POGO-13 Minutes

School of Ocean and Earth Science and Technology,
University of Hawaii at Manoa
9-11 January 2012

Monday 9 January

Inauguration

In his introductory remarks, the POGO Chairman underlined that the meeting was once again very well attended, with 29 out of 37 member institutions represented. The POGO meetings offer a unique opportunity for directors from institutes around the world to meet, and this is the strength and uniqueness of POGO.

The Action Items from POGO-12 were reviewed and progress on each one summarised by Shubha Sathyendranath, with reference to more detailed presentations to be made by the members responsible for specific items during the course of the meeting. There were no further comments on these.

Trevor Platt gave a presentation on the "State of the Partnership", to be used as a basis for the POGO strategy that is to be produced (as decided at POGO-12). This consisted of a review of where POGO has reached after 12 years of existence. The starting point was the existing Mission Statement translated early on into a suite of operational objectives.

Reports on POGO Activities: Capacity Building

POGO-SCOR Visiting Fellowships –Shubha Sathyendranath

Following the Sao Paulo declaration POGO took the lead in implementing capacity building, initially through the POGO-IOC-SCOR fellowship programme. Over the years this has grown into a family of capacity building programmes. These are an open opportunity, not only for POGO members, although 50% of host institutions and 25% of parent institutions are in fact POGO members. This programme has been inspirational for other programmes such as the European Commission's EAMNet and EUROMARINE projects.

Discussion points included:

- *Need to set priorities and budget for 2012*
  These will be similar to previous years.

- *Reviving the partnership with IOC*
  Due to the financial situation within IOC the reinstatement of financial support may not be possible in the immediate future, although collaboration with IODE is ongoing and should be further developed.

- *How to encourage applications from Africa?*
  The main problem for African applicants seems to be that they don't have contacts in developed countries who could be potential host supervisors. POGO could offer some help to African students to make these contacts.

- *Instigate AMT-type fellowships in partnership with other member institutions?*
  To expand the AMT-type fellowships it would be useful for the POGO Secretariat to provide an information sheet to the members setting out the terms of the POGO-AMT collaboration and how it works.

- *Former fellows –should we track them down (they are the future)?*
  Nippon Foundation money has to be spent on developing the NF-POGO alumni network, but POGO could invest additional funds to develop a network of SCOR-POGO and other trainees and bring them all together into a "super-network" of alumni.

POGO Visiting Professorships –Lisa Levin

Lisa Levin and David Checkley were last year's POGO Visiting Professors. During their 6-month stay in Namibia, they spent time teaching at the University, set up a lecture series, and helped their hosts with the design of the new research vessel, and with ecosystem assessment and biodiversity monitoring. The field trips they organised for the students provided not only hands-on training but for some students it was their first opportunity to see the ocean! The professors also spent time on community outreach (museum, schools, business community).

Challenges included slow and limited communications and internet, limited and expensive equipment, limited and unreliable ship time and personnel. They had also planned to visit Angola but it proved impossible to obtain visas from Namibia. They also experienced set-backs and additional expenses related to theft.

Namibian marine research is faced with a lack of federal funding, with most funding coming from overseas, limited research training (MSc level mostly), a lack of incentive for faculty to conduct research, and insufficient travel and sea-going opportunities.

The benefits for visiting the professors to undertake such teaching and research visits include:
- Exposure to a new ecosystem
- Appreciation for global science and conservation challenges (e.g. phosphate mining without consulting fisheries ministry or conducting any assessment)
- Meeting new friends and collaborators.

Recommendations for future development of Namibian research include:
- Fellowships for qualified students to study abroad
- Internships for extended research opportunities - focused on Namibia-specific research.
- Foreign mentors
- Preparation for undergraduate students (in math, English, writing, scientific method)
- Instructor preparation – offer training classes (in Namibia) for the instructors and professors to enhance the teaching level
- Facilitate access to the internet and the scientific literature
- Build a system of recognition for UNAM faculty and NatMIRC staff that rewards research and publication, and student training
- Create degree programs that partner with foreign institutions
- Administer capacity building funds outside of Namibia, while involving Namibian scientists in the process.

NF-POGO Centre of Excellence (CofE) –Gerry Plumley

The number of applicants increased initially but has been decreasing in the last couple of years, probably because applicants are becoming aware that it is a very competitive programme that allows no more than one student per country in any given year. A total of 20% of the scholars so far have been from Africa.

New modules include data management, maths and programming, and scientific writing. Occasionally students from developed countries have been included, to provide a greater diversity and networking opportunities.

Since 2009 there have been regional CofEs (Brazil, India), the next one (2013) possibly to be held in Thailand.

The CofE has been a strong step up from visiting professorship and fellowship programmes, and Bermuda/BIOS has proved to be an excellent location. The next step is the development of the NF-POGO Alumni Network for Oceans (NANO).

One of the strengths of the CofE has been that is very hands-on and "realistic" for developing country scientists. The students are exposed to state-of-the-art facilities but bearing in mind that developing countries can't afford these, it remains as practical as possible. Current CofE students have already been asking for help with writing proposals, which is encouraging. The lack of maths and statistics in ocean biology is a big problem everywhere so it is important for the CofE to encourage numerical literacy (need to find suitable lecturer for maths module).

The rule that only allows one student per country comes from the NF but if additional students could attend with their own funding (e.g. Brazilians) this could be accepted by NF and seen as valuable. BIOS has tried to get additional funding for the CofE to increase intake but this has failed so far. POGO members should continue to seek opportunities.

