



Global Ocean Acidification
Observing Network

**Global Ocean Acidification Observing Network (GOA-ON)
5th Annual Executive Council Meeting
Sopot, Poland
28th-30th May 2018**



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Objective of the meeting

The Global Ocean Acidification Observing Network ([GOA-ON](#)) held its 5th Annual Executive Council Meeting at the Institute of Oceanology of the Polish Academy of Science (IO PAN) in Sopot, Poland. The Objective of the meeting was to discuss upcoming activities, including the organization of the next GOA-ON International Workshop in Hangzhou, China, and capacity building activities. During the three day meeting the GOA-ON Executive Council Members further addressed new guidelines and recommendations, such as the Methodology for the Sustainable Development Goal Indicator 14.3.1, and heard updates from the regional hubs, with plans for coordination and collaborations on all scales. The new Distributed Secretariat was introduced and their roles and responsibilities defined.

1. Welcome

Welcome by Prof. Jan Marcin Węstawski, Director of the Institute of Oceanology of the Polish Academy of Sciences (IO PAN) and Maciej Telszewski.

2. Introductions and welcome to attendees and Secretariat

Welcome and introduction of attendees (see Annexe of Agenda for list of attendees). Three new EC members were welcomed, Nayrah Shaltout (National Institute of Oceanography and Fisheries, Egypt), Helen Findlay (Plymouth Marine Laboratory, UK), and Somkiat Khokiattiwong (Phuket Marine Biological Center, Thailand). Three new secretariat members were also welcomed, Katherina Schoo (IOC-UNESCO), Marine Lebrech (IAEA) and Meredith Kurz (NOAA).

3. Next GOA-ON Workshop Organization- Hangzhou 2019 (Fei Chai)

The next GOA-ON workshop is to be hosted by the State Key Lab of Satellite Ocean Environment Dynamics in Hangzhou. The local organizers are currently looking for suitable hotels and venues.

Following a presentation on background and information on the institute, and the city/region itself, the themes of the workshop were introduced (details are to be confirmed):

Themes:

1. Ocean and coastal acidification in a multi-stressors environment
2. Observing and monitoring ocean and coastal acidification and impact on ecosystems
3. Modelling and forecasting ocean and coastal acidification and ecosystem responses
4. How GOA-ON can better provide societal benefit through assessing stakeholders' needs and enhanced scientific capacity building

The local organizing committee and organizing staff will start preparations with support from the GOA-ON Secretariat and a local conference company. Two members of the GOA-ON EC (Fei Chai and Jan Newton) are Co-chairs of the Scientific Committee. A carbon offset charge will be levied. The participants of the workshop will include leading scientists, representatives from aquaculture, post graduate students, early career scientists and government officers. Participants will be required to pay a registration fee for the workshop. The workshop will be held in English and Chinese, simultaneous translation will be provided, to facilitate communication. The preliminary timetable was presented:

- Day 0: Arrival, pre-workshop on OA impacts in aquaculture (including people from industry).
- Day 1: Science Symposium: How GOA-ON has contributed to global and regional scientific understanding including through contributing to model development
- Day 2 and 3: Breakout Sessions (topics might include how to improve observations for models: and how to improve implementation regionally and globally) and Posters
- Day 4: Local field trip

Timeline

- July 2018: First call to go out to the public.
- December 2018: Deadline for early registration.
- January 2019: Detailed planning to start in January 2019, with the help from the GOA-ON Secretariat, as registration numbers and the associated fees will allow for budgeting.

Discussion and follow-up:

- The Ocean in a High-CO₂ World meeting is taking place in 2020 with similar themes; there is potential overlap between these two meetings.
- In coordination with the Executive Council the dates for the workshop were decided: 14 -18 April 2019.
- The name of meeting was finalised: 4th Global Ocean Acidification Observing Network (GOA-ON) International Workshop.

- The interaction with different stakeholders will need to be enforced, to increase their engagement and to improve the services provides by a ‘new generation’ of models. Case studies are one example of how to facilitate this communication.
- Among the potential outcomes of the workshop for GOA-ON will be the identification of gaps.
- The estimation of the number of participants, both national and international, needs to be adapted.
- It was reported that the Global Coral Reef Monitoring Network has asked for IOC’s input on OA observations. It would therefore be good to include coral reef monitoring communities in the workshop.
- International participation at the workshop, including Africa and South America, will need travel support.
- More focus is to be given to biology; many biologists are not aware that GOA-ON includes biological data despite GOA-ON’s Goal 2 which is focused on biology.
- The GOA-ON EC will be invited to be part of the Organizing Committee.
- The next Annual GOA-ON EC meeting is to take place on April 13th, 2019, and on April 18th, 2019, to coincide with the arrival and travelling/local field trip days of the 4th International GOA-ON Workshop in Hangzhou.

4. Updates on coordination with other networks (Libby Jewett)

Organisation / Network	Now	Outlook
NOAA OAP NOAA Ocean Acidification Program (Libby Jewett)	Funding is increasing	<ul style="list-style-type: none"> • Funding for research into mercuric chloride (Andrew Dickson funded for 3 years), and for study into alternatives to m-cresol dye for Spectrophotometric pH • funding to support travel grants for workshop in China in April 2019 • funding for North American Hub workshop • University of Washington will host a small workshop to develop a better methodology for detecting OA trends in coastal mooring time series • increased funding for the GOA-ON data portal website for the next 3 years
IOC-UNESCO Intergovernmental Oceanographic Commission of UNESCO (Kirsten Isensee)	<ul style="list-style-type: none"> • Supported WIOMSA in securing funding for ocean acidification 	<ul style="list-style-type: none"> • Funding for an Expert workshop on the SDG later this year • Funding for biological working group workshop 2018 or 2019 • Funding for Secretariat post for 18 months (Katherina Schoo)
IOCCP International Ocean carbon Coordination Project (Maciej Telszewski)	<ul style="list-style-type: none"> • Undergoing review from sponsors and 3 year extended funding 	<ul style="list-style-type: none"> • Efforts to include other Essential Ocean Variables not yet part of GOA-ON: oxygen, nitrous oxide, dissolved inorganic carbon.
SOLAS IMBER (Lina Hansson)	<ul style="list-style-type: none"> • Carbon working group disbanded in 2017, now lacking a carbon research think-tank. 	<ul style="list-style-type: none"> • Talks of a new implementation plan for future.

Organisation / Network	Now	Outlook
GOOS Global Ocean Observing System (Kirsten Isensee)	<ul style="list-style-type: none"> Look to GOA-ON for OA data. 	<ul style="list-style-type: none"> Reorganizing the coral reef program (funded by NOAA OAP) Link GOA-ON Implementation Strategy to GOOS methodology.
GCRNM Global Coral Reef Monitoring Network (Kirsten Isensee)	<ul style="list-style-type: none"> IOC part of the working group to guide the development of GCRMN as an ocean observing network NOAA also involved 	<ul style="list-style-type: none"> ICRI (parental body of GCRMN) new Presidency - Monaco, Australia, and Indonesia
WIOMSA Western Indian Ocean Marine Science Association (Kirsten Isensee)	<ul style="list-style-type: none"> WIOMSA, FutureEarth, IAEA, IOC workshop to discuss gaps. Received funding to support projects ocean acidification observation and research. 	<ul style="list-style-type: none"> Survey and proposal for projects, identify recipients.
GEO Group on Earth Observations (Somkiat Khokiattiwong)	<ul style="list-style-type: none"> Inventory of data by Blue Planet. Providing travel funding for GEO member states. 	<ul style="list-style-type: none"> Looking for another person with a marine focus.
IAEA OA-ICC International Atomic Energy Agency Ocean Acidification International Coordination Center (Lina Hansson)	<ul style="list-style-type: none"> Awaiting news on continued funding for the OA-ICC for next year 	<ul style="list-style-type: none"> Annual SIOA/OA-ICC expert meetings end of June in Monaco Funding for a workshop/training on data analysis and to test the SDG methodology, 22-26 October 2018 in Monaco Planned training courses in Sweden and Kuwait in June and Nov 2018 Collaboration in other courses organized by PERSGA, LAOCA and other partners Funding to support a meeting of the OA-Africa Executive Council in October 2018 (Liberia) Funding for Secretariat post for 2 years (Marine Lebrech)

