VECTOR SURVEILLANCE IN NEW JERSEY

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

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CDC WEEK 29: 17 July to 23 July, 2016

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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	1	1		
Green Bank (Burlington Co.)/25	**Coastal**	2.58	0.00	17‡	4		
Corbin City (Atlantic Co.)/25	**Coastal**	0.89	0.24	61(67)‡	9 (10)		
Dennisville (Cape May Co.)/50	**Coastal**	3.57	0.00	37	7		
Winslow (Camden Co.)/50	**Inland**	1.78	1.42	523	13		
Centerton (Salem Co.)/50	**Inland**	2.07	0.56	140	8		
Turkey Swamp (Monmouth Co.)/50	**Inland**	1.02	0.08	19 (23)	8 (9)		
Glassboro (Gloucester Co.)/50	**Inland**	0.65	0.06	77	8		

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

Remarks: No new positive EEE pools were detected in NJ. Last week, the first positive EEE pools in New Jersey were detected in two pools of *Culex pipiens* in Cape May collected 6 July 2016 at a non-traditional site. In 2015, the first detection of EEE in a pool of *Culiseta melanura* was collected at the Winslow resting box site on the 27th of July.

Traditional Resting Box Sites: 875 *Cs. melanura* from 58 pools have been tested for EEE, with 2 pools of 10 *Cs. melanura* to be tested. No positives at these traditional sites have been detected. Statewide, 1953 *Cs. melanura* have been tested, with no positives currently in *Cs. melanura*. 8941 specimens from 12 other species have also been tested, with two reported positives *Culex pipiens* pools.

	Additional *Cs. melanura* trapped by counties *traps with positives indicated in **BOLD.**				
County	**Trap types***	**Pools**	**Mosquitoes**	**Positives**	**MFIR**
Atlantic	Co_2, RB	13	114		
Burlington	Co_2	23	444		
Cape May	CDC, Co_2, GR, RB	48	99		
Cumberland	RB	3	10		
Middlesex	RB	26	387		
Ocean	Co_2, GR	9	24		
TOTAL		**122**	**1078**		

Additional *Cs. melanura*: Counties maintain trap sites for *Cs. melanura* in other areas, using a variety of traps. No positives have been detected.

Species other than *Cs. melanura*	**Pools**	**Mosquitoes**	**Positives**	**MFIR**
Aedes cantator	19	46		
Aedes sollicitans	4	64		
Anopheles bradleyi	18	117		
Anopheles crucians	1	4		
Anopheles punctipennis	7	11		
Anopheles quadrimaculatus	1	1		
Coquillettidia perturbans	53	752		
Culex erraticus	10	56		
Culex pipiens	401	6512	2	0.307
Culex restuans	1	3		
Culex salinarius	126	1277		
Culex sp.	31	86		
Culex territans	1	12		
State Total	**673**	**8941**	**2**	**0.224**

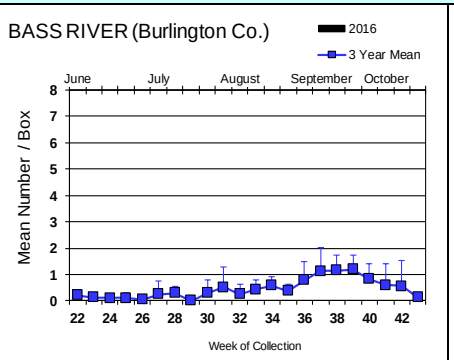
Additional Species: Twelve additional species were tested for EEE. First positive pools were detected in *Culex pipiens,* an ornithophilic species, in Cape May, collected on 6 July.

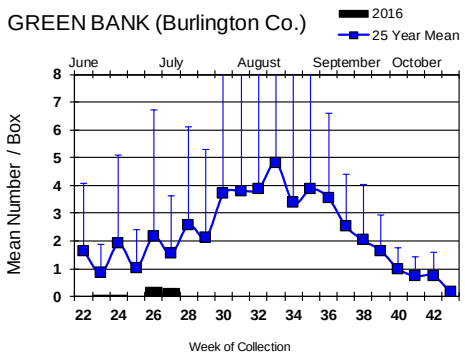
Horses and Humans: No positive horse or humans have been reported. Last year one positive horse was reported.

