



The Skeeter



Newsletter of the Virginia Mosquito Control Association

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April, 2014

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President's Message

Happy spring everyone! Thank you so much for the opportunity to lead our organization this year. I am truly honored and excited to take the reins. I would like to start off by saying thank you to everyone who made our 67th annual meeting such a great success. It started off rough with the wintry weather, but overall it turned out very well. Thank you to all of the speakers who shared their experiences and expertise. Thank you to all of the “behind the scene” workers. It takes a tremendous amount of preparation and hard work from a lot of people to put a meeting together.



Jennifer Pierce
VMCA President 2014

We have some upcoming opportunities in May and June. Our education committee is planning another annual mosquito identification course, May 14 and 15. This is a wonderful chance for new-comers to get a head start on learning about mosquitoes, if you are interested please contact Lisa Wagenbrenner. Her contact information is in the announcements section. The AMCA is sponsoring their Annual Washington Days Conference, May 5-7 in Alexandria, Va. This is a wonderful time to visit your legislative representatives and let them know more about our mosquito control efforts and concerns throughout the state. More information on how to sign up can be found on the AMCA website. Mosquito Control Awareness Week is June 22-28. This would be a good time to send out a press release or go out and educate the community on the significance of our mosquito programs.

Please let us know what your program is doing to recognize this week.

Now is a great time to join a committee. Committees are the backbone of our organization and I hope everyone can volunteer to be on one. It is a great way to broaden your knowledge about the many different aspects of our organization. Each committee plays a vital role in making the VMCA successful. If you have any questions feel free to contact anyone on the board or the chairperson of the committee. Please consider participating.

The busy mosquito time is quickly approaching. Good luck to everyone with their new season preparations. Every year is different and always brings new challenges. Please remember the importance of our jobs through it all. It is crucial to focus on our mission to protect the public and educate them about mosquitoes. Keep this in mind as the season heats up.

Most of all, have fun in all you do.

Jennifer Pierce, VMCA President

Announcements

Upcoming meetings

AMCA Washington Conference

May 5-7, 2014
Alexandria, VA

TMVCC Adulticide Rodeo

May 7, 2014
Hampton, VA

Adult Mosquito ID Course

May 14-15, 2014
Chesapeake, VA

SEE PAGE 7!



Entomological Society of America Annual Meeting

November 16-19, 2014
Portland, OR

Virginia Mosquito Control Association Annual Meeting

February 3-5, 2015

Mid-Atlantic Mosquito Control Association Annual Conference

TBA

**Have information on meeting that may be of interest to VMCA members?
Attend a meeting and want to submit a summary?
Send it to the editor (see page 17)!**

What's that?



Answer on Page 14.

VMCA organizational mailing address

**Make sure you send all forms to the
proper address.**

Virginia Mosquito Control Association
Penelope Smelser, Secretary/Treasurer
2800 Tarrant Street
Norfolk, VA 23509
Phone (757) 683-8662

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2014 Annual Meeting Recap

VMCA Awards

Outstanding Service Award- Ann Herring

Ann is a go-getter for the VMCA. She is constantly helping out “behind the scenes” and always gives 100%. She helps with annual meeting set up, selling t-shirts, manning the reception desk and with the hospitality room. She gives countless hours of hard work to our organization.

Distinguished Service Award- Charlie Pate

Charlie has given many years to the VMCA vendor community. He encouraged Central Life Sciences to sponsor numerous VMCA and TMVCC functions. One of the most popular is the TMVCC annual oyster roast. We appreciate the advice and knowledge to better our mosquito programs he has provided through the years. Enjoy your retirement, Charlie.

Honorary Member Award- Gene Payne

Gene has given so much to the VMCA. He was President twice, MAMCA president, AMCA president and chairman. He has received the R.E. Dorer award from both the VMCA and MAMCA. He has a long and distinguished service in mosquito control; including Kempsville/ Bayside commission in Virginia Beach, Great Bridge Mosquito Control and director of the Chesapeake consolidated commissions.

Honorary Member Award- Phil Meekins

Phil has provided pesticide certification and recertification training to countless employees. He served as VMCA President in 1987. He served decades as our VMCA historian.

Honorary Member Award- Dreda Symonds

Dreda has been an ambassador for mosquito education. Her passion involved teaching children with her infamous “Jo-Jo” mosquito education program. She was a founding member of TRAST group and getting arboviral chickens in the Tidewater area. She served as VMCA President in 1991.



2014 VMCA Award Winners. *Below left:* Dreda Symonds. *Below center:* Kirby Foley. *Below right:* Ann Herring. *Right:* Charlie Pate. Not pictured are Gene Payne, Phil Meekins, and Jorge Arias. Lisa Wagenbrenner presents the awards.



VMCA meeting recap, continued

Honorary Member Award- Kirby Foley

Kirby played a key role in bringing our organization into the Internet age. He oversaw the creation of the VMCA web page and spent many years maintaining it. He served as VMCA President and MAMCA state director.

