

Partnership for Observation of the Global Oceans (POGO)
Cruise Information Database & POGO Secretariat Activities

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1. Project Summary

Part 1. International Cruise Information Database

The aim was to develop, update and maintain an international cruise information database to facilitate resource sharing and information exchange related to past and planned research cruises (see <http://www.pogo-oceancruises.org>). Benefits include:

- Helping scientists from different countries coordinate future funded research through information about research vessels of opportunity;
- Aiding in retrospective ability to find data in regions of interest;
- Enabling projects to conduct joint work and to fill empty berths;
- Creating capacity-building and training opportunities;
- Aiding in tracking and distributing data;
- Allowing cost sharing among institutions, projects, and nations;
- Enabling intercomparisons, intercalibrations, and validation among different data types (e.g. CTD vs. Argo, in situ vs. remote sensing)

Part 2. Support of the activities of the POGO Secretariat

The Partnership for Observation of the Global Oceans (POGO, <http://ocean-partners.org>) was founded in 1999 as a consortium of the major oceanographic institutions around the world, represented by their Directors. As stated at the founding of POGO, the objective of POGO is to make a major contribution to the attainment of sustained *in situ* observations of the global ocean that meet the requirements of international research and operational programs. As a means of attaining this objective, POGO:

- Initiates key actions to enable effective coordination, integration, and implementation of international ocean observing strategies;

- Establishes collective agreements among institutions to promote timely developments in ocean science;
- Develops and promotes coordinated views of ocean institutions concerning ocean observation and science to governments, international bodies, and others;
- Facilitates linkages between oceanographic research and operational institutions in relation to their goals, plans, and programs;
- Undertakes capacity building;
- Promotes sharing of facilities and infrastructure;
- Encourages interdisciplinary use of observing infrastructure;
- Conducts public outreach.

POGO provides a forum for Members to meet with their peers, and with senior officials of partner organisations, to discuss issues of mutual concern. It also serves as a credible voice for the marine science community, through its leadership role in the informal grouping Oceans United (<http://www.oceans-united.org>), and as an advocating body for the establishment of an integrated, global ocean observing system. The activities supported by NOAA include:

- Execution of the annual meetings of POGO;
- Selection process for the Visiting Fellowship and Professorship programmes; and
- Communication with the POGO community (newsletter and websites).

2. Scientific and Observing System Accomplishments

Part 1. International Cruise Information Database

The POGO Cruise Information Database (www.pogo-oceancruises.org) was launched in May 2007 and is maintained by the British Oceanographic Data Centre (BODC). The website focuses on vessels greater than 60m in length and incorporates three major databases, including a research vessel directory, a cruise programme database and a database of Cruise Summary Reports (these are completed at the end of a cruise and describe the measurements made. They are quite widely used in Europe, but not in North America. Japan also uses them. They were developed by IOC's International Oceanographic Data and Information Exchange (IODE programme).

Cruise programme database

The cruise programme database currently includes details of about 2700 cruise programmes covering 55 research vessels from 18 countries. The table below indicates the content by year since 2007, when the project began. Since the start of the project cruise programmes have been regularly supplied by Australia, Belgium, France, Germany, Japan, Netherlands, Norway, Sweden, UK and USA (UNOLS including Bermuda); more recently Greece, Ireland, Italy, Romania and Spain have provided input. Some cruise programmes have also been provided by China, Finland and Iceland. No cruise plans were available from Sweden in 2011, as the research vessel, RV Argos, was out of commission pending repairs. This situation continued in 2012 with smaller vessels being chartered, consequently no information is included for 2012. Work has continued with UNOLS to set up a more automatic flow of cruise programme information (~150

cruises for large ocean going vessels, plus further cruises for regional cruises) which can be regularly updated during the year. Once this is completed a similar approach will be established for UK vessels. Work is underway following up contracts in Argentina, New Zealand, and South Africa.

