![NOAA logo] **National Oceanic and Atmospheric Administration**
Science Council

NOAA SCIENCE COUNCIL MEETING
July 16th, 2024
10:30 AM - 12:00 PM ET
Google Meet

MEETING MINUTES
ATTENDEES

Executive	*Other Attendees*
Sarah Kapnick, Chair	Abigail Arnold, OAR
Miranda Bitting, Exec Sec	Tiffany Atkinson, OAR
Emily Nocito, Exec Sec	Chelsea Berg, OAR
	Maximillian Brown, NOS
Principal	Joseph Fillingham, OAR
Sean Corson, NOS	Katie Geddes, OAR
John Cortinas, OAR	Fiona Horsfall, OAR
David Detlor, NMFS (Alt)	Jim Jenkins, OAR
Douglas Howard, NESDIS	Eric Kihn, NESDIS
Randall TeBeest, OMAO	Michael Kruk, OAR
Monica Youngman, NWS	Tony LaVoi, OFA
	Victoria Luu, OAR
	Jessica Morgan, NESDIS
	Hanna Odahara, OAR
Advisory	Andrew Peck, OAR
Benjamin Hope, NLAC Chair	Rob Redmon, NESDIS
Frank Indiviglio, NOAA Chief Information Office	Isha Renta, OAR
Alison Krepp, Social Sciences Committee Co-Chair	Karen Sender, NMFS
Casey Stewart, SAB Executive Director	Debbie Sinmao, OFA
Kelly Goodwin, S&T Synergy Committee Vice Chair	Kenneth Vierra, OAR
Cynthia Decker, Scientific Integrity Officer	Meredith Wagner, NESDIS
Gretchen Spencer, RDEC Exec Sec	Marian Westley, NOS
	Natasha White, HDQ
	Melissa Yencho, NMFS

http://sciencecouncil.noaa.gov

APPROVAL OF MINUTES AND REVIEW OF ACTION ITEMS

Notify Exec Sec at science.coucil.execsec@noaa.gov within two weeks of the following meeting if any changes to the minutes are needed.

CHAIR ANNOUNCEMENTS:
- NOAA's Office of Space Commerce has recently pushed a LANTERN assignment for some significantly important roles for"Traffic Coordination System for Space." The LANTERN opportunity can be found at this link.
- Thank you all for your comments on the Solar Radiation Modification SoS Fact Sheet. It has been finalized and uploaded to the Science Council website.
- CSC-Climate Seminar Series
  - We are excited to announce the second year of our climate science education initiative in collaboration with the NOAA Cooperative Science Centers (CSCs).
  - We are now looking for volunteer seminar session presenters from all Line Offices to join the initiative. The volunteer NOAA subject matter experts (SMEs) will lead sessions at the Climate Seminar Series delivered to a cohort of students and faculty from across the CSCs. NOAA SMEs who would like to volunteer to lead session topics can sign up using this link and more information will be circulated via email.

MINUTES
- The June meeting minutes were approved.

ACTION ITEM REVIEW
- The Exec Sec reviewed current action items.

BRIEFINGS: Briefing materials are available in the 2024 Science Council Meetings folder on Google Drive.
- **AI NAO/NCAI Update:** Joseph Fillingham and Rob Redmon

Informational

Part 1: NOAA Center for AI FY2024 Update (Rob Redmon and Monica Youngman)

Rob Redmon is the Director of the NOAA Center for AI. NCAI leads cross-NOAA implementation of the NOAA AI Strategic Plan. As I look at our 3-year-old toddler, I wonder what the world will look like for her. What improvements will we make and what challenges will we address for the next generation? AI is a rapidly evolving and positively disruptive emerging technology. AI will infuse into almost every aspect of our professional and personal lives. Hundreds of NOAA PIs already use artificial intelligence in their research, so we need to guide it. AI is not a new thing; mathematically it evolved a long time ago and is just a type of modeling. The recent increase in observations from so many types of platforms as well as increases in computing power has led to an AI revolution. The NCAI is envisioned as a nexus of NOAA research and a technical hub supporting our NOAA AI Strategic Objectives through our AI Community of Practice. It will provide cross-LO value benefitting our communities and stakeholders. Our work is governed under the NOAA Science Council and is guided by our AI Executive Champion Dr. Michael Morgan, the Assistant Secretary of Commerce for Environmental Observation and Prediction.

