meeting

RUTGERS New Jersey Agricultural Experiment Station

NEW JERSEY ADULT MOSQUITO SURVEILLANCE

Report for 8 June to 14 June 2008, CDC Week 24

Prepared by Lisa M. Reed, Scott Crans and Dina Fonseca
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.

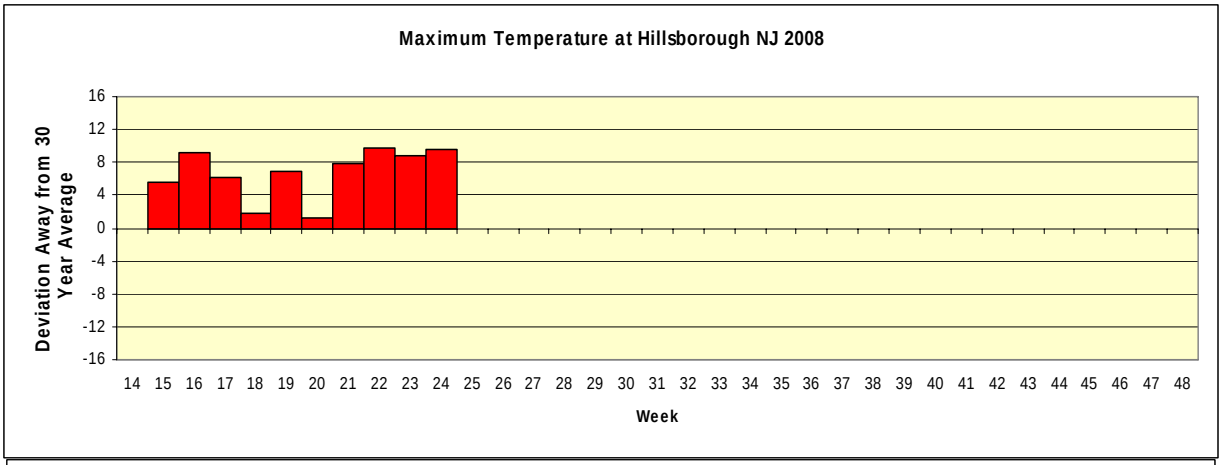
Summary table – Week 24

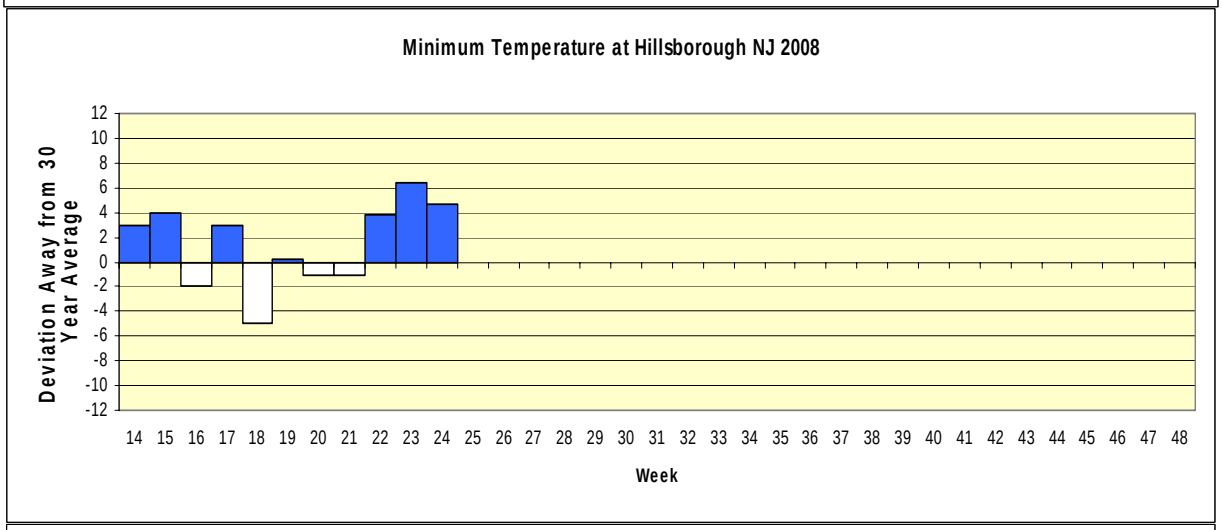
	Aedes vexans			*Culex* Mix			*Coquillettidia perturbans*			*Aedes sollicitans*		
Region	This Week	Average*	Increase	This Week	Average*	Increase	This Week	Average*	Increase	This Week	Average*	Increase
Agricultural	0.63	3.06	0	0.69	4.73	0	0.00	0.28	0	0.00	0.28	0
Coastal	18.03	3.09	4	1.43	4.16	0	0.00	1.82	0	5.48	8.83	0
Delaware Bayshore	0.00	3.52	0	0.00	19.21	0	0.00	3.79	0	0.00	4.39	0
Delaware River Basin	0.00	12.11	0	0.00	13.09	0	0.00	0.41	0	0.00	0.20	0
New York Metro	1.17	1.13	1	0.54	5.94	0	0.00	0.17	0	0.71	0.87	0
North Central Rural	1.90	0.21	4	4.71	1.02	4	0.00	0.00	0	0.00	0.00	0
Northwest Rural	7.66	4.10	2	0.97	2.45	0	0.00	<0.01	0	0.00	0.00	0
Philadelphia Metro	13.98	7.76	2	8.19	7.59	1	2.06	0.09	4	0.00	0.00	0
Pinelands	2.26	2.48	0	4.42	2.82	2	0.78	1.28	0	0.08	0.17	0
Suburban Corridor	6.96	3.61	2	3.35	2.37	1	0.12	0.02	4	0.00	0.00	0

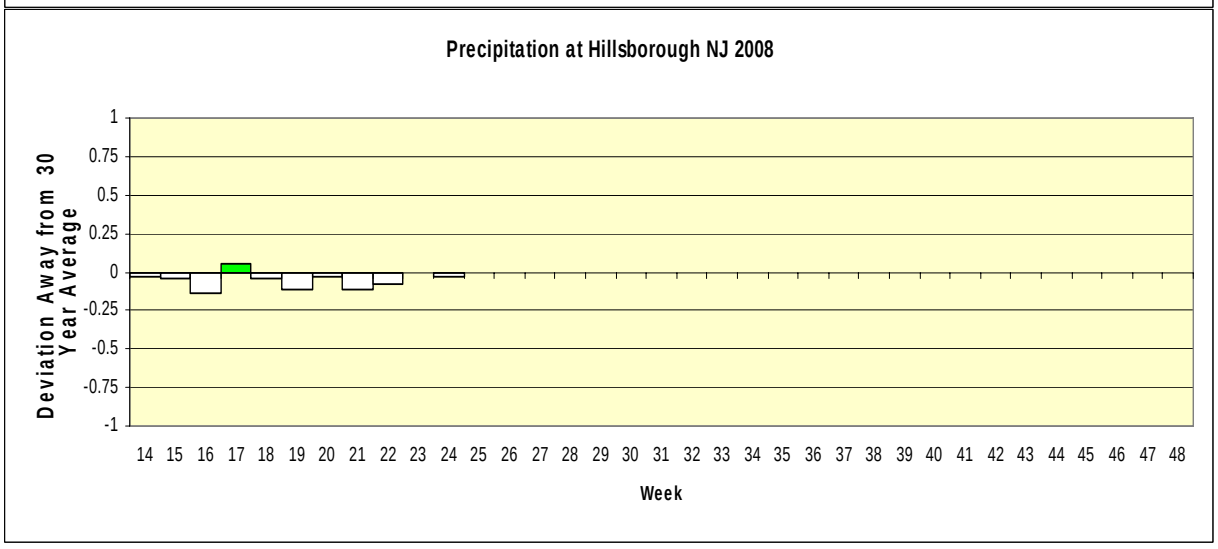
Averages represent data from, at most, the previous 5 years. Increase is a scale of current values from historical values where no difference or a decrease is represented by 0 (blue), up to 50% greater difference by 1 (green), up to 100% greater difference by 2 (yellow), up to 150% greater difference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

State Summary: Both *Aedes vexans* and the *Culex* mixed species group continue to show population increases from the previous week in areas along the coast and in urban and suburban areas as well as the North Central region. *Coquillettidia perturbans* has shown a remarkable increase in the Philadelphia Metro region and in the Suburban Corridor.

