RUTGERS
New Jersey Agricultural Experiment Station

VECTOR SURVEILLANCE IN NEW JERSEY

EEE, WNV, SLE and LAC

CDC WEEK 38: September 19 to September 25, 2010

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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	2.33	0.56	191†	17	0	0
Corbin City (Atlantic County)	Coastal	1.24	0.28	364	18	0	0
Dennisville (Cape May County)	Coastal	3.97	0.02	712	26	2	2.81
Winslow (Camden County)	Inland	1.62	0.90	2108	48	3	1.42
Centerton (Salem County)	Inland	2.75	0.72	1559	38	2	1.28
Turkey Swamp (Monmouth County)	Inland	0.85	0.26	759	63	0	0
Glassboro (Gloucester County)	Inland	0.09	0.28	490	17	0	0

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

Remarks: There are **20 positive EEE pools** to report at this time, two additional from last week. Sixteen positive pools are from *Cs. melanura*, from both traditional resting box monitoring sites (7 positives) and county-run traps (11 positives). No changes in positive pools at the traditional resting box sites (above). To date, 6134 *Culiseta melanura* mosquitoes forming 225 pools from the resting box sites have been tested. An additional 6383 *Cs. melanura* forming 361 pools have been sampled by the counties using a variety of traps (table to the left), producing a total of 11 additional positive pools. The latest positives come from Cape May, collected on 15 Sept. and from Cumberland, collected on 16 Sept. The remaining two pools were from *Culex erraticus*,

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**	2408	4	1.66
Camden	Gravid	3		
Cape May	CO_2, Gravid, **RB**	1743	2	1.15
Cumberland	Gravid, **RB**	503	2	3.98
Gloucester	**RB**	1444	3	2.08
Ocean	CO_2, Gravid, RB	232		
Salem	CO_2	1		
Sussex	CO_2, NJLT	32		
TOTAL		**6383**	**11**	**1.47**

collected previously.

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

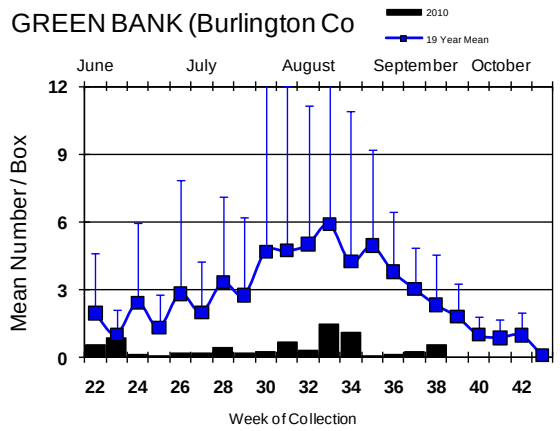
Species other than *Cs. melanura*	Pools	Mosquitoes	Positives	MFIR
Aedes albopictus	36	310		
Aedes canadensis canadensis	6	111		
Aedes cantator	3	3		
Aedes japonicus	5	22		
Aedes sollicitans	13	241		
Aedes taeniorhynchus	3	10		
Aedes triseriatus	18	57		
Aedes trivittatus	1	2		
Aedes vexans	22	353		
Anopheles bradleyi	32	424		
Anopheles crucians	2	122		
Anopheles punctipennis	7	72		
Anopheles quadrimaculatus	14	153		
Coquillettidia perturbans	54	897		
Culex erraticus	129	3974	2	0.50
Culex pipiens	344	2516		
Culex restuans	13	30		
Culex salinarius	50	598		
Culex spp.	227	4899		
Culex territans	2	2		
Culiseta minnesotae	1	1		
Psorophora columbiae	1	5		
Uranotaenia sapphirina	1	6		
State Total	**984**	**14808**	**2**	**0.14**

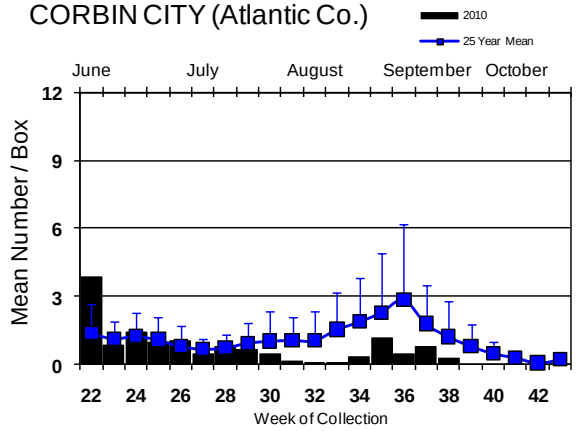
Horses and Humans: There are no positive horse or human cases to date.

