

## News from the POGO members

### Round-the-World Regatta: Science wins

Forty-five thousand nautical miles around the world, of which more than 12,000 alone lead through the harsh Southern Ocean — the Volvo Ocean Race is reckoned one of the toughest challenges in offshore sailing sports. Currently seven teams compete in the 2017/2018 edition.

But, whoever wins the regatta, science will definitely be on the podium. Researchers of the GEOMAR Helmholtz Centre for Ocean Research Kiel and the Kiel Cluster of Excellence "The Future Ocean", with support from Volvo Cars, have equipped the yacht "Turn the Tide on Plastic", skippered by the British Dee Caffari, with a set of ocean sensors.

These devices collect basic chemical and physical seawater data as well as the distribution of microplastic particles in the ocean. "This gives us a unique global record of the state of the seas," says project manager Dr. Toste Tanhua from GEOMAR.



"Turn the Tide on Plastic" yacht.  
Photo credit: Sam Greenfield, Volvo Ocean Race.

GEOMAR already has considerable experience with automatic underway measurements on cargo ships, but ocean-going racing yachts are sports equipment trimmed for maximum speed. Classical underway systems are too bulky, too heavy, and consume too much energy for deployment there.

The Kiel based company SubCtech has experience with the development of compact underway systems and adapted its system according to the specifications of the Volvo Ocean Race. A second Kiel based company (bbe Moldaenke) joined the consortium and developed a system for measuring microparticles in the oceans surface.

The development work is now paying off. "We've found high microplastics concentrations in the Mediterranean and in the Atlantic. Now we are very curious about what we will find in the Southern Ocean and the Pacific," emphasises Dr. Tanhua. The results will also contribute to the Horizon2020 project, AtlantOS, which aims for better ocean observation in the Atlantic Ocean.

Read more in the project blog from Dr.-Ing. Sören Gutekunst on: <http://www.oceanblogs.org/oceanobsvor/>

*This article was provided by Jan Steffen, Communication and Media, GEOMAR Helmholtz Centre for Ocean Research Kiel.*

### Water sports can support ocean science

- Coastal water sports are an untapped resource that could help scientists increase their understanding of the world's ocean.
- Measuring the temperature at the surface of the ocean is crucial to our understanding of its biological, chemical and physical environment. The sea surface temperature (SST) influences how gases move between the sea and the atmosphere, the distribution and feeding of marine animals such as fish, whales and seabirds, and impact global and regional climates. Yet the marine environment is under-sampled, due to high costs, so more cost-effective methods for studying SST are a priority for scientists and policy makers.
- Previously, surfboards equipped with temperature sensors and GPS trackers successfully demonstrated that surfers could obtain accurate SST measurements in coastal regions.



Surfboard equipped with sensors.  
Photo credit: Joschko Hammermann / Unsplash.

Now scientists have proposed making use of additional recreational water sports to gather further observations and fill in some of the gaps in coastal waters.

- Along the world's coastlines, countless people regularly participate in a range of activities from sea-kayaking to surfing to SCUBA diving. In the UK alone, almost 10 million people are estimated to regularly engage in coastal water sports. Over the course of a year, if each of these individuals participated in their favourite aquatic activity just 10 times, we could see around 100 million interactions between water sports enthusiasts and coastal seas. Even if only a small fraction of these individuals were to get involved in a project, there is still the potential for a wealth of citizen science data to be collected that would contribute towards our knowledge of key environmental processes.

"Considering the vast number of people that participate in aquatic recreation globally, and considering recent developments in technology, wireless data transfer and cloud-based storage, there is a huge potential to improve aquatic sampling through recreation," said lead author Dr Bob Brewin, of PML's Earth Observation group. "This is particularly true for many regions that are difficult to assess using conventional research vessels, such as in shallow coastal areas and coral reefs, or regions with limited monitoring infrastructure but high marine tourism."

*This article was provided by Nik Hubbard, Communications Officer, Plymouth Marine Laboratory, (PML).*

## News from the POGO members (cont'd)

### World-first research uses satellites and ocean models to explain Antarctic seafloor biodiversity

In a world-first, a research team of Australian and international scientists has used data collected by satellites and an ocean model to explain and predict biodiversity on the Antarctic seafloor.



Image taken during Collaborative East Antarctic Marine Census 2007/2008.  
Photo credit: Australian Antarctic Division.

The study combined satellite images of phytoplankton colour on the sea surface with models of how the microscopic phytoplankton are swept by ocean currents, sink to the seafloor and are then redistributed across it, to accurately predict the extent of seafloor life without the need for extensive physical sampling.

The study's lead author, IMAS PhD student Jan Jansen, said the breakthrough, published in the prestigious journal *Nature Ecology & Evolution*, would support better conservation and management of biodiversity in the Antarctic.

"For the first time, we are able to predict how much food is available to organisms on the Antarctic seafloor, and therefore how much life is supported across the region," Mr Jansen said.

"Scientists have long known that there was a relationship between organic matter on the surface and life on the seafloor.

"But until now there hasn't been a reliable model that not only explained the link but also enabled predictions of biodiversity.

"Our 'food availability model' brings satellite data and analysis of the rate at which organic matter sinks together with data about fluctuating ocean currents on and above the seafloor.

"This approach allows broad scale predictions of seafloor biodiversity over vast regions of the Antarctic continental shelf that were previously hidden, as well as predictions about how climate change will affect the ecosystem," Mr Jansen said.

Co-author, IMAS Professor Craig Johnson, said that while the study was based on a region in eastern Antarctica, the new approach could be used to generate maps of biodiversity across the continental shelf right around the Antarctic continent.

*This article was provided by Andrew Rhodes, Communications Manager, Institute for Marine and Antarctic Studies, (IMAS).*

### Autonomous Underwater Gliders survey the life of the Loop Current Eddy Poseidon

Continuous monitoring of Loop Current Eddies (LCEs) in the Gulf of Mexico (GoM) is challenging because they are moving mesoscale structures confined in the central and western GoM where water depths are greater than 1000 m.

