VECTOR SURVEILLANCE IN NEW JERSEY

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

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CDC WEEK 29: 15 July to 21 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**	0.00	0.00	0	0		
Green Bank (Burlington Co.)/25	**Coastal**	1.97	0.00	11	4		
Corbin City (Atlantic Co.)/25	**Coastal**	0.85	nc	41	6		
Dennisville (Cape May Co.)/50	**Coastal**	3.40	0.16	255	10		
Winslow (Camden Co.)/50	**Inland**	1.76	2.14	1262	29	1	0.792
Centerton (Salem Co.)/50	**Inland**	1.97	0.02	137	8	1	7.300
Turkey Swamp (Monmouth Co.)/50	**Inland**	0.89	nc	55 (61)	6 (7)		
Glassboro (Gloucester Co.)/48	**Inland**	0.52	0.22	103	7		

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

Remarks: Currently for the 2018 season, there are two detections of EEE among submitted mosquito pools, both at resting box sites (Winslow and Centerton).

Statewide, 3557 *Cs. melanura* from 212 pools have been tested, with two positive pools detected for an overall *Cs. melanura* MFIR of 0.562. 6601 specimens in 483 pools from 13 other species have also been tested, with no positives detected. Overall MFIR for all species statewide is 0.197.

Traditional Resting Box Sites: 1864 *Cs. melanura* from 70 pools have been tested for EEE (plus one pools totaling 6 to be tested) in 2018. One additional positive EEE pool was detected from the Winslow resting box site, collected in Week 28.

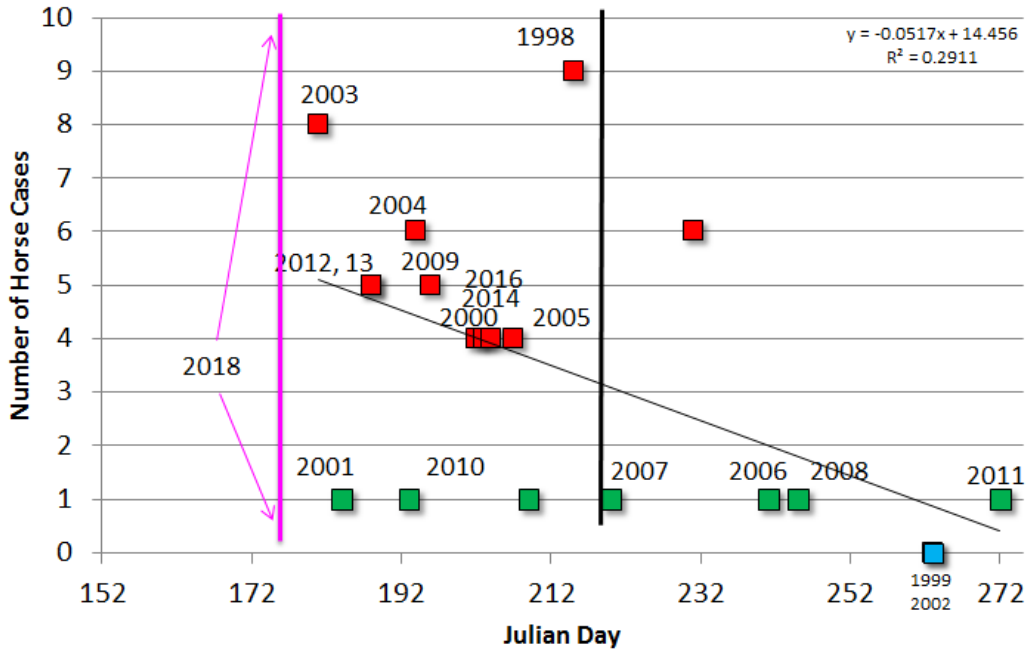
	Additional *Cs. melanura* trapped by counties *traps with positives indicated in **BOLD.**				
County	**Trap types***	**Pools**	**Mosquitoes**	**Positives**	**MFIR**
Atlantic	CO2, RB	13	453		
Bergen	RB	2	4		
Burlington	CDCL	18	755		
Cape May	GR, RB	79	223		
Cumberland	BGSCL, RB	8	42		
Ocean	CDCL, RB	12	103		
Passaic	RB	1	1		
Salem	CDCL	3	46		
Sussex	ABC	5	60		
Warren	CDCL	1	6		
TOTAL		**142**	**1693**		

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.