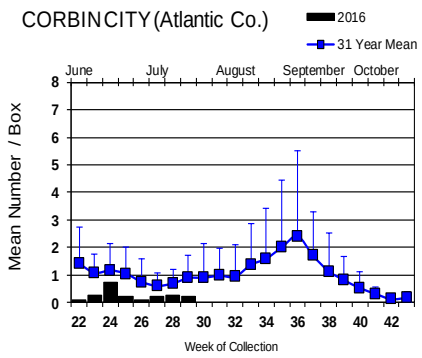
Horses and Vaccinations: The fate of unvaccinated equids reinforces the necessity of maintaining a vaccination schedule for arboviruses. For vaccination schedules recommended by the American Association of Equine Practices, see: http://www.aaep.org/vaccination_guidelines.htm

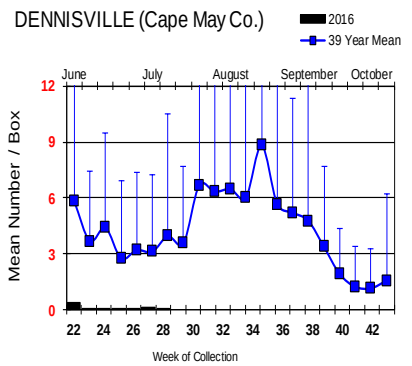
Culiseta melanura Population Graphs

Coastal

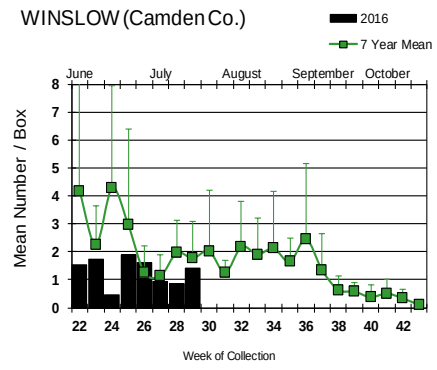


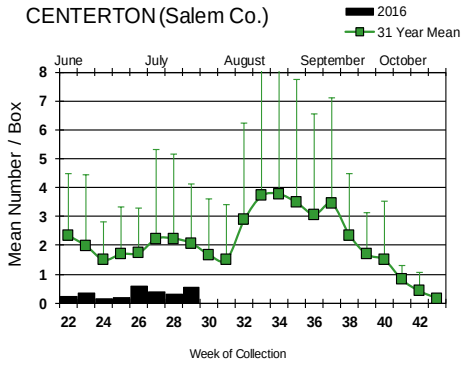


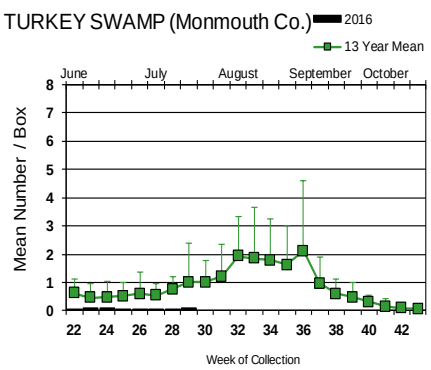


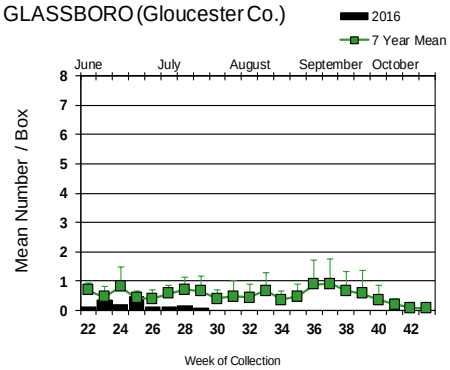


Inland









Low numbers continue to be reported for *Cs. melanura* populations at the traditional resting box sites. It should be noted that the first positive pools detected in *Culex pipiens* at a non-traditional site in Cape May illustrates virus circulating in avian hosts but are probably not involved as bridge vectors as *Cx. pipiens* appears to clear virus relatively quickly (Sardelis, M. R., Dohm, D. J., Pagac, B., Andre, R. G., & Turell, M. J. (2002). Experimental transmission of eastern equine encephalitis virus by *Ochlerotatus j. japonicus* (Diptera: Culicidae). *Journal of Medical Entomology*, *39*(3), 480–484. doi:10.1603/0022-2585-39.3.480).