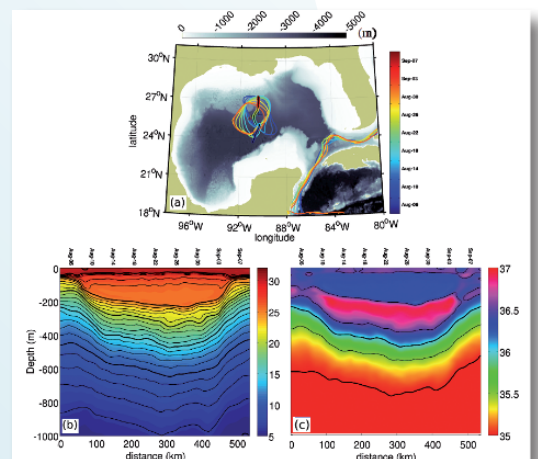
Autonomous underwater gliders intend to solve the problem of obtaining persistent and real-time observations in offshore waters and under stormy ocean conditions, as well as to reduce the operational costs of dedicated deep water research vessels. In this regard, the Grupo de Monitoreo Oceanográfico con Gliders (GMOG) was created in the Centro de Investigación Científica y Educación Superior de Ensenada (CICESE) in 2016 as a response to the need to improve our present state of knowledge of the hydrographical and biogeochemical variability of the western GoM.

Scientists of the GMOG have sampled using a 4-SeaGliders™ fleet, for longer than a year, a 300 km diameter LCE Poseidon from surface to 1000m depth with unprecedented averaged horizontal and vertical resolutions of 2 km and 2 m, respectively.

GMOG's gliders, equipped with a SeaBird conductivity-temperature sensor, an Aanderaa oxygen sensor, and WetLabs optical sensors to measure Chlorophyll fluorescence, coloured dissolved organic matter, and backscatter, successfully performed several cross-sections of the LCE Poseidon.

The group has obtained more than 4000 vertical profiles, along 5000 km glider's trajectory, within the LCE Poseidon from August 2016 to present. The hydrographic and biogeochemical real-time data can be visualized and inspected on the GMOG's website, <https://gliders.cicese.mx>.

GMOG is a contribution of the Gulf of Mexico Research Consortium (CIGoM) composed of several Mexican (UNAM, CINVESTAV-IPN, UABC, CIDESE, CICATA, INECC-SEMARNAT) and overseas (SIO-UCSD, WHOI, UCSB, RSMAS-UM, LOCEAN, UPMC-Paris, LEGOS, and GEOMAR) institutions; and funded through the Hydrocarbon Trust of the National Council of Science and Technology (CONACyT) and the Mexican Ministry of Energy (SENER).



GMOG's mission 0003: (a) trajectory of the glider across the young LCE Poseidon seen as regular time intervals inferred from Absolute Dynamic Topography contours  $\Delta z = 70$  cm, (b) vertical section of temperature ( $^{\circ}\text{C}$ ) and (c) vertical section of salinity (psu) along the trajectory shown in (a).  
Figure credit: Thomas Meunier, CICESE.

*This article was provided by Enric Pallàs Sanz, Physical Oceanography Department, Centro de Investigación Científica y Educación Superior de Ensenada (CICESE).*



## News from the POGO members (cont'd)

### Center for Ocean Mega-Science (CAS) is moving forward steadily and confidently

On December 20, 2017, the first Council meeting of Center for Ocean Mega-Science, Chinese Academy of Sciences (CAS), was held in Beijing.

Dr. Fan Wang, the director of Institute of Oceanology, CAS (IOCAS) and Yantai Institute of Coastal Zone Research, CAS (YICCAS) was elected as the chair of the Center for Ocean Mega-Science, CAS.



Dr. Fan Wang  
Image credit: IOCAS.

The Center for Ocean Mega-Science is composed of marine related research fields of 13 institutes of CAS, which is the new organization of CAS reformation and the new engine for furthering China Ocean Science development. IOCAS is taking the leading role in the Center.



13 Component Institutes of the Center for Ocean Mega Science, (CAS). Image credit: IOCAS.

The Center is a comprehensive research centre with global influence; an opening and sharing facility cluster of S&T innovation; an elite talent cultivation base and a platform for collaborations with domestic and international institutions.

It is expected to put forward major marine scientific research plans, strengthen marine-related scientific resources management, and operate the multi-disciplinary research units of *R/V* fleet, observation networks and fundamental analysis instruments.

*This article was provided by Yanwei Li and Fengfan Yang, International Cooperation Office, IOCAS.*

### A Marine Robotics Center in Oostende by Flanders Marine Institute (VLIZ)

The Flemish government invests 3 million EUR in the development of a Marine Robotics Centre at the Marine Station Ostend (Belgium).

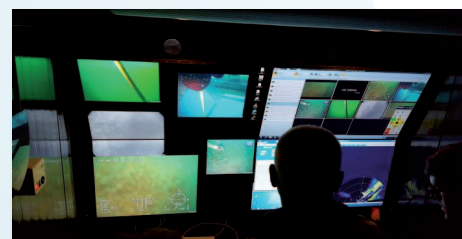
VLIZ is in charge and will acquire an unmanned surface vehicle (USV), an autonomous underwater vehicle (AUV) and a technical lab, to complement VLIZ's currently operational remotely operated vehicle (ROV) "Genesis" (<http://www.vliz.be/en/rov-genesis>).



The VLIZ ROV Genesis.  
Photo credit: VLIZ

The Marine Robotics Centre will operate and maintain the different robotic vehicles and associated sensors, creating novel research possibilities for the Flemish marine research community.

The vehicles will be deployed to collect large amounts of data and access otherwise difficult-to-sample regions with high accuracy. The USV allows controlled autonomous long-lasting measurements of both atmosphere and ocean characteristics in the Belgian part of the North Sea and beyond. The AUV will have a depth range up to 1000 metres and will be equipped with a multitude of sensors including a multibeam echosounder, a sub-bottom profiler, a synthetic aperture sonar and an environmental module.



View of the control room of the ROV Genesis.  
Photo credit: VLIZ

This allows seawater, seabed and sub-seafloor measurements related to chemical, biological, physical, geological and historical research from near-shore areas to continental slopes. Combined with the 1500 m depth-rated ROV, Flemish researchers and their (inter)national partners will have access to the latest technology in ocean sciences and can improve, extend and diversify their research.

