

**U.S. IOOS Advisory Committee
Hybrid Public Meeting
Meeting Minutes
July 24-25, 2024**

Notification and Availability of Meeting Materials

The Integrated Ocean Observing System Advisory Committee (IOOS AC) was announced to the public by Federal Register Notice and on the IOOS Advisory Committee website. Meeting presentations and background material are posted on the website. Attendees participated both in-person at The Pitch at the Wharf, 800 Maine Avenue SW, Washington, D.C., and virtually by Google Meet.

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, Division of Aquaculture & Wildlife Resources

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, Trinnet

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, U.S. Department of Energy (ex officio)

Laura Lorenzoni, National Aeronautics and Space Administration (ex officio)

Kristen Yarincik, IOOS Association (ex officio)

Susan Yee, Environmental Protection Agency (ex officio)

IOOS Leadership and Staff in Attendance:

Krisa Arzayus (DFO) IOOS Office

Becca Derex, IOOS Office

Courtney Edwards, IOOS Office

Susan Fox, IOOS Office

Laura Gewain, IOOS Office

Carl Gouldman, IOOS Office

Brian Zelenke, IOOS Office

July 24, 2024

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 convened the public meeting at 9:03 a.m. and welcomed attendees. She thanked the staff for their efforts in preparing for the meeting, particularly to MARACOOS, who hosted. She reviewed the agenda and discussed housekeeping matters.

Opening Remarks

Sara Graves, Co-Chair, U.S. IOOS Advisory Committee

S. Graves thanked the IOOS AC members and presenters for their participation in the meeting. She noted that many members will be rotating off the committee after the meeting, which will be discussed further in a later session. S. Graves chaired the meeting due to S. Rayder being unable to travel, though he joined remotely when possible.

IOOS Association Update

Kristen Yarincik, Executive Director, IOOS Association

K. Yarincik provided an update on IOOS Association (the Association) activities currently underway, implications of the IRA for the Association, and on their advocacy efforts. At its spring meeting, the Association awarded Dave Jones of StormCenter Communications, Inc., with the 2024 Caraid Award in recognition of his ocean-related communications work and partnership building. Though limited in capacity, the Association recognized the need to increase its communication efforts and contracted a firm to audit its outreach and provide recommendations. From this, it worked to develop a roadmap for how to implement the recommendations and is currently undertaking this in a phased and efficient way, starting with a refresh of its website, to be completed in September 2024. With support from NOAA, the Association is also developing a K-12 toolkit for underserved school audiences, focused on three themes: an introduction to ocean observations, coastal preparedness, and seafood and environmental change. The toolkit is currently under review by the RA education and outreach staff and is expected to be available on the IOOS website by the end of November.

NOAA IOOS is managing \$217.7 million in IRA funds, of which \$100 million is non-competitive funding to the Regional Associations (RAs) (\$55 million for regionally specific work and \$45 million for pan-regional and national scale efforts). The Association will provide coordination and management of projects for the pan-regional and national efforts, which fall into three categories: (1) waves, water levels, and webcams; (2) ecosystem change; and (3) equitable service delivery. The funding will enable the hiring of two new employees to support this work and will more than double the Association's annual operating budget. This puts the Association above the annual threshold for federal funding that requires an audit. Though it will entail much more work, it will allow the Association to receive and manage federal awards

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directly and will be better positioned to manage cross-regional collaborations and to grow community support activities.

On March 9, the FY24 budget was enacted, which kept the IOOS Regional line flat from FY23 at \$42.5 million. On March 11, the FY25 President's Budget and NOAA justification were released, which proposed \$10 million for IOOS Regional, representing a 76 percent cut from FY24. The Association had requested \$56 million for the IOOS Regional line along with advocating for \$13 million for the Program Office. K. Yarincik discussed the Association's strategy followed in advocating for their request and efforts to help secure a House mark of \$56 million for the program. The Senate has not yet released its mark and a consensus bill is unlikely by the start of the fiscal year. The Association has also provided extensive input on several recent bills and administration RFIs for federal strategies.

Q&A

R. Perry asked about the partisan breakdown of the congressional dear colleague letters supporting the \$56 million request. Of the 85 signatures in the House, 11 were from Republicans; of the 27 in the Senate, three were Republicans. This is fairly consistent with previous years.

D. Rudnick commented that NOAA took an unusually bad approach to its budget by sacrificing external programs, though the House mark conveys that Congress values IOOS. The AC should provide advice on the importance of NOAA's partnerships with external programs. Members discussed potential arguments that could be made for not cutting IOOS funding.

R. Perry asked if there is a strategy to build up support among Republicans while maintaining it with Democrats. K. Yarincik said that Congress is the primary audience for the Association's communications strategy.

