

MAMCA NEWSLETTER

The Official Mid-Atlantic Mosquito Control Association Newsletter

Spring 2019

President's Message

Spring has sprung and most of the Mid-Atlantic area has seen warmer than normal temperatures through the winter months as well as consistent rain. By now, this has turned into a very productive time of year for our profession with little rest in sight.

The 44th Annual meeting concluded in late March. I hope that most of you were able to attend, as these meetings are a perfect opportunity to speak with like-minded professionals consisting of a minimum of nine states. Although the weather didn't cooperate fully, the location was prime for outings that many took advantage of post-session. There was even a tour of the local Civil War museum after the meeting concluded on Thursday sponsored by our sustaining members.

Our Vice President Robert Cartner is working with South Carolina to put on a fantastic meeting next February. This meeting will be a joint meeting between MAMCA and the South Carolina Mosquito Control Association. If you are interested in attending, presenting, or gathering more information, stay tuned to our website for updates.

If you are interested in getting involved in MAMCA as a Board member or otherwise, please reach out to us for more information. We are always looking for volunteers to keep our Association moving forward and to help mosquito control programs across the region.



Tim DuBois – MAMCA President

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45TH ANNUAL MAMCA & 47TH ANNUAL SCMCA MEETING

February 19-21, 2020
Hilton Greenville
Greenville, South Carolina



Please join us for the 45th Annual MAMCA and 47th Annual South Carolina Mosquito Control Association Meeting next February. Located just minutes outside heart of downtown Greenville, the conference will play host to professionals from the Associations 9 supporting states from across the Mid-Atlantic region. Learn about the latest techniques and applications, network with other like-minded professionals, and support up and coming minds with our student competition.

More information about the meeting including hotel information, agenda, and registration forms can be found online at www.mamca.org/conference/.

Upcoming Meetings and Important Events

<u>Meeting</u>	<u>Location</u>	<u>Dates</u>
SOVE Conference <i>Society For Vector Ecology</i>	San Juan, Puerto Rico	Sept. 22 - Sept. 26, 2019
PestWorld 2019 <i>National Pest Management Association</i>	San Deigo, CA	Oct. 15 - Oct. 18, 2019
GMCA Annual Meeting <i>Georgia Mosquito Control Association</i>	Cordele, GA	Oct. 16 - Oct. 18, 2019
Entomology 2019 <i>Entomological Society of America</i>	St. Louis, MO	Nov. 17 - Nov. 20, 2019
FMCA Annual Meeting <i>Florida Mosquito Control Association</i>	St. Augustine, FL	Nov. 17 - Nov. 20, 2019
NMCA Annual Meeting <i>Northeast Mosquito Control Association</i>	Milford, MA	Dec. 9 - Dec. 11, 2019
NCMVCA Annual Educational Conference <i>North Carolina Mosquito and Vector Control Association</i>	Carolina Beach, NC	Dec. 10 - Dec. 12, 2019
VMCA Annual Meeting <i>Virginia Mosquito Control Association</i>	Virginia Beach, VA	Jan. 28 - Jan. 30, 2020
MAMCA Annual Meeting <i>Mid-Atlantic Mosquito Control Association</i>	Greenville, SC	Feb. 19 - Feb. 21, 2020
AMCA Annual Meeting <i>American Mosquito Control Association</i>	Portland, OR	Mar. 16 - Mar. 20, 2020



MAMCA MERCHANDISE

Represent the Association with new merchandise this year! Please reach out to Tim DuBois @ duboist@portsmouthva.gov for orders.

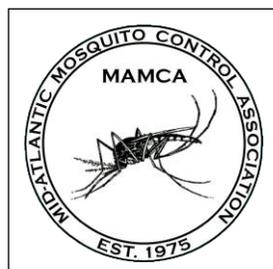
Gildan Soft Jersey Performance Short Sleeve Tee - \$15



Pint Glass with Duel Logo/Design - \$ 5



MAMCA Cut-Out Logo Decal - \$2



MAMCA Meeting Recap

The 44th Annual Meeting of the Mid-Atlantic Mosquito Control Association (MAMCA) took place at the Harrisburg Hilton in Harrisburg, Pennsylvania, the week of March 26-28, 2019. There were many very interesting, educational, and noteworthy presentations.

During the Pre-Conference Board Meeting, the MAMCA Board proposed to rename the Outstanding Student Award in honor of the late Dr. Bruce Harrison, who passed away in December 2018. Because of a change in job status, Tom Smith (PA) indicated that he was unable to assume the office of MAMCA President. Tim DuBois (VA) volunteered to fill the position. Dr. Stephanie Richards (NC) will continue in her role as Past-President. The MAMCA Board approved these changes.

During the Business Meeting, Jeannine Dorothy, Maryland Department of Agriculture-Mosquito Control Section, was awarded Lifetime Membership. Certificates of Appreciation were also presented (in absentia) to the following: Jason Conrad (Industry), James Joachimowski (DE), Ture Carlson (TN), and Joe Andrews (NC) for their service as Directors on the MAMCA Board.

At the Luncheon/Award Ceremony/Program, the Rowland E. Dorer Award was presented to Joe Strickhouser, Clarke Mosquito Control, for his over fifty years of exceptional contributions to mosquito control in the Mid-Atlantic region. Dr. Stephanie Richards was presented a plaque for her service as MAMCA President. After the award presentations, there was a very interesting talk given by Jim McClure about Civil War events that took place in York and surrounding areas of Pennsylvania. After the completion of the conference, a tour of the National Civil War Museum was provided, courtesy of the MAMCA Board.

The 45th Annual Meeting of MAMCA and 47th Annual Meeting of SCMCA will be held in Greenville, South Carolina, February 19-21, 2020. Please check the website at www.mamca.org for upcoming information.



Top Three: Attendees enjoy sponsored breaks and catch up with old and new friends.

Left: Stephanie Richards is presented the Presidential plaque by Tom Smith.

Right: Joe Strickhouser receives the R.E. Dorer award for his 50+ years of service.



