VECTOR SURVEILLANCE IN NEW JERSEY

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

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CDC WEEK 28: 8 July to 14 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**	0.20	0.00	0	0		
Green Bank (Burlington Co.)/25	**Coastal**	2.39	0.04	10 (11)	3 (4)		
Corbin City (Atlantic Co.)/25	**Coastal**	0.68	0.08	39 (41)	5 (6)		
Dennisville (Cape May Co.)/50	**Coastal**	3.75	0.16	247	9		
Winslow (Camden Co.)/50	**Inland**	1.81	3.36	1155	26		
Centerton (Salem Co.)/50	**Inland**	2.11	0.10	136	7	1	7.353
Turkey Swamp (Monmouth Co.)/50	**Inland**	0.67	0.24	55 (61)	6 (7)		
Glassboro (Gloucester Co.)/48	**Inland**	056	0.10	92 ‡	6		

*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, 3249 *Cs. melanura* from 184 pools have been tested, with one positive pool detected for an overall *Cs. melanura* MFIR of 0.308. 5718 specimens in 404 pools from 13 other species have also been tested, with no positives detected. Overall MFIR for all species statewide is 0.112.

Traditional Resting Box Sites: 1734 *Cs. melanura* from 62 pools have been tested for EEE (plus three pools totaling 9 to be tested) in 2018. No positives for the current week were detected, but one EEE positive pool had been detected during week 26 from the Centerton site on the western side of the state.

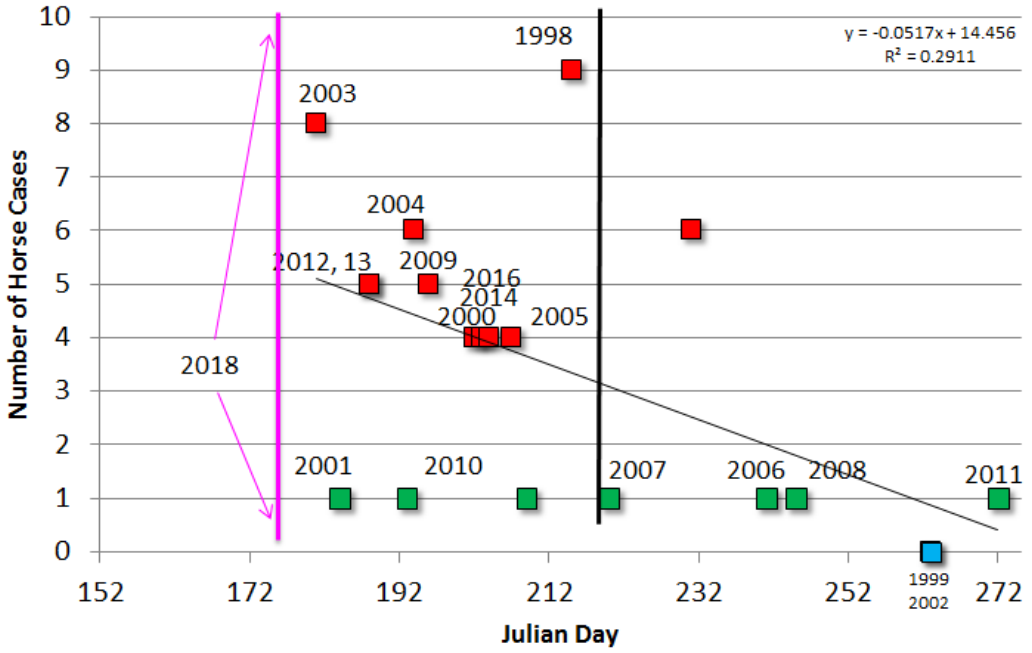
	Additional *Cs. melanura* trapped by counties *traps with positives indicated in **BOLD.**				
County	**Trap types***	**Pools**	**Mosquitoes**	**Positives**	**MFIR**
Atlantic	CO2, RB	13	453		
Bergen	RB	1	3		
Burlington	CDCL	13	600		
Cape May	GR, RB	67	203		
Cumberland	BGSCL, RB	6	40		
Ocean	CDCL, RB	12	103		
Passaic	RB	1	1		
Salem	CDCL	3	46		
Sussex	ABC	5	60		
Warren	CDCL	1	6		
TOTAL		**122**	**1515**		

