

VECTOR SURVEILLANCE IN NEW JERSEY

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

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CDC WEEK 27: 1 July to 7 July, 2018



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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	0.17	0.00	0	0		
Green Bank (Burlington Co.)/25	Coastal	1.48	0.00	10	3		
Corbin City (Atlantic Co.)/25	Coastal	0.58	0.16	35 (39)	4 (5)		
Dennisville (Cape May Co.)/50	Coastal	2.96	0.04	239	8		
Winslow (Camden Co.)/50	Inland	1.18	4.68	987	22		
Centerton (Salem Co.)/50	Inland	2.12	0.02	129	6	1	7.752
Turkey Swamp (Monmouth Co.)/50	Inland	0.47	NC	27 (55) ‡	5 (6)		
Glassboro (Gloucester Co.)/48	Inland	0.48	0.46	65	5		

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

Remarks: Currently for the 2018 season, there is one detection of EEE among submitted mosquito pools, in a pool of *Cs. melanura* collected on 26 June at the Centerton traditional resting box site.

Statewide, 2759 *Cs. melanura* from 139 pools have been tested, with one positive pool detected for an overall *Cs. melanura* MFIR of 0.362. 3037 specimens in 254 pools from 11 other species have also been tested, with no positives detected. Overall MFIR for all species statewide is 0.173.

Traditional Resting Box Sites: 1514 *Cs. melanura* from 53 pools have been tested for EEE (plus two pools totaling 32 to be tested) in 2018. No positives for the current week were detected, but one EEE positive pool has been detected earlier from the Centerton site on the western side of the state.

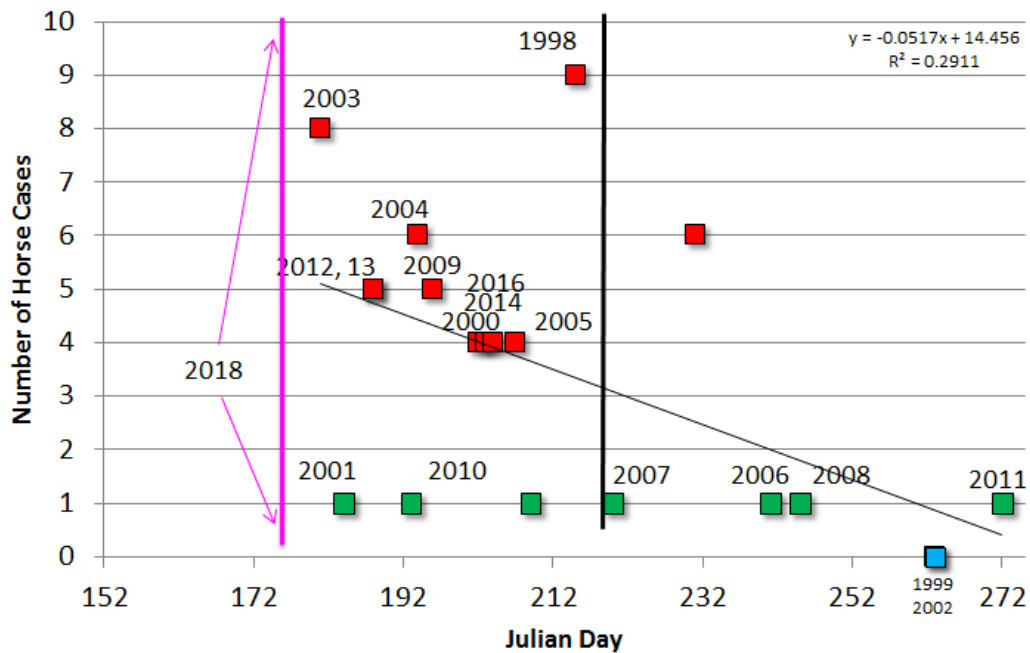
Additional <i>Cs. melanura</i> trapped by counties					
*traps with positives indicated in BOLD .					
County	Trap types*	Pools	Mosquitoes	Positives	MFIR
Atlantic	CO2, RB	11	357		
Bergen	RB	1	3		
Burlington	CDCL	12	525		
Cape May	GR, RB	40	136		
Cumberland	RB	2	15		
Ocean	CDCL, RB	11	102		
Passaic	RB	1	1		
Salem	CDCL	3	46		
Sussex	ABC	5	60		
TOTAL		86	1245		