Honorary Member Award- Dr. Jorge Arias

Jorge has a long history in mosquito control. He joined our organization in the early 2000's and quickly began work in education and training. He was especially interested in public education and developed various materials to share. He was a regular contributor to "The Skeeter" and the annual meeting.

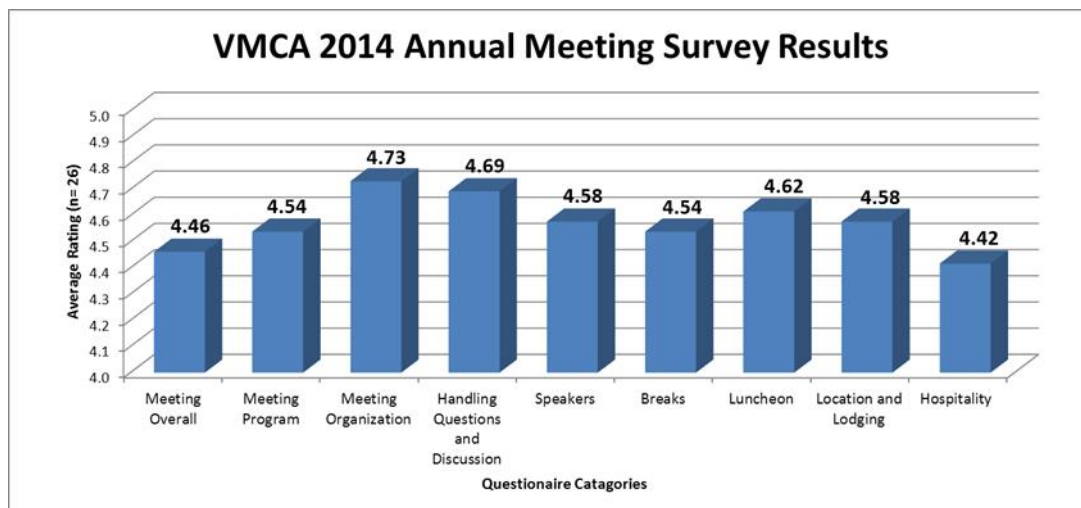
R.E. Dorer Award- Dr. Jorge Arias

Jorge has given almost 40 years to the field of public health. He spent much of his time working in Brazil, where he developed entomology training labs while working with sand flies and dengue. He joined the VMCA in 2003 when he started working at the Fairfax County Health Department. He quickly started revamping their testing and trapping methods and started focusing on community education. He began sharing these ideas at the VMCA annual meetings and "The Skeeter". He reached beyond Virginia and took his messages about mosquito control to the mid-Atlantic region. In 2011, he received Volunteer of the Year award for his contributions. He retired in 2013, but his dedication to mosquito work continues. He still finds time to do entomology work with dengue and *Aedes aegypti* in Brazil.

Congratulations to all of our award recipients. Thank you for your continued dedication to the VMCA!

Annual Meeting Survey Results

During the 2014 annual meeting we received 26 surveys. Shown below are the result averages to the questionnaire, including overall meeting. By the high scoring and positive feedback received in the surveys, it looks like everyone enjoyed this year's meeting. 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.



2014 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 an officer listed on the last page of this edition of *The Skeeter*!

Committee	Chair	Projects	Members
Legislative	Randy Buchanan	NPDES, VPDES, PESP	Lane Carr
Bylaws	George Wojcik	Bylaw revision and maintenance	
Annual Meeting: Program & Agenda	Jay Kiser	68th Annual Meeting program	
Annual Meeting: Vendor Planning	Josh Smith	Vendor correspondence / set-up	
Annual Meeting: Local Arrangements	Tim DuBois / Lisa Wagenbrenner	Location of place for annual meeting	George Wojcik, Lane Carr
Audit	Chris DeHart	Annual audit	Mitch Burcham, Ann Herring
Elections	Joe Simmons	Finds candidates for election, prepares ballot process and validates online voting	
Special Awards	Phil Meekins	R.E. Dorer, Outstanding Service Awards	Kirby Foley, Jennifer Pierce
Education	Lisa Wagenbrenner	Recertification, Adult ID class	Karen Akaratovic, Tim DuBois, Jay Kiser, Jennifer Pierce, Dreda Symonds
Historian	Tim DuBois	Historical archives	Andy Lima
Information	Justin Anderson	The Skeeter	Bruce Harrison, George Wojcik, Andy Lima
MAMCA	Tim DuBois	VA update for MAMCA meeting	
Membership	Penny Smelser	Keeps updated list of membership	Randy Buchanan, Ann Herring
Photography	Betsey Hodson	Collects photos for website, Skeeter, Facebook	Tim DuBois, Andy Lima, Lisa Wagenbrenner
Public Relations		Mosquito Awareness Week, Outreach and education	David Gaines
TMVCC	Jay Kiser	TMVCC representative	
TRAST	Charles Abadam	TRAST representative	
Website	Lane Carr	Maintains and revises VMCA website	Penny Smelser
Social Media		Facebook and Twitter	Justin Anderson, Andy Lima, Lisa Wagenbrenner
Hospitality	Ann Herring	Annual meeting hospitality room	Jennifer Pierce, Latoya White

What is the year going to be like?

