VECTOR SURVEILLANCE IN NEW JERSEY

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

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CDC WEEK 35: 27 August to 2 September, 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**	0.30	1.80	5 (14)	3 (4)		
Green Bank (Burlington Co.)/18	**Coastal**	3.72	1.39	89 (114)	7 (8)		
Corbin City (Atlantic Co.)/25	**Coastal**	1.99	0.84	202 (223)	13 (14)		
Dennisville (Cape May Co.)/50	**Coastal**	5.53	0.28	97	9		
Winslow (Camden Co.)/50	**Inland**	1.73	0.46	777	23		
Centerton (Salem Co.)/50	**Inland**	3.37	2.18	417	17	1	2.40
Turkey Swamp (Monmouth Co.)/50	**Inland**	1.53	0.18	174 (183)	12 (13)		
Glassboro (Gloucester Co.)/50	**Inland**	0.29	0.48	127	13		

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

Remarks: Five positive EEE pools have been detected in a *Culiseta melanura*. The latest two positives were found in county-set traps from Cape Maya nd Cumberland counties. One horse cases reported in Cumberland County.

Statewide, 4,791 *Cs. melanura* from 397 pools have been tested, with five positive pools detected for an overall *Cs. melanura* MFIR of 1.044. 9,273 specimens from 16 other species have also been tested, with no positives detected. Overall MFIR for all species statewide is 0.332.

Traditional Resting Box Sites: 1888 *Cs. melanura* from 97 pools have been tested for EEE, with 64 additional *Cs. melanura* from 4 pools to be tested. One positive pool was detected at the Centerton site, collected on 22 Aug.

	Additional *Cs. melanura* trapped by counties *traps with positives indicated in **BOLD.**				
County	**Trap types***	**Pools**	**Mosquitoes**	**Positives**	**MFIR**
Atlantic	GR, LT, RB	26	327		
Burlington	CO_2, **UVLT**	42	1331	2	1.50
Cape May	GR, RB	120	438	1	2.28
Cumberland	LT, RB	9	45	1	22.22
Gloucester	RB	35	287		
Middlesex	RB	15	278		
Monmouth	CDC	1	1		
Morris	ABC	1	1		
Ocean	GR, LT, RB	15	41		
Passaic	RB	3	3		
Salem	LT	4	34		
Sussex	ABC, BGS, GR, RB	28	104		
Warren	LT	1	13		
TOTAL		**300**	**2903**	**4**	1.38

Additional County-set *Cs. melanura*: Counties maintain trap sites for *Cs. melanura* in other areas, using a variety of traps. Two additional positive pools from Cape May and Cumberland counties were both collected on 17 Aug. Two positive pools was previously detected in Burlington County UVLTs.

Horses and Humans: One horse has been detected with EEE in New Jersey. This was a 5 yo mare from Cumberland County, with onset date of 23 Aug, euthanized on 28 Aug. There was no vaccination history. 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.

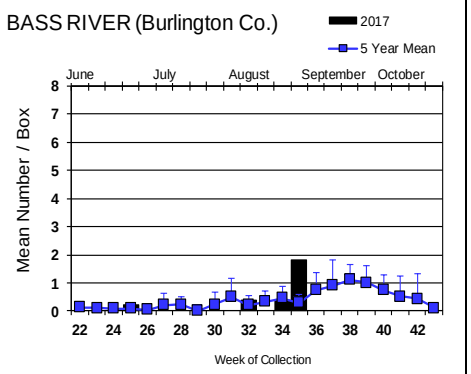
Horses and Vaccinations: The fate of unvaccinated equids reinforces the necessity of maintaining a vaccination schedule for arboviruses. For vaccination schedules recommended by the American Association of Equine Practices, see: http://www.aaep.org/vaccination_guidelines.htm

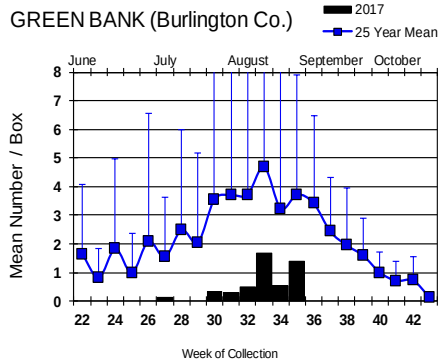
Additional Species: Sixteen additional species were tested for EEE. No additional positives were detected. Previously reported *Aedes provocans* was re-assigned to *Anopheles punctipennis.*

