

THE SKEETER

VOL. 83, No. 3

2023 Fall Newsletter



OFFICIAL NEWSLETTER OF THE VIRGINIA MOSQUITO CONTROL ASSOCIATION

President's Address

Happy Fall everyone!

I don't know about you, but this is my favorite time of year! I am already enjoying the cooler temperatures! I hope Tropical Storm Ophelia didn't cause too much trouble for everyone. I knew we couldn't make it through the end of September without some sort of storm.

I would like to take this time to give a shout out to all the VMCA board members! They are all working hard to make sure we have an amazing conference! With that being said, [Registration is now open](#) for the 2024 VMCA Annual Conference! Please take advantage of the early bird pricing. If you are [interested in presenting](#), please fill out the presentation form on the website.

Please take the time to read over the [proposed bylaw changes](#) that we will be voting on at the upcoming conference! Now is also the time to start thinking about anyone you want to nominate for special awards.

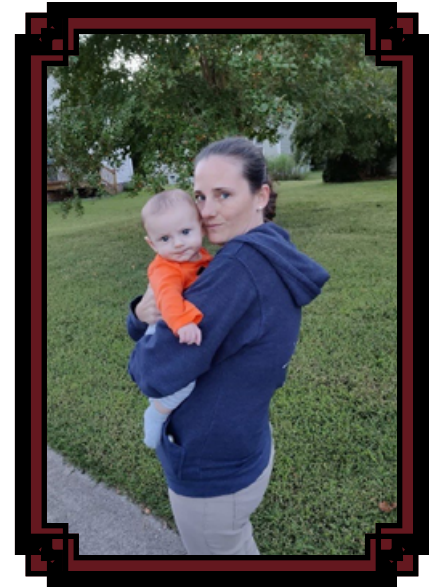
[Poster deadline](#) for the Student Competition Committee is November 30th. Now is the time to start thinking about any items you have that you would like to donate to the Student Competition Committee for the [Silent Auction](#).

This is your last chance to register for the [Tour de Skeeter](#), big thanks to our 2023 sponsors: Azelis, Central Life Sciences, Clarke, and Target!

New this year to the VMCA is the [Photo Contest](#), please submit any photos by December 31st.

If you are [interested in joining the board](#) or have someone you think would be a great candidate, please email Past President Wes Robertson at rob106@henrico.us.

Registration is now open for the [2024 Recertification Course](#) and make sure you take the time to read about the Chesapeake Mosquito Control Commission in the [City Spotlight!](#)



Carla Caulkins
2023 VMCA President



Announcements

UPCOMING EVENTS

VMCA Executive Board Meeting

October 18, 2023; more dates posted [online](#)
email virginiamosquito@gmail.com to register

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 IN THIS ISSUE

- [2](#) President's Address
- [3](#) Announcements, What's That?
- [4](#) TdS 2023 - Last Chance to Register!
- [5](#) VMCA Conference Registration
- [6](#) Call for Presentations
- [7](#) Call for Executive Board Nominations
- [8](#) Proposed Bylaws Changes
- [9](#) First Annual Photo Contest
- [10](#) Call for Award Nominations
- [11](#) C&P Committee Update
- [13](#) 8th Annual Student Poster Competition
- [14](#) Chesapeake in the Spotlight
- [18](#) Silent Auction 2024
- [19](#) VMCA Recertification Course 2024
- [21](#) What's That Answer
- [23](#) Jurisdictions and Resources
- [24](#) 2023 Sustaining Members
- [25](#) 2023 Committee List
- [26](#) 2023 Executive Board

DID YOU KNOW?

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

WHAT'S ON THE COVER

Psorophora ferox, the beautiful yet aggressively-biting lady we love to hate in the summer and fall months, has chosen sugar over blood this time; photography by Kaitlyn Price, Biologist for Virginia Beach Mosquito Control

WHAT'S THAT?



Answer on [page 21](#)

VIRGINIA MOSQUITO CONTROL ASSOCIATION

STUDENT COMPETITION COMMITTEE - 5TH ANNUAL EVENT

LAST CHANCE TO REGISTER!

TOUR DE SKEETER

\$20

**LATE REGISTRATION
CLOSES 10.13 @12PM**

**DON'T MISS YOUR
CHANCE TO WIN THE
\$200 AMAZON CARD!**



SATURDAY - OCTOBER 14, 2023 - 12-4PM

VIRGINIA CAPITAL TRAIL

**WWW.MOSQUITO-VA.ORG/
2023-TOUR-DE-SKEETER**

THANK YOU, 2023 SPONSORS!



77th Annual Conference Registration

2024 Membership and Conference Registration Are Now Open!

The 2024 annual conference will take place at the **Hilton Virginia Beach Oceanfront, February 20-22, 2024**. More details can be found at: <https://mosquito-va.org/2024-annual-conference>. As more details are available (including the link to VMCA's hotel room block), this site will be updated.