That is the 10 million dollar question. If I answer it, you have to give me 10 million dollars. I will try to give you an answer commensurate with the checks that are (or not) arriving in my mail box. This has been quite the winter for some folks. New terms like “Polar Vortex” have worked in to the metrological myth bag. I guess “El Niño” or jet stream oscillation was not good enough. This winter the “Polar Vortex” started pumping cold air from the north. This cold air mixed with ample moisture supplied from the Gulf of Mexico and remnants from the “Pine Apple Express”. The Pine Apple Express is a term meteorologists have coined to describe streams of tropical moisture that funnel out of the Pacific Ocean (Near Hawaii) towards the west coast. Ask anyone on the west coast if they can use the moisture. Lots of things need water to live, especially people, and they need all they can get right now. Many areas across Virginia have had more frozen precipitation than normal this past winter. Don’t believe me, ask someone that had to order anything that could be used for snow removal, or one of the kids that will be making up more than a week of snow days. Those of us that get to work shift work plowing streets and parking lots will be very glad to see warmer conditions. Some folks keep telling me that “at least the winter will kill the mosquitoes”. Unfortunately I do not share their sentiment, but I do enjoy telling people that I am collecting more mosquito larvae than normal.

From a Tidewater, Hampton Roads, Coastal Virginia, or whatever they want to call us, perspective *Oc. canadensis* don’t have a problem with snow and ice; they have evolved to survive in our region, no matter what you call it. The frequent rain last summer, fall, and winter has flooded up lots of vernal pools (temporary woodland pools or forested wetlands, again call it what you want, it is the same thing). We collected first- and second-instar *Oc. canadensis* larvae the first week of January. The second week of January brought cold temperatures and frozen precipitation. The local body shops are still working to clear the back log of smashed up cars. Most people in our area CAN NOT drive in snow and ice. Don’t feel bad, lots of folks out in California can’t drive in rain; they wreck and roll cars over when the roads are wet. Anyway, the point is the mosquitoes have everything they need reproduce successfully. Officially we won’t know for a few more months how bad things will get. Anecdotally it is looking pretty bad from our perspective. The woods are very wet and we are consistently dipping more than 10 larvae per dip. I don’t consider dipping to be very refined for quantitative analysis; there is too much variability among dippers and micro habitats on our sites. If it is any consolation, the last “bad year” for *Oc. canadensis* I only remember dipping two or three larvae per dip. I do remember the large number of acres flooded. That year we were still using the old New Jersey light traps, and the traps physically could not hold any more mosquitoes. Our gold standard bench mark for quantitative analysis these days are the CO₂ baited CDC light traps. The bad news is by the time you get the trap data it is too late.

We had a bad winter (at least in 100 year perspective), that will kill or slow down some bugs. Many areas across the state had more snowfall than normal. In general, mosquitoes in our state have evolved to survive in our climate. Yes, some species that are at the extreme ranges might be stressed or suppressed this season. The flip side of the coin also exists. More “Northern” species where Virginia is the Southern limit might have an advantage this season, e.g. *Culex pipiens*. This season has legacy from last season, and wet conditions from last season are forecast to continue into this season. Sustained wet conditions can help natural predators survive, flush out some larvae, promote growth of permanent water species (*Anopheles quadrimaculatus*, and *An. punctipennis*, and *Coquilletidia perturbans*).

The conditions we are experiencing have happened before, and they will happen again. Take the time to document what you have in your area this season. You might see something interesting that only these conditions can create.

Submitted by George Wojcik

VMCA Adult ID Course

The VMCA is holding a 2 day FREE adult mosquito ID course on May 14th and 15th. 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, including a tentative schedule, is also posted on the VMCA website (<http://mosquito-va.org/formstraining.htm>).

Supplies and microscopes are limited but we will have a few extras on hand. If possible, please bring the following items: microscope with lamp, power strip, extension cord, forceps, petri dishes, wipes, alcohol and notebook. The course will be held at Chesapeake Mosquito Control Commission, 900 Hollowell Lane, Chesapeake, Virginia 23320.

The course will start at 7:30 am on Wednesday, May 14 and at 8:30 am on Thursday, May 15.

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, sodas, and water for both days.

Please e-mail Lisa Wagenbrenner (lwagenbrenner@cityofchesapeake.net) with participant's name and city or county and what supplies you lack from the provided list.



TMVCC Meetings & Schedule

The Tidewater Mosquito and Vector Control Council (TMVCC) meets monthly to discuss problems and share ideas among vector-control programs in the Hampton Roads area.

