The PIER Review

Welcome to the December 2018 issue of the PIER Review, the monthly GOA-ON Pier2Peer newsletter. The Review highlights accomplishments, provides updates for our members, highlights open-access research on ocean acidification, and shares funding or job opportunities. Please send all of your ideas for the newsletter to Meredith Kurz (meredith.kurz@noaa.gov) and we will be sure to incorporate your feedback into future editions of The PIER Review.

P2P FEATURE

Participants in the IAEA OA-ICC Technical Meeting

The IAEA Ocean Acidification International Coordination Centre (OA-ICC) and the Global Ocean Acidification Observing Network (GOA-ON) held a technical meeting on the management, analysis, and quality control of ocean acidification data on 22-26 October 2018 at the IAEA Environment Laboratories in Monaco. The advanced workshop included participation from 15 scientists representing 15 different countries from various regions around the world. Many of the participants were Pier2Peer mentees or mentors.

Different data products and resources were presented, such as the GOA-ON data portal, SOCAT, GLODAP and the OA-ICC compilation of biological response data and bibliographic

database. The workshop brought together both chemical oceanographers and biologists and took an interdisciplinary approach to discuss ocean acidification data analysis. The workshop emphasized the importance of chemistry for biological experimentation (proper manipulation and reporting, but also development of scenarios and interpretation of data) and biology for chemical monitoring (identification of relevant spatio-temporal scales to inform monitoring strategies, etc.).

Dr. Sam Dupont (University of Gothenburg, Sweden) and Dr. Adrienne Sutton (National Oceanic and Atmospheric Administration Pacific Marine Environmental Laboratory, U.S.A.) gave lectures on quality assurance and quality control techniques used in monitoring and experimental research, such as estimating uncertainties, identifying outliers and flagging data. Participants were able to apply these theories to their own data sets that they brought with them to the workshop. Participants also provided feedback on the reporting process for the UN Sustainable Development Goal Target 14.3 Indicator 1, which calls for *"average marine acidity measured at an agreed suite of representative sampling stations."*

BECOME A Pier2Peer RECRUITER

We are always recruiting senior and experienced OA observing experts to serve as mentors and early career scientists from emerging regions to become mentees. If you know someone who would be a good mentor or mentee, direct them to the Pier2Peer website or put them in contact with Meredith Kurz (meredith.kurz@noaa.gov).

If you are attending a meeting or event, are interested in sharing a few slides on the program and disseminating sign-up information, please email Meredith and we will send you communication materials and sign-up sheets for your upcoming event. And thanks!

UPCOMING EVENTS and CONFERENCES

The 4th GOA-ON International Workshop will be held on 14-17 April 2019 in Hangzhou, China. Abstract submission and registration are both open now; abstracts are due 10 January 2019. Limited travel scholarships are available for qualifying scientists; instructions to apply are attached with this newsletter.

The American Geophysical Union (AGU) Fall 2018 Meeting will be held on 10-14 December 2018 in Washington, D.C., USA. Abstract submission is closed but registration is still open.

The Association for the Sciences of Limnology and Oceanography (ASLO) will hold the 2019 Aquatic Sciences meeting in San Juan, Puerto Rico, USA, from 23 February to 2 March 2019. There will be a session (#CS05) on ocean acidification. The deadline for abstract submission has passed but registration is still open.

The American Geophysical Union (AGU) Geoscience and Society Summit will be held on 12-21 March 2019 in Stockholm, Sweden. Abstract submission and registration are open.

The Eleventh Western Indian Ocean Marine Science Association (WIOMSA) Scientific Symposium will be held at the University of Mauritius from 1-6 July 2019. The call for abstracts will open on 1 December 2018.

OceanObs'19 is part of a decadal conference series on setting ocean observation priorities to be held on 16-20 September 2019 in Honolulu, Hawaii, U.S.A. OceanObs'19 will announce some scholarships to attend for early career scientists and those working in developing nations at a later date. Abstract submission for white papers is closed. Poster abstract submissions are due 1 March 2019. Registration is open and early bird prices are available until 1 March 2019.

UPCOMING OA Workshops

Latin America & the Caribbean Regional Symposium on Ocean Acidification Science & Policy

Organization: The Ocean Foundation, GOA-ON, the Latin America Ocean Acidification Network (LAOCA), the International Atomic Energy Agency's Ocean Acidification International Coordination Centre (IAEA OA-ICC), US NOAA, and other partners. Funded by the US Department of State and the Swedish International Development Agency.

