2019 Vermont Mosquito Surveillance Report

Vermont Agency of Agriculture, Food & Markets

The Vermont Agency of Agriculture, Food & Markets conducted a statewide survey of mosquitoes from June 17 through October 11 (17 weeks), looking for West Nile Virus (WNV) and Eastern Equine Encephalitis (EEE) presence in the state. Mosquitoes were collected from 105 permanent trap locations in 83 towns in all of Vermont's 14 counties.

Three types of traps were used: resting box traps, reduced CDC light traps, and gravid traps. Resting box traps target the main mosquito vector (transmitter) of EEE. Reduced CDC light traps were co-located with resting box traps at wetland locations and were used as a sensing tool for species and abundance in the area. Gravid traps were set at wastewater treatment facilities, targeting the main vector of WNV. Collections were made weekly and processed at the Vermont Agricultural and Environmental Laboratory in Randolph Center. The collections were identified to species and the vector species were pooled into vials of 1 to 50 mosquitoes. The mosquito pool samples were processed at the Vermont Department of Health Laboratory for arbovirus testing.

In addition to routine WNV and EEE surveillance, *Aedes albopictus* (the mosquito believed to be capable of transmitting Zika virus) surveillance was conducted at 37 sites throughout southern Vermont and along Lake Champlain. Two BG Sentinel trap locations and 35 oviposition trap locations were surveyed for 17 and 10 weeks, respectively.

2019 At-A-Glance Vermont Mosquito Arbovirus Data

- 76,763 mosquitoes collected
- 3,217 mosquito pools submitted for testing
- 5 mosquito pool were positive for WNV (0.16%)
- 0 mosquito pools were positive for EEE