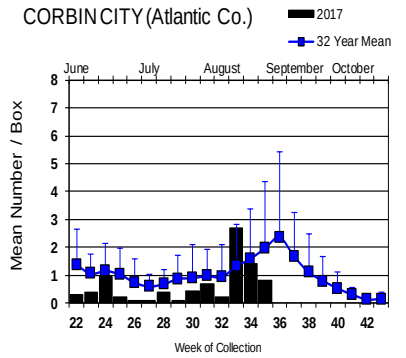
Species other than *Cs. melanura*	Pools	Mosquitoes	Positives	MFIR
Aedes canadensis canadensis	5	59		
Aedes cantator	10	26		
Aedes japonicus	2	20		
Aedes sollicitans	7	25		
Aedes taeniorhynchus	1	8		
Aedes triseriatus	1	4		
Aedes vexans	2	112		
Anopheles bradleyi	94	713		
Anopheles crucians	2	18		
Anopheles punctipennis	28	219		
Anopheles quadrimaculatus	12	163		
Coquillettidia perturbans	72	1352		
Culex erraticus	46	786		
Culex pipiens	526	4364		
Culex salinarius	199	1311		
Culex sp.	27	84		
Psorophora cyanescens	1	1		
Psorophora ferox	2	8		
State Total	**1037**	**9273**		

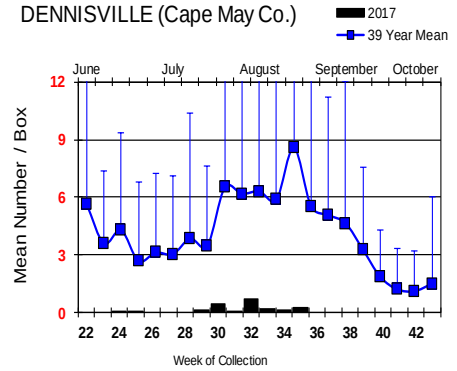
Culiseta melanura Population Graphs

Coastal

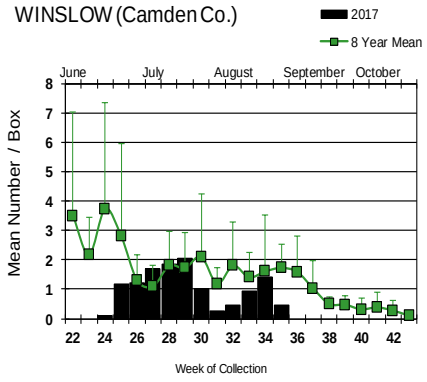


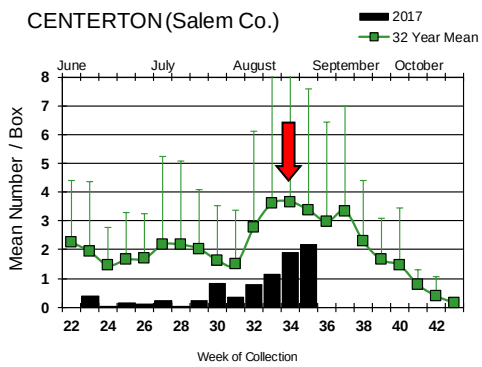


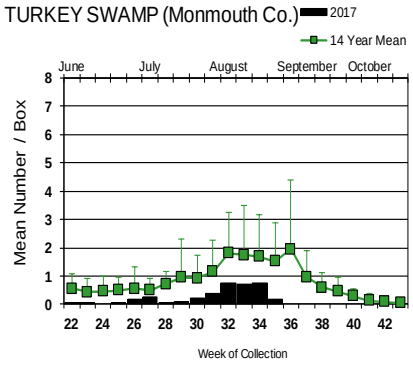


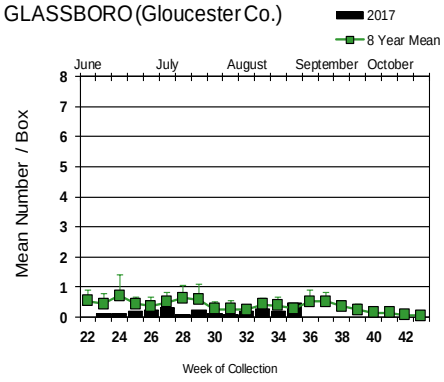


Inland









One detection of EEE has occurred at Centerton. Mosquito population increased at 5 out of the 8 locations. One positive horse was reported and due diligence should be continued. Positive pools, at this time in reporting, remain in the southern half of the state.

