2014 Arbovirus Surveillance in Vermont

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http://www.vermontagriculture.com

Overview

- Trapping Details
- Arbovirus Activity
- Deer and Moose Sero Survey
- Arbovirus Plan

Goals for 2014 Season

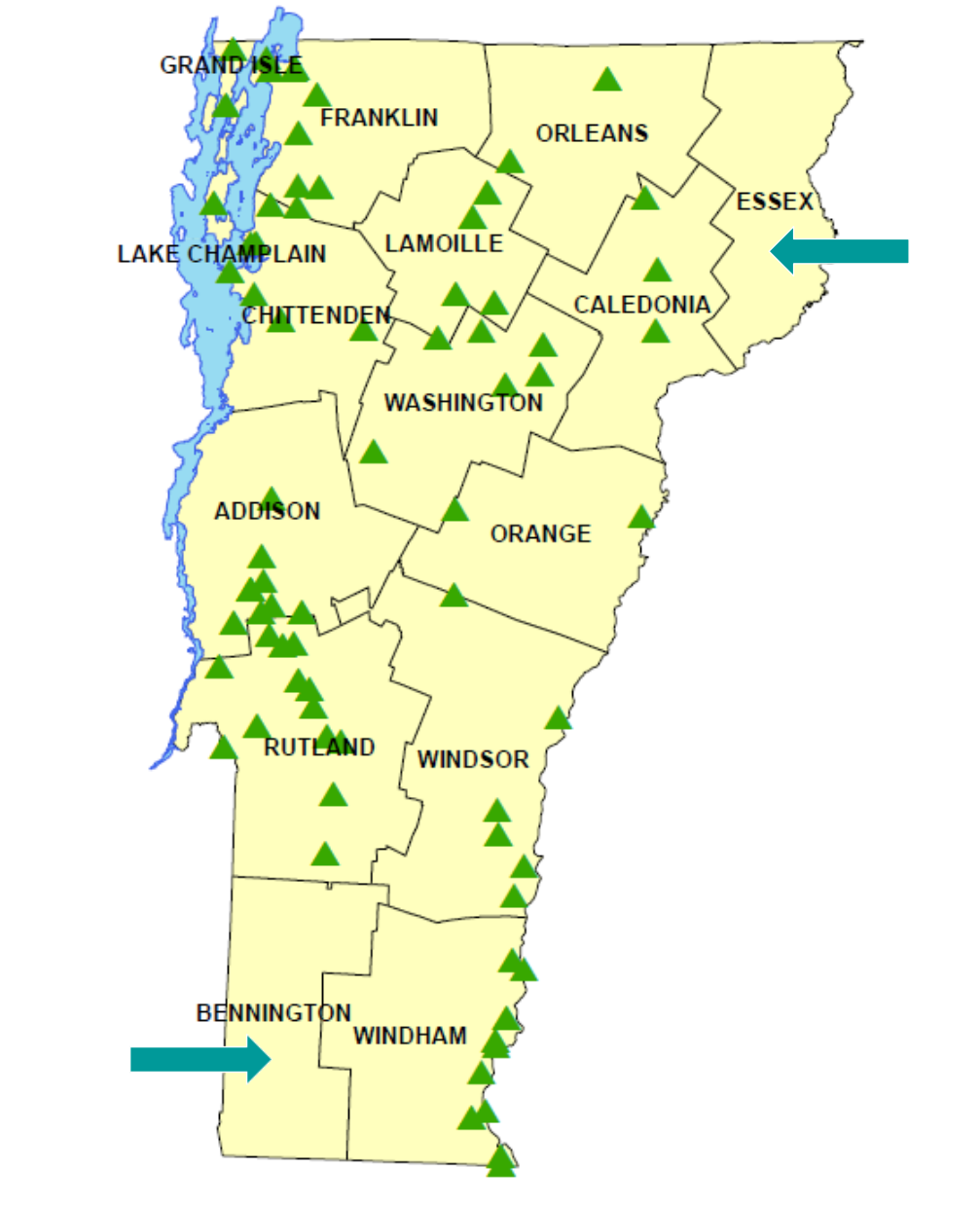
- Focus on EEE virus
- Increase trapping throughout the state
- Double number of mosquito pools tested
- Locate Cs melanura habitat
- 5th year of Moose and Deer sero survey for EEE antibodies

Mosquito Traps

- Resting Box Traps
  - Locate hardwood swamps
- Reduced CDC Light Traps
  - Same Sites as RBTs
  - CO_2 pellets but no light bulb
- Gravid Traps
  - Wastewater Treatment Plants in Urban Areas
  - Cow Manure/Rabbit Food Attractant

2014 Trap Sites

- 67 Trap Locations
- 54 Towns
- 12 Counties
  - Missing Bennington and Essex Counties

