



Northwest Biology Instructors Organization
2018 Annual Meeting

May 4-6

Portland Community College, Sylvania Campus
Portland, Oregon

NWBIO 2018 Overview Schedule

Date and Time	NWBIO Activity	Where	Options
Friday May 4 th , 2018 4:00 pm- 6:00 pm 5:00 pm-8:00 pm 6:30 pm-8:00 pm	<ul style="list-style-type: none"> • Check-In Begins • Socializing with your PNW Colleagues • Visit our Sponsoring Vendors/Publishers • Happy Hour • Welcome and Logistics • Keynote Speaker Sarah Jovan, US Forest Service 	PCC Sylvania Cafeteria	Tour the Learning Garden and eat pizza warmed by the coyote cob oven. Modify your phenotype w/Lucky Locks (bring \$ for sparkles!)
Saturday May 5 th , 2018 8:00 am-10:00 am	<ul style="list-style-type: none"> • Late Check-In • Light Breakfast • Visit our Sponsoring Vendors/Publishers 	PCC Sylvania Cafeteria	
Saturday May 5 th , 2018 8:30 am-9:20 am	<ul style="list-style-type: none"> • Concurrent Sessions 	TCB and ST	
Saturday May 5 th , 2018 9:30 am-10:20 am	<ul style="list-style-type: none"> • Second Concurrent Sessions 	TCB and ST	
Saturday May 5 th , 2018 10:30 am-11:20 am	<ul style="list-style-type: none"> • Third Concurrent Sessions 	TCB and ST	
Saturday May 5 th , 2018 11:30 am-12:20 pm	<ul style="list-style-type: none"> • Keynote Speaker Angela Ozburn, Oregon Health Sciences University 	PCC Sylvania Cafeteria	
Saturday May 5 th , 2018 12:30 pm-5:00 pm	<ul style="list-style-type: none"> • Bag Lunches • Carpool to Field Trips 		
Saturday May 5 th , 2018 5:00 pm-6:00 pm 6:00 pm-7:00 pm 7:00 pm-8:00 pm	<ul style="list-style-type: none"> • Happy Hour • Cinco De Mayo Banquet • Keynote Speaker Lisa Weasel, Portland State University 	PCC Sylvania Cafeteria	
Sunday May 6 th , 2018 8:00 am-10:00 am	<ul style="list-style-type: none"> • Light Breakfast 	PCC Sylvania Cafeteria	
Sunday May 6 th , 2018 9:00 am-9:50 am	<ul style="list-style-type: none"> • Concurrent Discipline Sharing Strands 	TCB rooms	Everyone please bring a fun, effective, quick class handout, URL, demo, activity, etc., to share for 2-10 minutes!
Sunday May 6 th , 2018 10:00 am-10:50 am	<ul style="list-style-type: none"> • Concurrent Discipline Sharing Strands plus Discussion 	TCB rooms	
Sunday May 6 th , 2018 11:00 am-noon	<ul style="list-style-type: none"> • NWBIO Business Meeting 	TCB rooms	