= 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(2/1 deer) GA(1) LA(2) MI(1) NC(1) SC(5) TX(1) WI(8)
- mosquito pools: MA(1) NJ(5) NY(9) RI(2)
- sentinel: FL(27) TX(**6**)
- 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					9/14
Alaska					
Arizona	0	97/135		0	40/44
Arkansas				0	3/6
California	239/264	2284/2545	130/155	9	59/87
Colorado	5	70		1	6
Connecticut		55/79			0
Delaware					
DC					
Florida	1	2	22/25		0
Georgia		0		1	7
Hawaii					
Idaho		75/108		2/5	1/3
Illinois	11/14	1144/1525			5/16
Indiana	0	388/420		4/5	2/6
Iowa	1	34/39		1	3/4
Kansas		13		0	4/6
Kentucky				5	
Louisiana	19/27	342/373			21/28
Maine		0		0	0
Maryland					
Mass.		170/217		0	0
Michigan	148	86		5/9	4
Minnesota					3
Mississippi		207/214		1	37/43
Missouri		0		1	3/8

	Birds	Mosquito Pools	Sentinels	Horses	Humans
Montana					
Nebraska	1	43/54		0	14/26
Nevada					1/6
New Hampshire		4		0	0
New Jersey		306/411		0	0
New Mexico					2/9
New York		712/865			3
North Carolina					
North Dakota	11	15		1	35/45
Ohio		600			1
Oklahoma					7/12
Oregon		45/53		4/5	2
Pennsylvania	20/25	1767/2223		0	1/4
Rhode Island		2		0	0
South Carolina	7	42			
South Dakota		55			10
Tennessee					2/3
Texas		701/786		2	36/48
Utah		172/268		4	2/8
Vermont					
Virginia				1	1
Washington	1	17/22		2/6	0
West Virginia					
Wisconsin	65/74	28		6	1
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.

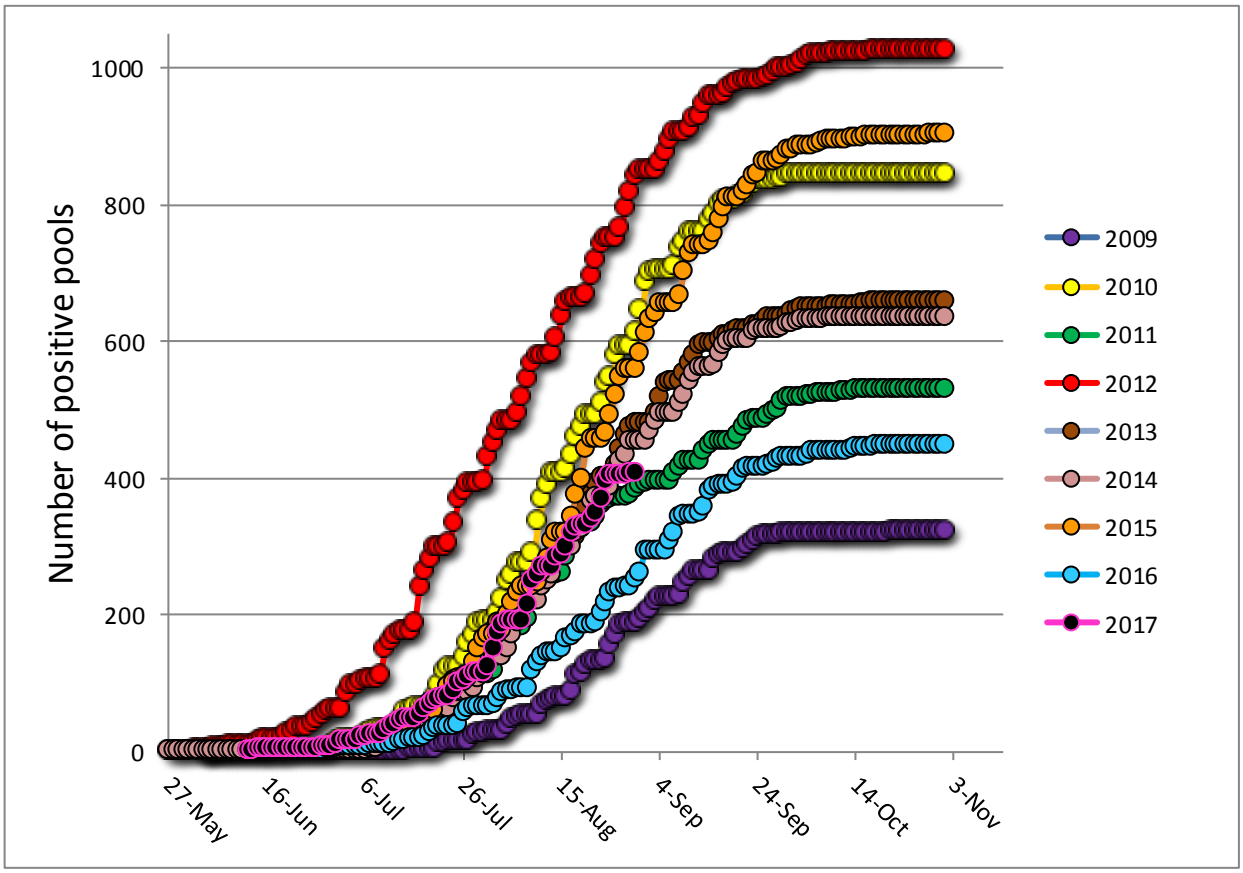
Mosquito Species Submitted and Tested for West Nile Virus Testing through 2 September 2017.

