VECTOR SURVEILLANCE IN NEW JERSEY

EEE, WNV, SLE, LAC, DENV, CHIK and ZIKV

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CDC WEEK 28: 9 July to 15 July, 2017

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 Department of Health, Department of Agriculture and of the 21 county mosquito control agencies of New Jersey.

Culiseta melanura and Eastern Equine Encephalitis

SITE/Boxes	Inland or Coastal	Historic Population Mean	Current Weekly Mean	Total Tested* (Collected)	Total Pools Tested* (Submitted)	EEE Isolation Pools	MFIR
Bass River (Burlington Co.)/5	**Coastal**	0.24	0.00	1	1		
Green Bank (Burlington Co.)/25	**Coastal**	2.49	0.00	7	2		
Corbin City (Atlantic Co.)/25	**Coastal**	0.68	0.40	53 (63)	6 (7)		
Dennisville (Cape May Co.)/50	**Coastal**	3.85	0.00	5	2		
Winslow (Camden Co.)/50	**Inland**	1.80	1.84	477	13		
Centerton (Salem Co.)/50	**Inland**	2.17	0.04	45	6		
Turkey Swamp (Monmouth Co.)/50	**Inland**	0.72	0.04	28 (30)	5 (6)		
Glassboro (Gloucester Co.)/49	**Inland**	0.63	0.06	52	6		

*Current week (in parentheses) results pending. ‡ corrected from previous week NC=no collection

Remarks: Total positive EEE pools detected is zero. No horse cases reported to date.

Traditional Resting Box Sites: 668 *Cs. melanura* from 41 pools have been tested for EEE, with 12 additional *Cs. melanura* from 2 pools to be tested. No positive pools were detected at these eight sites. Statewide, 1,832 *Cs. melanura* from 169 pools have been tested, with no positive pools detected for an overall *Cs. melanura* MFIR of 0.00. 3,039 specimens from nine other species have also been tested, with no positives detected. Overall MFIR for all species statewide is 0.00.

	Additional *Cs. melanura* trapped by counties *traps with positives indicated in **BOLD.**				
County	**Trap types***	**Pools**	**Mosquitoes**	**Positives**	**MFIR**
Atlantic	LT, RB	10	75		
Burlington	LT	17	621		
Cape May	GR, RB	74	297		
Cumberland	LT, RB	3	8		
Middlesex	RB	3	97		
Ocean	LT, RB	9	21		
Passaic	RB	1	1		
Salem	LT	2	8		
Sussex	ABC	9	36		
TOTAL		**128**	**1164**	**0**	**0.00**

Additional *Cs. melanura*: Counties maintain trap sites for *Cs. melanura* in other areas, using a variety of traps. No positive pools were detected in these traps.

Horses and Humans: No horses have been detected with EEE to date in New Jersey. Nearly all of the horse cases from previous years include those horses who were either not vaccinated or had incomplete vaccination histories. ***Horse owners are urged to make sure their horses are up to date on their vaccinations. Horse cases are known to occur through October and sometimes into November (see link below).*** Other sensitive species are non-native birds, such as Ostriches/Emus and Gallinaceous birds such as pheasants of Eurasian origins.

Horses and Vaccinations: The fate of unvaccinated equids reinforces the necessity of maintaining a vaccination schedule for arboviruses. For vaccination schedules recommended by the American Association of Equine Practices, see: http://www.aaep.org/vaccination_guidelines.htm

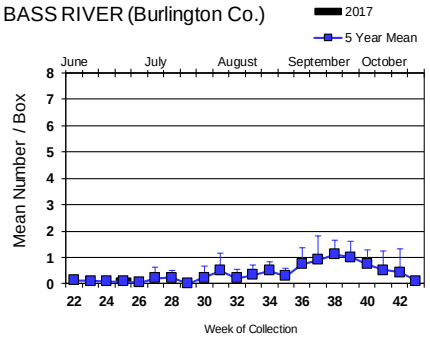
Additional Species: Twelve additional species were tested for EEE. No additional positives were detected.

