VECTOR SURVEILLANCE IN NEW JERSEY

EEE, WNV, SLE and LAC

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CDC WEEK 36: September 1 – September 7, 2013

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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**	1.50	1.20	36 (42)	10 (11)		
Green Bank (Burlington Co.)/25	**Coastal**	3.76	5.76	261 (405)	14 (17)	1	3.83
Corbin City (Atlantic Co.)/25	**Coastal**	2.59	0.72	248 (266)	14 (15)	1	4.03
Dennisville (Cape May Co.)/50	**Coastal**	5.64	0.16	225 (233)	12 (13)	1	4.44
Winslow (Camden Co.)/50	**Inland**	2.97	1.22	1458 (1519)	35 (37)	1	0.39
Centerton (Salem Co.)/50	**Inland**	3.28	1.00	782 (832)	23 (24)		
Turkey Swamp (Monmouth Co.)/44	**Inland**	1.86	8.14	1310	35	8	6.11
Glassboro (Gloucester Co.)/50	**Inland**	1.10	0.34	299 (316)	14 (15)		

*Current week (in parentheses) results pending.

Remarks: EEE activity increased significantly with triple the number of positive pools than found earlier and is disseminating in southern New Jersey, with additional positive pools found up through Burlington and Monmouth counties (see map, page 3). This activity reflects a general increase in activity throughout the eastern seaboard. To date, 24 positive EEE pools (*Cs. melanura*, *Coquillettidia perturbans, Culex erraticus* and *Cx. salinarius*) have been collected in New Jersey. Two presumptive horse cases have been reported.

Traditional Resting Box Sites: To date 4619 *Cs. melanura* from 157 pools have been tested from the traditional resting box sites with an additional 14 pools of 662 mosquitoes to be tested. Twelve pools have been detected positive for an overall MFIR of 2.60 for the traditional resting box sites. New positives were detected primarily at Turkey Swamp (8) with additional pools at Green Bank, Corbin City and Winslow.

Additional *Cs. melanura*: Two hundred seventy-five additional pools containing 6169 *Cs. melanura* have been tested from other sites using other traps in addition to resting boxes. A total of 9 positive *Cs. melanura* pools from non-traditional sites have been detected to date. Note that MFIR value is a "rough estimate" as other data already completed may be pending for entry to the West Nile database and not reflected in the tables below.

While *Cs. melanura* is primarily a bird feeder, it is not exclusively ornithophilic and may on occasion take a meal from a mammal. The appropriate precautions should be taken in its habitat.

Additional *Cs. melanura* trapped by counties
*traps with positives indicated in **BOLD.**

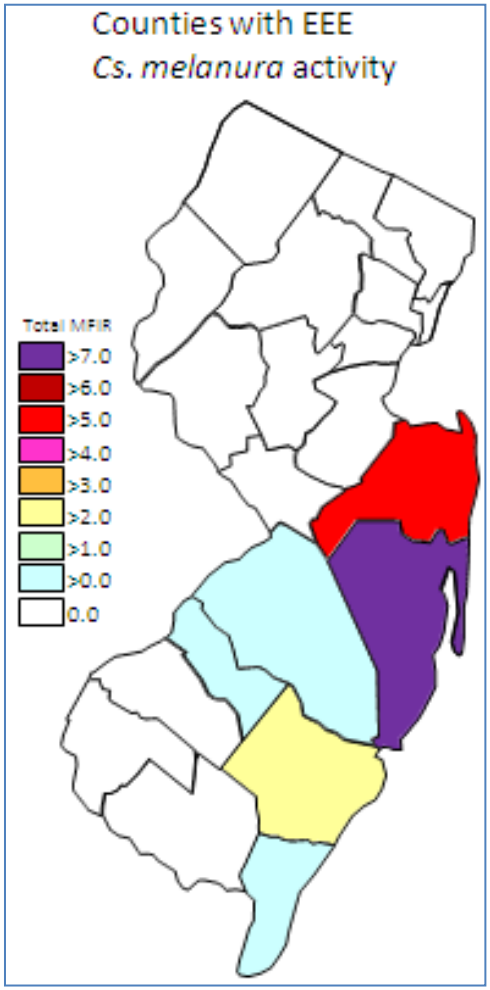
County	Trap types*	Number collected (pools)	Number of positives pools	MFIR
Atlantic	CO_2	1 (1)		
Burlington	**CO_2,** RB	4082 (70)	2	0.49
Cape May	CO_2, **Gravid**, LT, **RB**	1171 (15)	5	4.27
Gloucester	RB	649 (51)		
Monmouth	CO_2	37 (4)		
Ocean	**CO_2, RB**	197 (38)	2	10.15
Salem	CO_2	32 (6)		
TOTAL		**6169 (275)**	**9**	1.46*