Host and Location: Instituto de Investigaciones Marinas y Costeras (INVEMAR), Santa Marta, Colombia

Dates: 21 – 24 January 2019

Description:

The Ocean Foundation, GOA-ON, NOAA, and other partners will hold a 4-day symposium on ocean acidification science and policy in the Latin American & Caribbean region. Topics will include strategies for building low-cost monitoring systems, techniques for building resilient seafood supply chains including through technological interventions, and policy frameworks for building economic and social resilience at regional and national scales. The symposium will also focus both on existing practices and future options for researching the impacts on and the development of adaptation plans for coral reef ecosystems. Plenary lectures will have simultaneous translation in English and Spanish (French or Portuguese may be available if indicated in your registration), and laboratory demonstrations will be staffed by at least one bilingual (English and Spanish) trainer.

Confirmed speakers who will be presenting on ocean acidification science and demonstrating laboratory techniques include Dr. Jose Martin Hernandez Ayon (Universidad Autonoma de Baja California), Dr. Christopher Langdon (University of Miami), Dr. Nelson Lagos Suárez (Universidad Santo Tomás), Dr. Burke Hales (Oregon State University), and Dr. Melissa Melendez (University

of New Hampshire). There are additional confirmed lecturers on topics related to adaptation or monitoring options for the aquaculture industry, impacts on reefs and tourism, policy options to address OA regionally or nationally, and more.

Requirements: The symposium is open to all interested stakeholders and scientists. There is a $75 participation fee to cover basic costs. Registration closes on January 1st. The application period for travel support to the symposium and to attend the associated Advancing Training has closed.
Register for the symposium here

FUNDING and JOB OPPORTUNITIES

The Ocean Foundation Pier2Peer Scholarships

Organization: The Ocean Foundation
Description: Small grant program providing funds to Pier2Peer matches to collaborate on a project, conduct training visits, collect data for GOA-ON submission, etc.
Requirements: Applicants must be in a Pier2Peer partnership and applying to use funds to support this collaboration.
Amount: USD 5,000
Application Deadline: 16 January 2019 is the due date for the 2018 Fourth Quarter review period; applications are accepted on a continuing basis; submit to avalauriorton@oceanfdn.org and meredith.kurz@noaa.gov.
Application Details: Attachment with this email

POGO Shipboard Fellows

Organization: The Partnership for Observation of the Global Ocean (POGO)
Description: POGO offers a number of shipboard fellowship opportunities on ocean research vessels. Normally, specific calls for fellows working in certain sub-disciplines are issued six months before a cruise begins. However, POGO also fills available berth with qualified applicants on shorter notice. They have an issued an open call for early career scientists, technicians, postgraduate students, or post-doctoral fellows involved in oceanographic work at centers in developing countries and countries with economies in transition. Qualified applicants will be contacted if an appropriate shipboard fellowship becomes available.
Requirements: Applicants must involved in oceanographic work in a developing country or country with an economy in transition. They must provide a fellowship proposal, intentions to build capacity for ocean observing, and a summary CV.
Amount: Round-trip ticket from home institute to the host institution; up to two months' stay at home institution to train prior to cruise; accommodation at ship port; ship messing fee; seafaring medical and sea survival course.
Application Deadline: Open call with no stated closure.
Application Details

Tenure Track Scientist – Marine Chemistry and Geochemistry

Organization: Wood's Hole Oceanographic Institution (WHOI)

Description: WHOI is hiring tenure-track assistant scientists who conduct research in any area of marine chemistry and geochemistry that complements existing programs on the chemistry of the ocean and its interactions with the Earth as a whole. Applicants should have a doctoral degree, postdoctoral experience, and a record of scientific research publications in scholarly journals. Scientific staff members are expected to develop independent, externally-funded, and internationally-recognized research programs.
Application Deadline: 17 December 2018
Application Details

