



Global Ocean Acidification
Observing Network

*Newsletter of the Global Ocean Acidification Observing Network
(GOA-ON)*

Issue 15, July 2021

GOA-ON news

GOA-ON Programme Endorsed for UN Ocean Decade

GOA-ON is pleased to announce that our proposal “Ocean Acidification Research for Sustainability (OARS) - Providing society with the observational and scientific evidence needed to sustainably identify, monitor, mitigate and adapt to ocean acidification; from local to global scales” was endorsed as a [Decade Action](#) programme of the [UN Decade of Ocean Science for Sustainable Development](#). The OARS programme will build on the work of GOA-ON to further develop the science of ocean acidification by enhancing ocean acidification capacity, increasing observations of ocean chemistry changes, identifying the impacts on marine ecosystems on local and global scales, and providing society and decision makers with the information needed to mitigate and adapt to ocean acidification. As the Ocean Decade progresses, we will share [updates and keep the community involved](#). GOA-ON looks forward to getting to work with our partners to help deliver the Science we need for the Ocean we want!



2021
2030 United Nations Decade
of Ocean Science
for Sustainable Development



Save the date for [OA Week 2021](#), September 13-17

Last year the community came together virtually for [OA Week 2020](#), in lieu of the many meetings and conferences that were postponed. This year we're back, with more engaging talks, exciting plenary speakers and sessions being planned. Scheduled for [Monday the 13th of September to Friday the 17th, OA Week 2021](#) will feature sessions from each GOA-ON hub, plenary talks given by leaders in the field, and community discussion sessions that will promote conversations and networking with members of the GOA-ON community; more details to be announced in the coming weeks. As the pandemic still rages across many countries, events like these are vital to support our community and stay connected to colleagues abroad. We're looking for early career scientists, novel research, big ideas, and research experiences during a time of pandemic. Please contact your hub leaders for information about how to get involved with a regional session. If you'd like to give a presentation, suggest a community discussion session, or join the planning committee, please contact us at secretariat@goa-on.org. More details to come!

Welcome to the new GOA-ON Arctic Hub!

We extend an extremely warm welcome to the newly established GOA-ON Arctic Hub. We are currently working with the Hub



leaders to establish their website. In the meantime, please share the [member sign-up form](#) with colleagues interested in ocean acidification within the Arctic region.

"We started the discussion of the need for an Arctic hub during the GOA-ON workshop in Hobart in 2016 and investigated the possibilities with GOA-ON. It was decided that such a hub focusing on Arctic issues would be beneficial for the OA community. Then it was also suggested that I would lead the hub together with Kumiko Azetsu-Scott (Canada), Melissa Chierici (Norway) and Jessica Cross (USA) as co-lead/SSC. The hub has yet to be started. This year, we plan to have a few meetings. We will send out more information about the Arctic hub soon and will ask representatives for each country to gather names and information on GOA-ON Arctic hub members, or you can sign up [here](#)." - Agneta Fransson, GOA-ON Arctic Hub Co-chair

GOA-ON Webinar Series

The next webinar in the series will be shared by Dr. Eric Mortenson and will take place on 13 July 8pm EDT / 14 July 10am AEST. The webinar is entitled, “Regional Changes in Southern Ocean Biogeochemistry Due to Projected Carbon Uptake”. The Southern Ocean accounts for nearly half of the global ocean’s sink of anthropogenic carbon. Despite this important contribution, many climate models do not represent the mesoscale features that characterize the region due to limited spatial resolution. Here we apply a high-resolution ocean model that incorporates biogeochemistry with high-emission (RCP8.5) forcing in order to identify regions of pronounced change due to carbon uptake into the near future. We find that the annual uptake of carbon in the Southern Ocean south of 40° S is projected to double over the first half of the 21st century. The changes due to the increase in carbon will lead to acidification and lowering of aragonite saturation. We will present regions where changes to carbon system variables are respectively more and less pronounced to inform the siting of near-future observations. Register for the webinar [here](#).

The goals of the GOA-ON Webinar Series are to enable members to share their science with the broader audience, create opportunities for collaboration, and foster a sense of community among GOA-ON members. Webinars, advertised on the [GOA-ON Webinar Series webpage](#), take place every few weeks and consist of a presentation followed by a question and answer session. GOA-ON hopes to use this webinar series to lift the voices of early career scientists and other members of the GOA-ON research community who wish to share their science with a broader audience. If you are interested in giving a presentation or would like to suggest a topic, submit your proposed title and abstract [via this form](#).