Species	Pools	Mosquitoes	Positives	MFIR
Aedes albopictus	894	10161	6	0.590
Aedes atlanticus	7	24		
Aedes atropalpus	18	90		
Aedes canadensis canadensis	43	451		
Aedes cantator	28	240		
Aedes cinereus	1	54		
Aedes grossbecki	2	4		
Aedes japonicus	295	1254	2	1.595
Aedes sollicitans	26	625		
Aedes stimulans	1	10		
Aedes taeniorhynchus	12	90		
Aedes triseriatus	204	497		
Aedes trivittatus	3	5		
Aedes vexans	75	704		
Anopheles barberi	3	3		
Anopheles bradleyi	104	1010		
Anopheles crucians	2	18		
Anopheles earlei	1	1		
Anopheles punctipennis	66	321		
Anopheles quadrimaculatus	117	853		
Coquillettidia perturbans	83	1379		
Culex erraticus	57	854		
Culex pipiens	624	6597	10	1.516
Culex restuans	464	2400	4	1.667
Culex salinarius	218	1913	2	1.045
Culex spp.	1873	79357	382	4.814
Culex territans	38	100		
Culiseta inornata	1	1		
Culiseta melanura	400	4798	4	0.834
Orthopodomyia signifera	6	6		
Psorophora ciliata	3	3		
Psorophora columbiae	16	70	1	14.286
Psorophora cyanescens	1	1		
Psorophora ferox	13	176		
Uranotaenia sapphirina	2	23		
Grand Total	**5701**	**114093**	**411**	**3.602**

Remarks: To date, 5,701 pools of 114,093 mosquitoes from 34 species have been tested. 411 positive pools have been detected. Most continue to be in the enzootic vector, *Culex* (Mix, *pipiens* or *restuans*). *Aedes japonicus* became infected (this species is usually infected each year). Overall MFIR for New Jersey is at 3.602, up from 2.984 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. A previously reported *Aedes provocans* was re-assigned to *Anohpeles punctipennis*

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 2 September 2017.

