SEAMEO - UNESCO Joint Webinar on World Environment Day

United Nations Educational, Scientific and Cultural Organization

Sustainable Development Goals

STEM Education through Conservation Biology

Case Studies from Coral Reef to Tropical Rain Forest

Assoc. Prof. Dr. Krisanadej Jaroensutasinee
Walailak University

COVID-19 Effects on Biodiversity:Science Education Reimagined

STEM Education

Sensor Technology

IoT

Drone Mapping

Machine Learning

Artificial Intelligent

STEM Education

Conservation Ecology

- Coral Reef
- Tropical Rain Forest
- Marine Mammal
- Agriculture-Smart/Precision Farming

+ STEM education

- Advanced Analytics, Machine Learning/Intel
- Cloud Tech/IoT/CoT, Sensors, Drones
- Big Data, Deep Learning

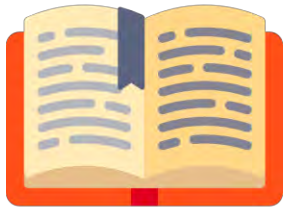
STEM Education

Smart Farming

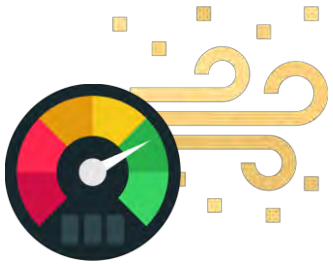
Coral Sensor Network

Tropical Forest

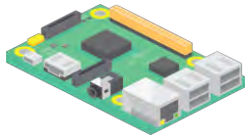
Mosquito App



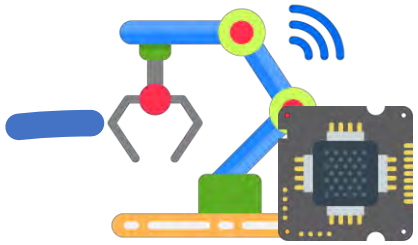
Indigenous Knowledge



PM2.5 sensor



Internet of Things



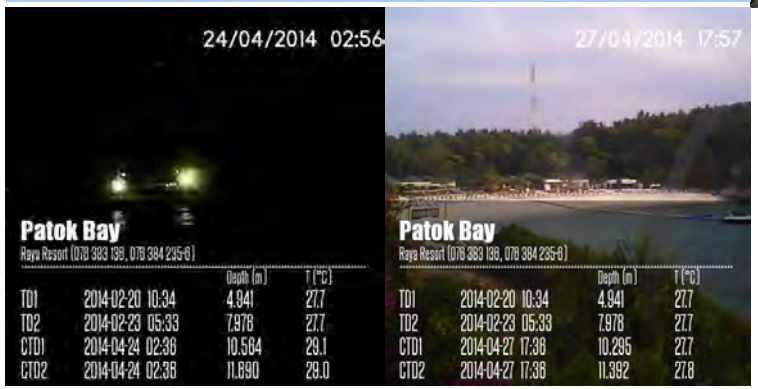
Big Data, AI, Machine Learning

