RUTGERS
New Jersey Agricultural Experiment Station

VECTOR SURVEILLANCE IN NEW JERSEY

EEE, WNV, SLE and LAC

CDC WEEK 37: September 12 to September 18, 2010

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Prepared by Lisa M. Reed, Scott Crans and Mark Robson at the Center for Vector Biology, Rutgers University.
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	3.04	0.26	161	14	0	0
Corbin City (Atlantic County)	Coastal	1.80	0.80	357	17	0	0
Dennisville (Cape May County)	Coastal	5.58	0.36	711	25	2	2.81
Winslow (Camden County)	Inland	3.34	0.54	2068	47	3	1.45
Centerton (Salem County)	Inland	4.07	0.94	1523	37	2	1.31
Turkey Swamp (Monmouth County)	Inland	0.94	0.26	746†	59	0	0
Glassboro (Gloucester County)	Inland	2.78	0.88	476	16	0	0

*Including trial run last week in May. † adjusted for this week's pool, to be reported next week

Remarks: There are **18 positive EEE pools** to report at this time, no change from last week. Sixteen positive pools are from *Cs. melanura*, from both traditional resting box monitoring sites (7 positives) and county-run traps (9 positives). No changes in positive pools at the traditional resting box sites (above). To date, 6042 *Culiseta melanura* mosquitoes forming 215 pools from the resting box sites have been tested. An additional 6116 *Cs. melanura* forming 319 pools have been sampled by the counties using a variety of traps (table to the left), producing a total of 9 additional positive pools. The remaining two pools were from *Culex erraticus*, collected previously.

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

County	Trap types*	Number collected	Number of positives	MFIR
Atlantic	CO_2	17		
Burlington	**CO_2**	2329	4	1.72
Camden	Gravid	3		
Cape May	CO_2, Gravid, **RB**	1727	1	0.58
Cumberland	Gravid, **RB**	469	1	2.13
Gloucester	**RB**	1310	3	2.29
Ocean	CO_2, Gravid, RB	228		
Salem	CO_2	1		
Sussex	CO_2, NJLT	32		
TOTAL		**6116**	**9**	**1.47**

The table below indicates non-melanura species tested for EEE:

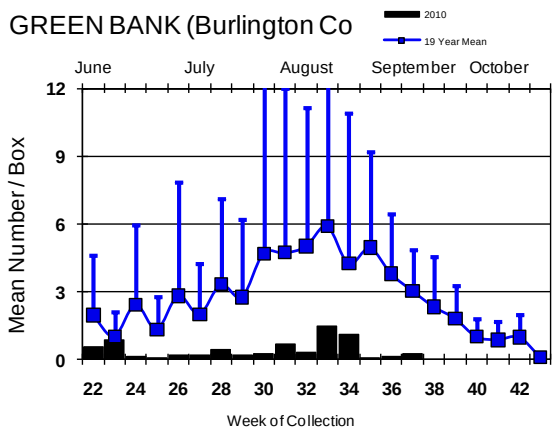
Species other than *Cs. melanura*	Pools	Mosquitoes	Positives	MFIR
Aedes albopictus	23	275		
Aedes canadensis canadensis	5	107		
Aedes cantator	3	3		
Aedes japonicus	4	21		
Aedes sollicitans	12	237		
Aedes taeniorhynchus	3	10		
Aedes triseriatus	18	57		
Aedes trivittatus	1	2		
Aedes vexans	12	223		
Anopheles bradleyi	30	388		
Anopheles crucians	2	122		
Anopheles punctipennis	3	64		
Anopheles quadrimaculatus	13	152		
Coquillettidia perturbans	51	892		
Culex erraticus	96	3391	2	0.59
Culex pipiens	294	2341		
Culex restuans	9	20		
Culex salinarius	47	591		
Culex spp.	196	4621		
Culex territans	2	2		
Culiseta minnesotae	1	1		
Psorophora columbiae	1	5		
Uranotaenia sapphirina	1	6		
State Total	**781**	**12977**	**2**	**0.15**

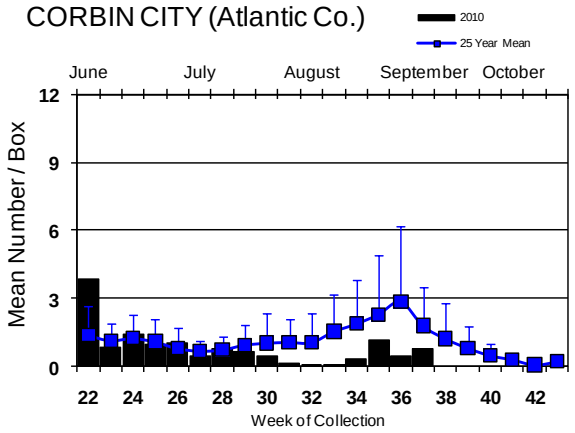
Horses and Humans: There are no positive horse or human cases to date.