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



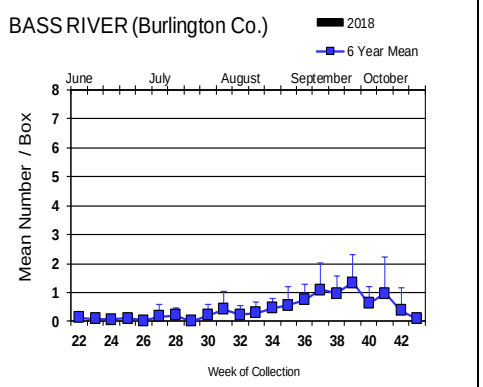
black line is drawn, we generally get one or no horse cases (exception was 2017, where a late detection was associated with 6 horse cases). This year, first detection occurred on 26 June – the PINK line. This line is the earliest for this graph, and may suggest that we may see multiple horse cases in NJ this year. Horse owners are urged to make sure their livestock/pets are up to date on vaccinations.

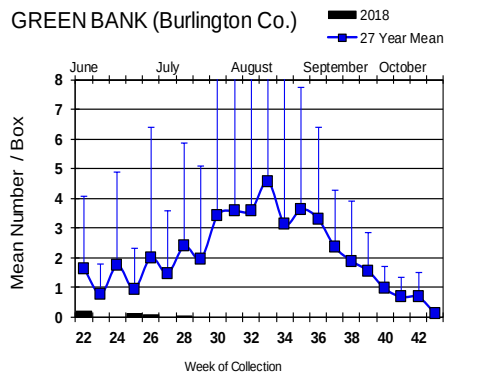
Additional Species: Thirteen additional species were tested for EEE. No positives were detected.

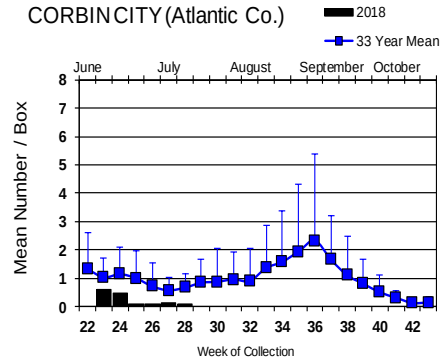
Species other than *Cs. melanura*	**Pools**	**Mosquitoes**	**Positives**	**MFIR**
Aedes canadensis canadensis	1	10		
Aedes cantator	2	2		
Aedes sollicitans	1	1		
Aedes vexans	1	6		
Anopheles bradleyi	4	15		
Anopheles punctipennis	3	11		
Anopheles quadrimaculatus	1	1		
Coquillettidia perturbans	33	839		
Culex erraticus	12	37		
Culex pipiens	315	4990		
Culex salinarius	80	305		
Culex spp.	25	74		
Culiseta inornata	1	10		
Psorophora ferox	4	300		
State Total	**483**	**6601**		

