

Partnership for Observation of the Global Oceans

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News from the POGO members

Towards a better understanding of Tropical Atlantic variability and its impact on coastal fisheries off West Africa



A view of the PIRATA buy at 10°S,10°W captured during Meteor Survey M98, July 2013. Photo credit: M. Ostrowski. Subsidence fishing is a major source of livelihood for communities living along the seaboard of West Africa and their fishing yields are very sensitive to climate variability. For 18 countries of total population of 400 million located in the tropical region, there is a unique aspect of this variability: the remote forcing. For instance, coastal upwelling may in this region respond more to remote wind patterns induced on the western side of the ocean basin than the local wind conditions near the coast. An improved predictability of this upwelling holds a promise for an improved management of small-scale fisheries around the tropical sector of West Africa's seaboard.

R. A. Imbol Koungue of the Nansen Tutu Center at the University of Cape Town (http://www. nansen-tutu.org) conducts studies on the mechanisms and variability of the interannual Benguela Niño events affecting the coasts of southeastern Atlantic from Gabon to Namibia. Combining observations from the PIRATA mooring program (http://www.pmel.noaa. gov/pirata/), modeling studies and satellite data, he has identified warm and cold event scenarios that affect in this region on time-scales longer from the previously assumed dominant time-scale of an acute event locked to the austral summer. He is currently visiting

the Institute of Marine Research in Bergen, Norway (http://www.imr.no) with a goal to perform a study on the impacts of these scenarios on the transport and retention patterns of larval pelagic fish off the Angolan coast and in the northern Benguela Current upwelling region.

This above collaboration between the Nansen Tutu Center and Institute of Marine Research is a part of an EU FP7 research project PREFACE (http:// www.preface-project.eu).

This article was provided by Dr Erlend Moksness, Research Director, Institute of Marine Research (IMR).

Rutgers Scientists Help Create World's Largest Coral Gene Database

'Genetic toolkit' will help shed light on which species survive climate change

Coral reefs – stunning, critical habitats for an enormous array of prized fish and other species – have survived five major extinction events in the last 250 million years.

Now, an international team of scientists led by Rutgers University faculty has conducted the world's most comprehensive analysis of coral genes, focusing on how their evolution has allowed corals to interact with and adapt to the environment. A second study led by Rutgers researchers with University of Hawaii colleagues shows – for the first time – how stony corals create their hard skeletons, using proteins as key ingredients.

The coral gene analysis, published in the journal eLife and led by Rutgers professors Debashish Bhattacharya and Paul Falkowski, stems from an international symposium and workshop held at Rutgers and funded by the National Science Foundation.

Leaders in the field of coral biology and genomics met to plan an analysis of 20 coral genomic datasets and provide a comprehensive understanding of coral evolution since the organisms appeared 525 million years ago. Coral gene databases have been posted on the comparative.reefgenomics.org website.



Coral reef in Komodo National Park in Eastern Indonesia. Photo credit: Michael Lesser, University of New Hampshire.

Bhattacharya, Falkowski and coauthors found dozens of genes that allow corals to coordinate their response to changes in temperature, light and pH and cope with stress triggered by the algae that live with them and exposure to high levels of light. An intriguing theory that arose from the study is that the vast genetic repertoire of corals may help them adapt to changing ocean conditions.

The other study – led by former Rutgers post-doctoral fellow Tali Mass and published in Proceedings of the Royal Society B: Biological Sciences – explains how stony corals create their hard, calcium carbonate skeletons. It also explains how this process might be affected as the oceans become more acidic due to climate change.

This article was provided by Todd B. Bates, Science Communicator, Rutgers, The State University of New Jersey.



News from the POGO members (cont'd)

The potential impacts of Offshore Wind Farms on shelf seas

Shelf seas comprise 7% of the oceans and host enormous economic activity. They hold around 20% of all ocean life and sustain around 90% of the world's fisheries. The development of Offshore Wind Farms (OWFs) has grown with increased renewable energy demand (the UK has 1465 offshore wind turbines). The renewable energy environmental impact is overwhelmingly positive, however, there is little evidence of potential impacts.