VLIZ has the ambition to set up the Marine Robotics Centre as a facility for cutting edge research through national and international collaborations by the end of 2019.

*This article was provided by Jan Mees, Director, VLIZ.*

## News from the POGO members (cont'd)

### Fellowship paves way for Goa – Scotland Arctic science collaboration

A marine scientist and POGO-SCOR fellow from Goa is currently working with Arctic researchers at the Scottish Association for Marine Science (SAMS), as India increases its interest in the Arctic regions.

Divya David, who works in the Ocean Sciences Group at the National Centre for Antarctic and Ocean Research (NCAOR) in India, is working with Dr Finlo Cottier of SAMS, after gaining a three-month joint POGO-SCOR (Scientific Committee on Ocean Research) Visiting Fellowship.

India began research programmes in the Arctic in 2008 and has deployed moorings in Kongsfjorden, Svalbard from 2014. Through literature reviews, Ms David discovered that Dr Cottier and SAMS had similar research interests in the region.

It is hoped the collaboration will help improve our knowledge of the interactive processes between the north Atlantic and Arctic fjord waters.

"India's economy is hugely affected by monsoon systems and we are in continuous effort to improve the accuracy of climate predictions," Ms David explains.

"Observational and modelling studies on monsoons are mostly limited to the tropical processes.

"Research in polar regions will add on more data from climatically-relevant high latitude areas and will subsequently enhance the precision of the studies, which is important to India.

"Beyond that, the Indian government is keen to develop the country's research capability and we currently send around 40 scientists a year to the Arctic to carry out surveys."

Prof Nicholas Owens, SAMS Director and POGO Chair Elect, said: "We are delighted to host Divya as a POGO-SCOR fellow and as a talented researcher from a country investing greatly in its efforts to better understand the Arctic region."

"Given that SAMS also has leading Arctic researchers and a thirst for knowledge into how the region is affected by the fast-paced change in climate, we believe that this can be an extremely successful collaboration, both now and in the near future."



Divya David with SAMS Director Prof Nicholas Owens  
Photo credit: SAMS

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

### Seek through collaboration to improve earth system predictions at high resolution



QNLN, TAMU, and NCAR representatives signing the iHESP Memorandum of Agreement.  
Photo credit: QNLN, Department of Int'l Affairs



Bird view of QNLN West campus.  
Photo credit: QNLN, Department of Int'l Affairs.

Climate variations impact the likelihood and intensity of ocean disaster and extreme weather. Such events have profound effects on human morbidity and mortality rates, agriculture, energy use, industrial activity, marine ecosystems, and coastal sustainability, with economic impacts in the billions of dollars. Thus, developing the capability of predicting such climate variability and its impacts on regional scales at high spatial resolutions can potentially yield enormous social, economic, and environmental benefits, making it an extremely valuable tool for policymakers and stakeholders.

Qingdao National Laboratory for Marine Science and Technology (QNLN) co-worked with NCAR and Texas A & M University (TAMU) to establish the International Laboratory for High-Resolution Earth System Prediction (iHESP), to address this urgent need to develop a new advanced modeling framework for high-resolution multiscale Earth System prediction capable of providing reliable information at both global and regional scales, taking full advantage of their combined expertise.

iHESP is planned to be launched at College Station, Texas, US in Spring 2018. The overarching objective of iHESP is to accelerate efforts in: 1) high-resolution ocean and Earth System Model development; 2) high-resolution ocean and earth system simulation and prediction; and 3) advancing scientific understanding of interactions among different earth system components across different space and time scales. The specific plan in the first five years is finalised.

iHESP is expected to quickly develop into a world-class research centre for Earth system modelling and prediction, through gathering high-calibre talent, pooling complementary resources, and carrying out innovative research. It is also anticipated to closely work with such international programmes and initiatives as Future Earth, IGBP, and WCRP to provide scientific guidance and management strategies for climate prediction.

QNLN, a hitherto unique national laboratory in China, was launched in 2015. A comprehensive institution, QNLN pools innovative resources and teams for original research, to boost the nation's capacity for innovation. Sticking to the principles of openness, mobility, collaboration, and sharing, as part of its internationalisation strategy, QNLN vigorously advances the construction of a global collaborative innovation network.

*This article was provided by Gongke Tan, Head of the Int'l Affairs Department, QNLN.*



## News from the POGO members (cont'd)

### Experts Team Up to Save Endangered African Penguins

The African Penguin of South Africa has seen a significant decline in population since 2001. In some South African colonies, the drop in population has been as high as 80 percent. Competition with fisheries, oil spills, climate change, diseases and predators are all contributing factors in their dramatic decline. Now, with fewer than 25,000 breeding pairs, they are considered an endangered species by the International Union for Conservation of Nature.

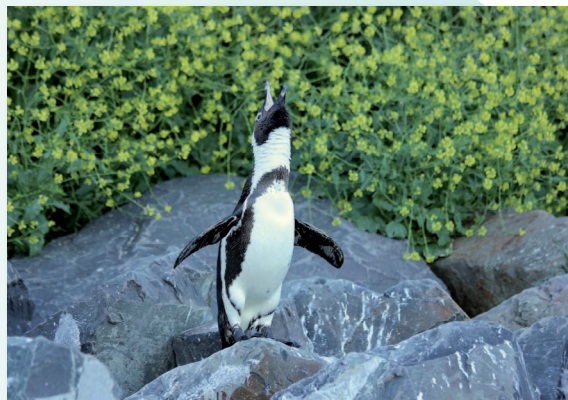
To preserve this species and optimize rehabilitation efforts, Adam M. Schaefer, M.P.H. an epidemiologist from Florida Atlantic University's Harbor Branch Oceanographic Institute, is collaborating with Nola J. Parsons, BVSc., Ph.D. from the Southern African Foundation for the Conservation of Coastal Birds (SANCCOB), and Ralph E.T. Vanstreels, D.V.M., Ph.D., Nelson Mandela University.

The researchers conducted a first-of-its-kind study on prognostic health indicators such as body mass, blood analysis, and infectious disease exposure. They analyzed 3,657 adult African Penguins that were admitted to the SANCCOB facility in Cape Town for rehabilitation over a 13 year period.

