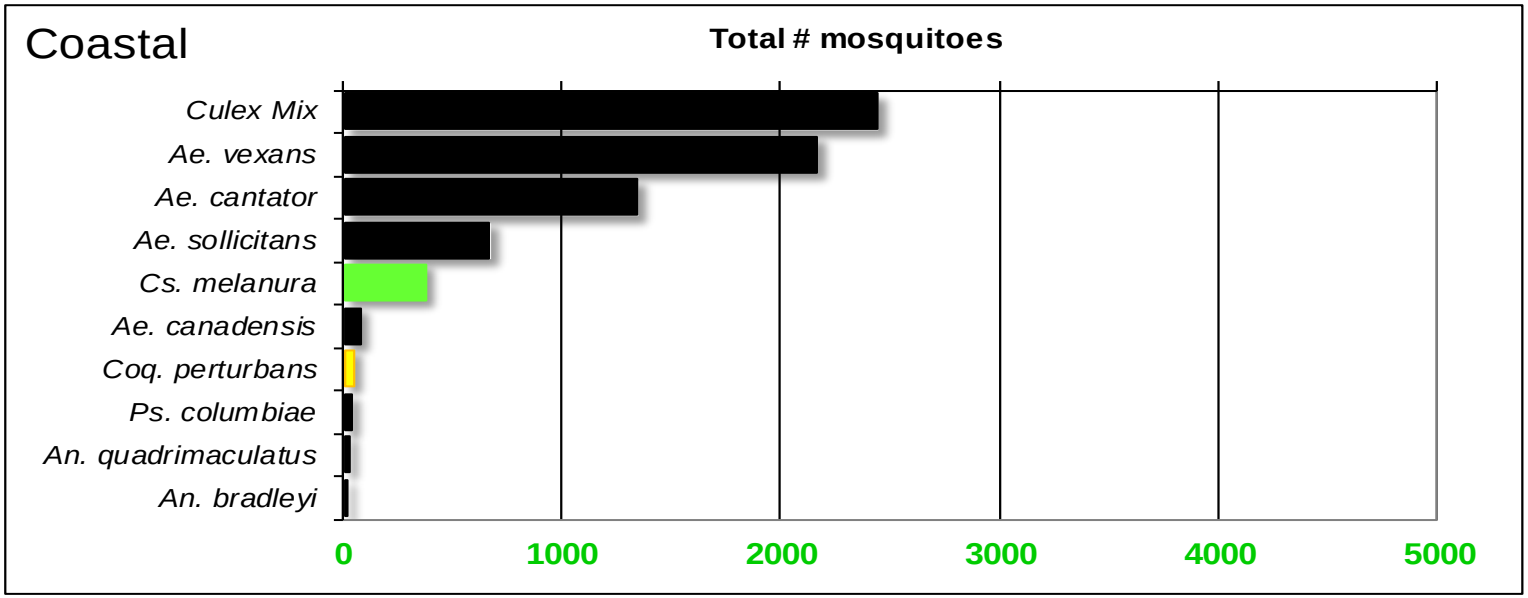
WNV *EEE*

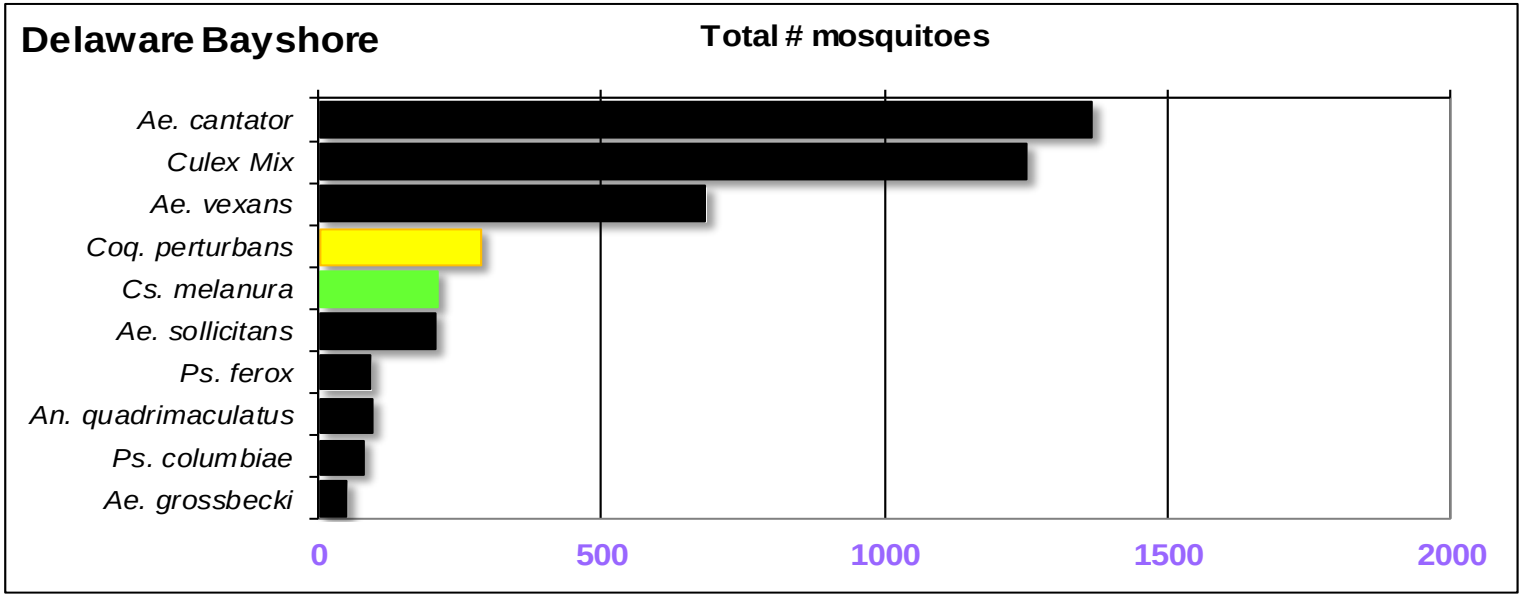
Top Ten Mosquito Species/Region - *Ae. albopictus,* *Ae. japonicus (invasives);* *Cs. melanura or Cx. erraticus* *Coq. perturbans*