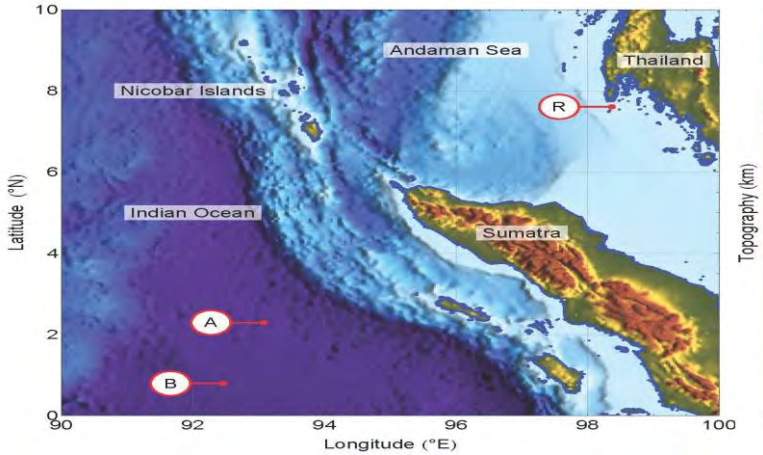
Data Visualization

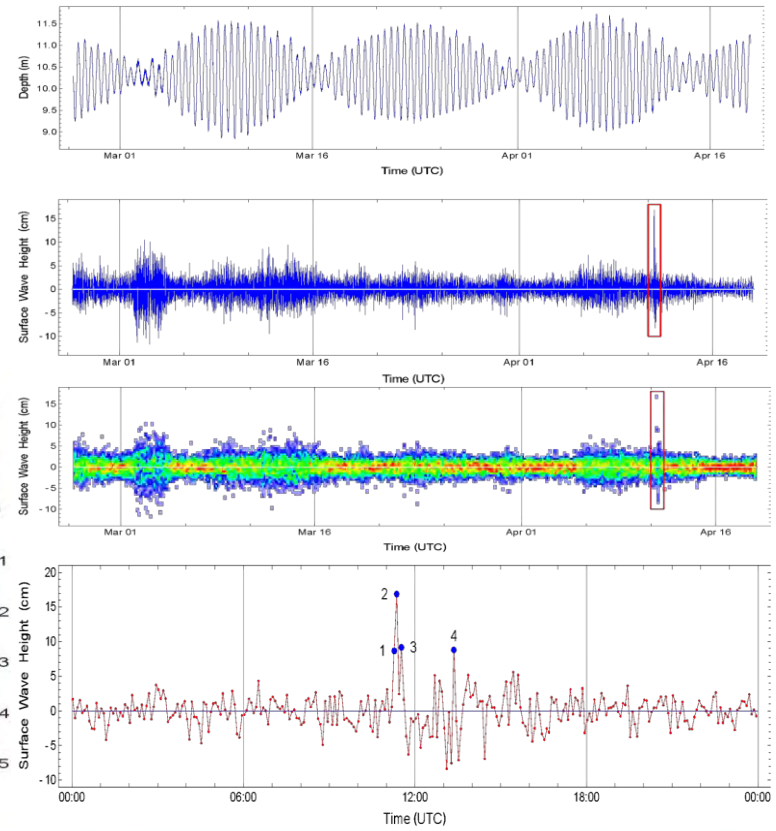
STEM Education

Coral Sensor Network

Monitor temperature, salinity, depth for coral bleaching event realtime



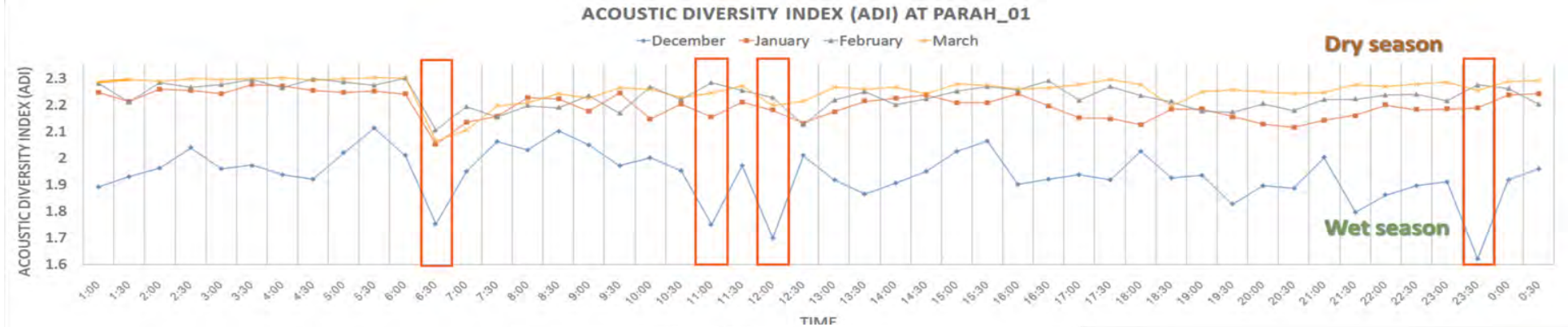


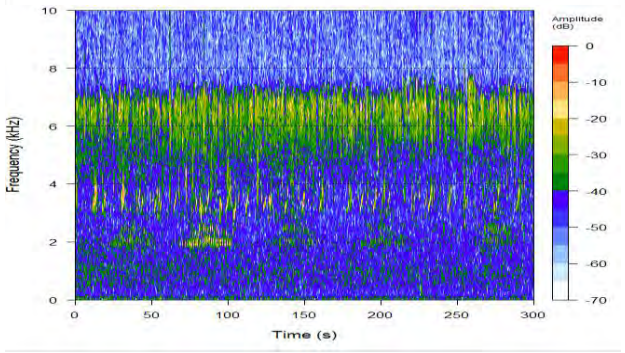


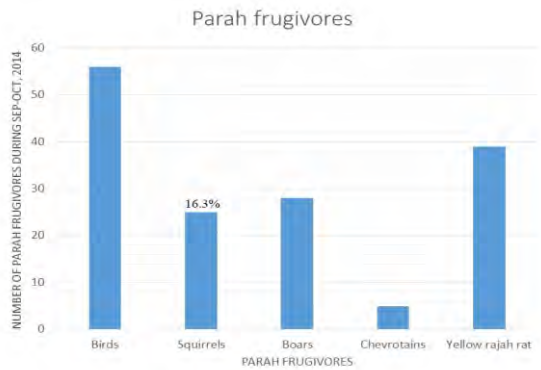
STEM Education

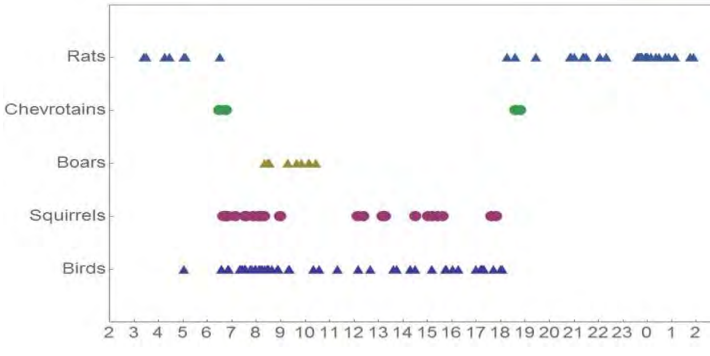
Sound Scape Ecology

- **Biodiversity Index** (Acoustic Diversity Index)
- **Anthropogenic effects** (Airplanes, cars, aircondition)
- **Climate Change** (rainfall, wind, thunderstorm)









STEM *Education*

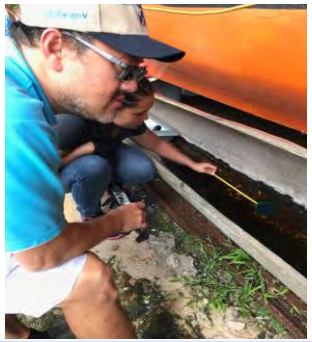
Drone Mapping

- Coral Reef area
- Marine debris
- Coastal erosion
- Dugong seagrass

STEM Education

Health Prevention

- Dengue, Zika, Malaria



GLOBE MOSQUITO PROTOCOL

WHY SHOULD WE DO THE GLOBE MOSQUITO PROTOCOL?

MOSQUITOS AND HUMAN DISEASES

Mosquitos are main vectors for many human diseases

MOSQUITO LIFE-CYCLE

Mosquitoes undergo complete metamorphosis (egg ▸ larva ▸ pupa ▸ adult)

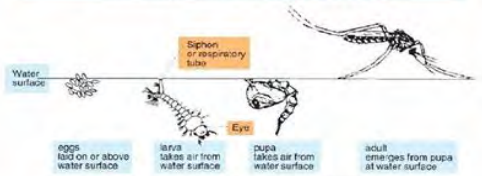
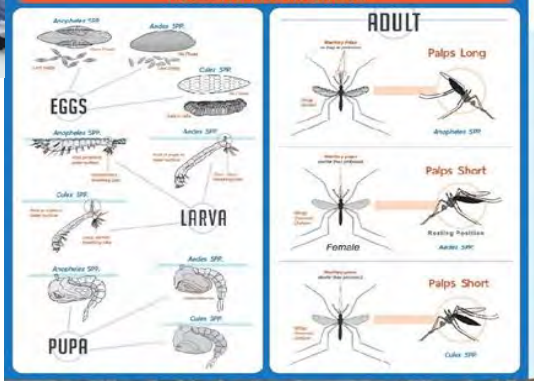