Year	No. of programmes	No. of Countries	No. of vessels
2007	537	13	32
2008	494	13	40
2009	357	14	35
2010	392	14	32
2011	474	12	33
2012	450	14	37
2013 and 2014	22	4	6

Table 1: Number of cruise programmes received per year

Ship operators are provided with a blank spreadsheet and guidance notes to assist in completion of the spreadsheet. Wherever possible they are encouraged to extract from their own databases rather than re-type information. The ship operators who have replied are cooperative but, in general, do not have a lot of time to spend on this or have other more pressing priorities. The databases maintained by the various ship operators are all different and where information is provided on their web-sites it is often in the form of pdf files with variable amounts of detail, so this is not suitable for software (e.g. web services) to automatically access. We request that the SeaDataNet vocabularies are used in the spreadsheet, but even when the BODC vocabularies are listed, these are not often used – although this has improved for European contributors with the EUROFLEETS projects. This means that work has to be done at BODC translating the information into the appropriate codes. Information is currently being requested for 2013 cruises (and 2014, etc., if available).

To improve the flow of information in a more automated way to the cruise programme database, the SeaDataNet Mikado software has been adapted and extended for use with cruise programme information. The Mikado software allows one to map the fields of a database (e.g. in this case that maintained by a ship operator) into the agreed standard fields. When this has been done once, it is a relatively simple matter of running the software to generate the information in the required format (as XML files), including the use of the standard codes/dictionaries, which can be forwarded to BODC. Checks can also be incorporated (e.g. checking that the end of the cruise is after the start). This new version of Mikado is being tested out within the EUROFLEETS project (see below) and then adapted to POGO contributors if they wish to use it. This should improve efficiency and remove the need for most of the manual checking and editing.

The website was refreshed (including adding the new POGO logo) at the end of 2009 and the layout resulting from searches was improved. The initial browse facility provides summary information on the left hand side of the web page; this shows the number of cruises undertaken by vessel name, country of operator, discipline (e.g. physical, chemical, biological), sea area and cruise status (planned, underway, completed). It also provides a quick link to search by

geographic area (latitude/longitude range) and time period. A more advanced search facility, which allows searching by a combination of items is also available. Coloured dots indicate whether a cruise is planned, currently taking place, or has been completed. There is also an option to show if the cruise has been cancelled. This is updated automatically for the in progress and completed cruises. A further update is currently underway, with particular attention to the Home Page (see Figure 2 for suggested layout).

One of the continuing problems encountered is the lack of geographic information – most operators will provide some general description of the area to be visited, but do not have latitude-longitude ranges available in their own systems. BODC add these in, but this is a time consuming exercise. Some cases are reasonably straightforward, e.g. the USA (UNOLS) contribution often has US Navy Squares which can be converted fairly easily. Others may only have a text description (e.g. Porcupine Abyssal Plain, Off Omaezaki, Sagami Bay). The latitude/longitude range is important to the cruise programme database as it is the basis for the geographic searching, and this information is viewed on a map.

The online Content Management System (CMS) for the cruise programme information, established in 2008, is in regular use by NIOZ for *RV Pelagia* cruises, and occasionally by Germany for *FS Polarstern* and *FS Meteor*. Other countries (e.g. Italy) have expressed an interest in using the CMS, especially for updating information. The CMS can be reached at the POGO International Cruise Information Database web-site (www.pogo-oceancruises.org) and selecting “Planned Cruise Programmes” and “Updating Cruise plans via the online Content Management System” or directly at: www.pogo-oceancruises.org/vu_cruises/welcome.asp

The system has been designed so that:

- Each operator can only manage its own records AND for a fixed set of vessels
- Where a vessel is shared and thus operated by two (or more) operators, each operator manages and sees only its own records (see e.g. Argos in Sweden)
- The CMS works on the basis that the account holder is also the operator - thus they cannot change the operator.