Discussion and follow-up:

The EC agreed that the interaction with the networks is key to building a strong and relevant GOA-ON. Issues and opportunities discussed were:

- Upcoming workshops in Seattle to discuss how to handle data management among different groups. Development of QC routines at PMEL for shelf data/ coastal OA data. Future workshops to determine communication between data streams.
- Western Indian Ocean Marine Science Association (WIOMSA) is a success story where GOA-ON has helped facilitate the award of funding for OA research. The effort should be documented to provide an example of how GOA-ON and partner groups are building the observing capability and integrating new efforts into the network. **Action: Secretariat** to showcase this success story in newsletter and on website, giving recognition to those involved.
- Potential groups to reach for establishing stronger collaboration: GO₂NE (IOC working group: Global Ocean Oxygen NEtwork) working group will be meeting in Kiel, Germany in September 2018. Scientific publications are forthcoming. Multi stressor environments / OA are part of the discussion.

- The IAEA supported a workshop on OA in 2016 for Member States of the Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden ([PERSGA](#)). IAEA has arrangements to teach another course this year, as well as providing input toward preparation and some funding from IAEA. The GOA-ON Secretariat could be involved in communication with PERSGA countries.
- The new edition of the World Ocean Assessment is scheduled to come out in 2020 and OA is to be included in one of the chapters. Guidelines for the WOA were discussed.
- IPCC Special Report on Oceans and Cryosphere does not include enough discussion on OA in coastal environments and may have contradictions in the different sections or require more up to date information. GOA-ON EC and other members need to be alerted to the need to review the oceans report. Timeline: 1) Input required by end of 2018 (review of second order draft) and cut-off for inclusion of published papers by 15 May 2019, 2) Third lead author meeting July 2018, 3) Report finalised 14. June – 9. August 2019.
- At the GEO Blue Planet meeting last year participants were reportedly very interested in GOA-ON. Blue Planet is mostly an organisation for meetings, but with local hubs, which is considered helpful.
- International Group of Marine Ecological Time Series ([IGMETS](#)) have completed a stocktake of time series stations for ecology and have done some work on shipboard biogeochemical time series. The EC asked the secretariat to determine which (IGMETS) sites have carbonate chemistry data and are identified on the GOA-ON data portal. These sites may provide a way to identify existing infrastructure relevant to GOA-ON and identify opportunities to build the observing network. **Action:** Secretariat and technical architects to undertake a stocktake of the stations/platforms/moorings sending current and live carbonate data.

Group discussion: Definition of GOA-ON in the context of the other networks (Maciej Telszewski)

Is GOA-ON a Network? During the discussion GOA-ON was placed in the overall OA space using a value chain diagram (value chain adapted from G7 Think Piece on Ocean Observations).

The value chain comprises:

- Data systems
- Assessing and understanding
- End user societal benefit (governing/acting)
- Observations Coordination
- Services (informing)
- Predicting/modelling
- System requirements

Discussion and follow-up:

- GOA-ON interacts with SOCAT, GLODAP and other networks coordinating global databases, and facilitating observing and interaction with stakeholders.
- Open ocean is mostly covered by the other more established carbon networks but coastal observation is the GOA-ON niche and strength; coastal seas are where most of the stakeholders are. Opportunities to increase visibility of GOA-ON are needed e.g. through providing predictions for shellfish communities.
- Capacity building is an important part of GOA-ON, leading to observation and coordination: observations are being carried out through capacity building that would otherwise not be happening and with a great rate of success. GOA-ON is getting involved in capacity and network building in ways that are not always obvious and this effort needs to be advertised more visibly.
- GOA-ON has a key role in contributing to observations in developing countries and coordination through regional collaboration hubs, e.g. the WIOMSA OA effort included GOA-ON advice and guidance and GOA-ON provides a greater scope for stakeholder interaction for WIOMSA OA researchers at a national and international level.
- More funding opportunities have been made available to members due to participation in GOA-ON, and national funding sources are typically more responsive to members than to individual labs or researchers. Recognition of GOA-ON by the UN General Assembly in 2017 and the inclusion of OA as a headline climate indicator for the United Nations Framework Convention on Climate Change (UNFCCC) are also likely to increase awareness of OA and increase opportunities to support observing.
- The schematic (value chain) is to be part of the GOA-ON led community whitepaper for OceanObs'19. This is an opportunity to qualify what GOA-ON is and where the network sees itself, with strengths and weaknesses, and scope for development.

- A question was raised as to whether GOA-ON needs to distinguish itself more strongly from other groups. The strengths and benefits of cooperating with GOA-ON are not clear to some groups and the whitepaper will help describe and provide outreach on the functions of GOA-ON. Equally, it is not clear if GOA-ON benefits from the same interactions, as OA may be included in a long list by other groups and not acted upon because they are not the first priority. .
- Funding opportunities will be more clearly visible and defined if agencies have a better idea of the particular role of the network.
- Open ocean community need to be made more aware of the benefits of GOA-ON's coastal work, as both coastal and open ocean data together are crucial to get the whole picture.
- The GOA-ON hub approach was considered beneficial to promote the development and coordination of local expertise to address the regional issues.

5. **GOA-ON Implementation Strategy Process (Jan Newton)**

The group agreed that the Strategy will be a living document. It will include hyperlinks, allowing regular updates. The Strategy is structured as follows:

- 1) Information on framing the issue
Articulate why participation in GOA-ON is important and relevant
 - 2) Implementing GOA-ON via regional hubs and capacity building.
How to build observing capacity, improve regional coordination including mentorship and training opportunities, close gaps in observing and knowledge.
 - 3) Implementing GOA-ON Goal 1: Measurement Quality:
Update information on the measurement data quality goals of GOA-ON Goal 1
 - 4) Implementing GOA-ON Goal 2: Biological Needs
Recommendation on how to implement goal 2: ecosystem responses, some content is still needed, especially for chemical monitoring needed to support the biology and core variables to observe.
 - 5) Implementing GOA-ON Goal 3: Data requirements for Forecasting OA and its impacts
No comments yet provided on this section, input is needed to optimize model forecasting
 - 6) Implementing GOA-ON's Data Management
Guidance is needed from GOA-ON's data management experts on data management and the submission strategy for the GOA-ON portal
 - 7) Long-term trend analysis practices for GOA-ON scientists
To be completed after 2019 workshops
- Appendix: References, links, glossary

Discussion and follow up:

Action needed from EC members	Person responsible	Timeline
Review of Implementation Strategy	Executive Council send comments to Jan Newton	15 June 2018
Add SDG content with links Add SDG 14.3.1. methodology with links	Kirsten Isensee to receive comments on document from EC	10 June 2018
Document updates and links in Appendix New chairs for LAOCA, update regional hubs information	Libby Jewett	June 2018
Climate vs weather objective: address uncertainty and pH	Dick Feely	June 2018
Biology outputs, biological observations (Manuscript in progress)	Sam Dupont to receive comments from EC	June 2018

