VECTOR SURVEILLANCE IN NEW JERSEY

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

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CDC WEEK 30: 24 July to 30 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**	0.30	0.00	1	1		
Green Bank (Burlington Co.)/25	**Coastal**	2.13	0.08	17 (21)	4 (5)		
Corbin City (Atlantic Co.)/25	**Coastal**	0.91	0.60	67 (82)‡	10 (11)		
Dennisville (Cape May Co.)/50	**Coastal**	6.67	0.14	44	8		
Winslow (Camden Co.)/50	**Inland**	2.03	1.36	591	15		
Centerton (Salem Co.)/50	**Inland**	1.67	0.22	151	9		
Turkey Swamp (Monmouth Co.)/50	**Inland**	1.00	0.04	23 (25)	9 (10)		
Glassboro (Gloucester Co.)/50	**Inland**	0.39	0.02	78	9		

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

Remarks: No new positive EEE pools were detected in NJ. Total positive EEE pools detected remain at 2, found earlier in *Culex pipiens* in Cape May (collected 6 July).

Traditional Resting Box Sites: 972 *Cs. melanura* from 65 pools have been tested for EEE, with 3 pools of 21 *Cs. melanura* to be tested. No positives at these traditional sites have been detected. Statewide, 2491 *Cs. melanura* have been tested, with no positives currently in *Cs. melanura*. 10,660 specimens from 14 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	15	147		
Burlington	Co_2	31	794		
Cape May	CDC, Co_2, GR, RB	65	139		
Cumberland	RB	4	19		
Middlesex	RB	28	396		
Ocean	Co_2, GR	9	24		
TOTAL		**152**	**1519**		

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 albopictus	1	1		
Aedes cantator	22	49		
Aedes sollicitans	10	377		
Aedes taeniorhynchus	1	22		
Anopheles bradleyi	32	166		
Anopheles crucians	2	40		
Anopheles punctipennis	8	16		
Anopheles quadrimaculatus	1	1		
Coquillettidia perturbans	60	918		
Culex erraticus	13	59		
Culex pipiens	466	7038	2	0.284
Culex restuans	1	3		
Culex salinarius	169	1860		
Culex sp.	35	98		
Culex territans	1	12		
State Total	**822**	**10660**	**2**	**0.188**

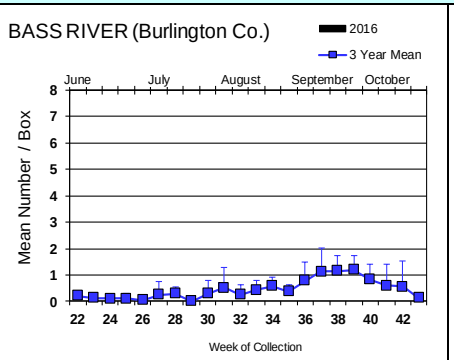
Additional Species: Twelve additional species were tested for EEE. First positive pools were detected in *Culex pipiens,* an ornithophilic species, in Cape May, collected on 6 July.

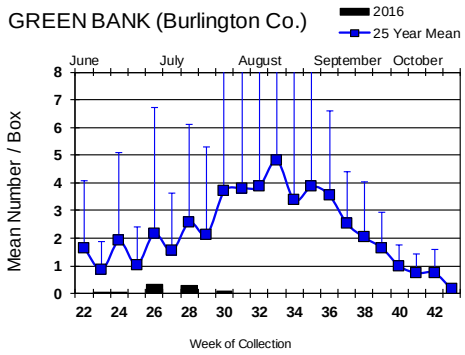
Horses and Humans: No positive horse or humans have been reported. Last year one positive horse was reported.

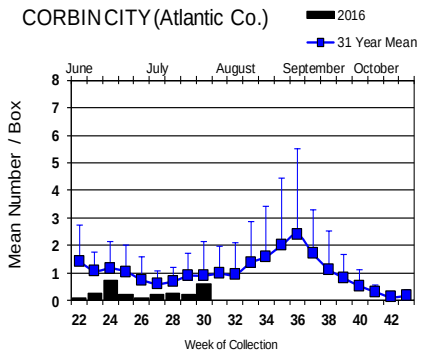
Horses and Vaccinations: The fate of unvaccinated equids reinforces the necessity of maintaining a vaccination schedule for arboviruses. For vaccination schedules recommended by the American Association of Equine Practices, see: http://www.aaep.org/vaccination_guidelines.htm

