



# The 4<sup>th</sup> Global Ocean Acidification Observing Network (GOA-ON) International Workshop

Apr. 14 - 17, 2019 • Hangzhou, China

## **Introduction to and session descriptions of The 4th GOA-ON International Workshop**

14-17 April 2019 Hangzhou, China

The 4th GOA-ON International Workshop will bring together scientists from around the world to discuss emerging aspects from the coupled effects of ocean acidification with multi-stressors, review global ocean acidification status and forecast capabilities, and explore opportunities for capacity development. We seek to better understand ocean acidification's impacts on industry, increase coordination across nations and stakeholders, and highlight the widespread recognition of the threat of ocean acidification to the health and sustainability of marine ecosystems.

Topics to be covered are:

- Ocean and coastal acidification in a multi-stressors environment
- Observing ocean and coastal acidification and the impacts on organisms and ecosystems
- Regional and global modelling on physical-biogeochemical coupling processes related to ocean acidification and the associated ecosystem responses
- Shaping GOA-ON to better meet the information needs of global to local decision makers

The workshop consists of various events to facilitate an open, multi-level and comprehensive communication and exchange among participants. There will be invited keynotes, selected oral presentations at plenary sessions, parallel sessions which will feature accepted oral presentations leading into workshop-style discussion as a way to develop guidance for future GOA-ON efforts, poster sessions, special events, and summaries organized in a three-and-a half day program. In addition, the Organizing Committee will host several activities to foster a relaxing atmosphere for participants, including ice-breaker, workshop banquet, and city tour by night.

### **Session 1: Ocean and coastal acidification in a multi-stressors environment**

***Co-Conveners: Bronte Tilbrook & Wei-Jun Cai***

#### ***Description:***

Marine ecosystems are under increasing threats from changing environmental conditions. Multiple environmental stressors may interact to produce complex and unexpected effects, including “synergistic” effects that are greater than the sum of those caused by individual stressors. In many regions, the interaction between ocean acidification and other stressors, including warming, hypoxia, and Harmful Algal Blooms (HABs), is expected to alter marine ecosystems and the extent of biological impacts. The consideration of multi-stressors in examining ocean and coastal acidification and the impacts on ecosystems is an emerging need for synthesizing current research and for providing novel insights into the future ocean. This session invites submissions of field observations, laboratory experiments, model simulations and synthesis work on the role of multi-stressors in examining present and future





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responses to ocean acidification.

## **Session 2: Observing ocean and coastal acidification and the impacts on organisms and ecosystems**

**Co-Conveners: Maciej Telszewski & Kunshan Gao**

### **Description:**

Ocean acidification is a progressive environmental change observed in oceanic and coastal waters; its effects on marine organisms and ecosystems are gaining increasing attention and are projected to increase with time. With the development and expansion of observing networks to monitor change, including advances in floats, gliders, real-time data acquisition systems, and geo-stationary satellites, it is imperative to acquire and exchange sufficient data to document chemical and biological change due to ocean acidification. Ecological, biogeochemical, physiological and molecular responses of different organisms, populations and communities to ocean acidification need to be observed and documented, especially in the context of multiple stressors and fluctuating environmental conditions. Such data will help to secure an understanding that facilitates modeling of ocean acidification and its effects to allow for forecasting of ecological consequences. This session welcomes contributions that address progress and needs for ocean and coastal observations to monitor ocean acidification and its effects, considerations for optimizing data sharing and recommendations on data synthesis products from observational data.

## **Session 3: Regional and global modelling on physical-biogeochemical coupling processes related to ocean acidification and associated ecosystem responses**

**Co-Conveners: Samantha Siedlecki & Feng Zhou**

### **Description:**

One of GOA-ON's three goals is to acquire and exchange the data and knowledge necessary to optimize modeling for ocean acidification and its impacts, specifically to provide spatially and temporally resolved biogeochemical data for use in parameterizing and validating models, including societally-relevant forecasts and projections. Recent advancements in *in-situ* experiments and observing capabilities have facilitated the development of high-resolution models capable of delivering prognostic information, aiding evaluation of key processes, and identifying regions of heightened vulnerability or resilience. There is need to develop world-wide predictive capability for ocean biogeochemistry and ecosystems on time scales ranging from days to seasons to decades to better monitor and forecast changes relevant to resource management and to assure their integration with data from ocean observing platforms. Improved observing data frequency and coverage both in time and space has allowed improved constraints on ecosystem and biogeochemical models. In this session, we welcome contributions on modeling activities from global to coastal regions advancing the development of marine ecosystem forecasting relevant to ocean acidification. Research addressing biogeochemical modelling approaches, development of operational systems, biogeochemical model validation and data assimilation, and physical-biogeochemical coupling are particularly encouraged.





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## **Session 4: Shaping GOA-ON to better meet the information needs of global to local decision makers**

*Co-Conveners: Libby Jewett & Kirsten Isensee*

### **Description:**

Ocean acidification has potentially serious ramifications for life in the ocean. GOA-ON is focused on providing actionable information for decision makers, whether they be delegates to the UN Framework Convention on Climate Change (UNFCCC), the 2030 Agenda or oyster growers along the coast. The scope of this session is to discuss how ocean acidification and ecosystem response information is currently used and how GOA-ON might improve access to information needed by decision makers. China has a very large aquaculture industry that we hope to engage as a case study, bringing scientists together with aquaculture operators to discuss what information is needed to ensure the long-term viability of an industry that is an increasingly important source of protein for a growing human population world-wide. On the global scale, the session welcomes contributions on development of GOA-ON products within the context of the UN Sustainable Development Goals (SDG) 14.3 target (2030 Agenda). On the local scale, the session invites submissions on how to develop tailored ocean acidification sampling strategies that can support aquaculture and fisheries industries to adapt to and mitigate negative impacts and increase local knowledge to understand regional vulnerability to ocean acidification. We welcome contributions on effective ways to communicate ocean acidification to enhance engagement.

