RUTGERS
New Jersey Agricultural Experiment Station

VECTOR SURVEILLANCE IN NEW JERSEY
EEE, WNV and SLE
CDC WEEK 30: July 26 to August 1, 2009

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Supported by funding from the NJ State Mosquito Control Commission.

Culiseta melanura and Eastern Equine Encephalitis

SITE	Inland / Coastal	Historic Mean	Current Weekly Mean	Total Tested to Date*	Total Pools Submitted	EEE Isolations	MFIR
Green Bank (Burlington County)	Coastal	4.9	0.32	164	25	0	0
Corbin City (Atlantic County)	Coastal	1.1	0.52	56	15	0	0
Dennisville (Cape May County)	Coastal	7.8	3.39	761	35	4	5.26
Winslow † (Camden County)	Inland		0.76	38	1	0	0
Centerton (Salem County)	Inland	1.9	0.08	281	39	0	0
Turkey Swamp (Monmouth County)	Inland	1.1	2.52	253	122	0	0
Glassboro (Gloucester County)	Inland		0.86	298	23	0	0

*Including trial run last week in May. † Date of site change-over occurred during Week 30. During this week, the old Waterford site had 1/50 *Cs. melanura* collected.

Remarks: Site relocation has occurred for two sites: The Waterford site is now in Winslow Township and will be referred to as such. The move was about 1.6 miles (as the crow flies) from the old Waterford site. This site was changed as populations at the Waterford site decreased substantially in recent years. Falling trees resulting in an open canopy plus boisterous partygoers upending resting boxes resulted in reduced effectiveness of this site. The second site involved moving the Glassboro site less than a half mile from the original site to a place with less public traffic. Both sites will build up new historical data.

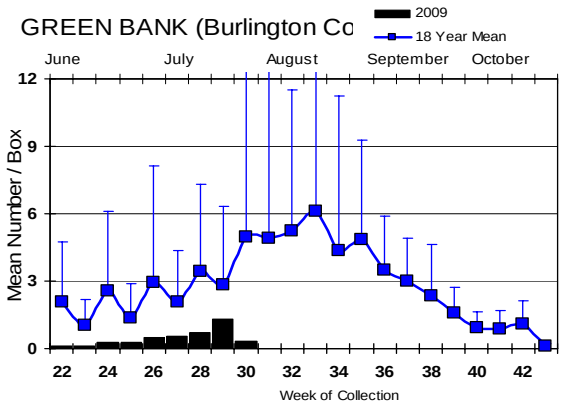
Four additional positive pools of EEE were detected, including three pools of *Culiseta melanura* from Dennisville and one *Culex salinarius* (collected on 15 July) from a county-operated CO_2 trap in Burlington County. The MFIR value for the positive Dennisville *Cs. melanura* was 5.26 and the MFIR value for the positive *Cx. salinarius* was 2.30. Vaidyanathan (et al 1997 Vector competence of mosquitoes (Diptera: Culicidae) from Massachusetts for a sympatric isolate of eastern equine encephalomyelitis virus. J. Med Ent, 34(3):346-352) ranked *Cx. salinarius* highest among potential bridge vectors of EEE they tested due to vector competence and behavioral qualities.

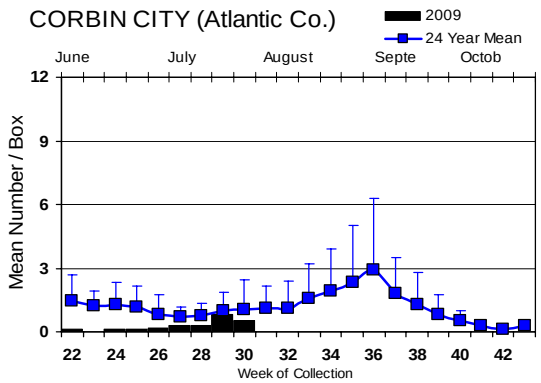
To date, 260 pools from 1851 *Cs. melanura* mosquitoes have been sent for EEE testing from the seven resting box collections. Previously, Ocean County has submitted *Cs. melanura* samples collected from gravid and CO_2 traps while Gloucester County has sampled additional sites with resting boxes. Other species tested for EEE from resting boxes include: *Aedes atlanticus, Ae. japonicus, Ae. triseriatus, Ae. vexans, Anopheles barberi, An. crucians, An. punctipennis, An. quadrimaculatus, Culex erraticus, Cx. pipiens, Cx. restuans, Cx. salinarius,* Mixed *Culex* pools, and *Cx. territans.* Additional species from other trap types include: *Aedes abserratus, Ae. albopictus, Ae. canadensis, Ae. cantator, Ae. cinereus, Ae.*

