

Report on the 2014 POGO-SCOR Fellowship Programme

This year saw the fourteenth fellowship programme implemented using POGO funds with supplementary financial support from SCOR. The announcement was posted on 27 November 2013, with a closing date of 10 January 2014.

This year saw a total of 48 applications, which was greater than the previous year. This was possibly a result of a slightly longer application period. Applications were received from 22 countries.

Eight candidates were selected and hail from around the world, namely Argentina, Brazil, India, South Africa, Indonesia and Iran. This year's host institutions included University of Hawaii at Manoa (USA), Institut de Ciències del Mar (ICM-CSIC) (Spain), Nansen Environmental and remote sensing center (Norway), Plymouth Marine Laboratory (UK), Lamont-Doherty Earth Observatory, Columbia University (USA) and Queen Mary University of London (UK).

The applications were screened independently by a committee of four, 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.

One successful candidate from Iran subsequently had personal circumstances which resulted in her being unable to accept the POGO-SCOR visiting fellowship. The POGO Executive decided that by the time that they were informed, it was too late by that stage to offer the fellowship to another candidate.

POGO and SCOR commend the efforts from all the supervisors and colleagues at the various host institutions who agreed to devote time and energy required for the training. The programme would not have been viable without such efforts from prominent scientists and their teams.

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 fellowships are yet to be completed and their reports are expected to be received by the end of the year, but those received so far have been

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 useful purpose.

There is tremendous interest in the fellowship programme at all levels, both in the oceanographic institutions of the developing nations, as well as among leading scientists who are eager to contribute to this initiative. It is seen to be filling a niche in capacity building through specialised training that is not filled by intensive courses or by participation in scientific meetings. It helps improve the *esprit de corps* among oceanographic institutions around the world, and serves as a stepping stone to building collaborations.

Furthermore, the POGO-SCOR fellowship scheme is increasingly seen by other organisations as a model in capacity building, and similar schemes have been set up by other programmes based on the success of the POGO-SCOR model (e.g. EU projects, the Europe-Africa Marine Network, EAMNet; and the EUROMARINE consortium of European Networks of Excellence). The POGO Secretariat is often approached for help/advice on setting up similar fellowship schemes, or proposals to partner up with other organisations.

Demography of Fellowships

Parent Institutions of Successful Candidates:

Argentina	National Institute for Fisheries Research & Development (INIDEP)
Brazil	University of Algarve, Portugal
South Africa	University of Cape Town
India	National Institute of Oceanography Space Applications Centre (ISRO), Ahmedabad
Indonesia	Indonesian Institute of Science
Iran	Sharif University of Technology Gorgan University of Agricultural Sciences (cancelled)

Host Institutions:

Norway	Nansen Environmental and remote sensing centre
Hawaii	University of Hawaii at Manoa
Spain	Institut de Ciencies del Mar (ICM-CSIC)
UK	Plymouth Marine Laboratory (two different supervisors)
UK	Queen Mary University of London
USA	Lamont-Doherty Earth Observatory, Columbia University

Gender distribution

Female: 4

Male: 4

2014 Fellows



Georgina Daniela Cepeda – Argentina

Parent supervisor and institution: Dr. María Delia Viñas – National Institute for Fisheries Research & Development (INIDEP), Argentina.

Host supervisor and institution: Dr. Erica Goetze, University of Hawaii at Manoa, Hawaii.
Fellowship period: June-August 2014 (3 months)
Topic: Metagenetic methods for time series monitoring of zooplankton biodiversity in the Argentine Sea.

