

Partnership for Observation of the Global Oceans

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16th POGO Annual Meeting in Tenerife, Spain

This year's POGO Meeting was hosted by the Instituto Español Oceanografía (IEO) in Tenerife, Spain, from 27-29 January 2015. The meeting held at the Centro Oceanográfico de Canarias, IEO was well attended with nearly 50 participants from 15 countries coming together for POGO-16. The Minutes from the meeting are now available to download from the POGO website at http://ocean-partners.org/pogo-16.

John Field opened the Meeting, welcoming the participants and introducing Kentaro Ogiue of the Nippon Foundation. Mr Ogiue addressed the plenary, reaffirming the Foundation's commitment to "Developing People for the Ocean" and he announced a new scheme to support the alumni from all of the Foundation's programmes. The Spanish General Director for Research, Technology and Innovations, Dra. Marina Villegas, underlined the importance of POGO as a mediator for international strategy on ocean observations. After a warm welcome, John Field handed over the Chair to Karen Wiltshire, who in turn introduced the new Executive Director, Sophie Seeyave and POGO's Finance Committee.

In addition a series of presentations showcasing Spanish oceanography, reports on POGO activities from 2014 were given and an overview of progress with the International Quiet Ocean Experiment and the International Indian Ocean Expedition-2 (IIOE-2) were presented.

The Mission Statement, Vision and Values for POGO were re-drafted and work was commenced on drafting a Strategy document. In addition the structure and protocol for the selection of the Executive Committee was reviewed. The constitution of the Executive Committee can now be viewed here: http://ocean-partners.org/executive-committee.

A pre-meeting was held with representatives of GOOS and during POGO-16 itself and this, along with a new format of mini presentations from selected POGO Members, parallel scientific workshops with discussion sessions, as well as invited presentations proved to be a successful and productive configuration.

The next POGO annual meeting will be hosted by the Japan Agency for Marine Earth Science and Technology (JAMSTEC) and will take place in Yokohama, from 26-28 January 2016. Plymouth Marine Laboratory kindly offered to host the following meeting, in 2017.



POGO-16 delegates who visited the 'Ayuntamiento de La Laguna'. Photo Credit: Santa Cruz de Tenerife City Council.



News from the POGO members

Please welcome the innovative underwater vehicle HROV Ariane

Thanks to the arrival of HROV Ariane (Hybrid Remotely Operated Vehicle), the family of underwater vehicles at Ifremer (French research institute for exploitation of the sea) is growing! This compact vehicle - its size is comparable to that of a city car - offers new deployment options up to 2500 meters below the sea. Powered by on-board Li-on batteries, HROV Ariane is especially conceived for



HROV Ariane, Ifremer's new hybrid submarine. Image Credit: Ifremer / Olivier Dugornay

by on-board Li-on batteries, HROV Ariane is especially conceived for small research vessels, working as autonomous underwater vehicle (AUV) -without requiring input from an operator – as well as remotely operated underwater vehicle (ROV).

HROV Ariane can carry out missions of seabed mapping – even on steep slopes e.g. close to underwater canyons. Furthermore, it is able to collect samples and manipulate light tools. HROV Ariane is a cost effective, flexible and fast response for coastal interventions. This underwater vehicle takes into account emerging needs, particularly related to issues such as the Marine Strategy Framework Directive (MSFD), Marine Protected Areas (MPA) and the Water Framework Directive (WFD). HROV Ariane can carry out missions linked to underwater observatories, inspection of coastal sites and exploration of biodiversity near cliffs. It complements existing deep intervention vehicles (Nautile, Victor 6000 ...), mainly implemented from large ocean research vessels. The official christening of HROV Ariane will

be held Thursday, April 23, 2015, at Ifremer premises in La-Seyne-sur-Mer (close to the Mediterranean Sea). Ifremer began the development of its patented hybrid design in November 2010, within the European Centre for Underwater Technology (CETSM), attracting industry partners for uses beyond the scientific field. Sea trials of HROV Ariane will continue throughout the year 2015, through four campaigns at sea on research vessels Le Suroît and Europe. The aim is to achieve an operational system capable of providing scientific campaigns in 2016.

This article was provided by Thomas Isaak, Communications & Press, Ifremer

Two trillion light bulbs burning in our oceans

The Argo network of floating data monitors across the world's oceans has revealed a noticeable rise in temperature in as little as eight years.

The global Argo is a network of more than 3750 floats, jointly funded by over 30 nations. It enables scientists to observe the basic physical state of all world oceans simultaneously.