Species other than *Cs. melanura*	Pools	Mosquitoes	Positives	MFIR
Aedes canadensis canadensis	4	41		
Aedes cantator	8	8		
Aedes japonicus	1	19		
Aedes sollicitans	1	1		
Aedes vexans	1	75		
Anopheles bradleyi	29	210		
Anopheles crucians	1	17		
Anopheles punctipennis	4	11		
Coquillettidia perturbans	22	440		
Culex erraticus	6	90		
Culex pipiens	214	1762		
Culex salinarius	77	376		
Culex sp.	10	37		
State Total	**378**	**3087**		

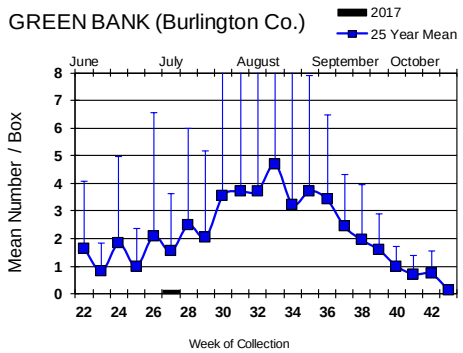
Culiseta melanura Population Graphs

Coastal

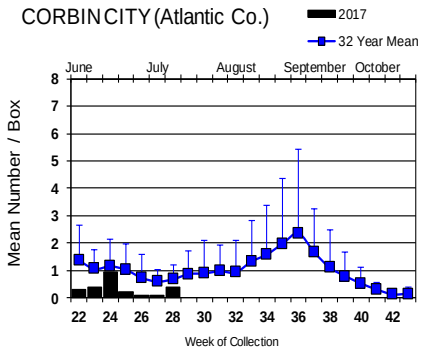
BASS RIVER (Burlington Co.)



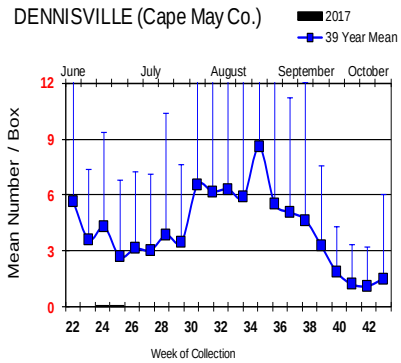
GREEN BANK (Burlington Co.)



CORBIN CITY (Atlantic Co.)

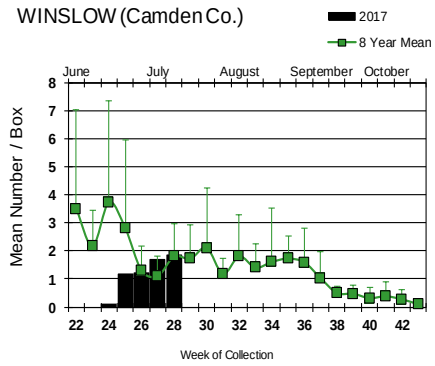


DENNISVILLE (Cape May Co.)

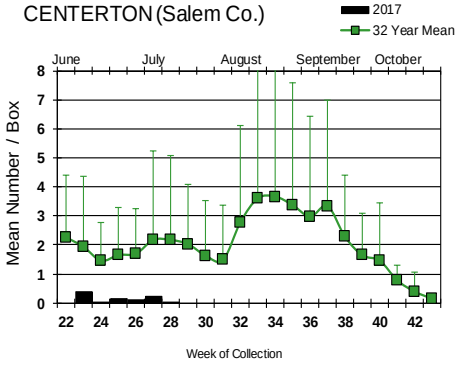


Inland

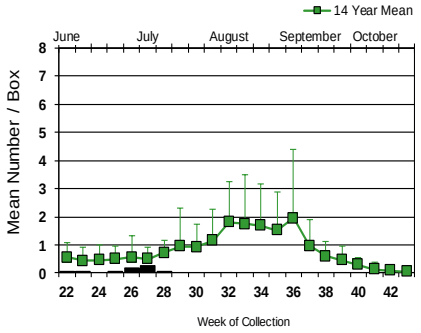
WINSLOW (Camden Co.)