The CMS is currently under review to allow more flexibility for updating and to allow a national contact rather than the ship operator to enter and update records. At present a choice has to be made whether to use the spreadsheet entry or the CMS, a further improvement to be considered is to allow bulk upload of the spreadsheet information followed by updates *via* the CMS. At present this is only available to those with administration privileges, but it could encourage more regular updating.

Offers have been received from the International Ocean Carbon Coordination Project (IOCCP) and the Climate Variability and Predictability Program (CLIVAR) through GO-SHIP, to enter cruise programme information when it becomes available to them. Note that the GO-SHIP cruise programme information was last updated in May 2010. Following discussions with CCHDO, including at meeting at BODC with Steve Diggs in March 2012, it has been agreed that they will provide the information they hold in their SeaHunt system (primarily for ocean basin-wide transects collecting high quality hydrographic (CTD) data. These details may be quite sparse, and will be initially marked preliminary, and updated with more detailed information as plans are

confirmed, and care taken that duplicate entries are not created. We are working with CCHDO/SeaHunt to develop automated two-way flow of information. Currently, all of the cruise programmes visible in SeaHunt are all Polarstern cruises which are already in the Cruise Programme Database (including those for 2013 and 2014).

The EU-funded 'EUROFLEETS: Towards an Alliance of European Research Fleets' (www.eurofleets.eu) is a four year Integrated Infrastructure Initiative (I3) FP7 project running from September 2009-August 2013, with 24 partners and coordinated by Ifremer, France. EUROFLEETS brings together the existing European Research Fleet owners to enhance their coordination and promote the cost-effective use of their facilities in order to support the efficient provision of essential research services for monitoring and sustainable management of the regional seas and the oceans and allow access to all European scientists. One work package, WP2: Virtual research fleet platform, which is led by Maris (our partner for the POGO work) and including BODC, is based on the same databases (programmes, vessels, cruise summary reports) as the POGO system, and includes regional vessels as well as ocean-going ones. The system utilises and builds on the developments carried out for POGO, and POGO in turn will benefit from an enhanced system. In particular the EUROFLEETS project will develop more automatic harvesting from the operator databases and refresh the information at regular intervals using the SeaDataNet Mikado software (described above). These developments are beginning to improve information provision from the project partners. A follow-on EUROFLEETS project will commence in 2013, with an increased number of partners, which will continue to develop the virtual research fleet platform, including the cruise programme database for European research vessels.

Global Directory of Ocean-going Research Vessels

The Global Directory of Ocean-going Research Vessels has been operational since early July 2007. It has been developed by EurOcean with support of MARIS and it contains characteristics, owners and operators' information for ocean-going research vessels. The content format conforms to the Oceanic database, operated by the University of Delaware. This global directory has been developed as a special version online research vessel directory for all European vessels previously developed by EurOcean, which can be found at the EurOcean portal (www.eurocean.org). It contains up-to-date information on ocean-going Research Vessels, operated worldwide, and is accessible from the www.pogo-oceancruises.org website.

The Directory software was upgraded to enable research vessel operators to maintain the vessel information themselves by an online Content Management System. During the second half of 2007 European operators were invited by EurOcean to validate and improve the entries for their vessels. Subsequently the identified operators of these non-European vessels have been invited to validate and update their entries, using the online Content Management System.

The Research Vessel Directory now contains facts and figures of 170 Research Vessels. The Research Vessels are provided with a ship code, identifying a unique hull, through cooperation with ICES, US NODC and BODC. These ICES ship codes are used in each of the 3 databases in the full POGO system as linking pin. There are nine vessels in the database which are less than 60m in length of which Belgica is the shortest at 50.90m. Cruise programmes for vessels less than 60m unless have not been specifically requested unless it was deemed useful to do so (e.g.

Bermuda with Atlantic Explorer at 51m), or the operator requested it (e.g. Finland, with Aranda at 59.80m, Belgium with Belgica).