Species other than *Cs. melanura*	Pools	Mosquitoes	Positives	MFIR
Aedes albopictus	1	1		
Aedes atlanticus	2	66		
Aedes canadensis canadensis	3	77		
Aedes cantator	19	24		
Aedes sollicitans	4	19		
Aedes sticticus	2	3		
Aedes taeniorhynchus	1	2		
Aedes triseriatus	1	17		
Aedes vexans	1	32		
Anopheles bradleyi	15	78		
Anopheles punctipennis	3	51		
Anopheles quadrimaculatus	1	5		
Coquillettidia perturbans	18	259	1	3.861
Culex erraticus	78	2670	1	0.375
Culex pipiens	360	4766		
Culex restuans	2	2		
Culex salinarius	78	748	1	1.337
Culex spp.	65	383		
Psorophora columbiae	2	5		
State Total	**656**	**9208**	**3**	**0.326**

Additional Species: The table to the left indicates non-*Cs. melanura* mosquitoes tested for EEE. First positive in a non-*Cs. melanura* species was a pool of *Cx. salinarius* collected 3 August in Cape May County. *Coquillettidia perturbans*, a suspected inland vector of EEE, was found positive in Ocean County. *Culex erraticus*, an indiscriminant feeder that will bite both birds and mammals was found positive in Monmouth County.

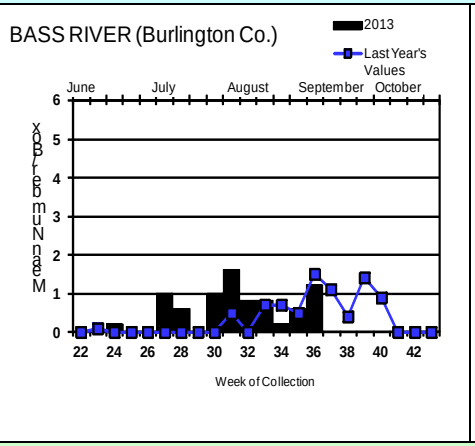
Horses and Humans: Currently there are no reported human cases. Two presumptive horse cases are reported. The first was in Cape May County. This 7 yo gelding had a date of onset 2 August and was euthanized the following day. Vaccination history is unknown. The second horse is in Monmouth County with an onset date of 27 August. This is another year with a pre-August date (July 9th) of first positive mosquitoes and multiple horse cases. The season may continue, in some years, well into October.

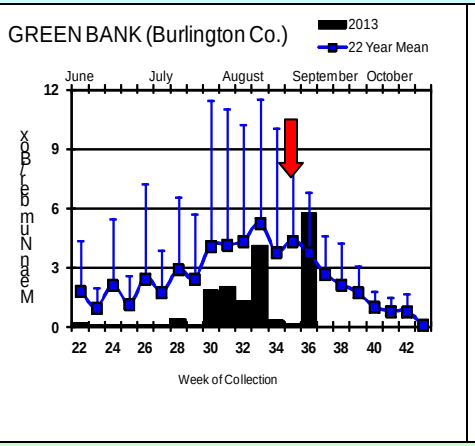
Horses and Vaccinations: The fate of unvaccinated equids reinforces the necessity of maintaining a vaccination schedule for arboviruses. For vaccination schedules recommended by the American Association of Equine Practices, see: http://www.aaep.org/vaccination_guidelines.htm

