POGO-14 Background Documents

1. Essential briefings

1.1. Report on Action Items

1.2. POGO activities –capacity building
1.2.1. POGO Capacity Building (fellowships, professorships, UCT bursary, Austral Summer Institute)
1.2.2. NF-POGO Centre of Excellence
1.2.3. NF-POGO Alumni Network for Oceans (NANO)
1.2.4. IODE Capacity building

1.3. POGO activities –science coordination and outreach
1.3.1. New GEO Ocean Task “Oceans and Society: the Blue Planet”
1.3.2. Expo 2012 –POGO display

1.4. International programmes and activities supported by POGO
1.4.1. OceanSITES
1.4.2. Southern Ocean Observing System (SOOS)
1.4.3. Global Alliance of CPR Surveys (GACS)
1.4.4. Atlantic Meridional Transect (AMT) Programme

1.5. South African Initiatives in Ocean Observing
1.5.1. OceanSAfrica
1.5.2. South African Environmental Observation Network
1.5.3. Ma-Re BASICS

1.6. Regional Ocean Observations
1.6.1. KIOST’s development strategy
1.6.2. KIOST ocean observations
1.6.3. Indonesian Through Flow monitoring
1.6.4. FIO’s deep ocean observation
1.6.5. Agulhas Current Synthesis, Chapman conference
Report on POGO-13 Action Items

Capacity Building

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

   *Report:* the Secretariat has continued to run the existing capacity building programmes (e.g. Visiting Fellowships, Visiting Professorships, etc) and Year 4 of the Centre of Excellence came to a successful conclusion in May 2012. A considerable amount of time has also been spent solving certain issues with BIOS management regarding continuation of the Centre of Excellence after Year 4, and following the departure of senior members of BIOS management who were deeply involved in running the CofE. In consultation with the Nippon Foundation, the POGO Executive decided to postpone Year 5 indefinitely (in May 2012), and following a face-to-face meeting with the NF in October 2012, the decision was made to open up the opportunity to all POGO members to host the Centre of Excellence in 2013. POGO has partnered with the EU project “GreenSeas” in running its AMT fellowship for on-board training, and has obtained funding from GreenSeas to contribute towards the cost of the AMT fellow selected for the 2012 cruise. The Secretariat has also made efforts to expand the highly successful Visiting Fellowship for Research Cruise training (currently limited to 1 fellow per year on the AMT cruise) to other cruise programmes, and has been discussing potential collaborations with other partners, in particular the Porcupine Abyssal Plain cruise which is run by NOC every spring/summer as part of a time-series measurement programme (itself part of EuroSITES/OceanSITES).

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

   *Report:* The Indian National Centre for Ocean Information Services (INCOIS) has received final approval to proceed with the setting up of an International Training Centre for Operational Oceanography on the INCOIS campus. State-of-the-art training as well as boarding facilities are being established in the INCOIS campus in a phased manner, with a target to initiate the first of the training programmes from mid-2013. Trevor Platt and Shubha Sathyendranath held discussions with Dr. Shenoi, Director of INCOIS, regarding possible involvement of POGO in the activities of the Centre when it becomes operational. It is anticipated that POGO will contribute actively to training at the Centre. Details are yet to be established.

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
Report: A proposal was submitted by Edmo Campos to the “Science without Borders” programme to obtain funding for Gerry Plumley to visit Brazil to discuss plans for a Centre of Excellence in Brazil. The proposal was not successful.

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

   Report: Sophie Seeyave prepared some new promotional materials on capacity building programmes, including a poster that was presented at the First European Conference on Ocean Literacy in Bruges (Oct 2012) and at the “Oceans and Society: Blue Planet” Symposium in Brazil (Nov 2012), and a new POGO flyer. Trevor Platt and Sophie Seeyave published an article on POGO (including a section on capacity building) in the “Marine Scientist” magazine of the Institute of Marine Engineering Science and Technology (IMarEST) in Feb 2012, and had interviews published in the Research Europe magazine “International Innovation Environment” (Dec 2012) and in the e-newsletter “World of Associations News” (Jan 2013).

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

   Report: collaboration with IODE was continued through the Capacity Building session at the “Oceans and Society: Blue Planet” Symposium in Brazil, November 2012. The session was convened by Ariel Troisi (IODE Co-Chair from Argentina). The data management course was once again held at the Centre of Excellence (year 4). In addition, several POGO scholars have been motivated by the module to pursue further training in data management and have attended IODE courses held in Ostende, Belgium. POGO continues to support the Summer Schools website, by adding new opportunities and introducing new users to it (both training providers and beneficiaries). Collaboration with SCOR has also continued, through the POGO-SCOR Visiting Fellowship programme, and the SCOR Capacity Building Workshop in Namibia (Nov 2012) attended by former POGO Visiting Professorship holders (hosts) Bronwen Currie and Anja Kreiner, and by the POGO Incoming Chair John Field.

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

   Report: The database has been created, with basic information on the trainees (name, training course attended, affiliation). It includes 141 trainees.

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.
Report: The request was sent and a few responses received.

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. Report: Sophie Seeyave prepared and circulated a document outlining the structure of the research cruise training programme. Sophie also contacted the EURO-BASIN project manager to explore the possibility of setting up a joint programme with EURO-BASIN (or one of the EURO-BASIN cruises), and was invited to attend the Porcupine Abyssal Plain (PAP) cruise session at the Annual EURO-BASIN meeting in May 2012 at PML. The interaction with cruise PI Richard Lampitt was very positive, and a POGO-PAP-GreenSeas fellowship was set up for 2013, with the call for applications issued in November 2012, and a closing date of 19 December 2012. The EU project GreenSeas has expressed an interest in partnering with POGO for the delivery of its Capacity Building component. The project has allocated 15K EUR for young scientists to join research cruises, and asked POGO for help in organizing this. As a result, GreenSeas is contributing towards the 2012 POGO-AMT fellowship costs, and towards the new 2013 POGO-PAP fellowship in 2013.

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. Report: Due to changes with the NF-POGO centre of Excellence, this Action Item is no longer relevant.

10. Share information on teaching modules and related information available among POGO member institutions. Action: Gerry Plumley, Peter Pissierssens. Report: An e-mail was sent to POGO members requesting input. A few responses were received, but these were mainly with links to educational/outreach materials (these have been added to the POGO website at http://ocean-partners.org/outreach.

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. Report: A Kick-Off Symposium was organized, with funding from the Canadian Space Agency, and with help from colleagues working for the Fisheries Applications of Remotely-sensed Ocean colour (FARO) project. This was held in Ilhabela, Sao Paulo, Brazil, on 19-21 November, immediately prior to the 9th GEO Plenary Session. The Symposium was very successful, attended by over 70 participants from over 20 countries. At the Symposium, it was decided that a White Paper would be produced in 2013, outlining the scope and purpose of the Blue Planet Task. A website and mailing list will also be set up, and the aim is to
hold another Symposium in late 2013 focussing more on the societal aspects of the Task.

**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  
   **Report:** OceanSITES has been working on two near-term objectives. First, it advocates the establishment of a core, backbone network with homogeneous, multidisciplinary instrumentation. Second, in response to an identified need (workshop in Paris in 2011), OceanSITES is moving to deploy deep (deeper than 2,000 m) temperature/salinity recorders at as many sites as possible. The support of POGO was sought on these two initiatives. For deep temperature, the effort has met with significant success. 50 sites were set as a target. 30 sites have been identified with initial deployments, and 23 new matching sensors have been identified to support long-term maintenance. Work to develop a new multidisciplinary core network of sites continues at a slower pace, including a dialog with the ocean acidification community. The basic idea is to find the incremental funding to bring a core set of existing sites up to a common standard of core multidisciplinary sensors. The team is working on developing the specifics of which sensors and what depths.  
   The idea for POGO to organize workshops to coordinate ocean observatories, proposed at the January 2011 POGO meeting in Seoul, is put forward for discussion at POGO 13. Many activities are moving along and the discussion will revisit the proposed POGO workshops in the context of planning how best to coordinate and achieve synergies with other efforts. Among the efforts underway are those of the JCOMM DBCP, work under MTS/IEEE and GEO towards oceans communities of practice, and efforts such as COOPEUS, which aims toward interoperability among geophysical observatories.