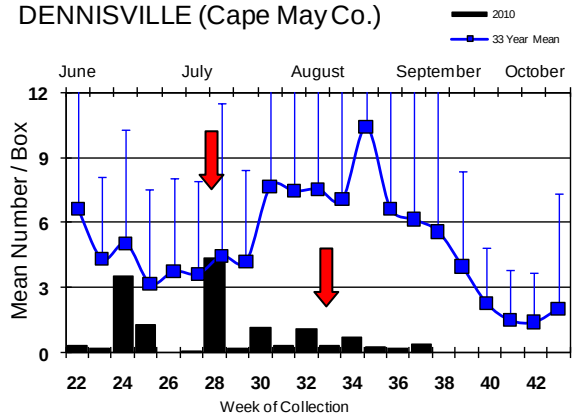
Horses and Vaccinations: The fate of unvaccinated equids reinforces the necessity of maintaining a vaccination schedule for arboviruses. For vaccination schedules recommended by the American Association of Equine Practices, see: http://www.aaep.org/vaccination_guidelines.htm

Culiseta melanura Population Graphs

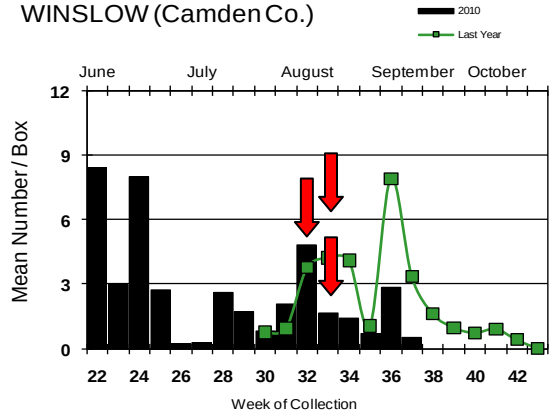
Coastal

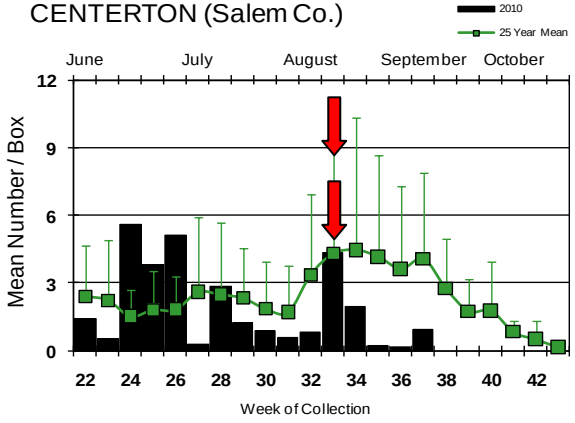


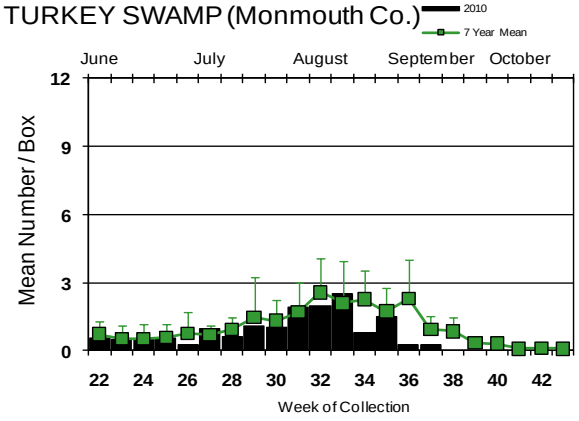




Inland

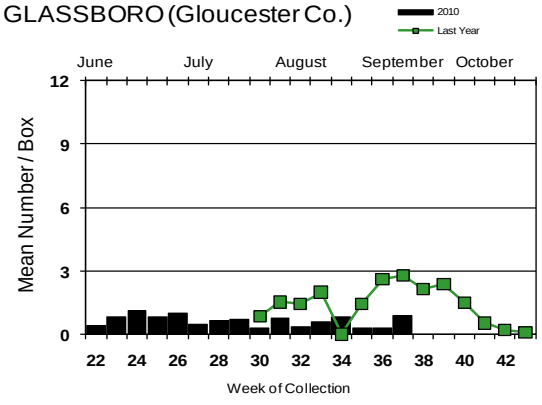






Apart from the Winslow site where populations dropped, all sites experienced an increase in *Cs. melanura* population levels. However, all sites remain well below recent historical trends. Drought conditions which seem to favor WNV activity may have a negative effect on EEE by reducing larval habitat amounts or conditions such that population levels drop (due to a decrease in survivorship?), thus reducing the vector generation which contributes to the amplification of the EEE virus.

= Positive pool(s) detected.



EEE in US (2010 cumulative cases): (Black or Red = previous + new reported cases occurring)

- equine: 8(AL) 89(FL) 7(GA) 6(IN) 4(MA) 22 (MS) 46(MI) 2(NC) 1(NE) 1(NH) 2(NY) 1(TX) 1(VA)
- mosquito: 2(CT) 2(GA) 6(FL) 3(IN) 65(MA) 1(NH) 16(NJ) 42(NY) 7(VA)
- sentinel: 2(AL) 142/30(FL chickens/wild) 1 turkey(ME) 19(TX) 5(VA)
- human: 1(TX-out of country acquired case) 4(FL) 1(MA>RI) 1(MA) 3(MI)

West Nile Virus

West Nile in US (2010 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					2/3
Alaska					
Arizona	2	239/243	9	2	82
Arkansas					3
California	310/333	1032/1098	133/148	14	38/45
Colorado	9	44/46		2/5	30/38
Connecticut		178/193			2/7
Delaware		1	6		
DC					
Florida	1Flavi		128	7	2
Georgia	1	45		1	6
Hawaii					
Idaho				1	
Illinois	42/48	1596/1803			4/11
Indiana	0	245/269		0	3
Iowa		0	2/3	1	1/2