We have been working on the schedule for the 2014 year, and it looks like it will be a nice full calendar. As we lock down dates, locations, and additional presentations, we will post this information on the VMCA website as soon as we can. Until then, make sure you keep up with our reminder emails for all the information you need. You can email Jay Kiser at jkiser@suffolkva.us if you would like your email to be added to our list.

April 16th – Joe Andrews from AllPro sponsored a meeting at Sandy Bottom Park in Hampton. Steve Robertson, Command Entomologist from Langley AFB, gave an additional presentation on pest management on military facilities around the world and within the US.

May 7th – Jeff Hottenstein from Clarke will be sponsoring our annual **adulicide rodeo** at Gosnold's Hope Park in Hampton (901 E Little Back River Road). The meeting will start at 11am and run roughly till 1pm. Please RSVP in order to get an accurate head count for lunch.

Updates will be posted to the [TMVCC page](#).

Are You Keeping Up With The Chikungunya Virus Express?

Bruce A. Harrison, David Gaines, Ryan L. Harrison, and Brian D. Byrd

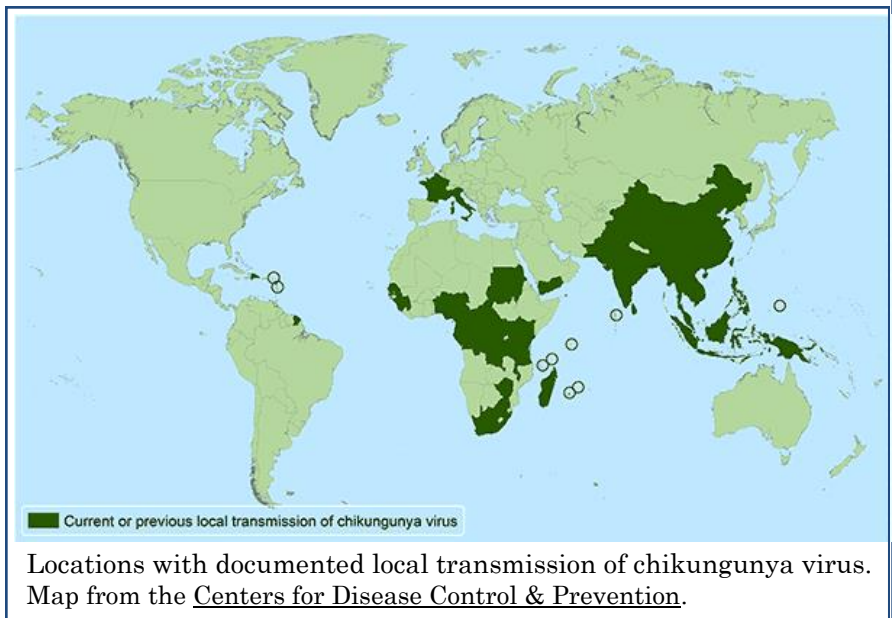
In December 2013, Dr. David Gaines, State Medical Entomologist, Virginia, sent out a message that provided described reports of confirmed locally acquired cases of Chikungunya virus (CHIKV) in people on the Island of Saint Martin in the Caribbean Region. Since then this virus has spread more widely in the Western Hemisphere to many islands in the Caribbean Region and French Guiana on mainland South America. Accordingly, we prepared this article to jog your memory to make sure you keep up with the spread of this virus and will be prepared for the control of container species in case CHIKV invades your area.

Briefly, over the last 6-7 years we have been following the ongoing progression of a developing pandemic of CHIKV cases. The name of the virus is attributed to the Kimakonde (Mozambique) word meaning “that which bends up” because it causes a febrile illness accompanied by severe muscle and joint pain that may leave people doubled over in pain. Although the disease is rarely fatal, it may be temporarily debilitating and fatigue may last for several weeks. The illness can also result in chronic joint pain and arthritis in the extremities

(hands, feet, wrists, ankles, elbows, and knees) that may persist for three to five years, or longer (CDC). Aside from the debilitating symptoms caused by this virus, our concerns are based on the large numbers of documented cases wherever the virus occurs, the lack of a licensed vaccine, and the fact that our common Asian tiger mosquito, *Aedes albopictus* (Skuse), is a primary vector. In most areas of the known CHIK distribution transmission is accomplished through a mosquito-human-mosquito virus cycle, without confirmed zoonotic mammal or

bird amplifying hosts. However, when CHIKV was initially discovered in Africa in 1953, non-human primates were found infected and suspected to have served as primary hosts and reservoirs for the virus. At that time *Aedes africanus* (Theobald) was incriminated as the enzootic vector for the virus. More recently *Aedes aegypti* (Linnaeus) and *Aedes albopictus* have been recognized as the primary vectors of this virus to humans. In Asia, nonhuman primates do not appear to be involved in the virus cycle.