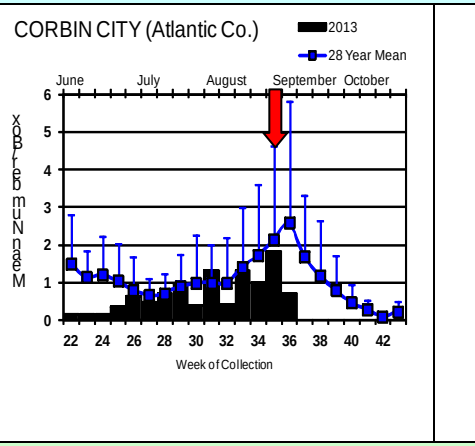


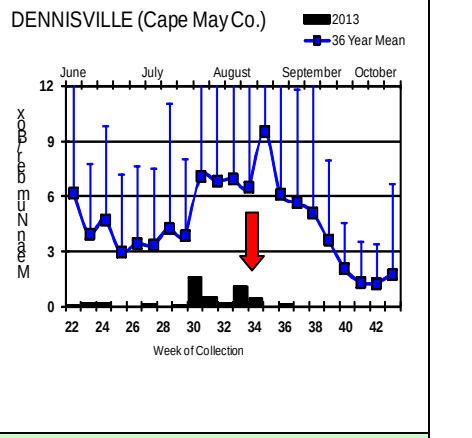
Culiseta melanura Population Graphs

Coastal

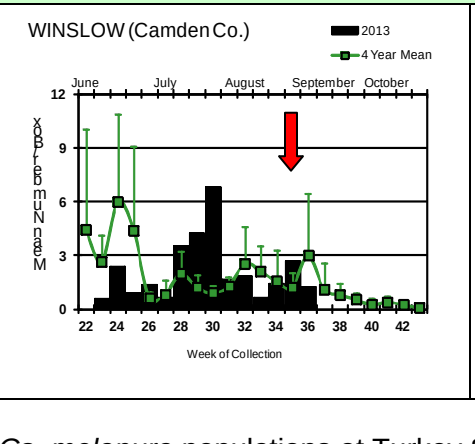


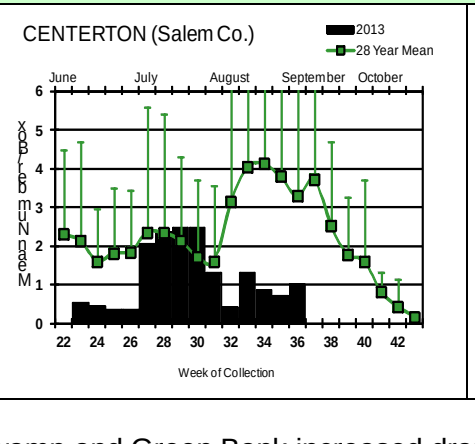


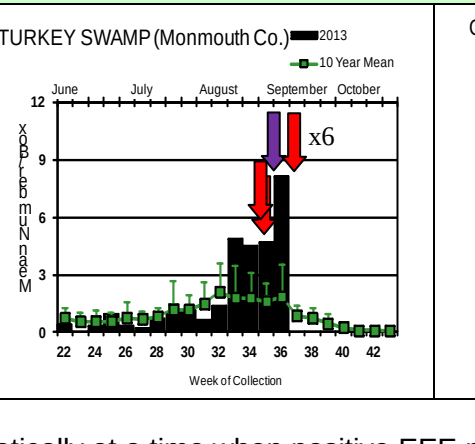


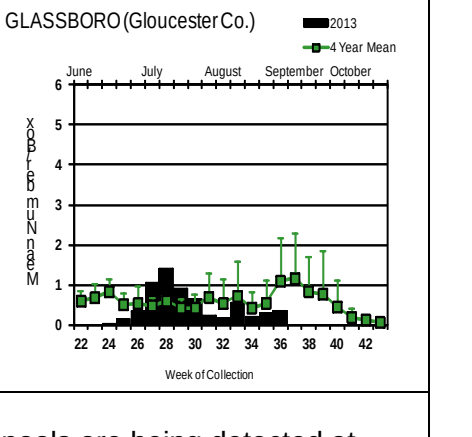


Inland









Cs. melanura populations at Turkey Swamp and Green Bank increased dramatically at a time when positive EEE pools are being detected at those sites. Note that the axis change on the Turkey Swamp graph was changed back to the original numbers to accommodate the large increase in population size. Activity is not restricted to populations with significant growth. The Dennisville site also produced a positive pool earlier this year when the abundance of the enzootic vector was at a probable historic low. Also note that while *Coquillettidia perturbans* and *Aedes sollicitans* (not yet positive), suspected inland and coastal vectors of EEE, are either waning or at historic lows, females that are present are likely in the parous state, having bloodfed previously and thus have a greater chance of being positive. Use due diligence. Although numbers may be low, the potential for disease transmission could be higher than earlier in the season due to their higher parous state. This status should be confirmed through parity dissections to aid management decisions.

