



GULF OF MEXICO COASTAL OCEAN OBSERVING SYSTEM

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GCOOS Board and Members Meeting Report

18-20 April 2018, Double Tree Hotel

New Orleans, LA

The 26rd Meeting of the Gulf of Mexico Coastal Ocean Observing System Regional Association (GCOOS-RA) Board of Directors (BoD) was held 18-20 April 2018 in New Orleans, LA. The attendees and their GCOOS-RA roles are listed in [Appendix A](#). The agenda is given in [Appendix B](#).

OPEN MEMBERS MEETING 19 April 2018

Bill Lingsch welcomed participants and self-introductions were made. The agenda was adopted and the first speaker, Dr. Bill Burnett, took the podium.

Dr. Bill Burnett: Naval Meteorology and Oceanography Command

An update on the developing GoM autonomous system testbed was provided. While still in the early stages, there have been tangible accomplishments. There is fiscal support for the AUVs and a large inventory. Resources and capabilities now need to move to the surface and air, with data connectivity from gliders to aerial vehicles. There are 136 buoyancy gliders, operated from Navy Command, mainly with temperature, salinity and depth capabilities. Thirty is the maximum number simultaneously deployed, encouragingly without any system failures or losses; 50 is the current goal to work through pilot and support capacity challenges before the summer goal of deploying more than 100 is attempted. Twelve were successfully deployed for ~33 days with continuous data acquisition; batteries remain the limitation. The long-term goal is to have 1,000 gliders and Argo floats with about a third out at a time. Work is underway, comparing Global Ocean Model (5 km resolution) and Gulf of Mexico model (1 km resolution) output with and without glider data.

Funding for NASEM Loop Current studies will be approximately \$120M over 10 years. The Navy is interested in partnering with those collecting data, especially high-resolution bathymetry around Cat Island. Mississippi Governor Bryant supports creating an autonomous system test bed as part of a strong Blue Economy initiative. USM is home to the first unmanned certification program. Sixteen people recently became the first group to complete the five-week training. There are about 30 students in the incoming group. The course provides end-to-end training, not just for piloting vehicles but everything from making power decisions to calibrating systems. The Navy, NASA and EPA are among those interested in the USM program. Sara asked how the Navy is handling data management and mining for

use in models. Non-proprietary data from NCEI is used but someone has to QA/QC and serve. GCOOS might have a role here.

The Navy will require 12 survey ships to run operations. They currently have six with funds to build a seventh. Terry asked if Navy leadership is convinced of the return on investment for gliders. The push to simultaneously fly all gliders in the inventory is to help make the case. Value was demonstrated for the submarine fleet with the sonar performance graph; refined sonar profiles made possible with high-resolution density data from gliders provides an obvious tactical advantage. Stephan thinks that to really scale-up to the desired level, gliders need to be more autonomous—able to communicate, respond and adapt to the environment and each other. SBIR, cooperative research or NOPP funding may provide opportunities to develop such systems. Scaling LIDAR equipment and other atmospheric profiling sensors to fit on drones is also of interest but it is currently difficult to convince ship pilots to let anything fly near their vessels. Carl asked if the Navy has a vision to advance the testbed. Bill said there is interest in bringing observation data from IOOS closer to the Navy. Roles for IOOS include suggesting locations to fly gliders to fill known data gaps and data management. There was consensus that there was a missed opportunity during the DWH response to show how all systems could align and respond quickly in a coordinated way. Once operational, the Navy hopes to be part of the IOOS glider plan. Currently, about 50% of Navy glider data is classified; under the full glider contingency, it is more likely to be about 10%. More examples of how the information supports good decisions as shown with sonar data informing submarine missions are needed.

Dr. Ruth Perry: Shell Exploration and Production Company

Shell Exploration and Production has been operating in the Gulf since 1978, gradually moving to deeper OCS areas where there remains a paucity of observations. Offshore monitoring capabilities are being developed via the Public-Private Deep Ocean Observatory Collaboration. FPSO Stones and collaboration with the Navy on hurricane forecasts are two projects that are underway.

Stones is an oil and gas exploration project about 200 miles off the coast of New Orleans, LA, at a depth of approximately 3,000m. Operations are conducted from a floating production, storage and offloading (FPSO) facility. A pipe attached to a buoy midship can be dropped below sea level, allowing the ship to relocate in bad weather. In addition to required ADCP data sent to NDBC, Shell collaborates with LSU via the Serpent program. LSU staff train Shell employees on ROV equipment and Shell allows scientists to use the ROVs for deep sea biodiversity work. Harte Research Institute has a catalog of these observations. Converting these data to usable science is of interest, especially as this relates to regulatory issues around the platform. Shell Ocean Discovery XPrize is also involved with deep floor mapping targeting rapid response using AUVs. There is a mooring in 3,000m that can be used as a hub to build out the observatory. USM currently conducts water quality analyses there twice per year when the mooring is serviced. Other companies are also starting to deploy in deepwater and Shell is working with them to see how best to connect. Shell sends data to GCOOS.