Plymouth Marine Laboratory addressed this with a hydrodynamic model (FVCOM) of the existing wind farms in the eastern Irish Sea. FVCOM permits flexible arrangement of model elements to include the actual wind turbines in a model of the south-western UK shelf. Whereas most previous studies have focused on small-scale domains (e.g. a single wind farm), the impacts of offshore wind farms can now be investigated regionally too.

The scientists found that although each turbine is small (5m diameter), cumulatively they change the local flow of water, increasing mixing in the vicinity of the offshore wind farm. Most of the turbines are in well-mixed waters, but the largest straddles a tidal front. The increased mixing changes stratification by



The sea around the Walney, Ormonde, West of Dudden Sands and Barrow wind farms west of Morecombe Bay from the Landsat 8/OLI satellite June 2014. Shows the colour of ocean and the turbid wakes (darker areas of water) generated by the wind turbines extending SE away from the farms due to the tidal flow.Photo credit: Silvana Mallor Hoya, PML.

the largest straddles a tidal front. The increased mixing changes stratification by 5-15% around the wind farm and could impact nutrient availability. As most future OWFs in the UK will be in seasonally stratified areas, this work is crucial for sustainable development of new OWFs.

The model also shows that OWFs increase and decrease tidal heights around the UK coastline. In the far-field (e.g. off the southeastern English coast), increases in the M2 tidal constituent amplitude of 1%-2% (about 6cm-12cm) were found, changes which might have consequences for coastal habitats, economic investment and flooding (the Thames Barrier, for example, protects London and is increasingly deployed). This work suggests a potential contributing factor as well as climate change and changes in river discharge.

Cazenave, P.W., Torres, R., Icarus Allen, J., Unstructured grid modelling of offshore wind farm impacts on seasonally stratified shelf seas, Progress in Oceanography (2016), http://dx.doi.org/10.1016/j.pocean.2016.04.004

This article was provided by Helen Murray, Communications Officer, Plymouth Marine Laboratory (PML).

Marianas expedition discovers and shares deep-sea secrets



A hydromedusa jellyfish from the genus Crossota seen April 24, 2016, at ~3,700 m in the Marianas Trench National Monument. Photo Credit: NOAA Office of Ocean Exploration & Research. New species and geologic features are among the many discoveries from the NOAA 2016: Deepwater Exploration of the Marianas, a three-cruise expedition from April 20 to July 10 to study unknown and poorly known areas in and around the Marianas Trench National Marine Monument. This research is part of NOAA's three-year CAPSTONE (Campaign to Address the Pacific Monument Science, Technology, and Ocean Needs) effort to explore high-priority unknown areas in the Pacific marine national monuments. Florida Atlantic University's Harbor Branch Oceanographic Institute (FAU), home to the NOAA Cooperative Institute for Ocean Exploration, Research and Technology (CIOERT), played a central role by contributing two science leads and enabling remote participation via its Exploration Command Center (ECC), one of 11 such facilities established by NOAA and its partners worldwide.

FAU Research Professor and CIOERT Executive Director Shirley Pomponi, Ph.D., was the biology science lead for the third leg and CIOERT Associate Executive Director Deborah Glickson, Ph.D., served as geology science lead on the first leg.

Expedition priorities included acquiring data to support science and management needs, exploring the diversity and distribution of benthic habitats and features, characterizing seamounts in and around the Prime Crust Zone (PCZ), investigating the geologic history of Pacific seamounts, and engaging

(PCZ), investigating the geologic history of Pacific seamounts, and engaging the scientific community and public through telepresence-based exploration. The PCZ is the area of the Pacific with the highest concentration of commercially valuable deep-sea minerals, which underscores a principle behind the expedition: the need to assess and document marine resources, all of which are bound to face increasing anthropogenic pressures.

Mapping (all three legs) and ROV dive (legs one and three) operations were central to the expedition, with more than 20,000 km2 of seafloor mapped during the first leg. The dives delivered spectacular high-definition images to the ECCs and the NOAA Office of Ocean Exploration and Research website (oceanexplorer.noaa.gov).

