VECTOR SURVEILLANCE IN NEW JERSEY

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

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CDC WEEK 31: 30 July to 5 August, 2017

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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**	0.50	0.00	1	1		
Green Bank (Burlington Co.)/25	**Coastal**	3.70	0.28	15 (22)	3 (4)		
Corbin City (Atlantic Co.)/25	**Coastal**	0.98	0.68	77 (94)	9 (10)		
Dennisville (Cape May Co.)/50	**Coastal**	6.18	0.04	35	5		
Winslow (Camden Co.)/50	**Inland**	1.18	0.28	614	18		
Centerton (Salem Co.)/50	**Inland**	1.48	0.36	116	9		
Turkey Swamp (Monmouth Co.)/50	**Inland**	1.15	0.40	44 (64)	8 (9)		
Glassboro (Gloucester Co.)/49	**Inland**	0.27	0.08	72	9		

*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: 974 *Cs. melanura* from 62 pools have been tested for EEE, with 44 additional *Cs. melanura* from 3 pools to be tested. No positive pools were detected at these eight sites. Statewide, 2,655 *Cs. melanura* from 255 pools have been tested, with no positive pools detected for an overall *Cs. melanura* MFIR of 0.00. 4,420 specimens from 15 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	18	178		
Burlington	CO_2, UVLT	24	787		
Cape May	GR, RB	94	337		
Cumberland	LT, RB	4	19		
Gloucester	RB	10	84		
Middlesex	RB	8	159		
Ocean	GR, LT, RB	11	23		
Passaic	RB	3	3		
Salem	LT	3	33		
Sussex	ABC, BGS, RB	18	58		
TOTAL		**193**	**1681**	**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.

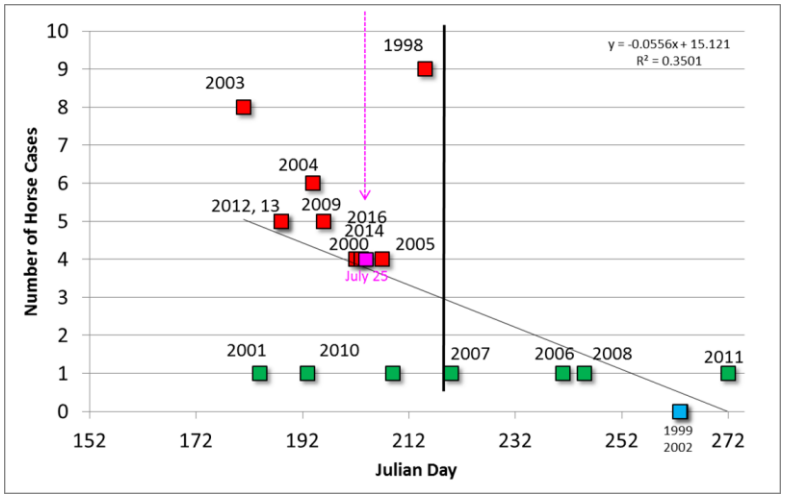
Horses and Humans: No horses have been detected with EEE to date in New Jersey. Nearly all of the horse cases from previous years include those horses who were either not vaccinated or had incomplete vaccination histories. ***Horse owners are urged to make sure their horses are up to date on their vaccinations. 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: Fifteen additional species were tested for EEE. No additional positives were detected.

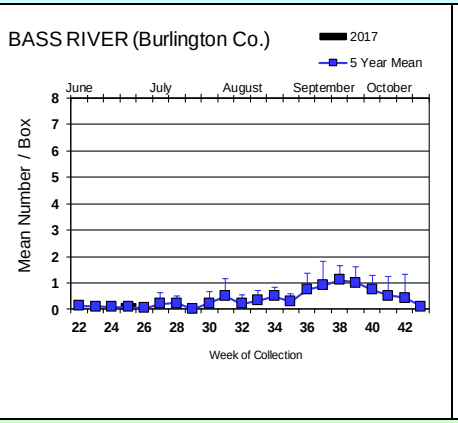
Species other than *Cs. melanura*	Pools	Mosquitoes	Positives	MFIR
Aedes canadensis canadensis	4	41		
Aedes cantator	8	8		
Aedes japonicus	2	20		
Aedes sollicitans	2	14		
Aedes taeniorhynchus	1	8		
Aedes vexans	1	75		
Anopheles bradleyi	56	492		
Anopheles crucians	1	17		
Anopheles punctipennis	14	121		
Anopheles quadrimaculatus	4	33		
Coquillettidia perturbans	47	812		
Culex erraticus	19	246		
Culex pipiens	350	2947		
Culex salinarius	140	824		
Culex sp.	15	44		
Psorophora cyanescens	1	1		
State Total	**665**	**5703**		