News in the Region

Delaware

The Delaware mosquito season has now begun to pick up pace, most recently with a larval brood presenting on our saltwater coastal marshes downstate. In late March, our section concluded a successful woodland pool campaign, which comprised of 7,200 acres of aerial larviciding. Over the last month, our staff has participated in two outreach events; Ag Day 2019 hosted by the College of Agriculture and Natural Resources at the University of Delaware and Make-a-Splash which is an interactive environmental education event for over 700 4th grade students from around the state. In preparation for the season, staff has been busy calibrating aircraft and operational equipment, updating regional maps, and canvassing potential new breeding habitats. The Delaware Mosquito Control Section has also welcomed two new members to its staff, Environmental Scientist Matthew Esposito and Dr. Lauren Maestas.

With Delaware now beginning its tick surveillance program, Dr. Lauren Maestas has been hired as our Tick biologist. The first couple years of the program will be heavily focused on tick species and abundance throughout the state, as well as pathogen surveillance; with that Dr. Lauren Maestas has provided the following update:

We are beginning to gain our footing. We are still acquiring the various materials necessary for the program, but have begun making contacts in and out of the department. We are in contact with various veterinarians and wildlife rehabilitators who are willing to participate in the program, and have begun sending out tick collection kits to these various participants. We have distributed tick collection kits to agency personnel who will be working mandatory turkey check stations throughout the state for spring turkey season. Also, off-host tick collections from vegetation on state lands began in mid-April. We are following these various routes of surveillance to approach the subject of ticks and tick-borne disease from a one-health perspective; garnering information from various members of the community and combining the findings to make more informed large scale management decisions.

Submitted By: Shaun McIntire

“Rainy Day Rhyme” - By Kyle Brinson

**Here is some knowledge to never forget
 For after a rain when everything's wet.
 Standing water that does not flow
 Is where mosquito larvae can grow.
 In four days or less get rid of the water.
 No mosquitoes; no need for a swatter.
 In five or more days if the water still stands,
 They emerge from the water and fly to the lands.
 After some rest they hunt for their prey.
 They'll feed on humans both night and day.
 Drinking blood 'till stomach's fill,
 They're vectors of disease with potential to kill.
 If the water remains in a natural hole,
 You can get help from mosquito control.
 Count on them with great reliance.
 They know what to do, it's all about science.**

Georgia

Georgia's wet and relatively mild winter gave us an early start with nuisance mosquito calls, with *Aedes vexans* being a primary culprit. We also had a horse case of Eastern Equine Encephalitis (EEE) reported in March, which is early, as most cases are reported from May-October.

Our goals for the 2018 mosquito surveillance season included doing some level of mosquito surveillance in every county in Georgia, continuing to provide equipment and training to Environmental Health Specialists in all 18 Public Health Districts, and having the ability to support local outreach for mosquito complaints. We were able to accomplish this, adding to our information on mosquito species in Georgia, as well as building infrastructure and cooperation between the various groups who do mosquito control.

We also began statewide pesticide resistance testing in 2018. Preliminary data from several southern counties showed *Aedes albopictus* to be susceptible to permethrin, but *Culex quinquefasciatus* showing varied levels of resistance to both permethrin and lambda cyhalothrin.

Our goals for the 2019 mosquito surveillance season include:

- Doing some level of mosquito surveillance in every county in Georgia again
- Doing targeted surveillance in areas where *Aedes aegypti* were found in the 1950s
- Providing equipment and training to Environmental Health Specialists in all 18 Public Health Districts
- Having the ability to continue to support local outreach for mosquito complaints
- Continue doing testing for pesticide resistance, especially in high risk areas of Georgia

The accomplishment of these goals will allow the Georgia Department of Public Health to be better prepared for the next mosquito-borne disease to emerge.

The Georgia Mosquito Control Association is also making some changes this year, in meeting location. Our annual meeting will be at Lake Blackshear Resort in Cordele, GA on Oct 16-18. Please check out our website (www.GAmosquito.org) and our latest newsletter (<http://www.gamosquito.org/resources/newsletters/DIDEEBYCHA19.pdf>) for additional information.

Happy hunting, and make sure you wear an EPA-registered repellent when out chasing those mosquitoes.

Submitted by: Dr. Rosmarie Kelly

Maryland

In mid-April, Maryland began spring larvicide applications. Just less than 6000 acres of woodland vernal pools were treated by aircraft with liquid larvicide. Dry formulations of larvicide materials are currently being applied throughout the state.

Maryland is currently hiring seasonal staff in preparation for summer mosquito control. Interviews are being conducted and should finalize by the first week of May. The plan is to begin adulticide applications around the third week of May. We are currently testing new Dell laptops with Frontier Precision's newest tracking software. We hope to incorporate the tracking software in our ULV program.

Submitted by: Kyle Brinson

North Carolina

Mosquito- and tick-borne disease prevention efforts at the state level have increased in the past few years, especially due to partnerships between the Communicable Disease Branch of the North Carolina Division of Public Health and multiple North Carolina universities. Lyme disease research published by Paul Lantos in 2015 elucidating the extent of Lyme expansion into North Carolina used human disease surveillance data to suggest that Lyme will continue to creep into North Carolina along the southwestern border of Virginia.¹ With the help of CDC Expanding Laboratory Capacity (ELC) funding in 2018, the Communicable Disease branch contracted Dr. Gideon Wasserberg at UNC-G, Dr. Michael Reiskind of North Carolina State University, Dr. Steve Seagle of Appalachian State University, and Dr. Graham Hickling of the University of Tennessee to survey a total of 19 counties in the northwest portion of North Carolina, and counties in Virginia and Tennessee that border North Carolina. Additionally, Dr. Reiskind is targeting three counties in central North Carolina including Wake, Chatham, and Johnston counties. Entomological surveillance in these nineteen counties is ongoing, and ticks collected will be sent to the CDC in Fort Collins for pathogen testing. Preliminary results indicate that *Borrelia burgdorferi* is present in ticks collected via flagging in the northeastern part of North Carolina, but not in central North Carolina.