A summary of Shell's monitoring evolution was given. In 2008, they worked with NCEI and NDBC to contribute meteorology, LIDAR, ADCP and CTD data; in 2012, there was a shift to autonomous technology with the purchase of their first Seaglider, using expertise from NDBC and USM to pilot. Information mainly supported storm intensity and eddy formation forecasts; Downtime from strong Loop Current and eddy formation in 2015 led to working with the Ocean Task Force. They intend to do adaptive sampling this summer for eddy tracking and are working with IOOS to get information to the

glider DAC. There is a 30 yr commitment to the FPSO Stones project and associated deep mooring. Funded by different entities (e.g., industry, government and private sector all with similar data needs) there is interest in bringing new partners to the team to build the offshore site. The main mooring has capacity limitations so a secondary mooring with inductive cabling might be needed. The data priority is to meet Shell's engineering and safety needs. There were questions about the existing flexibility of the system to swap out instruments. Currently, only surface and bottom ADCP data are transmitted in real time. New partners are providing funding so the full water column profile can be delivered in RT. A question arose about how to set up glider tracks targeting understanding of inter-annual variability in LC/eddy dynamics. There is a balance between where data are needed and the ability to retrieve instruments so far offshore. Despite the remoteness, systems still get vandalized. A comment about Mexico starting their offshore leasing program was made. Can we identify monitoring synergies with them? (link available shortly)

Kent Satterlee: Gulf Offshore Research Institute

The recently formed Gulf Offshore Research Institute is working on a project called MMEERSET--Marine Monitoring Energy and Environmental Research Science Education and Training. The goal is to repurpose oil and gas platforms for research purposes. Steering committee members include Satterlee; Robert Fondren, the Fondren Foundation; Pat Murray, Coastal Conservation Association; Larry McKinney, Harte Research Institute; and Chuck Wilson, Gulf of Mexico Research Initiative. Feasibility studies are underway to determine if/how these platforms can be used to support research and monitoring. Under investigation are topics such as regulatory approvals, liability, decommissioning issues, financial arrangements, platform capabilities, potential users, costs to maintain and operate, and potential funding sources. Information will be used to inform development of a business model. The Bureau of Ocean Energy Management and Bureau of Safety and Environmental Enforcement have been supportive. Partnerships with other agencies are being developed. The Gulf Offshore Research Institute is being set up as a LLC nonprofit organization, with Satterlee as the Executive Director, to facilitate engagement with federal agencies.

The group proposes to take defunct platforms, remove the wells and production equipment, maintain the heliport and other structural framework, add renewable energy/power, communication and subsea capacity, and repurpose for science applications. The platforms could serve as AUV hubs with buoy arrays nearby. Five platforms between Flower Garden Banks and the Mississippi River Delta would be selected along the 400-500 m isobaths, near the shelf break. With a ~60 mi radius around each platform, significant coverage for the northern GoM could be achieved. It costs about \$4M to convert each platform. Potential contributors include BOEM, RESTORE, NRDA, DOD, NOPP, NSF, NAS and the oil and gas industry. Steve Buschang, TGLO, said that for abandoned platforms in water too shallow to topple for artificial reefs, repurposing might be a good option. A demonstration platform might be available by Summer 2019. Work with the operators/owners of the platforms is ongoing. (link available shortly)

Juan Carlos: Director General del CICESE

The CIGoM project in the southern Gulf of Mexico has six Mexican and nine international partners with more than 1900 researchers in five lines of research. The core objectives are similar to GCOOS--to understand the present state and natural variability of the Gulf by making physical, chemical and biological measurements. Observations from platforms have been challenging. Six buoys were all vandalized one week to three months after being deployed, despite being 60 to 80 mi offshore. New to

