

**U.S. IOOS Advisory Committee
Hybrid Public Meeting
Meeting Minutes
December 4-5, 2023**

U.S. IOOS Advisory Committee Members Present:

Scott Rayder, Lynker (Chair)
Sara Graves, Ph.D., University of Alabama in Huntsville (Co-Chair)
Jason Biggs, Ph.D., Guam Department of Agriculture
Daniel Costa, Ph.D., Institute of Marine Sciences, University of California Santa Cruz
Catherine Edwards, Ph.D., Skidaway Institute of Oceanography, University of Georgia
Eoin Howlett, Trinnex
Molly McCammon, Alaska Ocean Observing System (AOOS)
Julio Morell, Caribbean Coastal Ocean Observing System (CARICOOS)
Ruth Perry, Ph.D., Shell Renewables & Energy Solutions
Daniel Rudnick, Ph.D., Scripps Institution of Oceanography, University of California San Diego
Oscar Schofield, Ph.D., Rutgers University Center for Ocean Observing Leadership
Jyotika Virmani, Ph.D., Schmidt Ocean Institute
Richard “Dick” West, ADM (ret.), Independent Consultant
Robert “Bob” Winokur, Independent Consultant
Carrie Schmaus, DOE (ex officio)
Kristin Yarincik, IOOS Association (ex officio)
Susan Yee, EPA (ex-officio)

U.S. IOOS Staff in Attendance:

Carl Gouldman, Director, IOOS Office
Krisa Arzayus (DFO), IOOS Office
Zack Baize, IOOS Office
Gabrielle Canonico, IOOS Office
Courtney Edwards, IOOS Office
Matt Hodanbosi, IOOS Office
Laura Gewain, IOOS Office
Maria Murray, IOOS Office

DAY 1 - December 4, 2023

Interagency Ocean Observation Committee (IOOC) Joint Session

IOOC Chairs, Enterprise Excellence Chairs

K. Arzayus opened the meeting and Kruti Desai, executive secretariat for the IOOC, introduced the Interagency Ocean Observation Committee (IOOC), which was joining this meeting virtually. The IOOC co-chairs, Lisa Clough and David Legler, presented the IOOC Strategic Plan revision approach for the IOOC. They have developed a roadmap and timeline. The initial strategic planning session is today (December 4, 2023) and the first decision meeting will be January 22, 2024. D. Legler mentioned that it is important to get stakeholder input for the IOOC. The IOOC developed a survey that they shared with Integrated Ocean Observing Systems (IOOS)

leadership and selected Advisory Committee (AC) members as well as other IOOC stakeholders to determine the funding and resource needs.

M. McCammon asked if the IOOC had done a strategic plan before. K. Desai replied that this is the first. M. McCammon followed up by asking how the IOOC historically has developed priorities. D. Legler said that the previous method was for the chairs and members to deliberate on important issues now and on the horizon. They began by addressing their charge in the Integrated Coastal and Ocean Observation Systems (ICOOS) Act, and once that was accomplished, they began thinking more tactically.

D. Costa asked about low-hanging fruit opportunities, noting the draft Marine Life recommendation about integrating Regional Association (RA) observations. D. Legler said IOOC has included innovation in the strategic plan, but they are cognizant of the low-hanging fruit that are easy to do. L. Clough said they are also being cognizant of the needs out there and where the IOOC can fill a needed role. S. Rayder asked about the metrics that will be used to measure impact. D. Legler said that it is a great suggestion to include those metrics. S. Rayder mentioned the National Weather Service (NWS) has great impact metrics on saving lives and property, and he encouraged the IOOC to bring metrics like that to the ocean. Laura Lorenzoni said there previously was a metrics group at the IOOC and they understand the importance. The IOOC is trying to come up with metrics that are robust and can be used in the future. S. Rayder said having common metrics across the IOOC would be very helpful. Brian Melzian added that before IOOS had its own strategic plan, they would provide input on NOAA's strategic plan relevant to IOOS.

M. McCammon asked if the survey can be sent out to more people on the AC. K. Desai said they decided not to because of the time delay inherent to large surveys. Lynne Carbone said they could potentially, if responses were timely. Alternatively, the AC could provide feedback to the draft strategic plan. L. Loenzoni said it would be more useful to get feedback on a draft document. K. Arzayus suggested that individual AC members could provide input on drafts, or that there could be consensus recommendations from the AC. M. McCammon said that the AC should add this to their list of things to do, to make sure they complete this task early enough in the IOOC drafting process.

M. McCammon talked about the Enterprise Excellence PWG, which is looking at all parts of the IOOS enterprise – IOOC, AC, IOOS RAs, IOOS Program Office, IOOS Association, and stakeholders. The PWG has met with the IOOC chairs and distributed a survey to the IOOC. They have met with IOOS Program Office staff. The working group plans to interview the IOOS RA directors in the new year to determine best practices and other recommendations. Later in the meeting, they will talk with the AC on how to best engage with current and past members.

C. Edwards discussed the IOOC survey results – this working group surveyed the other agencies outside IOOS that are part of the IOOC. They only received 4 responses. One survey question

asked how IOOS has helped their office. Responses included stakeholder engagement, data standards, tools for effective data distribution, and standards compliance. The next question related to current challenges or gaps in the IOOS office. Responses included development towards capacity and consistency between the regions, interoperability between the datasets/models. A third question was about the effectiveness of coordination among the community. Responses included alignment for collaborative work and funding agreement processes are a hold up. The final question was about agency needs and priorities. Responses included coastal climate signals, different agency data-delivery requirements, and web services. Surveys suggested agency interviews, particularly the U.S. Geological Survey (USGS) for data integration. She said that this was not supposed to be a large, all inclusive survey - just something to get the conversation moving. M. McCammon added that this survey was to learn about processes and overall best practices, but that it could provide useful information for the next IOOS Act reauthorization. Their survey may dovetail well with the IOOC strategic plan survey.

D. Legler said that the IOOC wants to see a successful IOOS, so there is interest in discussing the collaboration between the groups on these surveys in the long-term. L. Lorenzoni agrees that there is overlap and thinks that there should be collaboration. C. Gouldman mentioned the upcoming external review of IOOS in coming years. He said that there has not been a good connection between the work of the IOOC and subsequent successes. Perhaps the external review could consider this. D. Turner said that the IOOC should be included in that IOOS external review. M. McCammon thanked the four IOOC co-chairs for participating in the AC meeting and providing updates. She suggested the AC could be more involved in the IOOC, that the IOOC should look into how the AC can best serve the IOOC while drafting the strategic plan. K. Arzayus and K. Desai will work on next steps.

B. Melzen suggested having the AC complete at least some of the IOOC survey previously discussed, but L. Lorenzoni said it would be more beneficial for the AC to review the draft strategic plan. The IOOC signed off.

S. Graves asked to see the questions from the IOOC survey. L. Gewain will resend to the AC. D. Rudnick mentioned that in the law, the IOOS AC is supposed to have an advisory role for the IOOC, but the IOOC has not utilized the AC as such. It may be the right time to bring that up to the IOOC. C. Gouldman said that, if that is your perception, then it might be time. C. Edwards said that there might not be a procedure for providing input, which might be the reason. S. Graves asked if there are other advisory committees for other agencies that provide input to the IOOC. M. McCammon mentioned that there is also interaction with the White House Subcommittee on Ocean Science and Technology (SOST). C. Gouldman said that we are under one branch but there is reporting up both branches. M. McCammon also mentioned that there are different priorities between the IOOC and the IOOS, specifically the regions. B. Melzian said that the IOOS AC should look at the IOOC charter and see what listed mechanisms are. As a way

for Committees to feel heard, he explained how the agencies are required to provide a response to Committee recommendations. However, one issue is the turn over in the federal government.

The meeting will resume after lunch.

Meeting Welcome and Administrative Updates

Krisa Arzayus, U.S. IOOS Advisory Committee Designated Federal Officer and Deputy Director, NOAA's U.S. IOOS Office

K. Arzayus welcomed everyone to the meeting. She thanked the AC for being here. She went over the logistics of the meeting and how the minutes are handled. She turned it over to S. Graves, who is chairing this meeting. S. Graves went over the agenda.

U.S. IOOS Office Updates

Carl Gouldman, Director, U.S. IOOS Office

C. Gouldman gave an IOOS Program Office update. C. Gouldman mentioned that this is the same talk that he gave to the IOOS RAs for their Fall meeting last week. NOAA and NOS recently produced strategic plans. The IOOS strategic plan is updated every year. There is an unprecedented strategic alignment among all of these strategic plans, so IOOS needs to take advantage of that. The IOOS Program Office has awarded more money this year than ever before (\$83 million). He broke down the sources of that \$83M. He noted how this new funding is helping to implement some of the AC's previous recommendations. He discussed the breakdown of the Inflation Reduction Act (IRA) funding, from all of NOAA down to where IOOS is involved. He showed a grants calendar out to FY28 to showcase the extent of the overlapping awards. He discussed how NOAA now has a new definitions memo for Ocean Enterprise, which includes New Blue Economy. Work is in progress to repeat the Ocean Enterprise Study for 2025. This will include working with the Marine Technology Society (MTS), who is receiving some funds under the IRA Accelerators for the Ocean Enterprise Initiative.