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.  
   **Report:** The $5,000 for 2011 and $5,000 for 2012 were transferred to OceanSITES. Work to sustain that funding is ongoing.

3. **POGO to support the development of SOOS.** **Action:** Secretariat and Members. **Responsible:** Mike Coffin  
   **Report:** The SSC held its inaugural meeting in Salt Lake City, Utah, in February. Mr Gunn stepped down as Co-Chair shortly afterwards, due to a change in employment; Dr Oscar Schofield (Rutgers University, USA) was selected as the new SSC Co-Chair. The SSC Terms of Reference, SOOS Governance, and SOOS
Communications and Endorsement Policies were developed and approved by the SSC in 2012. The Data Management Sub-Committee (DMSC) of the SSC was created and held its first meeting in July in Portland, Oregon, alongside the SCAR Open Science Meeting. The role of the DMSC, chaired by Ms Kim Finney (Australian Antarctic Division), is to develop the SOOS data portal and data products and to liaise with international and national data centres. Draft DMSD Terms of Reference, a work plan, and a Data Management Policy have been developed. It is anticipated a pilot version of the data portal will be online by the end of 2012.

The SOOS-led ‘Seeing Below the Ice Workshop’ was held 22-25 October in Hobart, Tasmania. The workshop, sponsored by CSIRO, Antarctica New Zealand, CliC, and POGO, attracted over 50 international scientists and provided the opportunity to discuss the current status of both Antarctic and Arctic observing systems, define problems, and recommend solutions to develop a sustained strategy for observations in the Southern Ocean sea ice zone. It is anticipated the draft strategy will be released in early 2013.

A SOOS Forum will be held at the AGU Fall Meeting in San Francisco, California, on December 7, as part of the AGU Town Hall series. SSC members will discuss current SOOS activities and receive ideas from the broader Southern Ocean community.

The Co-Chairs, Executive Officer, SSC members, and IMAS Executive Director have presented SOOS at over 30 international meetings, workshops and conferences in 2012 to announce and promote SOOS to the scientific community and relevant programs. See background document for further information.

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

**Report:** POGO has followed the progress of GACS over the last year, and helped GACS in several ways, such as by funding a young scientist from Argentina to attend the MBA-SAHFOS phytoplankton identification workshop in July 2012, by publishing articles on GACS in its newsletter, and by including the CPR survey in the new GEO Task “Oceans and Society: Blue Planet”. POGO was invited to send a representative as an observer to the first meeting of the board of Governance, and this was attended by Sophie Seeyave. It was a good opportunity to learn about the progress made by the Alliance in its first year, and to provide advice and support where possible. The meeting discussed progress and set future directions for GACS. The meeting was attended by the available members of the BoG, as well as members of the two working groups on Database, and Standards & Methodology, plus observer/representatives from IOC, POGO, SCAR and a developing CPR survey. In order to address one of the GACS objectives “to facilitate new CPR surveys and develop capacity building procedures” they will be producing a “Start-up Kit” that will provide the basic information required to for those wanting to develop a new survey. In association, training workshops are being scheduled over the next year aimed at both novices wanting to acquire the correct skill and experienced personnel seeking to maintain their standards. This
is consistent with the objectives of POGO, and it is possible that POGO will become involved in this aspect of the programme.

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
   Report: Mike Coffin agreed to serve as a reviewer, and Karen sent several suggestions for potential reviewers from AWI. Unfortunately, there was a delay in finalizing the Science Plan, therefore it has not yet gone out for review. Jesse Ausubel was interviewed on a Boston news radio station on the subject of ocean noise and the IQOE (http://www.wbur.org/2012/12/20/ocean-noise).

6. Write a letter from POGO to KORDI for their observing programmes. Action: Dongchull Jeon. Attempts have been made to clarify with KORDI/KIOST exactly what they require.

7. IMR (Norway) Southern Ocean cruise: those interested in collaboration and coordination to contact Einar Svendsen. Action: Einar Svendsen
   Report: The planning is moving forward with Dr. Olav Rune Godeoe in charge (olav.rune.godeoe@imr.no). The expedition with R/V G.O.Sars are planned for 2014/15 where the activity in the Southern Ocean will start in early January 2014 and probably run for about 3 months. Since Norway just have decided to build a new ice-going vessel, the idea of postponing the expedition until 2015/16 has been raised to be able to use this new vessel instead of G.O.Sars. Plans for corporate field work with British Antarctic Survey in 2014/15 have already been established, including cooperation with the Norwegian Polar Institute. The main scientific issues are:
   a. Understand the dynamics of a krill-dominated ecosystem;
   b. Understand and quantify interactions between krill and land-based predators;
   c. Understand the krill dynamics in time and space, including the importance of a bottom based component;
   d. Study the physics-biology interactions using combined methodology including remote sensing, oceanography, acoustics and biological sampling.
   Other countries have shown interest and will be included. These are China (already in), South Africa, USA, Australia and New Zealand (a bit vague). Other elements will be considered, such as scientific programs from SOOS, SCAR etc.

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.
Report: The document was circulated to the members of the group. It was decided that it was more or less ready to be circulated, although it would be better to have a separate version for the public (website).

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) Report: the text for the website was revised and uploaded, along with the list of time-series stations. In addition, a document outlining the issues to be tackled has been sent to prospective members of the Working Group and it is anticipated that a side meeting of this group will take place during POGO-14.

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. Action: Secretariat Report: The POGO exhibit in Yeosu was a success, with over 1 million visitors during the 3-month Expo period (May-August 2012). A full report (including photos and a link to a video of the exhibit) can be viewed on the POGO website: [http://ocean-partners.org/activities2/expo-2012](http://ocean-partners.org/activities2/expo-2012).

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. Report: No personnel were seconded to the POGO Secretariat.

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 Report: POGO-14 is being hosted by MARE and other members of the consortium in Cape Town, from 21 to 24 January 2012.
POGO Capacity Building

POGO is universally admired for its suite of capacity-building programmes which provide advanced training in ocean observations, especially for personnel from developing countries and economies in transition, through a series of fellowship schemes and a Centre of Excellence. It comprises:

- The Nippon Foundation-POGO Centre of Excellence in Ocean Observations (Bermuda Institute of Ocean Sciences) – see separate document.
- The POGO-SCOR Fellowship Programme, annually, under which scientists from developing countries can spend up to three months training in a major oceanographic institution. POGO awards about a dozen of these each year. The programme is over-subscribed by a factor of up to eight. To date, more than 130 young scientists have been trained under this scheme - see below and full reports in Ancillary Documents.
- The POGO Visiting Professor Programme under which one senior scientist, annually, visits a developing country to conduct training in ocean observations - see below and full reports in Ancillary Documents.
- The POGO-AMT Fellowship Programme, under which one scientist annually can participate in a major oceanographic cruise (the AMT cruise), and spend time at a participating major oceanographic institute before and after the cruise to experience cruise preparation and data analysis. In 2011, this programme was over-subscribed by a factor of fifty – see below.
- The POGO-UCT Bursary Programme under which one African graduate student, annually, is supported to study at the University of Cape Town, South Africa – see separate document.
- Travel support for participants from developing countries attending Austral Summer Institute courses at the University of Concepcion, Chile – see separate document.

All in all, this suite of training programmes is making a very significant contribution to reducing the deficit in trained observers of the ocean in developing countries. Under POGO capacity-building schemes, over 300 young scientists from about 50 countries have received advanced training. The massive over-subscription for POGO training schemes provides ample proof that the effort is responding to a genuine need. Feedback from both host supervisors and the trainees themselves is highly positive.

