



THE SKEETER



President's Message

I'd like to start off by thanking all of you for all the great work that you do! Mosquitoes and mosquito-borne diseases have been newsworthy throughout most of the off-season this year due to the outbreak of Zika virus that is currently going on in the Americas. In February, Governor McAuliffe created the Virginia Zika Task Force to help coordinate preparations for the threat of Zika virus. The VMCA is represented on the task force by two of our members, Dreda McCreary and Tim McGonegal, as well as Dr. David Gaines, entomologist with the Virginia Department of Health.

I would also like to thank you all for making the 69th VMCA meeting another great one. We had a great venue at the Portsmouth Renaissance and a diverse agenda with many great speakers. Although a winter storm the weekend before caused us to make some last minute agenda changes, it was a great meeting with lots of informative presentations. We have another great educational opportunity coming up in May with the upcoming mosquito identification course—for details, see the VMCA Adult ID Course announcement inside the Skeeter. The VMCA is hoping to sponsor a larval ID course next spring. You can help us get ready for this course by collecting and preserving larvae throughout the season. If you are interested in providing specimens for the course, please contact Jay Kiser jkiser@suffolkva.us for more information.

It's not too soon to start thinking about next year's meeting which will be a big one for us in several ways. The 2017 meeting, which will be held in Newport News, will be the 70th Annual Meeting of the VMCA and it will be a joint meeting with the Mid-Atlantic Mosquito Control Association. Look for more information in future editions of the Skeeter and also on the VMCA website (<http://www.mosquito-va.org>) This meeting will be an opportunity for us to show our regional peers the many great programs we have in Virginia. As you are getting ready for the season, think about possible presentation ideas for next year's meeting.

As you read through this edition of the Skeeter and the great articles that have been submitted by members of the VMCA, take a few minutes to think about the ways that you may also be able to contribute to the association. Take



Josh Smith
VMCA President 2016

note of the various committees listed in the Skeeter and consider reaching out to the chair or any member of the Executive Board if you're interested in participating. You can always let us know your interest in the committees at the Annual Meeting, too. There's also a great "Flashback" section in this edition where we travel back in the Skeeter to see some old articles written about some very contemporary topics. The first of these articles is almost 30 years old! While you read these and the other articles in this edition, please think about how you might also be able to contribute to the Skeeter. We all see interesting and unusual things in our jobs and, who knows, maybe the future VMCA members will someday be flashing back to an article you've written about the novel or noteworthy things that you encounter in your job as a mosquito control professional.

Thanks and have a great day!

Volume 76, Issue 2

What's in this issue

APRIL 2016

Announcements, What's That?	2	BG Traps and Resting Boxes Need	11
VMCA Adult ID Course	3	a Good Home	
69th VMCA Recap	4-5	What's That? Answer	12-13
2016 VMCA Committees	6	Flashback	14-16
AMCA & MAMCA Recaps	7-8	VMCA Membership Form	17
Merchandise Sales, Zika Task Force	9	2016 Sustaining Members	18
Spotlight: City of Hampton	10	Virginia Mosquito Control	19
TMVCC Update		Jurisdictions & Resources	

Announcements

Upcoming Meetings

Virginia [Bioblitz](#) 2016

April 23, 2016
multiple locations in VA

[TMVCC](#) Adulthood Rodeo

May 4, 2016
Hampton, VA

[AMCA](#) Washington [Conference](#)

May 9-11, 2016
Washington, DC

[VMCA](#) Adult Identification [Course](#)

May 11-12, 2016
Suffolk, VA 23434

[Tick Management](#) [Symposium](#)

May 16-17, 2016
Washington, DC

Entomological Society of America/ International Congress of Entomology [Joint Annual Meeting](#)

September 25-30, 2016
Orlando, FL

[NCMVCA](#) 51st Annual [Conference](#)

November 14-16, 2016
Carolina Beach, NC

[VMCA/MAMCA](#) Joint Annual [Meeting](#)

January 31-February 2, 2017
Newport News, VA

Upcoming Meetings



Have information on a meeting that may be of interest to VMCA members? Attend a meeting and want to submit a summary? Please send it to the [Editor!](#)



Save the Date!

Joint Meeting

Virginia Mosquito Control Association

70th Annual Meeting

&

Mid-Atlantic Mosquito Control Association 42nd Annual Conference



VMCA Organizational Mailing Address

Virginia Mosquito Control Association
Penelope Smelser, Secretary/Treasurer
2600 Tarrant Street
Norfolk, VA 23509
Phone (757) 683-8662
Email: Penelope.Smelser@norfolk.gov

What's that?



answer on page 12

VMCA Adult ID Course

The VMCA is holding a 2 day FREE adult mosquito ID course on May 11th and 12th. It will be conducted by the combined efforts of local mosquito control biologists.

This is not taxonomy or a refresher course but a more practical training geared toward seasonal interns, summer part-time biology positions or mosquito biologists new to the area. Class size is limited to 20 so please make every effort to send eligible participants. Sign-up is on a first come first serve basis. New participants have preference over

returning individuals; if space is available then others will be accepted. Please sign up early.

This information is also posted on the [VMCA website](#). The course will be held at Suffolk Mosquito Control, 800 Carolina Rd, Suffolk, Virginia 23434 in the Admin building training room 128. Lunch is on your own but there are plenty of places to eat within a short drive. An on-site refrigerator is available. We will provide coffee, donuts, fruit, soda, and water for both days.

*Submitted by Education Committee Chair
Lisa Wagenbrenner*

Supplies/microscopes are limited but we will have a few extras on hand.

Please bring the following items:

- microscope with lamp
- power strip
- extension cord
- forceps
- petri dishes
- Kim wipes
- alcohol
- notebook/pens/pencils
- refillable coffee mug (optional)

Tentative Schedule for Mosquito Identification Course May 11 & 12, 2016

Wednesday- May 11, 2016

7:30- 8:00	Light refreshments
8:00-8:05	Overview of Course
8:05-9:30	General mosquito info
9:30-9:40	Break
9:40-10:30	Diseases and economic impact of mosquitoes
10:30-11:00	Environmental concerns with field work
11:00-11:30	Lab protocol
11:30-12:30	Lunch (on your own)
12:30-12:45	Anopheles genus
12:45-1:00	Culex genus
1:00-1:15	Minor genera
1:15-1:30	Break
1:30-1:45	Dichotomous Key demonstration
1:45-3:00	ID mosquitoes w/microscopes & key/flash cards
3:00-3:30	Introduce traps and setup demo

Thursday- May 12, 2016

7:30-8:00	Light refreshments
8:00-9:00	Retrieve traps and TEA demo
9:00-9:15	Aedes genera (woodland/saltmarsh/open areas)
9:15-9:30	Aedes genera (natural/artificial containers)
9:30-9:45	Psorophora genus
9:45-10:00	Break
10:00-12:00	ID mosquitoes w/ microscopes & key/flash cards
12:00-1:00	Lunch (on your own)
1:00-2:00	ID mosquitoes w/microscopes & key/flash cards

Please e-mail **Lisa Wagenbrenner** (lwagenbrenner@cityofchesapeake.net) with participant's name, city/county, and any supplies you are lacking.