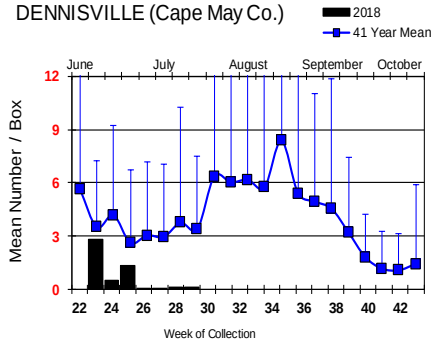
Culiseta melanura Populations

Coastal

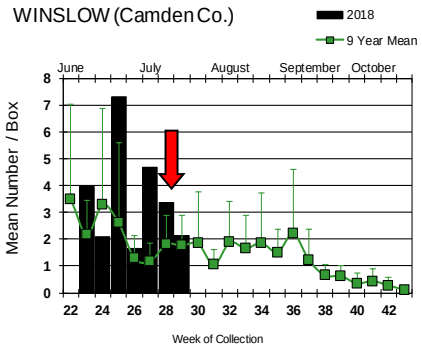


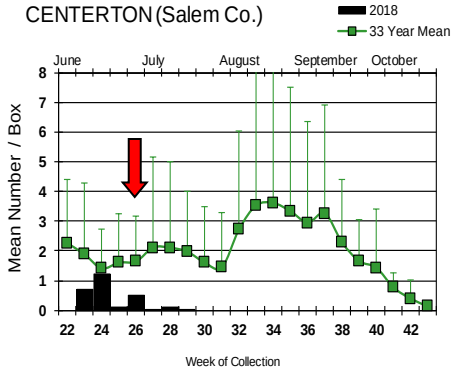


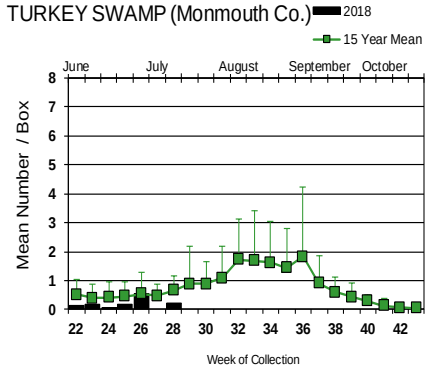


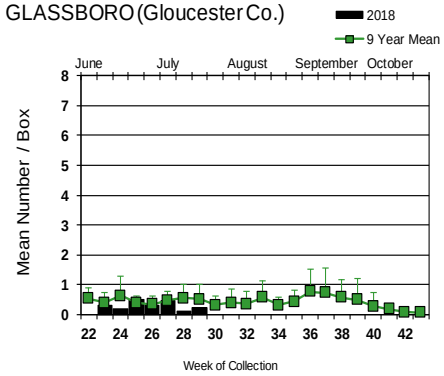


Inland









Populations continue to be low at most sites. A second positive was detected during Week 28 at the Winslow site. The first positive *Culiseta melanura* pool was collected during week 26 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(40/2 mule & donkey)
- mosquito pools: FL(2) NJ(2) RI(4)
- sentinel: FL(96/6 owl emus & 5 emu flocks)
- 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					1
Alaska					
Arizona		7			1
Arkansas					
California	50/67	106/171			9/10
Colorado					
Connecticut		2/8			
Delaware	2				
DC					
Florida	1	1	31/32		
Georgia		Present			
Hawaii					
Idaho		2/4			
Illinois	3	140/338			1
Indiana		17/37			
Iowa		1			
Kansas					
Kentucky		present			
Louisiana	4	9/184			6
Maine					
Maryland					
Mass.		13/45			
Michigan	10	11			
Minnesota		Present			
Mississippi		24/43			1/2
Missouri	1				

	Birds	Mosquito Pools	Sentinels	Horses	Humans
Montana					
Nebraska		2			2
Nevada					
New Hampshire					
New Jersey		44/76			
New Mexico					
New York		1/14			1
North Carolina					
North Dakota	4/5	1/5			2
Ohio		110/308			
Oklahoma		5/6			1
Oregon		4/7			
Pennsylvania		268/589			
Rhode Island					
South Carolina					
South Dakota		7			1
Tennessee					
Texas		134/187			3
Utah		Present			
Vermont		5			
Virginia					
Washington		6/12			
West Virginia		1			
Wisconsin	5/11	4/5			
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 20 July 2018