Climate Deviations

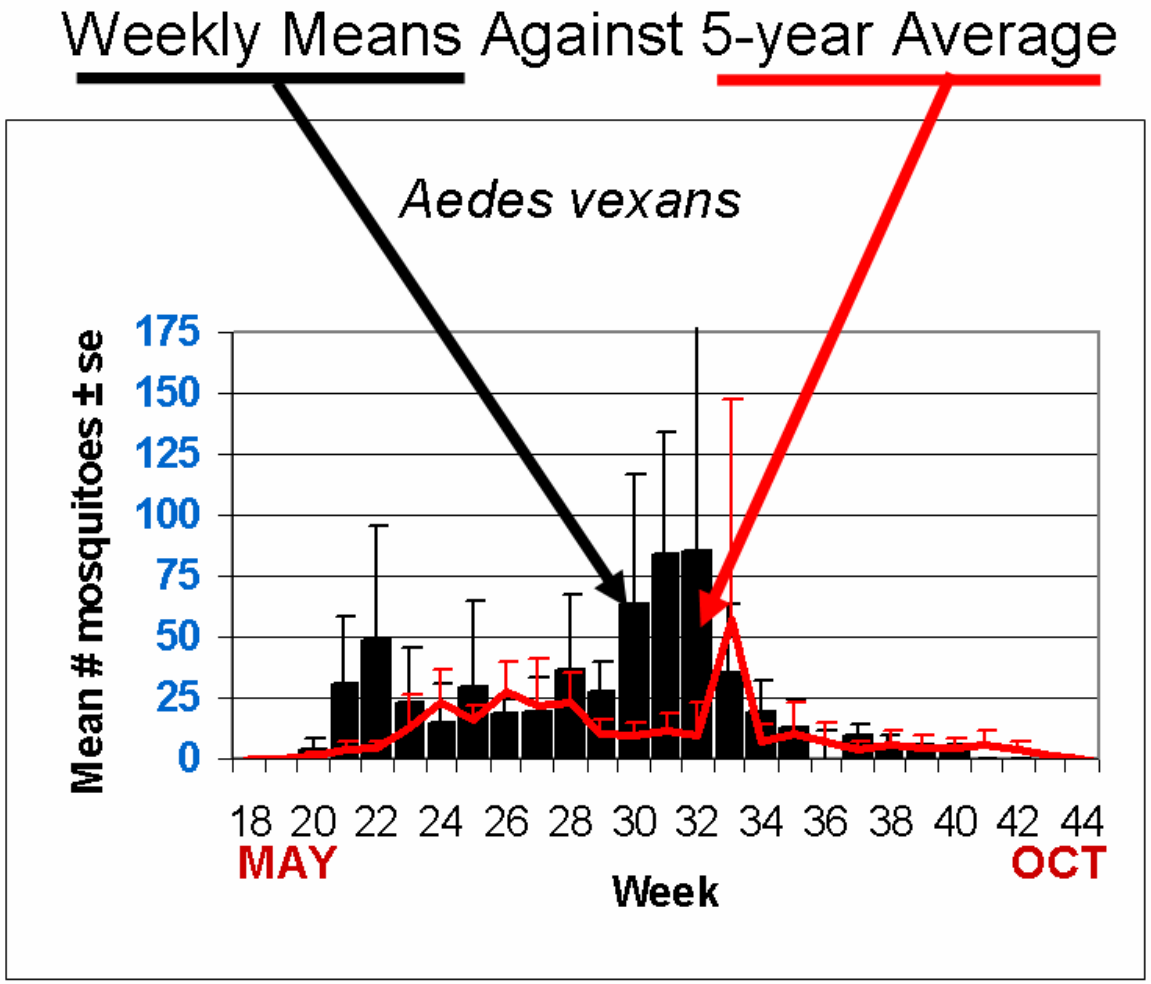




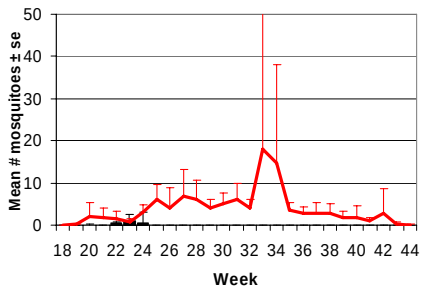
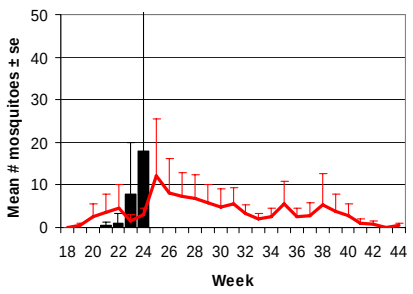
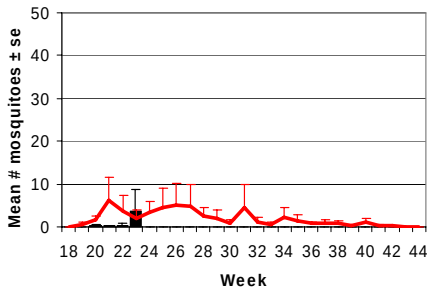
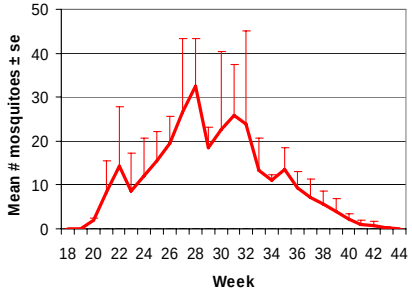
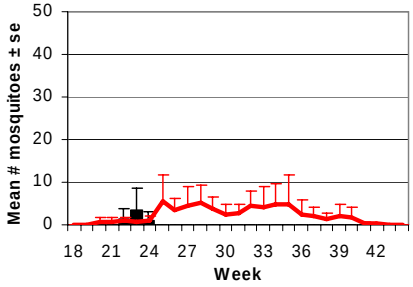
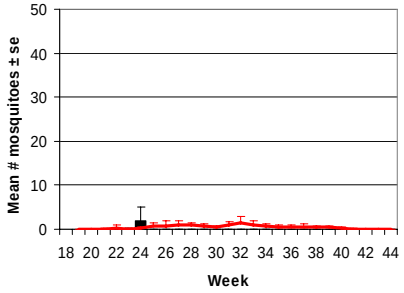
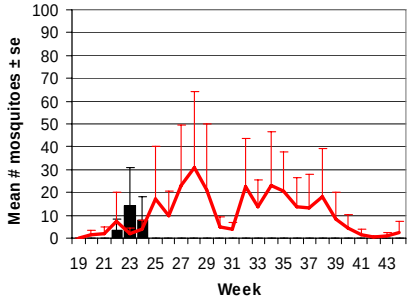
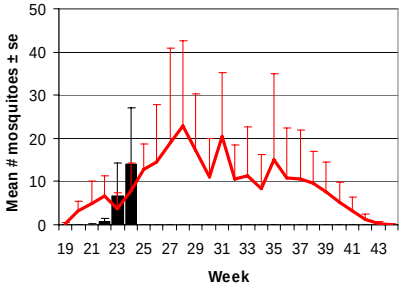
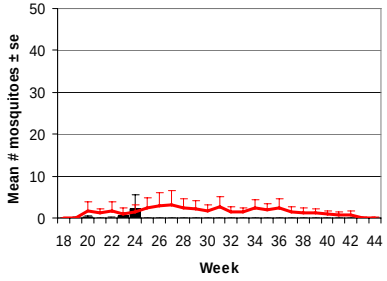
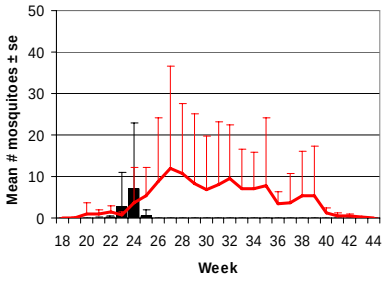


The figures show the average maximum temperature, minimum temperature and precipitation deviations from 30 year averages. Current data is from the Hillsborough NJ weather station (a station close to central NJ which recorded all three parameters and was available online at the NJ state climatologist) while historical data was from the New Brunswick weather station. Color bars above the zero line indicate warmer maximum or minimum temperatures and wetter conditions while white bars indicate cooler temperatures and dryer conditions.

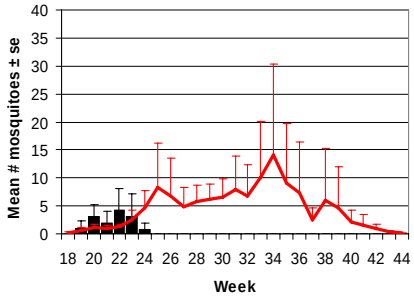
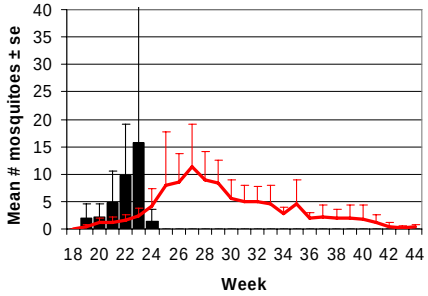
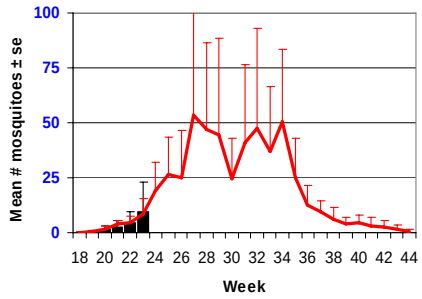
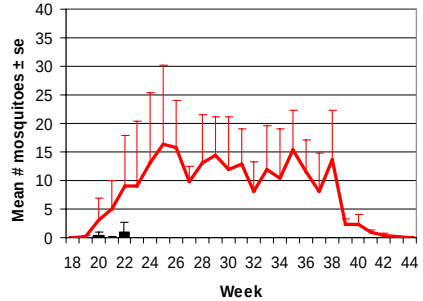
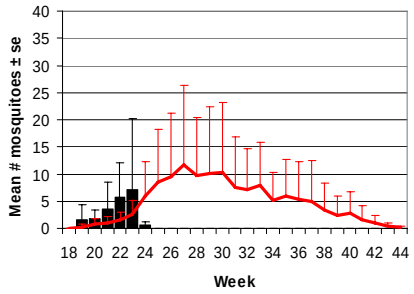
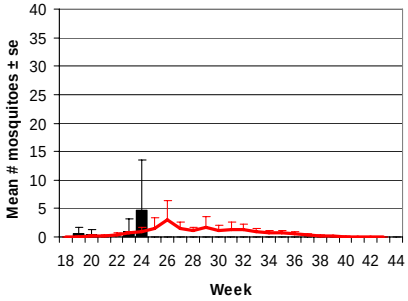
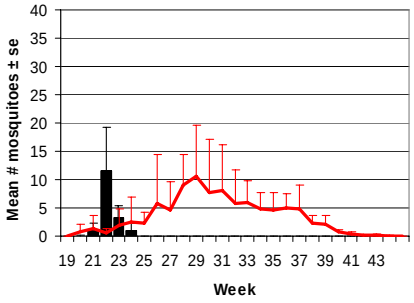
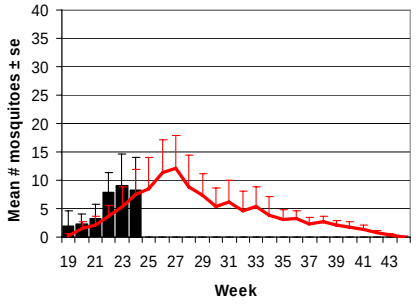
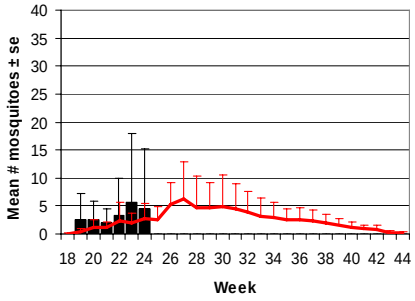
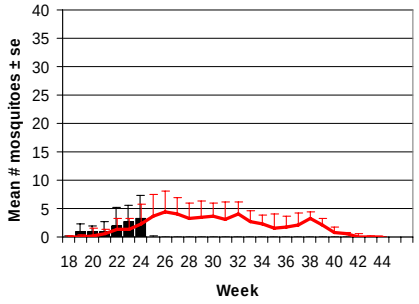
The Species Graphs: The species graph pages include a graph with two plots for each of the ten regions defined on the first page (Agricultural, Coastal, Delaware Bayshore, Delaware River, New York Metro, North-Central, Northwestern, Philadelphia Metro, Pinelands, and Suburban Corridor). Below is an example 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 Week 23 are from Atlantic, Bergen, Burlington, Camden, Essex, Hunterdon, Mercer, Monmouth, Ocean, Passaic, Somerset, and Warren counties. Note: County data is sent in at a variety of times throughout the week.