6. GOA-ON website and data portal (Cathy Cosca, Jan Newton)

- GOA-ON is planning to increase the number of live streaming platforms, particularly moorings. All datasets which are streaming live are marked green on data platform. **Action:** Cathy Cosca and Secretariat to coordinate and cooperate on stocktake of live streaming platforms
- The data portal is to be included in the GOA-ON slide deck, including a call to encourage the addition of more platforms. **Action:** Secretariat is responsible for creating the slide deck and for distribution to the members of the EC.
- The GOA-ON website navigation is to be assessed (**Action:** Secretariat will take the lead on this).
- Ensure that the regional hubs and their data platforms are included and a call will be made for more regional platforms to be added. **Action:** Secretariat will contact the regional hubs.
- The possibility of adding a link to other platforms where the data may be available such as SOCAT, GLODAP, to enable people to quickly access data, was discussed.
- GOA-ON newsletter is to include a call to include data and platform, if available. The webpage is to be updated regularly (aiming for bi-weekly/monthly news updates). Members are encouraged to email website@goa-on.org with requests and ideas for news items to be added to the website. This can include conferences, funding calls or opportunities, planned workshops, etc.
- The news slide shown on the website landing page is to be updated regularly, members of the EC were asked to provide slides (to include text on news item, photos and other relevant information, if applicable). Old slides are being archived to the News Tab.

Follow-up

- Analysis of the number of platforms reporting, what is the percentage, can we increase the numbers of these? Cathy Cosca agreed to follow up.
- Benjamin Pfeil mentioned that many data centres do not really provide data even after they committed to doing so. The life cycle of the data from raw to Quality Controlled data should be followed and the data centres should make it available. GOA-ON is aiming to provide [FAIR data](#). Data archive and all data sets and streaming are to be centralised; currently data may be parsed out into many different platforms. Data management is also to be linked to publications, i.e. some countries require published data to be made available: Pangaea, EMODnet etc.
- Based on questions of how data flows from researchers to data centers, Benjamin Pfeil pointed out that if data are submitted to national data centres the centres have an obligation agreed by member nations to deliver these data to the International Oceanographic Data and Information Exchange (IODE) of UNESCO. The standardized methodology to be discussed later will help with the reporting to IODE and GOA-ON, although not all data centres may follow this methodology.
- Not all countries have their own data centres for reporting and Benjamin Pfeil and Kirsten Isensee were asked to write a paragraph for inclusion on the GOA-ON website on how to submit data in this case e.g. through portals like EMODnet (<http://www.emodnet.eu>) who have support to ingest data.
- Data submission: Under the 2030 Agenda and the SDGs it is defined that Targets support SDG goals, and the indicator(s) of a target is the reporting of a measurement. When Indicator 14.3.1 is submitted to the EC of the IOC it will become a UN requirement, making reporting of data a national obligation. The SDG Methodology will thereby be important not just for the target, but also because it provides a good scientific tool.
- The Secretariat is to compile a data handling and data flow into a GOA-ON report.

7. Local Seminar by scientists from IO PAN

Karol Kuliński and Piotr Kukliński from IO PAN presented results of recent studies.

Karol Kuliński presented on the alkalinity titrations in the low salinity waters of the Baltic Sea, where total borate concentrations appear to be underestimated (in press, Marine Chemistry). Data on bryozoan mineralogy were presented by Piotr Kukliński showing most bryozoans at high latitudes were calcitic and the Mg content is variable, but is typically lower at high latitudes than in warmer waters. The talks also showed a documentary of a recently Southern Ocean circumnavigation by a Polish yacht that was the first ever circumnavigation below 60°S under sail. Piotr Kukliński was part of the crew during this adventure.

8. Ocean Acidification Indicators

a. SDG 14.3.1 Methodology (Kirsten Isensee)

The Methodology for the Sustainable Development Goal Indicator 14.3.1 was presented and discussed in detail. The Methodology for 14.3.1 is to be presented at the 51st assembly of the IOC this year (July 2018) and can now be viewed [here](#).

Discussion and follow up:

- Based on the presented document clear international, regional and local capacity/infrastructure gaps were identified, in particular with issues related to reporting of 14.3.1 data sets.
 - Working with the International Oceanographic Data and Information Exchange (IODE) and other international and regional data centres, e.g. ICOS, EMODNET, will facilitate national reporting of OA data sets, as requested by the 14.3.1 methodology.
 - Data processing can be supported by regional hubs, based on local capacity and existing infrastructure. This might require targeted regional workshops for data reporting and processing.
 - WMO-IOC Joint Technical Commission for Oceanography and Marine Meteorology and the IOC International Oceanographic Data and Information Exchange Global Data Assembly Centres (JCOMM/IODE GDAC) will work on quality control (QC), integration, harmonization, and standardization of the data
 - Requested support from the IODE management team in January 2018
 - Support development of a 14.3.1 data repository/portal to be hosted at IODE
 - Encourage strong collaboration between IODE secretariat, IOC HQ, and Expert Group to develop 14.3.1 methodology.
 - OceanTeacher Regional Training Centers (RTCs) are to be utilized for capacity building.
 - NODCs and other relevant National Data Centers are strongly encouraged to participate in the 14.3.1 data collection process.
- GOA-ON can help support the methodology by:
 - Updating the GOA-ON portal and contacting PIs can give insight into which countries are collecting pH and other data required in the methodology. **Action:** Secretariat members to reach out to PIs and members per allocated region.
 - Capacity building efforts to include teaching about how to submit data and why this is important.
 - External Reviewers for the methodology: Kirsten Isensee agreed to send the document to Andrew Dickson, Krisa Arazayus, Abed Hassoun, and Rohan Ramessur.

Timeline:

Date	Goal
January/February 2018	Finalise draft, review data submission and QC process
3-6 July 2018	51 st Session of IOC EC for adopting methodology
July-September 2018	First analysis of SDG 14.3.1 relevant data in collaboration with IODE
November 2018 – April 2019	Development of data infrastructure including data repository, revision of methodology as required
February 2019	Submission for Tier upgrade to IAEG (Interagency Expert Group) on SDG Indicators

b. The Global Climate Indicators (Richard Feely)

In May 2018, the World Meteorological Organization (WMO) through the Global Climate Observing System (GCOS) have recognized OA as a headline climate indicator, which is an important step to increase the visibility of OA and it feeds into reporting for the United Nations Framework Convention on Climate Change. The GCOS indicators are used to tell stories about climate change in a way that can be understood by non-experts; the ocean themes comprise sea level rise and OA. The criteria for physical indicators include: Relevance, representativeness, traceability, timeliness, limited number; an agreed upon data source; aim for annual updates; an example plot. Work on framing this will begin in July and GOA-ON needs to deliver an agreed upon dataset and figure to GCOS (Katy Hill). Discussions points were:

- What data and datasets do we want to report?
 - Surface pH and surface pCO₂ were considered the most available data for the initial reporting.
 - Where: Data from open ocean HOTS, BATS, ESTOC, NIWA etc are possible. The EC settled on:
 - The need for stations that are representative of the major ocean basins.
 - Different stations would be in the same figure and include a map showing location of the station.
 - The number of years needed to discern a trend were considered to be 11 years for the open ocean and as long as 30 years in the more variable coastal ocean.
 - Three open ocean stations and one coastal station would be presented, if possible.
 - All involved will need to agree upon constants, standards, depth ranges, metadata, etc.
- How do we want the data to be represented?
 - Units? Maps, plots, tables?
 - Side-by-side plots of pCO₂ and pH
 - Where are the data going to be located (GOA-ON website or portal)? This is still to be determined.
- How will the information be updated and who will do it? How will it be funded is still to be determined.
- How do we want this product to grow over time?
 - Review sites and consider adding new sites at future EC meetings
 - Consider expanding to coastal stations if there is sufficient data
- Timeline and Action
 - WMO annual climate report comes out in April 2019.
 - Richard Feely has agreed to evaluate the data and to prepare an initial figure (with support by Marine Lebec) to send to GCOS by the end of June 2018.

