

# **THE SKEETER**

**VOL. 83, No. 2**

**2023 Summer Newsletter**



**OFFICIAL NEWSLETTER OF THE VIRGINIA MOSQUITO CONTROL ASSOCIATION**

# President's Address

Happy beginning of summer everyone!

I would like to officially welcome Zachary Cohen to the board as our Interim Industry Representative! I would also like to officially announce that the 2024 VMCA annual meeting will be held February 20-22, 2024. We will be at the Hilton Virginia Beach Oceanfront again! It's never too early to start thinking about presentations for the meeting! Please reach out to President Elect [Karen Akaratovic](#) if you are interested in presenting.

## Recent highlights:

- The [Governor's Proclamation](#) was granted for Mosquito Control Awareness Week (June 18-24)!
- The Education Committee put on another successful [adult mosquito identification course](#). Thank you to everyone who attended and gave a presentation.
- Chesapeake and Virginia Beach had a very successful [chicken roundup](#)! Thanks to Jeffery at Fresh Start Farms for having the chickens ready for us!

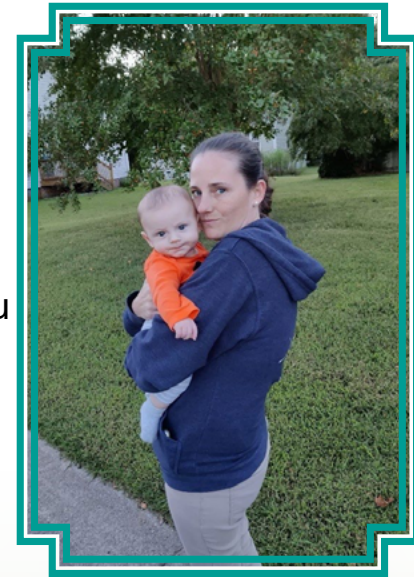
## Upcoming events:

- Registration for the 2023 [Tour De Skeeter](#) is now open.

A big thanks to last year's sponsors: Adapco, Central Life Sciences, Clarke, and Target!

- The Student Competition Committee's [8th annual poster competition](#) will be inviting schools from neighboring states again. This turned out great at our last annual meeting.

Also, the board is excited to share with everyone a proposal for some [bylaws changes](#). The Bylaws Committee has been working hard to put this together so please take the time to read through it!



Carla Caulkins  
2023 VMCA President

# Announcements

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## DID YOU KNOW?

You can check our [news page](#) for more updates and renew your membership anytime [online](#)!

## WHAT'S ON THE COVER

An adult female *Aedes aegypti* collected in a CDC trap by Penelope Smelser in Norfolk on May 19th, 2023. This species has not been found in Norfolk for over 2 decades. More info on [page 16](#).

## UPCOMING EVENTS

### VMCA Executive Board Meeting

dates posted [online](#); all members welcome email [virginiamosquito@gmail.com](mailto:virginiamosquito@gmail.com) to register

### SOVE Annual Meeting

September 17-21, 2023 - Charleston, SC

### Tour de Skeeter

October 14, 2023 - VA Capital Trail

### Entomology 2023

November 5-8, 2023 - National Harbor, MD

### NCMVCA Annual Conference

November 15-17, 2023 - Carolina Beach, NC

### SCC Poster Competition Deadline

November 30th, 2023; [details here](#)

### MAMCA 49th Annual Conference

January 23-25, 2024 - Annapolis, MD

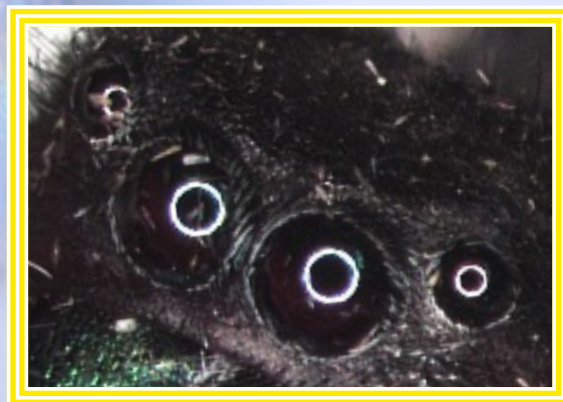
### VMCA 77th Annual Conference

February 20-22, 2024 - Virginia Beach, VA

### AMCA 90th Annual Meeting

March 4-8, 2024 - Dallas, TX

## WHAT'S THAT?



Answer on [page 23](#)

# Mosquito Control Awareness Week



## CERTIFICATE of RECOGNITION

*By virtue of the authority vested by the Constitution in the Governor of the Commonwealth of Virginia, there is hereby officially recognized:*

### MOSQUITO CONTROL AWARENESS WEEK

**WHEREAS**, mosquito borne diseases, including malaria, yellow fever, West Nile virus, Zika virus, and other mosquito-borne illnesses have historically been a source of human and animal suffering, illness, and death in the United States and worldwide; and

**WHEREAS**, an excess number of mosquitoes diminishes our enjoyment of the outdoors, public parks and playgrounds, hinders outdoor work, decreases livestock productivity, and reduces property values; and

**WHEREAS**, the American Mosquito Control Association (AMCA) was established on June 26, 1935, to provide a nationally organized network to help mosquito control professionals develop and encourage effective and environmentally safe mosquito control activities; and



**WHEREAS**, the Virginia Mosquito Control Association (VMCA) serves to facilitate communication and education among Virginia's mosquito control professionals to improve the efficiency and effectiveness of mosquito control operations in Virginia; and

**WHEREAS**, the Virginia Department of Health partners with multiple state agencies and government organizations in a public awareness campaign to prevent the spread of the West Nile virus, Zika virus, and other mosquito-borne viruses and encourage the elimination of mosquito breeding habitats around the home; and

**WHEREAS**, it is important for individuals and organizations to work with the Virginia Department of Health and local mosquito control organizations to help decrease the effects of mosquito-borne illnesses;

**NOW, THEREFORE**, I, Glenn Youngkin, do hereby recognize June 18-24, 2023, as **MOSQUITO CONTROL AWARENESS WEEK** in the COMMONWEALTH OF VIRGINIA, and I call this observance to the attention of all our citizens.