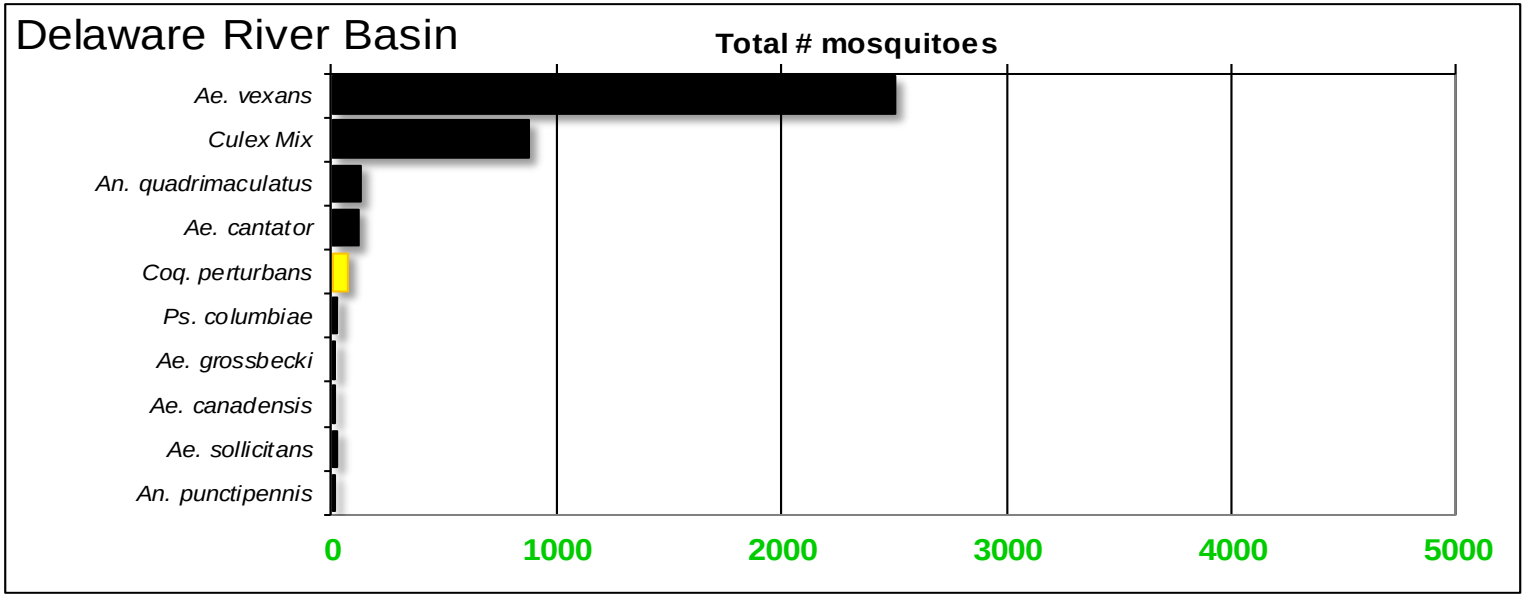
Note: In early season when fewer species are caught, graphs may show less than ten species/region or 25 statewide.