Figure 1. Mosquito life-cycle and Aedes Mosquito development cycle

MOSQUITO IDENTIFICATION



COLLECTION

MOSQUITO LARVAE AND CONTAINER TYPES

GLOBE MOSQUITO DATA ENTRY

INTEGRATED HYDROLOGY

MOSQUITOS

CONTAINER

KRISANADEJ JAROENSUTASINEE, PH.D.

Center of Excellence for Ecoinformatics,
Walailak University
222 Thaiburi, Thasala District
Nakhonsithammarat, Thailand 80161
Tel (+66) 075672005-6 Fax (+66) 075672004
Email: krisanadej@gmail.com

ELENA SPARROW, PH.D.

IARC Education Outreach Director
and Research Professor
The International Arctic Research Center,
University of Alaska Fairbanks
location: 203 F Akasofu Building
email: ebsparrow@alaska.edu
phone: (+1)907-474-7699

MULLICA JAROENSUTASINEE, PH.D.

Center of Excellence for Ecoinformatics,
NECTEC-WU Walailak University
222 Thaiburi, Thasala District
Nakhonsithammarat, Thailand 80161
Tel (+66) 075672005-6 Fax (+66) 075672004
Email: mullicajn@gmail.com

RUSSANE LOW, PH.D.

Russanne Low, Ph.D.
Senior Earth Scientist
for Education and Public Outreach
Institute for Global Environmental Strategies
Arlington, VA, USA
Email: russty_low@strategies.org

SCIENTIST AND EDUCATOR

REBECCA A. BOGER, PH.D.