  
Governor  
  
Secretary of the Commonwealth

Acquired and Submitted by Public Relations Committee Chair Penelope Smelser

# VMCA Bylaws Proposed Changes

*These will be voted on during the 2024 VMCA Business Meeting (February 22, 2024)*

Please review the 2024 proposed bylaw changes located here: <https://mosquito-va.org/bylaws>. The bylaws document is typed in black font with proposed changes typed in three different colors based on the category of the changes (colors are seen below with its respective change). Each proposed change (1, 2, and 3) will need to be approved by the board and voted on by the membership at the annual business meeting in 2024. Below is a summary of the proposed changes and the reasoning for those changes:

1. **Split the duties of the VMCA secretary/treasurer into two separate executive board positions.**

What this will accomplish:

- A heavy workload will be divided between two positions, while allowing each to collaborate with and provide assistance to the other.
- Having two members of the executive board that will remain in the same position for multiple years. This will allow each to fully grasp the duties of their positions and increase the level of guidance given to the VMCA board as a whole.
- Splitting the terms of secretary and treasurer to opposite years will allow for continuity from year to year.

2. **Remove the first vice president board position and have the vice president as the entry-level position to the board.** What this will accomplish:

- The years of potential commitment associated with joining the VMCA board will be shortened from five years to four years. This may increase the interest to join the board from the VMCA membership.
- If the proposal of separating secretary and treasurer is accepted, this deletion of an executive board position will keep the number of voting board members the same as in past years.
- This is a realignment of the board to reflect the current needs of the organization.

3. **Verbiage changes and extra explanations where needed for clarity and consistency.**

If the proposed changes to the executive board structure in 1 and 2 are accepted, they will be implemented during the 2025 and 2026 elections. If members of the 2024 board resign between the bylaws change and the next election, positions will be filled according to the newly adopted bylaws (i.e., the first vice president will not be filled; the secretary and treasurer positions will be filled separately or individually).

*continued next page*

**Back to the Beach!**

**Save the date for VMCA's 77th Annual Conference**

**February 20-22, 2024**

**Hilton Virginia Beach Oceanfront**

# Bylaws Changes Continued

Pending approval by the membership, the changes will create a few situations that will resolve over a two-year period: election of the first vice president and terms of the secretary and treasurer.

Current Board	New 2025 board*	How changes will be implemented
Current Past President	Current Past President	No change
President	President	No change
President Elect	President Elect	No change
Vice President	Vice President	No change
First Vice President	Eliminated	Position will be eliminated from the 2025 elections and thereafter. No interim will be chosen if vacant during 2024.
Secretary/Treasurer	Split into two positions - Secretary: elected in odd years - Treasurer: elected in even years	<ul style="list-style-type: none"> <li>- secretary/treasurer duties will be divided into the separate positions.</li> <li>- 2024 elected secretary/treasurer can remain as both in 2024 or resign from one (in which case VMCA board will fill open position with interim)</li> <li>- 2025 elections will contain the secretary position</li> <li>- 2026 elections will contain the treasurer position</li> </ul>

\*If changes are adopted (changes can start in 2024 if members resign)

**Submitted by Bylaws Committee**

**Chair: Jay Kiser    Members: Charles Abadam, Josh Smith, and George Wojcik**

**Bits & Bites**

**Bits & Bites**

**Bits & Bites**

## Advancing Transparency of ESA Evaluations Through Publicly Available Data

EPA has made the geographic data used to conduct Endangered Species Act (ESA) assessments for pesticides, publicly available for the first time via interactive maps. The maps and underlying data that EPA has released support the Agency’s broader efforts to improve protections for federally threatened or endangered (listed) species as outlined in the [ESA Workplan](#) and increase transparency in EPA’s pesticide review process. [More information here.](#)

**Submitted by Randy Buchanan, Legislative Committee Chair**

# C&P Committee Call for Culicidae

Hello there, VMCA members!

As you are hopefully already aware, the Walter Reed Biosystematics Unit (WRBU) is in search of mosquito specimens from all over the state of Virginia as they bolster their U.S. mosquito collection. The majority of the more than **1 million specimens** they currently manage come from other places in the world (mainly the tropics). Hopefully you were able to begin collecting exemplar mosquito specimens this spring, many of which are listed in Karen Akaratovic's article in the 2023 Spring *Skeeter*. As you know, many of the species that are present in abundance early in the year disappear as our "main" summer species move in. That said, if you haven't begun, it's not too late! If you've never submitted to WRBU before, anything you collect can have value.



The WRBU manages the blood-sucking arthropods component of the Smithsonian Institution's National Insect Collection.

Preserving mosquitoes has a number of benefits to the VMCA, its members, and the jurisdictions for whom we work. These mosquito collections provide an important physical snapshot of species diversity in our respective regions, as well as the genetics of our local population(s). Making a reference collection for your office can help with training, provide specimens for comparison, and provide staff with a new skill. Plus, if you do choose to submit samples to the WRBU just outside Washington, D.C., your team can visit the

## LARGEST MOSQUITO COLLECTION

on the planet! Submitting samples also gets your name(s) immortalized in the historical record of U.S. mosquito collections!



Various species from Fairfax County, pinned and ready for submission to WRBU.

Please consider joining the newly-formed Curations and Preservation (C&P) Committee for tips and tricks on curating larvae, pupae, and adults for either the U.S. mosquito collections, or to provide specimens for VMCA training events. Its members are happy to share tips and tricks for both first-timers and more experienced curators. Please email [Wes Robertson](#) for more details on how we can help your jurisdiction begin to immortalize their mosquitoes in the largest mosquito collection in the world!

Click [here](#) for a quick video showing Fairfax County's 2023 visit to the WRBU.

Submitted by **Andy Lima**  
Curations & Preservation Committee

Buckle up! The next page lists some summer species to be on the lookout for and as you might expect, it's lengthy. Those with an asterik are fairly rare so they would be stellar finds!

continued next page

# Call for Culicidae Continued

Can you find these summer species?