NWBIO 2018 Saturday Concurrent Session Schedule

Times	TCB 208	ST 307	TCB 211	TCB 217	TCB 218
8:30 am	<p>Torture Techniques For an Engaged Classroom Nichole Warwick</p>	<p>A Network Approach to Vertical Transfer and Articulation for Student Success in Biology: a fourth workshop hosted by the Northwest Biosciences Consortium RCN-UBE Stacey Kiser, Anne Kruchten, Erin Baumgartner, Amy Beadles-Bohling, Jeffrey Brown, Jason Duncan, Lori Kayes, Shannon Seidel, Walter Shriner, Stasinos Stavrianeas, and Chad Tillberg</p>	<p>From Humble Grass to Mighty Corn: Teaching Molecular Genetics with HHMI BioInteractive Resources Javier Robalino</p>	<p>Visualize It: Using Molecular Models to Predict the Effects of Mutations on Protein Function Sandra Porter</p>	<p>Introduction of an Emerging Model to Biology Labs: Waking Students up With Explorations of Metabolic Dormancy Erin E. Shortlidge</p>
9:00 am	<p>Deep Ocean Exploration and Science Communication—Adventures on the Exploration Vessel <i>Nautilus</i> Linda Ferguson-Kolmes</p>				
9:30 am	<p>Flying Dinosaurs in the City: An Educational Documentary of the Great Blue Heron and Bald Eagle Maria Morlin</p>	<p>Monitoring Students' Principle-Based Reasoning in Animal and Plant Physiology Using Computer-Scorable Constructed Response Assessments Mary Pat Wenderoth, Jennifer H. Doherty, Jenny McFarland, Jack A. Cerchiara, and Emily Scott</p>	<p>Not My Day Job: Modeling the Interdisciplinary Nature of Inquiry Through Poetry, Art, and Literature Walter Shriner and Josephine Pino</p>	<p>Biology Skills: Collaboratively Defining Core Competency Learning Outcomes Alexa Clemmons</p>	<p>Gastropods of the Gorge: Starting a Local Undergraduate Research Project Catherine Crosby</p>
10:00 am					
10:30 am	<p>Undergraduate Research Experiences in NonScience Majors Classes at a Community College (an NSF grant) Stacey Kiser and Pat Boleyn</p>	<p>Using Learning Progression Assessments to Inform Your Physiology Teaching Emily Scott, Jack A. Cerchiara, Mary Pat Wenderoth, Jenny McFarland, and Jennifer H. Doherty</p>	<p>Teach Less, Learn More: Leveraging Digital Resources to Improve Student Outcomes Yali Chen</p>	<p>Searching the Biomedical Literature Ann Madhavan</p>	<p>Extraction of DNA from Spiders and Their Webs: Using Webs to Identify Species Dakota Hufford*, Miranda Jones*, and Alyssa Neumann*</p>
11:00 am	<p>Cerego Pilot Study at the College of Western Idaho: Expanding Class Time for Student-Centered Activities by Using a Vocabulary Software Application of Spaced Rehearsal Holly Paquette</p>				

11:30 am Cafeteria

*Undergraduate Researchers

**Graduate Researcher

NWBIO 2018 Sunday Concurrent Session Schedule

Times	TCB 208	TCB 211	TCB 218
9:00 am	The Next Generation Science Standards: Are College Educators Ready? Stasinos Stavrianeas	Creating and Evaluating an Open Textbook for Community College Students Matthew Fisher	
9:30 am		Virtual Field Trips for Marine Biology: A Proposal and Request for Feedback Stephen Norton	
10:00 am	Discipline Sharing Strands and Discussion Anatomy & Physiology Instructors	Discipline Sharing Strands and Discussion Microbiology Instructors	Discipline Sharing Strands and Discussion General Biology Instructors
10:30 am			
11:00 am	NWBIO Business Meeting in TCB 218 All		
11:30 am			

Noon: Drive Home Safely!

Sessions beginning at 8:30 AM Saturday

Torture Techniques for an Engaged Classroom

Nichole Warwick, Clatsop Community College

Inspiring learning is at the heart of what we do and using inquiry based learning is one way to get material across in ways that create working knowledge, but teaching a class this way takes time and creativity. Regardless of the class type, there are simple activities to get students in the proper frame of mind and to help them meet our desired outcomes. While my students may joke about what activities I have in store for them from my torture chest, they are engaged and excited to see how I will be framing the content each class. This workshop will provide examples of strategies used in my A&P, Microbiology, and General Biology for non-majors courses. Steal from my toolbox to help build your own. You might even find a few things to get them off their cell phones.