Note axis change (from 12 to 6) on Bass River, Corbin City, Centerton and Glassboro sites. Note axis change on Turkey Swamp *back* to original numbers to accommodate increased population activity.

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

EEE in US (2013 cumulative cases): (Black or Red = previous + new reported cases occurring)

- equine: 4(AL) 1(AR) 28(FL) 20(GA) 1(KY) 5(LA) 3(MA) 1(MD) 1(MI) 8(MS) 7(NC) 2(NJ) 1(TX) 29(SC) 1(VA) 1(VT)
- mosquito pools: 29(CT) 1(GA) 42(MA) 5(MD) 8(ME) 1(NC) 5(NH) 24(NJ) 32(NY) 1(RI) 67(VA) 15(VT)
- sentinel: 3(AL) 1(DE) 124/4 wild(FL) 1(GA) 1(NC) 12(VA)
- human: 2(FL) 1(GA) 1(MA)

West Nile Virus in US

West Nile in US (2013 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	148/164	4	1	9/16
Arkansas				1	2/3
California	903/982	1854/2085	262/316	8	87/101
Colorado	9/10	372/417		1/2	87/113
Connecticut		57/73			2
Delaware	4/7		6/12	1	
DC		21			
Florida			65	2	1
Georgia	0	64		0	2
Hawaii					
Idaho		66		3/5	8/13
Illinois	46/50	1274/1588		1/2	2/3
Indiana	0	247/305		1	1/4
Iowa		12/14	3	5	8
Kansas		1			4
Kentucky				2	
Louisiana		145/157	53/55	1	21/31
Maine		0		0	0
Maryland		4/5			3/6
Mass.		216/259		0	2
Michigan	30	6		0	5/6
Minnesota	1	34		1/2	36/46
Mississippi		35/42		2	23/27
Missouri		4		3	1

	Birds	Mosquito Pools	Sentinels	Horses	Humans
Montana	1	11/16		9	1
Nebraska	1	86/123		1/2	22/29
Nevada	1	30/42			7
New Hampshire		7			
New Jersey	19/22	391/473		0	6
New Mexico		1		1/3	5/7
New York		357/389		2/3	2/4
North Carolina					
North Dakota	6	20		0	34/39
Ohio		93/130		1	3/4
Oklahoma		18		1	2/3
Oregon	1	51/64	0	1/2	5/8
Pennsylvania	13/15	1002/1140		0	3/4
Rhode Island		3/4			
South Carolina	1			1	
South Dakota	8	368		2	71
Tennessee	0	458/519		0	3/7
Texas	1	239/261		5/7	21/31
Utah		35/57	0	1/4	1/3
Vermont		16		1	
Virginia		11/98	2		
Washington	0	11/12		0	1
West Virginia		20			
Wisconsin	50/53	19		0	4/5
Wyoming	5	51/52		7/11	10/17

* 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 6 September 2013

Species	Pools	Mosquitoes	Positives	MFIR
Aedes albopictus	596	4624	1	0.216
Aedes atlanticus	5	71		
Aedes atropalpus	4	7		
Aedes canadensis canadensis	46	832		
Aedes cantator	31	114		
Aedes grossbecki	1	1		
Aedes japonicus	317	1884	2	1.062
Aedes sollicitans	10	47		
Aedes sticticus	3	5		
Aedes taeniorhynchus	14	123		
Aedes triseriatus	94	238		
Aedes trivittatus	7	59		
Aedes vexans	64	691		
Anopheles bradleyi	23	113		
Anopheles crucians	1	37		
Anopheles punctipennis	28	198	1	5.051
Anopheles quadrimaculatus	88	1787		
Coquillettidia perturbans	32	375		
Culex erraticus	86	2695		
Culex pipiens	728	18726	56	2.990
Culex restuans	522	6057	17	2.807
Culex salinarius	82	766		
Culex spp.	2713	117668	385	3.272
Culex territans	14	17		
Culiseta melanura	450	10882	11	1.011
Orthopodomyia signifera	4	4		
Psorophora ciliata	3	4		
Psorophora columbiae	21	165		
Psorophora ferox	27	329		
Psorophora howardii	1	10		
State Total	**6015**	**168529**	**473**	**2.807**

Remarks: To date, 6015 pools of 168529 mosquitoes from 29 species have been tested, with 473 positive pools detected. First positive was detected in a pool collected on 26 June in Middlesex County. Positive pools continue to be detected primarily in the enzootic vectors. Potential bridge vectors are also being detected, with positive pools in *Aedes albopictus, Aedes japonicus* and *Anopheles punctipennis*.

