VECTOR SURVEILLANCE IN NEW JERSEY

EEE, WNV, SLE, LAC, DENV, CHIK, ZIKV, and JCV

Prepared by Lisa M. Reed and Dina Fonseca
Center for Vector Biology, Rutgers University

20 October to 26 October, 2019, CDC Week 43
Data download 1:07 pm 25 October

This New Jersey Agricultural Experiment Station report is supported by Rutgers University, Hatch funds, funding from the NJ State Mosquito Control Commission and with the participation of the Department of Health, Department of Agriculture and of the 21 county mosquito control agencies of New Jersey. Data is held in JerseySurv, a subset of the CalSurv system.

NOTE: County/species tables for arboviruses are now in a supplemental file here

Arbovirus Summary

- **73 EEE positive pools, 13 animal cases: 11 horse cases, 1 alpaca case, 1 deer; 3 human cases (Atlantic, Somerset, Union Counties)**
- **363 WNV positive pools (+4 RAMP positives), 0 horses, 7 human cases (Atlantic(2), Bergen(2), Burlington, Gloucester, Hunterdon County)**
- **1 LAC positive pool**
- **5 JCV positive pools**
- **0 SLE, DENG, CHIK, ZIKA positive pools**
- **Note: Data downloads times are noted and do not necessarily reflect all pools submitted and analyzed to that point in time. This report may vary from other reports from the same dataset as they are snapshots in time.**

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**	0.07	0.00	19	8		
Green Bank (Burlington Co.)/25	**Coastal**	0.12	0.04	200 (201)	16 (17)		
Corbin City (Atlantic Co.)/25	**Coastal**	0.16	na	192	20	1	5.208
Dennisville (Cape May Co.)/50	**Coastal**	0.00	0.06	76	15		
Winslow (Camden Co.)/50	**Inland**	0.11	0.14	900	29	6	6.667
Centerton (Salem Co.)/50	**Inland**	0.12	0.06	249	18	2	8.032
Turkey Swamp (Monmouth Co.)/46	**Inland**	0.05	0.06	1273	36	7	5.499
Glassboro (Gloucester Co.)/50	**Inland**	0.07	0.02	174	15	2	11.494

*Current week (in parentheses) results pending. ‡ corrected from previous week NC=no collection

Remarks: No additional positive EEE pools detected. Currently in 2019, there are 73 detections of EEE virus: 54 pools of *Culiseta melanura* (18 collected at traditional resting box sites, and 36 collected at county trap sites) and 19 pools in *Aedes albopictus, Ae. canadensis, Ae. triseriatus, Culex pipiens* and *Culex* Mix. The first positive pool was collected on 3 July at Turkey Swamp, Monmouth County. There are 13 animal cases (11 horses, 1 alpaca 1 deer) and three human cases (Atlantic, Somerset, Union County).

Statewide, 13,450 *Cs. melanura* from 971 pools have been tested, with an overall *Cs. melanura* MFIR of 4.015. 187,846 specimens in 9,560 pools from 40 other species have also been tested, with 19 positive pools detected (*Aedes albopictus, Ae. canadensis, Ae. triseriatus,* and *Culex* Mix/*Cx. pipiens* pools). Overall MFIR for all species statewide is 0.363.

Traditional Resting Box Sites: 3,083 *Cs. melanura* from 157 pools have been tested, with 18 positive pools detected – 1 at Corbin City, 2 at Centerton, 2 at Glassboro, 7 at Turkey Swamp, and 6 at Winslow. An additional 1*Cs. melanura* in 1 pool is at labs to be tested.

	Additional *Cs. melanura* trapped by counties *traps with positives indicated in **BOLD UNDERLINED.**				
County	**Trap types***	**Pools**	**Mosquitoes**	**Positives**	**MFIR**
Atlantic	BGS, **CO_2**, GR, **RB**	99	2539	7	2.757
Bergen	CO_2, RB	10	81		
Burlington	**ULVT**	86	2666	8	3.001
Cape May	GR, **RB**	194	471	1	2.123
Cumberland	AGO, RB	40	244		
Gloucester	CO_2, **RB**	74	1941	3	1.546
Middlesex	RB	23	100		
Monmouth	CO_2, **Other**	24	183	1	5.464
Morris	**CO_2**, **RB**	81	746	6	8.043
Ocean	**CO_2**, GR, RB	69	447	1	2.237
Salem	CO_2, GR, **RB**	25	77	1	12.987
Sussex	**CO_2**, GR **RB**	81	753	8	10.624
Union	NJLT	6	64		
Warren	CO_2, NJLT	2	55		
TOTAL		**814**	**10367**	**36**	**3.473**

Additional County-set *Cs. melanura*: Counties maintain trap sites for *Cs. melanura* in other areas, using a variety of traps. Last year, half of the EEE detection came from such trappings. In 2019, 36 pools of *Cs. melanura* have been found positive. Earliest positive pools were found in Salem County, collected 9 July, and Ocean County collected 10 July.