Suffolk Mosquito Control (Admin building, training room #128) 800 Carolina Road, Suffolk VA 23434

From I-664S/I-264W/I-64W

Take exit for US-58W/US-13S
Merge right to stay on US-13S, follow signs for Ahoskie NC/Edenton NC/Virginia 32
Go straight through light crossing Carolina Rd
Turn left at the yield sign

From SR-32N/US-13N

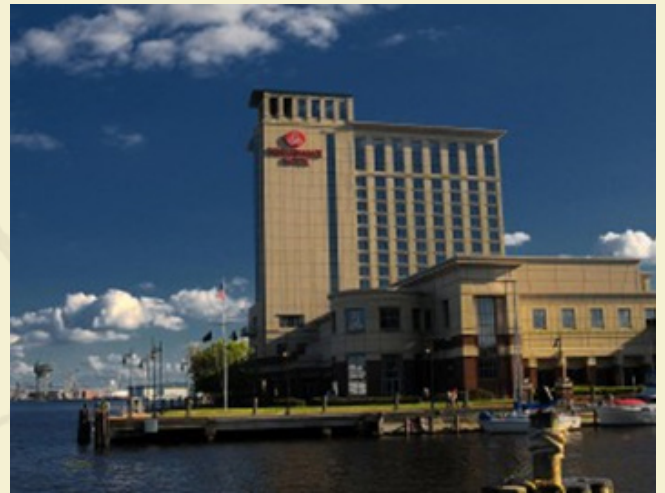
Merge/stay on US-13N past Suffolk Airport
Turn right onto Tyson Court

Follow the road to the rear parking lot.
The training room is located in the administration building (see diagram).
Contact 757-514-7608 for assistance



VMCA 69th Annual Meeting Recap

VMCA's 69th annual meeting took place January 26th-28th in the Renaissance Portsmouth-Norfolk Waterfront Hotel. This was a great meeting at a fantastic location.

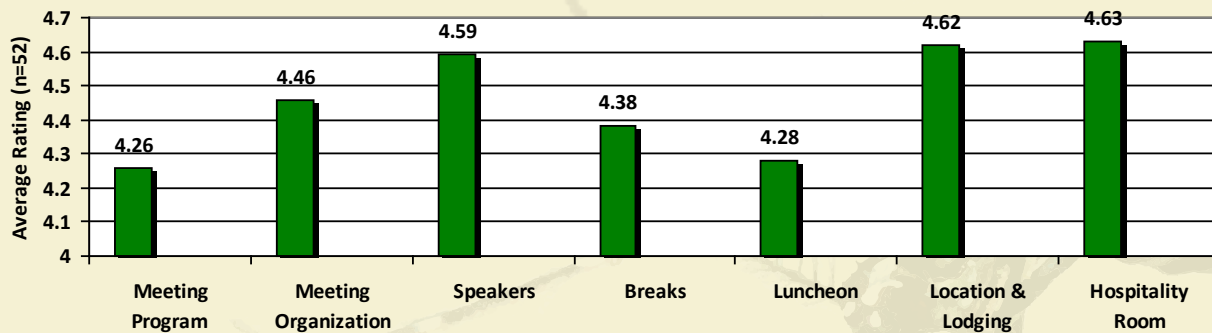


At the 2016 annual meeting there were 52 surveys collected. The surveys revealed high scores and positive feedback. Out of 52 surveys, 23 people rated the meeting as excellent, 26 people rated the meeting as good, and 3 people rated the meeting as average. There were a few changes this year such as starting the meeting in the afternoon on the first day as well as changing the days of week of the meeting. Over half of the members enjoyed having the meeting Tuesday-Thursday, starting in the afternoon on the first day. There were some interesting topics presented this year. For instance: mosquitoes protect themselves from iron overload after blood feeding, Zika virus, *Aedes aegypti* control methods, and larval control in vacuum sewers in Yorktown, just to name a few.

We appreciate all of your comments and suggestions and will keep them under consideration to make next year's meeting even better. Thank you to everyone that participated, and we look forward to seeing you all next year. Shown below are the result averages to the questionnaire, including overall meeting.

Survey results submitted by First Vice President LaToya White

VMCA 2016 Annual Meeting Survey Results



Presidential Plaque: Jay Kiser

Passing the torch of VMCA presidency. At the end of the 2016 VMCA annual meeting, Jay Kiser (on the left) received the presidential plaque from the new 2016 VMCA president Joshua Smith (on the right) while passing him the ceremonial presidential gavel.

VMCA 69th Annual Meeting Recap



VMCA Secretary-Treasurer Penny Smelser (left) receiving the distinguished service award from VMCA President Jay Kiser (right).

Distinguished Service Award: Penelope Smelser

After being hired by the Norfolk Health Department in 2004, Penelope immediately served as TRAST Coordinator from 2004-2006. In 2011, the VMCA Secretary-Treasurer position was vacated and Penelope graciously offered to fill the position in the interim. After being formally elected in 2012 as Secretary-Treasurer of the VMCA, Penelope worked very hard to not only fulfill the duties of the Secretary-Treasurer, but go above and beyond learning the logistics and responsibilities of this financial system. This was accomplished when no guidelines were given, showing this level of commitment and responsibility in a volunteer position cannot be overstated!

Penelope's duties include all financial coordination, handling of membership and annual dues, purchasing of speaker gifts, and the overall organization of the VMCA's business affairs. Penelope also recently volunteered to be the Chair of the Website Committee, and upgraded the organization's website with a new look.

While the job is not flashy, the position of Secretary-Treasurer is crucial to the success of the VMCA, and Penelope has exceeded at all levels.



Kirby Foley (left) receiving the R.E. Dorer award from VMCA President Jay Kiser (right).

R.E. Dorer Award: Kirby Foley

Mr. Kirby has served the VMCA in many capacities over the years, and was instrumental in the upkeep of the VMCA web page during the early days of this site. Perhaps one of Mr. Foley's largest contributions to VMCA is his ongoing contribution to the education and recertification of VMCA members. Mr. Foley has been a main presenter at VMCA sponsored re-certification classes for over a decade. He presents topics that are tedious in nature that others do not want to present, and presents his material thoroughly and concisely.

He is a great asset to the VMCA, and we hope this award shows the Association's appreciation for his time and effort.

*Awards submitted by Past President Jay Kiser
Photos taken by Photography Chair Elizabeth Hodson*

Nominating committee seeks Candidates

VMCA's Nominating Committee is seeking nominations for the 2017 VMCA executive board.