Mexico are HFR and gliders. Technicians are honing skills to service and calibrate AUVs. Satellite imagery is being used to study energy transfer into and out of the Gulf through the Yucatan Channel and Florida Straits. About 10 people are working to get project information into a central data portal. This is an area for collaboration with GCOOS. Also underway is numerical modeling of the physics and biochemistry of the system, and spill analysis scenarios, especially below 2,000 m. Investment is being made in human resources with training on how to apply the information. The goal is to have a system of observation platforms by 2020 that can support sustainable development, homeland security and public health and safety. Juan was asked what the nature of the vandalism was. Some buoys were stripped of all equipment; in other cases the entire buoy was missing. Because of this, his team is putting equipment in safe places vs ideal science locations. Joe Swaykos said that NDBC has similar issues with the Tau buoys in the equatorial Pacific. Cameras transmitting in real time combined with AIS have allowed the state department and other countries to respond quickly with consequences to vandals. Homeland Security prompted surveillance because the buoys are used as drug bases. Juan said that in Mexico, they are considering using the statue of Guadalupe because it is respected and people don't typically mess with it. When asked if he thought PMEX would start publicly sharing data, he said they are moving in that direction with the formation of consortia but it is only speculation as to how much they will share. The Mexican Navy has a mandate to provide observations along the coast. The CIGoM work helps them so they provide ship support for the buoys. However, reliance on the navy results in a bottleneck because they aren't always able to be responsive to needs. (link available shortly)

Drs. Porfirio Alvarez and Xavier Flores: MexiCOOS

There are 34 institutions involved in MexiCOOS. PMEX is no longer a national company but it's possible they are moving back in that direction. HFR work for the southern GoM is underway at the University of Baja. Work is challenging because oceans and coastal areas are under federal jurisdiction. There is a national ocean data integration effort underway. In 2015, Mexico signed a MoU with UABC-GCOOS for CIIMAR to develop HFR and MexiCOOS. Funding came three years later with partners from every coastal state involved. One goal of the MoU was to create synergies and enable harmonization of HFR data between Mexico and the US. The next HFR will be installed in Yucatan, then Veracruz. The aim is to have all installed by the end of the year. There are vandalism concerns for the radars as well as the buoys. Educating the public about their purpose is key.

Xavier explained the technical side of the Mexican HFR project. Giving work to locals and engaging students helps reduce vandalism because it gains community support. His team is close to being able to share data with IOOS/GCOOS. Juan Carlos said the main challenge going forward is to engage fishermen in both using data and protecting the assets. They need to become vested in the system. Mike mentioned the ABCD approach, which places value on human assets in communities. Work needs to start at earliest level in schools. MexiCOOS is working with Cuba as well and hopes to be able to bring them equipment soon for use in fisheries research. ([Alvarez & Flores Presentation](#))

Carl Gouldman: IOOS Program Office

The OECD economic report, *The Ocean Economy in 2030*, estimates that the global ocean economy in 2010 accounted for 31M FTE. By 2030, the projected value is \$3 Trillion and 40M FTE. The US IOOS Enterprise Strategic Plan 2018-2022 was recently released. The mission is to meet the safety, economic and stewardship needs of the nation. There is a refreshed list of IOOS core variables including physics, biogeochemistry and biology/ecosystem parameters. The FY 2018 enacted budget was \$41.8 M. The

2019 request is currently at \$26.2M and 2020 proposals are in progress. There was a budget increase for OAR to support AUV cooperative institutes and labs. Included is language stating that efforts must contribute observations to the IOOS program. Carl has sent regional buildout plans to OAR and is meeting with them to determine how to proceed. Carl congratulated GCOOS on becoming Certified RICE and for Citizen Science efforts, which won a 2017 EPA Gulf Guardian Award. He thanked GCOOS for hosting the IOOS Advisory Committee meeting, ATN workshop, and for filling in gaps in surface current observations with the two new radars at the mouth of the Mississippi River. He said that certification is getting the attention of many others in federal entities. There was a brief pause in the talk and Barb was presented with a photo of the Certification signing, autographed by the GCOOS Board and staff. Carl mentioned several upcoming opportunities with NAS, RESTORE and other funding. Several collaboration initiatives are underway including the NOAA water initiative (www.noaa.gov/water); NOS modeling portfolio and Coastal and Ocean Modeling Testbed-new projects & three technologies (ADCIRC, ROMS and FVCOM); and the Y River Summit to get NOAA & USGS to coordinate sampling and work more efficiently. Carl also said the *U.S. Nearshore Community Integrated Research Implementation Plan: The National Plan*, is available online. The 2016 plan collaboration with federal, industry, academic and NGO partners, focuses on coordinated coastal processes work (<https://uscoastalresearch.org>).