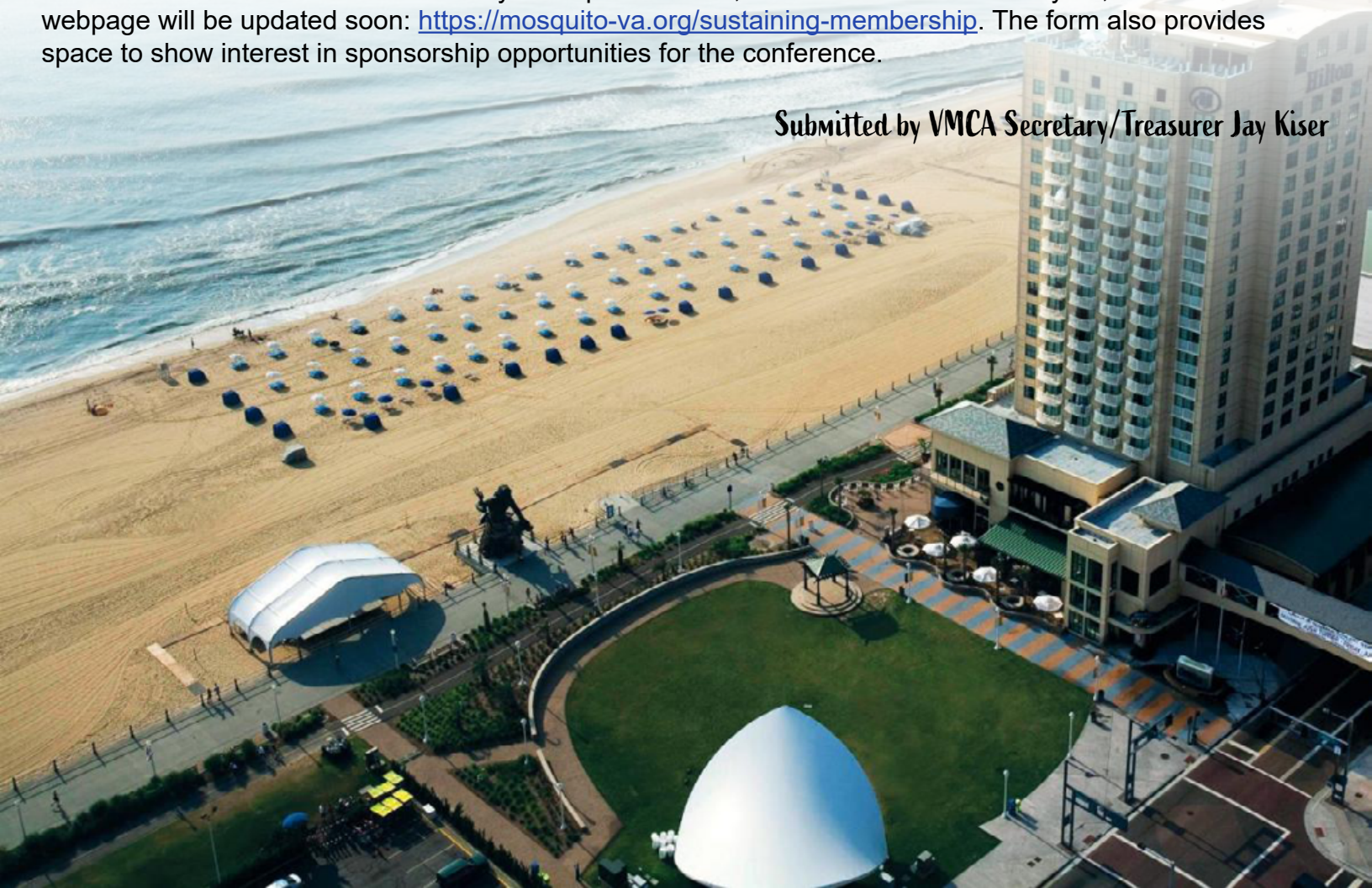
VMCA is offering an **early bird registration** this year and it is now open through January 26, 2024. Early bird registration offers a price discount, so be sure to register by this deadline and avoid higher prices. Online registration forms can be found here: <https://mosquito-va.org/2024-annual-conference>.

Honorary members, don't forget you can come to the conference for free. Make sure you still register so we know you are coming.

As usual, **VMCA membership** is complimentary when registering for the annual conference. If you do not plan to attend the conference and would like to be a VMCA member, please sign up here: <https://mosquito-va.org/membership>.

Sustaining members, you also have an early bird option for sustaining membership/conference registration. We are still working on your registration form and updating the conference sponsorship section, but it should be finished soon. You will have an early bird option as well, with a due date of January 26, 2024. The VMCA webpage will be updated soon: <https://mosquito-va.org/sustaining-membership>. The form also provides space to show interest in sponsorship opportunities for the conference.

Submitted by VMCA Secretary/Treasurer Jay Kiser





CALL FOR PRESENTERS!

VMCA'S 77TH

Annual Conference

Feb. 20-22, 2024 @Hilton VB Oceanfront

*Thinking about presenting at the 2024 conference?
We're so excited to see all of you!*

*Look
who's
already
signed up!*



SUBMIT PRESENTATIONS BY:
 **NOVEMBER 3**

[SUBMIT HERE](#)

www.mosquito-va.org/2024-annual-conference

Contact President Elect Karen Akaratovic with any questions

Call for Executive Board Nominations



We are currently seeking nominations for several positions within the Executive Board of the Virginia Mosquito Control Association. The executive structure consists of a President, Past President, President Elect, Vice President, First Vice President, Industry Representative, MAMCA Representative, TMVCC Representative, and Secretary/Treasurer.