Species	Primary Habitat Type
<i>Ae. aegypti</i> *	artificial containers, tires
<i>Ae. albopictus</i>	artificial containers, tires, treeholes
<i>Ae. atlanticus</i>	shaded floodwater/woodland pools
<i>Ae. atropalpus</i> *	rock holes, tires
<i>Ae. dupreei</i> *	woodland pools
<i>Ae. fulvus pallens</i> *	woodland pools (deep in woods)
<i>Ae. infirmatus</i>	shaded floodwater/temporary woodland pools
<i>Ae. japonicus</i>	rock holes, tires, artificial containers
<i>Ae. mitchellae</i> *	temporary freshwater pools
<i>Ae. sollicitans</i>	salt marsh - upper area depressions and neglected ditches that flood in high tide
<i>Ae. taeniorhynchus</i>	salt marsh, brackish waters
<i>Ae. tormentor</i>	shaded floodwater/woodland pools
<i>Ae. triseriatus/hendersoni</i>	treeholes (low/high, respectively), tires
<i>Ae. trivittatus</i> *	woodland pools/temporary shaded floodwater
<i>Ae. vexans</i>	mainly sunny floodwater
<i>An. barberi</i> *	treeholes
<i>An. bradleyi</i>	salt marsh, brackish waters
<i>An. crucians</i>	freshwater swamp
<i>An. georgianus</i> *	freshwater
<i>An. punctipennis</i>	permanent/semi-permanent freshwater with overhanging vegetation on margins
<i>An. quadrimaculatus</i>	swamps, grassy freshwater pond and lake margins
<i>Cx. pipiens</i>	stagnant, heavily polluted water, artificial containers; gravid trap pans!
<i>Cx. erraticus</i>	pond margins, permanent water with emergent vegetation and/or duckweed
<i>Cx. tarsalis</i> *	fresh to heavily polluted water
<i>Cx. territans</i>	pond margins, grassy pools, freshwater swamp
<i>Cs. melanura</i>	cryptic; fresh acidic waters, swamp and ground pools
<i>Ps. ciliata</i>	temporary rain pools, floodwater
<i>Ps. columbiae</i>	open sunny field floodwater
<i>Ps. cyanescens</i> *	open field, pastureland
<i>Ps. ferox</i>	woodland pools
<i>Ps. horrida</i>	woodland pools
<i>Ps. howardii</i>	temporary rain pools, floodwater
<i>Ps. mathesoni</i>	woodland pools
<i>Tx. rutilus septentrionalis</i>	tree holes, tires
<i>Ur. sapphirina</i>	permanent/semi-permanent water covered with vegetation, often duckweed/algae

\*indicates rare species

Submitted by Karen Akaratovic, Curations & Preservation Committee



# Adult Mosquito ID Class Summary



The VMCA held their annual Adult Mosquito Identification Course on Monday, May 8th, 2023 at the Suffolk Mosquito Control facility. This course takes place early in the mosquito season as a training method for seasonal/additional staff from local mosquito control jurisdictions. There were eleven students in attendance to the course this year. Those individuals came from mosquito control jurisdictions of Fairfax, Henrico, and York counties, and the cities of Portsmouth, Suffolk, and Virginia Beach.

Course organization and planning falls under the duties of the VMCA Education Committee. Committee members make sure that all details are worked out in order for the course to properly serve its purpose. Members of the committee, as well as local mosquito control biologists, have the opportunity to present on the course topics. This year, the topics were covered by Karen Akaratovic (Suffolk), Tim DuBois (Portsmouth), Kaitlyn Price (Virginia Beach),

Janice Pulver (York County), Penelope Smelser (Norfolk), Lisa Wagenbrenner (Chesapeake), and Addie Weddle (Portsmouth). All presenters also serve as course instructors, by assisting students during the portion dedicated to mosquito specimen identification via the use of microscopes.

Only three of the eleven students were able to complete the course survey. All three responses held an overall high rating. The comments section of the survey included a desire for more time to be spent on each genera/species for note taking. Another mention was for the presentations to contain images from microscope photography. This feedback will definitely be considered when organizing the next identification course. In the future, the survey will be sent out immediately following the course in hopes of obtaining more responses. It is important to have the course assessed by the targeted audience from year to year to keep relevance and attainability.

*Thank you to all who were involved in making the 2023 Adult Identification Course another accomplishment for the VMCA.*

The ability of the course to be successful relies on the efforts made by various VMCA members. The course would not have gone over smoothly without the undertaking made by Karen Akaratovic, who stepped up in order to coordinate all day-of details at the Suffolk Mosquito Control facility. As a committee member, Karen is always working behind the scenes to offer assistance. The committee is fortunate to have such outstanding professionals as members each year.

Thank you, again for your support!

*Submitted by  
Katherine Reutt  
Education Committee Chair*



# 5th Annual TOUR DE SKEETER



Annual bicycling fundraiser event to support the VMCA student poster competition. Get outside, socialize, spread mosquito control awareness, and support students!



**All activity levels welcome!**

Bike, walk, run, skate,  
or just come hang out at the meeting point!

**Saturday  
Oct 14, 2023  
12-4 PM**

**Registration  
\$35**

**Kids are FREE!**  
or get a matching  
youth tee for \$20

### Full Registration Includes:

- ✓ Event T-shirt
- ✓ Swag Bag
- ✓ Entry to win \$200 Amazon card
- ✓ Light fare at meeting point
- ✓ Trail Map upon request

### Virginia Capital Trail

Meeting Point TBA

### Registration Link

[mosquito-va.org/2023-tour-de-skeeter](https://mosquito-va.org/2023-tour-de-skeeter)

**Got Questions? Want to Sponsor? Email us!**  
[VirginiaMosquito@gmail.com](mailto:VirginiaMosquito@gmail.com)

# NEVBD Pesticide Resistance Monitoring Program

Do you know if your *Aedes albopictus* or *Culex pipiens* populations are susceptible to the chemicals you are using?



Do you have the time and/or trained staff to conduct multiple CDC Bottle Bioassays in-house every year?

If you answered “no” to the above questions, you might want to consider sending in your mosquitoes for testing at Cornell University. If you are able to collect *Culex pipiens* egg rafts from gravid pans and/or *Aedes albopictus* eggs laid on ovicup papers, you can

## SEND THEM FOR FREE

to be tested for a variety of chemicals, both adulticide and larvicide. They will even send you free collection kits (shown below) for either species if needed.



There are collection and submission guides for both species on their website and when you're ready to submit, you simply fill out the online submission form and ship your samples overnight (with a moist sponge for *Ae. albopictus* eggs or on ice packs for *Cx. pipiens* rafts/first instar larvae).

### More information:

<https://www.neregionalvectorcenter.com/resistance>  
[pesticide@cornell.edu](mailto:pesticide@cornell.edu)

### Key points:

- Try to submit larvae/eggs from routine surveillance sites
- Each adult assay requires at least 450 eggs/larvae (only females are tested)
- Each larval assay requires at least 150 eggs/larvae
- Ship larvae overnight and not on Fridays



The team at Cornell does an outstanding job performing these tests and is very quick to relay results. They are more than happy to explain any/all parts of the process if you have questions and can conduct enzyme testing if you can't collect enough eggs/larvae for the resistance bioassays. Additionally, if your jurisdiction has fund restrictions, you can even request to ship specimens using Cornell's FedEx account number.