B. Winokur asked if the Committee's previous recommendations on Diversity, Equity, Inclusion, and Accessibility (DEIA) and unfunded requirements have influenced how IOOS is planning to spend the IRA funds. C. Gouldman said there is DEIA language in the IRA Request for Applications (RFA) for the RAs. The RFA for the Bipartisan Infrastructure Law (BIL) for years 3-5 will be published in the spring, and this will address needs from unfunded requirements. R. Perry asked what the key risks are that C. Gouldman mentioned, besides the employee burnout. C. Gouldman said he is worried about missing opportunities to connect with other NOAA program offices, including how the work that will be done by those offices may meet IOOS needs. R. Perry asked if there is anyone higher up at NOAA that is trying to mitigate that. C. Gouldman said yes, there is a reporting process up to the Program Management Council (PMC), which reports to the Department of Commerce (DOC). There are also BIL/IRA implementation

meetings for the program offices. R. Perry asked in the NOAA hierarchy, is there anyone above the IOOS Office that is making sure other program offices know what is happening in IOOS. Dr. Spinrad has a policy team that C. Gouldman talks to. There is also the NOAA Earth Systems Integration Board (ESIB), where the NOAA Assistant Administrators meet regularly. D. Costa mentioned that there are some NOAA groups that are good at working with IOOS, for example through the Animal Telemetry Network (ATN). There are some NOAA National Marine Fisheries Services (NMFS) Fisheries Science Councils (FSC) that provide data while others do not. C. Gouldman said that the IOOS team tries to meet with the other offices. R. Perry voiced concern about the time commitment for C. Gouldman and his team to do that, adding that there must be a better way, such as the ESIB. S. Graves asked how often do other offices or the community come to the IOOS Office. C. Gouldman cited having a second Deputy Assistant Administrator (DAA) in NOS as beneficial to address R. Perry's previous concern. The IOOS staff are sitting on boards and talking with the community, which alleviates asks of C. Gouldman. Because of that, other offices do come to IOOS. S. Graves asked if IOOS is able to hire new staff from this funding in a timely manner and if they are getting qualified applicants. C. Gouldman said it doesn't happen as quickly as they'd like, but they are doing better than some offices. E. Howlett noted that several IOOS staff have gone on detail, but C. Gouldman said that actually helps the connectivity between offices.

IRA Funding Opportunities

Request for Applications to Regional Associations

Maria Murray, Regional Coordinator, IOOS Office

M. Murray began her presentation by mentioning that this IRA RFA is a \$100 million opportunity and that IOOS want this to be transformative for the IOOS Enterprise. The key tenets of IRA that are emphasized in this RFA include deepening relationships, providing equitable service delivery, meaningful stakeholder engagement, increasing coastal resilience, and supporting frontline and overburdened communities. The IRA RFA was published on September 29, 2023. IOOS developed [a website](#) for resources for the RAs. This opportunity is only open to the IOOS 11 RAs. There are two topic areas. It is a cooperative agreement, therefore IOOS can actively work with the RAs to develop their proposals. The IOOS Fall meeting was held last week and focused almost entirely on the IRA RFA. IOOS is coordinating with other NOAA experts and have brought them in to work with the RAs on their proposals, which are due March 5, 2024. IOOS hopes the funding will be distributed to the RAs by August 2024.

The IOOS Program Office sees this funding opportunity as distinct from other funding sources. Core funding is designed for sustained operations within a region. BIL funds are focused on recapitalization with a region. IRA funds are focused on equitable service delivery, both within and across regions. The degree of overlap for these proposals will vary depending on the region. The Program Office and RAs are working strategically to think about what opportunities fit under each bin. All IRA RFA applications will need to have focus on coastal communities, particularly underserved, frontline, and overburdened communities. These should be finite

projects for five years that have lasting impacts on the IOOS Enterprise. There are two topic areas. Topic Area 1 is for projects within 1 region. Topic Area 2 is for pan-regional or national projects and includes the integrated priorities of: 1) water levels and wave buoys, 2) ecosystems and monitoring, and 3) equitable service delivery. This funding is transformational, and as such IOOS would like the RAs to treat this differently than business as usual.

S. Graves asked if IOOS heard anything surprising at the recent IOOS Fall meeting from the RAs. M. Murray stated that it has been a process for all of us to get together. IOOS was surprised that the RAs decided each RA would get the same amount of funding for Topic 2. J. Virmani asked about calculating the long-term savings this funding is providing by being about to recapitalize infrastructure. M. Murray wasn't sure, but the RAs have been thinking strategically about how they will use both BIL and IRA for recapitalization. K. Yarincik added they have been pushing repair over the past few years, and this funding will address that and modernization. However, there is still an issue with sustaining the infrastructure. Under IRA Topic 2, they are considering low cost technologies.

*Ocean-Based Climate Resilience Accelerators Competitive Business Accelerator Program
Zack Baize, New Blue Economy Program Manager, IOOS Program Office*

Z. Baize opened his presentation with an overview of the Ocean-Based Climate Resilience Accelerators (OCRA) funding opportunity. NOAA will provide a combined total of \$60 million in funding over the course of approximately five years to accelerator entities. The IOOS Office is working to make the award selections for Phase 1. The overall purpose is to address critical ocean based climate resilience under 4 themes: renewable energy, carbon sequestration, hazard mitigation, and ecosystem services. There has been some need for education over the last year to help people understand what is meant by business accelerators. IOOS wants to identify subject matter experts in and outside NOAA to help these accelerators. A lot of their expertise is business markets and commercializing federal technologies. Phase 1 participants, once identified, work with these accelerators, including workshops to address technical assistance issues. They are in the final stages of getting phase 1 awarded and notified. The goal is for the Phase 2 RFA to be published in early 2024, to be due summer of 2024. About \$5M is available for Phase 1 awards, with the subsequent funding Phase 2. About 15 applicants will be chosen for Phase 1, and there will be a down select process from those for Phase 2. The overall objective of this project is to establish a national network of ocean-based climate resilience accelerators. NOAA wants to identify new accelerators and create a network so all can work together.

K. Yarincik asked about the process for engaging NOS partners, including the RAs, for technical assistance. She also asked if the February workshop is a part of this. Z. Baize confirmed this will be part of the February workshop, noting not much can be discussed publicly until the selected applicants are notified. Most of the technical assistance activity will occur between about February to September 2024.

S. Graves asked about the impact this type of accelerator is having, based on existing, more long-standing accelerators at other agencies. Through his own previous experience with accelerators, Z. Baize believes much of the tension between public and private sectors can throttle the public sector mission. The public sector has come to realize working with the private sector helps to advance the public sector mission more effectively and efficiently. The public sector is seeing the benefit of supporting these companies that provide a service to the public sector and those companies can then become continued service providers. S. Graves would like to hear more specifics at a future meeting, such as how many companies continue to be successful.

M. McCammon asked if the NOAA accelerators are coordinating with other accelerator programs, such as at Department of Energy (DOE) or National Science Foundation (NSF). She also asked if NOAA is looking to build up those programs, or going in a completely different direction.

Z. Baize said there is some overlap. While the theme areas have been identified to support the NOAA mission, all of these accelerators from the different agencies are seeking to support U.S. based companies to increase the U.S. private sector capacity to lead in some of these theme areas. DOE is also working with accelerators for offshore wind, but under a different direction. The NOAA accelerators for offshore wind are focused on improving information and services that support off-shore wind, such as planning and permitting, whereas DOE is focused more on the infrastructure of offshore wind, such as new turbine technology.

NOPP Marine Carbon Dioxide Removal Research Portfolio

Gabby Kitch, Carbon Dioxide Removal Program Lead, Ocean Acidification Program

G. Kitch began her presentation mentioning the IOOS helped fund the FY23 Marine Carbon Dioxide Removal (mCDR) Research Portfolio through IRA funding. The Intergovernmental Panel on Climate Change (IPCC) states that manually removing CO₂ from the atmosphere is critical to stabilizing climate change. There are four marine approaches to mCDR, details of which can be found in NOAA's recent marine carbon dioxide removal strategy. Because this issue overlaps with several agencies, they began working with the National Oceanographic Partnership Program (NOPP). We ended up funding \$24.3M with partners. IRA funding was transferred from IOOS to Oceanic and Atmospheric Research (OAR) Ocean Acidification Program (OAP), and \$14M was distributed out as grants. Through NOPP, they were able to fund 17 projects through 47 unique institutions with 79 unique Principal Investigators (PI). For more information, read the [press release](#). G. Kitch reviewed the types of projects this includes, as well as the mCDR methods used.

There were no questions or comments.

NOPP Marine Life

Gabrielle Canonico, Marine Life Program and MBON Manager, IOOS Program Office

The title of her presentation is based on the Call for Proposals submitted by NOAA on behalf of NOPP in FY22. This is an interest in biodiversity from the Office of Science and Technology Policy (OSTP) and SOST. There are a number of efforts geared towards strengthening and coordinating federal agencies and non-federal partners in this space. The need is urgent - the challenges of biodiversity, climate, social justice, and national security are all intertwined. A recent Government Accountability Office (GAO) report noted the poor understanding of the impacts of ocean warming, calling out specifically the impacts to biodiversity and food webs. In FY22, NOPP awarded five 5-year projects, and they will do the same in FY24. These projects link to RAs and local communities.