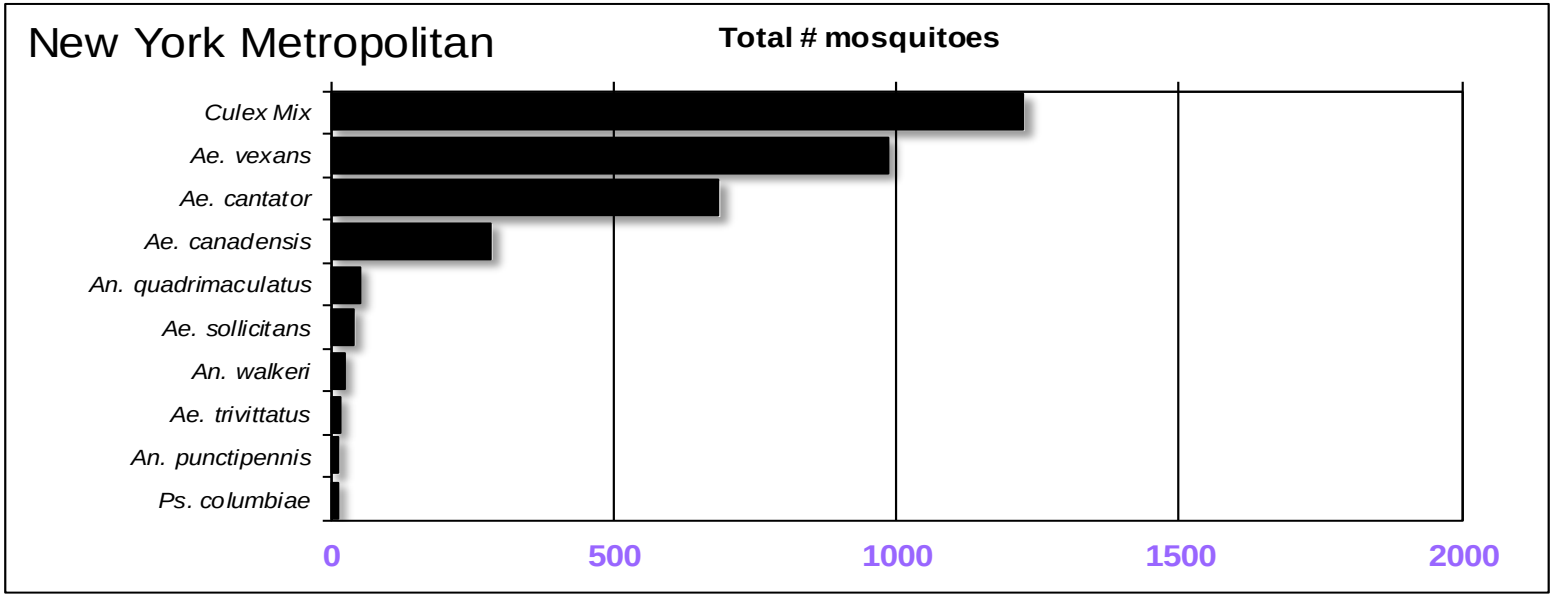


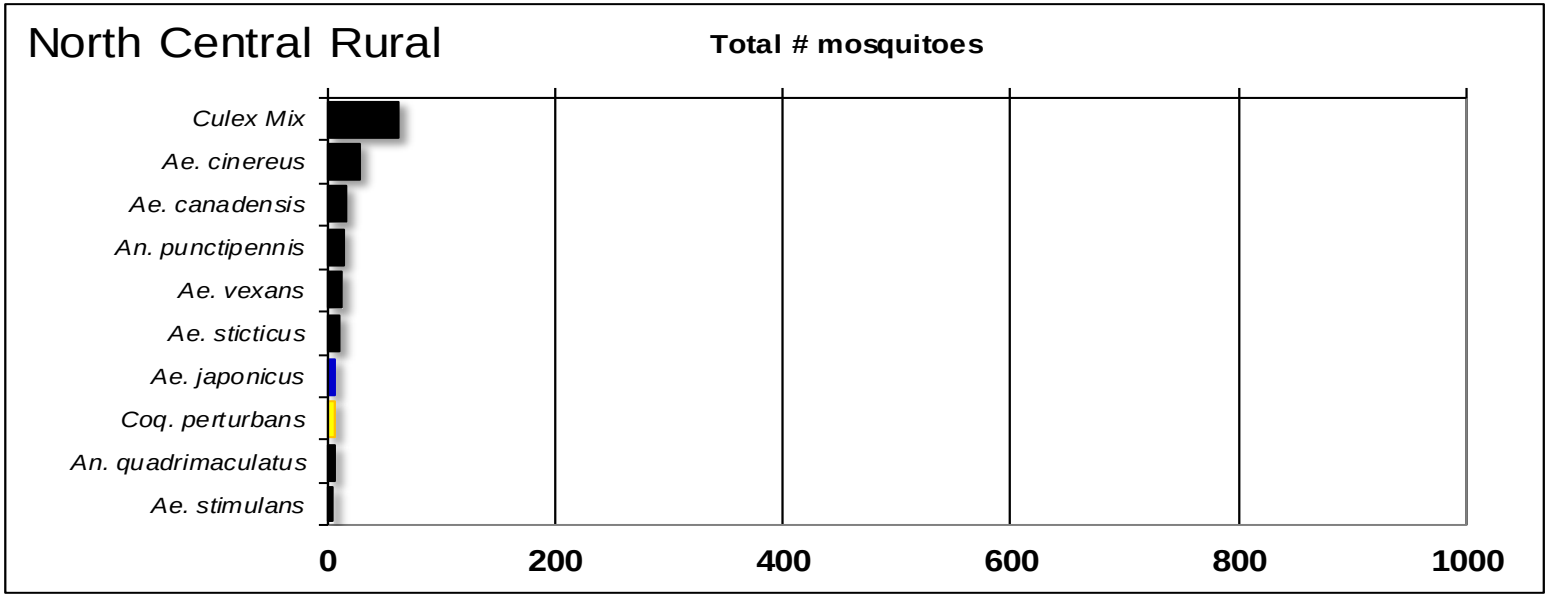

Agricultural
Total # mosquitoes
Ae. vexans
Culex Mix
Ps. columbiae
Ae. cantator
Ae. sollicitans
An. quadrimaculatus
Ae. canadensis
Cs. melanura
Ps. ciliata
An. punctipennis
0
2000
4000
6000
8000
10000