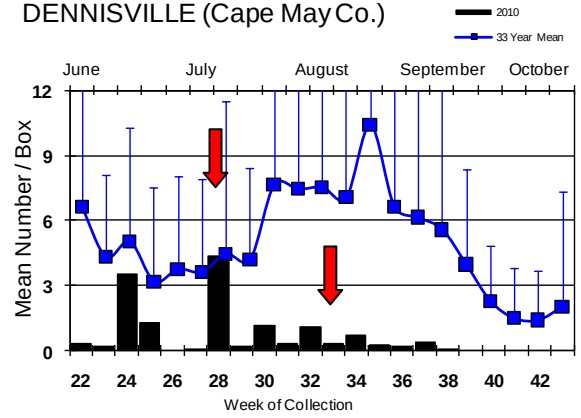
Horses and Vaccinations: The fate of unvaccinated equids reinforces the necessity of maintaining a vaccination schedule for arboviruses. For vaccination schedules recommended by the American Association of Equine Practices, see: http://www.aaep.org/vaccination_guidelines.htm

Culiseta melanura Population Graphs

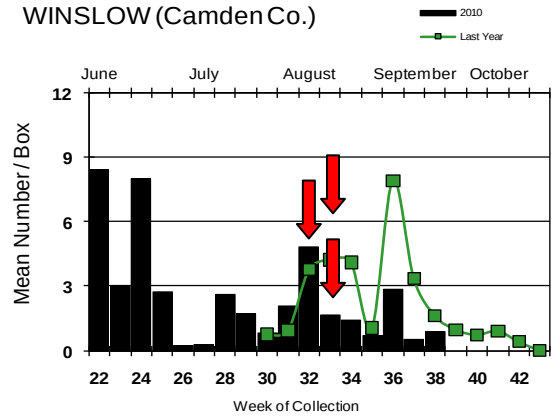
Coastal

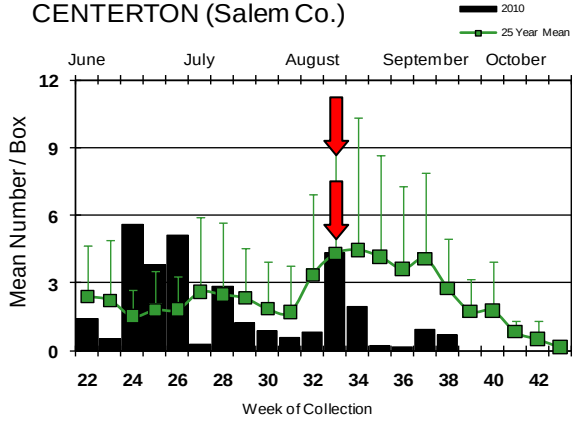


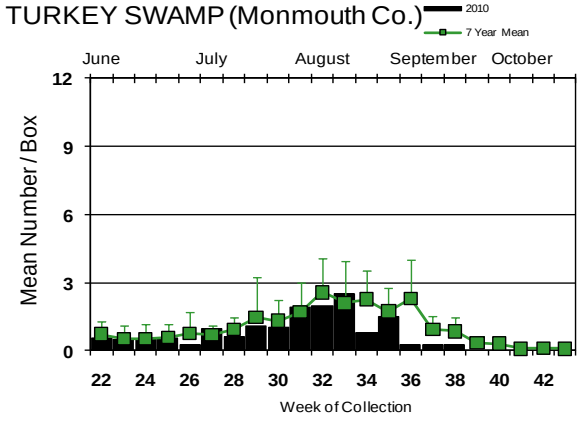




Inland

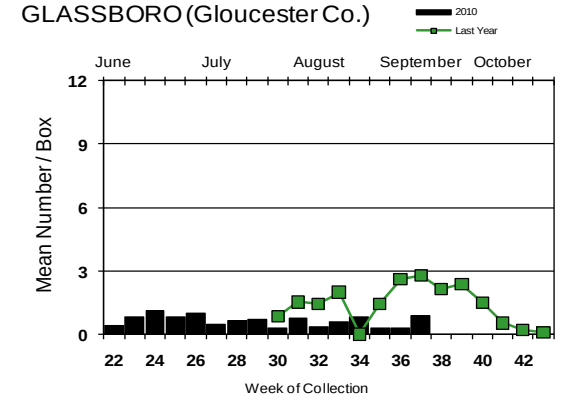






Green Bank Winslow and Glassboro all experienced increases from the previous week, yet all seven sites continue to show *Cs. melanura* populations tracking below historical values. Last positive from the traditional monitoring sites was 5 weeks ago, during week 33.

= Positive pool(s) detected.



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

