

# Mosquitoes Buzz Around GLOBE! The Challenges and Successes of a Citizen Science Project

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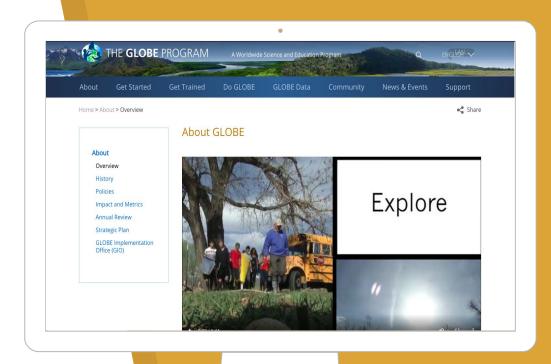




### What is GLOBE?

#### Global Learning and Observations to Benefit the Environment

- An international science and education program that brings together students, teachers, scientists and the public to contribute meaningfully to our understanding of the Earth and global environment
- GLOBE connects teachers and students to Earth system science, high-caliber scientific research and a global network of scientists
- GLOBE promotes lifelong engagement with science by providing an opportunity for citizen scientists of all ages to join the GLOBE network
- Sponsored by NASA and supported by NSF, NOAA, and the State Department; implemented by the University Corporation for Atmospheric Research (UCAR) in Boulder, Colorado











## High level Zika project objectives:

- Zika education and breeding site elimination
- Develop & strengthen networks of public health officials, GLOBE Country Coordinators, scientists, and teachers
- Providing public health officials important data to track mosquitoes and fight mosquito-borne disease





















## 30 Participating Countries

- ▼ 10 focus countries identified by DoS
- additional initial implementation countries









## **Country List**

#### 10 focus countries identified by Department of State:

- Argentina
- Benin
- Dominican Republic
- Guatemala
- Marshall Islands
- Micronesia
- Palau
- Paraguay
- Thailand
- Togo

#### Additional implementation countries:

Burkina Faso, Cameroon, Colombia, Costa Rica, India, Nigeria, Peru, Philippines, Senegal, Suriname, Uganda, Vietnam

And other countries are also using the protocol!









## 135+ CMTs Country Mosquito Trainings

80+ L W S Local Mosquito Workshops

36 countries

160,000+
total measurements from all GLOBE countries

as of March 23, 2020



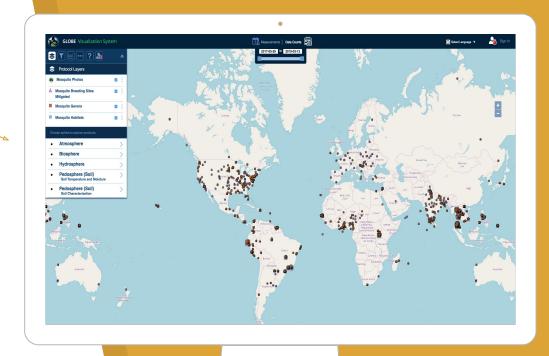












## May 2018 - March 2020

More than 160,000 measurements!









### Data Points Entered into the Database for Africa Region

as of March 23, 2020

Country	Total data points
Total	57231
Benin	10687
Botswana	13
Burkina Faso	1338
Cameroon	134
Chad	106
Ghana	272
Guinea	168
Kenya	1492
Madagascar	430
Mali	73
Niger	24
Nigeria	479
Rwanda	41
Senegal	38071
South Africa	69
Togo	1450
Uganda	2384







#### SUCCESSES + CHALLENGES

#### Successes

- Community that steps up
- Exceeding project metric goals
- MHM tool on GLOBE Observer App
- Expansion beyond initial countries
- Integration of project into core GLOBE Program through Mission Mosquito
- Research
- Mosquito Protocol Bundle

#### **Challenges**

- Equipment
  - ▶ Lens
- MHM tool on GLOBE Observer App
- Hosting workshops
- ► COVID-19









## PUBLIC HEALTH RESEARCH

"Assessment of population dynamics and biting trends of Aedes aegypti in northern Benin: Public health implications." International Journal of Mosquito Research in October 2018

- Lead author was the Francophone Regional PHO
  - Dr. Rock Aikpon
- Co-authors: Mark Brettenny (Regional Coordinating Officer) & Ylliass Lawani
- Presents important findings about the biting behavior of Aedes mosquitoes in Benin, and the probability of exposure to Aedes aegypti mosquitoes (based on the indoor and outdoor collection of 485 adult Aedes aegypti mosquitoes)