I encourage everyone to take advantage of this program and contribute to ongoing pesticide resistance research.

Submitted by Karen Akaratovic  
 City of Suffolk Mosquito Control

# Hampton Roads Sentinel Chicken Roundup



The annual “Sentinel Chicken Roundup” is an eagerly anticipated event that marks a significant milestone in our ongoing efforts to control mosquito populations. On May 15th, with great excitement and gratitude, representatives from the Virginia Beach and Chesapeake mosquito controls made their way to Fresh Start Farm in Gloucester for the second consecutive year. Our mission was to collect 48 golden comet chickens, each 17 weeks old, who would soon become our dedicated sentinel chickens.

These sentinel chickens play an invaluable role in our mosquito control strategy. As nature’s guardians against mosquito-borne diseases, they act as “living traps” that help us detect the presence of viruses such as West Nile virus (WNV) and eastern equine encephalitis virus (EEEV) within the local mosquito population. Due to their high susceptibility to these diseases, sentinel chickens provide us with an early warning system. When an infected mosquito bites a sentinel chicken, the chicken’s immune system responds by producing

disease-specific antibodies. Regular blood sampling from the chickens allows us to monitor the presence and activity of these diseases, empowering us to implement targeted control measures and protect public health.

To ensure accurate and timely monitoring, the sentinel chickens undergo weekly blood draws. The collected blood samples are then transported to the Department of Consolidated Laboratory Services (DCLS) in Richmond. At DCLS, the samples undergo testing to identify the presence of WNV and EEEV antibodies. This testing process provides us with critical data to gauge the level of disease transmission and make informed decisions regarding mosquito control strategies.

In the event that a sentinel chicken tests positive for WNV or EEEV antibodies, we swiftly take action to prevent further disease transmission. The positive chicken is promptly removed from its location, reducing the risk of infection. In its place, a new sentinel chicken is introduced, ensuring uninterrupted monitoring

of mosquito activity in that area. The positive chicken, along with any extra/spare chickens, is carefully held until mid-October when the mosquito season concludes.

At the end of their vigilant service, these dedicated sentinel chickens are not forgotten. Instead of being rehomed or repurposed, they are given a well-deserved retirement at a chicken sanctuary. This ensures that they can peacefully enjoy the remainder of their lives, free from the responsibilities of mosquito control.

We extend our sincere appreciation to Fresh Start Farm for their unwavering support in providing us with these remarkable sentinel chickens for the second consecutive year. Their partnership is instrumental in our collective efforts to monitor and control mosquito populations, safeguarding our communities from the threats of mosquito-borne diseases.

Submitted by Kaitlyn Price  
Virginia Beach Mosquito Control



# 8TH ANNUAL STUDENT POSTER COMPETITION IN VECTOR BORNE SCIENCES

**NOW INVITING STUDENTS FROM:**  
*Virginia, North Carolina, Tennessee, Kentucky, Maryland, West Virginia and District of Columbia*



## THE DETAILS



### MUST BE ORIGINAL RESEARCH

*In areas of vector borne sciences, IE: diseases, surveillance methods, pesticides, arthropod vectors, etc.*



### POSTER PRIZES

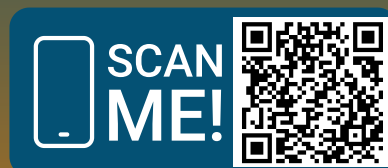
*1st Place: \$500  
2nd Place: \$300  
3rd Place: \$200*



### VMCA CONFERENCE

*Opportunity to present research at 2024 Annual Conference in Virginia Beach, VA*

