OO Exchange, September 21, 2026
Topical focus: Time-series data/observations
Facilitator: Amy Maas and James Poterma

Summary

Twenty-one attendees participated in the virtual session (36 individuals registered). The group first reviewed introductory information about the DCL process and resources, including a discussion about audience, and who respondents might be writing to/for. There were questions about the level of detail to include and what tone to use in responses provided.

- NSF, perhaps as high level as the Office of the Director, is convening and recommending members for a review panel. We do not know who those members are (and we may never know who they are).
- If speaking to non-specialists, you can lead them very far, if you give them an effective chain to follow. Make sure that your sentences link- the end of one connects to the next. Start from the broader part and then drill down to details as necessary. Include a problem statement, if you can, and include a period of time- a topic that everyone can relate to and a time-period and a quantitative amount. For example: “half of all the oxygen is produced by the ocean each year…”
- Sharing authentic experiences is important.

There were also questions about the NSF ocean-observing and what the existing portfolio is. CLIVAR recently shared a list.

The group then split into four breakout groups focused on key questions in the DCL:

- Q1: How should NSF's investments complement and/or differ from other national and international efforts; for example, the National Oceanic and Atmospheric Administration's (NOAA) ocean observation systems?
- Q3: What types of observations would best advance the national interest?
- Q5: Which elements in NSF's existing observational portfolio should be maintained or updated to fulfil the identified needs?
- Q8: How should NSF seek to balance the development of new ocean observing technologies with the collection of more data using established technologies?

Key takeaways from this OO Exchange included:

- **Goal of this DCL and collecting community input:** help **inform NSF to then make the informed decisions they need in order to sustain ocean observing investments.**
- **NSF and NOAA both conduct/support ocean observing, and they are complimentary, but they are and will continue to be different**. They measure different spatial and temporal components. **NOAA’s mission is about monitoring and prediction, it is more operational, and it is very economically focused. NSF has a more exploratory mission and is more about process studies and hypothesis-driven, frontier science.** NOAA also has a different attention to data gaps than NSF.
    - **NSF stated goal to achieve ‘transformative’ science. Time-series data is a critical part of the system, and unless NOAA is potentially taking existing programs over, then the U.S would be reducing its national scientific capacity.**

    - **NSF concentrates on fundamental research, which is complementary to the missions of other agencies and projects.** Fundamental research often provides the seeds for other national and international efforts and/or answers questions that arise from other programs.
    - **Coordination is critical**... Example: tropical pacific research leads to an understanding of ENSO, resulting in an observing array from another agency, which enables prediction of impacts worldwide. Other examples: OOI, OSNAP, GO-BGC, SOCCOM.
- **Ocean observing systems allow a variety of individuals to conduct independent research (when they might not be able to otherwise)**. For example, HOTS/BATS data allows for other people to conduct their own research based on data provided. This is then a **cost savings**, as those individuals don't need to go out and measure nitrate or other variables, as it's already available to them.
    - **Importance of long-term time series data to graduate students and early career scientists** (other agencies support this type of data collection, and/or ECS engagement, but not to the same degree as NSF and/or they more focus more on technical staff). A lot of students **build their education and careers on these time series data**.
- Important to focus on **science drivers**, the **different approaches different systems use to observe them, and how they all fit togethe**r. Also consider **complimentary platforms** that help individuals do their science…what are the scales and the temporal domains that are important to do the work you do?
    - Potential framing: I study X, these are the systems I use, this is the data I need, and this is important for X
- **Time series provides important context for research**. **New and innovative observations cannot be contextualized without the background information that time series provides**. Technologies also need to reflect methodologies. Innovation needs continuity in order to establish context, including AI models etc. Thus, continued, **long-term ocean observing measurements are critical to supporting and developing new technologies as well as "good" AI-driven data**.
    - **Need to maintain established technologies as a known, reliable baseline.** Responsible transition from one technology to another is critical for long time series. New observing techniques need to be developed, but these new technologies can only be interpreted with an understanding of how they differ from and/or reflect older methods. **NSF should take a leadership role in developing new technologies and integrating these into established observing strategies.** Example: carbon cycling: Currently can measure pH and pCO2, need reliable field-tested sensors for DIC and total alkalinity. Particle imaging for phytoplankton, zooplankton, marine snow, … AI can be used here to enhance imaging techniques and processing.
        - Many applications for AI in relation to data QC, processing and identifying patterns and relationships.
- **Persistent observing (detecting change) is critical to "national interest":**
    - Coordinated coastal observing (food security, natural hazards)
    - Benthic/seafloor observations and research (deep sea mining)
    - Open ocean surface conditions (i.e. weather) for maritime safety and commerce (transportation, shipping).

- Coastal environmental conditions (relevance to aquaculture, commercial fishing community, shellfish).