Are you or a VMCA member you know interested in being on the VMCA board? If so, please contact the Nominating Committee Chair, Jay Kiser (jkiser@suffolkva.us), with the name and contact information of your nomination. We are seeking nominations for the First Vice President opening on the 2017 executive board. The member voted into this position typically moves up the ranks of the executive board each successive year; a five year commitment. VMCA needs the help of dedicated and enthusiastic individuals to keep our organization running great.

Submitted by Nominating Chair Jay Kiser

2016 VMCA Committees

The VMCA is successful because its members get involved in the operations of the association. Below are the current committees and their chairs. Please join a committee by contacting any executive board member listed on the last page of this edition of The Skeeter!

Committee	Chair(s)	Members	Projects
Annual Meeting (Local Arrangements)	Tim DuBois	George Wojcik, Lisa Wagenbrenner, Ann Herring, Jamie Durden, Maggie Rivera	Decides location of future meetings
Annual Meeting (Program/Agenda)	Jeff Hottenstein	Tim DuBois	Organize annual meeting program
Annual Meeting (Vendor Planning)	Jeff O'Neill	George Wojcik, Joe Andrews	Vendor correspondence/setup
Audit			Annual audit of financial records
Bylaws	George Wojcik, Jay Kiser	Charles Abadam, Randy Buchanan	Bylaw revision/maintenance
Education	Lisa Wagenbrenner	David Gaines, Jay Kiser, Jennifer Pierce, Karen Akaratovic, Rachel Kempf, Dreda Symonds, Timothy DuBois, Maggie Rivera, Bruce Harrison, Joe Andrews, Michelle Slosser	Recertification, Adult ID course
Elections		Penelope Smelser, Joshua Smith	Sets up online voting, sends out voter information, counts votes, announces winners during annual business meeting
Historian	Tim DuBois	Connie Hartsfield, Andy Lima, John Orr	Historical Archives
Hospitality Room	Ann Herring, Jamie Durden	Jay Kiser	Annual meeting hospitality room
Information	Karen Akaratovic	Justin Anderson, Tim DuBois, Rachel Kempf, Jay Kiser, Wes Robertson	The Skeeter, Facebook, Instagram
Legislative	Randy Buchanon	Lane Carr, Betsy Hodson	NPDES, VPDES, PESP
Membership	Penelope Smelser	Joe Andrews	Keeps updated list of membership
Merchandise	Karen Akaratovic	Tim DuBois, Ann Herring, Andrew Lima, Maggie Rivera, Michelle Slosser, Lisa Wagenbrenner	Coordinating sales merchandise for annual meeting
Nominating	Jay Kiser	Michelle Slosser, Lauren Lochstampfor	Finds candidates for election, prepares/gathers profiles of nominees for ballots
Photography	Elizabeth Hodson	Jay Kiser, Maggie Rivera, Andy Lima	Takes photos of VMCA-related events for website, The Skeeter, Facebook, and Instagram
Public Relations	Rachel Kempf		Mosquito Awareness Week/Outreach & Education
Special Awards	Phil Meekins	Jennifer Pierce, LaToya White, Kirby Foley	Annual meeting awards- R.E. Dorer, Outstanding Service
Student Competition	Jay Kiser	Charles Abadam, Karen Akaratovic, Jamie Durden, Dennis Salmen, Lane Carr, Michael Bowry, Francis Valera	Organizes a student research/poster project competition with an award to be given at the annual meeting, raises funds for award
Technical Support	Jason Pevear, Charles Abadam		Maintains/advises on VMCA hardware/software; operates computer/projector during annual meeting
Website	Penelope Smelser	Lane Carr, Andy Lima	Maintains/revises website

AMCA 82nd Annual Meeting Recap

Virginia Mosquito Control Programs were represented well at the 2016 American Mosquito Control Association (AMCA) which took place on February 7-11 in Savannah, Georgia. We had 11 people representing two counties and three cities. AMCA attendees included Lisa Wagenbrenner and Dreda Symonds of Chesapeake Mosquito Control Commission; Tim Dubois of the Hampton Mosquito Control; Tim McGonegal of Prince William County; Charles Abadam, Jamie Durden, Ann Herring, and Jay Kiser of Suffolk Mosquito Control; and Leah Henretta, Betsy Hodson, and Michelle Slosser of York County Mosquito Control. Over the past 10 years I have attended six AMCA annual meetings and this is the largest group from Virginia that has attended. It is great to see more of my colleagues attending these conferences. Kudos for the attendees that weren't supported by their home city but found a way to attend the meeting. Jamie Durden and Ann Herring paid their own membership, registration, and split the cost of the hotel. Michelle Slosser had her membership and registration waived by being a volunteer for the AMCA meeting and was able to bunk with Betsy and Leah.

The AMCA is an outstanding organization and their annual conference is a mosquito nerd's heaven or more professionally a mosquito biologist's heaven. You get the opportunity to talk about mosquito biology, operations, new research, emerging and infectious diseases, new equipment (toys), etc. for a whole week! Sometimes it can be overwhelming to take in so much valuable information. By the end of the day your exhausted from listening to people speak and all you really want is a nap. Don't nap too long because Happy Hour is near and one of your newly formed mosquito friendships could be ready to buy you a beer and debate over why mosquitoes exist. It's during the social hour where you really get

to know the people running mosquito programs all over the country. You can ask them what mosquito species are common in your area, what their primary vector is for WNV, and what are their typical control measures. In the same conversation you can ask them what are their hobbies, how are their kids doing, and what Netflix show they're currently binging. Many times the best collaborations and meetings happen after the main presentations of the day are over, when we are all comfortably socializing and sharing ideas and aspirations for the coming mosquito season.

I had a feeling that the 2016 AMCA agenda would be packed with Zika Virus presentations but surprisingly enough there was not. The recent news reports of Zika outbreaks, it's possible link to microcephaly, and the imported cases coming into FL was creating a stir in the mosquito control community. More people were talking about Zika in conversations throughout the conference. The only Zika centric presentation was given on Monday, February 8 the same day that President Obama asked congress for \$1.8 Billion to combat Zika Virus. In my opinion some of the most interesting work is coming out of the University of Kentucky, Mosquito Mate, and Oxitec. These three entities are working on controlling *Aedes albopictus* and *Aedes aegyptis* using sterile insect techniques on male mosquitoes, releasing sterile males by the million into environments, using male mosquitoes as delivery vehicles for insecticides via auto dissemination, and using Wolbachia for mosquito control. The vendor hall was dressed to the nines; everyone was giving away free gifts, and drawing tickets for raffles. The biggest winner from Virginia was Lisa Wagenbrenner who came away with a new iPad and a new Microsoft Surface Pro. Dreda Symonds claimed that her presence was the reason for Lisa's luck, like a lucky charm, but that's questionable. Either/or Lisa practically made money to attend this year's AMCA.



For those of us that did not stay at the conference hotel our daily commute consisted of riding a ferry back and forth across the Savannah River.