Cruise Summary Reports (CSR) database and Content Management System (CMS)

The Cruise Summary Report (CSR) database has been developed by BSH/DOD, Germany. It focuses on details of completed cruises and provides a first level inventory of oceanographic measurements made and samples taken. The ROSCOP (Report of Observations/ Samples Collected by Oceanographic Programmes) was conceived by IOC/IODE in the late 1960s in order to provide an inventory for tracking oceanographic data collected on Research Vessels. The ROSCOP form was extensively revised in 1990, and was re-named the Cruise Summary Report (CSR). Most marine disciplines are represented in the CSR, including physical, chemical, and biological oceanography, fisheries, marine geology/geophysics, marine contamination/pollution, and marine meteorology. Traditionally, it is the Chief Scientist's obligation to submit a CSR to his/her National Oceanographic Data Centre (NODC) not later than two weeks after the cruise. In the past these have been periodically transmitted to the ICSU World Data Centres for Oceanography and to ICES.

The CSR activity gained new momentum in Europe during EU-funded marine data management projects EURONODIM and Sea-Search under the lead of BSH/DOD, Germany. The combined ICES and Sea-Search/SeaDataNet CSR database now comprises details of approximately 40,000 oceanographic research cruises primarily from Europe and North America, some information extending back over the last 40 years. This ongoing CSR database can be found *via* the POGO research cruises website at www.sea-search.net/roscop.

As part of the POGO-CoML-NOAA initiative BSH/DOD has developed a special version of the CSR database, that gives access to Cruise Summary Reports of all ocean-going vessels worldwide larger than 60 metres. It is directly accessible from the www.pogo-oceancruises.org website. There is an online Content Management System (CMS) to allow Chief Scientists and NODCs of countries outside Europe to prepare and deliver their Cruise Summary Reports. This is now available and linked into the International Research Cruise Information system. It can be found at: http://seadata.bsh.de/csr/online/pogo_index.html. The general login/password is csonline/jellyfish. A short User Guide is available.

Retrieval software has also been developed in line with that used for SeaDataNet, but with the POGO “look and feel” and limited to POGO ships. This allows searching of all cruise summary reports provided to BSH, including those supplied before the POGO system was developed, but restricted to the larger research vessels. Links have also been implemented between the cruise programme part of the system and the CSR database.

Highlights

The Cruise Programme Database continues to be operational and contains over 2700 cruise programmes from almost 20 countries. Requests and reminders for 2013 cruise programmes are underway. Further links are being developed with Argo and Euro-Argo to ensure that the Cruise Programme Database meets their needs. The Research Vessels Database continues to be operational and updates and amendments have been made during the year. Vessel operators have access to the database and are able to update details of their own vessels. The Cruise Summary

Report (CSR) database is operational for input of new CSRs and searching of existing ones. It is linked into the POGO Cruise Information site.

Outreach activities since January 2012 have been twofold: (i) at the EUROFLEETS annual meeting (October 2012), the POGO research cruise information system was described – and as noted above, it has formed the basis for the EUROFLEETS system, and (ii), a meeting was held with representatives of Argo and Euro-Argo projects to discuss improvements to the Cruise Programme Database to better meet Argo needs. For the Cruise Programme Database to be of maximum use to Argo the following is required: information available at least 6 months ahead (preferably 1 year), improved information about working area for the cruise (e.g. image of planned cruise track), name of PI/Chief Scientist and contact details. The name of the research vessel is not necessary at this time, and it is understood that the information may be preliminary, especially if it is provided a long time in advance. It was agreed to work with Argo, in particular with the international Argo Data Management Team and European Argo projects, to improve the Cruise Programme Database.

The figure below shows access to the POGO Research Cruise Information System web-pages during 2012 (January to October). It shows fairly regular usage, with slightly higher numbers of visitors than in 2011 and 2010. These figures exclude robots/spiders, etc. visiting the site.