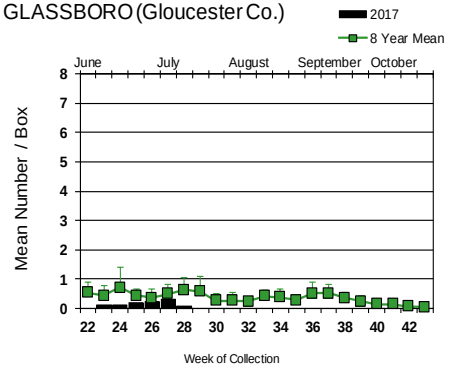
CENTERTON (Salem Co.)



TURKEY SWAMP (Monmouth Co.)



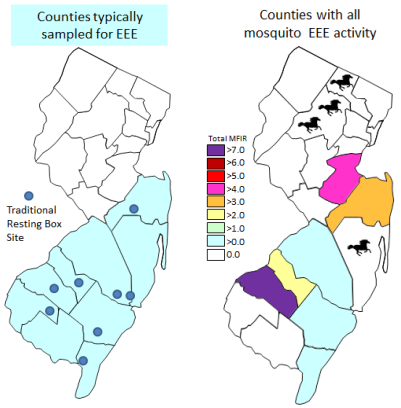
GLASSBORO (Gloucester Co.)



No detection of EEE has occurred at the traditional resting box sites. Mosquito population abundances remain low in the resting box collections - the Winslow site abundances appear to be approaching average levels, similar to light trap collections.

Maps to right: Last year's data showed an unusual increase in activity well north of the typical areas of testing in New Jersey. The map on the left shows the area that is usually tested, with the locations of the traditional resting box sites. The map on the right shows locations and MFIR values of horse cases and positive mosquitoes. The occurrence of EEE in Middlesex County (pink) indicated the first positive EEE *Cs. melanura* of the season.


= Positive pool(s) detected (red = melanura, purple = other species).



EEE in US (2017 cumulative cases): (Black or Red = previous + new reported cases occurring)

- equine:
- mosquito pools:
- sentinel: FL(9) TX(3)
- human:

West Nile Virus Positive Organisms in US, 2017

West Nile in US (2017 cumulative cases): Single black values indicate no change from previous week. Black values / red values equals previous week/New totals.
Note: Data reported by all states should be considered provisional and subject to change. Sources for this table can be found here.

	Birds	Mosquito Pools	Sentinels	Horses	Humans
Alabama					1
Alaska					
Arizona	0	12/47		0	16/20
Arkansas				0	0
California	39/51	412/490	1/2		3
Colorado					1
Connecticut		1			0
Delaware					
DC					
Florida			8/9		0
Georgia		0			0
Hawaii					
Idaho		4		0	0
Illinois	3/4	80/137			0
Indiana	0	20/24		0	2
Iowa		2		0	0
Kansas		5		0	2/3
Kentucky				1	
Louisiana					
Maine		0		0	0
Maryland					
Mass.		2/7		0	0
Michigan					
Minnesota					
Mississippi		39/51		1	2
Missouri		0		0	2

	Birds	Mosquito Pools	Sentinels	Horses	Humans
Montana					
Nebraska	1	0		0	1
Nevada					
New Hampshire		0		0	0
New Jersey		8/16		0	0
New Mexico					2
New York		4			
North Carolina					
North Dakota	2/3	0		0	0
Ohio		3			0
Oklahoma					
Oregon		1			
Pennsylvania	1	27/67		0	0
Rhode Island		0		0	0
South Carolina		5			
South Dakota		9/10			1/2
Tennessee					
Texas		70/136			6/8
Utah		2/3		0	0
Vermont					
Virginia					
Washington	0	3/4		0	0
West Virginia					
Wisconsin	25/31	1		0	0
Wyoming					

* Can include other species (e.g., dogs, cows) reported positive.

