

# 2023 Vermont Mosquito Surveillance Report

Vermont Agency of Agriculture, Food & Markets

The Vermont Agency of Agriculture, Food & Markets conducted its annual statewide surveillance of mosquitoes from June 26 through October 20, 2023 (17 weeks), tracking West Nile Virus (WNV) and Eastern Equine Encephalitis (EEE) presence in the state. Mosquitoes were collected from 110 permanent trap locations in 90 towns within all of Vermont's 14 counties.

Three types of traps were used: resting box traps (RBTs), reduced CDC light traps (CDCs), and gravid traps (GVTs). RBTs target the main mosquito vector (transmitter) of EEE. CDC traps are co-located with RBTs at wetland locations and are used to assess mosquito species and abundance in an area. GVTs are set at wastewater treatment facilities, targeting the main vector for WNV. Collections were made weekly and processed at the Vermont Agricultural and Environmental Laboratory (VAEL) in Randolph Center. The specimens were identified to species, and known or suspected primary and secondary vector species were pooled into vials of 1 to 50 mosquitoes. The mosquito pool samples were processed at the Vermont Department of Health Laboratory in Colchester VT and Centers for Disease Control and Prevention Laboratory in Ft Collins CO for arbovirus testing.

In addition to routine WNV and EEE surveillance, surveillance for the Asian Tiger Mosquito (*Aedes albopictus*), the mosquito species known to vector dengue, chikungunya, and yellow fever and suspected to be a weak vector species for Zika virus in areas of endemic presence, was conducted at 18 sites throughout southern Vermont. Two BG-Sentinel trap locations and 16 oviposition trap locations were surveyed for 16 and 10 weeks, respectively.

## 2023 At-A-Glance Vermont Mosquito Arbovirus Data

- 162,434 mosquitoes collected
- 4,031 mosquito pools submitted for testing
- 11 mosquito pools were positive for WNV
- 14 mosquito pools were positive for EEE