G. Canonico discussed the NOPP Ocean Life Forum held in August. They determined the needs discussed in the 2010 NOPP Workshop Report are still accurate, highlighting a “call to action” to coordinate and share knowledge, engage diverse communities, identify shared practices, and communicate ocean life benefits and actions needed. Following this meeting, a federal writing team was assembled to draft a national ocean biodiversity strategy. She encouraged the Committee to review and respond to the Request for Information. Although the writing of this Strategy has to be a federal process, they want to ensure that it includes ways to partner with those outside of the government. They are aiming to release the strategy in May 2024. Drafting an Implementation Plan will follow.

She highlighted the Summit on Ocean Biodiversity on January 23, 2024. There has been progress on ocean biodiversity from grassroots organizations, but high-level buy-in is needed. They are hearing that high-level support during the meeting planning, so the objective of the meeting is for that support to be visible and to discuss commitments. The themes for the summit are reflective of the objectives for funding for IRA: biodiversity and conservation, frontline communities, relevance for climate solutions, finance, opportunities for innovation. She noted that IOOS funding to marine life over the years has been an important catalyst for progress made around ocean observation.

D. Costa said he has heard many times the importance of having information and data that can be integrated in a common way. He noted that Topic 2 for the IRA was about integration across RAs. One problem with the RAs is that they don’t all collect data in the same way. There are new techniques coming online, and now is the time to agree to data collection methods to allow for interoperability. G. Canonico added that the problem isn’t just with the RAs, but also other federal agencies. D. Costa said this is the major recommendation from the Marine Life PWG.

NCCOS Effects of Sea Level Rise

David Kidwell, Competitive Research Program Director, National Centers for Coastal Ocean Science

He oversees the external granting arm of National Centers for Coastal and Ocean Science (NCCOS). Over the past 10 years, the program has been trying to gain a better understanding of not only the impacts of sea level rise, but also the tools and capacity for how ecosystems can provide hazard mitigation and adapt to sea level rise. The overarching question is how to incorporate ecosystems to protect from rising seas. They use a co-production approach and transdisciplinary research teams. They currently have 20 active projects from recent effects of sea level rise competitions.

They noticed a disconnect between the research in how coastal ecosystems will respond to sea level rise and how that information was being used to inform implementation or adaptation projects on the ground. They released a funding opportunity, prior to IRA, for this topic. Because of the IRA funding, they were able to fund 8 total projects (3 from base funding and 5 from IRA funding). This was intended as a pilot project, so in a few years they will assess with partners lessons learned. The IRA projects are 2 year projects for \$2.2M.

He discussed two projects that leverage existing capacity. One was based in California looking at how to integrate social science into adaptation solutions on the ground (i.e. protecting one community will put another at higher risk). Providing advanced modeling will help communities bridge that gap and facilitate dialogues to come up with adaptation plans. The second project was based in Los Angeles County looking at non-equitable impacts of flooding. Funding will be used to develop and assess potential adaptation solutions that look at a more holistic regional watershed to mitigate non-equitable flood impacts.

He closed by talking about where effects of sea level rise sit in the adaptation process, as compared to sister offices in NOAA such as IOOS or Sea Grant.

S. Graves asked if he works with the national water model. He replied not yet, but there has been dedicated funding for the Cooperative Institute for Research to Operations in Hydrology (CIROH) looking at how to integrate the fine resolution coastal models needed by NCOOS into the national water model.

Climate Program Office/ Office of National Marine Sanctuaries

Virginia Selz, Climate Variability and Predictability Program Program Manager, Climate Program Office

V. Selz provided an overview of the Climate Program Office (CPO). There are 4 focus areas of CPO: Earth System Sciences and Modeling; Climate and Societal Interactions; Education and Engagement; and Integrated Programs focused on drought and heat. They have a competitive research program; climate observations and monitoring program (focuses on using existing observations for dataset development and analysis); modeling analysis predictions and projects program; climate and fisheries adaptation program (focused on adaptation science and impacts to communities); and communication education and engagement division.

CPO has worked with the Office of National Marine Sanctuaries (ONMS) to develop a solicitation with the goal of increasing climate information and tools to improve ONMS management and planning. Seven projects were funded in FY22, and IRA funding allowed an additional 4 projects to be funded. While details haven't been released yet, the 4 IRA projects cover indicators for the National Marine Sanctuaries system, climate projections, and real-time monitoring involving collaborations with RAs. Recipients of the non-IRA projects have formed a Science for Sanctuaries Task Force to look at cross-project collaborative threads. The PIs of the IRA projects will be integrated soon. Upcoming activities for the task force include chairing a session at Ocean Sciences and holding a PI meeting in summer 2024. CPO will also be hiring 2 positions.

Marine Technology Society Ocean Enterprise

Brendal Townsend, Senior Director Ocean Enterprise Initiative, MTS

Ocean Enterprise was launched at Marine Technology Society (MTS) in July 2023. B. Townsend defines Ocean Enterprise as an emerging and vital sector that leverages the power of ocean data and information to address ocean challenges of the 21st century. It includes a range of sectors. In comparison to the definition of New Blue Economy, Ocean Enterprise is more evolved in that it includes the societal and environmental challenges and supports the evolution and development of the economy. She reviewed the principles of the Ocean Enterprise. In recognizing challenges and gaps the ocean enterprise faces, the Ocean Enterprise Initiative (OEI) was launched to improve coordination, communication, and collaboration among stakeholders. It is a permanent program in MTS, but NOAA did provide seed money. She reviewed the activities for addressing their goals.

S. Graves asked for more information on the digital OEI library. B. Townsend said they are actively working on the vision for this space. She referenced the Ocean Visions website, which has an interactive roadmap, as inspiration for the OEI library. Clicking on a topic would provide all the partners and activities in that area. R. Perry asked how the workshops are being messaged. For Ocean Sciences, a link was created on the MTS website for anyone who has registered for the kick off event to be invited. It is invite only. R. Perry suggested MTS re-think that strategy. B. Townsend clarified this event is only for the recipients of the Accelerators.

K. Yarincik asked for more information on the workforce programming. B. Townsend said that effort is just getting started and she welcomes input from others. They are aware many others are doing similar efforts, so they aren't looking to do anything duplicative. MTS is known for getting the right people in the room to get the right outputs.

C. Gouldman added that this OEI effort, including all the proposed workshops, are an answer to R. Perry's question earlier in the meeting about creating synergy across programs. While the Ocean Sciences meeting is just for Accelerator recipients, they may invite someone from the

Ocean Enterprise to speak. R. Perry noted that the projects being funded by Accelerators are only as good as their ability to scale, so they should consider who they could bring in from the Ocean Enterprise to help with scaling. C. Gouldman explained the process for the Accelerators over the 5 years, emphasizing there will be opportunity for iteration.

J. Virmani asked how the OEI roadmap action items differ from Ocean Visions for mCDR. B. Townsend said they probably won't, so they are hoping to work together to address gaps.

S. Graves opened the floor for open discussion. R. Perry asked V. Selz about one of her slides appearing to fund a National Marine Sanctuary that hasn't been designated yet. She clarified the map shown was of Sanctuaries that exist or are in designation, not those that are funded. S. Graves said she is particularly excited about the Accelerator projects and to see where that goes. M. McCammon expressed concern about what happens when the IRA funding for the Accelerators ends, noting how NOAA is good at developing one-off products that aren't sustained. The original idea was that the outcome from this funding would be so impactful that Congress would have to increase funding, but this isn't happening. There is a desire from communities for more sustainable operational services from NOAA, but NOAA doesn't have a process to make this happen. C. Gouldman says the office worries about this. He stated the way the IRA funds are used needs to be cognizant of this, but there will be some demonstration projects that will require additional funding. IOOS is exploring other sources of funding. Z. Baize noted that showing long-term impact has little to do with getting appropriations. R. Fontana said that because this funding is supplemental, it can't be considered base or having an operations and maintenance (O&M) tail. She added to Z. Baize's comment that if stakeholders tell Congress about the long-term impact, as opposed to NOAA, that will make a great difference.

R. Perry questioned why NOAA was operating in the Accelerator space in the first place, if they are unable to operationalize and sustain the outcomes. Z. Baize said they are not helping to develop technology further (already done by applicants), but rather a sustainable business model. J. Virmani noted how the product outcomes could be incorporated in the regions should be part of the business model. C. Gouldman emphasized the need for public involvement via workshops and focus groups moving forward. R. Perry said there needs to be the NOAA mission and the IOOS mission. If the regions can't benefit, then why is IOOS involved? An IOOS lens should be applied to the Accelerator theme areas. O. Schofield echoed these concerns, noting that the Accelerator program through NSF hasn't seen tangible benefits. M. McCammon reiterated previous sentiments that IOOS was directed to spend this IRA money using an Accelerator program, because NOAA sits in DOC. R. Perry said she understands, but IOOS can still put their lens to it. B. Townsend added that MTS intends to monitor these projects over time to ensure the projects are successful and meet IOOS needs. C. Gouldman said the theme areas will get more specific over time. This is a new way to innovate with private, public, and NGOs. R. Perry encouraged IOOS to include stronger connections to the regions. C. Gouldman

said they are conscious of not overtaking the RAs right now, as they are applying to a separate RFA.

