VECTOR SURVEILLANCE IN NEW JERSEY

EEE, WNV, SLE, LAC, DENV and CHIK

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CDC WEEK 34: 23 August to 29 August, 2015

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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**	0.43	1.00	9‡ (15)	7 (8)		
Green Bank (Burlington Co.)/23	**Coastal**	3.49	0.36	81 (90)	10 (11)	1	12.35
Corbin City (Atlantic Co.)/25	**Coastal**	1.65	0.24	203 (209)	11 (12)		
Dennisville (Cape May Co.)/50	**Coastal**	9.05	0.10	220	10		
Winslow (Camden Co.)/50	**Inland**	1.50	5.82	1542	37	6	3.89
Centerton (Salem Co.)/50	**Inland**	3.88	0.68	635	20		
Turkey Swamp (Monmouth Co.)/49	**Inland**	1.88	0.64	329 (361)	15 (16)		
Glassboro (Gloucester Co.)/50	**Inland**	0.36	0.30	199	13		

*Current week (in parentheses) results pending. ‡ corrected

Remarks: EEE activity has ramped up considerably in New Jersey with a total of 14 positive pools, 9 in *Culiseta* melanura and 5 in *Culex erraticus.* One horse case has occurred. 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: Seven EEE positive *Cs. melanura* pools have been detected at the state resting box sites to date. The Winslow site detected three additional positive pools from the previous week. 3218 *Cs. melanura* from 123 pools have been tested for EEE with an additional 4 pools containing 52 *Cs. melanura* to be tested. MFIR for the traditional resting box sites is 2.18 with a statewide MFIR of 1.44 for *Cs. melanura* and a statewide MFIR of 1.32 for all species tested.

	Additional *Cs. melanura* trapped by counties *traps with positives indicated in **BOLD.**				
County	**Trap types***	**Pools**	**Mosquitoes**	**Positives**	**MFIR**
Atlantic	CO_2	16	283		
Burlington	**CO_2**	54	2018	2	0.99
Cape May	GR, RB	38	207		
Cumberland	CO_2, RB	13	135		
Gloucester		8	290		
Middlesex	RB	7	42		
Ocean	CO_2, GR, RB	12	58		
Salem	CO_2	1	1		
TOTAL		**149**	**3034**	**2**	**0.66**

Additional *Cs. melanura*: Counties maintain trap sites for *Cs. melanura* in other areas. Two additional positive pools from Burlington County, the first collected from a CO_2 trap on 3 August have been detected.

Species other than *Cs. melanura*	**Pools**	**Mosquitoes**	**Positives**	**MFIR**
Aedes atlanticus	1	7		
Aedes canadensis canadensis	1	22		
Aedes cantator	23	36		
Aedes sollicitans	10	368		
Anopheles bradleyi	6	8		
Anopheles crucians	2	18		
Anopheles punctipennis	7	25		
Anopheles quadrimaculatus	2	51		
Coquillettidia perturbans	73	1683		
Culex erraticus	10	277	5	18.05
Culex pipiens	149	1286		
Culex restuans	2	2		
Culex salinarius	35	527		
Culex sp.	16	62		
State Total	**337**	**4372**	**5**	**1.14**

Additional Species: Thirteen additional species were tested for EEE. 5 positive pools, all from *Culex erraticus* at one resting box site (county) were collected on 18 Aug, in Cape May.

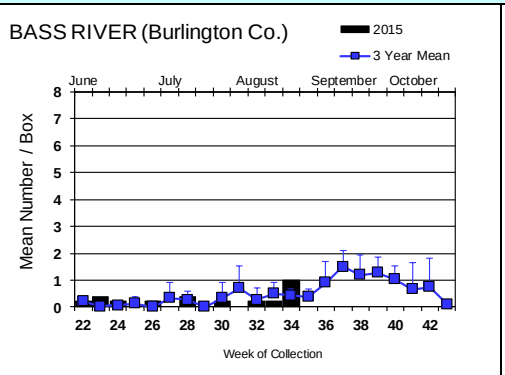
Horses and Humans: One horse, a 2 yo unvaccinated mare in Gloucester County, euthanized 25 Aug (no date of onset reported).