Protocol: New Jersey Department of Health (NJDH Public Health Environmental and Agricultural Laboratories, PHEAL) and the Cape May County Department of Mosquito Control tests mosquito pools using RT-PCR Taqman techniques.

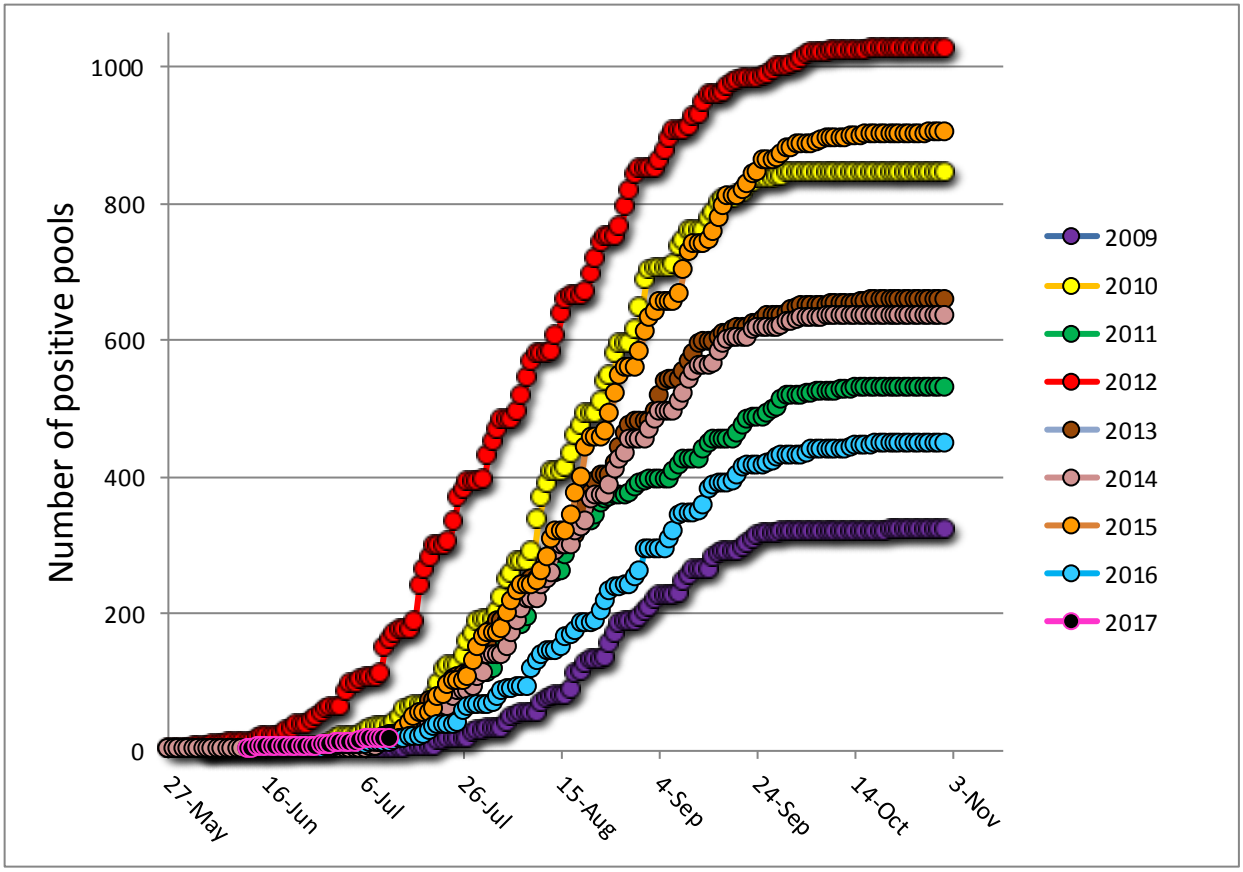
Mosquito Species Submitted and Tested for West Nile Virus Testing through 14 July 2017.