NF-POGO Alumni Network for Oceans –Sophie Seeyave

A Planning Meeting (funded by NF) took place in Oct 2010 to discuss the formation of an Alumni Network and possible Alumni Meeting. After the meeting NF-POGO awarded 2 fellowships to former scholars from the CofE to help the Secretariat (remotely) develop the Network. These fellowships proved to be very effective. Between Feb and Sept 2011, 209 Alumni were sent a questionnaire on their current education/ employment, publications, conferences attended, projects and other aspects of their career development. So far 128 out of 209 have returned the questionnaire, with a much higher response rates for the alumni of the Bermuda CofE (100%), and for the regional CofEs (77%). The information provided by the alumni has been entered in an Access database, and also added to the NANO website (www.nf-pogo-alumni.org) along with general information about the Network, an electronic newsletter (launched in September 2011 and managed by the alumni themselves) and links to NANO "friends", who are senior scientists supporting the network. The website statistics show that it receives on average 50 visitors per day, from 58 countries on 5 continents. One of the main goals of the network is to encourage and facilitate international collaboration and to set up joint research projects to be carried out by the alumni. A meeting was held in Abingdon, UK, in Sept 2011 to prepare proposals for these projects. Four regional proposals were prepared and submitted to NF in Dec 2011 for potential funding in 2012.

Karen Wiltshire suggested linking graduate schools in Europe/US to POGO and linking the alumni lists from these to NANO. She also suggested creating a booklet of all alumni photos with short CVs (information that is on NANO website).

POGO-SCOR-IOC present and future collaborations in capacity building –Ed Urban

There are many organisations conducting capacity building in marine science, with POGO, SCOR and IOC being the main ones. Ideally, each organisation should lead in a different area of interest, and cooperate with others where interests and approaches coincide. Therefore, occasional coordination meetings are needed between IOC, POGO and SCOR, and other organisations. Joint approaches to new funding sources should be considered. SCOR would like to see POGO and/or IOC finance some future coordination meetings (the last two were funded/organised by SCOR).

The 2010 meeting in Bremen recognised the need for a single source of information on summer schools and subsequently IODE developed the ocean summer schools website. In 1998 SCOR held a meeting to develop the idea for regional graduate schools in oceanography, but this has not yet been realised.

General discussion on capacity building

It was suggested that an effective way to move forward with IOC-POGO-SCOR collaboration would be to form a coordination committee.

Satish Shenoi announced that the Indian government has asked INCOIS to establish an international centre for operational oceanography. This was discussed at the IODE meeting and IOC agreed to be a partner. It represents a 33M USD investment from the Indian government. They plan to run 2-8 week programmes for short-term training (Indian Ocean rim, African countries) similar to the CofE regional training. Furthermore, the Vice-Chancellor of Hyderabad University will offer a 2-year MSc programme in marine/atmospheric sciences. The building space is already available and training is planned to start in July/Aug 2012. Skeleton staff will be fully supported by the Indian government, and will be complemented with visiting instructors. INCOIS would like POGO to become a partner, and to help deliver the training.

Edmo Campos added that Brazil has many excellent students in POGO programmes and can now obtain research funding/facilities but they are still lacking in human capacity. They would like to write a proposal to develop a branch of the CofE in Brazil. They would need to discuss how to finance other aspects of the training (e.g. travel).

Peter Pissierssens mentioned that rather than bringing all students to IODE in Belgium for training (this allows only 18-20 at a time) they want to have a regional focus and use modern technology to share lectures through distance learning. They are actively developing this (see presentation).

Susan Avery suggested that it would be a good idea to link up NANO and other CB initiatives that are taking place in different regions (India, Brazil).

Wendy Watson-Wright said that IOC voted to create a sub-commission for Africa, with a coordinator in Nairobi. Other organisations/institutes potentially interested in collaborating include a training centre in Qingdao, and plans for a regional network in the Western Pacific. The ACCESS programme in South Africa is trying to become an African centre; Iran has requested to create a

regional centre in the Middle East. The University in Kuweit has a beautiful centre for oceanography that could benefit from capacity development.

John Field suggested that there is a gap in our capacity building efforts. In Africa generally, and UCT in particular, faculty are very stretched in supervising research projects. Funding more postdocs (there are many looking for positions) would really help to relieve their burden.

Reports on POGO activities: International Science Collaboration

Expo 2012: Yeosu Declaration –Dosoo Jang

106 countries and 23 domestic participants, plus a number of international organisations have registered to participate in the Expo 2012. The Yeosu declaration has been prepared by a Drafting Committee, a Domestic Review Committee, and an International Review Committee consisting of 20 marine experts (including POGO). The objectives of the Declaration are to increase the level of interest of the world citizens, including non-ocean communities, in issues and phenomena facing the ocean and coasts, to consolidate the will of international communities in order to Protect the Marine Environment, while simultaneously advancing technologies for green growth; and to create a legacy for EXPO 2012.

The Declaration will be promoted further at the World Oceans Summit, the 151st BIE Assembly and the Rio + 20 Summit. The culmination will be the Yeosu Declaration forum at the closing of the Expo, with the theme "Measures to translate the spirit of the Yeosu Declaration into action".

Expo 2012: POGO exhibit –Sophie Seeyave

The exhibit will be articulated around 3 themes:

1. Ocean observations: how have we been observing the ocean over the last century?

1.1. Display of historical and new equipment (real objects as well as photos/videos) to show the evolution of ocean science and development of new technology, including the Continuous Plankton Recorder, the evolution of instruments for measuring temperature in the ocean (Nansen bottle with reversing thermometer, bathythermograph, CTD) and the evolution of instruments for measuring currents (different types of current meters).