A Network Approach to Vertical Transfer and Articulation for Student Success in Biology: A Fourth Workshop Hosted by the Northwest Biosciences Consortium RCN-UBE

Stacey Kiser, Lane Community College

The Northwest Bioscience Consortium (NWBC) is an NSF funded RCN-UBE group working to align introductory biology curricula in the Pacific Northwest with the concepts and competencies of Vision and Change. We report on our fourth winter workshop, "A network approach to vertical transfer and articulation for student success in biology." Held February 8-9, 2018, this workshop brought together 2Y and 4Y faculty to collaborate on the NWBC model that all students are transfer students, whether they are transitioning from one institution to another or from introductory courses to advanced courses within the same institution. Using the Dynamic Governance decision-making system, biology sub-discipline groups drafted course learning outcomes based on the BioCore categories. The learning outcomes were posted and participants were invited to comment. The sub-discipline groups rewrote the learning outcomes and a final round of review achieved consent by all participants. We present the course learning outcomes consented to at the workshop and will work in small groups to address final comments. Our goal is to create a set of minimum course learning outcomes that the majority of 2Y and 4Y colleges and universities in Oregon can consent to teach and that support students success in introductory biology courses and vertical transfer to advanced biology courses. This work informs the statewide committee working on articulation issues in the biology major in Oregon.

Co-Presenters: *Anne Kruchten, The College of Saint Scholastica; Erin Baumgartner, Western Oregon University; Amy Beadles-Bohling, University of Portland; Jeffrey Brown, Linfield College; Jason Duncan, Willamette University; Lori Kayes, Oregon State University; Shannon Seidel, Pacific Lutheran University; Walter Shriner, Mt. Hood Community College; Stasinios Stavrianeas, Willamette University; Chad Tillberg, Linfield College*

From Humble Grass to Mighty Corn: Teaching Molecular Genetics with HHMI BioInteractive Resources

Javier Robalino, Howard Hughes Medical Institute

Corn is ubiquitous in our modern diet. But, where did it come from? In this hands-on session, participants will explore the use of HHMI's free teaching materials to guide students through the process of asking questions and analyzing evidence about the molecular genetic basis for the differences between corn and its close wild relative, teosinte. We will model the combined use of video and classroom-ready exercises to support active learning, share ideas on best practices for the undergraduate classroom, and reflect about how HHMI BioInteractive resources can support effective instruction.

Visualize it: Using Molecular Models to Predict the Effects of Mutations on Protein Function

Sandra Porter, Shoreline Community College, Digital World Biology LLC

The wide application of DNA sequencing has resulted in an explosion of missense mutations in public databases. While some of these mutations have helped our ability to understand genetic disease and explain some phenotypes, the significance of most mutations is unknown. This gap between the DNA sequence and a functional result has caused substantial problems in clinical testing and diagnosis. We are interested in exploring a strategy where students could use their knowledge of amino acid chemistry and protein structure as a tool to make predictions about the functional consequence of specific mutations. To achieve this goal, we need to develop students' skills to the point where they can make informed and realistic predictions about the effect of a mutation on the function of a protein with an understanding of how proteins work at molecular and biochemical levels. In this session, we will illustrate the process that scientists use for this type of investigation and discuss how games might be used to help students develop these skills.

Introduction of an Emerging Model to Biology Labs: Waking Students up with Explorations of Metabolic Dormancy

Erin Shortlidge, Portland State University

A national goal for education reform is to provide opportunities for all biology undergraduates to participate in research. Traditionally, undergraduates gain research experience by apprenticing in faculty-led research labs; however, only a fraction of undergraduates have access to these opportunities. Course-based Undergraduate Research Experiences (CUREs) are a type of laboratory course where students conduct experiments to answer relevant research questions, thus allowing undergraduates to gain authentic research experience at a large scale. To increase equity in opportunities for biology undergraduates to participate in authentic scientific research at Portland State University (PSU), we have designed and implemented a CURE to pilot in four sections of the Spring 2018 Principles of Biology laboratory series. For this pilot project, students are working on research that contributes to work currently being conducted in Dr. Jason Podrabsky's lab (PSU, Biology Department). Students will be testing how different biotic factors impact the tendency of embryos of the annual killifish *Austrofundulus limnaeus* to enter Diapause I, a profound state of metabolic dormancy and developmental arrest. Little is known about what causes embryos to arrest in Diapause I, and this novel student work will produce robust and potentially publication-quality data. We will evaluate student outcomes as well as perceptions of CURE and traditional laboratory curriculum. Results will be used to assess both the effectiveness of the CURE curriculum for PSU's specific student population and to guide the implementation and expansion of CUREs at PSU.