Nominations are needed for Industry Representative, First Vice President, and Secretary/Treasurer.

That said, there might be some unique circumstances surrounding the Secretary/Treasurer position in 2024. It is VMCA's intention to propose and vote on a splitting of the Secretary/Treasurer position at this year's annual business meeting. The elected nominee for the current combined position may retain/occupy only one of these positions and leave the other to be filled by an interim in 2024. The most effective way to get this done would be to have several interested members run for the combined position with the understanding that the person with the second highest number of votes would be considered for 2024 interim if the "Secretary/Treasurer splitting motion" carries. This would allow for membership to associate a particular person with the position's interest and allow for a very quick transition.

As a reminder and to hopefully help with obtaining nominees, I have listed the duties of all positions currently accepting nominations for 2024. You can also find more detail in the [2023 VMCA Guidelines](#).

The Secretary/Treasurer:

- ▶ The **VMCA Secretary** is responsible for keeping the minutes at official functions and monthly Executive Board meetings. They are also responsible for presenting (usually in typed form) minutes prior to Executive meetings. Additionally, they work together with the board and members to ensure proper notices and emails are given and provided in accordance with the bylaws (serve as the primary VMCA contact/coordinator) on announcements, events, etc.

continued next page

Call for Board Nominations Continued

- ▶ The **VMCA Treasurer** is responsible for handling the VMCA financial responsibilities which include but are not limited to maintaining bank account and associated payment options (e.g., checkbooks), keeping accurate records, making purchases, issuing receipts, refunds, reimbursements, keeping track of funds and financial reports and contributing to the annual VMCA audit.

The First Vice President is responsible for actively participating in VMCA board meetings and the annual conference, assisting other board members as needed, and compiling the annual conference statistics via surveys, reports, and/or other means.

The Industry Representative represents the interests of the vendors and works to address their interests, needs, and concerns within the VMCA structure.

You may nominate yourself or someone else by reaching out to **Wes Robertson**

and indicating the position of interest. Please include your contact information.

The slate of candidates will be presented for voting at this year's Annual Conference February 20-22, 2024.

Submitted by Past President & Nominations Committee Chair Wes Robertson

Proposed Bylaws Changes

Please review the 2024 proposed bylaw changes located here: <https://mosquito-va.org/bylaws>.

These proposed changes will be voted on during the 2024 VMCA Business Meeting (February 22, 2024). The list of changes can be found below. The article on the website (and in the Summer *Skeeter*) will give you explanations for the changes and the actual proposed wording in the bylaws document.

Please take a look and be ready to share your opinion during the discussion and voting at the 2024 business meeting. Proposed bylaws changes include:

- Splitting the duties of the VMCA secretary/treasurer into two separate executive board positions.
- Removing the first vice president board position and have the vice president as the entry-level position to the board.
- Verbiage changes and extra explanations where needed for clarity and consistency.



Submitted by Bylaws Committee Chair Jay Kiser

**CENTRAL LIFE SCIENCES
PRESENTS....**

**THE 1ST
ANNUAL
VMCA PHOTO
CONTEST**

*Show your photography skill
& win cash prizes*



CONTEST
DEADLINE
**DECEMBER 31,
2023**

VOTING BEGINS
**JANUARY 1,
2024**



TOTAL CASH
PRIZES
\$250

For general entry rules and detailed
photo criteria, please visit our site:

<https://mosquito-va.org/1st-annual-photo-contest>

**GIVE US
YOUR BEST
SHOT!**

JOIN IN THE
FUN



Call for Award Nominations



Each year at the annual meeting, VMCA recognizes individuals or a group of individuals who have contributed to making the VMCA the best it can be. The Awards Committee and VMCA Executive Board accept and encourage nominations of members and peers who deserve recognition.

Award Descriptions

R.E. Dorer Award: The highest honor award that may be given to a very elite individual that has contributed much to VMCA. Nominations should be submitted in writing to the awards committee and will be brought to the executive board for unanimous approval.

Honorary Membership: An award that may be given to someone that has contributed to VMCA and may be near retirement. Nomination for this honor must be justified in writing and submitted to the executive board for review. The executive board shall be required to vote unanimously to confirm the honorary membership nominee.

Dr. Jorge Arias Student Competition Award: Award given to the winner of each year's student competition.

Dr. Bruce Harrison Mosquito Research Award: Award bestowed on an individual or group of individuals who have contributed greatly to the improvement of mosquito knowledge in or affecting the state of Virginia through the peer-reviewed publication of mosquito research and shown a dedication to the sharing of this knowledge through teaching and training; Written rationale for the nominations must be submitted to the executive board for unanimous approval.

Distinguished Service Award: Awarded for exceptional service with VMCA organizational work

Outstanding Service Award: Awarded for exceptional service in field work

Certificate of Appreciation: Award given to a non-member that did some special service for VMCA

For a list of past award recipients, check out the [Awards Page](#) on the VMCA website.

Please send your nominations and supporting documentation via email to Awards Committee Chair [Jennifer Barritt](#) by December 15th, 2023

Curations and Preservation Committee Update & Call for Culicidae

Welcome to Fall!

The Curation and Preservation Committee has been slowly accumulating specimen lists from around the state to boost our blossoming adult & larvae mosquito collections. In addition to preserving larvae in vials of 80% ETOH we have also pinned some of our adult specimens in several view boxes. That said, take a few minutes and check out our specimen lists below. We would love for you to fill in some of our specimen gaps.