1.2. Timeline of ocean explorations and development of POGO
Time line showing major landmarks in ocean exploration and ocean observations, and the year of foundation of all POGO member institutes.

2. POGO member institutions: who is carrying out these observations? (also why, where and when?)

Digital display showing:
2.1. Videos introducing the POGO member institutions
2.2. Videos highlighting the issues that are being tackled (e.g. climate change, ocean acidification, depletion of fish stocks, natural disasters)
2.3. Videos showcasing projects/cruises/expeditions led by the POGO member institutions.

3. Experiencing the ocean through the five human senses

Interactive and fun displays, aimed primarily at children, to demonstrate how the ocean looks/sounds/feels/smells/tastes.

OceanSITES –Uwe Send

OceanSITES can be described as a "POGO child". The data management team is very active (monthly Webex calls). The recent meeting at SIO was very successful, attended by over 40 participants from 14 countries, plus NASA/NOAA. Many teams/institutions were represented for the first time. They decided to build on existing data sets/infrastructure as well as starting new time-series, but to tighten requirements and focus on the unique contributions of each station. A minimum set of variables to be measured by all sites was defined a year ago but needs to be revised in light of the Essential Ocean Variables that will be defined as a result of the Framework for Ocean Observing.

OceanSITES is 95% complete, but needs funding for the remaining 5% (2M $). OceanSITES can make an instant contribution to the Deep Ocean Observing strategy.

Ed Hill commented that the programme needs to demonstrate how these measurements fit into the global scheme of ocean observations and what their scientific/societal benefits are. These need to be clearly justified to funding agencies.

GEO Task Blue Planet –Trevor Platt

Since the inception of GEO, POGO has been committed to supporting it. POGO has been involved in various marine initiatives of GEO and has lobbied with GEO that, collectively, the aggregate of marine work in GEO be given more prominence. In 2011, POGO took the lead to write an overarching Ocean Task for the next GEO Work Plan. Other programmes have asked to join, so that the initiative is now highly representative of the marine community.

The new Task is called SB01 "Oceans and Society: the Blue Planet". This Task aims to:

- Provide sustained ocean observations and information to underpin the development, and assess the efficacy, of global-change adaptation measures (such as those related to vulnerability and impacts of sea-level rise).
- Improve the global coverage and data accuracy of coastal and open-ocean observing systems (remote-sensing and in-situ).
- Coordinate and promote the gathering, processing, and analysis of ocean observations.
- Establish a global ocean information system by making observations and information, generated on a routine basis, available through the GEOSS Common Infrastructure.
- Develop a global operational ocean forecasting network.
- Provide advanced training in ocean observations, especially for developing countries.
- Raise awareness of biodiversity issues in the ocean.

Components:

- C1: Global Ocean Information Coordination and Access (includes implementation of GOOS)
- C2: Operational Systems for Monitoring of Marine and Coastal Ecosystems
- C3: A Global Operational Ocean Forecasting Network (includes ChloroGIN, OceanSITES, IOCCG, CPR, IQOE)
- C4: Applications of Earth Observations and Information to Sustainable Fishery and Aquaculture Management (includes SAFARI).

The first proposed Action is a Blue Planet Symposium. This would immediately precede the GEO Plenary (November 2012) in Foz do Iguaçu (Brazil). It would include sessions on each of the GEO Societal Benefit Areas and aim to engage regional policy makers. It would also be an ideal vehicle for a showcase of Oceans United. The Secretariat would welcome POGO members interested in helping to organise it. Sponsors will need to be sought.

Discussion of POGO strategy

Karen Wiltshire and Alexandra Kraberg started the discussion with some ideas on what POGO can bring to its members and what it could achieve. POGO can be seen as a means of communication, exchanging ideas, setting up collaboration, fulfilling global commitments, and a means for the members to "earth" themselves. POGO could aim to modernise communications, enhance rather than compete with each other's scientific output, link outreach between institutions, and define achievable goals for important action items.

One such goal could be the long-term coordination of long-term datasets through data integration. This could link up with the German project MaNIDA, which aims to integrate different data management systems. POGO could create over-arching research themes to focus and guide activities for long-term data (research as well as outreach and capacity building).

The uniqueness of the POGO mission needs to be re-considered. For example, there is the perception that there is too much overlap between the GOOS and POGO missions. However, GOOS/JCOMM are very operational, whereas POGO could be seen as more time-series oriented. This focus could be the POGO "niche".

A comment was made that POGO has many activities but not always clear goals/products, except in capacity building. It was argued that POGO does have other goals in addition to capacity building, such as promoting and supporting Argo and OceanSITES. The POGO mission states that it doesn't set scientific goals and this should be adhered to as it is the remit of organisations like SCOR.

The main mission of POGO is to do collectively what can't be done individually. POGO's uniqueness is in "who we are". It is also important to concentrate on complementarity with other organisations and not just on uniqueness. A comment was made that POGO is very important, particularly for small countries (e.g. Netherlands), to justify the need for ocean observations to their funders. It must not be forgotten that the ocean is not an isolated system, and needs to be positioned in an Earth system context (need to collaborate more with non-marine organisations?).

What is lacking for the oceanographic community is a regular international conference that brings together all oceanographers (the Ocean Sciences meetings are not truly representative). The Ocean Facilities Exchange Group (OFEG) is a European consortium for the exchange of research ships and equipment (e.g. ROVs) that could be used/expanded on by POGO.