9. Regional Networks (Bronte Tilbrook)

European Hub: (Helen Findlay), other contact is Steve Widdicombe

Plymouth Marine Laboratory (PML) is acting as coordination center to promote GOA-ON activities. The hub is in the early stages of development and is utilising the range of expertise in-house (biological, carbonate monitoring, ocean acidification experiments, modelling), especially for the Western English Channel Observatory as an exemplar case study on the implementation of multi-parameter OA monitoring.

- The regions considered within the Northeast Atlantic hub are based on ICES Final report (OSPAR Regions). The next goal is to start discussion with other countries outside of the northeast Atlantic Region.
- Carol Turley is actively promoting GOA-ON at COP and other meetings.
- The hub has applied to the UK Department of Food and Rural affairs (DEFRA) for funding for a workshop for strategy development with European partners about the North East Atlantic (NEA) hub. The hub has also applied for additional funds for going to COP24 for a display/attendance. Funds are being sought to support a website.
- The next steps will include contacting JERICO (Joint European Research Infrastructure Network for Coastal Observatories) and GOA-ON members from European countries in the North-eastern Atlantic region.
- Recent publications covering OA from countries in Europe field will also be used to contact the authors as possible hub contributors.

OA Africa (Nayrah Shaltout)

The goals and visions of OA Africa are to ensure that Africa is resilient to, and knowledgeable about, the potential threats posed by OA. This will be done through the efforts of a network of scientists coordinating OA research and monitoring to provide information and guidance to stakeholders and policymakers. Between the first hub meeting in 2015 and the second in 2017 there has been a marked increase in the number of members, especially on the west coast of Africa. Several successful training workshops and meetings have taken place since the start of the network.

- In an effort to promote OA on World Ocean Day a simultaneous sampling of OA on that day along the coast of the African continent took place. The measurements were recorded in a map and spread via social media to raise awareness and compare pH values. This led to increased visibility of the issue and the network.
- Concerning the status of the OA Africa White Paper, there are 4 papers at different stages for the various regions of Africa. It would be good to feature these white papers on the GOA-ON website (**Action:** Marine Lebec to take the lead on this) and to also have WIOMSA feature it.
- The ApHRICA project consists of the deployment of SAMI pH sensors in the south-western Indian Ocean, building on knowledge gained from previous workshops to start monitoring efforts.
- Africa Day of Seas and Ocean is a 2 day symposium focused on blue economy, which will take place in October 2018. The theme is to improve governance and resource management.
- An Infrastructure and training survey (Sam Dupont) is ongoing to evaluate the current state of and to facilitate and focus future efforts.
- Current policy engagement and funding sources are aiming at identifying and engaging with research, outreach, policy agencies to increase awareness and funding.
- OA Africa aims to increase understanding of impacts on local marine resources affecting food security, fisheries jobs, aquaculture industry, and MPAs.

Discussion and developments:

- WIOMSA is calling for proposals for monitoring OA or experiments on biological response to OA.
- Three projects have been proposed and have asked Nayrah Shaltout for help finding a funding agency.
 - The Pier2Pier program has just funded 2 OA projects in Africa, in Nigeria and Ivory Coast.
- The designation of more leaders in the network is recommended to facilitate planning within the hub, such as coordinated World Ocean Day events.
- An update on the number of people that have had training and the number of countries involved is required to see where gaps exist.
- There are plans for IAEA to fund an OA-Africa steering committee meeting preceding the data management workshop in October 2018 in Monaco as an opportunity to develop the hub more.
- Communication in the network means more people are joining: it is considered necessary to get email addresses to establish and maintain contact. This is difficult due to sometimes limited resources, cultural differences, or lack of facilities.
- A suggestion to support funding for someone to help the African network in an administrative role has been put to the EC.
- France has labs established in Africa, and try to include some of these researchers. France has submitted a voluntary commitment in the framework of the SDG 14 (#OceanAction17506)

WESTPAC (Somkiat Khokiattiwong)

The focus of this hub is on the ocean acidification effects on coral reef ecosystems; however, ocean forecasting system and monsoon onset monitoring are important research themes. Goals for this hub includes standard operating guidelines/manuals for OA monitoring in this particular region.

Workshops / trainings:

- The first OA workshop 2015 in Thailand had 35 participants (including NOAA and WHOI).
- The 2nd OA workshop took also place in 2015 and had a thematic focus on SOPs, determining what exactly needs to be measured. The workshop created a technical manual working group.
- The 3rd workshop in 2016 followed the creation of the SOP and moved on to hands-on trainings using the established SOPs (ARM processes for biological data), pH and TA measurements.

- WESTPAC was involved at 10th WESTPAC Science Symposium in session on OA and its impacts. This included the organisation of a workshop to inform and foster cooperation and collaboration.
- WESTPAC has a voluntary commitment for capacity building and monitoring (#OceanAction15266, #OceanAction15274).
- The 4th workshop for OA group of WESTPAC showed that several countries have implemented the SOPs. Several others secured funding to implement SOPs. The goal is to include Korea soon.
- There have been discussions on China's involvement in WESTPAC, as China currently does not have its own national OA program.
- Coordination between WESTPAC workshop and Hangzhou 2019 GOA-ON meeting has been proposed. **Action:** Fei Chai and Somkiat Khokiattiwong to coordinate efforts on this.
- Currently the website for WESTPAC is the IOC sub-commission website. A link to OA WESTPAC from the GOA-ON website is to be set up.

LAOCA (Cristian Vargas)

Update on the regional hub:

- New countries have joined the hub: Costa Rica and Panama. Most data quality in LAOCA is category 2 (a few in category 1). New co-chairs have been appointed for the next 2 years for LAOCA.
- LAOCA has seen International representation at the OAiRUG meeting, GOOS meeting.
- In 2019 the first carbon chemistry cross- calibration exercise is planned in the hub.
- There is no updated database of observing systems in the region; this is a priority for the hub and for GOA-ON. **Action:** Cristian Vargas and Meredith Kurz to increase representation of OA observing efforts on the portal, with support from Cathy Cosca.
- An updated draft version on OA research in Latin America is to be produced.
- The LAOCA Symposium in 2017 (info accessible via website) had 76 participants (sessions: observations, modelling, and physiological effects of OA). The Symposium identified gaps in monitoring efforts and gaps in modelling. Next LAOCA symposium will take place in 2020 in Peru. **Action:** Cristian Vargas, Meredith Kurz and Michelle Graco to compile lists of past participants and capacity development efforts in the region to avoid repeated efforts and identify gaps.
- The visibility of the effects OA has on shellfish needs to be increased, particularly in this region.