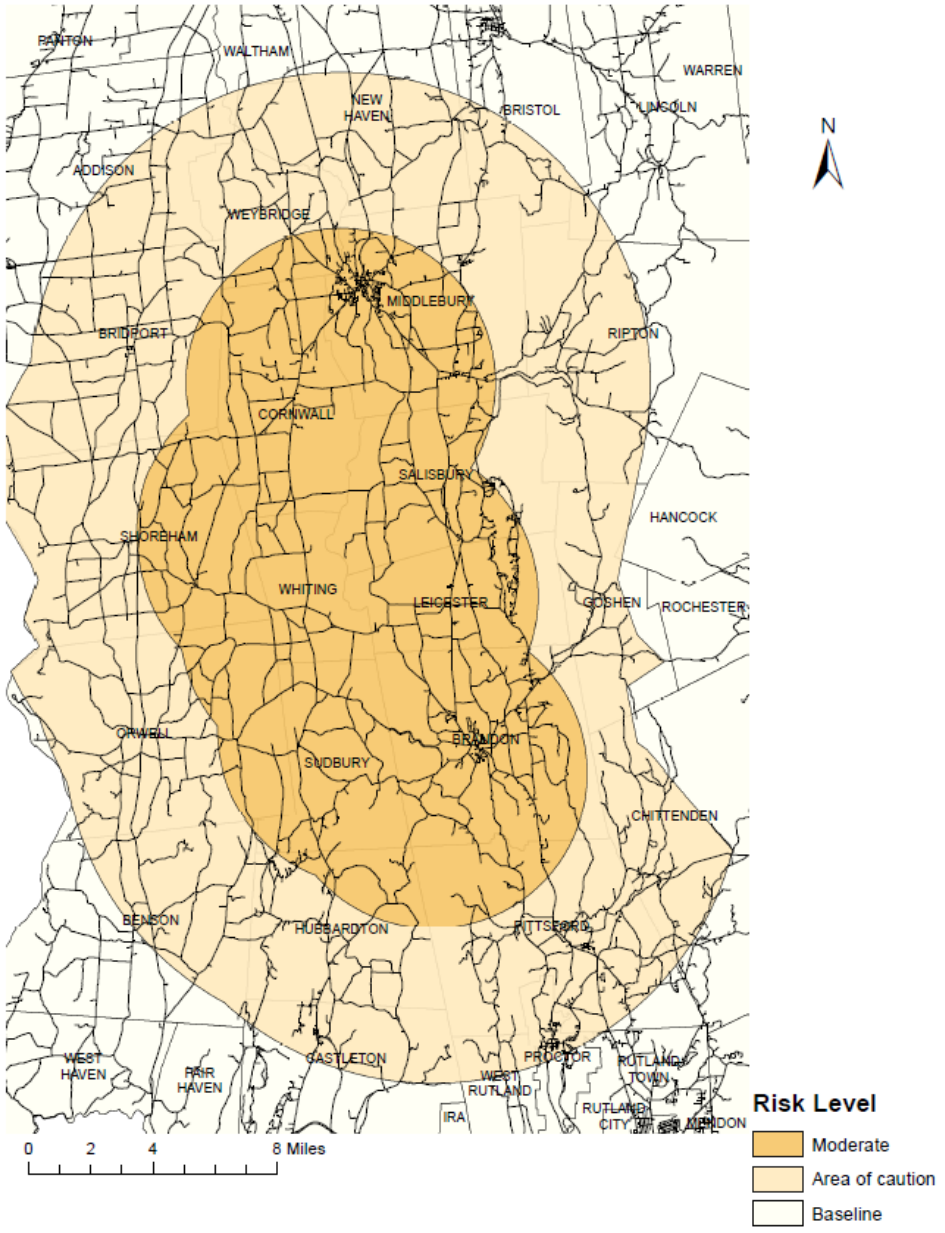


Nearly State-wide Surveillance

- 67 CDC Light Trap Sites
- 51 Resting Box Trap Sites
- 10 Gravid Trap Sites
- Two Elevated Risk Areas
  - Addison/Rutland Counties
  - Franklin County