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



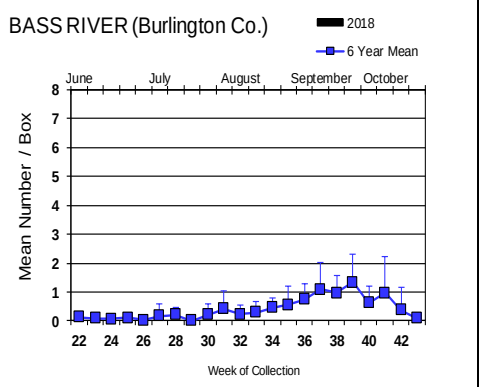
black line is drawn, we generally get one or no horse cases (exception was 2017, where a late detection was associated with 6 horse cases). This year, first detection occurred on 26 June – the PINK line. This line is the earliest for this graph, and may suggest that we may see multiple horse cases in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

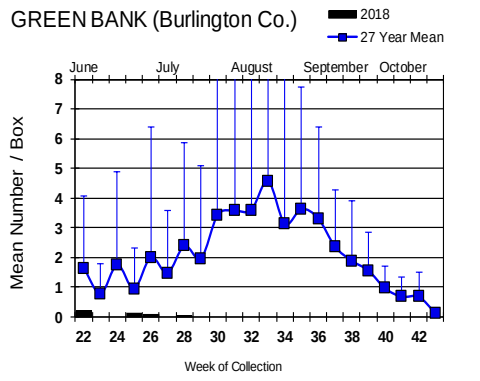
Additional Species: Thirteen additional species were tested for EEE. No positives were detected.

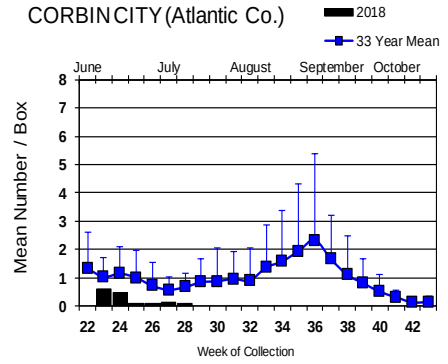
Species other than *Cs. melanura*	**Pools**	**Mosquitoes**	**Positives**	**MFIR**
Aedes canadensis canadensis	1	10		
Aedes cantator	2	2		
Aedes sollicitans	1	1		
Aedes vexans	1	6		
Anopheles bradleyi	3	12		
Anopheles punctipennis	3	11		
Anopheles quadrimaculatus	1	1		
Coquillettidia perturbans	27	625		
Culex erraticus	9	31		
Culex pipiens	271	4374		
Culex salinarius	57	267		
Culex spp.	23	68		
Culiseta inornata	1	10		
Psorophora ferox	4	300		
State Total	**404**	**5718**		