Tuesday 10 January

International programmes and activities supported by POGO

Framework for Ocean Observing –John Gunn

There is no parallel to JCOMM in biology/biogeochemistry for setting Essential Ocean Variables (EOVs). The FOO aims to articulate best practices and believes that an integrated observing system will be a derivative of an EOV-based approach driven by requirements. The IOC assembly passed a resolution to dissolve i-GOOS and GOOS-SSC and form a new GOOS steering committee. Rather than form a separate committee it was proposed that the FOO should be governed by the same committee. This will consist of 15 members with observers. It is not clear if POGO would have a representative on the committee or an observer status. It is essential to align existing organisations to the framework. The governance structure should be determined as soon as possible to start implementation. An important issue to resolve is where coastal observations will sit (PICO plan). Sponsors' input to the panels will be required, as well as consultations with GEO.

The Institute for Marine and Antarctic Studies (IMAS) and Southern Ocean Observing System (SOOS) –Mike Coffin

Australia has invested heavily in marine science, and 40% of Australian marine science capacity and 60% of Antarctic research capacity is located in Tasmania (CSIRO, AAD, IMAS, University of Tasmania). UTAS hosts both Australia's Integrated Marine Observing System (IMOS) and IMAS, which itself hosts the International Project Offices for SOOS and the International Antarctic Institute (IAI).

The SOOS IPO is funded until 2015 with support from AAD. The Initial Science and Implementation Strategy has recently been published (http://www.soos.aq/pdf/SOOS_Strategy-lowres.pdf). John Gunn and Mike Meredith are Co-Chairs of the Scientific Steering Committee that was recently constituted out of a pool of 70 nominations. The first SSC meeting will take place in February in Salt Lake City (N.B. Oscar Schofield succeeded John Gunn as Co-Chair in February 2012).

It was agreed that POGO members with Southern Ocean interests should be encouraged to contribute data. The involvement of IOC/GOOS is currently under discussion, in terms of what they will gain from being part of GOOS. Antarctic Treaty Consultative Meetings and SCAR are still the main hubs for discussing what different parties are doing in the Antarctic, but SOOS can play an important role in providing a common strategy to nations.

The Global Alliance of CPR Surveys –Sonia Batten

Nine CPR surveys are currently in existence. The idea is to put them together to give a global perspective. Twelve labs and fifty vessels from nearly forty shipping companies are involved (it is never a problem to find ships). POGO can provide the interface between GACS and other ocean observing systems, and help with capacity building.

The Memorandum of Understanding was signed in Sept 2011 but still needs to be ratified. GACS will have a simple governance structure (Board of Governance, database Working Group and standards/ methodologies Working Group). The website will be coming soon: http://globalcpr.org.

The Panel for Integrated Coastal Observations (PICO) –Tony Knap

GOOS started out with four panels (OOPC, coastal, health of the ocean…). The coastal panel has been subsumed by PICO. The PICO plan has the building blocks of a system of systems. Regional COOSs are being implemented in the developed countries but the global network exists in concept only. This should be built up gradually from the region level. The next step is to formulate a proposal for a super-site in south-east Asia. Capacity building is essential for the implementation of PICO. The IOC WESTPAC sub-commission in Bangkok could help in the implementation of the super-site.

The question was asked whether it is really necessary to divide observations into coastal and open ocean, since the boundary between the two is only conceptual and difficult to determine. We are still facing the problem that biological observations are in the coastal realm whereas the open ocean tends to be dominated by physics. This problem needs to be addressed in the overall governance. All members need to consider where they can contribute to these initiatives.

Some reflections on the Census of Marine Life –Jesse Ausubel

Some elements that contributed to the success of the CoML included having and following an organisation chart; international SSC meetings every 4 months that reviewed milestones and were surprisingly effective; an international secretariat; and establishing and reviewing partnerships with international organisations.

Lessons:

- Big things can be done
- Have a clear charter
- Enjoy the era of macroscopes
- Practical management helps
- Respect the power of trust and conviction: the programme worked because of the participants, not the organisational structure.

The International Quiet Ocean Experiment (IQOE) –Ian Boyd

The project is now seeking endorsement from POGO and SCOR to go forward. This represents an opportunity to ensure that sound measurement is an integrated part of global ocean observations.

The IQOE will adopt a community-based approach, focussed on innovation and minimisation of economic impact. It aims to evaluate the current state, how is it changing, what are the consequences, and how does the present differ from the past. Work streams will integrate into ocean observing systems, data management and communication, modelling, economic consequences, engagement with industry and with the public.

The Science Plan is to be finished in February. It is structured around 4 themes:

1. Ocean soundscapes
2. Defining the effects of sound on marine organisms
3. Observing sound in the ocean
4. Industry and regulation.

The outcomes will be increased recognition of sound as an important dimension of global change, reduced uncertainty and technological innovation.

The next step is for POGO/SCOR to nominate up to 3 people to review the proposal and approve a planning committee.

GEO Biodiversity Observation Network (GEOBON) –Trevor Platt

GEOBON has both a Community of Practice and a Task within GEO. It is a voluntary committee guided by a steering committee comprising key stakeholders. It emphasises open-access data resources. There are 8 topical WGs –WG5 is marine ecosystem change focussing on distribution, extent and condition of marine ecosystems and how they are changing over time. The current Chair is Carlo Heip, who is seeking a co-Chairman to replace Jan de Leeuw. GEOBON is linked to the Blue Planet task within the new Work Plan, for example with the CPR programme. Over 10M EUR of EU funding is earmarked to support GEOBON.