Co-Researchers Emma Goodwin, Daniel Zajic, Jason Podrabsky

Sessions beginning at 9:00 AM Saturday

Deep Ocean Exploration and Science Communication—Adventures on the Exploration Vessel *Nautilus*

Linda Fergusson-Kolmes, Portland Community College

What are the roles of authentic stories in undergraduate teaching? The Ocean Exploration Trust (OET) is a non-profit dedicated to promoting deep ocean exploration and science communication. The experience of spending three and half weeks exploring the submarine canyons in the Olympic Coast National Marine Sanctuary, aboard the Trust's research vessel the *Nautilus*, as a science communication fellow, will be discussed. The goal is to share the opportunities and resources available to educators and students through the OET and to stress the importance of sharing different pathways in STEM to inspire the next generation of scientists.

Building the Buzz for Biotechnology in NW Montana

Ruth Wrightsman, Flathead Valley Community College

Flathead Valley Community College's NSF-ATE project, Team SCoRE Biotechnology, provides DNA Bootcamp workshops for area high school and middle school teachers with the goal of increasing the awareness of biotechnology and its applications. The two-day workshops provide participants with theory and hands-on practice in biotechnology laboratory exercises including bacterial transformation, crime-scene DNA forensic simulations, DNA barcoding of plants, and testing for GMO food products. Bootcamp "graduates" are provided loaner equipment and reagents needed to implement new lab exercises, and with in-classroom assistance by FVCC faculty. In the past two years, we have hosted five two-day workshops for 60 participants from 12 high schools and 10 middle schools. Over 2000 high school and middle school students have been impacted with new biotechnology laboratory activities.

Deliberative Democracy: Connecting STEM Undergraduates with Real-World Problems

Liz Griffith, Portland State University

Following national calls for decreasing attrition rates in STEM, institutions have been embedding active learning (AL) into STEM courses. Portland State University is implementing a novel AL strategy, Deliberative Democracy (DD). DD is a platform for students to use course materials by working in small groups to reach a consensus on scientific problems. Intended outcomes of DD include improving student confidence in communicating science and building community in the classroom. Although there is data supporting the benefits of AL, little is known about how students perceive AL. To explore this question, we asked: how do students feel about DD and is DD achieving its intended outcomes with students? A survey with open-ended prompts was administered to our STEM courses. We used content analysis to develop a coding rubric identifying themes found in the responses. For biology students, the top positive responses about DD were the real-world applications and the classroom community. The top negative responses about DD were group dynamics and how student time was spent (i.e. more lecture/exam prep instead of DD). Evaluation of intended outcomes is underway. We are also examining if these data are different among various student groups such as post-baccalaureates, underrepresented minorities, and community college transfers. Examining these demographic differences could improve equitable implementation of AL and deepen our understanding of who AL benefits and why.

Sessions beginning at 9:30 AM Saturday

Flying Dinosaurs in the City: An Educational Documentary of the Great Blue Heron and Bald Eagle

Maria Morlin, Vancouver Community College

I live beside a colony of Great Blue Herons, and have monitored them for 17 years with the Stanley Park Ecology Society. In 2008 some students and I did a flight to foraging study from the roof of the building. Four years ago I had the idea of making a documentary of the herons as part of my professional development.

I showed a preliminary bit of footage at the BC Bio in Vancouver three years ago, and the full version is ready for viewing now. One reviewer said: *"It is a beautifully-shot nature documentary highlighting the extraordinary plumage, behaviours, and encounters with eagles, of a really iconic bird on the Pacific Coast: The Great Blue Heron. The narration is both educational and humorous."*

Indeed, in the last year of filming there was an enormous amount of eagle predation that I managed to capture on film, and as a result, I included footage of the bald eagle and eaglets in their own nest in Vancouver. I would like to present it as a documentary/workshop. Since it was my first documentary, I could impart some wisdom on making documentaries and/or have a Q&A.

