GCOOS Board Meeting Minutes: 2022

SPRING 2022: 4-5 May (Virtual)

4 May 2022

Participants: Board: Alyssa Dausman, Dave Driver, Sara Graves, Pat Hogan, Stephan Howden, Kate Hubbard, Kirsten Larsen, Bill Lingsch, Antonietta Quigg, Nick Shay, Joe Swaykos, Jan van Smirren, Nan Walker (missing: Ruth Perry, Kim Yates, Renee Collini); Staff: Jorge Brenner, Felimon Gayanilo, Barb Kirkpatrick, Chris Simoniello, Jen Vreeland, Kerri Whilden: Other: Bill Burnett, Ashley Peiffer, Josie Quintrell, Kristen Laursen, Oriana Villar

Joe: Joe opened the meeting at 1:00 ET, welcomed everyone and introduced Bill Burnett.

Bill Burnett, Director NDBC: Talked about NDBC role in the Blue Economy; NDBC operates the world's largest anchored network, 106 weather buoys, about 50 Coastal Marine Automated Network (C-MAN) stations, TAO array for climate; currently in a La Nina year so expect higher than average hurricanes; they run the tsunami network and in Jan 2022 saw effect on a DART buoy and warned other countries; said this event even registered a change in atmospheric pressure in the GoM as it rotated around the Earth. NDBC is moving more into unmanned/uncrewed and unanchored systems; NDBC has a ~15 yr data set in GoM with DART, weather buoys & C-MAN stations; in 2004, became the IOOS DAC, sharing technology and getting data to the GTS; operate 18 HFR stations-hourly gridded surface data (vectors); GCOOS, CENCOOS, NANOOS & PacIOOS completed data migration to IOOS RA ERDAPP, SECOORA is in progress.

Emerging observations-DARPA Ocean of Things-3 types of sensors—biodegradable, high volume, low-cost sensors distributed over large ocean areas; currents, SST, sea state, location; partnering with USM on surface currents and SECOORA for data throughput; crowd sourcing component. Also working with NRL to serve data and use in models. Only measuring about 10% of ocean as a foundational baseline. Need to expand use of Internet of Things, need ocean mesonet for GoM; thoughts on filling obs gaps in GoM—need to work better with fishermen, energy industry, ships of opportunity; gaps in deep water obs west of WFS & S. Atlantic; Pat commented that Tropical Atmosphere Ocean (TAO) TPS removing more buoys than adding, what would purpose be of adding high resolution sensors? Nick applauded Bill's efforts-it's great putting subsurface current information on buoys and other platforms; Joe asked about

SCOOP-digital thermistor array—how long before we see in the GoM? Bill said maybe in the next 5 yrs b/c working a lot now on TAO, TOPS and DART makeover.

Josie Quintrell, Executive Director, IOOS Association, will be retiring around June; the 2021-2026 IOOS Assoc SP has six priorities, money for DEI and filling the gaps; RA budgets –dedicated regional IOOS line—FY21 $40.5M; FY22 $41K; FY23 TBD; infrastructure modernization has a request of $20.3M in FY23 IA request; inflation 8.5%; innovation comp grants FY21 & 22 $4.5M, FY23 at $5M; FY23 IA request is $75.3M; national IOOS has $6.8M in FY21; $7.2M in FY22 and TBD in FY23; expecting about $500K cut to RAs; $150M for coastal ocean obs is anticipated ($100M operations, $50M construction); 69 House members signed IOOS letter; senate letter is in circulation; reach out to elected officials and let know how important ocean obs are—number of people contacting the offices does matter. IOOS has a coastal climate task team, participating in US CLIVAR workshop; contingent valuation estimates IOOS at $197M/yr ($156M/yr for organizations and $41M/yr for individuals); international issues—Russia at war with Ukraine, inflation, affecting federal budgets; Jorge asked how the economic valuation project can be expanded; there were about 3,000 responses informing the study, more are thought to be needed to add credibility; very tough to tease out the dollar value for data that get assimilated into models; Stephan said you'd need to quantify the improvement to a forecast to determine it's value—e.g., how does a hurricane intensity forecast improvement translate to evacuation costs?

Carl Gouldman, Director, IOOS: There is a $5.6M hurricane supplemental, ~$3M for gliders for hurricane ops to SECOORA which will make subawards to other RAs; ocean economy $1.5 Trillion in 2010, expected to double by 2030; SLR and blue economy work force development are priorities; USM will be hosting 13th Radio waves operators WG meeting in 2024; blue economy work is part of Carl's main job; there are coalition building opportunities b/c getting highest attention from above; Krysa, Derrick and Dave E working a lot on this; Nick asked about UGOS LC work—can eddy shedding process be operational and transitioned to IOOS after 4-5 yrs? Stephan suggested a program like GulfCorp can establish better ties between IOOS and Mexican equivalent; Katharine Weatly (sp?) asked if standards for uncrewed systems are in place; Carl said various methods are in progress.