Horses and Humans: Over the past ten years, first onset dates for horses have been in August or October except for 2012, where an onset date was 22 July. Last year five horses were reported with EEE. All had either an incomplete or no vaccination history. ***Horse owners are urged to make sure their horses are up to date on their vaccinations. Horse cases are known to occur through October and sometimes into November (see link below).*** Other sensitive species are non-native birds, such as Ostriches/Emus and Gallinaceous birds such as pheasants of Eurasian origins. In 2019, 11 horses and one alpaca and one deer have been found with EEE.

Case	Animal	Age	Sex	County	Date of Onset	Euthanized ?	Vaccinated?	Comment
13	Deer	unknown	unknown	Camden	July			Tissue collected by state vet
12	Horse	3 year old	Gelding	Camden	30 Sep	30 Sep	EWT Feb/Mar	
11	Horse	1 year old	Filly	Burlington	24-Sep	29-Sep	Unknown	
10	Horse	Unknown	Gelding	Ocean	?	26-Aug	Not vaccinated	
9	Horse	4 year old	Gelding	Ocean	?	26-Aug	Not vaccinated	
8	Horse	1 year old	Filly	Atlantic	?	24-Aug	Not vaccinated	
7	Horse	3 or 4 month old	Gelding	Salem	?	25-Aug	Not vaccinated	
6	Horse	18 year old	Gelding	Morris	25-Aug	26-Aug	Not vaccinated	
5	Horse	2 year old	Gelding	Ocean	15-Aug	16-Aug	Unknown	
4	Alpaca	7 year old	Unknown	Camden	2-Aug	3-Aug	Unknown	
3	Horse	yearling	Colt	Monmouth	5 Aug	5-Aug	April vaccination (incomplete)	
2	Horse	20 year old	Gelding	Ocean	26-Jul	26-Jul	Unknown	
1	Horse	12 year old	Mare	Ocean	23-Jul	23-Jul	Possible incomplete	11-14 miles from two active EEE sites

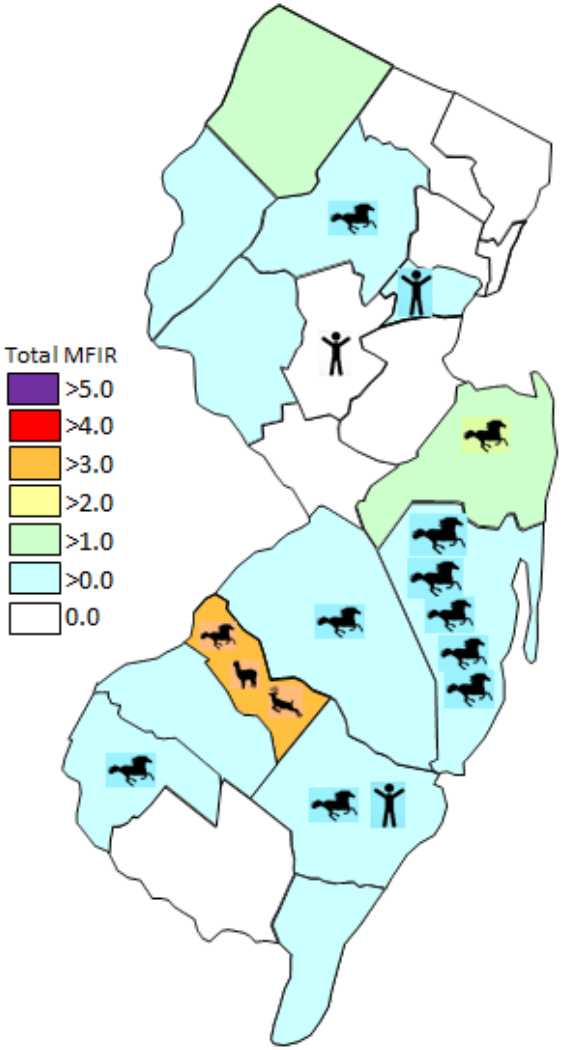
Horses and Vaccinations: The fate of unvaccinated equids reinforces the necessity of maintaining a vaccination schedule for arboviruses. For vaccination schedules recommended by the American Association of Equine Practices, see: http://www.aaep.org/vaccination_guidelines.htm