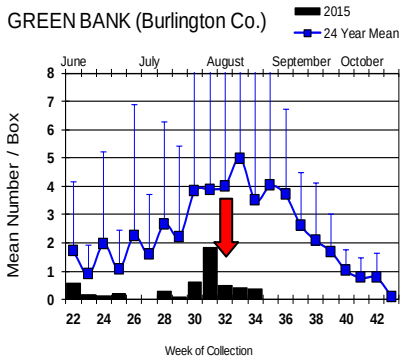
No humans have been reported with EEE.

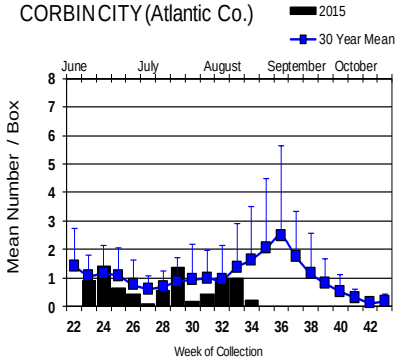
Horses and Vaccinations: The fate of unvaccinated equids reinforces the necessity of maintaining a vaccination schedule for arboviruses. For vaccination schedules recommended by the American Association of Equine Practices, see: http://www.aaep.org/vaccination_guidelines.htm

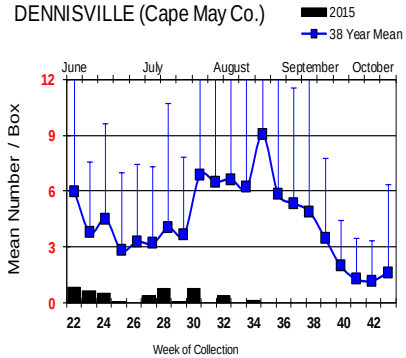
Culiseta melanura Population Graphs

Coastal

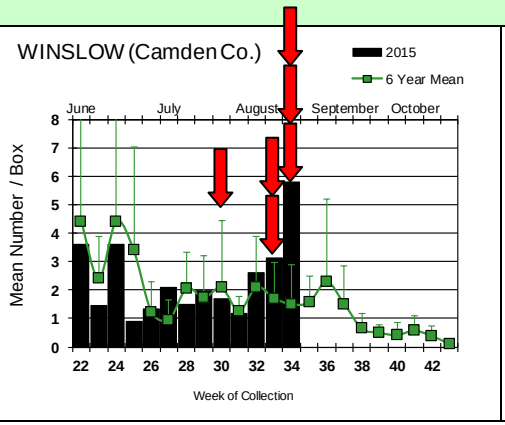


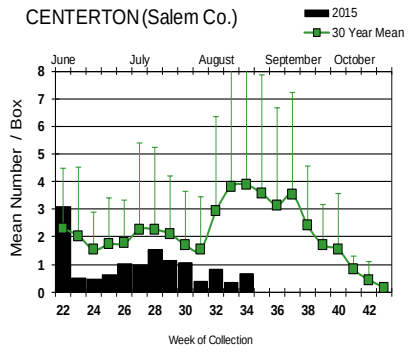


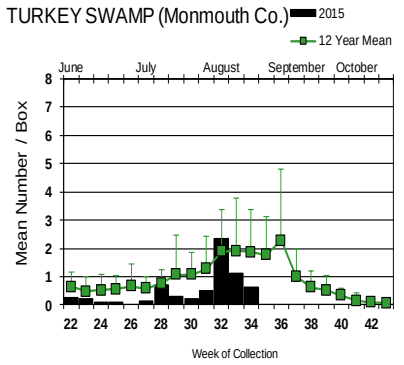


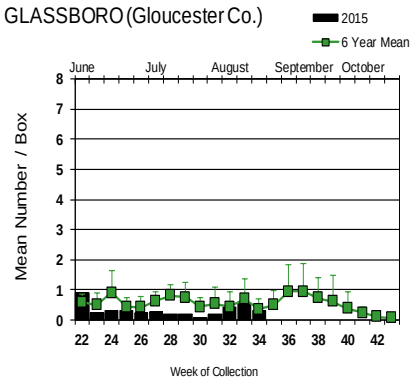


Inland









Populations of *Cs. melanura* at Winslow continued to increase significantly above historical averages, with three additional positive pools detected during this time. Bass River also showed increased populations above historical values, but no EEE activity. Centerton showed some increase in population levels, but still remained well below the historical averages.

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

EEE in US (2015 cumulative cases): (Black or Red = previous + new reported cases occurring)

- equine: FL(18/1goat) LA(1) MS(2) NC(1) NJ(1) SC(3) TX(8) VA(1)
- mosquito pools: NJ (14) NY(13)
- sentinel: FL(62), TX(16)
- human: LA (1)

West Nile Virus Positive Organisms in US, 2015

West Nile in US (2015 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					3
Alaska					
Arizona	0	59/65		2	25/45
Arkansas				1	8/9
California	503/581	1768/2073	150/174	3	57/83
Colorado	6/8	48/112		4/5	8/17
Connecticut		64/83			0
Delaware	1/2				1
DC					1
Florida		6/8	60/76		4/5
Georgia	0	0		0	4
Hawaii					
Idaho	0	12/13		1/3	4/6
Illinois	23	713/811		2	1/3
Indiana	0	130/259			1/3
