OBSIC Operations Subcommittee
Fall Meeting
Oct 31 – Nov 1, 2024
University of Washington, 309 Madrona Hall

Attendees: Wenyuan Fan (UCSD), Jim Gaherty (NAU, chair), Helen Janiszewski (UH), Susan Schwartz (UCSC), Brandon Shuck (LSU), John Collins (WHOI), Andrew Barclay (WHOI), Gail Christeson (NSF)
Remote: Anne Becel (LDEO, Th 9-9:30am, 12pm+; Fr 9am+); Matt Wei (URI, 9am-2pm+)
zoom link:
https://nau.zoom.us/j/85809636444?pwd=Db2AvpykGZvuErEkMVZbHZH9njQbvt.1

Meeting Summary: The OBSIC OS, including WHOI facility and NSF representatives, met for a 1.5 day meeting at the University of Washington. The meeting agenda consisted of: (1) program updates from NSF and the OBSIC facility, including operations and the data metric hub; (2) prominent new business, including future facility developments to support the active-source community, and mechanisms to work within MSROC to improve community engagement; (3) an informational session on two prominent new initiatives from the Cascadia region that overlap with OBSIC activities in seafloor instrumentation; and (4) open discussion of OS topics articulated in the committee terms of reference. The bulk of the meeting included participation of the facility as well as NSF. The meeting closed with a short committee-only discussion.

Overall, the committee agrees that the OBSIC facility has been a productive and effective resource for the community, with significant advances in the last year on several fronts. Most importantly, the facility successfully supported a large number of OBS experiments in the field. In addition, the facility made significant progress in developing the new MSRI-funded broadband instruments, as well as updating key components (sensors and dataloggers) across the existing broadband fleet. The broadband OBS fleet is now significantly modernized, and the number of available instruments continues to grow. The data metrics hub is now fully operational, continues to be improved (in part based on user feedback) and expanded significantly, and additional data products and data metrics are in the planning stage. All of these activities are critical for ongoing and future success of OBSIC. The committee engaged in detailed discussion of advances and priorities (as detailed in the minutes below), and is supportive of continuation of this suite of activities.

For new business, the committee had an extensive discussion on ideas for advancing OBSIC's goal of entirely replacing the pool of dedicated short-period instruments for active-source experiments. The committee previously developed a white paper articulating this need, but a resulting MSRI proposal was declined, and funding through this mechanism seems unlikely. A number of ideas were considered as a path forward, with enthusiasm for obtaining and testing the capabilities of specific off-the-shelf instruments for academic-style active-source imaging

experiments. In addition, the committee is working with MSROC on possible mechanisms for improved community outreach, given the funding restrictions on workshops and similar initiatives from NSF.

Agenda
Thursday, 31 October
Welcome, Introductions, Meeting Overview, Notes/Minutes (Gaherty)

NSF update (Gail Christeson, NSF)

- OCE decadal report to be released in early 2025
- GEO success rates down on average and in all individual divisions (42% -> 36% from 2023 -2024); due to budget cuts
- 3 core panels per year, plus 1 P4Climate
- ~10 significant field proposals funded per year
- Ship scheduling reminder – 18+ months lead time for global ships
    - heavy pressure on larger ships due to pandemic backlog, delay in delivery of regional class vessels
- Langseth- potential to be extended, 27-28 regional plan in development

Update on WHOI OBSIC facility activities (Collins)

