



Science Background

1. Introduction to GO MHM
2. Mosquito Vectors of Disease
3. Satellite Data and NASA Connections
4. Prior Knowledge Quiz
5. Using the app for the first time: tutorial
- 6. Describing your mosquito habitat site using the GO MHM App**

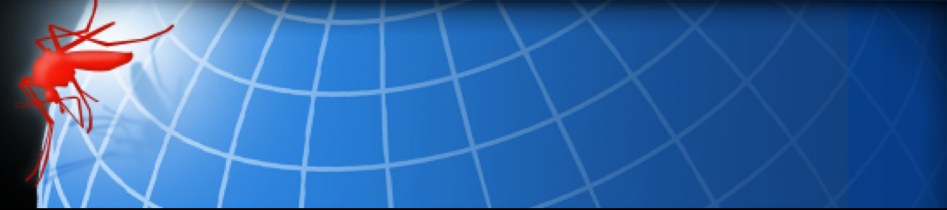
Lunch and Fieldwork

Hands-on session and Tour of GO MHM

7. Using the macrolens
8. Identifying specimens
9. Breakouts- Small Group Work
10. Education and Training Resources/ Bingo and Digital Games

The background of the slide is a blue-toned illustration of a pond. In the center, a black mosquito is shown in profile, standing on the water's surface. Its reflection is visible below it. The pond is surrounded by stylized grass and lily pads. In the upper left, a light blue circle represents the sun or moon. The title 'Mosquito Habitat Mapper' is overlaid at the bottom in white text.

Mosquito Habitat Mapper



- **GLOBE Observer** is an international network of citizen scientists and scientists working together to learn more about our global environment, including our changing climate and its impacts.



- Our investigation focuses on mosquito larvae- the larva is an immature developmental stage that lives in water, doesn't bite and doesn't pose a health hazard to humans!



Mosquito Habitat Mapper: Steps

Time and Location

Enter the **local** date and time of the observation:

Jul 7, 2016

9:28 AM

Enter location coordinates:

Latitude: 34.1244

Longitude: -117.7491

Map of Pasadena showing the observation location.

Next

1

Locate/Describe

Observe and Count

Step 2 - Observe and Count Larvae

Would you like to sample larvae and perform a count?

You will need to carefully scoop or suction larvae from the water source.

Image of a person sampling larvae from a water source.

Yes

No - I'm done

2

Sample/Count

Identify

Photograph Larva

Take up to 3 photographs of the full body of the larva. Your goal is to get a picture similar to the pictures below.

Image 1: Larva in water.

Image 2: Larva in water.

+ Photo

+ Photo

+ Photo

Finished Taking Photos

3

Photograph/Identify

Eliminate Breeding Grounds

Step 4 - Eliminate Breeding Grounds

Thank you for recording your observations. Please review or add any comments you'd like us to know about this observation.

Comments from earlier are already listed here. User can add to/modify/delete contents.

Step 4 eliminates mosquito breeding grounds. By dumping or treating water, you can significantly decrease the spread of mosquitoes. Public health officials in your area may have suggestions on how to treat water that cannot be dumped.

Did you dump out the water?

Yes

No

4

Decommission



Necessary Equipment

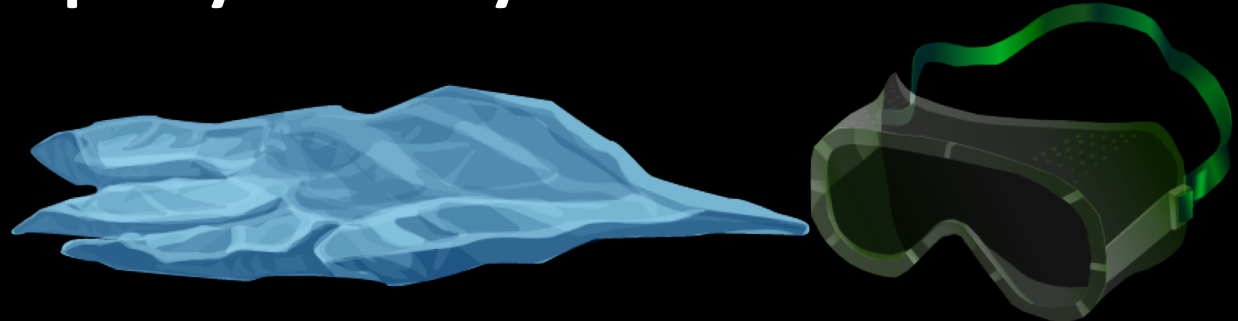


**Necessary Equipment-
You can make your own!**



Citizen Science Safety

- Wear long sleeves, pants socks and shoes, insect repellent
- Wear gloves and/goggles to be protected from contaminated water sources.
- Sample in your own yard or in public areas. Do not take samples on private property unless you have obtained permission.