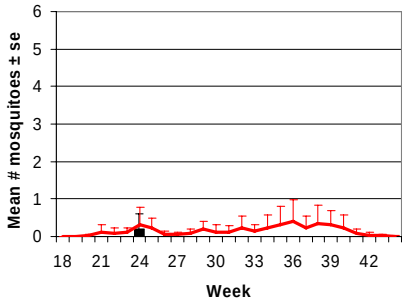
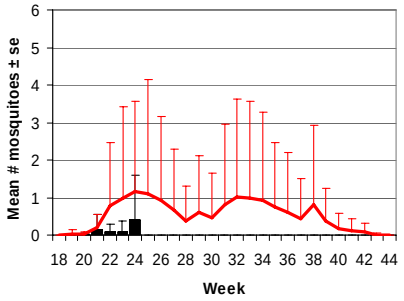
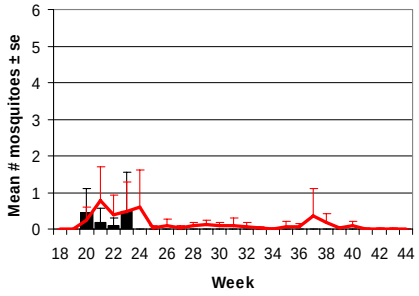
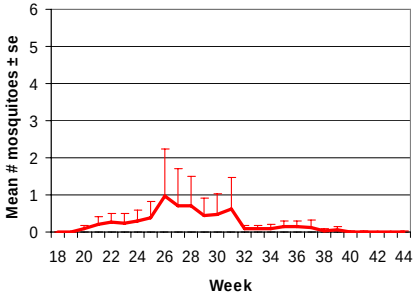
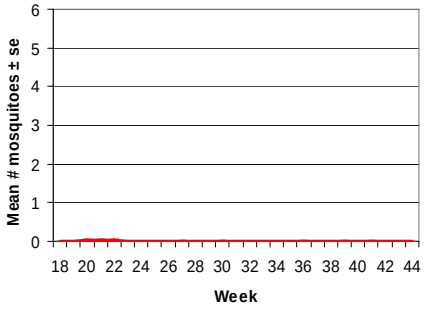
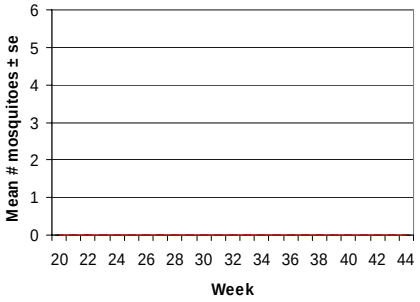
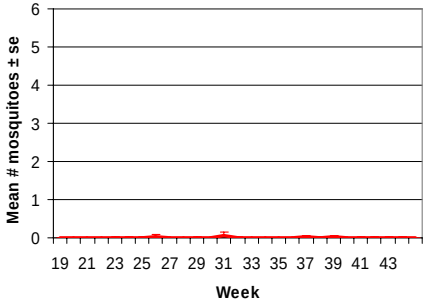
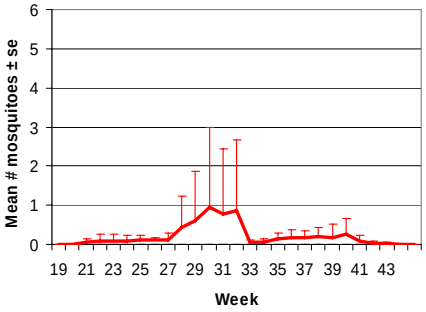
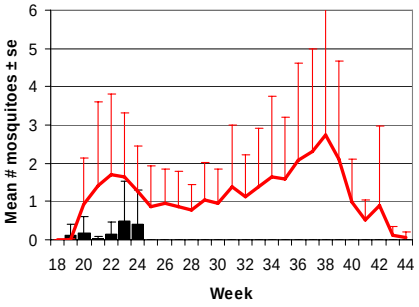
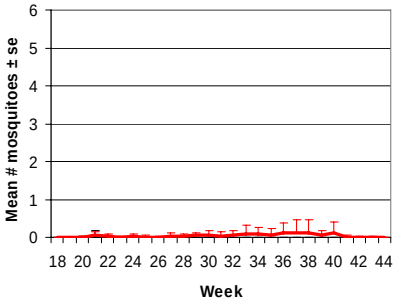
Aedes vexans - Fresh Floodwater Species
Multivoltine Aedine (*Ae. vexans* Type)

Agricultural	Coastal	Delaware Bayshore	Delaware River Basin
			
New York Metro	**North Central Rural**	**Northwestern Rural**	**Philadelphia Metro**
			
Pinelands	**Suburban Corridor**	**Comments**	
		*Aedes vexans* populations are significantly higher than historical trends in the Coastal and the Northwestern Rural regions. The Philadelphia Metro region is also producing populations in abundance. Other regions are not reporting such large numbers and this disparate data points to the differences in habitat availability. Rainfall is often distributed unevenly throughout the state. External sources, such as stream runoff, can create a habitat even when rain does not fall in the vicinity (e.g., the Northwestern Rural's confluence of three streams). While water is important in the hatching of this species, a drying period is critical for successful egg development to proceed. This species is a host for the dog heartworm filarial, *Dirofilaria immitis.*	

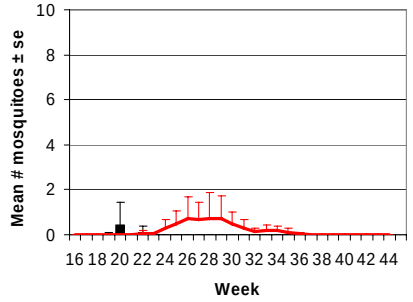
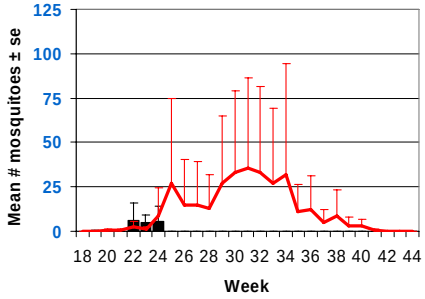
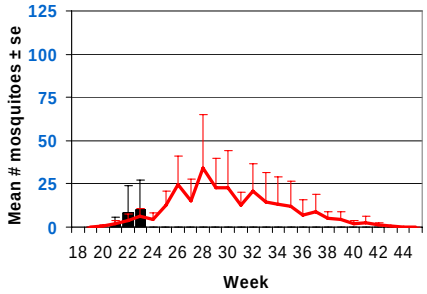
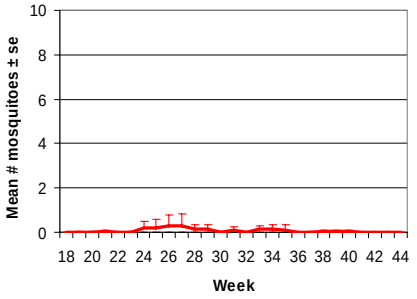
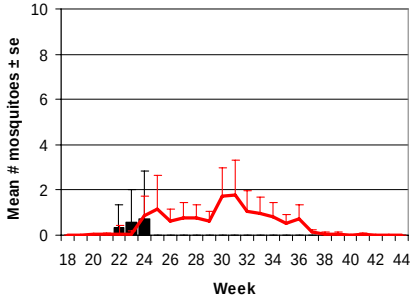
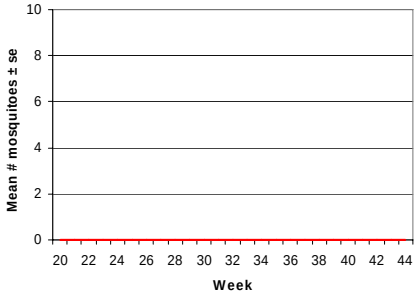
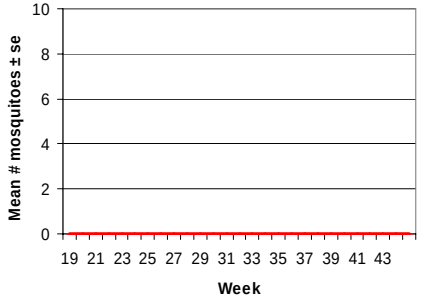
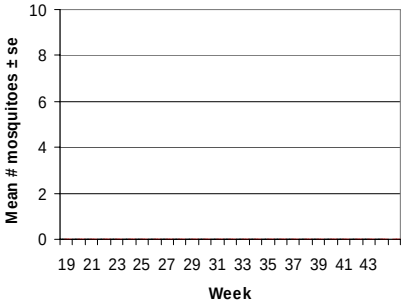
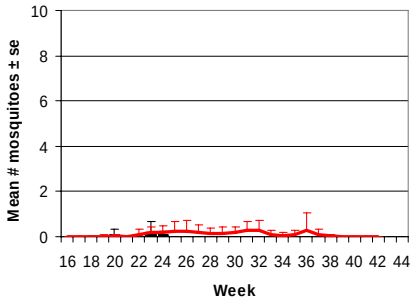
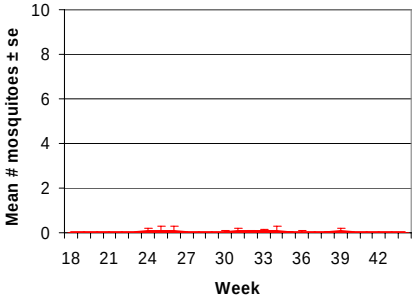
Culex Mix – Permanent Water Species
Multivoltine *Culex*/*Anopheles* (*Cx. pipiens* Type)

Agricultural	Coastal	Delaware Bayshore	Delaware River Basin
			
New York Metro	**North Central Rural**	**Northwestern Rural**	**Philadelphia Metro**
			
Pinelands	**Suburban Corridor**	**Comments**	
		*Culex* (*Cx. pipiens, restuans,* and *salinarius*) populations have exploded in the Coastal region during the previous week with values well above historical trends. Most regions show population abundances around historical values except for the Delaware River Basin, where populations are very low. *Culex* species provide both the enzootic (*Cx. pipiens* and *Cx. restuans*) vectors and a likely epizootic (*Cx. salinarius*) vector, with the first two as significant bird feeders and the latter as an opportunistic feeder. Large populations of these species should raise concerns about a potential for WNV amplification. *Cx. pipiens* is also involved in the transmission of the urban St. Louis encephalitis.	