Vermont Mosquito Surveillance Results and Traps Locations, 2019

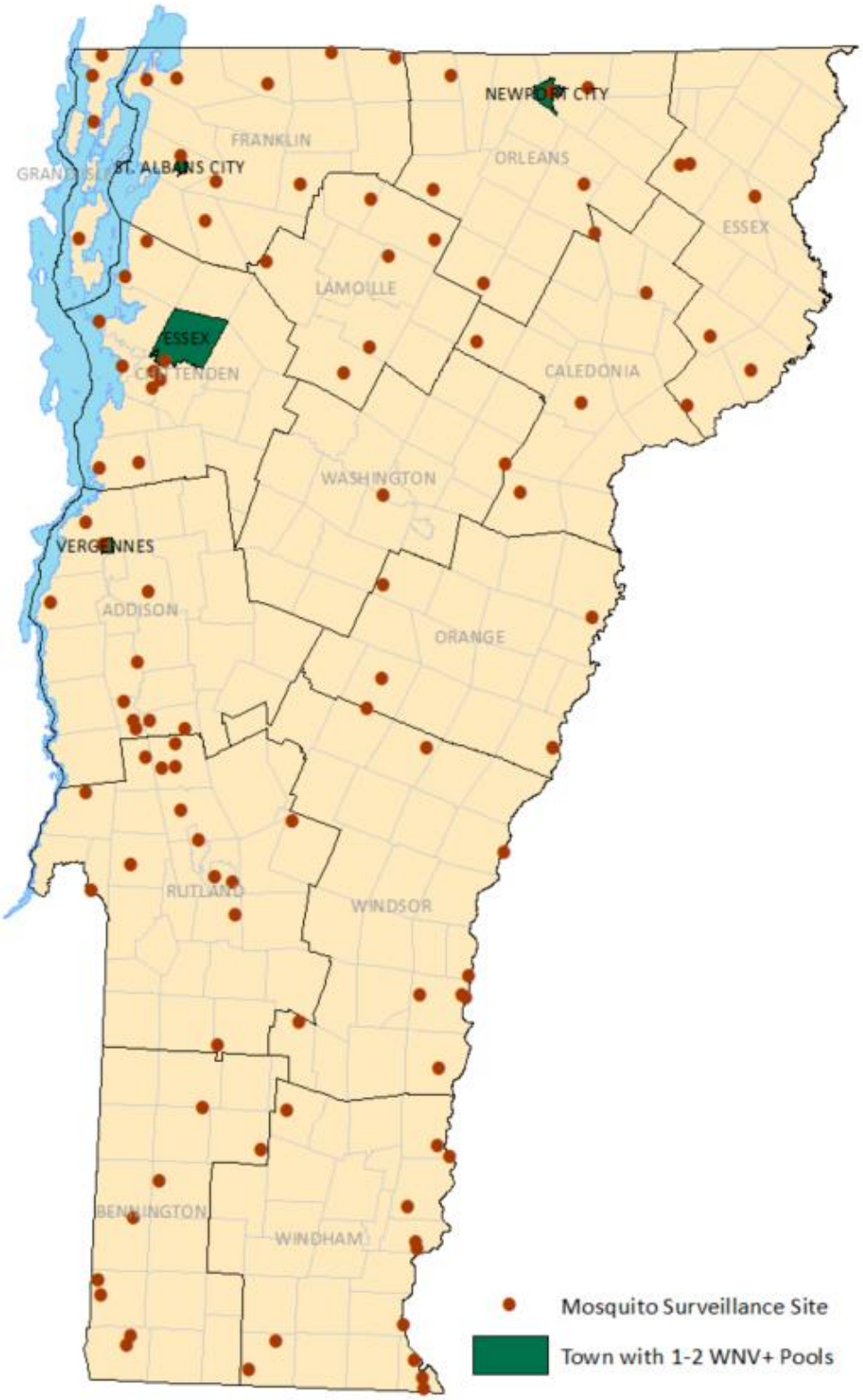


Table 1. 2019 Vermont arbovirus testing results

CDC Week #	Beginning Sunday	Batches Tested	EEE+ Samples	WNV+ Samples
26	23-Jun	120	0	0
27	30-Jun	137	0	0
28	7-Jul	292	0	0
29	14-Jul	292	0	0
30	21-Jul	323	0	0
31	28-Jul	261	0	0
32	4-Aug	321	0	0
33	11-Aug	250	0	1
34	18-Aug	242	0	0
35	25-Aug	208	0	1
36	1-Sep	196	0	2
37	8-Sep	156	0	0
38	15-Sep	115	0	0
39	22-Sep	102	0	0
40	29-Sep	112	0	1
41	6-Oct	60	0	0
42	13-Oct	30	0	0
Total		**3,217**	**0**	**5**

Table 2. 2019 Vermont West Nile Virus-positive mosquito pools

Date Collected	Town	County	Genus species
8/12/2019	Essex	Chittenden	*Culex pipiens/restuans*
8/22/2019	Newport City	Orleans	*Culex pipiens/restuans*
8/28/2019	Vergennes	Addison	*Culex pipiens/restuans*
9/3/2019	Essex	Chittenden	*Culex pipiens/restuans*
10/1/2019	St Albans City	Franklin	*Culex pipiens/restuans*

Table 3. 2019 Vermont towns trapped (n = 83)

Town	County
Addison	Addison
Alburgh	Grand Isle
Bakersfield	Franklin
Barton	Orleans
Belvidere	Lamoille
Bennington	Bennington
Benson	Rutland
Berkshire	Franklin
Brandon	Rutland
Brattleboro	Windham
Brighton	Essex
Brookfield	Orange
Burke	Caledonia
Burlington	Chittenden
Cambridge	Lamoille
Castleton	Rutland
Charlotte	Chittenden
Colchester	Chittenden
Concord	Essex
Cornwall	Addison
Craftsbury	Orleans
Danby	Rutland
Danville	Caledonia
Derby	Orleans
Eden	Lamoille
Enosburg	Franklin
Essex	Chittenden
Fair Haven	Rutland

Town	County
Fairfax	Franklin
Fairfield	Franklin
Ferdinand	Essex
Ferrisburgh	Addison
Grand Isle	Grand Isle
Groton	Caledonia
Hardwick	Caledonia
Hartford	Windsor
Highgate	Franklin
Hyde Park	Lamoille
Jay	Orleans
Killington	Rutland
Leicester	Addison
Londonderry	Windham
Lowell	Orleans
Lunenburg	Essex
Manchester	Bennington
Marshfield	Washington
Milton	Chittenden
Montpelier	Washington
Morrisville	Lamoille
New Haven	Addison
Newbury	Orange
Newport City	Orleans
Pittsford	Rutland
Pownal	Bennington
Proctor	Rutland
Putney	Windham