The IOOS authorization bill has passed in the Senate but not the House. Current budget numbers are tied to the FY16 budget so if authorized, funding will be \$5M lower. Those championing the bill know that this level is too low so support for the bill has shifted. There seems to be a wait and see attitude as IOOS decides whether to make another push on Hill. When asked what he would do with an extra \$4M in the IOOS budget, Carl said he would build on the IOOS Association Filling the Gaps campaign. Funding this year would go to SECOORA, GLOS and AOOS. Identified needs of the RAs are used to inform decisions. Sara asked about IOOS interests. Carl said IOOS is focused on collaboration and coordinating across agencies. The RAs have infrastructure for engagement and IOOS can use this to build relations across new programs and partners. ([Gouldman presentation](#))

Farewell to Outgoing Board Members

Following lunch provided by GCOOS, outgoing Board members Gary Jeffress, Terry McPherson and Mike Spranger were recognized for their service. Each said a few words about their experience. Gary was encouraged to participate by founding member Worth Nowlin and stayed engaged because he was impressed with the passion of the group. Terry was initially a NASA and Gulf of Mexico Alliance representative who came on board to build synergies. He is impressed that members advocate for GCOOS and that we're able to operate across different administrations because there is value to the taxpayers. He reminded the group to continually assess who our stakeholders are and how they are using GCOOS information. Mike was one of the founding Board members for O/E. He stayed engaged because of the commitment from everyone involved. Together, we have overcome hurdles and accomplished a lot. Data Management, O/E and industry partnerships have been GCOOS strengths and examples for other RAs.

Dr. Barbara Kirkpatrick, Director's Report

Details of the Director's report can be found in the presentation ([link](#)). GCOOS continues to grow its membership with new organizations and individuals. Efforts are underway to develop the Everything Beaches Portal, a centralized beach and water quality portal. The beta product, with \$30K support from an Ocean Technology Transfer (OTT) award, will be available this summer. A budget summary was

provided, with an explanation of why it is written at a \$4M/yr level knowing it will be descope to the actual amount. This approach is required to allow the program office to effectively move money should more become available. In addition to the OTT award, last year's budget included \$450K for two new radars, and about \$90K to host a Flower Garden Banks National Marine Sanctuaries synthesis workshop (to understand the cause of coral and other wildlife die-offs), the IOOS Federal Advisory Committee meeting, and IOOS Animal Telemetry workshop. The money also supported continued development of the Gulf of Mexico Coastal Ocean Acidification Network. Additionally, \$30K is going to Dr. Tony Knapp, Texas A&M University (TAMU), for HFR operations and maintenance; and \$25K to Dr. Paul Montagna, Harte Research Institute, to complete Ecosystem Modeling work. Talk shifted to hurricane impacts on monitoring infrastructure. The pier that Lisa Campbell, TAMU, mounted the plankton-monitoring Cytobot on was destroyed. TCOON lost one station. Steve Buschang lost two TGLO buoys. FEMA is supposed to provide funds to repair and harden the TGLO buoys. Eric Milbrandt, Sanibel Captiva Conservation Foundation, lost one RECON weather station. Because emergency response teams in both Lee County and the City of Sanibel use the information for decision making the community funded replacements. Both NASEM and NSF provided opportunities to replace equipment lost or damaged by storms. GCOOS wrote requests at three tiers—repairs, enhancements and new equipment. Monty Graham commented that USM recently wrapped up Hurricane Katrina recovery with the opening of its last post-Katrina-funded building.

Dr. Kirkpatrick announced the Board election results. Bill Lingsch and Alyssa Dausman are returning to the Board. New members whose terms start in the fall are Mike Lee, USGS, Renee Collini, Northern Gulf of Mexico Sentinel Site Cooperative, and Dr. Nick Shay, University of Miami. Discussion shifted to the lack of commitment to use post-DWH funds to support monitoring. There was agreement that despite all the money spent, we are no better positioned today to respond should something happen. While we might be more organized, we lack real data. The NASEM Loop Current opportunity is the first real influx of funds that can move us forward.

Felimon Gayanilo, GCOOS Interim Data Management and Communications Report

Felimon's presentation ([link](#)) provided a summary of the 52 products served by GCOOS. The products are on servers distributed in several places. To facilitate monitoring systems and infrastructure function, he and Bob Currier are starting to use Nagios Core, a free and open source application. He informed the group that the Matt Howard memorial site was still up and that messages to the family can be left at <http://matthew-howard.forever.missed> until January 2019. A variety of activities and fundraising in Matt's name have been proposed. Ideas include traditional scholarships; a data management vision mockumentary; and naming a Gulf of Mexico seamount or other geologic feature in his name. A "certification" celebration followed with cake, a band and mini Mardi Gras parade in honor of Matt and GCOOS RICE certification for which he was so instrumental.