(Continued on next page)

AMCA 82nd Annual Meeting Recap

Submitted by Charles Abadam

Presenters at this year's AMCA included:

- Charles Abadam (City of Suffolk) - "The new BG Sentinel 2.0: Comparing old and new Biogents traps and lures"
- Leah Henretta (York County) - "Evaluation of Natular XRT for larval control in a vacuum sewer system in York County, Virginia"
- Jay Kiser (City of Suffolk) - "Hourly distributions of EEEV vectors and respective infection rates in freshwater hardwood swamp habitats of southeastern Virginia"
- Tim McGonegal (Prince William County) - "Utilizing a customized mobile field data management application for mosquito larval control and surveillance"



Pictured above: Jamie Durden, Ann Herring, Jay Kiser, and Michelle Slosser were given a tour of the Chatham County Mosquito Control facility complete with a lab, operations, and a hangar. This particular program has three helicopters for pesticide application use.



Pictured above: Standing left to right: Jay Kiser, Jamie Durden, Betsy Hodson, Dreda Symonds, Ann Herring, James Will, and Charles Abadam. Kneeling left to right: Michelle Slosser, Leah Henretta, and Lisa Wagenbrenner

MAMCA 41st Annual Meeting Recap

The 41st Annual Mid-Atlantic Mosquito Control Association Conference took place March 30-April 1, 2016 in Nashville, TN. It was a very exciting meeting, with lots of interesting presentations ranging from "New Type of Gravid Trap" by Dr. Rosmarie Kelly to "Community Ecology of LaCrosse Virus Vectors" by Dr. Katie Westby, just to name a couple. Our very own Jay Kiser, from Suffolk Mosquito Control, biologist and past president of the VMCA, gave a fascinating talk on "The New BG Sentinel 2.0". If you missed this meeting, copies of presentations can be found on the MAMCA [website](#). Virginia was well represented at this year's annual meeting with Dr. David Gaines (VDH), Brian Ketchum (Newport News), Tim DuBois (Hampton), Jay Kiser, Jamie Durden, Ann Herring (Suffolk), and Jeff Hottenstein (Clarke/VMCA president elect) in attendance.

Dr. Rosmarie Kelly from Georgia moved to the past president position and Dr. Abelardo Moncayo from Tennessee was elected president (both shown at bottom right as Dr. Kelly accepts presidential award

from Dr. Moncayo). Tim DuBois from Virginia became vice president, and Dr. Stephanie Richards from North Carolina stepped into the vice president elect position. Additionally, state representatives from North Carolina (Joe Andrews), Delaware (James Joachimowski), and Tennessee (Ture Carlson) were elected.

Looking ahead, start making plans now to attend the combination MAMCA/VMCA Annual Conference Jan 31-Feb 2, 2017 at the Marriott at City Center in Newport News, VA.

Submitted by MAMCA's VA representative Ann Herring





Merchandise Sales Continue!

Didn't get what you wanted at the VMCA annual meeting?
 Weren't able to attend due to weather, time, funding?
 Want one of those snazzy portfolios the guest speakers received?

There's still time to get all that mosquito swag you just have to have!

	<p>Black t-shirt with <i>Aedes albopictus</i> design (\$10-15)</p>		<p>Black zip-up hooded jacket or gray hooded sweatshirt with white <i>Ae. albopictus</i> design (\$25-35)</p>		<p>Blue can cooler with mosquito silhouette (\$2)</p>
	<p>Blue or Gray t-shirt with mosquito anatomy design (\$8)</p>		<p>Black, leather-looking portfolio with VMCA logo-paper pad and pen, included (\$10)</p>		<p>Black/white decal/stickers with <i>Ae. albopictus</i> design (\$1-2)</p>
	<p>Tan or Gray long sleeve shirt with mosquito swarm design (\$10)</p>		<p>Pint glass with <i>Ae. albopictus</i> design (1 for \$6, 2 for \$10)</p>		<p>Black/white pen with VMCA & website print (2 for \$1)</p>
	<p>Tan long sleeve shirt with "<i>Ae. albopictus</i> Wanted" design (\$15)</p>		<p>Green reusable tote bag with VMCA logo (\$3, Free with \$50 purchase)</p>		

The Merchandise Committee is continuing to sell the items listed through local pickup or shipment. If you have any questions or are interested in purchasing something, please contact VMCA Merchandise Chair, Karen Akaratovic (kakaratovic@suffolkva.us) AND VMCA Secretary/Treasurer Penelope Smelser (Penelope.Smelser@norfolk.gov). Payments can be made by cash (local pickup only), check, or credit card. Local pickups will be conducted at Suffolk Mosquito Control (800 Carolina Road). Shipping will be paid by the purchaser and will be done through the lowest cost method (unless otherwise requested). This information will also be available [online](#) soon.

Virginia Zika Virus Task Force

On February 26, 2016 Governor McAuliffe created a state task force to coordinate preparations for the threat of Zika virus. Dr. David Gaines from the Virginia Department of Health, Tim McGonegal from Prince William County Mosquito and Forest Pest Management, and Dreda Symonds from Chesapeake Mosquito Control Commission are representing the mosquito control segment of the task force. As of March 31, 2016 there have been 9 confirmed cases of Zika (all imported) in Virginia. Dr. Gaines has composed a door hanger that may soon be sent as an electronic template for all jurisdictions to print and disperse as needed. Updates will be sent to membership via email. For more information or if you have any questions, concerns, suggestions, etc. please check out the links listed below or contact our reps on the task force:

[Virginia's official Zika web page](#)
[Task Force News Release](#)
[VDH Zika Update 3/30/2016](#)

City in the Spotlight: Hampton

Hampton's Outreach and Education is focused on environmental balance:

The Mosquito Control program in Hampton is now a part of the Environmental Services Division. Formerly known as the "Entomology Division", Environmental Services encompasses a wide range of services focusing on stormwater management, the environment, and public health. The program has evolved over the past five years to incorporate new stormwater management regulations while simultaneously restructuring the I.M.M. program to function in a synergistic fashion, strengthening efficacy and lessening negative ecological impacts.

Chris DeHart accepted the Environmental Services Manager position in 2010. His philosophy of bolstering Hampton's natural mosquito predation while reducing pesticide use has set precedence for promoting a stronger natural ecology within Hampton. His education and career history in turf science has added a unique approach to the program's pesticide application timing, specific targeting techniques, and active ingredient rotation. This approach has helped reduce the negative environmental impacts of unnecessary and non-evidentiary pesticide applications.

This philosophy has re-focused our team to survey a bit more in depth, treat only when certain, and let natural predation occur as often as possible. This process can be slow, but over time we have not only seen an increase in indigenous predators, but decreased populations of certain mosquito species. The process has developed a great amount of confidence, respect, and support from local beekeepers and environmental advocates.