M. McCammon said IOOS must continue to emphasize its role in measuring the coastal climate signal. This message has lost steam and needs to be brought back, at least internally. She added that extramural grants are built on long-lasting relationships and are core programs that are now interwoven into NOAA operations.

IOOC Update

Laura Lorenzoni, IOOC Co-Chair and Program Scientist, Ocean Biology and Biogeochemistry Program, NASA Headquarters Science Mission Directorate

L. Lorenzoni presented the update. The Coastal Climate Signal Task Team has been a focus of the IOOC and will be hosting a workshop in collaboration with U.S. CLIVAR in September on optimizing ocean observing networks for detecting the coastal climate signal. Following the workshop, a task team will develop an implementation plan for the workshop recommendations. In advance of this meeting, IOOC provided the IOOS AC with responses to its recommendations on the National Ocean Partnership Program (NOPP) and marine life, and L. Lorenzoni said she would be available to answer any follow up questions after the presentation. The IOOC Strategic

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Plan has been released and is currently undergoing agency and SOST review. The Strategic Plan focuses on three specific goals: (1) Ocean Observing System development; (2) Partner engagement; and (3) Ocean Observing System sustainability. The IOOC has begun implementation planning and will develop an internal document that outlines the steps IOOC should take to accomplish its strategic goals and objectives. It expects to have a draft in the fall of 2024. IOOC wants to ensure it has the support of IOOS and that the implementation approaches will help to enable meaningful progress.

Q&A

B. Winokur asked if there is a role the IOOS AC could play to assist in the implementation. L. Lorenzoni said she believes there will be, though what it is remains unclear because it is still early in the process. IOOC will keep the IOOS AC informed.

J. Virmani asked how much of the RA funding comes from the other IOOC agencies, as this could assist with Goals 2 and 3. K. Desai said the IOOC has discussed the regional aspect in Objective 3.2 on aligning investments to build common gaps across agencies and advance shared priorities. It expects this information gathering to be part of the implementation plan. K. Yarincik said that all of the non-NOAA funding that goes to the RAs is through normal grant solicitations and is project-focused.

R. Perry asked what other federal observing entities are critical to this effort. K. Desai said the Strategic Plan lists many federal partners IOOC hopes will be part of its implementation. It will be heavily reliant on its SOST-IWG partners and will leverage its existing networks with other observing systems.

Enterprise Excellence PWG Working Session

Catherine Edwards and Molly McCammon, AC Members and PWG Chairs

M. McCammon discussed the drafting of the proposed Enterprise Excellence recommendations. The IOOS Enterprise includes a number of components that are all reflected in the authorizing legislation, including the IOOC, IOOS Program Office, IOOS RAs, IOOS AC, and stakeholders. The working group conducted extensive surveys and interviews of people within these components. It chose not to focus on stakeholders in this exercise, because it felt it was outside its capacity.

C. Edwards presented the working group's high-level findings, which were also available in a summary document. Two key themes emerged from the feedback it received: (1) A perception of the insularity of IOOS at regional and national level limits the effectiveness of the IOOS Enterprise; and (2) The Enterprise needs a strategic, long-term vision. Recommendations under the first theme included increasing connections among IOOS components to improve understanding of the program's needs and help leadership advocate more effectively, as well as urging the NOAA Administrator and the Program Office to take a more proactive role in advocating for IOOS and the RAs and foster further collaborations. The second theme called for strengthening the IOOS Enterprise and the Program Office and developing a long-term vision for

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the program. C. Edwards noted that these surveys were conducted prior to the release of the President's Budget, but are still useful perspectives that address the big picture of what IOOS is doing.

Q&A

J. Virmani asked if the surveys captured anything that would shed light on the disconnect between IOOC and the IOOS RAs. C. Edwards said the RAs would seem to be a natural fit with regional offices of other agencies, and there is some question as to why they are not more integrated. There was also confusion about the IOOS AC's role with the IOOC. M. McCammon said that some IOOC members are not as connected with programs outside of their individual agencies. She added that the IOOS program has done a good job integrating itself within NOAA, but at the expense of advocating strongly enough for the program itself. Although small, IOOS is often the glue that holds together various pieces of the federal observation portfolio. J. Virmani urged IOOC to educate and promote IOOS within its agencies.

B. Winokur suggested a very explicit recommendation for the Program Office to develop a communication and coordination plan with key milestones and benchmarks, which could fit under Recommendation 1. Developing a formal mechanism to bring agencies together to get things done would also be a useful part of this plan. K. Yarincik liked the idea.

D. West commented that IOOS is integrated across NOAA and it would be helpful to better understand the agency's investment in ocean observing so the AC can better help promote the program. He asked about IOOS's relation with Ocean Exploration (OE) regarding data collection. K. Arzayus said IOOS has interacted with OE primarily through NOPP, but would find out if there were active data management discussions between IOOS and OE.