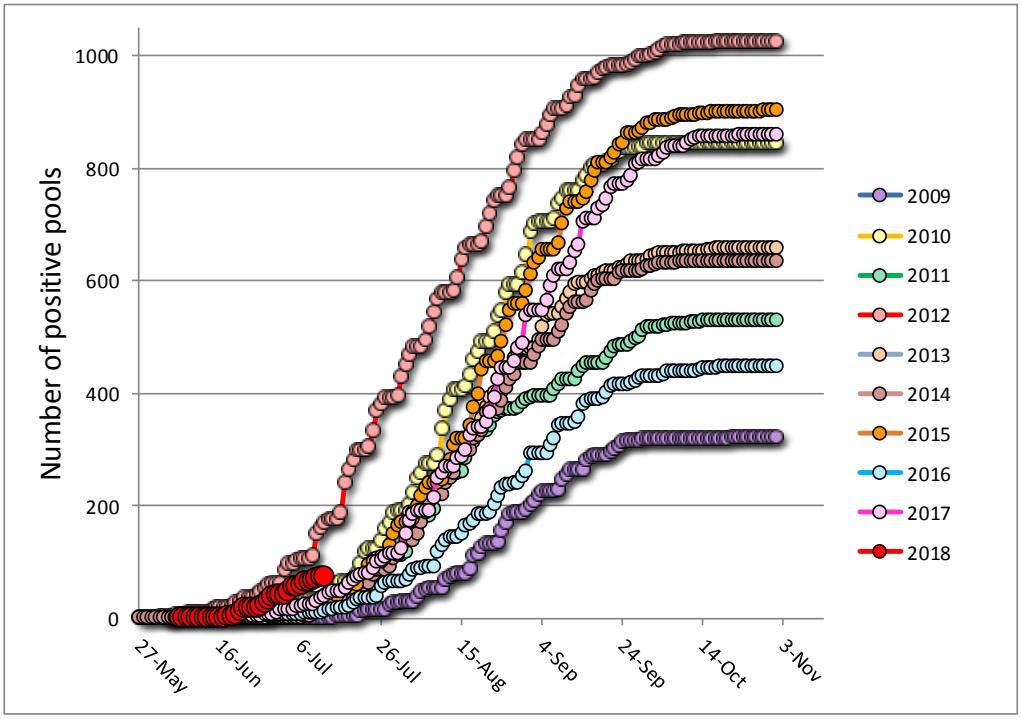
Species	Pools	Mosquitoes	Positives	MFIR
Aedes albopictus	222	865	6	6.936
Aedes atropalpus	13	43		
Aedes canadensis canadensis	21	184		
Aedes cantator	6	51		
Aedes excrucians	1	2		
Aedes grossbecki	2	10		
Aedes infirmatus	1	1		
Aedes japonicus	248	1700	4	2.353
Aedes sollicitans	5	37		
Aedes sticticus	3	37		
Aedes triseriatus	96	242		
Aedes trivittatus	8	63		
Aedes vexans	20	301	1	3.322
Anopheles barberi	1	7		
Anopheles bradleyi	8	32		
Anopheles punctipennis	21	67		
Anopheles quadrimaculatus	71	1450		
Coquillettidia perturbans	41	994	1	1.006
Culex erraticus	16	73	1	13.699
Culex pipiens	340	5522	3	0.543
Culex restuans	308	2964	1	0.337
Culex salinarius	89	537		
Culex spp.	1038	46755	54	1.155
Culex territans	6	22		
Culiseta inornata	1	10		
Culiseta melanura	208	3474	5	1.439
Orthopodomyia signifera	1	2		
Psorophora columbiae	3	17		
Psorophora ferox	25	485		
Grand Total	**2823**	**65947**	**76**	**1.152**

Remarks: To date, 2823 pools of 65,947 mosquitoes from 28 species have been tested. A total of 76 positive WNV pools have been detected and found in Atlantic, Bergen, Burlington, Camden, Cape May, Cumberland, Gloucester, Hudson, Hunterdon, Mercer, Middlesex, Monmouth, Morris, 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, Ae. vexans, Coquillettidia perturbans, Culex erraticus,* and *Culiseta melanura*.