- equine: 8(AL) 91(FL) 8(GA) 7(IN) 4(MA) 24 (MS) 52(MI) 4(NC) 1(NE) 1(NH) 2(NY) 1(TX) 1(VA)
- mosquito: 2(CT) 2(GA) 6(FL) 3(IN) 65(MA) 1(NH) 20(NJ) 65(NY) 2(RI) 8(VA)
- sentinel: 2(AL) 149/30(FL chickens/wild) 1 turkey(ME) 3(SC) 19(TX) 5(VA)
- human: 1(TX-out of country acquired case) 4(FL) 1(MA>RI) 1(MA) 3(MI) 1(NY)

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					3
Alaska					
Arizona	2	262/285	3	2/3	82/88
Arkansas					3
California	333/359	1126/1217	190/219	14/16	45/51
Colorado	9	46/47		5/6	38/48
Connecticut		193/206			7
Delaware		1	6		
DC					
Florida	1Flavi		128/177	7	2/6
Georgia	1/3	45/85		1	6/9
Hawaii					
Idaho				1	
Illinois	50/52	1915/2040			11/18
Indiana	0	283		0	4/5
Iowa		3	3/6	1	2/3
Kansas					5
Kentucky	1	5		3/4	
Louisiana		474	10	3	23
Maine					
Maryland		7			7/10
Mass.		104/114		0	3
Michigan	3	1		1	12/16
Minnesota	2	8			3
Mississippi		2/5		2	5
Missouri		51/53		1	2/4