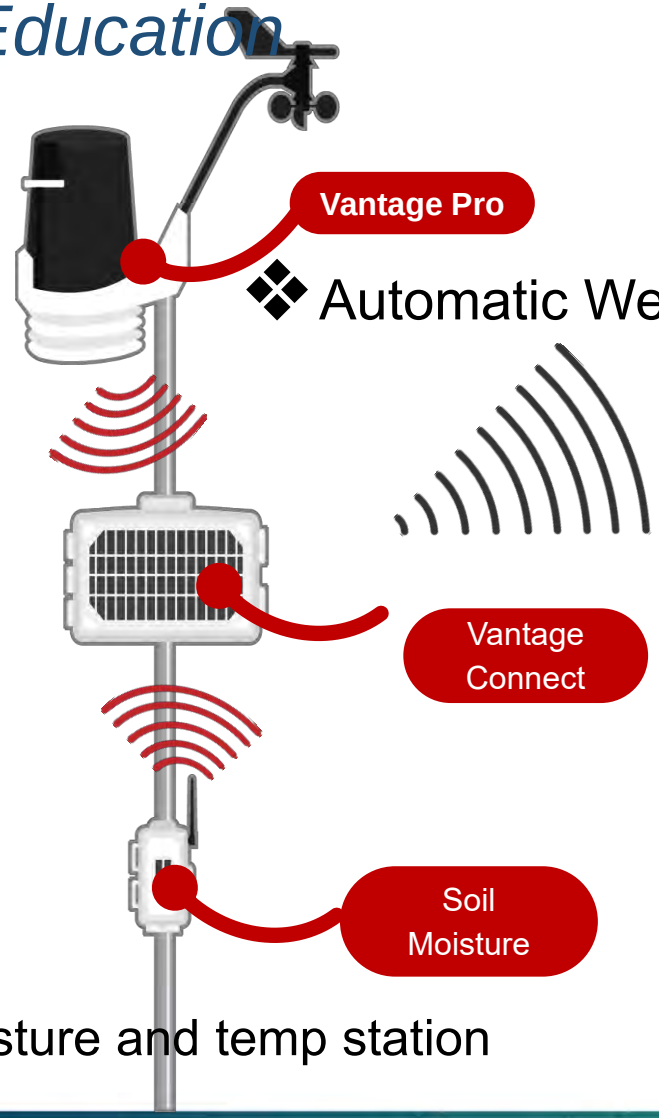
Earth and Environmental Sciences
Brooklyn College
Location: 4151 Ingersoll Hall
Phone: 718.951.5000 x2159
Fax: 718.951.4753
Email: beckyboger@gmail.com

CENTER OF EXCELLENCE FOR ECOINFORMATICS, SCHOOL OF SCIENCE, WALAILAK UNIVERSITY
222 THAIBURI, THASALA, NAKHON SI THAMMARAT 80161, THAILAND

STEM Education

Smart Agriculture

Weather Station



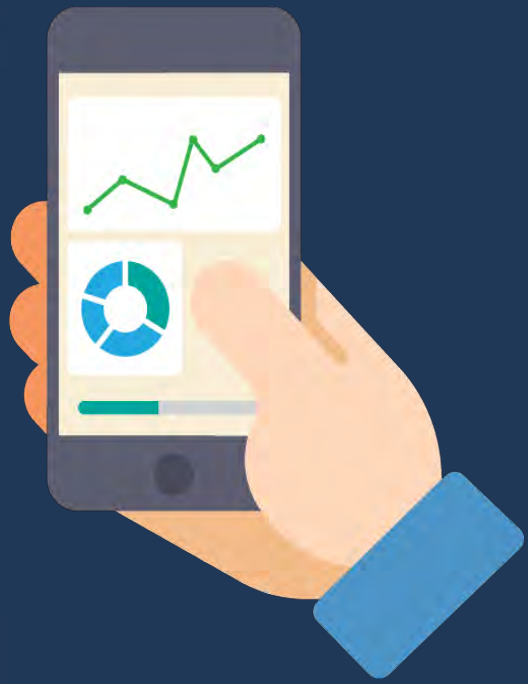
❖ Automatic Weather station

❖ Soil moisture and temp station

Cloud

Computer

Smart Phone



Impacts

25 schools*40 students*10 containers/month*10 mosquitos/container*12 months*11 countries = 13.2 Million mosquito larvae killed

Dengue Free Southeast Asia

Increase Coral Reef Diversity
No marine debris
Better tourism income
Zero Hunger (SDG)

Drone Mapping Coral Sensor Network

Reduces in crop lost due to climate changes.
Increase crop quality and quantity.
Reduce pesticide and fertilizer uses.

Smart Agriculture using Sensors and

High Biodiversity in Tropical Rainforest

Soundscape ecology
Camera Trap