Scott Rayder, Executive Director, Alabama Water Institute, University of Alabama—Cooperative Institute for Research to Operations in Hydrology (CIROH), $360M, first round focus on water quantity; working to develop the next generation of WQ monitoring; cooperative hydrologic triangle in Tuscaloosa—across from the new USGS building; aimed at global water security; goal is to put actionable water intelligence at everyone's fingertips; original version of water model used is from UCAR/NCAR; now up to 3rd generation; building in cloud; main goal is to support the National Water Center mission; developing the next gen water model for NOAA; CIROH has four main components: water prediction system, community water model, hydroinformatics, and decision support; Joe says difficulty is trying to get people to understand the messages you are trying to tell—especially hard in multi-lingual communities; Josie says in IAJJ there is $200M

for mapping—especially need at the interface between land and sea; USGS has more than 85 yr record of water data; they make universities pay to host their data; U AL is paying USGS for long-term data sets; it's a hurdle that needs to be overcome; Scott says you can buy a lot of ocean observing for one satellit; what will data buying look like for oceans & coasts? What are some best practices? NOAA, air force, NASA-all bought data—some of this duplicate information. How do you get people to understand climate risks? Most money is tied up in homes; FL is among the fastest growing states and the long-term prognosis is not good; Scott says there is a market for GCOOS data—need to be at the table b/c can help build resilience at the coast for a lower cost; data for risk analysis; biggest challenge: making people aware of risk and transitioning people out of risk.

Ashley Peiffer, IOOS Association DEI Fellow-working on DEIA Dialogues and data accessibility; administration & training policies, procedures and practices; service equity to improve access to information; co-design and co-development to leverage partnerships; and community engagement for workforce development and relationship building; Antonietta asked if Ashley could help with providing data to show why this is important when talking with stakeholders; NOAA does not yet have a DEIA office but there are many initiatives across different offices.

Jorge Brenner, Executive Director, GCOOS; Stephan is the new Board secretary; Kirsten is Vice Chair and will take over for Joe in the Fall. GCOOS has 58 data providers, 423 stations and 1616 sensors; monthly, 150,000 files are received, 118 CSV files generated/hr; annual elections are held in the spring; bi-laws need to be fine-tuned to codify the election process; Private sector-Ruth and Jan will remain on the board; Government-Pat Hogan and Jessica Henkle with Restore the Gulf; Academia-Nan and Stephan will remain.

Closing remarks: Sara commented that the presentations were extraordinary -a lot of great information was shared; Joe thanked participants and the meeting was adjourned.

5 May 2022

Participants: Board: Renee Collini, Alyssa Dausman, Dave Driver, Sara Graves, Pat Hogan, Stephan Howden, Kate Hubbard, Kirsten Larsen, Bill Lingsch, Ruth Perry, Antonietta Quigg, Nick Shay, Joe Swaykos, Jan van Smirren, Nan Walker, Kim Yates; Staff: Jorge Brenner, Felimon Gayanilo, Barb Kirkpatrick, Chris Simoniello, Jen Vreeland, Kerri Whilden: Other: Bill Burnett, Laura Gewain, Carl Gouldman, Ashley Peiffer, Josie Quintrell, Kristen Laursen, Oriana Villar

Joe: made a motion for the board to accept the agenda, Sara in favor, Nan 2nd, all in favor.

Jan: provided the Treasurer's report. For the NGO, Jorge needs to get situated to be able to write checks; currently, Jan and Barb have this capability; As of May 1, 2022, there is $11,004.79 in the account. Excomm reviews the balance monthly. Still using Wells Fargo. The cost of running the NGO is $2500/yr--$1,000 for the tax return TDC; $1,000 for accounting software; and $500 for incidental expenses; there is about $11K in the Matt Howard

Scholarship Fund—how best to handle going forward? If revenue is kept under $15K, there is a simple tax return we can do; About half of the RAs are currently run as nonprofits; do we want to generate sponsorship/money for the NGO? Is it worth keeping the 5013C status? Remind people to solicit donations for Matt's fund and submit nominees for award. Jorge said Board insurance costs about $10k/yr; what is the source of funds for this? Follow up needed with IPO to see if ok to use IOOS money for Board NGO insurance. Follow up with Oriana. Jan will send a pdf of the treasurer's report to the Board. Sara moved to accept the report, Bill second and all in favor.

Felimon: NTL project—to date, 132 stations are registered. 38 of these are active. 13 platforms are not yet registered and the data go to NCEI, not GCOOS. Kirsten said once information is in the NCEI archive, it's tough to pull it back out. Working on pushing to the cloud. Kim asked about the cost of increasing cloud storage capacity. Kirsten said we need to critically evaluate the role/cost of GCOOS hosting NTL data, especially without additional resources. What is the benefit? How much of these data are being used? Pat said modelers won't push their data out; people have to pull it and we don't want to be in the modeling business without a specific purpose; need to ask Why are we doing it? What is the cost? What is the cost/benefit? Who is benefitting? Jorge said the data are important to industry—they use every day; follow up conversations are needed, especially with regard to use for wind farm efforts.

Juan Carlos: continuing activities with Mexico: 5 buoys being deployed in S. GoM; maintaining 16 HFRs, gliders will be deployed next year; working on Sargassum monitoring; CIGOM and GCOOS working on collaborations to share data from HFR, gliders, buoys, and satellite tracking of spills. Planning a joint course between NOAA and CIGOM; talking with GCOOS about an operational modeling network (HYCOM, ROMS, NEMO) for things like risk assessment, SLR, Sargassum, HABs, OA, coastal eutrophication; check out the Mexico data atlas series: https://atlascigom.cicese.mx/red-radares; https://oorco.eng.uabc.mx/red-radares; for gliders: https://gliders.cicese.mx/datos. Pat asked about collaborations with PMEX but was told the data are proprietary and can't be shared.

Jorge: provided an overview of the IOOS RA award and how funds have been allocated. 13 subawards with 21 co-PI projects total $2,520,205 and make up 59% of the budget; the subawards are allocated to 10 academic, two NGO and one private organization; In addition to the IOOS RA award, there are multiple projects underway from a variety of funding sources: COMT (IOOS), OTT (IOOS), CETACEAN (NOAA), GCAN (NOAA), HABscope (NOAA), UG2, NTL (IOOS/BSEE), and Next Gen Water Nutrient Sensors (EPA); additional proposals are also in review; Oriana said there are two IOOS funding streams. Round 1 is core funds to maintain existing needs; Round 2 is directed funding from other line offices (discretionary) or interagency funds for specific projects. Jorge is working to expand core observations to include radars, gliders and buoys; migration to cloud for some data and products. Considering a "whole-system" vision –review and expand partnerships and outreach –especially private sector/industry and international.