Risk Map for 2014 Season

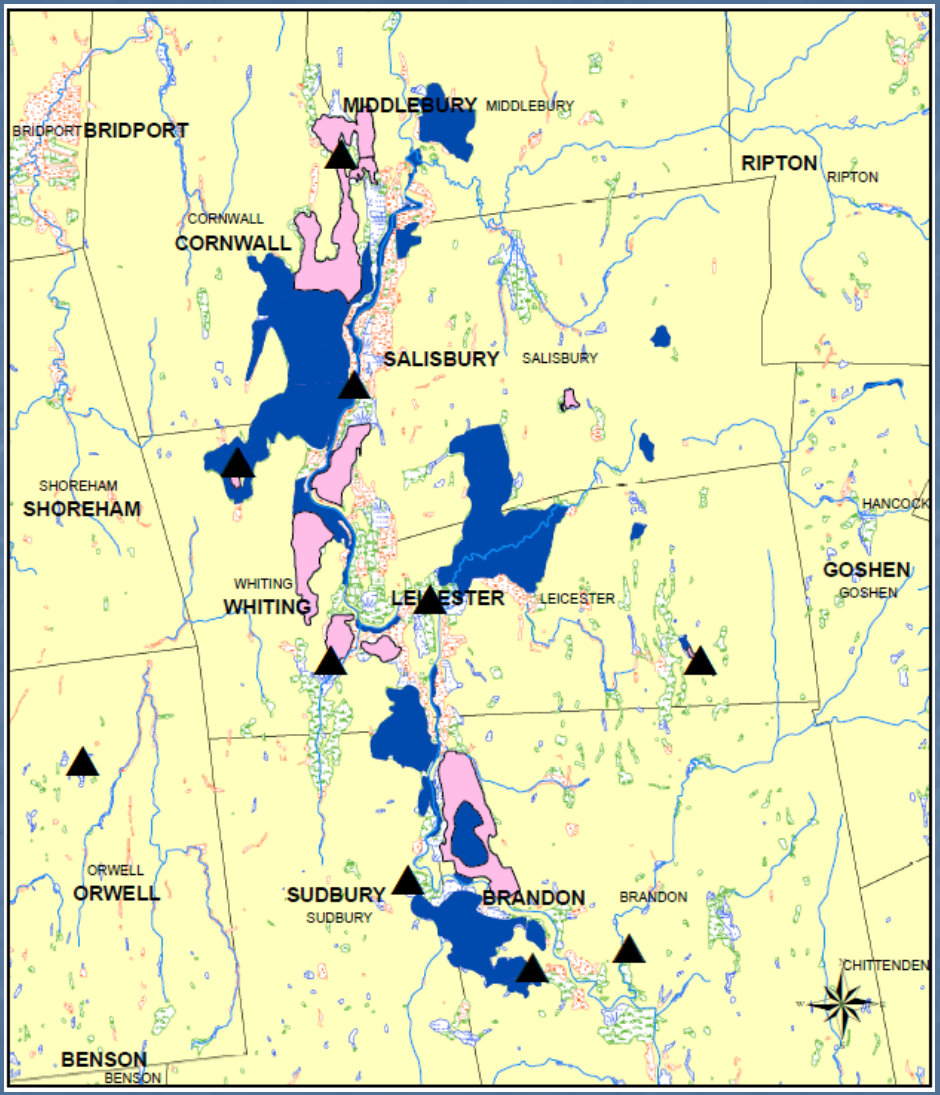
- 5 mile radius from EEE+ pool sample



Vermont Department of Health

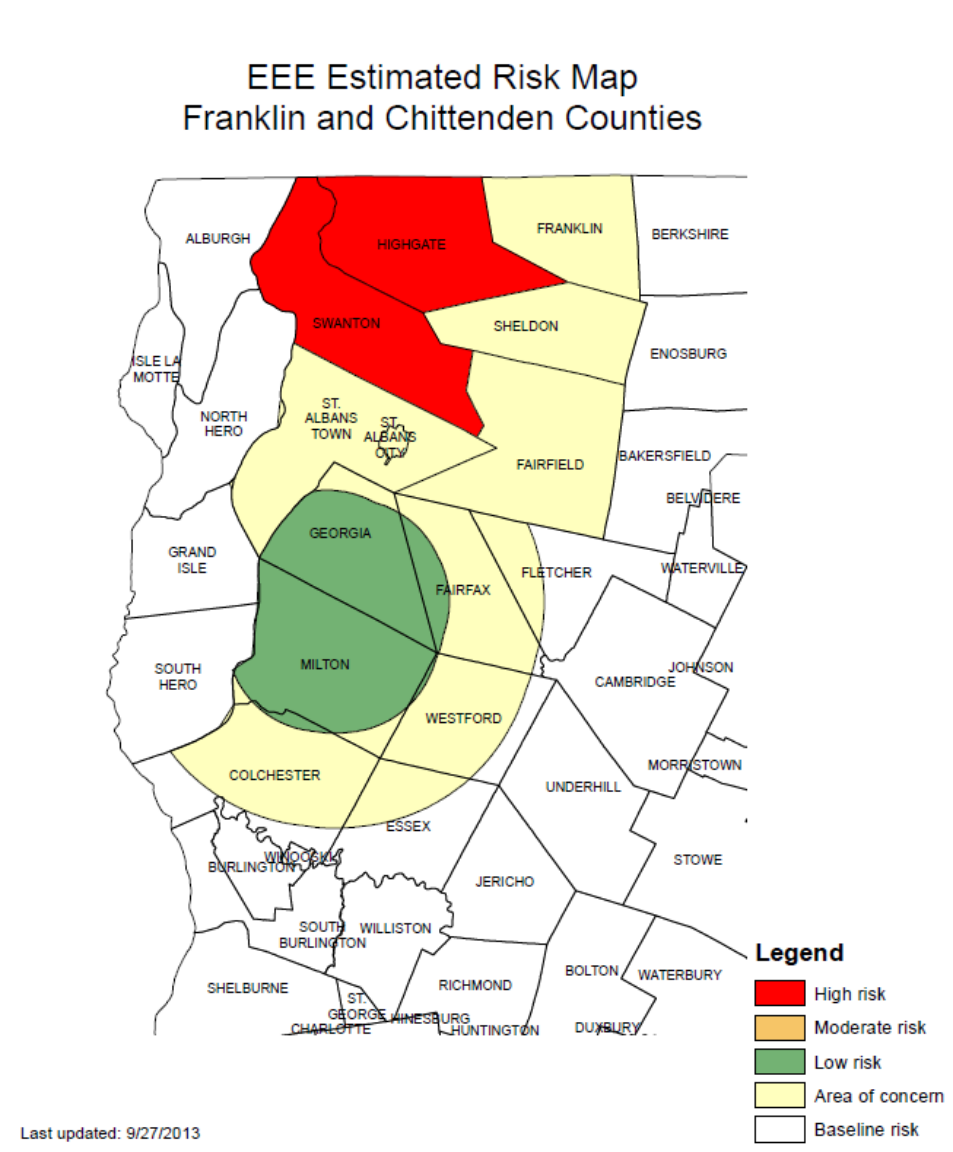
Interest Area

- Addison/Rutland County Wetland Complex
  - Hardwood Swamps
  - Acidic Hardwood Swamps
- History of EEE activity