AT&T 9:29 AM 100%

← Time and Location

Enter the **local** date and time of the observation:

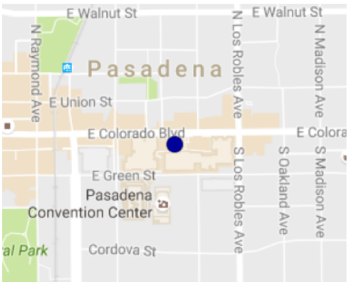
Jul 7, 2016 ▼

9:28 AM ▼

Enter location coordinates:

Latitude: 34.1244

Longitude: -117.7491



Next

Recording Data, Step 1. Locating and recording breeding sites

- Open GLOBE Observer Mosquito Habitat Mapper.
- The app will automatically download the date, time and the latitude / longitude of your location.
- You will be able to verify the location by the map that is provided.



Step 1: Locate



Locate sources of standing water and see if you see mosquito larvae



Step 2: Sample and count

There are several different tools to choose from. Use the one that you find best for your sampling sites:

Bulb syringe/Mosquito dipper/Net and wash bottle

You can also ask your local mosquito control authority which method they prefer to use.





This method is appropriate for all environments and sampling sites.

Press and collapse bulb, place syringe tip near the top of the water surface. Release bulb so bulb inflates and water enters the syringe.

Transfer sample to plastic bag, by holding tip and then releasing the sample into the bag.



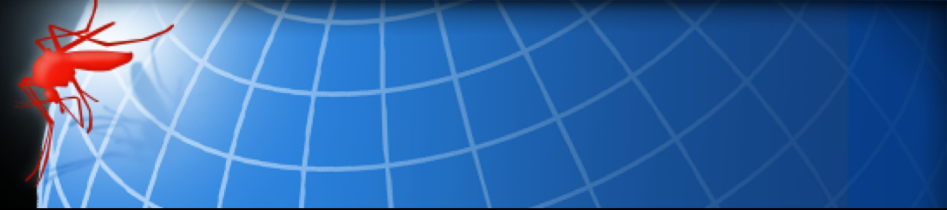
Safe Handling of Samples



Leave air in bags so that larvae can breathe, and keep bags cool and in the shade. If they warm up in the sun, the larvae may die.

Identify the larvae soon after collection. If left overnight, any pupae in the sample may become adult flying mosquitoes.

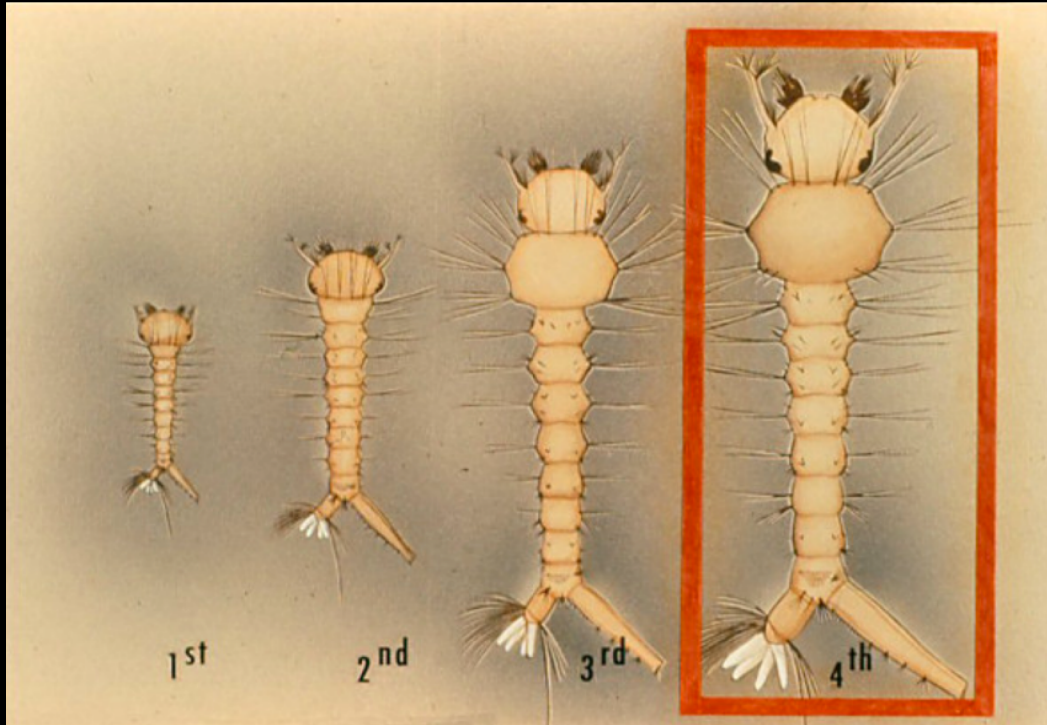
If you find adult mosquitoes in your sample bag, shake the bag to drown the adult mosquitoes and dispose of the sample by pouring on the ground.