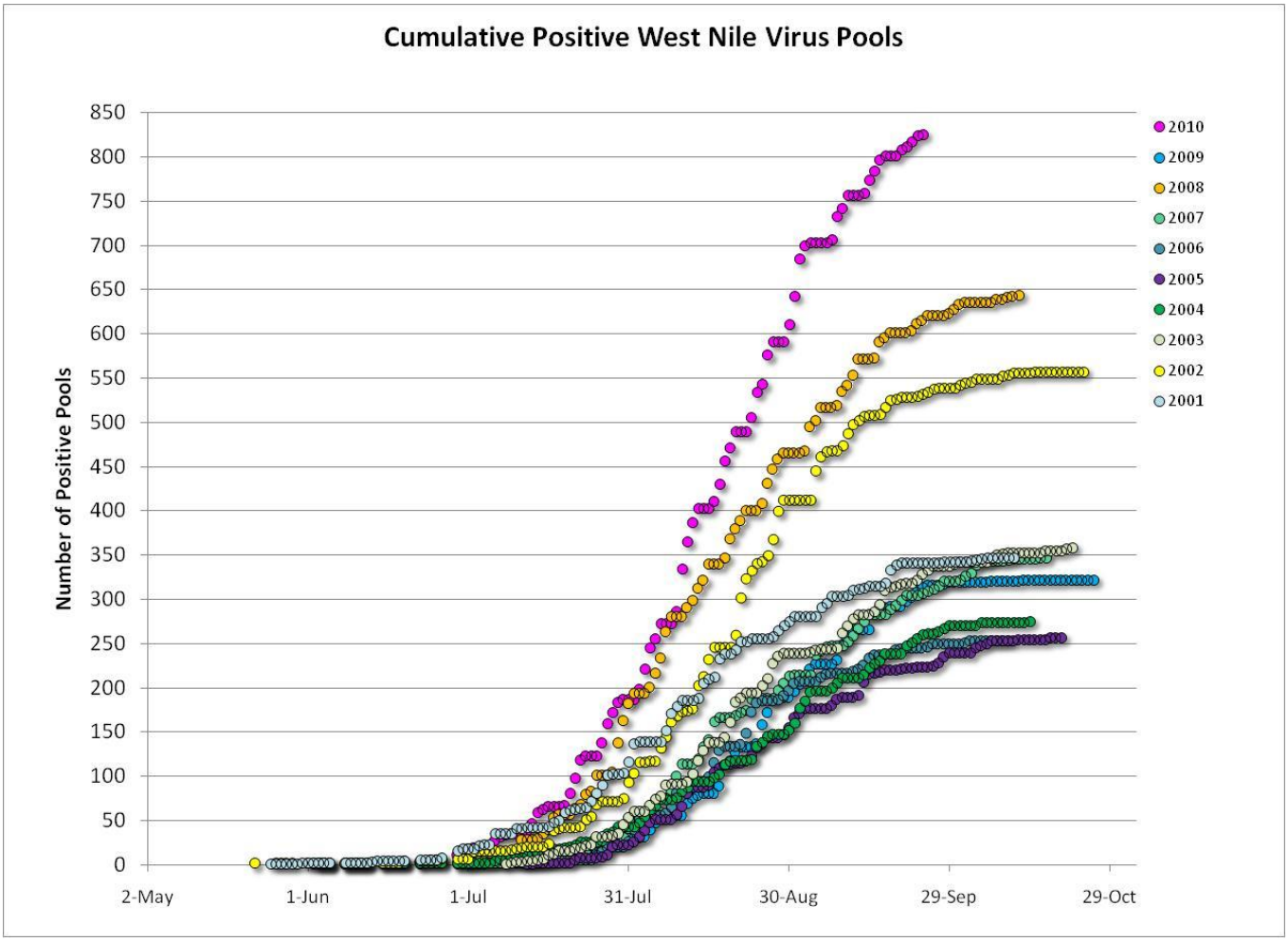
	Birds	Mosquito Pools	Sentinels	Horses	Humans
Montana					
Nebraska	6/7	83/86		0	29/30
Nevada		17		2	2/3
New Hampshire		1		0	0
New Jersey	117/122	765/807	0	1/2	11/17
New Mexico					7/11
New York	2	822/870		0	80/84
North Carolina			1		
North Dakota				2/3	7/8
Ohio		171/228		0	2
Oklahoma		3			
Oregon	0	3	0	0	0
Pennsylvania	15/17	984/990		2	8/13
Rhode Island		2			
South Carolina		7			
South Dakota		1			17/20
Tennessee	0	232/273		0	0
Texas	1	108/119		1/4	31/39
Utah		24/26	1	1/2	
Vermont	1	9		0	0
Virginia		89/98	13		2
Washington	2	105/126		0	0
West Virginia	0	26		0	0
Wisconsin	3/4	3		0	1
Wyoming		16		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 27 Sep 2010