There are 3 human cases of EEE, coming from Atlantic, Union, and Somerset Counties. For more information, see DOH Vectorborne Surveillance reports: https://www.nj.gov/health/cd/statistics/arboviral-stats/

Species other than *Cs. melanura*	Pools	Mosquitoes	Positives	MFIR
Aedes abserratus	14	259		
Aedes albopictus	1143	9003	2	0.222
Aedes atlanticus	15	134		
Aedes atropalpus	1	3		
Aedes aurifer	3	14		
Aedes canadensis canadensis	139	2536	2	0.789
Aedes cantator	19	297		
Aedes cinereus	1	1		
Aedes grossbecki	5	12		
Aedes infirmatus	1	1		
Aedes japonicus	798	4656		
Aedes mitchellae	1	1		
Aedes provocans	2	8		
Aedes sollicitans	34	793		
Aedes sticticus	5	100		
Aedes stimulans	2	10		
Aedes taeniorhynchus	23	351		
Aedes thibaulti	2	27		
Aedes triseriatus	219	1034	2	1.934
Aedes trivittatus	29	545		
Aedes vexans	128	1131		
Anopheles barberi	3	3		
Anopheles bradleyi	161	1275		
Anopheles crucians	35	380		
Anopheles punctipennis	173	1203		
Anopheles quadrimaculatus	237	1945		
Anopheles walkeri	7	397		
Coquillettidia perturbans	291	5170		
Culex Mix	3741	138574	12	0.087
Culex erraticus	336	2924		
Culex pipiens	886	9706	1	0.103
Culex restuans	600	1682		
Culex salinarius	343	2132		
Culex territans	45	119		
Culiseta inornata	2	5		
Orthopodomyia signifera	11	13		
Psorophora ciliata	1	1		
Psorophora columbiae	27	290		
Psorophora ferox	49	865		
Psorophora howardii	1	1		
Uranotaenia sapphirina	27	245		
State Total	**9560**	**187846**	**19**	**0.101**

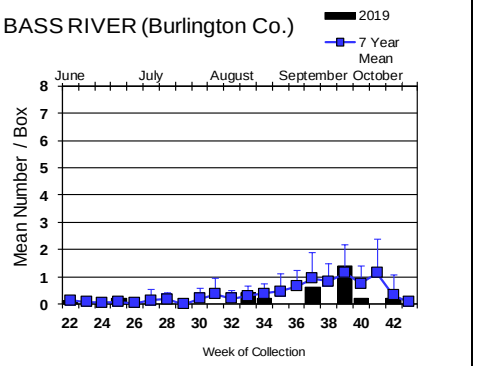
Additional Species: 40 additional species were tested for EEE. 19 positive pools have been detected in three species, the latest species being *Culex* Mix or *pipiens* in Hunterdon, Gloucester and Burlington Counties. (Note: *Culex pipiens* is refractory for EEE virus).

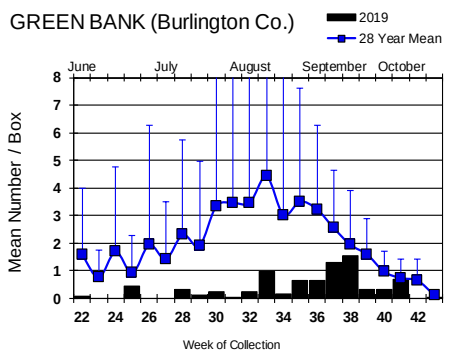
Overall MFIR rates, human and animal cases per county:

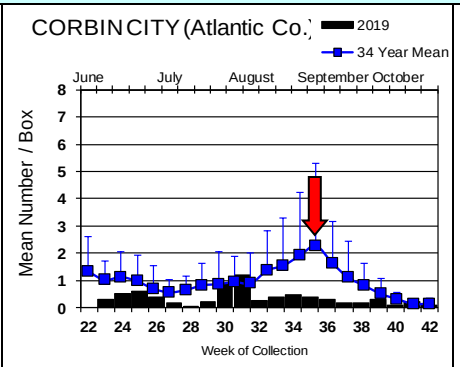


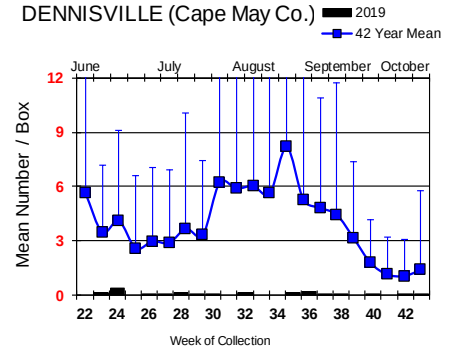
Culiseta melanura Populations

Coastal

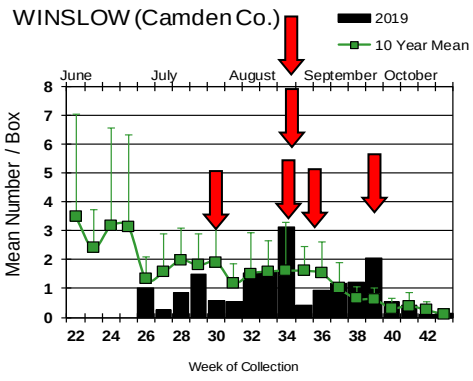


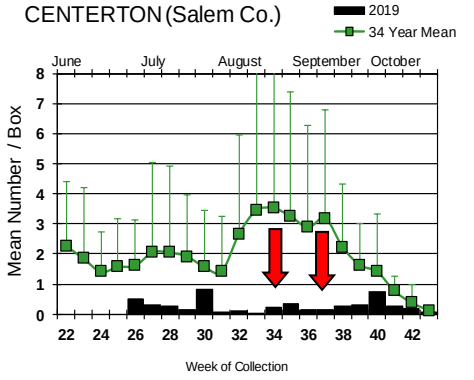


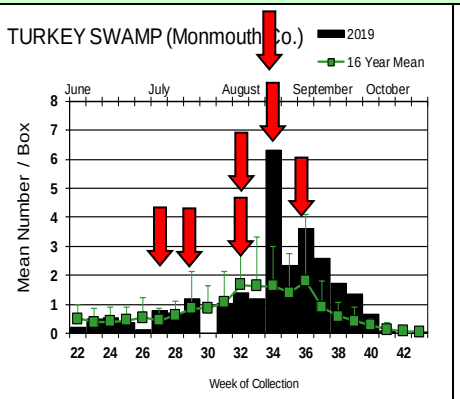


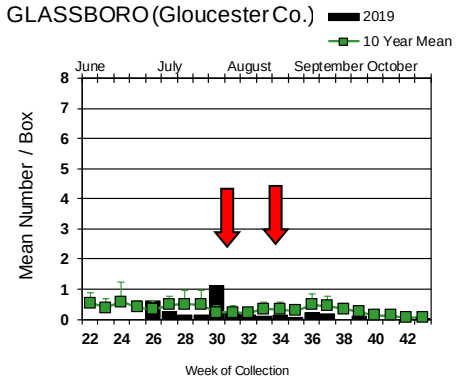


Inland









Culiseta melanura populations at the traditional resting box sites continue to decline as we go into fall.

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

EEE in US (2019 cumulative cases): (Black or Red = previous + new reported cases occurring)

- **equine:** 3(CT) 28(FL) 1(GA) 14(IN) 28(LA) 9(MA) 1(MD) 1(ME) 39(+deer (MI) 1(MN) 7(MS) 1(NC) 2(NH) 9(+1 alpaca, NJ) 7(+1 goat NY) 4(OH) 1(+3 deer RI) 3(SC) 6(TX) 3(WI) 5(CAN-ON)
- **mosquito pools:** 122(CT) 1(IN) 5(LA) 428(MA) 3(MD) 2(ME) 16(NH) 73(NJ) 66(NY) 9(RI)
- **sentinel:** 110(+1 emu 1 BAEA, FL) 3(DE) 1(LA) 1(ratite NY)
- **human:** 1(CT) 1(IN) 12(MA) 10(MI) 1(NC) 3(NJ) 3(RI)

West Nile Virus Positive Organisms in US, 2019

West Nile in US (2019 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				1	4
Alaska					
Arizona	5	356/362	1	1	172/173
Arkansas					6
California	193/202	3225/3262	130	15	158/169
Colorado		109		3	104/113
Connecticut		82		1	3
Delaware					
Florida	1		374/480	7/8	1
Georgia					1/9
Hawaii					
Idaho	0	41		3	11
Illinois	4	1142		2	14
Indiana	0	170/174		0	1/3
Iowa				2	5
Kansas					5/6
Kentucky				1/2	1
Louisiana	3	175		1	16
Maine		0			0
Maryland(+DC)		4			3(7DC)
Mass.		87		0	3
Michigan	16/18	54		1	8
Minnesota				1	3
Mississippi		26		7	13
Missouri		0		2	2/3