Additional County-set *Cs. melanura*: Counties maintain trap sites for *Cs. melanura* in other areas, using a variety of traps. No positives have been collected at these sites. (Last week, Monmouth data were from Turkey Swamp and should have been listed in the first table – tables revised.)

Horses and Humans: Currently, there is no horse or human cases reported. Last year, there were 6 horses detected with EEE. EEE is nearly always fatal for those horses without a complete vaccination history. Horses in New Jersey that have gone down in the past with EEE have either an incomplete vaccination history or NO vaccination history. Note that Florida is experiencing early and continued EEE activity with horse and now 1 human case. **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

The graph to the right represents NJ EEE data with the first detection of the virus graphed as Julian date against the number of horse cases that occurred each year from 1998 to present. Around the beginning week of August, where the black line is drawn, we generally get one or no horse cases (exception was 2017, where a late detection was associated with 6 horse cases). This year, first detection occurred on 26 June – the PINK line. This line is the earliest for this graph, and may suggest that we may see multiple horse cases in NJ this year. Horse owners are urged to make sure their livestock/pets are up to date on vaccinations.

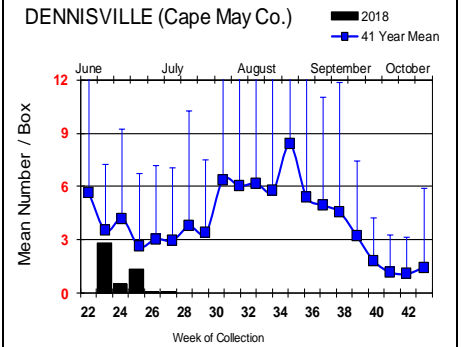
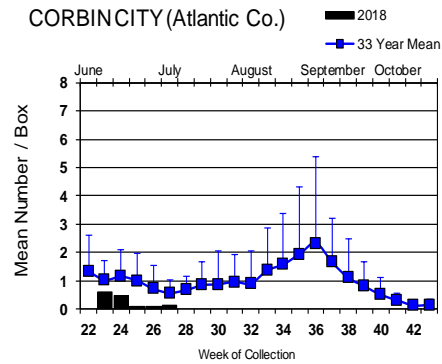
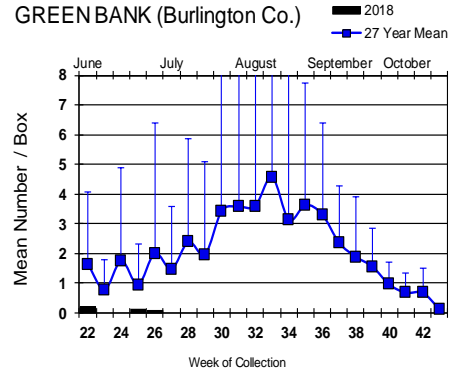
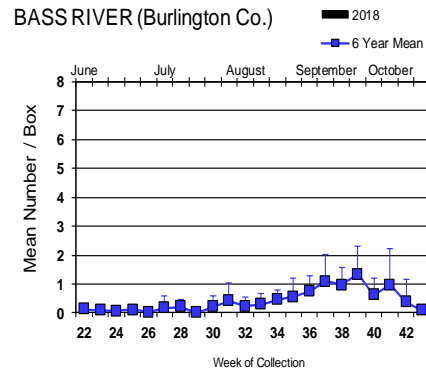


Additional Species: Eleven additional species were tested for EEE. No positives were detected.