Tenure Track Scientist – Physical Oceanography
Organization: Wood's Hole Oceanographic Institution (WHOI)
Description: WHOI is hiring tenure-track assistant scientists in physical oceanography regardless of approach (observational, modeling, and theory) and especially encourage those with a theoretical/dynamical focus. We seek, but not exclusively, individuals with expertise in: 1) coastal dynamics, 2) high-latitude processes, 3) climate variability, and 4) submesoscale processes and mixing. Candidates with interdisciplinary interests in the interplay between ocean dynamics and biological or geochemical processes, or in the interaction of the ocean with the atmosphere, the land, and the cryosphere are encouraged.
Application Deadline: 17 December 2018
Application Details

Tenure Track Assistant Professor – Computational Physical Oceanography
Organization: Oregon State University (OSU) College of Earth, Ocean, and Atmospheric Sciences
Description: OSU is seeking a colleague with expertise in exploring ocean dynamics using physics-based numerical modeling tools, and who will develop and maintain a vigorous, research program applied to either ocean circulation or atmosphere-ocean coupled systems. They welcome applications by candidates who specialize in developing novel computational tools and/or data assimilative methods applied to a range of data types and temporal/spatial scales. They also encourage applicants who have an interdisciplinary focus that would connect with existing CEOAS strengths, e.g., atmosphere-ocean interaction, biogeochemical ocean modeling, paleoclimate reconstructions, or beach evolution/sediment processes. The successful candidate is expected to raise significant external research funds and to contribute to the educational mission of the College at the undergraduate and graduate levels by teaching courses at the upper-division and/or graduate level.
Requirements: PhD in Oceanography, Atmospheric Sciences, Geophysics, Physics, or another related discipline. More skill-based requirements listed with application details.
Application Deadline: 30 January 2019
Application Details

PhD Assistantship in the Effects of Ocean Warming and Acidification on the Coral Microbiome
Organization: University of Miami Rosenstiel School of Marine and Atmospheric Sciences
Description: This project will focus on the study of how environmental changes affect the composition of the microbiomes in corals and consequently how these changes affect the hosts. Ongoing global warming effects, such as rising sea temperature and acidity, have strong

impacts on free-living marine microbial communities, but its effects have not been properly studied on host-associated microbiomes. To tackle this, students will use a combination of state-of-the-art molecular biology, ecophysiology and bioinformatics.
Requirements: See requirements for admission to the RSMAS graduate school.
Amount: Annual salary of USD 29,724, tuition and health insurance.
Application Deadline: 1 January 2019
Application Details

US Agency for International Development Partnership for Enhanced Education and Research
Organization: US Agency for International Development and US National Science Foundation
Description: The award is intended to foster international partnerships between eligible developing country institutions and a partner US institution.
Requirements: Applications must be submitted together by representatives from either a higher education institution in the US or from a higher education institution in a developing country. Either institution may be the prime awardee and the two institutions must have well developed plans to collaborate. Examples of previous awards
Amount: USD 500,00 to 1,000,000
Application Deadline: Next deadline January 2019
Application Details

Western Indian Ocean Marine Science Association Marine Research Grant Programme
Organization: Western Indian Ocean Marine Science Associated (WIOMSA)
Description: The award is designed to enhance the capacity of scientists in the Western Indian Ocean region to conduct marine research. There are three tiers (MARG I, II,III) that vary in duration and amount. MARG I and II applications are closed.
Requirements: Applicants should be young scientists studying the Western Indian Ocean region
Amount: USD 3,000 (MARG III), USD 6,000 (MARG II)
Application Deadline: No deadline for MARG III
Application Details

EMBO Short-Term Travel Fellowships
Organization: European Molecular Biology Organization
Description: The fellowship funds research exchanges of up to three months between laboratories in eligible member countries and cooperation partners.
Requirements: Applicants must be from one of the member or cooperation countries and traveling to a lab in another member or cooperation country. Research must be related to life sciences. The travel must be associated with a larger project and not just limited to training in a technique, though it can include that type of training.
Amount: Travel and living costs of the traveling fellow
Application Deadline: Three months before proposed starting date of travel
Application Details

Jobs Lists:

Earthworks Oceanography Jobs List

The Global Marine Community Newsletter & Jobs List
Ocean Opportunities
Eurocean Jobs List
European Geosciences Union – Ocean Sciences Division
Josh's Water Jobs List

NEWS and links to select OPEN ACCESS ARTICLES on OA

News:

The methodology for collecting data to contribute to **Sustainable Development Goal (SDG) 14.3.1 (*"average marine acidity measured at an agreed suite of representative sampling stations"*)** has been accepted and promoted from Tier III to Tier II! Tier II classification means that the "Indicator is conceptually clear, has an internationally established methodology, and standards are available, but data are not regularly produced by countries." The UN Statistics Division shares the metadata of SDG indicators classified as Tier II or Tier I ("Indicator is conceptually clear, has an internationally established methodology, and standards are available, and data are regularly produced by countries for at least 50 per cent of countries and of the population in every region where the indicator is relevant"), but not those classified as Tier III ("No internationally established methodology or standards are yet available for the indicator, but methodology/standards are being developed or tested"). The Indicator Methodology, which provides guidance to scientists and countries about how to carry out measurements and how to report them, was developed with the support of experts in the ocean acidification community, including members of GOA-ON. You can view the methodology here.

The Australian Integrated Marine Observing System (IMOS) has collaborated with the Institute for Marine and Antarctic Studies and the Australian Ocean Data Network (AODN) portal to design and share a series of marine data and science e-lectures. Courses on Ocean Primary Productivity, the Carbon Cycle, and Ocean Acidification are available here. The lectures use real datasets to help students expand their use of Matlab, Python, and/or R code to analyze marine datasets.

An Oct. 29 publication in the Proceedings of the National Academy of Sciences (PNAS) is receiving a lot of media attention. Sulpis et al. connect north Atlantic and Southern Ocean bottom waters that are rich in anthropogenic CO_2 with increased levels of $CaCO_3$ dissolution on the seafloor in portions of those regions. The reaction that causes this has a neutralizing effect on the water, but does not occur quickly enough to neutralize the overarching increase in dissolved ocean CO_2. The findings have negative implications for benthic calcifiers and indicate that anthropogenic CO_2 in the ocean is already having observable effects on sediments in some locations. The original article is available here.

Open-access science:

Bates, N.R. 2018. **Seawater carbonate chemistry distributions across the Eastern South Pacific Ocean sampled as part of the GEOTRACES Project and changes in marine carbonate chemistry over the past 20 years.** *Frontiers in Marine Science*. DOI 10.3389/fmars.2018.00398

Ericson, J.A., Hellessey, N., Kawaguchi, S., Nicol, S., Nichols, P.D., Hoem, N., and P. Virtue. 2018. **Adult Antarctic krill proves resilient in a simulated high CO_2 ocean.** *Communications Biology.* 1(1):1-9 DOI 10.1038/s42003-018-0195-3

Falkenberg, L.J., Dupont, S., and R.G.J. Bellerby. 2018. **Approaches to reconsider literature on physiological effects of environmental change: examples from ocean acidification research.** *Frontiers in Marine Science.* https://doi.org/10.3389/fmars.2018.00453

Jiahuan, R., Wenhao, S., Xiaofan, G., Wei, S., Shanjie, Z., Maolong, H. and L. Guangxu. 2018. **Ocean acidification impairs foraging behavior by interfering with olfactory neural signal transduction in Black Sea Bream, *Acanthopagrus schlegelii.*** *Frontiers in Marine Science.* DOI 10.3389/fphys.2018.01592

Markowitz, D.M., Laha, R., Perone, B.P., Pea, R.D., and J.N. Bailenson. 2018. **Immersive virtual reality field trips facilitate learning about climate change.** *Frontiers in Psychology*. https://doi.org/10.3389/fpsyg.2018.02364

Martinez, A., Hernandez-Terrones, L., Rebolledo-Vieyra, M., and A. Paytan. 2018. **Impact of carbonate saturation on large Caribbean benthic foraminifera assemblages.** *Biogeosciences*. DOI 10.5194/bg-15-6819-2018

Meng, Y., Guo, Z., Fitzer, S.C., Upadhyay, A., Chan, V.B.S., Li., C., et al. 2018. **Ocean acidification reduces hardness and stiffness of a Portuguese oyster shell with impaired microstructure: a hierarchical analysis.** *Biogeosciences.* DOI 10.5194/bg-15-6833-2018

Ramesh, K., Hu., M.Y., Thomsen, J., Bleich, M., and F. Melzner. 2018. **Mussel larvae modify calcifying fluid carbonate chemistry to promote calcification.** *Nature Communications* 8(1):1-8. DOI 10.1038/s41467-017-01806-8.