D. Costa commented on the synergy between this work and that of the Marine Life Working Group. The survey results are consistent with the finding that IOOS is not reaching its full potential because the RAs act independently and do not necessarily manage data the same way. He appreciated everything that was included in the recommendations, but the bandwidth to implement them may be lacking. The effort it takes to get money in place is significant and the incentive for RAs to work together is not there structurally.

D. Rudnick said he did not understand what the working group was trying to accomplish and could not support any of the document in its current form. He worried that the summary gave too negative a view of the program and particularly objected to the term "insularity." M. McCammon said some of the confusion arose from bringing too many focus areas into the one topic of "Enterprise Excellence." She agreed it may have come across as too negative and welcomed recommendations to change the wording. E. Howlett said the IOOS AC should be very specific about defining topics for working groups.

B. Winokur suggested including a certain number of positive statements about the program.

J. Virmani felt changing how it was characterized may be a good idea.

M. McCammon said findings that acknowledged success could still be added. She suggested changing the topic from Enterprise Excellence to IOOS Enterprise Sustainability.

J. Virmani asked about recommending that all agencies consider RA funding to be operational and not time-limited grants. S. Graves thought that would be very difficult to get approved.

After extensive discussions, the working group decided to continue working on the document in hopes of having something to present to R. Spinrad the following day.

NASA Guest Speaker

Dr. Karen St. Germain, Earth Science Division Director, NASA

K. St. Germain presented on NASA's earth science work, particularly with respect to ocean observations. NASA's earth science observing satellite portfolio provides a unique vantage point to better understand how the earth works as a system, positioning the U.S. to be a global leader. NASA's abilities in this area help further all other U.S. science agencies and communities in their work. K. St. Germain presented several visualizations of NASA earth system models. In December 2022, NASA launched its Surface Water and Ocean Topography (SWOT) mission. With its high spatial resolution, SWOT will allow researchers to do a global inventory of inland water for the first time, opening up many new areas for potential collaboration with NOAA. In February, NASA launched the Plankton, Aerosol, Cloud, and Ocean Ecosystem (PACE) satellite, a trailblazing mission for ocean color and atmospheric science studies, which is expected to profoundly advance understanding of the ocean's role in climate. To date, it is the only hyperspectral ocean color sensor that can provide high quality daily global coverage. In partnership with the Intergovernmental Panel on Climate Change (IPCC), NASA built a visualization of the data discussed in the IPCC report to show users what their local impacts will look like. A partnership of several federal agencies is currently working to expand upon the tool and provide information on available resources for mitigating the impacts of climate change. NASA's next big mission will be the NASA-ISRO Synthetic Aperture Radar (NISAR) launching in 2025, which is equipped with tools for detecting change in position of physical features at the centimeter scale. This will be especially relevant in combination with the other two missions and for monitoring coastlines.

Q&A

S. Graves asked about K. St. Germain's interactions with NOS. She said she meets regularly with NOS Assistant Administrator Nicole LeBoeuf.

J. Biggs asked if NASA was surprised to not see more large volcanic features in its remote sensing data. K. St. Germain said although they do not show up in the graphics she presented, NASA is seeing them and expects that SWOT will dramatically improve its understanding of bathymetry. J. Biggs commented on the potential application of this data for mapping geothermal energy and asked if the hyperspectral sensors were able to drill below the surface levels. K. St.

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Germain said NASA can see slightly submerged areas thanks to the additional spectral fidelity, but the project is still in its early days.

B. Winokur congratulated NASA on launching SWOT and discussed some of his own work to get the effort started. He said that SWOT's radar altimeter data will be critical for ocean forecasts. K. St. Germain said that NASA is already building the Sentinel-6C mission and is in conversations about what will come next.

E. Howlett and J. Virmani asked a series of clarifying questions about SWOT. K. St. Germain said she would like to connect NOAA and IOOS AC members with NASA's science team, which can provide a more in-depth science briefing. J. Virmani asked if NASA has achieved its goal of mapping the entire U.S. EEZ. K. St. Germain said it has not, but NOAA and NASA can work together to get to that resolution.

D. Rudnick asked how it is decided whether a satellite should be flown by NASA or NOAA. K. St. Germain said NOAA's satellite capabilities are always driven by requirements. Historically, these have been more focused on weather, though they have been expanding into new areas recently. NASA's observations are sometimes directed or competed through funding announcements. It also focuses on innovation, developing new observation approaches and sustained operations, as opposed to operational observations. She welcomed any recommendations the IOOS AC might have on how to spur more high-level collaborations between NOAA and NASA.