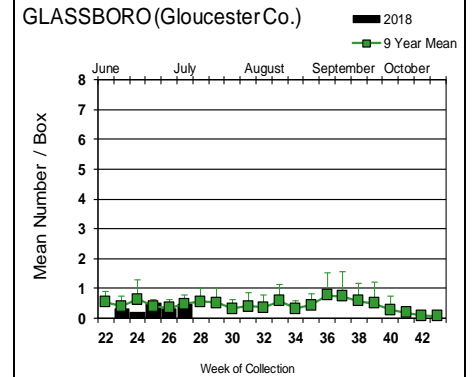
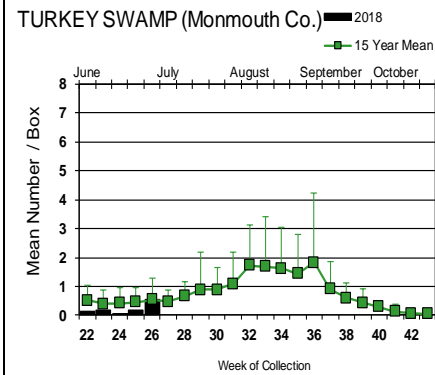
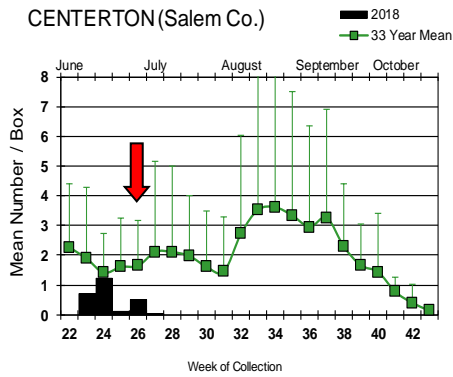
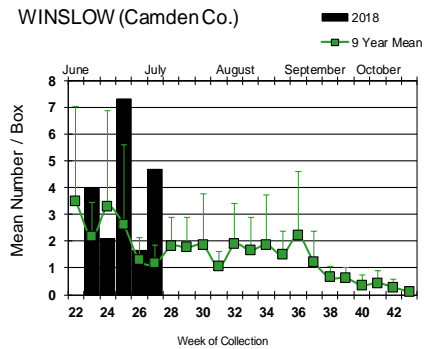
Species other than <i>Cs. melanura</i>	Pools	Mosquitoes	Positives	MFIR
<i>Aedes cantator</i>	2	2		
<i>Aedes sollicitans</i>	1	1		
<i>Anopheles bradleyi</i>	1	6		
<i>Anopheles punctipennis</i>	2	7		
<i>Anopheles quadrimaculatus</i>	1	1		
<i>Coquillettidia perturbans</i>	19	253		
<i>Culex erraticus</i>	5	22		
<i>Culex pipiens</i>	173	2512		
<i>Culex salinarius</i>	31	172		
<i>Culex</i> spp.	18	51		
<i>Culiseta inornata</i>	1	10		
State Total	254	3037		

Culiseta melanura Populations

Coastal



Inland



Populations from the traditional resting box sites were again variable this week, with highest numbers observed at the Winslow site. The first positive *Culiseta melanura* pool was collected last week from the traditional resting box site at Centerton, representing the earliest collection dates from the past twenty year

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

EEE in US (2018 cumulative cases): (Black or Red = previous + new reported cases occurring)

- equine: FL(35/1 mule)
- mosquito pools: FL(2) NJ(1) RI(3)
- sentinel: FL(77/6 owl emus)
- human: FL(1)

