



# GULF OF MEXICO COASTAL OCEAN OBSERVING SYSTEM

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The ninth annual meeting of the Outreach and Education Council (OEC) of the Gulf of Mexico Coastal Ocean Observing System Regional Association (GCOOS-RA) was held at the Double Tree by Hilton, New Orleans, LA, November 9-10, 2016. This document constitutes the report of the OEC.

Special thanks to the OEC members for their continued commitment to build ocean literacy programs in the Gulf of Mexico region and the GCOOS Board of Directors and staff for the GCOOS-wide support the OEC receives. Invited guests Dr. Becky Boger, Brooklyn College, Kevin Cailluet, Slidell Mosquito Control Board, and Abdiel Rosario-, USF College of Marine Science, made valuable contributions to our council meeting.

## 1.0 Opening of Meeting

### 1.1 Welcome, Introductions

The meeting began with a welcome by the OEC Chair, Chris Verlinde, and Outreach and Education Manager, Dr. Chris Simoniello. Following brief introductions for the benefit of the invited participants, Simoniello provided an overview of the meeting objectives and deliverables. She thanked those who made contributions to the first GCOOS Strategic Plan and informed the group that a digital copy of the document was provided on the flash drive attached to their lanyards. The list of attendees with affiliations is provided in [Appendix 1](#). The meeting agenda is provided in [Appendix 2](#).

### 1.2 Purpose of the Meeting

#### Objectives

1. Identify next steps for further development of the Citizen Science Data Portal;
2. Collaborate with the GCOOS Products and Services Advisory Council to identify and prioritize needed regional products; and
3. Professional development to gain knowledge and skills to implement GLOBE Observer app development and protocols aimed at crowd sourcing the tracking of *Aedes aegypti* and *A. albopictus* in the GoM.

## 2.0 Updates from GCOOS Board Members Representing Outreach and Education

2.1 Jean May Brett, Louisiana Department of Education, Retired, provided insight to the group on the subtleties between adopting Next Generation Science Standards and the current practice of adapting these standards to support each state's specific disciplinary core ideas. She shared her wealth of knowledge answering the questions posed by council members, especially insights about language to use when incorporating science standards into proposals. Based on interest, the Council is considering requesting she lead a professional development session at the next meeting to update everyone on current practices across the Gulf and nation.

2.2 Joe Swaykos, recently named Chief Scientist, National Data Buoy Center (NDBC), provided an update on activities at the NDBC. He informed the group that he is NDBC's representative to the worldwide marine meteorological and oceanography communities Joint Technical Commission for Oceanography and Marine Meteorology (WMO-IOC JCOMM) and explained that the purpose of this group is to provide a mechanism for international coordination of oceanographic and marine meteorological observing, data management and services. He is at the forefront of understanding what is needed to advance ocean predictions and the needs of the National Center for Environmental Prediction. He encouraged the OEC to continue finding ways to make meaningful contributions to ensure these data are widely impactful.

2.3 Mike Spranger, University of Florida, shared a slide show of recent outreach and education work he has conducted in Japan. He emphasized the importance of incorporating social and cultural aspects of communities into the fabric of education to make it relevant and meaningful. A major barrier to overcome for many of the program participants was negative associations of the ocean as a result of deadly tsunamis. Young children are especially fearful. His program activities were designed to help them overcome fear through understanding and fun water-based experiences.

### 3.0 Gulf-wide Outreach Campaign

3.1 Lee Yokel, Gulf of Mexico Alliance Education and Engagement Coordinator, provided an overview of GOMA's Year of the Gulf campaign. The idea was proposed at the June All Hands Meeting in Baton Rouge as a means to establish the importance of the GOM to our every-day lives. Melissa Pringle, Allen Engineering, is a strong proponent. Discussions are underway to determine interest among the Priority Issue Teams and to identify potential sources of funding. Alliance headquarters is interested and involved in the discussions. The first round of funding would be used to hire a public relations and marketing firm to develop a strategy for implementation and a branding scheme.

Guidance from the OEC on three topics related to the campaign were discussed: 1) potential audiences, 2) channels to share information and 3) funding sources.