There was conversation about how GCOOS should approach engaging with the modeling community; Pat questioned whether GCOOS wants to get into the modeling business b/c it requires resources; Joe shared this concern; Sara said the conversation is needed with the Modeling Task Team to determine what role GCOOS might play; running models vs disseminating models vs packaging data for others to use in models…many options. Need a body of experts to ID products relevant to GCOOS stakeholders. Stephan said there are useful tools GCOOS could provide and used Bob Arnone example-data to compare model differences. There are challenges assimilating CODAR data where there are freshwater plumes; we might be able to help with stratification issues; TAMU, USM and USF are partnering on research with gliders—doing contingency analysis for storms; TAMU is running four deepwater missions; USF if running one deepwater mission; and USM is running four shallow missions; the hurricane supplemental has $1.3M total for 2 yr for six institutions.

Joe: Talked about the need to formalize the election process. He informed the group that Ruth and Jan will hold their industry seats; Nan and Stephan will keep their academic seats; and Pat and Jessica Henkle (Restore the Gulf) will be government sector representatives. He then shared a slide for the election bi-law revision. He will send to the board for review and the subject will be revisiting at the Fall 2022 meeting. Discussion shifted to the Buildout Plan and the upcoming IOOS recertification of GCOOS. Stakeholder input to the plan is essential. Rather than rewrite the entire plan, we will consider writing an addendum that outlines 3-4 major priorities; The plan will be focused and targeted. The Excom has not yet come up with a plan to write. Chris will design a user survey to solicit input to the plan and work with Jorge and the Board once a writing plan is determined; the survey will align with the GCOOS SP and ID needs by sector. The IPO wants the full certification package in November. A small team will follow up to create a checklist and timeline. Joe thanked everyone for their time then Pat made a motion to adjourn, Bill 2nd and all in favor.

GCOOS Board Meeting Minutes: 2022

FALL 2022 (Virtual)

27 September 2022

This meeting was scheduled to take place in-person in Gulfport, MS, but had to be changed to a virtual platform due to Hurricane Ian.

Participants: Board: Renee Collini, Alyssa Dausman, Dave Driver, Sara Graves, Pat Hogan, Stephan Howden, Kate Hubbard, Kirsten Larsen, Bill Lingsch, Ruth Perry, Antonietta Quigg, Joe Swaykos, Nan Walker, Tom Wissing; Staff: Jorge Brenner, Barb Kirkpatrick, Chris Simoniello, Jen Vreeland; Other: Carl Gouldman; Missing: Nick Shay, Jan van Smirren, Kim Yates

Joe: Joe established that there was a quorum and the meeting commenced. Minutes from last meeting: determine who has and send to Joe; he will circulate and seek board approval; Jan P&L report was given by Joe. Nothing of substance has changed; Joe asked for a motion to approve Kim Yates for Board Vice Chair; motion made by Dave, second by Sara and all in favor; thanks were extended to Sara as she rotates off as past Chair; she was the first to complete the cycle of chair elect-chair-past chair. Joe passed the torch to Kirsten who is now Chair. Kirsten said she will be reaching out to the board and staff to talk about current and future opportunities.

Carl: Carl is helping Nicole LeBoeuf build case studies for the Blue Economy and Climate Ready Nation; asked if GCOOS was involved with SECOORA low-cost WL sensor work; he is working with Knauss Fellow Schuyler Nardelli in the IPO; Stephan asked about UGOS work—is Carl talking with GRP about UGOS models? Pat and Derrick Snowden are on NOAA's modeling team so they are POCs; he is also working on a Benefits of Ocean Observing Catalog—there are currently 10 work packages about what data are being used to support what decisions.

Felimon: gave a presentation outlining Modeling Task Team objectives before seeking board approval; aim is to define criteria of models (attributes, grade model function relevance to GoM community); modeling team would evaluate procedures (e.g., strategies to attract models, retrieval); open membership, 3 yr commitment, Y1 quarterly meetings held remotely; the team will not develop models, only ID useful ones ready for use in the GoM. GCOOS is on a COMT modeling project and will be working to pull models together—overcome resolution issues when coupling different models; modeling discussions ensued…composition of the Task

Team—where will members come from, how many, who will lead? Consensus that someone actively using the models should lead. Pat thinks it would be good for GCOOS to have higher visibility in the modeling community; maybe provide a catalog of models—possibly tie to GANDALF as a possible data layers; GANDALF has 3 different models available; Navy model is said to be excellent; Joe, Pat think MTT is a good idea to explore what GCOOS can do for stakeholders; Dave cautioned need caveats about what models can and can't tell you; NOAA is sensitive to programs endorsing specific models; models must have attributes and skill level, not specifically endorsed by GCOOS; "walk before run" approach encouraged. Kate, Pat, Dave, Tom all willing to be part of proposed MTT. Joe made a motion for a MTT, Bill 2nd, all in favor; an update on status will be given at the spring meeting;

Jorge: gave an update on the Bipartisan Infrastructure /Jobs Act of 2021 funding; 1 new HFR station in FL run by FSU; 1 spare HFR for USM, TAMU; resiliency is major purpose of funding; DMAC cloud test bed and server needs-TAMU CC and TAMU; about $1.6M Glider (battery-TAMU, USF, USM); ADCP-USM, DISL; Coastal Station-mooring, met stations, modem-USM

Ben Hamlington, NASA JPL, SLR focus: (Bob Leben was his advisor) in western GoM vertical land motion is primary cause of relative SLR; eastern GoM much higher rate of SLR than other regions—real or artifact of model? Primary causes- near-term subsidence, longer-term ice sheet melting; altimetry is not affected by subsidence like tide gauge so shows ocean cause; mid-depths of the GoM are warming—accelerating the rate***; need data sources to ID sources of the mid-depth heat content***; Board interest in following up with Ben on this topic.