All webinars are recorded and able to be viewed on the [GOA-ON Youtube Channel](#):

1. [Unifying biological observations to detect and compare OA impacts across marine species and ecosystems](#) (Sam Dupont, Steve Widdicombe)
2. [Measuring OA to support the 2030 agenda for sustainable development](#) (Kirsten Isensee, Katherina Schoo)
3. [Measuring protons with photons: A pH analyzer and community science program to change the relationship between humans and ocean science](#) (William Paradis, David Long, Kalina Grabb)
4. [What do you \(really\) need to know to understand multiple stressors?](#) (Sam Dupont, Christina McGraw, Christopher Cornwall)
5. [Canada’s ocean acidification community of practice](#) (Kristina Barclay)
6. [Arctic-African collaborative OA research on the Canary Current and Benguela Current upwelling systems](#) (Melissa Chierici, Mohammed Idrissi, Chibo Chikwililwa)



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GOA-ON WEBINAR SERIES

Regional changes in Southern Ocean biogeochemistry due to projected carbon uptake

Wednesday, 14 July 2021

at 10:00 Australian Eastern Standard Time (UTC+10)

Register here: <https://register.gotowebinar.com/rt/3191371397724780304>

Dr. Eric Mortenson

Postdoctoral Researcher,
Commonwealth Scientific
and Industrial Research
Organization (CSIRO),
Hobart, Australia

Description: The Southern Ocean accounts for nearly half of the global ocean's sink of anthropogenic carbon. Despite this important contribution, many climate models do not represent the mesoscale features that characterize the region due to limited spatial resolution. Here we apply a high-resolution ocean model that incorporates biogeochemistry with high-emission (RCP8.5) forcing in order to identify regions of pronounced change due to carbon uptake into the near future. We find that the annual uptake of carbon in the Southern Ocean south of 40° S is projected to double over the first half of the 21st century. The changes due to the increase in carbon will lead to acidification and lowering of aragonite saturation. We will present regions where changes to carbon system variables are respectively more and less pronounced to inform the siting of near-future observations.



Ocean Acidification
International
Coordination Centre
OA-ICC

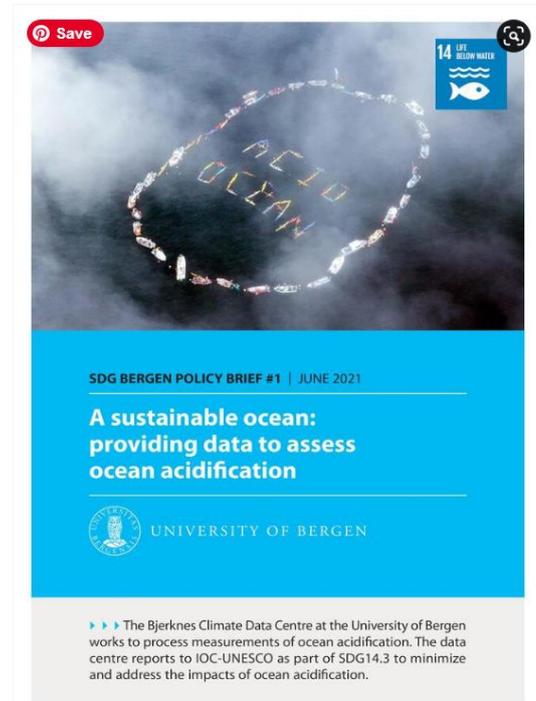


Ocean acidification news

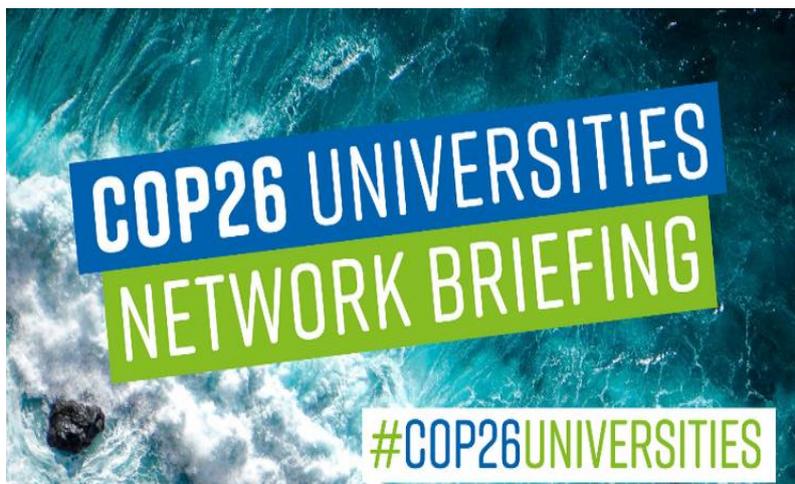
SDG Bergen Policy Brief # 1 focuses on ocean acidification data