POGO-SCOR Visiting Fellowships 2012
Out of 75 applications received, twelve POGO-SCOR Visiting Fellowships were awarded for 2012, although one was cancelled due to the excessive cost of the accommodation proposed at the host institute. The successful applicants were selected on the basis of the quality of their application, relevance of the proposed training to POGO and SCOR, and demonstration that it will lead to sustained capacity building at the host institute. The selection committee also had to strive to achieve regional balance in the final selection. The awardees were from Russia, Poland, Cape Verde, South Africa, Kenya, Bangladesh, China, Chile and Mexico. The host institutions included Belgium, Germany, Denmark, Norway, UK, France, Italy, Australia and USA.

POGO-AMT Fellowship 2012
This year’s POGO-AMT fellow was Ms Priscila Lange, from the Federal University of Rio Grande, Brazil. She was working with Dr. Gavin Tilstone, from Plymouth Marine Laboratory, on the contribution of microphytoplankton to total primary production in the sub-tropical Atlantic Gyres. She arrived at PML in mid-September to receive training prior to the cruise, then embarked on RRS James Cook on 6th October with the rest of the AMT scientific party. The 6-week cruise started in Southampton (UK) and ended in Punta Arenas, at the southern tip of Chile. Ms Lange then returned to UK to spend a further 4 weeks at PML carrying out some post-cruise analyses.

POGO Visiting Professorships 2011 and 2012
The 2011 Visiting Professorship was awarded to Prof. Walker Smith (Virginia Institute of Marine Science, USA) who visited Lam Ngoc Nguyen at the Institute of Oceanography in Nha Trang, Vietnam, for 4 weeks in March 2012. Training was on the use of fluorescence in oceanographic studies of coastal waters of Vietnam.

The 2012 Visiting Professorship took place shortly afterwards, in April 2012. Prof. Iossif Lozovatsky (University of Notre Dame, USA) visited Dr. Kanapathipillai Arulananthan (National Aquatic Resources Research and Development Agency [NARA], Sri Lanka), to conduct a training course on “Coastal Dynamics: Observation and analysis of currents, internal waves and turbulence on shelves”.
Map showing the countries of origin of all POGO trainees (shaded green).
NF-POGO Centre of Excellence in Observational Oceanography

Introduction
From 2008 to 2012, the Bermuda Institute of Ocean Sciences (BIOS) was host to the Nippon Foundation-POGO Centre of Excellence (CoE) in Observational Oceanography. The most recent programme ran at BIOS from 1st August 2011 to 31st May 2012 with the Centre offering a 10-month programme of study to 10 students from around the world each year. The aims of the training provided at BIOS were to promote excellence in integrated, multidisciplinary oceanography on a global scale.

The (CoE) is intended to benefit the oceanographic community in regions or countries where ocean science is less advanced, and to improve the networking between scientists working in well-established and developing institutes of oceanography, by providing opportunities for human resource development in a sustained manner. A secondary goal is to facilitate networking among the trainees and professors of the Visiting Professorship.

In October 2012, it was decided there will be the opportunity for an alternative institute to host the CoE and a call for applications from prospective hosts was announced in December.

Timeline
The 4th Centre of Excellence programme ran from 1 August 2011 to 31 May 2012. In addition to the training in Bermuda, each year the Centre organises regional training at a (movable) site outside Bermuda. This regional training lasts from two to four weeks, and builds on the presence at the chosen site of scholars who have already taken the Bermuda training, thus increasing the impact of the investment in the Centre. In 2012, the regional training course was held in Hyderabad, India.

A provisional proposal for a new “phase” of the Centre of Excellence (2012-2013) has been submitted to the Nippon Foundation and an announcement has been made to invite POGO members to apply to host the Centre of Excellence. These are now being accepted. The evaluation of proposals and the selection of the host institute will be made in the Spring of 2013, followed by the preparatory stage for the Host Institute and the Announcement of Activities of the Centre of Excellence.

Long-term outputs
The opportunity for scientists and graduate students to interact closely with leading experts in their field can be extremely inspiring. The Centre of Excellence allows many trainees to be exposed to this opportunity at the same time. The legacy of a successful CoE is long-term; an entire group of scientists are trained from various parts of the world, and they in turn will return to their home countries, and will be in a position to train newcomers to their institutes.

The CoE has a direct and immediate impact on scientific capabilities in oceanography in developing countries. It brings the experience and status of major institutions to students and trainees who otherwise would not have that exposure. It enhances the effectiveness of POGO in advancing the goal of an integrated global ocean-observing network for the benefit of society worldwide.

Furthermore, collaborations between institutions are likely to be stimulated through the Centre of Excellence. Such collaborations enable institutions from developing countries to establish joint programs and secure funding that might not otherwise be available.

Relationship between POGO and Nippon Foundation
Nippon Foundation is POGO's biggest sponsor, by far. Their annual support at present exceeds $600K per annum. POGO has cultivated with care its working relation with the programme officers at NF, and it may be said that these interactions are on the highest level of mutual trust. The principal joint initiatives between POGO and NF are the Centre of Excellence in Ocean Observations at BIOS (Bermuda) and the network (NANO) of former scholars trained under NF-POGO programmes (including the former NF-POGO Visiting Professor scheme).

POGO and the Nippon Foundation expect the former scholars of the Centre and other NF-POGO training schemes to remain engaged by participation in the NF-POGO Alumni Network for Oceans (NANO). The pool of former scholars has now reached a significant membership (151 official members). The network is under active development and now has published 3 issues of its newsletter (see Briefing Document on NANO and Ancillary Documents) and has run four regional research projects in 2012.
Summary of funding received from Nippon Foundation Grants:

$381,000 for Year 1 of NF-POGO Visiting Professorship Programme;
$241,000 for Year 2 of NF-POGO Visiting Professorship Programme;
$281,000 for Year 3 of the NF-POGO Visiting Professorship Programme.

$495,000 for Year 1 of the NF-POGO Centre of Excellence Programme (2008).
$495,000 for Year 2 of the NF-POGO Centre of Excellence Programme (2009).
$522,800 for Year 3 of the NF-POGO Centre of Excellence Programme (2010).
$99,200 for NF-POGO Alumni Network preparatory meeting (2010).
$522,800 for Year 4 of the NF-POGO Centre of Excellence Programme (2011).
$27,744 for NANO Meeting (2011)
$522,800 for Year 5 of the NF-POGO Centre of Excellence Programme (2012) - unspent.
$125,000 for NANO activities (2012)
NF-POGO Alumni Network for Oceans (NANO)

Background

The Nippon Foundation, through its partnership with POGO, has provided professional training in observational oceanography to 232 young scientists from around the world, the majority from developing countries, between 2005 and 2012. Networking was always a priority for the joint NF-POGO initiatives and both the NF and POGO wanted the benefits of the training to extend beyond the formal training period.

The idea of forming a network of former scholars, or “alumni” thus emerged and matured into a meeting to formulate plans for the network. This meeting was held in London in October 2010, involving selected scholars and instructors, and Nippon Foundation and POGO representatives. The vision for the Network established during this meeting was "Integrated Observations of a Changing Ocean" and the unifying thread that would hold the network together was a common interest in, and commitment to, ocean science, and the common will to communicate scientific results to the general public. The network was named NF-POGO Alumni Network for Oceans, or NANO.

Objectives

The main objectives of NANO are to:
- Establish regular communication between the Nippon Foundation, POGO and their former scholars,
- Provide them with further support, and
- Organize new activities that will involve professional collaboration between the Alumni.