This article was provided by Larry Macke, ELS, Research Communications Project Manager, FAU Harbor Branch Oceanographic Institute.



News from the POGO members (cont'd)

Continental scale base-lining of the oceans unseen biodiversity

Marine microbes which account for 90% of oceanic biomass, form the foundation of the marine food web and are the engines driving the chemical cycles that ultimately control global climate. Because molecular methods, which were historically expensive and low throughput, are required to accurately census microbes, there exist very few long-term monitoring datasets, particularly from the southern hemisphere. The

Australian Marine Microbial Biodiversity Initiative (AMMBI) is a multi-institutional project designed to address this critical data shortfall. AMMBI is embedded in Australia's Integrated Marine Observing (IMOS) monthly System National Reference Stations (NRS) data collection. Samples are collected approximately monthly at seven time-series stations around the continent spanning 30° S latitude. By partnering with Bioplatforms Australia AMMBI generates extensive next generation sequencing datasets, including phylogenetic marker genes and functional gene data targeting Bacteria, Archaea and microbial eukaryotes (otherwise known as phyto / zooplankton).

The locations for sampling have been identified to provide critical information about the impact of Australia's unique twin southerly flowing boundary currents, the Leeuwin Current in the west and the East Australia Current in the east, the extension of which are resulting in the most rapidly warming waters on the globe. Lead scientist of the project, Dr Levente Bodrossy at the Commonwealth Scientific and Industrial Research Organisation (CSIRO), Oceans and Atmosphere (O&A) division, said that standardized ongoing sampling and molecular analyses in project this size was unprecedented. "This dataset will provide a comprehensive baseline for identifying climate related shifts in the primarily invisible but critical marine microbes

that dominate ocean biomass and biogeochemistry. Our continental scale network resolves microbial dynamics in waters ranging from tropical, through temperate to polar biomes."

It is exactly this capacity to observe seasonal microbial dynamics across different latitudes that will enable this project to go beyond current day boundaries says AMMBI co-founder Dr Mark Brown at UNSW Australia. "Comparative time-series analysis will allow us accurately define multivariate environmental niches for individual microbes and incorporate their dynamics into predictive models, leading to

predictions of their distribution and biogeochemical impact under future ocean scenarios."

AMMBI is focused at the nexus of microbial ecology, biogeochemistry and oceanographic modeling, and ultimately aims to enhance our capacity to predict the resilience of ocean ecosystems and their response to change.

The RLS includes underwater censuses of over 3,000 fish species

in 44 countries around the world, managed and coordinated at

This article was provided by Dr. Kenneth Lee, Director, Oceans and Atmosphere Commonwealth Scientific Industrial Research, Australian Resources Research Centre (CSIRO).

Sampling locations and details for the Australian Marine Microbial Biodiversity

Initiative.

Biodiversity as important as climate for marine fish production, new study shows

Diverse fish communities are more productive and resistant to changing temperatures, a new study by the Institute for Marine and Antarctic Studies (IMAS) marine biologists, along with US and Chilean colleagues, has found.

The findings are based on the latest global analysis based on the Reef Life Survey (RLS) dataset, led by the US Smithsonian Institution.

The study confirmed biodiversity is a key factor needed for fish resources to thrive over coming decades, as communities with more fish species are more productive and more resilient to both rising temperatures and temperature swings.

The accelerating loss and rearrangement of species all over the globe have troubled both scientists and the public for decades but the question of whether biodiversity offered practical value - for humans and ecosystems – had previously remained controversial.

"Preserving biodiversity is not just an aesthetic or spiritual issue - it's critical to the healthy functioning of ecosystems, and the important services they provide to humans, like seafood," said lead author Emmett Duffy from the Smithsonian Institution.



IMAS.

RLS diver surveying reef fishes, Raja Ampat, West Papua. Photo credit: Rick Stuart-Smith.

"This study is based on more than 4500 underwater surveys," IMAS co-author Dr Rick Stuart-Smith said.

"It was only possible with the enthusiastic contributions of highly trained RLS volunteer divers, which allowed us to achieve this comprehensive coverage of the world's reefs, from tropical to polar waters."