Upcoming activities/ capacity building:

- 2018 Galapagos OA School will take place in August 2018.
- In 2019 the hub wants to organize a meeting with some regional hubs for specific ecosystems (coral reefs vs upwelling regions for example).
- LAOCA will support a 2019 workshop focused on impacts to shellfish industry, mixing social science with natural science in a manner similar to the Regional Vulnerability Assessment (RVA) project in Washington State, USA. **Action:** Jan Newton and Cristian Vargas are to communicate on this further.
- There are some difficulty with shipping of chemicals. GOA-ON staff experienced with shipping instruments and chemicals are called upon to help and reach out to people with experience in these matters. **Action:** Meredith Kurz to gather information to facilitate shipping of chemicals
- Idea to reach out to Caribbean SIDS (Small Island Developing States) to assess potential to organize together as a small hub.

North American Hub (Richard Feely)

This hub is in the early stages of development. Following the first conference call with 37 participants in September 2017 to discuss the vision for the hub a survey to assess the needs of the community was carried out. The first face to face meeting of the hub will take place at the Hakai Institute in October 2018. There is strong collaboration in Canada.

- The USA includes EPA, NOAA, IOOS and state programs (WOAC, for example).
- Among the interests from the group are issues such as helping with trainings, data exchange between countries, webinars.
- NOAA, Fisheries and Oceans Canada (DFO) meeting is taking place in mid- October 2018, which will require coordination since the Hakai Meeting is scheduled around the same time and many members are likely to

be participating in both. **Action:** EC Members in North America to make an effort to attend the Hakai meeting.

- Coral reef experts from Mexico, who attended the OA-iRUG Meeting in Santa Marta need to be included in the hub.
- **Action:** Richard Feely and Cathy Cosca to work on a website for the hub.

10. OceanObs'19 (Richard Feely, Jan Newton)

The next OceanObs conference will take place from September 16-20, 2019 in Hawaii. The conference has had a strong influence in new directions for ocean observations in the past: OceanObs'99 galvanized ARGO, OceanObs'09 stimulated biological observations and GOA-ON was called for in the proceedings of OceanObs'09. Two GOA-ON EC members are on the Program Committee (Jan Newton and Fei Chai). There will be a slight change in the proceedings regarding the white papers which are now being organized, prepared, published before the meeting. Groups that were approved for writing a paper were merged with similar groups to avoid redundancy; a lead group was designated. White papers will be reviewed by and published in *Frontiers in Marine Science* (Open Access).

- GOA-ON's abstract submitted by Libby Jewett as lead author was accepted
 - For the final manuscript GOA-ON's paper was merged with "Ocean Acidification: preparing for the future" and a LAOCA paper; GOA-ON was designated as lead author.
 - The first paper is led by Lydia Kapsenberg and discusses the need for new methods to study biological factors, and the need for technological innovations.
- Papers can be up to 12,000 words long, with a maximum of 15 figures or tables; mini-review articles can contain up to 3,000 words and 2 figures or tables. GOA-ON will be submitting a manuscript in the 12,000 words category.
- Some ideas for topics in the white paper:
 - History (mentioning beginnings in OceanObs'09)
 - GOA-ON functions and organization
 - Coordination with carbon community
 - Coordination with SDG14
 - GOA-ON needs and vision for next decade
 - Regional Hubs
- Deadline for all submissions is 30 September 2018.
- There is a need to be aware of and coordinate with white papers that might have overlapping content to avoid too much duplication with papers on coastal observation in general, and those discussing science and policy coordination at various levels, including local, regional, bilateral and international.
- Best practices from IOCCP are to be the subject of another OceanObs white paper. The goal is to be able to access best practice documents online for certain variables and whichever measurement platform concerned (moorings, gliders, etc.). GOA-ON could contribute to filling gaps. It is planned to use the OA information exchange to see which best practices people are using for specific measurements.

Follow-up:

- Richard Feely will work on vision and coordination process, reach out to some of the colleagues mentioned.
- Maciej Telszewski's figure from the "who are we" discussion (value chain from G7 Think Piece on Ocean Observations) is to be adapted and included in the manuscript.
- NOAA OAP can cover the publication fee.
- Libby Jewett and Bronte Tilbrook are to be the lead authors on the GOA-ON white paper.
- Libby Jewett, Maciej Telszewski, Dick Feely, Jan Newton, and Meredith Kurz agreed to meet on the Monday, June 4th 2018, during ICES ECCWO to discuss first/next steps.

11. Capacity development (Meredith Kurz)

Pier2Peer (Meredith Kurz)

Pier2Peer is a platform for knowledge exchange, which takes a more indirect approach through mentee-mentor matching. P2P has been growing steadily, 65 pairs, 83 mentees from 48 countries, 57 mentors from 15 countries (mostly US scientists). While many of the mentees do biological observations, most mentors are chemists. There is a need for more mentors, especially mentors with biological background. The aim is to recruit more mentors by sending a call out to all GOA-ON members. The Ocean Foundation has funded scholarships of US\$5000 per student to support monitoring and some impact experiments. Seven scholarships have been awarded so far, with additional funding from Sweden. The possibility of using the scholarship funding program to get more mentors aboard was discussed. The scholarship program needs to be advertised more, as it is unknown even by most EC members. The future availability of funds from The Ocean Foundation for this activity are unclear and members of the EC agreed that alternative sources for funding need to be considered.

Follow-up:

- The local hubs are encouraged to reach out to their members to actively recruit mentors, as there are currently fewer mentors than mentees.
- Agreement that having an objective, such as a manuscript, in the pipeline increases the likelihood of a successful outcome. Identifying a goal for the partnership between mentor and mentee is crucial and has been mentioned in the feedback received in the past.
- GOA-ON should require a report from the scholarship recipients at the end of the pairing. The Ocean Foundation apparently has an agreement with the students already in place, a contract that includes a reporting clause, with a data management requirement for mentors/mentees. NOAA will follow up on this.
- In order to increase visibility and advertisement the possibility to use videos of mentees giving presentations was raised. Success stories need to be made visible.
- Funding continuation by The Ocean Foundation is unclear.

Discussion:

- Suggested that researchers could advertise their current projects to attract students and make them aware of opportunities.
- Where are the reports by past mentees, as required by The Ocean Foundation, being held and how they can be made more visible/accessible?
- It was suggested that GOA-ON could provide information on alternative sources of funding for mentees, through the P2P network. The Secretariat is to compile a list of funding sources on newsletter (to include non-US funding sources). **Action:** Secretariat to compile list of funding opportunities and websites advertising funding opportunities.
- It was suggested that newsletters should in the future go to all members in the GOA-ON database, not just P2P members (this item is still under debate, as the newsletter is also considered a special treat for P2P members. Newsletters are archived on the websites).
- GOA-ON kits consist of the least expensive functional equipment needed to constrain the carbonate chemistry. The list of gear and SOPs is to be posted on the GOA-ON website, after it has gone through a vetting process by the OA Information Exchange and an open community review process.
- The workshop in Mauritius August 2017 was a follow up to the TOF-led workshop in Mauritius in 2016 with the same participants as the original workshop. A larger group of applicants were trained and a subset of these received the kits (delays in kits reaching trainees mainly due to shipping issues)
- The workshop in Fiji November 2017 was split into two parts, with 20 participants for the general lectures, week 1 and eight participants for the hands-on applied course in week 2. Four sets of kits are in the process of being shipped (there are problems with shipping agents). P2P mentors were assigned to the students receiving the kits.
- The follow up workshop in Hawaii August 2018 is being planned as a data management focused course, but since the kits have not arrived yet (there are serious difficulties with shipping to the Pacific Islands) there is no data available. Data management is an important first step in quality control of the data for GOA-ON. **Action:** Cathy Cosca to follow up on data availability, possibly use a data set from PMEL for the students.
- A Caribbean and Latin America regional workshop is planned for January 2019. IOCARIBE will need to be engaged, more focus will be put on coral reefs.