Iowa		1/2		0	1/2
Kansas		0			6/7
Kentucky				1/2	
Louisiana	19/27	365/401			20/23
Maine					
Maryland					2
Mass.		86/99		0	1
Michigan	10	6/9			
Minnesota	2/3	1/2		1	4
Mississippi		40/41		1	13/18
Missouri		98		4	2

	Birds	Mosquito Pools	Sentinels	Horses	Humans
Montana					1
Nebraska	0	70/73		0	14/20
Nevada		63			3
New Hampshire		0		0	0
New Jersey	13/15	370/429		0	3/6
New Mexico					2/3
New York		36			1
North Carolina					
North Dakota	0	4		1	4/8
Ohio		134			8
Oklahoma		2			15/21
Oregon	3	26	0	1	0
Pennsylvania	14/17	1425/1821			6/9
Rhode Island		1		0	0
South Carolina					1
South Dakota		7			10/14
Tennessee		117			1
Texas	6/12	798/934		5	17/39
Utah		53/127		2	
Vermont		12/19			
Virginia					
Washington	3/6	127/135		15/18	15/18
West Virginia					
Wisconsin	15/30	4		0	1
Wyoming					1/4

* 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 31 August 2015

Species	Pools	Mosquitoes	Positives	MFIR
Aedes albopictus	624	4838	11	2.274
Aedes atlanticus	2	13		
Aedes atropalpus	1	1		
Aedes canadensis canadensis	19	258	1	3.876
Aedes cantator	29	206		
Aedes grossbecki	9	40		
Aedes japonicus	234	1365	5	3.663
Aedes sollicitans	10	368		
Aedes sticticus	1	1		
Aedes taeniorhynchus	3	35		
Aedes triseriatus	68	223	2	8.969
Aedes trivittatus	3	4		
Aedes vexans	47	849	1	1.178
Anopheles bradleyi	7	23		
Anopheles crucians	3	19		
Anopheles punctipennis	31	102		
Anopheles quadrimaculatus	42	597		
Coquillettidia perturbans	77	1761		
Culex erraticus	27	393	2	5.089
Culex pipiens	345	10545	55	5.216
Culex restuans	228	1775	2	1.127
Culex salinarius	37	563	2	3.552
Culex sp.	1783	71459	340	4.758
Culex territans	6	10		
Culiseta melanura	275	6259	8	1.278
Psorophora ciliata	3	20		
Psorophora columbiae	12	229		
Psorophora ferox	7	14		
Grand Total	**3933**	**101970**	**429**	**4.207**