Species	Pools	Mosquitoes	Positives	MFIR
Aedes albopictus	588	3683	9	2.444
Aedes canadensis canadensis	27	479		
Aedes cantator	10	24		
Aedes japonicus	342	1550		
Aedes sollicitans	20	295		
Aedes sticticus	1	1		
Aedes stimulans	3	8		
Aedes taeniorhynchus	7	96		
Aedes triseriatus	164	363		
Aedes trivittatus	9	41		
Aedes vexans	114	1245		
Anopheles barberi	2	2		
Anopheles bradleyi	43	445		
Anopheles crucians	3	124		
Anopheles punctipennis	52	409		
Anopheles quadrimaculatus	102	1053		
Anopheles walkeri	5	29		
Coquillettidia perturbans	108	1655	1	0.604
Culex erraticus	142	4013		
Culex pipiens	898	18636	171	9.176
Culex restuans	284	1637	6	3.665
Culex salinarius	74	964	1	1.037
Culex spp.	2758	98552	627	6.362
Culex territans	3	4		
Culiseta inornata	1	1		
Culiseta melanura	583	11090	15	1.353
Culiseta minnesotae	1	1		
Orthopodomyia signifera	5	6		
Psorophora ciliata	1	1		
Psorophora columbiae	4	9		
Psorophora cyanescens	1	1		
Psorophora ferox	4	5		
Uranotaenia sapphirina	3	13		
State Total	**6362**	**146435**	**830**	**5.668**

Remarks: The number of positive WNV mosquito pools to date is 830 and continues to be ahead of previous years (see graph next page – note that 2008 was adjusted to account for the results of additional pools tested after the end of the season). This week, new positives were detected in *Coquillettidia perturbans* as well as *Culex* species. While *Coq. perturbans* is not an efficient vector of West Nile, it is an indication that other mammalophilic species may be acquiring the virus, in addition with *Aedes albopictus*, which is an efficient vector.



Humans, Horses and Wild Birds: To date in 2010, seventeen human cases of West Nile virus have been detected (six additional from last week) and include the following counties: Atlantic (1 case), Camden (3), Cumberland (1), Essex County (1), Hudson (2), Mercer (2), Monmouth (2), Ocean (2), Passaic County (2) and Union (1). 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

A second horse was found infected with WNV in Gloucester County, with an onset of symptoms on 18 Sept. One horse was previously found positive for WNV in Atlantic County with onset date of 17 August. No vaccinations were done for either horse.

One hundred and twenty-four dead, wild birds out of 231 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 (25 positives/32 tested American Crows, 32/45 Fish Crows, 42/56 Blue Jays and 11/21 unidentified Crows), 2/7 Hawks (unknown species) and 12/70 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
830/ 6362 (13.0%)	305/ 7003 (4.4%)
2010 Positive Birds to date / Total Birds Submitted	This time last year
124/ 231 (53.7%)	27/ 107 (25.2%)

WNV Results by County through 27 Sep 2010

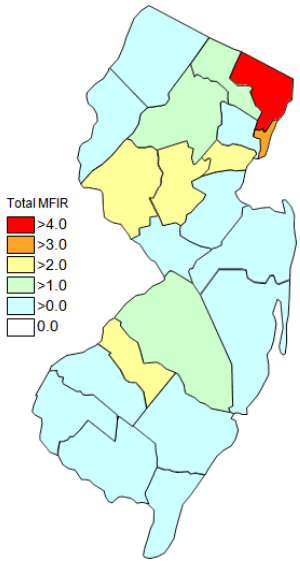
County	Species	Pools	Mosquitoes	Positives	MFIR
Atlantic		**263**	**6461**	**60**	**9.286**
	Aedes albopictus	33	307	1	3.257
	Aedes canadensis canadensis	3	56		
	Aedes cantator	3	14		
	Aedes japonicus	11	23		
	Aedes sollicitans	2	10		
	Aedes taeniorhynchus	1	24		
	Aedes triseriatus	4	8		
	Aedes trivittatus	3	26		
	Aedes vexans	25	363		
	Anopheles bradleyi	5	14		
	Anopheles punctipennis	6	109		
	Anopheles quadrimaculatus	3	4		
	Coquillettidia perturbans	10	37		
	Culex erraticus	6	25		
	Culex spp.	117	4973	57	11.462
	Culex territans	1	1		
	Culiseta melanura	29	466	2	4.292
	Orthopodomyia signifera	1	1		
Bergen		**215**	**15156**	**135**	**8.907**
	Aedes albopictus	5	30		
	Aedes japonicus	3	14		
	Culex spp.	207	15112	135	8.933
Burlington		**303**	**9186**	**46**	**5.008**
	Aedes albopictus	27	286		
	Aedes canadensis canadensis	4	109		
	Aedes japonicus	3	16		
	Aedes sollicitans	6	185		
	Aedes taeniorhynchus	2	9		
	Aedes triseriatus	1	7		
	Aedes vexans	19	346		
	Anopheles bradleyi	6	176		
	Anopheles crucians	2	122		
	Anopheles punctipennis	1	13		
	Anopheles quadrimaculatus	4	11		
	Coquillettidia perturbans	9	352		
	Culex erraticus	16	634		
	Culex pipiens	5	99	1	10.101
	Culex restuans	1	1		
	Culex salinarius	7	43		
	Culex spp.	112	4167	42	10.079
	Culiseta melanura	76	2599	3	1.154
	Psorophora columbiae	1	5		
	Uranotaenia sapphirina	1	6		
Camden		**239**	**5760**	**76**	**13.194**
	Aedes albopictus	40	140	3	21.429
	Aedes canadensis canadensis	1	1		
	Aedes japonicus	19	26		
	Aedes triseriatus	2	2		
	Aedes trivittatus	1	1		
	Aedes vexans	3	50		

