RUTGERS
New Jersey Agricultural Experiment Station

NEW JERSEY ADULT MOSQUITO SURVEILLANCE

Report for 11 July to 17 July 2010, CDC Week 28

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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.

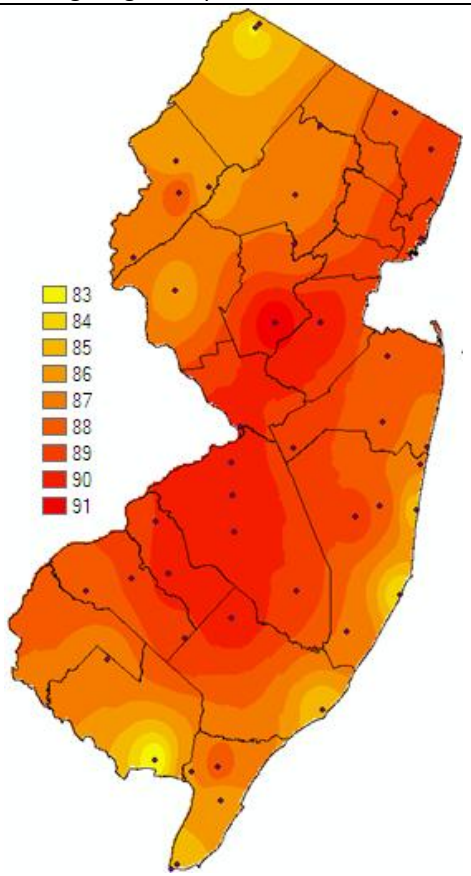
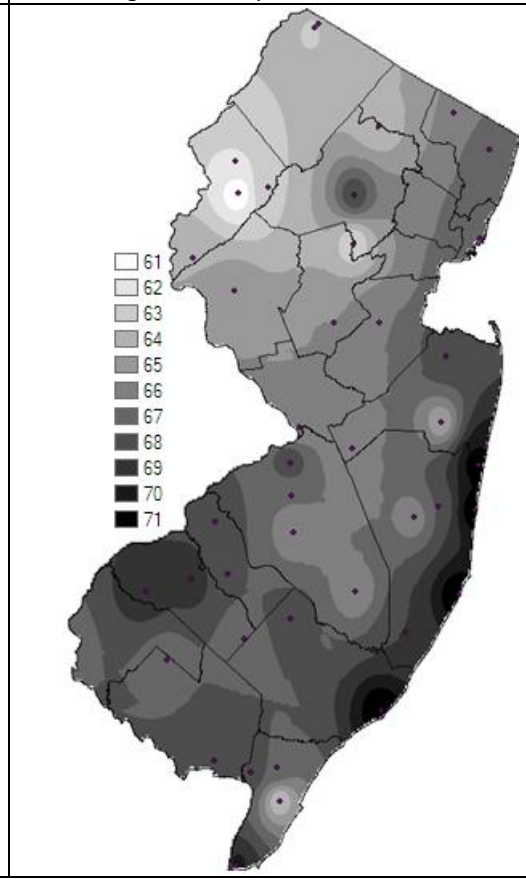
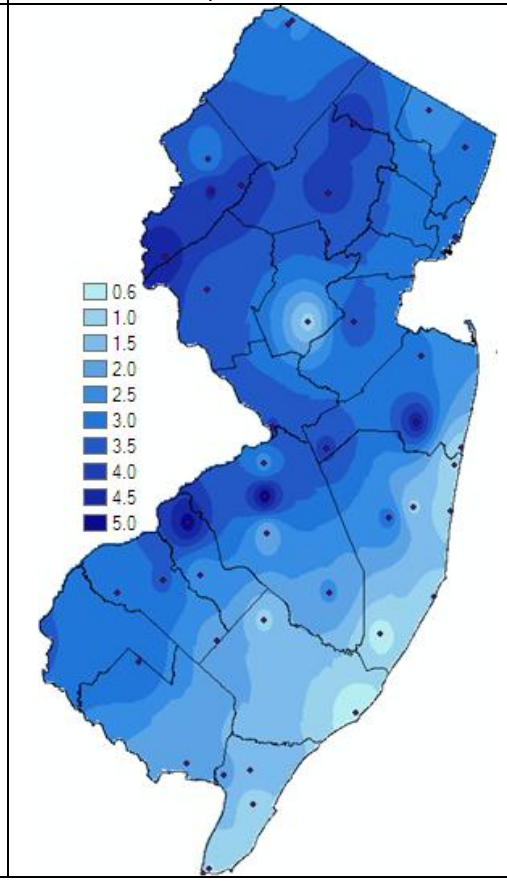
Summary table – Week 28

	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	**0.07**	**3.20**	**0**	**0.64**	**2.99**	**0**	**0.21**	**0.80**	**0**	**0.00**	**0.10**	**0**
Coastal	**0.08**	**5.59**	**0**	**0.57**	**7.03**	**0**	**0.05**	**1.68**	**0**	**0.41**	**16.75**	**0**
Delaware Bayshore	**0.14**	**2.44**	**0**	**0.69**	**20.25**	**0**	**0.14**	**2.89**	**0**	**0.03**	**29.31**	**0**
Delaware River Basin	**0.39**	**12.36**	**0**	**0.11**	**4.49**	**0**	**0.00**	**0.28**	**0**	**0.00**	**0.13**	**0**
New York Metro	**0.07**	**6.83**	**0**	**5.69**	**11.34**	**0**	**0.07**	**0.29**	**0**	**0.00**	**0.31**	**0**
North Central Rural	**0.08**	**0.72**	**0**	**0.24**	**0.87**	**0**	**0.00**	**0.03**	**0**	**0.00**	**0.00**	**0**
Northwest Rural	**0.74**	**26.07**	**0**	**0.69**	**6.45**	**0**	**0.69**	**1.05**	**0**	**0.00**	**0.00**	**0**
Philadelphia Metro	**0.24**	**14.86**	**0**	**0.52**	**7.75**	**0**	**0.00**	**0.87**	**0**	**0.00**	**0.00**	**0**
Pinelands	**0.21**	**1.94**	**0**	**0.38**	**3.10**	**0**	**0.25**	**2.15**	**0**	**0.01**	**0.07**	**0**
Suburban Corridor	**0.35**	**9.86**	**0**	**0.53**	**3.71**	**0**	**0.18**	**0.79**	**0**	**0.00**	**0.01**	**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.

State Summary: None of the four pestiferous species above had abundances higher than recent historical levels.

Climate Factors

Average High Temperatures 1 Jul to 21 Jul	Average Low Temperatures 1 Jul to 21 Jul	Total Precipitation 1 Jul to 21 Jul
		

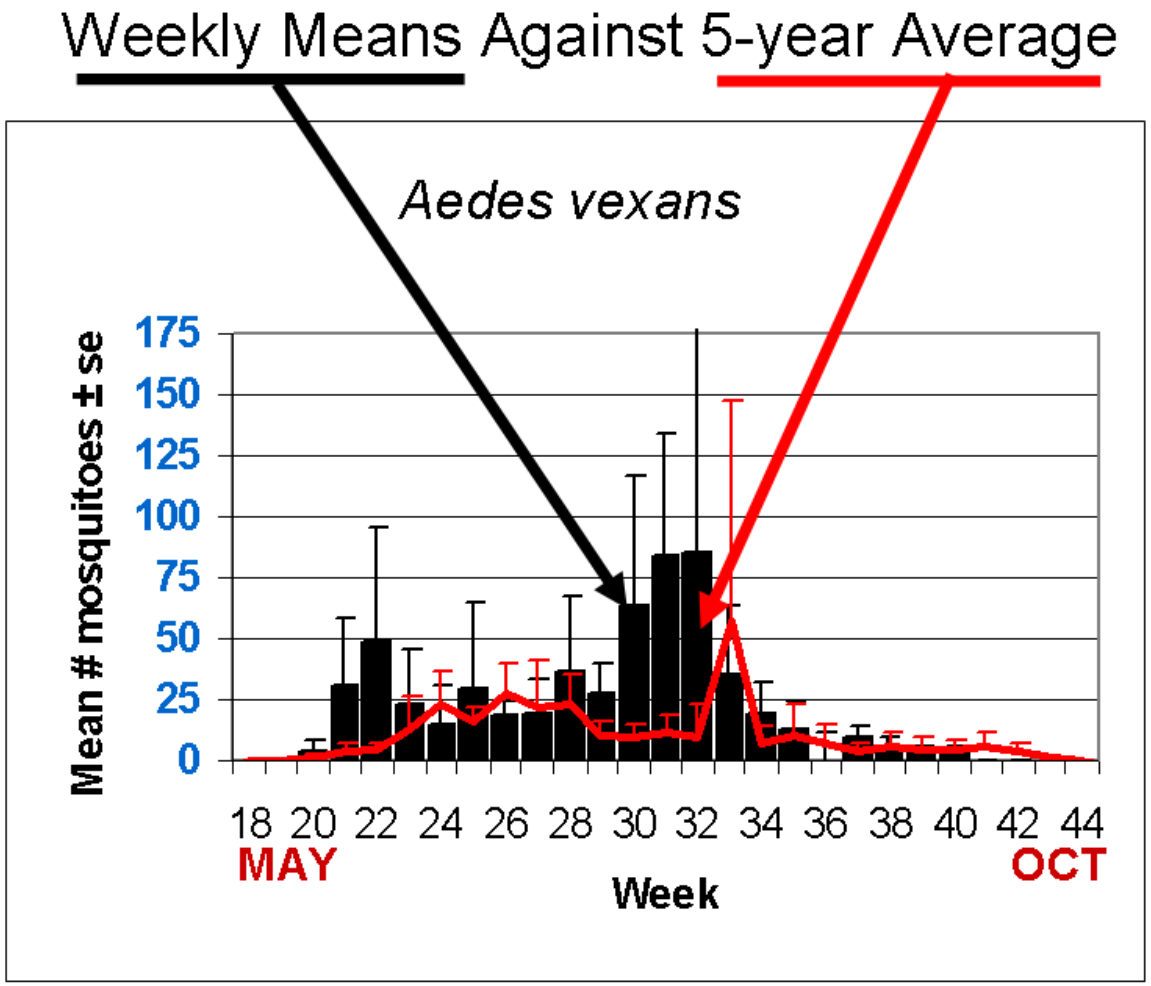
The three figures show the interpolation of average maximum and minimum temperature and total precipitation from July 1 to July 21, 2010 in New Jersey. Data points are from 40 weather stations maintained through the New Jersey Weather & Climate Network and the State Climatologist. Interpolation between points was performed using ArcMap 9.2.