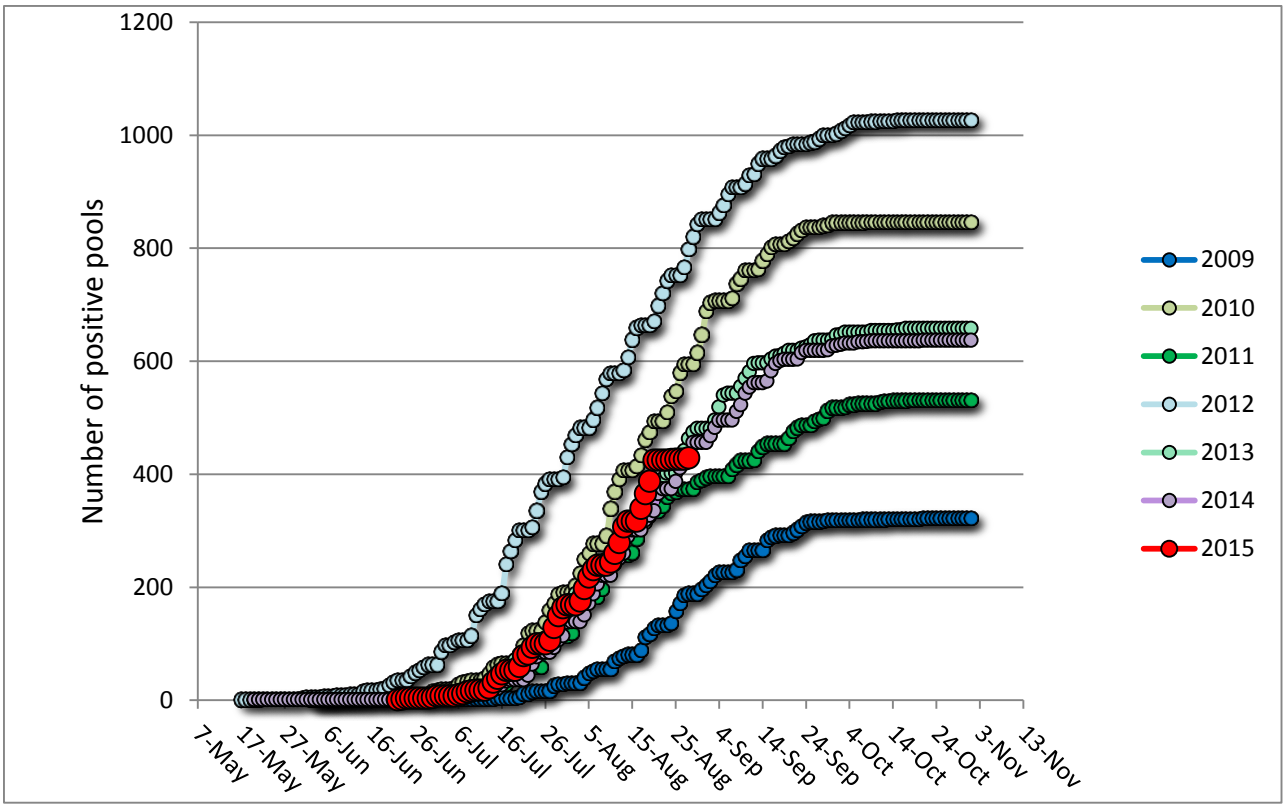
Remarks: To date, 3933 pools of 101,970 mosquitoes from 27 species have been tested, with 429 positive pools detected, most in ornithophilic *Culex/Culiseta* pools. *Culex salinarius* collected on the 14th and 20th in Cape May is the latest species to test positive. Non-*Culex* species to become positive were pools of *Aedes canadensis* (sampled 20 August in Union County), *Aedes triseriatus* (sampled 11 August in Salem County) and *Aedes vexans* (sampled 5 August in Cumberland County). First positive of the season occurred in Middlesex County, in a pool of mixed *Culex*, collected on the 22nd of June. First positive pool in non-*Culex* was in an *Aedes albopictus* pool, collected in Monmouth County on 10 July. First positive pool in a non-*Culex* ornithophilic species was found in *Culiseta melanura* in Cape May 21 July. Overall state MFIR is 4.207, up from the previous week of 3.917.