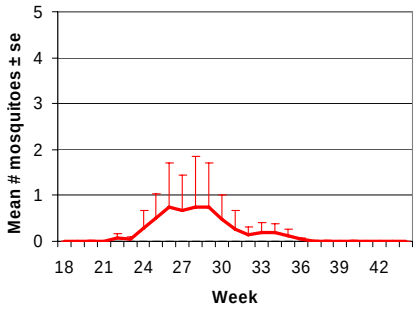
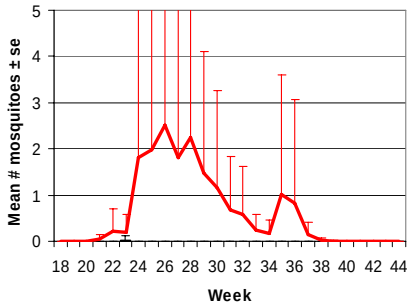
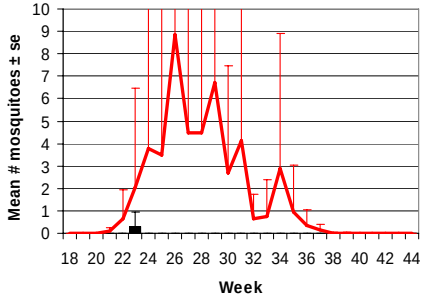
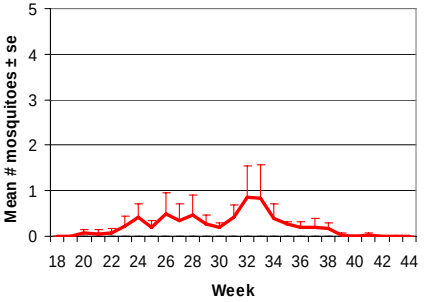
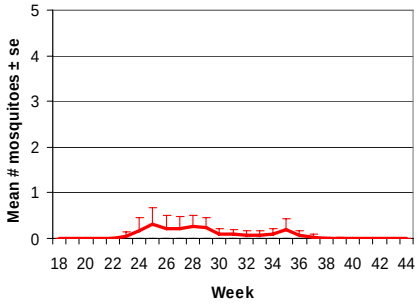
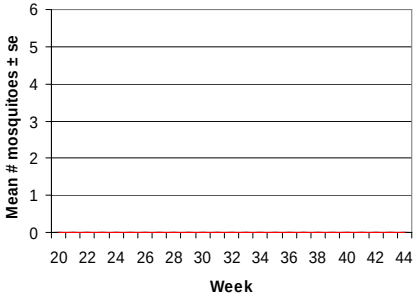
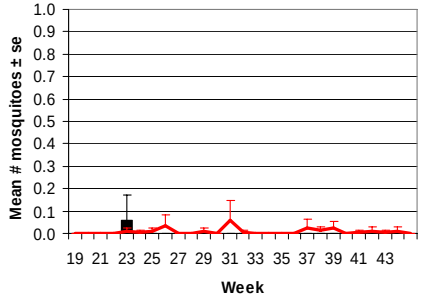
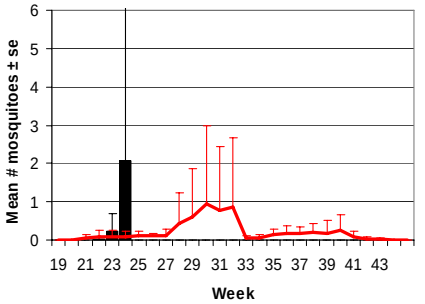
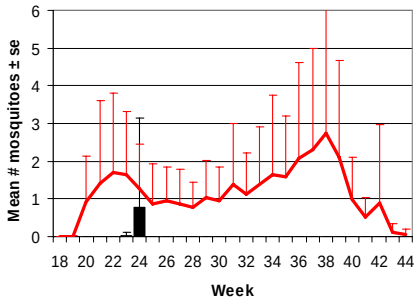
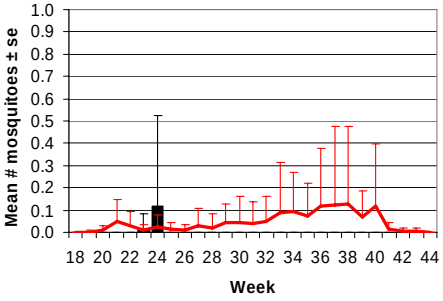
Culiseta melanura – Miscellaneous Group Unique (*Cs. melanura* Type)

Agricultural	Coastal	Delaware Bayshore	Delaware River Basin
			
New York Metro	**North Central Rural**	**Northwestern Rural**	**Philadelphia Metro**
			
Pinelands	**Suburban Corridor**	**Comments**	
		*Culiseta melanura* populations have appeared in the Agricultural, Coastal, Delaware Bayshore and the Pinelands regions; although their numbers are generally lower than expected from historical values. This has been similarly noted in the resting box number from the Vector Surveillance program. In the past, positive mosquito pools have been found in monitoring sites with low population values.	

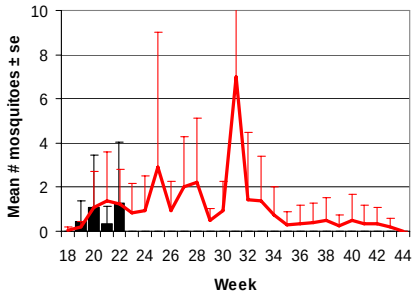
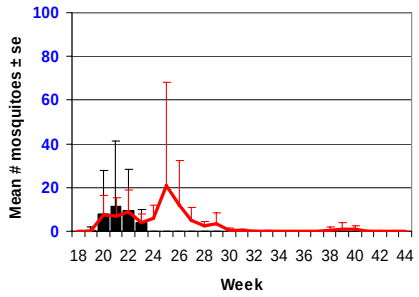
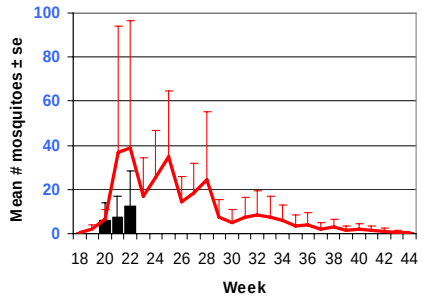
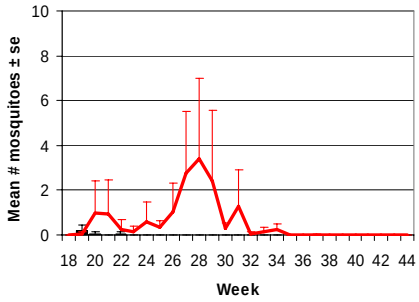
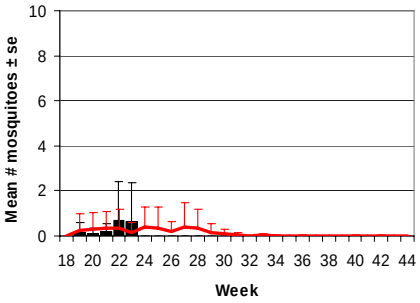
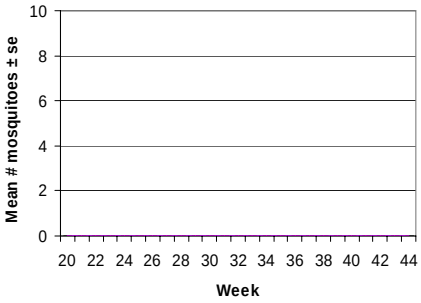
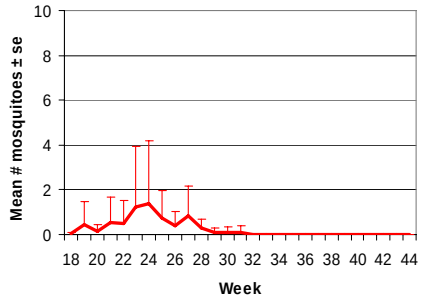
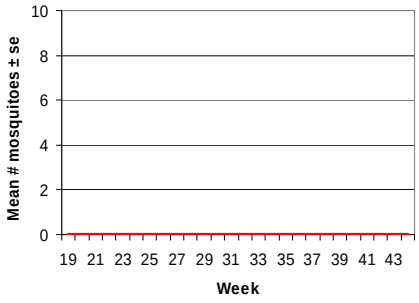
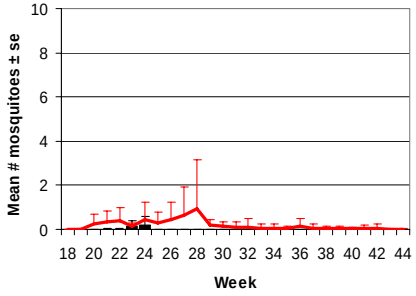
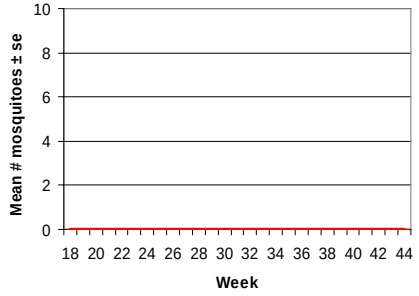
Aedes sollicitans - Salt Floodwater Species
Multivoltine Aedine (*Ae. sollicitans* Type)

Agricultural	Coastal	Delaware Bayshore	Delaware River Basin
			
New York Metro	**North Central Rural**	**Northwestern Rural**	**Philadelphia Metro**
			
Pinelands	**Suburban Corridor**	**Comments**	
		*Aedes sollicitans* population peaks will begin to build on each other as subsequent flooding events by tidal action and rainfall contribute to the emergence of this species. Apart from an early appearance in the Agricultural region (as explained by the nearby coast to the most southerly trap site), population abundances are similar to historical values. The next full moon event is June 18th. We thus would expect lower values this week (the 25th week of this report) with increasing populations occurring after the following week. This species is suspected of being involved in coastal cases of eastern equine encephalitis among humans (Crans, 1977 The status of *Aedes sollicitans* as an epidemic vector of eastern equine encephalitis in New Jersey, Mosq. News, 37(1): 85-89.	