A report in Nature Climate Change, 'Unabated planetary warming and its ocean structure since 2006' reveals the top 2000m of the world's oceans warmed at a rate of 0.4 to 0.6 watts per square metre (W/m 2) between 2006 and 2013. The translates to a warming of roughly 0.005°C a year in the top 500m metres of ocean and 0.002°C a year at depths between 500 and 2000m. That's the equivalent of adding the heat of two trillion continuously burning 100-watt light bulbs to the world's oceans.

Lead author Dean Roemmich, from Scripps Institution of Oceanography, said the rate of ocean heat gain is not unusual. He said what is new is that the rate and patterns of ocean heat gain are revealed over a period as short as eight years, thanks to the Argo array, that the warming signal is shown to extend to 2000m and deeper, and that it is occurring predominantly in the Southern Hemisphere ocean south of 20°S.

Co-author Susan Wijffels, from CSIRO Oceans and Atmosphere, explained that when we measure globally and deep enough, we see a steady rise in the Earth's heat content, consistent with the expected greenhouse gasdriven imbalance in our planet's radiation budget.

CSIRO Oceans and Atmosphere operates Argo Australia, which is a component of IMOS. Previously, scientists had to rely on ships for periodic readings to inform opinion about temperatures and conditions in our seas. The equipment available meant readings could only be taken at 700m or less. Now the organisations behind the Argo technologies are looking to develop a new generation of deep ocean floats that can record fundamental data at depths of as much as 6000m.

This article was provided by Simon Torok (Communication Manager) and Susan Wijffels (Research Oceanographer), Oceans & Atmosphere Flagship CSIRO



Deploying an Argo float in the Southern Ocean. Photo Credit: Alicia Navidad, CSIRO



News from the POGO members (cont'd)

Satellite images reveal ocean acidification from space

Pioneering techniques that use satellites to monitor ocean acidification are set to revolutionise the way that marine biologists and climate scientists study the global ocean.

This new approach, published in the journal Environmental Science and Technology, offers remote monitoring of large swathes of inaccessible ocean from satellites that orbit the Earth some 700 km above our heads.

Each year more than a quarter of global CO2 emissions from burning fossil fuels and cement production are taken up by the Earth's oceans. This process turns the seawater more acidic, making it more difficult for some marine life to live. Rising CO2 emissions, and the increasing acidity of seawater over the next century, has the potential to devastate some marine ecosystems, a food resource on which we rely, and so careful monitoring of changes in ocean acidity is crucial.

Researchers at Plymouth Marine Laboratory, PML, the University of Exeter, Institut Francais Recherche Pour L'Exploitation de la Mer (Ifremer), the European Space Agency (ESA) and a team of international collaborators are developing new methods that allow them to monitor the acidity of the oceans from space.



Total alkalinity from space. Red indicates higher alkalinity and, therefore more resilient to acidification than the blue areas, which highlight areas of lower alkalinity. Image courtesy of Ifremer/ESA/CNES

Current methods of measuring temperature and salinity to determine acidity, though highly accurate, are restricted to in-situ instruments and measurements taken from research vessels. This approach limits the sampling to small areas of the ocean, as research vessels are very expensive to run and operate. The new technique uses satellite mounted thermal cameras to measure ocean temperature while microwave sensors measure the salinity. Together these measurements can be used to assess ocean acidification more quickly and over much larger areas than has been possible before.

PML scientist Dr Peter Land, who is lead author of the paper, said: "In recent years, great advances have been made in the global provision of satellite and in-situ data. It is now time to evaluate these new data sources to help us understand ocean acidification, and to establish where remotely-sensed data can make the best contribution." The development of the technology and the importance of monitoring ocean acidification are likely to support the development of further satellite sensors in the coming years.

This article was provided by Helen Murray, Communications Officer, Plymouth Marine Laboratory

Study Supplies Insight into Behavior of African Monsoon



"Coring-monsoon". Lead geologist John Peck (U. Akron), far right, and the team archiving sediment cores aboard the drilling platform on Lake Bosumtwi. Photo Credit: Tim Shanahan The Sahara is a vast desert landscape, with nothing but sand as far as the eye can see. But for a period of about 10,000 years, the Sahara was characterized by lush, green vegetation and a network of lakes, rivers and deltas.

by lush, green vegetation and a network of lakes, rivers and deltas. This "green Sahara" occurred between 14,800 and 5,500 years ago during what is known as the "African Humid Period." Why and how it ended is the subject of scientific study that holds important information for predicting the region's response to future climate change.