J. Biggs said their issue is more about the timeliness of data. D. Costa said he thought Accelerators were originally to pair industry with academics, to take basic R&D and make it implementable. C. Gouldman added the third leg of that stool is mission needs. R. Perry emphasized that J. Biggs' and M. McCammon's earlier points support the need for these projects to meet IOOS needs in regions. Z. Baize added that this is what the technical assistance piece will support. He asked for clarity around earlier comments from R. Perry on NOAA vs. NOS vs. IOOS missions. R. Perry noted how one of the theme areas is renewable energy, but J. Biggs just stated all they need is real-time observations - so the NOS mission of renewable energy doesn't support the IOOS need. S. Graves closed the session.

PWG Working Session: Marine Life

D. Costa kicked off the session as one of the Marine Life PWG co-chairs. The PWG focused on the importance of the "I" of "IOOS" (i.e. integration). The draft includes examples of core biological measurements. As emphasized by Topic Area 2 of the IRA RFA, cross-RA synthesis is important. The Global Ocean Observing System (GOOS) Bio-Eco panel has been working on specification sheets for Essential Ocean Variables (EOVs) for ecosystems. Part of their recommendation is to implement these common measurements, approaches, and tools. They also built into the recommendation the GOOS concept, pilot, and mature phases of observing systems, including examples of each. ATN is example of mature system integrated across the RAs. Passive acoustics an example of methodology in place within NOAA. Environmental DNA (eDNA) is a pilot example.

O. Schofield, the other co-chair, stated that while eDNA is great, there are other biodiversity technologies that are more mature, such as Imaging Flow Cytobots (IFCB). D. Costa asked for clarity on next steps to finalize the draft. K. Arzayus said the draft had only been reviewed by the members of the PWG, so this is now the opportunity for the full AC to provide input. The outcome of this meeting should be to have a solid idea of what the recommendations are, as we don't want to introduce a new concept outside of the meeting.

M. McCammon said the recommendations need to be more specific, as it isn't clear for some what the recommendation is. There was discussion about the intent of the second recommendation about core biological measurements. It was agreed that the intent was to both identify a core set of measurements, but also to standardize them across the regions. O. Schofield noted that among the RAs, basic measurements are not consistent against the enterprise. Their intent was to have an integrated set of measurements for biology similar to physical measures like temperature or salinity. M. McCammon suggested "IOOS should identify a core set of biological measurements that would be collected in a standardized way across the regions". She asked if there was an example to use as a pilot. O. Schofield said ATN and acoustics

were the most mature. D. Costa said acoustics is not integrated. The hope is that the RAs would come together to identify measurements that are taken in the same way. G. Canonico asked about plankton measurements beyond Harmful Algal Blooms (HABs). O. Schofield responded that even a fundamental measure of phytoplankton biomass lined up against NOAA and National Aeronautics and Space Administration (NASA) ocean color data would be a great capability.

D. Costa said they wanted to be generic and not prescriptive in the recommendations, to allow the RAs and the community to develop the variables. GOOS has already developed some variables, which the RAs could choose to use or not. G. Canonico added that IOOS through the IOOC adopted the naming that GOOS uses for the biological variables.

M. McCammon reiterated the goal is to have integrated biological observations, suggesting an initial step be the IOOS regions identify 1-2 specific biological capabilities that can be integrated with standardized measurements across the regions. R. Perry noted the potential difficulty in identifying common biological threads across the regions (for example, not all RAs having HABs). O. Schofield said instead of HABs specifically, to have a common measurement for plankton in the water column. Take it to a core that the regions can then apply where relevant. R. Perry noted that acoustics is a common core variable that is not standardized, nor is there an aggregation of that data.

D. Rudnick said how Ecosystem Change is one of the topics being discussed as part of the Topic 2 of the IRA RFA, which emphasizes the regions collaborating nationally. He suggested connecting that effort to the work here. J. Morell is part of the Ecosystem Change group and added the group is interested in biogeochemical sampling, including sensors, HABs, eDNA. Other topics include benthic monitoring, ATN, passive acoustics, and cybotots. K. Yarincik added another aspect of the nationalization of standardization and integration of data. Workshops will be held to discuss specific thematic areas. D. Costa didn't think this recommendation would have this level of granularity, noting generally that the RAs do not collect biological data in a consistent way. D. Rudnick said the purpose of his comment was to note that there will be an effort towards this standardization through the IRA proposal. J. Biggs said the group was more forced on steering IOOS towards standardizing mature technologies, noting that eDNA is not mature enough yet. S. Graves asked what the group wanted to include about eDNA. O. Schofield doesn't think eDNA should be called out in the recommendations over other technologies, referencing the [GOOS maturity levels](#). J. Biggs agreed. J. Virmani suggested merging the existing eDNA text with the preceding section on emerging technologies. She also suggested a recommendation to periodically use regions to assess technologies. O. Schofield agreed. D. Costa added what is being asked is just for the core backbone and the RAs can continue to do other observing.

R. Perry said passive acoustics is an example of data being collected across the regions that is not standardized or aggregated. If the data was standardized and aggregated, there are many applications and products that could be created by the RAs. Data should follow quality assurance/quality control (QA/QC) standards. She gave an example of mapping of habitat and benthic sampling being done for offshore wind. The data collection is consistent, but not aggregated. There is also a time component to be able to use the data to answer biological questions. This could be paired with other IOOS data, such as gliders, to see ecosystem of change. What is needed is the data repository and integration with other data.

M. McCammon asked about the timing of the recommendations. K. Arzayus said the goal is have final recommendations to be presented at the next public meeting (late spring/early summer). D. Costa is encouraged by the fact that the projects under IRA are going in a similar direction.

M. McCammon asked if it would be helpful for the AC to state that the regions should do specific measurements. J. Morell said it wouldn't hurt to do so. D. Rudnick said that was the intention of his earlier comments - for the AC to provide input now relating to IRA, as opposed to waiting several months until these recommendations are approved. He believes the RA Directors would welcome comments. K. Yarincik voiced concerns about the timing with the current IRA process, but K. Arzayus noted recommendations could be approved as quickly as tomorrow depending on the Committee.

J. Biggs noted that the University of Hawaii (for PACIOOS) doesn't do long term biological data. But to measure changing ecosystems, you need baseline data and time series, with someone with taxonomic knowledge analyzing it. These are repeated measurements over time, so he questioned how that could be automated, noting the OceanVisions AI project. G. Canonico questioned the impact of the AC providing a recommendation relating to IRA. She thinks there is an opportunity for the AC to think more broadly and think systematically about what is IOOS' role, such as collection of observations or identification of interoperable data. J. Virmani agreed, but noted the intent was to provide these two as examples in this moment in time as the most important. O. Schofield suggested pointing to some of the more mature technologies, as he gets nervous about what the "right technology" is. He hoped that the variables chosen by the IOOS enterprise would be able to answer if biological productivity is increasing or decreasing, relating to the climate recommendations to AC previously made.

R. Perry asked about large datasets that aren't integrated yet into a national inventory. An example is bathymetric and habitat maps being developed in the Atlantic for offshore wind that will not be in one same place. She also asked about other data inventories with biological intent, such as Passive Acoustic Monitoring (PAM). Relating to J. Bigg's previous comment, the Bureau of Ocean Energy Management (BOEM) has decades of ROV footage, but the biological productivity hasn't been analyzed because it is too much for one person. She recommends

having a recommendation about developing a national inventory, with sub-recommendations on existing or emerging datasets with biological value to be integrated. IOOS has a unique ability to work with industry and has trust with the community that their data will be quality.

D. Costa said they kept this recommendation more generic because of the concern about fisheries data not being accessible outside of NMFS. There was a hard enough time getting the chemical and physical oceanographic measurements. The biological data is complicated, so they wanted to be aspirational. R. Perry and M. McCammon emphasized the need for regional integration, noting that data not directly biological may be pertinent for biological analysis. O. Schofield said there is a threat that data will disappear in the “dark data tower”. E. Howlett added that one solution will not solve it and a hybrid solution is needed.

M. McCammon asked the PWG chairs about including a rough national assessment of where the national capability is with this collection. For example, plankton is collected regularly across the regions, but here is what is missing. This would be a qualitative assessment. D. Costa didn't think this would be too difficult, but he questioned if IOOS and the RAs should pursue this, referring to an earlier statement about what the pillars of IOOS are. It is a big ask to go outside of what the RAs are doing. J. Virmani suggested making this recommendation to the IOOC, rather than to NOAA. Many members voiced agreement. O. Schofield suggested framing it as a gap analysis. Members collectively crafted the recommendation as the IOOC should conduct an assessment of the type and quality of existing biological measurements. The purpose being to understand what is being collected and where the data is going. M. McCammon raised the issue of such inventories quickly becoming obsolete. J. Virmini said it doesn't need to be an inventory, but rather a national assessment. O. Schofield noted how marine ecologists have at least 6 different databases where data are hosted, and it is accepted these repositories are not interconnected.

K. Arzayus suggested next steps for the Committee to spend the next few weeks editing the draft recommendations document. She proposed a virtual meeting in January or February 2024 to officially approve the recommendations. Since these have been debated publicly, she said it would be acceptable to discuss with the RAs, in the context of “the AC is deliberating on this topic”. M. McCammon said they could also pull out one recommendation to approve tomorrow for the RAs.