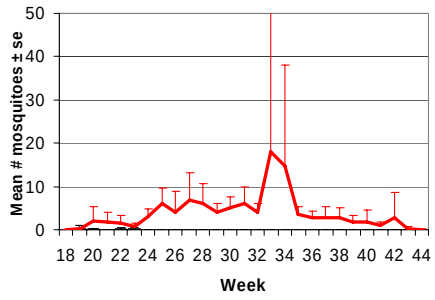
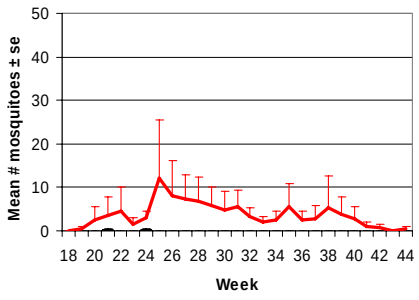
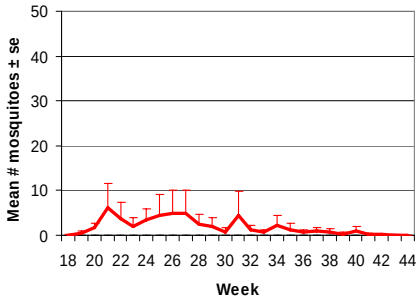
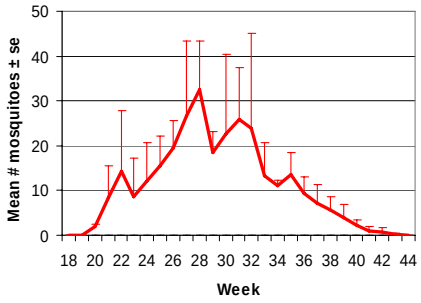
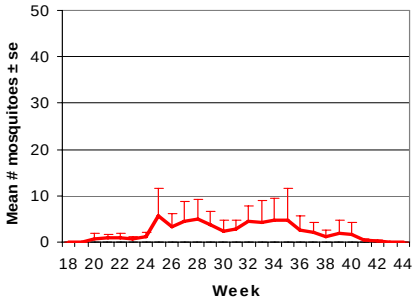
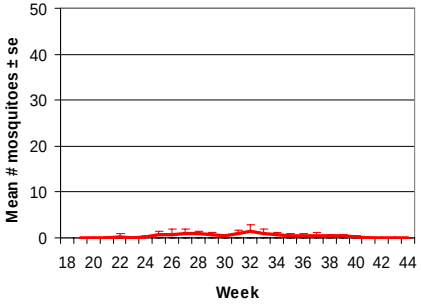
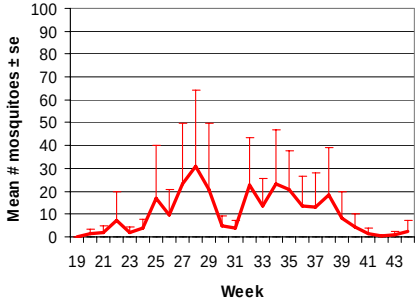
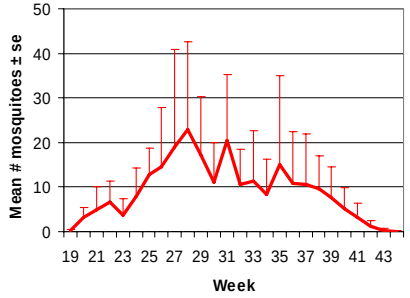
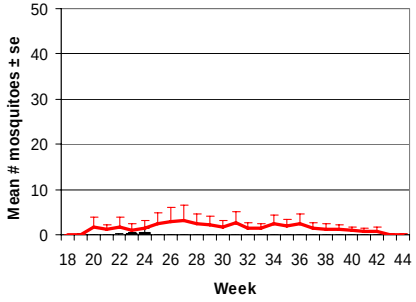
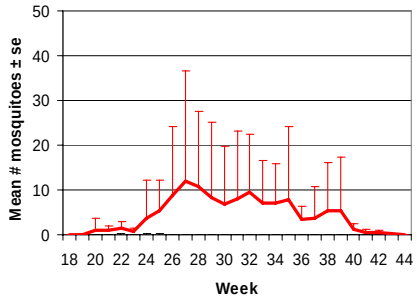
Coquillettidia perturbans- Monotypic Species
(*Cq. perturbans* Type)

Agricultural	Coastal	Delaware Bayshore	Delaware River Basin
			
New York Metro	**North Central Rural**	**Northwestern Rural**	**Philadelphia Metro**
			
Pinelands	**Suburban Corridor**	**Comments**	
		*Coquillettidia perturbans* have appeared in great numbers in the Philadelphia Metro region during a period when low values are normally reported. Activity was shown to be at one light trap site only. Large error bars are associated with this species, suggesting that they are distributed in a very patchy pattern throughout New Jersey. This species requires emergent vegetation as both an air supply and an anchor and this characteristic is a likely basis for the patchy distribution of this species. Eastern equine encephalitis has been isolated in *Cq. perturbans* and this is suspected to play a role in inland transmission.	

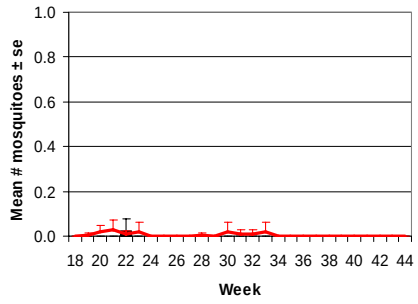
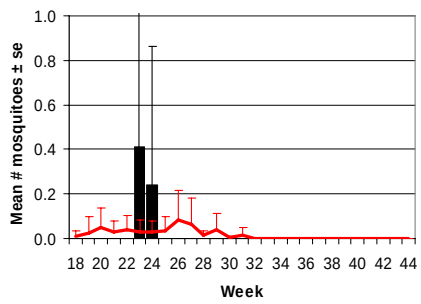
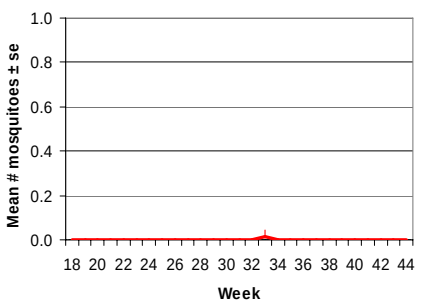
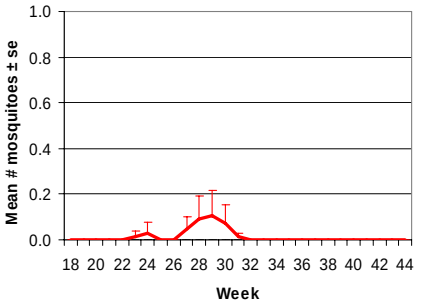
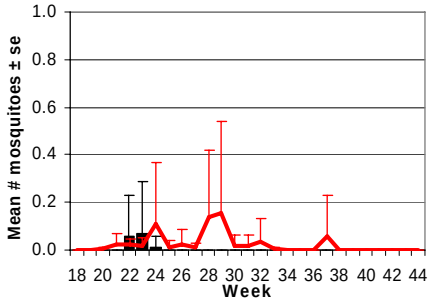
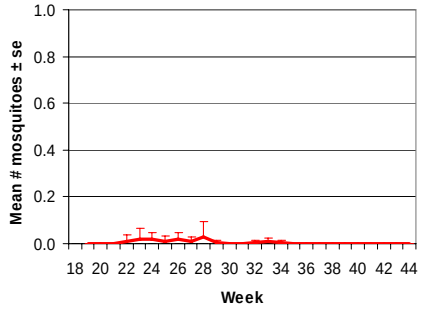
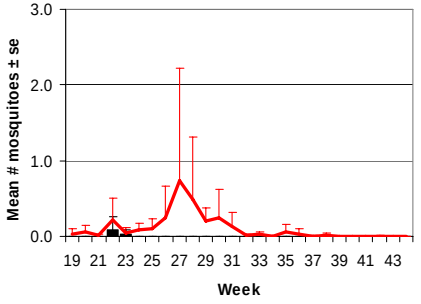
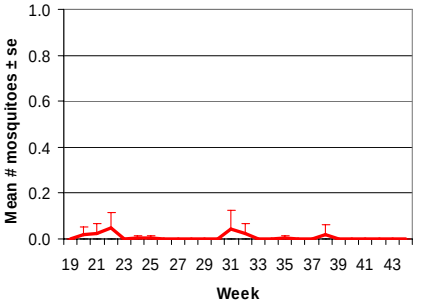
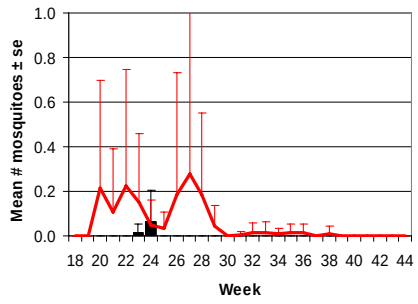
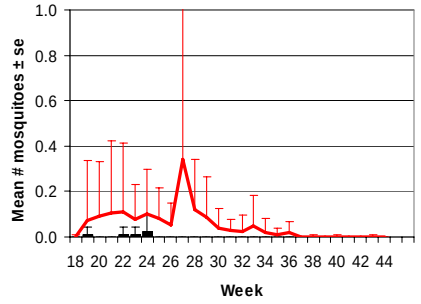
Aedes cantator- Salt Floodwater Species
Multivoltine Aedine (*Ae. sollicitans* Type)

Agricultural	Coastal	Delaware Bayshore	Delaware River Basin
			
New York Metro	**North Central Rural**	**Northwestern Rural**	**Philadelphia Metro**
			
Pinelands	**Suburban Corridor**	**Comments**	
		*Aedes cantator* populations have been around historical values for the Agricultural, Coastal Delaware Bayshore (high variation of historical values includes zero values) and the New York Metro regions. The Agricultural region shows high values associated with anthropogenic sources, such as fertilizer runoff. The interior Northwestern Rural site includes another anthropogenic source, a textile factory. The low population numbers suggests that operations at that plant may have changed, reducing the saline source.	