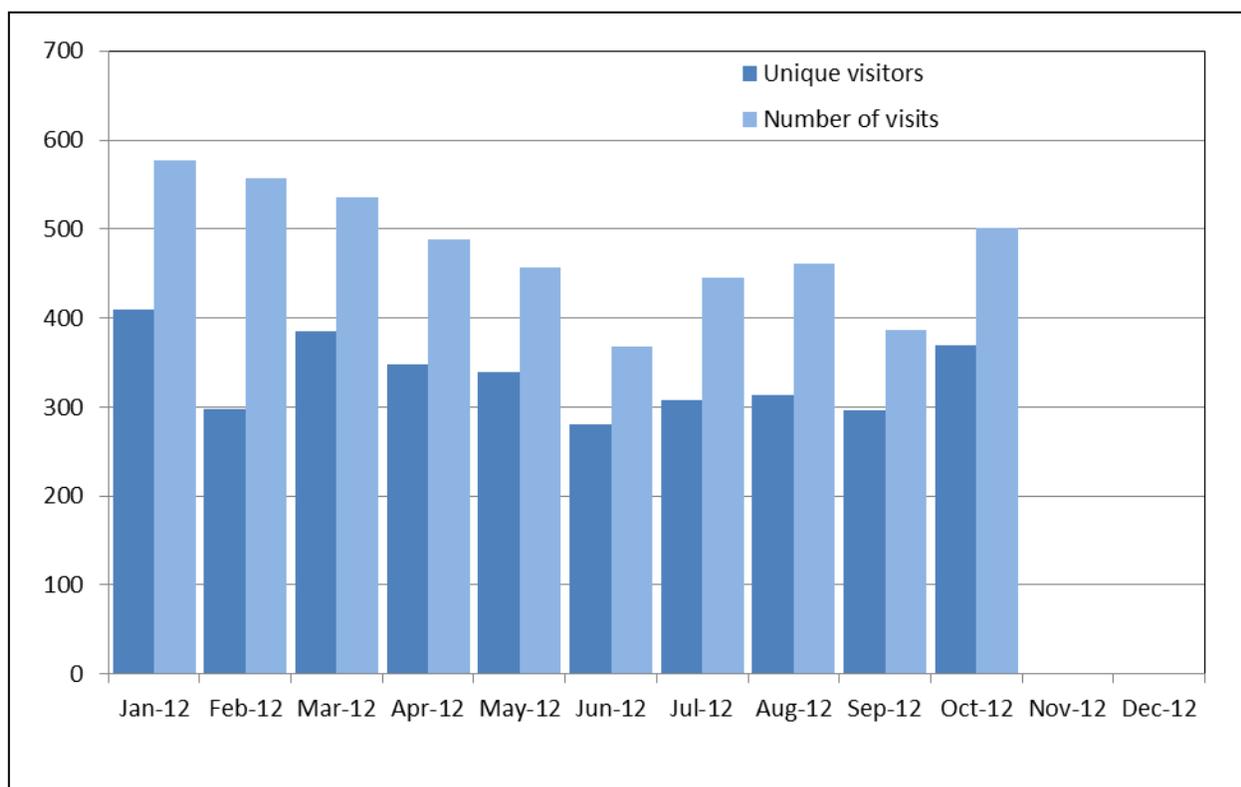


Figure 1. Cruise Information Database usage statistics for 2012 (January to October)

Average number of unique visitors/month	335	(compare 311 in 2011, 270 in 2010)
Average number of visits/month	478	(compare 451 in 2011, 388 in 2010)
Average number of pages per visit	8.7	(compare 7.7 in 2011, 8.4 in 2010)