Georgina Cepeda currently has a postdoctoral position with the National Council of Scientific and Technical Research (CONICET). At the present she is involved in studying the spatiotemporal variation of the mesozooplankton community at the fixed permanent station EPEA (part of ANTARES) and along the COS-TAL ocean section (Argentine Sea). During the POGO-SCOR fellowship, Georgina participated on a cruise aboard the R.V Falkor. During this cruise, zooplankton samples were collected for metagenetic community analyses, using both oblique ring net tows and depth-stratified sampling with a MOCNESS system (Multiple Opening - Closing Nets and Environmental Sampling System). Georgina participated in all types of field sampling, and learned to quantitatively split and preserve bulk plankton collections for both metagenetic and morphological analyses. Following the cruise, Georgina spent the rest of her traineeship working on laboratory analyses of the material collected on this Falkor cruise, and in learning the techniques for DNA extraction of bulk plankton samples and PCR of whole community samples. She tested out a series of new DNA extraction techniques, and identified the best approach for analysis of this bulk plankton material. She then mastered the literature for prior work on metagenetic analyses of metazoan communities, and decided on several gene fragments and PCR primer combinations to try. She then began the process of testing out these genes and primer combinations for DNA sequence-based analyses of zooplankton community composition. Although we did not quite make it through the whole process to NGS sequencing of the material collected on the Falkor cruise, Georgina was able to participate in most steps of the process and learn the basic techniques for application to samples in Argentina.



Sunita Pandey – India

Parent supervisor and institution: Dr. Loka Bharathi P.A. – National Institute of Oceanography, Goa, India.

Host supervisor and institution: Dr. Rafel Simo – Institut de Ciències del Mar (ICM-CSIC), Barcelona, Spain.

Fellowship period: 12th May to 8th August 2014 (3 months)

Topic: How to organize, maintain and get the most from a Fixed-Point Time-Series Coastal Observatory for marine microbial ecology and biogeochemistry, with emphasis on the contribution and potentialities of single cell biogeochemistry techniques

Sunita Pandey is currently working on 'Phytoplankton and bacterial interaction in DMSP dynamics'. The research includes fixed point time-series field measurements of DMS, DMSP and other relevant biotic and abiotic parameters that are known to affect the production of DMSP and the flux of DMS. During the POGO-SCOR fellowship, Sunita underwent training in how to organize, maintain and get the most from a Fixed-Point Time-Series Coastal Observatory for marine microbial ecology and biogeochemistry. Sunita was able to participate in several of the host institute's monthly sampling trips to Blanes Bay and will go through the full process from sampling design to sample processing.

Learning tools for the analysis and interpretation of time series data has helped Sunita to further explore the existing data. Besides this, she has also received training in the functioning, use and potentialities of two single cell biogeochemistry techniques: MARCARDFISH and FSSC. By participating in the 6th International DMSP symposium, the dates for which fell within the training period and is being held in the host institute, Sunita was able to interact with international scientists conducting research in the field of DMSP.



Issufo Halo – Mozambique

Parent supervisor and institution: Dr. Bjorn Backeberg – Nansen-Tutu Centre for Environmental Marine Research, South Africa.

Host supervisor and institution: Prof. Johnny Johannessen – Nansen Environmental and Remote Sensing Center, Norway.

Fellowship period: January 2015 – February 2015 (2 months)

Topic: Modelling the mesoscale ocean circulation in the southwest Indian Ocean.

Issufo Halo is currently working on modelling the sources and sink of ocean-eddy energy in the greater Agulhas Current System. Issufo's objectives are to set up an oceanic regional model configuration that will accurately simulate the mesoscale circulation in the southwest Indian Ocean. An accurate representation of mesoscale eddies in the Agulhas systems will greatly enhance the current understanding of the forcing mechanisms driving the source and sink of oceanic eddy energy, which have a strong implication both on the climate system and on the productivity of the marine systems. Originally, Issufo intended to complete his fellowship during December 2014-January 2015, however, due to issues with his visa application, this has postponed until January 2015.



Lilian Krug – Brazil

Parent supervisor and institution: Dr. Ana Maria Branco Barbosa – Centre for Environmental and Marine Research, University of Algarve, Portugal.

Host supervisor and institution: Dr. Shubha Sathyendranath, Plymouth Marine Laboratory, UK.

Fellowship period: 31st of July to 31th of October 2014 (3 months)

Topic: Delineation of biogeochemical provinces in SW Iberia.