	Birds	Mosquito Pools	Sentinels	Horses*	Humans
Montana					3
Nebraska	1	29		0	23
Nevada					25/39
New Hampshire		1		1	
New Jersey		362/363		0	7
New Mexico					28/38
New York		553/571		0	11
North Carolina					1
North Dakota	1	6		0	8/9
Ohio		263		2	2
Oklahoma					4/5
Oregon	0	85	0	7	9
Pennsylvania	1	400+		1	1/3
Rhode Island		4			
South Carolina	1	3			
South Dakota		9			11
Tennessee					1/3
Texas	1	111/112		1	22/26
Utah	1	272		8/9	20/21
Vermont		4/5			
Virginia					1/4
Washington	0	27		2	6
West Virginia					
Wisconsin	2	45		0	2
Wyoming	0	8		3	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 through 25 October 2019

Species	Pools	Mosquitoes	Positives	MFIR
Aedes abserratus	14	259		
Aedes albopictus	1584	10154	4	0.394
Aedes atlanticus	15	134		
Aedes atropalpus	1	3		
Aedes aurifer	3	14		
Aedes canadensis canadensis	139	2536		
Aedes cantator	19	297	1	3.367
Aedes cinereus	1	1		
Aedes grossbecki	5	12		
Aedes infirmatus	1	1		
Aedes japonicus	817	5224	3	0.574
Aedes mitchellae	1	1		
Aedes provocans	2	8		
Aedes sollicitans	34	793		
Aedes sticticus	5	100		
Aedes stimulans	2	10		
Aedes taeniorhynchus	23	351		
Aedes thibaulti	2	27		
Aedes triseriatus	527	2228	1	0.449
Aedes trivittatus	29	545		
Aedes vexans	128	1131		
Anopheles barberi	3	3		
Anopheles bradleyi	161	1275		
Anopheles crucians	35	380		
Anopheles punctipennis	174	1204	2	1.661
Anopheles quadrimaculatus	237	1945		
Anopheles walkeri	7	397		
Coquillettidia perturbans	295	5383	3	0.557
Culex spp.	3741	138574	318	2.295
Culex erraticus	337	2930	1	0.341
Culex pipiens	887	9707	9	0.927
Culex restuans	603	1685		
Culex salinarius	343	2132		
Culex territans	45	119		
Culiseta inornata	2	5		
Culiseta melanura	971	13450	21	1.561
Orthopodomyia signifera	11	13		
Psorophora ciliata	1	1		
Psorophora columbiae	27	290		
Psorophora ferox	49	865		
Psorophora howardii	1	1		
Uranotaenia sapphirina	27	245		
Grand Total	**11309**	**204433**	**363**	**1.776**