Species	Pools	Mosquitoes	Positives	MFIR
Aedes albopictus	212	1086		
Aedes atropalpus	11	67		
Aedes canadensis canadensis	39	425		
Aedes cantator	25	217		
Aedes cinereus	1	54		
Aedes grossbecki	2	4		
Aedes japonicus	121	430		
Aedes sollicitans	8	175		
Aedes stimulans	1	10		
Aedes taeniorhynchus	4	44		
Aedes triseriatus	105	250		
Aedes trivittatus	1	1		
Aedes vexans	15	181		
Anopheles barberi	2	2		
Anopheles bradleyi	34	281		
Anopheles crucians	1	17		
Anopheles punctipennis	16	45		
Anopheles quadrimaculatus	31	262		
Coquillettidia perturbans	29	452		
Culex erraticus	9	95		
Culex pipiens	251	2840	1	0.352
Culex restuans	239	1576		
Culex salinarius	79	389		
Culex spp.	634	27836	15	0.539
Culex territans	13	56		
Culiseta melanura	171	1838		
Orthopodomyia signifera	1	1		
Psorophora columbiae	1	1		
Psorophora ferox	2	6		
Grand Total	**2058**	**38641**	**16**	**0.414**

Remarks: To date, 2,058 pools of 38,641 mosquitoes from 28 species have been tested. 16 positive pools were detected, all in the enzootic vector, *Culex* (Mix or *pipiens*). First positive *Culex* Mix pool was detected in Sussex County on 12 June. Last year, the first positive pool of *Culex* Mix was collected on 14 June in Monmouth County.

Humans, Horses and Wild Birds: No human or horse cases have been detected. Last year, human cases were first reported in CDC week 20, but under unusual circumstances. First typical case occurred in CDC week 27. For further information, see http://www.nj.gov/health/cd/statistics/arboviral-stats/ .

Birds are no longer routinely tested in New Jersey.



Above is a graph showing cumulative number of positive pools for the last 9 years, inclusive of the most active (2012) and least active (2009) years. It is still too early to see any trends for the current year (black markers with pink borders).

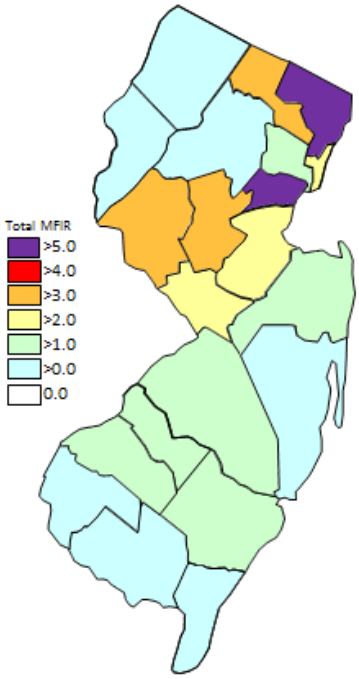
WNV Results by County through 14 July 2017.

County	Species	Pools	Mosquitoes	Positives	MFIR
Atlantic		**51**	**1331**		
	Aedes japonicus	1	2		
	Aedes sollicitans	4	168		
	Aedes taeniorhynchus	2	41		
	Aedes triseriatus	1	12		
	Aedes vexans	1	19		
	Anopheles bradleyi	3	51		
	Coquillettidia perturbans	6	333		
	Culex pipiens	12	412		
	Culex salinarius	1	9		
	Culex spp.	3	155		
	Culiseta melanura	16	128		
	Psorophora columbiae	1	1		
Bergen		**15**	**692**		
	Aedes japonicus	1	7		
	Culex spp.	14	685		
Burlington		**74**	**3270**	**2**	**0.612**
	Aedes albopictus	2	44		
	Aedes canadensis canadensis	2	35		
	Aedes cantator	1	1		