In a study published in Nature Geoscience, a team of researchers provides new insight into the behavior of the African monsoon at the end of the African Humid Period and the factors that caused it to collapse.

"Our work suggests that the African monsoon's response to climate forcing is more complicated than previously understood," said lead author Tim Shanahan, with The University of Texas at Austin Jackson School of Geosciences.

The scientists used the chemical composition of leaf waxes preserved in sediments from Lake Bosumtwi, Ghana, to create a reconstruction of precipitation in humid tropical West Africa for the past 20,000 years.

"From this new record, we determined that, rather than collapsing abruptly across the entire region, the monsoon decreased more gradually and migrated southward over a period of several thousand years," said co-author Konrad Hughen, with the Woods Hole Oceanographic Institution.

This southward shift could appear as abrupt changes locally – for example, a lush jungle reverts to grassland – but does not mean the entire region underwent abrupt changes at the same time. "These are important components to understand and they must be included in climate models of the future," said Hughen. The authors also noted that "changes in the timing or intensity of the seasonal rainfall influence food and water security for more than 150 million people."

Funding for this study came from NSF and the UCAR NOAA Climate and Global Change Postdoctoral Fellowship. This article was provided by Stephanie Murphy, Manager of Public Information and Internal Communications, WHOI



International Training Course on Ocean Colour Remote Sensing - Data, Processing and Applications

The International Training Centre for Operational • Oceanography (ITCOocean), ESSO-Indian National Centre • for Ocean Information Services (INCOIS) organized a * training course on "Ocean Colour Remote Sensing - Data, As global environmental changes and human activities are Processing and Applications" during November 10-14, impacting our oceans like never before it is increasingly 2014. The course was co-sponsored by Ocean Teacher • important to ensure effective management of our seas.

lectured on the basics of ocean colour remote sensing, • us to put a value on marine 'goods and services'. By lectured on the basics of ocean colour remote sensing, reversing the looking glass, environmental challenges can be considered in a new way and informed decisions can be and on the vertical structure of PP model. Dr. Shubha . made to accept some changes and losses for the benefit Sathyendranath, PML, UK delivered lectures on topics • of other goods and services that are valued more highly. related to ocean colour algorithms, biological-physical • The research findings of VECTORS, an EU funded marine interactions in the ocean and phytoplankton community • research project, are now available on a new website structure. Dr. K.H. Rao (NRSC, Hyderabad), Dr. R.M. Dwivedi • (www.marine-vectors.eu), which includes more details (CMLRE, Kochi), Dr. Mini Raman (SAC, Ahmedabad), Prof. P. • of this approach and a broad range of other findings. Shanmugham (IIT, Chennai) and Dr. Aneesh Lotliker lectured • dovernance of marine environments across Europe as well as gave hands-on-exercises on remote sensing, •



The training programme participants with faculty staff. Photo Credit: INCOIS

Ocean data using SeaDAS . and of based case

participants and faculty and gave a brief out line of various • with detailed summaries of the outcomes and clear links activities of INCOIS. Dr. B M Rao, ITCOocean coordinator • to related research tasks explained the design of the course and topics to be and project results. It covered. Prof. Trevor Platt inaugurated the course formally allows users to search by by lighting the lamp. He emphasized the importance of specific subjects, policies ocean colour research and appreciated the efforts of or locations that are of INCOIS in organizing such training courses. Dr. Claudia Delgado, Coordinator, IODE/IOC gave a brief introduction on the various activities of Ocean Teacher Global Academy. on the various activities of Ocean Teacher Global Academy. • to explain the Ecosystem Dr. Srinivasa Kumar, Head, Advisory Services and • Services approach Satellite Oceanography Group at INCOIS distributed the • used in VECTORS and certificates to the trainees during the valedictory function. • why it is valuable to

More details on this course can be found at : http://www.incois.gov.in/portal/ITCOocean/ITCOocean_ OCRS.jsp

INCOIS

New website highlights an innovative approach to a sustainable future for our seas

A new website provides access to the research results of the VECTORS project to support marine management decisions, policies and governance as well as future research and investment.

Global Academy, IODE/IOC. This course was attended • Until recently ocean management has focused on the by 28 participants, from Bangladesh, Ghana, India, • impact that humans have had on the marine environment. Madgascar, Malaysia, Mauritius, Romania and Tanzania. • Now using a new approach more emphasis is given to appreciating the impact that the marine environment has Prof. Trevor Platt, Plymouth Marine Laboratory (PML), UK • on our societies and economies, in some cases enabling governance of marine environments across Europe.