International Journal of Entomology Research ISSN: 2455-4758; Impact Factor: RJIF 5.24 Received: 07-02-2019; Accepted: 09-03-2019 Volume 4: Issue 3: May 2019: Page No. 57-62



#### Larval breeding characteristics and distribution of Aedes mosquito species in the economic capital of Benin: A public health concern

Rock Aikpon1\*, Jean Robert Klotoé2, Gado Dramane3, Mark Brettenny4, Ylliass Lawani5 Centre de Recherche Entomologique de Cotonou (CREC), 06 BP 2604 Cotonou, Bénin 2-3 Ecole normale Supérieure de Natitingou; Université Nationale des Sciences, Technologies, Ingénierie et de Mathématic (UNSTIM), Bénin

 Globe Zika Project, Francophone countries Public Health Officer, Bér <sup>4</sup> Globe Africa, Regional Coordinating Office, Bénin <sup>5</sup> Globe Zika Project, Benin Coordinator, Bénin

Abstract Advisors in a vector for transmitting numerous advisores. Knowledge of the breeding labriat of this mosquito is crucial for preventing advisorous occurrence and for implementing appropriate interventions for control. Therefore, this study control for the control of the prevention of the control of the study of the control of and reared to the adult stage for species identification.

and reacts on the about stage as species inclinational of the of the stage of the s unspector contains were the contained to the insect with make integrated to the contained test and an expectating just posturing the fast after mongainted herves (4.93%) and this is perfectly appliented by the marketing of second-and time in the study area. The dominant Aode moneyant soperists that emerged from the collected larves was Ae. Agrypt, suggesting a potential furset for advorsar transmission.

This study highlights the need for the establishment of a suitable entrological surveillance program for Aode em monquioto-form Addinatally, public latell reducation, creating knowledge and awareness of the residents on mosquiot-form descess should be

Keywords: Aedes mosquito, breeding habitat, threat, Benin

Ander mosquito is the main vector for the transmission of summerous mosquito-borne viruses (arborus) such as Zika virus, degue virus, ledges virus, degue virus, ledges virus (arborus) such as Zika virus, degue virus, ledges virus virus and chilumgunys virus (1<sup>14</sup>). The global burden of these diseases has of second-hand tires from Europe, America and Asia Aedes mosquito is the main vector for the transmis significantly increased in several countries in the world during the past decades [54]. Zika was declared a public during the past decides "". Zala was deciated a public health energency of international concern in February 2016 10". The spread of these various follows the presence of the primary vector, dodes acceptor "which was formerly found in sub-Saharan African where its originated 10", but has now spread to other continents through trade spread and currently is distributed worldwide through man-made activities (10.11).

Aedes aegypty mosquito is distributed in urban areas and breeds in indoor and outdoor settings in a wide variety of natural and artificial water-holding containers such as rubber tires, plastic tanks, water storage jars, cement tanks, flower vases, plastic bottles. Moreover, several climate and environmental conditions such as weather variables (rainfall, relative humidity and temperature) may play an important role in Aedes mosquito abundance and

Several biotic and abiotic factors might enhance the risk of transmission of Aedes -borne arboviral diseases in Benin. In

fact, the long periods of dry season in some parts of the remains a lucrative activity in Cotonou, the economic capital city of Benin. The storage of these second-hand tires offers good breeding sites for Ae. aegypti in this area. The unplanned urbanization in Benin still also remains wide, favoring the presence of high population densities with

associated artificial breeding sites for Aedes mosquitoes.

Very little information is available on Aedes mosquito primary breeding sites and on the efficiency of Aedes mosquito control measure in Benin. In this study, we report through Globe Observer (a platform developped by Globe Zika project for Aedes larvae breeding identification) on the first more elaborate entomological Aedes surveys in Benin. This study provides therefore baseline information on the types of Zika vectors breeding in natural and artificial water storage materials. The results of this study will enable providing community awareness about Aedes mosquitoes and the preventive and control interventions to be