Summary of progress in 2012

- Membership grew to 151 official members from 37 countries, mainly through the addition of alumni from the Regional Centre of Excellence in Hyderabad (Feb 2012).
- Two newsletters published (May and October 2012) and a number of hard copies distributed (see Ancillary documents).
- Four regional projects set up in April 2012, in Latin America, Africa, SE Asia and Indian Sub-Continent. These are funded by the Nippon Foundation to a total level of 125K USD. Themes include societal benefit angles such as coastal pollution, hazards, climate change, and management of coastal resources.
- Project coordination meeting was held in Brazil in November 2012 to discuss progress in the 2012 projects and to prepare proposals for 2013. These have been submitted to the Nippon Foundation, with an associated budget of 195K USD.
- NANO celebrated its first official anniversary in June 2012, and to mark the occasion a competition was held involving a questionnaire and request for feedback. The prizes were NANO USB sticks and text books.
- NANO calendars were produced in December 2012 for promotional and outreach purposes.
One of the major objectives of the IODE Programme (http://www.iode.org) is to assist IOC Member States to acquire the necessary capacity to manage marine data and information, and thus become full partners of the IODE network. OceanTeacher is IODE’s capacity development tool.

The OceanTeacher e-learning platform (http://www.oceanteacher.org) has two main components: the OceanTeacher Digital Library (a collection of knowledge and resources) and the OceanTeacher OpenCourseWare (a collection of course outlines and courseware). In addition the system includes video recordings of courses that are included in the OpenCourseWare pages (http://vimeo.com/iode). OceanTeacher has become a comprehensive web-based training system structured in a way to support classroom training (face-to-face), blended training (combining classroom and distance learning), online tutoring and online self-learning. When the Digital Library and the OpenCourseWare are used together for a training event this is called an OceanTeacher Classroom.

The objective of the OceanTeacher Training Academy is to establish a facility that provides an annual teaching programme of courses related to oceanographic data and information management and related disciplines that will contribute to the sustainable management of oceans and coastal areas. The OceanTeacher Training Academy thus underpins all Ocean Data and Information Networks (ODINs) developed under IOC/IODE activities. The development of the OceanTeacher Academy started in 2005 with the establishment of the IOC Project Office for IODE in Oostende, Belgium.

Cooperation between POGO and IODE was established within the framework of the “Nippon Foundation-POGO Centre of Excellence (CofE) in Observational Oceanography” organized at the Bermuda Institute for Ocean Sciences in Bermuda, to ensure that basic data management is included in academic training programmes in oceanography. The OceanTeacher e-learning platform is used for the data management module of CofE.

From a training system that focused entirely on oceanographic data and information management, OceanTeacher has gradually developed into a multi-purpose training system focusing on several IOC (e.g. HAB, ICAM, MSP) as well as non-IOC (e.g. EUMETSAT) programmes. Ultimately OceanTeacher should be able to provide a multi-disciplinary training platform.

In seven years the OceanTeacher Academy has organized over 50 courses for over 1200 students from 120 countries and taught by 20 lecturers. One of the main conclusions is that we cannot provide training to all those who require it from just one location. In addition the continuous increase in airfares makes the cost per student quite high. It was therefore decided to, as from 2012, further develop the distance learning capacities of OceanTeacher, but of more importance, to move towards a distributed architecture of regional training facilities. Such a distributed network of training facilities will allow a better focus on local and regional needs, as well addressing the language issue, which has been a recurrent comment from students. A successful experiment took place in March 2012, when 2 groups of students attended the same course: one group in Oostende and
another in Hyderabad, India (INCOIS). The OceanTeacher Pilot Global-Classroom Project has been submitted for funding, and we hope it will be implemented in 2013, in order to fine-tune the methodology and technology. Discussions have already started with several Member States, namely Kenya, Argentina and India in order to establish training centres. We would like to invite POGO members to consider participating in this initiative. IODE22 meeting in March 2013 will propose a closer collaboration with research institutes by offering them to become a data node. This will also allow the wider share of expertise in Data and Information Management. The real innovation of the new OceanTeacher Global Classroom model is that we will blend traditional classroom-based training with distance learning. Although the goal is to promote a more local/regional focus we should not forget the importance of bringing together students from different regions to foster south-south and north-south cooperation. By using advanced video conferencing technology we will be able to broadcast courses taught live in one region, to one or more other regional centres or invite individual lecturers to teach a class from their own university or even home. The system will of course also allow interaction between lecturer and students and training assistants in the other regional centres will be able to provide assistance with practical exercises. Additional benefits include a more efficient time-use for lecturers, less tiring travel for students and lecturers and of course, following from this, reduced carbon emissions. Using the same baseline curriculum in OceanTeacher we will be able to reach more students in more countries. In addition, through cooperation with local Universities accredited certificates will be issued. POGO members will be invited to discuss ways and means to collaborate with the OceanTeacher Academy as well as to identify ways on how OceanTeacher can assist, as appropriate, their institution.
A kick-off symposium for the new GEO marine Task SB-01 "Oceans and Society: the Blue Planet" was held in Ilhabela, São Paulo State, Brazil, from November 19 to 21, 2012. The symposium was co-sponsored by the Canadian Space Agency (CSA), the Group on Earth Observations (GEO), the National Institute for Space Research (INPE) and POGO. It took place just prior to the GEO-IX Plenary, held in Foz do Iguaçu, Brazil (November 22 and 23, 2012).

The Symposium highlighted each of the Task components through special sessions on their programme elements. A broad range of themes were addressed during the symposium. The objectives of the Blue Planet symposium were to:

- Learn about the various relevant on-going activities;
- Coordinate better the ocean-related activities within GEO;
- Speak with a collective voice to GEO member nations and participating organisations;
- Raise awareness of the societal benefits of ocean observations to the broader community, targeting in particular policy makers and funding agencies;
- Seek new avenues for enhancing implementation of ocean observation systems; and
- Promote capacity building globally, especially in developing countries.

The symposium brought together a total of 68 participants from 24 countries, comprising leaders and representatives of various international organisations and networks (including the new GEO Director, Dr Barbara Ryan), research scientists and postdoctoral and graduate students. The symposium offered the opportunity for participants to become familiar with the full scope of the Task, and helped to develop synergies and to plan future activities. The meeting turned out to be a landmark event in the development of marine work within GEO.

Action Items from the meeting included the drafting of a “Mission statement and Vision” document, which will outline the Task strategy and will serve as the basis for a White Paper, which itself will include concrete plans for Blue Planet in the following areas:

- Future governance;
- Data/products sharing, access and exchange policy;
- Geo-spatial/digital architecture and information management;
- Education, outreach and new digital forms of communication;
- Capacity building (training scientists, social scientists, etc.);
- Production of material highlighting societal applications, benefits and end-user engagement;
- Detailed overview of all on-going works and projects linked with Blue Planet.

The idea is to have a White Paper that will provide the roadmap for the Task implementation. The meeting also resolved to set up a website and mailing list and to hold another Symposium in late 2013.
POGO Outreach at Expo 2012 Yeosu Korea

After almost two years of preparations, the POGO exhibit at Expo 2012 Yeosu Korea was opened to the public on 12 May 2012, along with the many other exhibits featured in the 23 pavilions that occupy the imposing 25-hectare Expo site.

The theme of this year’s International Expo is “the Living Ocean and Coast”, sparked POGO’s interest back in January 2010 when the Expo was first brought up by scientists of the then Korea Ocean Research and Development Institute, KORDI (now Korea Institute of Ocean Science and Technology, KIOST), during the 12th POGO Annual Meeting. A proposal was subsequently submitted and was selected by the Oceans and Coasts Best Practices Area (OCBPA) Organising Committee. POGO was allocated 150 K USD in kind to prepare its exhibit in close collaboration with the design company appointed by the OCBPA (SigongTech).

The exhibit concept that we proposed was articulated around three main themes:

(1) The history of ocean observations
(2) The institutes carrying out these observations
(3) Experiencing the ocean – an interactive display.