### Vermont Agency of Agriculture's Mosquito Surveillance Results and Trap Locations (RBT, CDC, and GVT Traps), 2023

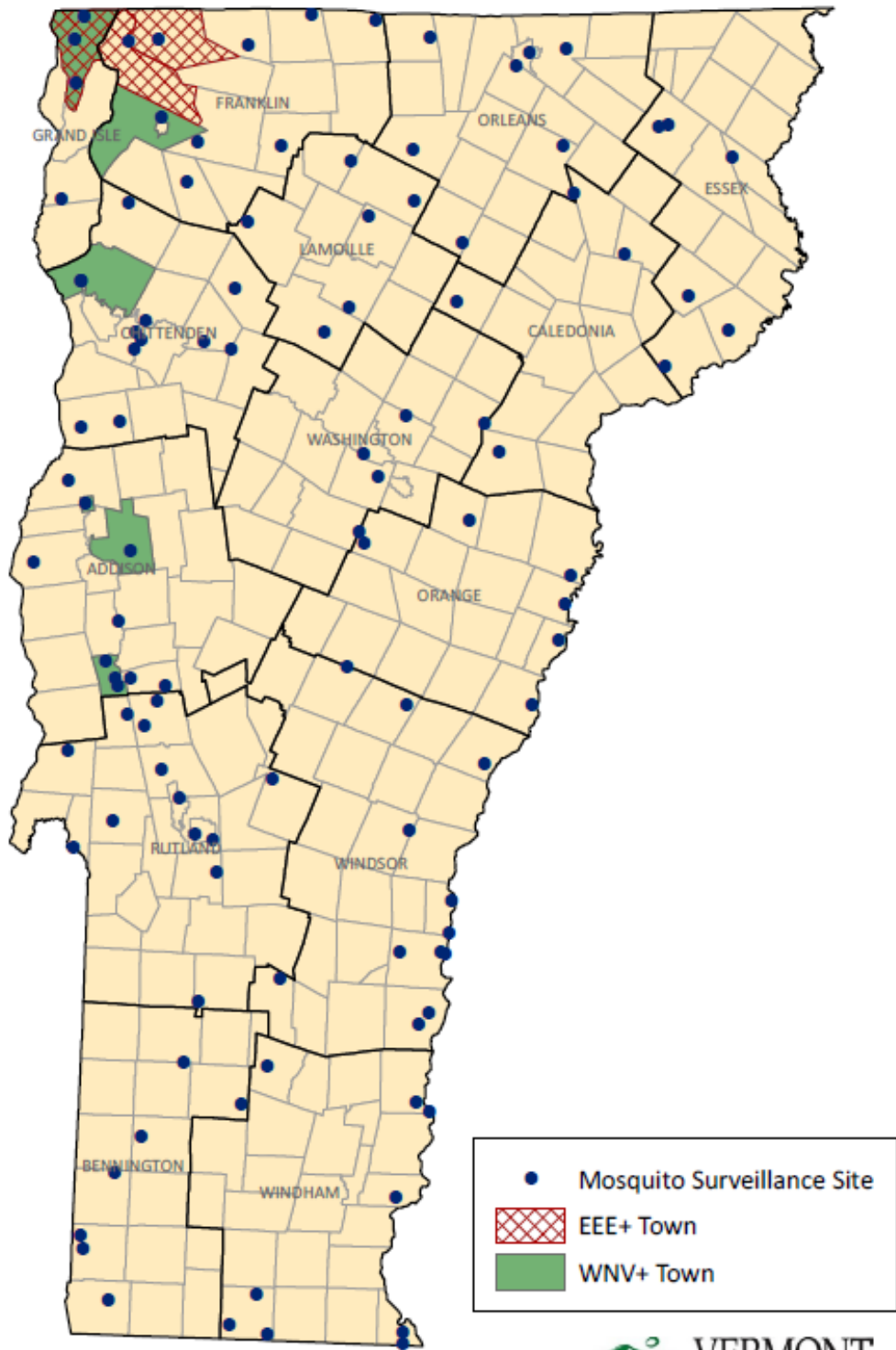


Table 1. 2023 Vermont Arbovirus Testing Results (Vermont Agency of Agriculture)

CDC Week #	Beginning Sunday	Pools Tested	EEE+ Pools	WNV+ Pools
26	25-Jun	159	0	0
27	2-Jul	208	0	0
28	9-Jul	127	0	0
29	16-Jul	162	0	0
30	23-Jul	171	0	3
31	30-Jul	182	0	0
32	6-Aug	168	4	2
33	13-Aug	165	0	0
34	20-Aug	210	1	0
35	27-Aug	352	5	2
36	3-Sep	337	1	1
37	10-Sep	322	2	1
38	17-Sep	289	0	0
39	24-Sep	382	1	2
40	1-Oct	381	0	0
41	8-Oct	286	0	0
42	15-Oct	130	0	0
<b>Total</b>		<b>4,031</b>	<b>14</b>	<b>11</b>

Table 2. 2023 Vermont WNV and EEE-positive Pools (Vermont Agency of Agriculture)

<b>Date Collected</b>	<b>Town</b>	<b>County</b>	<b>Species</b>	<b>Virus Result</b>
7/25/2023	Alburgh	Grand Isle	<i>Culex restuans/pipiens</i>	WNV
7/25/2023	St Albans	Franklin	<i>Culex restuans/pipiens</i>	WNV
7/27/2023	Vergennes	Addison	<i>Culex restuans/pipiens</i>	WNV
8/8/2023	Alburgh	Grand Isle	<i>Culiseta melanura</i>	EEE
8/8/2023	Alburgh	Grand Isle	<i>Culex restuans/pipiens</i>	EEE
8/8/2023	Swanton	Franklin	<i>Culiseta melanura</i>	EEE
8/8/2023	Swanton	Franklin	<i>Culiseta melanura</i>	EEE
8/8/2023	Colchester	Chittenden	<i>Culiseta melanura</i>	WNV
8/10/2023	Vergennes	Addison	<i>Culex restuans/pipiens</i>	WNV
8/21/2023	Swanton	Franklin	<i>Culiseta melanura</i>	EEE
8/29/2023	Alburgh	Grand Isle	<i>Culiseta melanura</i>	EEE
8/29/2023	St Albans	Franklin	<i>Culex restuans/pipiens</i>	WNV
8/29/2023	Swanton	Franklin	<i>Culiseta melanura</i>	EEE
8/29/2023	Swanton	Franklin	<i>Culex restuans/pipiens</i>	EEE
8/30/2023	Alburgh	Grand Isle	<i>Culiseta melanura</i>	EEE
8/30/2023	Swanton	Franklin	<i>Culiseta melanura</i>	EEE
8/31/2023	Vergennes	Addison	<i>Culex restuans/pipiens</i>	WNV
9/5/2023	Highgate	Franklin	<i>Culiseta melanura</i>	EEE
9/7/2023	Vergennes	Addison	<i>Culex restuans/pipiens</i>	WNV
9/11/2023	New Haven	Addison	<i>Culex restuans/pipiens</i>	WNV
9/12/2023	Swanton	Franklin	<i>Culiseta melanura</i>	EEE
9/12/2023	Swanton	Franklin	<i>Culiseta melanura</i>	EEE
9/25/2023	Swanton	Franklin	<i>Culiseta melanura</i>	EEE
9/25/2023	Whiting	Addison	<i>Culiseta melanura</i>	WNV
9/28/2023	Vergennes	Addison	<i>Culex restuans/pipiens</i>	WNV

