

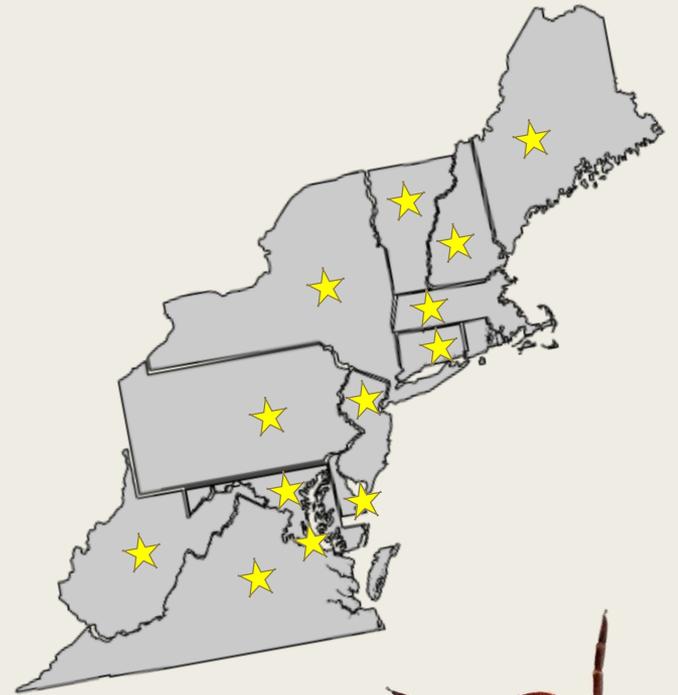


Northeast Regional Center for Excellence in Vector-Borne Diseases

Laura C. Harrington

NEVBBD - Who We Are

- Funded by CDC in December 2016 to address pressing needs in mosquito- and tick-borne disease threats
- Lead Organizations
 - *Cornell University, College of Agricultural & Life Sciences*
 - *New York State Department of Health*
 - *Columbia University*
 - *Connecticut Agricultural Experiment Station*
 - *Rutgers University*
- Represents 13 states and the District of Columbia
 - *We have partnerships with over 60 individuals across more than 20 organizations in the region*



NEVBD Goals

- NEVBD has 3 overarching goals:

1. **Train a cadre of public health entomologists** with the knowledge and skills required to rapidly detect, prevent and respond to vector-borne disease threats in the US
2. **Build effective communities of practice** via collaborations between academic communities and public health organizations at federal, state, and local levels for vector borne disease surveillance, response and prevention
3. To conduct applied research to **develop and validate effective vector-borne disease prevention and control tools and methods** necessary to anticipate and respond to disease outbreaks

HIGHLIGHTS

Partnerships and Achievements from 2018



NEVBD - National Resource

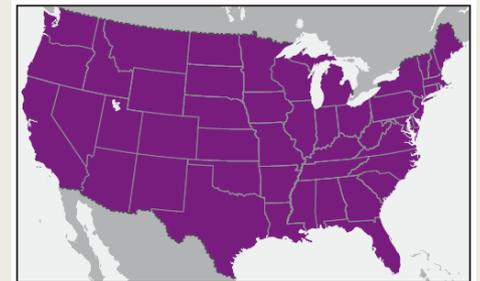
■ Training Programs for Professional Communities

- *Integrated Tick Management Webinar, August 2018*
 - National audience - participants from US states beyond the NE
- *Discussions on the Invasive Asian Longhorned Tick, Haemaphysalis longicornis, November 2018*
 - Over 300 Participants from 27 US states + international attendees
- *Vector Biology Boot Camp*
 - In-person training in tick and mosquito surveillance program operations
- *Webinars posted on NEVBD website*



■ US National Tick Surveillance Program Survey

- *Understanding current activities in tick surveillance, testing, and control from all 50 US states + territories*
 - NEVBD lead organization, working with other Centers of Excellence in VBD
 - Summary report posted on website soon



NEVBD is Accessible to the Public

- NEVBD website: neregionalvectorcenter.com
- NEVBD Quarterly Digest Newsletter
- NEVBD Weekly Announcements e-newsletter
- Twitter @_NEVBD
- Expert interviews and commentary in leading periodicals, webinars
- Reports – annual report summary