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

EEE in US (2016 cumulative cases): (Black or Red = previous + new reported cases occurring)

- equine: FL(12) NC(1) SC(8) VA(2)
- mosquito pools: NJ(2) MA(1)
- sentinel: FL(50) GA(2) TX(21)
- human:

West Nile Virus Positive Organisms in US, 2016

West Nile in US (2016 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	39	0	0	18/22
Arkansas				0	0
California	547/656	896/1159	19/30	2	0
Colorado		9			3
Connecticut		1			0
Delaware					
DC					
Florida		2	50	1	
Georgia		0			0
Hawaii					
Idaho	0	4		0	0
Illinois	2/3	100/114		0	3
Indiana	0	10/16		0	1
Iowa		1			0
Kansas		0			0
Kentucky				0	
Louisiana					0
Maine		0			0
Maryland					
Mass.		3/10		0	0
Michigan		3			
Minnesota					
Mississippi		3/20			4
Missouri		0		0	0

	Birds	Mosquito Pools	Sentinels	Horses	Humans
Montana					
Nebraska	2	15/23		0	1/3
Nevada					1
New Hampshire		0		0	0
New Jersey		12/14		0	1
New Mexico					
New York		5			
North Carolina					
North Dakota	4/6	4/12		0	1/2
Ohio		1		0	1
Oklahoma		7			2
Oregon	0	2	0	0	0
Pennsylvania	2	54/90			1
Rhode Island		0			
South Carolina					
South Dakota					6
Tennessee					
Texas		330		2	7
Utah		6/12			
Vermont					
Virginia					
Washington	0	18/27		1	0
West Virginia					
Wisconsin	5	0		0	0
Wyoming					0

* 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 23 July 2016

Species	Pools	Mosquitoes	Positives	MFIR
Aedes albopictus	358	1592		
Aedes atropalpus	15	51		
Aedes canadensis canadensis	24	389		
Aedes cantator	27	236		
Aedes grossbecki	1	1		
Aedes japonicus	262	1363		
Aedes sollicitans	7	175		
Aedes sticticus	1	6		
Aedes taeniorhynchus	8	290		
Aedes triseriatus	96	209		
Aedes vexans	21	174		
Anopheles atropos	1	1		
Anopheles barberi	2	2		
Anopheles bradleyi	23	249		
Anopheles crucians	2	9		
Anopheles punctipennis	26	41		
Anopheles quadrimaculatus	35	301		
Coquillettidia perturbans	68	1495		
Culex erraticus	12	61		
Culex pipiens	532	14185	2	0.141
Culex restuans	526	6586		
Culex salinarius	129	1385		
Culex spp.	1174	47656	12	0.252
Culex territans	10	98		
Culiseta melanura	178	1875		
Psorophora ciliata	1	1		
Psorophora columbiae	3	3		
Psorophora ferox	3	26		
Grand Total	**3545**	**78460**	**14**	**0.178**

Remarks: To date, 3545 pools of 78,460 mosquitoes from 27 species have been tested, with 14 positive pools detected, all in *Culex*. This first positive pool of *Culex* Mix was collected on 14 June in Monmouth County.

Humans, Horses and Wild Birds: One human from Camden County had been reported with WNV, onset of early July. Last year 26 humans and one horse were positive. Onset in 2015 for humans began in early August and the onset for the horse case began in September. For further information, see http://www.state.nj.us/health/cd/westnile/techinfo.shtml.

Birds are no longer routinely tested in New Jersey.

WNV Results by County through 23 July 2016

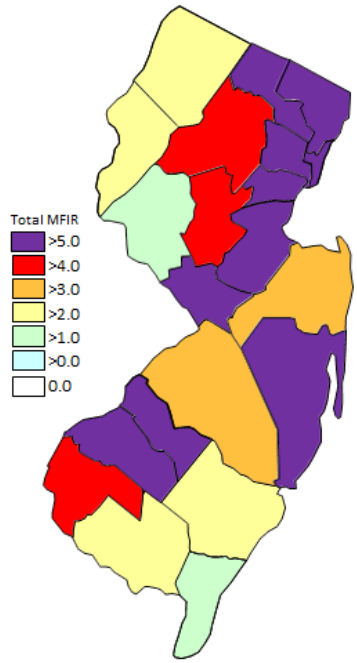
County	Species	Pools	Mosquitoes	Positives	MFIR
Atlantic		**84**	**2285**	**2**	**0.875**
	Aedes albopictus	8	25		
	Aedes japonicus	1	4		