Warmer nighttime temperatures occurred during this past week with many areas receiving substantial amounts of rain. Coastal and higher elevation areas are cooler during the day, but the Coastal areas retain heat during the night. Less rain fell to the southern coastal areas.

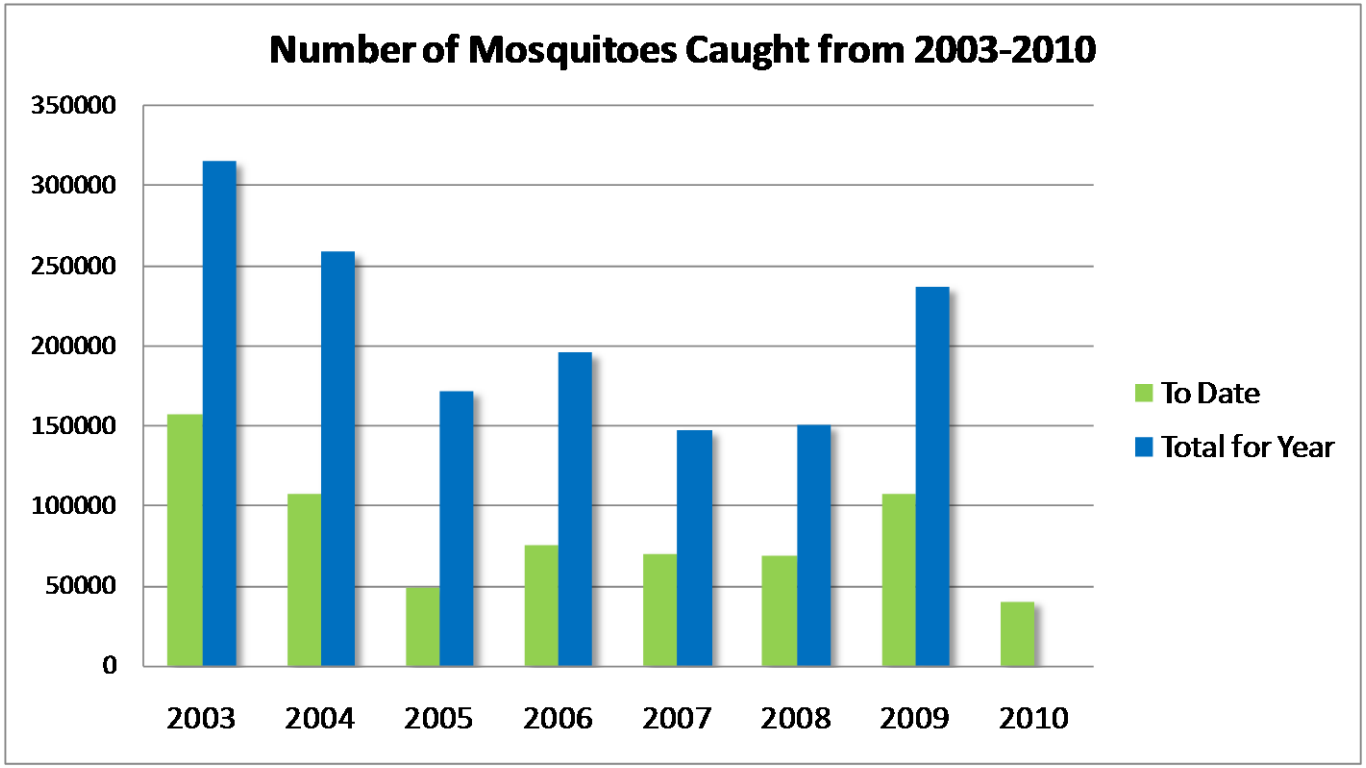
NJ Weather & Climate NETWORK

ONJSC at Rutgers University

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 Atlantic, Bergen, Camden, Cape May, Essex, Hudson, Hunterdon, Mercer, Middlesex, Monmouth, Morris, Ocean, Salem, Somerset, Sussex, Union and Warren counties. Note: Previous week's data are from Atlantic, Bergen, Burlington, Camden, Cape May, Essex, Hudson, Hunterdon, Mercer, Middlesex, Monmouth, Morris, Ocean, Salem, Somerset, Sussex, Union and Warren counties.



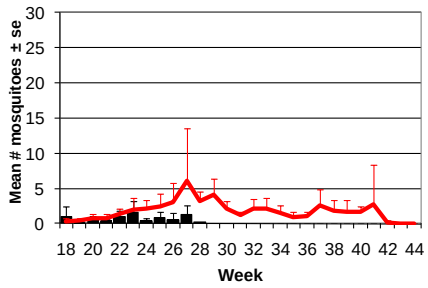
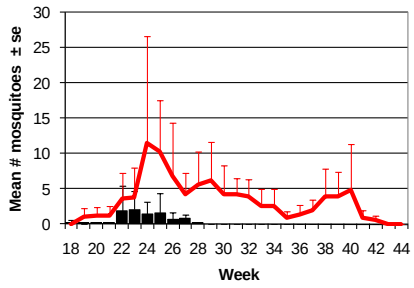
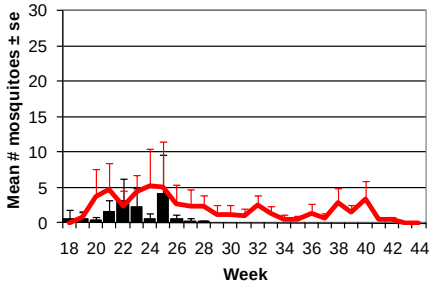
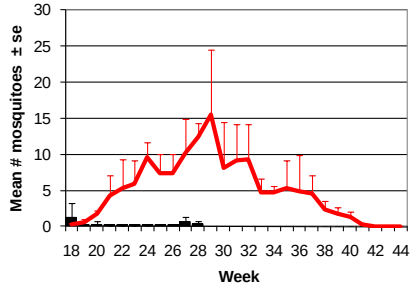
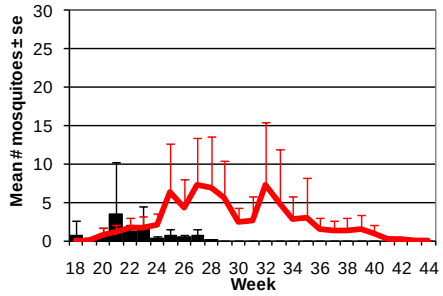
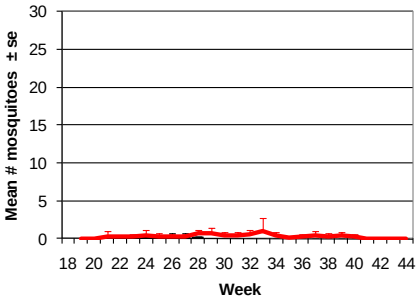
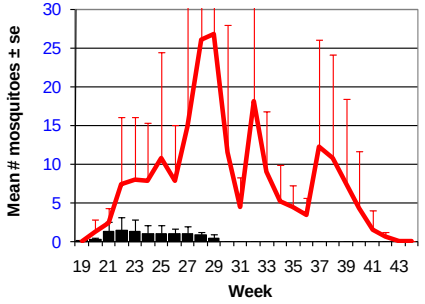
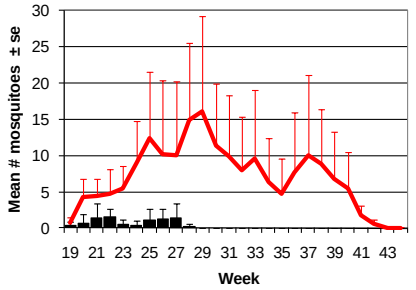
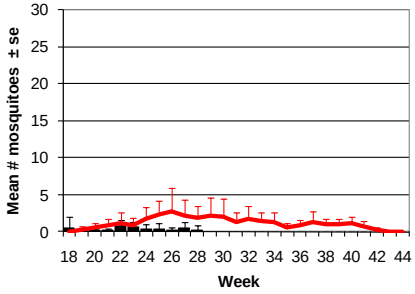
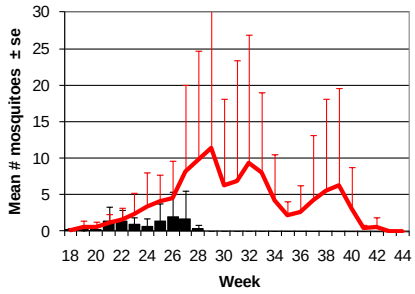
Numbers of Mosquitoes



This graph shows the total numbers of mosquitoes caught in the light traps of this program up to and including Week 28 as well as the total caught for each year from 2003 to 2010. Currently, this year has caught the fewest number of mosquitoes to this week and about 10,000 mosquitoes less than the next fewest number caught (2005). Considering the marked increase in WNV activity this year (see Vector Surveillance reports: http://vectorbio.rutgers.edu/vector.php), as compared to the past few years, smaller numbers of mosquitoes can also pose an arboviral threat when all the players (hosts and vectors) are present in a smaller hyperspace.