West Nile Virus Positive Organisms in US, 2018

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					0
Alaska					
Arizona	0	7	0	0	1
Arkansas		0			0
California	34/35	31/47	0	0	4/9
Colorado		0			0
Connecticut		1/2			0
Delaware					
DC					
Florida			28/30	0	0
Georgia		1			
Hawaii					
Idaho	0	2		0	0
Illinois		63/86		0	1
Indiana	0	2/4		0	0
Iowa		1			
Kansas		0		0	0
Kentucky				0	0
Louisiana	0	9		0	0
Maine		0			0
Maryland	0	0		0	0
Mass.		2/8		0	0
Michigan	2/10	6/7		0	0
Minnesota		1			
Mississippi		4			
Missouri	1	0		0	0

	Birds	Mosquito Pools	Sentinels	Horses	Humans
Montana				0	0
Nebraska		0		0	0
Nevada					
New Hampshire					
New Jersey		7/25		0	0
New Mexico					0
New York					
North Carolina					
North Dakota	2	1		0	2
Ohio		26/67		0	0
Oklahoma		3			1
Oregon	0	1/4	0	0	0
Pennsylvania	0	55/111		0	0
Rhode Island					
South Carolina					
South Dakota		1/6			1
Tennessee					
Texas		58/97			
Utah		1			
Vermont		0		0	0
Virginia					
Washington	0	3/5		0	0
West Virginia		1			
Wisconsin	3/5	3		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 through 6 July 2018

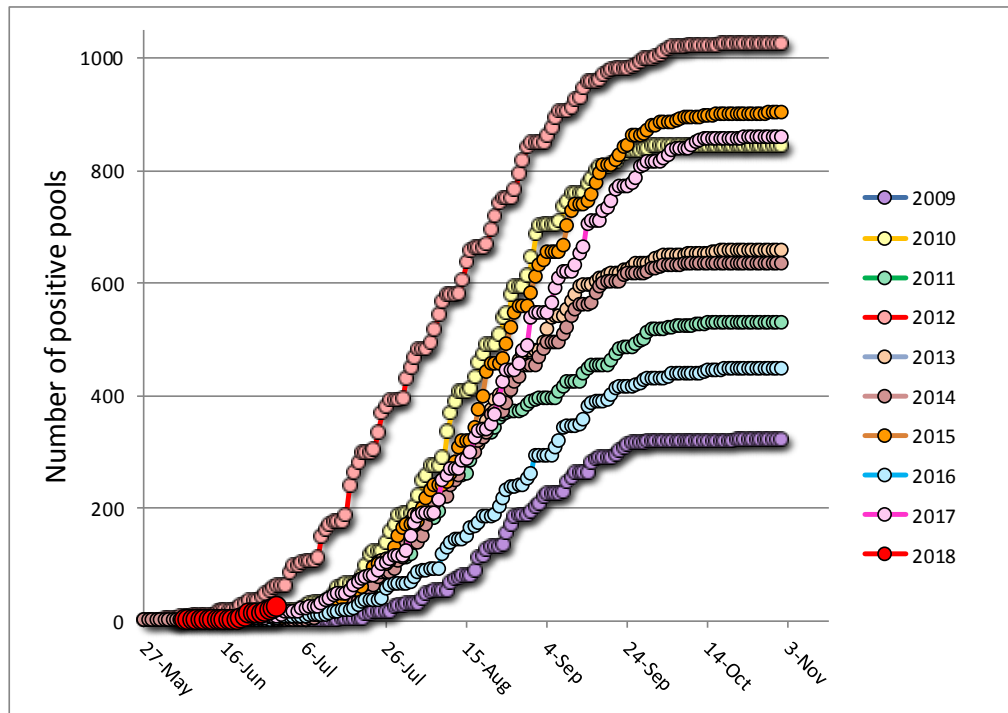
Species	Pools	Mosquitoes	Positives	MFIR
<i>Aedes albopictus</i>	132	504	5	9.921
<i>Aedes atropalpus</i>	11	40		
<i>Aedes canadensis canadensis</i>	13	72		
<i>Aedes cantator</i>	5	50		
<i>Aedes grossbecki</i>	2	10		
<i>Aedes japonicus</i>	140	862	2	2.320
<i>Aedes sollicitans</i>	4	9		
<i>Aedes sticticus</i>	2	2		
<i>Aedes triseriatus</i>	38	79		
<i>Aedes trivittatus</i>	5	53		
<i>Aedes vexans</i>	8	162		
<i>Anopheles barberi</i>	1	7		
<i>Anopheles bradleyi</i>	2	7		
<i>Anopheles punctipennis</i>	15	58		
<i>Anopheles quadrimaculatus</i>	37	933		
<i>Coquillettidia perturbans</i>	22	256	1	3.906
<i>Culex erraticus</i>	5	22		
<i>Culex pipiens</i>	195	3012	2	0.664
<i>Culex restuans</i>	236	2194		
<i>Culex salinarius</i>	38	329		
<i>Culex</i> spp.	630	26507	12	0.453
<i>Culex territans</i>	2	2		
<i>Culiseta inornata</i>	1	10		
<i>Culiseta melanura</i>	136	2704	3	1.109
<i>Psorophora columbiae</i>	2	8		
<i>Psorophora ferox</i>	13	151		
Grand Total	1695	38043	25	0.657