Humans, Horses and Wild Birds: Six human cases of WNV have been reported, one each in Bergen, Burlington, Camden, Gloucester, Middlesex and Passaic counties. For further information, see http://www.state.nj.us/health/cd/westnile/techinfo.shtml.

No horse cases have been detected.

Bird testing began in mid-April. Fifteen positive birds have been reported, mostly corvids. To date, 44 birds have been tested. Species includes: American Crow (*Corvus brachyrhynchos* 2/8) Fish Crow (*Corvus ossifragus* 1/10), Blue Jay (*Cyanocitta cristata* 2/4), unidentified corvid (2/3), Hawk/Raptor (1/2) and other avian species (3/17). Counties (positives)

submitting birds are Atlantic, Bergen, Burlington, Cape May, Cumberland, Essex, Gloucester, Hunterdon, Mercer, Monmouth, Morris, Ocean, Passaic, Salem and Warren.



The figure above shows WNV activity as the accumulation of positive pools over the season. The plateau during the current two weeks should partially disappear as more positive samples are recorded.

WNV Results by County through 31 August 2015

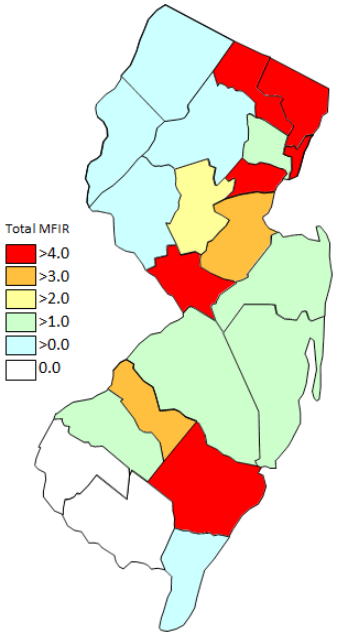
County	Species	Pools	Mosquitoes	Positives	MFIR
Atlantic		**144**	**4390**	**1**	**0.228**
	Aedes albopictus	21	211		
	Aedes japonicus	10	37		
	Aedes sollicitans	3	136		
	Aedes taeniorhynchus	1	5		
	Aedes vexans	6	238		
	Coquillettidia perturbans	22	777		
	Culex spp.	53	2499	1	0.400
	Culiseta melanura	27	486		
	Psorophora ferox	1	1		
Bergen		**84**	**4611**	**34**	**7.374**
	Aedes albopictus	3	5	1	200.000
	Aedes japonicus	8	235		
	Aedes triseriatus	1	1		
	Culex spp.	72	4370	33	7.551
Burlington		**155**	**4400**	**14**	**3.182**
	Aedes albopictus	12	150	2	13.333
	Aedes atlanticus	1	7		
	Aedes canadensis canadensis	1	22		
	Aedes japonicus	4	40		
	Aedes sticticus	1	1		
	Aedes triseriatus	1	2		