The SDG Bergen launched its [Policy Brief series](#) on World Ocean Day, with the publication of “[A sustainable ocean: Providing data to assess ocean acidification](#)”. The Policy Brief contains three policy recommendations for management of ocean acidification data provided by data analysts and researchers. This will help raise awareness among policy-makers, civil society and business on the importance of ocean acidification observation and science to mitigate and adapt, contributing to the sustainable use of ocean resources. [Benjamin Pfeil](#), leader of this first Policy Brief and member of the GOA-ON Executive Council, hopes that the recommendations provide policy-makers with science-based knowledge to make decisions to save our ocean.

[SDG Bergen](#) is a University of Bergen strategic initiative to engage in science diplomacy, in particular towards the Sustainable Development Goals (SDGs), and an official SDG14 Hub for United Nations Academic Impact and the International Association of Universities.



Why the Ocean Matters in Climate Negotiations

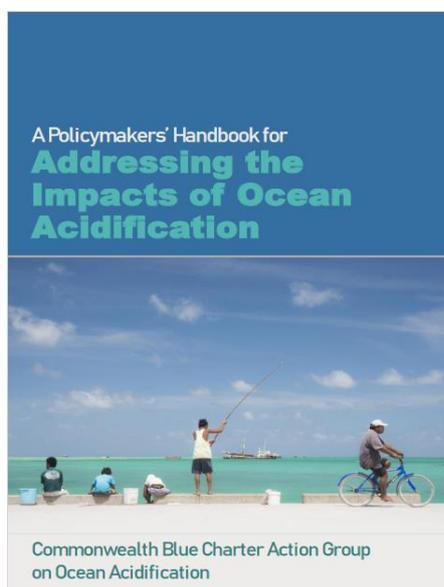


A report highlighting [why the ocean matters in climate negotiations](#) has been published by the COP26 Universities, a network of more than 60 UK based Universities and research centres. The report shines a spotlight on the critical role the ocean plays in greatly slowing the rate of climate change but

also the subsequent impacts of this, including ocean acidification, and why support from nations for better inclusion of the ocean at the United Nations climate negotiations, such

as [COP26 in Glasgow](#) this November, is so important. The briefing, led by Plymouth Marine Laboratory, summarizes the latest research and knowledge on the importance of the ocean, as well as offering a range of opportunities to nations in order to ensure that the ocean can be developed sustainably for the benefits it provides to people around the world. Developed by a team of experts from leading UK marine and environmental science universities and centres and published in association with the COP26 Universities Network, the briefing also makes suggestions on how the ocean can be better incorporated in the United Nations Framework Convention on Climate Change ([UNFCCC](#)) process.

Ocean Acidification Policy Handbook

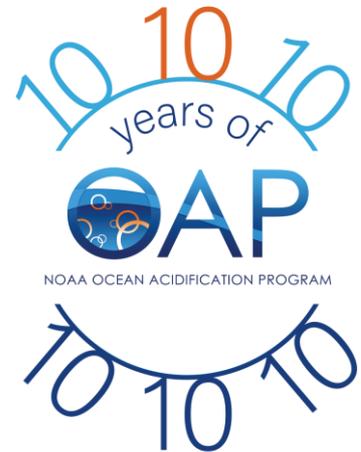


A [Policymakers' Handbook](#) designed to help policymakers utilise existing resources to identify and implement strategies to address ocean acidification has been published by the New Zealand government, which champions the [Commonwealth Blue Charter Action Group on Ocean Acidification](#). The Handbook provides tools for establishing Pathways towards Action to identify practical strategies to address ocean acidification. Templates for an inventory of ecosystems, resources, and existing relevant policy, vulnerability and risk assessments as well as gap analyses are provided along with examples and guidance on how to use them. GOA-ON, the GOA-ON in a Box kits and the SDG 14.3.1 Indicator Methodology and Data Portal are highlighted among the recommended resources in this helpful Handbook.

Success Stories!