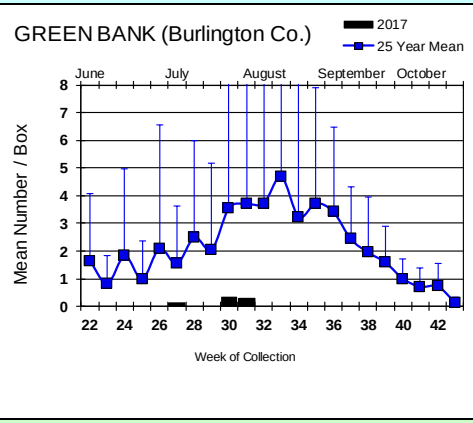
We are currently at Julian day 216 of the year and without any positive EEE pools. Past history (graph to right) suggests that multiple horse cases of EEE appear to be more likely if the first positive EEE pools of *Cs. melanura* occur before the first week of August in New Jersey. We did have a single horse case in 2011 with no detection of virus in mosquito samples, an unusual situation.

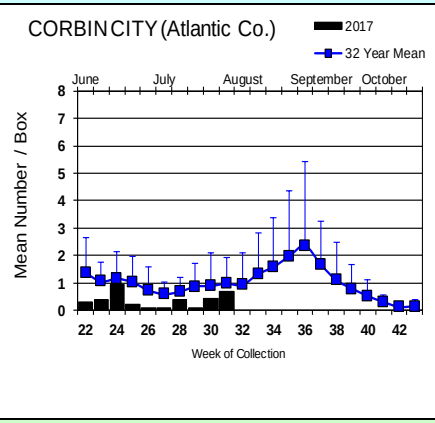


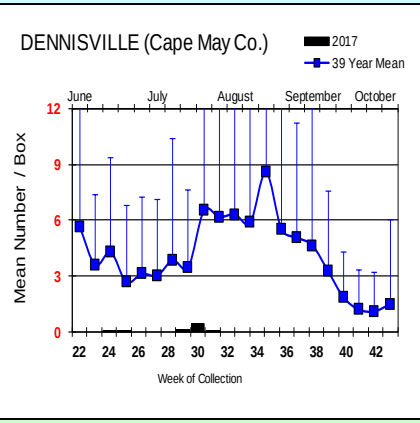
Culiseta melanura Population Graphs

Coastal

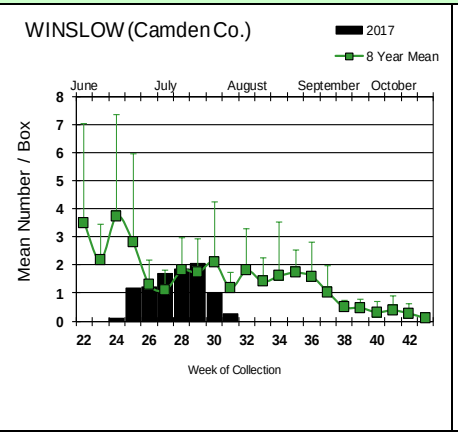


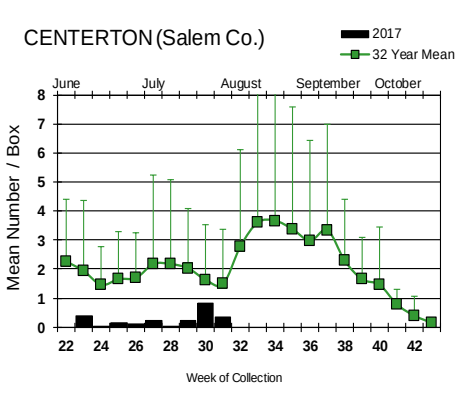


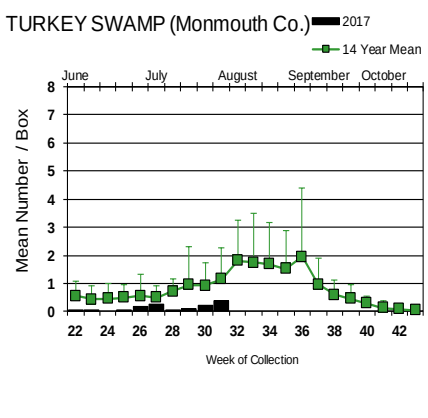


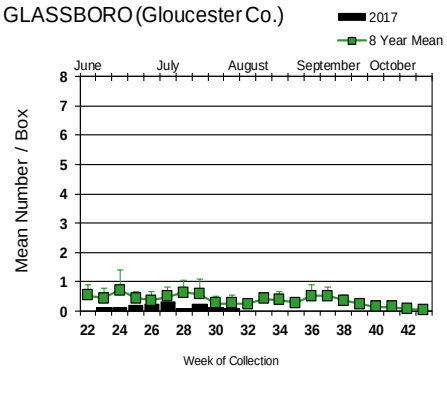


Inland









No detection of EEE has occurred at the traditional resting box sites. Mosquito population abundances remain low in the resting box collections.

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

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

- equine: FL(1) GA(1) LA(1) SC(2) WI(2)
- mosquito pools: RI(2)