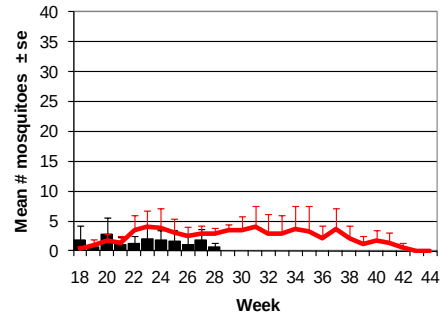
If a regression is created to predict total number of mosquitoes from the numbers at week 28, the line is:
Total number = 0 + 2.233(x),
Where x = number of mosquitoes at week 28, and intercept = 0. Thus, for 40,900 mosquitoes collected so far for this season, we might expect to collect 91,330 mosquitoes by the end of the season. This equation had an adjusted R^2 of 81% and $F=318_{1,6}$, $p<0.0001$).

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

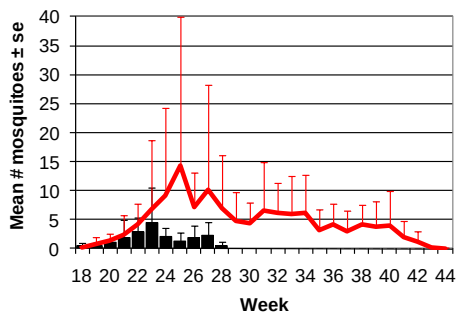
Agricultural	Coastal	Delaware Bayshore	Delaware River Basin
			
New York Metro	**North Central Rural**	**Northwestern Rural**	**Philadelphia Metro**
			
Pinelands	**Suburban Corridor**	**Comments**	
		*Aedes vexans* continue to experience very low numbers this season. Rainfall from last week and into this week should have provided habitat locally for mosquito production. With ample heat, *Ae. vexans* can exploit new habitat quickly. This species is known to transmit dog heartworm (Hendrix et al 1980 Natural transmission of *Dirofilaria immitis* by *Aedes vexans*. American Journal of Veterinary Research 41(8): 1253-1255.	

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

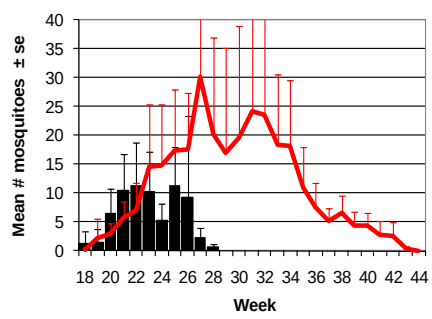
Agricultural



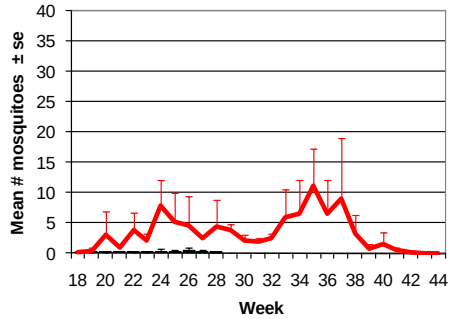
Coastal



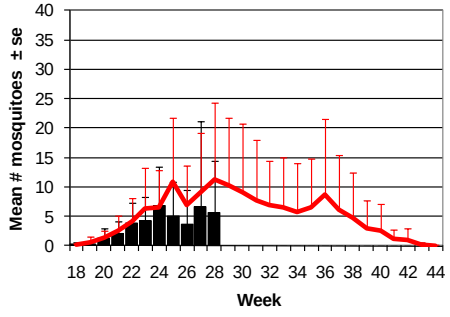
Delaware Bayshore



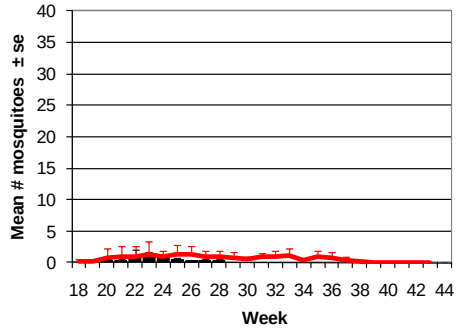
Delaware River Basin



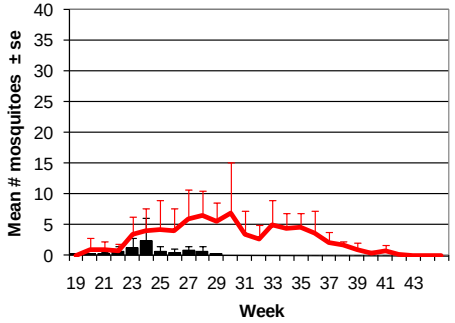
New York Metro



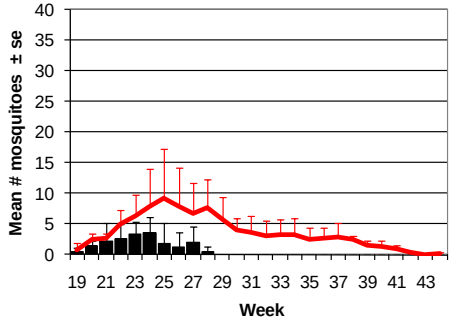
North Central Rural



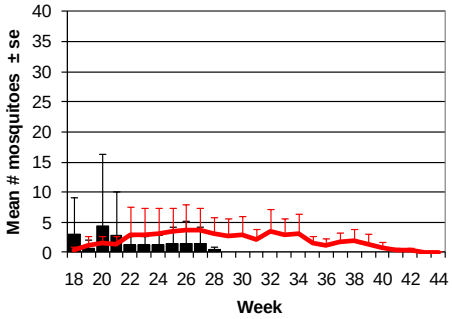
Northwestern Rural



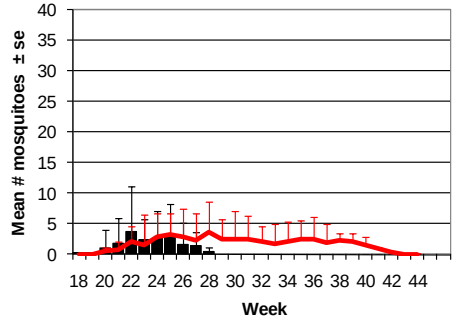
Philadelphia Metro



Pinelands



Suburban Corridor

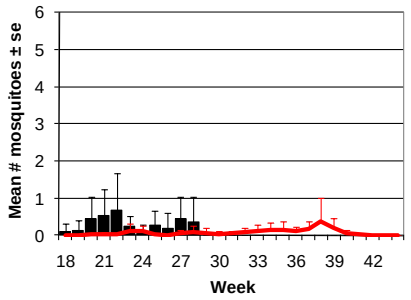
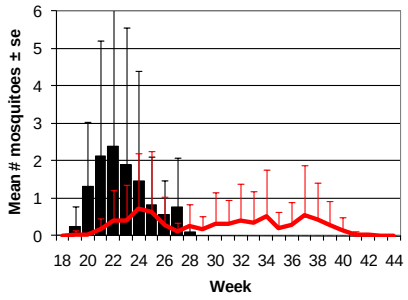
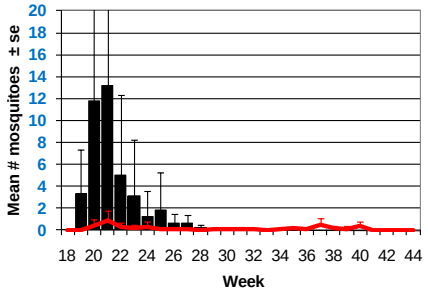
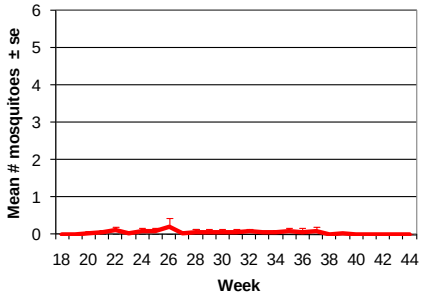
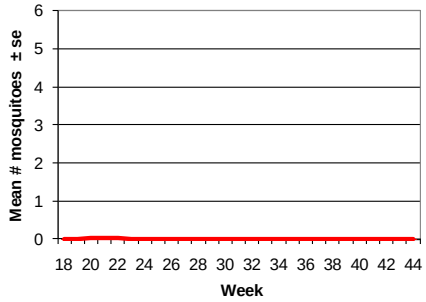
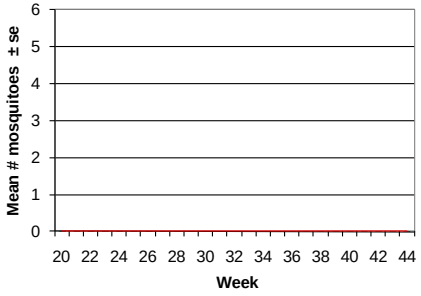
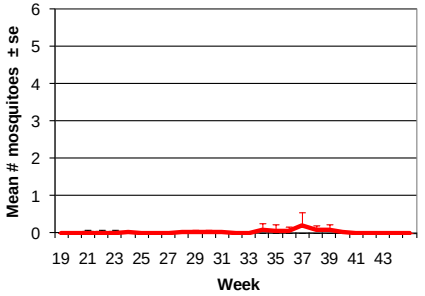
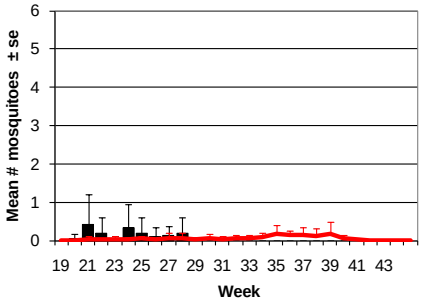
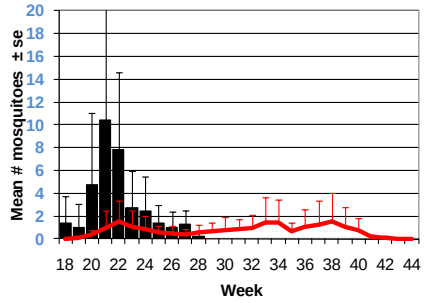
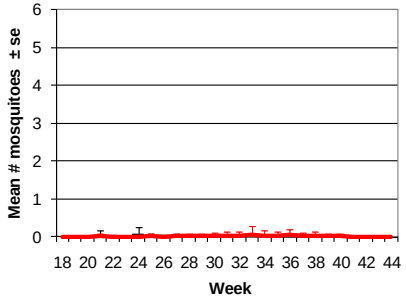