	Aedes sollicitans	2	108		
	Aedes sticticus	1	6		
	Aedes taeniorhynchus	4	266		
	Aedes vexans	4	134		
	Anopheles bradleyi	1	10		
	Coquillettidia perturbans	10	76		
	Culex erraticus	1	21		
	Culex pipiens	11	609	2	3.284
	Culex restuans	3	52		
	Culex salinarius	4	123		
	Culex spp.	11	664		
	Culiseta melanura	22	175		
	Psorophora ferox	1	12		
Bergen		**70**	**4880**	**3**	**0.615**
	Aedes albopictus	5	20		
	Aedes japonicus	1	60		
	Culex spp.	64	4800	3	0.625
Burlington		**85**	**3034**	**1**	**0.330**
	Aedes albopictus	5	58		
	Aedes atropalpus	2	15		
	Aedes japonicus	6	111		
	Aedes triseriatus	4	10		
	Anopheles barberi	1	1		
	Anopheles bradleyi	1	6		
	Anopheles crucians	1	4		
	Culex salinarius	11	362		
	Culex spp.	34	2091	1	0.478
	Culex territans	1	12		
	Culiseta melanura	19	364		
Camden		**77**	**2698**	**2**	**0.741**
	Aedes albopictus	6	24		
	Aedes japonicus	10	30		
	Culex spp.	48	2121	2	0.943
	Culiseta melanura	13	523		
Cape May		**1429**	**12533**		
	Aedes albopictus	71	104		
	Aedes atropalpus	13	36		
	Aedes canadensis canadensis	5	8		
	Aedes cantator	19	46		
	Aedes japonicus	135	287		
	Aedes sollicitans	2	4		
	Aedes taeniorhynchus	2	2		
	Aedes triseriatus	60	116		
	Aedes vexans	3	5		
	Anopheles atropos	1	1		
	Anopheles bradleyi	17	111		
	Anopheles punctipennis	6	7		
	Anopheles quadrimaculatus	30	293		
	Coquillettidia perturbans	23	412		
	Culex erraticus	4	12		
	Culex pipiens	402	6516		
	Culex restuans	442	3851		

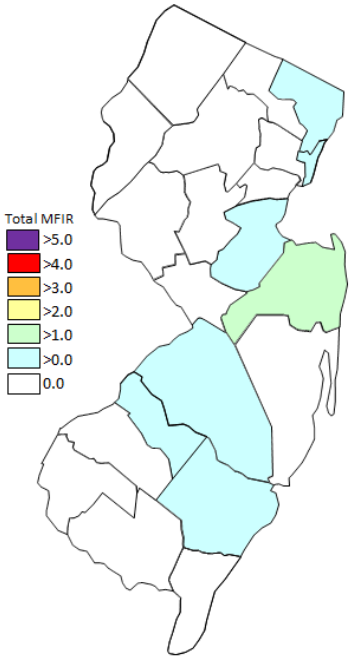
	Culex salinarius	102	422		
	Culex spp.	27	77		
	Culex territans	9	86		
	Culiseta melanura	55	136		
	Psorophora ferox	1	1		
Cumberland		**38**	**702**		
	Aedes albopictus	1	1		
	Aedes cantator	1	1		
	Aedes japonicus	3	6		
	Aedes sollicitans	2	60		
	Aedes taeniorhynchus	2	22		
	Anopheles bradleyi	4	122		
	Anopheles crucians	1	5		
	Anopheles punctipennis	1	2		
	Anopheles quadrimaculatus	1	3		
	Coquillettidia perturbans	3	29		
	Culex salinarius	11	423		
	Culex spp.	1	2		
	Culiseta melanura	3	10		
	Psorophora ciliata	1	1		
	Psorophora columbiae	2	2		
	Psorophora ferox	1	13		
Essex		**91**	**362**		
	Aedes albopictus	27	99		
	Aedes japonicus	5	8		
	Aedes triseriatus	2	2		
	Anopheles punctipennis	1	1		
	Culex spp.	56	252		
Gloucester		**128**	**6975**		
	Aedes albopictus	3	49		
	Aedes japonicus	9	141		
	Aedes triseriatus	1	4		
	Anopheles punctipennis	1	3		
	Culex pipiens	106	6701		
	Culiseta melanura	8	77		
Hudson		**81**	**3817**	**1**	**0.262**
	Aedes albopictus	8	115		
	Culex spp.	73	3702	1	0.270
Hunterdon		**74**	**3173**		
	Culex spp.	74	3173		
Mercer		**130**	**4015**		
	Aedes japonicus	4	43		
	Aedes triseriatus	2	24		
	Culex pipiens	13	359		
	Culex restuans	77	2676		
	Culex spp.	34	913		
Middlesex		**147**	**6261**	**1**	**0.160**
	Aedes albopictus	18	104		