Pat paper: OHC over past 80 yrs-analysis of heat not from surface flux—horizontal advection through Yucatan Straits

Bob gave an update on GANDALF and briefly on HABscope. GANDALF use has extended far beyond the GoM—from AOOS to NERACOOS and HI to FL. Uncrewed systems, floats and surface vehicles have been included—no longer just gliders. For HABscope, version 2 is underway and hopefully soon all version 1 models will be upgraded to the new system. Work is underway to analyze species other than Karenia brevis.

Joe mentioned the team will be working on the Buildout Plan Addendum and that the draft will need to be completed by November.

Jorge updated the group on staffing status, open positions and plans to fill; is the NOAA Contractor approach something to consider for GCOOS/RAs?

Joe wrapped up saying that day 2 of the closed board meeting will be rescheduled for some time in November and that a poll would be sent soon to check availability.

Sara made a motion to adjourn, Dave second, and all in favor.

GCOOS Board Meeting Minutes: 2022

Fall 2022: Board Meeting 15 November 2022 (Virtual)

Participants: Board Members: Renee Collini, Sara Graves, Pat Hogan, Stephan Howden, Kirsten Larsen, Bill Lingsch, Ruth Perry, Antonietta Quigg, Nick Shay, Joe Swaykos, Jan van Smirren, Nan Walker, Tom Wissing, Kim Yates; Staff: Jorge Brenner, Barb Kirkpatrick, Chris Simoniello, Jennifer Vreeland; Others: Kristen Laursen, Ashley Peiffer, Kristen Yarincik; Missing: Alyssa Dausman, Dave Driver

Welcome, Board Chair Kirsten Larsen: BOD Mtg Minutes from 4-5 May 2022 are in Google drive. Motion to approve board minutes as presented—Joe motion, Stephan second, all in favor. Kirsten then welcomed Kristen Yarincik, new IOOS Association Executive Director.

Welcome and Q&A with Kristen Yarincik, IOOS Association ED; she has spent the last 20 yrs at Consortium for Ocean Leadership (now called Center for Ocean Leadership); taking over for Josie Quintrell who is retiring; Josie will stay on for a while as an advisor.

Kirsten question: what do you see as the first big push working with Congress/Hill; interesting year this year with recent influx infrastructure and inflation reduction act funds; all will impact how we approach at least to 2025; working on messaging to help agencies understand that these funds don't meet long-term operation needs; communication strategy is to tell better stories—have an opportunity with influx of funding to return to Congress/admin and show impact of investment in IOOS;

Joe question: coastal MS-change in Congressional seat-Mike Ezell starting—GCOOS has not interacted with him much-just elected last week; not sure how many other coastal members have changed; need to make introductions; Kristen working with Emily/ESP –lobbying advisors--to determine a plan; Joe says USM just elected new president—around USM long time in admin capacity –pleased b/c open minded and has serious plans to expand program in Gulfport; great opportunity; Joe Paul—good match with director of research; both into revitalizing Gulf campus;

Retirement of Senator Shelby; staffer elected in his place; good for transfer of issues? Sara Graves U AL-Huntsville knows Shelby's office well; newly elected staffer is likely someone she knows; Kristen said Collins and another woman leading Appropriations—could be good for coasts and oceans; Senator Wicker also moving into new -position. Ted Cruz likely taking over Wicker's old position as lead on Senate Commerce Committee.

Ruth—Josie used to map out changes in election and tiers of priority visits-partners in Congressional offices we need to build better relations with; a lot of investment from inflation reduction act, offshore wind, aquaculture…do we have an overall Congressional advocacy plan to focus on who we need to work with to advance as a region? Exercise we need to go through to maximize efforts; Dept of Energy and others moving into ocean obs—how do we better position region in GoM given mid-terms and looking to 2024? Continue supporting our Congressional champions as well; Kristen knows Ruth is on the IOOS Advisory Committee—take this conversation up to higher level with that group? Ruth says yes—will bring up in Dec 2022 meeting; Ruth asked how we can help Kristen coming into this role. Does she have familiarity with this region? For now, she asks to be responsive when she has needs for info, turn-around time on Dear Colleague letters, etc; will be developing new communication content; in GoM tropical storms and hurricanes are biggest challenge—when come into GoM—someone going to be impacted—dead end into land—unique challenge to keeping our obs going; work to reauthorize CENOTE with this Congress; Bill says in past, limited gliders but this year, Navy made it a high level requirement to support hurricane glider missions so we're in good position to move forward with this leveraging; CENOTE legislation important for this; Stephan said one way to reduce reliance on what Navy can provide is to get more glider assets in the regions; Navy partnership is great and hopefully remains but we are in a position where if we don't have them participate, we do not have enough coverage; coordinating hot wash for hurricane season--Kathleen Bailey and Bill coordinating; Stephan: different states—work in MS but lives in LA—frustrating that LA is so focused on coastal restoration, obs not priority; difficult place to work because of marshy coastline; view is that ocean not important to what's happening at coast.