Comments

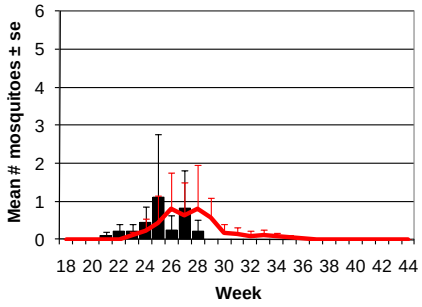
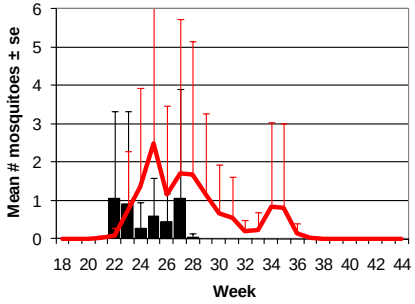
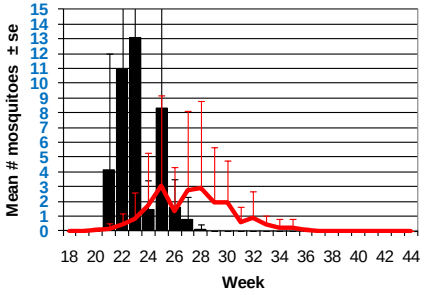
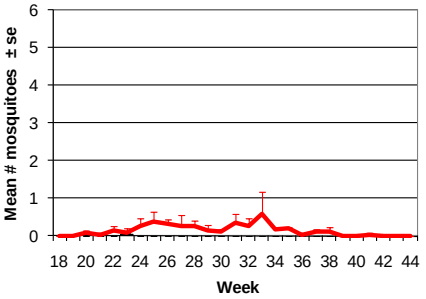
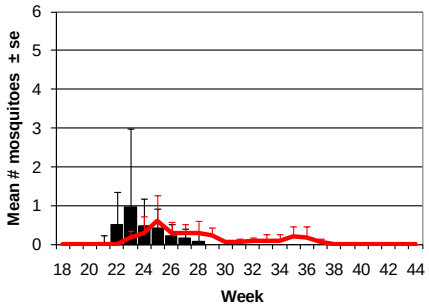
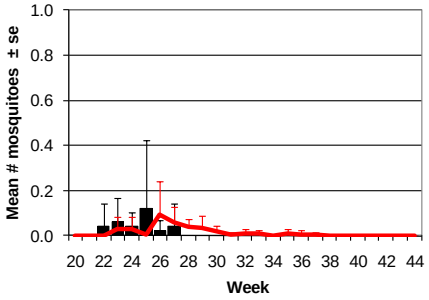
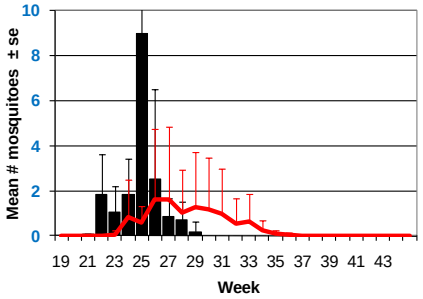
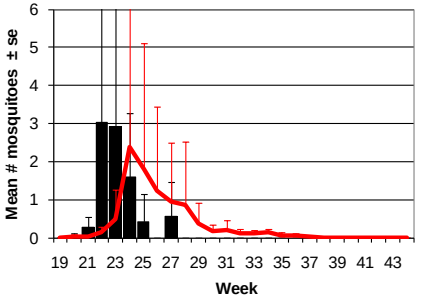
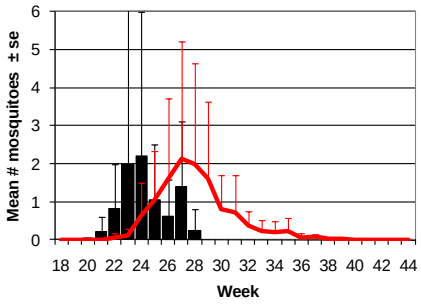
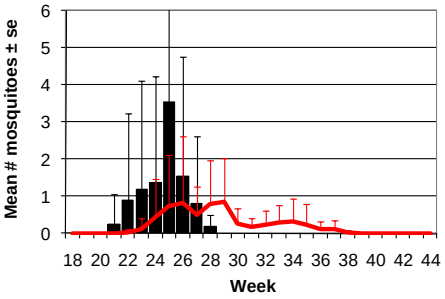
Culex Mix is represented by three species of *Culex* mosquitoes: *Cx. pipiens, Cx. restuans* and *Cx. salinarius*. These mosquitoes are usually grouped together as there is considerable difficulty in separating them to species easily after travelling through the grind of the light trap, often in the company of protesting moths and beetles.

Culex populations continue to show the effects of the extended drought conditions. With the recent rainfall, some habitat is expected to be restored and population may increase. Note that for most regions, however, population trends begin to decrease in general historically within a few weeks.

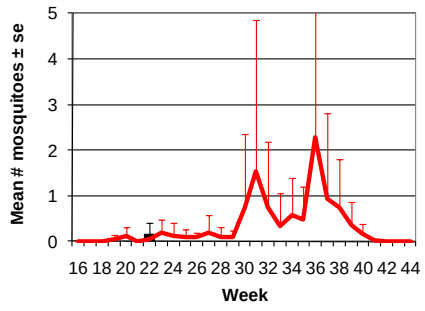
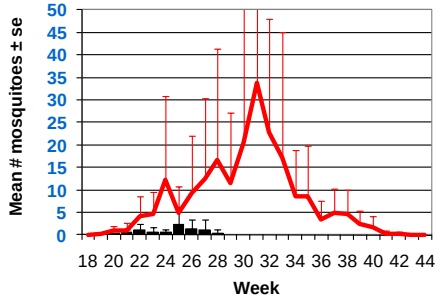
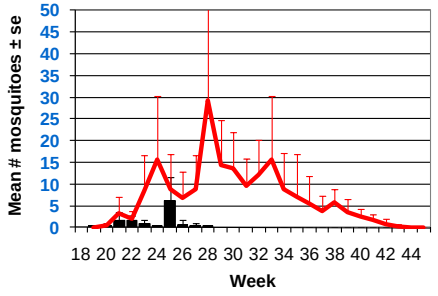
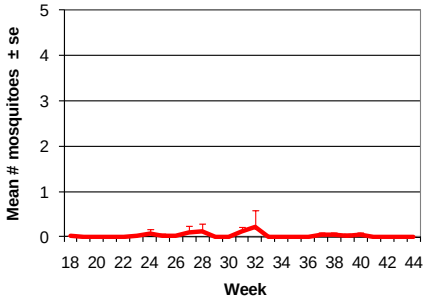
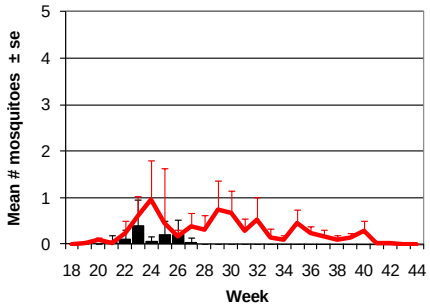
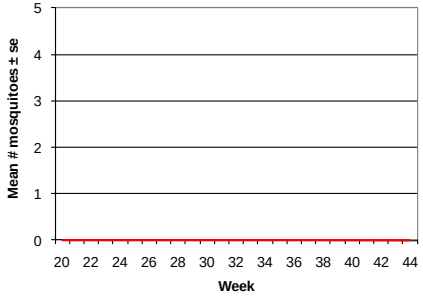
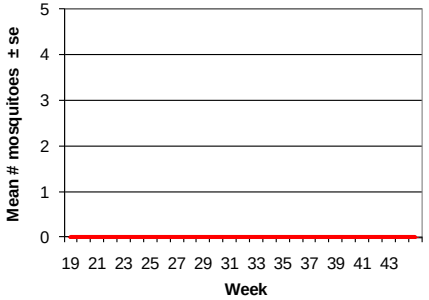
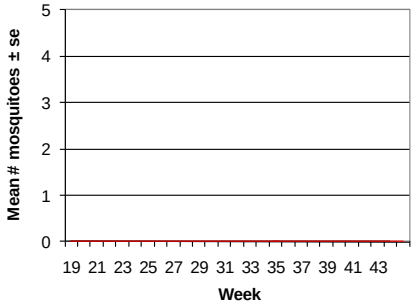
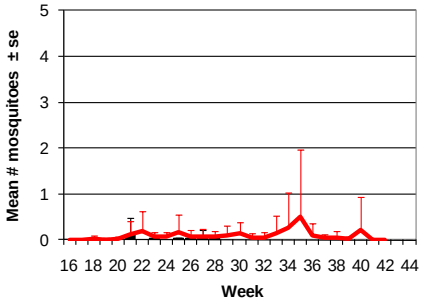
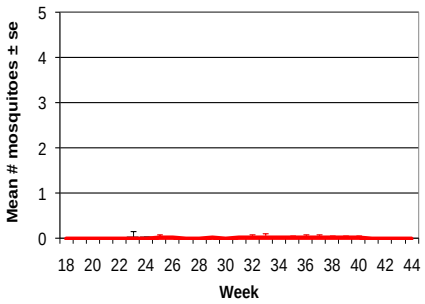
Culiseta melanura – Miscellaneous Group Unique (*Cs. melanura* Type)