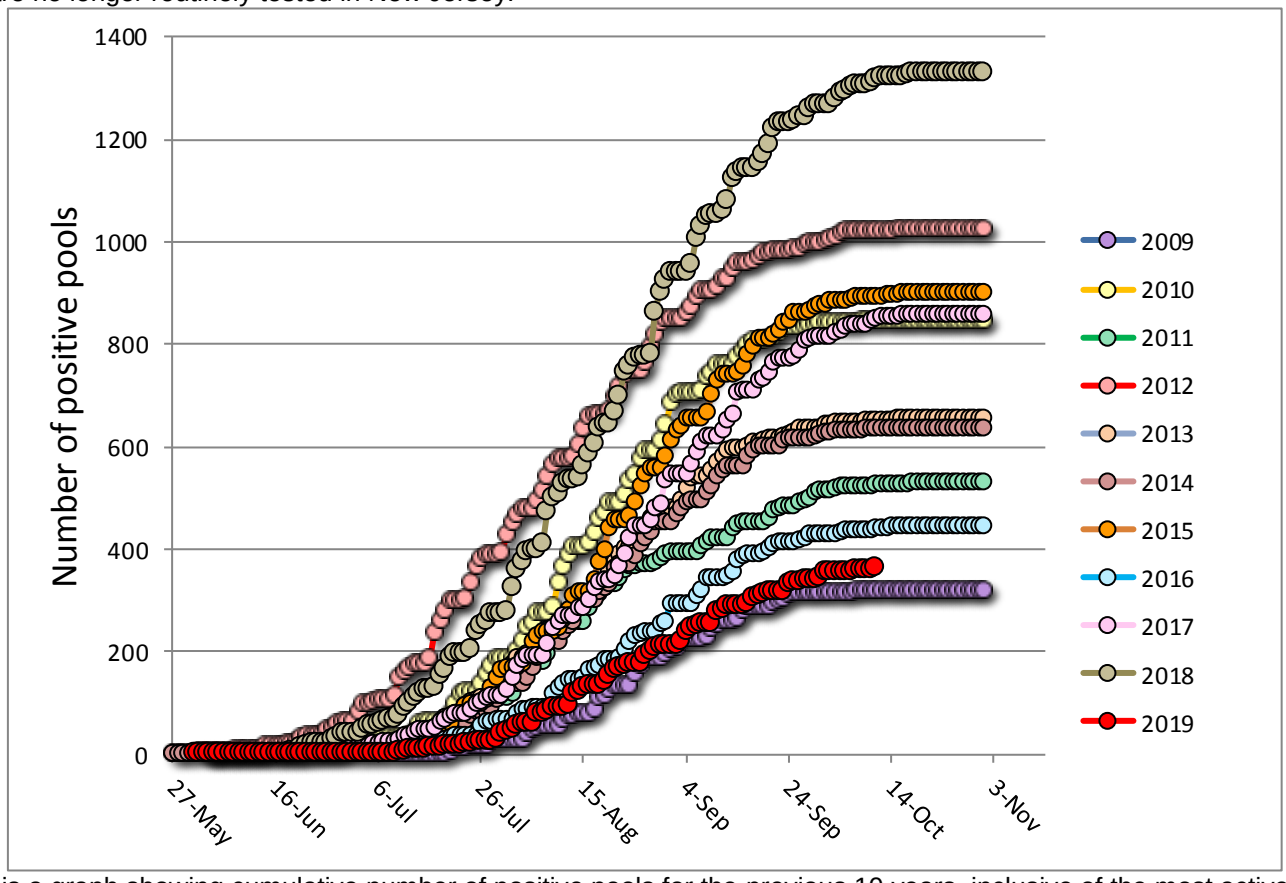
Remarks: To date 11,309 pools of 204,433 mosquitoes from 41 species have been tested. A total of 363 positive WNV pools have been detected by RTPCR throughout the state beginning with a pool of *Aedes triseriatus*, collected on 31 May, 2019 in Passaic County. This pool was also co-infected with LAC (see table below). Majority of the positives are in *Culex* bird-feeding species pools. Also positive are *Aedes albopictus, Ae. cantator*, *Ae. japonicus, Anopheles punctipennis, Coquillettidia perturbans*, *Culex erraticus,* and *Culiseta melanura.* Last year was a year of significant activity, with over 1300 positive pools detected. Currently, the statewide MFIR rate for all mosquitoes decreased from 1.790 to 1.776.

In addition to RTPCR positives, 4 positives determined by RAMP were also detected (in *Aedes cantator* and *Culex)*. See end of WNV by county by species table in the addendum.

Humans, Horses and Wild Birds: There have been seven human cases of West Nile virus, the latest two occurring in Bergen and Burlington counties. The fifth case was detected in Gloucester County, date of onset is unknown. The fourth case is in Atlantic County, with date of onset 4 Sep. The third case is in Bergen County, with date of onset as 30 Aug, and possible out of state exposure. The second case is from Atlantic County, with date of onset 2 September. The first is from Hunterdon County reported, with an onset date of 21 June. The first case represents the earliest typical case reported in New Jersey. (A few years ago, there was one case reported in May from a long-term hospitalized patient making date of infection difficult to determine.) For more information, see NJ arboviral reports from the Department of Health: https://www.nj.gov/health/cd/statistics/arboviral-stats/ . Last year we have over 60 cases reported, the highest to date.

Currently, there are no reported horse cases for WNV. Last year only one WNV horse case has been reported, occurring in Burlington County. For further information, see http://www.nj.gov/health/cd/statistics/arboviral-stats/.

Birds are no longer routinely tested in New Jersey.



Above is a graph showing cumulative number of positive pools for the previous 10 years, inclusive of the most active (2018) and least active (2009) years. The red series represents this year, starting with the first positive pool.

Go here for the table supplement of arbovirus by county by mosquito species.