Nick: In the wake of Ian, what was astounding to him was that w/i 24 hr landfall NOAA upped storm surge prediction by a factor of two; big proponent of collecting ocean and atm data during hurricanes; multiplatform problem; from a GoM perspective, trying to understand what's going on with storm surge models is a priority; Ft. Myers was hit like a bulldozer; how can we start thinking about broader scale impacts in GoM to be much more prepared; report the stories to help build case for Congress.

GCOOS DEIA Task Team Review: Chris Simoniello &Ashley Peiffer: Ashley Slides –overview of her DEIA work as IOOS Association DEIA Fellow; what she's been doing, focus areas of fellowship and what learned; internal policies and practices RAs focused on; hiring practices, by laws, Board structures, etc; fellowship goals for yr—support internal and external communication, helping with collaboration across regions; GCOOS is fortunate that other programs in region also doing work in this area—e.g., NAS GRP Gulf Scholars, GOMA DEIA Fellows in state agencies, NOAA RCT activities, etc. We are engaged in these activities and can build on them in our network; DEIA is not a stand-alone topic—the Task Team is proposed as a first step to building diversity, equity and inclusion across the entire GCOOS enterprise. Questions were asked about the TT membership--the number of representatives, how they would be selected and if international participation is planned. Chris, Jorge and Ashley will

discuss these questions and Jorge will share ideas with the Board. Chris will provide staff support and the TT will determine the Chair and priorities actions.

IOOS RICE Recertification Update: Jorge reviewed the BoP Addendum/Recertification requirements including an overview of what IPO requires and how we are proceeding. The BoP Addendum includes two appendices with assets and stakeholder survey, introduction that explains why we created the document; key observations aligned to strategic plan, the technology being used, emerging technologies, OE, communications, how GoM is connected, DEIA, and how we create priorities from stakeholder input. March 7, 2023 is the official deadline but need to get content to IOOS in Nov 2022; info will be put on data portal under certification link; Jorge will keep the board posted as hear back from IPO; tomorrow at the open meeting we are hosting 3 panels for key areas of SP; Chris will update the stakeholder input Appendix with any new input that arises. RICE recertification documents can be found in a Google folder: https://drive.google.com/drive/folders/1DB-judzfmbUQWX76uXUAepv06O7nvi08

Discussion

Kate: Where is funding coming from to support all the activities in the BoP Addendum? Joe—frustrating b/c effort into BoP but expectation of added funding is unrealistic; putting money into updating admin products instead of obs; Antonietta—NSF opportunities for facilities support—has not seen this group chasing those types of funds from other organizations; wondering if it is not an option or no interest to do that? What's possible vs what's needed with current funding? Jorge says inter-agency coordination is effective and efficient when occurs the right way (e.g., HABS) but for other things, limited cross-agency coordination; we've tapped into hurricane supplemental funding; infrastructure bill—recapitalize existing parts of network—not much opportunity to expand. Inflation reduction act can potentially help us expand. Last week, IOOS working on spending plan; money might be cut 75%; were going to allocate couple $100 M to IOOS but now likely 75% cut to that budget; opportunity for us to grow but uncertain; Stephan for Buildout—need to consider rising costs of existing obs; university does not have big workforce; people move up in salary but not out to other job areas so costs go up w/o increase in support; interagency WG set up when Ocean.US dissolved and IPO set up, is that still working? Jorge says yes to some degree—still talk; we have some money from EPA but none of it streamlined without Oriana to coordinate (e.g., like she did for nutrient sensor project—allows projects to get started but now lacking that); Kim—there are a number of interagency WGs-what are we talking about? NOS WG? Need to find out which one talking about b/c number of interagency WGs we can tap into; get idea of where else we can plug in; what about state department? International monitoring is important for GoM—what opportunities exist there for trinational approach? Especially for DEIA push w/i federal government; Carl NOS rep to Americas WG; Need to share success of meeting like OA Summit in Mexico; more broadly come together with good ideas to shop around to State; sell that we are capturing data that no one else is.

Nick: multi-agency groups make these funding decisions; NOAA at heart of it but NSF and other agencies want the science behind why making measurements; we've tried several times to go back to NSF for currents with HFR; comments state only being used for monitoring when really can be used for research; not sure what solution is other than grounding observations in science; scientifically defensible science; is this the same problem other agencies? Are they not seeing value of added ocean obs for modeling? What is the reason not joining in with NOAA to throw money into issues plaguing GoM?

Renee—circumventing the science challenge by convincing funders that continuing what they're doing is improving applied science and foundational science—advancing science—need to ID who will be advancing and how—need to spell it out; Kim USGS—can't afford to do everything everywhere—if propose monitoring—has to be tied to research question answering for a limited amount of time; pass monitoring to state or local entities to maintain-practice at USGS; Kim says direct requests for funding to agencies at the correct level of management can also be effective;

Election by law update and 2023 Elections: Joe Swaykos reviewed the Article 4 By laws—member of board assist staff in prep for upcoming spring election; Dave Driver volunteered and Jen and he worked the issue; in future, if board member assisting is up for re-election (e.g., like Dave is this term), he/she is not eligible to assist in the election process because of COI issues. Kirsten question—is the person appointed by Board or volunteer? Change text: The GCOOS BOD member who serves in this role cannot be up for reelection. Joe asked for a vote and all in favor. none opposed; Next volunteer will be needed by early spring when process ramps up; usually vote in March time frame; Let Kirsten know if interested in serving in this role.

Several members will be up for re-election in 2023
https://docs.google.com/document/d/1FCdJN0H5OCWFzCWPDswyfvBH7DD-fvBo/edit

Those running have to let Jorge know they are interested and need to submit an updated CV. In 2018, the by laws were changed to reflect term limits—3 consecutive 3-yr terms.