Results of the study provide invaluable information on the importance of minimizing their rehabilitation time, proactively treating their diseases, and controlling mosquitos to avoid infection. The biggest risk factors for mortality are things that can be addressed in the first 10 days of their admission. This finding is key because approximately 70 percent of deaths occur during this time. They also identified markers of body mass and hematologic parameters that are important criteria in the initial assessment and treatment of wildlife admitted for rehabilitation.

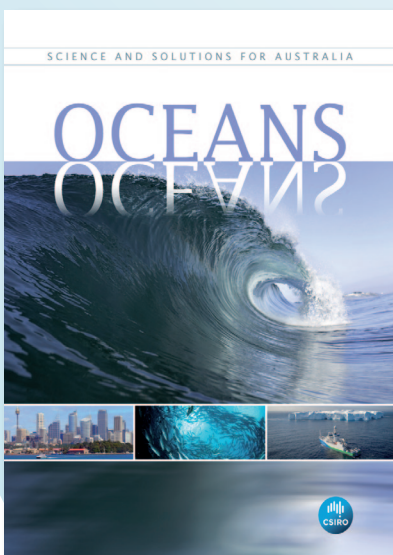
Further details and results are published online at *Journal of Wildlife Diseases*, <http://www.jwildlifedis.org/doi/full/10.7589/2017-06-146>

*This article was provided by Kayla Egbert, Communication Coordinator at FAU Harbor Branch Oceanographic Institute.*



African Penguin (*Spheniscus Demersus*)  
Photo credit: Renata Hurtado.

## The science of oceans – new book launched by CSIRO Australia



CSIRO recently published a new book "Oceans: Science and Solutions for Australia." The book is a non-technical summary of decades of Australian marine research and is authored by over 50 marine researchers from CSIRO, and collaborators from national and international research agencies.

Each chapter describes the important ways in which the oceans influence our lives, from the ocean's influence on our weather, climate and the economy, to international security and social wellbeing. The book also captures the important role of the research community in guiding the sustainable development of marine resources.

Australia's marine estate is the third largest in the world, reaching from New Guinea to Antarctica and incorporating large parts of the Indian, Pacific and Southern Oceans – three of the world's four major oceans. The effects of ocean warming around Australia are already being seen through the distribution of fish species (tropical fish are being found further south) and bleaching of coral reefs.

You can now access the Oceans book on the CSIRO website where it can be downloaded for free:  
<http://www.csiro.au/en/Showcase/Oceans>

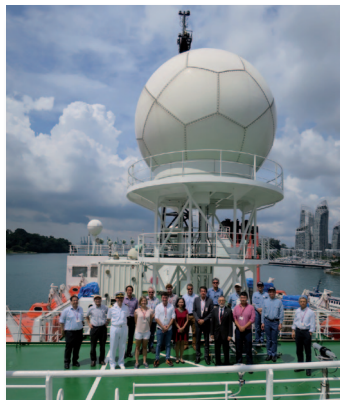
*This article was provided Tony Worby, Director of CSIRO Oceans and Atmosphere.*



Cowfish found on a recent CSIRO voyage aboard the Australian Marine National Facility RV *Investigator* on a trip to the Australian north-west shelf.  
Photo credit: CSIRO

## News from the POGO members (cont'd)

### Celebrating the commencement of the first multi-national intensive observation as part of the YMC Field Campaign



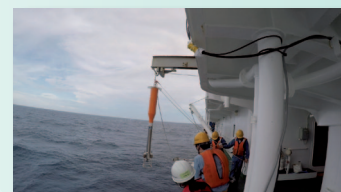
Group photo onboard R/V MIRAI.  
Photo credit: JAMSTEC.

The Years of the Maritime Continent (YMC) is a 2-year international field campaign project starting from July 2017. YMC is designed to improve understanding and prediction skill of weather and climate systems over the Maritime Continent through several Intensive Observation Periods (IOPs) focusing on specific research topics. Over 70 institutes/universities from 20 countries and regions are involved. Its first IOP, "YMC-Sumatra 2017", has been conducted from November 2017 through January 2018 as a joint effort of Indonesia, Japan and US. The main purpose of YMC-Sumatra is to study the diurnal cycle of rain, the Madden-Julian oscillation (MJO), and their interaction in the west coast of Sumatra Island.

On November 19, 2017, while R/V MIRAI called at Singapore before entering into the Indian Ocean, a "send-off ceremony" was held to celebrate the commencement of the first IOP cruise. Distinguished guests from the World Meteorological Organization (WMO), Meteorological Service Singapore, and several WMO scientific panels who have endorsed the YMC, joined this ceremony and addressed speeches with encouragements to onboard scientists and ship crews. A ship tour was also made to introduce observation instruments, etc.

condition. For example, it is well known that rain diurnally developed over the coast propagates offshoreward in the evening during the convectively suppressed period of the MJO. However, while we captured the passage of the MJO convection, offshoreward propagation of rain was not so obvious during the suppressed phase of the MJO. Such a feature was not reported in previous studies, and it implies possible relation to large-scale conditions associated with the La Nina. This will provide a good opportunity to reveal scale interaction.

Data will be available to the public from the YMC web site at <http://www.jamstec.go.jp/ymc/>.



Deploying microstructure profiler.  
Photo credit: JAMSTEC.

*This article was provided by Kunio Yoneyama, Director, Department of Coupled Ocean-Atmosphere-Land Processes Research (DCOP), JAMSTEC.*

## Celebrating 20 years of the Atlantic Meridional Transect



RRS Discovery at South Georgia.  
Photo credit: JAMSTEC.

We are delighted to announce a special issue of Progress in Oceanography, celebrating 20 years of the Atlantic Meridional Transect (AMT).

Established in 1995, AMT is a well-respected multi-disciplinary programme, and now part of the Natural Environment Research Council funded National Capability, that undertakes biological, chemical and physical oceanographic research during an annual voyage between the UK and destinations in the South Atlantic. This enables scientists to make open ocean observations through a wide latitudinal range, including the rarely sampled north and south Atlantic gyres. The AMT cruise programme is unique, provides an outstanding platform for interdisciplinary research, and works towards a greater understanding of the ocean and the biogeochemistry within it.

The special issue is a collection of 16 original research articles, providing a wealth of knowledge from over two decades of observations. The issue can be found here: <https://www.sciencedirect.com/science/journal/00796611/158>.