Advisory Committee Membership

All Members

S. Graves announced the new AC members: Dr. Eric Anderson, Dr. Sara Bender, Stephanie Bryan, Dr. Glen Gawarkiewicz, Dr. Monty Graham, Dr. Barbara Kirkpatrick, Dr. Laura Lilly, Nick Rome, Steve Woll, and Debra Hernandez from SECOORA, who will be the new Chair. The incoming members that were present remotely introduced themselves. Staff is working out details on how the existing members can engage the oncoming members to help with the transition. Returning members include J. Biggs, D. Costa, C. Edwards, E. Howlett, and J. Morell. Members rotating off the committee include S. Rayder, S. Graves, M. McCammon, R. Perry, D. Rudnick, O. Schofield, J. Virmani, D. West, and B. Winokur.

C. Edwards presented a summary on succession planning based on the AC survey results, highlighting a need for an improved onboarding processes. Incoming AC members have been provided a history of IOOS AC and its recommendations. M. McCammon suggested a facilitated discussion between the returning and new members. D. Costa said that having the Chair and Vice Chair roles staggered, with the Vice Chair replacing the outgoing Chair would better maintain continuity. K. Arzayus said staff hopes to have that in place eventually. R. Perry and others asked about the possible appearance of a conflict of interest in having an Executive Director of an IOOS RA serve as Chair of the AC. K. Arzayus said the ethics attorney found that it was not a conflict, since the scope of the AC's advice is very broad and is focused on strengthening the IOOS enterprise. J. Virmani said this will need to be abundantly clear to the

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regions. M. McCammon said that the IOOS AC was previously constrained because no one on the committee was intimately familiar with the RAs. She has some concern about the ability of an RA Director to approach the NOAA Administrator with difficult messages from the IOOS AC. Members noted that the IOOS Program funds the Executive Directors' salaries. E. Howlett pointed out that the IOOS AC does not direct funding.

M. McCammon asked if it was worthwhile for the working group to pursue recommendations. Members felt the recommendations included valuable content. The AC discussed how they wanted to approach the IOOS budget reduction with the Administrator on the following day. J. Biggs commented that the AC needs to start thinking about ways IOOS can move the country forward, such as geothermal mapping.

Public Comment

Jan Newton, Executive Director of NANOOS, commented on the need to improve awareness of the IOOS RAs. She reflected that many positive connections and relationships have been forged since the surveys were done, and the AC should be conscious of that in shaping its recommendations.

Open Discussion

All Members

K. Arzayus said that S. Rayder requested the NOAA impact statements that were submitted to Congress, although there were no formal impact statements in the FY25 President's Budget. J. Potts said NOAA does not typically develop impact statements to be included in its requests, though it does draft impact papers on key focus areas for House and Senate marks, which are currently underway.

M. McCammon asked how the AC wanted to use its time the following day. Members mentioned getting clarification on the relationship between the IOOC and IOOS AC. R. Perry hoped to hear from congressional staffers on how IOOS could stretch its ask in the next reauthorization. She said the AC should think of reauthorization as a tool to maintain the stability of the program.

The AC decided to continue refining the working group recommendations and not present them to the NOAA Administrator at this meeting. R. Perry said they need to hear the Administrator's perspective on what is currently not working in the IOOS funding model in order to present meaningful recommendations on how to avoid similar situations in the future. D. Costa commented on the fatigue that will come with having to argue for funding each year. Members also wanted to discuss how to increase awareness of IOOS's work within NOAA. J. Virmani said the AC needed to make clear that continued cuts will eventually lead to a point where the community walks away from IOOS. O. Schofield noted the importance of protecting the partnerships that have taken more than a decade to develop. B. Winokur said extramural programs are just as important as NOAA's in-house programs.

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Mid-Atlantic Regional Association Coastal Ocean Observing System (MARACOOS) Briefing

Gerhard Kuska, Executive Director, MARACOOS

G. Kuska presented on the recent work of MARACOOS, whose region covers ten states from Cape Cod to Cape Hatteras. MARACOOS recently celebrated its 20th anniversary, when it presented the Mid-Atlantic Ocean Observing Leadership Awards to Senator Chris Coons and Representative Frank Pallone. All of MARACOOS's work centers on stakeholder needs in five areas: maritime safety, energy, coastal hazards, water quality, and fisheries and natural resources. It has increasingly been investing in more region-wide efforts rather than work focused on individual subregions. MARACOOS's OceansMap is its flagship portal and visualization tool for ocean observations and forecasts, incorporating data from a wide variety of sources. It has been working to develop a relationship with the offshore wind sector, which has been challenging given the number of states in its region. It has been negotiating data sharing agreements with offshore wind developers, both to support their work and receive their data. NERACOOS and MARACOOS collaborated on the development of an Offshore Wind Data Assembly Center to ensure that the met-ocean data collected are effectively managed and available to all stakeholders. G. Kuska discussed MARACOOS's plans for IRA funds. Despite a substantial infusion of resources, IRA will not enable MARACOOS to do everything it wants. The IOOS Program has come a long way in creating a national network and it cannot afford to go backwards.