With the past five years trending towards reduced mosquito populations, we have had the opportunity to focus more time on outreach and education. While Hampton has always incorporated public outreach and education as a component of the I.M.M. program, there was a need for improvement. The Environmental Services team has developed a new website, updated pamphlets, conducted several local TV interviews, increased school educational events, and improved communication with

local beekeepers and environmentalists; all of which have begun to show dividends. Hampton continues to seek new opportunities to educate the public on the importance of mosquito control while reducing its footprint on the environment. Our newest venture will be increasing our bat box and purple martin house programs in collaboration with local Boy Scout groups to increase awareness of mosquito control through natural means. Utilizing all aspects of a balanced integrated system will make enough difference to achieve a program's public health and environmental improvement goals.

The Environmental Services biologist has participated in the regional Hampton Roads Public Works Academy with the goal of teaching high school students about the importance of mosquito control and public health. Last year marked the first year Environmental Services accepted interns from this program and we hope to continue this trend in the foreseeable future. Currently, New Horizons is the only school participating, but we are very excited about future involvement from other participants.



Above: Hampton Staff

Front L-R: Greg Atkinson, Sr. Chris DeHart

Middle L-R: Tim DuBois, Joshua Snyder, Kenneth Jackson

Back L-R: Edward Bishop, Robert Tweedy, John Miller

Submitted by Tim DuBois

TMVCC Update

The Tidewater Mosquito and Vector Control Council have an exciting year planned. With the threat of Zika virus it is very important we stay on top of all information and pass it on to members of our group. All of our sponsors continue to present valuable information on their products and services and because of that we are thankful for everything they do for us. Every month is taken by a sponsor and updates will be sent via email. The plan is to have meetings on both sides of the water as much as possible to be fair to all members.

The May Rodeo meeting will be held May 4, one week earlier due to the AMCA's Washington Days. This will allow the trucks to be calibrated to meet the high alert needs for the municipalities. We have ideas for continuing education but if there is a topic that hasn't

been covered please pass on topics to TMVCC President Elizabeth Hodson, elizabeth.hodson@yorkcounty.gov.



(L to R): President Elizabeth Hodson, Vice President Jamie Durden, Secretary Mitch Burcham)

Submitted by TMVCC President Elizabeth Hodson

Used BG 1.0 traps need a good home

Six older BG Sentinel traps have been donated to the VMCA. They are the second generation BG1.0 traps; white, cloth top, internal poles for structure, body made of the thinner tarp material. Each trap includes 2 catch bags, top funnel (plastic and cloth portion), fan, wiring, and zipper bag for transport. All traps are in similar condition: used but taken care of, about 6-8 years old, and still in working condition.

We would like for these traps to go to VMCA members that are in the most need of them. If you are a current VMCA member and you are interested, please email The Skeeter Editor [Kakaratic@suffolkva.us](mailto:kakaratic@suffolkva.us) and state how many traps of the six you or your jurisdiction would like (minimum to maximum), what you would use them for, and why you feel you are in the most need of them. We will take into account all the information you provide and make a decision based on the number of



members we can satisfy, the role these traps will play in your program/project, and your inability to acquire these traps elsewhere. Members that are chosen to receive these traps will be required to sign a transfer of equipment waiver form. Deadline for submissions will be **April 19th, 2016**.

Resting Box Giveaway

City of Suffolk Mosquito Control recently moved into a new building and during the move, realized they still had 4 resting boxes, made by Andy Lima from the Fairfax County Health Department. Suffolk received these traps a few years ago but is not going to be using them. They are still in fairly good condition; perhaps a nail or two will be needed. There are two of each size, 12.5" and 15" cubes. As you can see in the pictures, there is a hole drilled in one side that is covered with a screen for applying knockout chemical and a handle on the other side for easy carrying.

These are passive surveillance traps that require no power supply, bait, or carbon dioxide. They can be left out in the field and checked on a regular schedule or as time allows. They are great for catching gravid, blood fed, and unfed mosquitoes, especially *Anopheles* spp. or *Culiseta melanura*. Compared to other traps, these will produce a higher capture rate of blood fed mosquitoes which can be very useful for studying blood parasites or conducting host-blood meal analysis. Andy has recommended setting them in groups and to focus on areas with minimal understory and vegetation as you want the box to be the most attractive resting spot.



Check out [this link of Andy Lima performing a resting box collection](#).

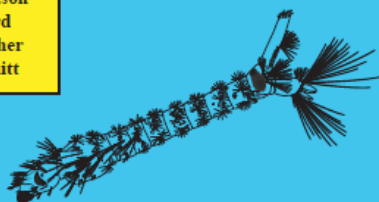
Please send requests with how many and what size(s) you would like to Karen Akaratovic (kakaratic@suffolkva.us). Traps will be given on a first come, first served basis.

What's That? Answer



The Mosquitoes of the Mid-Atlantic Region: An Identification Guide

Bruce A. Harrison
Brian D. Byrd
Charles B. Sither
Parker B. Whitt



That is a portion of an adult *Uranotaenia sapphirina* illustration on the cover of the long-awaited book: **The Mosquitoes of the Mid-Atlantic Region: An Identification Guide** by Dr. Bruce A. Harrison, Dr. Brian D. Byrd, Charles B. Sither, and Parker B. Whitt. The book is spiral-bound, 201 pages, and includes keys to both larval and adult female mosquitoes. Check out the table of contents on the right to see all the information covered. If you would like to order a copy, page 12 contains the order form with information on where to send payment. If you would like the original pdf, please contact the editor: kakaratovic@suffolkva.us

TABLE OF CONTENTS

Section	Title	Page
I.	Introduction.....	1
II.	Taxonomic Interpretations and Sources.....	7
III.	Mosquito Taxa Recognized in the Mid-Atlantic Region.....	17
IV.	Basic Morphology of Mosquitoes.....	20
V.	Using a Dichotomous Key.....	23
VI.	Distinguishing Female from Male Mosquitoes.....	23
VII.	The Adult Keys.....	24
	Adult Morphology.....	25
	Key to the Female Genera.....	28
	(Includes <i>Coquillettidia perturbans</i> , <i>Toxorhynchites rutilus</i> , and <i>Wyeomyia smithii</i>)	
	Keys to Species (Adult Females):	
	<i>Aedes</i>	33
	<i>Anopheles</i>	55
	<i>Culex</i>	61
	<i>Culiseta</i>	66
	<i>Mansonia</i>	67
	<i>Orthopodomyia</i>	70
	<i>Psorophora</i>	71
	<i>Uranotaenia</i>	76
VIII.	The Importance of Identifying Larval Instars.....	78
IX.	Acquisition of Characters to Separate the Larval Instars.....	80
X.	The Larval Keys.....	83
	Larval Morphology.....	84
	Key to Genera of Fourth Instar Larvae.....	86
	(Includes <i>Coquillettidia perturbans</i> , <i>Toxorhynchites rutilus</i> , and <i>Wyeomyia smithii</i>)	
	Keys to Species (4 th Instar Larvae):	
	<i>Aedes</i>	92
	<i>Anopheles</i>	114
	<i>Culex</i>	123
	<i>Culiseta</i>	130
	<i>Mansonia</i>	133
	<i>Orthopodomyia</i>	134
	<i>Psorophora</i>	135
	<i>Uranotaenia</i>	140
XI.	Notes (1-24) Referenced in the Keys.....	141
XII.	Glossary.....	149
XIII.	State Records.....	166
XIV.	Table of Taxonomic Actions and New Records.....	183
XV.	Couplet Sequences (Species).....	184
XVI.	Illustration Index (Terminal Couplets).....	187
XVII.	Vector Graphics and Illustration Sources.....	189
XVIII.	References.....	190
XIX.	Biographical Sketches.....	200