"This collection, which covers 20 years of research activity in the greater Atlantic Ocean, ranges from oceanographic conditions to insight into ecosystem variables," said Dr Andy Rees, part of PML's Marine Biogeochemistry and Ocean Observations group, and manager of the AMT programme since 2007. "The AMT special issue therefore presents the state of the art in our current understanding of the function of the Atlantic Ocean."

*This article was provided by Nik Hubbard, Communications Officer, PML.*



## Capacity Building updates

### Testimonials from POGO-SCOR Fellows 2017-2018

#### Tell us about your training

**Luis Antonio:** "This fellowship, carried out at the Bjerknes Climate Data Centre (BCDC) of the University of Bergen, aimed to learn, practice and apply state-of-art methods of data analysis for the carbonate system. During this training we started to uniform data handling, and quality control for new carbonate system datasets."

**Olesugun:** "I learned how to use different techniques for coastal observations and surveys, focusing on how to acquire, process and interpret data on ocean forcing and sea level change studies using satellite altimetry. I learned how to calculate and model coastal-storm inundation elevations, in order to identify areas that, both in present-day and future, are potentially affected by coastal hazards."

**Ankita:** "Dr. Bertrand Chapron, my host supervisor at IFREMER (France), gave me a very interesting research topic that involved utilizing satellite dataset to study the ocean wave parameters and further apply the concept of wave transformation to derive bathymetry".

#### How did you benefit from the programme?

**Luis Antonio:** "By learning about the experience of different research infrastructures for ocean observing systems, FAIR principles (Findable, Accessible, Interoperable, and Reusable) for scientific data management, concepts on data quality control, and creation of metadata for carbonate system parameters. This training was also extremely valuable to manage and run quality control analysis to our own carbonate system datasets from different moorings and research cruisers."

**Olesugun:** "My experience during the POGO-SCOR Fellowship training at Laboratoire d'Etudes en Geophysique et Oceanographie Spatiales (LEGOS), Toulouse (France), has exposed me to different field techniques in coastal oceanography that will be of great help in my career, now and in the future."

**Ankita:** "At IIT-Bombay, my parent institution, I am currently working on my PhD research that includes applying machine learning techniques to optical imagery to derive bathymetry. During my visit to IFREMER, I learnt how to use the physics of satellite imageries to derive sea wave parameters which was a different approach to my problem-solving. Also, this visit gave me an opportunity to interact with some renowned scientists in the field of Satellite Oceanography; in addition to my own host supervisor Dr Chapron who is an expert in SAR based ocean studies."

#### Your future aspirations

**Luis Antonio:** "As part of the Latin-American Ocean Acidification Network (LAOCA Network, <http://laoca.cl/en/>) we aim to continue our collaboration with the BCDC and incorporate LAOCA as a regional hub for the Global Ocean Acidification Observing Network (GOA-ON), assuring quality, consistency and documentation of the carbonate system datasets."

**Olesugun:** "As a lecturer and researcher, the skills acquired during training are extremely necessary for my teaching career and research development. Also, as the coordinator of the fieldwork in the Department of Marine Science and Technology, Federal University of Technology, Akure (Nigeria), I will impart my skills and exposure from this training to my students via organized fieldwork and practical classes. Further, I have discussed with my host supervisor the possibility of setting up a video-camera coastal monitoring programme along the Nigerian coast for a better understanding of coastal sedimentary transport and the morphological evolution of this coastal sector. Lastly, there is a plan for continued collaboration."

**Ankita:** "My main aspiration is to become an efficient and skilled Satellite Oceanographer, who can contribute significantly to the understanding of the oceans that surround us. I believe the successful completion of my PhD in my chosen research area would enable me to put a strong foundation towards the completion of this goal. Therefore, the most important benefit of this programme was that it provided a new and interesting dimension to my PhD objectives. At present, my most immediate goal is to effectively complete the research work I started during this fellowship and write a peer-reviewed journal paper in collaboration with the scientists at IFREMER, France."

#### About the POGO-SCOR Fellowship Programme:

The fellowship program is open to scientists, technicians, postgraduate students (preferably of PhD level) and post-doctoral fellows of developing countries and countries with economies in transition and involved in oceanographic work. Applicants must be citizens of developing countries or economies in transition, as defined by the Development Assistance Committee (DAC) of the OECD.

The main purpose of the programme is to advance sustained ocean observations and their applications. Priority is given to applicants in early stages of career development. This fellowship is intended to support training in oceanographic observations, not to learn research techniques. Its main purpose is to advance sustained ocean observations and their applications; it offers the opportunity to visit other oceanographic centres for a short period (1 to 3 months) for training on any aspect of oceanographic observations, analyses, and interpretation.

*This article was provided by Laura Ruffoni, POGO Secretariat.*



Luis Antonio Cuevas.  
University of Concepción, Chile.



Olusegun A. Dada.  
Federal University of Technology,  
Akure, Nigeria.



Ankita Misra.  
Indian Institute of Technology,  
Bombay, India.

## Capacity Building updates (cont'd)

### POGO-SCOR Workshop at NIOZ, Texel, 5th to 9th of November 2017



The POGO-SCOR workshop "International Training Workshop for Nutrient Analysis" was held at The Royal Netherlands Institute for Sea Research (NIOZ) in the Netherlands, from 6th to 9th November. This initiative was funded by POGO, SCOR, NIOZ, PML and JAMSTEC.

The purpose of the workshop was to give technicians from developing countries, who work in the field of marine nutrients, the possibility to become familiarized with the latest technique in seawater nutrient analysis, Segmented Continuous Flow Analysis (CFA).

It is increasingly important to produce internationally comparable nutrient data and therefore essential that institutes around the world share, as much as possible, their knowledge on nutrient measurement methods. This training was set up to show people how to produce reliable data and how to gain international accuracy through the use of Certified Reference Materials (CRMs).

The disadvantage of a practical course is that the number of participants is limited. From an overwhelming 235 application letters, only 9 participants were able to join this workshop. The participants who joined were chosen for their capacity-building potential and were all from different institutes and different countries.