Larvae vialled in 80% ETOH

Aedes albopictus (50)
Aedes atlanticus (6)
Aedes japonicus (44)
Aedes triseriatus (22)
Aedes vexans (50)
Culex pipiens (40)
Culex restuans (50)
Culex salinarius (45)
Orthopodomyia signifera (48)
Psorophora columbiae (26)
Psorophora ferox (31)
Psorophora howardii (8)
Toxorhynchites rutilus septentrionalis (8)
Uranotaenia sapphirina (2)

Adults pinned or in cold storage

Anopheles punctipennis (3)
Aedes albopictus
Aedes japonicus
Aedes triseriatus (2)
Coquillettidia perturbans
Culex restuans/pipiens
Psorophora columbiae (5)
Psorophora ferox
Toxorhynchites rutilus

Single adults unless otherwise indicated.

In addition to the above specimens, we have received several other larvae and adults that are still waiting identity confirmation. If you would like to contribute, please ensure that all larval specimens are stored in 80% ethyl alcohol (ethanol) and all adults are kept in cold storage preferably in hard vials/encasements to prevent damage.

**Specimens can be packaged for transfer and delivered directly to
Wes Robertson at this year's VMCA Annual Conference.**

Submitted by Wes Robertson, Curations and Preservation Committee Chair

C&P Committee Call Continued

Fall is a great time to get out and find some larvae!

As we all know, just because the weather is cooling off, doesn't mean the mosquitoes have disappeared. In fact, fall can be one of the best times to go larval hunting - more pleasant weather and usually less bitey! Additionally, hurricane season can cause all kinds of flooding and flushing of habitats. Below is another list for you, adjusted to reflect collections we already hold. Happy Hunting!

| Species | Primary Habitat Type |
|------------------------------------|---|
| <i>Ae. aegypti</i> * | artificial containers, tires |
| <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. 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>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. 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



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

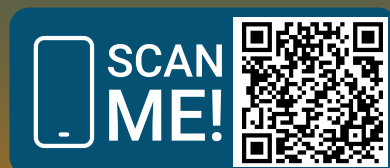
1st Place: \$500
2nd Place: \$300
3rd Place: \$200



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>

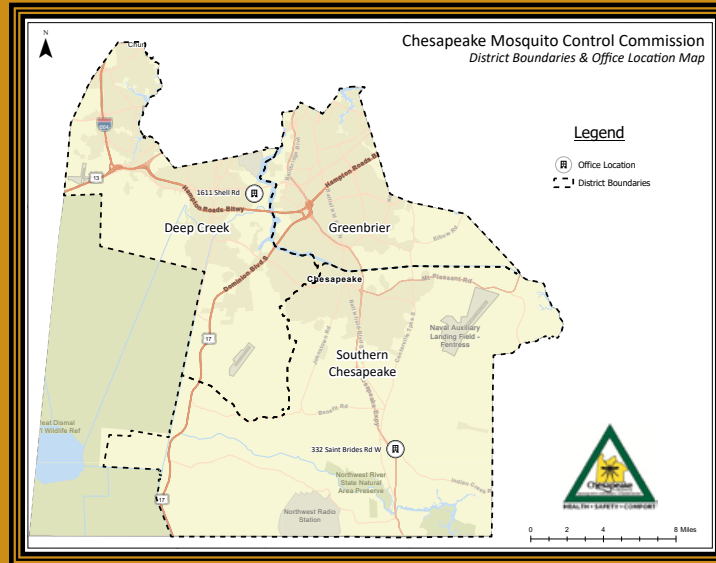
Chesapeake in the Spotlight

CMCC Mission and Organization

Much like other mosquito control districts of Virginia, the mission of the Chesapeake Mosquito Control Commission (CMCC) is to protect the health and welfare of the citizens and visitors of Chesapeake by controlling mosquito populations, and mosquito-borne diseases. Our philosophy is to use IPM practices, with an ecologically sensitive approach. By employing several different control techniques and the safest, most effective pesticides for target species, we strive to achieve our goals with minimal disruption to people or the environment.

The Chesapeake Mosquito Control Board of Commissioners consists of six volunteer members appointed by the Chesapeake City Council, and a designee of the Virginia State Health Commissioner who serves as Commission Chair. The Board oversees the operating budget and the overall mosquito control program. Details of the operation and day-to-day financial decisions are the responsibility of the Director.

The Commission consists of three working districts: Deep Creek, Greenbrier, and Southern Chesapeake. The other departments of CMCC include administration, biology, and mechanical.



Biology Department and Surveillance

Surveillance of mosquito populations and mosquito-borne disease activity drives all pesticide application decisions. CMCC has a sophisticated monitoring program designed to provide data on the populations of many different mosquito species and the activity of EEE and WNV. The biology department carries out this program by using different types of adult mosquito



traps. The department consists of three full-time employees and two seasonal technicians. Mosquito traps are set on a two-week rotation and an average of 55 traps are set per week.

So far for the 2023 mosquito season we have set 1,187 mosquito traps and caught 123,818 female mosquitoes. The top three species caught to-date for this season are: *Culex salinarius* with 44,313 caught,

Culiseta melanura with 24,873 caught, and *Culex pipiens* with 17,555 caught. The high numbers of *Culex salinarius* is an odd characteristic of the 2023 Chesapeake mosquito season. Arboviral disease test results are relatively consistent for the city with a total of 12 EEE and three WNV positive mosquito pools this season (as of EPI Week 37).