OA-ICC (Lina Hansson)

GOA-ON's presence is growing in the fields of science, training and outreach. Capacity building takes place in cooperation with the regional networks and provides regional training courses, promotes the participation of scientists in International meetings and gives support of regional ocean acidification networks.

- The OA-ICC has organized and/or supported several trainings during the past years:
- OA training and networking in Africa with OA Africa NetworkThe Ocean Foundation, US Department of State, Future Earth Coasts, IMBER, SOLAS, local universities and hosts: courses in South Africa (2015), Mozambique, Mauritius (2016), Senegal, Ghana, Mauritius (2017), all together over 100 participants from 30 African countries.
- OA Training and Networking in Latin America and Caribbean with LAOCA, , IOCCP, The Ocean Foundation, IAEA TC, local hosts and universities: courses in Brazil (2012), Chile (2014), Mexico (2015), Chile LAOCA (2015), Mexico (2016),
- Other past trainings: Italy (2014), China (2015), New Zealand (2015), Saudi Arabia PERSGA (2016), Fiji (2017).
- OA-ICC Activities and supported activities in 2018: International Course in Sweden (June); Expert Meeting, France/Monaco; LAOCA Galapagos Course, August; PERSGA training course, Jordan, 30 September – 4. October; African Day of Oceans, Liberia, October 2018 (and OA-Africa Steering Committee side meeting).

Capacity development (Sam Dupont)

Capacity development workshops have faced some difficulties with regional differences, and target audiences which were very mixed and at very differing levels. An evaluation was carried out to receive feedback and enable the refocusing of the teaching and learning outcomes for the students. Some of the results of the evaluation were:

- Different cultural thinking affects the outcome of the courses, the networking abilities of students amongst themselves and within the wider network.
- Strategy, based on course evaluations by students: more targeted training – similar audience with similar needs, find best location in terms of infrastructure (lab equipment etc.), travel, and regional strengths.

In the next steps, a questionnaire to gauge expertise, Infrastructure, Regional strengths and resources, Challenges, Networks and Contacts was built. Evaluating the questionnaire showed it captures the reality of the situation.

- Four categories of countries – based on Capacity and Infrastructure, Haves and Needs.
- Affects future training, as knowing what the situation is before training allows the courses to be tailored, both in terms of the location as well as in terms of the participants. Sweden as a Category 1 host will have Category 2-3 attendees, for example.
- The course in Sweden in June 2018 will run for three weeks to enable planning, set up and sampling of an experiment and data analyses. The course is designed for a la carte measurements in week 3. The plan is to have a paper out at the end.
- Capacity building is moving from a pure training course towards a more integrated networking approach, facilitating cooperation within and between hubs.
- There are plans to carry out experiments evaluating the impact of OA on seafood in one global experiment. This will be a coordinated research effort, including outreach activities, with a clearly defined and reachable endpoint. Research is to be targeted towards the most important local seafood and the treatments are to be designed to be relevant at a local scale (deviations from normal/today, with help from GOA-ON and/or the kits already sent out). Kits or part of kits will be provided to participants. The goal is to publish a big paper together. There has been a lack of data coming out of the trainings and workshops, which has been frustrating to both sides (trainees and teachers).

The Ocean Foundation – relationship to the GOA-ON.

The discussion focused on maintaining an open communication with The Ocean Foundation (TOF), given the intersection of the GOA-ON and TOF, while avoiding a potential conflict of interest between GOA-ON and TOF. TOF also have an advocacy role for legislative action, whereas GOA-ON has a strictly scientific mission to provide access to OA observations, including facilitation and provision of evidence to allow policy makers and communities to decide on strategies. The EC discussed that GOA-ON is supposed to provide guidance to TOF for their capacity building activities; therefore having TOF as member of the GOA-ON EC might represent a conflict of interest. The Ocean Foundation call themselves “Friends of GOA-ON”.

Discussion:

- GOA-ON needs a common vision and strategy on capacity building. The white paper could include a section on the capacity building and their effect and efficiency. A more focused long term strategy is needed, based on lessons learned from the capacity building that has been done. Funding for capacity building seems patchy and budgets are sometimes short-term, therefore capacity building has been done relatively spontaneously.
- GOA-ON's capacity building has grown rapidly and has been visionary in the many different levels that have been involved. The strategy has not been articulated or written down anywhere yet. The white paper is an opportunity for that. Pathways will have to be different depending in the local and regional needs and infrastructure.

Decision:

- A close coordination between The Ocean Foundation and GOA-ON is expected to be established and maintained with respect to ocean acidification capacity building activities.
- TOF could be asked to participate in future telephone calls with a specific capacity building focus, and possibly in the capacity building discussions in the next in person meeting.

12. Standing up the new GOA-ON Secretariat (Kirsten Isensee)

	Marine Lebec	Meredith Kurz	Katherina Schoo
Communication	Website		
	(with Troy and Cathy Cosca) <ul style="list-style-type: none"> Review content and revise Add capacity development section Add link for Hangzhou meeting, coordinate with organising website Closed section for EC members with access to EC documents 	Review content and revise	Review content and revise
		Flyer – update and improve	GOA-ON slide deck/ presentation
	GOA-ON newsletter <ul style="list-style-type: none"> Working document for all to contribute with news and updates, photos. Develop strategy and target audience. Activate Twitter and facebook accounts. 		
Coordination	Regional hub focal points		
	OA Africa Samoa SIDS	LAOCA North America	WESTPAC Australia (Bronte Tilbrook) Europe
Implementation Strategy		Create template for Implementation Strategy general review. Distribute finished Strategy to network.	
	Graphics for Implementation Strategy needed: Boxes and Figures, Photos, Maps		
Products	Climate change indicator WMO/GCOS (with Richard Feely)		SDG 14.3.1
	OceanObs'19 – support preparation of GOA-ON white paper and related papers		
	GOA-ON Data portal Support data portal update – check member emails and affiliations up to date Send data portal update invitations, divide by region to be more efficient Member list to show who has a product on data portal		
Capacity building	Future OA-ICC/INT709 courses		SDG 14.3.1 Ocean Teacher Course
			Capacity activity stock take (so far)
		Pier2Peer	
	Support development of capacity building strategy (OceanObs white paper)		
Workshop Hangzhou	Support Fei Chai and local organising team		
	Link updates from workshop website on GOA-ON website		