In the decades following its discovery CHIKV spread out of Africa, but did not cause extensive outbreaks like the present. In the 1960s there were cases of CHIKV in Thailand when Bruce and Ryan were there. In fact one of our friends had a case that lasted for several weeks. However, at the beginning of the current outbreak the virus first spread to several Indian Ocean islands, including the Island of Reunion in 2005-06, where one third of its residents (266,000 of the 800,000) contracted active CHIKV infections. Of even more interest, the



Chikungunya, continued

virus was primarily transmitted by *Aedes albopictus* on Reunion. At that time this was thought to be due to the rarity of *Aedes aegypti* on the island. Subsequently, researchers found this was also due to a single mutation of the virus that adapted it to and enhanced the vector efficiency of *Ae. albopictus*. In 2006-07 it spread to India where both *Ae. aegypti* and *Ae. albopictus* occur, which resulted in 1.5 million recorded cases in 2007. It also spread to Italy in 2007, where it caused a small outbreak (200+ cases), and again the vector was *Ae. albopictus*. Meanwhile, it was also spreading eastward to Indonesia, Thailand, Malaysia, Singapore, Vietnam, southern China, and the Philippines, where both mosquito species are present. Examples of outbreaks since 2007 include 50,000 cases in southern Thailand in 2012, and 924 cases in 2013 in Singapore, a country that has been trying to control this virus since 2007. The primary vector in Singapore is *Ae. albopictus*, while both *Ae. aegypti* and *Ae. albopictus* are involved in Thailand. Most recently CHIKv has shown up on several isolated Pacific Islands in Micronesia, and now it has arrived in the Western Hemisphere.

The potential introduction of this virus and its subsequent spread should be taken very seriously by mosquito control personnel working in areas of the USA where *Ae. albopictus* and/or *Ae. aegypti* occur and commonly cause residential nuisance complaints. For those of you only utilizing crepuscular/nocturnal spraying we are now talking about daylight feeding species

that live in close association with people and their dwellings and are mostly unaffected by insecticide applications made from crepuscular/nocturnal spray trucks. This should send a shudder up your spine. How many backpacks and employees do you have? Not enough, I assure you.

Addressing focal outbreaks of CHIKv in the USA next summer or a following summer presents many problems for mosquito control personnel. Now is the time to seriously consider how you and your program would/will approach emergency control of *Ae. albopictus*. When CHIKv arrives in the Mid-Atlantic area of the U.S., the media will certainly spread the info and hype about the



Aedes albopictus.
Photo: J. Gathany, CDC.

virus and how to control *Ae. albopictus*. We suggest you have a white paper with educational recommendations that stress the need for “Tip and Toss” and source reduction as your primary prevention strategy, have brochures to pass out, as well as a description of other essential parts of your overall control plans. This should be ready to hand out to the media so that what they say agrees with what you will be doing. Also, this winter make sure that your backpacks, light weight ULVs, and thermal foggers are all in good condition for use this coming year and have plenty of the pesticide you will need for these on stock. Also, each program should make sure they have a good stock of repellents available for their employees to use while in the field. Each program needs to prepare for the potential that next mosquito season is when the virus will arrive in the United States, and possibly their area. This may be hard to do since you like-

Chikungunya, continued

ly operate on yearly budgets that have to be submitted during early winter months, but you can go ahead and prepare the paper work and make plans for whatever will be needed.

In case you still think this is primarily an *Ae. aegypti* driven virus and are not convinced of the urgency of developing control plans for this virus because you only deal with *Ae. albopictus*, think again. Also, there is a good possibility that other North American mosquito species may be able to transmit this virus. Turell et al. (1992, *J. Med. Entomol.*, Vol. 29:49-53) conducted laboratory vector competency tests using *Ae. aegypti* and *Ae. albopictus* strains infected with an Asian strain of CHIKv, which is the strain currently invading the Western Hemisphere, and found that *Ae. albopictus* was a more competent laboratory vector of this virus than *Ae. aegypti*, regardless of the geographic strains of the two species. The U.S. populations of *Ae. albopictus* they tested included strains from New Orleans, Houston, Honolulu, and Polk County, Florida. More recently, McTighe and Vaidyanathan (2012, *Vector-Borne and Zoonotic Diseases*, Vol. 12:867-871) tested the vector competency of Virginia and Georgia strains of *Ae. albopictus* for CHIKv and determined that they were all highly competent vectors of this virus. In their conclusions these last authors stated, **“Only early and specific detection of human cases coordinated with vector control can reduce the risk of local transmission of CHIKv in the U.S.”**

The Caribbean islands and tropical South America will enjoy warm weather and endure mosquitoes that bite locals as well as tourists throughout our winter. There are recent reports indicating that up to 18,000 probable or confirmed cases, with 5 deaths, may have already occurred in the Western Hemisphere to the present. In addition, over 1,000 suspected cases of CHIKv are now being reported from the Dominican Republic, the most heavily visited tourist stop-over in the Caribbean in 2013. The fact that CHIKv was already causing illness on St. Martin for more than a month before its detection last December, and that so many cases are being found four months later on other Caribbean islands and French Guiana suggests that it has already spread well beyond containment in the Americas. As pointed out by David this virus is readily able to invade the southern and eastern portions of the United States because of the many people vacationing in the tropics this time and later in the year. Thus, numerous infected travelers could soon be bringing the virus into the U.S., which will significantly enhance the risk of local autochthonous outbreaks in the U.S. this coming summer. Remember, it only takes one CHIKv sick person that was not detected in an airport or on a ship to return home and be bitten by either *Ae. aegypti* or *Ae. albopictus* to start a focal outbreak.