- sentinel: FL(13) 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	57/72		0	26/30
Arkansas				0	0
California	115	1125	34	2	6
Colorado		7			2
Connecticut		8/10			0
Delaware					
DC					
Florida	1	1	10/13		0
Georgia		0		1	5
Hawaii					
Idaho		30/42		1	1
Illinois	10	438/550			1/2
Indiana	0	93/118		0	2
Iowa		6/12		0	1
Kansas		13		0	4
Kentucky				2/3	
Louisiana	7/13	175/258			7/19
Maine		0		0	0
Maryland					
Mass.		27/56		0	0
Michigan				3	
Minnesota					
Mississippi		93/106		1	16
Missouri		0		0	2

	Birds	Mosquito Pools	Sentinels	Horses	Humans
Montana					
Nebraska	1	11		0	3
Nevada					1
New Hampshire		0		0	0
New Jersey		71/107		0	0
New Mexico					2
New York		74/110			1
North Carolina					
North Dakota	4	5		0	2/5
Ohio		151			0
Oklahoma					2
Oregon		3/7			
Pennsylvania	2/3	277/644		0	0
Rhode Island		0		0	0
South Carolina	4	5/14			
South Dakota		22/28			4
Tennessee					2
Texas		308/390			18
Utah		22/45		0	0
Vermont					
Virginia				1	1
Washington	0	8/10		0	0
West Virginia					
Wisconsin	38/48	4/6		1/2	0
Wyoming				1	

* 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.