Monica Youngman is the Chair and Ben Richards is the Co-Chair of the NOAA AI Executive Committee (NAIEC). We will cover 3 topics today as part of our yearly update to the Science Council: NAIEC Chair leadership transitions, NCAI annual update, and the draft AI NAO development. We wish to thank Jebb Stewart for his service as the outgoing Co-chair of the NAIEC. The NAIEC is here to bring all the line office perspectives together to help guide the NOAA Center for AI, the AI Working Group, and the Generative AI Working Group. The goal is to enable the use of AI to allow us to more fully meet our mission here at NOAA.

Status update on the NCAI: Our implementation vision is to have NCAI as the center of excellence/technical hub. Think of that as a very efficient grants management office, managing standards and outcomes, providing a library of expertise at NOAA, contract resources, AI-ready data standards, etc. We have completed the initial steps toward creating a library of human talent, training materials, data standards, and new partnerships. This is about coordinating the knowledge sharing about what NOAA is already doing. There are now over 1200 members in the NOAA AI Community of Practice, and we're looking to upgrade that with dynamic workspaces that will foster new partnerships and accelerate information exchange. Overall, we are looking to optimize scientific workflows that support decision support services as well as our administrative processes.

We are proposing several program development avenues to make all (or most of) of NOAA's data AI-ready for use by NOAA and by the private sector. We want to maximize the returns on our nation's billion-dollar investments into earth and ecosystem observations. Our programmatic home is under NESDIS and NCEI. Investments to date and some of our high-impact outcomes:

- NCAI Program Office
    - NCAI IOC to FOC: Continuing efforts supporting development and sustainment with new financial resources.
    - Cross-LO NCAI Deputy (3TM proposal memo), and increase NCAI Director to full time.
    - NOAA AI NAO in development: Briefed today by Joe Fillingham
- Engagement / Community of Practice
    - Provide a dynamic collaboration Workspace by resourcing NCAI's Slack proposal
- AI-Ready Data Standards
    - Provide a dynamic collaboration Workspace by resourcing NCAI's Slack proposal
- AI-Ready Data Capacity
    - Increase our AI/Analysis/Cloud readiness at scale.
- Training the Workforce
    - Encourage all AI use cases to develop computational notebooks. Provide 1-click access to Cloud w/data, code, notebooks.
- Advance AI Research
    - Develop a real Innovation fund to achieve operational efficiencies and retain the workforce. Create AI-ready data lakes for Observations to Prediction model development.
- Research to Applications
    - Build agility into NOAA's test beds and cloud engagement interface.

In 2021, we conducted a gap assessment by reaching out to about 100 people at NOAA. It highlighted the need to convert NOAA AI success stories into interactive learning journeys. This was followed up by a NAIEC roadblock survey. There are packages of information from these two initiatives if you want to learn more. In May 2023 we conducted our first live educational cloud event using NOAA cloud. Over 80 people attended from across line offices and disciplines. The results of this event have been published. We are not asking for any specific decisions today, but here are some actions leadership can take today: support maturing NCAI and its various proposals for development and sustainment, promote yearly LANTERN detail assignment as NCAI's deputy toward a future permanent position, and review the new AI NOAA Administrative Order. NCAI is authorized for up to $10 million and mandated by the National AI Initiative Act of 2021, but not yet appropriated. NCAI is currently operating on NESDIS management reserve and supplemental funds, showing value and impact across the NOAA mission space. NOAA's AI Workshop series is an example, as they usually have hundreds of attendees. AI-ready data standards is another example of a high-impact outcome. Needs: Now is the time to stabilize NCAI's future for Trustworthy AI as a service to NOAA's mission. This includes a deputy detail, sustained financial resources, and the NOAA Administrative Order. The number one fundamental need of the

community is a federated, searchable, accessible repository for AI training datasets. We also need modern tools for tracking AI projects so we can stay informed about projects across NOAA and coordinate information exchange.

Part 2: NAO 216-128: Artificial Intelligence in NOAA (Joseph Fillingham)

Joe is currently on a detail assignment as the special advisor to Dr. Michael Morgan. We are requesting that the Science Council please review the draft NAO on Artificial Intelligence in NOAA and provide comments and suggestions within 2 weeks. NCAI and NAIEC will adjudicate substantive comments and provide a final version to the Science Council for virtual approval.