	Aedes vexans	2	14		
	Anopheles crucians	1	17		
	Anopheles punctipennis	1	3		
	Coquillettidia perturbans	4	93		
	Culex erraticus	1	1	1	1000.000
	Culex salinarius	6	201		
	Culex spp.	48	1740	9	5.172
	Culiseta melanura	72	2109	2	0.948
Camden		**216**	**7841**	**40**	**5.101**
	Aedes albopictus	16	31		
	Aedes canadensis canadensis	3	15		
	Aedes cantator	1	1		
	Aedes japonicus	41	363	1	2.755
	Anopheles punctipennis	2	6		
	Culex spp.	113	5877	36	6.126
	Culiseta melanura	38	1543	3	1.944
	Psorophora ferox	2	5		
Cape May		**664**	**4161**	**21**	**5.047**
	Aedes albopictus	35	57		
	Aedes atropalpus	1	1		
	Aedes canadensis canadensis	5	5		
	Aedes cantator	23	36		
	Aedes japonicus	70	168		
	Aedes sollicitans	1	1		
	Aedes triseriatus	32	70		
	Aedes vexans	3	8		
	Anopheles bradleyi	6	8		
	Anopheles punctipennis	6	6		
	Anopheles quadrimaculatus	33	539		
	Coquillettidia perturbans	23	564		
	Culex erraticus	8	225		
	Culex pipiens	149	1286	16	12.442
	Culex restuans	178	650	1	1.538
	Culex salinarius	24	70	2	28.571
	Culex spp.	10	27		
	Culex territans	6	10		
	Culiseta melanura	48	427	2	4.684
	Psorophora columbiae	1	1		
	Psorophora ferox	2	2		
Cumberland		**144**	**2494**	**3**	**1.203**
	Aedes albopictus	19	212		
	Aedes atlanticus	1	6		
	Aedes canadensis canadensis	2	53		
	Aedes cantator	1	2		
	Aedes grossbecki	9	40		
	Aedes japonicus	3	11		
	Aedes sollicitans	6	231		
	Aedes taeniorhynchus	2	30		
	Aedes triseriatus	3	7		
	Aedes trivitattus	1	2		
	Aedes vexans	17	480	1	2.083
	Anopheles bradleyi	1	15		
	Anopheles punctipennis	3	30		

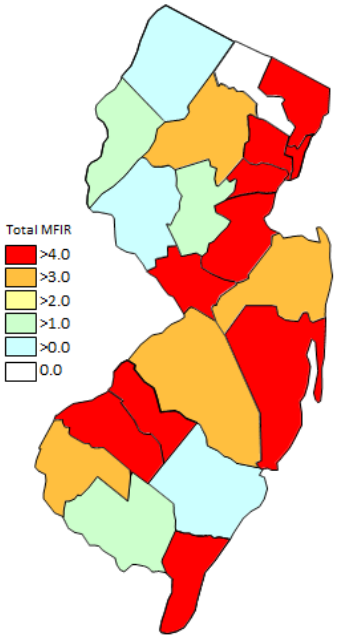
	Anopheles quadrimaculatus	3	23		
	Coquillettidia perturbans	9	64		
	Culex erraticus	2	52		
	Culex restuans	1	1		
	Culex salinarius	5	256		
	Culex spp.	31	627	2	3.190
	Culiseta melanura	13	135		
	Psorophora ciliata	3	20		
	Psorophora columbiae	9	197		
Essex		**113**	**1957**	**8**	**4.088**
	Aedes albopictus	5	9		
	Aedes japonicus	18	40		
	Aedes trivittatus	1	1		
	Anopheles punctipennis	1	2		
	Anopheles quadrimaculatus	2	17		
	Culex spp.	84	1882	8	4.251
	Psorophora ferox	2	6		
Gloucester		**304**	**9720**	**39**	**4.012**
	Aedes albopictus	127	956	4	4.184
	Aedes japonicus	4	35		
	Aedes triseriatus	1	3		
	Coquillettidia perturbans	1	2		
	Culex pipiens	150	8235	35	4.250
	Culiseta melanura	21	489		
Hudson		**143**	**6065**	**41**	**6.760**
	Aedes albopictus	22	342		
	Culex spp.	121	5723	41	7.164
Hunterdon		**158**	**7897**	**7**	**0.886**
	Culex spp.	158	7897	7	0.886
Mercer		**193**	**5165**	**23**	**4.453**
	Aedes albopictus	12	42		
	Aedes japonicus	11	55		
	Aedes vexans	16	104		
	Coquillettidia perturbans	5	37		
	Culex pipiens	45	1023	4	3.910
	Culex restuans	46	1121	1	0.892
	Culex spp.	58	2783	18	6.468
Middlesex		**245**	**8160**	**47**	**5.760**
	Aedes albopictus	87	241		
	Culex spp.	151	7877	47	5.967
	Culiseta melanura	7	42		
Monmouth		**363**	**6049**	**22**	**3.637**
	Aedes albopictus	180	1718	2	1.164
	Aedes canadensis canadensis	6	93		
	Aedes cantator	4	167		
	Aedes japonicus	6	15		
	Aedes triseriatus	1	1		
	Aedes trivittatus	1	1		