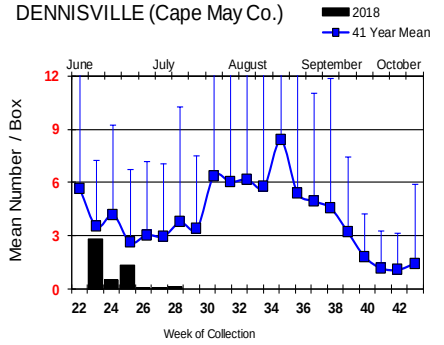
Culiseta melanura Populations

Coastal

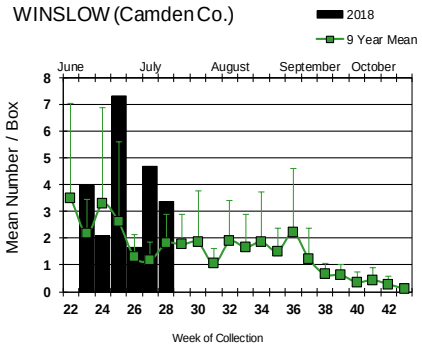


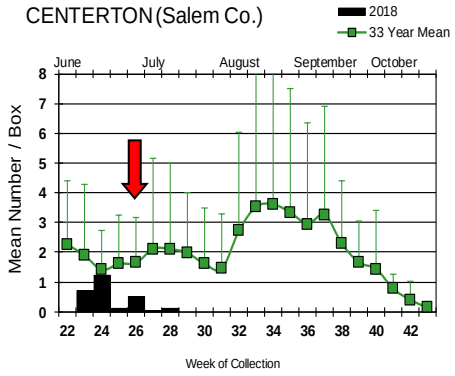


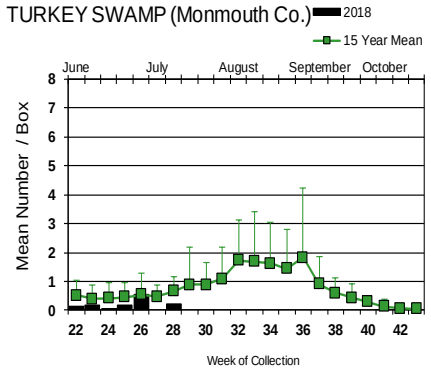


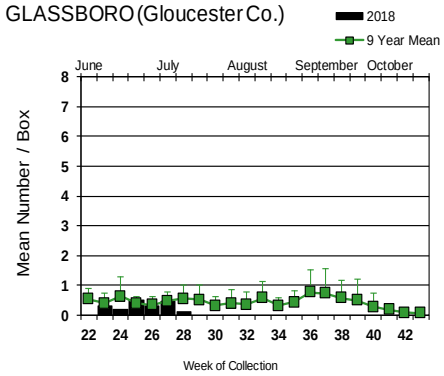


Inland









Apart from populations at the Winslow resting box site, all other sites are well below historical values. 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(37/2 mule & donkey) NC(2)
- mosquito pools: FL(2) NJ(1) RI(3)
- sentinel: FL(89/6 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					1
Alaska					
Arizona		7			1
Arkansas					
California	35/50	47/106			9
Colorado					
Connecticut		1/2			
Delaware	2				
DC					
Florida			30/31		
Georgia		1			
Hawaii					
Idaho		2			
Illinois		86/140			1
Indiana		4/17			
Iowa		1			
Kansas					
Kentucky		present			
Louisiana		9			
Maine					
Maryland					
Mass.		8/13			
Michigan	10	7/11			
Minnesota		Present			
Mississippi		4/24			1
Missouri	1				

	Birds	Mosquito Pools	Sentinels	Horses	Humans
Montana					
Nebraska					
Nevada					
New Hampshire					
New Jersey		1/7			
New Mexico					
New York		1			1
North Carolina					
North Dakota	2/4	1			2
Ohio		67/110			
Oklahoma		3/5			1
Oregon		4			
Pennsylvania		111/268			
Rhode Island					
South Carolina					
South Dakota		7			1
Tennessee					
Texas		97/134			
Utah		Present			
Vermont		5			
Virginia					
Washington		5/6			
West Virginia		1			
Wisconsin	5	3/4			
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 13 July 2018

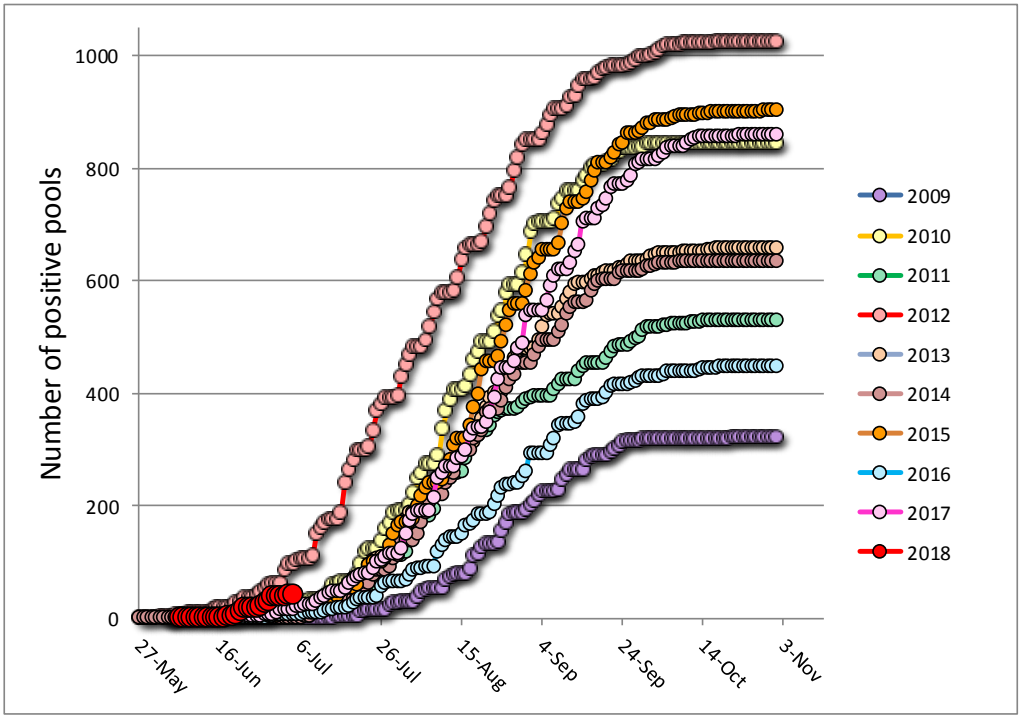
Species	Pools	Mosquitoes	Positives	MFIR
Aedes albopictus	191	726	6	8.264
Aedes atropalpus	13	43		
Aedes canadensis canadensis	19	157		
Aedes cantator	5	50		
Aedes excrucians	1	2		
Aedes grossbecki	2	10		
Aedes infirmatus	1	1		
Aedes japonicus	206	1342	4	2.981
Aedes sollicitans	5	37		
Aedes sticticus	3	37		
Aedes triseriatus	71	171		
Aedes trivittatus	6	61		
Aedes vexans	15	266	1	3.759
Anopheles barberi	1	7		
Anopheles bradleyi	6	28		
Anopheles punctipennis	16	62		
Anopheles quadrimaculatus	58	1318		
Coquillettidia perturbans	33	778	1	1.285
Culex erraticus	11	37	1	27.027
Culex pipiens	293	4874	2	0.410
Culex restuans	272	2586		
Culex salinarius	66	499		
Culex spp.	815	35389	24	0.678
Culex territans	2	2		
Culiseta inornata	1	10		
Culiseta melanura	185	3250	5	1.538
Orthopodomyia signifera	1	2		
Psorophora columbiae	3	17		
Psorophora ferox	19	453		
Grand Total	**2320**	**52215**	**44**	**0.843**