Why an Artificial Intelligence NAO: NAOs are durable intra-agency directives that remain effective until superseded or canceled by appropriate action. NAOs cover substantive program matters and administrative management policies, procedures, requirements, and responsibilities applicable to two or more organizations within the agency. Due to the speed at which AI implementation is moving, it is critical to establish a governing structure for AI. NOAA AI strategy and policy and mandated through Executive Order 13859 and Section 5303 of the National AI Initiative Act of 2020 - Division E of the 2021 National Defense Authorization Act (NDAA). These direct the NOAA Administrator to implement a comprehensive program to improve the use of AI systems across the agency in support of the NOAA mission and to "establish a Center for Artificial Intelligence." Executive Orders 13960 and 14110 as well as OMB Memo M-24-10 are also applicable.

The purpose of this NAO is to provide high-level direction that guides procedures, decisions, and actions regarding AI management, coordination, and development throughout NOAA. Guidance on how this policy is to be implemented will be provided in procedural directives that address the full development lifecycle of all domains of NOAA AI development.

Current scope of the policy:

1. All NOAA Artificial Intelligence algorithm and application development and to the personnel and organizations that manage these algorithms, unless exempted by statutory or regulatory authority. Algorithm development requirements set forth in this NAO apply after a project advances beyond technology readiness level 4 (see readiness level definitions defined in NAO 216-105B: Policy on Research and Development Transitions).
2. AI directed towards scientific research and NOAA operations and not towards AI used to enhance simple administrative tasks, such as auto-complete that is integrated into common applications.
3. All scientific software that contains, relies upon, or enhances discovery using AI/ML, including but not limited to software procured by the Organization.
4. Applies to applications that are using generative AI in the creation of human readable text based on NOAA data and user requests and inputs.
5. This NAO applies to applications that are using generative AI in the creation, editing, or workflow of text, images, video, and code.

Key policy elements:

- Ethical Principles: All AI/ML systems used within NOAA must adhere to ethical principles, including transparency, fairness, accountability, and the protection of privacy and civil liberties.
- Trusted Data: AI/ML algorithm development is reliant on high-quality, reliable, and well-curated data to ensure accurate and unbiased outcomes.
- Collaboration and Efficiency: NOAA offices and divisions shall collaborate to share best practices, data, and lessons learned in AI implementation, ensuring efficient use of resources and avoiding duplication of efforts.

- Safety and Security: NOAA shall prioritize the safety and security of AI systems to protect them from malicious attacks, unauthorized access, or exploitation.

Again, the request of the Science Council is to review the draft AI NAO with this background information in mind. Following Science Council review, the NAO will be reviewed by the NOAA Executive Panel (NEP) and the NOAA Executive Committee (NEC). There will be a Workshop on Leveraging AI in Environmental Sciences September 16-20. It will be a hybrid meeting with in-person portions in up to three locations (Seattle, Boulder, and College Park most likely). The topic is heat resilience.

Discussion/Q&A

Tony LaVoi (Chief Data Officer): Very helpful presentation. (left off at 33:50) Last week we had the opportunity to meet with the Science Advisory Board through the Data Archiving and Access Requirement Working Group (DAARWG). During the two days we had a session on AI-ready data. One of the take-home messages was that a lot of what we're trying to do as an agency is really predicated on fundamental data management 101 practices. ex: metadata, access, quality, etc. In order to do all the bright shiny cool stuff with AI, we must pay attention to core data management processes. Tony will be sending out an email later today to let everyone know that the Data Management Handbook is going out for a 45-day comment period. The final handbook will be released as of October 1st with 5 metrics to track.

Sean Corson: I'm excited to see any type of initiative that can help us maintain the appropriate level of discipline with our data. Especially with the Chevron decision, we need to have our data house in order. Regarding the pilot projects for generative AI, will the lessons learned from these efforts be communicated back?

Monica Youngman: The Generative AI Working Group is working to collect those lessons learned about not just going through the approval process but also connecting people across NOAA who are doing similar things or using similar tools.

Frank Indiviglio: It's about the community part, not trying to reinvent the wheel. Let's see if we can cross-pollinate and work together to implement some of these AI tools.