Remarks: To date, 1695 pools of 38,043 mosquitoes from 25 species have been tested. A total of 25 positive WNV pools have been detected and found in Atlantic, Bergen, Camden, Cape May, Gloucester, Hunterdon, Ocean, Salem, Somerset, and Warren counties. First positive WNV pool detected has been revised from 7 June 2018 in Warren County to 5 June in Gloucester County, in *Culex pipiens*. Last year, the first positive *Culex* Mix pool was detected in Sussex County on 12 June and the first non-*Culex* positive was collected in *Aedes albopictus* on 14 July in Gloucester County. This year, the first non-*Culex* positive species was *Aedes japonicus*, also collected in Gloucester County on 7 JUNE, more than one month earlier. Other positive non-*Culex* species include *Aedes albopictus*, *Coquillettidia perturbans*, and *Culiseta melanura*.

***NOTE* - 3 additional WNV pools have been reported to the counties, but are not yet in the database. This report should be considered up for revision as necessary.**

Humans, Horses and Wild Birds: Currently, no horse or human cases of WNV have been detected. In 2017, eight human cases of WNV were detected and two horse cases were detected. 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 previous 9 years, inclusive of the most active (2012) and least active (2009) years. The red series near the bottom of the graph represents this year.

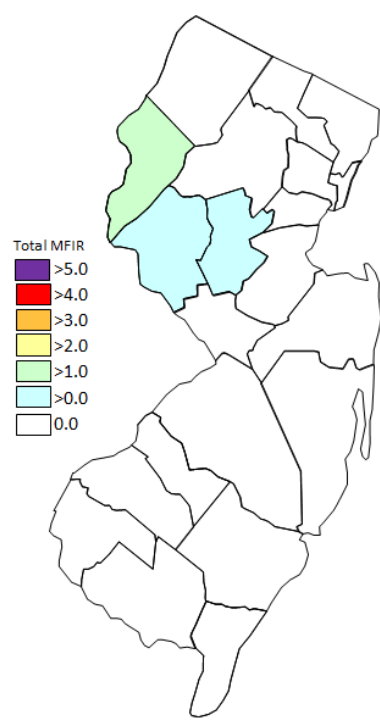
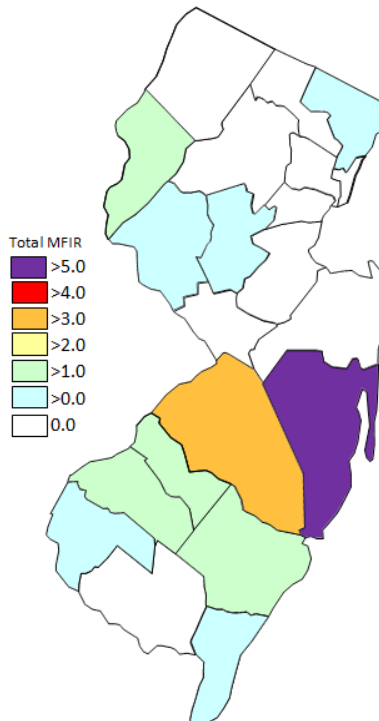
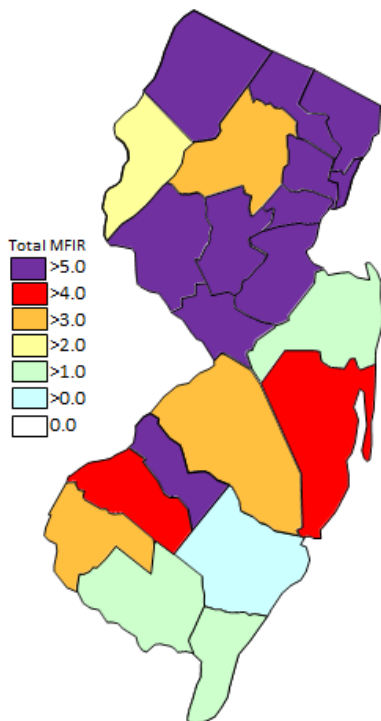
WNV Results by County through 6 July 2018.

County	Species	Pools	Mosquitoes	Positives	MFIR
Atlantic		31	1010	2	1.980
	<i>Aedes albopictus</i>	2	9	1	111.111
	<i>Aedes canadensis canadensis</i>	2	36		
	<i>Aedes japonicus</i>	1	5		
	<i>Aedes vexans</i>	1	20		
	<i>Coquillettidia perturbans</i>	2	29		
	<i>Culex erraticus</i>	1	9		
	<i>Culex pipiens</i>	4	237		
	<i>Culex salinarius</i>	1	24		
	<i>Culex spp.</i>	4	196	1	5.102
	<i>Culiseta melanura</i>	11	336		
	<i>Psorophora ferox</i>	2	109		
Bergen		41	3003	1	0.333
	<i>Culex spp.</i>	40	3000	1	0.333
	<i>Culiseta melanura</i>	1	3		
Burlington		33	1752	3	3.989
	<i>Aedes japonicus</i>	2	69	1	14.493
	<i>Culex salinarius</i>	1	39		
	<i>Culex spp.</i>	21	1119	1	0.894
	<i>Culiseta melanura</i>	12	525	1	1.905
Camden		60	2807	3	1.069
	<i>Aedes albopictus</i>	5	6	1	166.667
	<i>Aedes japonicus</i>	3	23		
	<i>Anopheles punctipennis</i>	2	3		
	<i>Culex spp.</i>	27	1786	2	1.120