Agricultural	Coastal	Delaware Bayshore	Delaware River Basin
			
New York Metro	**North Central Rural**	**Northwestern Rural**	**Philadelphia Metro**
			
Pinelands	**Suburban Corridor**	**Comments**	
		*Culiseta melanura*, the enzootic ornithophilic vector of eastern equine encephalitis, continues to track historic levels in the regions where they are normally found. Eastern equine encephalitis activity has begun in the southern portions of the state, indicating that continued vigilance of this species is required.	

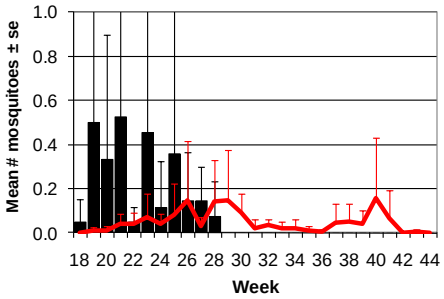
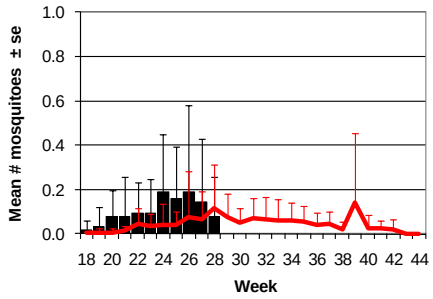
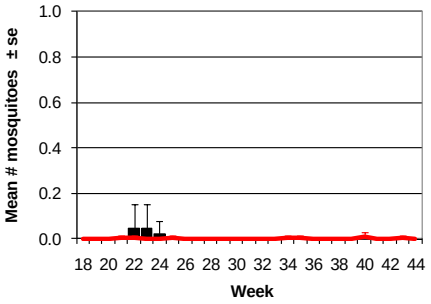
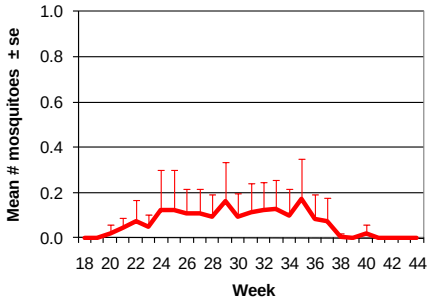
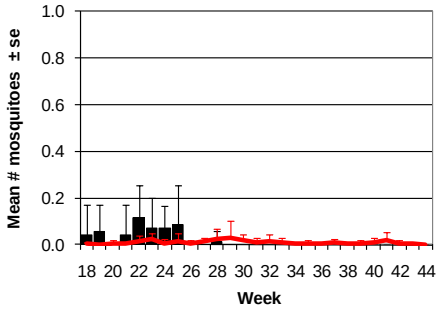
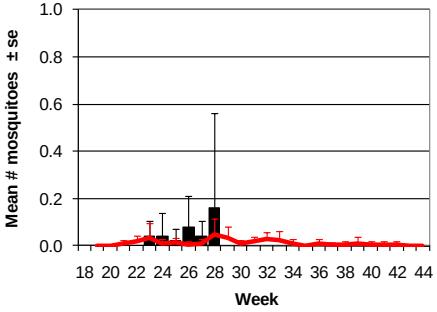
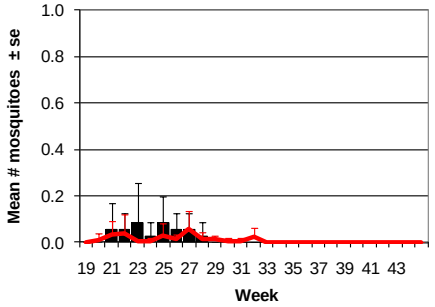
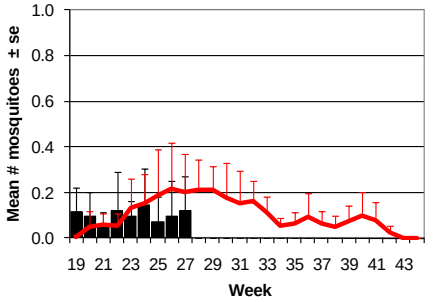
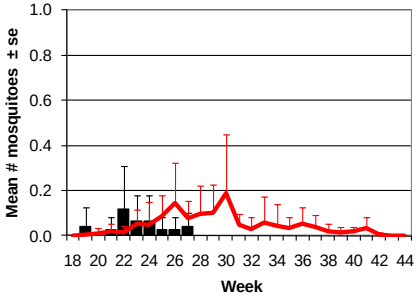
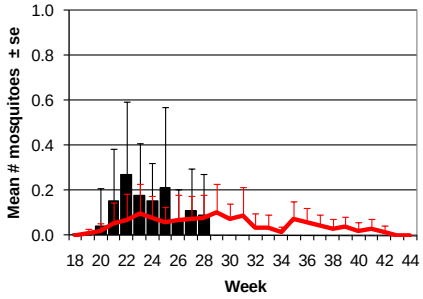
Coquillettidia perturbans – Miscellaneous Group
Monotypic (*Coq. perturbans* Type)

Agricultural	Coastal	Delaware Bayshore	Delaware River Basin
			
New York Metro	**North Central Rural**	**Northwestern Rural**	**Philadelphia Metro**
			
Pinelands	**Suburban Corridor**	**Comments**	
		*Coquillettidia perturbans* populations continue to decrease throughout the state. Given the increased EEE activity and the suspicion that this species may act as an inland bridge vector for EEE, it is hoped that the potential influence of *Coq. perturbans* will have disappeared as increased EEE activity occurs.	

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* population numbers continue to be below recent historical trends at the two regions of highest production, the Coastal and the Delaware Bayshore. In fact, the low levels of *Ae. sollicitans* make it difficult to see clearly defined emerging cohorts. Historic trends will even themselves out as older data is replaced by more recent data as these trends are five-year running means.	