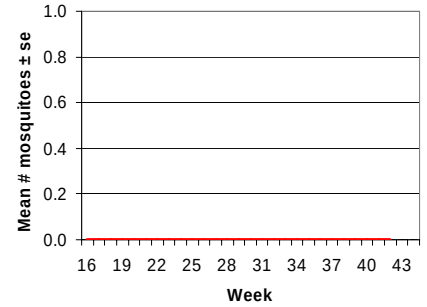
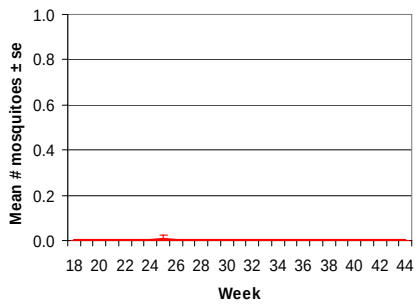
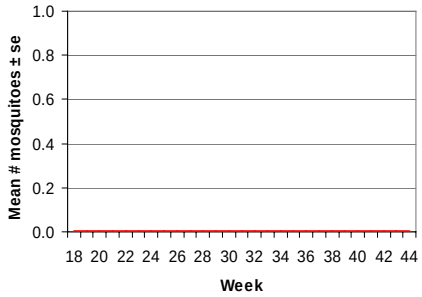
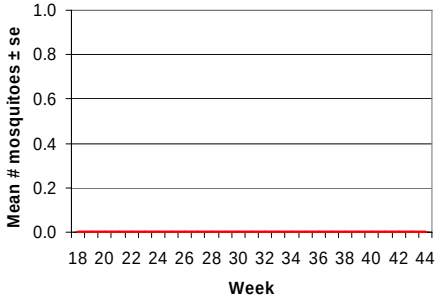
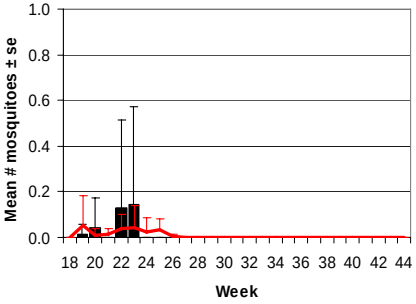
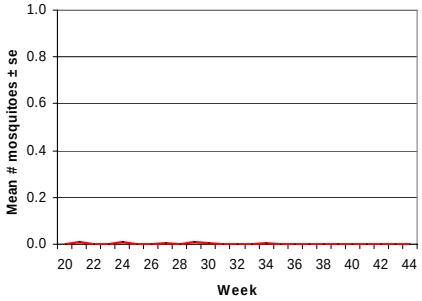
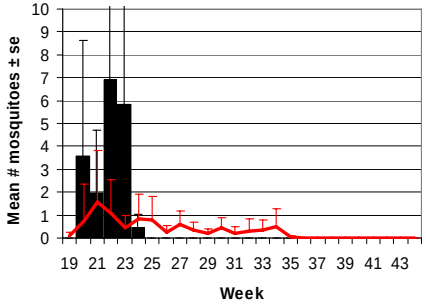
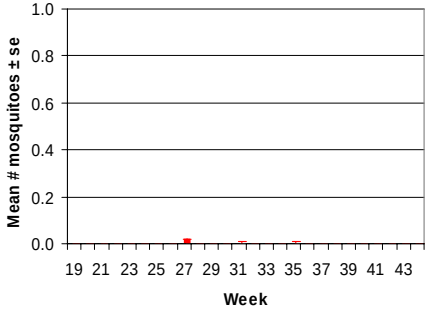
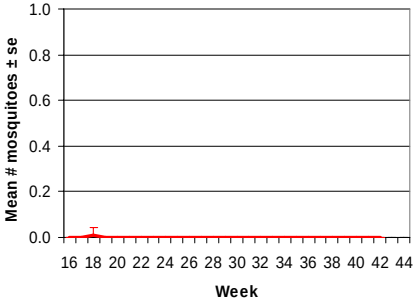
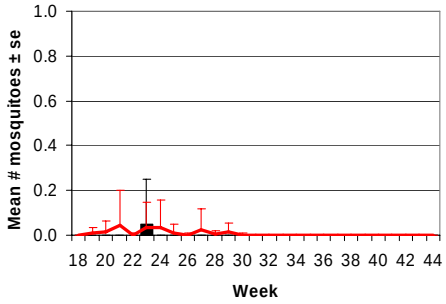
Aedes canadensis – Early Spring Species
Univoltine Aedine (*Ae. canadensis* Type)

Agricultural	Coastal	Delaware Bayshore	Delaware River Basin
			
New York Metro	**North Central Rural**	**Northwestern Rural**	**Philadelphia Metro**
			
Pinelands	**Suburban Corridor**	**Comments**	
		*Aedes canadensis* populations are considerably reduced over historical values in all regions across the state. This ubiquitous species is usually found throughout the state, from early spring to fall. This year, with rising temperature early in the spring, this species may have emerged and was well on the wing prior to the beginning of these reports. This is the last *Ae. canadensis* report until the situation changes.	

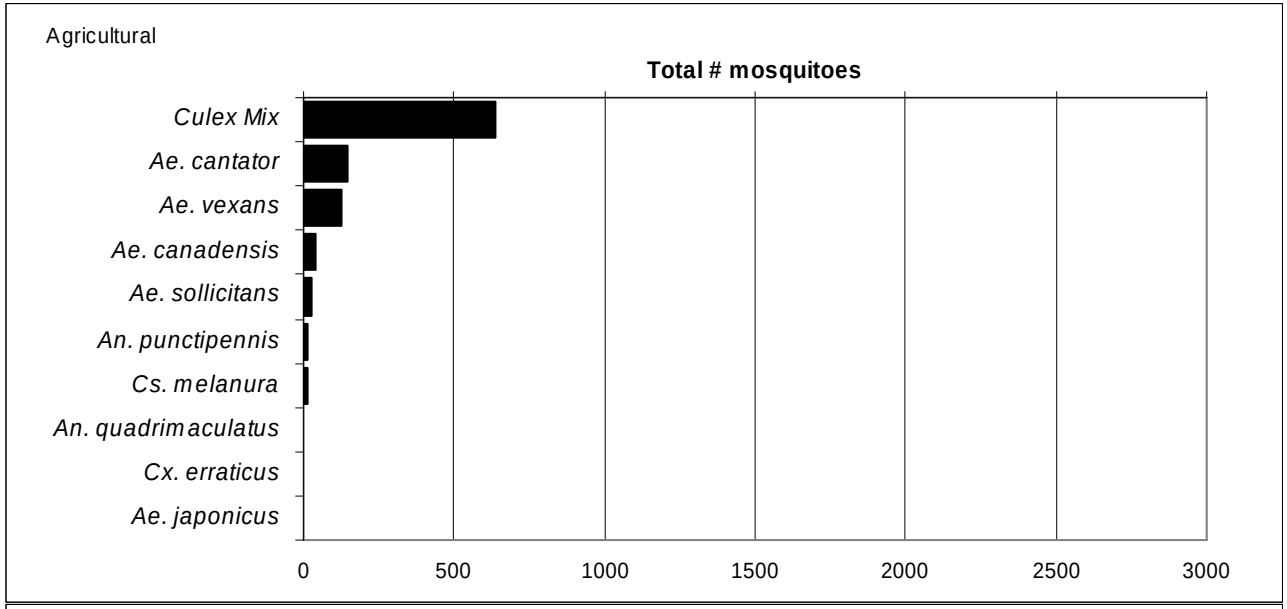
Aedes sticticus – Early Spring Species
Univoltine Aedine (*Ae. canadensis* Type)

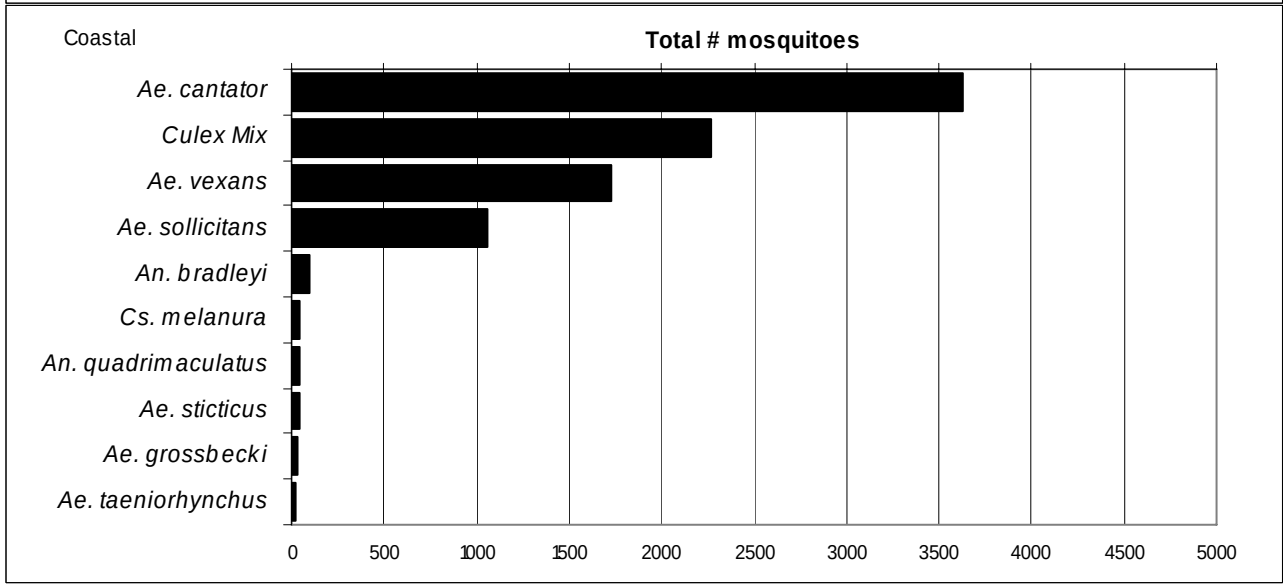
Agricultural	Coastal	Delaware Bayshore	Delaware River Basin
			
New York Metro	**North Central Rural**	**Northwestern Rural**	**Philadelphia Metro**
			
Pinelands	**Suburban Corridor**	**Comments**	
		*Aedes sticticus* is an aggressive biter that appeared in significant numbers in the Coastal region during this and the previous week. Other populations were apparent in the Agricultural, New York Metro, Northwestern Rural, Pineland, and Suburban Corridor regions and were well within historical ranges. The same conditions that influenced *Aedes vexans* to emerge during Weeks 23 and 24 apparently influenced *Ae. sticticus* as well. In other areas where *Ae. sticticus* is normally found, the populations have been variable. This species can re-appear toward the end of the mosquito season.	