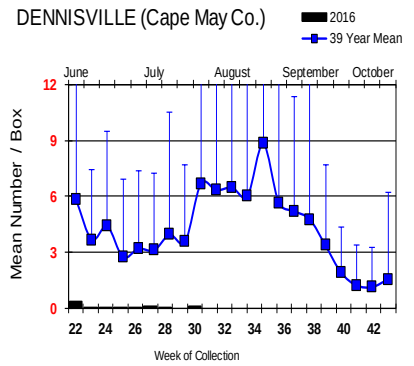
Culiseta melanura Population Graphs

Coastal

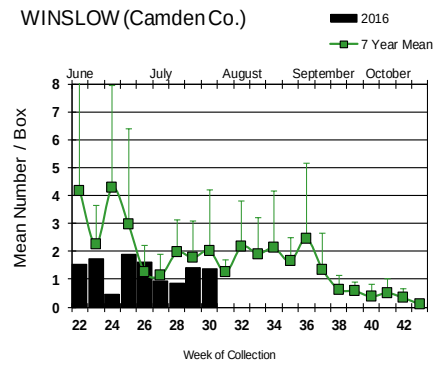


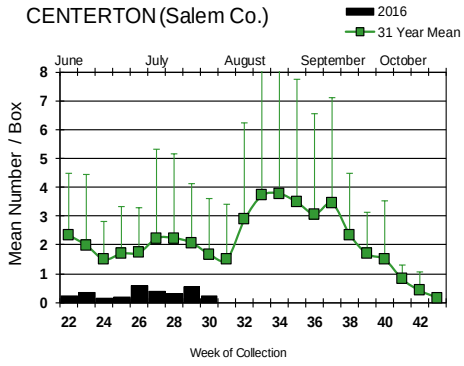


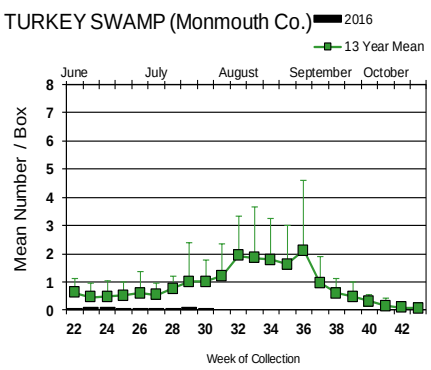


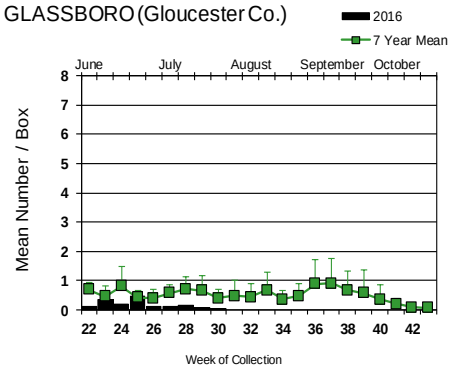


Inland









Low numbers continue to be reported for *Cs. melanura* populations at the traditional resting box sites. No positives reported at these sites, but two positive *Culex* pools found at other county sites (Cape May).

= 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(16) GA(5) NC(1) SC(11) VA(3) (new cases)
- mosquito pools: NJ(2) MA(1)
- sentinel: FL(51) 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					1/2
Alaska					
Arizona	0	39	0	0	22
Arkansas				0	1
California	656/715	1159/1487	30/73	2	3
Colorado	1	9/17			3/4
Connecticut		1			0
Delaware					
DC					
Florida		2	50/51	1	
Georgia		0			0
Hawaii					
Idaho	0	4/14		0	0
Illinois	3/4	114/339		0	3
Indiana	0	16/20		0	1
Iowa		1			0
Kansas		0			0
Kentucky				0	
Louisiana					0
Maine		0			0
Maryland					
Mass.		10/18		0	0
Michigan	13	3			1
Minnesota					
Mississippi		20			4/5
Missouri		8		0	0

	Birds	Mosquito Pools	Sentinels	Horses	Humans
Montana					
Nebraska	2	23/28		1	3/5
Nevada					1
New Hampshire		0		0	0
New Jersey		14/39		0	1
New Mexico					
New York		5			5/11
North Carolina					
North Dakota	6	12/15		0	2/4
Ohio		1		0	1
Oklahoma		7		1	2
Oregon	0	2/8	0	0	0
Pennsylvania	2	90/148			1
Rhode Island		0			
South Carolina					
South Dakota		28			6/19
Tennessee					
Texas		330/604		2	7/13
Utah		12/27			
Vermont					
Virginia					
Washington	0	27/39		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 30 July 2016