In total 13 lectures were presented by several experts. Lectures covered the role of nutrients in the oceans in general, statistics, how to make proper calibrations, the use of nutrient reference materials and internal laboratory standards, worldwide nutrient inter-comparison exercises and much more.

These theoretical lectures were followed by the practical part of the workshop. In the laboratory 3 different CFAs were set up and then several runs could be performed so that the participants could learn through hands-on practice. Different groups were covering different issues and, at the end of the practical session, the results were presented to the other groups. Also, some basic laboratory practices, such as weighing, making stock standards, handling pipettes and preparing reagents, were carried out.

The informal character of these practical sessions made communication much easier and stimulated question-asking and the exchange of information. All participants went home with a lot of information and were all invited to join the upcoming inter-comparison exercise.



This article was provided by Jan van Ooijen and Karel Bakker, NIOZ Royal Netherlands Institute for Sea Research, Department of Ocean Systems, and Utrecht University, Texel, the Netherlands. Images depict students in practical sessions (Image credit: NIOZ).

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## Capacity Building updates (cont'd)

### Testimonials from POGO-SCOR Workshop at NIOZ



Miriam Edith Solis  
Argentina

"This Workshop allowed me to update my knowledge about nutrient analysis and to know, precisely and in a brief period, the most important points that I have to check in the analytical procedures that I am applying.

I intend to apply the knowledge gained, not only as nutrient analyst but also as consultant for studies that need this type of measurements. The aim is to improve the quality of these data for oceanographic studies, mainly in the Argentinean Patagonia."

**Miriam Edith Solis**



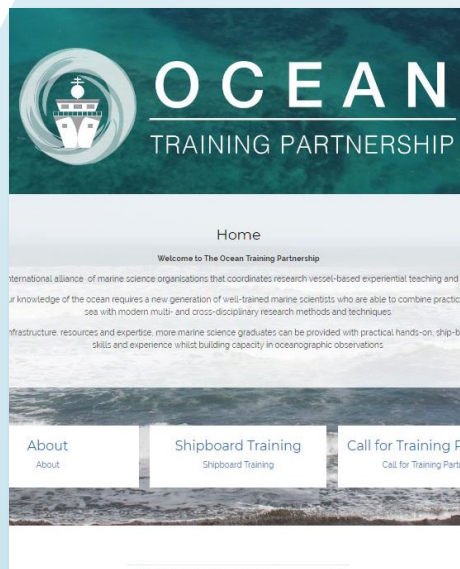
Vitor Gonzalez Chiozzini  
Brazil

The concentration of nutrients present in ocean waters and their spatio-temporal variation is an issue that has gained importance in the face of new scientific discoveries, and it is important that the data obtained by different laboratories around the planet can be compared with a high degree of reliability.

The workshop provided the interaction between people working on the same activity and facing the same laboratory analytical problems, allowing them to exchange experiences and expanding an already existing network of researchers. Throughout the workshop I was able to acquire important information to increase the accuracy of the results obtained in the Biogeochemistry Laboratory of Nutrients, Micronutrients, and Trace elements in the Oceans of the Oceanographic Institute of the University of São Paulo (Brazil) and, in this way, to produce data with global comparability."

**Vitor Gonzalez Chiozzini**

## Ocean Training Partnership



On 15 December 2017, the new Ocean Training Partnership (OTP) ship-board training portal was launched at [www.oceantrainingpartnership.org](http://www.oceantrainingpartnership.org).

The OTP is an international alliance of marine science organisations that coordinates shipboard training experiences. Using funding from the Nippon Foundation, this initiative, which is led by the POGO in collaboration with the Strategic Marine Alliance for Research and Training (SMART) and the Alfred Wegener Institute Helmholtz Centre for Polar and Marine Research (AWI), will provide grants to support training cruises, and fellowships for early-career scientists is developing countries.

In 2017, NF-POGO funded three OTP training fellowships, one each on of the Porcupine Abyssal Plain (PAP) Cruise (April-May), the Atlantic Meridional Transect (AMT) cruise (September-November), and the UK

North Atlantic GEOTRACES section GA13-FRidge Cruise (December 2017-February 2018).

The current partners are now inviting institutions with spare capacity on research vessels, or Principal Investigators with spare berths on a planned research cruise, to get involved with this capacity-building project. Visit [www.oceantrainingpartnership.org/call-for-partners](http://www.oceantrainingpartnership.org/call-for-partners) for details, or keep updated by following OTP on twitter (@ocean\_training).

*This article was provided by Fiona Beckman, POGO Secretariat.*



Azyyati collecting and analysing water samples on the FRidge Cruise. Photo credit: Azyyati A. Aziz.

## POGO Working Groups

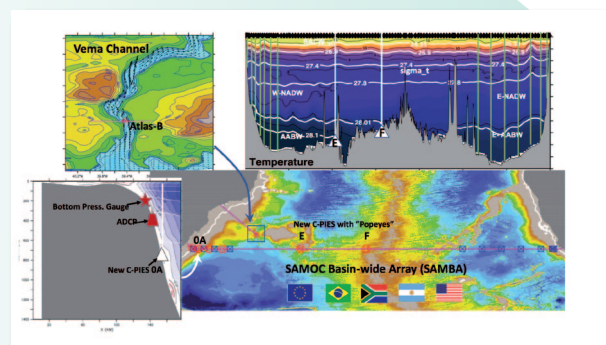
### SAMBAR: A new 5-year project to monitor meridional fluxes in the South Atlantic

The South Atlantic Meridional Overturning Circulation (SAMOC) initiative started in 2007 as an international collaboration between institutions from Argentina, Brazil, France, Germany, Russia, South Africa, Spain, the UK, the USA and other countries. SAMOC has been endorsed by CLIVAR and its research efforts are being coordinated with activities happening under the framework of the European Union H2020 project AtlantOS and the Brazilian National Institute of Science and Technology (INCT) Mar-COI. Among the first field components of SAMOC was the SAM project, first funded by the U.S. NOAA in 2008 and operating as a close cooperation with partners in Argentina and Brazil. The Brazilian component has been funded mainly by the São Paulo State research foundation FAPESP (grants 2008/58101-9 and 211/50552-4) and is part of the GOOS-Brazil program.