The other main technique for monitoring disease activity in Chesapeake is the use of sentinel chicken flocks. Small groups of chickens are placed strategically throughout the city where they may be exposed to biting mosquitoes. Both EEE and WNV depend on circulation through the wild bird population, and as the diseases amplify, the chickens are often infected. We take a very small sample of the chickens' blood, once a week, and submit it to the state laboratory.

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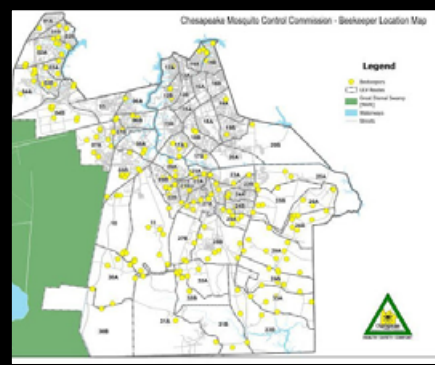
Chesapeake Spotlight Continued

The lab then notifies us of the results and we can let the appropriate people know, so we can send out notifications and treat the specific areas, as done for any positive result from arboviral disease testing. Thus far (as of EPI Week 37), there have been 2 EEE positive chickens for the 2023 mosquito season.

More than any other factor, mosquito populations and disease activity are dependent on weather conditions. The biology laboratory records daily weather data, including temperatures, rainfall and wind speed / direction, from different sources including weather stations at the Deep Creek and Southern Chesapeake locations. This information is used to predict problems with certain species, direct control efforts and thoroughly plan pesticide applications.

Alongside seasonal surveillance, the biology lab runs resistance tests, as well as efficacy tests on the products being used annually. The methods of testing include bottle bio-assay, cage field trials, shipping larval samples to outside lab resources, and larval field trials among others.

During the winter months we have an extensive larval surveillance program. We go out weekly to dip for larvae and report back to the field crews on what we are seeing. In the spring



Top to Bottom: Biologist Katherine Reutt; FieldSeeker spray session; ArcGIS-CMCC; Beekeeper location map

the field crews will place long lasting products in the places where we are seeing the larvae.

Advancements of 2023 – New ULV Software

New for the 2023 season, the Commission purchased the FieldSeeker Windows ULV software and equipment upgrade to replace our aging system, in support of our light-duty ULV truck fleet. The new software provides detailed data and a centralized location for data storage for each ULV spray session. Operationally the system renders beneficial information that supports the success of our ULV program. Information obtained through the system includes location and speed of our 14 ULV vehicles, flow rate and application verification.

Pertinent data can be entered into the system including spray routes, restricted areas and imported shapefiles. The information is transferred and corresponding maps are created by our GIS Analyst to visually illustrate our spray sessions, which highlights the new systems capability to be integrated into our current GIS profiles.

continued next page

Chesapeake Spotlight Continued

The user function incorporated into the mobile devices provides our operators with real time visual and auditory cues that alert our drivers of impending hazards and or restricted areas throughout our 33 ULV application routes. The notification feature improves accuracy for drivers to navigate responsibly around our 200 combined Beekeepers and Pesticide sensitive citizens, supporting our commitment to being environmentally responsible.

Mosquito Control Information Team

CMCC holds community education, outreach and engagement at a high level of importance. The emergence of the Mosquito Control Information Team in early 2022 set a new standard on how we inform the public of all things related to our mosquito control efforts. Educational materials were updated and all employees were encouraged to sign up to become team members, which allowed for an exceedingly high level of participation. Over half of the commission employees are team members and each department is well represented.

High participation from employees enabled the MCIT to attend over 20 events within the city in under two years. There is a wide variety of events that the team attends, each serving a purpose for different audiences. Events



attended by our team include: the Chesapeake Jubilee, school career days, Town Meetings, and National Night Out, among others. There are opportunities for the team to either attend events or contribute to an activity almost every month out of the year! This new organization and conduct of community engagement has granted CMCC more positive interactions with the citizens of Chesapeake.

The MCIT has surpassed its initial goal of expanding outreach activity participation. We have embraced the use of current community engagement resources in order to update display materials, use relevant media methods, and further our interdepartmental communications within the city to gain a stronger platform.

continued next page

Chesapeake Spotlight Continued

Thus enhancing our ability to carry out the CMCC mission. The team also empowers employees to become more active in their roles within the commission. Employees can showcase their knowledge and geniality while educating citizens and engaging with the public.

Participation through the MC Information Team lets us do a better job of maintaining the “health, safety, and comfort” throughout Chesapeake. We have learned more about concerns of citizens, and we are able to spread accurate

information. The team has made a lasting impression on our community and is a fine addition to our mosquito control operations.



Collaborative Efforts By:

Lisa Wagenbrenner, Director
 Carla Caulkins, Biologist II
 Zollie Russell, Operations Manager
 Katherine Reutt, Biologist I/
 MC Information Team Coordinator

Bits & Bites

In our summer issue, we reported on the findings of **5 locally acquired malaria cases in the US** (4 in Florida and 1 in Texas). On August 28, 2023, the CDC issued another Health Alert Network Update.

