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Hello Ocean Explorers!



It has been an exciting time for the OECI, beginning with the April 2022 NOAA & OECI Celebration in Rhode Island. This event brought together many of our NOAA and OECI collaborators, partners, and supporters to tour the Okeanos Explorer at its home port before it embarked on the 2022 exploration season and to the URI Narragansett Bay Campus to hear remarks and see presentations, including those from the Bridge to Ocean Exploration

undergraduate students. It was amazing to see so many of us in one place and gratifying to see the interest in and support for ocean exploration.

There were some new faces in the crowd as well, including Deb Smith, who has officially joined OECI as the Data Governance Manager and has already become a critical component of the OECI team. Everyone has welcomed Deb and she has been on a fast-track to evaluate our data management strengths and challenges from data generation to ultimate archiving. This week will also see the arrival of OECI Tuskegee University interns. We are grateful to the USM team for shepherding this program and so excited to meet the interns who will be joining OECI partner institutions for the summer.

The exploration season is well underway and has already yielded some fantastic results. The UNH *DriX* uncrewed surface vessel has been fully integrated with OETs E/V *Nautilus* and the *Nautilus* and *DriX* teams have gained valuable experience with the operation of the vehicle. *DriX* was joined recently by WHOI's *Mesobot* and *NUI* for a Technology Demonstration cruise that produced some clear advances for our OECI technology goals, including cooperative exploration by autonomous systems and multi-vehicle operations including deployments of all three uncrewed systems at once with *Nautilus* conducting independent operations. These experiences will pay huge dividends for the future efficiency of ocean exploration activities.

Congratulations to all the teams involved!

Best, Adam



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EV Nautilus Update: Technology Integration Success!

The OECI Year 3 Technology Integration Challenge just wrapped up and produced new and exciting progress towards true



autonomous multi-vehicle operations. Over the course of 16 days at sea, participants from OET, UNH, and WHOI collaborated to demonstrate the future potential of multiple autonomous vehicles working together. In ocean science this sort of multivehicle operation is rare, particularly because it takes dedicated engineering time at sea and a long term shared vision between institutions. Huge thanks to NOAA Ocean Exploration for sharing this vision and committing funds to support this effort.

The four platforms that were operated:

- E/V Nautilus acting as mothership and multibeam mapper
- Autonomous Surface Vessel (ASV) *DriX* acting as a surface/subsea communications hub, and also mapping and conducting water column profiling
- Autonomous Underwater Vehicle (AUV) *Mesobot* exploring the midwater while collection eDNA samples
- Hybrid AUV *Nereid Under Ice (NUI)* working as both an AUV and an ROV exploring the seabed and collection samples.

By the end of the expedition, communications protocols had been developed that allowed all three vehicles to be simultaneously operated through *DriX* to *Nautilus*. Beyond just an engineering demo, this multi-vehicle concept was employed to explore a target of interest that highlighted a new type of sampling- some are calling this "verified directed sampling". With four vehicles simultaneously exploring, position information and in situ conditions were relayed from multiple platforms at different places in the water column allowing for unprecedented insight into where the vehicles were in relation to a water column target. This insight allowed for micro adjustments to *Mesobot*'s depth based on the ability to see both the vehicle and the targeted layer from multiple perspectives. Team members were then able to command the vehicle to adjust its depth by just a meter or two to ensure that a sample was collected precisely where the scientist intended. Pretty cool, right!?

If you'd like to learn more, check outthis video produced by the Ocean Exploration Trust (OET), which gives an overview of our multi-vehicle operation. Also, be sure to follow along with all 2022 exploration activities, including many more OECIsupported initiatives, via the Nautilus Live website (https://nautiluslive.org/).

OECI Student Updates

Undergraduate students engaged in the various OECI-supported intern and part time work experience programs have been busy these last several months!

The **2022 Ocean Exploration Club** field trip took place April 6 – 10, 2022. Tuskegee University students and faculty visited a variety of USM facilities and participated in activities to explore the field of ocean exploration, science, and research. During the field trip, students and faculty were able to participate in outdoor learning at USM's Marine Education Center (MEC), interact and network with graduate students and professionals, visit the Marine Research Center and R/V *Point Sur* in Gulfport, MS, go behind the scenes at the Mississippi Aquarium, and participate in a variety of sampling techniques on the R/V *Jim Franks* and Cat Island.

The tremendous success of the program resulted from work across institutions throughout a pandemic. This was the first in-person interaction at USM, and all participated with great enthusiasm and with excitement of collaborating on field trips into the future!

The **2022 Ocean Explorers internship program** kicked off with a great start through orientation week. The paid internship program, coordinated by USM's MEC, engages students from Tuskegee University in the field of ocean exploration and research. This summer, five undergraduate students from Tuskegee University will be interning with research mentors across OECI partners: one intern placed at the University of Rhode Island, two interns placed at Woods Hole Oceanographic Institution, one intern placed at the University of New Hampshire, and one intern placed with the Ocean Exploration Trust at-sea and the University of Southern Mississippi for the land-based portion of the internship. The program will conclude August 5th, 2022, with the Ocean Explorers Symposium and Celebration (save the date!).