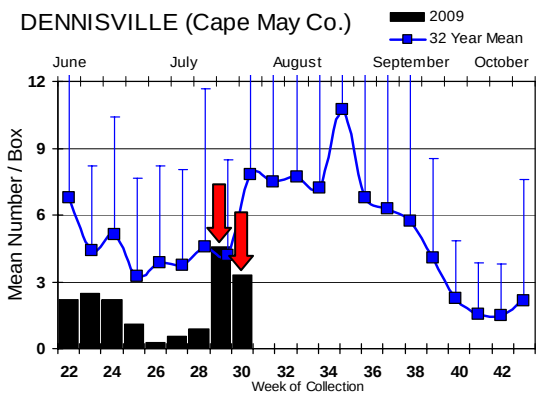
japonicus, Ae. sollicitans, Ae. sticticus, Ae. taeniorhynchus, Ae. triseriatus, Ae. trivittatus, Ae. vexans, Anopheles bradleyi, Coquillettidia perturbans, Culiseta inornata and Psorophora ferox. One pool of *Cx. salinarius* was detected positive in Burlington County.

Culiseta melanura Population Graphs

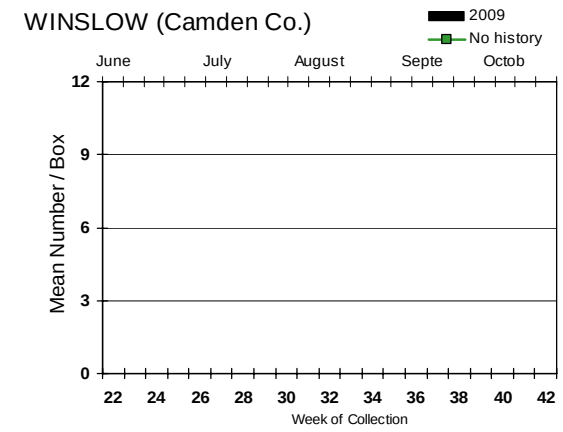
Coastal

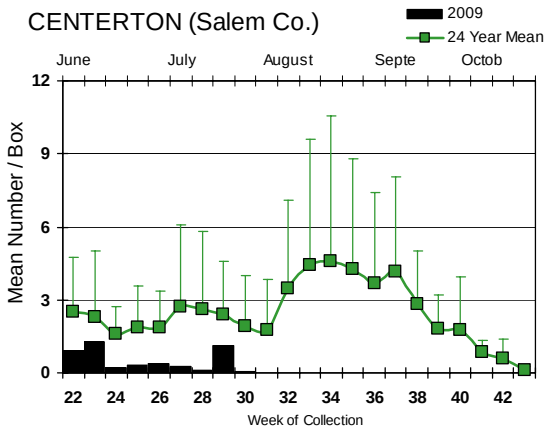


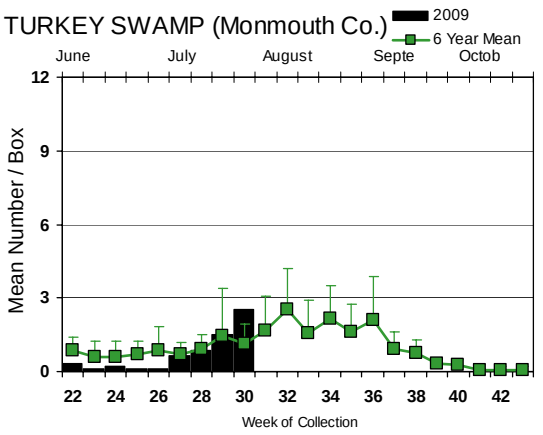




Inland

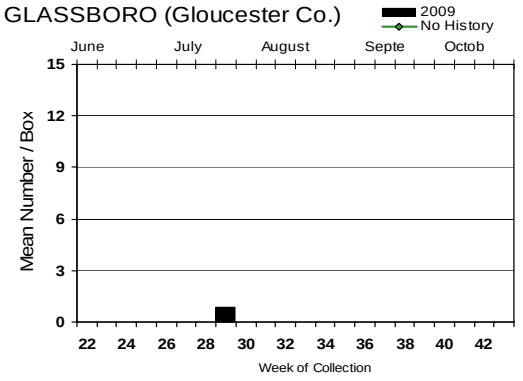






Culiseta melanura populations increased at Turkey Swamp to above the historical average. While the average at Dennisville decreased slightly from the previous week, three additional positive EEE pools of *Cs. melanura* were detected.

= positive pool detected.



EEE in US (2009 cumulative cases): (Red = new reported cases occurring)

- equine: 6(AL) 47(FL) 31(GA) 10(LA) 1(MO) 19(MS) 4(NC) 2(TX) 1(VA)
- mosquito: 1(FL) 1(LA) 1(MA) 5(NJ) 5(NY) 81(VA)
- sentinel: 2(AL) 104/49wild(FL) 17(NC) 30(VA)
- human:

West Nile Virus

West Nile in US (2009 cumulative cases): Single black values indicate no change from previous week. Black values / red values equals previous week/New totals.

	Birds	Mosquito Pools	Sentinels	Horses	Humans
Alabama			1/2		
Alaska					
Arizona	0	50/56	4	0	4/5