“On August 18, 2023, a **single case of locally acquired malaria was reported in Maryland in the National Capital Region**. This case was caused by the *Plasmodium falciparum* (*P. falciparum*) species and is unrelated to the cases involving local transmission of *Plasmodium vivax* (*P. vivax*) malaria in Florida and Texas described in the **[HAN Health Advisory 494](#)** issued on June 26, 2023.



Anopheles stephensi, invasive species in Africa
 photo credit: CDC

As an update to that report, to date, Florida has identified seven cases and Texas has identified one case of locally acquired *P. vivax* malaria, but there have been no reports of local transmission of malaria in Florida or Texas since mid-July 2023.”

To read the full report and for more information on malaria **[click here](#)**.

VIRGINIA MOSQUITO CONTROL ASSOCIATION

SILENT AUCTION 2024

PLEASE DONATE

All proceeds benefit the VMCA Student Poster Competition



WE ARE LOOKING FOR A VARIETY OF ITEMS, INCLUDING BUT NOT LIMITED TO:

- Vector themed items
- Tools
- Artwork
- Antiques/Historical items
- Gift certificates
- Treasures
- Themed Prize basket
- Apparel

Group donations by committee, agency, or vendors are always appreciated

Please drop off items at meeting registration desk by noon, February 20, 2024.

Items may also be sent/dropped off before the meeting to:

Suffolk Mosquito Control
800 Carolina Road, Suffolk, VA, 23434



VMCA Annual Conference

February 20-22, 2024
Virginia Beach, VA.

Conference information:



What does this support?



For more information contact:

Jay Kiser
virginiamosquito@gmail.com

ANNOUNCEMENT

VMCA RECERTIFICATION COURSE



January 17, 2024

Start Time: 9:00 AM

**Chesapeake Mosquito Control Commission
1611 Shell Rd., Chesapeake, VA 23323**

For registration + other course details, please visit:
<https://mosquito-va.org/recertification-course>

Recertification Course - Preliminary Agenda

VMCA RECERTIFICATION COURSE

Chesapeake Mosquito Control Commission
1611 Shell Road, Chesapeake, VA 23323

January 17th, 2024
Start time: 9:00 AM

Meeting called by VMCA Education Committee

Please bring: Pesticide Applicator Certificate/Number

| | | |
|---------------------|---|---|
| 9:00 AM | Registration Coffee & donuts will be available | Jay Kiser VMCA Secretary |
| 9:30 – 9:35 | Welcome | VMCA Board Member |
| 9:35 – 10:15 | Legal Aspects Certification categories and procedures, responsibilities of pesticide applicators, EPA approval of pesticide labeling, | Robert Christian Investigator, VDACS |
| 10:15 – 10:45 | Vectors, Life Cycle & Control/Surveillance/Environmental Mosquitoes, IPM, sensitive areas, harmful effects on non-target plants and animals | Katherine Reutt Biologist I, Chesapeake Mosquito Control Commission |
| 10:45 – 11:15 | Personal Protective Equipment Chemical resistant protective equipment, protecting your skin, eyes, respiratory tract and properly maintaining personal protective equipment | Lisa Wagenbrenner Director, Chesapeake Mosquito Control Commission |
| 11:15 – 11:45 | Formulations and Products Liquid Formulations, Dry Formulations, Fumigants and Adjuvants | TBA |
| 11:45 AM – 12:45 PM | BREAK Meal not provided by the VMCA | |
| 12:45 – 1:15 | Applying the Correct Amount Deciding how much to apply, calibration methods, calibrating your equipment and measuring accurately. | Jennifer Barritt Superintendent, Virginia Beach Mosquito Control |
| 1:15 – 1:45 | Pesticide Handling, Mixing and Loading Personal safety considerations, pre-application decisions, safe mixing and loading practices and applying pesticides safely. | Tim DuBois Interim Director of Public Works, City of Portsmouth |

What's That Answer

Many of us have been fortunate to observe a *Toxorhynchites* or *Psorophora* larva attacking and consuming another mosquito larva - whether in our dipper, a rearing chamber, or at best watching it under our microscope. **But did you ever wonder what our naked eyes are missing during this interaction?**

Using high-speed cameras, [Hancock et al. 2022](#) have shown us how *Sabethes cyaneus*, *Toxorhynchites amboinensis*, and *Psorophora ciliata* capture their prey, and it's pretty spectacular; the latter two species show **convergent evolution of prey-capture mechanisms**.

“Despite their distant relatedness in different tribes of the Culicidae and dissimilar life histories, the obligate predators *Tx. amboinensis* and *Ps. ciliata* have apparently converged on a similar mechanical strategy for preying on mosquito larvae (Fig. 7 [next page]). By utilizing high speed macrocinematography with sufficient light and magnification to resolve details in the movements of head structures and anteriorabdominal segments, we clearly elucidated dynamic head-propulsion mechanisms that appear to be dependent on hemostatic pressure generated in the anterior abdominal segments. Furthermore, prey grasping at the end of head-propulsion involves simultaneous cooperation of both the mandibles and the LPBs [lateral palatal brushes]...”