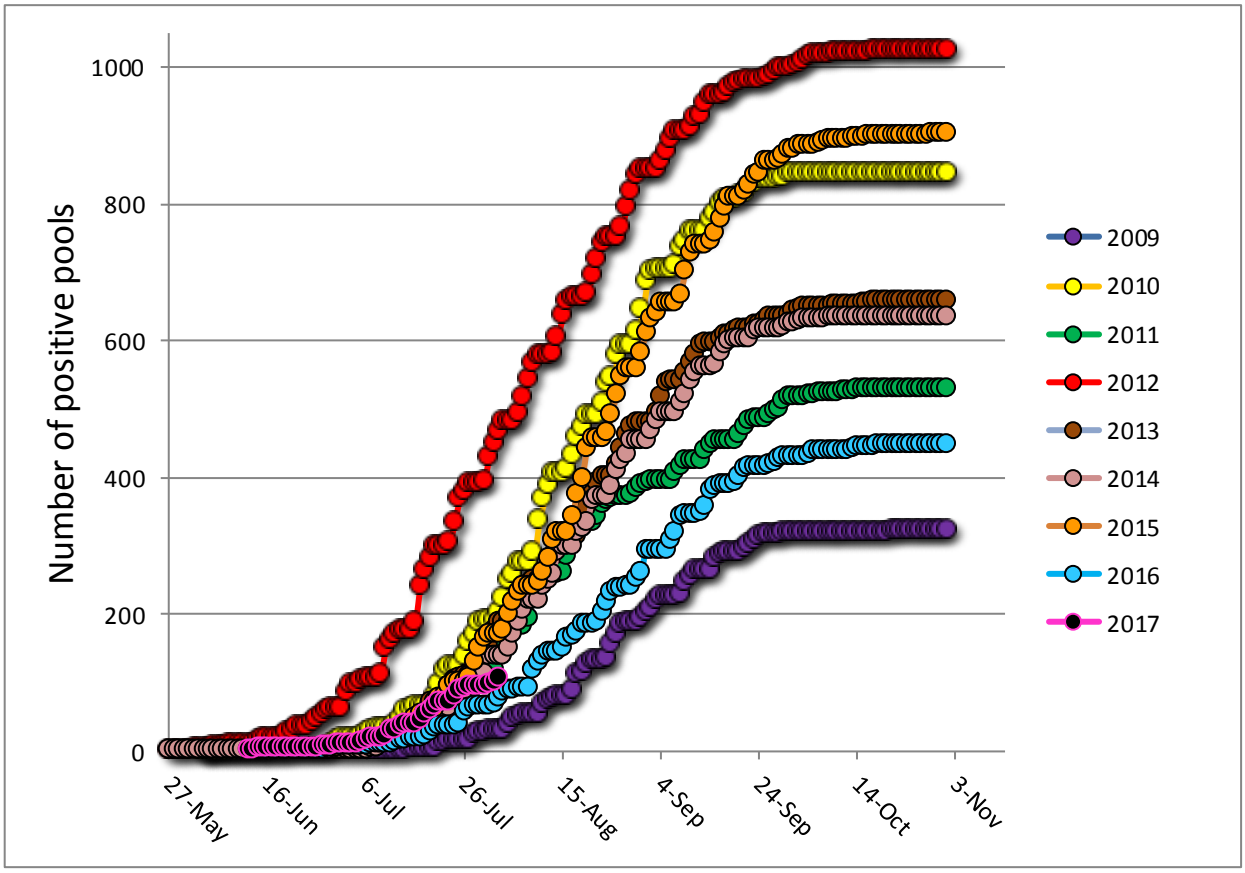
Mosquito Species Submitted and Tested for West Nile Virus Testing through 4 August 2017.

Species	Pools	Mosquitoes	Positives	MFIR
Aedes albopictus	467	3696	3	0.812
Aedes atropalpus	14	77		
Aedes canadensis canadensis	40	429		
Aedes cantator	26	222		
Aedes cinereus	1	54		
Aedes grossbecki	2	4		
Aedes japonicus	198	943		
Aedes sollicitans	10	190		
Aedes stimulans	1	10		
Aedes taeniorhynchus	7	83		
Aedes triseriatus	157	384		
Aedes trivittatus	3	5		
Aedes vexans	33	464		
Anopheles barberi	3	3		
Anopheles bradleyi	61	563		
Anopheles crucians	1	17		
Anopheles earlei	1	1		
Anopheles punctipennis	35	184		
Anopheles quadrimaculatus	69	472		
Coquillettidia perturbans	57	829		
Culex erraticus	28	311		
Culex pipiens	426	4920	5	1.016
Culex restuans	307	1860	1	0.538
Culex salinarius	147	1147		
Culex spp.	1124	49474	97	1.961
Culex territans	20	76		
Culiseta inornata	1	1		
Culiseta melanura	258	2662	1	0.376
Orthopodomyia signifera	2	2		
Psorophora ciliata	1	1		
Psorophora columbiae	2	2		
Psorophora cyanescens	1	1		
Psorophora ferox	5	38		
Uranotaenia sapphirina	1	22		
Grand Total	**3509**	**69147**	**107**	**1.547**

Remarks: To date, 3,509 pools of 69,147 mosquitoes from 33 species have been tested. 107 positive pools have been detected. Most are in the enzootic vector, *Culex* (Mix, *pipiens* or *restuans*). Late July saw activity in another ornithophilic species, *Cs. melanura* as well as a potential bridge vector, *Aedes albopictus.* Activity jumped considerably in Bergen County within July. Overall MFIR for New Jersey is at 1.547, up from 1.205 of last week. 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. While it is still early, there was a decrease in the cumulative positives, suggesting a possible low to moderate activity (black markers with pink borders for current year).