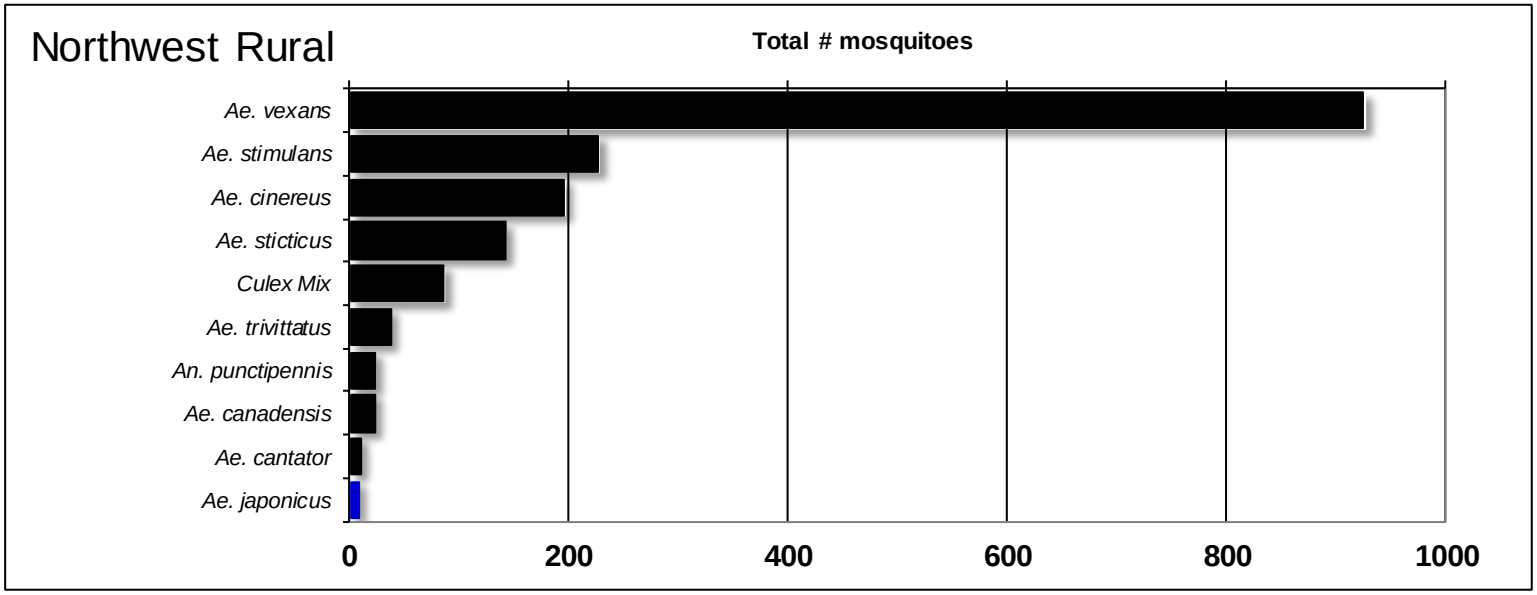

Coastal
Total # mosquitoes
Culex Mix
Ae. vexans
Ae. cantator
Ae. sollicitans
Cs. melanura
Ae. canadensis
Coq. perturbans
Ps. columbiae
An. quadrimaculatus
An. bradleyi
0
1000
2000
3000
4000
5000