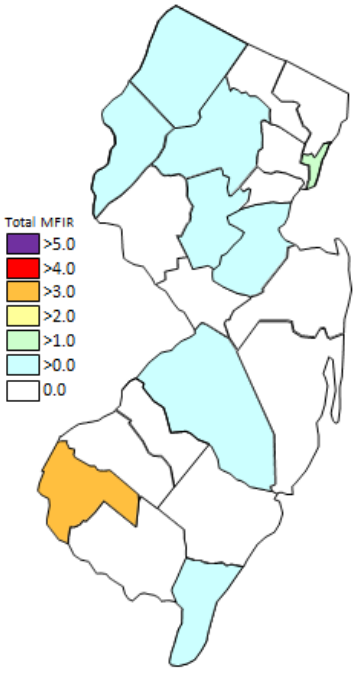
	Aedes japonicus	2	41		
	Aedes triseriatus	1	12		
	Aedes vexans	1	75		
	Anopheles bradleyi	1	75		
	Anopheles crucians	1	17		
	Culex salinarius	3	225		
	Culex spp.	40	2116	2	0.945
	Culiseta melanura	20	629		
Camden		**57**	**2551**		
	Aedes japonicus	3	12		
	Culex spp.	41	2062		
	Culiseta melanura	13	477		
Cape May		**944**	**3982**	**1**	**0.251**
	Aedes albopictus	102	155		
	Aedes atropalpus	11	67		
	Aedes canadensis canadensis	16	24		
	Aedes cantator	7	7		
	Aedes japonicus	63	125		
	Aedes sollicitans	1	1		
	Aedes triseriatus	75	149		
	Aedes vexans	5	6		
	Anopheles bradleyi	30	155		
	Anopheles punctipennis	5	8		
	Anopheles quadrimaculatus	27	248		
	Coquillettidia perturbans	9	11		
	Culex erraticus	6	90		
	Culex pipiens	215	1763	1	0.567
	Culex restuans	202	650		
	Culex salinarius	74	151		
	Culex spp.	5	9		
	Culex territans	13	56		
	Culiseta melanura	76	302		
	Orthopodomyia signifera	1	1		
	Psorophora ferox	1	4		
Cumberland		**22**	**150**		
	Aedes japonicus	2	17		
	Aedes triseriatus	1	2		
	Aedes vexans	2	9		
	Anopheles quadrimaculatus	3	13		
	Coquillettidia perturbans	2	23		
	Culex spp.	9	78		
	Culiseta melanura	3	8		
Essex		**37**	**290**		
	Aedes albopictus	13	29		
	Aedes japonicus	5	7		
	Culex spp.	19	254		
Gloucester		**36**	**1589**		
	Aedes albopictus	1	2		
	Aedes japonicus	3	14		
	Aedes triseriatus	1	4		

