Progress Report
Partnership for Observation of the Global Ocean (POGO)

POGO Secretariat Activities

Period of Activity: 01 October 2022 – 30 September 2023

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Budget Summary
FY 2023: 11,000 EUR

Partnership for Observation of the Global Ocean (POGO)

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1. Project Summary

The aim of the project is to provide support for the activities of the Partnership for Observation of the Global Ocean (POGO), of which National Oceanic and Atmospheric Administration (NOAA) is one of the members from the USA.

POGO (http://pogo-ocean.org) was founded in 1999 as a consortium of the major oceanographic institutions around the world, represented by their Directors. As stated at the founding of POGO, the objective of POGO is to make a major contribution to the attainment of sustained *in situ* observations of the global ocean that meet the requirements of international research and operational programmes. As a means of attaining this objective, POGO:

- Initiates key actions to enable effective coordination, integration, and implementation of international ocean observing strategies;
- Establishes collective agreements among institutions to promote timely developments in ocean science;
- Develops and promotes coordinated views of ocean institutions concerning ocean observation and science to governments, international bodies, and others;
- Facilitates linkages between oceanographic research and operational institutions in relation to their goals, plans, and programs;
- Undertakes capacity development;
- Promotes sharing of facilities and infrastructure;
- Encourages interdisciplinary use of observing infrastructure;
- Conducts public outreach.

In 2021, POGO launched its new five-year strategy, which takes into account the current international context and reaffirms our commitment to work as a global community to promote and deliver the truly global ocean observation system needed to advance understanding of the ocean and its wise use for the benefit of all humankind.

POGO provides a forum for Members to meet with their peers, and with senior officials of partner organisations, to discuss issues of mutual concern. It also serves as a credible voice for the marine science community, as demonstrated by its leadership role in the creation of the Blue Planet Initiative within the Group on Earth Observations (GEO) (see http://www.geoblueplanet.org). Through its various initiatives, POGO stands out as an advocating body for the establishment of an integrated, global ocean observing system. The activities supported by NOAA last year included:

- Preparation for and execution of the annual meetings of POGO;
- Participation in the United Nations Decade of Ocean Science for Sustainable Development and its Communications Advisory Group;
- Support for the launch of the Ocean Biomolecular Observing Network (OBON);
- Preparation of calls for Working Groups, Projects and Training Initiatives, selection process, and oversight of selected initiatives.
- Development of case studies on the societal benefits of ocean observations.

2. Scientific and Observing System Accomplishments

2.1.POGO Annual Meeting

POGO is a consortium of major oceanographic research institutions worldwide, typically represented at the Director level. POGO members meet once a year during 3-day meetings hosted by a member institute. These meetings provide the opportunity for reporting on activities carried out during the previous year and discussions of strategic issues related to global ocean observations, and forward planning for POGO.

For the first time since the Covid-19 pandemic, the 24th POGO Annual Meeting was held once again in-person. The plenary sessions were held from 24 to 25 and the Annual General Meeting (AGM) on 26 Jan 2023. The POGO-24 Meeting was attended by over 70 participants from 22 countries, including members, partners and observers. This year, POGO has welcomed 4 new members:

- Institut de Recherche pour le Développement (IRD, France)
- State Key Marine Environmental Laboratory, Xiamen University (China)
- Agency for Meteorology, Climatology, and Geophyics of the Republic of Indonesia (BMKG)
- National Institute of Oceanography and Fisheries (NIOF), Egypt.

During the plenary meeting, special sessions were held on the following topics:

- Deep Ocean Observations for Science, Conservation and Management
- Societal Applications of Digital Twins
- Coastal Ocean Observations
- Ocean Biomolecular Observing Network (OBON).

In addition, the AGM included discussion of:

- POGO Work Plan;
- Implementation of Ocean Sound EOV
- Biomolecular observations in support of the Convention on Biological Diversity (CBD)
- Collaboration with industry.

Figure 1: Group photo of the 24th POGO Annual Meeting held in Toulon, France, from 24-26 January 2023.