1. Audiences for activities included councils of chefs and restaurants engaged in sustainable seafood; convention centers and visitors bureaus, chambers of commerce, native American tribal councils; people at atypical areas such as bus and train depots and cruise ship ports; GK-12 educators; public relations/communications students; senior citizen community centers; hotel industry; possibly host STEM Day at sports teams events; Mardi Gras; arts and cultural centers, religious organizations; web-based outlets like Travelocity and Trivago; Naval community; and meetings with STEM-related sessions such as MTS IEEE which will be in Biloxi in 2020.
2. Ideas for channels for sharing information included social media, including snap chat and posting daily pictures of the GOM or selfie site similar to "I love estuaries", websites, public outreach events, sports events, traditional print media, radio and podcasts, science and education meetings like NSTA and NMEA, Legoland and amusement parks, state and county fairs, Earth Day events, film festivals, fishing tournaments/guide associations, outdoor nature events, journalism programs, Weather Channel, celebrities from the Gulf, non-profit and grassroots groups and marinas.
3. Potential funding sources mentioned were in-kind support from universities, tourism programs like Visit Florida, sponsorship with the logo on popular clothing lines like Guy Harvey, Salt Life, Naked Turtle, seafood councils, power companies, banks and corporate sponsorship, famous people, free concerts, oil and gas companies (Research Partnership to Secure Energy for America), oil spill support services and the lottery commission.

### 4.0 Joint OEC and Products and Services Advisory Council Session

4.1 Welcome, introductions and an overview of the purpose of the joint session were provided by Simoniello and GCOOS staff liaison to the PSAC, Dr. Shin Kobara. A brief history of the two councils was given and guidance and discussion on how the councils would collaborate ensued.

4.2 Dr. Barb Kirkpatrick, GCOOS Executive Director, provided an update on GCOOS-RA activities, sharing updates on the status of the GCOOS application to the IOOS Program Office to become an official Regional IOOS Certified Entity (RICE). She gave a high level overview of the first-ever GCOOS Strategic Plan,

outlining the four major sections (Marine Operations, Coastal Hazards, Ecosystems and Public Health) and the cross-cutting themes of outreach and education, data management, numerical models and long-term environmental change. For purposes of the joint meeting, she had the group consider the difference between invention and innovation before instructing everyone to think outside the box about how existing GCOOS resources could be combined into new products.

4.3 Ken Barbor, USM, provided an overview of the PSAC goals. The group was instructed to think about identifying audiences, and innovative products and services that would result in new capabilities, the effectiveness of which should be able to be assessed in an ongoing way. Broad themes of discussion included coastal hazards, harmful algal blooms, restoration and data collection tools, with the end goal being innovative products.

4.4 Chris Verlinde provided an overview of OEC goals. Given the long history of the OEC and the successful collaborative products developed, she suggested a similar approach by used by the PSAC. She showed examples of products and programs developed and outlined the approach taken by the education community from concept to implementation.

4.5 Dr. Matt Howard, GCOOS Data Manager, shared GCOOS data capabilities, saying there are three main elements to the program: getting data from the field; making available on desktops; and enabling discoverability and use by people. He summarized the roles of GCOOS DMAC staff: Felimon Gayanilo handles interoperability aspects of the data; Marion Stoessel focuses on ingesting and packaging large data streams; Bob Currier is an expert on decision support tools; and Kobara focuses on product development. GCOOS also supports a student data tech, Chuan Yuan-Hsu, based at TAMU-CC. The GCOOS mandate is to provide services to the community.

4.6 Dr. Shin Kobara demonstrated several GCOOS products created to serve the Gulf community. These included tools for lionfish and tiger prawn invasive species tracking, Citizen Science and Recreational Boater web pages, and Clean Marina information. Gayanilo also gave a brief summary on development of a digital platform to aggregate marine mammal health data for the Marine Mammal Commission.

4.7 Following the presentations, participants divided into three smaller groups to brainstorm the types of products GCOOS might develop. Each team had members from both the OEC and PSAC. Questions to be addressed in the session included: 1) What products are needed; 2) For what purpose are the products needed; 3) Who will benefit from the products; and 4) Can an existing product be improved; if so, identify the product and improvement needed. A summary from the group reports is provided here.

Group 1: Coastal Hazards/ Navigation Products included: (Team: Ann, Carol, Dianne, Jean, John, Jerry, Shin, Bill, Steve, Mike, Lee, Chris)

- High resolution circulation maps around sensitive habitats near inlets and bays for use by USGC during spill response;
- An interface to easily share beach monitoring data by adapting the EPA Beacon site for public audiences, including a color-coded rip current forecast system;
- Wind and wave information around high-risk areas, especially marinas, for recreational boaters and fishermen;
- A mobile app to warn if currents, wave height, direction and period are favorable for setting up risky harmonics. Note, input for this was from a pilot who said harmonics can make drafts unfavorable even if reports show the depth is safe.
- Mapping tool for EM to show location of critical infrastructure compared to high risk flood areas, taking into consideration changes in impervious landscape features. All levees are not factored into models because people have private lands that have been altered and changes in flow and subsequent mitigation capacity not considered.
- Adapt the Fly Over Country app used by airlines to show how the landscape (and response to storm surge) is changing over time.
- A simple tool to demonstrate coastal resilience in different communities, on neighborhood scales. Joe Swaykos will contact Keith Long, USM Center of Higher Learning, to determine if GCOOS can adapt their prototype product for public use.
- Create "what if" scenarios for emergency response to aid training and response. For example, if we

restore the dune, what changes can we expect for storm impact? Note: Chris Ellis said a Sea Grant gap analysis report on hazard response tools will be available soon. While there is a surplus of tools on environmental impacts, what is needed is connecting data sets to existing tools to increase resolution. Thus, a role for GCOOS might be to 1) help people figure out what tool to use; and 2) connect GCOOS data to the existing tool.

