

Ocean Observing Initiative Workshop - Chemistry  
May 19-21, 2017  
University Inn and Conference Center, Rutgers University

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**Wireless Information**

User name: OOIWorkshop

Password: OOIWorkshop

**Friday, May 19, 2017**

- 12- 3 pm      **Check in at the University Inn and Conference Center**  
Pick up packets in Inn Lobby and meet in Dining Room at 3:00pm.
- 3:00 pm      **Welcome and Introductions/Icebreaker Activity** (J. McDonnell)  
Participants will meet each other and the project team.
- 3:30 pm      **Welcome from the OOI Program** (M. Crowley)  
This talk will introduce the objectives of the OOI program from a research and education perspective.
- 4:00 pm      **Background Story of OOI and Undergraduate Teaching** (Dr. Silke Severmann, Rutgers University) This discussion will include perspective on the early days of teaching Introduction to Oceanography class using tools developed by the Education and Public Engagement (EPE) program.
- 4:30 pm      **Crosswalk of OOI and Introduction to Oceanography Textbook** (K. Hunter-Thomson and A. Pfeiffer-Herbert). We will review the multiple concepts within the Trujillo Introduction to Oceanography textbook for which OOI data can be used. Then we will explore how Anna used the biological productivity activities in her course in Spring 2017.
- 5:15 pm      **Strategies for Teaching with Data** (J. McDonnell and S. Lichtenwalner). We will take a look at examples of worksheets we use with undergraduates, list opportunities and challenges of working with these kinds of worksheets.
- 6:00 pm      Dinner at the University Inn and Conference Center.
- 7:00 pm      **Expectations and Goals of the Workshop** (C. Halversen and J. McDonnell). What do we hope to gain from the workshop collectively?
- 8:15 pm      Conclude for the evening!

**Saturday, May 20, 2017**

- 8:00 am Walk from University Inn to Cook Campus Student Center (room 202AB). Continental breakfast including coffee/tea available on site.
- 8:30 am **Welcome to Cook Campus Center!** (J. McDonnell). Opening announcements and review plan for the day.
- 8:40 am **Pedagogy: Introduction to the Learning Cycle** (C. Halversen). This session will include an overview of the Learning Cycle and how it can help our students make meaning of science content.
- 10:00 am Break
- 10:15 am **Invitation: Introducing Chemistry themes in Introduction to Oceanography Courses** (C. Halversen and J. McDonnell). We will discuss how chemistry themes and concepts are commonly introduced in Introduction to Oceanography classes, and what our students come in knowing about the chemistry of the ocean.
- 10:45 am **Explorations: Seasonal Salinity Variation & Processes that Change Salinity** (K. Hunter-Thomson and S. Lichtenwalner). We will jigsaw the Exploration activities, group (1) explores “**What kind of changes or patterns in salinity do you explore over a year?**” while group (2) explores “**As salinity in the surface ocean changes over time, what else changes?**” Each group will share out and report to the other what they did as learners.
- 11:15 am **Concept Invention:** (J. McDonnell and C. Halversen) Discussion: What are the processes that effect the variation of salinity over different time scales?
- 11:45 am **Applications: Seasonal Salinity Variation & Processes that Change Salinity** (K. Hunter-Thomson and S. Lichtenwalner). We will jigsaw the Application activities, group (2) applies “**How do seasonal patterns in salinity vary across the ocean?**” while group (1) applies “**Does salinity change over time in the surface ocean? Why?**” Each group will share out and report to the other what they did as learners.
- 12:15 pm Catered Lunch at the Cook Campus Center (room 202AB).
- 1:00 pm **Reflections: Seasonal Salinity Variation & Processes that Change Salinity** (K. Hunter-Thomson and S. Lichtenwalner). We will reflect on the two collections of Data Exploration activities as a whole.

- 2:00 pm Break
- 2:15 pm **Explorations: Changes in pH with Depth and Carbonate Buffering Systems** (K. Hunter-Thomson and S. Lichtenwalner). We will jigsaw the Exploration activities in this collection. Each group will share out and report to the other what they did as learners.
- 2:45 pm **Concept Invention:** (Dr. Michael Vardaro) Discussion and explanation of the carbonate buffering chemistry of ocean acidification. Mike also will discuss other data sources/programs that are observing ocean acidification.
- 3:15 pm **Applications & Reflections: Changes in pH with Depth and Carbonate Buffering Systems** (K. Hunter-Thomson and S. Lichtenwalner). We will jigsaw the Application activities in the collection. Each group will share out and report to the other what they did as learners. Then, we will reflect on the two collections of Data Exploration activities as a whole.
- 4:15 pm **Reflection and Brainstorm:** (J. McDonnell). What do we think about these data activities? Let's review where we are. Do we think differently about how we conceptually teach these themes and concept?
- 4:45 pm **Wrap up.** Walk back to the University Inn and Conference Center.
- 6:15 pm Car pool ride over to Old Man Rafferty's Restaurant.
- 6:45 pm Reservation at Old Man Rafferty's.

### **Sunday, May 21, 2017**

- 8:00 am Meet for Breakfast at the Conference Room B, University Inn and Conference Center. Welcome back and review logistics for the day-including travel back to the airport. Turn in W-9 forms if haven't already.
- 8:30 am **Explorations: Changes in Salinity with Depth and the Halocline** (K. Hunter-Thomson and S. Lichtenwalner). We will jigsaw the final Exploration activities. Each group will share out and report to the other what they did as learners.
- 9:00 am **Discussion of Concept Invention Opportunities:** We will discuss what potential, or current, ways to provide the Concept Invention to the students

around changes in salinity with depth and the halocline concepts.

- 9:30 am      **Applications & Reflections: Changes in Salinity with Depth and the Halocline** (K. Hunter-Thomson and S. Lichtenwalner). We will jigsaw the final Application activities. Each group will share out and report to the other what they did as learners. Then, we will reflect on the two collections of Data Exploration activities as a whole.
- 10:30 am      Break
- 10:45 am      **Foundational Ideas of Learning.** (C. Halversen). We will review instructional design ideas and how our foundational knowledge of learning can be applied to our teaching. We will discuss active learning techniques.
- 11:45 am      **Effective Practices for Teaching with Data.** We will review our current and potential for new teaching with data strategies including, orientation, interpretation, and synthesis.
- 12:15 pm      Lunch at the University Inn and Conference Center, Dining Room.
- 1:00 pm      **Implementation Planning Session** (J. McDonnell). We will discuss our ideas for integration of these data activities into our teaching. Participants will share their plans with each other and the OOI Teaching with Data team.
- 2:00 pm      **Looking Forward: Overview of the OOI Data Portal** (M. Vardaro and F. Knuth). In this session, we provide a preview of the OOI data portal and other interesting data products offered through the OOI.
- 3:00 pm      **Wrap up.** (J. McDonnell). Review of next steps and conclude the workshop. Car pool back to the airport.