<i>Culiseta melanura</i>	22	987		
<i>Psorophora ferox</i>	1	2		
Cape May	704	5845	1	0.171
<i>Aedes albopictus</i>	71	139		
<i>Aedes atropalpus</i>	11	40		
<i>Aedes canadensis canadensis</i>	6	10		
<i>Aedes cantator</i>	2	2		
<i>Aedes japonicus</i>	70	227		
<i>Aedes sollicitans</i>	1	1		
<i>Aedes sticticus</i>	1	1		
<i>Aedes triseriatus</i>	23	48		
<i>Aedes vexans</i>	1	1		
<i>Anopheles bradleyi</i>	1	6		
<i>Anopheles punctipennis</i>	3	5		
<i>Anopheles quadrimaculatus</i>	33	861		
<i>Coquillettidia perturbans</i>	3	3		
<i>Culex erraticus</i>	2	3		
<i>Culex pipiens</i>	173	2512	1	0.398
<i>Culex restuans</i>	206	1426		
<i>Culex salinarius</i>	29	136		
<i>Culex spp.</i>	16	43		
<i>Culex territans</i>	2	2		
<i>Culiseta melanura</i>	48	375		
<i>Psorophora ferox</i>	2	4		
Cumberland	23	271		
<i>Aedes albopictus</i>	3	28		
<i>Aedes japonicus</i>	1	6		
<i>Aedes sticticus</i>	1	1		
<i>Aedes vexans</i>	2	70		
<i>Anopheles punctipennis</i>	3	17		
<i>Anopheles quadrimaculatus</i>	2	70		
<i>Culex erraticus</i>	1	9		
<i>Culex pipiens</i>	3	36		
<i>Culex salinarius</i>	2	2		
<i>Culiseta melanura</i>	2	15		
<i>Psorophora columbiae</i>	1	6		
<i>Psorophora ferox</i>	2	11		
Essex	35	276		
<i>Aedes albopictus</i>	4	4		
<i>Aedes japonicus</i>	3	6		
<i>Aedes trivittatus</i>	3	4		
<i>Culex spp.</i>	25	262		
Gloucester	45	1152	2	1.736
<i>Aedes albopictus</i>	8	19		
<i>Aedes japonicus</i>	9	66	1	15.152
<i>Aedes triseriatus</i>	4	10		
<i>Anopheles barberi</i>	1	7		
<i>Culex pipiens</i>	2	21	1	47.619
<i>Culex spp.</i>	16	942		
<i>Culiseta melanura</i>	5	87		

Hudson	27	1563		
<i>Culex</i> spp.	27	1563		
Hunterdon	64	3183	1	0.314
<i>Culex</i> spp.	64	3183	1	0.314
Mercer	44	1206		
<i>Aedes albopictus</i>	3	56		
<i>Aedes canadensis canadensis</i>	1	6		
<i>Aedes japonicus</i>	9	49		
<i>Aedes vexans</i>	3	69		
<i>Culex pipiens</i>	3	44		
<i>Culex restuans</i>	6	252		
<i>Culex</i> spp.	19	730		
Middlesex	43	1485		
<i>Aedes albopictus</i>	2	12		
<i>Culex</i> spp.	40	1463		
<i>Culiseta melanura</i>	1	10		
Monmouth	103	1513		
<i>Aedes albopictus</i>	21	168		
<i>Aedes canadensis canadensis</i>	2	7		
<i>Aedes cantator</i>	3	48		
<i>Aedes grossbecki</i>	2	10		
<i>Aedes japonicus</i>	7	27		
<i>Aedes sollicitans</i>	3	8		
<i>Aedes trivittatus</i>	2	49		
<i>Aedes vexans</i>	1	2		
<i>Anopheles punctipennis</i>	6	32		
<i>Anopheles quadrimaculatus</i>	1	1		
<i>Culex salinarius</i>	4	108		
<i>Culex</i> spp.	39	1000		
<i>Culiseta melanura</i>	6	28		
<i>Psorophora ferox</i>	6	25		
Morris	99	3641		
<i>Culex</i> spp	99	3641		
Ocean	52	533	5	9.381
<i>Aedes albopictus</i>	5	53	3	56.604
<i>Aedes japonicus</i>	7	19		
<i>Aedes triseriatus</i>	2	4		
<i>Coquillettidia perturbans</i>	7	104	1	9.615
<i>Culex</i> spp.	17	241		
<i>Culiseta melanura</i>	14	112	1	8.929
Passaic	40	405		
<i>Aedes albopictus</i>	2	3		
<i>Aedes japonicus</i>	9	56		
<i>Aedes triseriatus</i>	1	4		
<i>Culex erraticus</i>	1	1		
<i>Culex pipiens</i>	7	158		
<i>Culex restuans</i>	7	83		
<i>Culex</i> spp.	12	99		