	Culex spp.	102	5769	1	0.173
	Culiseta melanura	27	388		
Monmouth		**285**	**2732**	**4**	**1.464**
	Aedes albopictus	143	692		
	Aedes canadensis canadensis	18	311		
	Aedes cantator	7	189		
	Aedes grossbecki	1	1		
	Aedes japonicus	15	31		
	Aedes sollicitans	1	3		
	Aedes triseriatus	5	12		
	Aedes vexans	4	19		
	Anopheles barberi	1	1		
	Anopheles punctipennis	14	25		
	Anopheles quadrimaculatus	2	2		
	Coquillettidia perturbans	4	5		
	Culex erraticus	2	5		
	Culex restuans	1	3		
	Culex spp.	58	1413	4	2.831
	Culiseta melanura	9	20		
Morris		**135**	**4861**		
	Aedes albopictus	10	30		
	Culex spp.	125	4831		
Ocean		**138**	**2164**		
	Aedes albopictus	33	233		
	Aedes canadensis canadensis	1	70		
	Aedes japonicus	19	72		
	Aedes triseriatus	6	12		
	Aedes vexans	1	1		
	Anopheles punctipennis	2	2		
	Coquillettidia perturbans	11	217		
	Culex erraticus	2	14		
	Culex restuans	1	2		
	Culex spp.	48	1499		
	Culiseta melanura	14	42		
Passaic		**140**	**3759**		
	Aedes albopictus	2	2		
	Aedes japonicus	35	144		
	Aedes triseriatus	3	4		
	Aedes vexans	9	15		
	Culex spp.	91	3594		
Salem		**99**	**697**		
	Aedes albopictus	16	29		
	Aedes japonicus	10	26		
	Aedes triseriatus	12	21		
	Anopheles punctipennis	1	1		
	Anopheles quadrimaculatus	2	3		
	Coquillettidia perturbans	8	81		
	Culex erraticus	3	9		
	Culex restuans	2	2		
	Culex spp.	36	384		

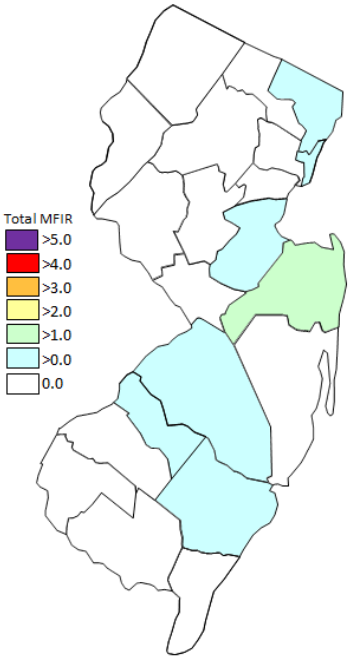
	Culiseta melanura	8	140		
	Psorophora columbiae	1	1		
Somerset		**75**	**1881**		
	Aedes albopictus	2	7		
	Aedes triseriatus	1	4		
	Culex spp.	72	1870		
Sussex		**135**	**5695**		
	Aedes japonicus	9	400		
	Coquillettidia perturbans	9	675		
	Culex salinarius	1	55		
	Culex spp.	116	4565		
Union		**15**	**738**		
	Culex spp.	15	738		
Warren		**89**	**5198**		
	Culex spp.	89	5198		
Grand Total		**3545**	**78460**	**14**	**0.178**



Cumulative WNV activity in 2015.



WNV activity to 23 July 2016.



WNV activity last week, 2016.

Saint Louis Encephalitis (SLE) to 23 July 2016.

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.

Currently, there are no reported positive pools of SLE for 2016.

County	Species	Pools	Mosquitoes	Positives	MFIR
Burlington		**35**	**2092**		
	Anopheles barberi	1	1		
	Culex spp.	34	2091		
Cape May		**428**	**6589**		
	Culex pipiens	401	6512		
	Culex spp.	27	77		
Grand Total		**463**	**8681**		

La Crosse Encephalitis (LAC) to 23 July 2016.