Indonesian Throughflow GATEWAY Programme –Dongchull Jeon

The programme is a collaboration between the US (URI, LDEO), China (SIO/SOA), Korea (KORDI), and Indonesia. The objective is to monitor the contribution to the ITF of Mindanao/Halmahera and Luzon Strait and to establish how leakage into the ITF depends on Mindanao Current transport. Proposals were submitted to national governments. The preliminary plan will be presented at the CLIVAR meeting in March 2012. Field work is planned to begin in 2013-2015. The US is conducting an independent project with Taiwan using moorings.

POGO support (sending letters to funding agencies) would be appreciated. It would be possible to integrate with PICO on a basin scale.

General discussion

IQOE:

The possibility of adding acoustical instruments to OceanSITES moorings was discussed. OceanSITES would be interested in hosting acoustical instruments as they can consolidate data from anemometers and other instruments, however the problem of the extremely large volumes of data generated by acoustical instruments would need to be overcome first. There is a real willingness for this project to bring biology and physics together. There may need to be a greater focus on the ocean acidification issue. The cost of programme has not been estimated yet. Navy officials of various countries have been engaged from the start and were well represented at the OSM.

There was some discussion about the title of the programme. Title does present a bias but this is the same as for other global changes (e.g. ocean acidification). The idea is that even though we currently don't fully understand the effects of anthropogenic sound, sooner or later a quieting will be required. Another implication of the title is that IQOE is about passive acoustics. Indeed, natural experiments and removals are deemed to be a valuable and innovative part of the programme.

The Sloan Foundation wants to encourage the next step only if POGO and SCOR think it is worthwhile. The programme is not highly defined yet, and there is room to modify things over the next couple of years. There is a need to define a global community, and this is a very good reason to have POGO involved. The next 2 years will involve more planning and scoping. If there is an International Year of Acoustics in 2017 involving POGO institutions there will be a need for proposal writing. AWI has been thinking of an acoustical programme and would like to take an

active role, since they have several specialists. The programme could also potentially enhance the visibility of POGO.

GEOBON:

For oceans to carry more weight within GEOBON POGO members need to send more people to their meetings, particularly through their National Committees.

POGO Mission statement:

The participants discussed how to update the Mission Statement and suggestions were sent to the Secretariat in writing. These will be incorporated in the new version.

Suggestions to enhance member engagement between meetings included forming working groups and exploring the possibility of seconding people from POGO member institutes to the POGO Secretariat (virtually or in person).

Emerging initiatives in Ocean and Earth Observations

The Mohole project 50 years after: Scoping and feasibility of reaching the mantle frontier – Kiyoshi Suyehiro

The International Ocean Discovery Programme is the new name of IODP (formerly Integrated Ocean Drilling Programme). It is hoped that mantle drilling will be achieved under the new programme. The Deep Carbon Observatory initiative has recently been funded by the Sloan Foundation, presenting possible collaborative opportunities.

Three candidate sites have been identified, that would involve over 10km of drilling (water depth + crust). An initial feasibility study for 2017 drilling has been carried out. Key issues that emerged were the extreme bottom-hole temperatures and limited drill bit life.

The Borehole into Earth's Mantle (BEAM) Science plan is to be produced with Sloan Foundation funds. The cost of the project would be 1M $ per day over 500 days, therefore a total cost of 500M USD. This represents a 5-fold smaller budget than space missions. Risk areas are to be discussed in February (safety, funding, public acceptance, environmental effects, science community support). With funding and engineering developments this could be within reach in 10 years' time.

Potential use of ITU telecommunication cables for monitoring the oceans –Rhett Butler

There is currently a global coverage of submarine fibre-optic cables with repeaters every 40km. The idea to exploit this for ocean observations has been around for some time but might now be within reach, since the right groups have been engaged. A workshop on this topic was hosted by ITU, WMO and IOC as part of "Green Standards Week".

The workshop addressed science, technology, law of the sea and business aspects. Most observing systems deal with the upper ocean, particularly with the growing use of satellites. Disaster (tsunami) monitoring systems are vulnerable to vandalism and have high maintenance costs and downtime issues. Current cables will be replaced in around 15-20 years' time; this would provide an opportunity to add sensors.

The workshop issued a Call to Action to form a joint task force and a "sensor strategy" was drafted. There are issues with measurements in Exclusive Economic Zones potentially being hindered by UNCLOS, the risk of added downtime, and ownership of the equipment. POGO could get involved in discussions about obtaining exemption for EEZs on the basis that ocean observations are for the greater good (similar to meteorological observations).

The SeaOrbiter Project –Ariel Fuchs and Jacques Rougerie

SeaOrbiter is an exploration vessel and a drifting sub-marine as well as marine observation platform permitting the *in-situ* and continuous observation of the marine ecosystem, the monitoring of physical and chemical parameters of the ocean/atmosphere interface and the development of research on human behaviour in extreme situations. The estimated cost of project is 30M EUR including scientific and diving equipment. Drifting is the main propulsion mode but the vessel can also be towed. It is not designed to be entirely submerged (more like an ice-berg). The advantage of being at the surface is to look at the ocean-atmosphere interface.

The plan is to have one vessel in each ocean, with plans for Southern Ocean/Antarctica/ Arctic to be developed in the coming years. 2012 is going to be the construction year. The project leaders want to create an International Science Committee and welcome POGO for scientific advice.

Ocean observations for disaster mitigation and response

Preliminary results of JAMSTEC mission for the Great 2011 Tohoku Earthquake –Yoshihisa Shirayama

Activities after the tsunami included rapid response geophysical survey, biological survey of disturbances caused by the earthquake and ecosystem response; monitoring and modelling of radioactivity off the coast of the Fukushima power plant (government request). All ship resources were used (26 cruises, 311 days).

