Consortium for Ocean Leadership

Update on the OOI Synthesis & Education (OOISE) Project

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OOI Facilities Board Meeting

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Project Overview

- Data Review
- Data “Nuggets” for Education
- Education Workshop
- Compilation of metrics of community engagement success in OOI 1.0
Data Review

- **Web portal established:**
  [https://datareview.marine.rutgers.edu/](https://datareview.marine.rutgers.edu/)

- **Approach:**
  - Instrument-stream deployment reviews: “system” or “operations” checks to make sure the data that is available is being delivered properly through the system, and that the various streams match up—or, when they don’t, that we have an understanding as to why
  - Automated plus human-in-the-loop; instrument-stream
  - Review notes entered on an instrument report page to be used by OOI 2.0 and other uses (requested link from OOI website “Community Tools”)
  - Monthly reports sent to OOI 2.0 for their consideration

- **Progress status:** ~30% complete
Data “Nuggets”

- Identify data of reasonably good quality—or in some cases that demonstrate well a measurement quality issue (e.g., biofouling)
- Describe what the data show and cross-reference that to undergraduate introductory course curriculum
- 15 “nuggets’ identified to date; curriculum cross-referencing work this summer
- Note: Education workshop participants felt this would be very helpful for educators
Education Workshop

- Held April 26-28, 2019
- Purpose to discuss undergraduate educator experiences using OOI in the classroom: successes and challenges, identify case studies
- Participants:
  - Cheryl Greengrove, UW Takoma
  - Sage Lichtenwalner, Rutgers University
  - Hilary Palevsky, Wellesley College
  - Anna Pfeiffer-Herbert, Stockton University
  - Silke Severmann, Rutgers University
  - Dax Soule, CUNY Queens College
  - Also COL: Stephanie Murphy, Leslie Smith, Kristen Yarincik
Education Workshop

**Workshop Outcome(s):**

- A manuscript to be submitted to *Oceanography* highlighting OOI as a resource for using data in the undergraduate classroom, including case studies for using data in course formats from introductory level lectures through independent research projects.

- There are success stories for using OOI data in the classroom, however, there are significant barriers for expanding usership outside of educators with direct and deep knowledge of OOI data (i.e., through personal research). The group identified recommendations for improving educators’ ability to use OOI data in teaching (see next slide).
Major barrier: Identifying, downloading (reliability), and quality controlling data are too time consuming for educational use

- Professors don’t have time (& in some cases expertise) to hunt through, QA/QC & process raw data, as well as build exercises for their students; students don’t have enough time within class to download or access current data & do exercises

Benefit of implementing educator recommendations*:

- Making the data portal more accessible for education will also help scientists whose research/application needs do not require accessing raw data to do their own quality control.

*The group recognized that implementing their recommendations will likely require additional financial and personnel resources.
1) **Data Delivery and QA/QC:**

- Need an easy way for an educator/researcher to determine a data set’s value before committing time to download, review and build curriculum around the data.

- Consider moving OOI data into the cloud with associated computational capacity to mitigate current inefficiencies → OOI data delivery currently relies on a pre-cloud cyberinfrastructure that generates large unique data files for download from user requests through a non-standard interface, resulting in long and unreliable download and requiring local computing capacity for the user. Also results in data sets that are functionally unique making reproducibility difficult.

- Provide curated datasets (version controlled & regularly updated) → datasets packaged to meet common oceanographic needs and to enable meaningful time series analysis, for example, all sensors of a particular point on a given mooring (e.g., all CTDs on a flanking mooring) or all sensors on a given profiler, and high level looks (hourly or daily data versus every second).

- QA/QC must be performed at OOI level to lift barrier to use → a lot of the data that are fundamental to what we teach in intro classes are not at high enough quality (require too much work and expertise = missed opportunities). Can provide these data streams in addition to raw; need data that aren’t just flagged but fixed and improved.
2) Support:

- Need responsive help desk → Even for an independent study, students need to be guided by someone who has already mastered the interface. Some professors will be able to provide this deep mastery of OOI data, but not most.

- Create a mechanism through which educators can directly engage with the OOI or with each other to collaborate on widgets, tools, and lesson plans → centralizing role(s) of education developer or community connector is more cost-effective than funding several external proposals.

3) Other:

- Develop ‘second generation’ widgets → the widgets available on the data explorations are good, but better to have widgets that allow for zooming and plotting and that pull or are regularly updated with current data.
1.0 Community Engagement Metrics

- Collect further data to report on success of OOI 1.0 community engagement activities:
  - Publications analysis
  - Follow up surveys with workshop participants (in particular data training)
  - Assessment of relative success of each type of engagement activity to inform future efforts
Questions?