	Aedes vexans	1	2		
	Anopheles crucians	2	2		
	Anopheles punctipennis	13	32		
	Anopheles quadrimaculatus	3	6		
	Coquillettidia perturbans	1	1		
	Culex erraticus	9	81		
	Culex restuans	1	1		
	Culex salinarius	2	36		
	Culex spp.	115	3528	20	5.669
	Culiseta melanura	16	334		
	Psorophora columbiae	2	31		
Morris		**198**	**7920**	**28**	**3.535**
	Aedes albopictus	23	334		
	Culex spp.	175	7586	28	3.691
Ocean		**160**	**2509**	**18**	**7.174**
	Aedes albopictus	45	387	2	5.168
	Aedes canadensis canadensis	1	3		
	Aedes japonicus	27	121	3	24.793
	Aedes triseriatus	3	16	1	62.500
	Aedes vexans	1	2		
	Coquillettidia perturbans	3	125		
	Culex erraticus	1	2		
	Culex spp.	67	1795	12	6.685
	Culiseta melanura	12	58		
Passaic		**9**	**149**		
	Aedes japonicus	2	5		
	Aedes triseriatus	2	3		
	Aedes vexans	1	1		
	Culex spp.	4	140		
Salem		**106**	**1283**	**5**	**3.897**
	Aedes albopictus	16	137		
	Aedes japonicus	11	21	1	47.619
	Aedes triseriatus	11	16	1	62.500
	Anopheles quadrimaculatus	1	12		
	Coquillettidia perturbans	7	23		
	Culex erraticus	6	32	1	31.250
	Culex pipiens	1	1		
	Culex restuans	2	2		
	Culex spp.	30	403	1	2.481
	Culiseta melanura	21	636	1	1.572
Somerset		**138**	**2192**	**4**	**1.825**
	Aedes albopictus	1	6		
	Aedes japonicus	8	121		
	Aedes triseriatus	5	23		
	Anopheles punctipennis	1	4		
	Coquillettidia perturbans	1	29		
	Culex spp.	122	2009	4	1.991
Sussex		**148**	**3077**	**3**	**0.975**
	Aedes japonicus	11	98		

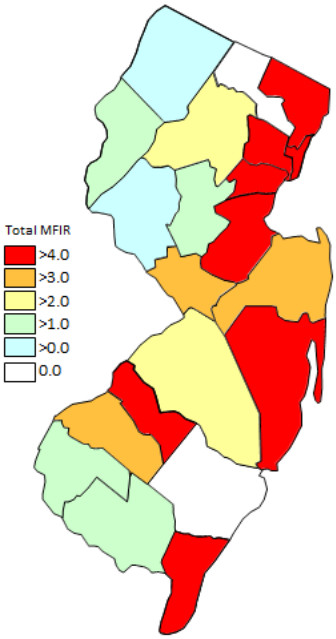
	Aedes triseriatus	8	81		
	Anopheles punctipennis	4	19		
	Coquillettidia perturbans	1	46		
	Culex spp.	124	2833	3	1.059
Union		**107**	**7622**	**65**	**8.528**
	Aedes canadensis canadensis	1	67	1	14.925
	Culex spp.	106	7555	64	8.471
Warren		**141**	**4308**	**6**	**1.393**
	Culex spp.	141	4308	6	1.393
Grand Total		**3933**	**101970**	**429**	**4.207**



Cumulative WNV activity in 2014.