K. Arzayus adjourned the meeting for the day.

DAY 2 - December 5, 2023

Briefing on National Centers for Environmental Prediction (NCEP), Environmental Modeling Center (EMC) [Matt Hodanbosi] - 00:01:00 of recording

Brian Gross, Director, EMC

B. Gross gave an overview of the Environmental Modeling Center (EMC) based at the NOAA Center for Weather and Climate Prediction. EMC develops numerical weather prediction applications. EMC puts observations into models – about 50% of their work. Errors from the data and from the models propagate. They have mostly global models – “the quilt” of 28 products for NCEP. They are trying to move from United Forecast System (UFS) applications and simplifying apps. They want to move to combined, simplified structure – common data implementation. There are annual/multiyear reanalyses for calibration. There are new hurricane prediction models implemented for the 2023 season. Currently they can only model 1 hurricane at a time, but they want to move on to a point where they can include multiple hurricanes at a time. They are moving to a new system with coupled models and recently got funding for a seasonal forecast system to replace the Climate Forecast System (CFS). There is a joint, cross-agency effort for data assimilation. They are working to apply artificial intelligence and machine learning (AI/ML), for example with data thinning and assimilation. They want to use AI/ML to make their supercomputer use spread out more through a 24-hr period, as it peaks every 6 hours right now for the Global Forecast System (GFS).

E. Howlett asked if AI/ML will realistically replace numerical models, or be a complementary system. B. Gross said that, if we get enough data with good resolution, then the AI/ML could train on that. J. Virmani asked what is missing. B. Gross said deep ocean and aerosols, adding that they get some redundant data that are not used. C. Edwards talked about gliders and how they can be moved and re-moored, so that glider data can inform models and then the models can inform where to collect data. She asked if there were other platforms like gliders that are used. B. Gross said that the system can incorporate gliders and dropsondes, but the QC is the main issue. J. Virmani asked how much is missed by including the land as only a boundary layer, the Amazon and Sahara are probably very important. B. Gross said that it is on a list of tasks to do, but they are resource limited. Right now they are working with Princeton to start that process. B. Winokur asked about the collaboration with NOAA and the Navy. B. Gross said that they are working together at the Joint Center and are all starting at the same point. The interactions are vital and vigorous. C. Gouldman brought up the Earth Systems Integration Board’s Modeling Team, the Marine Mammal Commission/SCOOS being interested in HAB forecasting for marine mammal health, asking how coastal coupling is going. B. Gross said that they are looking at biogeochemistry and have used NOS as an example since NOS has been doing coastal modeling for a while. There are opportunities for more collaboration and

increasing coastal coupling. B. Winokur asked when we will be a weather ready nation. B. Gross thinks that the goal is zero deaths and minimized damage.

Updates from IOOS Association

Kristen Yarincik, Executive Director, IOOS Association (IOOSA)

K. Yarincik provided an overview and debrief on the IOOS Fall meeting last week, which was focused on advancing IRA proposal topics. She also provided an update on an off-shore wind (OSW) subcommittee that has been developed to support dialogue and collaboration on OSW engagement. K. Yarincik shared that the IOOS Association has been participating in forums working to advance biodiversity observations including the NOPP Ocean Life Forum and an upcoming Summit on Ocean Biodiversity.

K. Yarincik went on to explain the FY24 and FY25 appropriations requests. For FY25, they shifted away from the “Repair and Prepare” request because of the status of budget discussions in Congress and newly awarded funds from BIL/IRA. Instead, they plan to celebrate successes and share lessons learned from BIL and IRA, as well as account for inflation and depreciation in annual requests. They are going to focus their requests on the authorization appropriations level of \$56M. They will include in their talking points building into the annual budget funds for repair and maintenance. Finally she reviewed some relevant authorization bills anticipated this Congress including the Weather Act Reauthorization and Ocean Regional Opportunity and Innovation Act of 2023 and noted that IOOS reauthorization (ICOOS / COORA) is scheduled for FY25. The Commerce Committee is already requesting input.

J. Virmani asked why they are not maintaining the request for \$80M. K. Yarincik said it is strategic in that they do not want to appear greedy, and that some of the needs normally addressed by appropriations will be met by BIL or IRA. J. Virmani asked if there is still a need for \$80M next year, and K. Yarincik said there is always a need. B. Winokur asked if “depreciation” refers to the need to replace aging infrastructure, or depreciation of value. K. Yarincik said it does refer to the need for infrastructure repair. However, the regions are facing the challenges of inflation as well. Inflation is not built into their funding. D. West advises removing the term “special projects” from the \$56M FY25 request. M. McCammon asked if there is excitement among the RAs with this new funding. K. Yarincik said they are excited, but it has been overwhelming. J. Morell agreed, noting it is a particular challenge to figure out how to continue the work after the 5 year funding has ended. J. Virmani asked how they will weave the ongoing infrastructure needs into the annual request, but K. Yarincik said they haven’t figured it out yet, particularly because they never receive the full amount requested.

New Member Solicitation Discussion

K. Arzayus reminded the committee that applications for new members are due on January 2, 2024. A membership matrix has been distributed for reference. Members do not need to run names past the IOOS office - they just need for candidates to officially apply. She described the

different sectors/expertise areas that are being solicited and noted that there is a desire to get adequate geographic representation as well. Committee members are encouraged to reach out to their professional networks to support candidates to apply. A committee term is 3 years, and positions are renewable for a second term. There are 10 openings and no applications have been received. K. Arzayus asked the group to discuss the status and strategy for personally encouraging applications.

R. Perry asked about extending the deadline to mid-January, and K. Arzayus said that is possible but another Federal Register Notice (FRN) would be required. After discussion, it was decided that the office will look to extend the deadline to January 17, 2024. B. Winokur asked if members can nominate candidates, or if candidates need to self-apply. C. Edwards (IOOS Program Office) said there isn't a nomination process, that the candidates need to actually apply. C. Gouldman said if candidates need a push to apply, that needs to come from members.

M. McCammon said there needs to be a balance of bringing in "fresh eyes", but still people with knowledge about IOOS and who can think big picture. She thinks it is important to have 2 Committee members closely connected to the RAs. She has reached out to Sheyna Wisdom from AOOS, Julie Thomas from SCOOS, and Josie Quintrell. She is planning to reach out to Ed Paige, the Chair of the U.S. Marine Exchange in Alaska. S. Graves has reached out to Barbara Kirkpatrick from GCOOS.

C. Schmaus asked if this process applies to ex-officio members. K. Arzayus said their terms will need to be revisited at the IOOC level. C. Shumaus said she could find someone for off-shore, since that is not her expertise. O. Schofield has reached out to Jim O'Donnell at University of Connecticut and Josh Kohut, who is an offshore wind point person in the mid-atlantic. S. Graves said applicants should be encouraged to share their connections with and knowledge of IOOS in the application. C. Edwards (IOOS Program Office) said the application package includes specific questions to address that.

B. Winokur has reached out to Bob Shuchman at Michigan Tech University. R. Perry will reach out to Rebecca Green at the National Renewable Energy Lab (NREL). She asked about considering people who do ocean observations for offices like NMFS, but are not at NOAA. S. Graves suggested Matt Womble, former Congressional staffer and former Saildrone, now the head of the Alabama Water Institute. J. Virmani reached out to two contacts in philanthropy. R. Perry asked if there are other areas the IOOS office needs help with, especially with the execution of IRA and BIL. K. Arzayus cited the expertise areas listed in the solicitation, including data management, marine technology, blue economy, and maritime industry.

D. Rudnick has asked Toby Garfield. He recently retired from NOAA Southwest Fisheries Science Center (SWFSC), so there was a question as to if he could serve now, or if there was a waiting period following retirement. S. Graves asked about current employees from other federal

agencies, but C. Gouldman said historically those from other federal agencies served as ex-officio. J. Virmani asked about someone with weather or hurricane expertise, such as from the private sector (i.e. Weatherflow, Windy, Surfline). The name Steve Woll was discussed. M. McCammon asked about Ocean Vision AI, but J. Virmani said those staff are overworked.

S. Graves suggested Monty Graham from University of South Florida. The IOOS office will resend the email announcing the solicitation for the Committee to distribute. S. Graves suggested U.S. Global Change Research Program (USGCRP), which R. Perry said would be a good place for social scientists. C. Edwards suggested Mark Bourassa. K. Arzayus confirmed the 5 current members that will be staying on the Committee: C. Edwards, E. Howlett, D. Costa, J. Morell, and J. Biggs.

J. Morell will reach out to other RA Directors to apply. S. Graves suggested Robert Twiley. K. Arzayus asked Kelli Paige for suggestions for the Great Lakes. She spoke to Jen Read, former AC member, who was reaching out to other colleagues. She suggested considering non-profits or other community organizations. B. Winokur suggested Kate Moran from University of Victoria. K. Arzayus suggested Anya Waite. M. McCammon said there is a challenge with getting a tribal representative because they are so in demand. S. Graves will look into Stephanie Bryan. She also suggested Barbara Entwisle from UNC Chapel Hill. R. Perry asked about a representative in emerging technologies, such as mCDR. S. Graves suggested Mark Abbott.

K. Arzayus said the office will create a table with the names discussed and which Committee member suggested them, to know who will contact who.