Table 3. 2023 Vermont Towns Trapped ( $n=90$ ) (Vermont Agency of Agriculture)

Town	County	Town	County	Town	County
Addison	Addison	Fairlee	Orange	Richford	Franklin
Alburgh	Grand Isle	Ferdinand	Essex	Rockingham	Windham
Bakersfield	Franklin	Ferrisburgh	Addison	Royalton	Windsor
Barton	Orleans	Franklin	Franklin	Rutland	Rutland
Belvidere	Lamoille	Grand Isle	Grand Isle	S Burlington	Chittenden
Bennington	Bennington	Groton	Caledonia	Shaftsbury	Bennington
Benson	Rutland	Hardwick	Caledonia	Shrewsbury	Rutland
Berkshire	Franklin	Highgate	Franklin	Springfield	Windsor
Berlin	Washington	Hyde Park	Lamoille	St Albans	Franklin
Bolton	Chittenden	Jay	Orleans	Stowe	Lamoille
Bradford	Orange	Jericho	Chittenden	Stratton	Windham
Brandon	Rutland	Killington	Rutland	Sudbury	Rutland
Brighton	Essex	Leicester	Addison	Sunderland	Bennington
Brookfield	Orange	Londonderry	Windham	Sutton	Caledonia
Burke	Caledonia	Lowell	Orleans	Swanton	Franklin
Cambridge	Lamoille	Lunenburg	Essex	Thetford	Orange
Castleton	Rutland	Manchester	Bennington	Underhill	Chittenden
Charlotte	Chittenden	Marshfield	Washington	Vergennes	Addison
Colchester	Chittenden	Milton	Chittenden	Vernon	Windham
Concord	Essex	Montpelier	Washington	Victory	Essex
Cornwall	Addison	Morristown	Lamoille	Weathersfield	Windsor
Coventry	Orleans	New Haven	Addison	Weston	Windsor
Craftsbury	Orleans	Newbury	Orange	Whiting	Addison
Danby	Rutland	Newport	Orleans	Whitingham	Windham
Derby	Orleans	Norwich	Windsor	Williamstown	Orange
E Montpelier	Washington	Orange	Orange	Williston	Chittenden
Eden	Lamoille	Pittsford	Rutland	Windsor	Windham
Essex Junction	Chittenden	Pownal	Bennington	Woodstock	Windsor
Fair Haven	Rutland	Proctor	Rutland		
Fairfax	Franklin	Putney	Windham		
Fairfield	Franklin	Randolph	Orange		