Order Form

The Mosquitoes of the Mid-Atlantic Region: An Identification Guide

Bruce Harrison, Brian Byrd, Charles Sither, and Parker Whitt

Available February 2016

This 201 page spiral-bound 8.5 X 11 inch guide includes dichotomous keys to the adult females and fourth instar larvae for 8 states (DE, GA, NC, MD, PA, SC, VA, and WV) with more than 585 novel Adobe Illustrator figures. Printed on 100 lb gloss paper, this guide includes sections such as: 1) Taxonomic Interpretations, 2) State Records, 3) Basic Morphology, 4) The Acquisition of Characters to Separate Larval Instars, 5) Extensive Notes, 6) Couplet Sequences, 7) Illustration Index, 8) How to Use a Dichotomous Key, 9) Glossary, and others. The keys were thoughtfully reviewed by experts from the Smithsonian Institute, North American Mosquito Control Districts, and Academia. This long awaited guide will be available for shipping in February 2016.

Item	Quantity	Price per key	Total
Mosquito key		\$30	
		Grand total:	

Name: _____

Email Address: _____

Phone Number: _____

Employer: _____

Mailing Address (where key will be mailed): _____

Method of Payment: Check (payable to NCMVCA) Invoice required (emailed to address given) Credit card (see below)
 Credit card (Please check here if you wish to be contacted by phone to provide information)

Card number: _____ Expiration date: _____

Code on back of card: _____ Billing zip code: _____

Email or Mail Completed Form and Payment To:

Stephanie Richards (NCMVCA Secretary-Treasurer)
 3403 Carol Belk Building, 300 Curry Court
 Greenville, NC 27858

richardss@ecu.edu

Flashback



Looking forward in our beloved newsletter "The Skeeter", I will attempt to bring interesting and oddity articles from the past to enjoy and possibly learn a thing or two. With the emerging disease Zika Virus knocking on our doorsteps, and a non-stop flood of information on the news, what better way to start this but to look back at the introduction of *Ae. albopictus* to Virginia. This first section we will travel back to 1987, when "The Skeeter" warned us of an incoming threat, and also oddly enough, reminded us of an old friend. Just a note before we begin, the following is re-typed by myself in order for legibility and spacing in the current newsletter. No corrections are made, and the format is kept as close to the original as possible. Enjoy!!

Aedes aegypti RETURNS

During the early fall of 1987, *Aedes aegypti* was found in Norfolk, VA. This represents a reoccurrence of a species that has not been found in Virginia for many years.

Harry Winnik, the director of the Vector Control section of the Norfolk Health Department, found adults and larvae of the species in the Colonial Place section of Norfolk. He found the adults as a result of a backyard inspection stemming from complaints logged from residents in the area. Winnik found that the species was well established in the neighborhood, and was found in additional areas in Norfolk upon further investigation.

The reappearance of this species is not welcome at any time, but is especially unfortunate now since the Norfolk Health Department's money for backyard inspectors is unavailable. Winnik has been forced to depend on civic organizations to monitor breeding in Norfolk neighborhoods.

Colonial Place, the neighborhood where *Aedes aegypti* was initially found, is bordered by a marina. The naval shipyard is not far from the neighborhood. Speculation on how the species returned to Norfolk is varied, and specimens have been genotyped to try and determine which strain of *Aedes aegypti* the Norfolk population resembles. There has been no determination thus far.

Next we jump to 1991. Amazingly, either through slow progress or mosquito control keeping the invasive species at bay, *Ae. albopictus* took four years before the first was caught in Virginia.

Aedes albopictus in VA?

The *Aedes albopictus* surveillance program was activated in many parts of Tidewater during the summer of 1987. So far, no *Aedes albopictus* have been found in Virginia.

There is, however, speculation about their presence in the state. In North Carolina, the species have been found in several counties. At least two locations found positive for *Aedes albopictus* presence in North Carolina border Virginia counties that may not have an active mosquito surveillance program. The possibility that *Aedes albopictus* is actually already present inside Virginia's borders is probably great.

The surveillance program for the species will continue in several locations around Tidewater in 1988. Hopefully, areas outside Tidewater will begin monitoring programs of their own, since it seems that this species is nearing Virginia's borders outside of the state's major control areas.



(Continued on next page)

Flashback

Aedes albopictus in Virginia

On June 14, 1991, the first *Aedes albopictus* adults were collected from the State of Virginia. The specimens were collected in Virginia Beach, in the Aragonna Section of the City, and were found as a result of checking complaints by citizens. This neighborhood is relatively old, with many potential breeding sites found on properties inspected. *Aedes albopictus* larvae were found at these sites as well.

Several days earlier (6/11/91), larvae of *Aedes albopictus* had been collected by a backyard inspector. This collection came from a different neighborhood – Princess Anne Plaza – which is approximately 3 miles from the neighborhood where the adults were first collected. Princess Anne Plaza is also an older neighborhood, with many potential breeding sites on the properties inspected. Adults were found flying upon further investigation at these sites.

Aragonna and the Princess Anne Plaza area have become the focus of the backyard inspection program for the Virginia Beach Mosquito Control Bureau. Since the initial discovery of *A. albopictus* in the area, many breeding sites have been eliminated by the backyard inspectors. A media campaign (newspaper, television and radio) was initiated to educate citizens on reducing breeding sites in their yards. The species has continued to spread, however, to neighborhoods adjacent to those where they were initially found.