Risk Map for Northwest Vermont

- 2013 EEE+ Results
- Single mosquito in Milton
- 2 horse deaths in Highgate



Vermont Department of Health

Trapping Statistics

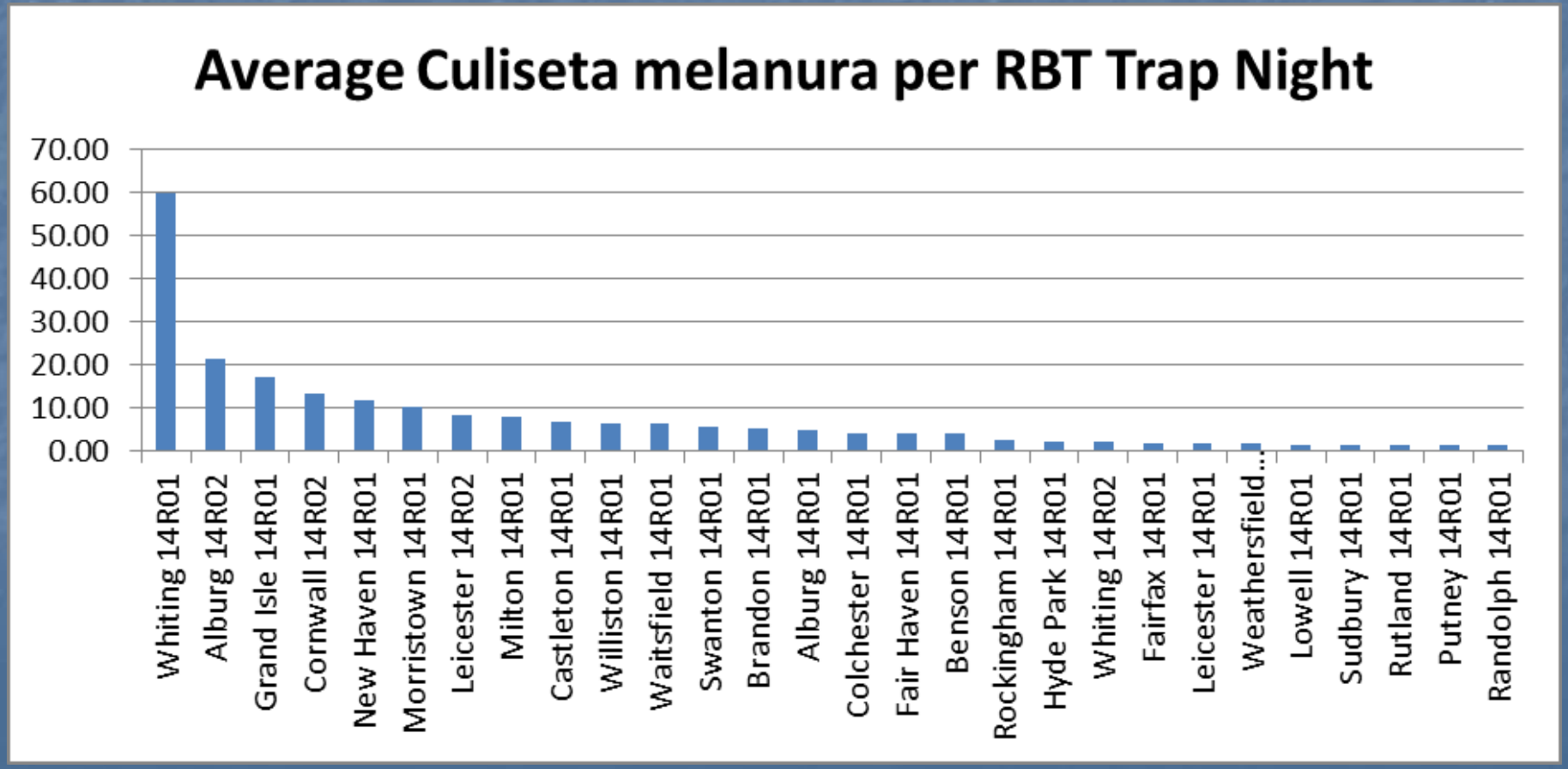
- 67,335 Mosquitoes Trapped
- 31 Species
- 3,245 Mosquito Pool Samples
- 41,700 Mosquitoes Tested
- 12 Species Tested for EEE and WNV
- 3,953 Cs melanura Collected

80% of Species Collected Represented by 7 Species

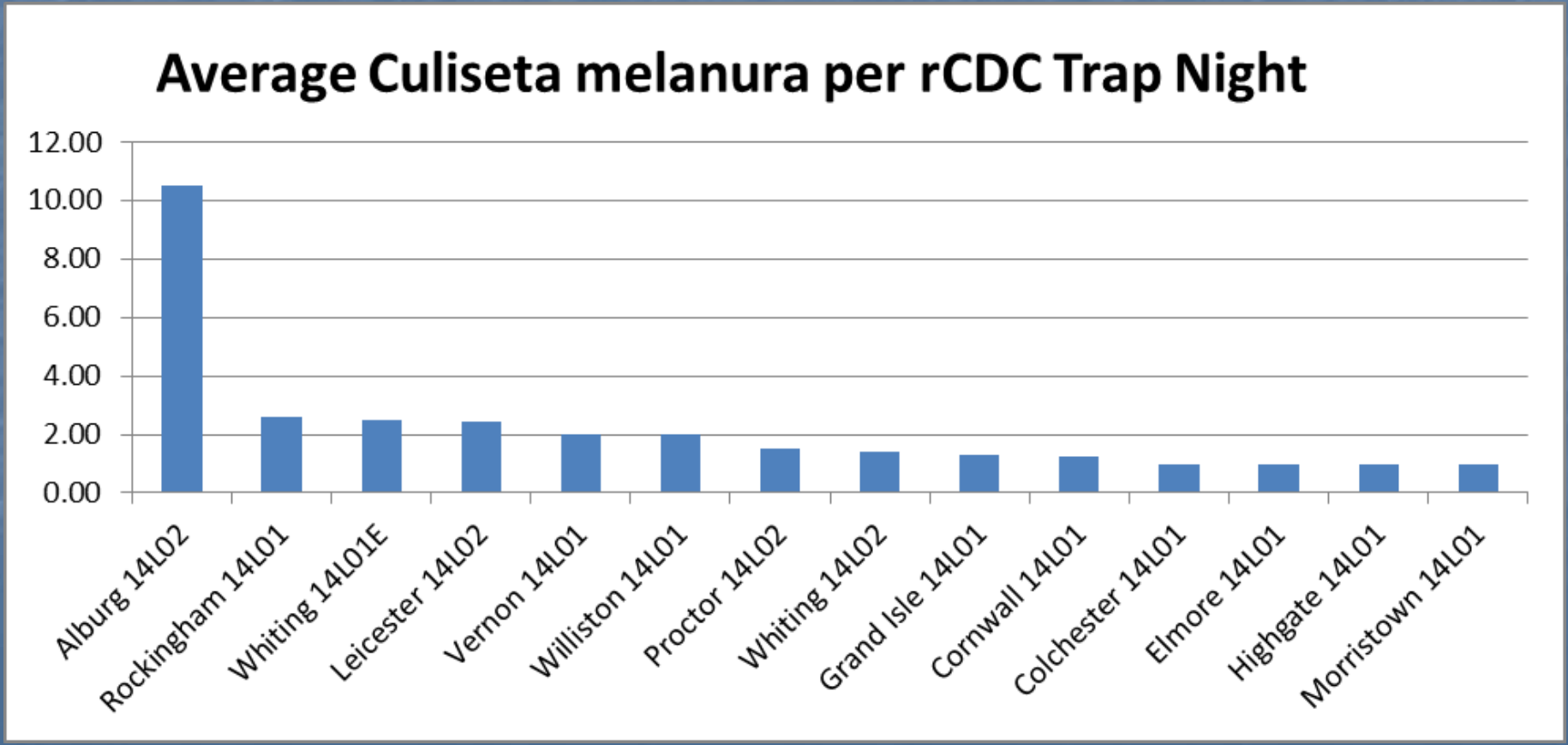
- 33.00% Cq. perturbans
- 14.75% Ae. vexans
- 9.10% Cx r/p
- 6.97% Oc. canadensis
- 5.92% Oc. trivittatus
- 5.87% Cs melanura
- 4.00% Ae cinereus

