VECTOR SURVEILLANCE IN NEW JERSEY

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

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CDC WEEK 32: 6 August to 12 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**	0.20	0.40	1 (3)	1 (2)		
Green Bank (Burlington Co.)/25	**Coastal**	3.72	0.48	22 (34)	4 (5)		
Corbin City (Atlantic Co.)/25	**Coastal**	0.94	0.24	94 (100)	10 (11)		
Dennisville (Cape May Co.)/50	**Coastal**	6.31	0.68	69	6		
Winslow (Camden Co.)/50	**Inland**	1.81	0.48	638	19		
Centerton (Salem Co.)/50	**Inland**	2.79	0.80	156	10		
Turkey Swamp (Monmouth Co.)/50	**Inland**	1.80	0.74	64 (101)	9 (10)		
Glassboro (Gloucester Co.)/50	**Inland**	0.23	0.18	81	10		

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

Remarks: First positive EEE pool was detected in a *Culiseta melanura* pool from Burlington County collected on 8 August. No horse cases reported to date.

Traditional Resting Box Sites: 1125 *Cs. melanura* from 69 pools have been tested for EEE, with 57 additional *Cs. melanura* from 4 pools to be tested. No positive pools were detected at these eight sites. Statewide, 3,218 *Cs. melanura* from 291 pools have been tested, with one positive pool detected for an overall *Cs. melanura* MFIR of 0.311. 6,850 specimens from 15 other species have also been tested, with no positives detected. Overall MFIR for all species statewide is 0.099.

	Additional *Cs. melanura* trapped by counties *traps with positives indicated in **BOLD.**				
County	**Trap types***	**Pools**	**Mosquitoes**	**Positives**	**MFIR**
Atlantic	LT, RB	21	230		
Burlington	CO_2, UVLT	32	1083	1	0.923
Cape May	GR, RB	99	349		
Cumberland	LT, RB	7	32		
Gloucester	RB	16	105		
Middlesex	RB	9	164		
Ocean	GR, LT, RB	11	23		
Passaic	RB	3	3		
Salem	LT	3	33		
Sussex	ABC, BGS, RB	21	71		
TOTAL		**222**	**2093**	**1**	**0.478**

Additional *Cs. melanura*: Counties maintain trap sites for *Cs. melanura* in other areas, using a variety of traps. One positive pool was detected in a Burlington County UVLT, collected 8 August.

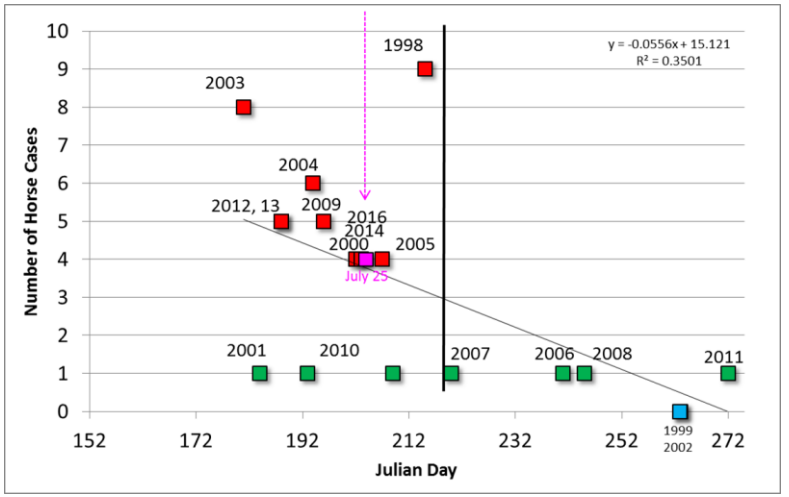
Horses and Humans: No horses have been detected with EEE to date in New Jersey. Nearly all of the horse cases from previous years include those horses who were either not vaccinated or had incomplete vaccination histories. ***Horse owners are urged to make sure their horses are up to date on their vaccinations.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