Changes in deep-sea organisms were observed around the fault line. It was decided to accelerate the implementation of DONET 2. This could provide an opportunity for partnership with IQOE. A new ship is scheduled for completion in 2013.

Indian Ocean tsunami warning and mitigation system –Satish Shenoi

The tsunami warning system was established as a result of the 26 December 2004 Indian Ocean tsunami that was responsible for 230,000 deaths. The system is governed by IOC but fully owned by the countries. It is a network of focal points, based on international cooperation and free data exchange. IOC provides the "glue" that brings everything together. Each nation is responsible for issuing warnings and must have strong links with emergency authorities. The system consists of coastal sea-level networks and deep-ocean tsunameters. The early warning system consists of risk assessment and reduction, monitoring and warning service; dissemination and communication, and awareness and response.

Wednesday 11 January

Other programmes with common interests with POGO

GEO Ocean Observing Community of Practice (CoP) –Trevor Platt

The CoP was established by the GEO User Interface Committee in 2011.It is now an element of the Blue Planet Task. The initial focus of the Community of Practice will be to:

1. Encourage collaborative action in the flow of data from the ocean observing system through data management systems to scientific and operational users; and
2. Encourage connection of ocean data streams to the GEOSS Common Infrastructure
3. Liaise with the Blue Planet Task.

Possible activities of the CoP include interfacing some key ocean observing system data systems with the GEO Common Infrastructure for data interoperability (Argo, OceanSITES, Ocean Observatories Initiative, Continuous Plankton Recorder (CPR), IODE Ocean Biogeographical Information System, IODE OceanDataPortal and WMO Information System). It will liaise with other identified leaders of the GEO 'Blue Planet' Task. The first face-to-face meeting will take place at Ocean Sciences 2012 in February. Discussions have been initiated regarding its contribution to the putative Blue Planet Symposium.

Possible coordination of Antartic research cruises with IMR Norway –Einar Svendsen

The Norwegian programme will conduct cruises in the Antarctic in 2014-15 focussing on the biological production and assessment of krill. They are seeking collaborators, for example to provide good ocean circulation or ecosystem models for the region. Participants at the meeting who expressed an interest in potential collaboration were IO-USP (Brazil) and BAS (UK).

IODE –Past and future interactions with POGO –Peter Pissierssens

IODE links up National Oceanographic Data Centres (NODC) and marine libraries worldwide. IODE activities consist of data and information management, with capacity development being an important aspect, in particular through the Ocean Data and Information Networks (ODIN) and Ocean Teacher Academy (OTA) (www.oceanteacher.org). ODINs provide equipment, training, and seed funding for operational activities and for newly created data centres and marine libraries. They work in a regional context, addressing common as well as national goals. Ocean Teacher runs ~8 courses per year (mostly on Oceanographic Data and Information Management) and has trained over 1000 students from 120 countries since 2005. OTA supports classroom learning, blended training, online tutoring and online self-learning.

IODE provides a lecturer (Dr Murray Brown) to the Nippon Foundation-POGO Centre of Excellence (2009-2010 and 2011-2012) for the data management module. The training materials are included in OTA.

IODE aims to set up regional training centres in Japan, Argentina and India that would expand the OTA to a "global classroom" using distance learning technology in order to reach hundreds of students instead of 20 per course. Is there a possibility that POGO members could provide regional centres? Also, POGO members could collaborate with IODE through the Global Classroom to receive and/or provide training. The CofE course could also use the same technology to "globalise" its programme. POGO members are also encouraged to use the IODE Ocean Data Portal to share and

disseminate data. It would be good for POGO to establish a data management literacy activity jointly with IODE.

POGO-IOC collaboration and implications of the withdrawal of US funding to UNESCO – Wendy Watson-Wright

SCOR was established in 1957 to foster international collaboration. IOC was established in 1960. It has functional autonomy from UNESCO, is composed of 142 member states and works through member states, regional bodies and sub-commissions (new one being set up in Africa in spring). IOC is the voice of ocean science within the UN.

Since the withdrawal of US funding, IOCCP employees will become SCOR employees and JCOMMOPS employees will become WMO employees. The oceanographic side of JCOMM may suffer. There is a possibility that OOPC may also go to WMO, however IOC is trying to retain Albert Fischer. All countries other than USA can still make financial contributions to IOC.

There general sympathy expressed for this unfortunate situation that IOC is experiencing. One person questioned whether there was a need for a more resilient system than IOC. Wendy Watson-Wright stressed that IOC will continue international coordination, with the help of POGO and others.

During Rio +20 there will be a 4-5 day science conference run by ICSU/UNESCO and IOC has been requested to convene a session on ocean observations. POGO could play a leadership role in this if it comes about.

Successful development of ocean observing capabilities in emerging countries

Brazilian activities and observations in the South Atlantic –Edmo Campos

Historically IOUSP has been dedicated mainly to coastal oceanography. However, in recent years there has been an increasing awareness of the need to better understand the impacts of the large scale on the coastal zone. IOUSP decided to contribute to observation and modeling in the South Atlantic, in particular establishing a climate observing system. In early 2011, instead of using an adapted oil platform for ocean observations, the Brazilian scientific community convinced the government to make a call for proposals, which ended up funding several multimillion projects, including the acquisition of a new ship.

Chilean progress in rebuilding its facilities since the 2010 earthquake and tsunami –Carina Lange

The time series station off Concepcion is now 10 years old. A coastal mooring and glider observations have been added. A new time-series has also been set up off Patagonia. With help from the international community, COPAS has made good progress with rebuilding its facilities. POGO can help further by continuing to support the Austral Summer Institute and helping to find funds for the new coastal station in Dichato. It would also be good to include COPAS time series stations in PICO and for COPAS to become part of GACS by including CPR surveys in supply ships to Easter Island/Juan Fernandez/Antarctic Chilean base.