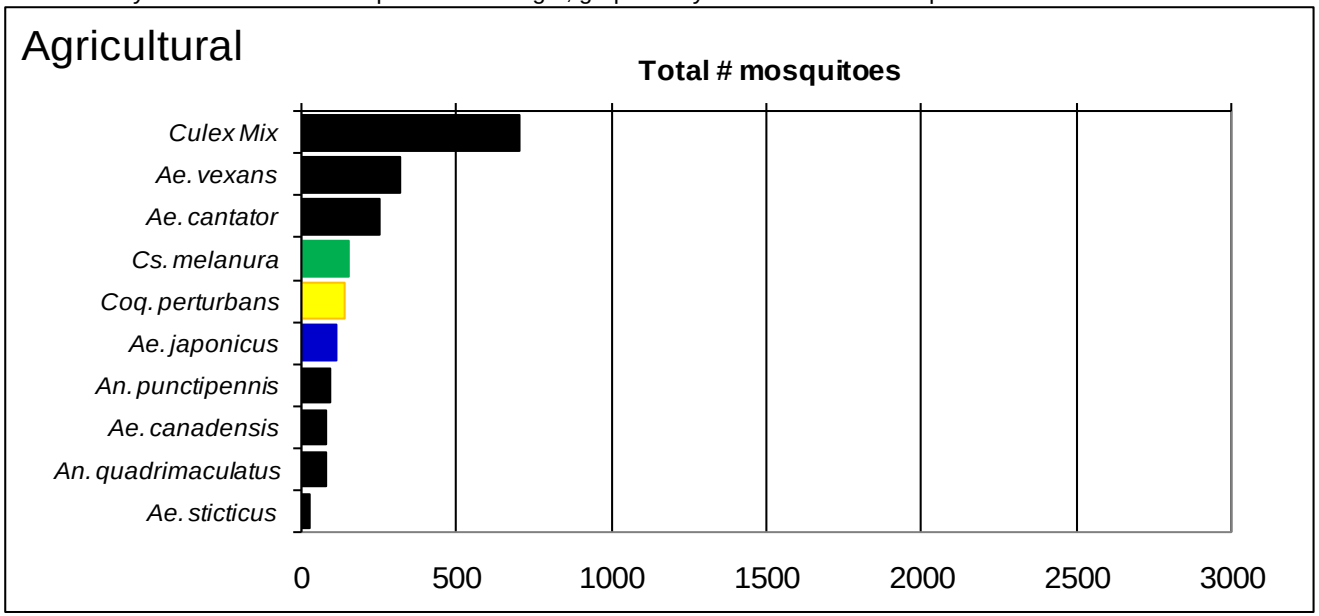
Aedes japonicus – Container Species
Multivoltine Aedine (*Ae. triseriatus* Type)

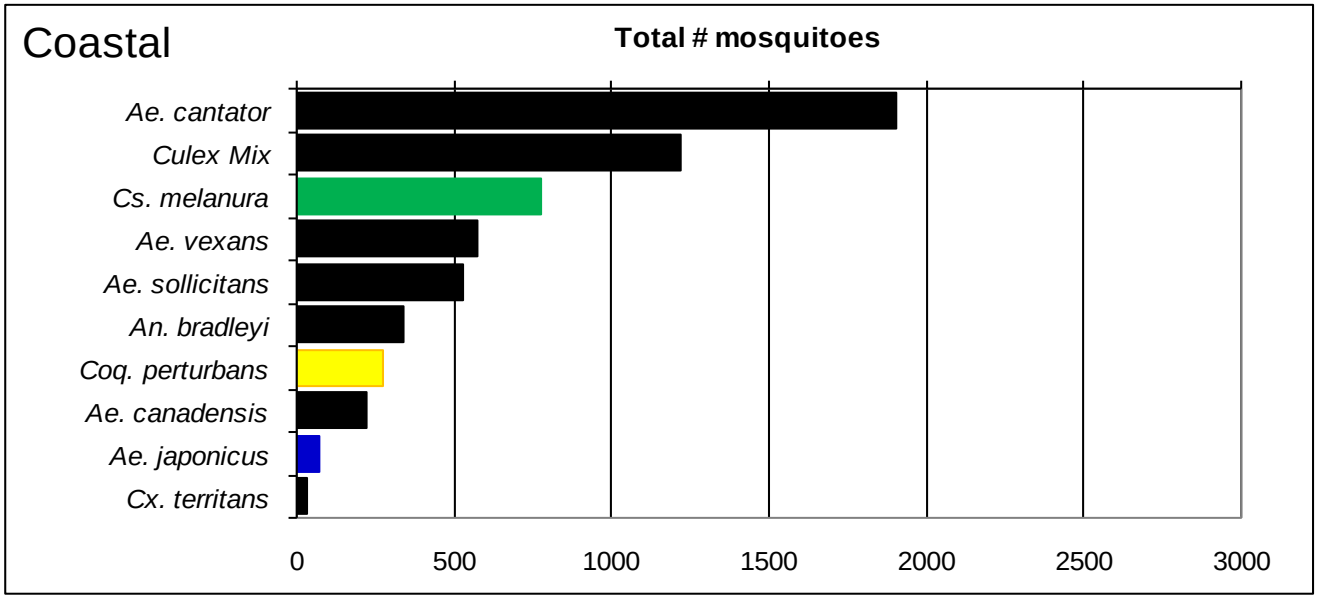
Agricultural	Coastal	Delaware Bayshore	Delaware River Basin
			
New York Metro	**North Central Rural**	**Northwestern Rural**	**Philadelphia Metro**
			
Pinelands	**Suburban Corridor**	**Comments**	
		*Aedes japonicus*, a hardy cold-tolerant species, has shown higher than historical numbers for several regions over several weeks. Populations continue to be around or below historical trends.	

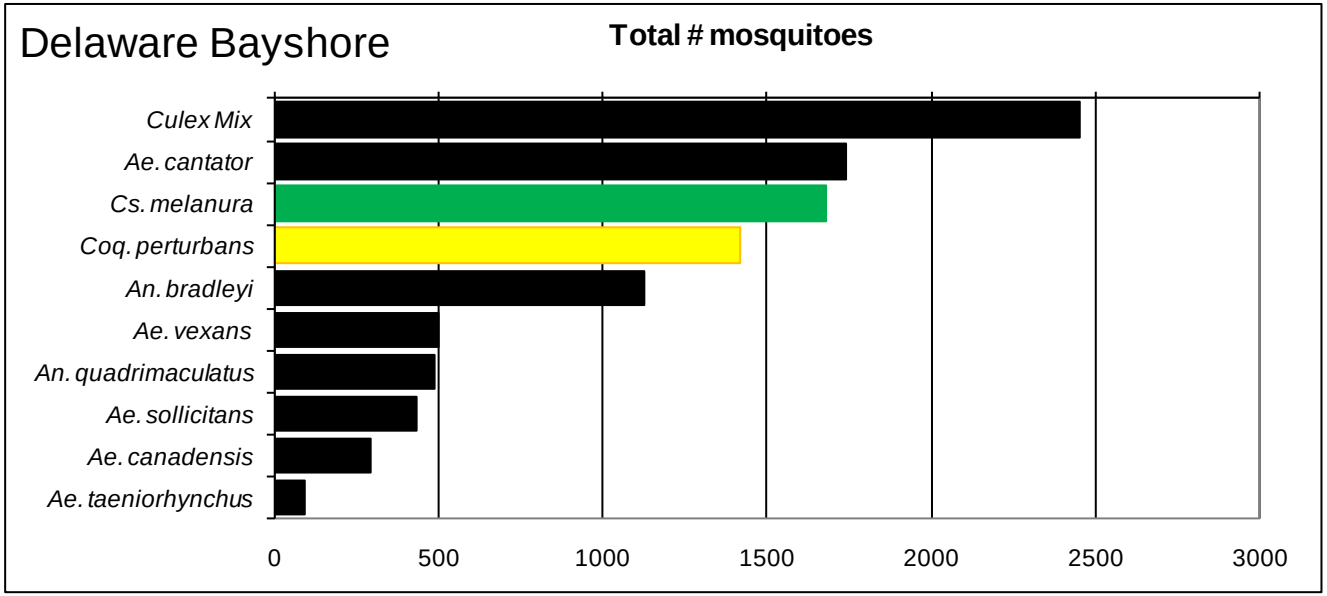
WNV *EEE*

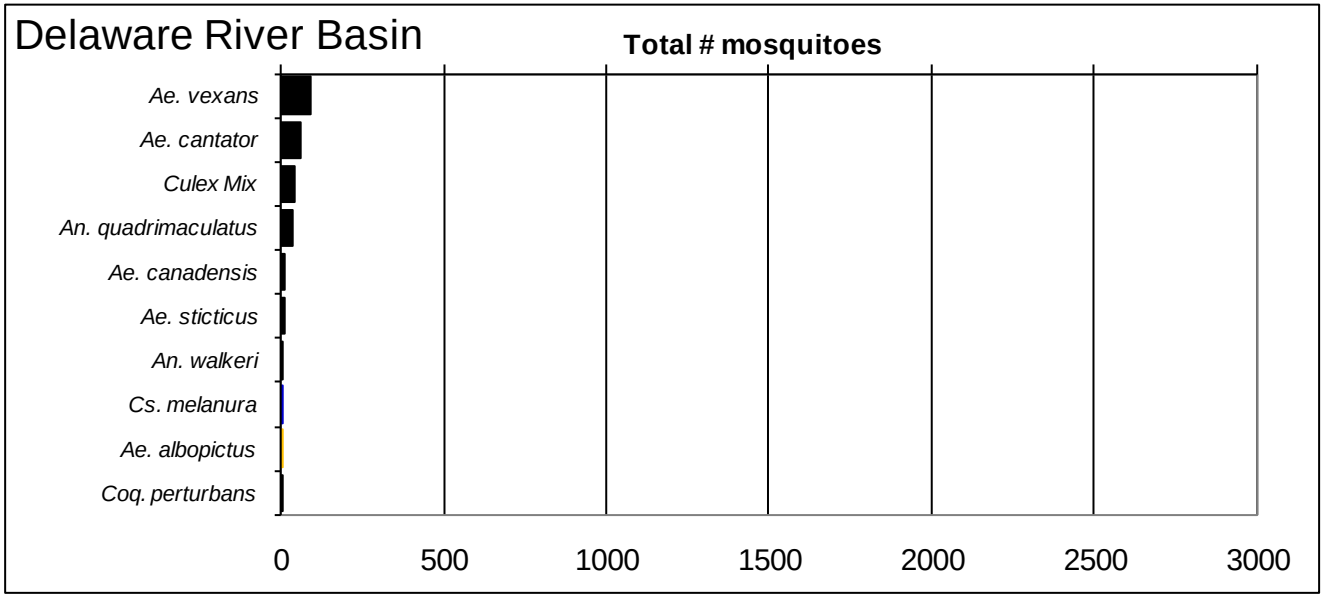
Top Ten Cumulative Mosquito Species/Region - *Ae. albopictus,* *Ae. japonicus (invasives);* *Cs. melanura or Cx. erraticus* *Coq. perturbans*