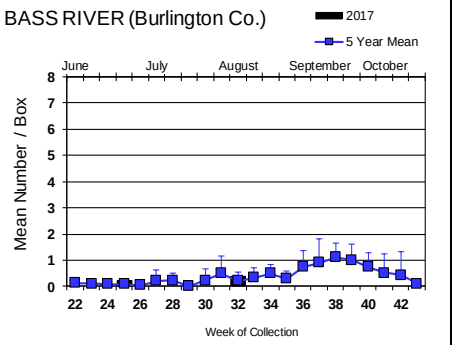
Species other than *Cs. melanura*	Pools	Mosquitoes	Positives	MFIR
Aedes canadensis canadensis	4	41		
Aedes cantator	8	8		
Aedes japonicus	2	20		
Aedes sollicitans	2	14		
Aedes taeniorhynchus	1	8		
Aedes vexans	1	75		
Anopheles bradleyi	66	616		
Anopheles crucians	1	17		
Anopheles punctipennis	19	137		
Anopheles quadrimaculatus	5	34		
Coquillettidia perturbans	50	926		
Culex erraticus	24	438		
Culex pipiens	425	3565		
Culex salinarius	154	901		
Culex sp.	18	49		
Psorophora cyanescens	1	1		
State Total	**781**	**6850**		

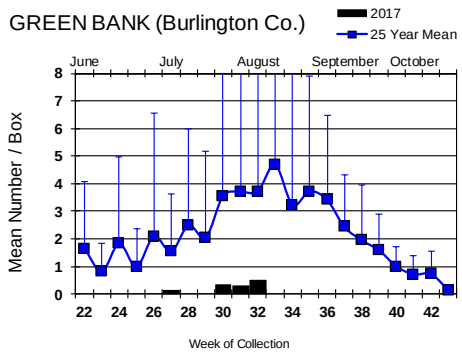
On Julian day 220 (8 Aug), the first positive pool was detected. Past history (graph to right) suggests that multiple horse cases of EEE appear to be more likely if the first positive EEE pools of *Cs. melanura* occur before the first week of August in New Jersey. Hopefully, we are far enough into the season that seasonal amplification of EEE (which is ultimately what the graph represents) remains relatively low. This remains to be seen.