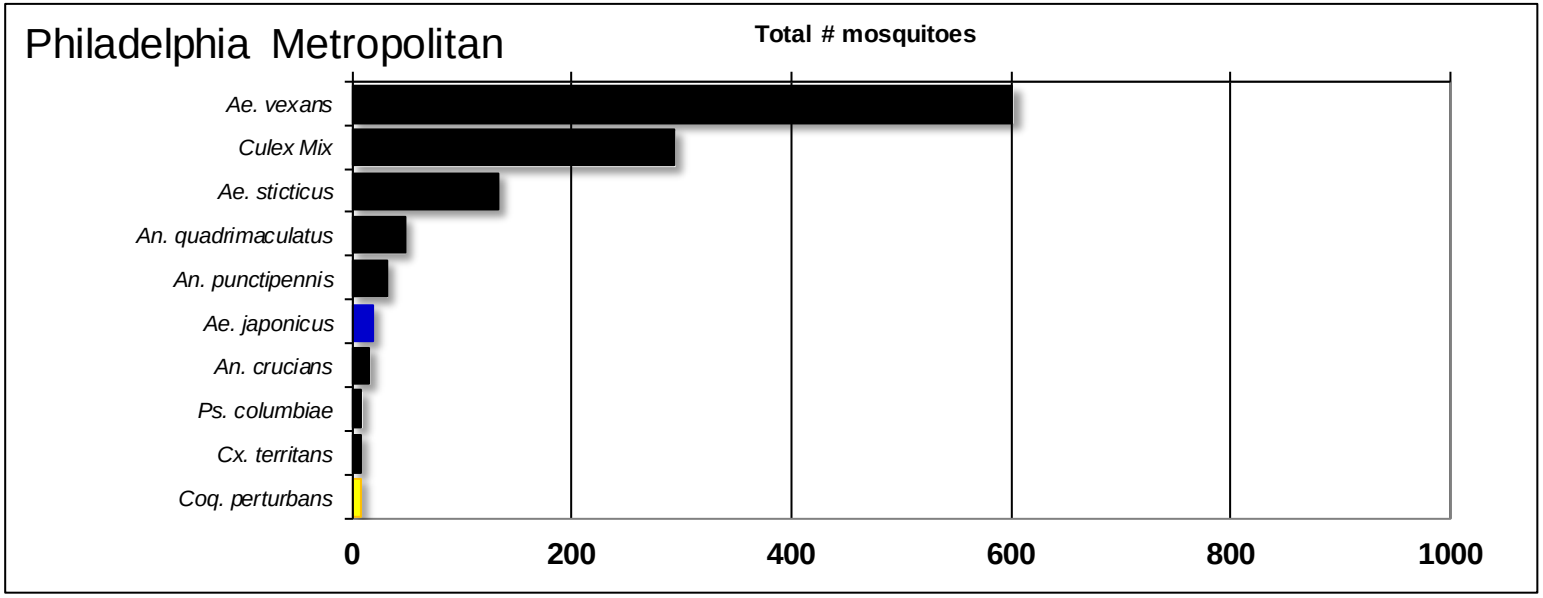

Delaware Bayshore
Total # mosquitoes
Ae. cantator
Culex Mix
Ae. vexans
Coq. perturbans
Cs. melanura
Ae. sollicitans
Ps. ferox
An. quadrimaculatus
Ps. columbiae
Ae. grossbecki
0
500
1000
1500
2000

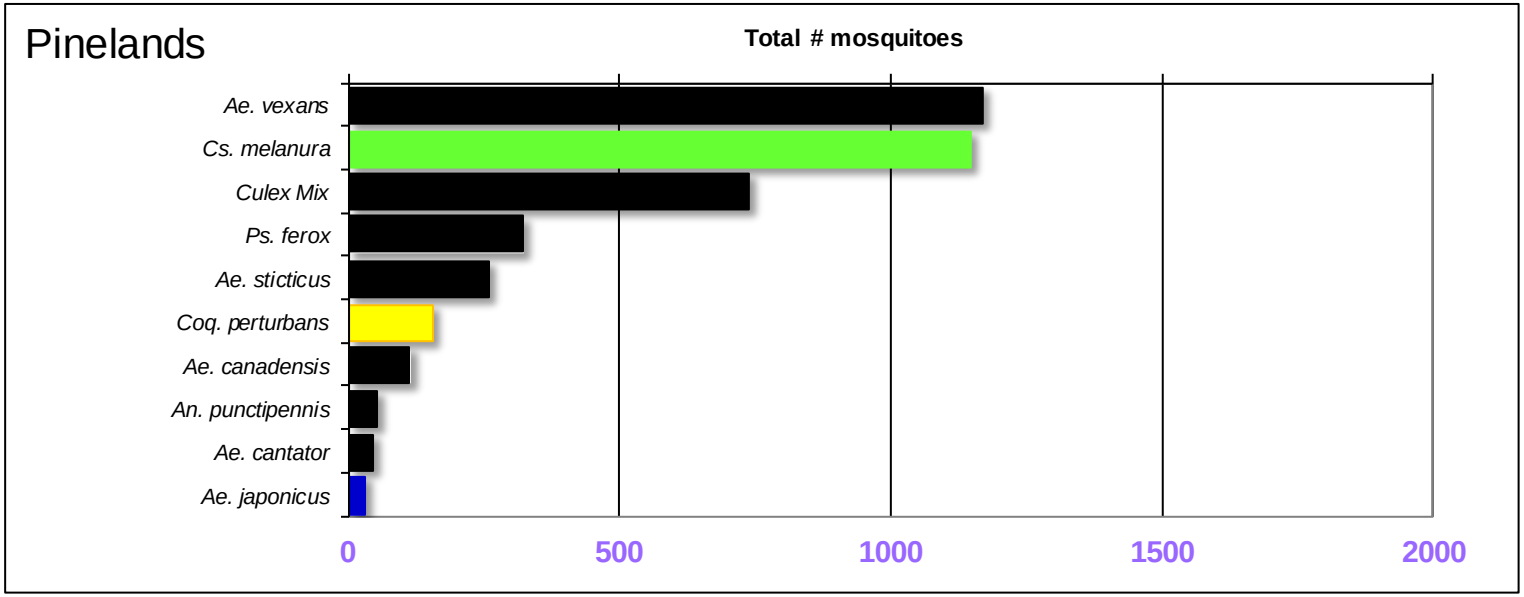

Delaware River Basin
Total # mosquitoes
Ae. vexans
Culex Mix
An. quadrimaculatus
Ae. cantator
Coq. perturbans
Ps. columbiae
Ae. grossbecki
Ae. canadensis
Ae. sollicitans
An. punctipennis
0
1000
2000
3000
4000
5000