Q&A

D. Rudnick asked about the NOAA Administrator's response to potential deleterious effects of cutting IOOS's budget. G. Kuska said the Administrator said difficult decisions had to be made and it was a negotiation among many layers of government. J. Virmani asked if he thought this would set a precedent for the future. G. Kuska said NOAA has essentially handed the matter to Congress to decide how IOOS should be managed, but IOOS needs leadership with a vision that cares about the program.

E. Howlett asked about the relationships between IOOS and the offshore wind industry. G. Kuska said MARACOOS was hoping that NOAA would direct the offshore wind industry to work with the IOOS RAs for their data. R. Perry discussed some of the complications in the offshore wind industry, and how IOOS often gets caught up in the mix. O. Schofield said that working with the offshore wind industry has been a challenge for the IOOS RAs because the developers prefer to work with the states, and RAs often cover multiple states.

Day One Adjournment

K. Arzayus adjourned Day One of the meeting at 5:01 p.m.

July 25, 2024

Congressional Session and Q&A - IOOS Authorizing Legislation

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Dana Rollison, Professional Staff Member (Majority), Senate Committee on Commerce, Science, and Transportation, Subcommittee on Oceans, Fisheries, Climate Change, and Manufacturing

D. Rollison provided updates on pieces of legislation relevant to IOOS. Reauthorization of the ICOOS Act is close, and there are no major changes planned. The bill will likely be introduced and then folded into another bill, such as the Weather Act. The Weather Act has made good progress and should be ready to introduce in September. The Ocean Regional Opportunity and Innovation Act will likely be folded into a larger bill. The BLUE GLOBE Act has passed out of committee. The Senate version of the NOAA Organic Act is very different from the House's version; committee staff is trying to find Republican support and determine what should be included. It is planning for some kind of consolidating end-of-year package for all of these bills.

M. McCammon asked if the authorizing legislation included any language clarifying the relationship between IOOC and the IOOS AC. D. Rollison was not sure, but offered to follow up. She also welcomed input on how the two committees should interact, but cautioned they would be bound to what is in the legislation for the foreseeable future. C. Gouldman did not think the IOOS Association made any suggestions on this topic, but did state that a definition of "operational oceanography" should be included. K. Yarincik said that the bill did include some language on the roles of IOOC and IOOS AC, but it would benefit from further clarification.

M. McCammon asked about the Organic Act and how it could affect NOAA's ability to transfer money from other agencies. D. Rollison said the bill contains some additional transfer authorities to address the problems. Members shared some of the barriers and burdens they experience when agencies attempt to transfer funds to NOAA, which they have been told is because of the lack of an Organic Act. N. LeBoeuf added that transfer authority is important because moving funds between agencies is extremely burdensome and discourages other agencies from partnering with NOAA.

J. Virmani asked about the likelihood of getting the Organic Act through Congress. D. Rollison said this is the closest they have been in a long time and there is significant recognition of its necessity, though it is a highly contentious time in Congress. N. LeBoeuf said NOAA's prediction mission needs to be included in the authorizing language.

U.S. IOOS Office Update

Carl Gouldman, Director, IOOS Program Office

C. Gouldman presented on IOOS program highlights and priorities. Following the past year's surge in effort, IOOS is poised to focus on implementing action-oriented plans for several years. Despite the budget scenarios IOOS is facing, there is still incredible alignment of strategies at all levels, with an emphasis on NOAA's vision for an equitable, Climate-Ready Nation, and an information-based blue economy. The focus now is to build on over 20 years of progress in developing an end-to-end value chain from observing, data, modeling, predictions, tools, decision support, all the way through to information delivery, with a view towards equity. IOOS is focusing on telling the story of the impacts of investments in its work. C. Gouldman discussed IOOS's efforts during Hurricane Beryl, highlighting the Glider Data Assembly Center that

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connected observations to the models. He shared some of the highlights of what they have been working on, including transitioning the HF Radar Data Assembly Center from Scripps to IOOS and using HF radar to provide wave measurements at test sites. He also discussed an ongoing MOA with the Navy for glider collaboration and an upcoming workshop towards an implementation plan of the National Ocean Biodiversity Strategy. IRA funds will fully fund existing NOFOs for the Ocean Technology Transition Program and the Marine Biodiversity Observation Network for their entire term. IOOS is also working with NOS on coastal coupling applications in the NOAA Cloud community platform. C. Gouldman presented a funding timeline for the next year and noted that the year-long lag between the appropriations year and when work starts in the regions allows some time to prepare for different scenarios.