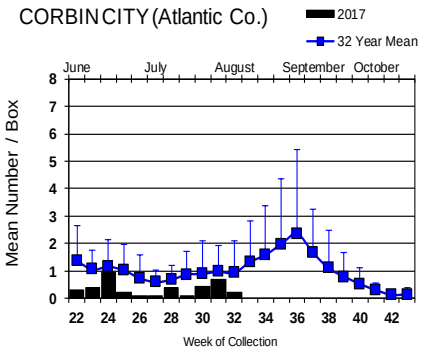


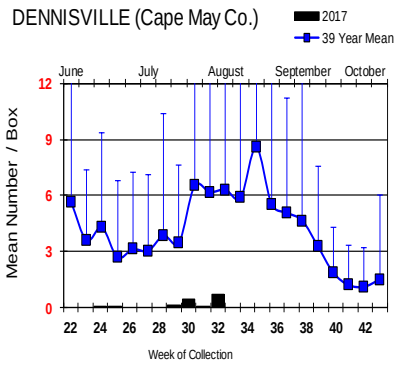
Culiseta melanura Population Graphs

Coastal

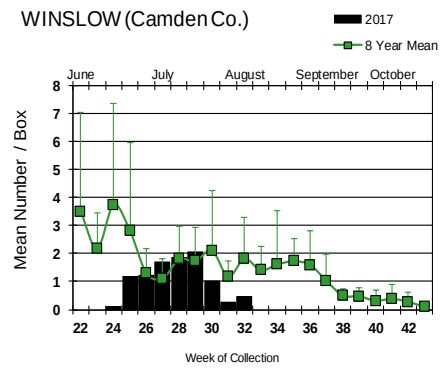


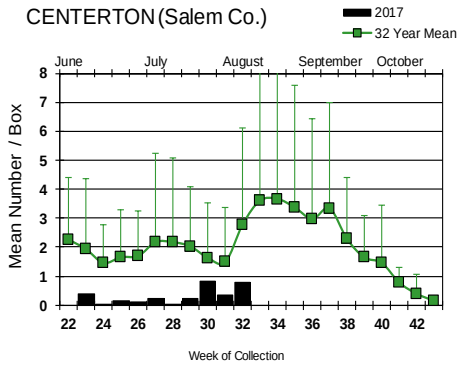


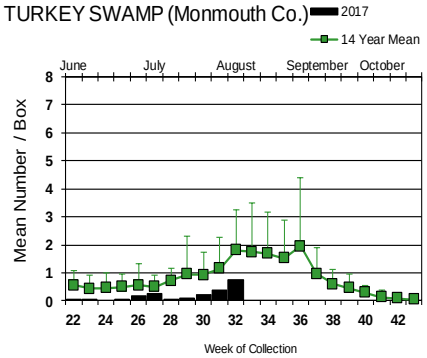


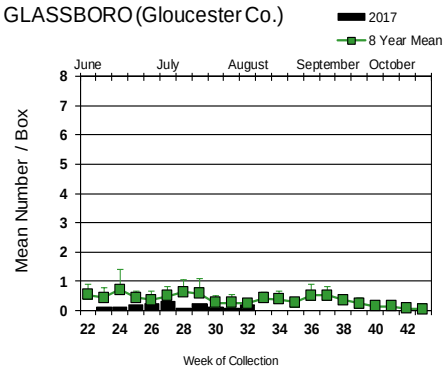


Inland









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(2) NC(1) SC(2) WI(2)
- mosquito pools: NJ(1) NY(1) 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	72		0	30
Arkansas				0	0
California	115/141	1125/1470	34/40	2/5	6/11
Colorado		7/35		1	2
Connecticut		10/22			0
Delaware					
DC					
Florida	1	1	13		0
Georgia		0		1	5/7
Hawaii					
Idaho		42/47		1	1
Illinois	10	550/607			2
Indiana	0	118/176		0	2
Iowa		12/20		0	1
Kansas		13		0	4
Kentucky				3	
Louisiana	13	258			19
Maine		0		0	0
Maryland					
Mass.		56/67		0	0
Michigan				3/5	
Minnesota					3
Mississippi		106/140		1	16/22
Missouri		0		1	2

	Birds	Mosquito Pools	Sentinels	Horses	Humans
Montana					
Nebraska	1	11/13		0	3/8
Nevada					1/6
New Hampshire		2		0	0
New Jersey		107/178		0	0
New Mexico					2
New York		110/137			1
North Carolina					
North Dakota	4/5	5/9		0	5/7
Ohio		151/322			0
Oklahoma					2
Oregon		7/9			1
Pennsylvania	3	644/912		0	1
Rhode Island		0		0	0
South Carolina	4/5	14			
South Dakota		28			4/10
Tennessee					2/3
Texas		390/489			18/24
Utah		45/74		1	0
Vermont					
Virginia				1	1
Washington	0	10/11		1	0
West Virginia					
Wisconsin	48/57	6/14		2/3	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.