We urge each program to obtain a book entitled *“Guidelines for Preparedness and Response for Chikungunya Virus: Introduction in the Americas.”* This book (161 pages) was prepared in 2011 by the CDC and Pan American Health Organization (PAHO) and is available in PDF format through a link on the CDC Chikungunya webpage <http://www.cdc.gov/chikungunya/> or through PAHO, Washington, D.C. You may also want to check the link for the CDC fact sheet for vector control professionals: <http://www.cdc.gov/chikungunya/pdf/CHIKVVectorControl.pdf>. Meanwhile keep your fingers crossed and prepare for emergency control of the Asian tiger mosquito and other day-biting container species.

Preparedness for Chikungunya virus in Virginia

During the 2014 VMCA Annual Business Meeting, discussion ensued regarding preparedness for the introduction of chikungunya virus (CHIKV) into the continental United States. It was noted that without dedicated funding, as well as a lack of state and local level support, it would be difficult to begin dedicated preparedness efforts as communicated in the PAHO/CDC document: *Preparedness and Response for Chikungunya Virus Introduction in the Americas*. With this realization, VMCA members agreed that a letter to the State Health Commissioner outlining our concerns and support for preparedness efforts was warranted.

On March 13, 2014, VMCA President Jennifer Pierce sent correspondence to Dr. Marissa Levine, Interim State Health Commissioner, on behalf of the VMCA Membership. On March 20, 2014, President Pierce received a positive response from Dr. Levine stating that VDH was in the process of preparing a clinician letter to alert health care providers practicing in Virginia.

Since that time, Dr. Levine has completed and distributed a Dear Colleague letter to Virginia Physicians highlighting Mosquito-borne Viral Diseases in Virginia and among Travelers, dated April 18, 2014. This correspondence reviews the recent introduction of CHIKV into the Americas and the current, ongoing outbreak in the Caribbean islands and French Guiana. The letter acknowledges that this could potentially affect Virginia residents.

Dr. Levine has asked, should you have any further questions, concerns, or ideas for additional actions about mosquito-borne illnesses, please contact David Gaines, PhD, Public Health Entomologist in VDH's Division of Environmental Epidemiology. He can be reached by telephone at (804) 864-8192 or by email at david.gaines@vdh.virginia.gov.

Thanks go out to Dr. Levine, Dr. David Gaines and President Jennifer Pierce for helping to take the first step in preparedness for the potential introduction of a new emerging arbovirus in our region.

Additional preparedness efforts are on-going on other State and local levels such as <http://www.floridahealth.gov/diseases-and-conditions/mosquito-borne-diseases/chikungunya.html>.

Dr. Kevin Caillouet (formerly of VCU and now at St. Tammany Parish Mosquito Abatement in Louisiana) has shared the list of priorities that he has developed for CHIKV planning in Louisiana. These include:

1. Timely notification of suspect and confirmed cases and place of residence.
2. CHIKV Mosquito testing protocol
3. Optimization of *Ae. albopictus* surveillance strategies
4. Resource sharing across mosquito abatement districts
5. Development of county-level response plans

Please share knowledge of any preparedness efforts that you are aware of via the e-mail listed below.

Respectfully,
Randy B Buchanan
VMCA Legislative Chair
buc06@co.henrico.va.us

Asian tiger mosquito—nuisance *and* disease vector

James C. Dunford, Brian F. Prendergast, Toby W. Palmer and Kathryn A. Barbara
Navy Environmental and Preventive Medicine Unit TWO, Norfolk, VA

The views expressed in this article are those of the authors and do not necessarily reflect the official policy or position of the Department of the Navy, Department of Defense, or the U. S. Government. Mention of a trademark, vendor, or proprietary product does not constitute a guarantee or warranty of the product by the US Navy and does not imply its approval to the exclusion of other products that may also be suitable.

In light of the recent outbreak of Chikungunya (CHIKV) in the Caribbean, a mosquito-borne disease new to the Western Hemisphere, we would like to take moment to briefly revisit regional work that has been conducted in the past to control container breeding *Culex* spp. and Virginia's #1 nuisance mosquito, the Asian tiger mosquito (*Aedes albopictus*). While it is widely known that *Culex* spp. have been implicated in the transmission of West Nile Virus (WNV), the invasive Asian tiger mosquito (ATM) is only suspected to play a minor role in WNV transmission; however, the recent emergence of CHIKV in the Western Hemisphere has made the ATM a more medically-relevant invasive species.