### Rapid Response Mosquito Collections

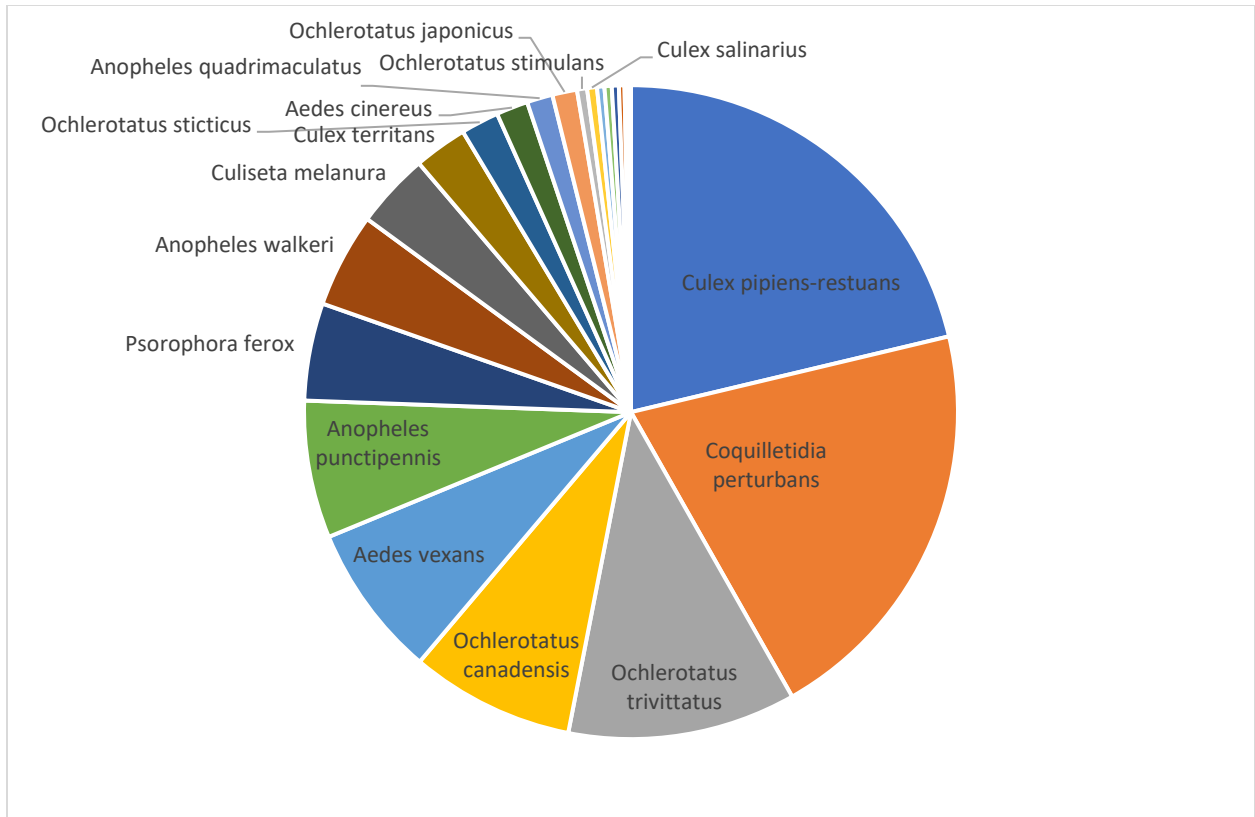
In August 2023, EEE-positive mosquito pools in northwestern Vermont prompted additional rapid response mosquito trapping within 4 towns in 2 counties. CDC light traps were set once per week at 7 locations. Resting box traps at 10 permanent trapping locations in northwestern Vermont were collected twice per week rather than once. Additional collections were continued for the rest of the surveillance season.

## 2023 Vermont Mosquito Species Statistics (Vermont Agency of Agriculture)

Table 4. 2023 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)
<i>Culex pipiens-restuans</i>	34,556	21.27	17,492	26.46
<i>Coquilletidia perturbans</i>	33,327	20.52	11,525	17.44
<i>Ochlerotatus trivittatus</i>	18,326	11.28	5,770	8.73
<i>Ochlerotatus canadensis</i>	13,163	8.10	8,522	12.89
<i>Aedes vexans</i>	12,326	7.59	6,107	9.24
<i>Anopheles punctipennis</i>	11,037	6.79	5,152	7.79
<i>Psorophora ferox</i>	7,830	4.82	0	0.00
<i>Anopheles walker</i>	7,591	4.67	0	0.00
<i>Culiseta melanura</i>	6,021	3.71	5,943	8.99
<i>Culex territans</i>	4,285	2.64	1,596	2.41
<i>Ochlerotatus sticticus</i>	3,052	1.88	0	0.00
<i>Aedes cinereus</i>	2,552	1.57	903	1.37
<i>Anopheles quadrimaculatus</i>	2,075	1.28	985	1.49
<i>Ochlerotatus japonicus</i>	1,985	1.22	1,653	2.50
<i>Ochlerotatus stimulans</i>	806	0.50	0	0.00
<i>Culex salinarius</i>	790	0.49	101	0.15
<i>Ochlerotatus excrucians</i>	591	0.36	0	0.00
<i>Ochlerotatus triseriatus</i>	581	0.36	0	0.00
<i>Ochlerotatus aurifer</i>	566	0.35	0	0.00
<i>Uranotaenia sapphirina</i>	448	0.28	0	0.00
<i>Culiseta morsitans</i>	255	0.16	253	0.38
<i>Culiseta minnesotae</i>	103	0.06	93	0.14
<i>Ochlerotatus fitchii</i>	51	0.03	0	0.00
<i>Ochlerotatus provocans</i>	33	0.02	0	0.00
<i>Ochlerotatus atropalpus</i>	30	0.02	0	0.00
<i>Ochlerotatus abserratus</i>	23	0.01	0	0.00
<i>Anopheles earlei</i>	18	0.01	0	0.00
<i>Ochlerotatus communis</i>	4	0.00	0	0.00
<i>Ochlerotatus intrudens</i>	3	0.00	0	0.00
<i>Ochlerotatus dorsalis</i>	2	0.00	0	0.00
<i>Orthopodomyia alba</i>	2	0.00	0	0.00
<i>Anopheles barberi</i>	1	0.00	0	0.00
<i>Culiseta impatiens</i>	1	0.00	0	0.00
Total	162,434		66,095	