***NOTE* - 1 *additional* WNV pool 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 20 July 2018.

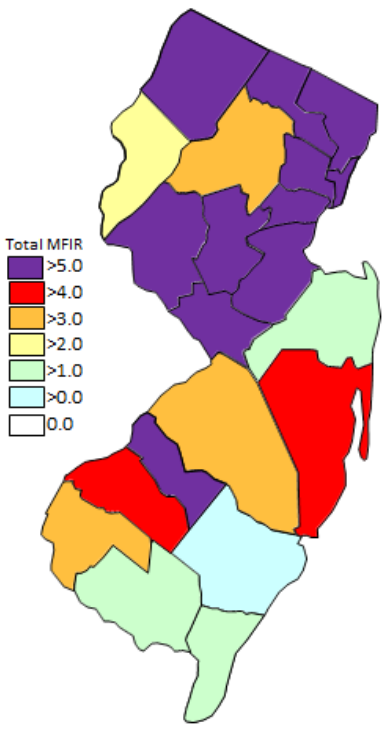
County	Species	Pools	Mosquitoes	Positives	MFIR
Atlantic		**59**	**1979**	**3**	**1.516**
	Aedes albopictus	2	9	1	111.111
	Aedes canadensis canadensis	3	54		
	Aedes japonicus	3	32		
	Aedes sticticus	1	35		
	Aedes vexans	3	32		
	Anopheles bradleyi	2	15		
	Coquillettidia perturbans	6	243		
	Culex erraticus	1	9		
	Culex pipiens	4	237		
	Culex restuans	1	23		
	Culex salinarius	1	24		
	Culex spp.	9	397	2	5.038
	Culiseta melanura	15	438		
	Psorophora ferox	8	431		
Bergen		**83**	**5916**	**9**	**1.521**
	Coquillettidia perturbans	1	17		
	Culex spp.	80	5895	9	1.527
	Culiseta melanura	2	4		
Burlington		**65**	**3060**	**8**	**2.614**
	Aedes canadensis canadensis	1	10		
	Aedes japonicus	4	101	1	9.901

	Aedes triseriatus	1	6		
	Aedes vexans	1	6		
	Culex salinarius	2	45		
	Culex spp.	37	2132	6	2.814
	Culiseta melanura	19	760	1	1.316
Camden		**78**	**3375**	**8**	**2.370**
	Aedes albopictus	7	10	2	200.000
	Aedes excrucuans	1	2		
	Aedes japonicus	6	49		
	Anopheles punctipennis	2	3		
	Culex spp.	32	2047	6	2.931
	Culiseta melanura	29	1262		
	Psorophora ferox	1	2		
Cape May		**1162**	**9455**	**2**	**0.212**
	Aedes albopictus	114	205		
	Aedes atropalpus	13	43		
	Aedes canadensis canadensis	7	11		
	Aedes cantator	2	2		
	Aedes infirmatus	1	1		
	Aedes japonicus	116	332		
	Aedes sollicitans	1	1		
	Aedes sticticus	1	1		
	Aedes triseriatus	59	132		
	Aedes vexans	2	2		
	Anopheles bradleyi	4	15		
	Anopheles punctipennis	5	7		
	Anopheles quadrimaculatus	63	1318		
	Coquillettidia perturbans	4	4		
	Culex erraticus	4	11		
	Culex pipiens	315	4990	2	0.401
	Culex restuans	253	1551		
	Culex salinarius	77	263		
	Culex spp.	22	59		
	Culex territans	6	22		
	Culiseta melanura	89	478		
	Orthopodomyia signifera	1	2		
	Psorophora ferox	3	5		
Cumberland		**68**	**640**	**4**	**6.250**
	Aedes albopictus	13	107		
	Aedes japonicus	6	33		
	Aedes sticticus	1	1		
	Aedes triseriatus	2	7		
	Aedes trivittatus	1	8		
	Aedes vexans	5	133		
	Anopheles punctipennis	4	21		
	Anopheles quadrimaculatus	5	126		
	Culex erraticus	4	14	1	71.429
	Culex pipiens	4	39		
	Culex restuans	1	1		
	Culex salinarius	2	2		
	Culex spp.	7	85	1	11.765
	Culiseta melanura	8	42	2	47.619
	Psorophora columbiae	1	6		