NEVBD Training Programs & Opportunities

■ MS in Entomology – Vector Biology & Public Health Curriculum

- *Innovative curriculum strongly endorsed by CDC and collaborators*
- *Internship placements with regional partners*



■ Cornell MPH Program Collaboration

- *MPH students engaged with NEVBD practicum and capstone projects*

■ NEVBD Doctoral and Postdoctoral Trainee Program

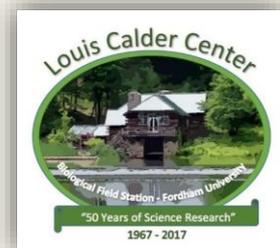
- *Driving applied research priorities and projects at NEVBD partner institutions*



■ Vector Biology Boot Camp

- *No-cost, hands-on training in vector biology, surveillance & control for professionals*

■ Targeted Webinars with Regional Experts

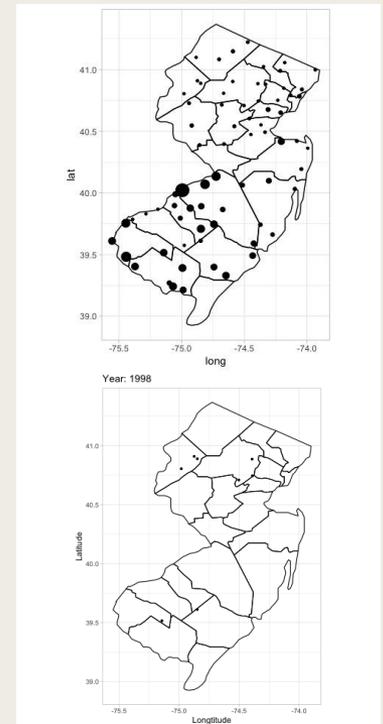


Graduate Masters of Science Program in Entomology: Vector-Borne Disease Biology at Cornell University

- Goal is to provide a foundation from which graduates **can immediately enter the workforce** in public health vector-borne disease surveillance, vector surveillance and control, and related fields.
- Combined Public Health and Entomology coursework
- Development of new integrated courses
- Summer internship placements with regional partners
 - *James Stewart - Scott Crans, NJ Dept Env Protection,*
 - *Purchhoki Sherpa - Richard Falco, NYS DOH*
 - *Erin Hasset - Maria-Duik-Wasser, Columbia University*

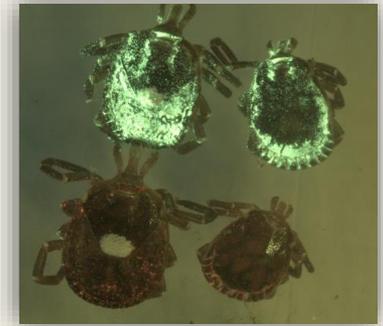
4 students selected for the 2019-2021 cohort

LET US KNOW IF YOU WOULD LIKE TO HOST AN MS STUDENT IN 2020!!



Improving Surveillance, Control & Management

- Coordinated surveillance efforts across Northeast have detected:
 - *Regional hotspots for West Nile virus, EEE, and Powassan virus*
 - *Several foci for invasive Asian longhorned tick in New York State*



- Vector-pathogen relationships
 - *Blacklegged tick can harbor multiple pathogens simultaneously*
 - Increased risk factor for human disease

- Habitat ecology of tick and mosquito vectors

- *Developed new smartphone “TickApp” to track tick and human interactions and educate the public*
- *Popular natural botanicals like cedar oil are NOT effective in the control of ticks*
- *Invasive shrubs, like Japanese barberry, provide ideal habitat for blacklegged ticks, increasing their survival*



Improving Surveillance, Control & Management

■ BG-sentinel scented lure comparison (CAES)

- *evaluated two novel chemical lures (Agrisense & Hercon) from Bedoukian Research, against standard human scent lure*
- *No detectable differences between lures for *Ae. albopictus**
- *Bedoukian lures attracted significantly more *Ae. taeniorhynchus*, *Ae. sollicitans*, *Ae. trivittatus*, and *Cx. salinarius**
- *Isolation of LaCrosse virus from 3 pools of *Ae. triseriatus**



■ Trap evaluations (CAES)

- *compare the efficacy of different trap types at the margins of *Ae. albopictus* distribution using ovitraps, BG Sentinels baited with CO₂, gravid traps, and CO₂-baited light traps*