Spring meeting date and location: Dates are still being determined; possibly the week of April 24th; we will be using the Marriott in Gulfport, MS, that was planned for the fall meeting but the MS Aquarium venue will be undergoing renovations. We'll use the USM Gulf Park Building facility—about a 7 min drive from the hotel; we can still plan a tour of the aquarium. Stephan suggested we reach out to new USM president Joe Paul, Kelly Lucas and MSU's Paul Mickle (also co-director NGI) and Robert Moorhead (confirm this name).

There are over 100 people registered for the meeting and we are close to capacity for the USM ballroom. Do we cap the number of registrants or move to the (more costly) auditorium across the street that can hold 500 people? Funds to host were already under-budgeted so can we afford to allow more people to register? Jorge will need to discuss with Excom.

Kirsten thanked Joe and Sara for all their service on the GCOOS Board; Joe requested to continue being invited to the staff meetings; Jorge welcomed his participation.

Open discussion: Kim—OA Summit in Mexico with HRI collaborators: 28 participants from US, Cuba, Mexico; goal and focus to work to find new ways to improve trinational collaboration and networking. Notes for white paper on an approach to trinational networking is in the works; collaborative research and monitoring around OA science; went very well; Kim is working with the Assoc of Marine Labs of Caribbean—May 2023 OA session—Mexico, Cuba opportunities to host sessions; AOML (Patricia Gonzalez) excited to continue joint collaboration with Mexico and Cuba; USM master's student Claire (Stephan student) joined meeting and is helping with white paper; Stephan—work with UGOS 1 TAMU working with Mexico to put out HFR in Yucatan Peninsula—UGOS 3 CICESE involved with gliders; Nick and Scott investigating ways to get radars into Cuba; connect Cuba, Yucatan, FL Strait; (Steve DiMarco PI on UGOS 3); Nick says subsurface flow measurements N. Caribbean also part of UGOS 3; Not sure who main contact in Cuba is; Joe: commented that now that we have fully transitioned to Jorge as ED, we should reengage with our funded PIs to share what's being accomplished with GCOOS funding. Chris informed the group that we will be launching a webinar series in January highlighting the work of our PIs. Nan says LA coast may be getting more radars—she heard this yesterday; not officially approved but going through our representatives in DC; Stephan—when new UNOLS vessel done, will lose $10K/day Pelican and Point Sur and have much more expensive option—not sure how that will affect ops; if you have NSF funding than UNOLS ship is free; NERR in LA moving forward—part of mandate is continuous obs; Nan asked if USCG wants data for SAR, where do they go? Nick says to Scripps site and get data on own; they use archives but you have to worry about QA/QC of data in archive; gets Tier 1 QA but if interested in work in particular area, probably better to contact PI directly b/c usually only provide subsample of data and have higher resolution information available. Jorge gave an update on Hurricane Ida hurricane supplemental funding; Kerri Whilden now with Fugro—bringing back their Chevron/Port Fourchon station; Nick said he did not sustain any damage to his radars from H. Nicole. Other discussion included updates on GCOOS folks impacted by recent hurricane activity and ways the NFIP changes will impact homeowners, including keeping insurance on generational homes.

Fall 2022: GCOOS Members Meeting 16 November 2022

Welcome and Purpose of Meeting: Board Chair Kirsten Larsen will let folks know spring meeting dates once decided; looking forward to next 2 yrs as GCOOS chair; first is roll call for directors and adopt meeting agenda.

Board Roll: Sara Graves, Pat Hogan, Stephan Howden, Kate Hubbard, Kirsten Larsen, Bill Lingsch, Ruth Perry, Antonietta Quigg, Joe Swaykos, Tom Wissing, Kim Yates; Missing: Renee Collini, Alyssa Dausman, Dave Driver, Nick Shay, Jan van Smirren, Nan Walker

Motion to adopt agenda-Sara, second Kim, none opposed; Purpose of today's meeting—to hear from stakeholders who use ocean obs data; series of panels based on the GCOOS Strategic Plan; thoughts for moving forward; inform plans for next five years.

GCOOS Overview of new projects: Executive Director Jorge Brenner said the new IOOS award started in 2021 just as he was coming on board; these are 5 yr projects; process for projects is competitive; we execute other funding as well but IOOS provides about 90% of our funding; priorities align with SP; slide shown with all funded GCOOS projects in new 5 yr cycle.

Panel Presentations and Discussion

Panel 1 Marine Operations

Ruth Perry (Shell), Ben Williams (Fugro), Dexter O'Malley (NOAA OMAO), Tershara Matthews (BOEM), Felimon Gayanilo (TAMU-CC/GCOOS), and slides provided by Nick Shay (UM) who could not attend. Joe Swaykos, panel moderator.

Ruth: showed photos; new oil & gas technologies for exploring and data observations are huge component of Shell's work; shifting to powering progress strategy; related to BOEM energy transition topics that Tershara will present; Stones platform, ultra deepwater, long-standing partnership with GCOOS for deepwater observatory—the deepest mooring platform in GoM; shifting to offshore winds; platforms of opportunities for obs; currently projects on east coast, auctioning projects in CA and coming to GoM; footprint; includes aircraft to vessels to assets themselves; ability to bring stakeholders together is key contribution of GCOOS.

For Marine Operations panelists other than Ruth, slides with answers to survey questions were provided to GCOOS in advance and responses were included in the Buildout Addendum Stakeholder Input appendix.