SAMBAR is a new contribution to SAMOC, based on recommendations of the POGO's sponsored SAMOC Working Group. It has been funded by FAPESP (grant 2017/09659-6) from Dec/2017 to Dec/2022. SAMBAR's main objective is to better understand the interannual variability of the heat transport across the SAMOC Basin-wide Array (SAMBA), at 34.5°S, and the associated impacts on regional circulation and climate. SAMBAR will build on the existing observing array with both new instruments and new GO-SHIP quality oceanographic cruises. A large team of international scientists will carry out this research, which also includes data analyses and numerical modelling.

SAMBAR has a high potential for immediate societal benefits. Large fractions of the South American and African coastal zones are exposed and vulnerable to the Atlantic Ocean. Slight changes in currents and thermodynamic properties can lead to dramatic impacts on regional climate, sea level, coastal geomorphology, and coastal ecosystem productivity. Improved knowledge of the large-scale processes in the region is essential for the proper design of coastal observing systems, effective management policies, and for mitigation, adaptation and protection of the environment.

*This article was provided by Dr. Edmo Campos and the SAMOC Science Team.*



Schematic design of SAMBAR. It includes: the deployment of an Atlas-B buoy to monitor the AABW flow in the Vema Channel, in addition to ocean properties in the upper 500 metres and air-sea fluxes at the surface; one new current-equipped pressure inverted eco-sounder (C-PIES) near the western boundary (0A), to enhance the study of the Brazil Current; and two other new C-PIES, with Popeyes datapods, in the ocean interior towards Mid Atlantic Ridge (E and F). The cruises will count on the support from the Brazilian vessels *NOC Alpha Crucis* and *NPqHo Vital de Oliveira*.

Image Credit: The temperature, velocity and bathymetry data used in this figure are from a numerical experiment run by E. Campos (Campos and Morozov, in preparation).

## POGO representation at international meetings

### POGO at 2017 GGSD Forum on "Greening the Ocean Economy"



Panellists and participants at the parallel session on "Monitoring Progress of SDG-14". Image credit: OECD.

The Organisation for Economic Cooperation and Development (OECD) holds a Green Growth and Sustainable Development (GGSD) Forum every year, and this year the focus of the Forum was on "Greening the Ocean Economy".

Through its engagement with the GEO Blue Planet Initiative, OECD was made aware of POGO and invited Sophie Seeyave to participate as a panellist in the Session on "Monitoring Progress of SDG-14".

The Forum focused on the investment, innovation and employment aspects of the fast-growing ocean-based industries, together with policies to protect and sustainably use marine and ocean resources and ecosystems. It explored how the economic development and conservation needs can be balanced successfully through innovations in established and emerging ocean industries, as well as marine spatial planning instruments.

Issues such as national and international capacity for ocean industry oversight, the role of science and technology (including digitalisation), responsible business conduct and waste management were addressed.

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## POGO representation at international meetings (cont'd)

The parallel session on SDG-14 was very interesting, with panellists providing national, regional and global perspectives on the development and use of indicators for SDG-14, as well as on opportunities for collaboration.

The session drew from an Issue paper ([http://www.oecd.org/greengrowth/GGSD\\_2017\\_Issue%20Paper\\_SDG14\\_Indicators\\_WEB.pdf](http://www.oecd.org/greengrowth/GGSD_2017_Issue%20Paper_SDG14_Indicators_WEB.pdf)) recently published by OECD on a preliminary assessment of SDG-14 indicators. The session focused on four main aspects:

- (1) How we can contribute to SDG14,
- (2) Innovative approaches to SDG14 data collection,
- (3) Linkage to marine ecosystem services valuation and national accounting, and
- (4) Linkages to ongoing policy processes, including MEAs, either already adopted or being negotiated.

The panellists started with some short presentations on the work of their institutions, and in the discussion tried to address the following questions:

- What are the data gaps and accessibility of SDG14 indicators?
- What are the challenges and opportunities for earth observation and big data to contribute to SDG14 monitoring?
- How can we foster international harmonization of measurement methodologies for regional and national indicators?
- How to enhance interdisciplinary science-policy interactions for SDG-14 monitoring (with linkages to the OECD paper just released)?

More information on the conference can be found here: <http://www.oecd.org/greengrowth/ggsd-2017/>.

*This article was provided by Sophie Seeyave, POGO Secretariat.*

## United Nations Climate Change Meeting: UNFCCC COP23, Germany, 6-17 November



COP23, or the 23rd Annual Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC), took place in Bonn, Germany, from 6-17 November 2017.

The UNFCCC, also known as the Rio Convention, was adopted in 1992 at the Rio Earth Summit, and entered into force in 1994, and a total of 195 nations have now signed on. Each year the parties to the agreement convene to assess progress in implementing the convention and, more broadly, dealing with climate change. The first Conference of the Parties was held in Berlin in 1995. In 1997, the participants established the Kyoto Protocol and, at COP21 (Paris in Nov/Dec 2015), the parties negotiated the legally-binding Paris Agreement. COP22 saw the first 'Oceans Action Day' within the UNFCCC COP programme. In 2017, COP23 was presided over by Fiji, with the support of the government of Germany.

The impact of climate change on the Ocean, and the resulting issues, have been slow to gain visibility on the UNFCCC agenda. However, with Fiji - an island state at huge risk from sea level rise - holding the COP23 presidency, there was a significant opportunity to promote Ocean issues at the conference, including the necessity for improved observations. Fiji used its presidency to launch The Ocean Pathway, an initiative to ensure the ocean is an integral part of the UNFCCC process by 2020.



Left to right: Lilian Krug, Dr Martina Stiasny, Laura Ruffoni, Sri Nandini. Image credit: POGO.



Lilian Krug (second from left) with Brazilian delegates. Image credit: POGO.



Left to right: Dr Ana M Queirós, Thecla Keizer, Fiona Beckman, Dr Carol Turley. Image credit: POGO.

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## POGO representation at international meetings (cont'd)

The conference attracts a variety of delegates – policy makers, business leaders, research institutes, NGOs, media – giving us a wide potential audience. As such, POGO joined forces with PML, BIOACID (A GEOMAR-led project), the UK Ocean Acidification Research Programme, and GOA-ON to co-host an exhibition stand entitled, 'Oceans of Impact', drawing attention to the four major stressors on the world ocean – Acidification, Warming, Deoxygenation, Sea Level rise – and giving delegates the opportunity to learn more about the causes, effects, impacts and options for action.