<i>Culiseta melanura</i>	1	1		
Salem	90	1738	1	0.575
<i>Aedes albopictus</i>	6	7		
<i>Aedes canadensis canadensis</i>	1	1		
<i>Aedes japonicus</i>	13	114		
<i>Aedes triseriatus</i>	8	13		
<i>Anopheles bradleyi</i>	1	1		
<i>Anopheles punctipennis</i>	1	1		
<i>Anopheles quadrimaculatus</i>	1	1		
<i>Coquillettidia perturbans</i>	10	120		
<i>Culex pipiens</i>	3	4		
<i>Culex restuans</i>	2	13		
<i>Culex</i> spp.	34	1286		
<i>Culiseta melanura</i>	9	175	1	5.714
<i>Psorophora columbiae</i>	1	2		
Somerset	50	2072	2	0.965
<i>Aedes canadensis canadensis</i>	1	12		
<i>Aedes japonicus</i>	2	34		
<i>Culex</i> spp.	47	2026	2	0.987
Sussex	45	1392		
<i>Culex restuans</i>	15	420		
<i>Culex salinarius</i>	1	20		
<i>Culex</i> spp.	24	892		
<i>Culiseta melanura</i>	5	60		
Warren	63	3196	4	1.252
<i>Aedes japonicus</i>	4	161		
<i>Culex</i> spp.	59	3035	4	1.318
Grand Total	1695	38043	25	0.657



Saint Louis Encephalitis (SLE) to 6 July 2018.

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 2018. No human cases have been reported.

County	Species	Pools	Mosquitoes	Positives	MFIR
Burlington		21	1119		
	<i>Culex</i> spp	21	1119		
Cape May		188	2553		
	<i>Culex pipiens</i>	173	2512		
	<i>Culex</i> spp.	15	41		
Grand Total		209	3672		

La Crosse Encephalitis (LAC) to 6 July 2018.

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 LAC have been tested yet for 2018. No human cases have been reported.

County	Species	Pools	Mosquitoes	Positives	MFIR
Burlington		2	69		
	<i>Aedes japonicus</i>	2	69		
Grand Total		2	69		

Dengue (DENV) to 6 July 2018.

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 been tested yet in 2018. There are currently 3 travel-related human cases in NJ.

County	Species	DENV1		DENV2		DENV3		DENV4		Pos.	MFIR
		Pool	Mos.	Pool	Mos.	Pool	Mos.	Pool	Mos.		
Atlantic		2	9	2	9	2	9	2	9		
	<i>Aedes albopictus</i>	2	9	2	9	2	9	2	9		
Middlesex		2	12	2	12	2	12	2	12		
	<i>Aedes albopictus</i>	2	12	2	12	2	12	2	12		
Ocean		5	53	5	53	5	53	5	53		
	<i>Aedes albopictus</i>	5	53	5	53	5	53	5	53		
Grand Total		9	74	9	74	9	74	9	74		

Chikungunya (CHIK) to 6 July 2018.

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 been tested yet in 2018. There are currently 2 travel-related human cases in NJ.

County	Species	Pools	Mosquitoes	Positives	MFIR
Atlantic		2	9		
	<i>Aedes albopictus</i>	2	9		
Middlesex		2	12		
	<i>Aedes albopictus</i>	2	12		
Ocean		5	53		
	<i>Aedes albopictus</i>	5	53		
Grand Total		9	74		

Zika (ZIKV) to 6 July 2018.

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 2018. There are currently 4 travel-related human cases in NJ.

County	Species	Pools	Mosquitoes	Positives	MFIR
Atlantic		2	9		

	<i>Aedes albopictus</i>	2	9		
Cape May		68	136		
	<i>Aedes albopictus</i>	68	136		
Middlesex		2	12		
	<i>Aedes albopictus</i>	2	12		
Ocean		5	53		
	<i>Aedes albopictus</i>	5	53		
Grand Total		77	210		