PWG Working Session: Enterprise Excellence

M. McCammon provided an update on the Enterprise Excellence PWG activities. They met with the IOOC Chairs, the full IOOC, and have distributed a survey to the IOOC members. Only 4 responses were received. There was an idea to shift the focus of the IOOC component to the IOOC strategic plan, but she said the two efforts don't align well. The next steps are to reach out individually to IOOC members to attempt to elicit survey responses. The messages received were sustainability and aging assets, not so much the processes/strengthening the relationship between the FAC and the IOOC.

D. Rudnick reiterated what he commented yesterday – that the AC is supposed to advise the IOOC based on the law. He said they should explore the fact that the IOOC doesn't utilize the AC in this way. M. McCammon noted that in the AC recommendations, there is usually a few directed to the IOOC, and the IOOC does provide a response. C. Gouldman added that he has told other agencies that the AC is a mechanism that those other agencies can use when they have a program/project that they want reviewed. Perhaps the AC can episodically review topics from each IOOC agency. D. Rudnick said that we should ask the IOOC for their view on the role

of the AC, now that they are working on the strategic plan. S. Graves asked if that was on the survey. C. Edwards said no, but there was a generic “how can we help you” question. K. Arzayus wanted to remind that there are ex-officio members of the IOOC on the AC. There have been some conversations about how to strengthen their role on AC. C. Schmaus said she is still getting up to speed on both groups but wants to be as helpful. J. Virmani asked about adding this question to the IOOC survey, including how the AC could be best utilized.

B. Winokur asked if there has ever been a time that the IOOC has asked for assistance from the AC. K. Arzayus said she doesn’t think so, but IOOS tries to coordinate at least an annual meeting between the IOOC leadership and the AC Chairs. S. Yee added that the IOOC members are unclear about the role of the IOOC and what are the benefits to the agencies. She said she was surprised by D. Rudnick’s comment since the AC does occasionally get brought up at IOOC meetings and the IOOC does provide comments to the AC recommendations. So maybe the work is done to just check boxes.

C. Gouldman said that he is thinking if we should increase the communication by having the ex-officio members provide agency updates, similar to how the Environmental Information Services Working Group has line off reps provide an update each meeting. C. Gouldman said that we should clarify roles and that we should find items that fit many of the agencies’ priorities and move those forward. M. McCammon asked for how we select the ex-officio members. K. Arzayus said the ex-officio members are IOOC members as well as the IOOSA director. More details are in the bylaws , which have not been updated in 4-5 years. S. Yee added that the 2-3 seats for regular IOOC members rotate between agencies every couple of years. Looking at the bylaws, K. Arzayus said the AC may want to update the ex-officio cycle from 2 years to 3 years to be in-line with the AC member cycle. Ex-officio members are non-voting members and should not directly be writing recommendations. K. Arzayus asked if there were any objections to changing the term from 2 to 3 years and there was no objection.

M. McCammon went back to the plan for the IOOC, saying that the working group will follow-up on the survey and come up with recommendations, then share those with the rest of the AC. The working group will survey RA Directors after the new year to ask how the AC can be impactful and what issues are of importance to the RAs. The working group previously discussed with K. Yarincik and she suggested splitting the survey in two parts, the second half to address after IRA/BIL. J. Virmani asked about incorporating the idea of advocating for ongoing recapitalization funding, as opposed to one-offs every few years, as previously raised by K. Yarincik. She noted how IRA isn’t set up to address these types of issues, but C. Gouldman added that some RAs are planning to use Topic 1 IRA funding in that way.

M. McCammon moved on to updates on the Program Office. They spoke with C. Gouldman and K. Arzayus about managing and looking at cumulative impacts of all the different funding opportunities. C. Edwards added that this conversation would impact the questions they included in the survey to RA Directors. C. Gouldman said he really liked inter-association work,

which is why topic 2 of the IRA funding is requiring interaction between RAs. This will require tracking, which can be used to highlight the successes. M. McCammon said that based on yesterday's conversation, she drafted a recommendation for Topic 2 and showing impact through tracking and showing what the different RAs are doing. K. Arzayus asked if the PMC has reporting requirements for annual milestones. C. Gouldman said it is up to the Programs what is being reported up to PMC. C. Gouldman then mentioned that the IRA OCRA will have metrics in the near-term for business and economic development, not impact. IOOS needs to see what other programs are doing across NOAA. There is a customer experience effort at NOAA headquarters to look at how customers make decisions with NOAA products, which may intersect with the water levels work under IRA Topic Area 2 with CO-OPS. M. McCammon brought up how the RAs make their own products for their regions and they each do things slightly differently, but it would be beneficial to have products that overlap to be able to have cross-RA metrics. This could turn into a recommendation.

E. Howlett brought up that C. Gouldman mentioned burn out yesterday and how there is only so much the Program Office can do. M. McCammon said that when she was an RA director, the IOOS Office was primarily grant management, but now it seems there is operational work. C. Gouldman said that is the case, IOOS Program Office is working on products with stakeholders and also the networking, coordinating, and communicating on the interagency level. E. Howlett said more bandwidth in the office would be more successful in program management. K. Arzayus added that the Data Management and Cyberinfrastructure (DMAC) and hurricane gliders are examples where the office spends a lot of time coordinating. D. Snowden added that the gap is currently that the IOOS Office does not know what the RAs are putting money towards with DMAC and if that is similar or not to IOOS office DMAC operations. This is an area that could be addressed with more staff. S. Graves asked if the RA certification has helped to understand the RA DMAC work. D. Snowden said he thought so, but it is a snapshot in time only updated every 5 years.

S. Graves asked about the interactions and reporting mechanisms between the RAs and the IOOS office. M. McCammon noted the annual reports from the RAs that are used for measuring success – these are looked at by IOOS staff, who can ask questions back to the RAs. There are also the regional coordinators that work with the RAs. K. Arzayus said that the regional coordinators are liaisons between the Office and the RAs. C. Gouldman added that knowing everything happening at the RAs is still too much for the coordinators. M. McCammon said there is a difference between the regional coordinators simply being there to help if needed, versus proactively looking for collaboration points across the RAs. C. Gouldman said that having the two coordinators will enable this. The way the regional coordinators divided up the 11 regions between them was to make sure they both cover each coast. He added they are looking at the reporting process to make it more effective and making sure the RAs are aware they are useful.

M. McCammon asked E. Howlett to talk about his DMAC discussion with D. Snowden and M. Wengren. E. Howlett said that cyber security is important to consider. Since IOOS is outside the larger NOAA IT, they can be more nimble. It might be unrealistic to ask all the RAs to be FedRamp compliant. Other issues discussed include sustainability of work being done, regional vs. national solutions, and growing data classes. D. Snowden added that technology for DMAC changes more frequently than technology for observations. IOOS Ops thinks a lot about what the national role is and how they can help all 11 regions versus what is inherently regional for the RAs.

R. Perry said that she doesn't think IOOS needs to be the expert for all data management, for example National Center of Environmental Information (NCEI) can provide expertise. She asked what data is in the IOOS portal that is accessible to stakeholders that IOOS could do better. IOOS should help bring together data from across NOAA as a data product service. E. Howlett said there are many successes in IOOS products, such as radar and glider Data Assembly Centers (DAC). C. Gouldman said he uses the RA certifications as proof IOOS can do this, but other programs see it differently. R. Perry asked how the AC could leverage their role to help with this. She said that the certifications are great for industry because it gives trust that IOOS can be the holders of private industry data and use it positively. The public-facing side of IOOS is stronger than other NOAA offices, and this should be amplified. C. Edwards added that there needs to be more bandwidth to the Ops division so that they do not burn out. R. Perry said IOOS is considered a neutral party.

M. McCammon brought up the final aspect of the enterprise – the AC. They surveyed a few past members and got some responses. She asked the AC how they want to be assessed. She suggested a facilitator to assess the AC's effectiveness or recommendations for the incoming members. S. Graves said it would be good for those who have been on multiple boards and other ACs to compare and provide comments. R. Perry said the value add from the previous members would be to provide knowledge to the new members to get them up to speed as quickly as possible. R. Perry asked if that can be done in a closed session without the staff. K. Arzayus said that is probably not allowed due to FAC rules. M. McCammon said the working group will discuss this further and come up with a plan for moving forward.

PWG Working Session: NOPP

B. Winokur kicked off the session by saying they drafted three recommendations and agreed to keep it simple and to-the-point. He noted how the AC heard about some of NOPP's work yesterday during the mCDR discussion. The document opening emphasizes NOPP is about partnerships. There was a significant investment in the NOPP, then there was a decline over a number of years. Recently in the past couple of years, NOPP has reorganized with NOAA in a leadership role, as they have appropriated funds. In the past, they used Broad Agency Agreements (BAA). This group fully endorses NOAA's steps to support NOPP. He noted they

should update this document with the more recent steps that IOOS and the NOPP have taken.

- #1: Recommend that NOPP can play a key role in putting together interagency programs (e.g., Ocean Climate Action Plan (OCAP)). NOPP provides an opportunity for agencies to work together. NOAA should take a key leadership role.
- #2: Recommend a focus on the requirements process, particularly for industry. Be more structured in engagement with industry so they can understand the background, requirements, and the drivers to respond to needs. They should improve communication with industry so they can further support NOPP.
- #3: Recommend expanding public-private partnerships. They also suggest NOPP consider additional, creative ways to fund work other than BAAs.