Humans, Horses and Wild Birds: To date, six human cases have been reported by the NJ Department of Health. The first case was from Burlington County with onset date of 5 August. Cases are from Bergen (1), Burlington (1), Camden (2), Gloucester (1) and Morris (1) counties. See http://www.state.nj.us/health/cd/westnile/techinfo.shtml for further information.

Last year the first horse was detected in mid July. No horse or other livestock have been reported positive in 2013 to date.

Bird testing began in mid-April. Twenty-two positive birds have been reported, mostly corvids. First American Crow positive has been detected. To date, 102 birds have been tested. Testing includes: American Crow (*Corvus brachyrhynchos* 1/5), Fish Crow (*C. ossifragus* 6/17), unidentified Crow (*Corvus* spp. 2/4), Blue Jay (*Cyanocitta cristata* 10/16), Hawk/Raptor (0/8) and other avian species (3/52). Counties (positives) submitting birds are Atlantic, Bergen, Burlington, Cape May,

Cumberland, Essex, Gloucester, Hunterdon, Mercer, Middlesex, Monmouth, Morris, Ocean, Salem, Sussex, Union and Warren (previous positive in error).

2013 Positive Mosquito pools to date / Total Mosquito Pools Submitted (PHEL)	This time last year (PHEL)
473 / 6015 (0.079)	893 / 5790 (0.154)
2013 Positive Birds to date / Total Birds Submitted	This time last year
22 / 102 (0.216)	95 / 231 (0.411)

WNV Results by County through 6 September 2013

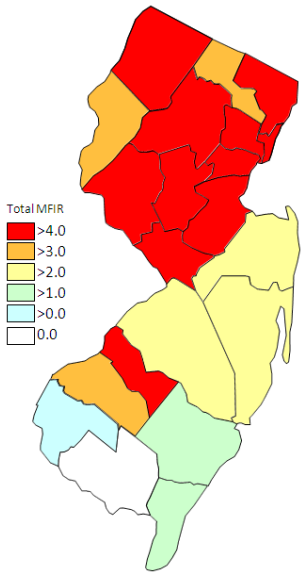
County	Species	Pools	Mosquitoes	Positives	MFIR
Atlantic		**140**	**2806**	**1**	**0.356**
	Aedes albopictus	12	134		
	Aedes canadensis canadensis	4	81		
	Aedes cantator	3	36		
	Aedes grossbecki	1	1		
	Aedes japonicus	6	24		
	Aedes sollicitans	2	23		
	Aedes sticticus	2	3		
	Aedes taeniorhynchus	6	30		
	Aedes triseriatus	4	11		
	Aedes vexans	11	279		
	Anopheles bradleyi	6	27		
	Anopheles punctipennis	1	11		
	Anopheles quadrimaculatus	3	11		
	Coquillettidia perturbans	5	35		
	Culex erraticus	3	97		
	Culex spp.	42	1555	1	0.643
	Culiseta melanura	21	290		
	Psorophora ciliata	1	1		
	Psorophora columbiae	2	2		
	Psorophora ferox	4	145		
	Psorophora howardii	1	10		
Bergen		**164**	**10361**	**74**	**7.142**
	Aedes japonicus	3	32		
	Culex spp.	161	10329	74	7.164
Burlington		**205**	**7814**	**18**	**2.304**
	Aedes albopictus	10	162		
	Aedes atlanticus	1	44		
	Aedes canadensis canadensis	1	63		
	Aedes japonicus	9	66		
	Aedes taeniorhynchus	1	2		
	Aedes triseriatus	1	17		
	Aedes vexans	2	10		
	Anopheles crucians	1	37		
	Coquillettidia perturbans	4	145		
	Culex erraticus	2	4		
	Culex pipiens	2	15		
	Culex restuans	1	1		
	Culex salinarius	3	97		
	Culex spp.	71	2767	12	4.337