Additionally, in June 2018, NC DPH initiated the NC Tick Identification Program, patterned after the West Virginia Veterinary Tick Submission Project.² The goal is to document the distribution of disease causing ticks across North Carolina including *Ixodes scapularis*, *Dermacentor variabilis*, *Amblyomma americanum*, and *Amblyomma maculatum*. Small animal veterinarians throughout the state were asked to submit ticks collected from animal specimens to the DPH. In conjunction with the discovery of *Haemaphysalis longicornis* in Polk County by the USDA (July 2018), the program was adapted to include large animal veterinary hospital submissions, so that the distribution of *Haemaphysalis longicornis* could be properly documented. So far, the program has identified the longhorned ticks in two additional North Carolina counties (Rutherford and Davidson). Ticks collected through the NC Animal Tick Identification Program are not being tested for pathogens.

Mosquito-oriented partnerships between the CDC, the state Division of Public Health, East Carolina University (ECU), Western Carolina University (WCU), and North Carolina State University (NCSU) have been gathering new information on disease-transmitting mosquito species since 2016, as well as updating some of work done by Nolan Newton's group in the former Public Health Pest Management Section. The goal of these projects is to suppress known disease vectors, and to be prepared for the next emerging mosquito-borne disease. First, a 2016 regional survey of container *Aedes* species updates to work published in 1998.³

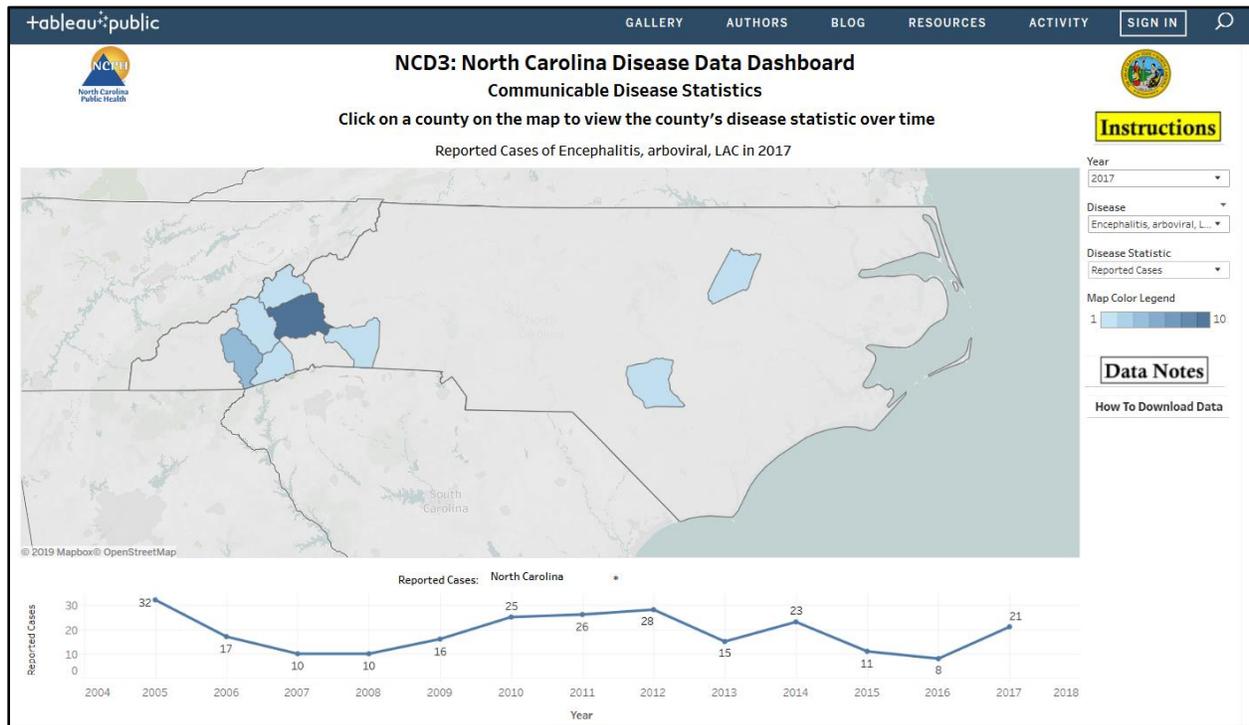
The survey found no *Aedes aegypti* in North Carolina, but did provide a good geographic overview of *Aedes albopictus* (it was found nearly everywhere in North Carolina), *Aedes triseriatus* and *Aedes japonicus* (found primarily in the west, but present statewide) and even *Aedes hendersoni* (found in central North Carolina)⁴ Second, insecticide resistance work in North Carolina has begun in earnest under Dr. Stephanie Richards, thus far revealing that *Aedes albopictus* collected in several North Carolina locations in 2017 were susceptible to natural and most common synthetic pyrethroids, while developing or definite resistance was found against Malathion and Chlorpyrifos.⁵ The situation with the West Nile virus vector *Culex pipiens/quinqüefasciatus* tested thus far (i.e., Winterville and Greenville, NC) is dire, showing resistance to nearly all common adulticide active ingredients.⁶ In order to adequately respond to future *Culex*-driven outbreaks, new adult suppression tools are needed for these species in North Carolina.

Third, a detailed review of reported North Carolina La Crosse encephalitis (LAC) cases was undertaken in 2018 which demonstrated that transmission reoccurred at specific residential properties.^{7,8} Therefore, IR work with

North Carolina (cont.)

Aedes triseriatus is planned as part of a multi-pronged effort to create mosquito suppression recommendations for homes with verified or potential risk. The project, led by Dr. Brian Byrd of WCU, Dr. Michael Reiskind of NCSU and Dr. Stephanie Richards of ECU, will investigate three critical aspects: 1) potential suppression tools (e.g., barrier sprays, gravid female traps, pyriproxyfen dispersal); 2) public acceptance of some of these tools; and 3) susceptibility to common adulticide active ingredients against *Aedes triseriatus*.

These efforts work in tandem with annual state funding to 15 North Carolina counties that have shown an interest and capacity to create Integrated Mosquito and Tick Management programs. The efforts of local vector control personnel has resulted in several improvements, not the least of which is adding daily mosquito surveillance data to MosquitoNet.



Finally, the state is working to improve communication about mosquito-borne and tick-borne diseases, including the introduction of annual vector-borne disease surveillance summaries⁹ and a visual data summary website.¹⁰ This website displays human mosquito and tick case data back to at least 2004, not to mention human data for dozens of other communicable diseases.