Monitoring Students' Principle-Based Reasoning in Animal and Plant Physiology Using Computer-Scorable Constructed Response Assessments

Mary Pat Wenderoth, University of Washington

To gain expertise in a field is to recognize, understand, and effectively use underlying disciplinary principles. Too often students rely on rote memorization rather than principle-based reasoning to solve problems. Students list steps in muscle contraction or generation of action potentials but cannot reason to a correct prediction when changes are introduced in the system. A learning progression (LP) helps us understand how students' mental models of key principles are refined and strengthened over a curriculum. LP-based assessments provide a nuanced measure of students' progress towards a goal, rather than a binary right/wrong verdict. Our goal is to develop LP-based computer-scorable constructed response (CR) assessments to describe how students reason about the physiological principles of flux (i.e., movement of substances down gradients) and mass balance (i.e., Conservation of Mass).

Our current learning progression is: Lowest level, L1: story-telling or non-mechanistic reasoning; L2: beginning principle-based reasoning but with errors; L3: principle-based reasoning using components in isolation; L4: principle-based reasoning with consideration of the interacting components, L5: principle-based reasoning with full consideration of interacting components and threshold values. We collected short answer responses from over 5000 students ranging from freshman to seniors. We will present our constructed-response questions and our progress in computer-scoring.

Co-presenters: Jennifer H. Doherty, Jenny McFarland, Jack Cerchiara, Emily Scott

Biology Skills: Collaboratively Defining Core Competency Learning Outcomes

Alexa Clemmons, University of Washington

The AAAS report *Vision and Change* asked us to move discussions of curricula away from lists of topics in favor of core concepts and competencies (skills). However, descriptions of core concepts and competencies were left intentionally broad to encourage ongoing conversations among educators. For the core concepts, such conversations have taken place, culminating in the BioCore Guide. No equivalent resource yet exists to help educators interpret the core competencies. To successfully implement teaching of the core competencies, we must first unpack them by defining and obtaining consensus on competency learning outcomes.

In this interactive workshop, we will provide an overview of the collaborative and iterative revision process used to develop a set of core competency learning outcomes (BioSkills Guide). We will share a draft of the BioSkills Guide and participants will choose one of the six core competencies to explore more deeply in a small group. Participants will be asked to draw from their expertise related to their unique teaching backgrounds (e.g., institution type, biology subdiscipline). We will close with a group-wide discussion including 1) What is a reasonable level of skill mastery to expect for undergraduates? 2) How can 2- and 4-year institutions coordinate on competency curricula? We hope this workshop will give participants an opportunity to reflect on past teaching experiences and develop concrete future goals for teaching core competencies in their class.

Gastropods of the Gorge: Starting a Local Undergraduate Research Project

Catherine Crosby, Clark College

Clark College has started an undergraduate research project that will span the entire 200 level biology sequence for biology majors. The project teaches concrete research skills in molecular biology, ecology and we are looking to incorporate physiology in the next academic year. In this presentation, we will showcase the project in its current state, talk about our future plans and offer a template for we built this project that you could use in your own local environment. In addition, I will be leading a brainstorming and constructive feedback session on project improvements and a chance for you to bounce ideas for new projects near your school around with your peers. What makes our project successful is working with the natural environment in our backyard: the Columbia River Gorge. The Gorge is packed with rich and largely unexplored biota that lends itself well to student research. Many of the rare and endemic species of gastropods in the gorge have been unstudied since the 1990's. No one knows the populations present, genetic relationships or effects of climate change on the populations. Our undergraduates are in a position to add a valuable piece to the biological survey of the Gorge.

Session beginning at 10:00 AM Saturday

Not my day job: Modeling the Interdisciplinary Nature of Inquiry Through Poetry, Art and Literature

Walter Shriner, Mt Hood Community College; Josephine Pino, Portland Community College

Biology is beautiful. We all feel this, yet we often separate our esthetic appreciation of nature when we enter the classroom. Does this separation serve our students? Might we better support learning by reinforcing the value of interdisciplinary connections by providing opportunities for students to interact with the biological discipline through artistic expression? Join us in a discussion of how we can help students learn biology through creative expression and bridge the divide between artist and scientists by sharing our own art. We encourage participants to bring examples from their classrooms and share their own works.

