COP28 VIRTUAL OCEAN PAVILION EXHIBITS

PARTNERSHIP FOR OBSERVATION OF THE GLOBAL OCEAN (POGO)

Description

Ocean observing to address climate change, human health and food security

The Partnership for Observation of the Global Ocean (POGO) is supporting the development and implementation of a Global Ocean Observing System (GOOS) for the benefit of society – through innovation, capacity development and outreach/advocacy.

Ocean Observing and Climate Change

Ocean observations are critical for understanding and predicting climate change, as well as the effects of climate change on ocean ecosystems, and possible negative feedback loops and tipping points, beyond which the ocean may no longer be able to act as a sink of carbon dioxide and climate change buffer for humans. POGO is supporting GOOS to become truly global (including poorly-observed regions such as coastal areas around developing nations, particularly in the Southern Hemisphere, polar regions and the deep ocean), providing continuous and long-term information on all aspects of the ocean (physical, chemical, as well as biological parameters).

Current POGO projects relevant to climate change include:

(1) The BIOTTA project, focusing on developing capacity for ocean acidification monitoring in West Africa; in partnership with the Ocean Foundation, the project will provide training and equipment to 6 countries around the Gulf of Guinea to join the Global Ocean Acidification Observing Network (GOA-ON); the extent and effects of are still poorly understood;

(2) The NF-POGO Alumni Network for the Ocean (NANO) global project on Deoxygenation, Acidification and Productivity (NANO-DOAP), a network of 33 time-series stations in 18 countries monitoring a common set of essential ocean variables on a bimonthly basis. Like BIOTTA, NANO-DOAP is filling some of the large gaps in coastal observations and developing capacity for monitoring and understanding the effects of climate change in coastal regions;

(3) The Ocean Biodiversity Observation Network (OBON), a programme endorsed in June 2021 by the UN Decade of Ocean Science for Sustainable Development, to monitor, research and understand ocean life by analyzing biomolecules. The programme will transform how we sense, harvest, protect, and manage ocean life, which faces multiple stresses including pollution, habitat loss, and climate change. It will also help communities detect biological hazards like harmful algal blooms and pathogens and be a key component of next-generation ocean observing systems.

Ocean Observations for Climate Adaptation

Ocean observations play a major role in helping coastal communities to adapt to climate change, for example by providing early-warning systems for sea-level rise and extreme weather events (storm surges, coastal flooding, hurricanes, heat waves). In addition to these obvious threats of climate change to coastal communities, there are indirect threats linked to food security and human health. Global warming and an increase in extreme weather events - such as droughts, floods, storm surges and heat waves - drive pathogen emergence and associated disease outbreaks.

For example, the highest incidence of cholera is reported in highly-populated coastal regions, connected with enhanced pollution of water bodies and food sources. The responsible pathogen, the bacterium Vibrio cholerae, thrives in warm waters with moderate salinity and can be harboured by plankton and detritus. Ocean observations are vital in providing information that inform the prediction of climate-driven Vibrio cholerae hotspots and associated cholera outbreaks. However, very few countries include disease early-warning in their Nationally Determined Contributions in spite of the high incidence of cholera outbreaks worldwide (source: ESA-Future Earth PODCAST DEMO project*).

POGO is a consortium of over 50 oceanographic research institutions working together towards developing global ocean observations. POGO also works with partner organisations at regional, international and intergovernmental levels, particularly focused on delivering the goals of the UN Decade of Ocean Science for Sustainable Development.

**Footnote: other collaborators include UK Research and Innovation (UKRI), India Department for Biotechnology (DBT), Japan Science and Technology Agency (JST) Towards a Sustainable Earth (TaSE) program to the Pathways Of Dispersal for Cholera And Solution Tools (PODCAST) project led by the Plymouth Marine Laboratory (UK), and the GEO Blue Planet Water-associated Diseases Working Group supported by POGO.*

POGO's Thematic Focus

The Ocean

The ocean plays a critical role in regulating the Earth's climate (by absorbing most of the excess carbon dioxide and heat from the atmosphere) and weather (redistributing heat from the Equator towards the Poles through the major ocean currents, with associated impacts on atmospheric temperatures, rainfall and wind patterns). Furthermore, micro- and macroalgae use carbon dioxide for photosynthesis and therefore play a major role in locking away some of the excess carbon dioxide absorbed by the ocean –through the sinking of dead phytoplankton to the ocean floor as well as through coastal ecosystems such as mangrove forests and seagrass meadows (so-called "blue carbon").