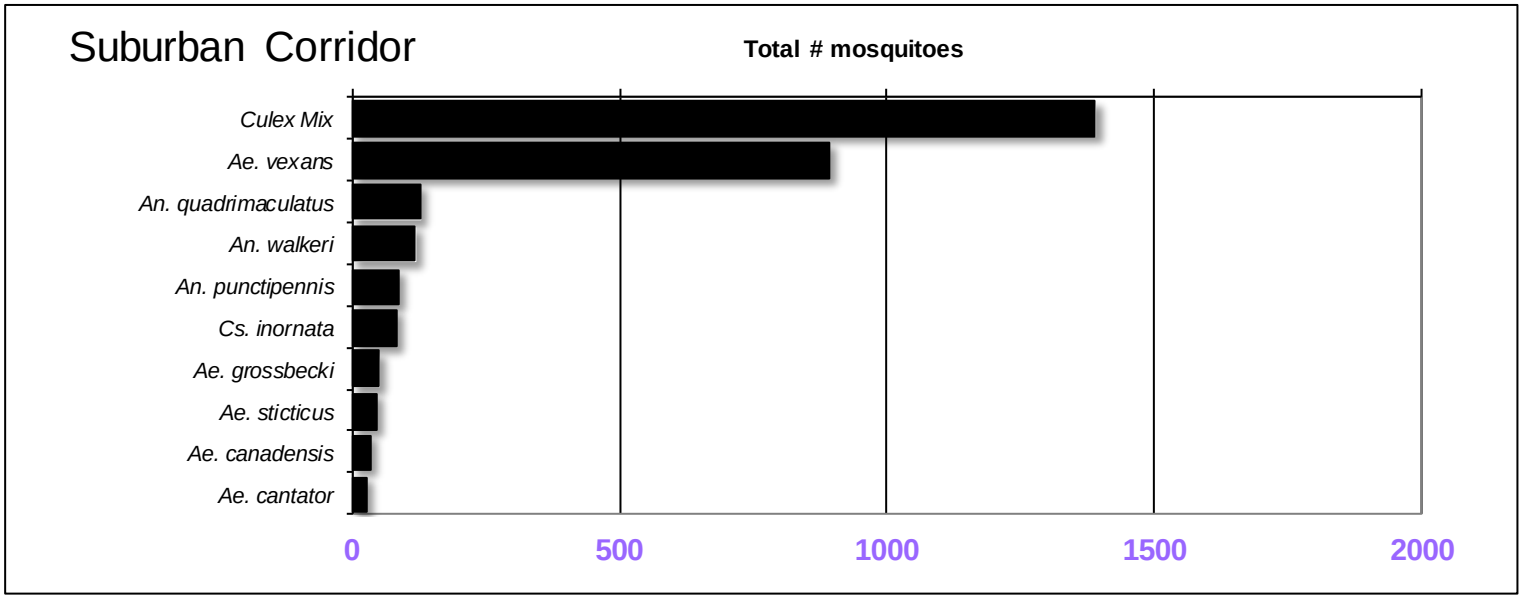

New York Metropolitan
Total # mosquitoes
Culex Mix
Ae. vexans
Ae. cantator
Ae. canadensis
An. quadrimaculatus
Ae. sollicitans
An. walkeri
Ae. trivittatus
An. punctipennis
Ps. columbiae
0
500
1000
1500
2000


North Central Rural
Total # mosquitoes
Culex Mix
Ae. cinereus
Ae. canadensis
An. punctipennis
Ae. vexans
Ae. sticticus
Ae. japonicus
Coq. perturbans
An. quadrimaculatus
Ae. stimulans
0
200
400
600
800
1000


Northwest Rural
Total # mosquitoes
Ae. vexans
Ae. stimulans
Ae. cinereus
Ae. sticticus
Culex Mix
Ae. trivittatus
An. punctipennis
Ae. canadensis
Ae. cantator
Ae. japonicus
0
200
400
600
800
1000


Philadelphia Metropolitan
Total # mosquitoes
Ae. vexans
Culex Mix
Ae. sticticus
An. quadrimaculatus
An. punctipennis
Ae. japonicus
An. crucians
Ps. columbiae
Cx. territans
Coq. perturbans
0
200
400
600
800
1000