Sessions beginning at 10:30 AM Saturday

Undergraduate Research Experiences in Non-Science Majors Classes at a Community College (an NSF grant)

Stacey Kiser and Pat Boleyn, Lane Community College

Lane Community College received an NSF IUSE grant (#1505081) in 2015 to incorporate research experiences into biology and environmental science non-majors classes. We used the funds to pay for curriculum development time (mostly part-time faculty teach the non-science majors courses), equipment, and travel to professional development. Faculty assigned posters as an assessment and we display those posters at the annual Science Undergraduate Research Day (SUGR Day) along with posters from the Botany and Zoology majors and independent study projects. The grant was written for two years, but we requested a no-cost extension to complete the work this year. Join us as we display student posters and share curriculum-in-progress to sustainably implement research projects into a variety of non-science majors courses.

Using Learning Progression Assessments to Inform Your Physiology Teaching

Emily E. Scott, University of Washington

A learning progression (LP) describes student learning as it unfolds across a course or curriculum and describes "successively more sophisticated ways of thinking about a topic". A LP consists of both a framework describing levels of achievement as well as a set of assessments that elicits evidence of students' current level of reasoning. A LP helps us understand how students' mental models of key principles are refined and strengthened over a curriculum. LP-based assessments provide a nuanced measure of students progress towards a goal, rather than a binary right/wrong verdict. LPs afford faculty insight into how students' reasoning develops and this insight can inform their course design to better support students' learning.

In this workshop we will share LP-based constructed response (CR) assessments we have developed for animal and plant physiology. These assessments require students to reason about the physiological principles of flux (i.e., movement of substances down gradients) and mass balance (i.e., Conservation of Mass). CR assessments allow students to fully express their understanding of physiological mechanisms rather than merely recognize the correct answer among multiple-choice distractors. Workshop participants will evaluate assessments for use in their own teaching and score sample student answers with a LP-rubric.
Co-Presenters: Jack A. Cerchiara, Mary Pat Wenderoth, Jenny McFarland, Jennifer H. Doherty

Teach Less, Learn More: Leveraging Digital Resources to Improve Student Outcomes

Yali Chen, Cengage

Non-majors biology instructors typically cite scientific literacy and critical thinking as overarching course goals; yet non-majors students tend to struggle with the basics and understanding the relevancy of the course to their lives. To bridge the gap, Cengage is creating a teaching and learning experience that delivers quality learning materials with a focus on future challenges and greater emphasis on problem-solving and transferable skills. This workshop is a co-design session, focusing on creating an engaging and highly visual learning experience.

Searching the Biomedical Literature

Ann Madhavan, National Library of Medicine

This presentation will highlight those resources of particular interest to biology instructors and their students, including PubMed, NCBI, PubMed Central, and Toxnet. The mission of the National Network of Libraries of Medicine (NNLM) is to advance the progress of medicine and improve the public health by providing all U.S. health professionals with equal access to biomedical information and improving the public's access to information to enable them to make informed decisions about their health. The Program is coordinated by the National Library of Medicine and carried out through a nationwide network of health science libraries and information centers. The NLM offers a wide range of free, online resources to allow students and faculty to effectively and efficiently search the biomedical literature.

Extraction of DNA from Spiders and Their Webs: Using Webs to Identify Species

Dakota Hufford, Clackamas Community College and Portland State University

Spiders perform irreplaceable ecosystem services in the form of insect and vector control, as well as provide food as prey and material resources in their silk for other animals. Spiders are also unique in that they produce venom. Venom is at the forefront of research in multiple fields, including medical and agricultural. Our research question is “can webs offer enough usable DNA to identify the spider that made it?” The purpose of our experiment is to find a less invasive means of identification of species for the purpose of bio-monitoring and identifying species without having to physically see or kill the animal. We go about answering this question by extracting the DNA of a spider, and will ultimately extract DNA from a web of the same species and compare the two.