D.Rudnick said B. Winokur did a great job summarizing their work. As he is supportive of recommendations being short and to-the-point, they could be shortened to: 1) encourage NOAA to continue to invest in NOPP, as it's the best example of cooperation across the sectors, 2) industry needs to know how to invest because they don't know far enough in advance where to make investments, and 3) look for new ways to expand those partnerships. D. West said NOPP is underutilized. The capability to partner outside the federal government is unlimited. He said every RA should be engaged with NOPP and outside partners. B.Winokur said when this PWG started about a year ago, there was significant concern on the future of NOPP due to the major drop in funding. However a lot has happened to NOPP in a positive way since then. NOAA's leadership role is an important factor. There's more work and investment to be done on the part of the federal agencies.

K.Yarincik said she and C. Schumas edited the recommendations to bring them back to IOOS. When looking at cross-cutting strategies such as OCAP, they're all underpinned by observations. They wanted to recommend that NOPP leverage and enhance existing efforts and put out funding calls that support these strategies, with mCDR as a good example. For the third recommendation, they want consideration for how the RAs can be a creative option for moving funds and partnering with other organizations. C. Shumaus said DOE is jealous of the fact that the RAs are able to take funds from industry.

K.Arzayus asked who the intended audience was for the second recommendation, if it was the IOOS Office. K.Yarincik said it is NOAA and the agencies, following on from the industry discussion at the California meeting. They want to make sure NOPP calls for proposals are meeting as many agency requirements as possible. K. Arzayus requested the recommendation be revised to clearly identify the audience. D.Rudnick said he thought that recommendation should go to the IOOC, for agencies to make requirements clear as far in advance as possible for industry to respond. B. Winokur added that the recommendation could be directed to the interagency working group under NOPP, but it also applies to NOAA as the lead of NOPP. It is a collective activity. M. McCammon agreed that the PWG needs to make the audience more clear

because that is who will develop the response. She added that the RAs already have the capability to bring in multiple sources of funding without NOPP, so she suggested adding that while the RAs can do this on their own, the NOPP provides larger scale and multi-agency funds. Agencies don't realize the RAs can accept funds from multiple agencies and other sources. C. Gouldman added that not all regions can do this as easily, such as ones hosted at universities.

J. Virmani circled back to the second recommendation. Her recollection from the meeting in California was that the RAs also needed a national plan, not just NOAA. So she isn't sure if that would make it a NOAA or IOOC recommendation. K. Arzayus clarified that the recommendations will go to the NOAA Administrator and IOOC, and then will be passed on to the IOOS office. She encouraged the Committee to use an IOOS lens in thinking about how IOOS would implement the recommendation.

K. Arzayus noted that G. Canonico has been actively using NOPP for Marine Life applications over the past decade. In her review of the draft recommendations, she encouraged you to make note of the successes to drive innovation, standardization, and observations. G. Canonico provided a suggested sentence to add to the background section in the role NOPP has played in IOOS.

M. McCammon asked if the Committee can approve the recommendation now, with the intent that the audience for the recommendation is clarified. K. Arzayus said they would prefer to wait in order to prepare a package of all the recommendations at once.

Going back to the potential recommendation discussed earlier on IRA RFA Topic Area 2, S. Graves asked if all the recommendations were for the IOOS office, or if some are directed to the RAs via the IOOS office. C. Gouldman assumed that was a recommendation for the IOOS Office to provide guidance to the RAs. K. Arzayus said to clarify the implementer (ex. We recommend that NOAA request the IOOS office to...). K. Yarincik voiced concern about this making it a more formal ask and the pressures around this timeline. There was discussion about who the recommendations are directed to and who responds. K. Arzayus said the recommendations are directed to NOAA, and then are delegated down to the IOOS office. C. Gouldman said he doesn't think there has been a recommendation directed to the RAs, and K. Yarincik added she doesn't think this is the best opportunity to test that. C. Gouldman said because the IRA RFA is a non-competitive opportunity, the IOOS office can relay this recommendation to the RAs.

M. McCammon reiterated the intent that these NOPP recommendations will be submitted along with all the recommendations, not on their own.

NOAA Response Deep Dive

Carl Gouldman, Director, IOOS Office

Kelli Paige, Equity, Partnerships, and Service Delivery Lead, IOOS Office

C. Gouldman kicked off the session, stating how this session would provide updates to the NOAA response provided in June to the Committee's original February recommendations. K. Paige began, focusing on the DEIA recommendations. She provided her background, noting that she has been involved with IOOS via GLOS since 2009. She gave examples of community organizing projects she was involved with. In reference to a book she is reading, she thinks of IOOS as public interest technology and it should be treated as such. She discussed her role, which includes supporting IRA RFA implementation and advancing the AC's recommendations. She resonated with DOC CDO calling himself "connector-in-chief".

Jumping to the specific recommendations, she sees the first recommendation relating to DEIA mission and vision statements as nearly complete. For the second recommendation on having a DEIA Implementation plan, she would like to leverage the BIL and IRA funding to support that. Such a plan can help diversify the types of partners IOOS and the RAs work with. A Strategic Plan will help address many of the items in recommendation 3, such as conducting assessment of barriers and opportunities for DEIA, workforce development, and identifying opportunities for leveraged funding.

J. Virmani asked if the third recommendation would precede the second recommendation. K. Paige said many of the items could occur concurrently and be consolidated into one larger effort. M. McCammon noted how in Alaska, most of their population is indigenous or underserved. She asked about the emerging issues for regions where these groups make up a smaller portion of the population. K. Paige responded that because everyone is resource limited, the instinct is to do the "low hanging fruit" projects. But in RAs where the overburdened or frontline community is not as clear, RAs need to identify who the target stakeholders are and what their information needs are (such as the MARACOOS examples she shared from the Fall RA meeting). We need to consider how to center our services and make decisions about what services we focus on to target our intended stakeholders. M. McCammon asked if there is still an IOOS Association Fellowship for DEIA. K. Yarincik said there is not one anymore.

C. Gouldman provided updates on select New Blue Economy and Climate recommendations. The details are provided in the talking points document (provided to members and on the website).

R. Perry asked regarding technology advancements, are there other ways IOOS is leveraging the IOOS network besides the Accelerators. C. Gouldman highlighted the Ocean Technology Transition (OTT) projects that are separate from Accelerators. Applicants are required to include IOOS as a partner. He wants to evaluate the OTT project for effectiveness and potential restructure. All of the IRA funding for Topics 1 and 2 are also applicable. He showed the flowchart breaking down all the levels of IRA funding to address questions from the Committee.

C. Edwards asked about evaluation of the AC recommendations, such as looking at the impact of a recommendation. K. Arzayus said IOOS has not specifically tracked that, but they do track the total number of recommendations received over the life of the AC, percentage fully implemented, and percentage partially implemented. C. Gouldman added that they do track progress on a more detailed level internally, but it was more useful today to select a few examples.

M. McCammon said they made a recommendation for NOAA/IOOS to take the lead in understanding the coastal climate signal. One piece of that was for the Climate and Ocean-Variability, Predictability, and Change (CLIVAR) to fund a coastal climate signal workshop, and she asked for a status update. K. Arzayus said CLIVAR did agree to fund it. They have established a steering committee to create a workshop to be scheduled in April. There is also a corresponding IOOC Task Team working in parallel and with the steering committee to receive hand off of the recommendations. D. Rudnick said he is on the steering committee and he anticipates a public announcement any day.

M. McCammon said they could go back the past 6 years to see how many of their recommendations are implemented as part of their Enterprise Excellence assessment. K. Arzayus said there is a master public list on the website that has this information.

Following on from the earlier discussion about the potential for an immediate recommendation around IRA RFA Topic Area 2, S. Graves suggested a more general recommendation as part of Enterprise Excellence for the RAs to work together on national activities. K. Yarincik liked this suggestion. C. Gouldman voiced concern about the timing of the AC putting out a recommendation now for the RAs, as IOOS is releasing instructions frequently to the RAs and this could cause angst with them. It might be better to hold off for a later recommendation. M. McCammon noted how in the 5 year cooperative agreements for the RAs, there is a requirement for pan-regional products. Based on her experience, this usually is a last minute token project. Because the RAs are resource limited and have their own priorities, the question is how to push for these pan-regional efforts while providing the resources to do so. K. Yarincik said the approach for the IRA RFA is still developing, but they are planning to take some off the top to address this resource issue up front. She added that data standardization and integration is front and center; product development is difficult because they are region-specific; and they are trying to have a dual approach for regional and pan-regional outcomes.

J. Virmani said it is critical to produce a national program out of Topic 2 and show the collective impact of all the RAs- to show Congress what was produced for the entire country. C. Gouldman said IOOS can't specifically request the RAs meet a national need so that more funds can be requested. He added that a national or pan-regional product doesn't mean a single product that meets national need, but is a consistent product that can be tailored to a region. The way the

RAs are dividing up the funding is looking at what absolutely needs to be funded that isn't connected to a region, and then looking at how each region supports each of the 3 Topic Area 2 proposal topics. J. Biggs asked if this will fill the biological need and major gaps in IOOS.

C. Gouldman said he thought so. He paraphrased a comment made by J. Morell outside of this meeting, in that this IRA Topic 2 funding is causing the RAs to work together in ways they never have before and this funding is transformational. J. Morell said he understands the ask for a national product and standard measurements, however biological measurements around ecosystems vary greatly by region. The main concern for CARICOOS is understanding how their ecosystems are evolving for their local communities. Perhaps we can develop some indices that could be used more broadly across the nation to track ecosystem health, but then the regions can focus on what they need to track at a regional level.