South African Activities –John Field

OceanSAfrica is a consortium of South African marine science organisations. The 4 Pillars of OceanSAfrica are:

- In situ observations (DEA: Oceans & Coasts)
- Remote sensing (UCT, MRSU)
- Modelling (Nansen-Tutu Centre)
- Data and product dissemination (SAEON)

An African Marine Remote Sensing Network is being developed through ChloroGIN-Africa, DevCoCast and the Marine Remote Sensing Unit. A new ice breaker SA Agulhas II will be launched in March 2012 (134m long, accommodating 100 scientists and 45 crew).

South Africa is leading capacity development initiatives for the rest of Africa for example through workshops in collaboration with IOC, WMO, Nansen-Tutu, EamNET and ACCESS (Africa Centre for Climate and Earth Systems Science). The University of Cape Town runs an Applied Marine Science Master's degree that has had 76 graduates since 2002, most of them from South Africa and other African countries. They also have a video-conferencing facility that could provide opportunities for distance learning.

The First Institute of Oceanography initiatives in Indian Ocean climate observations –Ma Deyi and Yu Weidong

FIO contributes to the Indian Ocean Observing System (IndOOS) through time-series observations and a regional programme. FIO is developing buoys, the latest development being the addition of CO_2 sensors (in collaboration with IMBER/SIBER). FIO is involved the IOC-WESTPAC SEAGOOS pilot project "Monsoon Onset Monitoring and its Social and Ecosystem Impacts", with a cruise that took place in April-May 2011, and a number of summer schools and workshops.

Development of ocean observations by IOCAS –Sun Song

The Chinese Academy of Science has 3 institutes for marine research. The seas around China are complex hydrographic environments, affected by severe problems such as harmful algal blooms, green algae blooms, jellyfish blooms. IOCAS is establishing a coastal ecosystem observing system, including long term observing and research vessel-based survey. They are also involved in the North Pacific Ocean Circle Experiment (NPOCE). A new research vessel has just been launched (100m long, 49 scientific berths and 31 crew).

General discussion

POGO should be pro-active in sharing best practices and expertise between developed and developing countries. The OceanSITES working group will promote this.

The CofE could take advantage of UCT, ASI and other course modules via video-conferencing.

Many countries have research projects in the Southern Hemisphere. IOC is doing some coordination but generally these efforts could be better coordinated. SOOS can also play an important role in this respect, since all 3 continents located in the Southern Hemisphere are represented on the SOOS committee.

The vandalism issue can be partially solved by educating fishermen on the use of these instruments, encouraging them to take care of them. However, it is not necessarily possible to reach out to fishermen from other countries. There is also the piracy problem. In India they implemented the use of conical buoys as they are more difficult to get onto to remove instruments.

POGO Business

News and Information Group

Sophie Seeyave gave a report on the News and Information Group Meeting that was held on 8 Jan and attended by Jan Seys, Andreas Villwock, Karen Wiltshire, Trevor Platt, Shubha Sathyendranath and Sophie Seeyave, with Tiffany Wardman, Craig Macaulay and Cindy Clark participating via teleconferencing.

The meeting emphasised the need for full representation of member institutes (currently only 12 official reps) and re-established the role of the NIG as an *advisory* body to the POGO Secretariat. It also established the need for a simple, feasible Strategy and Action Plan and reinforced the need for face-to-face meetings once a year in conjunction with POGO Meetings and for a critical mass of attendees.

Specific actions included requesting each POGO member to appoint a representative to the NIG, the need for more 1-page articles for the website on ocean observations for societal benefit, and requesting member contributions to the POGO newsletter. Occasional press releases issued by the members could be signed as "POGO" press releases. POGO members will be requested to ensure their websites have a visible link to the POGO website.

Activities for the NIG could include production and dissemination of new promotional materials (including for capacity building), and refining the powerpoints on POGO and ocean observations in general to be distributed to the members so that Directors can give presentations on POGO to their institutes. NIG members could also include articles on POGO in their institute newsletters.

The page on the POGO website with links to programmes that deal with long-term datasets will be further developed, with some introductory text to be provided by Alexandra Kraberg. This initiative could be further developed in collaboration with the Marine Network for Integrated Data Access (MaNIDA) initiative (AWI).

Venue and dates for POGO-14

John Field gave a presentation on Cape Town as a venue for the next POGO Meeting and showed various hotel/meeting venue options. Cape Town was agreed as the venue for POGO-14, which will be held on 22-24 January 2013.

SOEST Science Presentations

Hawaii Ocean Time series –Matt Church

Near monthly cruises to Station ALOHA have been conducted since October 1988. ALOHA is a deep, open ocean (~4800 m) site. Shipboard and remote (moorings, gliders, floats, and satellites) measurements of ocean biogeochemistry, physics, and plankton ecology are made. These are 4-day cruises, with intensive sampling to 1000 m. The value of HOT observations continues to increase with time. HOT provides one of the few records of biogeochemical and physical variability in the open ocean waters of the Pacific across multiple time scales: episodic, seasonal, interannual, and multidecadal. Knowledge gained from HOT furthers our understanding of global-scale ocean change. For example, HOT observations indicate that both chlorophyll and primary production are increasing and prominent increases are occurring below the depth of satellite detection. Shipboard time series programmes remain vital components of ocean observing strategies.