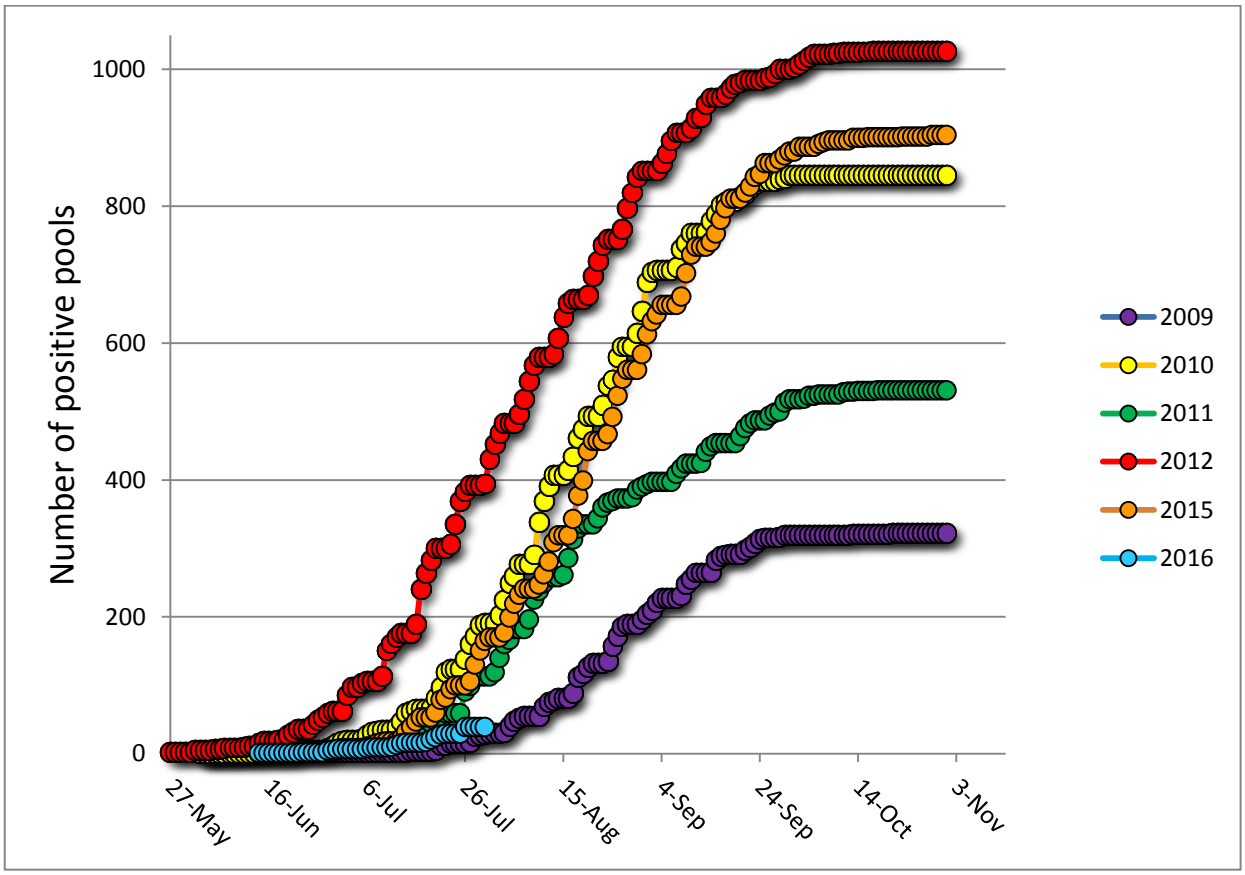
Species	Pools	Mosquitoes	Positives	MFIR
Aedes albopictus	426	1960		
Aedes atlanticus	2	4		
Aedes atropalpus	18	60		
Aedes canadensis canadensis	30	624		
Aedes cantator	30	239		
Aedes grossbecki	1	1		
Aedes japonicus	302	1675		
Aedes sollicitans	14	489		
Aedes sticticus	1	6		
Aedes taeniorhynchus	11	317		
Aedes triseriatus	127	267		
Aedes trivittatus	2	34		
Aedes vexans	33	421		
Anopheles atropos	1	1		
Anopheles barberi	2	2		
Anopheles bradleyi	37	298		
Anopheles crucians	3	45		
Anopheles punctipennis	34	103		
Anopheles quadrimaculatus	59	507		
Coquillettidia perturbans	78	1842		
Culex erraticus	19	73		
Culex pipiens	626	16493	5	0.303
Culex restuans	593	7021	1	0.142
Culex salinarius	172	1968		
Culex spp.	1396	56502	33	0.584
Culex territans	14	173		
Culiseta melanura	215	2413		
Orthopodomyia signifera	3	3		
Psorophora ciliata	1	1		
Psorophora columbiae	6	46		
Psorophora ferox	6	52		
Uranotaenia sapphirina	1	3		
Grand Total	**4263**	**93643**	**39**	**0.416**