Town	County
Randolph	Orange
Richford	Franklin
Rockingham	Windham
Royalton	Windsor
Rutland	Rutland
Shaftsbury	Bennington
Shrewsbury	Rutland
South Burlington	Chittenden
Springfield	Windsor
St. Albans City	Franklin
Stowe	Lamoille
Stratton	Windham
Sudbury	Rutland
Sunderland	Bennington
Sutton	Caledonia
Swanton	Franklin
Thetford	Orange
Vergennes	Addison
Vernon	Windham
Victory	Essex
Weathersfield	Windsor
Westminster	Windham
Weston	Windsor
Whiting	Addison
Whitingham	Windham
Williston	Chittenden
Windsor	Windsor

Rapid Response Mosquito Collections

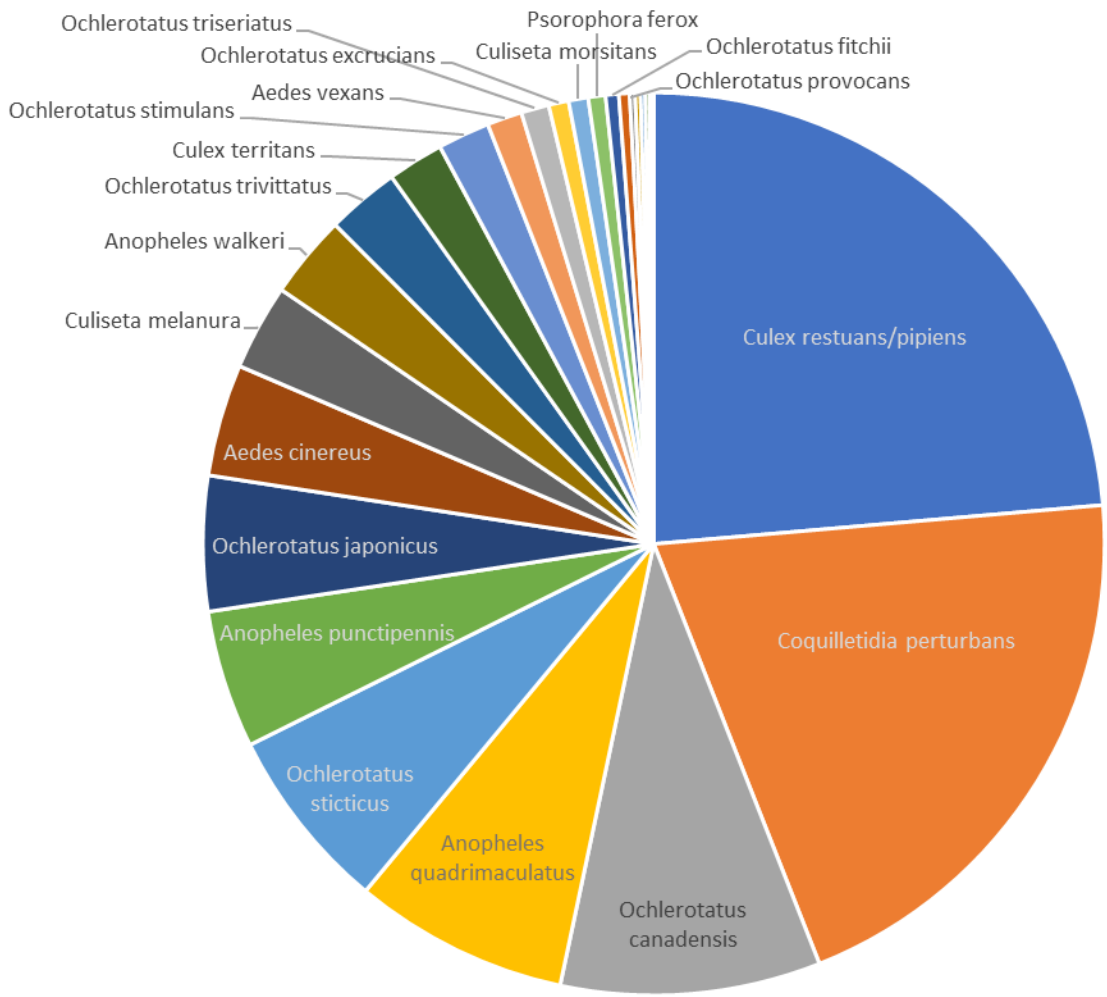
In September, EEE activity in Massachusetts along Vermont's southern border prompted targeted mosquito trapping in 2 towns in Windham county. CDC light traps were set once per week for 5 weeks at 3 locations. A total of 16 mosquitoes were collected and tested for WNV and EEE, all of which were negative.