With the help of the POGO News and Information Group, who provided a lot of the material used for the exhibit, the POGO Secretariat worked with SigongTech to produce an exhibit that would be educational and interesting for the general public visiting the Expo. The first theme was illustrated by a time-line depicting some major events in the history of ocean observations, as well as the dates the POGO member institutions were established. Visitors could use their iPhones and the QR code system to access more detailed information about these events. The second theme consisted of a 12-minute video presenting the 37 POGO member institutions, which was created especially for the Expo. The third, and probably the most popular theme, consisted of five interactive kiosks where the visitors could experience different aspects of the ocean. They could look through a microscope at phytoplankton cells, listen to the natural and anthropogenic sounds that can be heard in the ocean, experience the pressure and light fields at different depths, and the temperature of different water masses.

The Theme Pavilion (that includes the OCBPA) has proved to be very popular, with long queues of people waiting to enter. The number of Expo visitors has been steadily increasing since the beginning of the school holidays at the end of June, reaching 78,000 visitors in a single day. So far, nearly 1 million people have visited the OCBPA and POGO exhibit.

We also had the opportunity to organise a special communication event, which took place from 22 to 24 June. This consisted of a mixture of public lectures and video and film screenings. The lectures were given in Korean by Drs Seung-Hyun Son (NOAA) and Yu-Hwan Ahn (KIOST), and by Drs Yoshihisa Shirayama (JAMSTEC), Shubha Sathyendranath, Trevor Platt and Sophie Seeyave in English. The topics covered satellite oceanography and ocean colour, the Great Tohoku Earthquake of March 2011, biological oceanography and sound in the ocean. All lectures were well received by adults and children alike, and it was extremely satisfying to see the look of concentration on all the childrens’ faces, and their enthusiasm when it came to asking questions.
The focus of OceanSITES is on sustained, Eulerian time series with high temporal resolution. Long-term goals remain to secure sustained support, upgrade existing stations to multidisciplinary sampling, install new stations in key unsampled regions, and make the data rapidly available to the scientific community and the public. OceanSITES is working to develop metrics for the completion and effectiveness of the network, working with diverse groups that use the data, such as the operational weather forecasting and modeling centers and the IPCC teams. The project has gone beyond point where “more is better”, and is now looking at identifying and closing the gaps (disciplinary, geographic, vertical coverage) in the global array. Thanks to POGO, the funding of the project office staff support at JCOMM was covered in 2012; work continues to sustain that funding. The next combined OceanSITES Scientific Steering Committee and Data Management meeting is being planned for Seoul in May 2013.

OceanSITES builds on existing data sets/infrastructure (works to preserve the investment) but also seeks to motivate and advocate for the start new time series in key regions to collect long-term records for the first time (establishing oceanic versions of the Keeling CO2 time series). OceanSITES has decided to tighten requirements to be an OceanSITE and focus on the unique contributions of such sites: providing high temporal resolution (diurnal cycle) to directly observe processes/interactions and events; providing the long climate timescale with high accuracy to recognize slow global change; and observing on global scales, i.e. open ocean, not coastal sites. Sites, which do not yet satisfy all requirements, are expected to work towards them, and OceanSITES should contribute to requirements being defined by other groups, e.g. the biodiversity framework. OceanSITES is finalizing a document on “How to Become an OceanSITE.” OceanSITES will also seek to facilitate addition of new sensors and defining best practices that can be shared across existing and potential new site operators.

To demonstrate the value of OceanSITES, each site will develop key products, with attention to potentially key or iconic results (e.g. the Keeling time series of CO2 increase). The Scientific Steering Team will then look for the next level of products those that draw from more than one site and demonstrate the additional impact of the array. The OceanSITES website is being developed further, and the new website will provide mission statements, explain the value of and requirements for sustained ocean time series, show products and iconic results, and give network and data system status/metrics.

OceanSITES has been working on two near-term objectives. First, it advocates the establishment of a core, backbone network with homogeneous, multidisciplinary instrumentation. Second, in response to an identified need (workshop in Paris in 2011), OceanSITES is moving to deploy deep (deeper than 2,000 m) temperature/salinity recorders at as many sites as possible. The support of POGO was sought on these two initiatives. For deep temperature, the effort has met with significant success. 50 sites were set as a target. 30 sites have been identified with initial deployments, and 23 new matching sensors have been identified to support long-term maintenance. Work to develop a new multidisciplinary core network of sites continues at a slower pace, including a dialog with the ocean acidification community. The basic idea is to find the incremental funding to bring a core set of existing sites up to a common standard of core multidisciplinary sensors. The team is working on developing the specifics of which sensors and what depths.

The idea for POGO to organize workshops to coordinate ocean observatories, proposed at the January 2011 POGO meeting in Seoul, is put forward for discussion at POGO 13. Many activities are moving along and the discussion will revisit the proposed POGO workshops in the context of planning how best to coordinate and achieve synergies with other efforts. Among the efforts underway are those of the JCOMM DBCP, work under MTS/IEEE and GEO towards oceans communities of practice, and efforts such as COOPEUS, which aims toward interoperability among geophysical observatories.
SOOS Activities and Milestones in 2012

1. Organisation, Governance & Leadership

The **SOOS Scientific Steering Committee (SSC)** was created from a pool of international nominees in early 2012. Nominations were assessed and recommended by the SOOS Co-Chairs (Dr Michael Meredith, BAS; Mr John Gunn, Australian Institute of Marine Science) and the Executive Officer (Dr Louise Newman), and approved by SCAR and SCOR.

2. SOOS Meetings & Workshops

The **SSC** held its inaugural meeting in Salt Lake City, Utah, in February. Mr Gunn stepped down as Co-Chair shortly afterwards, due to a change in employment; Dr Oscar Schofield (Rutgers University, USA) was selected as the new SSC Co-Chair. The SSC Terms of Reference, SOOS Governance, and SOOS Communications and Endorsement Policies were developed and approved by the SSC in 2012.

The **Data Management Sub-Committee** (DMSC) of the SSC was created and held its first meeting in July in Portland, Oregon, alongside the SCAR Open Science Meeting. The role of the DMSC is to develop the SOOS data portal and data products and to liaise with international and national data centres. Draft DMSD Terms of Reference, a work plan, and a Data Management Policy have been developed. It is anticipated a pilot version of the data portal will be online by the end of 2012.

The SOOS-led ‘Seeing Below the Ice Workshop’ was held 22-25 October in Hobart, Tasmania. The workshop, sponsored by CSIRO, Antarctica New Zealand, CliC, and POGO, attracted over 50 international scientists and provided the opportunity to discuss the current status of both Antarctic and Arctic observing systems, define problems, and recommend solutions to develop a sustained strategy for observations in the Southern Ocean sea ice zone. It is anticipated the draft strategy will be released in early 2013.

3. Proposals

SOOS proposals have been submitted for a **SCOR Working Group**, and an **EU 7th Framework Programme for Research (FP7)**. SOOS has also contributed to a large US proposal for a Southern Ocean Biogeochemical Observations and Modelling (SOBOM) centre, to be based at Princeton University, New Jersey. Numerous other smaller projects have received endorsement from SOOS at their proposal stages.

4. Publications

The SOOS **Initial Science and Implementation Strategy** was published in early 2012 (the Strategy can be downloaded at [www.soos.aq](http://www.soos.aq)). SOOS has published or submitted seven articles in 2012 (Attachment 2) to announce and promote SOOS to the scientific community and relevant programs.

5. Communication & Outreach

The SOOS corporate identity has been developed, including the SOOS ‘wire ball’ logo, communication products developed and distributed, and a website ([www.soos.aq](http://www.soos.aq)) and social media site ([www.facebook.com/SOOSnews](http://www.facebook.com/SOOSnews)) launched. Individuals can subscribe to become a member of SOOS on the website. The members’ database is used as a communication tool to reach the SOOS community (members can also search the database based on name, expertise, affiliation, etc.). A newsletter, **SOOS Update**, has been developed and is distributed regularly to all SOOS subscribers, sponsors and endorsers.
Global Alliance of CPR Surveys (GACS) Update –October 2012

The general goal of GACS is to understand changes in plankton biodiversity at ocean basin scales through a global alliance of CPR surveys. GACS was established in September 2012 during a workshop hosted by the Sir Alister Hardy Foundation for Ocean Science (SAHFOS).

