

Introduction

Vector borne diseases are a threat to human health in the U.S. The mosquito *Aedes Aegypti* can transmit diseases such as yellow fever, dengue, and zika. It is important to teach the public and school children about these mosquitos and prevention options. This project developed a lesson plan and in-class activities to reach 4th graders about vector borne diseases and prevention.

Topics included in the lesson plan address science standards such as

- NGSS: Structure, Function, and Information Processing
- Developing and Using Models
 - Engaging in Argument from Evidence
 - Structure and Function
 - Information Processing
 - Cause and Effect
 - Systems and System Models

Methods

This project had three phases:

1. Learning about teaching methods

Background research on the topic of developing effective lesson plans included shadowing the educators at the National Center for Atmospheric Research (NCAR) on their classroom activities with visiting school groups and summer camps, public tours, as well as attending public lectures by leading NCAR scientists. Observations were recorded in detailed notes, and focused on what the children took interest in, and teaching methods that got and kept them engaged.

2. Participation in mosquito fieldwork

The field work was conducted with scientists at NCAR's Research Application Lab in the Weather, Climate and Health program. NCAR scientists try to better understand when and where *Aedes Aegypti* mosquitos will be present, why these viruses are expanding in the Americas, and what to expect in the future. Our field work focused on understanding which type of environment the vector *Aedes Aegypti* preferred to live in and the diseases that it carried like zika, dengue, and yellow fever. The research required observations, measuring, and recording data of mosquito traps over a one-week period.

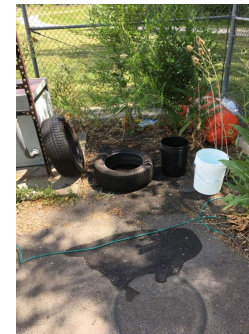
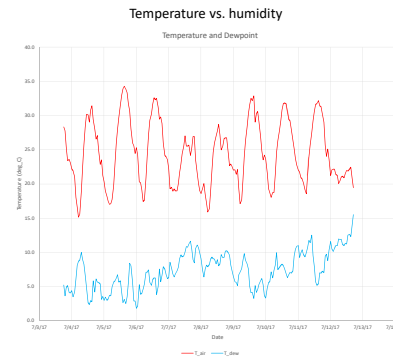
3. Development of lesson plan and classroom activity

The research conducted during the classroom observation and during field work was used to develop a lesson plan about vectors and their choice of habitat with a connection to climatic changes and human health. The lesson plan includes an illustrated booklet about vectors, their habitat and vector borne diseases, and a hands-on activity for students, that simulates taking data from mosquito traps.

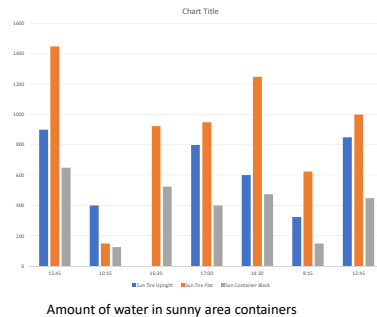
Results of the Mosquito Fieldwork



Containers in Sunny Area



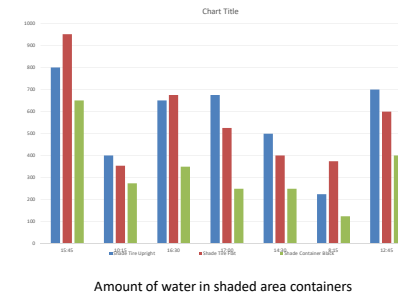
Containers in Shaded Area



Fieldwork showed that there is a correlation between temperature and humidity.



CDC Features. (2016, December 07). Retrieved July 24, 2017, from <https://www.cdc.gov/features/stopmosquitoes/index.html>



Results - Lesson Plan

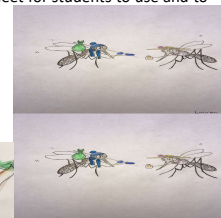
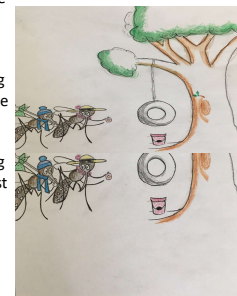
The lesson plan that was created during this internship is based off of the research that was gained from reading various books, articles, and doing various workshops, and doing shadow teaching. Through the activities outlined in this lesson plan students and teachers gain an insight about the vector mosquito *Aedes Aegypti* and the environment that it can live and reproduce. The lesson plan includes a short book, an activity, and worksheet for students to use and to help them better understand vector borne diseases and their relationship to weather factors.

Included in the lesson plan:

- Summary
- Research Connection
- Prior Student Knowledge Required
- Student Objective
- Standards Alignment
- Suggested ELL, Special Needs, Adaptations
- Formative Assessment
- Summative Assessment
- Required Common Materials
- Required Less Common Materials
- Step-by-Step Procedure

Activity included in the lesson plan:

- Short Book
- Three measurement activities
- The first measurement will consist of students measuring the amount of water in each container.
- The second measurement will consist of the students measuring the amount of added water to the containers.
- The final measurement will consist of the students measuring the amount of water that was lost in each container.



Conclusions

It has been very valuable as a teacher-in-training to be involved in scientific research. From doing the in-class observations I now understand better how people learn and know how to be a better communicator. For instance, when being a shadow teacher, I noticed what children were interested in like being able to touch objects, as well as the importance of color and making things interesting. It became clear that 4th grade students love to be active, which in turn made me develop a hands-on activity. The goal of this project was to teach 4th grade students about vector borne diseases. The hands-on activities combined with the illustrated booklet will help teachers to do so effectively.

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Acknowledgements

I would like to thank the STAR program and NCAR/UCAR for hosting me this summer, and SIUE for introducing me to this opportunity. Andy Monaghan, Mary Hayden, Scott Landolt, Valerie Sloan, Ellen Carpenter, Tim Barnes, Marc Mueller, Lorena Medina Luna, Rebecca Haacker, Shealyn Malone, and Seth Horstlein mentored me on this project.

This material is based upon work supported by the National Science Foundation through the Robert Noyce Teacher Scholarship Program under Grant #1340110. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation. The research was also made possible by the California State University STEM Teacher and Researcher Program, in partnership with Chevron (www.chevron.com), the National Marine Sanctuary Foundation (www.marinesanctuary.org), National Center for Atmospheric Research.