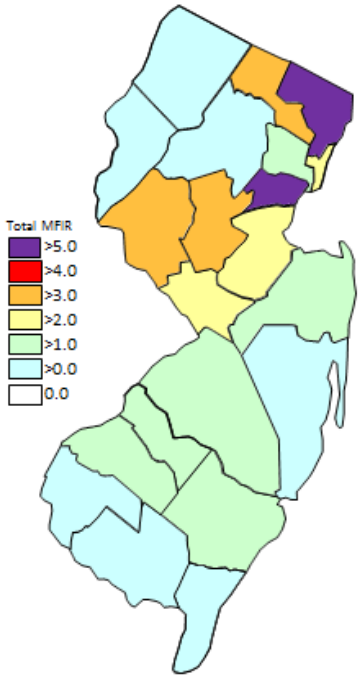
County	Species	Pools	Mosquitoes	Positives	MFIR
Atlantic		**134**	**3402**	**1**	**0.294**
	Aedes albopictus	8	55		
	Aedes japonicus	3	118		
	Aedes sollicitans	6	318		
	Aedes taeniorhynchus	3	71		
	Aedes triseriatus	1	12		
	Aedes vexans	5	224		
	Anopheles bradleyi	7	266		
	Coquillettidia perturbans	13	456		
	Culex erraticus	6	153		
	Culex pipiens	24	719		
	Culex salinarius	3	52		
	Culex spp.	13	355		
	Culiseta melanura	39	529	1	1.890
	Psorophora columbiae	1	1		
	Psorophora ferox	2	73		

Bergen		**130**	**6050**	**74**	**12.231**
	Aedes albopictus	4	129		
	Aedes japonicus	9	86		
	Culex spp.	117	5835	74	12.682
Burlington		**169**	**5889**	**16**	**2.717**
	Aedes albopictus	9	182		
	Aedes canadensis canadensis	3	53		
	Aedes cantator	2	18		
	Aedes japonicus	4	92		
	Aedes taeniorhynchus	1	8		
	Aedes triseriatus	3	34		
	Aedes vexans	2	112		
	Anopheles bradleyi	2	150		
	Anopheles crucians	2	18		
	Coquillettidia perturbans	1	49		
	Culex erraticus	2	140		
	Culex salinarius	10	569		
	Culex spp.	75	3038	14	4.608
	Culiseta melanura	52	1425	2	1.404
	Orthopodomyia signifera	1	1		
Camden		**137**	**5127**	**21**	**4.096**
	Aedes albopictus	16	110	1	9.091
	Aedes japonicus	14	61	1	16.393
	Culex spp.	84	4179	19	4.547
	Culiseta melanura	23	777		
Cape May		**2300**	**10069**	**9**	**0.894**
	Aedes albopictus	391	1067		
	Aedes atlanticus	7	24		
	Aedes atropalpus	17	80		
	Aedes canadensis canadensis	18	28		
	Aedes cantator	8	8		
	Aedes japonicus	148	319		
	Aedes sollicitans	5	5		
	Aedes taeniorhynchus	3	3		
	Aedes triseriatus	141	232		
	Aedes vexans	27	55		
	Anopheles bradleyi	93	508		
	Anopheles punctipennis	8	11		
	Anopheles quadrimaculatus	86	612		
	Coquillettidia perturbans	17	22		
	Culex erraticus	27	378		
	Culex pipiens	527	4365	6	1.375
	Culex restuans	395	1136	2	1.761
	Culex salinarius	183	496	1	2.016
	Culex spp.	18	35		
	Culex territans	38	100		
	Culiseta melanura	130	536		
	Orthopodomyia signifera	4	4		
	Psorophora columbiae	4	5		
	Psorophora ferox	3	17		
	Uranotaenia sapphirina	2	23		