COP23 was attended by a total of 16,000 delegates, including over 9,200 government officials, 5,500 representatives of UN bodies and agencies, intergovernmental organizations and civil society organizations, and 1,200 members of the media. The exhibit was in place for 2 weeks, with POGO, NANO and PML representatives interacting with delegates in multiple languages (English, French, Portuguese/Spanish, Arabic, Dutch, Italian, Indonesian, Fijian, Fijian Hindi). With such a variety of backgrounds and languages on the stand, it was possible to engage with enquiries on all levels, and we received a number of requests for further information and collaboration from a number of participants.

*This article was provided by Fiona Beckman, POGO Secretariat.*

## POGO Annual Meeting

### 19th POGO Annual Meeting

The 19th POGO Annual Meeting (POGO-19) was hosted by Scripps Institution of Oceanography in La Jolla, California, USA, from 23-25 January 2018, and attended by over 60 participants from 14 countries.

Dr. Margaret Leinen, Director of Scripps Institution of Oceanography and Vice Chancellor of the University of California San Diego, opened the meeting and gave some historical background on POGO, which had held its second meeting at Scripps 18 years previously. The POGO Chair, Prof. Karen Wiltshire, Vice Director of the Alfred Wegener Institute for Polar and Marine Research, welcomed the participants and presided over the subsequent three days of meetings.

The local host organised a session showcasing the wide variety of ocean observing programmes run out of Scripps, such as Argo (including BGC-Argo and Deep-Argo) and the Coastal Data Information Programme. There was a strong focus on new technologies, including the Wirewalker™, and innovations in biological observation and the use of artificial intelligence.

In addition to reports on POGO activities from 2017 (including progress on Action Items, NF-POGO capacity building programme, new partnerships, reports on Working Groups and Training Initiatives led by POGO Members) presentations were given by members, sponsors, partner organisations, and NANO Alumni. POGO was very pleased to introduce its latest member, the Marine Institute in Galway, Ireland.

The agenda also included sessions on topics of interest to the POGO Members and community, including the POGO Industry Liaison Council, Arctic Observations and Innovative Biological Sampling. These workshops included presentations by partner organisations (International Arctic Science Committee, IASC, Sustaining Arctic Observing Networks, SAON, and the Scientific Committee on Oceanic Research, SCOR) to stimulate dialogue and collaboration. The meeting was also attended by representatives of the Intergovernmental Oceanographic Commission (IOC), the Global Ocean Observing System (GOOS) Regional Alliances and EuroGOOS, the SMART Subsea Cables initiative, and XPrize.



POGO-19 group photo. Image credit: Scripps Institution of Oceanography.

POGO was honoured to have, as a special guest, Prof. Walter Munk, professor emeritus of geophysics in the Cecil H. and Ida M. Green Institute of Geophysics and Planetary Physics at Scripps Institution of Oceanography at UC San Diego. His pioneering contributions to physical oceanography and geophysics advanced the science and understanding of ocean waves, wind-driven ocean gyres, deep-sea tides, internal waves, the rotation of the earth, ocean acoustics, and geophysical data analysis. Having recently celebrated his 100th birthday, Prof. Munk's scientific achievements have been recognised by many awards, prizes and medals over the years, including the President's National Medal of Science, the nation's highest award for lifetime achievement in scientific research, "for his unique contributions to the sciences of the geophysics and physical oceanography which have led to a better understanding of the earth's rotation, the complexities of ocean waves, tidal processes and acoustic propagation."

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## POGO Annual Meeting (cont'd)

The conference dinner was held at the beautiful Birch Aquarium on Scripps campus, where the delegates were given an exclusive behind-the-scenes tour of the facilities and exhibits. The Plenary Meeting on 23-24 January was followed by a 1-day Partners' Meeting, during which the Members had the opportunity to discuss future priorities and POGO business.

Dr. Eduardo Balguerías Guerra (Spanish Institute of Oceanography) and Prof. Steve de Mora (Plymouth Marine Laboratory, UK) rotated off the Executive Committee and were thanked for their hard work and dedication to POGO. An additional seat had been left vacant since Dr. Erlend Moksness resigned from his position as director of the Institute of Marine Research, Norway, therefore elections were held for 3 vacant seats on the Executive Committee. Newly elected members were Prof. Henk Brinkhuis (Royal Netherlands Institute for Sea Research, NIOZ), Prof. Peter Herzig (GEOMAR Helmholtz Centre for Marine Research Kiel, Germany) and Prof. Nick Owens (Scottish Association for Marine Science, UK, and incoming Chair for 2019-2020).

The 20th POGO annual meeting will take place in Mindelo, Cape Verde, from 22-24 January 2019.

POGO would like to thank the following sponsors, who contributed to POGO-19, through their sponsorship, technology exhibits and informative presentations.



*This article was provided by Sophie Seeyave, POGO Secretariat.*

4TH GEO
JULY 4-6, 2018

# BLUE PLANET SYMPOSIUM

**Our Future is Blue: Linking Ocean and Coastal Information with Societal Needs**

The 4th GEO Blue Planet Symposium will serve as a forum for discussion of ocean and coastal information for sustainable development, blue growth and societal awareness. The symposium will bring together producers, and current and potential users, of ocean and coastal information, who will share their experience with the audience.

**OCEAN & COASTAL  
INFORMATION  
IN SUPPORT OF  
SUSTAINABLE  
DEVELOPMENT**

**OCEAN & COASTAL  
INFORMATION IN  
SUPPORT OF BLUE  
GROWTH**

**SOCIETAL AWARENESS  
OF THE VALUE OF  
OCEAN & COASTAL  
INFORMATION**

The 4th GEO Blue Planet Symposium will take place in Toulouse, France, from 4-6 July 2018.

For further details visit the conference website at <https://symposium.geoblueplanet.org>

POGO Secretariat  
Plymouth Marine Laboratory  
Prospect Place  
Plymouth PL1 3DH, UK  
Tel. +44 (0)1752 633424    E-mail [pogoadmin@pml.ac.uk](mailto:pogoadmin@pml.ac.uk)    <http://ocean-partners.org>