Remarks: To date, 4263 pools of 93,643 mosquitoes from 31 species have been tested, with 39 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.

The graph below shows cumulative positive pools for several years, with 2012 as the most active year and 2009 as the least active year. While it currently appears that New Jersey may be on track for low activity, last year we saw a similar pattern that increased to the second most active year as the season progressed and samples were completed.



WNV Results by County through 30 July 2016

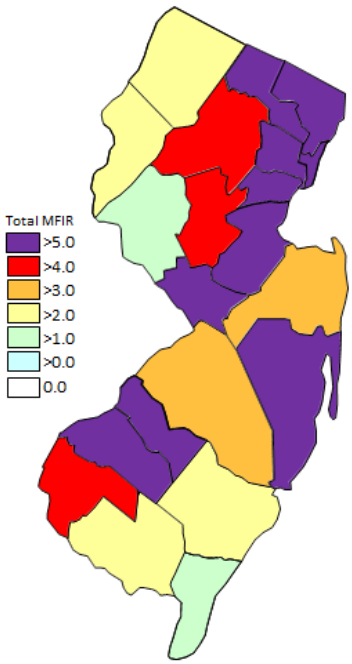
County	Species	Pools	Mosquitoes	Positives	MFIR
Atlantic		**99**	**3084**	**4**	**1.297**
	Aedes albopictus	8	25		
	Aedes japonicus	1	4		
	Aedes sollicitans	5	333		
	Aedes sticticus	1	6		
	Aedes taeniorhynchus	4	266		
	Aedes vexans	5	176		
	Anopheles bradleyi	1	10		
	Coquillettidia perturbans	11	104		
	Culex erraticus	1	21		
	Culex pipiens	15	849	4	4.711
	Culex restuans	3	52		
	Culex salinarius	4	123		
	Culex spp.	14	889		
	Culiseta melanura	25	214		
	Psorophora ferox	1	12		
Bergen		**90**	**6365**	**5**	**0.786**
	Aedes albopictus	5	20		
	Aedes japonicus	2	120		
	Culex spp.	83	6225	5	0.803
Burlington		**109**	**3799**	**2**	**0.526**

	Aedes albopictus	6	86		
	Aedes atropalpus	3	18		
	Aedes japonicus	7	163		
	Aedes taeniorhynchus	1	22		
	Aedes triseriatus	5	13		
	Anopheles barberi	1	1		
	Anopheles bradleyi	1	6		
	Anopheles crucians	2	40		
	Coquillettidia perturbans	1	58		
	Culex salinarius	11	362		
	Culex spp.	43	2304	2	0.868
	Culex territans	1	12		
	Culiseta melanura	27	714		
Camden		**109**	**3408**	**2**	**0.587**
	Aedes albopictus	9	33		
	Aedes japonicus	14	56		
	Culex spp.	71	2728	2	0.733
	Culiseta melanura	15	591		
Cape May		**1752**	**14058**		
	Aedes albopictus	106	157		
	Aedes atlanticus	1	2		
	Aedes atropalpus	15	42		
	Aedes canadensis canadensis	11	243		
	Aedes cantator	22	49		
	Aedes japonicus	151	317		
	Aedes sollicitans	2	4		
	Aedes taeniorhynchus	2	2		
	Aedes triseriatus	86	152		
	Aedes vexans	6	9		
	Anopheles atropos	1	1		
	Anopheles bradleyi	31	160		
	Anopheles punctipennis	8	9		
	Anopheles quadrimaculatus	53	498		
	Coquillettidia perturbans	24	414		
	Culex erraticus	7	15		
	Culex pipiens	468	7043		
	Culex restuans	498	3976		
	Culex salinarius	137	522		
	Culex spp.	30	85		
	Culex territans	13	161		
	Culiseta melanura	73	183		
	Orthopodomyia signifera	2	2		
	Psorophora columbiae	1	1		
	Psorophora ferox	3	8		
	Uranotaenia sapphirina	1	3		
Cumberland		**60**	**1595**		
	Aedes albopictus	1	1		
	Aedes cantator	1	1		
	Aedes japonicus	4	7		
	Aedes sollicitans	5	148		
	Aedes taeniorhynchus	3	26		
	Aedes vexans	4	190		
	Anopheles bradleyi	4	122		

