

Newsletter #6

April 17, 2019

Source Reduction means Mosquito Reduction
Smithsonian's Mosquito! Curriculum
Spotlight: Medford Memorial Middle School,
Medford, NJ USA

GLOBE Mission Mosquito - <http://bit.ly/GLOBEMM>

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Welcome Message: Dorian Janney, Campaign Coordinator

A co-worker of mine brought in some wiggling larvae that she found last weekend in a birdbath. We were really surprised to see larvae this early in the spring as we have had some very cold nights. As it is unlikely that the mosquito larvae mom had gone through the complete life cycle, we believe these larvae represent the first generation for this season. We pulled out our cell phone lens and spent the next ten minutes engaged in scientific exploration as we used the dichotomous key in the “*Mosquito Habitat Mapper*” tool to try to identify the type of larvae we had in front of us. We identified the larvae in the genus *Aedes*, but it didn’t appear to be one of the three key disease carrying genera based on the hair tuft that we noted that was inserted between the pecten. How exciting it was to dialogue and assist each other as we worked on identifying the larvae! We lost track of time while we were fully immersed in the processes of scientific endeavor. Be sure to be extra vigilant about making regular observations right now as we are really hoping to document when active mosquito season begins and ends around the globe.

In this edition of the newsletter, we have some great new resources to share with you. Dr. Low shares some great tips for reducing the potential mosquito breeding habitats in the *Science Cafe*. We feature the Smithsonian’s Mosquito! curriculum in our *Educator’s Corner* with a blog written by Francine Baker sharing insights on this fabulous free resource. Our *Spotlight* this month shines on Vicky Gorman and her students in Medford, NJ.

Science Cafe: Dr. Russanne Low, Scientist

Source Reduction means Mosquito Reduction

By using the GLOBE Observer Mosquito Habitat Mapper tool, you are not only providing useful surveillance information as to where and when mosquitoes are found. By eliminating the breeding site, you are providing an important public service known as “source reduction.” Take a look around your home, park and school to see what steps can be to reduce mosquito breeding in your neighborhood:

1. Remove all unnecessary containers where water can accidentally accumulate. Make sure water in pet bowls and in saucers under plants is refreshed no less than twice a week.
2. Clean debris from gutters, where water can pool and become stagnant.
3. Remove standing water and seepage from around intentional water storage, such as cisterns and rain barrels, and make sure that stored water is covered with a lid or net and/or larvicide.
4. Grade and drain standing pools of water that are found near septic systems, cesspools, and ditches, and make sure that irrigation equipment is adjusted so it doesn’t create puddles.

What potential breeding habitats do you see? To read the rest of this column, click [here](#).

Educator's Corner- Smithsonian's Mosquito! Curriculum

Introducing *Mosquito! Community Research Guide: How Can We Ensure Health for All from Mosquito-borne Diseases?*

During our Educator webinar on April 10th, Andre Radloff from the Smithsonian Science Education Center shared information on this fantastic free curriculum. Dr. Russanne Low helped to develop this curriculum, and she is one of the scientists profiled in the curriculum in the "Meet the Team" section. The "Mosquito Habitat Mapper" tool is highlighted in the readings! This resource can be accessed [here](#) and you can read this excellent [blog](#) about it.



Spotlight: Medford Memorial Middle School, Medford NJ, USA

GLOBE teacher Vicky Gorman and her middle school students have been working hard to help reduce the threat of mosquito-transmitted disease in their region. Before they began to use the *Mosquito Habitat Mapper*, they did some research to find out which mosquito-transmitted diseases are found in their location. They live in Burlington County, New Jersey.

Based on a brochure produced by the NJ government about mosquitoes in their state, the students found out that the two most prevalent diseases transmitted by mosquitoes are West Nile virus and Eastern Equine Encephalitis (EEE). Humans can contract both illnesses. Last year in New Jersey, there were 44 cases of West Nile fever; three of which were fatal. There are other mosquito-borne illnesses, but most of those come into the US from travelers. Burlington County is within 1-3 hours of Philadelphia, Liberty International (Newark, NJ), Baltimore, Washington D.C. and all New York airports. All of these cities are entrance points for overseas travelers.

Two teams of students from Gorman's class decided to conduct an investigation to help them determine where and when *Culex* genus mosquitoes might breed during active season. *Culex* mosquitoes transmit both West Nile fever and EEE. They like stagnant water and can lay eggs in very shallow water. The students were surprised to find there are also both *Aedes aegypti* and *Aedes albopictus* in New Jersey, as well.