	Culex pipiens	5	366		
	Culex spp.	20	1151		
	Culiseta melanura	6	52		
Hudson		**44**	**2266**	**4**	**1.765**
	Culex spp.	44	2266	4	1.765
Hunterdon		**83**	**3588**		
	Culex spp.	83	3588		
Mercer		**54**	**1353**		
	Aedes japonicus	14	65		
	Culex pipiens	3	127		
	Culex restuans	23	712		
	Culex spp.	14	449		
Middlesex		**29**	**1855**	**1**	**0.539**
	Culex spp.	26	1758	1	0.569
	Culiseta melanura	3	97		
Monmouth		**186**	**1817**		
	Aedes albopictus	70	729		
	Aedes canadensis canadensis	21	366		
	Aedes cantator	16	171		
	Aedes grossbecki	2	4		
	Aedes japonicus	12	59		
	Aedes sollicitans	3	6		
	Aedes taeniorhynchus	2	3		
	Aedes triseriatus	6	6		
	Aedes trivitattus	1	1		
	Aedes vexans	4	9		
	Anopheles barberi	2	2		
	Anopheles punctipennis	10	27		
	Coquillettidia perturbans	3	3		
	Culex salinarius	1	4		
	Culex spp.	26	393		
	Culiseta melanura	7	34		
Morris		**59**	**2580**	**2**	**0.775**
	Culex spp.	59	2580	2	0.775
Ocean		**62**	**562**		
	Aedes albopictus	16	94		
	Aedes japonicus	3	27		
	Aedes triseriatus	3	11		
	Coquillettidia perturbans	3	70		
	Culex spp.	28	339		
	Culiseta melanura	9	21		
Passaic		**33**	**252**		
	Aedes japonicus	6	36		
	Aedes triseriatus	2	6		
	Coquillettidia perturbans	3	5		
	Culex erraticus	1	2		
	Culex pipiens	15	171		

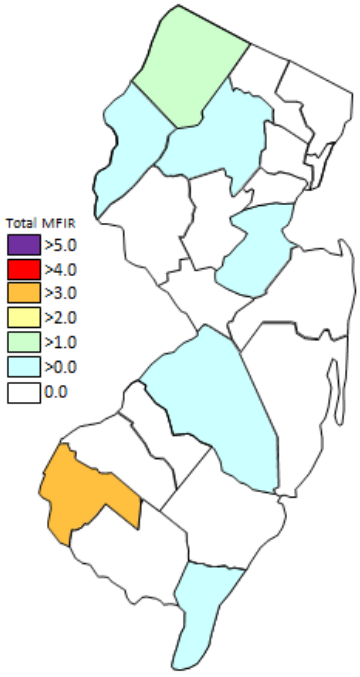
	Culex restuans	5	31		
	Culiseta melanura	1	1		
Salem		**41**	**273**	**1**	**3.663**
	Aedes albopictus	6	25		
	Aedes japonicus	3	5		
	Aedes triseriatus	5	12		
	Aedes vexans	1	2		
	Anopheles quadrimaculatus	1	1		
	Coquillettidia perturbans	3	7		
	Culex erraticus	2	3		
	Culex pipiens	1	1		
	Culex spp.	10	162	1	6.173
	Culiseta melanura	8	53		
	Psorophora ferox	1	2		
Somerset		**56**	**2246**	**1**	**0.445**
	Aedes japonicus	1	4		
	Culex spp.	55	2242	1	0.446
Sussex		**61**	**1293**	**1**	**0.773**
	Aedes albopictus	1	2		
	Aedes triseriatus	10	36		
	Culex restuans	9	183		
	Culex spp.	32	1036	1	0.965
	Culiseta melanura	9	36		
Union		**14**	**868**		
	Aedes albopictus	1	6		
	Culex spp.	13	862		
Warren		**100**	**5833**	**3**	**0.514**
	Aedes cantator	1	38		
	Aedes cinereus	1	54		
	Aedes japonicus	2	9		
	Aedes stimulans	1	10		
	Aedes vexans	1	61		
	Anopheles punctipennis	1	10		
	Culex spp.	93	5651	3	0.531
Grand Total		**2058**	**38641**	**16**	**0.414**



Cumulative WNV activity in 2016.



WNV activity to 14 July 2017.



WNV activity last week, 2017

Saint Louis Encephalitis (SLE) to 14 July 2017.

New Jersey will be primarily testing for SLE this year only when adjacent states show human activity (Cape May tests mosquitoes in the Cape May lab independently). SLE has had previous activity in New Jersey, most notably in 1964 and 1975 (CDC's SLE website), the latter prompting the surveillance reporting by Rutgers. SLE is a flavivirus and has a similar transmission pattern to West Nile, with *Culex* species as the predominant vectors.

No pools of SLE have tested positive for 2017.