Step 2: Count



- Provide a count of the larvae and pupae in your sample.
- You need to be as precise as you can in your estimate.
- Do you see how different they look? Why do you think?



The features that we use to identify the specimen are seen on the **4th instar larva**. You will look for the biggest larvae you have in your sample. If you can't distinguish the features, it's possible that your larvae are still in one of the 1st-3rd instars. In this case, you can count your larvae, but you will not be able to identify them.



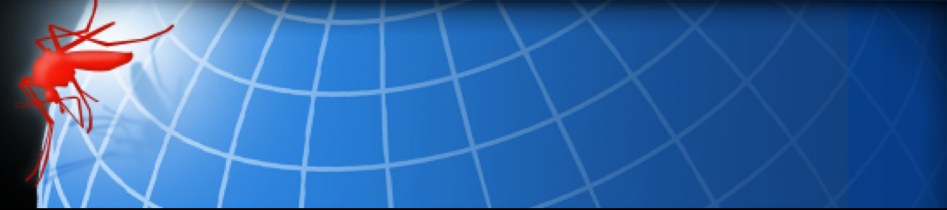
After the 4th instar, the mosquito larva turns into a pupa, where it metamorphoses into an adult mosquito. You may find pupae in your sample.



Step 3. Photograph and Identify-1



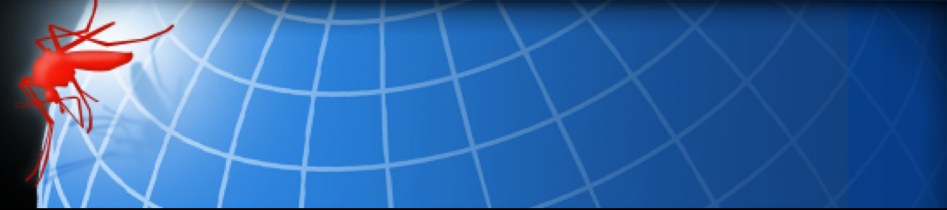
Pour part of the sample containing larvae on to a white tray or plate.



Step 3. Photograph and Identify-2



- You can use a dropper or spoon to isolate one larva and put it on a white surface. Suspend in a small drop of water.

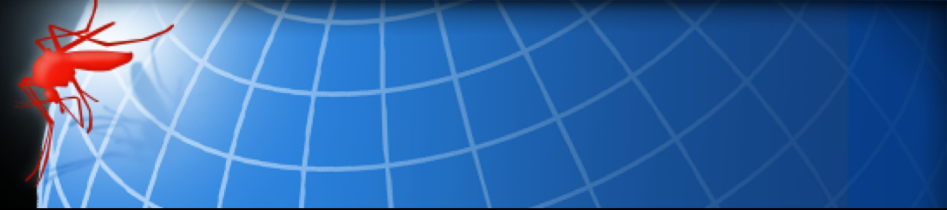


Step 3. Photograph and Identify-3



If there is too much water, the larva can swim and will be hard to keep the lens in focus. You can remove most of the water by blotting it up using the corner of a paper towel.

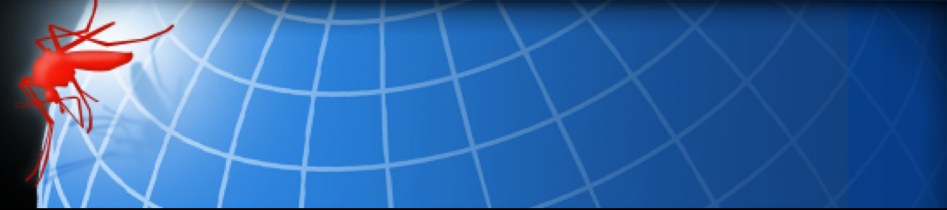
If the larva is still moving too fast to see, you can euthanize it with a drop of alcohol.



Step 3. Photograph and Identify-4



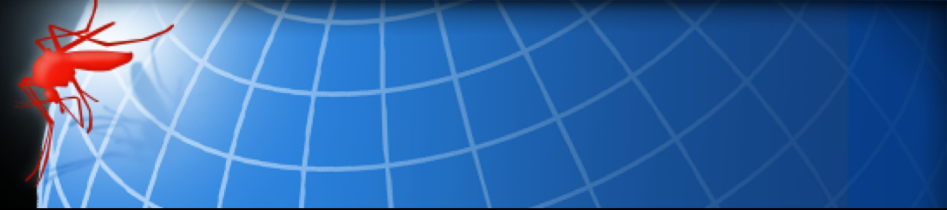
Use a probe or toothpick to position the larvae so you can see the diagnostic features.