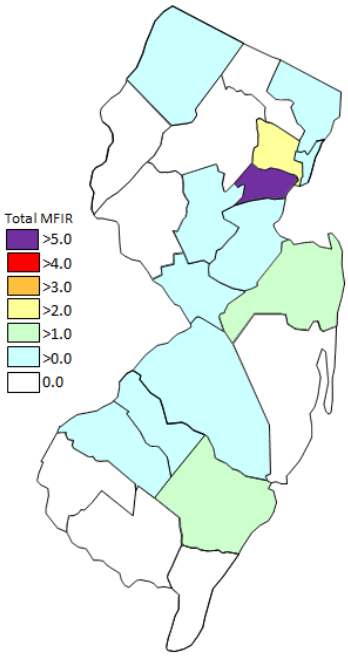
	Anopheles crucians	1	5		
	Anopheles punctipennis	1	2		
	Anopheles quadrimaculatus	1	3		
	Coquillettidia perturbans	4	104		
	Culex salinarius	19	906		
	Culex spp.	1	2		
	Culiseta melanura	4	19		
	Orthopodomyia signifera	1	1		
	Psorophora ciliata	1	1		
	Psorophora columbiae	4	44		
	Psorophora ferox	1	13		
Essex		**98**	**405**	**1**	**2.469**
	Aedes albopictus	27	99		
	Aedes japonicus	5	8		
	Aedes triseriatus	2	2		
	Anopheles punctipennis	1	1		
	Culex spp.	63	295	1	3.390
Gloucester		**169**	**8695**	**1**	**0.115**
	Aedes albopictus	16	199		
	Aedes japonicus	13	182		
	Aedes triseriatus	1	4		
	Anopheles punctipennis	2	10		
	Culex pipiens	128	8222	1	0.122
	Culiseta melanura	9	78		
Hudson		**96**	**4794**	**2**	**0.417**
	Aedes albopictus	8	115		
	Culex spp.	88	4679	2	0.427
Hunterdon		**89**	**3923**		
	Culex spp.	89	3923		
Mercer		**150**	**4491**	**2**	**0.445**
	Aedes japonicus	4	43		
	Aedes triseriatus	2	24		
	Aedes vexans	1	3		
	Culex pipiens	15	379		
	Culex restuans	88	2986	1	0.335
	Culex spp.	40	1056	1	0.947
Middlesex		**165**	**7051**	**3**	**0.425**
	Aedes albopictus	18	104		
	Culex spp.	118	6550	3	0.458
	Culiseta melanura	29	397		
Monmouth		**308**	**2937**	**5**	**1.702**
	Aedes albopictus	148	719		
	Aedes atlanticus	1	2		
	Aedes canadensis canadensis	18	311		
	Aedes cantator	7	189		
	Aedes grossbecki	1	1		
	Aedes japonicus	16	32		
	Aedes sollicitans	2	4		