IOOS's grants portfolio in FY24 consisted of 21 existing awards, 44 new awards, and a total amount of \$171,977,786, more than double FY23, which was already significantly higher than previous years. Its business team is stretched thin with serious burnout risk. It has required a tremendous amount of effort to get BIL and IRA funds out. The IOOS regional line stayed static at \$42.5 million for FY23 and FY24. IOOS national funding also remained flat at \$7.5 million, with about a \$600,000 decrease in program implementation due to reprogramming and de-obligation assessments. External funds executed by the Program Office are down \$1.2 million in FY24 to a total of \$7.3 million. C. Gouldman reviewed the IRA funding breakdown and reviewed the complementary purposes of IRA versus BIL funds.

C. Gouldman thanked the AC for its recommendations. He discussed some of his takeaways from a recent meeting with PacIOOS, including its work on integrated sea level rise and wave run-up tools and community-based validation of forecasts. American Samoa has the highest relative rate of sea level rise in the U.S. due to seismically induced subsidence. There is a great urgency for tools to support planning processes and PacIOOS is helping to bring these products and services to these vulnerable communities. PacIOOS is also helping to support data management in a regional rebuilding partnership in the wake of the Lahaina fires in Maui.

Q&A

M. McCammon said NOAA's Office for Coastal Management is developing an RFP to expand the Regional Ocean Partnership Program and asked how this might affect the Regional Ocean Data Sharing Initiative (RODSI) funds that go to the regions. C. Gouldman said he wasn't sure but OCM is currently seeking comments on how this has been working.

E. Howlett asked for more information about the Hawaii fire data that was being collected. C. Gouldman said there are a lot of different entities collecting various kinds of data and PacIOOS is bringing it together in different layers.

NOS Update

Nicole LeBoeuf, NOS Assistant Administrator

N. LeBoeuf discussed recent NOS activities. She recognized the impressive work of the IOOS AC and acknowledged the service of the outgoing members, particularly Chair Rayder. The

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IOOS AC has generated 51 recommendations over the last six years. NOAA appreciates this effort and seriously considers each recommendation, sometimes even carrying them over to other parts of the agency. NOS's Strategic Plan was released last October and is in the midst of implementation. The plan is as forward-looking as it can be, but takes into account that the needs of the country will change over the next five years. The first ever National Ocean Biodiversity Strategy emphasizes the need for new approaches and technologies. N. LeBoeuf thanked Gabrielle Canonico from the IOOS Program Office for her leadership. She also thanked the IOOS AC for its advocacy and the resulting positive outcomes on the House mark for IOOS. NOS had to retool its programs in order to get the IRA and BIL funding out. The budget cycle is making it very difficult to retain good people across NOAA and NOS. Partnerships and external voices that can help course correct and guide the agency are more important than ever.

Q&A

E. Howlett asked about NOS'S techniques of addressing the retention and recruitment challenge. N. LeBoeuf said NOAA has a great brand and a great mission, which are helpful, but it is not making a graceful transition to a hybrid work environment. There is also a need to better communicate that ocean science is an area that can really make a difference to the future. The messaging for recruitment is not that dissimilar from getting Congress to understand NOAA's importance.

S. Graves asked what led to emphasizing the term "operational oceanography." C. Gouldman said it is already included in the ICOOS Act. N. LeBoeuf added that it is part of focusing the attention on key concepts.

D. Rudnick commented on the confusing nature of the recent budget proposals from the White House and Congress. N. LeBoeuf said one of the major downward pressures on NOAA has been the additive costs associated with capital expenditures NOAA has committed to, with many large costs coming due at the same time.

C. Edwards asked about the challenge of communicating the importance of the ocean. N. LeBoeuf responded that communicating cost avoidance is very difficult. She described some of NOS's efforts to raise awareness of the need for climate predictions and ensure critical facilities have the information they need.

R. Perry commented on the problems with NOAA's funding model and the challenges of managing asset-driven costs. The agency needs to restructure how it addresses ocean observations and reframe the management of its assets. N. LeBoeuf said NOAA having its Fiscal Responsibility Act (FRA) top line lifted would greatly improve its position. She added that reorganization would take five to seven years, and NOAA does not have that kind of time.

NOAA Update

Dr. Rick Spinrad, Under Secretary of Commerce for Oceans and Atmosphere & NOAA Administrator