	Anopheles punctipennis	5	7		
	Anopheles quadrimaculatus	2	2		
	Culex erraticus	2	8		
	Culex pipiens	1	28		
	Culex spp.	130	4485	71	15.831
	Culex territans	1	2		
	Culiseta melanura	27	997	2	2.006
	Othopodomyia signifera	2	3		
	Uranotaenia sapphirina	1	1		
Cape May		**1529**	**16525**	**10**	**0.605**
	Aedes albopictus	94	176		
	Aedes canadensis canadensis	2	2		
	Aedes cantator	3	3		
	Aedes japonicus	46	77		
	Aedes sollicitans	7	56		
	Aedes taeniorhynchus	4	63		
	Aedes triseriatus	37	64		
	Aedes vexans	2	75		
	Anopheles bradleyi	23	244		
	Anopheles punctipennis	1	2		
	Anopheles quadrimaculatus	47	709		
	Coquillettidia perturbans	16	157		
	Culex erraticus	102	3275		
	Culex pipiens	504	5526	6	1.086
	Culex restuans	228	1138	2	1.757
	Culex salinarius	46	644	1	1.553
	Culex spp.	169	1306		
	Culiseta melanura	198	3008	1	0.332
Cumberland		**63**	**667**	**1**	**1.499**
	Aedes albopictus	8	41		
	Aedes triseriatus	6	9		
	Anopheles bradleyi	3	4		
	Anopheles punctipennis	3	4		
	Anopheles quadrimaculatus	5	13		
	Culex erraticus	6	48		
	Culex pipiens	5	30		
	Culex restuans	5	14		
	Culex territans	1	1		
	Culiseta melanura	21	503	1	1.988
Essex		**262**	**3224**	**25**	**7.754**
	Aedes albopictus	44	175		
	Aedes japonicus	34	282		
	Aedes sollicitans	1	18		
	Aedes stimulans	1	3		
	Aedes triseriatus	20	41		
	Aedes vexans	20	125		
	Culex spp.	142	2580	25	9.690
Gloucester		**394**	**11034**	**117**	**10.604**
	Aedes albopictus	27	282	1	3.546
	Aedes japonicus	3	20		
	Aedes vexans	3	66		
	Anopheles barberi	1	1		