- Review of OBSIC Cruises from 11/2023 through 6/2024 details are covered in June 2024 meeting summary
- Expeditions
    - June 2024 recovered Hooft Galapagos instruments- 53 deployed, 49 recovered. Likely crevice corrosion responsible for non-recovery (three ARRA design; one new design). Redesign process underway. Data quality looks high
    - Sept 2024- recovered Wilcock Axial Seamount Year 2- 14 OBS deployed, 14 recovered. Also recovered BBOBS that was not recovered on previous years deployment, using Jason. This recovery will allow them to see the failure mechanism, which is likely the same as Galapagos.
    - Upcoming deployment cruise to Cape Verde (Warren) in late November 2024- 20 SPOBS
- Data Submissions Completed
    - Blake Plateau (Van Avendonk), Axial Seamount (Wilcock), and Galapagos (Hooft)
- Instrument Requests
    - 2 new short-period requests since June 2024; total of 6 for the year to date
    - 2 new BB requests since June 2024; total of 7 for the year to date
- Upgrades to OBS Fleet
    - 6 Nanometrics T-360 OBS and 6 Nanometrics 120 Horizon ordered and expected delivery in mid-November 2024; 15 Nanometrics Pegasus Data-Loggers; 15 DAS housings and 15 Battery Housing; 1 Abalone frame etc.
- Rapid response fleet
    - 10 Sercel MicrOBS instruments available; mock test completed in April 24; ready for a response event if needed
- Participation in FDSN OBS Data Standards activities

    - Active participation from France, Germany, Portugal, China, and USA
    - AGU abstract, and more information on github
- Questions and discussion on activities overview
    - Nice table of all assembled dataset. OBSIC will add this information to webpage to better advertise the availability of these data.
    - Improve instrument availability information. Both number of various types, and tentative scheduling.
    - Useful discussion of using APGs. Cost to add would be $86k for A-0-A, and $26k for standard APG. The relatively short duration of OBS deployment makes it unclear if A-0-A is worth the extra cost and will result in quality data (likely depends on plate motion rates, coupling, etc.). Current mechanism would be additional line item on the informational budget, and NSF and reviewers can choose to fund.

Update on OBSIC Data products and tools (Barclay)

- Implementing tilt and compliance analysis for each station
    - Tilt first in all high-coherence bands, using the maximum horizontal orientation
    - compliance in depth-dependent frequency band (and high coherence)
    - provides angle and direction of tilt for each day, and a compliance transfer function
    - Committee comment: it would be useful for OBSIC to develop a Github page to more widely distribute codes that would be useful for the community. Examples include the implemented tilt compliance codes, data quality metrics algorithms, etc.
- Implementing drift correction on problem stations
    - Compute alternative drift correction for instruments with no GPS-based drift correction applied (generally recovered with dead battery so no final time stamp)
    - Best mechanism is to determine instrument drift using ambient-noise cross correlations with a station that has good timing
    - Add in mechanism to clearly label data that lacks a good drift correction
- Slab testing:
    - Continued improvement of slab testing procedures (presented at WHOI last fall)
    - expanded capacity (up to 8 seismometers and 11 DPG at a time)
    - Allows OBSIC to turn around instruments much more quickly – 80% through testing of the 63 Galapagos instruments in only 2 months since recovery.

New Business

Update and continued discussion of active-source fleet refurbishment (Collins, Gaherty)

- Motivation: current short period fleet is now 25 years old, with limited (<30) instruments available directly from WHOI OBSIC, and an additional (<60) instruments available via subaward from UCSD. This instrument mix is very limiting for PIs, and is costly to maintain and operate. A wholesale upgrade to modern active-source instrumentation would be of major benefit to the community.
- Option 1 – OTIC proposal in Feb to develop 2 options: (1) a MEMS-based sensor (no leveling, but questionable lower frequency response (below 6Hz)); (2) a tradition sensor that would need leveling capability

- Option 2 – buy Sercel MicrOBS (100 at 2.5M Euros, 200 at 4.8M Euros). OBSIC would need to test a few in for an active-source data collection prior to pursuing this plan, perhaps in Fall 2025 on Shuck Atlantic expedition.
- An in-between option is to start to acquire Sercel's – MGG could fund ~25 at a time? This scenario could help keep current fleet alive and systematically move towards a more capable system.
- Any new fleet would require a fleet management system that will require significant up front cost.
- However, modern rechargeable power systems combined with housing the new fleet on the Langseth (or replacement) will significantly reduce operational cost (no shipping, tech support, battery fees)
- The committee expressed support for further exploring options involving Sercel instrumentation, and recommended that WHOI proceed with evaluating these instruments.
- In any scenario, major funding would likely need to wait until there is a clear path for a Langseth replacement