2.2. Leadership of international initiatives

Oceanscape

The POGO Secretariat continues to maintain and promote the "Oceanscape" portal, and to invite new submissions. Oceanscape was an initiative from POGO and the GEO Blue Planet to identify the numerous organisations (including projects, programmes, and other structures) working in the "ocean space", and to clarify the connections between them (as well as identifying opportunities to make connections where none exist). Led by POGO, the Oceanscape portal was launched during Ocean Obs'19 in September 2019, as a community effort that aims to serve a variety of stakeholders:

- the scientific community, who may not be aware of all the initiatives taking place in the "ocean space", and who could benefit from identifying synergies, new collaborations and avoiding overlap or duplication;
- NGOs, as well as the private sector, who may be looking for suitable organisations for collaboration;
- governments and funding agencies, who may not have a clear picture of the "oceanscape" of organisations, what they are each doing and how they differ from one another.

Over the last year, the POGO Secretariat has been working closely with the Ocean Info Hub project of IOC-IODE to connect Oceanscape to Ocean Info Hub so that its metadata can be harvested and exposed through Ocean Info Hub. This was achieved in September 2023.

UN Decade of Ocean Science for Sustainable Development

In March 2023, we were pleased and proud to receive endorsement as one of three new UN Ocean Decade Implementing Partners (DIPs) announced by the IOC Executive Secretary. POGO has been designated as a DIP for its commitment to supporting the Decade by coordinating existing Decade Actions, catalyzing new initiatives, leading targeted communications and outreach, and mobilizing resources.

Ocean Decade-endorsed activities supported by or involving POGO include:

- Ocean Biomolecular Observing Network (OBON) (2021 onwards, see below)
- 2023 NF-POGO Regional Training Programme on Sustainable Marine Resource Management
- West Africa Marine Science Symposium (2023)
- International Nutrient Inter-comparison Voyage (INIV) (2023)
- North-South Atlantic Training Transect (NoSoAT) 2022
- COP27 Ocean Pavilion (2022)
- OARS - via the POGO WG, "Action for Sustainable Ocean Acidification Research (ASOAR)"

Find out more about our UNOD involvement on our dedicated page on the POGO website.
The POGO Communications Officer has continued to serve on the UN Ocean Decade Communications Advisory Group, recently renamed the Strategic Communications Group. The Decade is bringing together diverse stakeholders, including civil society, private industry, and science, to tackle the major challenges facing the ocean, and by association, facing our society.

Ocean Biomolecular Observing Network

In 2017 POGO launched a task force with the objective to focus on the development of technologies and strategies dedicated to improving the biological and biochemical observation of the ocean, which is still lagging behind the advances and progress made in the realm of physical observations. The task force has since then been developing capacity and knowledge exchange, with a workshop on Machine Learning/Artificial Intelligence for Biological Observations (2019) and an International Virtual Conference on the use of Environmental DNA (eDNA) in Marine Environments: Opportunities and Challenges, held in 2020. The virtual meeting provided an opportunity to envision a sustainable global omics/eDNA monitoring system and to promote global coordination among the organizations that are fostering eDNA and 'omics' measurement for marine environments, culminating in a programme proposal, the Ocean Biomolecular Observing Network (OBON). The OBON aims to organize a global programme that uses biomolecular techniques to greatly enhance coastal and open ocean biological observations. Many observing systems collect biological material that can be directly analyzed for biomolecules. In addition, all ocean lifeforms contain or leave behind a biomolecular trace (nucleic acids) that can be analyzed directly from a seawater sample. The program will utilize both molecular techniques to understand and monitor life in the sea at every trophic level and scale. These observations will allow us to understand how life varies in response to climate and anthropogenic forcing, and how these changes impact society.

The POGO CEO is part of the OBON Science Advisory Committee and the POGO Communications Officer is supporting the communications activities of OBON until an interim Coordination Office can be established. The SAC has been meeting virtually on a monthly, with the frequency dropping to every 2 months once the Executive Committee was established in July 2023 (with ExCom meetings held fortnightly). The SAC also meets in hybrid mode, together with the OBON projects, on an annual basis. The Marine Biological Association (MBA) in Plymouth, UK, has been helping with the provision of part-time staff for OBON, funded by POGO, and working closely with the POGO Secretariat. OBON participated in calls for new projects to be endorsed by the UN Ocean Decade, and as a result 14 projects have been endorsed under OBON to date. More information on OBON can be found at https://www.obon-ocean.org/. The POGO Secretariat and part-time Programme Assistant have also been working on the development of a new OBON website and publication of newsletters.