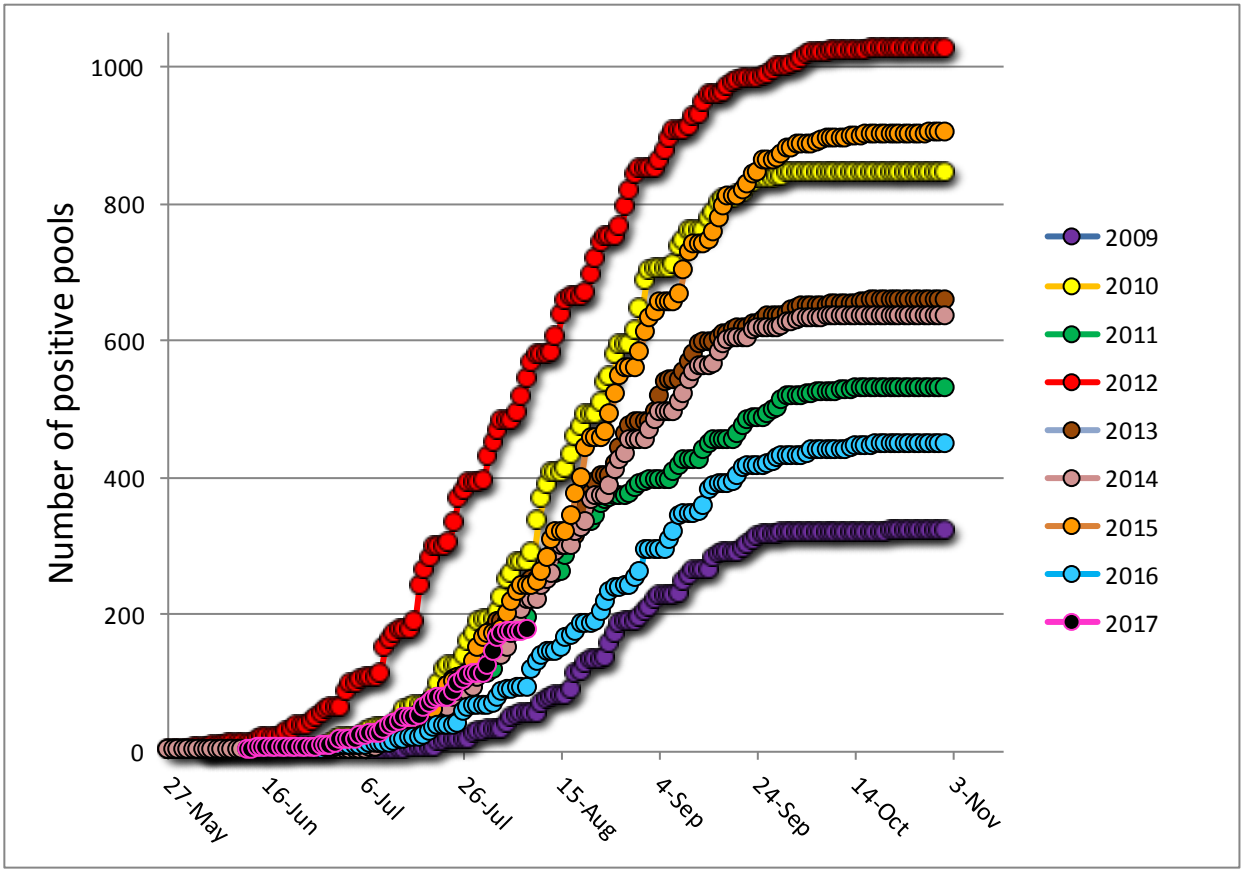
Mosquito Species Submitted and Tested for West Nile Virus Testing through 11 August 2017.

Species	Pools	Mosquitoes	Positives	MFIR
Aedes albopictus	582	4879	3	0.615
Aedes atlanticus	1	2		
Aedes atropalpus	14	77		
Aedes canadensis canadensis	40	429		
Aedes cantator	26	222		
Aedes cinereus	1	54		
Aedes grossbecki	2	4		
Aedes japonicus	241	1070		
Aedes sollicitans	14	376		
Aedes stimulans	1	10		
Aedes taeniorhynchus	8	84		
Aedes triseriatus	170	405		
Aedes trivittatus	3	5		
Aedes vexans	39	472		
Anopheles barberi	3	3		
Anopheles bradleyi	73	837		
Anopheles crucians	1	17		
Anopheles earlei	1	1		
Anopheles punctipennis	45	212		
Anopheles quadrimaculatus	86	552		
Coquillettidia perturbans	60	943		
Culex erraticus	34	504		
Culex pipiens	501	5538	6	1.083
Culex restuans	353	1979	1	0.505
Culex salinarius	163	1281		
Culex spp.	1310	57229	164	2.866
Culex territans	26	83		
Culiseta inornata	1	1		
Culiseta melanura	294	3225	3	0.930
Orthopodomyia signifera	3	3		
Psorophora ciliata	1	1		
Psorophora columbiae	6	48	1	20.833
Psorophora cyanescens	1	1		
Psorophora ferox	5	38		
Uranotaenia sapphirina	2	23		
Grand Total	**4111**	**80608**	**178**	**2.208**