WNV Results by County through 4 August 2017.

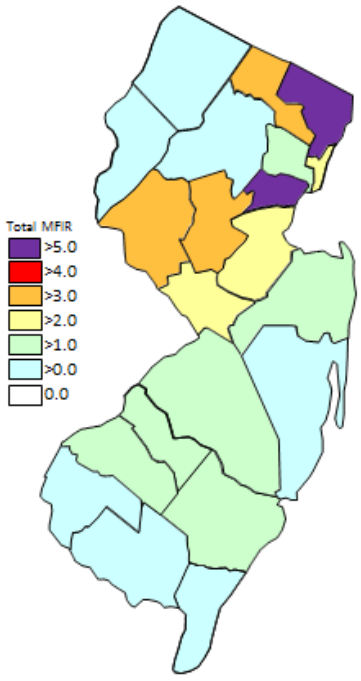
County	Species	Pools	Mosquitoes	Positives	MFIR
Atlantic		**87**	**2234**		
	Aedes japonicus	3	118		
	Aedes sollicitans	4	168		
	Aedes taeniorhynchus	3	71		
	Aedes triseriatus	1	12		
	Aedes vexans	5	224		
	Anopheles bradleyi	3	51		
	Coquillettidia perturbans	10	383		
	Culex erraticus	2	47		
	Culex pipiens	18	608		
	Culex salinarius	1	9		
	Culex spp.	8	257		
	Culiseta melanura	27	255		
	Psorophora columbiae	1	1		
	Psorophora ferox	1	30		
Bergen		**65**	**2907**	**19**	**6.536**
	Aedes albopictus	1	50		

	Aedes japonicus	8	72		
	Culex spp.	56	2785	19	6.822
Burlington		**105**	**4187**	**6**	**1.433**
	Aedes albopictus	5	104		
	Aedes canadensis canadensis	2	35		
	Aedes cantator	1	1		
	Aedes japonicus	3	76		
	Aedes taeniorhynchus	1	8		
	Aedes triseriatus	2	30		
	Aedes vexans	1	75		
	Anopheles bradleyi	1	75		
	Anopheles crucians	1	17		
	Culex salinarius	5	342		
	Culex spp.	55	2621	5	1.908
	Culiseta melanura	28	803	1	1.245
Camden		**77**	**3188**	**1**	**0.314**
	Aedes albopictus	3	22		
	Aedes japonicus	5	22		
	Culex spp.	51	2530	1	0.395
	Culiseta melanura	18	614		
Cape May		**1472**	**6360**	**4**	**0.629**
	Aedes albopictus	205	333		
	Aedes atropalpus	14	77		
	Aedes canadensis canadensis	16	24		
	Aedes cantator	7	7		
	Aedes japonicus	93	196		
	Aedes sollicitans	1	1		
	Aedes triseriatus	110	194		
	Aedes vexans	8	11		
	Anopheles bradleyi	56	362		
	Anopheles punctipennis	5	8		
	Anopheles quadrimaculatus	56	403		
	Coquillettidia perturbans	13	15		
	Culex erraticus	16	233		
	Culex pipiens	351	2948	4	1.357
	Culex restuans	258	751		
	Culex salinarius	131	306		
	Culex spp.	9	15		
	Culex territans	20	76		
	Culiseta melanura	100	373		
	Orthopodomyia signifera	1	1		
	Psorophora ferox	1	4		
	Uranotaenia sapphirina	1	22		
Cumberland		**62**	**683**		
	Aedes albopictus	5	12		
	Aedes japonicus	8	36		
	Aedes sollicitans	1	13		
	Aedes triseriatus	1	2		
	Aedes vexans	5	42		
	Anopheles bradleyi	1	75		
	Anopheles quadrimaculatus	6	31		
	Coquillettidia perturbans	7	100		