The researchers tracked how 25 different environmental factors influenced total fish biomass on coral and rocky reefs around the world.

Surprisingly, one of the strongest influences was biodiversity: both the number of species (species richness) and the variety of ways they use their environment (functional diversity) enhanced fish biomass.

The study is available at: http://www.pnas.org/content/early/2016/05/10/1524465113. This article was provided by Andrew Rhodes, Communications Manager, Institute for Marine and Antarctic Studies (IMAS).



News from the POGO members (cont'd) IMECOCAL's 58th cruise



Pacific coast of the Baja California peninsula. Black dots indicate locations of selected stations. White numbers show some of the transect numbers.

The IMECOCAL (Investigación MExicana de la COrriente de CALifornia) program completed its latest cruise in April, 2016 aboard the R/V Alpha Helix owned and operated by CICESE since 2015. The sampling grid is based on the CalCOFI (California Cooperative **Oceanic Fisheries** Investigations) plan laid out in 1950 extending southward from the US-Mexico border along the Baja California peninsula for approximately 900 km and offshore 200 to 450 km. The sampling grid is shown in the accompanying figure. Previously regular quarterly cruises were carried out aboard CICESE's R/V Ulloa (1997-2013) and INAPESCA's Ř/V BIPO (2014-2015).

IMECOCAL's cruises are coordinated as closely as possible with the quarterly CalCOFI surveys to provide coverage of the combined regions of the California Current ecosystem within the same time frame. IMECOCAL collects hydrographic data with CTD casts down to 1000 m measuring temperature and salinity profiles, as well as fluorescence and oxygen. Biological sampling includes primary productivity measurements and collection of zooplankton and icthyoplankton. There is also underway collection of temperature, salinity and fluorescence along with continuous sampling of fish eggs between stations by continuous pumping with a CUFES (Continuous Underway Fish Egg Sampler) system.

IMECOCAL is an inter-institutional program supported principally through competitive grant awards from the Mexican National Council of Science and Technology (CONACYT).

This 58th cruise covered only the northern region (first 6 stations along the lines) plus one station just north of Punta Eugenia, with 45 CTD casts, 43 Bongo net tows to collect zooplankton and 8 stations with measurements of primary production. Continuous underway measurements were taken of temperature and salinity, pH, and CO2 partial pressure. Underway measurements of meteorological data were made and subsurface currents data was taken with an ADCP. This time there was no underway sampling of icthyoplankton. Tim Baumgartner, Oceanology Division, CICESE.

This article was provided by Dr. Edgar Pavia, Director de la División de Oceanología, Oceanology Division of The Center for Scientific Research and Higher Education at Ensenada (CICESE).

Arctic Marine Biological Hotspot Supported by Underwater Storage House of Organic Matters

First observation of annual variations in phytoplankton biomass

A research team led by Dr. Shigeto Nishino at JAMSTEC analyzed hydrographic and biogeochemical data collected from moorings installed in Hope Valley, the southern Chukchi Sea



during July 16, 2012 to July 19, 2014. It identified annual variations in phytoplankton biomass and also found phytoplankton blooms in autumn.

By combining the mooring data with the data obtained from the JAMSTEC's research vessel Mirai during September to October in

Launching of CTD (Conductivity-Temperature-Depth Profiler) system and water samplers into the sea from R/V Mirai (August 31, 2013) Photo credit: JAMSTEC

2012 and 2013, it was indicated that these autumn blooms were triggered by regenerated nutrients associated with the decomposition of particulate organic matters, which were transported and stored at the bottom of the valley. It is the first time such annual variations in phytoplankton were identified in Hope Valley.