Species	Collected	% Collected
Coquillettidia perturbans	22222	33.00%
Aedes vexans	9934	14.75%
Culex pipiens-restuans	6126	9.10%
Ochlerotatus canadensis	4691	6.97%
Ochlerotatus trivittatus	3988	5.92%
Culiseta melanura	3953	5.87%
Aedes cinereus	2692	4.00%
Anopheles quadrimaculatus	2145	3.19%
Anopheles punctipennis	1554	2.31%
Culex territans	1452	2.16%
Anopheles walkeri	1322	1.96%
Ochlerotatus sticticus	1320	1.96%
Ochlerotatus stimulans	1241	1.84%
Ochlerotatus japonicus	1198	1.78%
Culiseta morsitans	959	1.42%
Ochlerotatus triseriatus	843	1.25%
Culex salinarius	668	0.99%
Uranotaenia sapphirina	326	0.48%
Psorophora ferox	172	0.26%

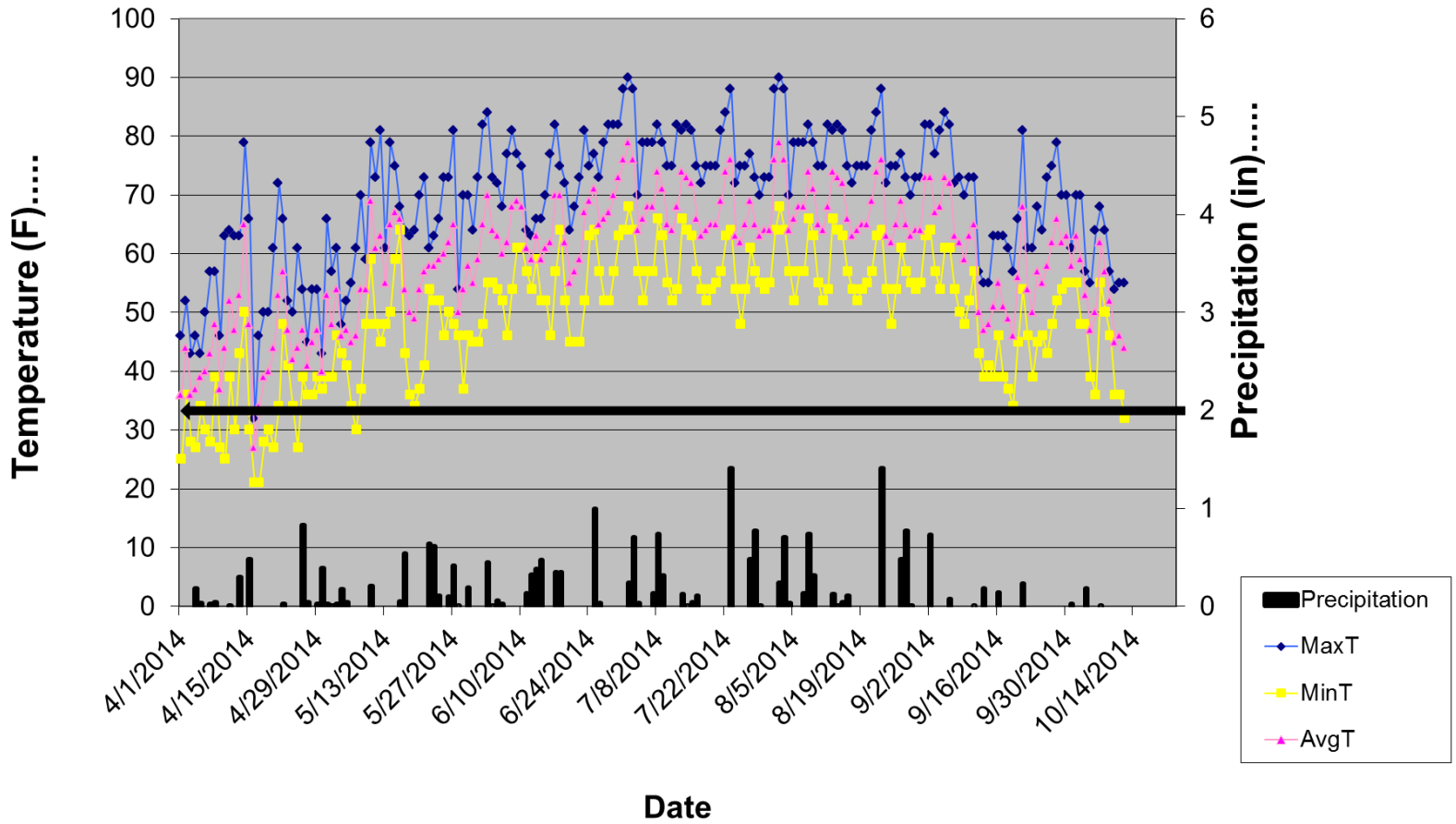
Culiseta melanura in Resting Box Traps



Culiseta melanura in CDC Light Traps



Precipitation and Temperatures



Source: http://www.nws.noaa.gov/climate/index.php?wfo=btv – Rutland NOAA Data

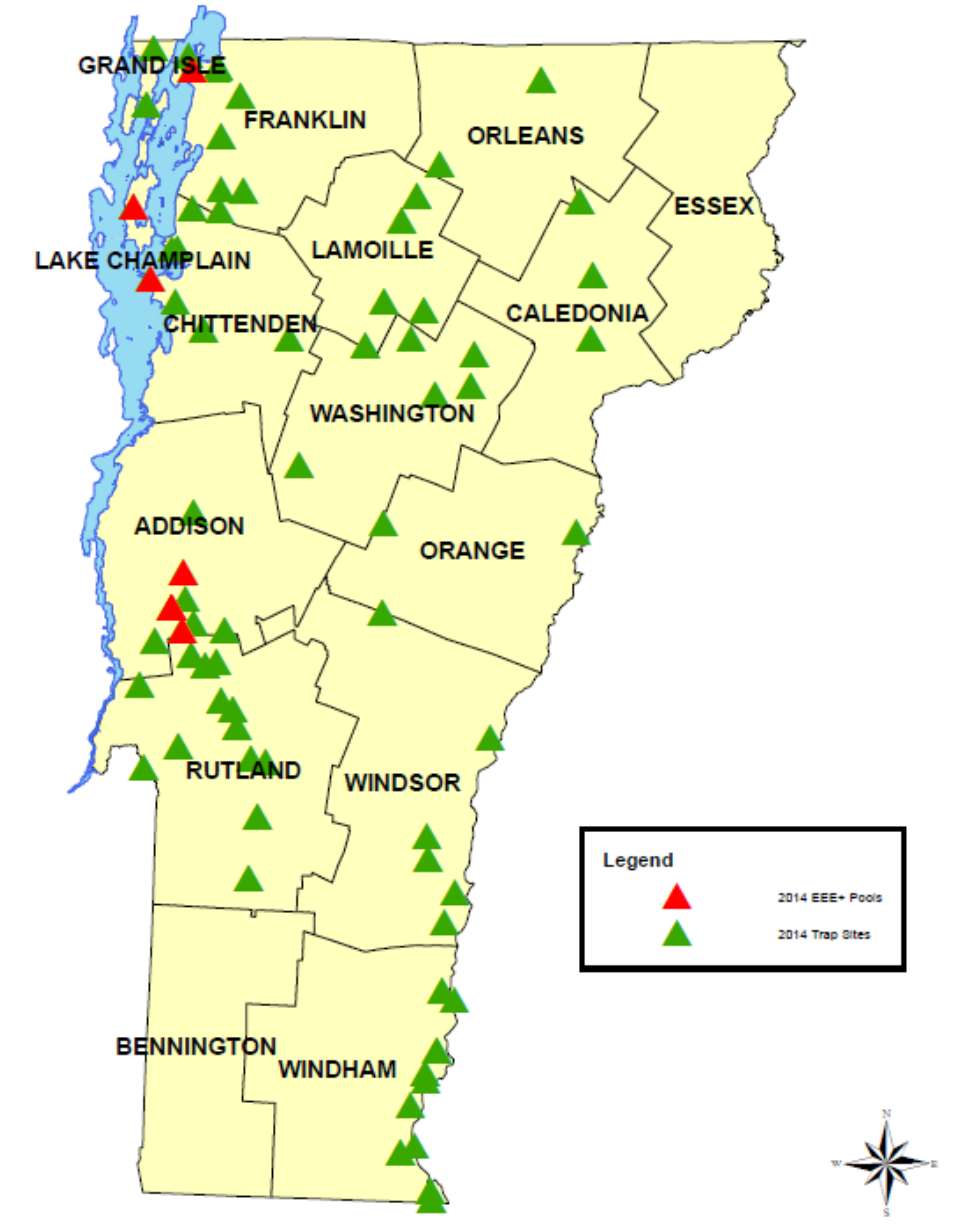
2014 Arbovirus Activity

No Human Cases