> phytoplankton • The website collates information on the pressures and classification using challenges facing European seas and presents an improved ocean colour understanding of the mechanisms by which these data, atmospheric • pressures cause changes in marine life and how human c o r r e c t i o n • activity and behaviour exacerbates them. VECTORS has procedures, etc. • determined the impacts of changes in marine life on a colour • range of ecosystems, their structure and functioning, the essing • services they provide, as well as the economic and societal processing implications for us all.

> estimation • VECTORS used modelling techniques to project the primary • future changes and consequences of human activities productivity using in the marine environment under different scenarios of satellite data were adaptation and mitigation. This helps us to understand also demonstrated , what will happen to our seas in the future, subject to on . how we manage them now, and what will be the societal studies. • ramifications for us.

Dr. Satish Shenoi, Director, INCOIS welcomed the presenting the individual research findings of VECTORS

the management and governance of European seas.



This article was provided by B. Madhusudan Rao, ITCOocean, • This article was provided by Jennifer Lockett, Project Manager, Plymouth Marine Laboratory





News from the POGO members (cont'd)

High-tech industry wants to mine trace elements from the deep sea floor, but how will this affect sea life?

Mobile phones, tablet computers, PCs, electric cars increasingly electronic devices are powered by batteries, and these batteries contain metals. Rising demand causes metal shortages and a rise in metal prices. This has led to a renewed global interest in deepsea mining. However, the effects of large-scale industrial mining activities on the deep-sea environment are unknown. Over the next three years, a European team of scientists will study the long-term consequences of deep-sea mining in the Pacific Ocean. The NIOZ Royal Netherlands Institute for Sea Research (Texel and Yerseke) takes part in this research project, which is partly funded by the Netherlands Organisation for Scientific Research (NWO). NIOZ scientists are going to collect data during three research cruises aboard the German research vessel 'Sonne' later this year and they will use these data to address some of the key questions on deep-sea mining.

Modern oceanographic research has found that oceans abound in mineral resources. Manganese nodules in particular can be found in large numbers in parts of the Pacific and Indian Oceans. The nodules are highly valuable because they contain not only manganese and iron, but also nickel, cobalt and rare metals that play a key role in the electronics industry. In order to prevent an underwater 'gold rush' in international waters in this emerging industry, the UN Convention on Law of the Sea has established the International Seabed Authority (ISA).

NIOZ landers ready to be launched Photo Credit: NIOZ

NIOZ biologist Dr Dick van Oevelen says "Deep-sea mining will seriously disrupt seabed life because at the mining site the top layer of the seafloor – containing all seabed life – is excavated completely. Recovery is because at the mining site the top layer of the seafloor – containing all séabed life – is excavated completely. Recovery is expected to take decades. In addition, seabed life in the surrounding area may be disrupted if the seabed is covered with fine silt stirred up during mining activities and with mining waste". In the 1980s and 1990s, several countries conducted investigative work to gain a better insight into the short-term and long-term effects of mining manganese nodules. As part of the current 'Ecological Aspects of Deep-Sea Mining' research project, which is carried out under the banner of the European 'Joint Programme Initiative' (JPI Oceans) and co-ordinated by the German marine research institute GEOMAR in Kiel, these experimental sites will be revisited to find out to what extent the original ecosystem has recovered. The latest underwater technologies, such as multibeam sonar systems, autonomous underwater vehicles (AUVs) and remotely operated underwater vehicles (ROVs) will be used to chart the ocean floor in the manner of 'Google Maps'. Research includes the analysis of sediment samples and experiments at a depth of 4 kilometres to find out if seabed composition, geochemical processes, species composition, and the composition of seabed life show any significant differences between disturbed and undisturbed parts of the seafloor. NIOZ geologist Dr Henko de Stigter, stated "The Dutch scientists will contribute to the project by setting up the measuring devices on the ocean floor to measure currents and turbulence in the layer just above the seabed. This information helps to predict the dispersal of plumes of stirred-up silt and mining waste in case of mining activities". The Netherlands Organisation for Scientific Research of stirred-up silt and mining waste in case of mining activities". The Netherlands Organisation for Scientific Research (NWO) has contributed to the European JPI Oceans research cruise as part of its 'Economic Priority Area "Water"; JPI is a European partnership established to prevent the fragmentation of research activities by individual member states. This article was provided by Jan Boon, Head of Communications, NIOZ

Blue blood on ice – How an Antarctic octopus survives the cold

An Antarctic octopus that lives in ice-cold water uses an unique strategy to transport oxygen in its blood, according to research published in Frontiers in Zoology. The study suggests that the octopus's specialized blood pigments could help to make it more resilient to climate change than Antarctic fish and other species of octopus.