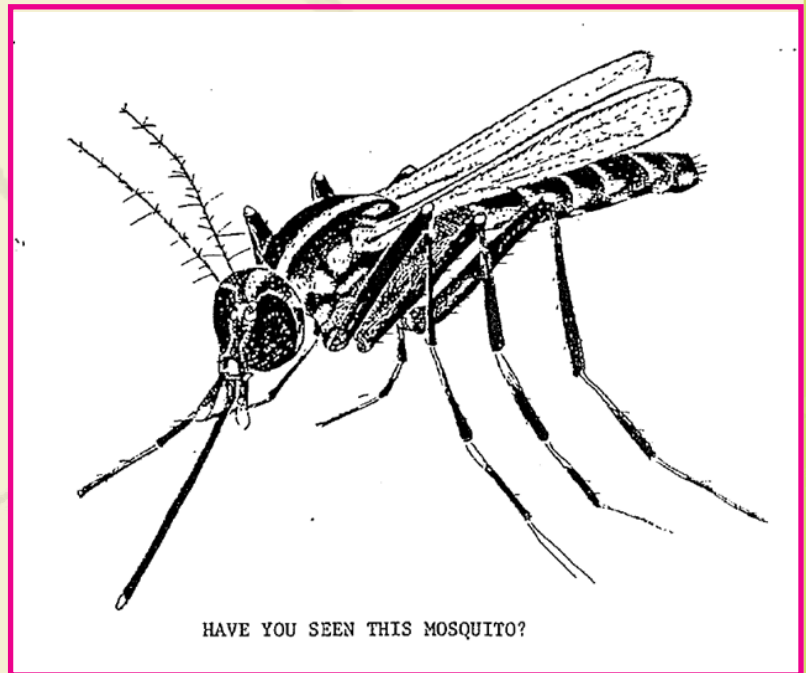
Phil Meekins
VA Beach Mosquito Control

Finally, we have an excerpt from December of 1992. This "Skeeter" had an all too familiar face with a simple question to its readers.

Do You Have *Aedes albopictus*?

First spotted in a tire dump in Houston, Texas in 1985, the Asian Tiger Mosquito has with man's help greatly expanded its range within the United States and indeed worldwide. It is found in such exotic places as India, as far north as Chicago, and as close to you as Virginia Beach, Richmond, and probably a dozen other spots as yet undetected. Maybe in your own backyard.

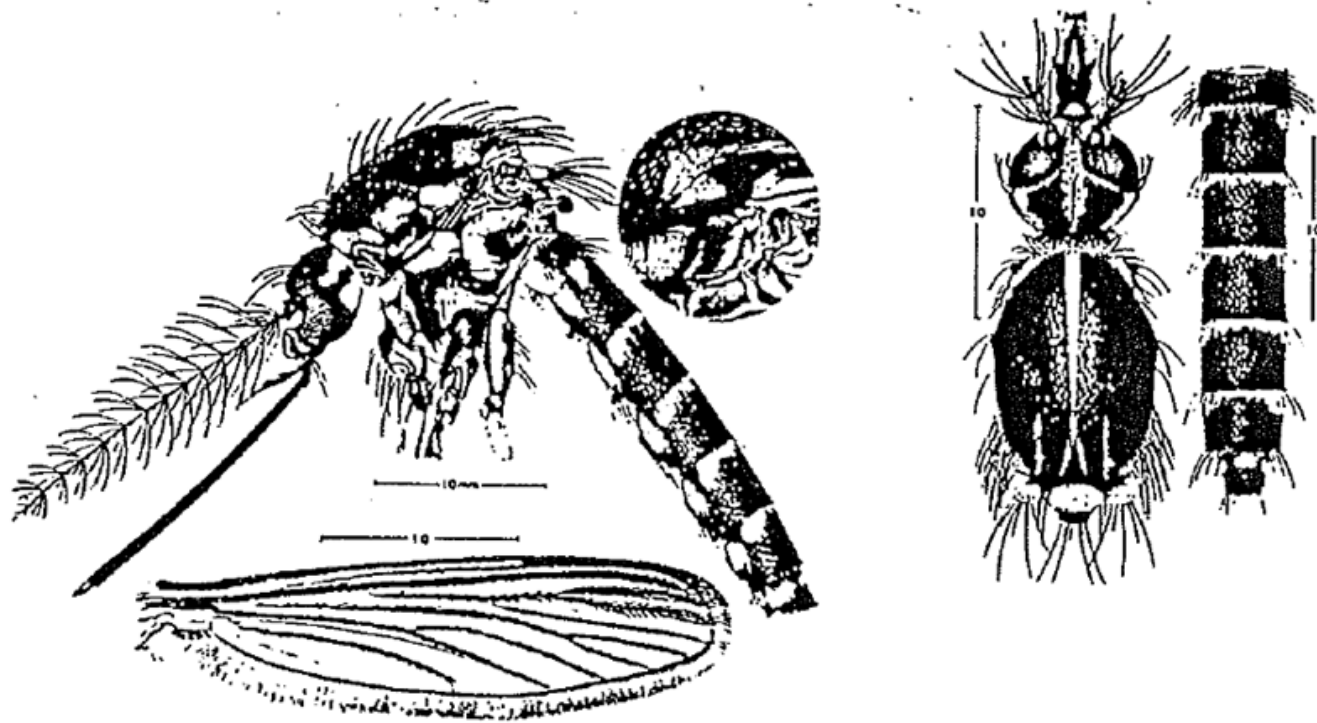
There is some debate on the impact of this new mosquito but one thing everyone agrees to is the fact that they are aggressive biters and wherever they are found the opinion is the same: *Aedes albopictus* is bad news. And not just from an annoyance standpoint – this insect has been shown to be capable of transmitting a number of diseases, opening up places like Chicago to the spectre of Dengue.



In our area there are two mosquitoes that might look similar without a magnifier. The first is *Aedes aegypti* which is also marked in black and white but displays the familiar lyre design on the thorax where *Ae. albopictus* shows a white stripe. The other mosquito is *Aedes triseriatus*, our 'tree-hole' mosquito has more than one white stripe on its thorax.

(Continued on next page)

Flashback



Aedes albopictus in Virginia Beach

Our first *Aedes albopictus* larval samples were collected by one of our back yard inspectors from the Princess Anne Plaza neighborhood on June 11, 1991. On the 14th, the first adult specimens were collected about 4 miles away in Aragona Village. Surveillance in the immediate areas revealed that the species had already become fairly well established in these neighborhoods.

From here, the Asian Tiger Mosquito spread to the Malibu and Seatack sections. Strangely, no source of infested tires could be located anywhere near these neighborhoods. However, three of the four neighborhoods have a very transient population, and we suspect that someone may have inadvertently imported when moving into the area.

1992 saw a further spread of the species into Witchduck sections of Kempsville, MacDonald Park, new sections of Thailia, London Bridge and Cape Henry Shores. Unfortunately, the surveillance budget has been cut and we have not been able to sustain the level of surveillance we would like to, so there are probably other sections of the city where this species can be found.

-- Dread [sic] McCreary

And with that, our dear friend the Asian Tiger Mosquito had a hold and has yet to let go.

I hope you enjoyed this article through time and I look forward to bringing you many more stories of our newsletter's past.