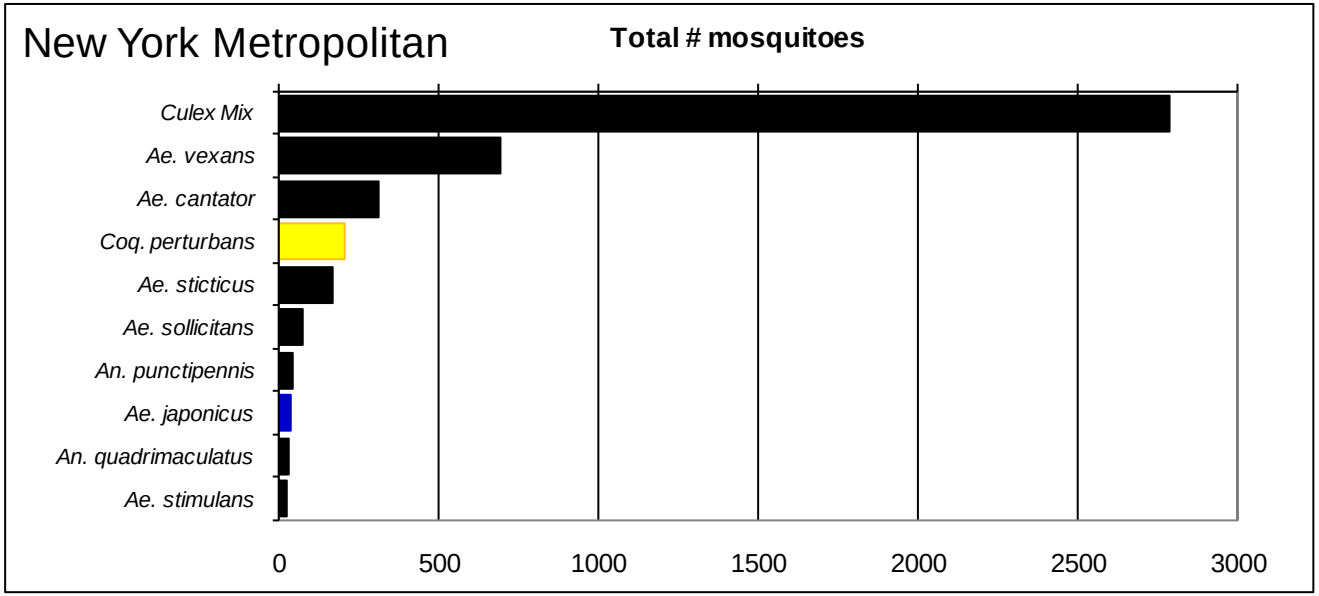
Note: In early season when fewer species are caught, graphs may show less than ten species listed.