	Aedes taeniorhynchus	1	1		
	Aedes triseriatus	5	12		
	Aedes trivittatus	1	1		
	Aedes vexans	5	21		
	Anopheles barberi	1	1		
	Anopheles punctipennis	17	33		
	Anopheles quadrimaculatus	2	2		
	Coquillettidia perturbans	4	5		
	Culex erraticus	2	5		
	Culex restuans	1	3		
	Culex spp.	65	1552	5	3.222
	Culiseta melanura	10	24		
	Psorophora ferox	1	19		
Morris		**155**	**5668**		
	Aedes albopictus	10	30		
	Culex spp.	145	5638		
Ocean		**156**	**2362**		
	Aedes albopictus	40	313		
	Aedes canadensis canadensis	1	70		
	Aedes japonicus	20	73		
	Aedes triseriatus	8	14		
	Aedes vexans	1	1		
	Anopheles punctipennis	2	2		
	Coquillettidia perturbans	13	219		
	Culex erraticus	2	14		
	Culex restuans	1	2		
	Culex spp.	54	1612		
	Culiseta melanura	14	42		
Passaic		**160**	**4149**		
	Aedes albopictus	2	2		
	Aedes japonicus	41	168		
	Aedes triseriatus	4	5		
	Aedes vexans	11	21		
	Culex spp.	102	3953		
Salem		**120**	**830**		
	Aedes albopictus	18	32		
	Aedes japonicus	10	26		
	Aedes triseriatus	12	21		
	Anopheles punctipennis	2	2		
	Anopheles quadrimaculatus	3	4		
	Coquillettidia perturbans	9	82		
	Culex erraticus	7	18		
	Culex restuans	2	2		
	Culex spp.	47	491		
	Culiseta melanura	9	151		
	Psorophora columbiae	1	1		
Somerset		**90**	**2180**	**1**	**0.459**
	Aedes albopictus	2	7		
	Aedes japonicus	1	8		
	Aedes triseriatus	1	4		

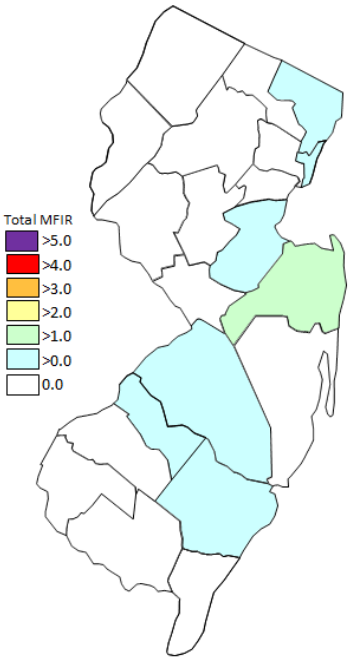
	Culex spp.	86	2161	1	0.463
Sussex		**157**	**6417**	**1**	**0.156**
	Aedes japonicus	13	468		
	Aedes triseriatus	1	16		
	Aedes trivittatus	1	33		
	Anopheles punctipennis	1	44		
	Coquillettidia perturbans	12	856		
	Culex salinarius	1	55		
	Culex spp.	128	4945	1	0.202
Union		**29**	**1573**	**10**	**6.357**
	Aedes albopictus	2	18		
	Culex spp.	27	1555	10	6.431
Warren		**102**	**5859**		
	Culex spp.	102	5859		
Grand Total		**4263**	**93643**	**39**	**0.416**



Cumulative WNV activity in 2015.



WNV activity to 30 July 2016.



WNV activity last week, 2016.

Saint Louis Encephalitis (SLE) to 30 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		**44**	**2305**		
	Anopheles barberi	1	1		
	Culex spp.	43	2304		
Cape May		**497**	**7124**		
	Aedes albopictus	1	1		
	Culex pipiens	466	7038		
	Culex spp.	30	85		
Grand Total		**541**	**9429**		

La Crosse Encephalitis (LAC) to 30 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		**21**	**280**		
	Aedes albopictus	6	86		
	Aedes atropalpus	3	18		
	Aedes japonicus	7	163		
	Aedes triseriatus	5	13		
Grand Total		**21**	**280**		

Dengue (DENV) to 30 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		**9**	**33**	**9**	**33**	**9**	**33**	**9**	**33**		
	Aedes albopictus	9	33	9	33	9	33	9	33		
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		**18**	**32**	**18**	**32**	**18**	**32**	**18**	**32**		
	Aedes albopictus	18	32	18	32	18	32	18	32		
Grand Total		**230**	**1102**	**230**	**1102**	**230**	**1102**	**230**	**1102**		

Chikungunya (CHIK) to 30 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		**9**	**33**		
	Aedes albopictus	9	33		
Cape May		**106**	**160**		
	Aedes albopictus	105	156		

	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		**18**	**32**		
	Aedes albopictus	18	32		
Grand Total		**336**	**1262**		

Zika (ZIKV) to 30 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 69 imported human cases of Zika.

County	Species	Pools	Mosquitoes	Positives	MFIR
Cape May		**106**	**160**		
	Aedes albopictus	105	156		
	Culex pipiens	1	4		
Monmouth		**6**	**8**		
	Aedes albopictus	6	8		
Grand Total		**112**	**168**		