R. Spinrad provided the update. He has spent a lot of time during his tenure as Administrator talking about the value of IOOS's observations. BIL and IRA funding has created many opportunities for on-the-ground applications of the use of observations for enhanced coastal resilience, habitat restoration, and more. NOAA anticipates asking IOOS AC in the next couple months to help make the arguments about the impacts from the BIL and IRA funds specific to ocean observations. NOAA still has a lot of work to do hiring people into the agency, even after bringing on 1,700 people last year. The new business administrative system has some defects that are being worked through. Burnout is also an issue. R. Spinrad hopes NOAA can sustain its momentum over the final year of this Administration, but it is still unclear what kind of transition will come after the elections. The agency will also face a major transition once BIL and IRA funding comes to an end. In June of 2023, FRA guidance was released and necessitated significant reductions in the budget request for a number of programs, including IOOS. IOOS's budget request was down 76 percent from FY24. There is some recovery identified in the House mark, but it remains to be seen what will happen. He recognized the effort of the IOOS Association for its messaging in Congress about the impacts of the budget. R. Spinrad would like to see IOOS's budget process elevated to the status of some of the bigger acquisition programs they have had success with in recent years, such as satellites, ships, and aircraft. Much of NOAA's recent work in these areas was made possible by BIL and IRA funds, but also because of the availability of strategic approaches. For the first time, NOAA has a facilities and infrastructure strategy, including a prioritized list of where it would put any new money that becomes available. With all of the challenges, there are also reasons to be hopeful on budget and out-year developments, given the advancements in cloud capabilities, AI, and uncrewed systems. Deep sea mining and mCDR also present interesting opportunities, and ocean observations will be an important part of each. The demand for more forecast products and services will drive a more formal approach towards operational requirements for IOOS. R. Spinrad will push for moving towards transforming NOAA's ocean observation portfolio into an acquisition program and will use some of the lessons learned from other major acquisition programs to design what that might look like.

Q&A

M. McCammon suggested NOAA find ways to do more with cheaper alternatives. R. Spinrad said that commercial data buys have to be a major component of what NOAA does. The challenge of this is the reliability and sustainability of the data stream and QA/QC.

B. Winokur supported the approach to acquisition, especially with respect to key performance parameters, milestones, and holding to a schedule. The criticality of discipline in the acquisition system is essential to gaining support from OMB and Congress.

D. Rudnick thanked R. Spinrad for thinking about ocean observations the same way as satellites. He stressed the need to figure out a way to include external partners in this effort.

R. Perry said NOAA will have to consolidate its internal ocean observing community and restructure it in order to deliver on the innovation, acquisition, and operations at scale. R. Spinrad agreed that efficient coordination makes sense, but he was not sure a structural or

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organizational change was needed. He cited other programs in NOAA that have done this, such as the corals program.

K. Yarincik said she was concerned about a possible reorganization of IOOS.

J. Virmani followed up on the multiple mentions of burnout among NOAA staff and asked what is being planned to retrain people to use new technologies and AI more effectively. R. Spinrad said the Climate-Ready Workforce involves training people to understand what earth system observations are and how they should be used. He added that NOAA is offloading some of its work on Federally Funded R&D Centers (FFRDCs) to ease some of the burnout.

M. McCammon asked how the IOOS AC can help with developing an acquisition program for ocean observations. R. Spinrad said NOAA has built acquisition programs before and there is a lot of experience available. It needs to explore templates for the kind of program that would work well for ocean observations.

PWG Recommendations Presentation and Response

D. Rudnick presented the PWG's three recommendations to enhance NOPP that were previously sent to NOAA and provided background for each. These recommendations were: (1) NOAA should provide leadership, through NOPP, for interagency collaboration and coordination to enhance national observing programs, meeting national priorities that require an interagency approach; (2) IOOS should work with NOPP leadership and appropriate sponsor agencies to develop a process that clearly identifies observing and sensing requirements for NOPP projects far in advance; and (3) NOAA and the IOOC should expand public-private partnerships, including working with philanthropic organizations, and assess ways to use innovative or alternate funding mechanisms other than BAAs to fund NOPP projects. B. Winokur said NOPP took a big hit in the FY25 budget and if that funding is not restored he expected that Recommendation 2 would be looked at skeptically by industry.

C. Gouldman presented the IOOS Program Office's response to the recommendations, which have not yet been officially cleared by NOAA. He thanked the AC for its recommendations on how best to leverage NOPP. The IOOS Office and other programs have been discussing the need for a broader ocean observing strategy across NOAA. The IOOS Office agrees with the recommendation on public-private partnerships and is keenly watching the progress of the Accelerator Program. It is currently finalizing the awards for this year, focusing on work that yields innovative approaches. The office is including the use of commercialization, development, and technology awards within those programmatic funds, which are a new mechanism within the grant structure. R. Spinrad said NOPP is primarily about predictive capabilities and products and services, but those require research and observations. NOAA needs to start focusing on coordinating and integrating operational products and services among the federal agencies as well. D. Rudnick said the AC sent these recommendations to IOOC and one of the drivers behind the first recommendation was to get all of the agencies to recommit to NOPP. He asked NOAA to reconnect with the other agencies and urge them to recommit. As these new technologies are developed, they will need a home. Knowing the requirements ahead of time will help industry to

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understand the value of NOPP. M. McCammon said the IOOS AC should review the current definition of "operational oceanography" to ensure it aligns with its intentions.