Conversely, the excess carbon dioxide being absorbed by the ocean is affecting the ocean's natural pH buffering capacity and causing ocean acidification. Negative impacts have been observed on the growth and reproduction of a variety of marine species, although the implications for ocean ecosystems are still not fully understood - particularly when the issue of acidification is coupled with the other climate-related threats of warming and deoxygenation, and other human impacts such as pollution (chemicals, noise, plastics...).

Science & Research

Advancing scientific understanding of the ocean is critical to tackling climate change. We believe that this understanding is rooted in making systematic, high quality measurements. POGO seeks to lead innovation and development of the crucial components of the ocean observing system. Our members are at the forefront of oceanographic methods and technology development, therefore POGO is in a critical position to identify the emerging methods and technologies that can be expanded and deployed on a global scale. POGO is also strongly focused on the affordability issues associated with ocean observing, particularly for developing countries, and is therefore engaged in projects looking to develop low-cost sensors and systems for coastal ocean observing.

Capacity Building

POGO also recognises that the expertise for conducting ocean observations is not evenly distributed between countries, and therefore the ocean is unevenly observed, with a much higher density of observations conducted in the North Atlantic and North Pacific, than in, for example, the South Atlantic, South Pacific and Indian Ocean. In addition to developing global capacity through low cost technologies, POGO also provides professional training opportunities for early-career scientists, mainly from coastal developing countries, to expand the worldwide capacity for conducting sustained ocean observations, data collection, analysis and management, and interpreting the scientific results for the benefit of society. This is conducted through research fellowships and scholarships, shipboard training, and regional training programmes. Of equal importance is the continued support POGO provides to its alumni, particularly through the NF-POGO Alumni Network for the Ocean (NANO) and its collaborative ocean observation projects.

More Information:

Find out more about POGO-supported activities at https://pogo-ocean.org/innovation-in-ocean-observing/activities/

POGO is also proud to be a UN Ocean Decade Implementing Partner. Read more about our UNOD-specific activities here: https://pogo-ocean.org/partners/un-ocean-decade/

Links

1. Observing case studies https://pogo-ocean.org/pogo-member-case-studies/
2. Quick links for COP https://pogo-ocean.org/cop-28/
3. Ocean training partnership https://www.oceantrainingpartnership.org
4. Ocean biomolecular observing network (OBON) https://www.obon-ocean.org
5. UN Ocean decade implementing partner activities https://pogo-ocean.org/partners/un-ocean-decade/
6. NANO: NF-POGO Alumni Network for the Ocean https://nf-pogo-alumni.org

7. Website https://pogo-ocean.org
8. Videos https://www.youtube.com/playlist?list=PL3Mh9bBxde-Xh7h4heNc6DHN2Kp8q4va5
9. Newsletter https://pogo-ocean.org/pogo-newsletter/
10. Twitter https://twitter.com/POGO_Ocean
11. Facebook https://www.facebook.com/POGO.Ocean/
12. Instagram https://www.instagram.com/pogo_ocean/

Videos

1. An introduction to POGO https://player.vimeo.com/video/884007215
2. Pillar 1: innovation in ocean observing https://player.vimeo.com/video/884015221
3. Pillar 2: capacity development https://player.vimeo.com/video/884015649
4. Pillar 3: outreach and advocacy https://player.vimeo.com/video/884016032
5. POGO outro: working together https://player.vimeo.com/video/884017433

Documents

1. Three pillars of POGO https://vepimg.b8cdn.com/uploads/vjfnew/10412/content/docs/1699554656pogo-intro-2023-final-compressed-pdf1699554656.pdf
2. Annual report https://pogo-ocean.org/pogo-annual-report/
3. 5-year strategy https://pogo-ocean.org/pogo-strategy/
4. Case study: UK/AMOC https://vepimg.b8cdn.com/uploads/vjfnew/10412/content/docs/1699890981pogo-case-study-uk-050123-pdf1699890981.pdf
5. Case study: Japan/plankton populations are changing as the ocean warms and acidifies https://vepimg.b8cdn.com/uploads/vjfnew/10412/content/docs/1699891290pogo-case-study-japan-050123-pdf1699891290.pdf
6. Case study: China/Bailong Buoy https://vepimg.b8cdn.com/uploads/vjfnew/10412/content/docs/1699891383pogo-case-study-bailong-110123-pdf1699891383.pdf