Arkansas					1
California	240/271	233/292	13/24	1	1/5
Colorado		3/14			2
Connecticut	0	1	0	0	0
Delaware					
DC					
Florida	2 (flavi)	0	2	0	0
Georgia	0	0		2	0
Hawaii					
Idaho		7 counties			1
Illinois	3/5	45/59	0	0	0
Indiana	0	8/13		0	0
Iowa		3	1	0	0
Kansas					
Kentucky				1	
Louisiana		13/37		1	1
Maine					
Maryland	0	1		0	0
Mass.		1		0	0
Michigan		0	0	0	0
Minnesota		3			1
Mississippi		2/3		2	4/9
Missouri		195		1	
Montana		+		1	
Nebraska	0	0		0	1

	Birds	Mosquito Pools	Sentinels	Horses	Humans
Nevada		4+			4/5
New Hampshire		0		0	0
New Jersey	0	10/16	0	0	0
New Mexico				0	0
New York	0	1/3	0	0	1
North Carolina					
North Dakota	0	0		0	0
Ohio	0	11/18		0	0
Oklahoma	0	0	0	0	0
Oregon	1/2	1/76	0	2	0
Pennsylvania	2	8/14	0	0	0
Rhode Island					
South Carolina	0	0			
South Dakota	0	2	0	0	2/3
Tennessee	0	23/39	0	0	1
Texas	1/2	88/150	0	1/2	2
Utah		78/120		1	0
Vermont	0	0	0	0	0
Virginia		0	1		0
Washington	1	63/161	0	2/3	0
West Virginia	1	7/72	0	1	0
Wisconsin	0	0	0	0	0
Wyoming		9/12			

Note: Some data reported by states are provisional and are subject to change. Sources for this table can be found here.

Protocol: New Jersey Department of Health and Senior Services (NJDHSS Public Health and Environmental Laboratories, PHEL) and the Cape May County Division of Mosquito Control tests mosquito pools using RT-PCR Taqman techniques.