Panel 1 Marine Operations Discussion: Joe asked Felimon about data from oil & gas community—usable rate was about 40%; what is usable data rate now? Getting a ton of downloads so not sure if 40% is still valid; Ben--data quality on NTL—made progress on data quality control and QARTOD flagging from NDBC to GCOOS; location and position of rig are factors—are GPS accurate vs metadata sheets being presented—always one of the hazards in GoM---great current profile but in wrong place in the Gulf! Still a challenge Ben and others struggle with; Bill question for Ruth—wind farm—time frame in GoM—how do you go about determining location? Passing question to Tershara—timeframe, types of measurements made to determine where, when—Marine Spatial Planning model helping to cite wind farm areas;

partner with NOAA to use model; two model components Constraints component (no go areas) 20 nm buffer for birds, menhaden and other; also considers proximity to active oil and gas pipelines and platforms; result was 13 areas mostly deconflicted and suitable for offshore winds; report on BOEM website; 1 near Galveston, another ~58 nm from Lake Charles, 2023 leasing expected; then site assessment plans from companies to see where turbines can go; ~5 yr before see first turbines in water; if acquire lease, Shell would deploy metocean buoy with lidar to get wind characterization, then geotechnical, archaeological surveys depending if gaps in BOEM and NOAA data sets needed to quantify baselines; GoM is data rich cf other areas looking at for wind; Ben-Fugro—GoM less interesting b/c so much data after 30 yrs operating here! Felimon-any programs to collect metocean data before deployments? Ruth says have to in order to support permitting before can deploy—at least one year on site to support engineering work; prep survey work up front then sustained monitoring for cables, platform, etc; potentially other survey requirements e.g. for birds, acoustic receivers, a lot of R&D money with (Navy?) systems technology for offshore wind.

Nancy R—big effort for GOMRI to get data into GRIID C but now many more programs in Gulf, GRP, RESTORE, NSF, etc; how do we keep track of all this? GCOOS should not host all but maybe provide pointers where others should go for data not at A&M; Michael-still confusion where data in Gulf are going and who is coordinating; need to get handle on; Pat—how does NCEI fit into all this? Archive or public access required for obs collected? Where will these be stored? NCEI? RESTORE? Other? Felimon said GCOOS pipeline to NCEI also some GRIID C data to NCEI; strategy is to send all data to NCEI whenever possible; what repository is offshore wind data going to? Regulations not written yet—Ruth talking through with BOEM and BESSE in Atlantic—early permitting phase still working on framework; learning from NTL process and others; no NTL prescripted for wind—current conditions of permits might change over time; Pat question for Dexter—will OMAO be acquiring uncrewed system hardware or more O&M-type effort to deal with hardware of others? Hardware vs management of platforms activities for OMAO? What is the goal? Combination –look within USV—hydrography maybe buy hardware to support USVs; for others—e.g., gliders for fisheries, phytoplankton work with partners; first ID alliances to use so combination of data service and buying/maintaining own hardware; Pat asked about Saildrone—they sell data, not hardware; OMAO using Saildrone data as service; Tom question for Dexter—OMAO leaning to provide capabilities to bring down cost of data acquisition—what is the model? How going to do this? For UMS, trying to work out efficiencies—Ocean Aero, other USV, Triton—measuring hypoxia—what is best approach? Translate into operational environment—either work with manufacturer trying to force multiply aspects –ship time too expensive so trying to decrease cost using unmanned systems; what is best approach? New division so trying to figure out strategy; Stephan for Dexter—for hurricane glider initiative, rely a lot on Navy, any effort to compare offshore wind work with aquaculture? Ruth says permitting nightmare; NOAA tricky agency to deal with for permitting for aquaculture; operations in support of fisheries—buying products that support biodiversity; opportunity for pilot projects? Ruth working with rec fishermen—interest in support of new

platforms to help reef-aggregating fish given the rate of structures on the shelf being decommissioned; how can scour structures be designed to help these species? Quantify biodiversity impact if wind farm co-located with aquaculture; Tony K and Stephan involved with DOE projects pushing for offshore aquaculture; opportunity for GCOOS? Steve D has experience with this: Rafael question—comment—data reach for GoM—not enough to make models accurate; GoM has more measurements than others but does not mean enough! Question—quality of data—NTL—issue of repositioning is one of many embedded into assimilation; a lot of work curating these time series but new data sets coming to archive that must be reviewed and further treated; will GCOOS keep doing this additional QA? Felimon says not sure…not on his plate right now; up to Jorge and Kirsten to determine; Jorge says limited resources do not allow us to conduct full QA/QC --hopefully a comprehensive proposal to IOOS for this purpose will address the need; GCOOS has capacity issues and additional resources are needed to take on more responsibilities.

Panel 2 Coastal Hazards

Bill Lingsch (Underwater Glider User Group), Nan Walker (LSU), Yonggang Liu (USF), Debra Hernandez (SECOORA) and Tim Osborn (NOAA) all provided presentations with answers to stakeholder survey questions in advance of the session. Pat Hogan, session moderator. Stephan commented that it is difficult to capture who is using GCOOS data and how it is being used; Debra said SECOORA is working to determine appropriate data access tools for the low cost water level network; looking at multi-hazard products—low cost web cam, WL sensor and also integrating model output for a suite of sensor strains to use to inform decisions, receive alerts, inform actions at the community level. Tim said NOAA has a hydrographic survey agreement with USF and that academia is extremely important because of the enormous experience with local model development.