The Antarctic Ocean hosts rich and diverse fauna despite inhospitable temperatures close to freezing. While it can be hard to deliver oxygen to tissues in the cold due to lower oxygen diffusion and increased blood viscosity, ice-cold waters already contain large amounts of dissolved oxygen.

In Antarctic fish, this reduces the need for active oxygen transport by blood pigments (e.g. haemoglobin), but little is known about the adaptations employed by blue-blooded octopods to sustain oxygen supply in the cold.

Lead author Michael Oellermann from the Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research (AWI), Germany, said: "This is the first study providing clear evidence that the octopods' blue blood pigment, haemocyanin, undergoes functional changes to improve the supply of oxygen to tissue at sub-zero temperatures. This is invested to Antarctic fich to the cold conditions in the



Antarctic octopod Pareledone sp.

is important because it highlights a very different response compared to Antarctic fish to the cold conditions in the Southern Ocean. The results also imply that due to improved oxygen supply by haemocyanin at higher temperatures, this octopod may be physiologically better equipped than Antarctic fishes to cope with global warming."

Original publication: Michael Oellermann, Bernhard Lieb, Hans O. Pörtner, Jayson M. Semmens and Felix C. Mark. Blue blood on ice: Modulated blood oxygen transport facilitates cold compensation and eurythermy in an Antarctic octopod. Frontiers in Zoology 2015 - available here: http://www.frontiersinzoology.com/content/12/1/6/abstract This article was provided by Margarete Pauls, Office for Information Strategy, Alfred Wegener Institute



News from the POGO members (cont'd)

IMBER and the Hjort Centre join forces

The Hjort Center Secretariat and IMBER's International Project Office (IPO) celebrate their co-location at the Institute of Marine Research in Bergen

On 19 March 2015, with about 30 guests, good food and drinks, speeches and singing, the Bergen Hjort Centre for Marine Ecosystem Dynamics (http://www.hjortcentre.no) and the global IMBER (Integrated Marine Biogeochemistry and Ecosystem Research, http://www.imber.info/index.php) marked the co-location of their leadership at the Institute of Marine Research (IMR) in Bergen, Norway. Both have an overall objective of understanding and quantifying the dynamics of marine and coastal ecosystems, describe their state, and (as far as possible) predict and project changes including developing future scenarios based on options for human interference under varying and changing weather and climate. This shall contribute to secure productive, healthy and sustainable ecosystems for the benefit of present and future generations. This is also in line with IMR's most important international collaboration institution ICES (International Council for the Exploration of the Seas).



The Hjort Centre and IMBER co-locate at IMR Photo Credit: IMR

IMBER and the Hjort Centre are complementary with the core of the "Hjort-scientists" coming from Bergen (IMR, UiB, NERSC, Uni Res) with the main focus on the northern Atlantic and the Arctic, while IMBER integrate researchers and research around the globe. This creates possibilities to compare processes and mechanisms in different ecosystems to evaluate which are general and which are site specific. While the Hjort Centre also investigate the potential for harvesting more food from the ocean in a sustainable way, IMBER has a clear goal on integrating marine natural science with research on social, political, governance and economic mechanisms, and not the least communicating marine and human research with stake holders and the general public. This includes motivating and educating young people towards early carrier marine scientist.

By the co-location we will contribute to faster progress within understanding marine ecology; faster and better approaches towards ecosystem-based marinemanagement; improve the international visibility of the Hjort Centre and IMBER research; improve our participation in the debate on global marine challenges; improve the impact of research on policy and implementation; improve the recruitment of and job-possibilities for early carrier scientists.

The Hjort Centre secretariat is led by director Olav Sigurd Kjesbu supported by Silje Seim with guidance from a "core group" of researchers at the individual institutes. IMBER IPO is lead by director Einar Svendsen supported by Lisa Maddison, Veslemoy Kjersti Villanger and Bernard Avril with guidance from a science steering group of 15 researchers from around the globe, lead by Eileen Hoffman, USA.