The annual meeting of the GACS Board of Governance (BoG) was held at UNESCO Paris on 19 and 20 September, hosted by IOC/GOOS. The meeting discussed progress and set future directions for GACS. The meeting was attended by the available members of the BoG, as well as members of the two working groups on Database, and Standards & Methodology, plus observers/representatives from IOC, POGO, SCAR and a developing CPR survey. One day meetings were conducted for both working groups prior to the BoG.

Each group developed various procedures and recommendations for consideration and ratification by the BoG. Primarily, these were to ensure the successful development of the global CPR database, and continuation of a standardised set of methodologies for CPR based research. Procedures were agreed for the incorporation of data, access of data and display of data products. Metadata descriptions of the global CPR data will be made publicly available through the GACS website at www.globalcpr.org.

In order to address one of our objectives “facilitate new CPR surveys and develop capacity building procedures” we will be producing a “Start-up Kit” that will provide the basic information required for those wanting to develop a new survey. The kit will include information on how the CPR works, designing and establishing CPR routes, at sea methodology, laboratory procedures, taxonomic tools, data storage and analysis.

In association, training workshops are being scheduled over the next year aimed at both novices wanting to acquire the correct skills and experienced personnel seeking to maintain their standards. A number of training sessions have already been conducted during 2012. A workshop was recently conducted at the Australian Antarctic Division to train French, Brazilian and Korean scientists who are establishing CPR surveys in the southern Indian Ocean, Drake Passage and Pacific sector of the Antarctic region. Training sessions in 2013 are expected to focus mainly on plankton identification.

GACS is very grateful for the support offered by the various institutes leading the region surveys as well as from supporting agencies such as POGO, IOC and SCAR.
Continuation of The Atlantic Meridional Transect (AMT) through NERC National Capability funding

Steve de Mora¹, Andy Rees¹, Mike Zubkov²

¹Plymouth Marine Laboratory, Prospect Place, The Hoe, Plymouth, PL1 3DH, UK.
²National Oceanography Centre, University of Southampton Waterfront Campus, European Way, Southampton, SO14 3ZH, UK

The Atlantic Meridional Transect (AMT) is a multidisciplinary programme which undertakes biological, chemical and physical oceanographic research during an annual voyage between the UK and destinations in the South Atlantic - previously the Falkland Islands, South Africa and Chile, a distance of up to 13,500km. This ocean transect crosses a range of ecosystems from sub-polar to tropical and from euphotic shelf seas and upwelling systems to oligotrophic mid-ocean gyres. AMT has provided an in-situ observation system for the Atlantic Ocean between ~50°N and ~50°S since 1995, and to-date this has involved 223 scientists from 18 different countries. Data that has been gathered during this project informs on trends and variability in biodiversity and function of the Atlantic ecosystem during this period of rapid change to our climate and biosphere. AMT is unique in its ability to acquire data on long NS transects of the Atlantic and to make observations on basin scales. It represents the longest running programme based in the Atlantic Ocean that makes repeat measurements of core parameters and provides a platform for excellent multi-disciplinary oceanographic research. The main deliverable of AMT is an exceptional time series (1995-present) of spatially extensive and internally consistent observations on the structure and biogeochemical properties of planktonic ecosystems in the Atlantic Ocean that are required to validate models addressing questions related to the global carbon cycle.

A full list of AMT publications, which currently includes 220 published articles including two special issues of Deep-Sea Research II and one of Progress in Oceanography, can be found at: http://www.amt-uk.org/publications.aspx. This unique spatially extensive decadal dataset continues to be deposited and made available to the wider community through the British Oceanographic Data Centre (http://www.bodc.ac.uk/projects/uk/amt/). The programme is hosted by Plymouth Marine Laboratory (http://www.pml.ac.uk/) in collaboration with the National Oceanography Centre, Southampton (http://noc.ac.uk/) and provides an exceptional opportunity for nationally and internationally driven collaborative endeavours. An integral part of the AMT, which has resulted in more than 60 completed PhD theses, is to provide a training arena for the next generation of oceanographers. This aim has been enhanced recently through the development of the POGO-AMT fellowship programme (http://ocean-partners.org/) which supports the participation of students or early career professionals from developing nations. Participants in this fellowship programme benefit from working alongside experienced researchers in the development of research skills, the formation of collaborative links and capacity building for their home institutes and countries.
**OceanSAfrica: Developing Operational Oceanography Capabilities for Africa**

OceanSAfrica is a multi-institutional initiative that will develop operational oceanography capabilities in South Africa and Africa. Conceived at the first African Operational Oceanography Meeting held in Cape Town in July 2009 under the auspices of the African Centre for Climate and Earth Systems Science (ACCESS), the first phase of the initiative has made significant national advances. It will now enter a second phase designed to build and showcase substantial national, regional and African capabilities as explicit components of international marine operational programmes. It has several primary aims, designed to strongly leverage existing national and regional achievements into African capabilities:

1. Provide a strategically-directed *platform* amongst African marine research institutes for the identification, development and showcasing of new capabilities in the fields of ocean modelling, earth observation, in situ observation and dissemination technologies.

2. Develop *vehicles to transfer* these capabilities to operationally mandated marine agencies.

3. Develop new national and regional *human capacity and infrastructure* in the marine science, technological and technical domains.

4. Create mechanisms for *focused and sustainable development* of this expertise and infrastructure.

5. Facilitate the development of *new national structures* for operational oceanography and marine meteorology, concomitantly with the development of new government agency mandates in the domain.

6. Scoping and implementation plans to form *regional and African partnerships* to transfer maturing domain-specific operational competencies from the research to the operationally mandated community.

7. Provide regional components for *integration into international* operational and scientific programmes and commitments, such as JCOMM, GMES and GMES-Africa, and appropriate GEO, GOOS and GODAE tasks.

OceanSAfrica is comprised of four pillars: (1) *In Situ* Observations, (2) Remote Sensing, (3) Modelling, and (4) Dissemination. Each pillar is led by an individual institution, but involves active commitment from other institutions, increasingly Africa-wide. A key focus area across all pillars is capacity building – the creation and sustained maintenance of a much-expanded science, engineering and technology (SET) expertise base in the marine domain.
### In Situ Observations
**Lead:** Department of Environmental Affairs, Branch Oceans & Coasts

Consolidating, expanding and adding value to existing autonomous and ship based observational facilities, particularly through improved communication links and near real-time data access.

Developing new scientific and technical capabilities to use currently available autonomous platforms and sensors, such as gliders, profiling floats and buoys.

Developing new low-cost, modular and distributable autonomous platforms and sensors such as miniature floats and semi-expendable bio-optical sensors, improving African *in situ* observational capabilities and the SET base.

### Remote Sensing
**Lead:** Council for Scientific and Industrial Research, NRE Earth Observation

Consolidating, expanding and adding value to existing national and regional facilities, such as FP7 DevCoCast/EAMNet and AMESD/MESA, to provide routine earth observation data and user training for marine and freshwater domains.

Maximising calibration/validation contributions and uptake readiness for forthcoming earth observation missions, strongly focusing on the Sentinel series for marine & aquatic physics & biogeochemistry.

Developing new algorithms and products for African shelf-sea, oceanic and freshwater users and contributing to sensor and algorithm validation programmes for ESA and NASA.

### Ocean Modelling & Assimilation
**Lead:** Department of Oceanography, University of Cape Town

Developing South African and regional expertise and capacity in regional ocean modelling and data assimilation to predict the ocean state. Assessing regional ocean current and wave forecasting models for critical southern African shelf sea regions using the ROMS, HYCOM and Deltares platforms.

First stage demonstration of data assimilation capabilities using HYCOM and the EnKF with the aim of generating long-term regional ocean hind- and forecasts with direct application to both operational forecasting and reanalyses, for a wide variety of users.