Kansas					2/5
Kentucky		5		2/3	
Louisiana		412/474	4/10	3	19/23
Maine					
Maryland		1/7			6/7
Mass.		97/104		0	3
Michigan	3	1		1	9/12
Minnesota	2	7/8			3
Mississippi		2		2	5
Missouri		51		1	2

	Birds	Mosquito Pools	Sentinels	Horses	Humans
Montana					
Nebraska	6	81/83		0	16/19
Nevada		12/17		2	1
New Hampshire		1		0	0
New Jersey	103/115	643/725	0	1	5/11
New Mexico					5/6
New York	0	758/822		0	52/76
North Carolina			1		
North Dakota				2	7
Ohio		171		0	2
Oklahoma		3			
Oregon	0	3	0	0	0
Pennsylvania	13/15	884/926		2	1/8
Rhode Island					
South Carolina		1/7			
South Dakota		1			17
Tennessee	0	185/232		0	0
Texas	1	105/108		1	24/31
Utah		23/24		1	
Vermont	1	6/9		0	0
Virginia		89	13		
Washington	0	105		0	0
West Virginia	0	26		0	0
Wisconsin	3	3		0	1
Wyoming		13/16		1	1/3

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 20 Sep 2010

Species	Pools	Mosquitoes	Positives	MFIR
Aedes albopictus	512	3375	8	2.370
Aedes canadensis canadensis	26	475		
Aedes cantator	10	24		
Aedes japonicus	326	1511		
Aedes sollicitans	18	289		
Aedes sticticus	1	1		
Aedes stimulans	3	8		
Aedes taeniorhynchus	7	96		
Aedes triseriatus	149	347		
Aedes trivittatus	8	40		
Aedes vexans	90	867		
Anopheles barberi	2	2		
Anopheles bradleyi	39	405		
Anopheles crucians	3	124		
Anopheles punctipennis	42	393		
Anopheles quadrimaculatus	86	896		
Anopheles walkeri	5	29		
Coquillettidia perturbans	105	1650		
Culex erraticus	109	3430		
Culex pipiens	787	17711	161	9.090
Culex restuans	233	1468	5	3.406
Culex salinarius	71	957	1	1.045
Culex spp.	2545	92972	578	6.217
Culex territans	3	4		
Culiseta inornata	1	1		
Culiseta melanura	530	10678	12	1.124
Culiseta minnesotae	1	1		
Orthopodomyia signifera	5	6		
Psorophora ciliata	1	1		
Psorophora columbiae	3	8		
Psorophora cyanescens	1	1		
Psorophora ferox	3	4		
Uranotaenia sapphirina	2	11		
State Total	**5727**	**137785**	**765**	**5.552**