2.3.POGO Projects, Working Groups and Training Initiatives

Support is provided to initiatives proposed by POGO members, which aim to identify and fill gaps in global ocean observation. Members can apply for funding for Projects, Working Groups

and/or Training Initiatives which are dedicated to specific priority areas directly relevant to POGO's core mission, i.e. sustained, long-term ocean observing systems and shared use of infrastructure, data and information. Working Groups provide a platform for the members to discuss and produce recommendations for addressing key issues. They may also focus on solutions for improving ocean observations, such as new technologies, novel partnerships and funding sources, and improving data access and visualisation.

A call for proposals was announced in April 2023 and received 11 applications, of which 5 were selected for funding:

- Coastal Marine Heatwave Interdisciplinary Research group (CMHIR), led by IMAS, Australia
- An EOV Based Atlantic Integrated Ocean Observing System, led by NOAA, USA
- Coastal Observing Lab in a Box (COLaB), led by the University of Ghana
- Training on Ocean Observations for Coastal Applications, led by INCOIS, India
- Training on Hands on MinION: Generating reference DNA barcodes for West African marine fishes, led by IRD, France.

The current activities can be found at https://pogo-ocean.org/innovation-in-ocean-observing/activities/.

3. Outreach and Education

POGO is very active in the areas of public outreach and training and education, and these are outlined as two of the three pillars of POGO's Mission:

1. Lead innovation and development of the crucial components of the ocean observing system.
2. Identify and contribute to the development of the key skills, capabilities and capacities needed to achieve the vision.
3. Work with governments, foundations and industry, to articulate the benefits to society and required funding to build and sustain the system.

Capacity building is an important part of POGO's agenda, with a suite of programmes that have so far trained over 1,200 scientists from around 90 countries. Public outreach has been conducted over the years through participation in international exhibitions, including GEO Ministerial Summits, United Nations Climate Change Conferences (UNFCCC), and World Expo. POGO's alumni network (NANO) has an outreach component, which includes a platform for sharing (and translating) outreach materials among its members. POGO also takes advantage of its trainings to promote outreach initiatives such as the successful "floating summer schools" on-board RV Polarstern, the latest of which took place in Sept 2022.

POGO became an Observer NGO to UNFCCC in 2017 and has participated in the annual Conference of the Parties (COP) ever since. POGO participated at COP27 in Sharm El-Sheikh, Egypt, in November 2022, by having an exhibit (in collaboration with Plymouth Marine

Laboratory, PML, and the International Coastal and Ocean Organisation, ICO) and co-organising a side event. COP27 was attended by nearly 50 thousand people from 195 countries, including politicians, representatives of non-governmental organizations, the scientific community and business sector.

POGO co-hosted a side event, entitled, "Observing and understanding climate change and biodiversity from the coast to the deep ocean", jointly with the University of Southampton/Deep Ocean Stewardship Initiative (DOSI). This year, POGO was also a partner in the first physical Ocean Pavilion to have a presence at COP. The Ocean Pavilion was an initiative led by WHOI and Scripps, with other partners including several other POGO Members: CNRS, IFREMER, PML, and NOC. The exhibit was in place for 1 week, with POGO, NANO and PML representatives interacting with delegates in multiple languages.

The POGO-OBON-DOSI Side Event focussed on how developing capacity for observing and understanding marine ecosystems will support tracking, forecasting and stewardship of these ecosystems to address the intertwined threats of climate change and biodiversity loss from the coast to the deep ocean. More details can be found on the POGO website, including a YouTube link to a recording of the session. The Ocean Pavilion was a hub for those interested in Ocean matters throughout the two weeks of COP, hosting networking events, meetings and a packed schedule of side events. POGO co-hosted two side events, (1) "Ocean observations for climate change: From local observations to a global system" (with GOOS) and (2) "Ocean observations for climate change: How do we train and educate the next generation of scientists and citizens?".

Figure 2 Side event on "Observing and understanding climate change and biodiversity from the coast to the deep ocean", led by POGO in collaboration with DOSI/University of Southampton at COP27 in Sharm El-Sheikh, Egypt.