Co-Presenters: Miranda Jones and Alyssa Neumann

Session beginning at 11:00 AM Saturday

Cerego Pilot Study at the College of Western Idaho: Expanding Class Time for Student-Centered Activities by Using a Vocabulary Software Application of Spaced Rehearsal

Holly Paquette, College of Western Idaho

As our department embraces Vision and Change, we have been exploring ways to free class time for student centered, activity based learning. For vocabulary heavy biology classes, instructors spend much of their time going over this “foreign language”, often at the expense of truly student-centered activities in class time. It is difficult for many faculty to give up traditional lecture time spent covering necessary terms and vocabulary. To address this challenge, we piloted a memory-based online learning platform to address vocabulary learning for students in an efficient and effective way outside of class.

Using the software application, Cerego, students participated in flashcard style learning of crucial terms as homework. The software follows research-based data of spaced rehearsal (forced time away) to do effortful recall in contrast to effortless recall. The application lengthens time between reviews as memory increases. To assess our pilot program, ten identical questions were put on the final exam of our test sections and our control sections. The vocabulary in the questions corresponded to the Cerego sets.

The results from the sections piloting Cerego were significantly higher (over 10%) than in the control sections. Discussions and activities in class spent less time reviewing vocabulary and more time delving deeper into content. Faculty and students have had positive feedback.

Sessions beginning at 9:00 AM Sunday

The Next Generation Science Standards: Are College Educators Ready?

Stasinos Stavrianeas, Ph.D., Willamette University

The Next Generation Science Standards (NGSS) have been adopted by 19 States with an additional 19 States adopting science curricula based on NGSS. Students in the secondary education system are currently studying science through the NGSS three-dimensional framework and will be entering college classrooms soon. In this session I will briefly present the structure of NGSS and invite participants to discuss some preliminary questions: Are colleges ready for these students? Is our curriculum a step forward in their academic journey? Are we prepared to engage all students in ways that promote their involvement in STEM fields?

Participants to this session are invited to bring their introductory course syllabi to facilitate discussions of Student Learning Objectives and Outcomes especially with regard to alignment of these objectives with NGSS.

Creating and Evaluating an Open Textbook for Community College Students

Matthew Fisher, Oregon Coast Community College

Open textbooks are free, online resources that can replace traditional textbooks and save students money. The costs of traditional textbooks continue to increase and this can particularly affect at-risk, low-income students. Few studies have analyzed student perceptions of open textbooks and how they influence academic achievement, but the emerging trend is positive.

In this interactive presentation, I will recount my own journey as I created an open textbook for an environmental biology class, highlighting the resources, both financial and technical, that I utilized. Additionally, I present results from a classroom study in which I assessed student perceptions of an open textbook and calculated the subsequent cost-savings. My results closely mirror previous studies in that most students had favorable opinions of the open textbook and would prefer to use them over traditional textbooks. The average cost savings per student was \$81 and was determined using a novel method that does not assume all students buy new textbooks. These savings were likely important to the students, the majority of which worked 5 hours or more and have received Pell Grants or other tuition waivers.

Session beginning at 9:30 AM Sunday

Virtual Field Trips for Marine Biology: A Proposal and Request for Feedback

Stephen Norton, Centralia College

A big challenge when teaching Marine Biology is providing students with field experiences. Students certainly find field trips to be insightful, but logistical and time constraints limit the diversity of habitats to be visited. I am developing a series of virtual field trips that, while lacking the odors of a sunbaked mud flat on a low tide, will provide some flavor of a field trip to key marine habitats. These habitats may include the exposed and protected temperate rocky intertidal, mud flats, sandy beaches, temperate seagrass beds, *Nereocystis* and *Macrocystis* kelp forests, temperate subtidal rock walls, dock fouling communities, Indo-Pacific coral reefs, Caribbean coral reefs, and Caribbean mangrove communities. Each investigation will include a) a habitat overview, b) description major physical forces at play, c) natural history of the dominant organisms with video and still pictures, d) illustrations of biotic and abiotic interactions that structure each community, and e) one or more quantitative exercises. In the quantitative exercises, students will collect and analyze data from still or video from the habitat. Examples might include the community changes accompanying a tidal gradient in the rocky intertidal, a fish transect across coral reefs, or relative abundance of invertebrates in a quadrat. Full development of these virtual field trips will be a multi-year project. I encourage feedback and suggestions from fellow marine biology instructors