Figure 1. Application of *Bti* containing dye using the Curtis Dyna-Fog Maxi Pro 2D at Langley Air Force Base, VA.

The World Health Organization and Centers for Disease Control and Prevention (CDC) reported in December 2013 that CHIKV was confirmed on the French side of St. Martin in the Caribbean, and numerous additional cases have since been reported on Sint Maarten, Martinique, Guadeloupe, Saint Barthelme, French Guyana, Dominica, and the British Virgin Islands. We should expect an increase in cases as we move into the height of the tourist season given the lack of immunity in both local and tourist populations. The virus is transmitted by *Aedes aegypti* and *Ae. albopictus*, the latter being all too familiar to mosquito control specialists in Virginia since its appearance in the early 1990s. Chikungunya is not usually deadly, but can cause severe headache, joint pain, rash and fever. There is currently no vaccine or specific treatment for the

virus. The disease has spread out of Africa in recent years to the Indian Ocean region, Asia and Europe. So far, the CDC reports 109 travelers have carried it into the U.S. and it hasn't spread; however, WNV arrived in the U.S. in 1999 and is now established across much of North America.

What does this mean for the establishment of CHIKV in the U.S.? A competent vector of CHIKV has been in the area for almost 25 years and travel to and from endemic regions is frequent (the CDC reports approximately 9 million U.S. residents travel to the Caribbean each year). Epidemiologically, it appears that CHIKV, unlike WNV, may not be zoonotic in some of its range (it is however zoonotic in Africa). Perhaps the standard of living in the U.S.



Figure 2. Vector-control specialists and company representatives calibrating equipment.

Asian tigers, continued

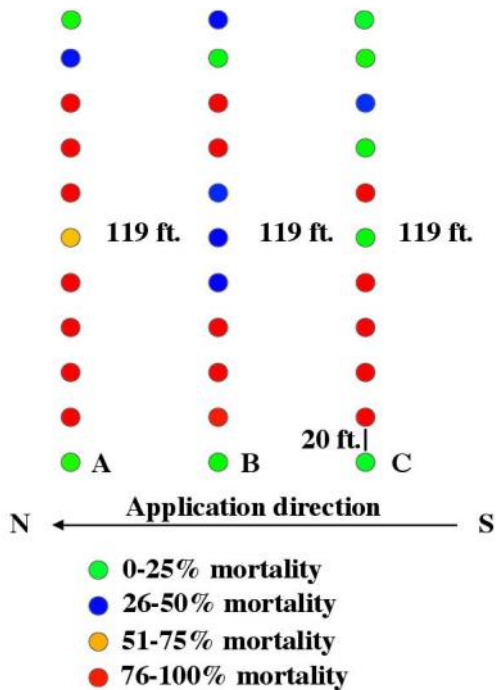


Figure 3. Larval mortality in plastic cups seeded with *Culex* spp. larvae.

(i.e., air conditioning and screens) makes non-zoonotic vector-borne diseases rare, leaving the homeless and migrant populations primarily at risk--CHIKV will likely test that theory. If CHIKV is zoonotic, it will have profound effects on disease ecology, and that question must be answered.

First reported at the 2010 VMCA meeting, a collaborative evaluation was carried out at Langley Air Force Base, VA using truck mounted applications of *Bacillus thuringiensis israelensis* (*Bti*) to control container breeding mosquitoes (*Truck-mounted applications of Bti to control container breeding mosquitoes*, Burcham et al.). Results using spot cards and plastic cups seeded with larvae to evaluate the Curtis Dyna-Fog Maxi Pro 2D (see Figures 1 and 2) demonstrated that Vectobac WG *Bti* could be applied up to distances of 300 ft. (91.44 m) when humidity was at 75%. Overall *Culex* spp. larval mortality was 65% in the test population, with 76% or higher larval mortality in plastic cups adjacent to spot cards where the greatest amount of *Bti* was collected (see Figures 3-5). This study brought the Air Force, Navy, Virginia mosquito control districts, and equipment/larvicide company representatives together to develop improved methods and additional tools to control

Aedes and *Culex* spp. There have been numerous similar equipment and larvicide evaluations published, reported, or presented at meetings in the past two or three decades providing specialists valuable insight on how to better control container breeding mosquitoes before the disease transmitting adult stage, which may be now more relevant to this region than ever.

The mosquito control community was challenged over two decades ago to manage a new invasive mosquito, and an impressive amount of national and international collaboration followed. We hope that evaluations to discover improved ways to control container breeding mosquitoes continue. Again we face another challenge, this time to develop a CHIKV surveillance plan and improve CHIKV diagnostics in the U.S. We hope funding agencies realize the need to support efforts to not only effectively manage the vectors, but to readily detect the presence of vector-borne disease. We are optimistic that an interagency surveillance plan can be developed, and the time is now.