This brings us to THAT (d in the figure below) which is a *Psorophora ciliata* larva striking an *Aedes aegypti* with its neck at peak extension, mandibles gaping, and lateral palatal brushes fanning. See the full strike sequence below. Even more impressive are the videos that you can [watch here](#) (1-5 are *Sa. cyaneus*; 6-8 are *Tx. amboinensis*; and my personal favorites, [9](#) and [10](#) are *Ps. ciliata*).

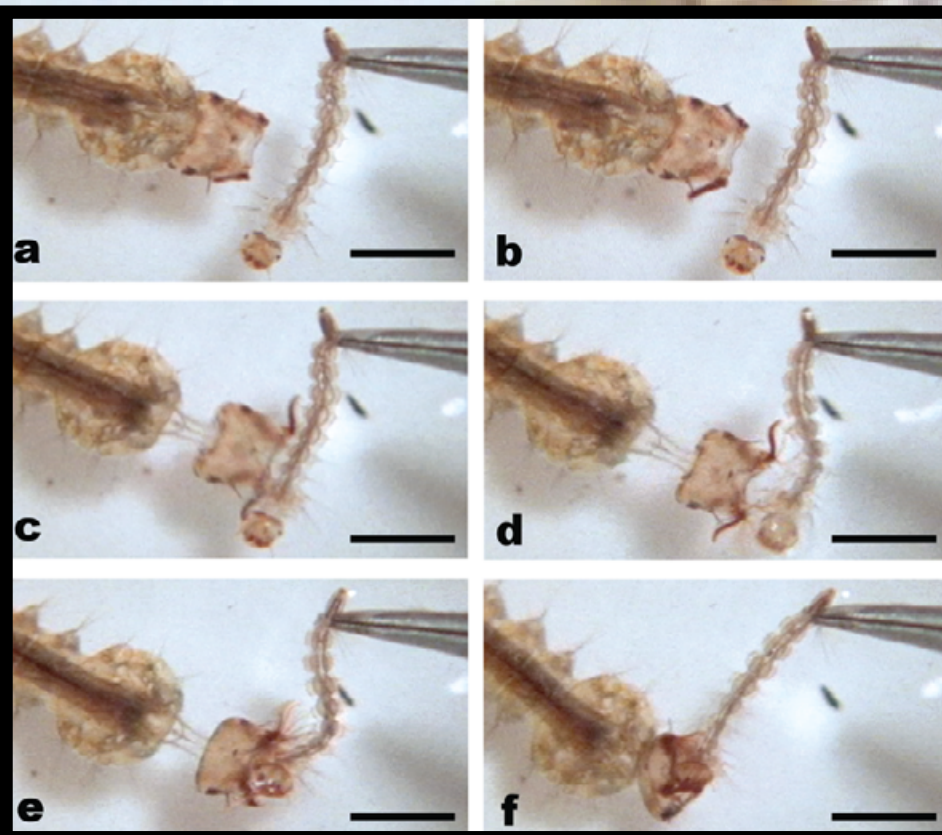
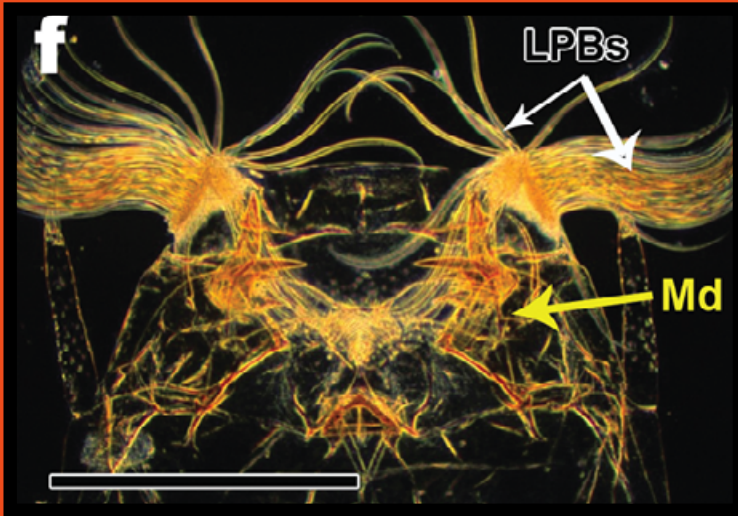


Fig. 6. Strike sequence frame grabs of *Ps. ciliata* on tethered *Ae. aegypti* prey: (a) LPBs closed in resting position and head in normal position against the thorax; (b) LPBs opening; (c) neck extension/head propulsion (note the contraction of abdominal segment 1 in the upper left of the frame) and LPBs in “open position” (pre fanning); (d) peak of neck extension, mandibles gaping and some LPB fanning; (e) gaping mandible closing and extensive LPB fanning to form basket; (f) head retraction, mandibles closed, and LPB elements folded down and forward from their fanned position more tightly onto the prey. Scale = 2 mm.

continued next page

What's That Answer Continued



Left: Detailed photography of *Ps. ciliata* mouthparts highlighting the curved lateral palatal brushes (LPB) and “heavily-toothed” mandibles (Md) which aid in prey-capture and manipulation (Figure 1(f) in the [article](#)).

Below: Detailed diagram of the key structures and mechanisms involved in *Tx. amboinensis* and *Ps. ciliata* prey-capture (Figure 7 from article).