In the Arctic Ocean, phytoplankton blooms occur when light irradiance necessary for photosynthesis increase with sea ice melting. Because of a large phytoplankton bloom in spring as a source of food for benthic organisms, the southern Chukchi Sea is, in particular, known as a biological hotspot, where various kinds of living organisms exist with feeding relationships. In this study, the mooring-based observations found small blooms also in autumn in Hope Valley in the southern Chukchi Sea. In addition, the ship-based observation data on Mirai indicated that bottom water in Hope Valley forms a dome-like structure, suggesting ocean circulation in a counter-clockwise direction and converge of deep water there. These autumn blooms are, therefore, likely to be associated with particulate organic matters transported into the bottom of the valley, where nutrients such as ammonia are produced to increase phytoplankton with the organic matter decomposition. In other words, Hope Valley is becoming a storage house of organic particles, in which nutrients for phytoplankton are produced.

The above results were published on Biogeosciences issued by European Geosciences Union on April 29, 2016 (JST).

This article was provided by Jin Tachihara, International Affairs Division, Japan Agency for Marine-Earth Science and Technology (JAMSTEC).



News from the POGO members (cont'd)

Robotics team attempts to uncover Orkney's Neolithic past



The Orkney project team with 'Freya' Photo credit: NFSD/SAMS.

SAMS' autonomous underwater vehicle 'Freya' has been on another voyage of discovery – this time conducting a survey to gain an insight into Orkney's archaeological past.

Working with Dr. Richard Bates (University of St Andrews) and local archaeologist Dr Caroline Wickham-Jones the SAMS AUV team conducted surveys of Loch Harray and Bay of Firth looking for evidence of submerged landscapes and possible settlements from the last 5,000 years.

This is the first time that such technology has been used to delve into, and attempt to explore, the Neolithic period in Orkney.

The work was supported by the Marine Alliance for Science and Technology for Scotland (MASTS). Freya is a yellow, three-metre long, underwater robot operated by the Obanbased SAMS, from the institute's Scottish Marine Robotics Facility.

The Gavia team of Dr John Howe, Karen Wilson and Colin Abernethy travelled to Orkney from SAMS to operate the vehicle and gather valuable data from the sea and loch floor.

This study is led by Dr Bates, a senior lecturer in earth sciences at the University of St Andrews and is part of the Rising Tides project which has brought together archaeologists, geophysicists and coastal geomorphologists from across Britain to investigate the submerged landscapes of Orkney.



The research team prepare the Gavia ahead of its survey. Photo credit: NFSD/SAMS.

The SAMS Gvia 'Freya' cuts through the surface of the water before diving. Photo credit: NFSD/SAMS.

Thousands of years ago, when people first settled in the Orkney, the islands were a very different place.

Lower sea levels meant that the islands comprised a single landmass, and many of the areas once settled by Orkney's early inhabitants now lie underwater.

Orkney based Caroline Wickham-Jones, a researcher with the University of Aberdeen, is also involved in the study to find out more about past submerged landscapes.

This article was provided by Euan Paterson, Communications and Media Officer, SAMS.

Capacity Building Updates

POGO-SCOR Visiting Fellowships 2016

This year 41 applications were received from 19 countries. Five POGO-SCOR Visiting Fellowships have been selected. The successful fellows are from Argentina, Ivory Coast, Malaysia and South Africa. Host institutions include Helmholtz Centre for Ocean Research Kiel, GEOMAR (Germany), Hokkaido University (Japan), National Oceanography Centre (UK), Plymouth Marine Laboratory (UK) and University of East Anglia (UK).



Celeste López Abbate, Argentina

"Analysis and interpretation of coastal food webs exposed to growing synergistic effects of multiple stressors".



Juan Manuel

Molina, Argentina

"Application of NEMURO modeling frame in Argentinean fisheries."





Jethan d'Hotman, South Africa

"Enhancing South Africa's sustained offshore observational capabilities through Argo and mooring arrays."

Ahon Jean-Baptiste Kassi, Côte d'Ivoire

"Characterization and monitoring of upwelling areas in Ivorian waters for fishery valorization using remote sensing data."



Mohd Fadzil Akhir, Malaysia

"Data management and deployment planning for ocean glider and oceanographic buoy."



Capacity Building Updates (cont'd)

Nippon Foundation-POGO Centre of Excellence Scholars at the Alfred Wegener Institute for Polar and Marine Research for 2016

The programme consists in 10 months of training at AWI's well-equipped training and teaching facilities in marine and oceanographic science. The first half of the training will take place on the UNESCO reserve Waddensea island of Sylt, where shelf/basin interactions will be the topic of study, and the second part of the training will take place on the island of Helgoland focussing on the study of open-ocean sciences.