Lilian is currently studying for a PhD whose objective is to understand how the environmental variation affects phytoplankton variability off southwest Iberia. During the fellowships, Lilian received updated training on advanced bioinformatic clustering algorithms used for clustering analyses of multidimensional oceanographic data sets, including hierarchical agglomerative clustering and fuzzy-logic based approaches. Moreover, the use of revised ocean-colour algorithms (e.g., Climate Change Initiative, Ocean Colour Group) and model-derived oceanographic variables (e.g., MyOcean catalogue) was also explored during the training.

The applications of the training represent a key contribution to Lilian's PhD thesis, and will be directly integrated into the objective, unsupervised delineation of biogeochemical provinces, with dynamic boundaries. The delineation of dynamic biogeochemical provinces in SW Iberia will also represent an asset for all researchers working within this study area and adjoining regions, including those associated to research centres from the parent institution. Moreover, the applications of this training, including bioinformatic clustering tools and data sources (e.g., satellite-retrieved information, modelling data), will be disseminated in BSc. and MSc. courses (e.g., Marine Ecosystems, Biological Oceanography, Advanced Methods in Biological Oceanography) at the parent institution.



Manoj Kumar Mishra - India

Parent supervisor and institution: Dr. Prakash Chauhan, Space Applications Centre (ISRO), Ahmedabad, India.

Host supervisor and institution: Dr. Shubha Sathyendranath, Plymouth Marine Laboratory, UK.
Fellowship period: 4th of July to 2nd October 2014 (3 months)
Topic: Evaluation of various methods for retrieving inherent optical properties in case-2 waters using ocean colour data.

Manoj Mishra's currently works as a scientist at the Space Applications Centre,



Mochamad Furqon Azis Ismail – Indonesia

Parent supervisor and institution: Dr. Zainal Arifin – Research Center for Oceanography, Indonesian Institute of Science, Indonesia.

Host supervisor and institution: Prof. Arnold L. Gordon, Lamont-Doherty Earth Observatory, Columbia University, USA.

Fellowship period: 31st of August – 16th of October (1.5 months)

Topic: Interannual variability of Makassar Strait throughflow from moored and archived hydrographic data.

Mochamad Azis Ismail is a researcher at the Physical Oceanography Laboratory, Research Center for Oceanography at the Indonesian Institute of Sciences. Mochamad's research focuses on observational exploration of water circulation and mixing and its role in Earth's climate system. His technical approach involves field work, analytical theory, numerical modeling and the intersection of all three in the utilization of ocean observation and prediction systems.

During the POGO-SCOR Fellowship, using the 2004-2011 time series of the along-channel current speed within Makassar Strait, which carries 80-85% of the total Pacific to Indian Ocean Indonesian Throughflow (ITF), Mochamad constructed the Makassar Strait transport profile time series. The product produced by him provides much insight into the forces that govern the ITF and how they vary with ENSO and with depth.



Seyedeh Elnaz Naghibi - Iran

Parent supervisor and institution: Prof. Mir Abbas Jalali – Sharif University of Technology, Iran.

Host supervisor and institution: Dr. Sergey Karabasov – Queen Mary University of London, UK.

Fellowship period: 1st of October to 30th Of November (2 months)

Topic: Interaction of the Earth's Wobble and Large Scale Oceanic Currents - Modification and Numerical Validation of a Semi-analytical Approach.

Seyedeh Naghibi is a PhD student currently investigating the interactions of the earth's wobble and large scale oceanic currents to verify whether ocean circulations can excite Chandler Wobble and how do they, in turn, are affected by Chandler Wobble.

In this project, research activities were undertaken by Seyedeh Naghibi along two main directions: 1) Investigation of the effect of Reynolds number in the highly idealised ocean model, which was originally implemented for the Earth's Wobble equations. For high Reynolds numbers, it was found that the standard linear eddy viscosity model leads to divergence of the Wobble's oscillations while the nonlinear (Smagorinski) viscosity model leads to a physically correct behaviour. It is an interesting result and a publication is in preparation. 2) Incorporation of a more realistic ocean circulation model in the Wobble equations which includes density stratification effects as well as the effect of atmospheric boundary layer through wind forcing.