Remarks: To date, 4,111 pools of 80,608 mosquitoes from 34 species have been tested. 178 positive pools have been detected. Most are in the enzootic vector, *Culex* (Mix, *pipiens* or *restuans*). A positive pool was detected in *Psorophora columbiae*, collected on 2 August. Activity jumped considerably in Bergen County within July. Overall MFIR for New Jersey is at 2.208, up from 1.547 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. One additional positive *Culex* was detected in Monmouth County from a non-county collected source, and will be reported when incorporated into the database

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 11 August 2017.

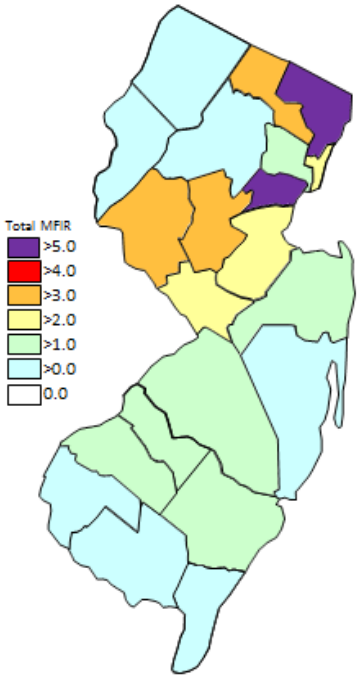
County	Species	Pools	Mosquitoes	Positives	MFIR
Atlantic		**97**	**2621**	**1**	**0.382**
	Aedes japonicus	3	118		
	Aedes sollicitans	4	168		
	Aedes taeniorhynchus	3	71		
	Aedes triseriatus	1	12		
	Aedes vexans	5	224		
	Anopheles bradleyi	5	201		
	Coquillettidia perturbans	11	447		
	Culex erraticus	4	127		
	Culex pipiens	18	608		
	Culex salinarius	1	9		
	Culex spp.	9	281		
	Culiseta melanura	31	324	1	3.086
	Psorophora columbiae	1	1		

	Psorophora ferox	1	30		
Bergen		**80**	**3596**	**30**	**8.343**
	Aedes albopictus	2	75		
	Aedes japonicus	9	86		
	Culex spp.	69	3435	30	8.734
Burlington		**132**	**5051**	**13**	**2.574**
	Aedes albopictus	7	138		
	Aedes canadensis canadensis	2	35		
	Aedes cantator	1	1		
	Aedes japonicus	4	92		
	Aedes taeniorhynchus	1	8		
	Aedes triseriatus	2	30		
	Aedes vexans	1	75		
	Anopheles bradleyi	2	150		
	Anopheles crucians	1	17		
	Coquillettidia perturbans	1	49		
	Culex erraticus	1	65		
	Culex salinarius	5	342		
	Culex spp.	67	2943	11	3.738
	Culiseta melanura	37	1106	2	1.808
Camden		**93**	**3774**	**7**	**1.855**
	Aedes albopictus	4	26		
	Aedes japonicus	9	38		
	Culex spp.	61	3072	7	2.279
	Culiseta melanura	19	638		
Cape May		**1744**	**7520**	**5**	**0.665**
	Aedes albopictus	270	473		
	Aedes atlanticus	1	2		
	Aedes atropalpus	14	77		
	Aedes canadensis canadensis	16	24		
	Aedes cantator	7	7		
	Aedes japonicus	118	243		
	Aedes sollicitans	1	1		
	Aedes taeniorhynchus	1	1		
	Aedes triseriatus	119	203		
	Aedes vexans	12	15		
	Anopheles bradleyi	65	411		
	Anopheles punctipennis	5	8		
	Anopheles quadrimaculatus	69	473		
	Coquillettidia perturbans	13	15		
	Culex erraticus	17	274		
	Culex pipiens	426	3566	5	1.402
	Culex restuans	298	846		
	Culex salinarius	144	332		
	Culex spp.	11	18		
	Culex territans	26	83		
	Culiseta melanura	106	419		
	Orthopodomyia signifera	2	2		
	Psorophora ferox	1	4		
	Uranotaenia sapphirina	2	23		