Building capacity and regional expertise in numerical ocean modelling and operational forecasting through postgraduate/short course training and provision of modelling tools and code modules.

### Dissemination
**Lead:** South African Environmental Observation Network (SAEON)

Integrate data and products into a powerful, user friendly, multi-media distributed dissemination system, delivering products of value to an extended user community. Products will include rapid environmental assessment of the marine and coastal environment, especially high risk extreme events and climate related change impacting on people, and support for the management of economically important offshore industries.

Specify and develop a set of guidelines, standards and reference implementations for a data management system capable of ensuring inter-operability for operational oceanography. Build and host a standardised meta-data repository where products, data sets, documentation and appropriate reports can be categorised and discovered.
About the South African Environmental Observation Network (SAEON), WWW.SAEON.ac.za

SAEON’s mandate is to detect, translate and predict environmental change in South Africa, in order to address environmental policy and management. This is achieved through state-of-the-art observation and monitoring sites and systems that: 1) drive and facilitate research on long-term change of South Africa’s terrestrial, coastal and marine ecosystems; 2) develop and maintain collections of accurate, consistent and reliable long-term environmental databases; 3) promote access to data for research and evidence-based decision making and 4) contribute to capacity building and education in environmental sciences.

SAEON researchers operate in six nodes:

- **The Ndlovu Node, Phalaborwa**
  Since becoming operational in 2004 it has established 18 long-term projects in the Savanna Biome. The focus is on vegetation change, firewood harvesting, impacts of elephants, river degradation and atmospheric carbon dioxide from fires.

- **The Elwandle Node, Grahamstown**
  Established in 2006, its role is to understand global climate change drivers in the coastal zone to ensure the protection of estuaries, shallow reef communities, rocky shores, beaches and dune ecosystems.

- **The Egagasini Node, Cape Town**
  Since 2007 researching global change in the offshore marine environment, through physical oceanography and studies of biodiversity and ocean-atmosphere linkages.

- **The Fynbos Node, Cape Town**
  Starting in 2008, it provides a research platform to understand how climate change and human activity are impacting on Fynbos ecosystems.

- **The Arid Lands Node, Kimberley**
  Set up in 2011 for long-term observation and data harvesting of the Karoo and Kalahari regions.

- **The Grasslands-Forests-Wetlands Node, Pietermaritzburg**
  Implemented in 2011 for long-term research and monitoring of grasslands, wetlands and forests.

Observation, information and education-outreach projects continue to grow across the six nodes, contributing to four of the National Research Foundation Strategic Performance Goals. SAEON’s distinctive competencies are in long-term environmental observation platforms and state-of-the-art geo-spatial data portals, which contribute to the success of the Department of Science and Technology’s Global Change and Space Science and Technology Grand Challenges. Ultimately SAEON’s outcomes are to be found in sustainable development, a Green Economy and a knowledge society.
Ma-Re BASICS
Marine research in the Benguela and Agulhas Systems for interdisciplinary climate change science

Marine Research Institute, University of Cape Town

Ma-Re BASICS is the focal research activity of UCT's Marine Research Institute. The initial aims of Ma-Re BASICS were to provide students and researchers with a common identity, a common goal and a supportive, stimulating and informative research environment so they could produce research results that would be unlikely without a multi-disciplinary structure. The project links individual (mainly postgraduate student) projects on marine social and ecological systems, typically funded mainly from other sources. Funds from BASICS are used as "glue money", supplementing other funds where necessary and providing cohesion among projects. This glue money is from the UCT Vice Chancellor's strategic initiative fund.

Ma-Re BASICS began in mid-2010 and is a four-year project. It is interdisciplinary, structured as a network of research across multiple disciplines, departments and faculties at UCT. There are four research work packages:

1) Ocean-atmosphere interactions
2) Physical-ecosystem forcing
3) Indicators to integrate across scales and support policy development and management
4) Adaptability of social-ecological systems under global change

Associated with each of these work packages are the research projects of postgraduate students. In 2012, 28 students received funding support from Ma-Re BASICS, but there are many non-funded students also associated with the project.

To meet its goals of producing knowledge that spans disciplines and typically is problem/solution-oriented, the BASICS project implements a variety of research synthesis activities. The first set of activities involved workshops within each of the work package themes, some of which contributed to subsequent research publications. A second set of activities aimed to stimulate and encourage communication, awareness and collaboration among the work packages. This was done through a series of ten small (4-6 person) discussion sessions involving postgraduate students and postdocs, facilitated by two staff members. During each session students provided short overviews of their current research projects, commonalities among projects were identified and problems and suggestions were openly discussed. This led to a third set of activities, where "themed lunches" are organised to bring together researchers in different disciplines to discuss a common theme. During 2013, the project aims to produce a series of interdisciplinary synthesis papers.
The Korea Ocean Research and Development Institute (KORDI) was restructured and renamed to the Korea Institute of Ocean Science and Technology (KIOST) on July 1, 2012 under the vision of becoming a global leading research institute in advanced ocean science and technology. KIOST will focus on providing solutions to pressing national maritime issues, while strengthening its research capacities, as well as the systematic framework for developing and sharing new marine technologies. KIOST has three main objectives: 1) To conduct systematic research and carry out large-scale projects to achieve sustainable management and use of the ocean and marine resources; 2) To educate and train students and prospecting young marine scientists, and 3) To build national capacity in ocean science and technology to secure global competitiveness and tackle global environmental issues.

KIOST will continuously expand its scope of research and infrastructure based on these objectives to nurture new marine industries and provide more precise real time forecasts. One of the distinctive changes between KORDI and KIOST is that KIOST will provide educational curricula to foster new ocean generations, while establishing an academy-research collaboration framework to provide flexible research environment. As a part of this effort, KIOST is planning to double its staff and budget by 2020. KIOST will be moving to the Busan Marine Cluster Area by 2015, which will be a new home to several key ocean-related institutions and create synergy effect to provide an opportunity to establish stronger infrastructure for KIOST. Also, KIOST signed a contract lately to build eco-friendly 5,000t-class research vessel, which will enable KIOST to expand its research capacities in the blue ocean.

Korea had a presidential election in December 2012, and Park Geun-hae was elected as the 18th President of the Republic of Korea, the first female president ever in Korea. President-elect Park announced publically that an ocean ministry will be created under her new Administration. Korea is expected to pursue the new ocean governance and integrate conventional maritime affairs with other related subjects. In other words, different governmental organizations should cooperate in sectors such as fisheries, climate forecasting, maritime industries and plants, marine leisure and tourism, which should suffice the growing economic, societal and environmental needs in Korea. Thus, the national ocean policy will most likely to change according to the new governance scheme. KIOST expects that the government will focus on investing in new research and developing new maritime industries, in parallel with a reformation in conventional industries. Also, new integrated policy will drive balanced development through appropriately placing human resources to prevent redundant financial investments to maximize the efficiency. Furthermore, the change in governance will also encourage the new administration to support the global community through international cooperation and bring out positive outcomes.
Ocean Observations in KIOST

Jae Hak Lee

Korea Institute of Ocean Science and Technology

jhlee@kiost.ac

Ocean observations in KIOST have been carried out mostly according to short term research projects. With glowing concern about problems due to environmental and climate changes in the seas adjacent to Korea, recent trends of ocean observations show increasing time series measurements, development of observing system and expanding research area from marginal seas to the open ocean such as the western tropical Pacific Ocean and the Southern Ocean.

For time series measurements, a current meter mooring site in the southwestern East Sea (Sea of Japan) has been maintained for four years to monitor the Dokdo Abyssal Current. In the western Korea Strait, monthly repeated collection of bio-geo-chemical data in the water column at fixed sites has been continued for six years now. Recently, a new monitoring site was selected in the area east of Jeju Island in the northern East China Sea and bi-monthly repeated observation has been conducted to obtain bio-geo-chemical data for the purpose of ecosystem/climate study.