■ Bloodmeal analysis - *Ae. albopictus* collected from (CAES)

- *Suffolk VA - 198 mosquito blood meals, 2017*
- *>98% were mammalian (human, domestic cat, white-tailed deer, rat, gray squirrel, opossum)*
- *PA - 34% domestic cat, 26% humans, 21% white-tailed deer, 18% Virginia opossum (n=452)*



Improving Surveillance, Control & Management

■ Feeding Ecology of *Aedes albopictus* – Long Island

- At farm sites, the majority of *Ae. albopictus* fed on horses
- At residential sites, the majority fed on humans, followed by cats.
- Host Feeding Index (HFI) suggests that *Ae. albopictus* prefers dogs and cats to humans according to both abundance and time-weighted data



Improving Surveillance, Control & Management

- **Egg Identification Guide for *Aedes albopictus* in the Northeast (Cornell)**
 - *key features for clearly differentiating Ae albopictus from Ae. triseriatus & Ae. japonicus*
 - *Includes description of methods for preparing eggs and visualizing them under a compound scope*
 - *archived through Cornell eCommons & available through the NEVBD website*
- **Detailed container surveys for *Ae. albopictus* in NY (Cornell)**
 - *two years across 9 sites in residential neighborhoods in southern NY*
 - *highly adaptable, generalist container breeder associated with urbanization and non-homogenously distributed by socioeconomic level*
 - *Results published in Journal of Medical Entomology*
- **Diapause variation among populations of *Ae. albopictus* along its northern edge**
 - *Results demonstrate that temperature plays a much larger role than previously thought in cuing diapause for northern populations*

Resistance Project

Project Goals

- Determine the extent of resistance monitoring operations in the region
- Address factors limiting resistance monitoring programs
- Provide education and resources
- Assist directly in the monitoring of pesticide resistance through specimen submission system
- Test susceptibility of tick populations



Providing Training and Materials

■ Field collection of mosquitoes

- *Guidelines for collection of mosquito eggs*
- *Kits for the collection of target species*
- *Guidelines for collecting specimens to be submitted to Cornell for resistance testing*

■ Monitoring for resistance to larvicides and adulticides

- *Specimen submission system*
- *All resistance testing is free, except for shipping costs*
- *Provision of larvicidal assay kits and protocols to collaborators*
- *Webinar to describe the detection methods employed*
- *Accessible resource for troubleshooting resistance methods*

- If you have additional questions about the program please contact James Burtis: jb766@cornell.edu

Pesticide Use and Resistance Survey

- If you are interested in participating in the survey please visit the NEVBD website: neregionalvectorcenter.com/resistance
 - *The survey is posted on the website and is currently open (NH & WV responses needed)*

- **Focuses on:**
 - *Mosquito monitoring activities*
 - *Common pesticides deployed*
 - *Resistance monitoring*
 - *Sharing pesticide use and resistance data*
 - *Roadblocks for existing resistance monitoring programs*



Cornell University

Pesticide Use and Resistance Survey

Thank you for participating in this survey of ongoing vector control activities in the northeastern United States.

You have been invited to participate in this survey because you work in an agency that may conduct mosquito or tick control operations. We will ask questions regarding the nature of ongoing vector collection, control, and resistance monitoring operations conducted by government agencies throughout the northeastern United States, as well as barriers and resource gaps. We will also ask you to suggest ways we can improve and enhance regional resistance monitoring for mosquito and tick vectors, and determine your interest in participating in a regional network to share pesticide use and resistance data. Your answers will guide our efforts to monitor pesticide resistance in mosquito and tick populations. The survey results will be summarized and made available on our NEVBD website.

This survey should take approximately 20 minutes to complete. Your participation is voluntary and you may refuse to answer any question. You may also stop the survey at any time. Your responses will remain anonymous, with your personal confidentiality protected. At the end of the survey you will have the option to choose how broadly your responses are to be shared. If you wish not share your agency's responses they will not be included in any county-level reports. If you have any questions about this survey, please contact one of the representatives listed below.

If you are taking this survey using a mobile device please rotate your device so that the screen is horizontal, as some questions will be easier to read.



Northeast Regional Center for Excellence in Vector-Borne Diseases

neregionalvectorcenter.com

Laura Harrington- Ich27@cornell.edu