Dr. Chris Simoniello, GCOOS Outreach and Education Report

An overview of O/E activities, local, regional and national engagement efforts, and accomplishments was presented ([link](#)). Simoniello continues to work with a wide range of stakeholders, from students and educators to NGOs and industry personnel. Recent efforts have focused on coordinating partners in the Gulf's Animal Telemetry Network. The OEC was honored at the 2017 Gulf Guardian Awards ceremony

for contributions to the Gulf Citizen Science data portal project. The annual meeting was held in Point Clear, Alabama, with efforts focused on developing Escape Room gaming that incorporates ocean observing system data. They also met jointly with the GCOOS Products and Services Advisory Council to formulate ideas for the Everything Beaches project. OEC Chair Chris Verlinde, and council members Lee Yokel, Dr. Jessica Kastler and Lei Hu, attended the meeting to show support for long-time OE pioneer and outgoing Board representative Mike Spranger.

Lei Hu, Dauphin Island Sea Lab

The DISL Environmental Monitoring program has seven stations in Mobile Bay ([see presentation](#)). They need long-term funding for sustained operations and systems need to be hardened; being on a barrier island has added vulnerability. Because they are solar powered, systems do not transmit during storms when information is most needed. Metrics on data users show that most are active during the week with 56% accessing via mobile phones and 39% via desktop using www.mymobilebay.com. Quality control time schedules vary with range checks done by the minute; data missing checks every 6 hrs; and stuck sensor checks every 24 hr. Visualizations include historical and monthly averages and special events. Efforts are made to enhance software programs, developed in-house to give flexibility. Success is based on the ability to accommodate user needs. GCOOS mainly funds DM, not operations.

Stephan Howden, University of Southern Mississippi

A summary of CenGOOS activities was provided ([see presentation](#)). The system includes three long range (5MHz) CODAR stations and a 3 m disc buoy. There are also non-IOOS funded projects, for example, MBRACE-2 25MHz stations in west MS Sound; Shell heat content gliders; Shell Stones mooring; and temporary 3-month tide gauge deployments at the Port of Gulfport with NOAA NOS. There have been a lot of repair fees and some failures with aging equipment. The IOOS loaner program has been very helpful. Stephan is working on permission to replace two electronic trailers that are falling apart with sheds. One has been done and the other is pending. Data collected go to the HFR DAC and from there, radials and vectors go to NCEI. Information is important to the climate and weather community whereas buoy information mainly supports ocean acidification work. Jack Harlan said there are 151 radars in US network and only one reported vandalism event since 2005. There have been break-ins where electronics are housed but overall not a big issue for radars. Stephan said he has a conflict with a developer in Destin who wants the system removed. Jack suggested using a SBIR to replace the existing clunky set up with a single pole array. Xavier says that in Mexico, his team made beach shade areas between the antenna posts and now people don't mind them! Hurricane-hardened installations are very attractive in southern LA because evacuations begins 72hr in advance of a storm and there is a lot of uncertainty that far out. Systems are unnecessarily turned off and valuable data are lost.

Nan Walker: Louisiana State University Earth Scan Lab

ESL provides RT satellite data to monitor environmental events. The main deliverable to GCOOS for the past 10 years has been web page publishing (true color images). Added each day are about 20 AVHRR images; 3 NIIRS SST composites; 8 GOES/SSH and 12 MODIS sediments/water color images. Animation generator software has been used the past couple years. For animated maps, Bob Leben's SSH data are overlain on SST data. Nan created a gallery of images to monitor a sediment plume through Lake Pontchartrain during the March-April 2018 Mississippi River flood. She would welcome GCOOS help with quality data file formats for prototype products to showcase. Image products from Harvey tracked the

plume off Yucatan into the southwestern Gulf over a SSH anomaly (warm water about 30C was much deeper than usual). Products for the Texas and Florida coasts are not currently being served. Nan has contributed to GCOOS communications with website articles, especially after Hurricane Harvey and O/E at Ocean Commotion. She also conducted a satellite oceanography class trip to a MODIS/VIIRS antenna where students measured temperature with conventional thermometers to simulate satellite-based radiometers. Nan reported that the GOES East satellite she has used since 2005 was replaced with the higher resolution and spatial coverage GOES-R system that came online in December. Without funds, she can no longer access information critical to her work tracking storms. A new VIIRS satellite was launched and is expected to be operational in about nine months. ([Walker presentation](#))

After Nan's talk, Bill thanked participants for attending and the meeting was adjourned.