OCEAN-GOING RESEARCH VESSELS - INTERNATIONAL CRUISE INFORMATION



Planned Cruise Programmes

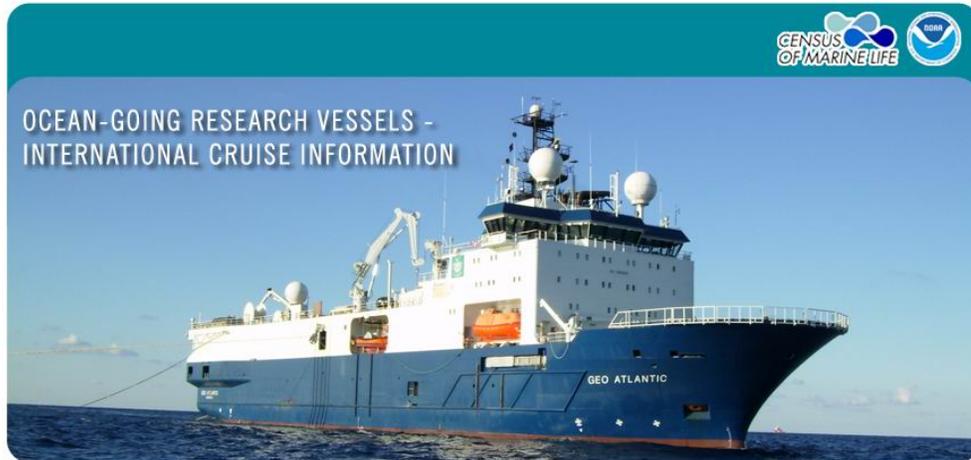


Research Vessel Characteristics



Cruise Summary Reports

Figure 2a. New international cruise information database homepage under development.



International Research Vessel Cruise Programmes

The compilation of a database of planned ocean-going cruises is coordinated by BODC. A survey format has been defined, which forms the basis of the database. This format is used by BODC to contact operators and to collect information on the planned cruises for the coming year. The collected information is compiled and finally edited by BODC. The information is then regularly transferred by BODC to MARIS for publication on the International Cruise Information website. In summary, a versatile User Interface has been developed, which supports user queries of the database by combining geographical and alpha numerical search criteria.

The database is being progressively populated from a growing number of operators. BODC is approaching all operators, that are managing research vessels that undertake ocean-going cruises. At the same time qualifying operators are invited to contact BODC by e-mail, so that their entries will be included.

Next to delivering cruise planning information in bulk, there is also an online Content Management System available that enables qualifying operators of research vessels to update the planning of their ocean-going cruises regularly online. Contact BODC for an online account.



Figure 2b. New cruise programme database page under development.

Part 2. POGO Secretariat Activities

Annual meetings of POGO

POGO is a consortium of major oceanographic research institutions worldwide, typically represented at the Director level. POGO members have the opportunity to meet once a year during 3-day meetings hosted by a member institute. These meetings provide the opportunity for reporting on activities carried out during the previous year and discussions of strategic issues related to global ocean observations, and forward planning for POGO.

The 13th POGO Annual Meeting was hosted by the School of Ocean and Earth Science and Technology, University of Hawaii at Manoa, from 9 to 11 January 2012. Some 30 of the 37

POGO member institutions were represented (including NOAA), as well as representatives from other organisations such as the Scientific Committee on Oceanic Research (SCOR).

The Honolulu Declaration (http://ocean-partners.org/attachments/776_Honolulu-declaration.pdf) was written by the participants and signed by the Chairman of POGO, outlining the importance of working together for increased understanding of how our oceans are affected by climate change, and to optimise the benefits to society of existing and future ocean observing systems. Particular emphasis was placed on continuing support for the Southern Ocean Observing System (SOOS), networking time-series observation stations; support of the “Oceans and Society: Blue Planet” Task of the Group on Earth Observations (GEO), including convening a Symposium in November 2012; continued development of Oceans United as a global forum for dialogue within the marine scientific community; support of the POGO exhibit at the EXPO 2012 in Yeosu, Korea; and continued investment in capacity building in developing countries and economies in transition, to further the global expansion of ocean observations.