MSROC report: pre-AGU meeting plans, webinars and workshops, liaison rotation (Janiszewski)

- pre-AGU meeting will focus on international science and facilities
    - Presentations on recent experiments on Blake Plateau and Galapagos
    - Will include several European and Japanese participants
- MSROC received 22 letters of interest for the next Langseth regional plan, many with OBS needs
- Clear desire to improve training in marine seismology and building the community. What is the best mechanism?
    - Broad agreement within MSROC and OBSIC OS for organized series of webinars – training, science, other topics
    - Also broad agreement in desire for community workshop, but clear that is difficult with NSF
    - MSROC will begin moving forward on an organized webinar series, but first needs to more specifically identify leaders and mechanisms
    - The committee discussed models to add on to SSA and/or next EarthScope? IUGG in Portugal? Bring in more international participation? No consensus reached.

Upcoming Experiment Schedule (Collins)

- Field schedule for next year is busy. Samoa (Shawn Wei) recovery currently scheduled too late to confidently expect batteries to be operational (20 mo post deployment), ideally can be moved up.
- Abers and Wiens broadband experiments are ship limited, currently going in 2026 unless something changes
- Shuck active-source experiment is the only new funded experiment, and backlog on broadband pool is lessening.

Presentation on COSZO and CRESCENT initiatives (Wilcock, Tobin)

- COSZO: Cascadia Offshore Subduction Zone Observatory is an NSF MRI project to upgrade existing Ocean Observatories Initiative (OOI) cable with geophysical instrumentation

- Focuses on upgrading and adding instruments to 4 nodes on southern (slope/shelf) cable
- Instruments include broadband and strong-motion (accelerometer) seismic, differential pressure gauges (DPG), high-frequency hydrophone,and absolute pressure gauges (both standard and self-calibrating (A-0-A)
- Project requires significant re-engineering of junction boxes, procurement of new instrumentation
- Project includes significant outreach, including numerous REUs (research experiences for undergraduates) and other student activities
- Currently working to simplify data streams from the instruments – currently some go to the OOI data center, while others go to the EarthScope DMC. Ideally all of the data will ultimately go to common data center(s).
- Duration is 4 years, and target is that the instrumentation will be installed and delivering data sometime in 2027.
- COSZO receives community input through a four-person advisory committee (Anne Sheehan, Helen Janiszewski, Matt Wei, Valerie Sahakian). Planning to add one additional member specifically with earthquake early-warning experience.
- CRESCENT: Cascadia Region Earthquake Science Center is an NSF Hazards center focused on earthquake hazards in the Cascadia region.
- CRESCENT includes an Offshore Observations special-interest group (SIG) and is looking for broad participation.
- SIG has no budget, so mostly coordination activities
- first SIG task is talking to SZ4D to coordinate

Friday, 1 October

Terms of Reference Topics: updates/action needed? (Gaherty, all)

Equipment usage guidelines

Facility performance assessment: improved feedback needed?

- Action Item- John will summarize cruise report assessments and provide this to OBSIC OS
- Action Item- John will provide an instrument usage table to the website

Facility health/effectiveness

Community Engagement

- Action Item - Jim will check into process for SSA topical meeting proposals.

Capacity building/training

- loss of one tech – high cost-of-living on Cape Cod is a key limitation. OBSIC will be searching shortly
- OBSIC is having continued success in use of co-op students from Cape Technical High School

Coordination with MSROC and marine community

- Generally good. No immediate need for an ex-officio rep from EarthScope. John will monitor data submission issues and bring us in as needed

Community initiative support

- Action item- Jim will reach out to SZ4D leadership to set up a web meeting with OBSIC OS and SZ4D leadership and operations committee to talk about mutual engagement

Executive session

- The OS encourages OBSIC to ensure clear communication with PIs about potential implications of assignment of subaward instruments to their experiments
- The OS would like to have future conversations on the development of deep-water capability short period instruments (or just housing) to cover deep trenches

end of meeting