County	Species	Pools	Mosquitoes	Positives	MFIR
Burlington		**5**	**375**		
	Culex spp.	5	375		
Cape May		**219**	**1771**		
	Culex pipiens	214	1762		
	Culex spp.	5	9		
Grand Total		**224**	**2146**		

La Crosse Encephalitis (LAC) to 14 July 2017.

New Jersey will be primarily testing for LAC this year only when adjacent states show human activity (Cape May tests mosquitoes in the Cape May lab independently). New Jersey has had 3 cases of this encephalitic disease since 1964 (see CDC's LAC website). The mortality is low but like other encephalitides, LAC can have both personal (lasting neurological sequelae) and economic impacts. LAC is a bunyavirus with a transmission cycle involving mosquitoes such as *Aedes triseriatus* and small mammals such as squirrels and chipmunks. LAC can not only infect *Aedes albopictus* but transovarial transmission was also demonstrated.
(Tesh and Gubler 1975 Laboratory studies of transovarial transmission of La Crosse and other arboviruses by *Aedes albopictus* and *Culex fatigans.* American Journal of Tropical Medicine and Hygiene 24(5):876-880).

No pools of SLE have tested positive for 2017.

County	Species			Positives	MFIR
Burlington		**5**	**97**		
	Aedes albopictus	2	44		
	Aedes japonicus	2	41		
	Aedes triseriatus	1	12		
Sussex		**10**	**36**		
	Aedes triseriatus	10	36		
Grand Total		**15**	**133**		

Dengue (DENV) to 14 July 2017.

New Jersey will be selectively testing for DENV (including serotypes) this year. Dengue has not had a history of local transmission here in New Jersey, but each year, travelers can bring virus back from areas in the world with virus activity. This is significant as humans are NOT dead-end hosts and thus there is the potential for local transmission (i.e., New Jersey mosquitoes biting a sick person and then biting and transmitting the disease to someone else) to be established. DENV is a flavivirus but unlike WNV, *Aedes* mosquitoes are predominant vectors. In New Jersey, *Aedes albopictus* is a candidate for local transmission. There are 4 serotypes tested for Dengue.

Note Same pools of *Ae. albopictus* are tested for the four serotypes of Dengue as well as Chikungunya.

Currently, there are no tested pools of Dengue in 2017.

County	Species	DENV1		DENV2		DENV3		DENV4		Pos.	MFIR
		Pool	Mos.	Pool	Mos.	Pool	Mos.	Pool	Mos.		
Grand Total											

Chikungunya (CHIK) to 14 July 2017.

New Jersey will be selectively testing for CHIK this year. Chikungunya is similar in symptoms to Dengue, a “breakbone” fever and has a low mortality rate. But this virus has had recent worldwide activity, and in the past year has come to the Western Hemisphere. As with Dengue, transmission can occur when a mosquito bites an infected human, then bites an uninfected human who subsequently becomes ill. CHIK is an alphavirus with *Aedes* mosquitoes as potential vectors. In New Jersey, *Aedes albopictus* is the mosquito of interest.

No pools of CHIK have tested positive in 2017.

County	Species	Pools	Mosquitoes	Positives	MFIR
Cape May		**102**	**155**		
	Aedes albopictus	102	155		
Grand Total		**102**	**155**		

Zika (ZIKV) to 14 July 2017.

New Jersey will be selectively testing for ZIKV this year. Zika is an emerging arboviral threat with significant health consequences for fetuses and recent activity in the Western Hemisphere. Humans are potential hosts that can transmit through sexual activity. ZIKV is a flavivirus with *Aedes* mosquitoes as potential vectors. In New Jersey, *Aedes albopictus* is the mosquito of interest.

No pools have tested positive in 2017.

County	Species	Pools	Mosquitoes	Positives	MFIR
Cape May		**102**	**155**		
	Aedes albopictus	102	155		
Grand Total		**102**	**155**		