Action items from the meeting included:

- To continue to support and reinforce its on-going capacity building activities, to support the development of international training centres in India and Brazil, and to identify research cruise training opportunities with its member institutes, following the model of the POGO-AMT cruise fellowship.
- 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.
- To support the development of SOOS, GACS (Global Alliance of CPR Surveys) and the International Quiet Ocean Experiment (IQOE).
- To promote the collation, and improved accessibility to existing time-series data, building on on-going activities.
- To hold the POGO-14 Meeting in Cape Town, South Africa, hosted by MA-RE in January 2013.



Figure 3. Attendees of the 13th POGO Annual Meeting in Hawaii, USA.

Selection process for the Visiting Fellowship and Visiting Professorship programmes

Lack of trained personnel is considered to be a major obstacle to development of a global ocean observing system. Therefore, a central element of the POGO agenda is capacity building and training. POGO has developed an extensive array of training and education activities targeted primarily at scientists from developing countries and those with economies in transition. In partnership with the Scientific Committee on Oceanic Research (SCOR), POGO has developed a Visiting Fellowship programme on Oceanographic Observations (<http://ocean-partners.org/training-and-education/pogo-scor-fellowship>) under which young professionals from developing countries can spend up to three months training in their speciality at a major oceanographic institution. This programme has been very successful in providing training for scientists and students from developing countries as well as in developing collaborations between institutes.

The fellowship programme has just completed its twelfth year. This year saw a total of 75 applications, which was 38 more than the previous year and 53 more than in 2010. This was possibly a result of a broader advertisement (making use of the NF-POGO Alumni Network for Oceans, in particular), combined with the longer application period. Applications were received from 32 countries, which was 11 more than the previous year.

The applications were screened independently by a committee of six, with representation from SCOR and POGO. In making their selection, the committee considered the following factors:

- quality of the application;
- relevance of the application to the priority areas identified in the fellowship announcement;
- evidence that the training will lead to improved sustained observations in the region, or improved applications of such data;
- evidence that the training would lead to capacity-building with potential lasting impact on regional observations, and
- the need to maximise regional distribution of the awards.

This year, twelve fellowships were offered to oceanographers from a range of countries (Russia, Poland, Cape Verde, South Africa, Kenya, Bangladesh, China, Chile and Mexico). The host institutions were also located in a wide variety of countries (Belgium, Germany, Denmark, Norway, UK, France, Italy, Australia and USA). Unfortunately, the fellow from Kenya had to cancel because of the cost of accommodation in the host city, which was several-fold higher than the maximum allowance. The money that was allocated for his fellowship will be spent instead on a new POGO research cruise fellowship to be initiated in 2013 in partnership with the EU project GreenSeas, and the Porcupine Abyssal Plain (PAP) Site cruise programme.

All the people involved in each fellowship (the fellowship holder, the supervisor at the parent institute and the supervisor at the host institute) were requested to submit short reports at the end of the training period. A number of reports are expected to be received by the end of December, but those received so far have been very enthusiastic. They indicate that these exchanges should lead to effective capacity building at the host institute and facilitate longer term collaborations

between the institutes concerned. All conclude that the programme serves a very useful purpose.

POGO also runs a Visiting Professorship Programme (<http://ocean-partners.org/training-and-education/pogo-visiting-professorship>) under which marine scientists of international standing teach at marine institutions in the developing world for periods of up to three months. This exposes young scientists, particularly from developing countries, to the best oceanographers world-wide and facilitates the formation of professional contacts, invaluable in the development of their scientific careers.

Ten applications were received for the POGO Visiting Professorship programme. Again, this number was several-fold higher than in previous years. The 2012 visiting professorship was successfully completed in April 2012. Prof. Iossif Lozovsky (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”.