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1. <https://doi.org/10.1093/ofid/ofv143>
2. <https://epi.publichealth.nc.gov/cd/ticks/providers.html>
3. www.biodiversitylibrary.org/content/part/JAMCA/JAMCA_V14_N2_P165-172.pdf
4. <https://doi.org/10.1093/jme/tjv190>
5. <https://doi.org/10.1093/jme/tjv216>
6. <https://doi.org/10.1093/jme/tjx198>
7. <https://doi.org/10.15585/mmwr.mm6739a8>
8. <https://www.cdc.gov/lac/tech/epi.html>
9. <https://epi.ncpublichealth.info/cd/figures.html>
10. <https://public.tableau.com/profile/nc.cdb>

Submitted By: A. Barbarin and M. Doyle

Pennsylvania

Pennsylvania began mosquito surveillance in April. We have begun to see large gravid trap numbers of *Culex restuans* and testing for West Nile virus will begin the week of May 6th. Counties have been busy treating floodwater areas that were cause for concern in 2018. County programs have been provided with their pesticide resistance kits and training will be provided in May and June. The individual programs will be conducting resistance testing at least once per season going forward. The statewide Mosquito Academy will take place on May 22-23 in McKean County. New employees in the county mosquito programs will be trained in all aspects of mosquito surveillance, control, and integrated pest management.

A weekly nymphal tick survey has begun in 38 counties across the state. This survey will continue until late August. Counties will also be surveying for adult ticks as time allows.

Submitted By: Christian Boyer

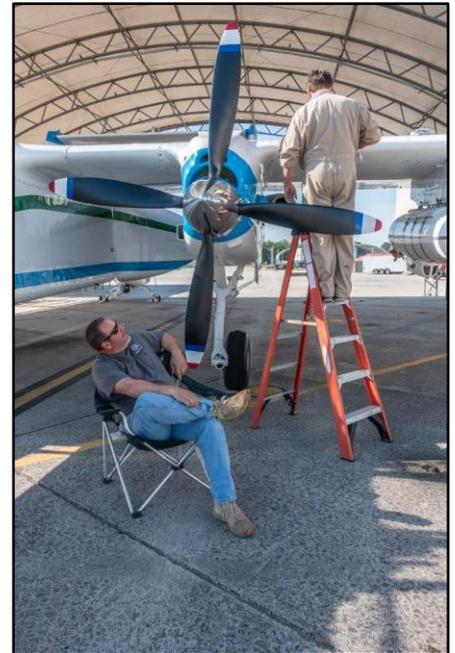
South Carolina

The South Carolina Mosquito Control Association (SCMCA) will be holding their annual Summer Workshop on June 12, 2019, in Pinopolis, SC. The SCMCA Summer Workshop is a mixture of presentations and breakout sessions geared towards increasing the knowledge of mosquito control professionals in South Carolina. The workshop is free and lunch will be provided as always. SCMCA is anticipating approximately 110 people attending the Summer Workshop this year. Presentations are being solicited and an agenda is available on the state association's website (www.scmca.net). SCMCA will not be holding an annual meeting in November of 2019, but will be co-sponsoring a joint meeting with MAMCA, February 19-21, 2020, in Greenville, SC.



Left: The 2019 MCAS Beaufort Air Show was in town, and the Blue Angels were there alongside Beaufort Counties own Aerial Team.

Right: Some work hard, some "supervise". Preparations for the Air Show isn't always hard work.



Beaufort County Mosquito Control has recently hired a second laboratory intern to help with the surveillance program. Richland County Vector Control is seeking a full-time Environmental Field Coordinator for their program. There is a door-to-door educational campaign that stretched from February 25th - March 14th in Charleston County that their mosquito control program completed as their winter Citizen's Awareness Program (CAP). North Myrtle Beach received and is implementing the new FieldSeeker Office and ULV system. They also recently constructed a 10,000 sq. ft. building to house new offices and a lab.

Submitted By: Robert Cartner

Tennessee

On May 1-2, the Tennessee Department of Health (TDH) hosted a mosquito control training session called Mosquito 3.0. With support from the Southeastern Center for Excellence for Vector-Borne Diseases, the workshop focused on teaching attendees about pesticide resistance in mosquitoes. Much like with antibiotics used against bacteria, resistance can occur in the pesticides used to combat mosquitoes. Since pesticides are one of our most important tools in battling disease carrying mosquitoes, being able to identify and manage resistance is of great public health importance. Participants included vector control groups, epidemiologists, entomologists, and program directors from several programs and states (AL, AR, KY, MO, MS, SC) as well as partners in TN. Dr. Janet McAlister from CDC presented for day 1 on pesticide resistance testing -mechanism of resistance, how to conduct the CDC bottle bioassay, and strategies to manage resistance during an outbreak. Dr. Abelardo Moncayo, Director of TDH Vector-Borne Diseases Program, introduced field and lab experiences on day 1 and 2 to demonstrate egg collection methods and how to raise mosquitoes from eggs to adults to obtain adults to conduct the CDC bioassay in their jurisdictions. He also trained attendees on larval identification techniques using specimens provided by the SE and NE Centers of Excellence in Vector-Borne Diseases. Participants appreciated the hands-on training and demonstrations that will facilitate implementation of training material.

Mosquito season is starting. Hamilton Co. (Chattanooga) and Shelby Co. (Memphis) have already seen some *Culex sp.* mosquitoes in preliminary trapping.

Submitted By: Brad Parman

Virginia

Southeastern Virginia

The localities in the southeastern portion of Virginia have seen an early start to the mosquito season after an unusual winter that had warmer temperatures and increased rainfall. *Aedes albopictus* has already appeared, and in high numbers in certain areas. *Culex* numbers are also higher than average in some localities. Portsmouth reported a salt marsh bloom in late April that brought in a nightly trap count of over 1600 mosquitoes, mostly *Aedes sollicitans*.

Other highlights for the area is the focus on education and outreach. Portsmouth has also focused on outreach events this spring and updated their website to try to reach the online crowd. York County Mosquito Control had a tire recycle day on April 20th, and collected almost 1000 tires (the county's largest tire collection to date). York County also completed all 3rd grade school programs and inspections of school grounds are on-going for larval habitats.



Left: Tire Pile from York County's Recycle Day.

Right: Chesapeake breaks ground on a new and improved facility for mosquito control.