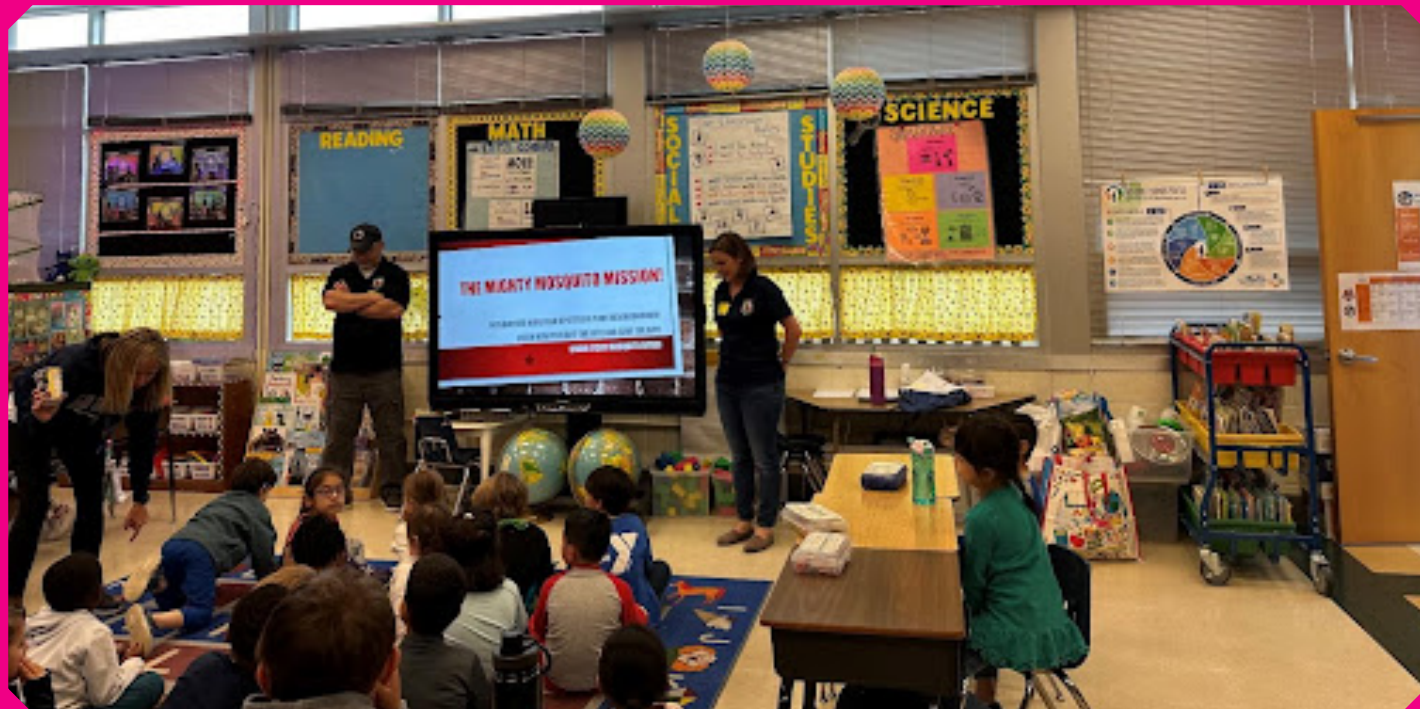
**More Info:**



**DEADLINE TO SUBMIT:**  
**November 30, 2023**

<https://mosquito-va.org/scc-poster-competition>

# The Mighty Mosquito Mission!



In the spring of 2023, Henrico County Standing Water Initiative (SWI) embarked on an expanded elementary education program. The goal of this program was to expand our outreach efforts. SWI had a history of presenting at area schools, but the frequency was typically sporadic. As a broad generalization, most of Henrico County SWIs outreach is focused on those seeking us out because they had a specific problem, or those attending events with interests geared toward our field of study (insects!). The goal of a new elementary outreach program at schools was to create a program that could be integrated into the current curriculum. Our hope is

that this curriculum integration will encourage schools to invite us back in the future. Essentially creating a true program that can be duplicated year after year, beyond sporadic presentation opportunities.

The first step to creating a program that would both share our mission (Fight-the-Bite!) and support the school curriculum was to research the Virginia Standards of Learning (SOLs). It was quickly apparent that a mosquito life cycle and biology program could easily fit into the Living Systems SOLs for Kindergarten, 1st, and 2nd grades without much modification between the grade levels. Individual programs unique to the grade level

curriculum would need to be created for the 3rd, 4th, or 5th grades.

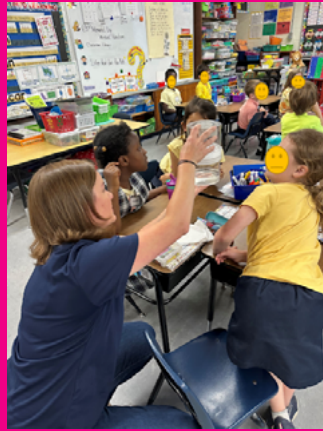
It was decided to move forward creating a themed program for our youngest county residents, the students in grades K-2. Using a theme not only increases the chances of students retaining more information from our presentation, but it also makes the whole thing a bit more fun, for us and the kids. SWI's moto "Pick-a-Day to Fight-the-Bite" was our inspiration for the theme. Using fun alliteration to drive the message home, the Mighty Mosquito Mission was created.

*continued next page*

# Mighty Mosquito Mission Continued

Our presentation focuses on 3 main take-away ideas. Mosquito anatomy, life cycle, and where to look in your yard for water. We use a lot of call and response, question and answer, and student interaction to keep the students engaged. We have a custom drawn coloring sheet of a backyard for students to circle all the hidden egg laying habitats as well as a mosquito headband "disguise" craft. Once the weather warmed up, we brought live larvae in emergence chambers for the students to see. When possible, we tried to have larvae, pupae, and adults in our emergence chambers for the students to see 3 out of the 4 life cycle stages. The presentation itself takes around 15 minutes to give. The remainder of our 30 minute time slot is spent making a mosquito headband 'disguise' and answering questions.

Each student is sent home with a take home sheet that has a recap of what we presented as well as our department contact information and an invitation to call or email for a free mosquito inspection. The hope was that



this would encourage more resident home inspections, however we don't have a way of tracking that. Our inspection request form does not have a "How did you hear about us" section. After each presentation, I emailed a thank you note and

survey to the teachers we presented to. The survey is used to judge how well the presentation was received, if the topic was relevant to what the teacher was or will be doing in their classroom and any feedback for improvement. A little over 50% of the teachers responded to the survey.

Overall, Henrico County Standing Water Initiative gave 78 presentations to 108 classes in 20 schools reaching approximately 2,100 students in a span of 11 weeks. Roughly 50% of the classes presented to were 2nd graders, with a fairly even split of 25% each 1st and Kindergarteners. 100% of respondents to our survey said they would be willing to have us back next year. Moving forward, we hope to start offering presentations in the fall to have more time to visit more schools. Here's to a reproduceable Elementary Outreach Program!

Submitted by  
Gina Serge  
Henrico County SWI

## Cover Story: *Aedes aegypti* in Norfolk



On May 19th as I was identifying the mosquitoes caught that day, I came across a specimen that was both strange and familiar. The object of curiosity was a single female *Aedes aegypti* collected in a CDC light trap. In my 20 years of mosquito surveillance, I had never collected or even seen an *Ae. aegypti* in person. It's a distinct mosquito and the lyre-shaped pattern found on top of the scutum is well known and easy to recognize. The color and markings make it possible to confuse it with at least three other species common to our area: *Aedes albopictus*, *Aedes japonicus*, and *Orthopodomyia signifera*. *Aedes japonicus* has previously been collected in Norfolk in recent years, but white tips on the palpus and white banding on the hind tarsomeres ruled out the possibility of *Ae. japonicus*. The line markings on the scutum of *Or. signifera* may look like *Ae. aegypti* at first glance but the two mosquitoes have little else in common. *Aedes albopictus* and *Ae. aegypti* are very similar in overall size and coloring but *Ae. albopictus* has a single narrow white stripe on top of the scutum. My specimen was undoubtedly *Ae. aegypti*.

*Aedes aegypti* is a notorious spreader of mosquito-borne diseases. Second only to maybe *Anopheles* with its penchant for spreading malaria [see below!]. *Ae. aegypti* is a vector for dengue, chikungunya, yellow fever, and Zika. It's a container breeder often found in close proximity to humans. Unlike *Aedes albopictus* which is a more indiscriminate feeder, *Ae. aegypti* feeds almost exclusively on humans. Currently *Ae. aegypti* can be found mainly in southern Florida and some gulf coast areas of Texas and Louisiana. Maps often include Virginia in the potential range for the species but biologists in the area will attest that *Ae. aegypti* is not established in Hampton Roads. It has been found in the area sporadically but not consistently. Districts in northern Virginia such as Prince William County and Fairfax County report low but regular collections of *Ae. aegypti* every year.

continued next page

**Bits  
and  
Bites**

Five locally acquired malaria cases (*Plasmodium vivax*) have been identified in Florida (4) and Texas (1) in the last 2 months (posted June 26, 2023). Local transmission has not been seen in the US since 2003 when 8 cases were reported in Palm Beach County, FL.