2019 Vermont Mosquito Species Statistics

Table 4. 2019 Mosquito species collected and tested for WNV and EEE

Species	Number Collected	Collected (% of total)	Number Tested for WNV and EEE	Tested for WNV and EEE (% of total)
Culex pipiens/restuans	18,136	23.63	16,460	29.06
Coquilletidia perturbans	15,647	20.38	14,176	25.03
Ochlerotatus canadensis	7,157	9.32	6,295	11.11
Anopheles quadrimaculatus	5,916	7.71	5,185	9.15
Ochlerotatus sticticus	5,081	6.62	0	0.00
Anopheles punctipennis	3,796	4.95	2,494	4.40
Ochlerotatus japonicus	3,709	4.83	3,372	5.95
Aedes cinereus	3,082	4.01	2,604	4.60
Culiseta melanura	2,362	3.08	2,362	4.17
Anopheles walkeri	2,290	2.98	2	0.00
Ochlerotatus trivittatus	2,003	2.61	1,776	3.14
Culex territans	1,546	2.01	507	0.90
Ochlerotatus stimulans	1,431	1.86	0	0.00
Aedes vexans	965	1.26	773	1.36
Ochlerotatus triseriatus	766	1.00	5	0.01
Ochlerotatus excrucians	552	0.72	0	0.00
Culiseta morsitans	539	0.70	539	0.95
Psorophora ferox	474	0.62	0	0.00
Ochlerotatus fitchii	362	0.47	0	0.00
Ochlerotatus provocans	294	0.38	0	0.00
Ochlerotatus diantaeus	151	0.20	0	0.00
Culex salinarius	146	0.19	85	0.15
Uranotaenia sapphirina	129	0.17	0	0.00
Ochlerotatus aurifer	119	0.16	0	0.00
Anopheles earlei	81	0.11	0	0.00
Ochlerotatus intrudens	14	0.02	0	0.00
Ochlerotatus atropalpus	6	0.01	0	0.00
Ochlerotatus communis	6	0.01	0	0.00
Anopheles barberi	1	0.00	0	0.00
Culiseta minnesotae	1	0.00	1	0.00
Ochlerotatus dorsalis	1	0.00	0	0.00
Total	76,763		56,636	

Mosquito species collected in Vermont, 2019



Vermont Targeted *Aedes albopictus* Surveillance

Aedes albopictus (Asian tiger mosquito) is believed to be capable of transmitting Zika, dengue, and other arboviruses in tropical and subtropical area where these diseases are endemic. It has an estimated geographic range that includes southern Vermont; however, those diseases are not endemic to our area.

In 2019, 2 BG-Sentinel traps were set for 17 weeks in 2 towns on the Vermont/Massachusetts border. Additionally, 35 oviposition trap locations were surveyed for 10 weeks (July 1 – September 6). Sites were located along major truck routes at rest areas, truck stops, tire dealerships, transfer stations, and boat launches, as this mosquito species is a container breeder with a preference for tires. Eggs were collected, counted, and processed at the Massachusetts Department of Health Laboratory for rearing and larval identification.

Aedes albopictus mosquito eggs were found at 1 site in Windham County for 2 consecutive weeks in August. This was the first documented detection of this species in Vermont.

Vermont *Aedes albopictus* Surveillance Results and Trap Locations, 2019

Continued surveillance will help determine if this species can overwinter or will be reintroduced.