RUTGERS
School of Environmental and Biological Sciences

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Dear Dr. Halverson:

I am writing to invite you to participate in an exciting workshop, May 20-22, 2016 at Rutgers University, focused on the integration of Ocean Observing Initiative (OOI) data into undergraduate teaching of introductory oceanography themes and concepts. You are being targeted for this project based on your interest in using online data and your exemplary work in undergraduate teaching. *We are inviting you to help us evaluate a collection of new OOI education data activities developed by Rutgers University faculty and education staff.* We have developed a series of five 20-minute activities that utilized OOI data and/or OOI Education & Public Engagement Tools to augment teaching of Oceanography concepts. Workshop participants will explore ways to effectively teach with data, share effective practices and hopefully expand their understanding of effective pedagogy, and brainstorm ideas for how to integrate OOI data into Introduction to Oceanography courses.

We have chosen to focus on Primary Productivity, as the overarching topic area we will be focusing our attention. Dr. Al Trujillo, author of "Essentials of Oceanography" Trujillo & Thurman, will be assisting and participating in the workshop. You can find additional information about the OOI and our education goals in the attached document.

During the workshop, we are asking that each participating professor provide detailed feedback on the developed OOI activities, including their perceived utility and effectiveness for the classroom. In addition, each professor will be invited to teach the OOI activities in their class and implement a short student assessment to help us collect some initial information on the students' impression of the OOI activities.

Each Professor will receive a $1000 stipend to support their participation in the pilot, which includes evaluation of OOI activities. In addition, travel, meal and hotel accommodation expenses will also be covered by our grant, separate from the stipend.

If you are interested in participating, please fill out the application here at (http://tinyurl.com/gnxsntu) by March 29, 2016. All information in the application will be kept confidential and is strictly for planning purposes of the pilot. We will contact you upon receipt of the application to discuss your participation in the workshop and project.

Thank you for your interest. We are excited to work with you and get your feedback.

Best,

Janice McDonnell

Scott Glenn

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Summary of Expectations of Participants

Prior to the Workshop
Professors will:

- Prepare a concept map related to biological productivity using an online OOI concept-mapping tool.
- Review the OOI website and provide a written response to a set of questions provided by the OOI team. Questions will be on the general usability of the OOI site and your opinions as to its use for teaching and learning.
- Submit an example worksheet/lesson on how you teach biological productivity.

During Workshop
Professors will:

- Participate in reviewing sample OOI activities.
- Make suggestions for revisions.

Post Workshop
Professors will:

- Keep notes on the implementation of the OOI activities in terms of what students are struggling with, what they like, how they are interacting with the interface, etc. We will provide a template and a set of guiding questions.
- Participate in interviews with project staff (going through the OOI activities step by step and providing feedback).

Professors will be invited to pilot at least two of the five OOI activities that are appropriate for laboratory or classroom settings. Examples of OOI activities include:

- **Primary Productivity *Invitation* Concept Map**: Students develop a concept map to elicit their prior knowledge and experience with "primary productivity."
- **Primary Productivity *Exploration* Data Activity:** Students conduct an open-ended exploration of primary productivity OOI data from a specific Array across various time scales to explore the data in ways that interest them.
- **Productivity in Polar or Temperate Latitudes *Concept Invention* Data Activity:** Students use OOI data across time to demonstrate the concept of productivity in each region. Students look at: Pioneer & Endurance Arrays for Temperate Oceans; Argentine Basin, Southern Ocean, Irminger Sea, and Station Papa for Polar Oceans.
- **Comparing Regional Productivity *Application* Data Activity:** Students explore primary productivity OOI data across time between different combination of Arrays (north vs. south hemisphere, Atlantic vs. Pacific, etc.) to draw conclusions about regional differences and similarities in productivity.
- **Primary Productivity *Reflection* Concept Map:** Students revise their original concept map to reflect their gained knowledge and experience with "primary productivity."

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About the OOI Education and Public Engagement Program (OOI EPE)
The Ocean Observatories Initiative (OOI) is designed to transform the way ocean science is conducted, and will provide a rich opportunity to reshape ocean science education as well.

The OOI program is designing, deploying and operating a large array of transformative research platforms and sensors. These sensors collect datasets necessary to understand the complex processes and challenges facing today's changing ocean. As a whole, the OOI will provide ocean scientists with an invaluable resource to conduct cutting-edge and cost-effective science. But most importantly, the OOI will provide abundant research experiences for the next generation of ocean scientists and their students, who will hopefully enter the ocean science workforce themselves.

The data and science advanced by the OOI presents a ripe opportunity to rethink how data from the ocean is used in educational settings. Recent advances in web-based education have led to the development of novel on-line instructional platforms. In addition, tools and programs for visualizing data have become widely available and easier to use, while the proliferation of web services has enabled easy access to scientific datasets. All of this provides scientists and educators a new capacity to effectively translate research results into understandable narratives and curricula that can engage students in active scientific inquiry through the use of data collection and analysis of real world phenomena.

The OOI Education and Public Engagement (EPE) Implementing Organization (IO) is leveraging the capabilities of the OOI and its Cyberinfrastructure with a cutting edge platform to advance ocean science education. The EPE IO provides a suite of web-based tools, underlying web services, online resources and an integrated Education portal that enables the delivery of compelling ocean education experiences to undergraduate and free-choice learners. This infrastructure capitalizes on the novel aspects of the OOI – including near real-time data, archived data sets, high-bandwidth telemetry, and a collaborative portal that brings together an online community of users. EPE resources are geared toward end-user product developers (i.e. educators) to help them generate new learning experiences that maximize the unique and transformative science and engineering capacities of the Ocean Observatories Initiative.

The EPE is refining the development of a suite of undergraduate teaching tools including data visualization tools, a concept map builder and a Data Investigation Builder (DIB). The OOI activities, which are the focus of this pilot study, utilize the data visualization tools and the concept map builder through activities that use near real-time data to investigate real-world phenomena.

For more information about the OOI, please visit http://oceanobservatories.org/about/