Remarks: To date, 2320 pools of 52,215 mosquitoes from 28 species have been tested. A total of 44 positive WNV pools have been detected and found in Atlantic, Bergen, Burlington, Camden, Cape May, Cumberland, Gloucester, Hunterdon, Mercer, Middlesex, Monmouth, 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* - 7 *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.

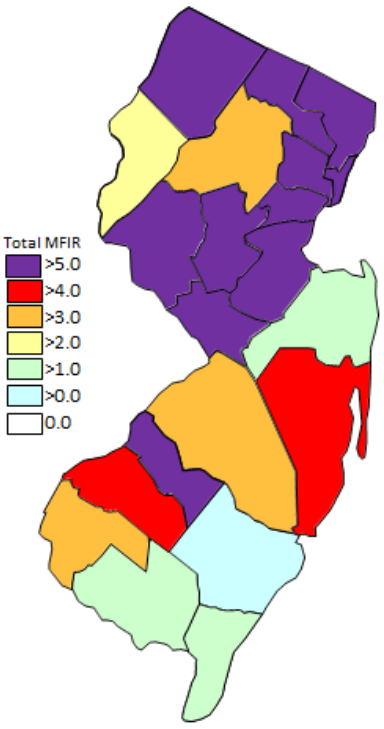
WNV Results by County through 13 July 2018.

County	Species	Pools	Mosquitoes	Positives	MFIR
Atlantic		**51**	**1796**	**2**	**1.114**
	Aedes albopictus	2	9	1	111.111
	Aedes canadensis canadensis	2	36		
	Aedes japonicus	1	5		
	Aedes sticticus	1	35		
	Aedes vexans	1	20		
	Anopheles bradleyi	2	15		
	Coquillettidia perturbans	5	237		
	Culex erraticus	1	9		
	Culex pipiens	4	237		
	Culex restuans	1	23		
	Culex salinarius	1	24		
	Culex spp.	6	245	1	4.082
	Culiseta melanura	18	492		
	Psorophora ferox	6	409		
Bergen		**61**	**4503**	**4**	**0.888**
	Culex spp.	60	4500	4	0.889
	Culiseta melanura	1	3		
Burlington		**49**	**2231**	**5**	**2.241**
	Aedes canadensis canadensis	1	10		
	Aedes japonicus	3	73	1	13.699
	Aedes triseriatus	1	6		