WNV activity to 31 August 2015.



WNV activity last week, 2015.

Saint Louis Encephalitis (SLE) 2015.

New Jersey will be testing for SLE this year only when adjacent states show human activity (Cape May tests its own 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.

County	Species	Pools	Mosquitoes	Positives	MFIR
Cape May		**159**	**1307**		
	Culex pipiens	148	1277		
	Culex restuans	1	3		
	Culex spp.	10	27		
Grand Total		**159**	**1307**		

La Crosse Encephalitis (LAC) 2015.

New Jersey will be testing for LAC this year only when adjacent states show human activity (Cape May tests its own 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).

County	Species	Pools	Mosquitoes	Positives	MFIR
Cape May		**32**	**70**		
	Aedes triseriatus	32	70		
Grand Total		**32**	**70**		

Dengue (DENV) to 31 August 2015.

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 2015. Currently, there are 21 imported human cases reported in New Jersey.

County	Species	DENV1		DENV2		DENV3		DENV4		Positives	MFIR
		Pool	Mos.	Pool	Mos.	Pool	Mos.	Pool	Mos.		
Atlantic		**21**	**211**	**21**	**211**	**21**	**211**	**21**	**211**		
		21	211	21	211	21	211	21	211		
Burlington		**12**	**150**	**12**	**150**	**12**	**150**	**12**	**150**		
		12	150	12	150	12	150	12	150		
Camden		**16**	**30**	**16**	**30**	**16**	**30**	**16**	**30**		
		16	30	16	30	16	30	16	30		
Cumberland		**19**	**212**	**19**	**212**	**19**	**212**	**19**	**212**		
		19	212	19	212	19	212	19	212		
Gloucester		**126**	**948**	**127**	**956**	**127**	**956**	**127**	**956**		
		126	948	127	956	127	956	127	956		
Hudson		**22**	**342**	**22**	**342**	**22**	**342**	**22**	**342**		
		22	342	22	342	22	342	22	342		
Mercer		**12**	**42**	**12**	**42**	**12**	**42**	**12**	**42**		
		12	42	12	42	12	42	12	42		

Middlesex	**87**	**241**	**87**	**241**	**87**	**241**	**87**	**241**		
	87	241	87	241	87	241	87	241		
Monmouth	**167**	**1672**	**167**	**1672**	**167**	**1672**	**148**	**1561**		
	167	1672	167	1672	167	1672	148	1561		
Morris	**23**	**334**	**23**	**334**	**23**	**334**	**23**	**334**		
	23	334	23	334	23	334	23	334		
Salem	**16**	**137**	**16**	**137**	**16**	**137**	**16**	**137**		
	16	137	16	137	16	137	16	137		
Grand Total	**521**	**4319**	**522**	**4327**	**522**	**4327**	**503**	**4216**		

Chikungunya (CHIK) to 31 August 2015.

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 2015. Currently, there are 20 imported human cases reported in New Jersey.

County	Species	Pools	Mosquitoes	Positives	MFIR
Atlantic		**21**	**211**		
	Aedes albopictus	21	211		
Burlington		**12**	**150**		
	Aedes albopictus	12	150		
Camden		**16**	**30**		
	Aedes albopictus	16	30		
Cape May		**35**	**57**		
	Aedes albopictus	35	57		
Cumberland		**19**	**212**		
	Aedes albopictus	19	212		
Gloucester		**127**	**956**		
	Aedes albopictus	127	956		
Hudson		**22**	**342**		
	Aedes albopictus	22	342		
Mercer		**12**	**42**		
	Aedes albopictus	12	42		
Middlesex		**87**	**241**		
	Aedes albopictus	87	241		

Monmouth		**167**	**1672**		
	Aedes albopictus	167	1672		
Morris		**23**	**334**		
	Aedes albopictus	23	334		
Salem		**16**	**137**		
	Aedes albopictus	16	137		
Grand Total		**557**	**4384**		