Mosquito Species Submitted for West Nile Virus Testing through 5 August 2009

Species	Pools	Mosquitoes	Positives	MFIR
Aedes abserratus	1	1		
Aedes albopictus	171	922		
Aedes atlanticus	5	8		
Aedes canadensis canadensis	76	1956		
Aedes cantator	40	330		
Aedes cinereus	2	7		
Aedes grossbecki	3	35		
Aedes japonicus	387	2734		
Aedes sollicitans	9	51		
Aedes sticticus	12	115		
Aedes taeniorhynchus	6	65		
Aedes thibaulti	6	9		
Aedes triseriatus	116	403		
Aedes trivittatus	22	380		
Aedes vexans	78	1188		
Anopheles barberi	3	14		
Anopheles bradleyi	16	127		
Anopheles crucians	3	26		
Anopheles punctipennis	72	252		
Anopheles quadrimaculatus	69	1208		
Anopheles walkeri	1	19		
Coquillettidia perturbans	35	434		
Culex erraticus	22	780		
Culex pipiens	534	12720		
Culex restuans	444	5648		
Culex salinarius	40	455		
Culex spp.	1807	78690	16	0.203
Culex territans	24	62		
Culiseta inornata	1	2		
Culiseta melanura	280	2343		
Culiseta morsitans	1	3		
Psorophora columbiae	1	1		
Psorophora ferox	9	50		
State Total	**4296**	**111,038**	**16**	**0.144**

Remarks: The number of pools positive for West Nile virus increased from 10 to 16. Hudson, Monmouth and Union counties contributed 4 of the 6 new pools. These counties reinforce the urban/suburban nature of this arbovirus. All infected pools come from mixed *Culex* pools, which can include *Culex pipiens*, *Cx. restuans* and *Cx. salinarius*.

Humans, Horses and Wild Birds: No humans have been reported positive for WNV by PHEL. For more details plus information about WNV, see the PHEL's West Nile Virus Alert and FAQ Sheets:
http://www.state.nj.us/health/cd/westnile/enceph.htm

No confirmed horse cases have occurred. No positive birds have been detected as of this week.

2009 Positive Mosquito pools to date / Total Mosquito Pools Submitted	This time last year* * 2008 started later (at least one month) last year than in 2009
16 / 3725	209 / 3438
2009 Positive Birds to date / Total Birds Submitted	This time last year* * 2008 started later (at least one month) last year than in 2009
0 / 51	11 / 96

WNV Results by County through 5 August 2009

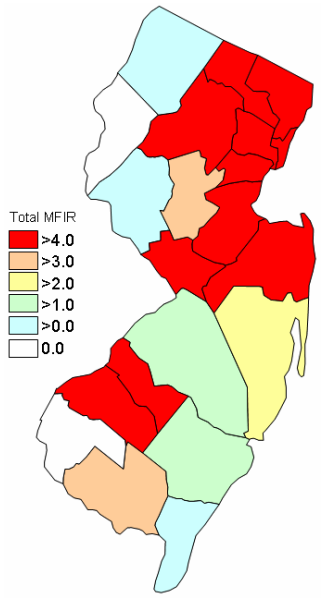
County	Species	Pools	Mosquitoes	Positives	MFIR
Atlantic		**120**	**2893**		
	Aedes albopictus	5	44		
	Aedes canadensis canadensis	4	38		
	Aedes cantator	6	140		
	Aedes grossbecki	1	8		
	Aedes japonicus	4	60		
	Aedes sollicitans	2	7		
	Aedes sticticus	2	18		
	Aedes taeniorhynchus	3	16		
	Aedes thibaulti	3	3		
	Aedes triseriatus	2	3		
	Aedes trivittatus	1	4		
	Aedes vexans	11	331		
	Anopheles bradleyi	1	9		
	Anopheles punctipennis	4	7		
	Anopheles quadrimaculatus	3	5		
	Culex erraticus	1	3		
	Culex restuans	2	5		
	Culex salinarius	2	37		
	Culex spp.	49	2101		
	Culex territans	1	1		
	Culiseta melanura	13	53		
Bergen		**83**	**6034**	**1**	**0.166**
	Aedes albopictus	1	6		
	Aedes japonicus	1	3		
	Culex spp.	81	6025	1	0.166
Burlington		**233**	**5422**	**1**	**0.184**
	Aedes abserratus	1	1		
	Aedes albopictus	19	89		
	Aedes atlanticus	1	1		
	Aedes canadensis canadensis	19	883		
	Aedes cantator	5	42		
	Aedes cinereus	1	6		
	Aedes grossbecki	1	26		
	Aedes japonicus	20	101		
	Aedes sollicitans	2	22		
	Aedes sticticus	2	85		
	Aedes taeniorhynchus	2	48		
	Aedes triseriatus	9	39		
	Aedes trivittatus	2	9		
	Aedes vexans	15	451		
	Anopheles barberi	1	1		
	Anopheles bradleyi	2	18		