Virginia (cont.)

The VMCA Adult ID Course was held on May 13th, and focused on local species identification for seasonal interns and new biology positions in the area. The class is taught by local mosquito biology professionals and can accommodate up to 30 participants. This year will be the first time that VMCA will add an online portion to the class that people can participate via streaming. More information can be found on the VMCA website (www.mosquito-va.org).

Central Virginia

The County of Henrico, located in central Virginia, adjacent to the Capital City of Richmond, VA has experienced a change in the local WNV amplification cycle.

In 2017, Henrico collected mosquitoes that tested positive for WNV, starting in week 28 and continuing through week 42. Positive trap sites were consistently spread across the County with an apparent strong correlation to human infrastructure / development. All positive mosquito pools were *Cx. pip./res.* with 109 out of 112 from gravid traps.

The 2018 mosquito season repeated this pattern with WNV positive mosquito pools from week 26 through 42, County-wide, with the occurrence of 6 WNV positive *Aedes albopictus* pools and 2 or 3 WNV human cases, depending on the source for human health statistics.

The 2019 season has started off in record setting fashion for early emergence of several mosquito species including *Aedes albopictus*. Hopefully our Fall 2019 report will debunk what we think is a significant change in our WNV amplification cycle.

Armed Forces

The Armed Forces Pest Management Board Deployed Warfighter Program is funding a clinical trial to study the effectiveness of insecticide-treated uniforms to reduce malaria transmission in the Tanzania People's Defence Force. The primary goal of AMTF has been to assist African partner militaries do develop relationships with their national malaria control programs. The AMTF facilitates are building relationships by bringing together representatives from the U.S., African partner militaries, and national malaria control programs.

For more information: <https://www.africom.mil/media-room/article/31752/africom-africa-malaria-taskforce-key-leader-event-2019->

Submitted By: Elizabeth Hodson



CALL FOR NEWSLETTER ARTICLES

The need for sharing information and collaborating with different states and jurisdictions is at an all-time high. This newsletter and others like it need articles to help readers have access to ideas and contacts to further their programs. Articles can be from any facet of mosquito, tick or other pest control operations. Please send any articles, pictures, or news to Tim DuBois at duboist@portsmouthva.gov to submit for the next newsletter!

West Virginia

During 2018, six human cases of La Crosse encephalitis and two human cases of West Nile encephalitis were detected in West Virginia. West Virginia also reported three travel-related malaria cases and one dengue case in the state.

During the period of May 17 through October 25 2018, the West Virginia Department of Health and Human Resources Mosquito Surveillance Program initiated adult mosquito surveillance at 49 localities in 25 counties: Boone, Cabell, Doddridge, Fayette, Greenbrier, Hardy, Harrison, Jackson, Kanawha, Lewis, Marion, Marshall, Mercer, Mineral, Monongalia, Nicholas, Ohio, Pleasants, Raleigh, Randolph, Ritchie, Taylor, Wayne, Wetzel, and Wood counties. Additional mosquito surveillance in more counties in northern West Virginia this year was due to the efforts of two new mosquito surveillance partners, Wheeling-Ohio Health Department and Monongalia County Health Department. Cabell-Huntington Health Department and Kanawha-Charleston Health Department continued to collect mosquitoes in their respective jurisdictions in 2018.

In 2018, 15 *Culex* mosquitoes, 11 *Aedes albopictus*, 1 *Aedes* spp., and 1 *Psorophora/Aedes* spp. sample tested positive for West Nile virus (WNV). Listed below were the number of WNV positive mosquito samples detected from each county: Cabell (15), Doddridge (1), Fayette (4), Kanawha (1), Mercer (1), Nicholas (2), Raleigh (3), and Wood (1). In comparison to previous years, WNV was more active in the mosquitoes from central and southern West Virginia this year. The human risk for WNV infection was ‘low’ in June but increased to ‘moderate’ in July, August, and September, based upon the WNV minimum infection rate in *Culex* mosquitoes. La Crosse virus, St. Louis encephalitis virus, and Zika virus were not detected in the mosquito populations. Two horses also tested positive for West Nile virus infection.

The Asian tiger mosquito, *Aedes albopictus*, is widely distributed throughout West Virginia. New county records for *Aedes albopictus* include Doddridge, Lewis, Marshall, Pleasants, and Ritchie counties in northwestern West Virginia and Hardy and Mineral counties in eastern West Virginia. Based upon CDC pesticide bottle bioassays, *Aedes albopictus* is susceptible to malathion, bifenthrin, and prallethrin in the Charleston area.

This year, West Virginia recorded a comparatively high incidence of human Lyme disease cases. In 2018, West Virginia had 671 human Lyme disease cases. In addition to Lyme disease, there have been 20 spotted fever group rickettsioses cases, four accounts of human ehrlichiosis, one case of indeterminate ehrlichiosis/anaplasmosis, and one human babesiosis case in West Virginia.

The Asian longhorned tick, *Haemaphysalis longicornis*, has been detected in 12 West Virginian counties distributed across the state. The West Virginia Department of Health and Human Resources, in conjunction with West Virginia Department of Agriculture Animal Health Division, United States Department of Agriculture Veterinary Services, West Virginia Division of Natural Resources, West Virginia University Extension Services, and veterinary practitioners involved with the West Virginia Veterinary Tick Submission Project, have been monitoring *Haemaphysalis longicornis* activity across West Virginia. Asian longhorned ticks have been recovered from cattle, white-tailed deer, coyote, pet dogs, and pet cats. *Haemaphysalis longicornis* larvae were collected in autumn. Asian longhorned tick nymphs were detected in both autumn and spring. During the summer, adult *Haemaphysalis longicornis* females were active. No male *Haemaphysalis longicornis* have been discovered in West Virginia.

Submitted by: Eric Dotseth

Asian longhorned tick (*Haemaphysalis longicornis*) in West Virginia

The Asian longhorned tick (*Haemaphysalis longicornis*) is an invasive East Asian tick species recently discovered in North America. The tick genus *Haemaphysalis* is identified by the lateral extension of palpal segment 2 (Fig. 1). The invasive *H. longicornis* closely resembles the rabbit tick, *Haemaphysalis leporispalustris*, a tick species native to the Western Hemisphere. Egizi *et al.* (2019) is a recently developed dichotomous key to differentiate *H. longicornis* from native congeners in North America. Characteristics on the tick mouthparts, like the long, pointy ventral spur on palpal article 3, the lack of cornua on the ventral surface of the basis capitulum, and the weak extension of the palpal article 2, differentiate Asian longhorned tick from the native rabbit tick (Fig. 2).