Panel 2 Coastal Hazards Discussion: Nancy—with so many information needs, and so many sites that need monitoring, how can GCOOS prioritize these important issues? Working to base decisions on where seeing demand—real time near-shore wind, wave and currents related to coastal storms and winter storms (most impactful to Gulf Coast states); Stephen—gaps in HFR—the gaps between eastern and western Gulf are larger than the size of the mid-Atlantic bite! West side, lots of O&G and fisheries but really hard place to operate HFR; Tim mentioned H. Harvey Sentinel WL stations—2 in all of LA—need more of those with HFR on them; single antenna systems, long range stations b/c if want to get WL throughout hurricane need these types of stations; radars that don't have to evacuate ahead of storms should be a high priority; Nan W—at one point GCOOS put money into HFR on the delta; Tim says GCOOS has helped a lot—in coastal LA after Ida—many fewer deaths in years after H. Sandy than during H. Sandy. Warnings and coordination with coastal populations and emergency managers has been effective; multiple years of Cat 4&5 storms w/o massive number of deaths is a testament but still a lot of gaps –areas with zero observations; FL 2nd fastest growing (21M people), TX fastest growing population in US); Joe—do we need more modeling for surge intensity? NOAA

inundation tool good but need local tide datum; WL gages—can display WL forecast too; Yonggang—3-D model ocean nowcast/forecast capability needed—single biggest need in his and Nick's opinions. Several comments were made that these are the types of stories we need to develop to show the value of investment in observations.

Panel 3 Healthy Ecosystems

Troy Pierce (EPA), Kim Yates (USGS), Kate Hubbard (FFWCC/FWRI) and Nancy Rabalais (LSU) provided answers to stakeholder survey questions in advance of the session. Alyssa Dausman (The Water Institute of the Gulf) also provided GCOOS user survey input but was unable to participate during the meeting. Responses were included in the Stakeholder Input addendum of the GCOOS Buildout Plan addendum submitted to IOOS for GCOOS RICE recertification. Antonietta Quigg moderated the session.

Kim encouraged more integration of biogeochemical observations in GCOOS through partnerships and collaborations; Kate asked if GCOOS can fund the building of new observation platforms with different sensor capabilities for sustained HAB-related observations. Nancy said that DO and hypoxia data for shellfisheries are needed as well as funding for real time transmission of satellite data; it would be helpful if GCOOS could lead the development of collaborative efforts among agencies and institution for access to and use of satellite imagery data;

Panel 3 Healthy Ecosystems Discussion: OA and DO are coupled—Nancy says if could simultaneously measure would be valuable; shellfisheries resources are where these two compounding factors may interplay more; Chris asked if wind platforms would be suitable for biogeochemical sensors; Kim says yes, we need these but also challenges b/c require monthly maintenance; pCO2 sensors are evolving but other sensors not as far along as these; access for open water resolution is climate grade—higher than weather-grade measurements; climate grade vs weather grade instruments very large difference in cost; Tom—what do you consider true spatial gap in coastal monitoring—pH, DO, HABs? Kate says simplest measurements of temperature and salinity would be great—resolution gaps—just buoy system and only a handful along WFS—supplement with glider missions; we are doing a better job getting routine measurements but still many gaps; this is why low cost sensors broadly deployed is very attractive; also need sentinel sites; a lot going on from rivers out to open ocean so need better resolution along entire gradient; also huge latitudinal shifts along coast with few assets north of Pasco and Pinellas Counties; Nancy—has nothing like what Kate just described; not sure how this happened but major data gaps in LA; TX—Xinping—agrees with Nancy-open ocean DO, pH tightly coupled; Stephan—similar issue to Nancy—unlike WFS, N GoM is very difficult to operate gliders on shelf b/c of density gradient; plus oil and gas ops; tough place to have robust monitoring system; need seafloor measurements near USM buoy b/c measuring pH, T, S at surface but hypoxia and associated changes at sea floor; don't have ground truth at seafloor to nail down what's going on; East of MS River Delta, evidence of sediment ground water discharge thought to be an important player; how do we address with monitoring? Dr. Li—

Debra question—what kind of WL sensors are you using? $500-$1,000 sensors—Debra no longer on call to answer but GCOOS will follow up and connect Xinping and Debra; Tony shared that TABS sensors are specific for oil spill direction and speed; sensors on 8 buoys—leases to TGLO going to TX shallow water carbon capture and storage—no eyes in the water in Flower Garden Banks NMS anymore; need them back; 4 gliders, 2 missions/yr; great radar network—HFR and gliders funded by GCOOS; Antonietta question for Kate—are there other HAB species on the radar? With different storm events are we seeing other species pop up? E.g. Dinophysis in Port Aransas; LA coast Pseudonitzschia is very important—domoic acid—found in stranded dolphins and other marine mammals; Heterosigma akashiwo —also toxic—not red tide but many other species of concern; Kirsten—also cyanobacteria out of Lake Pontchartrain, especially after Bonnet Carre Spillway opens; N GoM—shellfish harvest closure due to Pseudonitzschia—a species notoriously difficult to identify; more recently seeing estuarine benthic cyano HABS; huge amount of taxonomic discovery taking place. Problems arise when raft up to surface and then decay; without sustained observations and monitoring ,we won't know what other species might be out there.

Director's Update: Jorge provided an overview of GCOOS activities (content on slides);

QUESTIONS: Nancy—appears GCOOS is doing very well; many demands for ocean data; doing best to keep up with it; would like to see better prioritization about what's most important; not sure how best to do it but think it would be helpful; hopefully, addendum gets us closer to this—based on stakeholder input; Jorge will share addendum once board approved; Nancy thanked group for allowing her to participate; Pat says fair/interesting question; we've done stakeholder survey but is what the stakeholder says most important? We need to strike a balance between demand, capabilities, subject matter experts, budgets, science-based need, IOOS priorities, etc.

Closing Remarks: Kirsten thanked everyone for joining and the meeting was adjourned.