	Culiseta melanura	94	4379	6	1.370
	Psorophora ciliata	1	1		
	Psorophora columbiae	1	4		
Camden		**229**	**7172**	**28**	**3.904**
	Aedes albopictus	33	170		
	Aedes japonicus	26	88	1	11.364
	Anopheles punctipennis	1	1		
	Culex spp.	135	5505	27	4.905
	Culiseta melanura	34	1408		
Cape May		**1720**	**16901**	**14**	**0.828**
	Aedes albopictus	170	362		
	Aedes atlanticus	1	2		
	Aedes atropalpus	4	7		
	Aedes canadensis canadensis	6	7		
	Aedes cantator	20	25		
	Aedes japonicus	87	168		
	Aedes sollicitans	4	19		
	Aedes taeniorhynchus	6	90		
	Aedes triseriatus	43	69		
	Aedes vexans	19	32		
	Anopheles bradleyi	15	78		
	Anopheles punctipennis	1	1		
	Anopheles quadrimaculatus	69	1693		
	Coquillettidia perturbans	4	8		
	Culex erraticus	70	2458		
	Culex pipiens	460	6039	12	1.987
	Culex restuans	459	3602		
	Culex salinarius	74	601		
	Culex spp.	61	201	1	4.975
	Culex territans	14	17		
	Culiseta melanura	117	1396	1	0.716
	Orthopodomyia signifera	4	4		
	Psorophora columbiae	5	8		
	Psorophora ferox	8	11		
Essex		**168**	**2649**	**3**	**1.133**
	Aedes albopictus	66	431		
	Aedes japonicus	41	404		
	Culex spp.	61	1814	3	1.654
Gloucester		**352**	**14184**	**41**	**2.891**
	Aedes albopictus	15	501		
	Aedes japonicus	12	173		
	Aedes triseriatus	1	30		
	Aedes vexans	4	139		
	Anopheles punctipennis	6	144	1	6.944
	Anopheles quadrimaculatus	3	36		
	Coquillettidia perturbans	3	71		
	Culex pipiens	236	12024	40	3.327
	Culiseta melanura	69	978		
	Psorophora ferox	3	88		
Hudson		**157**	**8234**	**49**	**5.951**

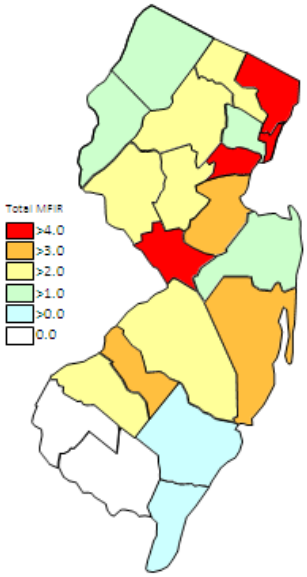
	Culex spp.	157	8234	49	5.951
Hunterdon		**260**	**12442**	**25**	**2.009**
	Culex spp.	260	12442	25	2.009
Mercer		**200**	**5619**	**32**	**5.695**
	Aedes albopictus	54	406		
	Aedes japonicus	11	48	1	20.833
	Aedes triseriatus	2	4		
	Aedes vexans	5	124		
	Culex erraticus	1	3		
	Culex pipiens	29	646	4	6.192
	Culex restuans	58	2450	17	6.939
	Culex salinarius	1	5		
	Culex spp.	39	1933	10	5.173
Middlesex		**221**	**7068**	**26**	**3.679**
	Aedes albopictus	10	152		
	Aedes japonicus	4	20		
	Culex spp.	207	6896	26	3.770
Monmouth		**284**	**4196**	**6**	**1.430**
	Aedes albopictus	53	662		
	Aedes atlanticus	3	25		
	Aedes canadensis canadensis	16	257		
	Aedes cantator	6	20		
	Aedes japonicus	24	94		
	Aedes sollicitans	1	1		
	Aedes taeniorhynchus	1	1		
	Aedes triseriatus	15	40		
	Aedes trivittatus	6	9		
	Aedes vexans	7	21		
	Anopheles punctipennis	13	29		
	Anopheles quadrimaculatus	1	1		
	Coquillettidia perturbans	2	6		
	Culex erraticus	4	43		
	Culex restuans	2	2		
	Culex salinarius	1	50		
	Culex spp.	73	1433	2	1.396
	Culiseta melanura	47	1390	4	2.878
	Psorophora columbiae	3	68		
	Psorophora ferox	6	44		
Morris		**315**	**13480**	**33**	**2.448**
	Culex spp.	315	13480	33	2.448
Ocean		**295**	**3831**	**12**	**3.132**
	Aedes albopictus	79	897	1	1.115
	Aedes canadensis canadensis	18	411		
	Aedes cantator	2	33		
	Aedes japonicus	29	97		
	Aedes sollicitans	1	2		
	Aedes triseriatus	4	7		
	Aedes vexans	13	20		
	Anopheles punctipennis	2	3		