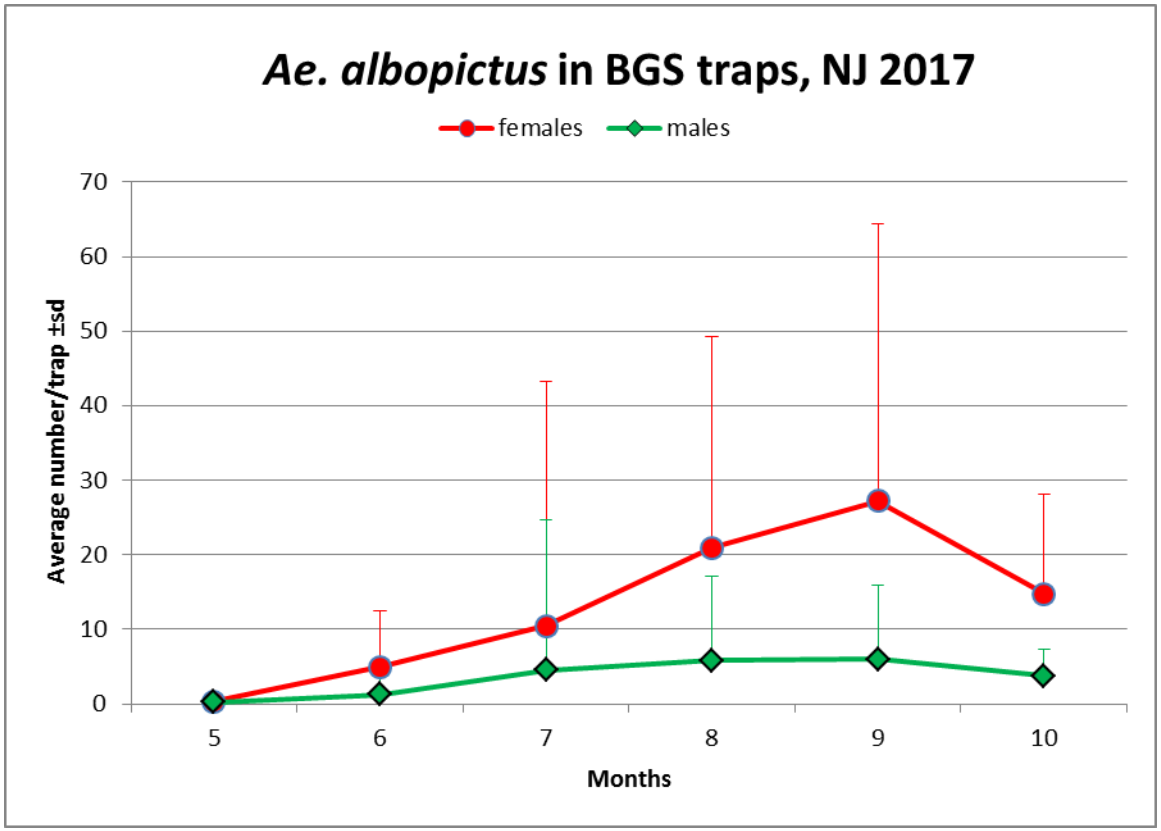

Pinelands
Total # mosquitoes
Ae. vexans
Cs. melanura
Culex Mix
Ps. ferox
Ae. sticticus
Coq. perturbans
Ae. canadensis
An. punctipennis
Ae. cantator
Ae. japonicus
0
500
1000
1500
2000


Suburban Corridor
Total # mosquitoes
Culex Mix
Ae. vexans
An. quadrimaculatus
An. walkeri
An. punctipennis
Cs. inornata
Ae. grossbecki
Ae. sticticus
Ae. canadensis
Ae. cantator
0
500
1000
1500
2000

***Aedes albopictus* in New Jersey**. With the emphasis on invasive *Aedes* and the occurrence of emerging arboviruses in the US, CDC attempted to map the distributions of certain aedine mosquitoes potentially responsible for transmission of these diseases. First maps illustrated the need for more in depth data points, resulting with CDC's MosquitoNet being initiated as a population corollary to ArboNet. Some data has been put in, and the following is a summary of *Aedes albopictus* distribution by sex and trap type in New Jersey, 2017.

Counties: *Ae. albopictus* data from BGS traps were entered from Atlantic, Cape May, Cumberland, Hudson, Mercer, Middlesex, Monmouth, Morris, Ocean, Passaic, Salem, and Warren counties. The distribution of reported BGS locations during 2017 was mapped using lat-long values (see Map to right).

BGS traps by sex: As expected, *Ae. albopictus* females were caught more frequently than males, with higher abundances seen during September than in May or June.