Remarks: The number of positive WNV mosquito pools to date is 765, well ahead of previous years. While most infections are found in typically ornithophilic species such as *Cx. pipiens* and *Cs. melanura*, this does not mean that threat of acquiring West Nile is nil. As summer progresses toward fall, mated *Culex* females are preparing for overwintering. Bloodmeal habits may change to include mammalian blood including human, as favored bird hosts depart for the winter (Kilpatrick et al 2006 West Nile virus epidemics in North America are driven by shifts in mosquito feeding behavior PLoS Biol 4(4): e82. doi:10.1371/journal.pbio.0040082 – but note that this was not evident in all studies- Savage et al 2007 Host choice and West Nile virus infection rates in blood-fed mosquitoes, including members of the *Culex* complex, from Memphis and Shelby County, Tennessee, 2002-2003. Vector-Borne and Zoonotic Diseases, 7(3): 365-386).

Humans, Horses and Wild Birds: To date in 2010, eleven human cases of West Nile virus have been detected and include the following counties: Atlantic (1 case), Camden (2), Essex County (1), Hudson (2), Monmouth (1), Ocean (2), and Passaic County (2). For more details plus information about WNV, see the West Nile Virus Alert and FAQ Sheets from the NJ Department of Health and Senior Services, Communicable Disease Service, Infectious and Zoonotic Disease Program: http://www.state.nj.us/health/cd/westnile/enceph.htm

One horse was found positive for WNV in Atlantic County with onset date of 17 August.

One hundred and seventeen dead, wild birds out of 221 tested are been positive for WNV, continuing to be well ahead of last year's results in terms of number and timing. This year's positive birds include 104/147 corvids (23 positives/30 tested American Crows, 32/45 Fish Crows, 39/53 Blue Jays and 10/19 unidentified Crows), 1/6 Hawks (unknown species) and 12/68 unknown species. Fish Crows, *Corvus ossifragus*, have appeared in number this year as compared to last year.

2010 Positive Mosquito pools to date / Total Mosquito Pools Submitted	This time last year
725/ 5449 (13.3%)	281/ 6669 (4.2%)
2010 Positive Birds to date / Total Birds Submitted	This time last year
117/ 221 (52.9%)	25/ 95 (26.3%)

WNV Results by County through 20 Sep 2010

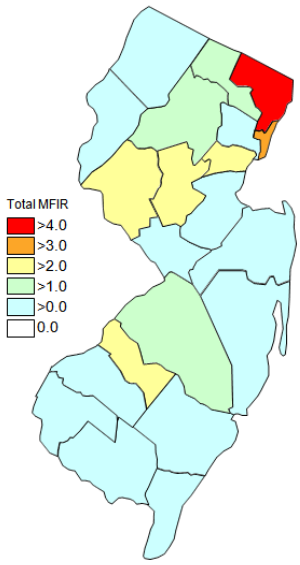
County	Species	Pools	Mosquitoes	Positives	MFIR
Atlantic		**222**	**5350**	**49**	**9.159**
	Aedes albopictus	29	265	1	3.774
	Aedes canadensis canadensis	3	56		
	Aedes cantator	3	14		
	Aedes japonicus	11	23		
	Aedes sollicitans	2	10		
	Aedes taeniorhynchus	1	24		
	Aedes triseriatus	4	8		
	Aedes trivittatus	3	26		
	Aedes vexans	17	154		
	Anopheles bradleyi	4	11		
	Anopheles punctipennis	5	108		
	Anopheles quadrimaculatus	3	4		
	Coquillettidia perturbans	9	35		
	Culex erraticus	2	5		
	Culex spp.	97	4166	47	11.282
	Culex territans	1	1		
	Culiseta melanura	27	439	1	2.278
	Orthopodomyia signifera	1	1		
Bergen		**200**	**14007**	**122**	**8.683**
	Aedes albopictus	5	30		
	Aedes japonicus	3	14		
	Culex spp.	192	14007	122	8.710
Burlington		**247**	**8599**	**40**	**4.652**
	Aedes albopictus	22	268		
	Aedes canadensis canadensis	3	105		
	Aedes japonicus	2	15		
	Aedes sollicitans	5	181		
	Aedes taeniorhynchus	2	9		
	Aedes triseriatus	1	7		
	Aedes vexans	11	221		
	Anopheles bradleyi	5	159		
	Anopheles crucians	2	122		
	Anopheles punctipennis	1	13		
	Anopheles quadrimaculatus	3	10		
	Coquillettidia perturbans	9	352		