- Create a way to explore how combinations of wind, currents and other variables would force changes in surface trajectories.
- Create an ‘amber alert’ system where warnings are texted to users when dangerous conditions like fog, tsunamis, water spouts and surges are expected.
- Identify coupled variables needed by various users such as the oyster restoration community and create easy-to-use interfaces to overlay information. Freshwater/salinity flow especially important; incorporate USGS salinity stations and include saltwater intrusion monitoring during storm and non-storm events;
- Show geomorphic change in shoreline over time; high resolution bathymetry, including LIDAR/National 3D elevation model
- Jerry Madden suggested asking NWS scientists to tell us what data gaps we can help fill, especially to improve rip current forecasts.

#### Group 2: Ecosystem Monitoring

- Beach-goers need a “one-stop” public-friendly (thumbs-up vs thumbs-down) water quality tool to show if the water is safe for various activities. Expanding the Beach Conditions Reporting System is the likely solution. Determine if differentiated Beach Conditions interfaces would be needed to serve multiple user groups (e.g., public, coastal managers, scientists). See CariCOOS portal for a quality example of how to make an interactive map with radar, waves, currents and buoy stations. CDC information, HFR data and a red, yellow, green flagging system might be included;
- The PSAC team is planning a call with Bill Kramer, EPA Beach Conditions lead, to determine how to make Beach Conditions information widely available and user friendly;
- GCOOS would like access to beach closure data and measurements of bacteria (e.g., Vibrio and Enterococcus) and HABs;
- Oyster/shellfish industry also need water quality products, especially as relates to the timing of harvests. Useful to managers/DMR, commercial and recreational harvesters; data of interest include freshwater flow, rainfall, bacteria, river discharge, salinity, historical data similar to what is on the H-N portal;
- Enable to overlay of data from various sources, including the Citizen Science data;
- App for mapping species migration movements and habitat use. Examples of related products included a *Sargassum* tracking tool in TX, the Fly Over Country App, and Cornell Birdcast. Determine if any of these developers are willing to share code. Audiences would be the general public and resource managers.

#### Group 3: Data, Model, Observations

- Fog forecasts for navigation. Temperature and humidity data are needed for this; visibility cameras are increasingly available for marine operations.
- High resolution salinity measurements are needed for precision navigation because freshwater cells can cause radical changes in buoyancy. High resolution bathymetry data is also needed for precision navigation.
- Story maps were mentioned as a way to communicate information on the expanded Beach Conditions site and a means to make the public more knowledgeable;
- Add a search feature to the GCOOS site to enable users to enter something like “SST” and see all locations where data can be accessed.
- Other topics overlapped with Coastal Hazards and Ecosystem Monitoring and are included above.

After team report-outs concluded, Kobara explained how the PSAC members would prioritize identified products and services the following day. Simoniello thanked both groups for their valuable input and provided information about Day 2 logistics. Visit ([PSAC REPORT](#)) for the full PSAC report.

#### 5.0 OEC Professional Development

5.1 Day two of the meeting was focused on providing OEC members with a unique Professional Development opportunity, courtesy of Dr. Rusty Low, Institute for Global Environmental Strategies. Through her efforts, participants would learn about the Global Learning and Observations to Benefit the Environment (GLOBE) Observer app and protocols aimed at crowd sourcing the tracking of *Aedes aegypti* and *A. albopictus* in the GoM.

Following a brief overview of the day, Simoniello introduced guest speaker Kevin Caillouet, Research Entomologist, St. Tammany Parish Mosquito Abatement District. He provided Mosquito Biology 101 with a highly educational overview of insect life cycles. He explained that the Zika virus was first identified in 1947 in Rhesus macaques in Uganda, a species not native to the area and as part of a breeding experiment. The virus is carried in humans and non-human primates and can be sexually transmitted once infected. Local risk is influenced by the rate of importation into an area; abundance of infected vectors; and human exposure to vectors. In November 2016, there were approximately 40 cases in Louisiana, three of those confirmed in St. Tammany and all related to travel. In Florida, there were over 1,000 cases, with 217 in Miami-Dade not related to travel. *A. aegypti* is a more tropical and urban species than *A. albopictus*. thus more prevalent in the city. Both have four larval instar stages, taking about 5-7 days to transition from egg to adult. Caillouet cautioned that maps related to species reporting can be misleading because they don't communicate health risks.