	Anopheles crucians	1	5		
	Anopheles punctipennis	6	22		
	Anopheles quadrimaculatus	1	6		
	Coquillettidia perturbans	13	224		
	Culex pipiens	1	75		
	Culex restuans	2	4		
	Culex salinarius	3	55		
	Culex spp.	62	2615	1	0.382
	Culex territans	2	10		
	Culiseta inornata	1	2		
	Culiseta melanura	38	578		
	Psorophora ferox	1	4		
Camden		**157**	**4851**	**7**	**1.443**
	Aedes albopictus	6	16		
	Aedes japonicus	19	43		
	Aedes thibaulti	1	1		
	Aedes triseriatus	1	1		
	Aedes trivittatus	2	2		
	Aedes vexans	1	1		
	Anopheles punctipennis	3	8		
	Anopheles quadrimaculatus	3	4		
	Culex pipiens	3	107		
	Culex restuans	2	2		
	Culex spp.	111	4654	7	1.504
	Culex territans	1	1		
	Culiseta melanura	4	11		
Cape May		**1028**	**16645**		
	Aedes albopictus	17	44		
	Aedes canadensis canadensis	1	6		
	Aedes cantator	5	11		
	Aedes japonicus	112	447		
	Aedes triseriatus	36	117		
	Anopheles bradleyi	8	86		
	Anopheles punctipennis	5	19		
	Anopheles quadrimaculatus	28	983		
	Coquillettidia perturbans	1	19		
	Culex erraticus	16	729		
	Culex pipiens	206	3453		
	Culex restuans	267	3642		
	Culex salinarius	10	119		
	Culex spp.	236	6022		
	Culex territans	7	29		
	Culiseta melanura	73	919		
Cumberland		**49**	**1252**		
	Aedes cantator	1	15		
	Aedes japonicus	6	31		
	Anopheles punctipennis	1	1		
	Culex pipiens	1	2		
	Culex restuans	2	6		
	Culex spp.	34	1150		
	Culex territans	1	1		
	Culiseta melanura	3	46		

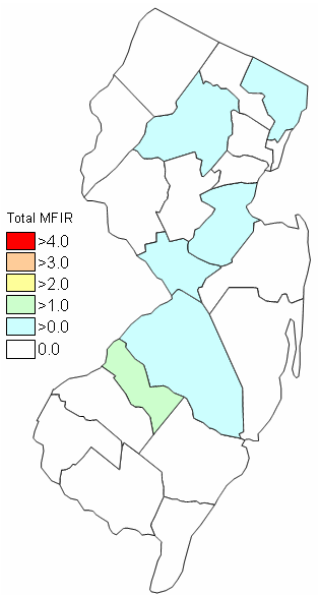
Essex		**118**	**2415**		
	Aedes albopictus	4	6		
	Aedes japonicus	11	37		
	Aedes sticticus	1	1		
	Aedes triseriatus	7	12		
	Aedes vexans	9	25		
	Anopheles punctipennis	1	1		
	Culex spp.	84	2331		
	Psorophora ferox	1	2		
Gloucester		**409**	**10021**		
	Aedes albopictus	25	337		
	Aedes atlanticus	1	1		
	Aedes canadensis canadensis	2	2		
	Aedes japonicus	39	412		
	Aedes thibaulti	1	4		
	Aedes triseriatus	2	2		
	Aedes trivittatus	1	75		
	Aedes vexans	6	57		
	Anopheles barberi	2	13		
	Anopheles crucians	2	21		
	Anopheles punctipennis	17	115		
	Anopheles quadrimaculatus	21	73		
	Anopheles walkeri	1	19		
	Coquillettidia perturbans	2	2		
	Culex pipiens	222	8455		
	Culex restuans	18	106		
	Culex salinarius	1	1		
	Culex territans	4	9		
	Culiseta melanura	42	317		
Hudson		**109**	**5635**	**1**	**0.177**
	Culex spp.	109	5635	**1**	**0.177**
Hunterdon		**122**	**6041**		
	Aedes albopictus	1	45		
	Culex spp.	121	5996		
Mercer		**361**	**6105**	**1**	**0.164**
	Aedes albopictus	29	73		
	Aedes japonicus	47	109		
	Aedes triseriatus	7	9		
	Culex erraticus	1	1		
	Culex pipiens	83	596		
	Culex restuans	117	1576		
	Culex salinarius	5	5		
	Culex spp.	72	3736	1	0.268
Middlesex		**212**	**11362**	**1**	**0.088**
	Aedes albopictus	2	15		
	Aedes japonicus	14	226		
	Culex spp.	196	11121	1	0.090