This year, 60 eligible applications were received. The applications were reviewed by a panel of 8 representatives from the AWI and POGO.

The ten successful candidates for the 2016-17 programme have now been selected and notified. The scholars are from Sudan, Iran, Tunisia, Turkey, Indonesia, Bangladesh, Brazil, Cameroon, India, Ethiopia.



Ahmed Alkarory ABDALAZEEZ, Sudan



Forough FENDERESKI, Iran



Sonia Khadija Maïté GUEROUN, Tunisia



Onur KARAKUŞ, Turkey



Jaya KELVIN, Indonesia



Md MASUD-UL-ALAM, Bangladesh



Helen Aparecida SOARES DE SOUZA, Brazil



Babette Christelle TCHONANG, Cameroon



Sudheesh VALLIYODAN, India



Zerihun Senbeto WOLDEYOHANNES, Ethiopia



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POGO Working Groups & Professional Training Initiatives

POGO Working Groups 2016 address key POGO strategic areas

This year sees the second year of funding for POGO Working Groups and training initiatives, to advance ocean observations while at the same time strengthen the ties between POGO members. Funded by POGO, support is provided to projects proposed by its members, which aim to identify and fill gaps in global ocean observation.

Observing and understanding the ocean below the Antarctic sea ice and ice shelves (OASIIS)

While changes in the Southern Ocean have widespread consequences for the planet, the paucity of observations in this part of the ocean hinders research. The OASIIS working group aims to develop a detailed implementation plan for an under-ice observing system. This truly global consortium led by Richard Coleman, IMAS, University of Tasmania, has members from the UK, US, Australia, Germany, China, South Africa and Sweden.

POGO Industrial Liaison Council (PILC)

One of POGOs mission statements is to work with industry to articulate societal benefits and required funding for the Ocean Observation System. To strengthen connections between the academic and industry world, PILC was formed. Lead by Stephen de Mora, PML, this group comprises members from industry (Ralph Rayner, Sonardyne), as well as POGO members (CSIRO, Australia; IEO, Spain, JAMSTEC, Japan, NIOZ, Netherlands).

Our Global Estuary (OGE)

Being a highly visible component of the global ocean, estuaries are key in raising societal awareness on ocean issues. Anthropogenic pressure however also makes it an endangered zone. OGE aims to pool the scientific expertise on estuaries of POGO members across geopolitical boundaries. Lead by US scientists Megan Davis (FAU Harbor Branch) and Antonia Baptista (OHSU), OGE has members from Australia, Brazil and Mexico.

Atlantic Meridional Transect (AMT) Ocean Training Programme

Shipboard training constitutes one of the major capacity-building opportunities for young oceanographers. POGO is funding one scholar to participate on the AMT cruise, which is unique in its ability to acquire multi-disciplinary oceanographic data along the north-south transects of the Atlantic Ocean. Coordinated by Andy Rees, PML, researchers of major European (PML, NOC, OGS), US (Bigelow) and South-African (UCT) institutes take part in this cruise.

POGO Activities

POGO Executive Committee Meeting

From 13-14 June, a meeting of the POGO Executive Committee was hosted by the Alfred Wegener Institute at the Helmholtz headquarters in Berlin. It was attended by Executive Committee members Karen Wiltshire (Chair), Eduardo Balguerías, Steve de Mora, Jan Mees, Yoshihisa Shirayama, Sun Song and Secretariat members Vikki Cheung and Sophie Seeyave (remotely). Apologies were received from Ed Hill and Margaret Leinen. The agenda items that were discussed included the review of POGO activities and follow-up on action items from the last annual meeting, POGO-17 in Yokohama.



Brandenburg Gate, Berlin.