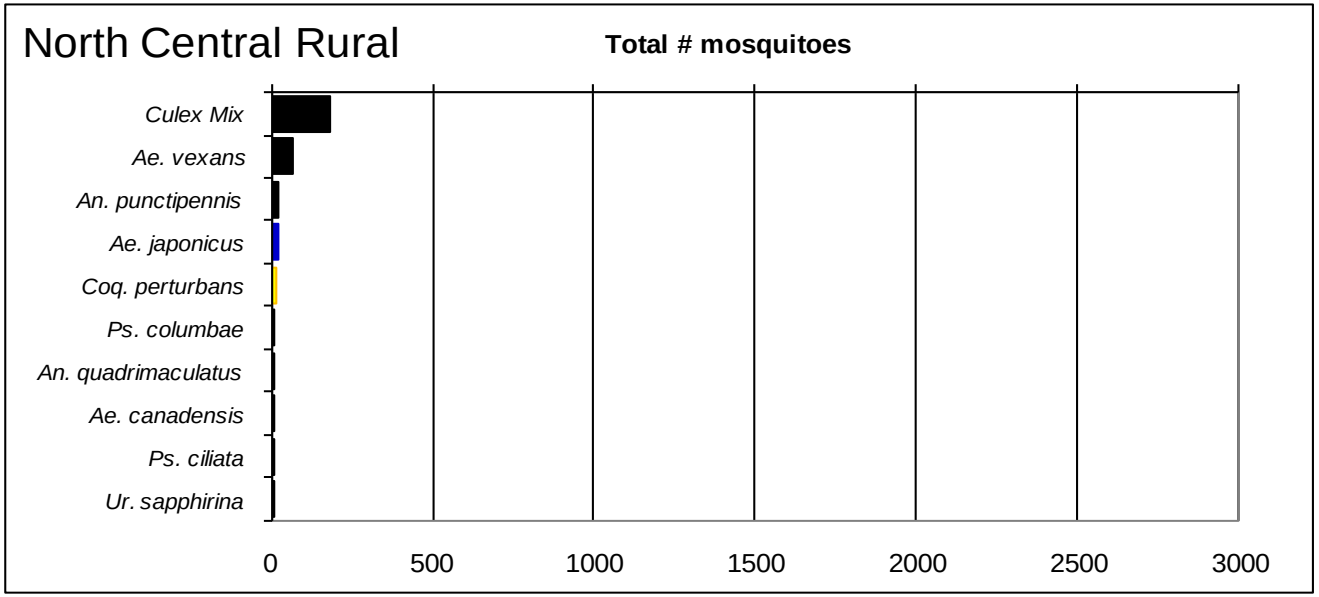


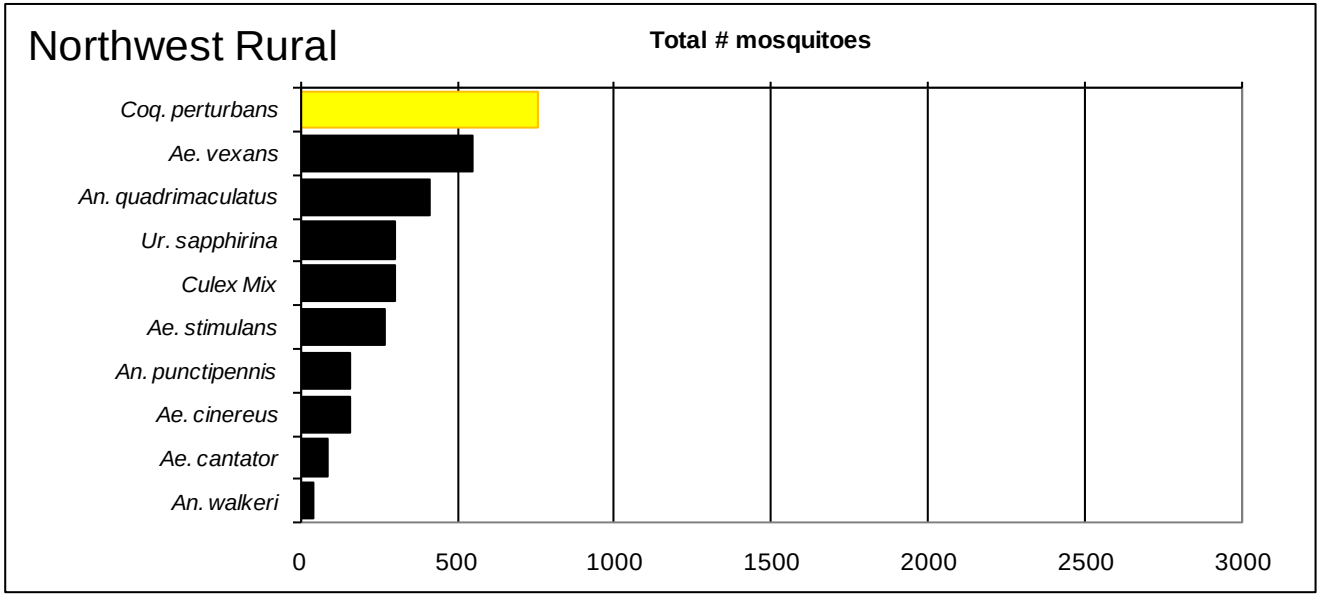


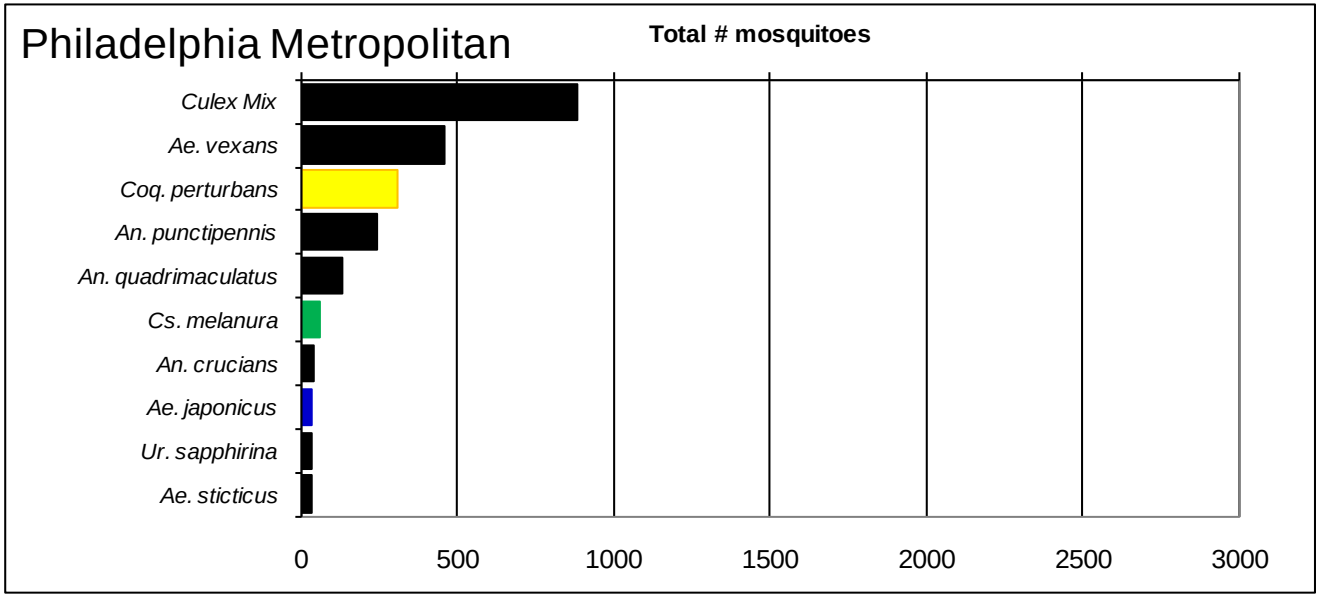

Delaware Bayshore
Total # mosquitoes
Culex Mix
Ae. cantator
Cs. melanura
Coq. perturbans
An. bradleyi
Ae. vexans
An. quadrimaculatus
Ae. sollicitans
Ae. canadensis
Ae. taeniorhynchus
0
500
1000
1500
2000
2500
3000

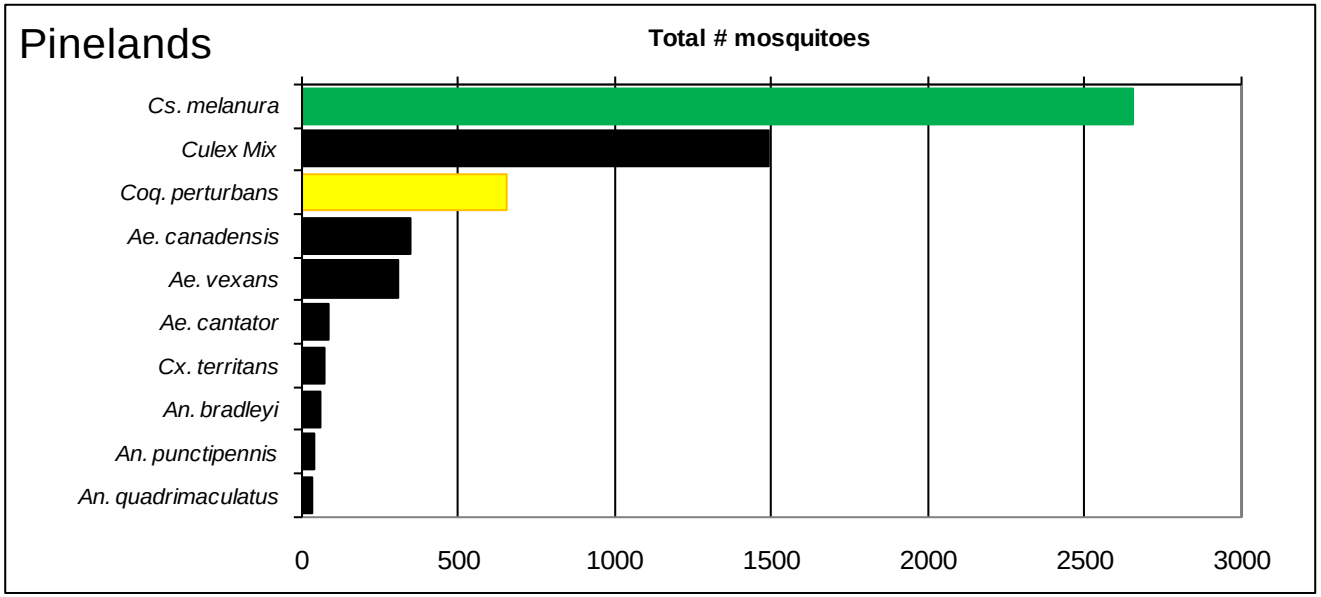

Delaware River Basin
Total # mosquitoes
Ae. vexans
Ae. cantator
Culex Mix
An. quadrimaculatus
Ae. canadensis
Ae. sticticus
An. walkeri
Cs. melanura
Ae. albopictus
Coq. perturbans
0
500
1000
1500
2000
2500
3000

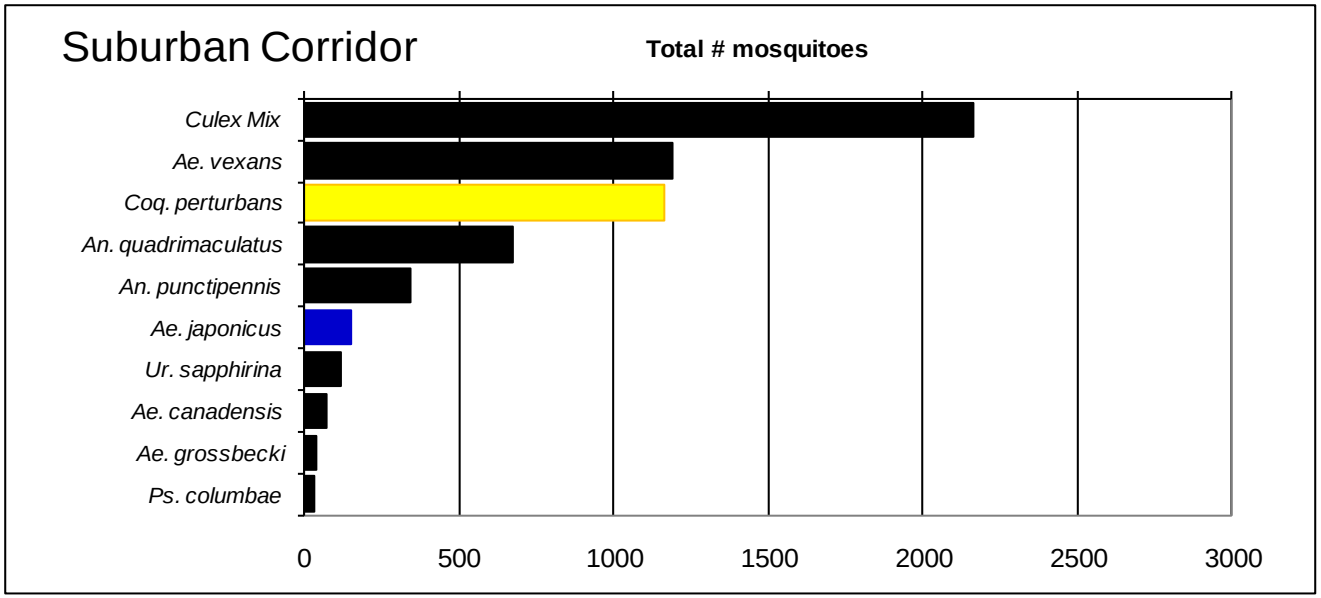

New York Metropolitan
Total # mosquitoes
Culex Mix
Ae. vexans
Ae. cantator
Coq. perturbans
Ae. sticticus
Ae. sollicitans
An. punctipennis
Ae. japonicus
An. quadrimaculatus
Ae. stimulans
0
500
1000
1500
2000
2500
3000


North Central Rural
Total # mosquitoes
Culex Mix
Ae. vexans
An. punctipennis
Ae. japonicus
Coq. perturbans
Ps. columbae
An. quadrimaculatus
Ae. canadensis
Ps. ciliata
Ur. sapphirina
0
500
1000
1500
2000
2500
3000


Northwest Rural
Total # mosquitoes
Coq. perturbans
Ae. vexans
An. quadrimaculatus
Ur. sapphirina
Culex Mix
Ae. stimulans
An. punctipennis
Ae. cinereus
Ae. cantator
An. walkeri
0
500
1000
1500
2000
2500
3000


Philadelphia Metropolitan
Total # mosquitoes
Culex Mix
Ae. vexans
Coq. perturbans
An. punctipennis
An. quadrimaculatus
Cs. melanura
An. crucians
Ae. japonicus
Ur. sapphirina
Ae. sticticus
0
500
1000
1500
2000
2500
3000


Pinelands
Total # mosquitoes
Cs. melanura
Culex Mix
Coq. perturbans
Ae. canadensis
Ae. vexans
Ae. cantator
Cx. territans
An. bradleyi
An. punctipennis
An. quadrimaculatus
0
500
1000
1500
2000
2500
3000


Suburban Corridor
Total # mosquitoes
Culex Mix
Ae. vexans
Coq. perturbans
An. quadrimaculatus
An. punctipennis
Ae. japonicus
Ur. sapphirina
Ae. canadensis
Ae. grossbecki
Ps. columbae
0
500
1000
1500
2000
2500
3000