Submitted by VMCA Historian Tim DuBois

VMCA membership application/renewal

Virginia Mosquito Control Association
 New Membership & Member Renewal Application

MEMBERSHIP TYPE: () RENEWAL () NEW Mark an "X" in the appropriate box
--

Membership payment is by calendar year

Name:	Regular \$ 15.00	
Phone:	Associate \$ 10.00	
Address:	Student: *Enclose proof of student status \$ 10.00	
Email:		
Organization:		
	Total Submitted	

Please "X" here if you cannot receive the newsletter by email

Questions or comments can be directed to Penelope Smelser, Secretary-Treasurer, 757-683-8662 or mail to: Penelope.smelser@norfolk.gov

Send payment (made payable to **VMCA**) and mail/fax this form to Secretary/Treasurer –or- fill out the form, save and submit by email.

Penelope Smelser
 VMCA Secretary-Treasurer
 2800 Tarrant Street
 Norfolk, VA 23509
 757-683-8662 office phone
 757-683-2500 office fax

- Regular Member :** VMCA Newsletter, hold office, serve on committees, propose motions, vote, and participate in business meetings.
- Associate Member:** VMCA Newsletter, participate in business meetings.
- Student Member:** VMCA Newsletter, serve on committees and participate in business meetings. (Student must be enrolled at least 1/2 time in an accredited college or university and produce valid College/University ID Card.)

2016 Sustaining Members

The VMCA gratefully acknowledges the support of the following sustaining members for 2016. 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!



Ted Bean
(814) 671-6516
tbean@myadapco.com



Zach Cohen
(800) 227-8664
zcohen@summitchemical.com



Matt Crabbe
(804) 334-7370
crabav@gmail.com



Ryan Pierson
(208) 324-8006
elecdata@elecdata.com

Jeff Hottenstein
(703) 498-9362
jhottenstein@clarke.com



Jeff O'Neill
(302) 312-3950
joneill@central.com



Priscila Cavalcante
540-383-2093
pcavalcante@dynamicaviation.com



Joe Andrews
(888) 603-1008
joea@allprovector.com



Doug Hill
(800) 570-4277
Dhill@morrellonline.com



Gordon Morrison
(919) 452-7145
Gordon.morrison@bayer.com



John Singletary
(703) 789-2076
john.singletary@univarusa.com



Jim Andrews
(910) 547-8070
j.andrews@valent.com



Virginia Mosquito Control Jurisdictions & Other Resources

As a result of revisions to the VMCA By-Laws, the organizational member category was eliminated. In order to facilitate communication among mosquito control programs, jurisdictions with known mosquito and vector control programs are listed below. If there are other jurisdictions that should be listed, please submit them to the editor.

Virginia Mosquito Control Jurisdictions

[Alexandria Health Department](#)

Boykins, Town of

[Chesapeake Mosquito Control Commission](#)

[Chincoteague Mosquito Control](#)

[Fairfax County Health Department](#)

Fort Eustis

[Gloucester County Mosquito Control](#)

[Hampton Environmental Services](#)

Henrico County

[Newport News Vector Control](#)

[Norfolk Vector Control](#)

[Poquoson Mosquito and Drainage](#)

[Portsmouth Mosquito Control](#)

[Prince William County Mosquito & Forest Pest Management](#)

[Suffolk Mosquito Control](#)

US Air Force / Langley Air Force Base

[Virginia Beach Mosquito Control](#)

[Williamsburg Mosquito Control](#)

[York County Mosquito Control](#)

Other Mosquito Control Organizations

[American Mosquito Control Association](#)

[Mid-Atlantic Mosquito Control Association](#)

Other Resources

[Virginia Department of Health](#)

[Centers for Disease Control & Prevention](#)

[Fairfax County Education and Outreach Materials](#)



WANTED: SUBMISSIONS!



Do you have information you'd like to include in the next issue of The Skeeter or a photo you'd like to share? We are always looking for organizational updates, operational news, education and outreach activities, pictures, stories, and anything remotely vector-related to include in upcoming newsletters as well as on [Facebook](#) and [Instagram](#).

Please send all items to The Skeeter Editor: Karen Akaratovic at kakaratovic@suffolkva.us

THE SKEETER

Newsletter of the Virginia Mosquito Control Association

Contact: Karen Akaratovic
Suffolk Mosquito Control
866 Carolina Road
Suffolk, VA 23434
(757) 514-7608
kakararovic@suffolkva.us



Find us on Facebook!

facebook.com/mosquitova



Follow us on Instagram!

@virginiamosquitocontrol

Visit us online:

www.mosquito-va.org

The Skeeter Production Team:

Committee Chair/Editor :
Karen Akaratovic
Suffolk Mosquito Control
kakararovic@suffolkva.us

Committee Members :
Justin Anderson
Radford University
janderson152@radford.edu

Jay Kiser
Suffolk Mosquito Control
jkiser@suffolkva.us

Rachel Kempf
Prince William Co. Mosquito & Forest Pest Management
rkempf@pwccgov.org

Tim DuBois
Hampton Environmental Services
tdubois@hampton.gov

Wes Robertson
Henrico County Public Works
rob106@co.henrico.va.us

Editorial Review :
VMCA Executive Board

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

Virginia

Mosquito Control Association

Founded 1947

2016 Virginia Mosquito Control Association Executive Board

- President:** Joshua Smith (703) 246-8477 Joshua.Smith@fairfaxcounty.gov
- President Elect:** Jeff Hottenstein (703) 498-9362 jhottenstein@clarke.com
- Vice President:** George Wojcik (757) 393-8666 wojcikg@portsmouthva.gov
- 1st Vice President:** LaToya White (757) 269-2884 lnwhite@nngov.com
- Secretary/Treasurer:** Penelope Smelser (757) 683-8662 Penelope.Smelser@norfolk.gov
- Past President:** Jay Kiser (757) 514-7608 jkiser@suffolkva.us
- *TMVCC Representative:** Elizabeth Hodson (757) 890-3792 Elizabeth.Hodson@yorkcounty.gov
- *MAMCA Representative:** Ann Herring (757) 514-7608 mherring@suffolkva.us
- *Sustaining Member/Industry Rep:** Jeff O'Neill (302) 312-3950 joneill@central.com

***Non-voting member of the Board**

Take the time to volunteer on a committee! An active membership makes for a stronger organization. Contact anyone on the Board to participate.

We Are Now On Instagram!

VMCA now has an Instagram account (@virginiamosquitocontrol)! The account is currently being piloted by Rachel Kempf of Prince William County's Mosquito & Forest Pest Management branch, and will feature photos meant to foster community engagement, spread VMCA's message across a broad range of audiences, and widen our social media reach.

Rachel is currently compiling a photo inventory for future posts, and would love for VMCA members to send her submissions for the page. Any pictures or short videos depicting mosquitoes, mosquito larvae, mosquito lookalikes, mosquito predators, habitats, sentinel chickens, field and lab staff at work, outreach and community events, general entomology, and cool finds out in the field are welcome and greatly appreciated.

Please email submissions to rkempf@pwccgov.org, follow and engage with us if you have an IG account, and help spread the word!

Submitted by PR Committee Chair Rachel Kempf



Above: Current IG photos
Below: Rachel Kempf of MFPM (with Wilson the Ball Python)