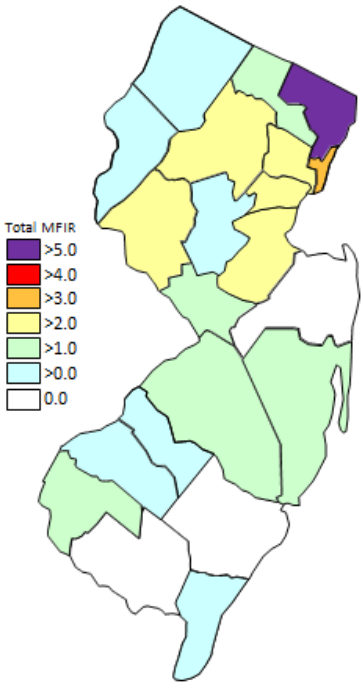
	Culex erraticus	1	11		
	Culex salinarius	4	176		
	Culex spp.	19	166		
	Culiseta melanura	4	19		
Essex		**66**	**458**	**1**	**2.183**
	Aedes albopictus	24	62		
	Aedes japonicus	7	12		
	Culex spp.	35	384	1	2.604
Gloucester		**147**	**5685**	**2**	**0.352**
	Aedes albopictus	33	510	1	1.961
	Aedes japonicus	8	85		
	Aedes triseriatus	2	26		
	Anopheles punctipennis	7	88		
	Anopheles quadrimaculatus	4	33		
	Coquillettidia perturbans	1	6		
	Culex pipiens	9	657		
	Culex spp.	64	4124	1	0.242
	Culiseta melanura	19	156		
Hudson		**75**	**4058**	**16**	**3.943**
	Culex spp.	75	4058	16	3.943
Hunterdon		**128**	**5838**	**13**	**2.227**
	Culex spp.	128	5838	13	2.227
Mercer		**79**	**1738**	**2**	**1.151**
	Aedes albopictus	1	17		
	Aedes japonicus	17	77		
	Culex pipiens	3	127		
	Culex restuans	29	773	1	1.294
	Culex spp.	29	744	1	1.344
Middlesex		**75**	**3953**	**11**	**2.783**
	Culex spp.	67	3794	11	2.899
	Culiseta melanura	8	159		
Monmouth		**297**	**3364**		
	Aedes albopictus	126	1968		
	Aedes canadensis canadensis	22	370		
	Aedes cantator	17	176		
	Aedes grossbecki	2	4		
	Aedes japonicus	18	80		
	Aedes sollicitans	4	8		
	Aedes taeniorhynchus	3	4		
	Aedes triseriatus	8	8		
	Aedes trivitattus	2	2		
	Aedes vexans	11	22		
	Anopheles barberi	3	3		
	Anopheles earlei	1	1		
	Anopheles punctipennis	19	62		
	Anopheles quadrimaculatus	1	1		
	Coquillettidia perturbans	7	8		
	Culex erraticus	2	6		

	Culex salinarius	2	14		
	Culex spp.	33	571		
	Culiseta inornata	1	1		
	Culiseta melanura	10	50		
	Orthopodomyia signifera	1	1		
	Psorophora ciliata	1	1		
	Psorophora columbiae	1	1		
	Psorophora cyanescens	1	1		
	Psorophora ferox	1	1		
Morris		**108**	**4596**	**10**	**2.176**
	Coquillettidia perturbans	4	166		
	Culex spp.	104	4430	10	2.257
Ocean		**101**	**1005**	**2**	**1.990**
	Aedes albopictus	30	334	1	2.994
	Aedes japonicus	5	38		
	Aedes triseriatus	4	12		
	Anopheles punctipennis	1	1		
	Coquillettidia perturbans	5	103		
	Culex erraticus	2	2		
	Culex spp.	43	492	1	2.033
	Culiseta melanura	11	23		
Passaic		**78**	**745**	**1**	**1.342**
	Aedes albopictus	1	5		
	Aedes japonicus	11	73		
	Aedes triseriatus	3	11		
	Coquillettidia perturbans	5	9		
	Culex erraticus	2	4		
	Culex pipiens	44	579	1	1.727
	Culex restuans	9	61		
	Culiseta melanura	3	3		
Salem		**74**	**784**	**1**	**1.276**
	Aedes albopictus	16	114		
	Aedes japonicus	4	6		
	Aedes triseriatus	9	24		
	Aedes vexans	1	2		
	Anopheles quadrimaculatus	1	1		
	Coquillettidia perturbans	5	39		
	Culex erraticus	3	8		
	Culex pipiens	1	1		
	Culex spp.	21	438	1	2.283
	Culiseta melanura	12	149		
	Psorophora ferox	1	2		
Somerset		**101**	**3485**	**3**	**0.861**
	Aedes albopictus	5	29		
	Aedes japonicus	5	38		
	Aedes triseriatus	1	3		
	Anopheles punctipennis	2	15		
	Culex spp.	88	3400	3	0.882
Sussex		**106**	**2293**	**2**	**0.872**