Dr. Sarah Kapnick: The High Performance Computing (HPC) NAO will be coming out for Science Council review very soon.

- **Invitation to Combine NOAA's Emerging Technologies Workshop with the USGS/CIROH/AWI Water Observing Technology Forum:** Marian Westley

Directional

Marian Westley is the Co-chair of the Observing Systems Committee, one of the two committees under the NOAA Observing Systems Council (NOSC). We have been invited as our agency to co-lead the 2025 USGS Water Observing Technology Forum (WOTF). The USGS has relocated their Hydrological Instrumentation Facility to Tuscaloosa, AL. As part of this development they have funding to support two WOTFs, the first of which was in April 2024. Some of the organizers of the WOTF have attended past NOAA Emerging Technologies Workshops (ETWs) and came to Marian with the idea to combine the two events into the 2025 WOTF.

Marian attended the last WOTF in April, and there were several NOAA people there. Her team is on the planning committee for the 2025 WOTF. Do we want this to stand in as the next ETW for NOAA? The NOSC hosted the Emerging Technologies Workshops starting in 2016 and also occurring in 2017, 2019, and 2021. The goals were better understanding of NOAA's technology requirements and gaps, greater R2X success, increased external use of our vast data holdings, and improved collaboration with partners in government and private sector. The Science Council was heavily involved with standing up and running the 2021 Emerging Technologies Workshop, so there was a proposal to move the primary responsibility for the ETW from the NOSC to the Science Council. The Science Council was briefed on this proposal in January 2023.

The 2024 ETW was hosted by AWI and CIROH at the campus of the University of Alabama Tuscaloosa. The two themes were imagery as data and mobile monitoring systems. There was also a small industry showcase. Planning for the 2025 WOTF has already started. On behalf of NOAA, Marian Westley and Meredith Wagner are attending these planning meetings. Other organizers are USGS, CIROH, and ACT. They are still deciding on a theme, but Marian has suggested coastal observing for coastal hazards.

How would the Science Council like to engage? Should it continue to be just Marian and Meredith Wagner organizing on behalf of NOAA? We are happy to do that. If so, what would be the preferred mode and cadence of communication? Would you like to put people on the planning committee? Are there any thoughts on extending the relationship to 2026?

Discussion/Q&A

John Cortinas: I like the synergy of the two groups working together on this topic. We need to be careful that it's not just these two groups working together moving forward. The ETW will need to be separate at some point if their needs are different from the WOTF. I'm comfortable with allowing the NOSC to take the lead. It's not necessary to engage the Science Council at this time.

Marian Westley: Do we want to reserve the branding name ETW and have the next one in 2026? Then in 2025 we can skip the ETW and have the WOTF instead. Or we can keep the branding as a one-time combined ETW/WOTF because the theme is water.

John Cortinas: Like the AI group, we have workshops with a topic. We can think of the ETW like this as well. This year's theme is water, so we're combining it with the WOTF.

David Detlor: I used to be involved with the NOSC. I think it would be appropriate for any type of collaboration to be a one-off.

Marian Westley: I'm open to theme suggestions as well. There is a lot more to water observing than just coastal hazards.

Sean Corson: It's a great idea to partner with WOTF this year. I would like to follow up with Marian about having the NOSC continue to work on the ETW. We're balancing both physical and resource considerations at the NOSC.

Meredith Wagner: The NOSC is trying to hand over responsibility of planning the ETW to another body, at least on a rotating basis. I planned the first four, but the next one I'm not sure the NOSC will take. We are considering passing on the responsibility to the Science Council, but we're willing to continue the conversation.

Dr. Sarah Kapnick: It's welcome that Marian wants to take on this year's meeting, but we want to make it clear that the Science Council is not going to organize the ETW in the future.

Rob Redmon: I'm happy to continue conversations about coordination with the AI workshop.

Tony LaVoi: Same for the data workshop.

ANNOUNCEMENTS
- Next meeting: Tuesday, August 13th at 10:30 am ET

ACTION ITEMS
- Exec Sec will send out info on the Space Commerce LANTERN opportunity.
- Exec Sec will send out info on the climate science education volunteer opportunity.
- Exec Sec will send out a tasker for review of the draft AI NAO.