As they did research on the *Aedes* mosquitoes, they discovered that *Aedes aegypti* and *A. albopictus* are often found in south central New Jersey. And, in both cases of the genus *Aedes*, they expect to find larvae in smaller containers and more sheltered areas, like the rain barrel shown here.

The research teams were excited to start looking for mosquitoes, but winter in NJ means cold temperatures. This makes winter the inactive or dormant season of mosquitoes in the Northeast. However, the students were surprised to learn that mosquitoes can hibernate during cold temps less than 50 degrees F. So, even though it's winter, the mosquitoes are still around! As they thought about how they could identify potential breeding habitats, they found several articles about scientists using drones in Central



Rain barrel in schoolyard.
Credit: V. Gorman

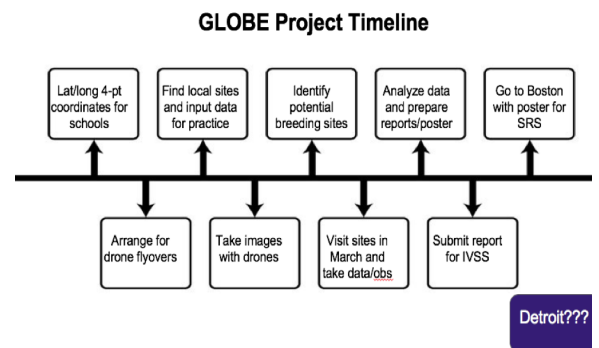


Three of the sites being studied. Credit: V. Gorman

America and Africa to identify potential breeding areas. They decided to try to use drones while there are not very many leaves on the trees in hopes to identify breeding areas in their region.

The two teams worked together to choose sites for drone flyover. They chose the six schools in their district. Each team will look at three sites and then compare their data. The list of places where they might find potential breeding habitats include flat roofs, gutters and drains, playground equipment, and low depression areas or ditches.

Here are some pictures of the different school environments. As they didn't yet have the drones, the pictures from above were taken from *Google Map*, and the picture of the schoolyard was taken by V. Gorman.



V. Gorman's students' GLOBE IVSS Project timeline

To ensure they were on track, the students developed the timeline (right) to aid them in being prepared to meet the deadlines for their GLOBE International Virtual Science Symposium (IVSS) research projection submission.

In addition to using the drones to identify potential places for mosquito breeding habitats, they will also use the Mosquito Habitat Mapper regularly and collect and report their data. We will check in with these teams and ask them to report in on their research next month! Stay tuned!

Featured Resources

Phenology Guide

During the March 13 Educator's Webinar, Liz Burck, a GLOBE Mission Mosquito team member, introduced attendees to our recently developed investigation entitled, "Local Mosquito Seasonality: Phenology (Educator's Guide)."

Phenology is the study of the timing of biological events in the life cycle of an organism. In this investigation, students will gather data on the beginning, duration and end of mosquito season in their locality, and compare that data to daily temperature readings. An analysis of the patterns and changes in those datasets will allow students to then interpret the impact of climate change on mosquito seasonality and range.

All of the information that you need to participate in this investigation is included in the guide. Simply go to the GLOBE Mission Mosquito website to download it- and get started. We are anxious to learn more about mosquito phenology in your local environment.

GLOBE Observer Mosquito Resource Library

Interested in learning more and teaching others how and why to use the *Mosquito Habitat Mapper* tool? Here you will find everything you need- and more- to get citizen scientists of all ages ready to help reduce the threat of mosquito-transmitted disease.

Tips and Tricks: Identifying Mosquito Larvae

Ready to try to identify larvae? [Here](#) are some tips and tricks taken from the "Frequently Asked Questions." Remember that most mosquitoes you find may not be one of the taxa that are included in the Mosquito Habitat Mapper. There are more than 3,500 species of mosquitoes! Most mosquitoes do not transmit disease- instead, they play an important role in the ecosystem, as pollinators and as food for bats, birds and aquatic organisms. If the larvae you have is not one of the three genera identified in the tool, you can select "other" as your species, and then mitigate the habitat as you would for one of our three genera.