Infrastructure/equipment expanded recently includes the array of coastal HF radar, surface mooring buoy stations, fixed marine platform, and satellite. Two fixed marine platform (ocean research station) were installed in the East China Sea (IEODO station) and southern Yellow Sea (Gageocho Station) and a new ocean research station will be installed in the southwestern East. As a part of surface composite network, the Geostationary Ocean Color Imager launched in 2010 is now in the operational phase.

The general goal of observations in the western Pacific Ocean and the Southern Ocean is to study ocean/climate variability. More than 10 subsurface current meter moorings have been maintained or planned to be deployed in the Philippine Sea, western equatorial Pacific Ocean and Amundsen Sea. All the activities are related to international projects or cooperative researches. It is expected that there will be more active participation in international efforts for ocean observation in the open ocean after KIOST launched the new research in a few years.
Indonesian Through-flow (ITF) Monitoring in a changing Global Climate

Dr Dongchull Jeon

Ocean Circulation & Climate Research Division, KIOST, 1270 Sadong, Sangnocku, Korea, 426-744
dcjeon@kiost.ac

Ever since bilateral meeting had been exerted for Indonesian Through-flow (ITF) monitoring design between KIOST, Korea and LDEO/Columbia University for NOAA, USA, it was proposed as a multi-national task at the 13th POGO meeting in Honolulu on January 9-11, 2012, and discussed as a main theme of CLIVAR Task Team meeting which was held in Jakarta on February 12-14, 2012. Up to 1980s, the role of ITF in the global climate change had been almost neglected and most numerical modelers had simulated under the assumption that the Indonesian seas were blocked. Although some efforts has been exerted to measure the variability and transport of ITF at a specific point (in the Makassar Strait) from 1990s, and it is still remained as a black box in the eastern Indonesian seas due to the complexity of the bottom topography and the fact that there are so many channels and straits. In 1993~1994, the transports through the Makassar Strait were estimated during SE and NW monsoons. The transport through the Makassar Strait was measured for 2 years (1996~1998) and correlated with Nino3 SST. During INSTANT (2003~2006) program, the variability of ITF transport and heat/freshwater fluxes were estimated by multi-national measurements of USA, France, Netherlands, Australia as well as Indonesia at Lombok, Ombai, Makassar Straits and at Timor and Lifamatola passages. Now second international collaborative program (ITF Gateway Program) is proposed to measure the transport viability of the ITF with long-term monitoring strategy.

The tentative components of ITF Gateway Program (2014~ ) may include:
- LDEO, USA: 7 CPIES across MC section (~7°N)
- KIOST, Korea: 3~5 ADCPs across Mindanao Retroflection (Mindanao ~ Halmahera)
- SIO, China:

The main objectives of the program are:

- To determine the time-varying velocity structure to estimate mass and heat transports of the Mindanao Currents, of the Mindanao Retroflection winding up and joining into the NECC between Mindanao and Halmahera
- To examine the relationship between Mindanao Currents and the Mindanao Retroflection including its leakage into the ITF
- To estimate mass and heat transports of the South China Sea Through-flow (SCSTF) through the Luzon and Karimata Straits, and the role of the SCSTF for the ITF
- To estimate the relationship between the ITF transport variability and the larger scale ocean and climate system such as ENSO

This program definitely needs more participation of other countries to accomplish more accurate and complete estimate of the ITF variability as part of the global ocean circulation under changing global climate.
The new era for FIO’s deep ocean observation

Dr Deyi Ma, Dr Wei Zheng and Dr. Lin Liu

First Institute of Oceanography, State Oceanic Administration, China
zhengwei@fio.org.cn

With the great effort to start the in-situ observation over the open ocean region in recent years, First Institute of Oceanography, State Oceanic Administration (FIO), is stepping forward to conduct and perform the in-situ scientific survey and long term buoy based observation over the deep sea ocean. The international cooperation between FIO and relevant countries laid on solid the bases for such activities, especially for the joint center and laboratory. With the foundation of Indonesia-China Center for Ocean and Climate and Thailand-China joint laboratory for climate and marine system, kinds of action had been performed over the tropical south-eastern Indian Ocean and Bay of Bengal region.

As one of the important developing direction, FIO is on the way seeking methods to strength the facilities construction to guarantee the deep ocean observation, including research vessel building, policy supporting et al. The new research vessels of FIO will face the world around 2014 and 2015, which provide the strong support to the future working.

The new cross-cutting international project, titled as the “Eastern Indian Ocean Upwelling and the Marine Ecosystem”, is initiated by FIO, China and JAMSTEC, Japan, which focuses on the in-situ observation and the relevant scientific research over south-eastern Indian Ocean, will be introduced briefly.
The “Agulhas Current System and its Role in Changing Ocean Circulation, Climate, and Marine Ecosystems” held from the 7-12th October 2012 at Spier, Stellenbosch, South Africa was the first American Geophysical Union Chapman Conference to be held on the African Continent and the first dedicated international Agulhas Conference. It was driven by the SCOR/IAPSO/WCRP* Working Group 136 on the Climatic Importance of the Agulhas Current.

In summary the conference was a huge success with over 100 people attending, the majority of whom were international, representing more than 10 nations and around 30 students. The conference proceedings were an exciting mix of oral presentations, posters, group discussions, social events, and field trips. There were only positive comments regarding the layout of the meeting in this manner and it certainly allowed for a good deal of discussions. People were incredibly enthusiastic and complimentary about the local organization and the content of the meeting.

The agenda covered an impressive range of topics, including physical oceanography, meteorology, climate, paleo-studies, marine ecosystems, fisheries, and biogeochemical cycles. The conference had 4 main thematic sessions and an entire day for extended discussions and reporting. Each thematic session is related to a leading scientific question:

1. What are the main circulation and transport features of the greater Agulhas System?
2. What are the effects of Agulhas system variability on regional weather, climate, bio-physical interactions, marine ecosystems and fisheries?
3. What is the impact of Agulhas Retroflection and Leakage on large-scale ocean circulation and climate?
4. What are the physical mechanisms that link the Agulhas system to changes in ocean circulation and climate?

Perspectives ranged from regional to global scales, attesting to the importance of the Agulhas Current as a key element of the ocean general circulation. Important objectives of the conference were to enhance and facilitate new scientific interactions and collaborations between scientists, institutions, and countries that are interested in and/or actively investigating the greater Agulhas system and its interactions with the atmosphere and marine ecosystems. Furthermore, an implementation plan for an observing system in the southwest Indian Ocean, under the auspices of Global Ocean Observing System, was discussed at the conference, as well as different modeling approaches. Given the scale of the southwest Indian Ocean and its variability it is a necessity that communities of both developed and developing countries join forces to collaboratively optimize the research and maintain the observing system. The key objective of the conference - to bring together scientists from around the world to present their research, exchange ideas, and collectively advance our understanding of the Agulhas Current system from an interdisciplinary perspective was most definitely achieved.

Dr Gansen Pillay of the National Research Foundation opened the conference, immediately setting a challenge that we have solid outcomes from this meeting and highlighting not only the need to develop human capacity in this area but also to fully understand the impact of the region on social development. Dr Mike McPhaden also gave video opening remarks.

The Wednesday morning discussion sessions (as well as discussion sessions after each morning of talks) provided some insight into future ideas and plans, in particular, with regards numerical modeling, observations and implementation. A highlight of this was that both Dr Lisa Beal and Dr Herman Ridderkinko have offered that the millions of dollars worth of equipment which is currently in place in the Agulhas Current (off East London) and the Mozambique Channel be ‘given’ to South Africa if we are able to maintain the mooring arrays (annual cruises and batteries etc) and if the data is made freely available.

Finally, below are some comments received regarding the conference:
“I enjoyed the Chapman Conference and it was one of the best meetings that I have ever attended”
“I have ever experienced. We must not lose the momentum”

---

* Scientific Council for Oceanographic Research, International Association for the Physical Sciences of the Ocean, World Climate Research Program