Step 3. Photograph and Identify-5



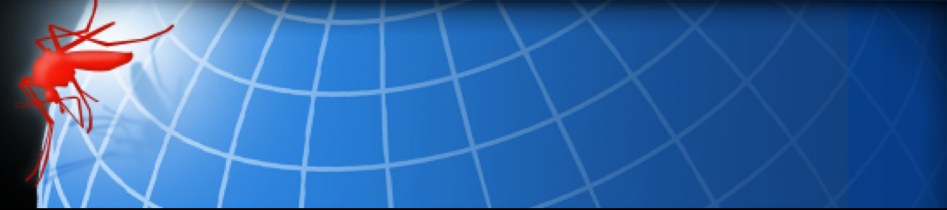
Attach a macro lens to a mobile device so that you can take a picture and upload it to the app.



Step 3. Photograph and Identify-6



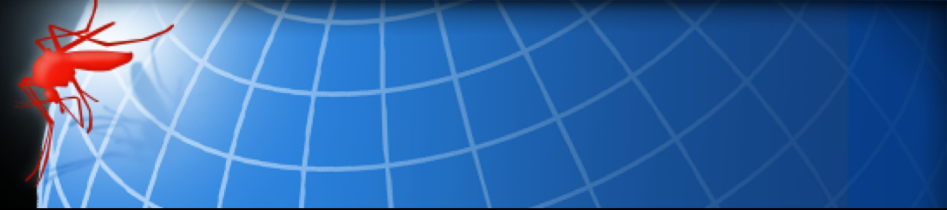
Clip the macro lens over the lens of the camera and line it up so that you see a perfect circle of light on your phone screen.



Step 3. Photograph and Identify-7



Line up the lens so that the specimen is in the circle of light on the viewer.



Step 3. Photograph and Identify-8

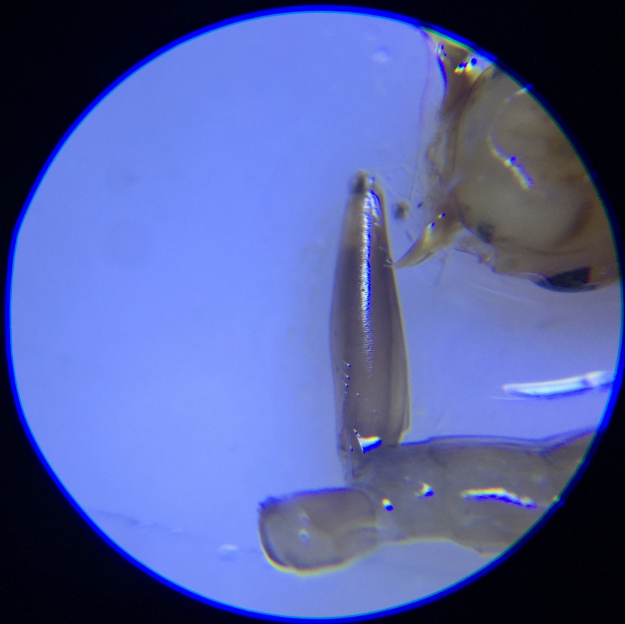


Many clip-on devices have a clear collar on them at the end of the lens. You can rest the collar of the lens on your plate.

The collar helps to you to find the focal length that is ideal for looking at your specimen.



Step 3. Photograph and Identify-9



Once you have determined that you have a mosquito larva, you will want to focus on the diagnostic features.

Now you are ready to identify your specimen, using the app or a local mosquito larva key.



Collecting Data: Step 4



Remove the breeding site from use by mosquitoes

- tip and toss water
- cover container
- contact public health official if you locate a breeding site that you can't remove from use by yourself
- **Note: most mosquitoes do not transmit pathogens to humans or cause disease**



Collecting Data: Step 4



If the larvae you found are “other” it is probable you have found one of the many mosquitoes that play an important role in the ecosystem. These mosquitoes are occasionally referred to as “nuisance” species, with respect to humans, but they also serve as food for other organisms and as pollinators for plants. Don’t worry about removing a breeding site from use unless it is a container species. Birds, frogs and other living things will thank you!



Acknowledgements

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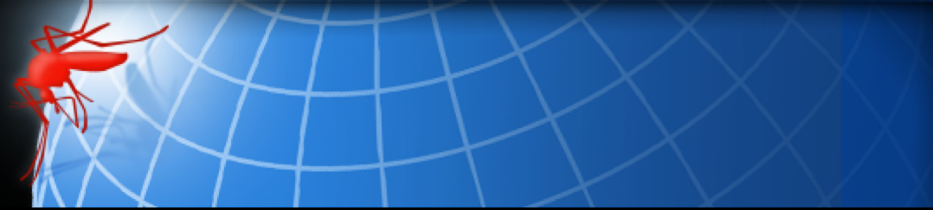
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