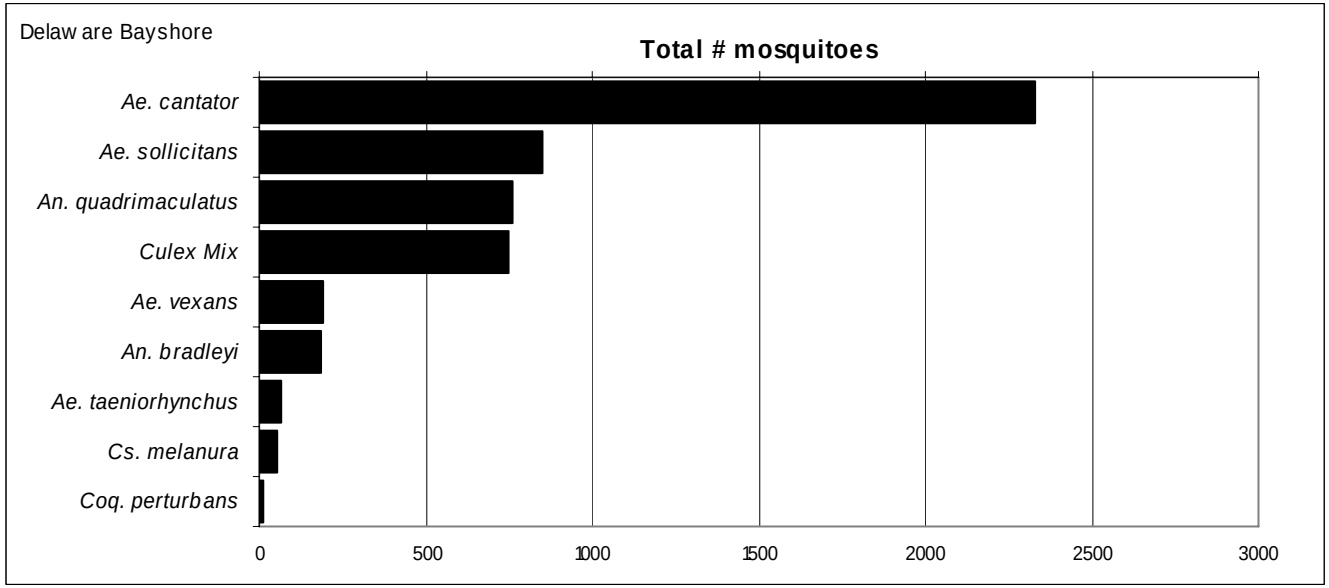
Aedes stimulans – Northern *Aedes* Species
Univoltine Aedine (*Ae. stimulans* Type)

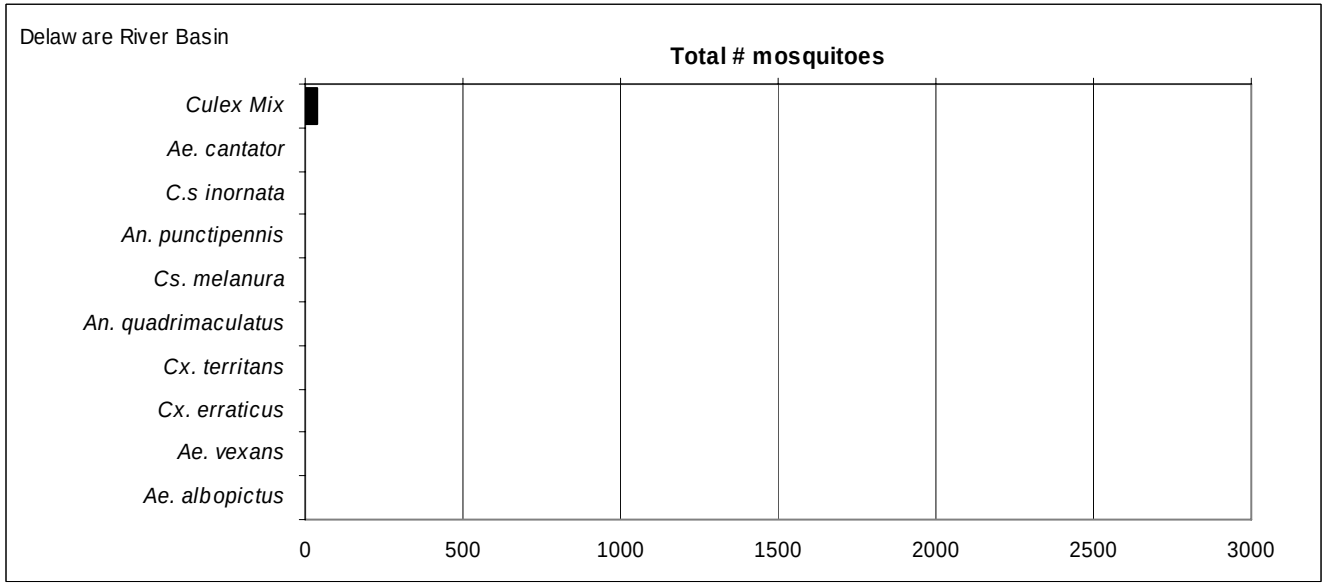
Agricultural	Coastal	Delaware Bayshore	Delaware River Basin
			
New York Metro	**North Central Rural**	**Northwestern Rural**	**Philadelphia Metro**
			
Pinelands	**Suburban Corridor**	**Comments**	
		*Aedes stimulans* populations are in significant numbers is the Northwestern Rural region of the state. Although numbers of this species are also high as to historical trends in the New York Metro region, absolute numbers are lower as compared to the Northwestern's values. This species has been on the wing well before the preparations of this report, and the population level in the Northwest would be expected to decline soon.	