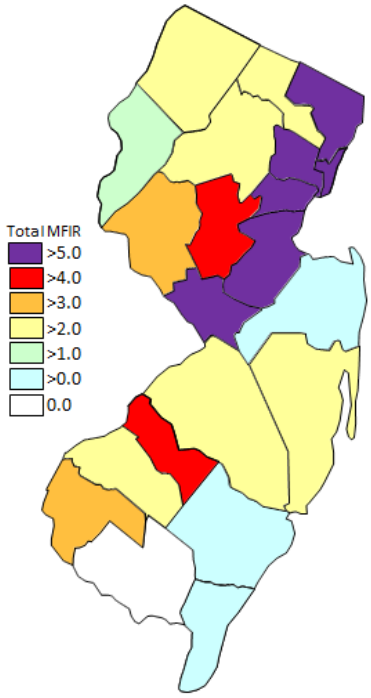
Cumberland		**116**	**1339**		
	Aedes albopictus	15	190		
	Aedes japonicus	8	36		
	Aedes sollicitans	2	20		
	Aedes triseriatus	1	2		
	Aedes vexans	14	159		
	Anopheles bradleyi	1	75		
	Anopheles punctipennis	1	5		
	Anopheles quadrimaculatus	9	47		
	Coquillettidia perturbans	9	103		
	Culex erraticus	3	16		
	Culex salinarius	6	246		
	Culex spp.	32	292		
	Culiseta melanura	9	45		
	Psorophora columbiae	2	22		
	Psorophora ferox	4	81		
Essex		**113**	**800**	**4**	**5.000**
	Aedes albopictus	45	174		
	Aedes japonicus	8	13		
	Culex spp.	60	613	4	6.525
Gloucester		**296**	**11543**	**26**	**2.252**
	Aedes albopictus	61	1590	2	1.258
	Aedes atropalpus	1	10		
	Aedes japonicus	10	112		
	Aedes triseriatus	3	34		
	Anopheles punctipennis	21	184		
	Anopheles quadrimaculatus	11	162		
	Coquillettidia perturbans	2	7		
	Culex pipiens	12	717	1	1.395
	Culex spp.	126	8312	23	2.767
	Culiseta melanura	48	414		
	Psorophora ferox	1	1		
Hudson		**111**	**5207**	**43**	**8.258**
	Culex spp.	111	5207	43	8.258
Hunterdon		**188**	**8838**	**35**	**3.960**
	Culex spp.	188	8838	35	3.960
Mercer		**159**	**2574**	**13**	**5.051**
	Aedes albopictus	8	87		
	Aedes japonicus	31	104		
	Culex pipiens	11	178	1	5.618
	Culex restuans	42	849	1	1.178
	Culex spp.	67	1356	11	8.112
Middlesex		**142**	**6009**	**32**	**5.325**
	Culex spp.	127	5731	31	5.409
	Culiseta melanura	15	278	1	3.597
Monmouth		**431**	**6476**	**3**	**0.463**
	Aedes albopictus	184	4312		
	Aedes canadensis canadensis	22	370		

	Aedes cantator	17	176		
	Aedes grossbecki	2	4		
	Aedes japonicus	21	86		
	Aedes sollicitans	13	282		
	Aedes taeniorhynchus	5	8		
	Aedes triseriatus	11	13		
	Aedes trivitattus	2	2		
	Aedes vexans	22	60		
	Anopheles barberi	3	3		
	Anopheles bradleyi	1	11		
	Anopheles earlei	1	1		
	Anopheles punctipennis	31	89		
	Anopheles quadrimaculatus	6	21		
	Coquillettidia perturbans	8	18		
	Culex erraticus	5	10		
	Culex salinarius	3	58	1	17.241
	Culex spp.	45	729	2	2.743
	Culiseta inornata	1	1		
	Culiseta melanura	15	181		
	Orthopodomyia signifera	1	1		
	Psorophora ciliata	3	3		
	Psorophora columbiae	7	35		
	Psorophora cyanescens	1	1		
	Psorophora ferox	1	1		
Morris		**197**	**7091**	**18**	**2.538**
	Aedes albopictus	21	103		
	Coquillettidia perturbans	12	429		
	Culex spp.	163	6558	18	2.745
	Culiseta melanura	1	1		
Ocean		**155**	**2364**	**7**	**2.961**
	Aedes albopictus	55	1124	1	0.890
	Aedes japonicus	6	40		
	Aedes triseriatus	4	12		
	Anopheles punctipennis	1	1		
	Coquillettidia perturbans	5	103		
	Culex erraticus	4	53		
	Culex spp.	65	990	6	6.061
	Culiseta melanura	15	41		
Passaic		**102**	**918**	**2**	**2.179**
	Aedes albopictus	4	31		
	Aedes japonicus	18	119		
	Aedes triseriatus	3	11		
	Coquillettidia perturbans	8	12		
	Culex erraticus	2	4		
	Culex pipiens	48	613	2	3.263
	Culex restuans	10	65		
	Culex spp.	6	60		
	Culiseta melanura	3	3		
Salem		**133**	**1845**	**6**	**3.252**
	Aedes albopictus	29	163	1	6.135
	Aedes japonicus	6	13	1	76.923
	Aedes triseriatus	12	29		