Monmouth		**309**	**2630**	**1**	**0.380**
	Aedes albopictus	18	92		
	Aedes canadensis canadensis	17	150		
	Aedes cantator	9	39		
	Aedes japonicus	20	129		
	Aedes thibaulti	1	1		
	Aedes triseriatus	13	67		
	Aedes trivittatus	6	6		
	Aedes vexans	7	52		
	Anopheles punctipennis	13	20		
	Anopheles quadrimaculatus	2	2		
	Coquillettidia perturbans	4	12		
	Culex erraticus	1	2		
	Culex pipiens	13	20		
	Culex restuans	21	35		
	Culex spp.	86	1806	1	0.554
	Culex territans	6	9		
	Culiseta melanura	71	187		
	Psorophora ferox	1	1		
Morris		**91**	**3762**	**1**	**0.266**
	Aedes japonicus	15	233		
	Aedes triseriatus	2	9		
	Culex spp.	74	3520	1	0.284
Ocean		**291**	**5556**		
	Aedes albopictus	28	148		
	Aedes atlanticus	3	6		
	Aedes canadensis canadensis	30	849		
	Aedes cantator	14	83		
	Aedes cinereus	1	1		
	Aedes grossbecki	1	1		
	Aedes japonicus	31	203		
	Aedes sollicitans	4	21		
	Aedes sticticus	6	10		
	Aedes taeniorhynchus	1	1		
	Aedes triseriatus	16	65		
	Aedes trivittatus	3	6		
	Aedes vexans	25	110		
	Anopheles bradleyi	5	14		
	Anopheles punctipennis	8	10		
	Anopheles quadrimaculatus	1	1		
	Coquillettidia perturbans	6	14		
	Culex restuans	3	3		
	Culex salinarius	10	57		
	Culex spp.	79	3888		
	Culiseta melanura	10	24		
	Psorophora columbiae	1	1		
	Psorophora ferox	5	40		
Passaic		**68**	**1486**		
	Aedes albopictus	2	10		
	Aedes canadensis canadensis	1	20		
	Aedes japonicus	14	229		
	Aedes triseriatus	4	20		

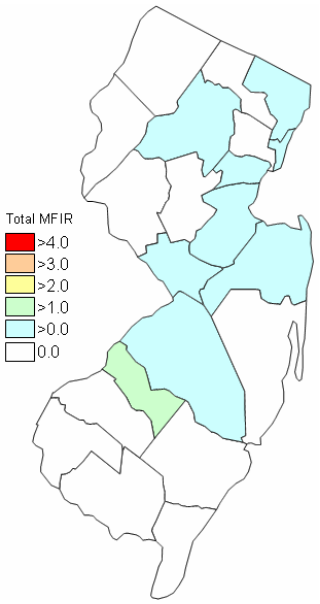
	Anopheles punctipennis	1	2		
	Culex spp.	46	1205		
Salem		**89**	**1985**		
	Aedes albopictus	6	26		
	Aedes japonicus	5	26		
	Aedes triseriatus	1	1		
	Aedes vexans	2	150		
	Anopheles punctipennis	8	33		
	Anopheles quadrimaculatus	7	127		
	Coquillettidia perturbans	2	64		
	Culex erraticus	3	45		
	Culex restuans	4	79		
	Culex salinarius	2	150		
	Culex spp.	23	1084		
	Culex territans	2	2		
	Culiseta melanura	24	198		
Somerset		**130**	**3463**		
	Aedes albopictus	5	8		
	Aedes canadensis canadensis	2	8		
	Aedes japonicus	18	325		
	Aedes sticticus	1	1		
	Aedes triseriatus	16	58		
	Aedes trivittatus	7	278		
	Aedes vexans	1	5		
	Anopheles punctipennis	5	14		
	Anopheles quadrimaculatus	3	7		
	Coquillettidia perturbans	3	4		
	Culex spp.	68	2752		
	Psorophora ferox	1	3		
Sussex		**113**	**2697**		
	Aedes japonicus	3	3		
	Coquillettidia perturbans	3	94		
	Culex pipiens	5	12		
	Culex restuans	6	190		
	Culex salinarius	7	31		
	Culex spp.	86	2354		
	Culiseta melanura	2	10		
	Culiseta morsitans	1	3		
Union		**76**	**2809**	**2**	**0.712**
	Aedes albopictus	4	8		
	Aedes japonicus	7	72		
	Aedes sollicitans	1	1		
	Aedes vexans	1	6		
	Coquillettidia perturbans	1	1		
	Culex spp.	62	2721	**2**	**0.735**
Warren		**124**	**7974**		
	Culex spp.	124	7974		
Grand Total		**4296**	**111,038**	**16**	**0.144**