14. What comes next? Roadmap for the upcoming 2 years

- Terms of reference for GOA-ON: Libby Jewett to share google doc with rest of the EC. This includes a list of who is currently on the GOA-ON EC and all representatives
 - IOCCP has a rotation system where, once a member's term is at an end, they cannot return. This is a disadvantage as this results in a loss of knowledge.
 - The GOA-ON EC decided several years ago that there would be term limits, as indicated in the GOA-ON Terms of Reference.
 - However, by the end of 2019, several members will approach the end of their 6 years (2 terms of 3), so the EC needs come to a decision whether this system is in need of change.
 - The EC recognized that there is still a lot of important work being done by EC members, which the group does not want to lose when members cycle off. The EC also recognized that it should not be perceived as a closed group.
 - The EC decided to extend terms for current members in three year increments, assuming they are in good standing and desire to continue. Libby Jewett will send revised Terms of Reference for input after the meeting.
- EC page on GOA-ON site:
 - 'Secretariat' should be a new category; they are to be included in 'Program Representational Members'.
 - Former members should be recognized on the GOA-ON website.
 - Governing bodies / representatives should be highlighted separately on the website.
 - Assess what expertise GOA-ON EC members have (IOCCP is doing this right now) to identify the gaps in expertise and recruit new members accordingly.
 - The focus should be on biological observations and modelling.
 - Biological data, including plankton data, should be kept on the data portal. IOOS just gave funding to add biological data (15k to each IOOS RA), so this will be more developed.
- **Big items for the next 2 years:**
 - Biological working group expert meeting: Kirsten Isensee / IOC is going to take responsibility for this (timing: January 2019).
 - GOA-ON 4th International Workshop to take place in Hangzhou, P R China, 14-18 April 2019.
 - GOA-ON EC Annual Meeting to take place in Hangzhou, P R China, 13 & 18 April 2019.
 - The white paper manuscript for Ocean Obs'19 is due 30 September 2018.
 - The EC is considering sending people to OceanObs'19 (registration to OceanObs'19 to open in the Fall of 2018).
 - A call for posters for OceanObs'19, from regional hubs for example, is to be launched (dates for submission to be announced in the fall of 2018, according to the Conference website).
 - The OurOcean Conference, Bali, 29-30th October 2018, would be a good opportunity to include an IOC-WESTPAC focal point (Registration dates and details not yet published).
 - COP24 will take place 3-14 December 2018, in Katowice, Poland: Carol Turley will be attending, GOA-ON can be represented in cooperation with her. She and others can help regional hubs, if they attend.
 - OA-ICC Advisory Board meeting coming up shortly.

Agenda

Monday 28 May 2018 (Bronte Tilbrook: lead of the day)

08:45 Arriving at IO PAN Institute of Oceanology

09:00 **1. Welcome** (Maciej Telszewski & IO PAN Hosts)

09:15 **2. Introductions and welcome to new attendees and Secretariat**

09:30 **3. Next GOA-ON workshop organization – Hangzhou 2019** (Fei Chai)

Organizing efforts
Primary scientific focus
invites
Fundraising

10:00 **3. Group discussion** (Jan Newton)

10:45 *Coffee Break*

11:05 **4. Updates on coordination with other networks** (Libby Jewett)

IOCCP (Maciej Telszewski), GOOS (Kirsten Isensee), GCOS (Bronte Tilbrook), GEO (Somkiat Khokiattiwong?), GCRMN (Kirsten Isensee), WIOMSA (Kirsten Isensee), Permanent Commission for the South Pacific (CPPS), UNFCCC?
Defining GOA-ON's relationship with these groups
Reporting to WMO (what should be OA indicator, other indicators? How to check accuracy? Who to do actual reporting and where should results reside? What funding?)
Coordinating with groups on OA observations, units, standards, etc.

12:00 **4. Group discussion** (Maciej Telszewski)

Definition of GOA-ON in the context of these other groups.

13:00 *Lunch*

14:00 **4. Group discussion continued** (Maciej Telszewski)

14:30 **5. GOA-ON Implementation Plan Progress** (Jan Newton, Meredith Kurz)

Review of first draft
Biological research in GOA-ON

15:30 **5. Group discussion** (Meredith Kurz)

16:15 *Coffee break*

16:35 **6. GOA-ON website and data portal** (Cathy Cosca, Jan Newton)

Developments and current status
Data availability and how to increase the coverage, how to connect with national and other global databases, observing systems

17:00 **6. Group discussion** (Jan Newton)

17:30 *Closing of day 1*

18:00 *Group dinner*

Tuesday 29 May 2018 (Libby Jewett: lead of the day)

- 9:00 **7. Local seminar by IO PAN**
- 10:00 **8. SDG 14 methodology** (Kirsten Isensee)
Updates
Opportunities for engagement by GOA-ON
Communities of Ocean Action
Ensuring there isn't duplication of efforts with various reporting standards and mechanisms, e.g. how can work already done on SDG14 apply to WMO reporting, etc.
- 11:00 *Coffee Break*
- 10:15 **8. Group discussion** (Kirsten Isensee)
Finalize methodology
Next steps
- 12:30 *Lunch break*
- 13:30 **9. Regional Networks** (Bronte Tilbrook)
Update on various regional networks
OA Africa (Nayrah Shaltout)
LAOCA (Cristian Vargas)
Western Pacific (Somkiat Khokiattiwong)
North America (Richard Feely)
Europe (Helen Findlay)
Any new ones in the works? Pacific Islands?
- 15:00 **9. Group discussion** (Libby Jewett)
What support is needed going forward (e.g. Are task teams to define issues within regional networks and overarching issues including measurement protocols and data delivery, socio-economic impacts useful)?
How to strengthen coordination and communication across hubs?
- 15:30 *Coffee break*
- 15:50 **9. Group discussion continued** (Libby Jewett)
- 16:30 **10. OceanObs'19** (Richard Feely, Jan Newton)
GOA-ON plans for engagement, white paper development
Who should lead authorship?
What should paper address/scope of paper?
How do we interact with other papers?
- 17:30 **10. Group discussion** (Bronte Tilbrook)
- 18:00 *Closing of day 2*
- 18:30 *Group walk and dinner in Gdańsk*

Wednesday 30 May 2018. (Maciej Telszewski: Lead of the day)

- 09:00 **11. Capacity development** (Meredith Kurz, Lina Hansson)
Update on Pier2Peer
Update on past and future trainings
ICC and ICC-INT projects
OA Information Exchange
- 10:00 **11. Group discussion** (Lina Hansson)
GOA-ON EC Relationship with The Ocean Foundation?
Coordinating with OA-ICC workshops and TOF workshops
- 11:00 *Coffee break*
- 11:20 **12. Standing up the new GOA-ON Secretariat** (Kirsten Isensee)
Defining roles and responsibilities, especially in context of distributed Secretariat members' placement in NOAA, IOC, and IAEA respectively
How to use new staff capacity to enhance website, communications, capacity dev efforts, synthesis products, etc.
- 12:30 *Lunch break*
- 14:00 **12. Group discussion** (Libby Jewett)
- 14:30 **13. Communication efforts – Products and fora** (Meredith Kurz)
OA data repository?
- 15:15 **13. Group discussion** (Kirsten Isensee)
- 15:45 *Coffee break*
- 16:05 **14. What comes next? Roadmap for the upcoming 2 years.**
Keep a running list of objectives through the course of discussion to review and expand upon here
- 17:00 **14. Group discussion and wrap-up** (Bronte Tilbrook)
- 17:30 **Close**

Attendees

Executive Council Members

- Bronte Tilbrook (co-chair, CSIRO)
- Libby Jewett (co-chair, US NOAA)
- Fei Chai (University of Maine)
- Sam Dupont (University of Gothenburg, Sweden)
- Richard Feely (US NOAA)
- Helen Findlay (Plymouth Marine Lab, UK)
- Somkiat Khokiattiwong (Phuket Marine Biological Center, Thailand)
- Jan Newton (University of Washington / IOOS)
- Benjamin Pfeil (University of Bergen, Norway)
- Nayrah Shaltout (National Institute of Oceanography and Fisheries, Egypt)
- Cristian Vargas (Universidad de Concepcion, Chile)

Support/Program Representational Members

- Kirsten Isensee (IOC-UNESCO)
- Lina Hansson (IAEA)
- Maciej Telszewski (IOCCP)
- Cathy Cosca (NOAA)

Secretariat

- Meredith Kurz (US NOAA)
- Marine Lebrech (IAEA)
- Katherina Schoo (IOC-UNESCO)