The next POGO-18 meeting will be hosted by Plymouth Marine Laboratory and the agenda has been drafted to include workshops on the following topics: Industry liaison; Arctic observations; and Marine Protected Areas in addition to the discussions on POGO business and activities. The proposals that were submitted from POGO members for three working groups: 1) POGO Industrial Liaison Council (PILC); 2) Observing and understanding the ocean below the Antarctic sea ice and ice shelves (OASIIS); and 3) Our Global Estuary (OGE) were approved and it was decided that a second call for proposals from the Members would be made for this year.

Mr Francois Bailet (DOALAS, UN) was invited to join part of the POGO Executive Committee meeting to discuss ways in which POGO can be involved in the second cycle of the World Ocean Assessment which has opened up dialogue between the organisations. Following the G7 Summit and the Science and Technology Ministers' Meeting in Tsukuba, it was noted that ocean observations is now listed among the actions in the communiqué. POGO's membership has grown over the past year which is providing a stronger voice and helping to achieve POGO's mission.



POGO Activities (Cont'd)

G7 Science and Technology Ministers set Ocean Observation as a priority for the Future of the Oceans

At the 2016 G7 Science and Technology Ministers meeting in Tsukuba, Japan, ocean observation was defined as a key priority for the future of the oceans. In line with the G7 ocean expert working group, POGO had proactively contacted the G7 to speak out for the ocean observation system.

'The Future of the Seas and Oceans' has been on the agenda of the G7 Science and Technology Minister's Meeting since 2015.



G7 Science and Technology Ministers' Meeting in Tsukuba. Photo source: Official Website of G7 JAPAN 2016 Ise-Shima.

Importantly, this year's official communiqué shows a clear shift in focus to embrace the ocean observation system.

In a letter sent to the G7 members, science ministers and their representatives, POGO stressed the importance of high quality, systematic, continuous and global scale observations. POGO emphasised that without a networked system of ocean observations, mitigation and adaptation strategies ensuring a sustainable human ocean future can be considered next to impossible.

In the actions outlined in their communiqué, the G7 Science and Technology Ministers have endorsed the development of enhanced global sea and ocean observations, acknowledging the success of the Argo network. Stressing that the health of the oceans was included as the United Nations sustainable development goal 14 (SDG 14), further support will be given to continuous ocean assessment through the UN Regular Process. Both issues have high priority for POGO, and by acknowledging their importance, ministers followed closely the recommendations of the G7 ocean expert working group. Several POGO members participated in a workshop at the National Oceanography Centre, UK in March 2016 to contribute to these recommendations. In addition, two pillars that POGO has been advocating since its conception in 1999 have

been included, namely: 1) the promotion of open science and global data sharing; and 2) the strengthening of collaborative approaches to encourage the development of regional observing capabilities including capacity building in developing countries. Importantly, the Group of Earth Observation was mentioned as a key player in open science. This global visibility of GEO highlights the importance of maintaining the GEO initiative 'Blue Planet'.

Owing to its constructive work, the expert group 'Future of the Oceans and Seas' will be maintained for future G7 summits.

These results clearly show how beneficial the input of the scientific community can be in shaping crucial policy decisions for the future of the oceans. Developing and maintaining a global observation system is paramount to advance the understanding of the ocean and its wise use for humankind. POGO will continue to offer its scientific perspective to guide policy makers and support the development of such a truly global system.

The Tsukuba Communiqué from the G7 Science and Technology Ministers' meeting in Tsukuba, Ibaraki can be seen here: http:// www.g8.utoronto.ca/science/2016-tsukuba.html

This article was provided by Magdalena Wutte, Assistant Scientific Coordinator, POGO Secretariat.

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POGO-18 Meeting

24-26 January 2017, Plymouth, United Kingdom – Hosted by Plymouth Marine Laboratory (PML)

The outline agenda for the POGO-18 meeting is now available on the POGO website at http://ocean-partners.org/pogo-18, a full agenda will be added in due course. Delegates are advised to make their travel and accommodation reservations well in advance since preferential rates are available for a limited time.

Attendees should register for the meeting using the online form by 31st October 2016 at https://docs.google.com/forms/d/e/1FAI pQLSdT60F6ko6agSzLFdK4BFRdcpNIS1O6r519z8_L6ZkfVDhTZQ/viewform

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