### **Student Research**

	IVSS Report Title	Grade
Kenya	Research on mosquitoes and diseases they transmit	Middle
Madagascar	Surveillance of Aedes albopictus mosquitoes vectors of ZIKA in urban area	Graduate
Philippines	Community Based Mosquito Vector Prevention Model : Conceptual Approach to Mitigating the Risk of Mosquito threats Thru Community Empowerment and Education	Middle
Thailand	Dengue situation with different ecological and environmental factors in the sub-district in Chiang Mai, Thailand	Middle
Argentina	Distribution and abundance of mosquitoes in the world. Preliminary report.	Secondary
	Comparative Studies of Larvae of Mosquitoes Present in the Gardenia's	

Urbanization, Barranquilla-Colombia





Colombia





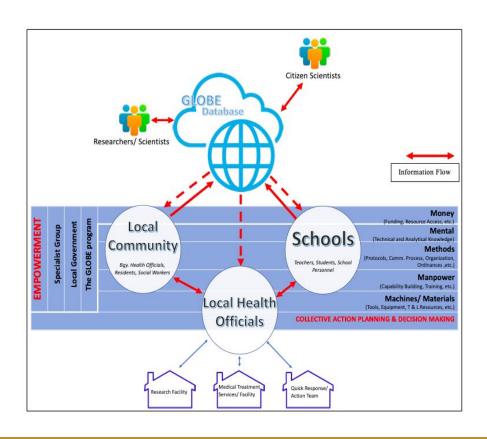


Middle

### Sample Student Research: The Philippines

#### GLOBE Program (Philippines) Local Mosquito Workshops Targets & Commitments

SUCCESS INDICATORS	TARGET NO.
Total Target Number of LMWs Conducted Nationwide	78
Total Target Number of LMW Participants	1320
Total Target Number of Unique Mosquito Data Uploaded	5280
Target Geographical Coverage	Nationwide, covering all 16 political regions of the country











## Mission Mosquito Campaign

#### Three basic questions initiated the campaign:

- Identify baseline (2018-2021) for range and distribution of vectors such as Aedes aegypti and Aedes albopictus.
- Identify seasonality of local mosquito vectors: first sighting, last sighting, period of greatest number of observations
- Quantify change in mosquito frequency and distribution at local, regional, national and global scales with specific reference to prevailing environmental parameters, such as precipitation, land cover, surface temperature, and soil moisture.





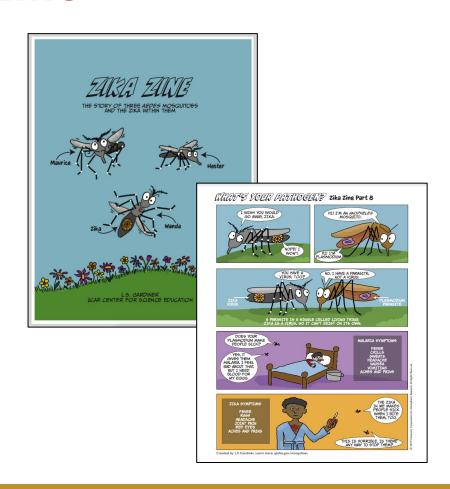


## Zika Zine

 UCAR Center for Science Education developed the "Zika Zine"

Available in 10

 languages: English,
 Spanish, French, Dutch,
 Hindi, Nepali, Portuguese,
 Tagalog, Thai, and
 Vietnamese











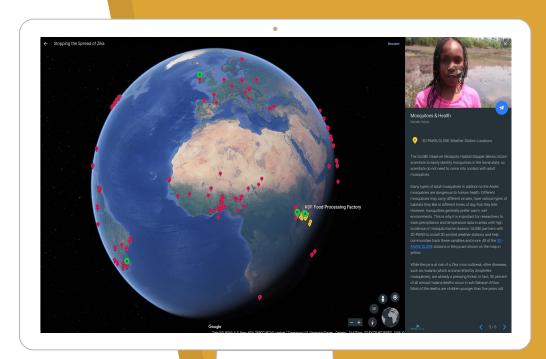
## Google Voyager + GLOBE Zika Collaboration

In 2019, the GLOBE Zika Education and Prevention Project began a collaboration with Google Voyager.

Google Voyager is a digital storytelling platform that uses Google Earth to take readers to specific locations around the world.

GLOBE's story, "Stopping the Spread of Zika," highlights global student involvement in the GLOBE Zika Education and Prevention Project.

Visit this link for more information, or do a Google search for "Google Voyager Zika".

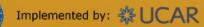














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## **THANKS!**

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