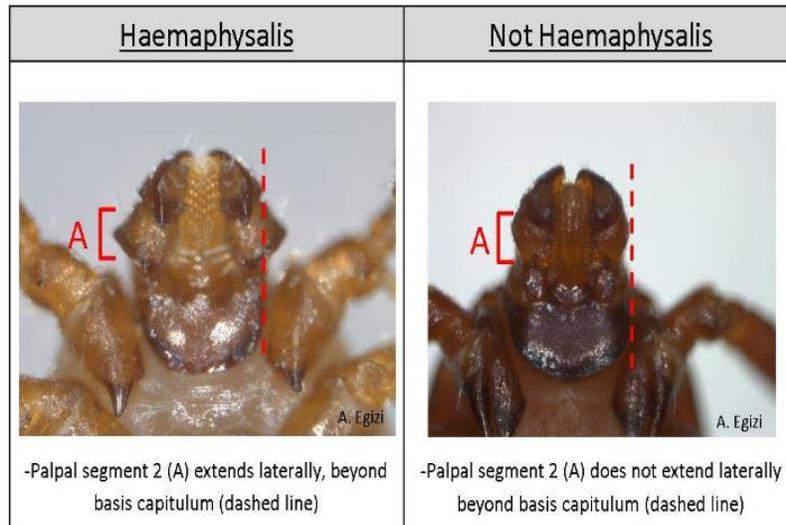


Fig. 1. Differentiation between *Haemaphysalis* ticks and other tick species. (Center for Vector Biology, New Jersey Agricultural Experiment Station. 2017. How to recognize a longhorned tick.

<http://vectorbio.rutgers.edu/outreach/exoticID.php>)

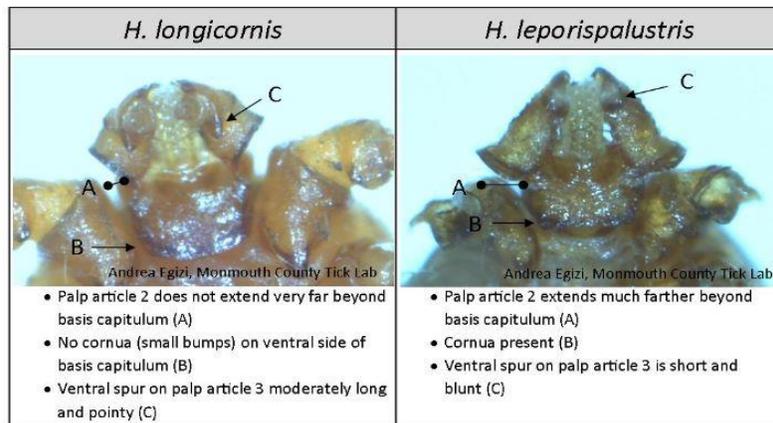


Fig. 2. Differentiation between *Haemaphysalis longicornis* and *Haemaphysalis leporispalustris*. (Center for Vector Biology, New Jersey Agricultural Experiment Station. 2017. How to recognize a longhorned tick.

<http://vectorbio.rutgers.edu/outreach/exoticID.php>)

Haemaphysalis longicornis is native to eastern Asia (northeastern Russia, Korea, Japan, and northeastern China). This species is an invasive species in Australia, New Zealand, New Caledonia, and Fiji. In the United

States, *Haemaphysalis longicornis* has been discovered in the eastern states (New Jersey, Virginia, West Virginia, North Carolina, Pennsylvania, New York, Maryland) and Arkansas. The West Virginia Department of Health and Human Resources, in conjunction with the West Virginia Department of Agriculture Animal Health Division, United States Department of Agriculture Veterinary Services, West Virginia Division of Natural Resources, West Virginia University Extension Services, and veterinary practitioners involved with the West Virginia Veterinary Tick Submission Project, have been monitoring *H. longicornis* activity across the state. In West Virginia, *Haemaphysalis longicornis* has been found in the following 12 counties: Lincoln, Mason, Putnam, Ritchie, Tyler, Marion, Taylor, Barbour, Upshur, Lewis, Hardy, and Monroe counties.

The Asian longhorned tick is considered a danger to both animal and human health. *Haemaphysalis longicornis* is one of the few ticks capable of achieving high enough densities to cause anemia on sheep and cattle hosts. For animal health, this tick is a confirmed vector for sheep theileriosis (*Theileria luwenshuni*) and babesiosis (*Babesia gibsoni*, *Babesia ovata*, *Babesia* sp. BQ1) and ticks from the field have been infected with bovine theileriosis (*Theileria orientalis*), anaplasmosis (*Anaplasma bovis*), and ehrlichiosis (*Ehrlichia chaffeensis*). For human health, *Haemaphysalis longicornis* is a confirmed vector for severe fever with thrombocytopenia syndrome virus and field samples have been infected with Japanese spotted fever (*Rickettsia japonica*), Lyme disease (*Borrelia burgdorferi*), anaplasmosis (*Anaplasma phagocytophilum*), and Powassan virus. Human and animal pathogens have not been detected in *H. longicornis* collected from the United States.

There are some life history traits of *H. longicornis* that enhance its invasive potential. The Asian longhorned tick has a broad host range. In West Virginia, this tick has been found on livestock (beef cattle), wildlife (white-tailed deer, coyote), and domestic animals (pet canine, pet feline). Additional hosts in the United States include livestock (sheep, horse, goat), wildlife (elk, opossum, red fox, grey fox, raccoon, striped skunk, groundhog, red-tailed hawk), and humans.

Haemaphysalis longicornis consists of both asexually and bisexually reproducing populations. Parthenogenetic (asexually reproducing) populations occur in eastern Russia, northern Japan, Australia, New Zealand, New Caledonia, New Hebrides, and Fiji. Conversely, bisexual (sexually reproducing) races occur in southeastern Russia, southern Japan, Korea, and China. Without the need for fertilization, parthenogenetic populations are capable of spreading rapidly and reaching high abundance. With no males currently recorded from the United States, *Haemaphysalis longicornis* in the United States are suspected of reproducing asexually.