10 years of NOAA's Ocean Acidification Program

[NOAA's Ocean Acidification Program](#) was created following the passage of the [Federal Ocean Acidification Research and Monitoring Act of 2009 \(FORAM Act\)](#) which specifically required that NOAA have a program to coordinate ocean acidification research and monitoring within the agency, with other Federal partners, and the international science community. Their ever-growing team started with just Director Dr. Libby Jewett in 2011, with Dr. Dwight Gledhill joining shortly after as Deputy Director. Numerous [Sea Grant Knauss Fellows](#) have contributed to the success of the program over the years, many of whom continue to serve with the program as it continues to grow, now comprising a [dedicated team of 10 staff](#).



Over the last 10 years, OAP has supported research and monitoring of ocean acidification throughout the nation's marine ecosystems, and around the world, and continues to build strong collaborations across the ocean acidification research community to advance NOAA's mission. OAP has worked across many offices within NOAA, bringing together the transdisciplinary capabilities of labs and programs around the nation, and working with the IAEA, IOC-UNESCO, and Global Ocean Acidification Observing Network to build OA science capacity globally. OAP has supported the maintenance, enhancement, and expansion of a biogeochemical monitoring network which includes state of the art moorings outfitted with sensors which take measurements every three hours and transmit data via satellite, sponsors research cruises on global class NOAA ships, and funds the deployment of instruments on private freight ships to take measurements as they move from port to port. The program has also incorporated the perspectives of social scientists to understand how ocean acidification is affecting or could affect coastal and human communities, and has furthered our understanding of species' vulnerabilities within national waters.

Within the [next 10 years](#), OAP hopes to conduct more research on the social science and adaptation aspects of OA, contribute to the understanding of carbon dioxide removal strategies, and aid in the development of new reliable, easy to work with, and ideally low-cost ways of observing ocean acidification, to increase accessibility of ocean acidification research worldwide – watch this space!



In the spotlight

Dr. Adrienne Sutton, GOA-ON Executive Council



[Dr. Adrienne Sutton](#) is the newest member of the GOA-ON Executive Council! An Oceanographer at NOAA's Pacific Marine Environmental Laboratory (PMEL), Dr. Sutton uses interdisciplinary approaches to explore how physical and biological mechanisms, such as the El Niño/Southern Oscillation and coral reef metabolism, drive variations in ocean carbon chemistry across time and space. These approaches include using time series observations and models to better understand natural variability and long-term anthropogenic trends in ocean carbon, and characterizing uncertainty in observation-based CO₂ flux estimates and the response of marine organisms to ocean acidification. Dr. Sutton's team also works with PMEL engineers to develop observing technology.

In addition to her position at NOAA's PMEL, Dr. Sutton is an Affiliate Assistant Professor at University of Washington's School of Oceanography, serves on the steering committees of [OceanSITES](#), [Prediction and Research Moored Array in the Tropical Atlantic \(PIRATA\)](#), and recently joined the Scientific Steering Group (SSG) of the [International Ocean Carbon Coordination Project \(IOCCP\)](#) working on the Time Series Efforts theme.



Members Corner: OA Research in the Galapagos

Ecuadorian researchers [Rafael Bermudez Monsalve](#), [Isabel Timpe](#), and their team received a GOA-ON in a box kit from The Ocean Foundation in 2019 to advance their research on ocean acidification in the Galapagos through the Escuela Superior Politecnica del Litoral (ESPOL). Using CO₂ vent sites as natural laboratories, their research examines how ocean acidification might change the marine benthic community of the Galapagos, and how those potential changes might affect the whole marine



ecosystem in the famously biodiverse archipelago. The GOA-ON kit continues to be very useful to the team for measuring carbonate system parameters in collected water samples.

OA research has its challenges in the

Galapagos; temperature control during laboratory pH measurements in this tropical region is difficult, and concern about loss has so far made deploying fixed equipment like the iSAMI impossible. Like most researchers around the world, their activities have been severely limited by the COVID-19 Pandemic, with no field work for almost a year. But the team forges ahead, having completed a three week research cruise this February in the Galapagos to conduct dive surveys of benthic community composition and measure water chemistry. They report several papers to be on the way and look forward to sharing their discoveries with the scientific community. You can read more about this exciting work on their [website](#).

Obituary: Dr. Chibo Chikwililwa, OA Africa Steering Committee

Dr. Chibo Chikwililwa passed away in late June due to complications with COVID 19. Her death leaves behind a loving family, colleagues, students and friends who deeply mourn the loss of such an outstanding person. Chibo was an oceanographer [passionate about the study of marine phytoplankton](#) and the potential impacts of ocean acidification on planktonic ecosystems. As a leader in her field she set a strong example for marine scientists everywhere, championing ocean acidification research on the Benguela current system, helping to form the OA Africa Network, and collaborating with fellow scientists and students at the international level, such as aboard Nansen program cruises and much more. She was an inspiring woman who gave so much to her field and community, advancing the role of Namibian women in ocean science. The global ocean acidification community sends its deepest condolences to her family and colleagues. We extend our thoughts to all those who have lost loved ones to COVID 19.