	Coquillettidia perturbans	8	72		
	Culex erraticus	2	8		
	Culex salinarius	3	13		
	Culex spp.	96	2071	11	5.311
	Culiseta melanura	38	197		
Passaic		**175**	**6140**	**13**	**2.117**
	Aedes albopictus	19	81		
	Aedes japonicus	16	165		
	Aedes triseriatus	7	12		
	Aedes trivittatus	1	50		
	Aedes vexans	1	50		
	Anopheles punctipennis	2	4		
	Anopheles quadrimaculatus	1	15		
	Coquillettidia perturbans	1	2		
	Culex spp.	125	5759	13	2.257
	Psorophora ferox	2	2		
Salem		**208**	**4306**		
	Aedes albopictus	26	116		
	Aedes japonicus	20	82		
	Aedes sollicitans	2	2		
	Aedes sticticus	1	2		
	Aedes triseriatus	13	36		
	Anopheles bradleyi	2	8		
	Anopheles punctipennis	2	5		
	Anopheles quadrimaculatus	11	31		
	Coquillettidia perturbans	5	36		
	Culex erraticus	4	82		
	Culex pipiens	2	2		
	Culex restuans	2	2		
	Culex spp.	74	2964		
	Culiseta melanura	29	814		
	Psorophora ciliata	1	2		
	Psorophora columbiae	10	83		
	Psorophora ferox	4	39		
Somerset		**222**	**5505**	**13**	**2.361**
	Aedes albopictus	20	122		
	Aedes japonicus	16	161		
	Aedes triseriatus	4	12		
	Aedes vexans	2	16		
	Culex spp.	180	5194	13	2.503
Sussex		**235**	**11033**	**12**	**1.088**
	Aedes japonicus	6	147		
	Culex spp.	228	10856	12	1.105
	Culiseta melanura	1	30		
Union		**218**	**11952**	**58**	**4.853**
	Aedes albopictus	28	409		
	Aedes japonicus	7	115		
	Culex spp.	183	11428	58	5.075
Warren		**247**	**12836**	**15**	**1.169**

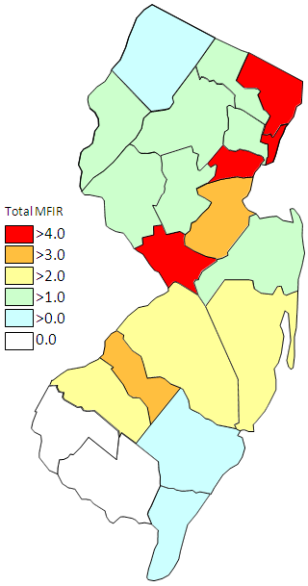
	Aedes albopictus	1	19		
	Aedes canadensis canadensis	1	13		
	Culex spp.	245	12804	15	1.172
Grand Total		**6015**	**168529**	**473**	**2.807**



Cumulative WNV activity in 2012.



WNV activity to 6 September 2013.



WNV activity last week, 2013.

Saint Louis Encephalitis (SLE) to 6 September 2013.

New Jersey will be selectively testing for SLE this year. 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 have been detected positive for SLE in 2013.

County	Species	Pools	Mosquitoes	Positives	MFIR
Burlington		**35**	**1140**		
	Aedes albopictus	4	77		
	Aedes japonicus	2	13		
	Culex erraticus	1	2		
	Culex pipiens	28	1048		
Cape May		**368**	**4782**		
	Culex pipiens	356	4748		
	Culex spp.	12	34		
Salem		**2**	**16**		
	Aedes triseriatus	2	16		
Grand Total		**405**	**5938**		

La Crosse Encephalitis (LAC) through 6 September 2013.

New Jersey will be selectively testing for La Crosse (LAC) virus this year. 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 have been detected positive for LAC in 2013.

County	Species	Pools	Mosquitoes	Positives	MFIR
Burlington		**1**	**17**		
	Aedes triseriatus	1	17		
Cape May		**39**	**65**		
	Aedes triseriatus	39	65		
Salem		**9**	**18**		
	Aedes triseriatus	9	18		
Grand Total		**49**	**100**		