Read the CDC's full health advisory [here](#).



## Cover Story: *Aedes aegypti* in Norfolk Continued

The initial specimen [shown on previous page] collected on 5/19/23 was in a CDC light trap placed in a cemetery in the southern part of the city. The cemetery is mostly surrounded by residential neighborhoods. Less than a mile away are 3 separate shipyards, with a fourth directly across the Elizabeth River. After the first *Ae. aegypti* was collected, we performed increased adult and larval surveillance in the area. Larval samples were taken from urns in the cemetery, as well as tires and other containers from the houses nearby. Of the 28 samples collected so far, 1 sample has produced a single male *Ae. aegypti*. The positive sample came from a concrete cemetery urn located about 100 feet from the light trap location. Under the recommendation from my colleagues, I dispatched BG sentinel traps to collect more adult specimens. Traps were placed in the cemetery, as well as additional traps set at varied distances and headings from the cemetery to gauge the extent of the *Ae. aegypti* population in the community. As of June 16th, 19 BG Sentinel traps were set in the area, plus additional light traps, and gravid traps. Five adult female *Ae. aegypti* have been trapped from two sites. The second collection site is located less than a quarter mile from the original cemetery site. Specimens were collected in EPI Weeks 20, 21, and 22 with none collected in Week 23. I also placed ovitraps and collected egg papers but have not yet attempted to identify the eggs or hatch them to adults.



Left: male *Ae. aegypti* hatched from larval collection; Right: 6 *Ae. aegypti* females collected from CDC and BG traps

It's not clear when the last *Ae. aegypti* was collected in Norfolk. As the resident biologist since 2004, this is the first one I have seen. State records indicate it was last collected in 2000 at two sites in the city. One of these sites is close to our current collection site but the other is located on the northern opposite side of the city. I spoke to Norman Grefe, currently Environmental Health Manager at the Norfolk Health Department, who was a biology intern that year and he said he does not recall trapping an *Ae. aegypti* that year but is unsure.

*continued next page*

# Cover Story: *Aedes aegypti* in Norfolk Continued

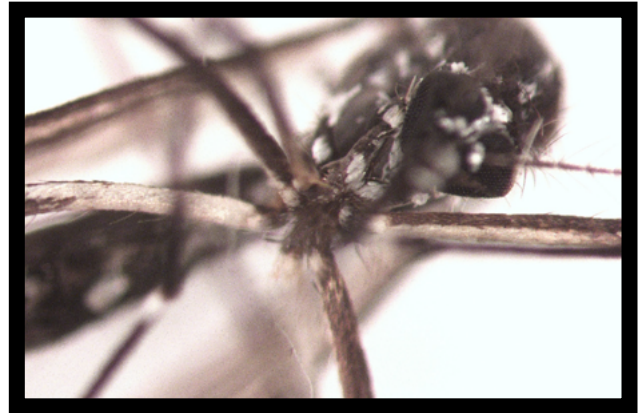
I plan to continue heavy trapping and larval surveillance in this area for the duration of the season. We currently have no plans to fog the neighborhood but may in the future if the need presents itself. We don't want to find ourselves back in the summer of 1855 when Norfolk was the site of the nation's worst yellow fever epidemic in United States history. Nearly one-third of the population of the city died when the *Benjamin Franklin* sailed into Norfolk from the West Indies for ship repairs bringing yellow fever with it. Perhaps our latest visitor followed a similar introduction.

Submitted by  
Penelope Smelser  
Norfolk DPH Vector Control

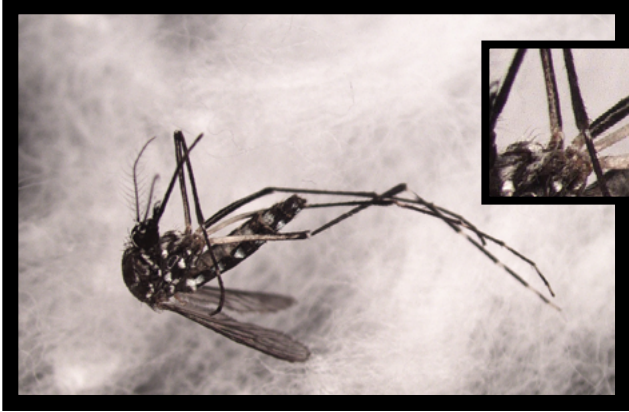
Check out these comparisons between  
*Ae. aegypti* (L) and *Ae. albopictus* (R)



Not listed in the key but noticeably different scales on sternum - dense and silvery on *Ae. aeg* vs. a bit more sparse, brighter white on *Ae. alb*



Another unlisted character but clearly different scale pattern on ventral abdomen - almost uniformly dingy, pale scales on *Ae. aeg* vs. black/white pattern on *Ae. alb*



Midfemur anterior longitudinal white stripe present only on *Ae. aegypti*



# NEVBD Vector Biology Boot Camp

The following few pages include testimonials from two VMCA members who attended the 2023 Vector Biology Boot Camp which is a free training event (housing and meals included!) designed for professionals working directly in vector surveillance and control.

The Northeast Regional Center for Excellence in Vector-Borne Diseases hosted a 3-day VectorBiologyBootCamp(Vector Biology Boot Camp - NEVBD (neregionalvectorcenter.com) at Penn State University. The training provides hands-on learning in vector surveillance operations for vector control professionals from the northeastern region of the US.

Day one included a presentation on tick and mosquito-borne disease concerns followed by a dinner to meet other professionals from North Carolina all the way up to Maine (and even one person from Arizona!). Day two involved a lab portion where



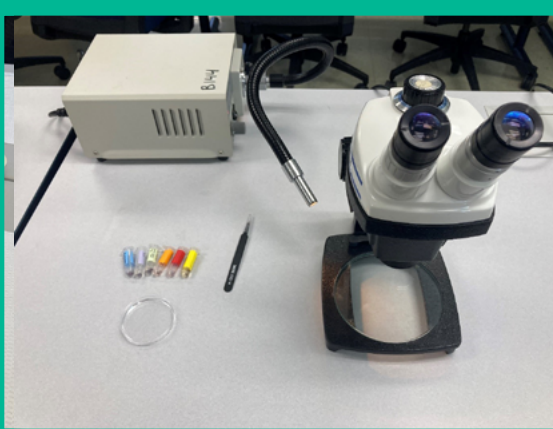
Learning about tick behavior with Dr. Erika Machtinger (front left)

participants identified tick and mosquito species and learned how to conduct a bottle bioassay with Lindsay Baxter (you might remember her from the 2023 VMCA Annual Meeting). Day two also consisted of a field portion where we learned about different mosquito traps including gravid traps, CDC hanging light traps, and resting boxes. We also used tick drags and observed different tick species' behaviors in the field. The Boot Camp concluded with lectures on vector-borne disease communication best practices, mosquito control, data management and analysis, and tick control.