	Culex erraticus	14	573		
	Culex pipiens	4	98	1	10.204
	Culex salinarius	6	38		
	Culex spp.	90	3911	37	9.460
	Culiseta melanura	65	2506	2	0.798
	Psorophora columbiae	1	5		
	Uranotaenia sapphirina	1	6		
Camden		**207**	**4988**	**67**	**13.432**
	Aedes albopictus	38	138	3	21.739
	Aedes canadensis canadensis	1	1		
	Aedes japonicus	16	23		
	Aedes triseriatus	2	2		
	Aedes trivittatus	1	1		
	Aedes vexans	1	45		
	Anopheles punctipennis	5	7		
	Anopheles quadrimaculatus	2	2		
	Culex erraticus	2	8		
	Culex pipiens	1	28		
	Culex spp.	108	3766	62	16.463
	Culex territans	1	2		
	Culiseta melanura	26	957	2	2.090
	Othopodomyia signifera	2	3		
	Uranotaenia sapphirina	1	5		
Cape May		**1325**	**15238**	**9**	**0.591**
	Aedes albopictus	71	139		
	Aedes canadensis canadensis	2	2		
	Aedes cantator	3	3		
	Aedes japonicus	43	74		
	Aedes sollicitans	7	56		
	Aedes taeniorhynchus	4	63		
	Aedes triseriatus	29	56		
	Aedes vexans	2	75		
	Anopheles bradleyi	22	225		
	Anopheles quadrimaculatus	36	627		
	Coquillettidia perturbans	16	157		
	Culex erraticus	78	2809		
	Culex pipiens	441	5067	6	1.184
	Culex restuans	182	984	1	1.016
	Culex salinarius	44	642	1	1.558
	Culex spp.	159	1268		
	Culiseta melanura	186	2991	1	0.334
Cumberland		**44**	**555**	**1**	**1.802**
	Aedes albopictus	4	19		
	Aedes triseriatus	4	7		
	Anopheles bradleyi	3	4		
	Anopheles punctipennis	2	2		
	Anopheles quadrimaculatus	5	13		
	Culex erraticus	4	17		
	Culex pipiens	2	21		
	Culex restuans	2	2		
	Culex territans	1	1		
	Culiseta melanura	17	469	1	2.132

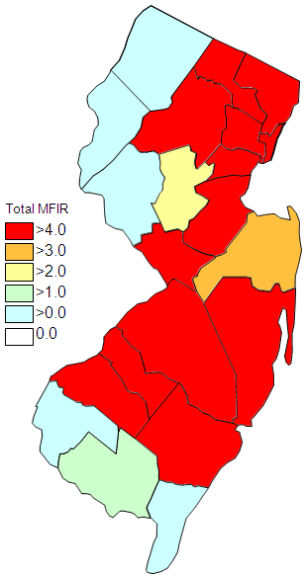
Essex		**245**	**3171**	**24**	**7.569**
	Aedes albopictus	43	174		
	Aedes japonicus	32	280		
	Aedes sollicitans	1	18		
	Aedes stimulans	1	3		
	Aedes triseriatus	18	38		
	Aedes vexans	17	104		
	Culex spp.	133	2554	24	9.397
Gloucester		**328**	**10393**	**104**	**10.007**
	Aedes albopictus	16	222		
	Aedes japonicus	3	20		
	Aedes vexans	2	65		
	Anopheles barberi	1	1		
	Anopheles punctipennis	1	50		
	Anopheles quadrimaculatus	3	30		
	Coquillettidia perturbans	3	12		
	Culex pipiens	224	8387	102	12.162
	Culiseta melanura	75	1606	2	1.245
Hudson		**183**	**9446**	**88**	**9.316**
	Aedes albopictus	1	25		
	Culex spp.	182	9421	88	9.341
Hunterdon		**210**	**10381**	**8**	**0.771**
	Aedes albopictus	2	61		
	Culex spp.	208	10320	8	0.775
Mercer		**218**	**4962**	**57**	**11.487**
	Aedes albopictus	43	109	1	9.174
	Aedes japonicus	25	38		
	Aedes triseriatus	4	5		
	Aedes vexans	3	75		
	Culex pipiens	96	4036	52	12.884
	Culex restuans	32	368	3	8.152
	Culex salinarius	12	264		
	Culex spp.	3	67	1	14.925
Middlesex		**238**	**9805**	**53**	**5.405**
	Aedes albopictus	9	60		
	Aedes japonicus	3	21		
	Aedes triseriatus	1	6		
	Culex spp.	225	9718	53	5.454
Monmouth		**299**	**2472**	**9**	**3.641**
	Aedes albopictus	53	375		
	Aedes canadensis canadensis	10	89		
	Aedes cantator	3	6		
	Aedes japonicus	36	97		
	Aedes sollicitans	2	22		
	Aedes triseriatus	13	21		
	Aedes vexans	4	11		
	Anopheles barberi	1	1		
	Anopheles crucians	1	2		
	Anopheles punctipennis	3	5		