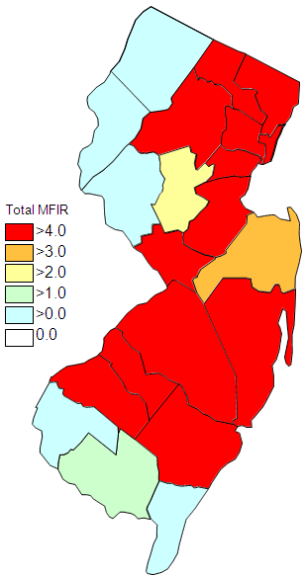
	Anopheles punctipennis	3	55		
	Anopheles quadrimaculatus	3	30		
	Coquillettidia perturbans	5	15	1	66.667
	Culex pipiens	259	8811	112	12.711
	Culiseta melanura	90	1754	3	1.710
Hudson		**196**	**10018**	**91**	**9.084**
	Aedes albopictus	1	25		
	Culex spp.	195	9993	91	9.106
Hunterdon		**225**	**11025**	**11**	**0.998**
	Aedes albopictus	2	61		
	Culex spp.	223	10964	11	1.003
Mercer		**226**	**4989**	**57**	**11.425**
	Aedes albopictus	47	115	1	8.696
	Aedes japonicus	25	38		
	Aedes triseriatus	4	5		
	Aedes vexans	3	75		
	Culex pipiens	100	4057	52	12.817
	Culex restuans	32	368	3	8.152
	Culex salinarius	12	264		
	Culex spp.	3	67	1	14.925
Middlesex		**251**	**9876**	**53**	**5.367**
	Aedes albopictus	11	74		
	Aedes japonicus	3	21		
	Aedes triseriatus	1	6		
	Culex spp.	236	9775	53	5.422
Monmouth		**320**	**2548**	**9**	**3.532**
	Aedes albopictus	59	395		
	Aedes canadensis canadensis	10	89		
	Aedes cantator	3	6		
	Aedes japonicus	39	106		
	Aedes sollicitans	3	24		
	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	5	11		
	Culex pipiens	1	1		
	Culex restuans	1	1		
	Culex salinarius	2	2		
	Culex spp.	94	1089	8	7.346
	Culiseta melanura	67	766	1	1.305
	Orthopodomyia signifera	2	2		
	Psorophora cyanescens	1	1		
Morris		**222**	**7530**	**47**	**6.242**
	Aedes albopictus	1	2		
	Aedes japonicus	17	156		

	Aedes vexans	1	5		
	Anopheles punctipennis	2	6		
	Anopheles quadrimaculatus	3	82		
	Coquillettidia perturbans	6	207		
	Culex spp.	192	7072	47	6.646
Ocean		**295**	**3990**	**18**	**4.511**
	Aedes albopictus	71	959	1	1.043
	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	2	2		
	Anopheles punctipennis	4	7		
	Anopheles quadrimaculatus	4	4		
	Coquillettidia perturbans	13	103		
	Culex erraticus	2	2		
	Culex pipiens	1	2		
	Culex restuans	4	5	1	200.000
	Culex salinarius	5	7		
	Culex spp.	90	2296	15	6.533
	Culiseta inornata	1	1		
	Culiseta melanura	37	232	1	4.310
	Psorophora ferox	2	3		
Passaic		**146**	**1851**	**11**	**5.943**
	Aedes albopictus	30	138		
	Aedes japonicus	25	178		
	Aedes triseriatus	10	21		
	Aedes trivittatus	1	1		
	Aedes vexans	1	3		
	Anopheles punctipennis	4	8		
	Anopheles quadrimaculatus	1	2		
	Coquillettidia perturbans	4	44		
	Culex spp.	69	1455	11	7.560
	Psorophora ferox	1	1		
Salem		**287**	**2414**	**1**	**0.414**
	Aedes albopictus	55	232		
	Aedes cantator	1	1		
	Aedes japonicus	21	25		
	Aedes triseriatus	18	20		
	Aedes vexans	25	72		
	Anopheles bradleyi	4	5		
	Anopheles punctipennis	5	5		
	Anopheles quadrimaculatus	21	124		
	Anopheles walkeri	4	5		
	Coquillettidia perturbans	11	22		
	Culex erraticus	3	10		
	Culex pipiens	10	23		
	Culex restuans	5	7		
	Culex spp.	82	1127		