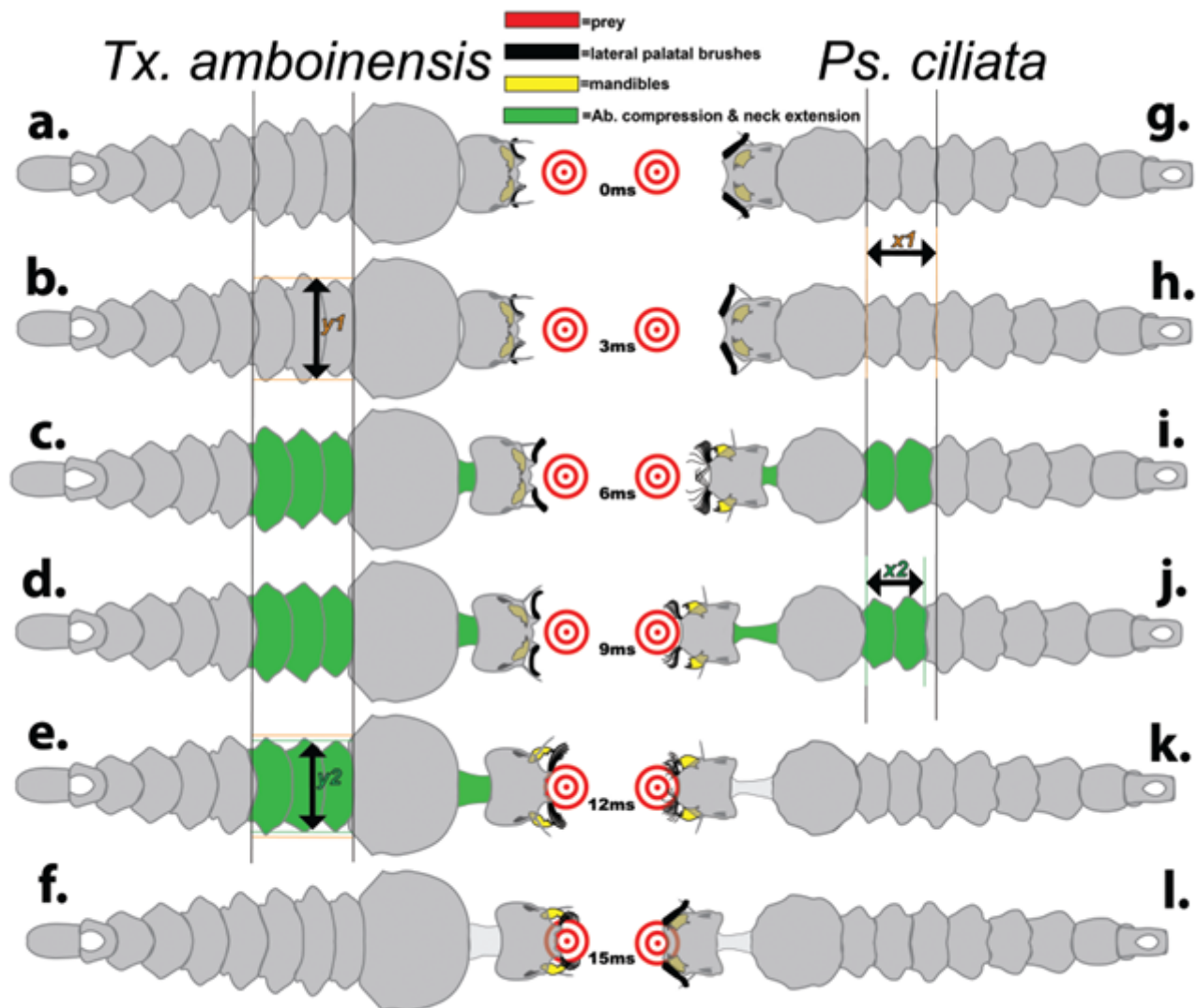


Fig. 7. Strike sequence on a bullseye prey target for *Tx. amboinensis* (a–f on left side) and *Ps. ciliata* (g–l on the right side). Key structures are the mandibles, LPBs, and necks. y_1 and y_2 represent changes in length due to radial compression in *Tx. amboinensis* abdominal segments I–III while x_1 and x_2 represent changes in length due to axial compression in *Ps. ciliata* abdominal segments I and II. Running time values from onset of strike movement shown as milliseconds (ms).

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 Public Works](#)
- [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 or you can [submit online](#).

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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

THE SKEETER

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

Skeeter Production Team

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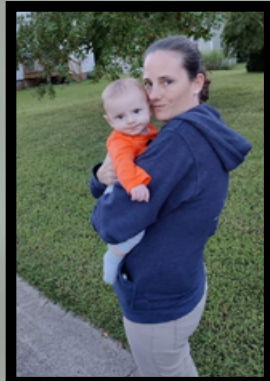
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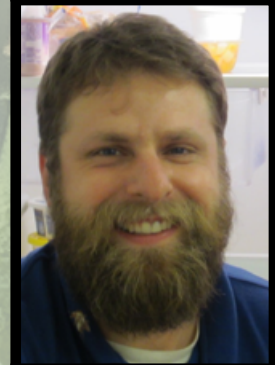
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The Skeeter is the official publication of the Virginia Mosquito Control Association. The VMCA membership is encouraged to submit articles, reviews, photography, and any other interesting facts or tidbits for publication. Submissions can be sent to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