K. Yarincik said the RAs are trying to enhance national capacity. For the Ecosystems monitoring project, they will be working on national scale models; working with NMFS on the climate ecosystem fisheries initiative. They are aware that some products at the national level will not be as meaningful at the local level, so they are trying to find the balance. D. Costa argued there are some fundamental measurements that can be taken across systems, such as primary production or acoustics. He gave an example of acoustics being used for productivity in coral reefs. Animal tracking is also a mature system in IOOS. These tools cross regions.

The Committee discussed whether or not they should move forward with a recommendation today around Topic Area 2. D. Rudnick said from his perspective with SCCOOS, the proposals are going in the right direction of a national product/project. M. McCammon asked what the program office's view was. C. Gouldman is inclined to support a recommendation. Clarissa Anderson, the SCCOOS Director, said she thinks there is a misperception as to how the Directors have come together on Topic 2. The Directors have taken to heart previous input from the AC to develop national capacity. They are working on national or pan regional outcomes with some regional foci.

J. Biggs made a motion that it is clear the RAs have heard the AC's previous recommendations on this topic, no additional recommendation will be made at this time, and a future recommendation could be made if needed once more details on the projects are released. C. Edwards seconded. No additional comments.

Public Comment Period

No public comments were received in advance of the meeting. No public comments were made at the meeting.

Open Discussion

K. Arzayus started the session by discussing future public meetings (when and where). The Committee could have a virtual meeting to vote on the recommendations, with PWG or

Administrative calls beforehand to prepare, all before the next in-person meeting. The Committee did receive an invitation from Nicole Bartlett, the NOAA Regional Coordinator in New England. The Committee discussed various date options and locations, with ideas including mid- to late-May and locations including Guam, Hawaii, and Alaska. It was advised to avoid May 14-16, due to a joint RA event in California, although a meeting could be scheduled before or after. K. Arzayus said to keep in mind we want to invite NOAA leadership to the next in-person meeting, and the location may impact their ability to attend. D. Rudnick noted the Festival of Pacific Arts & Culture in Hawaii June 6-16 and the Committee could try to schedule the meeting on either side of that. It was noted that due to Memorial Day and C. Gouldman being on leave, the last week of May is not an option. The week of May 20 is an option.

M. McCammon asked if the potential meeting in May would be the last meeting for those members rotating off. K. Arzayus confirmed. She said a virtual meeting at the end of February or early March will be to finalize and vote on the recommendations, with the in-person meeting in May being to present those recommendations to NOAA leadership and hear initial NOAA responses.

K. Arzayus asked how members want to use the next in-person meeting - presenting recommendations, discussing a draft NOAA response, or both. This is assuming some NOAA leadership can attend. B. Winokur suggested both as a good way to tie everything together as the last meeting for many members. D. Costa noted that Ocean Sciences is at the end of February. Since many members would already be there, it could be an opportunity for informal coordination on the recommendations. K. Arzayus asked what timeline works for each PWG. M. McCammon stated they thought they had until September 2024 to complete their recommendations, so they may have to rethink their plan to carry over into the new members.

K. Arzayus shifted the discussion to membership, asking if it made more sense for the new Chair to come from the 5 members who will remain on the Committee come September 2024, or if it should be one of the incoming candidates. If an existing member, they would only be the chair for 3 years before they rotate off, as opposed to a new member who could serve as Chair for up to 6 years. S. Graves said unless a new member has extensive experience with IOOS and the Committee, it would be better for the Chair to be an existing member. B. Winokur agreed, noting the potential change in Administration around when the new members are on board.

Meeting Wrap-Up: Actions and Next Steps

K. Arzayus invited each member to offer closing remarks.

- S. Graves: This has been a great meeting, with many interesting topics discussed. She expressed appreciation to the virtual participants. She asked for the Committee's help,

along with C. Edwards from the IOOS Program Office, to help move the drafting of the PWG recommendations forward to meet the new deadlines.

- D. Costa: He was pleased to hear that Topic 2 from the IRA RFA was already well in place. When he and O. Schofield started working on the Marine Life PWG recommendations, they thought it would be an uphill climb to get the RAs working together. However, that does not seem to be the case.
- E. Howlett: This meeting was less grueling as compared to the last public meeting in California. He thought the IRA panel sessions the previous day were informative. Overall he liked the format of this meeting.
- R. Perry: While the meeting in California was more grueling, she likes being able to “get in the weeds” on what regions are doing. She noted that PACIOOS is such a different region, so it would be nice to hold a meeting there to dig in further. Regarding the OCRA program, her concern is that, while it is clear IOOS can handle that project, she is worried about NOAA stretching the office too thin. She worries the IOOS office is trying to do too many things and not doing things they should be doing well. She doesn’t want IOOS’s core to be eroded by more funding. This point could be discussed with NOAA leadership at the next meeting. The staffing concerns previously expressed by Carl are also concerning to her.
- J. Virmani: She thanked the staff for putting together the meeting. While she also enjoyed the California meeting for diving into a region, the sessions at this meeting were shorter and included more breaks. She is concerned that the regions are not looking at what is coming down the line in terms of technology. She hopes that the Accelerators will provide insight on technology in early technology readiness levels to show what could be for the future of RAs.
- J. Biggs: He said this was a great meeting. He finds this AC valuable and is leaving this meeting more invigorated. The discussion on Topic 2 for the IRA RFA made him think of things differently for the Marine Life PWG. He can see how the RAs are stepping up to the plate and are taking some of the workload off of the IOOS office. He finds it hopeful how DEIA is now a major part of federal government and empowering to hear how the Committee recommendations are being institutionalized.
- C. Edwards: She echoed thanks to the IOOS staff. She appreciated the overview in the presentations of what the program would like to do with the new funding. She expressed an interest in hearing more details at an upcoming meeting on the exact plans for the funding, as the awardees will have been announced. She second R. Perry’s concerns about staffing and potential IOOS identity erosion. She hopes the Committee can be a resource to the IOOS office during the upcoming Program Review. Throughout this meeting, she noted themes among the PWGs, which could be used to create connections in the recommendations.
- M. McCammon: She thanked the staff, especially C. Edwards. She hopes that despite a potential change in Administration, the Committee recommendations will carry forward. There are other challenges, such as technology changes and how to do more/better for

less money. She noted how in 5 years, people will not want to stop projects started with this new funding, but they will also not want to give up existing projects. Regarding the discussion about her proposed Marine Life recommendations, she was trying to work with everyone and get a consensus.

- B. Winokur: He echoed sentiments about it being a great meeting, good discussions, and appreciation to staff. He especially appreciated the updates and new information, as it is important for FAC to be informed on what NOAA is doing and how it is spending its money. He added that the NOPP PWG is operating fine without a chair.
- S. Yee: She heard a lot of threads today, especially in the Enterprise Excellence discussion, that overlap with what the IOOC discussed in their strategic planning meeting. When the IOOC shares their draft strategic plan, she thinks it would be valuable for the Committee to provide feedback, especially noting ways the Committee recommendations could be integrated.
- C. Schmaus: She echoed S. Yee's comments about the overlap with the IOOS. She is interested in discussing the liaison idea further.
- C. Gouldman: He echoed thanks to the staff. He was glad to hear the Committee heard his concerns about staff burnout risk. Within the ocean enterprise, there are many pieces to make it successful. The way bandwidth was managed before is no longer sustainable. He noted the OCRA Notice of Funding Opportunity (NOFO) was not built by IOOS staff, as one way to manage workload. The other Foundational Four programs (National Geodetic Survey, Ocean and Coast Survey, and Center for Operational Oceanographic Products and Services (CO-OPS)) are all having serious budget and staffing challenges, resulting in some contractors being cut. He was pleased with the discussion about strategic alignment. He was frustrated with the IOOC meeting being scheduled as the same day, especially given that he is the NOAA representative. R. Perry emphasized how the Committee needs to help IOOS "knock on doors" and how the IOOC can help open those doors. C. Gouldman noted he is aware that none of the other IOOC agencies have an IOOS line item in their budgets and NOAA is named as the lead federal agency. He is here for the "programmatic long haul". He is worried about the FY25 and FY26 funding. However, the new "temporary" funding is not going to start until October 2024 (FY25), so the funding will last until FY30. Therefore there is time for the Committee to provide input. In that time, he wants sustained ocean observing, sustained improved services, and sustained staffing.
- K. Arzayus: She thanked the IOOS staff, especially C. Edwards, who led much of the meeting planning while K. Arzayus was on detail.

S. Graves asked C. Gouldman if IOOS could utilize any of the staff having to be cut from other offices, but he responded that the skill sets don't align. M. McCammon said if the Committee wants to provide comments on the IOOC strategic plan, that needs to be built into the timeline as that needs to be done at a public meeting. Comments would be more impactful as a consensus body, as opposed to individual comments. K. Arzayus said this would require an FRN

to do a virtual meeting. L. Gewain noted IOOC meetings scheduled for January and February. S. Yee said those are more working sessions and C. Schumaus said the IOOC is interested in staying on schedule. L. Gewain will work with the IOOC on the timeline.

The meeting was adjourned.