During this year, POGO also participated in the OCEANS 2023 Conference in Limerick, Ireland. OCEANS is the bi-annual event for global marine technologists, engineers, students, government officials, lawyers, and advocates. It is the flagship event of the Marine Technology Society (MTS) and the IEEE Oceanic Engineering Society (OES). The 2023 meeting was hosted by the University of Limerick, Ireland, with Marine Institute as a key partner/organiser, and took place from 5-8 June. OCEANS 2023 was a UN Ocean Decade endorsed activity.

This meeting is dominated by marine industry and engineering, and provides an opportunity for POGO to interact with a subset of the Ocean Observing community who do not generally attend the same events as the secretariat. The programme was focused on three main themes: (1) Offshore Wind, Carbon Neutral Energy by 2050; (2) Sustainable Commercial Use of Seas and Oceans; and (3) Ocean Health and Resilience, with the morning plenary sessions tackling on one theme per day. Former POGO Chair, Karen Wiltshire (AWI) was honorary chair of the conference. Fiona Beckman attended the meeting on behalf of POGO and staffed an exhibition booth. She also represented POGO in a special panel session, entitled ***"Fair solutions in Engineering for sustainable oceans"***, chaired by Niall McDonough (Marine Institute). Other panellists were Eva-Maria Brodte (AWI), Prof Karen Wiltshire (AWI), and Toste Tanhua (GEOMAR/GOOS). The panel discussed the global need for low cost/affordable observing devices, and shared examples of existing projects. Audience engagement was good, and the panel agreed to explore this topic further within the framework of the UN Ocean Decade.

POGO regularly issues press releases and "declarations" in conjunction with major events, and publications aimed at non-specialists on the topic of ocean observations and their societal relevance (e.g., "fact sheets" derived from its Working Groups). Two new case studies on geohazards were published during this period, based on work conducted by POGO members in India and France. These and other publications are available at https://pogo-ocean.org/outreach-and-advocacy/media-and-publications/.

The POGO Secretariat produced its quarterly newsletter in November 2022, February, May, and August 2023. The electronic newsletter is distributed to the POGO members and wider community, and includes updates on POGO activities and news from the POGO members. The aim is to facilitate exchange of information among the members as well as to keep them informed between annual meetings of progress made on issues that were discussed during the meetings, such as POGO projects and working groups, outreach, capacity development, partner programmes and so on. Another objective is to inform the wider community (in particular funding agencies and scientists within the POGO member institutions) of POGO's achievements.

The POGO Secretariat maintains the POGO website (www.pogo-ocean.org), which involves posting information on POGO meetings, announcements, news from the members, job vacancies, a conference/meeting calendar, and training opportunities. It also includes links to the history of POGO, on-line educational resources for the general public that can be used for example by teachers (https://pogo-ocean.org/outreach-and-advocacy/outreach-resources/). The Secretariat maintains a number of other websites for associated activities, namely:

- the NF-POGO Alumni Network for the Ocean (NANO): www.nf-pogo-alumni.org

- Ocean Training Partnership (shipboard training): www.oceantrainingpartnership.org
- Oceanscape portal: https://oceanscape.org.
- Ocean Biomolecular Observing Network: https://www.obon-ocean.org/ .

4. Publications and Reports

4.1. Publications by Principal Investigators

Miloslavich, P., and Coauthors, 2022: Developing Capacity for Ocean Science and Technology. *Blue Economy*, E.R. Urban Jr. and V. Ittekkot, V., Ed, Springer, Singapore, 467-504. https://doi.org/10.1007/978-981-19-5065-0_15.

Catarino, A., and Coauthors, 2023: Addressing data gaps in marine litter distribution: Citizen science observation of plastics in coastal ecosystems by high-school students. *Front. Mar. Sci.*, **10**, https://doi.org/10.3389/fmars.2023.1126895.

Severin, M., and Coauthors, 2023: Impact of the citizen science project COLLECT on ocean literacy and well-being within a north-west African and south-east Asian context. Front. Psychol., **14**, https://doi.org/10.3389/fpsyg.2023.1130596.

4.2. Other Relevant Publications

N/a.

5. Data and Publication Sharing

The project does not currently collect any data.

6. Project Highlight Slides

Please see attached slides.