The course was designed to give students a basic knowledge of small-scale processes in the ocean and introduce the state-of-the-art instrumentation, data analysis, and modern research concepts. A series of lectures (20 hours of classes during 8 training days) was focused on turbulence, mesoscale (eddy) dynamics and internal waves, including theoretical background, examples of numerical modeling results, description of various instruments (ADCP, ADV, CTR7, CTD and microstructure profilers Turbomap and MSS), methodology of measurements on shallow shelves and in the deep-ocean, and data processing. A special two-hour practical was also given to introduce the students to simple graphic and data processing packages (Grapher and Surfer) provided by Golden Software Inc. Field work on CTD profiling measurements started after completion of the theoretical course.

The training was favourably received by the students. Most of the students did not have a solid background in physical oceanography, being trained as marine biologists and geologists. However, they were able to digest the main part of the course and to understand the close relationships between mixing in the water interior and bio-chemical exchange and near bottom turbulence and sediment transport problems.

A close research collaboration has been initiated between NARA and University of Notre Dame (UND). Priyantha Jinadasa started working on his PhD dissertation focusing on internal wave study in shallow waters. He is planning to visit UND in the beginning of 2013. UND expects to invite two NARA students for 2-3 months of training in the US.

Communications with the POGO community (newsletter and websites)

The POGO Secretariat produced its quarterly newsletter in October 2011, January, April and July 2012. The four- to six-page electronic newsletter is distributed to the POGO members and wider community, and includes updates on POGO activities and news from the POGO members. The aim is to keep the members informed between annual meetings of progress made on issues that were discussed during the meetings, such as participation in the Group on Earth Observations (GEO), Expo 2012, capacity building, partner programmes and so on. Another

objective is to inform the wider community, and in particular funding agencies and scientists within the POGO member institutions, of POGO's achievements. These newsletters are always very well received. Occasionally, the newsletters are printed for distribution at special events (e.g. East Asian Seas Congress, July 2012). See <http://ocean-partners.org/index.php/component/content/category/53?layout=blog>.

The POGO Secretariat also maintains the POGO website (www.ocean-partners.org) and the Oceans United website (www.oceans-united.org). This involves posting information on POGO meetings, announcements, news from the members, job vacancies, a conference/meeting calendar, and training opportunities, to name but a few.

2.1. Outreach and Education

POGO is very active in the areas of public outreach and training and education. Capacity building is a central element of POGO's agenda (see previous section), with a suite of programmes that have so far trained around 500 scientists from over 65 countries. Public outreach is conducted through participation in international exhibitions, including GEO Ministerial Summits (Cape Town 2007 and Beijing 2010), the Oceanology exhibition in London, and the World Expo 2012 in Yeosu, Korea. POGO is also becoming involved in enhancing "Ocean Literacy" through the educational system, and participated in the First Conference on Ocean Literacy in Europe, held in Bruges in October 2012. POGO regularly issues press releases and "declarations" in conjunction with major events such as GEO Summits and POGO annual meetings to raise public awareness of the importance and societal relevance of ocean observations (see <http://ocean-partners.org/products/pogo-documents>). POGO published an article in the *Marine Scientist* magazine of the Institute of Marine Science Engineering and Technology (IMarEST) in Feb 2012, and another one is in press, to feature the Research Europe publication *International Innovation Environment* in late 2012. The POGO website also includes material aimed at the general public (videos, articles).

3. Publications and Reports

3.1. Publications by Principal Investigators

- Published
Seeyave, S., and T. Platt, 2012. POGO –Joining Forces to Observe the Ocean for Science and Society. *Marine Scientist*, **38**, 8-11.
- In press
Platt, T., and S. Seeyave, 2012. Partnership for Observation of the Global Oceans. *International Innovation Environment*, in press.
- Abstracts

Seeyave, S., T. Platt, and S. Sathyendranath, 2012. Providing Training in Ocean Observations for Developing Country Scientists: the POGO Experience. Poster presentation, *First Conference on Ocean Literacy in Europe*, Bruges, Belgium.

3.2. *Other Relevant Publications*

n/a