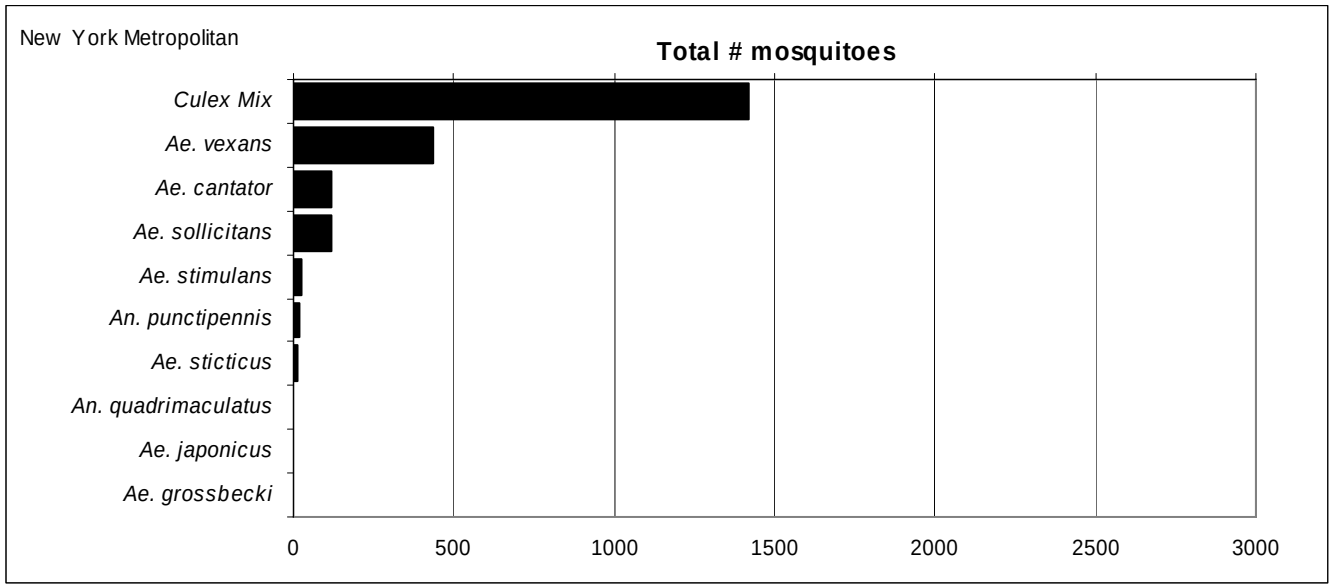
Top Ten Mosquito Species/Region

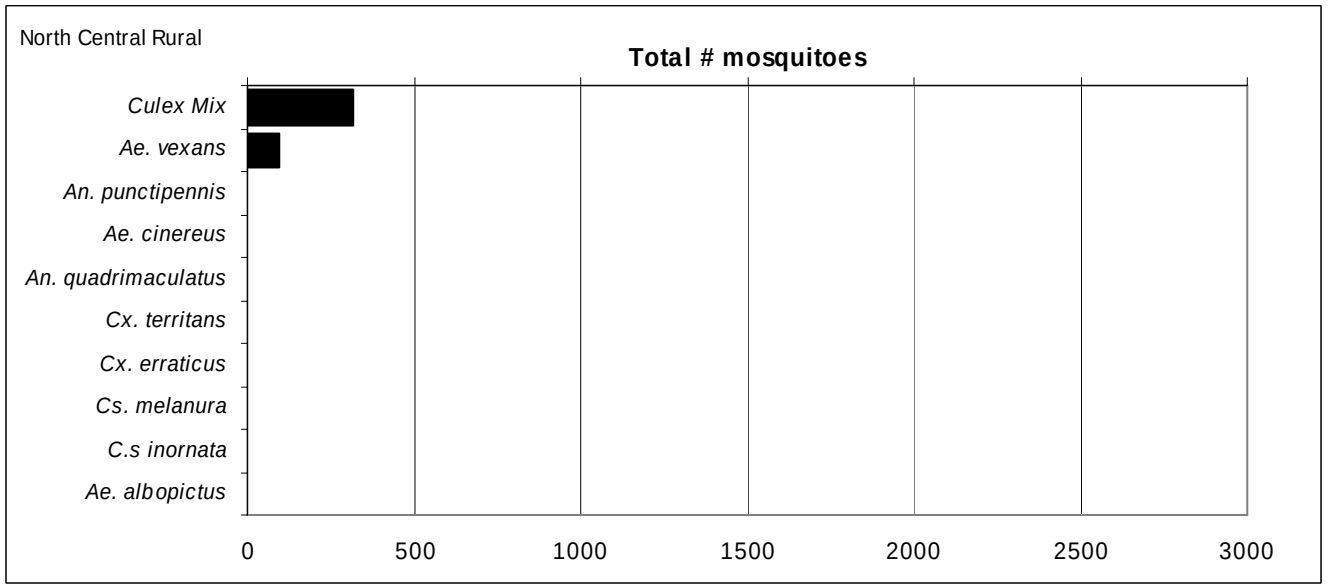


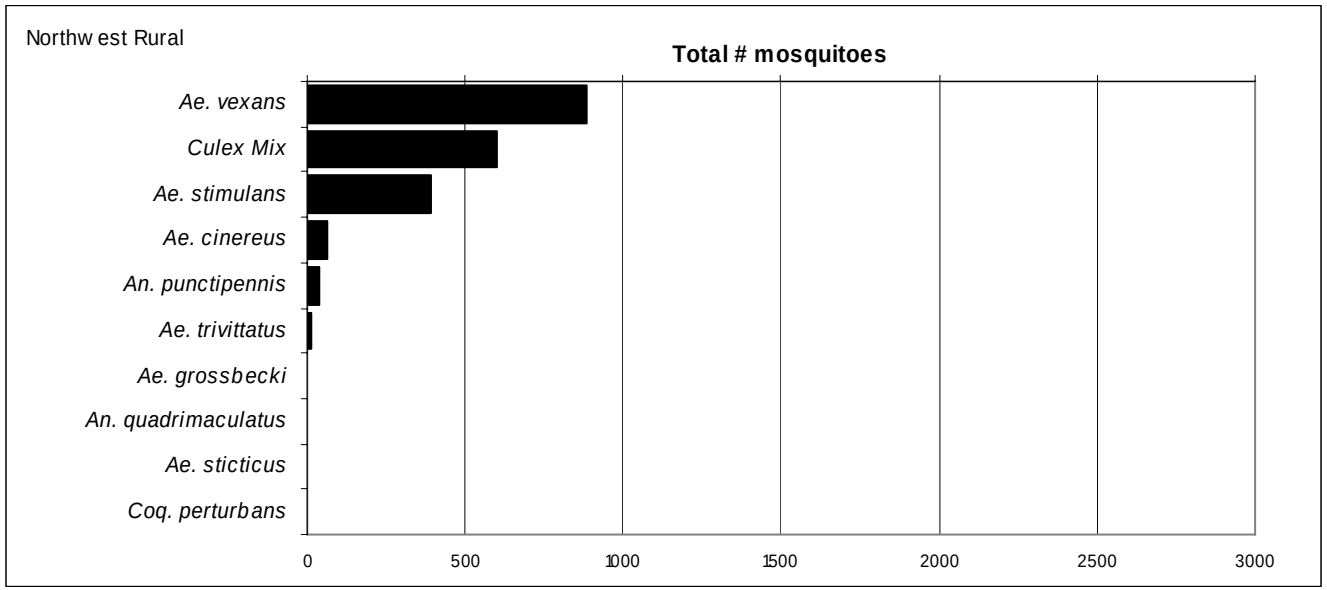


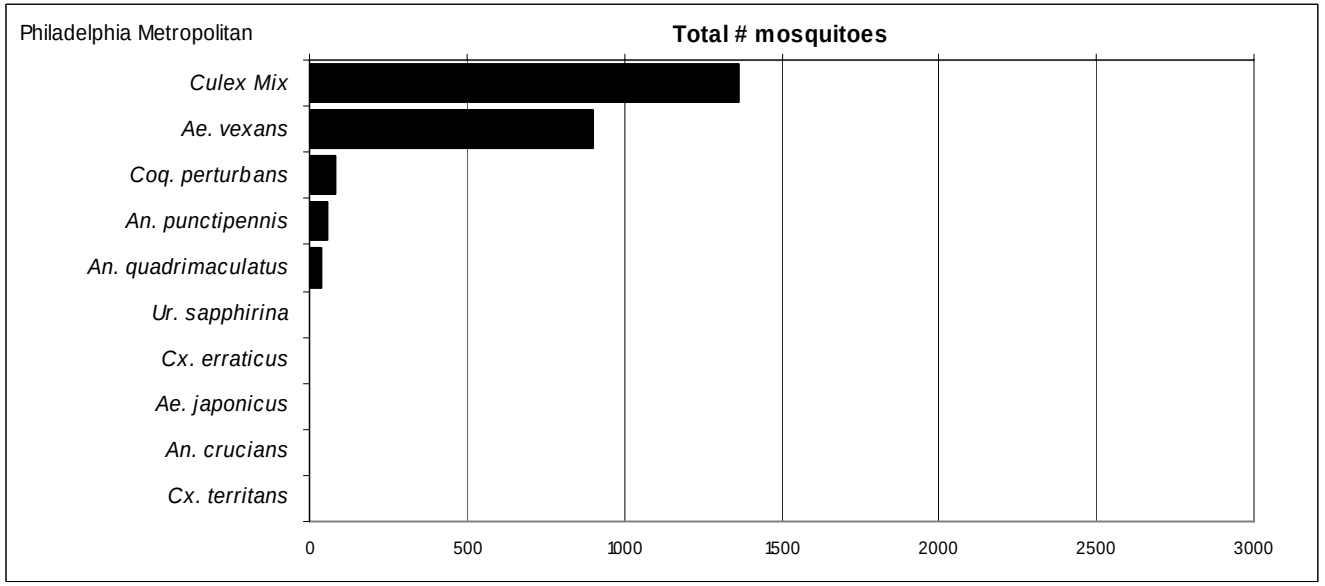

Delaware Bayshore
Total # mosquitoes
Ae. cantator
Ae. sollicitans
An. quadrimaculatus
Culex Mix
Ae. vexans
An. bradleyi
Ae. taeniorhynchus
Cs. melanura
Coq. perturbans
0
500
1000
1500
2000
2500
3000

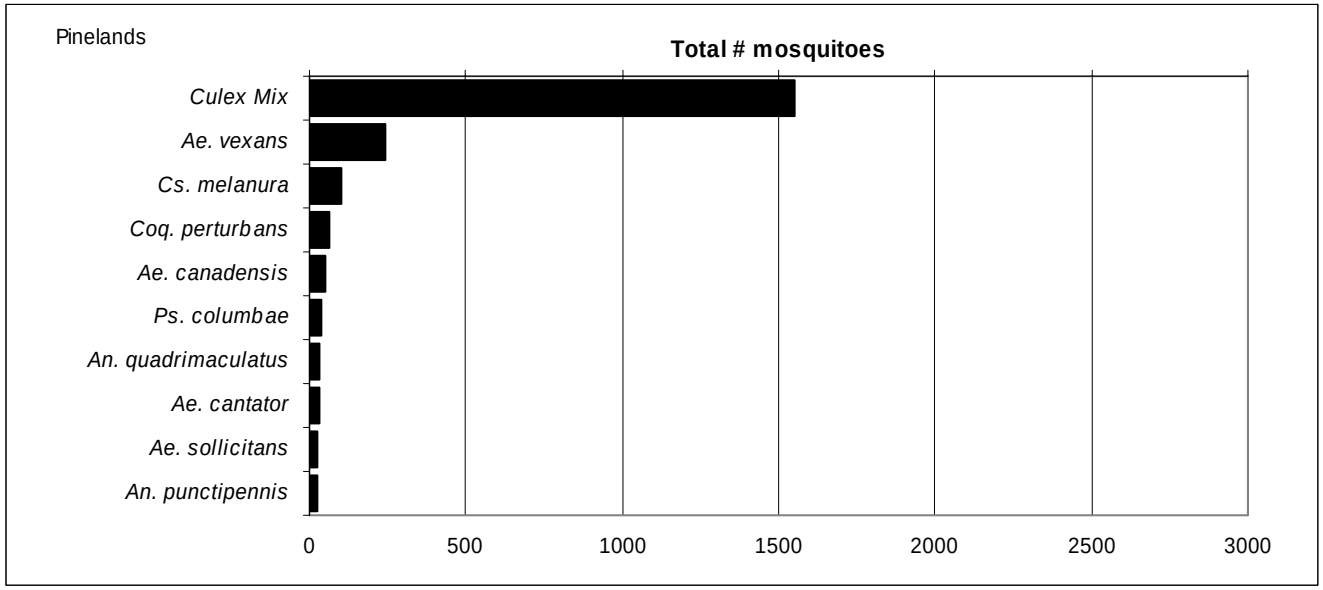

Delaware River Basin
Total # mosquitoes
Culex Mix
Ae. cantator
C.s inornata
An. punctipennis
Cs. melanura
An. quadrimaculatus
Cx. territans
Cx. erraticus
Ae. vexans
Ae. albopictus
0
500
1000
1500
2000
2500
3000

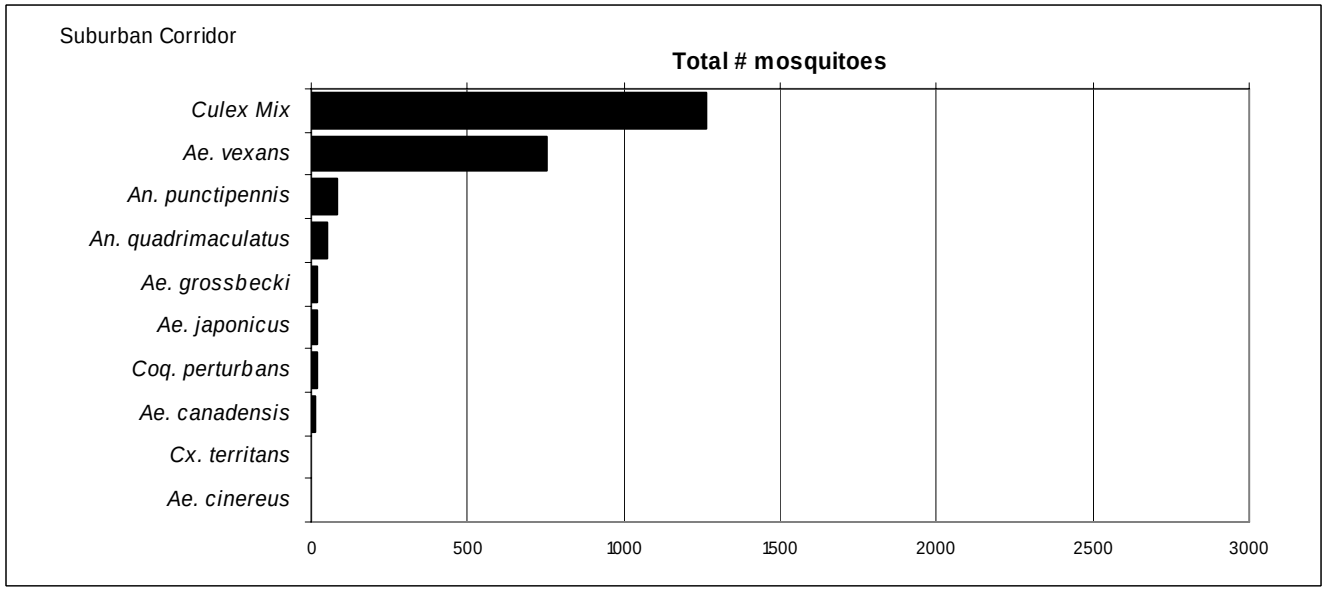

New York Metropolitan
Total # mosquitoes
Culex Mix
Ae. vexans
Ae. cantator
Ae. sollicitans
Ae. stimulans
An. punctipennis
Ae. sticticus
An. quadrimaculatus
Ae. japonicus
Ae. grossbecki
0
500
1000
1500
2000
2500
3000


North Central Rural
Total # mosquitoes
Culex Mix
Ae. vexans
An. punctipennis
Ae. cinereus
An. quadrimaculatus
Cx. territans
Cx. erraticus
Cs. melanura
C.s inornata
Ae. albopictus
0
500
1000
1500
2000
2500
3000


Northw est Rural
Total # mosquitoes
Ae. vexans
Culex Mix
Ae. stimulans
Ae. cinereus
An. punctipennis
Ae. trivittatus
Ae. grossbecki
An. quadrimaculatus
Ae. sticticus
Coq. perturbans
0
500
1000
1500
2000
2500
3000


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


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


Suburban Corridor
Total # mosquitoes
Culex Mix
Ae. vexans
An. punctipennis
An. quadrimaculatus
Ae. grossbecki
Ae. japonicus
Coq. perturbans
Ae. canadensis
Cx. territans
Ae. cinereus
0
500
1000
1500
2000
2500
3000