Not attending – Chen-Tung Arthur Chen, Albert Fischer, Peter Swarzenski, Salvatore Arico, Richard Bellerby

Global Ocean Acidification Observing Network (GOA-ON)

5th Annual Executive Council Meeting

Sopot, Poland

28-30 May 2018

Action Items and Major Decisions

Day 1: 28 May 2018

3. 2019 GOA-ON International Workshop

- **Fei & Jan (Scientific Committee Co-chairs)**
- **Marine** to work with Troy (UW) to build workshop page on GOA-ON website
- Decided on title for workshop: **4th GOA-ON International Workshop**
- Dates finalized:
 - 14th - 18th April, adding 13th for GOA-ON EC meeting as well as 18th (travelling day)
 - July 2018: First call goes out,
 - December 2018: deadline for early registration
 - January 2019: planning with secretariat

4. Updates on Coordination with Other Networks

- **Secretariat Members** (and maybe others) to help in showing the success of WIOMSA for GOA-ON. Should be announced on website, recognizing those that were involved
- **Executive Council** send out alert to GOA-ON for review of the IPCC Oceans Report (if the call for review is still out)
- **Secretariat and technical architects** to undertake a stocktake of the stations/platforms/moorings sending out current and live carbonate data and send update requests to members.

5. GOA-ON Implementation Strategy

- **Executive Council** provide edits to document to Jan by **15 June 2018**.
- Specific additions:
 - **Kirsten** to provide more SDG content & links to these, add SDG methodology & links
 - **Libby** updates and links in Appendix.
 - **Dick** to address uncertainty & pH measurements.
 - **Sam** to add content for biological observations section

6. GOA-ON Website and Data Portal

- **Secretariat & Cathy:** Making data portal more accessible - adding as a slideshow item for example. Creating a landing page when user opens up the data portal.
- **Secretariat & Cathy** to coordinate and cooperate on stocktake of live streaming platforms, send out update requests to members.
- **Secretariat:** Making sure homepage is constantly updated with news items, making sure to get stories from EC
- **Secretariat:** assess navigation of GOA-ON website and update as required

- **Secretariat** to contact the regional networks to add more regional platforms
- **Secretariat:** To compile a data handling and data flow into GOA-ON report
- **Benjamin Pfeil and Kirsten Isensee** agreed to write a short instruction on how to submit data to portals such as EMODnet for countries without data centres

Day 2: 29 May 2018

8. *SDG14.3.1 Methodology and Global Climate Indicators*

- **Katherina and Kirsten** to get outside feedback from Andrew Dickson, Roshan Ramessur, Abed Hassoun, Krisa Arzayus (and maybe others) after mid-June
- **Julian and Kirsten** to present methodology for IOC-UNESCO Executive Council approval at its 51st session on **3-6 July 2018**
- **Secretariat members** to work on updating data portal to update/increase picture of which countries have existing OA monitoring in their waters
- **Marine to work with Dick** to develop plan for obtaining appropriate data for the GCOS climate indicator reporting. Marine to take the lead on assembling the data and creating appropriate figure(s) (side-by-side plot of pCO₂ and pH); Meredith and Katherina to support when needed.
- **Executive Council** to review GCOS contribution at next EC meeting and identify possible coastal stations to add to the current stations, and revisit the idea of creating annual maps in addition to plots of pCO₂ and pH.

9. *Regional Networks*

The Secretariat members will function as liaisons to the regional hubs in the following structure:

- **Meredith** with LAOCA and NAOCA
- **Marine** with OA-Africa and developing Pacific SIDS networks
- **Katherina** with WESTPAC, Europe, and Australia (Bronte)
- European Hub
 - Contact JERICO for coordination
 - Search Bibliography for countries in Europe with publishing OA researchers and reach out to them for contributions
 - Carol Turley will probably be at COP24; should continue promoting GOA-ON in that venue, especially in context of facilitating countries' obligation to track SDG14.3 progress
- OA Africa
 - **Marine** to facilitate getting OA-Africa white papers on the GOA-ON website, as well as WIOMSA
 - **Marine and Nayrah** to work together to identify potential leaders to help coordinate future African World Ocean Day events and facilitate more continuous contact with members (i.e. preparation of regular newsletters, general maintenance of contacts, etc.)
 - **All** to proactively look for funding to at least pay someone part-time for the tasks in the above item

- WESTPAC
 - **Katherina** to help update link on GOA-ON website to OA-WESTPAC (currently links to just WESTPAC)
 - **Fei and Somkiat** to work together to ensure collaboration leading up to the Hangzhou 2019 meeting - considering China's participation in OA-WESTPAC?

- LAOCA
 - **Cristian and Meredith** to work together with Cathy and website staff to increase representation of OA observing assets in LA and Caribbean on the GOA-ON portal
 - **Meredith** to work with Cristian and Michelle Graco and others to track past workshops and capacity development efforts in Latin America and the Caribbean to avoid repeated efforts and identify gaps
 - Cristian planning 2019 meetings on specific systems (coral reefs vs upwelling systems, etc) - interested in cross-fertilization across hubs for expertise in these specific areas
 - **Jan and Cristian** to talk about such a workshop around shellfish industry and OA
 - **Meredith** to help with researching/learning about making it easier to ship chemicals if needed and where possible

- NAOCA
 - **Cathy** and Dick working on a website
 - **EC members in North America** to make best efforts to attend first official meeting at Hakai in October 2018

10. OceanObs19

- Decided to have our white paper fall into the "up to 12,000 words" category
- **Maciej, Jan, Dick, Libby, and Meredith** met at ECCWO in DC right after the EC meeting to draft an outline (to be distributed shortly)

Day 3: 30 May 2018

11. Capacity Development

- **Secretariat** Link to Royal Geographical Society (has links with funding opportunities) & other similar resources somewhere on GOA-ON website
- Decision made to compile a list of funding sources on P2P newsletter (include non-US funding sources). Newsletters are currently being sent out to mentors and mentees only, the EC says the letter should go to all members in the GOA-ON database.
- No kits delivered to Pacific Islands for workshop in ~Aug 2018 - perhaps could use a data set from PMEL. **Cathy** to follow up
- **Secretariat:** work on recruiting more mentors by sending a call out to all GOA-ON members and
- The local hubs are encouraged to reach out to their members to actively recruit mentors, as there are currently fewer mentors than mentees

13. Standing up the new GOA-ON Secretariat

Marine

- Focal point for website development
 - News items, add capacity development section, 2019 workshop page, closed page for EC members
- Focal point for Africa and the new SAMOA SIDS
- Climate change indicator WMO/GCOS (Advised by Dick and Bronte): compile data for 4 or 5 sites
- 2019 Workshop: flyer, save the date email, fundraising, workshop website

Meredith

- Update GOA-ON flyer
- Focal point for LAOCA and North America
- Implementation Strategy: create template for general review, distribute once it is finished, graphics for strategy
- Coordination with TOF, keeping track of Pier2Pier. Mentors/mentees to be added to EC log-in page

Katherina

- GOA-ON presentation/ slide deck to share
- WESTPAC, Bronte, Europe
- Focal point for SDG 14.3.1: update & reviews, testing of methodologies, Ocean teacher course
- Stock take of capacity building activities

Distributed Secretariat:

- Send out regular newsletters
- Ocean Obs' 19 paper: supporting prep of paper, fill in network G7 figure, develop capacity building strategy
- Update data portal (with **Cathy**) - send data portal update invitations.
- Show on members list who has a product on portal (not just member)
- Update GOA-ON EC page