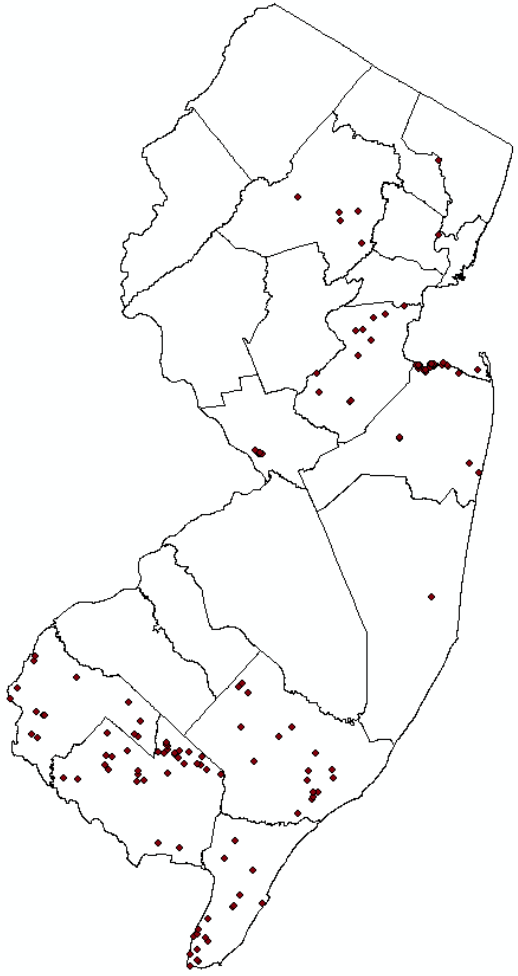
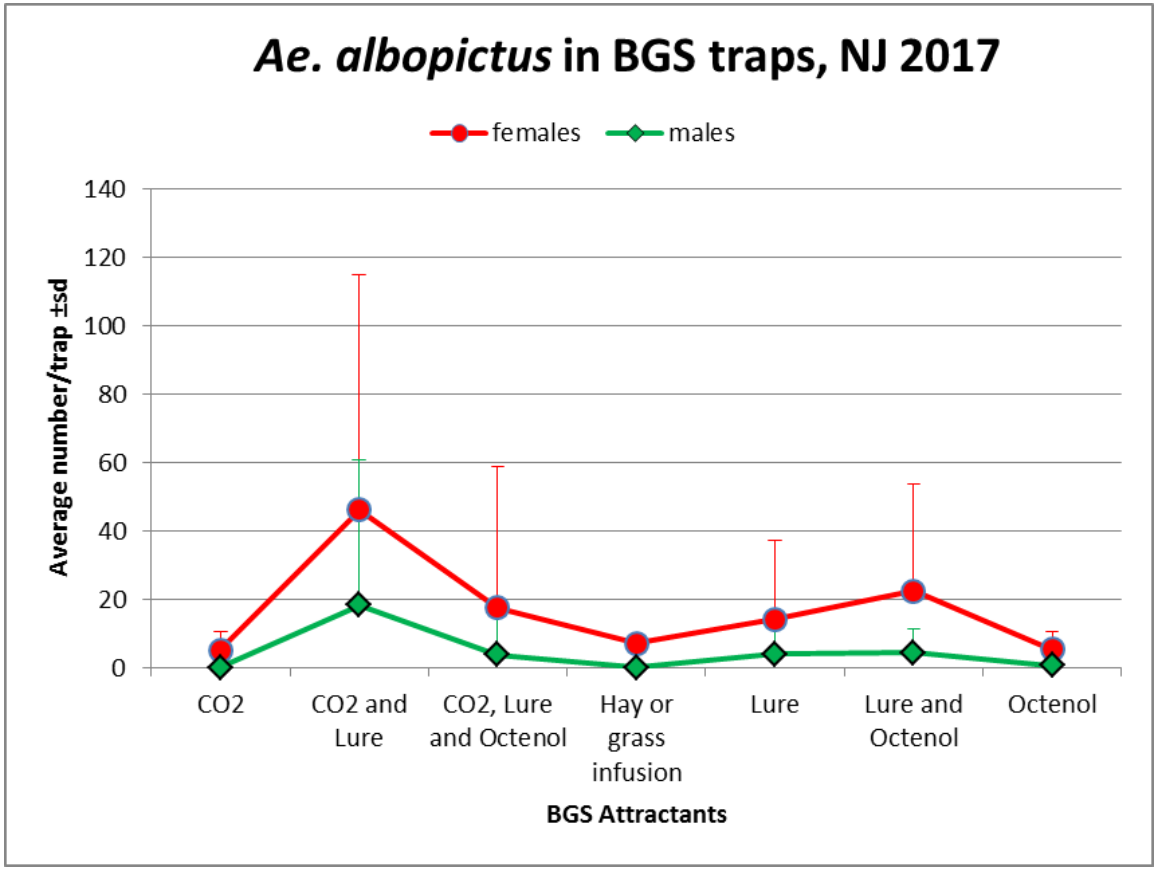


Figure 1. Map of BGS trap locations

BGS traps can be used in a number of different ways, with several different types of attractants. *Ae. albopictus* appears to be most attractive to the use of the lure which releases chemicals associated with human skin (ammonia, lactic acid, and caproic acid, according to Biogents https://www.bg-sentinel.com/) in combination with CO_2 or less effectively, with Octenol. Either CO_2 or Octenol alone was fat less effective. The lure by itself was less effective than in combination with the CO_2.



Statistical tests: Males were not tested as numerous traps only caught females resulting in many zero values for males and Hay or grass infusion was not included as there was only one value. Two one-way ANOVAs testing the effect of Month or Attractant on female *Ae. albopictus* population numbers were performed using IBM SPSS ver 24. There was a significant difference among months ($F_{5,680}$=4.817, P<0.001) with May being significantly lower than July, August or September (Tukey's B). July, August, September and October formed a subset significantly different from May or June (Tukey's B). There was a significant effect on attractants used ($F_{5,680}$=3.621, P=0.003) with CO2 and Lure attracting significantly more females than any other attractants or combinations (Tukey's B, . Because of the variability in the number of attractants used over each month, interactions were not tested.