*continued next page*



Setting up the CDC bottle bioassay to test for pesticide resistance in adult mosquitoes



ID'ing tick species



Black-legged adult male (left) and female (right) ticks – 'til death do us part

# Vector Biology Boot Camp Continued



Suited up to do tick sails!  
 Pro-tip: wear permethrin covered wrist bands to put around the wrist openings of the Tyvek suit.

As someone with only a year of experience in the vector control field, I found this experience to be invaluable. I've never done a bottle bioassay, dragged tick sails, or used resting boxes before, so I found the hands-on portions to be incredibly helpful for me. I also became more familiar with tick and mosquito-borne diseases, as well as which species they're linked to. For me, my favorite part of the Vector Biology Boot Camp was having the chance to connect with professionals from different states and programs. I enjoyed learning how others' jurisdictions managed mosquitoes and ticks, as well as what species or diseases they were looking for. All the lecturers provided a wealth of information and I'm grateful to have met so many experienced people in my field, who I'm sure I'll meet again in this tightly knit field.

Submitted by  
**Amanda Taglieri**  
 Fairfax County Health Department

**Call for  
 2024 VMCA  
 Board Nominations!**

Are you interested in being on the 2024 VMCA Executive Board or do you know a VMCA member who is? If so, please contact:

**Nominations Committee Chair Wes Robertson**

with name and contact information for you or your nominee.

**Call for Award Nominations!**

All that mosquito hunting, knowledge sharing, committee working deserves recognition! Please consider nominating your peers for their distinguished service to VMCA, outstanding field work, or research/education that benefits the state of Virginia.

**Read about all the awards  
 & how to submit a  
 nomination  
 here.**

**Bits & Bites**

**Bits & Bites**

**Bits & Bites**

# Vector Biology Boot Camp Continued

On May 16, 2023, I arrived at Penn State University in University Park, Pennsylvania to attend Penn State Cooperative Extensions 2023 Vector Biology Boot.

University Park is a picturesque place with rolling hills, lush forests, scenic farmlands, and wide-open spaces. I felt lucky to spend the next few days at this university nestled between these landscapes, reviewing, supporting, and advancing my knowledge of tick and mosquito pathogens, bionomics, and the latest control practices.

The program was designed by collaborators from Penn State Extension, Cornell University, and the Center for Disease Control. While its core programming was developed to provide newer professionals with an in-depth introduction to vector control, there was a lot of relevant

information and experiences for seasoned veterans, too. I found the presentation “Vector-Borne Disease Communication Approaches” by Dr. Amelia Greiner to be especially compelling. As a Professor of Practice, Public, & Ecosystem Health at Cornell, Dr. Greiner’s presentation focused on audience analysis and encouraging community member behavioral change by training scientists, management specialists, technicians, and others in our field to recognize “stages of change” and communicate with our audience at their current stage level (see table, next page). For example, to effectively communicate with someone who has never worried about mosquitoes probably won’t respond to blanket campaigns, mailers, messages, and outreach events. According to Dr. Greiner’s analysis this audience falls into the “pre-

contemplation” group and can only be influenced after the feeling of “investment” is established. Investment comes in many forms but can generally be encouraged through the recognition of benefits which are directly associated with the person’s emotional and/or practical motivations and needs. While this may seem intuitive, many of us fail to reach this group effectively and only reach individuals in the “contemplation”, “preparation”, “action,” or “maintenance” groups. The realization that Henrico’s program may need to identify the informational needs and goals procedurally and analytically at each stage, and then cater our outreach programming to meet audiences that we have been inadvertently missing was eye opening.

*continued next page*



# Vector Biology Boot Camp Continued

**Table 3.** Stages of Change Model

Stage	Definition	Potential Change Strategies
Precontemplation	Has no intention of taking action within the next six months	Increase awareness of need for change; personalize information about risks and benefits
Contemplation	Intends to take action in the next six months	Motivate; encourage making specific plans
Preparation	Intends to take action within the next thirty days and has taken some behavioral steps in this direction	Assist with developing and implementing concrete action plans; help set gradual goals
Action	Has changed behavior for less than six months	Assist with feedback, problem solving, social support, and reinforcement
Maintenance	Has changed behavior for more than six months	Assist with coping, reminders, finding alternatives, avoiding slips/relapses (as applicable)

*Theory at a Glance: A Guide for Health Promotion Practice:*

<https://cancercontrol.cancer.gov/sites/default/files/2020-06/theory.pdf>



For more information about this program including a list of covered topics, instructors, and to apply for future events, visit the [NEVBD website](#).

While Dr. Greiner's presentation was not the only presentation to raise significant questions about how Henrico's program can better itself, it exemplified how this conference, and its content will help establish new goals for future projects.

In addition to these types of presentations the Boot Camp provided comprehensive introductions to mosquito and tick identification & biology, surveillance methodologies, resistance testing, and data analysis. It also proved to be a wonderful opportunity to network and gain program and professional perspective from

professionals across the County including but not limited to the Northeast.

I highly recommend that all programs look at having representatives apply to future Boot Camps. If you want to know more about my experience, please feel free to reach out.

**Submitted by Wes Robertson  
Henrico County SWI**

## What's That Answer



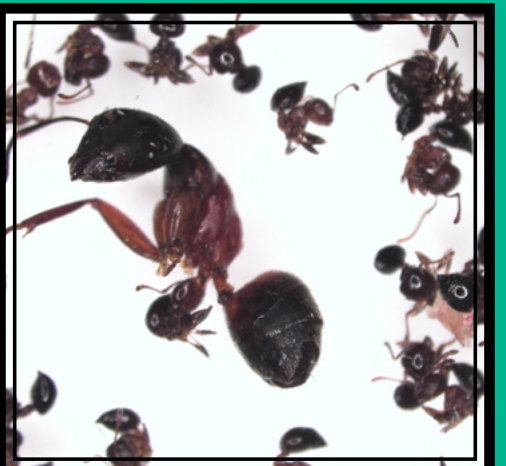
**That** is some adorable bycatch from a CDC trap (best guess at species: *Phidippus audax*, the bold jumping spider). I'll admit, I am normally not a spider person. It has taken me years of exposure in this field to come to... shall we say, tolerable terms with most arachnids. However, when they are immobilized under my microscope, I can see all their beauty without that creepy-crawly feeling I get in the field walking through a web or seeing them scramble (or in this one's case, jump!).