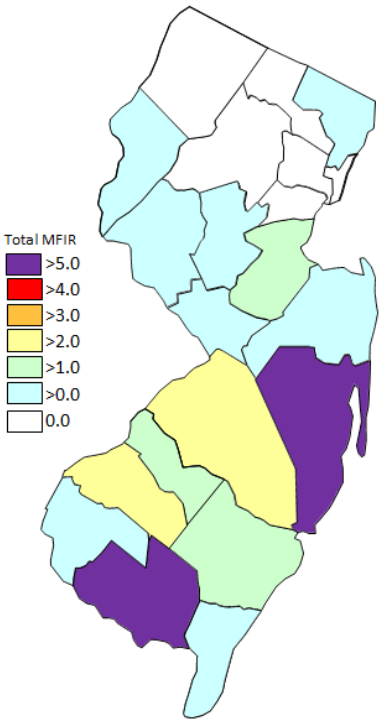
	Aedes vexans	1	6		
	Culex salinarius	2	45		
	Culex spp.	26	1484	2	1.348
	Culiseta melanura	15	607	2	3.295
Camden		**70**	**3181**	**6**	**1.886**
	Aedes albopictus	6	7	2	285.714
	Aedes excrucuans	1	2		
	Aedes japonicus	4	25		
	Anopheles punctipennis	2	3		
	Culex spp.	30	1987	4	2.013
	Culiseta melanura	26	1155		
	Psorophora ferox	1	2		
Cape May		**1004**	**8577**	**1**	**0.117**
	Aedes albopictus	100	185		
	Aedes atropalpus	13	43		
	Aedes canadensis canadensis	7	11		
	Aedes cantator	2	2		
	Aedes infirmatus	1	1		
	Aedes japonicus	104	318		
	Aedes sollicitans	1	1		
	Aedes sticticus	1	1		
	Aedes triseriatus	45	104		
	Aedes vexans	2	2		
	Anopheles bradleyi	3	12		
	Anopheles punctipennis	3	5		
	Anopheles quadrimaculatus	54	1246		
	Coquillettidia perturbans	4	4		
	Culex erraticus	3	9		
	Culex pipiens	271	4374	1	0.229
	Culex restuans	234	1522		
	Culex salinarius	54	225		
	Culex spp.	20	53		
	Culex territans	2	2		
	Culiseta melanura	76	450		
	Orthopodomyia signifera	1	2		
	Psorophora ferox	3	5		
Cumberland		**48**	**497**	**4**	**8.048**
	Aedes albopictus	9	56		
	Aedes japonicus	4	27		
	Aedes sticticus	1	1		
	Aedes triseriatus	1	1		
	Aedes trivittatus	1	8		
	Aedes vexans	4	132		
	Anopheles punctipennis	3	17		
	Anopheles quadrimaculatus	2	70		
	Culex erraticus	3	11	1	90.909
	Culex pipiens	3	36		
	Culex salinarius	2	2		
	Culex spp.	6	79	1	12.658
	Culiseta melanura	6	40	2	50.000
	Psorophora columbiae	1	6		
	Psorophora ferox	2	11		

Essex		**35**	**276**		
	Aedes albopictus	4	4		
	Aedes japonicus	3	6		
	Aedes trivittatus	3	4		
	Culex spp.	25	262		
Gloucester		**66**	**1863**	**4**	**2.147**
	Aedes albopictus	11	27		
	Aedes japonicus	17	206	3	14.563
	Aedes triseriatus	5	14		
	Anopheles barberi	1	7		
	Culex pipiens	2	21	1	47.619
	Culex spp.	24	1496		
	Culiseta melanura	6	92		
Hudson		**42**	**2336**		
	Culex spp.	42	2336		
Hunterdon		**84**	**4183**	**2**	**0.478**
	Culex spp.	84	4183	2	0.478
Mercer		**60**	**1549**	**1**	**0.646**
	Aedes albopictus	4	58		
	Aedes canadensis canadensis	1	6		
	Aedes japonicus	16	73		
	Aedes vexans	4	79	1	12.658
	Culex pipiens	3	44		
	Culex restuans	12	504		
	Culex spp.	20	785		
Middlesex		**63**	**2685**	**3**	**1.117**
	Aedes albopictus	2	12		
	Culex spp.	60	2663	3	1.127
	Culiseta melanura	1	10		
Monmouth		**131**	**2292**	**1**	**0.436**
	Aedes albopictus	25	276		
	Aedes canadensis canadensis	6	81		
	Aedes cantator	3	48		
	Aedes grossbecki	2	10		
	Aedes japonicus	8	35		
	Aedes sollicitans	4	36		
	Aedes trivittatus	2	49		
	Aedes vexans	2	7		
	Anopheles punctipennis	7	36		
	Anopheles quadrimaculatus	1	1		
	Culex salinarius	6	183		
	Culex spp.	51	1448	1	0.691
	Culiseta melanura	7	56		
	Psorophora ferox	7	26		
Morris		**102**	**3791**		
	Coquillettidia perturbans	3	150		
	Culex spp	99	3641		