Haemaphysalis longicornis survives in relatively cold climates in both its native range in eastern Asia and the continental United States of America. *Haemaphysalis longicornis* was first detected in the United States on November 2017 from domestic sheep in Hunterdon County, New Jersey. In spring 2018, the tick was confirmed to still be present in New Jersey. The first collection of *H. longicornis* in the United States was on August 31, 2010 from a white-tailed deer in Tyler County, West Virginia. This larval tick specimen was initially identified by the Southeastern Cooperative Wildlife Disease Study as rabbit tick (*Haemaphysalis leporispalustris*). The tick overwinters as both nymphs and adults in its native range and the United States.

References

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Submitted by: Eric Dotseth

Tick Talk from North Carolina and Other News & Articles

CDC study recently released: North Carolina No. 12 in the US for tick-borne diseases

A recent report from the CDC reveals that diseases transmitted through the bites of blood-feeding ticks, mosquitoes, and fleas are a “growing public health problem” in the United States. Reported cases of vector-borne diseases have more than tripled nationwide, growing from 27,388 cases reported in 2004 to a whopping 96,075 cases reported in 2016, according to the new Vital Signs report published by the CDC on Tuesday.

In North Carolina, between 2004 and 2016, there were 9,075 tick-borne disease cases, according to CDC data. According to the data, North Carolina was No. 12 in the U.S. for tick-borne diseases, which occur throughout the country but predominate in the eastern parts of the country and along the Pacific Coast.

www.cnn.com/2018/05/01/health/ticks-mosquito-borne-diseases-cdc-study/index.html
patch.com/northcarolina/charlotte/tick-borne-diseases-rise-nc-elsewhere-us-cdc

Other Interesting News & Articles

22% increase in tick-borne disease cases in 2017 nationally

State and local health departments reported a record number of tick-borne disease cases to the Centers for Disease Control and Prevention in 2017 — from almost 49,000 cases in 2016 to 59,000 cases in 2017. This may be due in part to climate change and the geographic spread of ticks throughout the country.

EPA tool that helps with repellent decisions

This handy tool from the Environmental Protection Agency can help you determine the best product for you.

www.epa.gov/insect-repellents/find-repellent-right-you

Lyme disease costs the U.S. health care system between \$712 million and \$1.3 billion a year

Johns Hopkins Bloomberg School of Public Health research suggests that prolonged illness associated with the disease in some patients is more widespread and serious than previously understood. Each year an estimated 240,000 to 440,000 new cases of the tick-borne illness are diagnosed. www.jhsph.edu/news/news-releases/2015/lyme-disease-costs-more-than-one-billion-dollars-per-year-to-treat-study-finds.html

Submitted By: Dr. Marcia E. Herman-Giddens

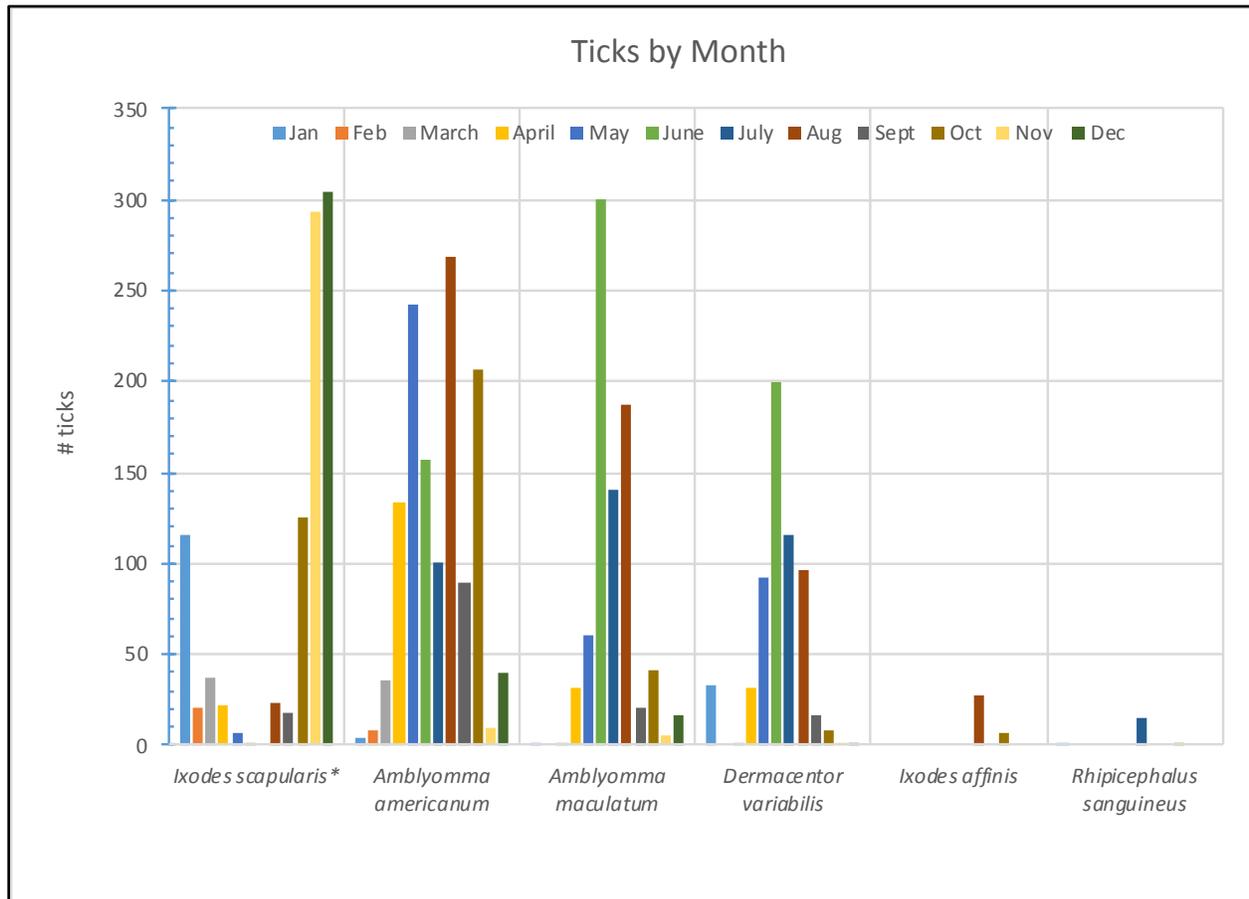
Promoting Environmental Health Tick Surveillance in Georgia

Surveillance for ticks has been mostly lacking in Georgia, even where tick-borne diseases have been reported. Tick surveillance is intended to monitor changes in the distribution and abundance of ticks. While several short-term attached tick studies have been completed, no surveillance for presence and prevalence have been undertaken due to lack of funding.