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).

Currently, there are no reported positive pools of LAC for 2016.

County	Species			Positives	MFIR
Burlington		**17**	**194**		
	Aedes albopictus	5	58		
	Aedes atropalpus	2	15		
	Aedes japonicus	6	111		
	Aedes triseriatus	4	10		
Grand Total		**17**	**194**		

Dengue (DENV) to 23 July 2016.

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. There are currently 40 imported human cases in New Jersey, no local transmission.

Note Same pools of *Ae. albopictus* are tested for the four serotypes of Dengue as well as Chikungunya.

No pools have tested positive in 2016.

County	Species	DENV1		DENV2		DENV3		DENV4		Positives	MFIR
		Pool	Mos.	Pool	Mos.	Pool	Mos.	Pool	Mos.		
Atlantic		**8**	**25**	**8**	**25**	**8**	**25**	**8**	**25**		
	Aedes albopictus	8	25	8	25	8	25	8	25		
Bergen		**5**	**20**	**5**	**20**	**5**	**20**	**5**	**20**		
	Aedes albopictus	5	20	5	20	5	20	5	20		
Camden		**6**	**24**	**6**	**24**	**6**	**24**	**6**	**24**		
	Aedes albopictus	6	24	6	24	6	24	6	24		
Cumberland		**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**		
	Aedes albopictus	1	1	1	1	1	1	1	1		
Essex		**27**	**99**	**27**	**99**	**27**	**99**	**27**	**99**		
	Aedes albopictus	27	99	27	99	27	99	27	99		
Hudson		**8**	**115**	**8**	**115**	**8**	**115**	**8**	**115**		
	Aedes albopictus	8	115	8	115	8	115	8	115		
Middlesex		**19**	**105**	**19**	**105**	**19**	**105**	**19**	**105**		
	Aedes albopictus	18	104	18	104	18	104	18	104		
	Culiseta melanura	1	1	1	1	1	1	1	1		
Monmouth		**122**	**638**	**122**	**638**	**122**	**638**	**122**	**638**		
	Aedes albopictus	122	638	122	638	122	638	122	638		
Morris		**12**	**33**	**12**	**33**	**12**	**33**	**12**	**33**		
	Aedes albopictus	10	30	10	30	10	30	10	30		
	Culex spp.	2	3	2	3	2	3	2	3		
Passaic		**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**		
	Aedes albopictus	1	1	1	1	1	1	1	1		
Salem		**16**	**29**	**16**	**29**	**16**	**29**	**16**	**29**		
	Aedes albopictus	16	29	16	29	16	29	16	29		
Grand Total		**225**	**1090**	**225**	**1090**	**225**	**1090**	**225**	**1090**		

Chikungunya (CHIK) to 23 July 2016.

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 have tested positive in 2016.

County	Species	Pools	Mosquitoes	Positives	MFIR
Atlantic		**8**	**25**		
	Aedes albopictus	8	25		
Bergen		**5**	**20**		
	Aedes albopictus	5	20		
Camden		**6**	**24**		
	Aedes albopictus	6	24		
Cape May		**72**	**108**		
	Aedes albopictus	71	104		
	Culex pipiens	1	4		
Cumberland		**1**	**1**		

	Aedes albopictus	1	1		
Essex		**27**	**99**		
	Aedes albopictus	27	99		
Hudson		**8**	**115**		
	Aedes albopictus	8	115		
Middlesex		**19**	**105**		
	Aedes albopictus	18	104		
	Culiseta melanura	1	1		
Monmouth		**122**	**638**		
	Aedes albopictus	122	638		
Morris		**12**	**33**		
	Aedes albopictus	10	30		
	Culex spp.	2	3		
Passaic		**1**	**1**		
	Aedes albopictus	1	1		
Salem		**16**	**29**		
	Aedes albopictus	16	29		
Grand Total		**297**	**1198**		

Zika (ZIKV) to 23 July 2016.

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 2016. Currently, New Jersey has 61 imported human cases of Zika.

County	Species	Pools	Mosquitoes	Positives	MFIR
Cape May		**72**	**108**		
	Aedes albopictus	71	104		
	Culex pipiens	1	4		
Monmouth		**6**	**8**		
	Aedes albopictus	6	8		
Grand Total		**78**	**116**		