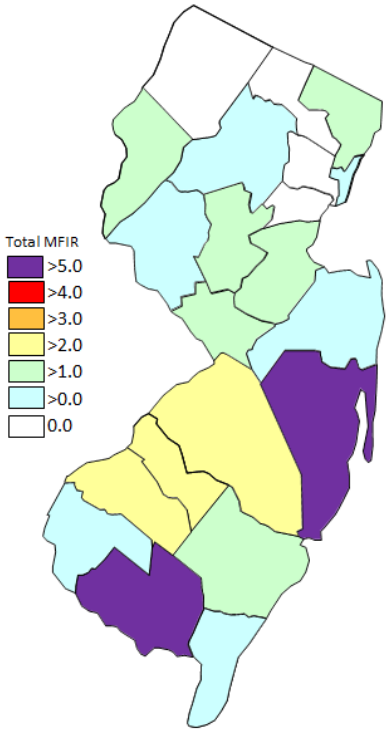
	Psorophora ferox	4	15		
Essex		**44**	**322**		
	Aedes albopictus	6	6		
	Aedes japonicus	5	13		
	Aedes trivittatus	3	4		
	Culex spp.	30	299		
Gloucester		**87**	**2990**	**6**	**2.007**
	Aedes albopictus	13	41		
	Aedes japonicus	19	248	3	12.097
	Aedes triseriatus	6	20		
	Anopheles barberi	1	7		
	Culex pipiens	2	21	1	47.619
	Culex spp.	39	2550	2	0.784
	Culiseta melanura	7	103		
Hudson		**56**	**3220**	**1**	**0.311**
	Culex spp.	56	3220	1	0.311
Hunterdon		**104**	**5183**	**4**	**0.772**
	Culex spp.	104	5183	4	0.772
Mercer		**80**	**1879**	**2**	**1.064**
	Aedes albopictus	5	60		
	Aedes canadensis canadensis	1	6		
	Aedes japonicus	21	107		
	Aedes triseriatus	2	7		
	Aedes vexans	6	101	1	9.901
	Culex pipiens	3	44		
	Culex restuans	19	709	1	1.410
	Culex spp.	23	845		
Middlesex		**86**	**3584**	**7**	**1.953**
	Aedes albopictus	2	12		
	Anopheles punctipennis	1	1		
	Coquillettidia perturbans	1	1		
	Culex spp.	81	3560	7	1.966
	Culiseta melanura	1	10		
Monmouth		**153**	**2787**	**2**	**0.718**
	Aedes albopictus	25	276		
	Aedes canadensis canadensis	7	90		
	Aedes cantator	4	49		
	Aedes grossbecki	2	10		
	Aedes japonicus	9	38		
	Aedes sollicitans	4	36		
	Aedes triseriatus	1	2		
	Aedes trivittatus	4	51		
	Aedes vexans	2	7		
	Anopheles bradleyi	1	1		
	Anopheles punctipennis	8	34		
	Anopheles quadrimaculatus	1	1		
	Coquillettidia perturbans	1	1		
	Culex salinarius	6	183		

	Culex spp.	63	1948	2	1.027
	Culiseta melanura	6	28		
	Psorophora ferox	9	32		
Morris		**124**	**4742**	**1**	**0.211**
	Coquillettidia perturbans	3	150		
	Culex spp	121	4592	1	0.218
Ocean		**100**	**735**	**5**	**6.803**
	Aedes albopictus	21	112	3	26.786
	Aedes japonicus	14	45		
	Aedes triseriatus	9	30		
	Anopheles quadrimaculatus	1	4		
	Coquillettidia perturbans	10	111	1	9.009
	Culex erraticus	1	1		
	Culex spp.	29	323		
	Culiseta melanura	15	109	1	9.174
Passaic		**62**	**626**		
	Aedes albopictus	2	3		
	Aedes japonicus	16	96		
	Aedes triseriatus	1	4		
	Coquillettidia perturbans	1	3		
	Culex erraticus	2	2		
	Culex pipiens	9	187		
	Culex restuans	9	95		
	Culex spp.	21	235		
	Culiseta melanura	1	1		
Salem		**136**	**3978**	**1**	**0.251**
	Aedes albopictus	11	22		
	Aedes canadensis canadensis	1	1		
	Aedes japonicus	15	131		
	Aedes triseriatus	12	17		
	Anopheles bradleyi	1	1		
	Anopheles punctipennis	1	1		
	Anopheles quadrimaculatus	1	1		
	Coquillettidia perturbans	14	464		
	Culex erraticus	4	36		
	Culex pipiens	3	4		
	Culex restuans	2	13		
	Culex spp.	59	3102		
	Culiseta melanura	11	183	1	5.464
	Psorophora columbiae	1	2		
Somerset		**80**	**3323**	**4**	**1.204**
	Aedes albopictus	1	2		
	Aedes canadensis canadensis	1	12		
	Aedes japonicus	5	62		
	Culex spp.	73	3247	4	1.232
Sussex		**83**	**2351**		
	Aedes triseriatus	2	15		
	Culex restuans	23	572		
	Culex salinarius	1	20		