Cumulative activity in 2008



Activity last week.



Recent Activity to 5 August 2009

Saint Louis Encephalitis (SLE) through 5 August 2009.

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.

County	Species	Pools	Mosquitoes	Positives	MFIR
Burlington		**186**	**4480**		
	Aedes abserratus	1	1		
	Aedes albopictus	19	89		
	Aedes atlanticus	1	1		
	Aedes canadensis canadensis	7	142		
	Aedes cantator	4	41		
	Aedes cinereus	1	6		
	Aedes japonicus	19	100		
	Aedes sollicitans	2	22		
	Aedes sticticus	1	41		
	Aedes taeniorhynchus	2	48		
	Aedes triseriatus	8	38		
	Aedes trivittatus	2	9		
	Aedes vexans	10	207		
	Anopheles barberi	1	1		
	Anopheles bradleyi	2	18		
	Anopheles crucians	1	5		
	Anopheles punctipennis	4	16		
	Anopheles quadrimaculatus	1	6		
	Coquillettidia perturbans	13	224		
	Culex pipiens	1	75		
	Culex restuans	1	3		
	Culex salinarius	3	55		
	Culex spp.	64	2906		
	Culex territans	1	4		
	Culiseta inornata	1	2		
	Culiseta melanura	15	416		
	Psorophora ferox	1	4		
Camden		**78**	**2764**		
	Aedes albopictus	4	8		
	Aedes japonicus	7	20		
	Aedes triseriatus	1	1		
	Aedes vexans	1	1		
	Culex pipiens	2	95		
	Culex spp.	63	2639		
Cape May		**452**	**9535**		
	Aedes cantator	1	2		
	Aedes japonicus	2	22		
	Aedes triseriatus	2	11		
	Anopheles quadrimaculatus	1	1		
	Coquillettidia perturbans	1	19		
	Culex erraticus	2	78		
	Culex pipiens	123	2335		
	Culex restuans	111	1358		

	Culex salinarius	4	25		
	Culex spp.	202	5673		
	Culiseta melanura	3	11		
Essex		**118**	**2415**		
	Aedes albopictus	4	6		
	Aedes japonicus	11	37		
	Aedes sticticus	1	1		
	Aedes triseriatus	7	12		
	Aedes vexans	9	25		
	Anopheles punctipennis	1	1		
	Culex spp.	84	2331		
	Psorophora ferox	1	2		
Hunterdon		**18**	**900**		
	Culex spp.	18	900		
Mercer		**343**	**6003**		
	Aedes albopictus	29	73		
	Aedes japonicus	43	105		
	Aedes triseriatus	7	9		
	Culex pipiens	80	585		
	Culex restuans	113	1533		
	Culex salinarius	3	3		
	Culex spp.	68	3695		
Grand Total		**1195**	**26097**		

Specimens submitted by the counties continue to be negative for SLE.

La Crosse Encephalitis (LAC) through 5 August 2009.

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).

County	Species	Pools	Mosquitoes	Positives	MFIR
Cape May		**125**	**497**		
	Aedes albopictus	14	36		
	Aedes japonicus	77	348		
	Aedes triseriatus	33	105		
	Culex restuans	1	8		
Passaic		**2**	**17**		
	Aedes triseriatus	2	17		
Grand Total		**127**	**514**		