	Anopheles quadrimaculatus	5	5		
	Coquillettidia perturbans	6	10		
	Culex erraticus	4	6		
	Culex pipiens	1	1		
	Culex restuans	1	1		
	Culex salinarius	2	2		
	Culex spp.	88	1062	8	7.533
	Culiseta melanura	63	753	1	1.328
	Orthopodomyia signifera	2	2		
	Psorophora cyanescens	1	1		
Morris		**211**	**7374**	**47**	**6.374**
	Aedes albopictus	1	2		
	Aedes japonicus	16	151		
	Aedes vexans	1	5		
	Anopheles punctipennis	2	6		
	Anopheles quadrimaculatus	3	82		
	Coquillettidia perturbans	6	207		
	Culex spp.	182	6921	47	6.791
Ocean		**277**	**3888**	**18**	**4.630**
	Aedes albopictus	67	902	1	1.109
	Aedes canadensis canadensis	7	222		
	Aedes japonicus	30	92		
	Aedes sollicitans	1	2		
	Aedes sticticus	1	1		
	Aedes triseriatus	12	29		
	Aedes trivittatus	2	2		
	Aedes vexans	6	19		
	Anopheles bradleyi	1	1		
	Anopheles punctipennis	2	4		
	Anopheles quadrimaculatus	2	2		
	Coquillettidia perturbans	13	103		
	Culex erraticus	2	2		
	Culex restuans	3	3	1	333.333
	Culex salinarius	5	7		
	Culex spp.	86	2265	15	6.623
	Culiseta inornata	1	1		
	Culiseta melanura	34	228	1	4.386
	Psorophora ferox	2	3		
Passaic		**134**	**1809**	**10**	**5.528**
	Aedes albopictus	28	136		
	Aedes japonicus	23	163		
	Aedes triseriatus	10	21		
	Anopheles punctipennis	3	7		
	Anopheles quadrimaculatus	1	2		
	Coquillettidia perturbans	4	44		
	Culex spp.	65	1436	10	6.964
Salem		**258**	**2061**	**1**	**0.485**
	Aedes albopictus	49	222		
	Aedes cantator	1	1		
	Aedes japonicus	20	24		