5.2 Following a barrage of questions for Caillouet, Simoniello introduced Abdiel Laureano-Rosario, University of South Florida College of Marine Science Institute for Marine Remote Sensing, who educated the team about vector-borne diseases such as Dengue, Chikungunya and Zika. His research has coupled the spread of species carrying these diseases to the physical environment, looking at parameters such as air temperature, SST, precipitation and humidity. Increases in SST translate to increased precipitation and humidity along the coast, all correlated to increased incidence of dengue. Because there are four types of dengue viruses, outbreaks occur before immunity is built up in a community. Now, SST is used as an early detection system to warn people to take greater precautions. Regarding Zika, *A. aegypti* is more salt tolerant than *A. albopictus* and is thought to be able to survive a few days in brackish water. He provided clear examples of the benefits of coupling physical oceanographic data to better understand mosquito distributions.

5.3 Dr. Rusty Low provided a tutorial on how to access GLOBE Observer apps on the GLOBE.gov website. There are online tutorials for approximately 50 protocols. People can complete training and become GLOBE certified. She highlighted the GLOBE Clouds and GLOBE Mosquito apps. Armed with basic mosquito biology, Low and invited guest Dr. Becky Boger, Brooklyn College, walked the OEC through *A. aegypti* and *A. albopictus* larval identification protocols. Graduate student Krishna Woerheide, University of Nebraska, assisted with the skills building activity. All participants were provided with hand lenses, collection cups, and mini cell phone camera lenses to enable zooming in on larvae. The focus of the activity was to teach people how to identify, take photos and upload images to train digital recognition software. *Anopheles*, *Culex* and *Aedes* are common species found in standing water. They have very different swimming patterns which is a helpful diagnostic.

When asked about the timeframe from pupa to adult Caillouet said less than a day. Because GLOBE protocols are used by children, Simoniello asked why the larvae are considered safe when the virus can be transmitted from adult to offspring. The answer is, no one is certain. Larvae do have hemolymph so the potential for transmission is possible. Gloves are recommended for handling all larvae. TO further decrease exposure risks, samples can be inactivated in alcohol. Charlene Mauro said she had trouble getting clearance from her school district to conduct similar work with the kids. Margaret Sedlecky suggested growing mosquito-eating fish and giving to people with water gardens and fish ponds to control populations. There is an example of this partnership in Boulder, CO, where *Gambusia* are being used in a service learning project.

The group embarked on a field trip around New Orleans to find standing water and collect larvae. A lesson learned during this outing is that Jean Lafitte National Park Service headquarters considered our numbers excessive and informed us we were not allowed to congregate on the property!

Upon returning to the meeting, OEC members were engrossed in identifying larvae, practicing taking pictures and uploading to become part of the digital library to develop the recognition software. More than

1,000 images of heads, thoraxes and abdomens are needed to develop the final product. The entire OEC was very grateful to Rusty, Becky and Krishna and our invited speakers, Kevin and Abdiel, for the enriching experience. We thank them all and look forward to implementing our new knowledge and skills in our various programs.

Participants were fully absorbed in mosquito identification activities and there was agreement to continue with that activity for the duration of the meeting. Prior to departing, Chris Verlinde and Simoniello thanked OEC members and invited participants for their time and encouraged people to send ideas for future professional development topics. The meeting was then adjourned.

[PSAC Meeting REPORT](#)

GCOOS OEC Meeting Participants Nov 2017, NOLA		
Rebecca	Boger	Brooklyn College
Kevin	Caillouet	Parish Mosquito Abatement District
Katie	Fortescue	FL Aquarium
Lei	Hu	DISL
Nate	Johnson	Galveston Bay Foundation
Jessie	Kastler	USM
Shin	Kobara	TAMU
Abdiel	Laureano-Rosario	USF of Marine Science
Dianne	Lindstedt	LA Sea Grant
Rusty	Low	IGES
Carol	Lutken	U Miss
Charlene	Mauro	Santa Rosa Schools
Jean	May-Brett	GCOOS Board
John	O'Connell	TX Sea Grant
Lloyd	Scott	MS School Board, Retired
Margaret	Sedlecky	Weeks Bay NERR
Chris	Simoniello	GCOOS
Mike	Spranger	U FL
Pamela	Terasaki	TX School District
Chris	Verlinde	FL Sea Grant
Lee	Yokel	GOMA

Angela	Sallis*	NCEI
Ann	Weaver*	NOAA
Krishna	Woerheide*	U. Nebraska
Joe	Swakos	GCOOS BOD
*GCOOS did not pay for expenses		