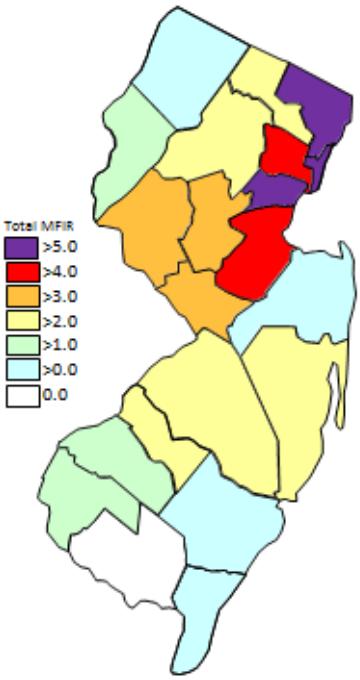
	Aedes vexans	3	6		
	Anopheles quadrimaculatus	4	8		
	Coquillettidia perturbans	6	66		
	Culex erraticus	8	100		
	Culex pipiens	1	1		
	Culex restuans	1	3		
	Culex spp.	39	996	3	3.012
	Culiseta melanura	21	451		
	Psorophora columbiae	2	7	1	142.857
	Psorophora ferox	1	2		
Somerset		**161**	**4953**	**21**	**4.240**
	Aedes albopictus	7	39		
	Aedes japonicus	6	41		
	Aedes triseriatus	2	6		
	Anopheles punctipennis	3	21		
	Culex spp.	143	4846	21	4.333
Sussex		**169**	**3415**	**7**	**2.050**
	Aedes albopictus	8	17		
	Aedes triseriatus	23	112		
	Culex pipiens	1	4		
	Culex restuans	16	347	1	2.882
	Culex salinarius	13	492		
	Culex spp.	80	2339	6	2.565
	Culiseta melanura	28	104		
Union		**131**	**7882**	**58**	**7.359**
	Aedes albopictus	28	787	1	1.271
	Culex spp.	103	7095	57	8.034
Warren		**227**	**12302**	**15**	**1.219**
	Aedes albopictus	1	1		
	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		
	Coquillettidia perturbans	2	114		
	Culex spp.	211	11953	15	1.255
	Culiseta melanura	1	13		
	Psorophora ferox	1	1		
Grand Total		**5701**	**114093**	**411**	**3.602**



Cumulative WNV activity in 2016.



WNV activity to 2 September 2017.



WNV activity last week, 2017

Saint Louis Encephalitis (SLE) to 2 September 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		**13**	**725**		
	Aedes triseriatus	1	4		
	Culex spp.	12	721		
Cape May		**544**	**4399**		
	Culex pipiens	526	4364		
	Culex spp.	18	35		
Grand Total		**557**	**5124**		

La Crosse Encephalitis (LAC) to 2 September 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		**14**	**293**		
	Aedes albopictus	8	171		
	Aedes japonicus	4	92		
	Aedes triseriatus	2	30		
Sussex		**23**	**112**		
	Aedes triseriatus	23	112		
Grand Total		**37**	**405**		

Dengue (DENV) to 2 September 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 2 travel-related human cases in NJ.

County	Species	DENV1		DENV2		DENV3		DENV4		Pos.	MFIR
		Pool	Mos.	Pool	Mos.	Pool	Mos.	Pool	Mos.		
Mercer		**8**	**87**	**8**	**87**	**8**	**87**	**8**	**87**		
	Aedes albopictus	8	87	8	87	8	87	8	87		
Grand Total		**8**	**87**	**8**	**87**	**8**	**87**	**8**	**87**		

Chikungunya (CHIK) to 2 September2017.

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		**390**	**1066**		
	Aedes albopictus	390	1066		
Mercer		**8**	**87**		
	Aedes albopictus	8	87		
Grand Total		**398**	**1153**		

Zika (ZIKV) to 2 September 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 16 travel-related human cases in NJ.

County	Species	Pools	Mosquitoes	Positives	MFIR
Cape May		**390**	**1066**		
	Aedes albopictus	390	1066		
Mercer		**8**	**87**		
	Aedes albopictus	8	87		
Grand Total		**398**	**1153**		