No Veterinary Cases

2014 EEE Activity in Vermont

- 8 EEE positive mosquito pools
- 6 Wetland sites
  - Grand Isle – 6/17
  - 3 Whiting – 8/19, 8/19, 9/9
  - Colchester – 9/3
  - Swanton - 9/26
  - Cornwall -10/8
  - Whiting – 10/8



Information about Grand Isle trap site on June 17

- Reduced CDC Light Trap
  (No light bulb, pellet CO2)
- EEE detected at just above threshold level
- Sample was retested
- 11 Oc canadensis in EEE+ pool sample

Grand Isle June 17 Confirmation Results

Test	Extraction Date	Test Date	Ct value
EEE screen	6/25/2014	6/26/2014	36.2071
EEE confirm	6/25/2014	6/26/2014	36.8547
EEE screen	6/25/2014	6/27/2014	36.2328/36.1266
EEE screen	6/27/2014	6/27/2014	36.3005/38.1534
EEE confirm	6/25/2014	6/27/2014	36.1097/35.7338
EEE confirm T3,T4, T34 primer set	6/25/2014	6/27/2014	34.6346/34.8956
EEE confirm	6/27/2014	6/27/2014	35.193/35.4131
EEE confirm T3,T4, T34 primer set	6/27/2014	6/27/2014	34.3563/34.9322