Not all specimens can be identified. A specimen might be damaged if the larva is caught in a net, for example. Other specimens do not have clear features that you can use to identify: maybe your specimen is from the 1st-3rd instar and the features are not fully mature so you can't use them to determine your genus or species. Sometimes, the larva is lying in such a way you can't see the features. Use a toothpick to gently move the mosquito so that the features are all in full view. The app shows an image of how the mosquito should be positioned for identification. You may want to look at 2 or 3 mosquito larvae in your sample before you make a final determination.

Here are a few resources that you might use to assist you:

- [Larval body parts:](#)
- [Know Your Mosquitoes:](#)
- [Mosquito Fortune Tellers:](#)

Don't forget to submit your data after you have taken it!

You need to click on the "Review/Send My Mosquito Observations" tab and click the observations you are ready to send to ensure we get them.

What's the Buzz? Mosquitoes in the News

Aedes aegypti spreading across US

Data suggest that *Aedes aegypti* is spreading across the United States — mainly up from the Southern states — at a rate of about 37 miles per year, although it has spread at faster rates in the past. On the other hand, *Aedes albopictus* seems to be spreading at ever faster rates across Europe, currently at a rate of about 93 miles per year.”

Urine Tests for Mosquitoes

Public health officials could soon be able to detect viruses in mosquitoes in the wild much more quickly and easily—thanks to the insect equivalent of a urine test. A new study in Australia shows that two kinds of commonly used mosquito traps can be readily modified to collect mosquito excreta, or liquid waste droplets, to be tested for signs of viruses.

Climate Change and Mosquitoes

Scientists have little doubt that climate change will expand the range of mosquito-borne diseases, as higher temperatures make it possible for mosquitoes to survive in more

places for more of the year. This is part of the perception that a warmer world will be a sicker world.

Loud Music Reduces Mosquitoes

Want to play some music that will keep mosquitoes at bay? Here is a fascinating article that suggests perhaps loud music may be used to manipulate mosquito behavior!

New Approach for Reducing Malaria

Results have been released from a study using a promising new approach for reducing cases of malaria. The study found that administering the drug ivermectin to humans, which renders their blood deadly for mosquitoes, reduced malaria cases in children under five by 20%.

Fighting Malaria with Digital Technology

Fighting malaria with the help of digital technologies: Over 3 billion people are at risk for contracting malaria, and over half a million people globally die each year from this deadly disease. Mobile health applications have grown rapidly and now may be utilized in many ways to decrease the threat of this disease.

Honor Roll: Most active over the past 30 days (as of April 15th)

GLOBE Member	School/ Institution	Country
M. Seck	Lycee Thilmakha	Senegal
F. Gueye	Lycee Thilmakha	Senegal
M. Sarre	Lycee Thilmakha	Senegal
M. Ndiaye	Lycee Thilmakha	Senegal
P. Pongmanawut	Princess Chulabhorn Science High School- Trang	Thailand
B. Fall	Lycee Thilmakha	Senegal
I. Mauad	Escola Minus Gérias	Brazil
E. Taborda	Columbia GLOBE v-School	Columbia
P. Nelson	CEOAS GLOBE v-School	USA

From the Zika Education and Prevention Project

In recognition of the Zika Education and Prevention project community, the GLOBE Implementation Office is happy to report that the three project regions of Asia and Pacific, Africa, and Latin America and Caribbean have collectively hosted over 100 Country Mosquito Trainings, over 20 Local Mosquito Workshops, and have added over 56,000 data points to the GLOBE Observer Mosquito Habitat Mapper App. Their efforts bring the Zika project closer to its 100,000 data points goal. More information can be found [here](#).

Upcoming Events:

April 17th, 2 PM (EDT)/ 6PM (UTC) Citizen Science Webinar

May 8th, 2 PM (EDT)/ 6 PM (UTC) Education Webinar
Protection and Prevention and 2019 IVSS Student Projects

May 29th, 2 PM (EDT)/ 6 PM (UTC) Citizen Science Webinar
Mosquitoes on the Landscape

Learn more at www.globe.gov/web/mission-mosquito.

Contact us: [Dorian Janney](#), [Rusty Low](#), [Cassie Soeffing](#), and [Liz Burck](#)

Watch for the next GLOBE Mission Mosquito Newsletter on May 15th

GLOBE Mission Mosquito is an initiative of **NASA Goddard Space Flight Center** and the **Institute for Global Environmental Strategies**, in partnership with **The GLOBE Program**.

Learn more at www.globe.gov/web/mission-mosquito.