**Mosquito species collected in Vermont, 2023 (Vermont Agency of Agriculture)**

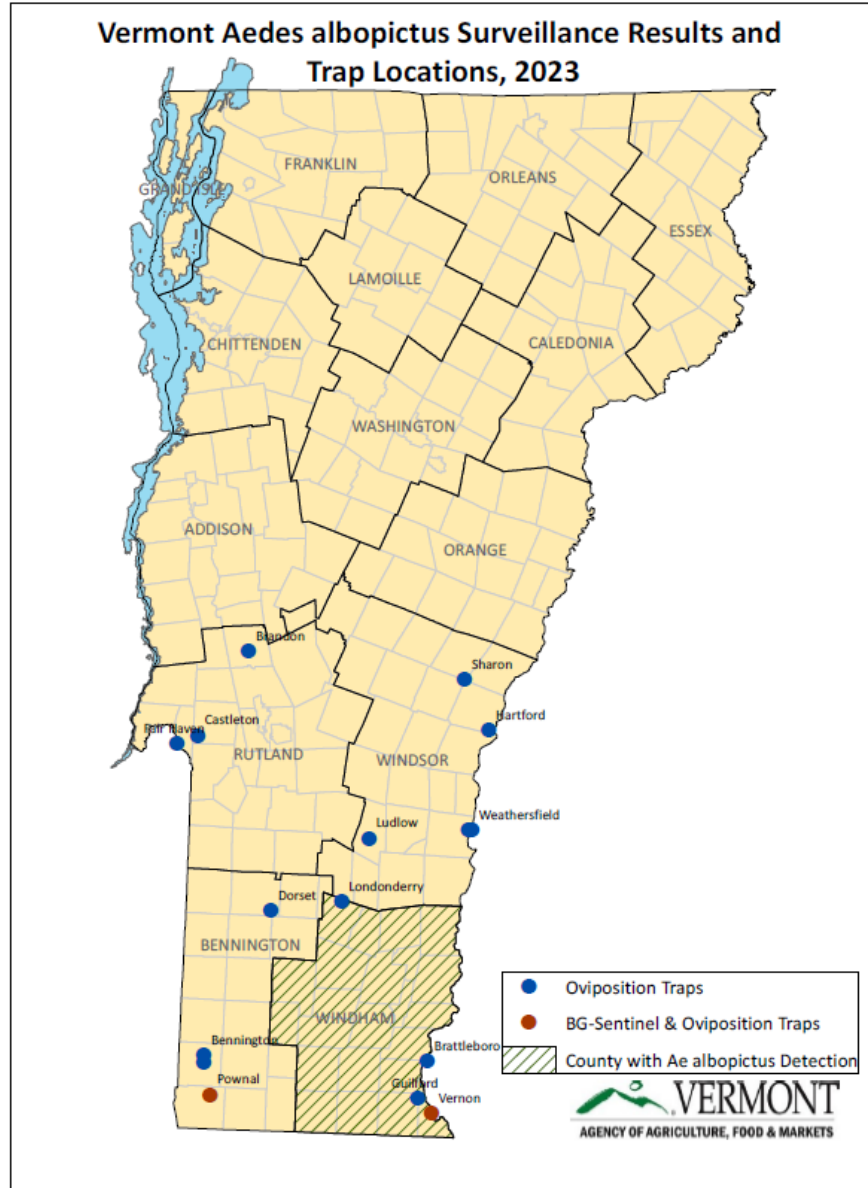


## Vermont Agency of Agriculture's Targeted *Aedes albopictus* Surveillance

*Aedes albopictus* (Asian Tiger Mosquito) is believed to be a potential weak vector of Zika, and a competent vector of dengue, chikungunya, and yellow fever in tropical and subtropical areas 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 2023, 2 BG-Sentinel traps were set for 16 weeks in 2 towns on the Vermont/Massachusetts border. Additionally, 16 oviposition trap locations were surveyed for 10 weeks (June 29 – September 7). Sites were located along major truck routes at rest areas, truck stops, tire dealerships, and transfer stations, as this mosquito species is a container breeder with a preference for tires. Eggs were collected, counted at VAEL, and processed at the Massachusetts Department of Public Health Laboratory for rearing and larval identification.

*Aedes albopictus* mosquito eggs were found at 1 site in Windham County for a total of 6 weeks, with 5 consecutive weeks of detections. *Aedes albopictus* had been detected for the first time in Vermont at this Windham County site in 2019.



It appears this species is established in Vermont, having been detected for several weeks consecutively each year over 5 years. The Agency will continue to track the spread of this species.