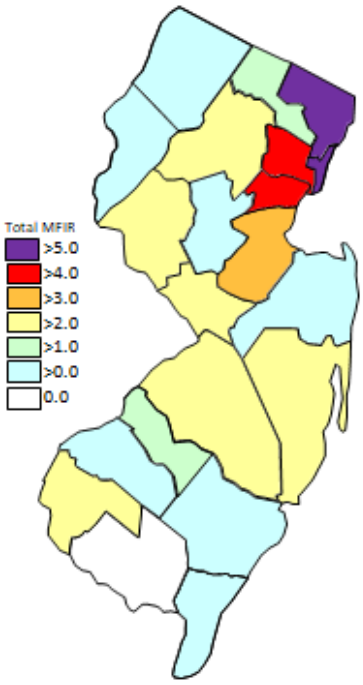
Cumberland		**73**	**809**		
	Aedes albopictus	8	38		
	Aedes japonicus	8	36		
	Aedes sollicitans	1	13		
	Aedes triseriatus	1	2		
	Aedes vexans	5	42		
	Anopheles bradleyi	1	75		
	Anopheles quadrimaculatus	7	37		
	Coquillettidia perturbans	7	100		
	Culex erraticus	1	11		
	Culex salinarius	5	227		
	Culex spp.	21	177		
	Culiseta melanura	7	32		
	Psorophora columbiae	1	19		
Essex		**87**	**653**	**3**	**4.594**
	Aedes albopictus	33	120		
	Aedes japonicus	8	13		
	Culex spp.	46	520	3	5.769
Gloucester		**184**	**6922**	**5**	**0.722**
	Aedes albopictus	42	688	1	1.453
	Aedes japonicus	9	97		
	Aedes triseriatus	2	26		
	Anopheles punctipennis	12	99		
	Anopheles quadrimaculatus	4	33		
	Coquillettidia perturbans	2	7		
	Culex pipiens	9	657		
	Culex spp.	78	5129	4	0.780
	Culiseta melanura	26	186		
Hudson		**86**	**4390**	**27**	**6.150**
	Culex spp.	86	4390	27	6.150
Hunterdon		**143**	**6588**	**16**	**2.429**
	Culex spp.	143	6588	16	2.429
Mercer		**107**	**1907**	**4**	**2.098**
	Aedes albopictus	1	17		
	Aedes japonicus	27	98		
	Culex pipiens	3	127		
	Culex restuans	34	788	1	1.269
	Culex spp.	42	877	3	3.421
Middlesex		**93**	**4972**	**18**	**3.620**
	Culex spp.	84	4808	18	3.744
	Culiseta melanura	9	164		
Monmouth	***One additional *Culex positive pool*	**331**	**4191**	**1**	**0.239**
	Aedes albopictus	140	2493		
	Aedes canadensis canadensis	22	370		
	Aedes cantator	17	176		
	Aedes grossbecki	2	4		
	Aedes japonicus	18	80		
	Aedes sollicitans	8	194		