Thank you to:

All of our Sponsors

Wiley, Pearson, Cengage, Van Griner, McGraw-Hill, National Library of Medicine, Fountainhead Press, Norton, Hopworks Urban Brewery, Townshend's Brew Dr. Kombucha, Giant Microbes, and The Awkward Yeti

Our Keynote Speakers

Sarah Jovan, Angela Ozburn, and Lisa Weasel

Our Session Speakers

Nichole Warwick, Linda Fergusson-Kolmes, Maria Morlin, Stacey Kiser, Pat Boleyn, Holly Paquette, Anne Kruchten, Erin Baumgartner, Amy Beadles-Bohling, Jeffrey Brown, Jason Duncan, Lori Kayes, Shannon Seidel, Walter Shriner, Stasinios Stavrianeas, Chad Tillberg, Mary Pat Wenderoth, Jennifer H. Doherty, Jenny McFarland, Jack A. Cerchiara, Emily Scott, Javier Robalino, Josephine Pino, Yali Chen, Sandra Porter, Ruth Wrightsman, Alexa Clemmons, Ann Madhavan, Erin Shortlidge, Liz Griffith, Catherine Crosby, Dakota Hufford, Miranda Jones, Alyssa Neumann, Matthew Fisher, and Stephen Norton

Our Field Trip Leaders

Shannon Ansley; Brett Schaerer and Micah Jordan; Nora Stevens and Ari Rapkin; Shawn Turner at Townshend's Brew Dr. Kombucha, April Ann Fong, and Ben Simon; Kevin Lien; and Alexie McKee

Learning Garden Tour

Peter Ritson and Venus Barnes

Master of Ceremonies

Micah Jordan

Catering

Dianna Benting and Jean Atkinson

Audio-Visual Support

Sue Bean Portinga

Webmasters

Brett Schaerer and Kevin Hutton

NWBIO Logo Creation

Shannon Ansley and Kevin Hutton

Portland Community College, Sylvania Campus Administration

Lisa Avery, Dieterich Steinmetz, and Erin Fivecoat

Our Organizing Committee

Brita Clothier, Brett Schaerer, Ben Simon, Linda Fergusson-Kolmes, April Ann Fong, Aaron Payette, Michelle Huss, Josephine Pino, Alexie McKee, and Alaron Lewis

Our Many Wonderful Student Volunteers

Sachyea Spackman, Jen Seamans, Casey Okami, Taylor Sawma, Rob Lewis, Ellie Dick, Khaleda Aqaei, Stephanie Harvey, Eric Chambers, Samuel Moore, Nico Brouhard, Jack Waddle, George Andrada, and more

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TOWNSHEND'S
**BREW DR.
KOMBUCHA**



The Awkward Yeti

Drew Oliver's
**GIANT
microbes**
...a million times
actual size!

- AM Automotive & Metals
- BK Bookstore
- CC Amo DeBernardis College Center
- CT Communication Technology
- HP Heat Plant
- HT Health Technology
- LIB Library
- PAC Performing Arts Center

- SCB South Classroom Building
- SS Social Science & Technology
- ST Science & Technology
- TCB Technology Classroom Building
-  Safe Assembly Area

-  Parking Permit Stations
-  Disabled Parking
-  30 Minute Visitor Parking
-  Purchase One Day Parking Permit
-  Wireless Hotspot
-  Next Generation Wireless
Provide faster speeds and better reliability.

All campus locations are Tobacco Free.



Portland Community College, Sylvania Campus Map