As much as we try to control for it via specialized lures, attractants, and innovative designs, bycatch is something we all deal with when it comes to live-animal trapping. For most of us skeeter stalkers, that means anything that's not a mosquito. Sometimes it's a slug in your BG bag, trapping mosquitoes in its trail of mucus; or a moth in a CDC who survives the freezer and flutters through your petri dish, scrambling your delicate piles of identified mosquitoes; or maybe ants have had a midnight feast and left you nothing but an assortment of thoraxes to make sense of.

But sometimes bycatch can liven up your day with something strange, interesting, or even...cute?  
You be the judge!

*continued next page*

# What's That Answer Continued



From left to right some of these are best guesses! If you know any of these species, please let me know!

**Top:** weevil (look at those puppy dog eyes!), ladybug larva feeding on *Cx. pipiens*, Mordellidae (tumbling flower beetle)

**Middle:** Cerambycidae (longhorn beetle), tree frog released from a BG trap, Emesinae (thread-legged assassin bug)

**Bottom:** Dolichopodidae (long-legged fly), Cercopoidea (spittlebug nymph), Ants! (*Crematogaster*, perhaps?)

Submitted by  
Karen Akaratovic  
Suffolk Mosquito Control  
with thanks to SMC staff  
for saving specimens!



# Jurisdictions, Organizations, and Resources

## Virginia mosquito control jurisdictions

- [Alexandria Health Department](#)
- [Boykins, Town of](#)
- [Chesapeake Mosquito Control Commission](#)
- [Chincoteague Mosquito Control](#)
- [Fairfax County Health Department](#)
- [Gloucester County Mosquito Control](#)
- [Hampton Environmental Services](#)
- [Henrico County](#)
- [Joint Base Langley-Eustis](#)
- [Newport News Vector Control](#)
- [Norfolk Vector Control](#)
- [Poquoson Mosquito and Drainage](#)
- [Portsmouth Mosquito Control](#)
- [Prince William County Mosquito & Forest Pest Management](#)
- [Suffolk Mosquito Control](#)
- [Virginia Beach Mosquito Control](#)
- [Williamsburg Public Works](#)
- [York County Mosquito Control](#)

Know of another jurisdiction, organization, or resource to add? Please submit them to the [Editor](#).

## Neighboring, regional, & national mosquito control organizations

- [American Mosquito Control Association](#)
- [Mid-Atlantic Mosquito Control Association](#)
- [Delaware Department of Natural Resources and Environmental Control](#)
- [Maryland Department of Agriculture](#)
- [New Jersey Mosquito Control Association](#)
- [North Carolina Mosquito and Vector Control Association](#)
- [Northeastern Mosquito Control Association](#)
- [South Carolina Mosquito Control Association](#)
- [Georgia Mosquito Control Association](#)
- [Florida Mosquito Control Association](#)

## Other resources

- [Virginia Department of Health](#)
- [Centers for Disease Control & Prevention](#)
- [Fairfax County Education and Outreach Materials](#)
- [Northeast Regional Center for Excellence in Vector-borne Diseases](#)
- [VMCA Employment Opportunities](#)
- [AMCA Career Center](#)

# SUBMISSIONS WANTED!

Do you have photos of mosquitoes or other insects, arachnids, maybe their related predators/prey?

Do you have any information you'd like to share with membership?



We'll take whatever you're willing to share!

- » organizational updates
- » operational news
- » experimental findings
- » education/outreach
- » photography

Please email *The Skeeter* Editor, Karen Akaratovic at [kakaratovic@suffolkva.us](mailto:kakaratovic@suffolkva.us) or you can [submit online](#).

# 2023 Sustaining Members

The VMCA gratefully acknowledges the support of the following sustaining members for 2023. Without their generous contributions, much of what we do would not be possible. Please do not hesitate to contact them. They are here to help you!



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**Volunteer on a committee!** Active members make a stronger organization. Contact the chairperson of a committee that interests you or any member of the VMCA Executive Board to participate.

Read about the committees in the [VMCA Book of Guidelines](#).

# 2023 VMCA Executive Board

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OFFICIAL NEWSLETTER  
OF THE  
**VIRGINIA MOSQUITO  
CONTROL ASSOCIATION**

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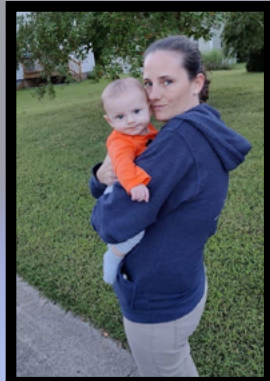
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CAULKINS, ANDY LIMA, PENELOPE  
SMELSER, OTHERS NOTED  
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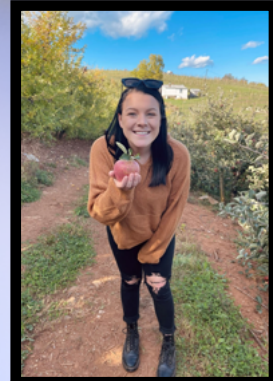


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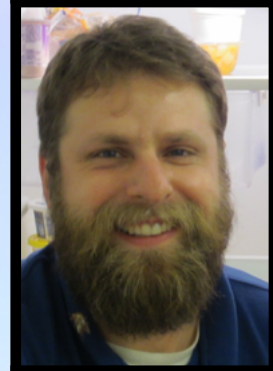


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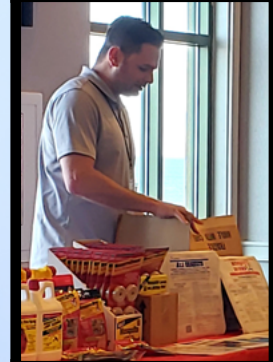


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The Skeeter is the official publication of the Virginia Mosquito Control Association. The VMCA membership is encouraged to submit articles, reviews, photography, and any other interesting facts or tidbits for publication. Submissions can be sent to Karen Akaratovic: [kakaratovic@suffolkva.us](mailto:kakaratovic@suffolkva.us)

