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In situ sensors for ocean acidification research – Synopsis

February 7th-8th, 2018

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February 26, 2019

Workshop Objectives

The OA sensor workshop was convened over two days (February 7th-8th, 2018) at the Laurel Point Inn, Victoria, British Columbia.

The purpose of the workshop was to convene a panel of experts to assess the state of the technology for ocean acidification sensors and make recommendations for maximizing the value of the existing and future data collections.

Workshop discussions and presentations were framed in the context of three major topic/questions:

1. *What are the factors limiting the precision, accuracy and reliability of sensor data?*
2. *What can we do to facilitate the QA/QC process and optimize the utility of these data?*
3. *What sort of data or metadata do we need to make these data most useful to future users?*

Agenda

Wednesday, February 7

- 0900 Welcome and Introductions, goals of the workshop
- 0930 General discussion of workshop goals and format
- 1000 coffee break
- 1015 **New technologies for sensor-based observations. Advantages and challenges of pCO₂ optodes. (Atamanchuk)**
- 1100 Discussion
- 1120 **Evaluation of sensor performance under controlled extreme conditions (Miller)**
- 1135 Discussion
- 1200 Lunch break
- 1300 **OA monitoring and its social promotion in Japan (Ono/Nakaoka/Shinoda)**
- 1330 Discussion
- 1400 **Major topic 1 - What are the factors limiting the precision, accuracy and reliability of sensor data?**
- 1500 coffee break
- 1515 **Major topic 2 - What can we do to facilitate the QA/QC process and optimize the utility of these data?**
- 1630 Review and synthesis
- 1700 adjourn
- 1800 Group dinner

Agenda

Thursday, February 8

- 0900 Review of previous day's discussion
- 0915 **Major topic 3 - What sort of data or metadata do we need to make these data most useful to future users?**
- 1000 coffee break
- 1015 **The ONC vertical profiler data set (Mihaly)**
- 1030 Discussion
- 1045 **European OA sensor projects: thoughts, advances and a planned way forward (Achterberg)**
- 1100 Discussion
- 1115 **New developments at SeaBird Instruments (Murphy)**
- 1130 Discussion
- 1200 Lunch break
- 1300 **Review of the three Major Topics: what do we want to get out of this workshop?**
- 1330 **Microfluidic pH sensors (Bresnahan)**
- 1400 Discussion of existing ONC data sets
- 1430 **Instrumented Alaska and BC Ferries pCO₂ inter-comparisons (Evans)**
- 1500 coffee break
- 1530 Review and synthesis
- 1700 adjourn

Major Outcomes

- 1. There is little consensus on Metadata standards for OA sensors. We should compile a list of standards and identify common practices from existing approaches: SOCAT, ARGO, WOCE.
 - a. Justin Buck has offered to help with assembly of existing (and scattered) Metadata standard)**
- 2. We need to establish a practical division between technical limitations of sensors and human execution of both sensor use and discrete sample collection/analyses.*
- 3. Recognition that current data are based on old physical chemistry. Uncertainty about some formulae derived in decades past propagates through extrapolations from raw sensor output and limits our ability to provide meaningful sea truth. .*
- 4. Should we set up for a limited duration an online web-forum for discussion of techniques? Instrument and sensor directory? IOOCP may be a good forum for this.*

Report Status

Workshop attendees agreed to submit the report as a multi-authored ‘Perspectives’ piece to Frontiers in Marine Science



Research Topic

Best Practices in Ocean Observing

Submit your abstract

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Overview

Articles **1**

Authors **72**

Impact

Comments

Submission Deadline: March 15, 2019

*Draft MS in review with co-authors;
plan to submit March 10, 2019.*

About this Research Topic

An immense corpus of well-tested methodology in ocean observing has been and is being amassed by national, regional, and international observatory networks. However, despite the quality of these efforts, the discoverability and sustainability of high-quality methodology is still limited by fragmented reporting and archiving. A new process, centred at the Ocean Best Practices repository of UNESCO IODE, is addressing part of these challenges by offering a persistent archive for methods and "Best Practises" (BPs). What remains is the creation of a forum to allow BP creators to describe and disseminate their developments. This Research Topic is an opportunity for BP developers to expose their methods to the ocean

Attendees (n=20)



Name	Affiliation	Country
Eric Achterberg	GEOMAR	Germany
Dariaa	Dalhousie University	Canada
Atamanchuk		
Justin Buck (remotely)	British Oceanographic Data Centre	UK
Philip Bresnahan	Scripps Institution of Oceanography	US
Jim Christian	Fisheries and Oceans Canada	Local
Patrick Duke	University of Calgary	Canada
Wiley Evans	Hakai Institute	Canada
Stephen Gonski	University of Calgary	Canada
Bruce Johnson	Pro-Oceanus Systems Incorporated	Canada
Kim Juniper	Ocean Networks Canada	Local
Steve Mihaly	Ocean Networks Canada	Local
Lisa Miller	Fisheries & Oceans Canada	Local
Mike Morley	Ocean Networks Canada	Local
Dave Murphy	Sea-Bird Scientific	US
Shin-ichiro Nakaoka	National Institute for Environmental Studies	Japan
Tsuneo Ono	National Research Institute for Far Seas Fisheries / Japan Fisheries Research and Education Agency	Japan
George Parker	Ocean Networks Canada	Local
Akash Sastri	Ocean Networks Canada	Local
Kyle Simpson	Fisheries & Oceans Canada	Local
Tomohiko Tsunoda	Sasakawa Peace Foundation	Japan

Media Outreach

TIMES COLONIST  MENU

LATEST NEWS Sailboat sinks in Selkirk waterway after explosion and fire

Scientists gather to push for data on ocean acidification

Richard Watts / Times Colonist
FEBRUARY 8, 2018 06:00 AM

Like 3     

Carbon dioxide is increasingly dissolving in the oceans and turning them more acidic, so scientists need a way to measure the phenomenon, a workshop of ocean scientists heard on Wednesday.

"Ocean acidification is happening globally," said Jim Christian, research scientist with Fisheries and Oceans Canada.

A study published last year in *Nature* found that some marine snails thriving in seawater that was 30 times more acidic than today's oceans suggests some animals are able to adapt to ocean acidification.

The Narwhal

Climate change raises ongoing questions

But, as the impacts of climate change increase, there is also the question of which creatures will be able to withstand the multiple stressors of increasing temperatures and decreasing oxygen, Ianson said.

One key to understanding what is happening in the water that surrounds us is to gather the essential baseline information. Sensors that measure pH levels are being installed at stations along the [Ocean Networks Canada observatory system](#) and on B.C. Ferries.

Jim Christian, research scientist with Fisheries and Oceans Canada and an adjunct faculty member at the University of Victoria, recently led an international workshop on gathering data to measure ocean acidification.

 Ocean Networks 
@Ocean_Networks

Follow

Framed by #VictoriaBC's picturesque harbour, CBC radio reporter Khalil Akhtar interviews @Ocean_Networks' chief scientist @skjuniper about this week's international workshop on collecting reliable ocean acidification #data. #climatechange #YYJ #knowtheocean



11:22 AM - 7 Feb 2018 from Victoria, British Columbia

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THANK YOU!

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