	Aedes taeniorhynchus	3	4		
	Aedes triseriatus	9	9		
	Aedes trivitattus	2	2		
	Aedes vexans	12	23		
	Anopheles barberi	3	3		
	Anopheles earlei	1	1		
	Anopheles punctipennis	23	73		
	Anopheles quadrimaculatus	2	2		
	Coquillettidia perturbans	7	8		
	Culex erraticus	3	7		
	Culex salinarius	2	14		
	Culex spp.	38	630	1	1.587
	Culiseta inornata	1	1		
	Culiseta melanura	11	70		
	Orthopodomyia signifera	1	1		
	Psorophora ciliata	1	1		
	Psorophora columbiae	3	23		
	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		**115**	**1363**	**4**	**2.935**
	Aedes albopictus	37	488	1	2.049
	Aedes japonicus	5	38		
	Aedes triseriatus	4	12		
	Anopheles punctipennis	1	1		
	Coquillettidia perturbans	5	103		
	Culex erraticus	3	8		
	Culex spp.	49	690	3	4.348
	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		**83**	**895**	**2**	**2.235**
	Aedes albopictus	17	119		
	Aedes japonicus	4	6		
	Aedes triseriatus	10	26		
	Aedes vexans	2	5		
	Anopheles quadrimaculatus	3	4		
	Coquillettidia perturbans	5	39		
	Culex erraticus	3	8		
	Culex pipiens	1	1		
	Culex spp.	23	491	1	2.037
	Culiseta melanura	13	189		
	Psorophora columbiae	1	5	1	200.000

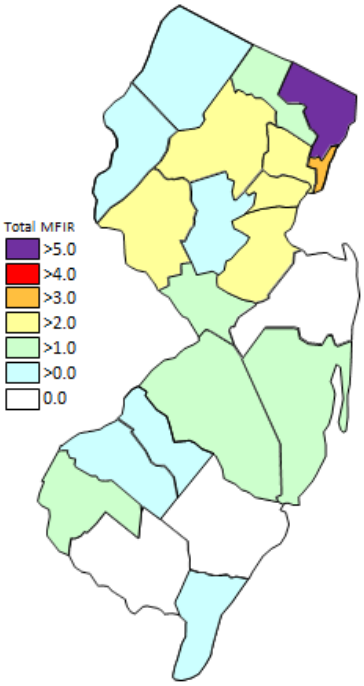
	Psorophora ferox	1	2		
Somerset		**116**	**3738**	**4**	**1.070**
	Aedes albopictus	5	29		
	Aedes japonicus	5	38		
	Aedes triseriatus	1	3		
	Anopheles punctipennis	3	21		
	Culex spp.	102	3647	4	1.097
Sussex		**121**	**2557**	**2**	**0.782**
	Aedes albopictus	4	9		
	Aedes triseriatus	18	71		
	Culex restuans	12	284		
	Culex salinarius	6	357		
	Culex spp.	60	1765	2	1.133
	Culiseta melanura	21	71		
Union		**61**	**3505**	**17**	**4.850**
	Aedes albopictus	11	161	1	6.211
	Culex spp.	50	3344	16	4.785
Warren		**179**	**10215**	**8**	**0.783**
	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.	167	9994	8	0.800
	Psorophora ferox	1	1		
Grand Total		**4111**	**80608**	**178**	**2.208**



Cumulative WNV activity in 2016.



WNV activity to 11 August 2017.



WNV activity last week, 2017

Saint Louis Encephalitis (SLE) to 11 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		**11**	**696**		
	Culex spp.	11	696		
Cape May		**436**	**3583**		
	Culex pipiens	425	3565		
	Culex spp.	11	18		
Grand Total		**447**	**4279**		

La Crosse Encephalitis (LAC) to 11 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		**12**	**249**		
	Aedes albopictus	6	127		
	Aedes japonicus	4	92		
	Aedes triseriatus	2	30		
Sussex		**18**	**71**		
	Aedes triseriatus	18	71		
Grand Total		**30**	**320**		

Dengue (DENV) to 11 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 11 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		**270**	**473**		
	Aedes albopictus	270	473		
Mercer		**1**	**17**		
	Aedes albopictus	1	17		
Grand Total		**271**	**490**		

Zika (ZIKV) to 11 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		**270**	**473**		
	Aedes albopictus	270	473		
Mercer		**1**	**17**		
	Aedes albopictus	1	17		
Grand Total		**271**	**490**		