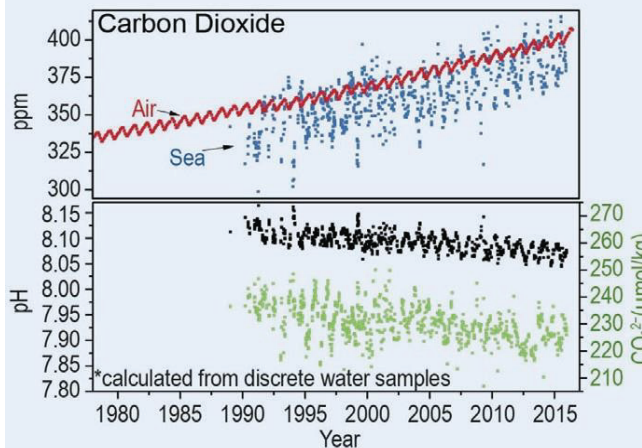




What is ocean acidification?

The oceans absorb about 30% of human-generated CO₂ emissions, leading to changes in seawater carbonate chemistry that are referred to collectively as 'ocean acidification' (OA).

Regular measurements during the past 25 years at three different stations in the Pacific and Atlantic Oceans show a clear trend in decreasing oceanic pH. This "other CO₂ problem" has emerged as a major environmental problem of international concern because changes in seawater chemistry from OA can affect marine organisms.



[^] OA in the surface ocean near Mauna Loa Observatory, Hawai'i, USA. Adapted from Dore et al. 2009, doi: 10.1073/pnas.0906044106

"We know [OA] has negative effects on marine ecosystem services, including fisheries and aquaculture, coastal protection, transportation and tourism."

Peter Thomson,
United Nations
Secretary-General's
Special Envoy for the
Ocean, 2021



Three high-level goals

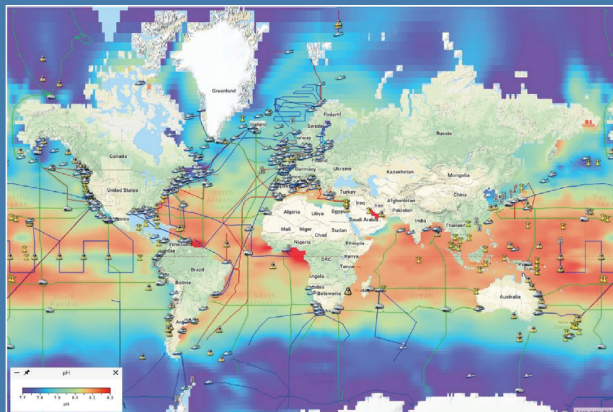
In response to the global threat of OA, an international network of scientists came together in 2012, united under three high-level goals, to form the Global Ocean Acidification Observing Network (GOA-ON).

1. Improve our understanding of global ocean acidification conditions
 - Determine the status of spatial and temporal patterns in carbon chemistry;
 - Document and evaluate variation in carbon chemistry to infer mechanisms (including biological mechanisms) driving OA.
2. Improve our understanding of ecosystem response to ocean acidification
 - Track biological responses to OA, together with physical and chemical measurements, relevant experimental studies and theoretical frameworks;
 - Quantify rates of change and identify areas as well as species of heightened vulnerability or resilience.
3. Acquire and exchange data and knowledge necessary to optimize modelling of ocean acidification and its impacts
 - Provide spatially and temporally resolved chemical and biological data to be used in developing models for societally-relevant analyses and projection.

Achieving a fully global network

Capacity building: Building capacity and strengthening infrastructure are essential in expanding the global coverage of OA observations. GOA-ON has two approaches:

1. direct assistance in the form of organising training workshops and providing low-cost OA monitoring equipment, and
2. Pier2Peer: a scientific mentorship program.

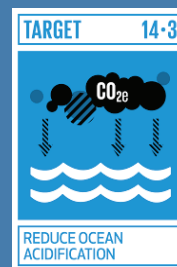


Visualising OA observing capability and data:

The GOA-ON data portal maps OA observing assets submitted by GOA-ON members, providing access to OA data and synthesis products collected from a wide range of sources, including moorings, research cruises, and fixed-time series stations. Some platforms display real-time data, and many platforms provide links to accessible data and metadata.

< *Global surface pH from the GLObal Ocean Data Analysis Project (GLODAP), as well as all observing platforms (2019)*

Sustainable Development Goals (SDGs): GOA-ON has committed to expand the spatial and temporal coverage of OA observations globally (Voluntary Commitment #OceanAction16542) in support of SDG Target 14.3. GOA-ON has been involved with implementation and dissemination of the indicator methodology, which provides guidance on how to carry out measurements following the best practices in the OA community and explains how to report the collected information to the IOC-UNESCO.



Support local actions and activities: The formation of geographically focussed regional hubs under the framework of GOA-ON has facilitated coordination at the regional level, enabling collaboration and research that is better tailored to smaller geographic areas. As of 2021, eight regional hubs are active: Arctic hub, Africa hub (OA-Africa), Latin American Ocean and Coastal Acidification network (LAOCA), Mediterranean hub (OA-Med), North American hub, North East Atlantic hub, Pacific Islands and Territories Ocean Acidification network (PI-TOA), Western Pacific hub (IOC-WESTPAC).

GOA-ON network in 2021 and the future



Over 900 scientists from 105 countries (shown in black)

UN Decade of Ocean Science:

GOA-ON's programme "Ocean Acidification Research for Sustainability" (OARS) was endorsed by the UN Decade of Ocean Science for Sustainable Development. OARS will build on the work of GOA-ON to further develop the science of OA by enhancing OA 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 OA.



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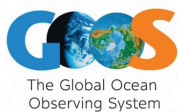
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Ocean Acidification International Coordination Centre
OA-ICC