Figure 4. Spot cards used to capture dye and *Bti* application. Left, distribution of cards in area of application. Right, Card with dye following application.

Definition of Waters of the United States under the Clean Water Act

The Environmental Protection Agency (EPA) and the U. S. Army Corps of Engineers (Corps) on April 21, 2014, jointly published in the Federal Register ([PDF version](#)) a proposed rule defining the scope of waters protected under the Clean Water Act (CWA). In light of recent U. S. Supreme Court cases (U.S. v. Riverside Bayview; Rapanos v. United States; and Solid Waste Agency of Northern Cook County v. U. S. Army Corps of Engineers), this proposed rule seeks to clarify what surface water bodies are protected under the CWA and provide predictability and consistency across the multiple Corps districts within the United States. [Public comments](#) are being accepted by the EPA on this proposed rule through July 21, 2014.

What's That? Answer

That is the eye of a bald eagle (*Haliaeetus leucocephalus*). A number of these birds died last winter following infection with West Nile virus. From the Utah Division of Wildlife Resources:

Laboratory results have confirmed what officials with the Utah Division of Wildlife Resources have been suspecting: West Nile virus killed the bald eagles that have died in Utah over the past few weeks. Testing at the Utah Veterinary Diagnostic Laboratory in Logan, Utah, and the National Wildlife Health Center in Madison, Wisconsin, has definitively ruled out many other possible causes of death, including toxic chemicals or poisons, lead poisoning, bacterial infections and several other viruses, including avian influenza and avian vacuolar myelinopathy.

Officials aren't certain how the eagles got West Nile virus, as the disease typically affects birds (including eagles) during warmer months, when mosquitoes that carry the disease are active. They think the birds might have contracted the virus after eating infected eared grebes that died recently on Great Salt Lake.

Leslie McFarlane, wildlife disease coordinator for the Utah Division of Wildlife Resources (DWR), says more than 2 million eared grebes stop at Great Salt Lake during their winter migration. Almost every year, about one percent of the population that visits the lake dies from a bacterial disease called



Photo: W. Lloyd MacKenzie, via Flickr

avian cholera. "Every time grebes die," she says, "we send some of the dead birds to a laboratory for testing. Usually, avian cholera jumps out as the cause of death. This year, though, the initial laboratory results were not as conclusive. That led us to believe that something else might have killed the grebes this year."

Additional testing on the eared grebes, however, have led to findings that are consistent with what's being found in the bald eagles.

In the winter, bald eagles obtain most of their food by eating dead animals. Since all of the eagles that have died have been within flying distance of the lake, McFarlane thinks the eagles might have contracted West Nile virus after eating grebes that died at the lake from the disease.

The full story may be found [here](#).

Submitted by Mitch Burcham

VMCA Membership Application and Renewal Form

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	
E-MAIL:		
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.)

2014 Sustaining Members

The VMCA gratefully acknowledges the support of the following sustaining members for 2014. 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!

<p style="text-align: right;">Ted Bean (814) 671-6516 tbean@myadapco.com</p> 	<p style="text-align: right;">Peter Connelly (772) 563-0606 peterc@amvac.net</p> 
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Virginia Mosquito Control Organizations & 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 districts, those that have traditionally been organizational members are listed below along with their websites. If there are other sites that should be listed, please submit them to the editor.

Virginia Mosquito Control Organizations

[Alexandria Health Department](#)

Boykins, Town of

[Chesapeake Mosquito Control Commission](#)

Emporia, City of

[Fairfax County Health Department](#)

Fort Eustis

[Gloucester County](#)

[Hampton, City of](#)

Henrico County

[Newport News, City of](#)

[Norfolk, City of](#)

[Portsmouth, City of](#)

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

Richmond, City of

[Suffolk, City of](#)

US Air Force / Langley Air Force Base

[Virginia Beach Mosquito Control](#)

[York County](#)

Health Information

[Virginia Department of Health](#)

[Centers for Disease Control & Prevention](#)

Other Mosquito Control Organizations

[Mid-Atlantic Mosquito Control Association](#)

[American Mosquito Control Association](#)

[AMCA/Fairfax County Education and Outreach Materials](#)

Submissions wanted!

Have something you'd like to include in the next issue of *The Skeeter*? We are looking for organizational updates, operational news, education and other outreach activities, pictures, stories, or other vaguely vector-related items to include in an upcoming newsletter.

Please send all items to Justin Anderson at janderson152@radford.edu.

The deadline for inclusion in the next issue is: **June 30, 2014.**

The Skeeter
Newsletter of
The Virginia Mosquito Control Association

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www.mosquito-va.org



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

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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, and any other interesting facts or tidbits for publication. Submissions can be sent to Justin Anderson at skeeter@radford.edu.

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