Meanwhile, **Bridge to Ocean Exploration (BOE)** undergraduate students from the New England Institute of Technology (NEIT), have been busy wrapping up their efforts on OECI-focused projects centered around data management, machine learning, and/or digital media asset design. In addition to presenting to the April 2022 NOAA/OECI event participants, the students are now working on final summary reports to outline project outcomes and provide feedback on the BOE program. This feedback will be important as a second cohort of BOE students will be recruited in Year 4 of the OECI.

In addition to their collaborative project efforts with members of the OECI and URI Inner Space Center, the students also went on field trips in May 2022 to tour WHOI and UNH ocean exploration facilities and connect with engineers, grad students, and other individuals engaged in ocean science activities at both institutions. It was a very informative set of trips, as the students took a deep dive into learning about OECIpartner activities. They were able to see human occupied submersible (HOV), *Alvin*, visit WHOI's new AVAST facilities, tour the VR lab at UNH, and more. Many thanks to all involved who made the 2-day series of trips the success that they were!



The **NOAA Ocean Exploration Explorer-in-Training Program** is also excited to be kicking of its 2022 internship activities, with eight seafloor mapping interns and one education intern working with the office this year. In addition, a NOAA Lapenta Program intern and a Hollings Scholar will be welcomed to the team for their summer internships.

On May 19, 2022, USM/TU Ocean Explorers, OECI/NEIT Bridge to Ocean Exploration

students, as well as current/past NOAA Ocean Exploration Explorer-in-Training interns, and other interested students, took part in the first **OECI Blue Economy Career Awareness Fair**. Hosting the event virtually through Zoom allowed broad participation from across the U.S. Students heard from different representatives from Blue Economy sectors such as ports and harbors, offshore wind, recreational fishing, and defense, and were able to ask targeted questions during timed "speed dating" sessions in breakout rooms. Overall, engaging conversation was had and participants left the event with a better understanding of the diverse career opportunities available in the Blue Economy. In feedback survey responses, participants expressed their appreciation for the "great networking opportunity" and hearing from the different sector representatives. 90% of survey respondents indicated they would participate in future Blue Economy Career fairs- the OECI looks forward to hosting another virtual program in 2023!

Welcome Deb Smith, OECI's New Data Manager!



Deb Smith joined the OECI as its new Data Governance Manager in April 2022. She comes to the OECI from Schmidt Ocean Institute where she had been working as marine tech on the R/V *Falkor* since 2006. Prior to that she was a Hydrographer at Leidos/SAIC. Deb has great knowledge of ocean science data and wonderful ideas about the potential to build upon the data management foundation that OECI has built.

The OECI team is really excited to have Deb onboard! Don't be surprised if Deb reaches out to you in the near future to learn more about your

specific activities and to discuss how OECI can simplify and improve (or learn from) your current data management practices.

Opportunities

NOAA Ocean Exploration - Call for Input - U.S. West Coast and Alaska

As part of its community-driven exploration model, NOAA Ocean Exploration invites exploration recommendations for mapping, remotely operated vehicle (ROV), and autonomous underwater vehicle (AUV) operations for Fiscal Years (FY) 2023 and 2024 on NOAA Ship Okeanos Explorer off the U.S. West Coast and Alaska. These expeditions will contribute to the interagency EXpanding Pacific Research and Exploration of Submerged Systems (EXPRESS) and Seascape Alaska campaigns. These



regional campaigns and expeditions will also contribute cross-agency objectives highlighted in the National Ocean Mapping, Exploration, and Characterization (NOMEC)

strategy.

Following consideration of all submissions, NOAA Ocean Exploration will design the FY23 and FY24 field seasons to address priorities identified in West Coast and Alaskan waters. Please note that a submission does not guarantee that NOAA Ocean Exploration will be able to act on each recommendation. All recommendations will be balanced with other NOAA Ocean Exploration and community priorities. Recommendations will be distributed across the expedition schedule and will be refined during collaborative planning conference calls.

Recommendations are to be submitted through NOAA Ocean Exploration's SeaSketch portal. SeaSketch is a web-based GIS portal that shows our general operating areas, previous surveys, managed areas, and regional maritime boundaries. For help developing and submitting your recommendations, review the instructions for using SeaSketch as well as Okeanos Explorer's operational capabilities (pdf).

Due dates for exploration recommendations:

- U.S. West Coast priority area: Tuesday, July 1, 2022
- Alaska priority area: August 1, 2022

If you need help with your submission, contact Caitlin Adams at caitlin.adams@noaa.gov. If you have specific questions about an expedition, contact Kimberly Galvez, Expedition Manager, at kimberly.galvez@noaa.gov.

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