Regional updates



Learn about our GOA-ON Hub communities

This June at the Executive Council meeting, GOA-ON hubs came together to present on their hub activities to their colleagues. We were inspired to learn about so much exciting activity, despite the challenges of the COVID-19 pandemic. Hubs reported on their membership and objectives, as well as recent and planned activities. Among these were intercountry research collaborations, data sharing, Hub webinar series, OA awareness events, and much more. These reports are available on the GOA-ON website for the benefit of all. To learn about what OA scientists can achieve through their regional hubs [take a look here](#).

New LAOCA webinar series!

The first of a series of webinars by LAOCA was broadcast live on their [RedLAOCA Youtube Channel](#) on 3 June 2021. The webinar was presented (in Spanish) by Dr. Martín Hernández Ayón, from Universidad Autónoma de Baja California in Ensenada, México. He discussed the differences and similarities among the Chile-Peru and Mexican oxygen minimum zones. The logistics of the seminar were supported by Millennium Institute of Oceanography and Instituto Milenio de Socio-Ecología Costera (SECOS). You can watch the webinar [here](#); turn on closed captions and you should have the option to select “auto-translate” to your language.

IOC-WESTPAC webinar series

[IOC-WESTPAC](#) held a series of webinars in May, which can be viewed on their [Youtube Channel](#):

Session 1:

Dr Liyang Zhan: Underway measurement of dissolved inorganic carbon (DIC) in estuarine waters, Dr. Chalermrat Sanhmanee: On-going observation of ocean acidification in coastal waters in Thailand, Dr Wa Iba: Effect of ocean acidification on growth, lipid, and carotenoid content of a widely used green microalgae in aquaculture *Chlorella vulgaris*

Session 2:

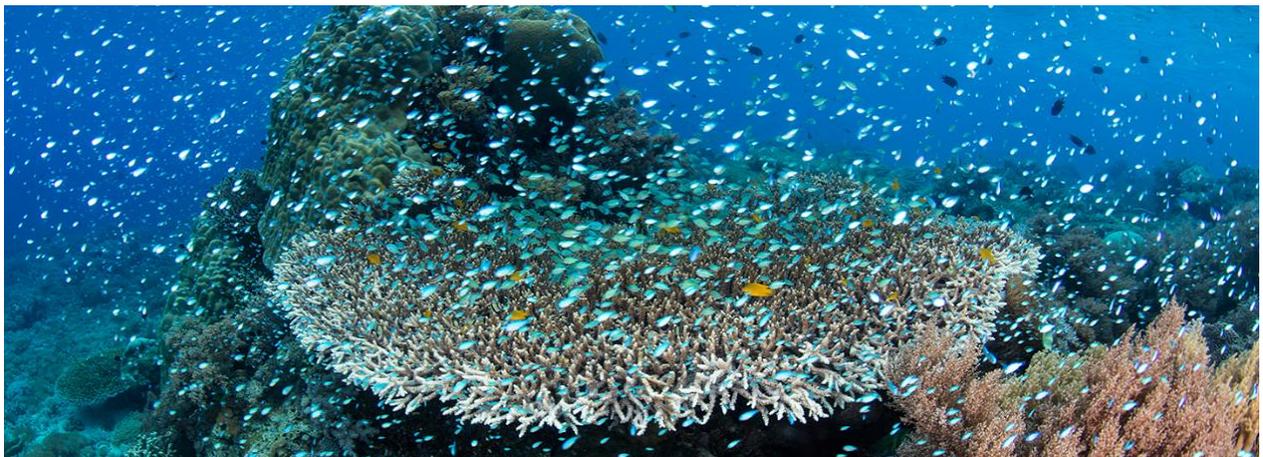
Ms. Khanittha Uthaipan: Integrative effects of deoxygenation and acidification along the sub-estuaries in the Upper Gulf of Thailand, Prof. Maria Lourdes McGlone: Coastal acidification, the other eutrophication problem in mariculture areas, Prof. Aileen Tan Shau Hwai: Effects of ocean acidification on oyster aquaculture

Session 3:

Dr. Suchana Chavanich: Coral reefs and ocean acidification - impact and adaptive capacity in Thailand and southeast Asia, Mr. Vo Tran Tuan Linh: Coral calcification in the southern part of Vietnam, studies with a new method, Dr. Patrick Cabaitan: Influence of acidification and associated stressors on coral reef resources in the Philippines

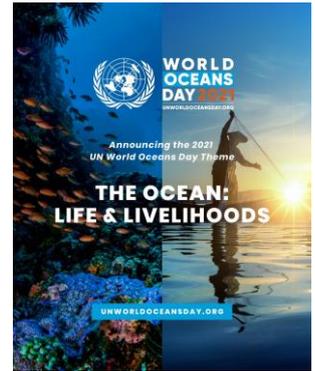
Session 4:

Ms. Nithiyaa Nilamani: Hard coral diversity of the tropical shallow reef in the vicinity of an underwater vent exposed to a lowered pH gradient, Ms. Raine Cabreira: Porites colonies get smaller in CO₂ vent-associated coral communities of SW Luzon, Philippines, Prof. Zulfigar Yasin: A suggested model on the future ocean acidification programme of IOC-WESTPAC - a national and regional approach to understanding



OA Med Hub

During the UN World Oceans Day event on the 8th of June 2021, the OA Med-Hub was represented during a session entitled "[Implementing UN SDG 14.3-Protecting Communities and Livelihoods from a Changing Climate](#)" to talk about "Climate Change in the Mediterranean and Actions to Understand and Address Ocean Acidification". The event was organized by the International Alliance to combat Ocean Acidification (OA Alliance) and The Ocean Foundation (TOF).



The [ASLO 2021 Aquatic Sciences Meeting](#) was held virtually from June 22-27, 2021. Three members of the OA Med-Hub co-chaired an ASLO session (SS84) during the meeting, entitled "Ocean acidification: trends and effects from local to regional scales" on the 25th of June 2021. The session highlighted the latest OA research from different parts of the world.

Announcements & Reminders

Officially rescheduled: 5th International Symposium on the Ocean in a High-CO₂ World

The 5th International Symposium on the Ocean in a High CO₂ World has officially been rescheduled for 13-16 September 2022 in Lima, Peru. Abstracts are currently being accepted (follow the abstract template .doc template, MS Word or compatible) and must be submitted electronically to: abstract@highco2-lima.org. Results will be notified by May 8, 2022. For more information on the Symposium themes and details, please visit the [Symposium website](#).



GOA-ON data explorer support requested

The [GOA-ON data explorer](#) contains over 800 assets and counting and is one of the key services provided by GOA-ON. This portal is community owned and maintained; we rely on scientists to submit entries when new OA observations and monitoring activities take place, such as cruises and surveys. If you have data to submit to a portal or new updates to share about an existing asset [please do so here](#). We work hard to maintain the portal and make it more comprehensive and up to date. If you have past experience managing data portals or large spatial datasets or just have ideas to contribute please get in touch at secretariat@goa-on.org; we would be interested in working with you.

GOA-ON adds new maps



We're excited to share new ways of visualizing GOA-ON membership and activities on our website. Now you may see the number of members in each country, as well as where GOA-ON in a box kits are at and past capacity building locations in our live GOA-ON web map, built in Tableau. We've also updated our [growth maps](#); GOA-ON is up to 860 members from 105 countries. [Try exploring the web map](#) to see the number of members in your country and the kinds of workshops we've done.

Subscribe to the [OA-ICC news stream](#) for daily posts with new OA publications, media coverage, upcoming events, job postings, etc.

- Use the [OA-ICC portal](#) for ocean acidification biological response data to access over 1100 data sets.
- Access over 8,600 ocean acidification publications from the [OA-ICC bibliographic database](#).



GOA-ON keeps growing

GOA-ON is a network currently composed of more than 800 members from 105 countries! We appreciate the interest and look forward to facilitating new and exciting collaborations together. A full list of GOA-ON members is available online on the [GOA-ON website](#). If you wish to change your affiliation as it is presented online, please email the GOA-ON Secretariat (secretariat@goa-on.org).

Are you involved in OA work that you would like to have included in future newsletters?
Contact the GOA-ON Secretariat: secretariat@goa-on.org

GOA-ON Secretariat

Kerri Dobson, NOAA Ocean Acidification Program
Trevor Eakes, IAEA Ocean Acidification International Coordination Centre
Katherina Schoo, Intergovernmental Oceanographic Commission of UNESCO



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