WHOI-Hawaii Ocean Time Series station –Roger Lukas

WHOTS is an element of NOAA's Ocean Reference Stations and part of the OceanSITES and JCOMMOPS international network. Trends, such as ENSO and annual cycles are resolved by HOT, whereas short-term variations such as effects of eddies and storms are resolved by WHOTS. The station consists of a surface buoy providing data in real-time, and a mooring that provides delayed-mode data. WHOTS data is applied to research on air-sea fluxes, ocean models, ocean climatology including atmospheric forcing and carbon variables, eddies and ecosystem dynamics.

ALOHA cabled observatory –Bruce Howe

The ALOHA Cabled Observatory (ACO) is part of Station ALOHA. It was deployed in 2011. Present sensors include CTD, pressure, ADPs, video, hydrophones and thermistor array (autonomous). It will provide a wealth of diverse data. New ideas and projects will be enabled, addressing further diverse topics (proposals need to be submitted).

Monitoring marine debris with models and observations before and after the tsunami of March 11, 2011

Drifting buoys are used to study the trajectory of marine debris (15,000 trajectories collected since 1979). No drifters were in the tsunami area at the time of the Great Tohoku Earthquake. The SCUD (Surface Currents from Diagnostic model) was used to model tsunami debris dispersion. Reports of debris washed up on beaches and seen by a navy ship in the Pacific in September 2011 were used for model validation (debris was found where the model had predicted).

Action Items

Capacity Building

1. POGO to continue to support and reinforce its on-going capacity building activities: Action: Secretariat, BIOS and members.

2. POGO welcomes the plan for establishing an international training institute in India for operational oceanography, and POGO to support the activities of the institute: details to be established through discussion with Satheesh Shenoi. Action: Secretariat and Satheesh Shenoi.

3. POGO welcomes the plan in Brazil to provide enhanced opportunities for regional training in ocean observations, and POGO to support these developments: details to be established through discussion with Edmo Campos. Action: Secretariat, Gerry Plumley and Edmo Campos.

4. POGO members to help disseminate information on POGO capacity building activities broadly. Action: N&I Group and POGO members.

5. POGO to work with IOC (including IODE) and SCOR to explore opportunities for collaboration, strengthening of on-going efforts and initiation of new activities, including distance learning, summer schools website, data management literacy, IODE course at Centre of Excellence, Ocean Teacher Academy. Action: Secretariat, Wendy Watson-Wright, Peter Pissierssens, Ed Urban, all Members.

6. POGO Secretariat to begin establishing a database of former trainees. Action: Secretariat.

7. POGO members with international graduate-training opportunities to provide appropriate web links to be added to POGO website. Action: N&I Group to send information to Sophie Seeyave.

8. Explore the possibility of identifying AMT-like training opportunities during cruises of other institutes. Action: Secretariat to prepare a one-page synopsis of the programme and distribute to Members. Members to investigate possibilities.

9. Members to explore availability of a suitable teacher for providing a mathematics and statistics module of one-to-two weeks at the NF-POGO Centre of Excellence in Bermuda. Action: POGO Members.

10. Share information on teaching modules and related information available among POGO member institutions. Action: Gerry Plumley, Peter Pissierssens.

GEO

1. POGO to explore the possibility of organizing a Blue Planet Symposium prior to the GEO Plenary in Brazil 2012, in partnership with members of Oceans United. Action: Secretariat.

Observing Elements: OceanSITES, SOOS, GACS, IQOE and others

1. OceanSITES to engage in the formation of a working group to look into sharing of expertise and facilities; POGO members to explore possibility of donating Microcats to OceanSITES pool; develop deep-ocean component. Responsible: Bob Weller.

2. POGO to provide a US $ 5,000 contribution in 2012 (in addition to a similar contribution earmarked in 2011) towards the OceanSITES international coordinator. But OceanSITES is to find a sustainable solution for funding the coordinator position. Action: POGO Secretariat.

3. POGO to support the development of SOOS. Action: Secretariat and Members. Responsible: Mike Coffin.

4. POGO to support the development of GACS. Action: Secretariat and Members. Responsible: SAHFOS Director.

5. Support IQOE by providing reviewers for the draft Science Plan and a POGO representative to the IQOE panel. Action: AWI (offer from Karen Wiltshire) + Mike Coffin + others to be identified.

6. Write a letter from POGO to KORDI for their observing programmes. Action: Dongchull Jeon.

7. IMR (Norway) Southern Ocean cruise: those interested in collaboration and coordination to contact Einar Svendsen. Action: Einar Svendsen.

POGO

1. POGO Strategy: The POGO Strategy Working Group to develop further the POGO Strategy Document and revise the POGO Mission Statement, using the material prepared by Trevor Platt. Action: Peter Herzig, Trevor Platt, John Field, Mike Coffin, Bruce Mapstone, Tony Knap.

2. Stewardship of Time-Series Data: POGO to promote the collation, and improved accessibility to existing time-series data, building on on-going activities, notably at AWI and in OceanSITES, facilitated by a time-series data working group. Action: Alexandra Kraberg, Karen Wiltshire, and members of the WG (to be named), and POGO members to send names of suitable working group members to the Secretariat. Text to be revised (Karen and Alexandra).

3. Outreach: POGO to support the POGO exhibit and activities at the Yeosu Expo in Korea in 2012, and possibly at the proposed Blue Planet meeting in Brazil, in connection with the GEO Plenary.

4. POGO Members to consider seconding their personnel to the POGO Secretariat and/or IOC to enable broadening the activities of the Secretariat. Action: POGO member directors.

5. POGO to hold the POGO-14 Meeting in Cape Town, South Africa, hosted by MA-RE in Jan 2013. Action: Secretariat and Executive Committee.