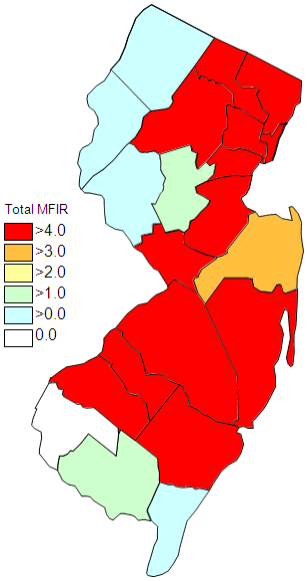
	Aedes triseriatus	15	17		
	Aedes vexans	24	58		
	Anopheles bradleyi	4	5		
	Anopheles punctipennis	5	5		
	Anopheles quadrimaculatus	19	52		
	Anopheles walkeri	4	5		
	Coquillettidia perturbans	11	22		
	Culex erraticus	3	10		
	Culex pipiens	7	16		
	Culex restuans	5	7		
	Culex spp.	70	917		
	Culiseta melanura	19	697	1	1.435
	Psorophora columbiae	2	3		
Somerset		**213**	**2598**	**7**	**2.694**
	Aedes albopictus	14	39		
	Aedes japonicus	20	130		
	Aedes triseriatus	15	64		
	Anopheles punctipennis	9	33		
	Anopheles quadrimaculatus	2	4		
	Culex spp.	153	2328	7	3.007
Sussex		**328**	**8472**	**5**	**0.590**
	Aedes japonicus	32	256		
	Aedes stimulans	2	5		
	Aedes triseriatus	16	48		
	Coquillettidia perturbans	17	321		
	Culex pipiens	11	57		
	Culex restuans	8	103		
	Culex salinarius	2	4		
	Culex spp.	221	7645	5	0.654
	Culiseta melanura	18	32		
	Culiseta minnesotae	1	1		
Union		**159**	**5742**	**41**	**7.140**
	Aedes albopictus	17	189	2	10.582
	Aedes japonicus	10	88		
	Coquillettidia perturbans	1	9		
	Culex spp.	131	5456	39	7.148
Warren		**181**	**6430**	**5**	**0.778**
	Aedes japonicus	1	2		
	Aedes triseriatus	5	18		
	Aedes trivittatus	2	11		
	Aedes vexans	2	35		
	Anopheles punctipennis	4	153		
	Anopheles quadrimaculatus	2	63		
	Anopheles walkeri	1	24		
	Coquillettidia perturbans	10	378		
	Culex spp.	152	5744	5	0.870
	Psorophora ciliata	1	1		
	Psorophora ferox	1	1		
Grand Total		**5727**	**137785**	**765**	**5.552**



Cumulative WNV activity in 2009.



WNV activity to 20 Sep, 2010.



WNV activity last week, 2010.

Saint Louis Encephalitis (SLE) through 20 Sep 2010.

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 tested positive to date for 2010.

County	Species	Pools	Mosquitoes	Positives	MFIR
Burlington		**231**	**8422**		
	Aedes albopictus	22	268		
	Aedes canadensis canadensis	3	105		
	Aedes japonicus	2	15		
	Aedes sollicitans	5	181		
	Aedes taeniorhynchus	2	9		
	Aedes triseriatus	1	7		
	Aedes vexans	11	221		
	Anopheles bradleyi	5	159		
	Anopheles crucians	2	122		
	Anopheles punctipennis	1	13		
	Anopheles quadrimaculatus	3	10		
	Coquillettidia perturbans	9	352		
	Culex erraticus	14	573		
	Culex pipiens	4	98		
	Culex salinarius	6	38		
	Culex spp.	90	3911		
	Culiseta melanura	49	2329		
	Psorophora columbiae	1	5		
	Uranotaenia sapphirina	1	6		
Camden		**168**	**3878**		
	Aedes albopictus	34	111		
	Aedes canadensis canadensis	1	1		

	Aedes japonicus	14	21		
	Aedes triseriatus	2	2		
	Aedes trivittatus	1	1		
	Aedes vexans	1	45		
	Anopheles punctipennis	5	7		
	Anopheles quadrimaculatus	1	1		
	Culex erraticus	2	8		
	Culex spp.	102	3670		
	Culex territans	1	2		
	Culiseta melanura	1	1		
	Orthopodomyia signifera	2	3		
	Uranotaenia sapphirina	1	5		
Essex		**218**	**3107**		
	Aedes albopictus	37	161		
	Aedes japonicus	28	270		
	Aedes sollicitans	1	18		
	Aedes triseriatus	9	20		
	Aedes vexans	10	84		
	Culex spp.	133	2554		
Hudson		**141**	**7266**		
	Aedes albopictus	1	25		
	Culex spp.	140	7721		
Salem		**1**	**7**		
	Culex spp.	1	7		
Sussex		**16**	**48**		
	Aedes triseriatus	16	48		
Grand Total		**775**	**23208**		

La Crosse Encephalitis (LAC) through 20 Sep 2010.

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 tested positive to date for 2010.

County	Species	Pools	Mosquitoes	Positives	MFIR
Cape May		**13**	**26**		
	Aedes triseriatus	13	26		
Cumberland		**4**	**7**		
	Aedes triseriatus	4	7		

Salem		**4**	**4**		
	Aedes triseriatus	4	4		
Warren		**10**	**106**		
	Aedes canadensis canadensis	4	86		
	Aedes triseriatus	6	20		
Grand Total		**31**	**143**		