Threshold < = 37

Other Species Present

EEE+ Sample

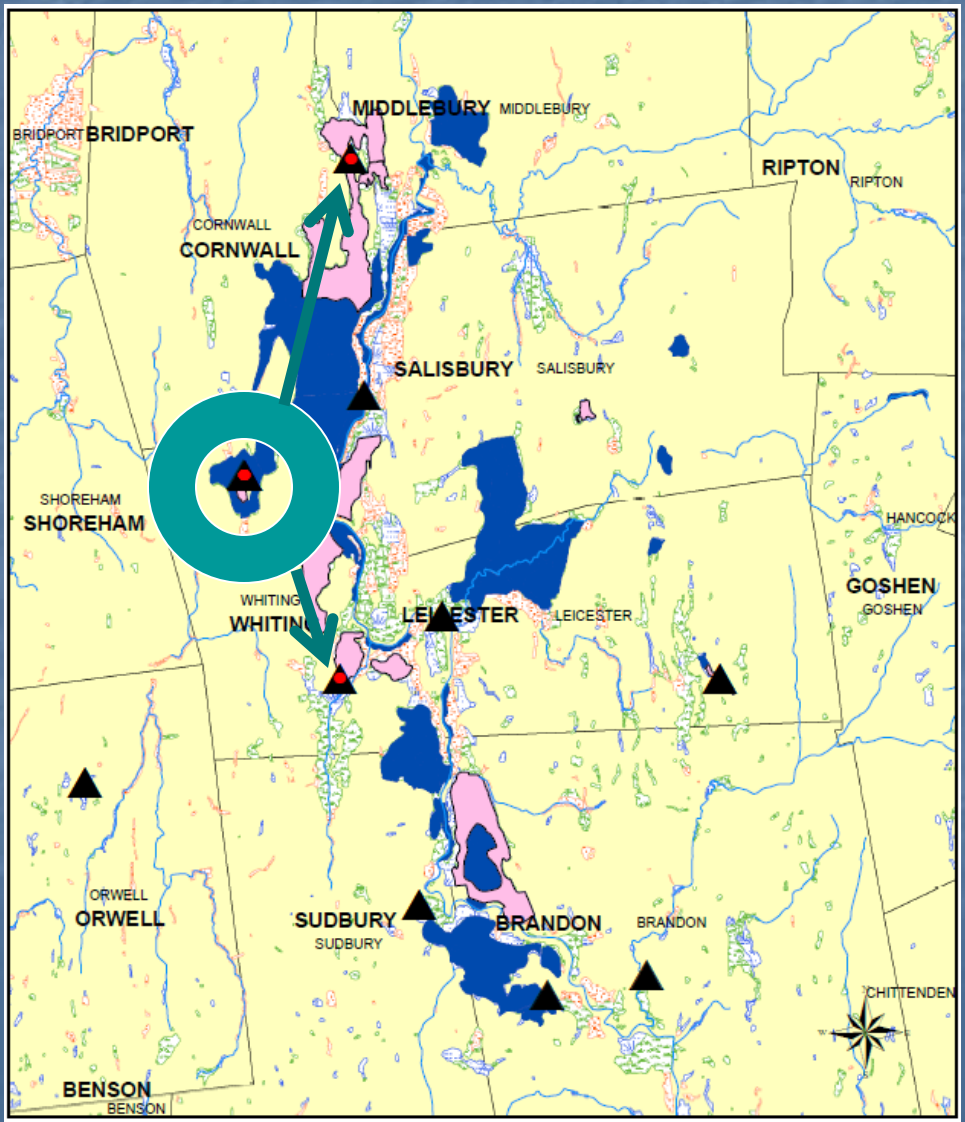
Species	Count	Lab#
Cq perturbans	50	140199
Cq perturbans	50	140200
Cq perturbans	21	140201
Cs melanura	3	140202
Oc canadensis	11	140203
Ae cinereus	40	140204
Cq perturbans	7	140210
Ae vexans	1	140211
Oc canadensis	50	140212
Oc stimulans	22	0
Oc provocans	25	0
Oc stimulans	11	0
Oc sticticus	113	0

What do we know about *Oc canadensis*?

- Common species
- Spring through Summer
- Two generations
- Mammal feeder
- May feed on reptiles
- Woodland pools and shaded wetlands
  - Often same habitat as Cs melanura

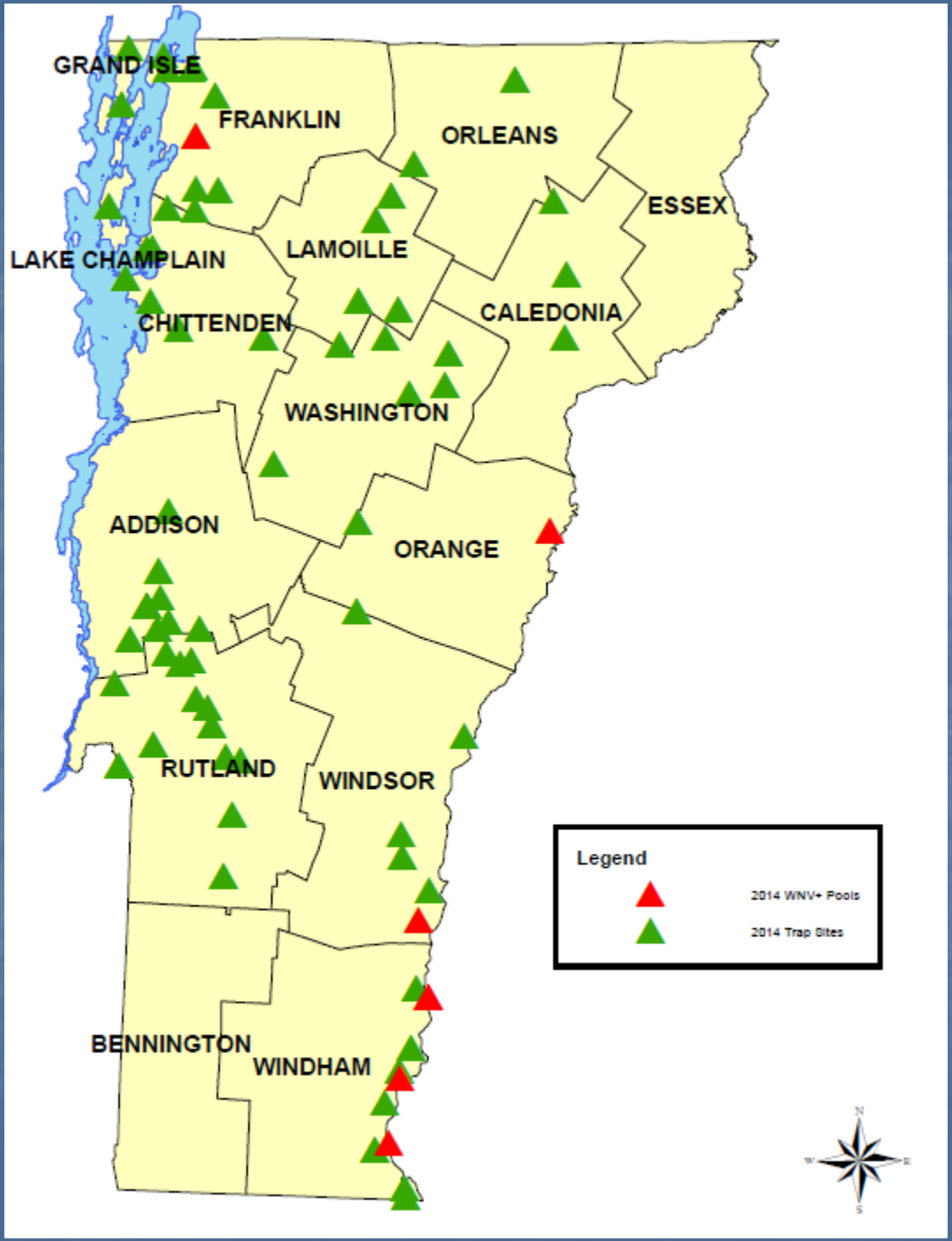
Enzootic Center?