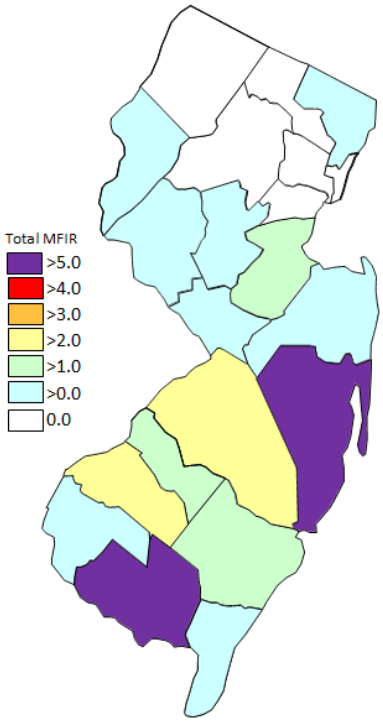
	Culex spp.	52	1684		
	Culiseta melanura	5	60		
Warren		**113**	**5802**	**9**	**1.551**
	Aedes japonicus	9	413		
	Aedes triseriatus	1	2		
	Aedes vexans	1	20		
	Culex spp.	100	5352	9	1.682
	Culiseta melanura	1	6		
	Psorophora columbiae	1	9		
Grand Total		**2823**	**65947**	**76**	**1.152**



Cumulative WNV activity in 2017.



WNV activity to 20 July 2018.



WNV activity last week, 2018

Saint Louis Encephalitis (SLE) to 20 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		**28**	**1615**		
	Culex spp	28	1615		
Cape May		**336**	**5047**		
	Culex pipiens	315	4990		
	Culex spp.	21	57		
Grand Total		**364**	**6662**		

La Crosse Encephalitis (LAC) to 20 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			Positives	MFIR
Burlington		**5**	**107**		
	Aedes japonicus	4	101		
	Aedes triseriatus	1	6		
Ocean		**4**	**9**		
	Aedes albopictus	2	3		
	Aedes japonicus	1	1		
	Aedes triseriatus	1	5		
Sussex		**2**	**15**		
	Aedes triseriatus	2	15		
Grand Total		**11**	**131**		

Dengue (DENV) to 20 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 4 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**		
	Aedes albopictus	2	9	2	9	2	9	2	9		
Middlesex		**2**	**12**	**2**	**12**	**2**	**12**	**2**	**12**		
	Aedes albopictus	2	12	2	12	2	12	2	12		

Ocean		**10**	**68**	**10**	**68**	**10**	**68**	**10**	**68**		
	Aedes albopictus	10	68	10	68	10	68	10	68		
Grand Total		**14**	**89**	**14**	**89**	**14**	**89**	**14**	**89**		

Chikungunya (CHIK) to 20 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 3 travel-related human cases in NJ.

County	Species	Pools	Mosquitoes	Positives	MFIR
Atlantic		**2**	**9**		
	Aedes albopictus	2	9		
Middlesex		**2**	**12**		
	Aedes albopictus	2	12		
Ocean		**10**	**68**		
	Aedes albopictus	10	68		
Grand Total		**14**	**89**		

Zika (ZIKV) to 20 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 6 travel-related human cases in NJ.

County	Species	Pools	Mosquitoes	Positives	MFIR
Atlantic		**2**	**9**		
	Aedes albopictus	2	9		
Cape May		**110**	**200**		
	Aedes albopictus	110	200		
Middlesex		**2**	**12**		
	Aedes albopictus	2	12		
Ocean		**10**	**68**		
	Aedes albopictus	10	68		
Grand Total		**124**	**289**		