This article was provided by Einar Svendsen, Director, IMBER International Project Office

POGO Capacity Building News

Report from University of Cape Town Bursary awardee Tsei Senam



Figure 1: 3D illustration of the steering of three Argo floats by the underlying bathymetry. The trajectories of the floats are represented by blue, magenta and black curves. I joined Marine Research Institute (University of Cape Town) to read a Master degree in Applied Marine Science (AMS) which commenced in January 2014. For this course, I was offered a POGO Scholarship, which was administrated through MA-RE. The AMS program is made up of coursework and a mini-dissertation.

The coursework component started with an introduction to statistical methods and numerical skills. This became useful when I was analysing Argo profiling data for my thesis. The second module consisted of Oceanography to biologists, Marine Law and some oceanography tools such as Matlab and Ocean Data View. I was therefore introduced to the fundamentals of oceanography and ocean governance (EEZ and law of the sea). We concluded the coursework aspect with Remote Sensing, Ecosystem Approach to Fisheries (EAF) and Marine Conservation modules. I was fascinated by the art of watching the oceans from space via satellites. And finally, I ended the coursework with Marine Conservation. Here, I was exposed to some methods used in conserving marine species include MPAs and marine reservoirs. As a requirement for the program, I took a project to investigate the sampling bias

of Argo profiling floats in the Southern Ocean South of Africa. Though Argo floats have contributed to successful sampling in vast and remote areas of the ocean, in the quantitative descriptions of these oceans by the Argo floats represent the full

it is also important to determine whether the quantitative descriptions of these oceans by the Argo floats represent the full regional perspective of the ocean. Argo floats may be sampling only part of the dynamics and related variability associated with the ocean. The study highlighted that Argo profiling float trajectories are entrained into circulation features of the Antarctic Circumpolar Current that are topographically steered (Figure 1).

I would like to thank POGO for its support which enabled me to attend the comprehensive Masters course at the University of Cape Town and further my knowledge.

This article was provided by Tsei Senam, Applied Marine Science Student, Ma-Re, UCT



POGO Activities Nippon Foundation and POGO's visit to the Centre of Excellence at AWI



NF-POGO CofE Scholars with Mr Ogiue, POGO and AWI Staff. Photo Credit: POGO

Earlier this month, Mr. Kentaro Ogiue representing the Nippon Foundation met with the current scholars of the NF-POGO Centre of Excellence at AWI in addition to Sophie Seeyave and Vikki Cheung of the POGO Secretariat. This also provided an opportunity to meet with staff members of AWI involved with the Centre of Excellence and for POGO to reiterate to the scholars the importance of knowledge transfer when they have completed their training and return to their home countries and explain how they can be involved in the NANO Network.

This article was provided by Vikki Cheung, Scientific Coordinator, POGO Secretariat

POGO representation at other meetings

The Atlantic: Our Shared Resource:

Representing POGO, Sophie Seeyave was invited to present at the European Commission, Brussels (16-17 April 2015) during the session on 'The Atlantic Ocean Research Alliance in a Global Context'. The meeting was also attended by several POGO Members.

IODE XXIII:

Sophie Seeyave attended the 23rd session of the IOC Committee on International Oceanographic Data and Information Exchange in Bruges, Belgium (16-20 March 2015), where the strategic plan for IODE was discussed.

POGO-17 will be held in Yokohama, Japan

The next annual meeting, POGO-17 will be held in Minato Mirai 21, a seaside urban area in Yokohama City. The meeting rooms of POGO-17 and the side meetings, and the hotels are planned to be within walking distance.

Yokohama is the second largest city in Japan and known for its international atmosphere related to its history that is strongly related to Yokohama Port. During the Edo-period (1603-1867), Japan was a closed country under the selfisolation policy of the Japanese government of that time. Japan was opened to the outside world in the end of Edo period, and Yokohama Port was one of the first ports of Japan that were opened to foreign trade in 1859. Many historic landmarks and former Western residences that were built in that era are still retained around the port.

Minato Mirai 21 is a business district and also one of Yokohama's popular tourist spots with numerous cafés, shops and restaurants in large shopping centers, museums and one of the world largest Chinatowns nearby. Access to Minato Mirai 21 district is less than an hour from Haneda Airport (Tokyo International Airport) and a little under two hours from Narita International Airport by public transportation. There are airport limousine buses that directly connect to Minato Mirai 21, and there are railway services from the airports to stations in Minato Mirai 21.

Further information on transportation and accommodation will be provided on POGO's website later.

The hosts of POGO-17, JAMSTEC are looking forward to seeing the delegates of the meeting in Yokohama.

This article was provided by Aska Vanroosebeke, International Affairs, JAMSTEC



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