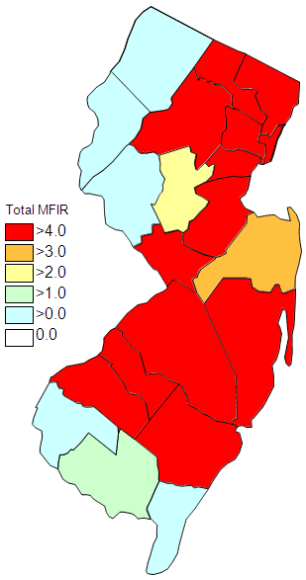
	Culiseta melanura	20	733	1	1.364
	Psorophora columbiae	2	3		
Somerset		**227**	**2724**	**8**	**2.937**
	Aedes albopictus	14	39		
	Aedes japonicus	20	130		
	Aedes triseriatus	15	64		
	Anopheles punctipennis	11	35		
	Anopheles quadrimaculatus	2	4		
	Culex spp.	165	2452	8	3.263
Sussex		**346**	**9077**	**5**	**0.551**
	Aedes japonicus	32	256		
	Aedes stimulans	2	5		
	Aedes triseriatus	16	48		
	Coquillettidia perturbans	17	321		
	Culex pipiens	12	59		
	Culex restuans	8	103		
	Culex salinarius	2	4		
	Culex spp.	238	8248	5	0.606
	Culiseta melanura	18	32		
	Culiseta minnesotae	1	1		
Union		**164**	**5836**	**43**	**7.368**
	Aedes albopictus	19	206	2	9.709
	Aedes japonicus	10	88		
	Coquillettidia perturbans	1	9		
	Culex spp.	134	5533	41	7.410
Warren		**189**	**6544**	**6**	**0.917**
	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.	160	5858	6	1.024
	Psorophora ciliata	1	1		
	Psorophora ferox	1	1		
Grand Total		**6362**	**146435**	**830**	**5.668**



Cumulative WNV activity in 2009.



WNV activity to 27 Sep, 2010.



WNV activity last week, 2010.

Saint Louis Encephalitis (SLE) through 27 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		**285**	**8994**		
	Aedes albopictus	27	286		
	Aedes canadensis canadensis	4	109		
	Aedes japonicus	3	16		
	Aedes sollicitans	6	185		
	Aedes taeniorhynchus	2	9		
	Aedes triseriatus	1	7		
	Aedes vexans	19	346		
	Anopheles bradleyi	6	176		
	Anopheles crucians	2	122		
	Anopheles punctipennis	1	13		
	Anopheles quadrimaculatus	3	10		
	Coquillettidia perturbans	9	352		
	Culex erraticus	16	634		
	Culex pipiens	5	99		
	Culex restuans	1	1		
	Culex salinarius	7	43		
	Culex spp.	112	4167		
	Culiseta melanura	59	2408		
	Psorophora columbiae	1	5		
	Uranotaenia sapphirina	1	6		
Camden		**201**	**4613**		
	Aedes albopictus	38	116		
	Aedes canadensis canadensis	1	1		

	Aedes japonicus	17	24		
	Aedes triseriatus	2	2		
	Aedes trivittatus	1	1		
	Aedes vexans	3	50		
	Anopheles punctipennis	5	7		
	Anopheles quadrimaculatus	1	1		
	Culex erraticus	2	8		
	Culex spp.	124	4389		
	Culex territans	1	2		
	Culiseta melanura	1	1		
	Orthopodomyia signifera	2	3		
	Psorophora columbiae	1	1		
	Uranotaenia sapphirina	2	7		
Essex		**235**	**3160**		
	Aedes albopictus	38	162		
	Aedes japonicus	30	272		
	Aedes sollicitans	1	18		
	Aedes triseriatus	11	23		
	Aedes vexans	13	105		
	Culex spp.	142	2580		
Hudson		**154**	**8318**		
	Aedes albopictus	1	25		
	Culex spp.	153	8293		
Salem		**1**	**7**		
	Culex spp.	1	7		
Sussex		**16**	**48**		
	Aedes triseriatus	16	48		
Grand Total		**892**	**25140**		

La Crosse Encephalitis (LAC) through 27 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		**6**	**9**		
	Aedes triseriatus	6	9		

Salem		**5**	**5**		
	Aedes triseriatus	5	5		
Warren		**10**	**106**		
	Aedes canadensis canadensis	4	86		
	Aedes triseriatus	6	20		
Grand Total		**34**	**146**		