The major tick-borne diseases in the southeastern US include Lyme disease, Rocky Mountain spotted fever, STARI, ehrlichiosis and anaplasmosis. In addition to tick-borne diseases, a toxin can be transmitted through the saliva of a tick bite that causes progressive paralysis, a condition known as “tick paralysis.” Tick feeding also may result in mild to severe allergic reactions in some individuals. Many tick-borne diseases are successfully treated if symptoms are recognized early. When the disease is not diagnosed during the early stages of infection, treatment can be difficult and chronic symptoms may develop.

Promoting Environmental Health Tick Surveillance in Georgia (cont.)

Currently, tick surveillance at the GDPH is only done in collaboration with the Georgia Department of Agriculture's (GDA) tick attachment study. While this is an acceptable method of determining presence of tick species, it does not provide prevalence data. With sufficient funding, active surveillance using tick drags could be provided in response to detection of tick-borne diseases. It may be possible to submit ticks to the CDC for testing, allowing the determination of presence and prevalence of pathogens in ticks. CO₂ traps would be used as a secondary method of determining the presence of *Amblyomma americanum* in an area.



Our current goals are to:

- Obtain a better understanding of tick species, and potential diseases, found in Georgia
- Monitor for *Haemaphysalis longicornis* species, otherwise known as the East Asian or Longhorned tick (currently found in New Jersey, Pennsylvania, New York, Maryland, Virginia, West Virginia, North Carolina, and Arkansas)

Currently, DPH provides tick collection kits and mailers to local veterinarians around the state. The ticks are sent for ID and testing to the National Veterinary Services Laboratories in Iowa.

This project has extremely limited funding, but language has been written into the upcoming ELC grant to support tick surveillance by the Vector Surveillance Coordinators, as well as to continue the collaboration with the GDA.

Submitted By: Dr. Rosmarie Kelly

MAMCA Sustaining Members



Bayer Environmental Science



Mid-Atlantic Mosquito Control Association Officers and Board Members

Timothy DuBois (President)

City of Portsmouth
2001 Frederick Blvd.
Portsmouth, VA 23704
Phone (757) 393-8666
FAX (757) 393-8282
duboist@portsmouthva.gov

Robert Cartner (Vice President)

Beaufort County Mosquito Control
84 Shankin Rd.
Beaufort, SC 29906
Phone (843) 255-5800
FAX (843) 255-9428
rcartner@bcgov.net

Thomas Moran (Vice President Elect)

F&W Reg. Mgr.
DE Mosquito Control Sect.
2430 Old County Rd.
Newark, DE 19702
Office Phone: (302) 836-2555

Stephanie Richards (Past President)

East Carolina University
3403 Carol Belk Building, MS#529
300 Curry Court
Greenville, NC 27858
Phone (252) 328-2526
richardss@ecu.edu

Andy Kyle (Secretary-Treasurer)

2471 Mayfield Street
York, PA 17406
Phone (717) 346-8241
FAX (717) 346-8591
akyle@pa.gov



Shaun McIntire (Delaware)

DNREC, Mosquito Control Section
2430 Old County Road
Newark, DE 19702
Shaun.McIntire@state.de.us

Rosmarie Kelly (Georgia)

Georgia Department of Public Health
50 Riverbrooke Ct
Covington, GA 30016
Phone (404) 408-1207
rosmarie.kelly@dph.ga.gov

Kyle Brinson (Maryland)

Maryland Dept. of Agriculture
27722 Nanticoke Road- Unit #2
Salisbury, MD 21801
Phone (Salisbury) (410) 543-6626
kyle.brinson@maryland.gov

Joe Andrews (North Carolina)

Allpro Vector Group
550 White Meadows Drive
Cameron, NC 28326
Phone (919) 343-8440
FAX (248) 773-7465
joea@allprovector.com

Christian Boyer (Pennsylvania)

PA DEP, Vector Management
PO Box 1467
Harrisburg, PA 17105
Phone (717) 346-8221
FAX (717) 346-8591
chrboyer@pa.gov

Robert Cartner (South Carolina)

Beaufort County Mosquito Control
84 Shankin Rd.
Beaufort, SC 29906
Phone (843) 255-5800
FAX (843) 255-9428
rcartner@bcgov.net

Brad Parman (Tennessee)

Tennessee Department of Health
2101 Medical Center Way
Knoxville, TN 37920
Phone (865) 244-6401
Brad.parman@tn.gov

Betsy Hodson (Virginia)

York County Mosquito Control
PO Box 532
Yorktown, VA 23692 Suffolk, VA 23434
Phone (757) 592--2255
Elizabeth.hodson@yorkcounty.gov

Eric Dotseth (West Virginia)

West Virginia Department of Health and
Human Resources
Office of Laboratory Services
167 11th Avenue
South Charleston, WV 25303
Phone (304) 356-4020
eric.j.dotseth@wv.gov

Brian Smith (Industry Representative)

UNIVAR USA
680 Elmwood Avenue
Sharon Hill, PA 19079
Phone (215) 260-0834
brian.smith@univarusa.com

Sue Ferguson (Historian)

112 Logan Rock Court
Irmo, SC 29063
Phone (803) 732-1141
fergussc@bellsouth.net

Timothy DuBois (Newsletter Editor)

City of Portsmouth
2001 Frederick Blvd.
Portsmouth, VA 23704
Phone (757) 393-8666
FAX (757) 393-8282
duboist@portsmouthva.gov