- EEE Focus wetland
  - 2012 – 8 pools
    - 6 weeks
  - 2013 – 14 pools
    - 4 weeks
  - 2014 – 3 pools
    - 2 weeks
- Peripheral EEE activity

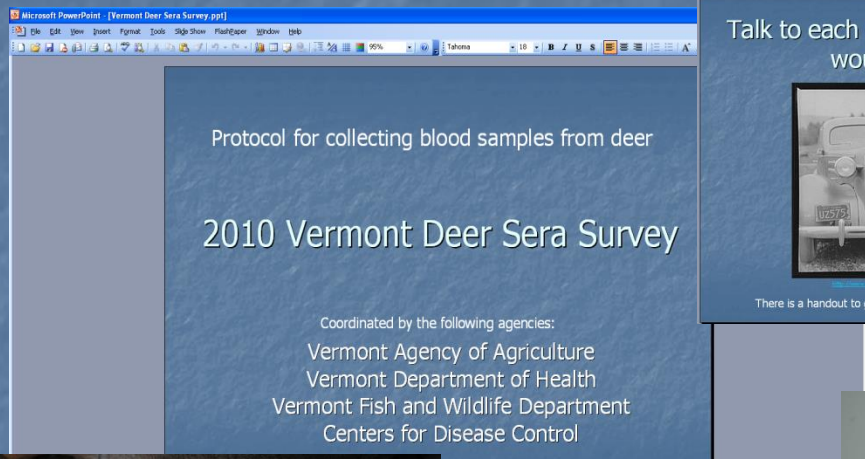


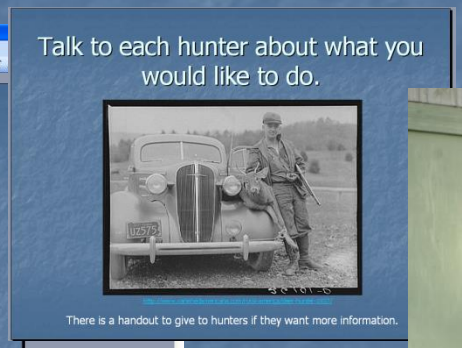
2014 WNV Activity in Vermont

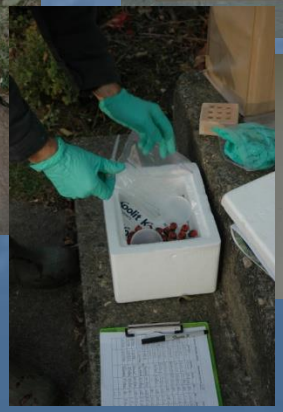
- 8 WNV positive mosquito pools
- 5 sites
  - St Albans 7/29
  - Newbury 8/18
  - Brattleboro 8/21
  - Putney 8/21
  - 3 Rockingham 8/21
  - Springfield 9/2



Vermont Deer Sera Survey







2013 Cervid Sero Survey

- 33 Moose
- 369 Youth Weekend deer
- 368 Rifle Season opening deer
- 770 Cervid total

2014 Cervid Sero Survey

- 36 Moose
- 387 Youth Weekend deer
- 414 Rifle Season opening deer
- 837 Cervid total

5th and Final Year

2,400 animals tested

The State of Vermont Arbovirus Surveillance and Response Plan

Working Plan June 2014

- http://healthvermont.gov/prevent/arbovirus/surveillance/documents/arbovirus_surveillance_response_plan.pdf
- Google: health vermont arbovirus surveillance plan

Plan of Action

- Information gathered from surveillance activities
- WNV/EEE – inform local policy makers about level of virus activity and health risk
- Adult mosquito suppression program – only as a last resort – based on good science and advice

Arbovirus Task Force

- Secretary of Agriculture
- Commissioner of Health
- State Epidemiologist
- State Agricultural Veterinarian
- State Entomologist
- VDOH Epidemiologists
- Public Affairs Office
- Vermont Pesticide Advisory Council

Components of Plan

- Education
- Surveillance
- Response

Response – based on Risk assessment

- Notification
  - First positive indicator
  - Positive mosquito
  - Positive domestic animal finding
  - Positive human case
- Vector Management
  - Larval suppression program
  - Adult suppression program

Acknowledgments

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  - Dan Fraysier
  - Ben Dillner
  - Sophi Veltrop

For More Information

- Vermont Agency of Agriculture
  - http://www.vermontagriculture.com/
  - Search for "Entomology"
- Vermont Department of Health
  - http://healthvermont.gov/
  - Search for "Diseases and Prevention"
- Agriculture - AlanGraham@state.vt.us
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