D. Costa presented IOOS AC's three marine life recommendations the AC sent to NOAA. These included: (1) Develop a national inventory of biological measurements routinely made across IOOS regions; (2) Identify core biological measurements and standards across the IOOS enterprise. Develop the capacity to ensure the development of a specific biological capability across the IOOS enterprise. IOOS should incorporate the GOOS framework for marine life observations to the extent possible; and (3) IOOS should fully implement the ATN (ARGOS and acoustic tracking systems) and ensure that key sentinel species are measured routinely. Implementation would include tracking data collected by all federal agencies.

C. Gouldman provided NOAA's response to the recommendations. The IOOS Office has enjoyed great collaboration through the IOOC via the BIO Task Team. IOOS Office staff plans to remain active in the efforts undertaken in this venture and staff will continue to encourage all IOOS funding recipients, including RAs, to track and apply the emerging standards and schemas. The IOOC has considered replicating this effort for other GOOS BioEco monitoring networks as resources become available. The IOOS Office acknowledges the needs specified in Recommendation 3 and has committed a permanent federal position to the coordinator role. It will continue pushing trends of data sharing, data wrangling, and innovating by driving it towards community practices, common data assembly, and delivery functions. The IOOS Office will continue to advance relationships with other federal agencies to identify and include marine species tracking data that are a priority to monitor with input from ATN stakeholders and the broader community. R. Spinrad added that there is a lot of work underway between NOS and NMFS with respect to coordinating common data standards.

M. McCammon provided an update on the Enterprise Excellence PWG. Draft recommendations were discussed yesterday, but resulted in a desire to reframe those recommendations. The PWG would like to continue working on these recommendations and potentially pass to the new Committee for action. C. Edwards noted these surveys occurred before the President's budget was released and before the IRA proposals were submitted. S. Graves said they plan to have a discussion with the incoming members as part of a transition. C. Gouldman raised the idea posed the day before about staggering the Chair and Vice-Chair roles, with the expectation that the Vice-Chair would become the Chair when the Chair rotates off.

IOOS Unfunded Requirements

Kristen Yarincik, Executive Director, IOOS Association

Becca Derex, Legislative Affairs Lead, IOOS Office

B. Derex presented a new survey on unfunded requirements across the RAs and provided background on why it was necessary. B. Derex and K. Yarincik will be starting a working group with several RA directors to come up with better internal records of the needs of RAs. They hope to balance the need for modernization with recapitalization of existing systems, and they intend to use the results of the survey to assist communication efforts with Congress, the Department of Commerce, OMB, and internally to make the case for funding increases. They aim to better

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understand the national status of the "health" of IOOS's observing systems, as well as create a list of unfunded requirements mapped to IOOS mission areas and an observing system recapitalization plan that are updated annually.

K. Yarincik provided further detail on each of the items and why they are needed. She said this is not an acquisition plan, but an assessment of the status of where the system is versus where they want to be. Being able to articulate what IOOS actually needs will have value on the Hill.

Q&A

J. Potts asked how infrastructure assessments are done, noting that having metrics tied to the system would greatly help with budget justifications. B. Derex said they want their standard of health to be about delivery to stakeholders. They intend to create profiles for three levels of facility needs directly related to the ability to deliver a product to stakeholders. This would still allow the regions to make internal decisions about their priorities, while translating well to NOAA budget formulation language. K. Yarincik said they need to talk with the RAs to further discuss how to approach this.

B. Winokur asked if this is an RA plan, an IOOS plan, or both. He cautioned against trying to do this on an annual basis because the approval process is cumbersome. He recommended updating the plan biennially and the unfunded requirements list annually. He also recommended not listing too many priorities and suggested grouping them in tiers. He said the list should be coordinated with the Technology, Planning, and Integration for Observation (TPIO) list of requirements.

S. Woll suggested asking what is driving the observation requirements. He asked if there is a list of where they originated. B. Derex said there is not one currently, and that is what this effort aims to accomplish. One document that does exist is based on infrastructure that was quickly developed to inform BIL, but does not include things like data management and modeling capabilities. C. Gouldman commented on the challenges of emerging technologies that do not yet have an operational marine product. It is not possible to build a requirement when the service it might provide is not yet defined. S. Woll said that from a private sector perspective, this helps map out what is needed and can help steer investments.

R. Perry agreed with comments that the team should get started on this without pinning everything down first, but expressed concern that the task further separates out the regions. She stressed the importance of a national tier. This should not become a winner/loser exercise among the regions.

J. Virmani noted that the Regional Priorities spreadsheet included what applies across all regions. She recommended sharing this with the new AC members along with the BIL version. M. McCammon said funding vulnerability should be factored into this assessment as well.

Public Comment

There was no public comment.

Public Meeting Adjourned

K. Arzayus adjourned the public meeting at 5:17 p.m.