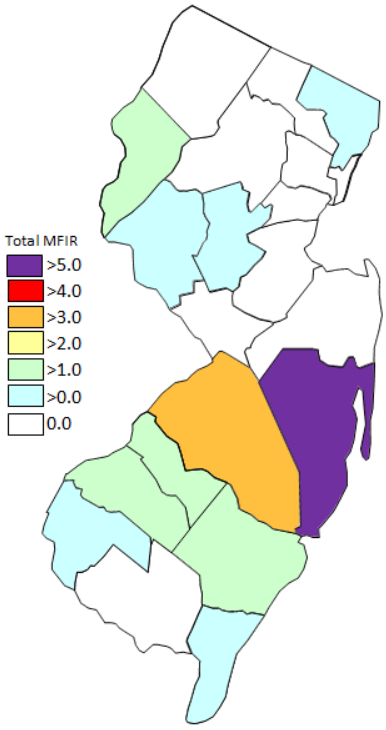
Ocean		**82**	**669**	**4**	**5.979**
	Aedes albopictus	16	78	3	38.462
	Aedes japonicus	12	43		
	Aedes triseriatus	7	26		
	Coquillettidia perturbans	9	108	1	9.259
	Culex spp.	25	308		
	Culiseta melanura	13	106		
Passaic		**41**	**406**		
	Aedes albopictus	2	3		
	Aedes japonicus	9	56		
	Aedes triseriatus	1	4		
	Culex erraticus	2	2		
	Culex pipiens	7	158		
	Culex restuans	7	83		
	Culex spp.	12	99		
	Culiseta melanura	1	1		
Salem		**113**	**2423**	**1**	**0.413**
	Aedes albopictus	10	11		
	Aedes canadensis canadensis	1	1		
	Aedes japonicus	15	131		
	Aedes triseriatus	11	16		
	Anopheles bradleyi	1	1		
	Anopheles punctipennis	1	1		
	Anopheles quadrimaculatus	1	1		
	Coquillettidia perturbans	12	279		
	Culex erraticus	2	6		
	Culex pipiens	3	4		
	Culex restuans	2	13		
	Culex spp.	43	1775		
	Culiseta melanura	10	182	1	5.495
	Psorophora columbiae	1	2		
Somerset		**65**	**2744**	**2**	**0.729**
	Aedes canadensis canadensis	1	12		
	Aedes japonicus	4	56		
	Culex spp.	60	2676	2	0.747
Sussex		**65**	**1926**		
	Culex restuans	16	441		
	Culex salinarius	1	20		
	Culex spp.	43	1405		
	Culiseta melanura	5	60		
Warren		**88**	**4287**	**4**	**0.933**
	Aedes japonicus	6	288		
	Aedes vexans	1	20		
	Culex spp.	79	3964	4	1.009
	Culiseta melanura	1	6		
	Psorophora columbiae	1	9		
Grand Total		**2320**	**52215**	**44**	**0.843**



Cumulative WNV activity in 2017.



WNV activity to 13 July 2018.



WNV activity last week, 2018

Saint Louis Encephalitis (SLE) to 13 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		**26**	**1484**		
	Culex spp	26	1484		
Cape May		**290**	**4425**		
	Culex pipiens	271	4374		
	Culex spp.	19	51		
Grand Total		**316**	**5909**		

La Crosse Encephalitis (LAC) to 13 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		**4**	**79**		
	Aedes japonicus	3	73		
	Aedes triseriatus	1	6		
Ocean		**4**	**9**		
	Aedes albopictus	2	3		
	Aedes japonicus	1	1		
	Aedes triseriatus	1	5		
Grand Total		**8**	**88**		

Dengue (DENV) to 13 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 13 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 13 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 5 travel-related human cases in NJ.

County	Species	Pools	Mosquitoes	Positives	MFIR
Atlantic		**2**	**9**		
	Aedes albopictus	2	9		
Cape May		**96**	**180**		
	Aedes albopictus	96	180		
Middlesex		**2**	**12**		
	Aedes albopictus	2	12		
Ocean		**10**	**68**		
	Aedes albopictus	10	68		
Grand Total		**110**	**269**		