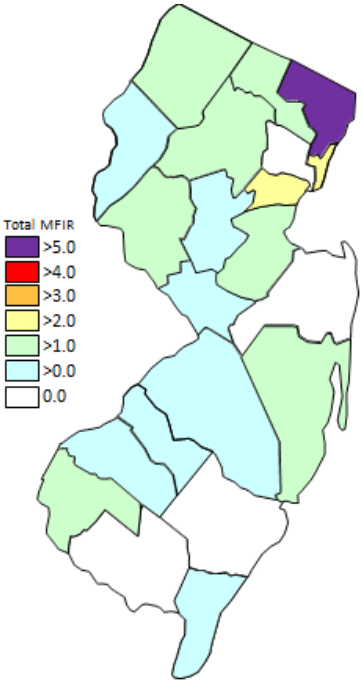
	Aedes albopictus	4	9		
	Aedes triseriatus	16	62		
	Culex restuans	11	275		
	Culex salinarius	4	300		
	Culex spp.	53	1589	2	1.259
	Culiseta melanura	18	58		
Union		**47**	**2725**	**7**	**2.569**
	Aedes albopictus	8	127	1	7.874
	Culex spp.	39	2598	6	2.309
Warren		**159**	**8861**	**6**	**0.677**
	Aedes cantator	1	38		
	Aedes cinereus	1	54		
	Aedes japonicus	3	14		
	Aedes stimulans	1	10		
	Aedes trivittatus	1	3		
	Aedes vexans	2	88		
	Anopheles punctipennis	1	10		
	Anopheles quadrimaculatis	1	3		
	Culex spp.	147	8640	6	0.694
	Psorophora ferox	1	1		
Grand Total		**3509**	**69147**	**107**	**1.547**



Cumulative WNV activity in 2016.



WNV activity to 4 August 2017.



WNV activity last week, 2017

Saint Louis Encephalitis (SLE) to 4 August 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. No human cases have been reported.

County	Species	Pools	Mosquitoes	Positives	MFIR
Burlington		**10**	**666**		
	Culex spp.	10	666		
Cape May		**359**	**2962**		
	Culex pipiens	350	2947		
	Culex spp.	9	15		
Grand Total		**369**	**3628**		

La Crosse Encephalitis (LAC) to 4 August 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. No human cases have been reported.

County	Species			Positives	MFIR
Burlington		**9**	**199**		
	Aedes albopictus	4	93		
	Aedes japonicus	3	76		
	Aedes triseriatus	2	30		
Sussex		**16**	**62**		
	Aedes triseriatus	16	62		
Grand Total		**25**	**261**		

Dengue (DENV) to 4 August 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.

No pools of Dengue have tested positive in 2017. There are two travel-related human cases in NJ.

County	Species	DENV1		DENV2		DENV3		DENV4		Pos.	MFIR
		Pool	Mos.	Pool	Mos.	Pool	Mos.	Pool	Mos.		
Mercer		**1**	**17**	**1**	**17**	**1**	**17**	**1**	**17**		
	Aedes albopictus	1	17	1	17	1	17	1	17		
Grand Total		**1**	**17**	**1**	**17**	**1**	**17**	**1**	**17**		

Chikungunya (CHIK) to 4 August2017.

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. There are 3 travel-related human cases in NJ.

County	Species	Pools	Mosquitoes	Positives	MFIR
Cape May		**205**	**333**		
	Aedes albopictus	205	333		
Mercer		**1**	**17**		
	Aedes albopictus	1	17		
Grand Total		**206**	**350**		

Zika (ZIKV) to 4 August 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. There are 13 travel-related human cases in NJ.

County	Species	Pools	Mosquitoes	Positives	MFIR
Cape May		**205**	**333**		
	Aedes albopictus	205	333		
Mercer		**1**	**17**		
	Aedes albopictus	1	17		
Grand Total		**206**	**350**		