5.0 CAPACITY-BUILDING ACTIVITIES

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5.1 SCOR Committee on Capacity Building Ittekkot

The 2006 SCOR meeting approved terms of reference for a SCOR Committee on Capacity Building, whose primary purposes are to oversee all of SCOR's capacity-building activities and to help the SCOR Secretariat manage these activities:

- Provide direction for all of SCOR's existing capacity-building activities: participation of scientists from developing countries and countries with economies in transition in SCOR activities, POGO-SCOR Fellowship Program, travel grants, and provision of reports to libraries in developing countries.
- Guide and assist SCOR Executive Director in development of new capacity-building activities, particularly the Regional Graduate Schools of Oceanography activity.
- Assist SCOR-sponsored projects in developing their capacity-building activities.
- Help SCOR arrange funding for existing and new capacity-building activities.
- Assist SCOR in interacting with regional and international groups related to capacity building in ocean sciences, such as the ICSU regional centers, START, IOC regional programs, etc.

Chair:
Claudia Benitez-Nelson (USA)

Other Members: Mary (Missy) Feeley (UK), Vanessa Hatje (Brazil), Venu Ittekkot (Germany), Prasanna Kumar (India), Margareth Kyewalyanga (Tanzania), Sun Song (China-Beijing), Jennifer Verduin (Australia)

Liaisons: Hal Batchelder (PICES), Jim Costopulos (Global Oceans), Julius Francis (WIOMSA), Peter Pissierssens/Claudia Delgado (IODE/IOC), Eric Raes (IIOE-2 Early Career Scientists Network), and Sophie Seeyave (POGO)

The membership of the committee was substantially renewed in 2016 and the committee has been active in improving the processes for requests for travel support for ocean science meetings and for applications for SCOR Visiting Scholars.

5.2 SCOR Visiting Scholars Ittekkot

SCOR began a program in 2009 to enlist the services of ocean scientists from the SCOR community, from both developed countries and developing countries, both recently retired and active, to teach short courses and to provide more extended on-site education and mentorship at developing country institutions. Some countries and/or individual institutions have requirements for their scientists to retire at a given age, sometimes as early as 60 years of age. Many retired ocean scientists are still interested in teaching and mentoring, and are supported by pensions after their retirement, so do not need salary support. Some active scientists can also use some of their already-supported work time to work in a developing country.

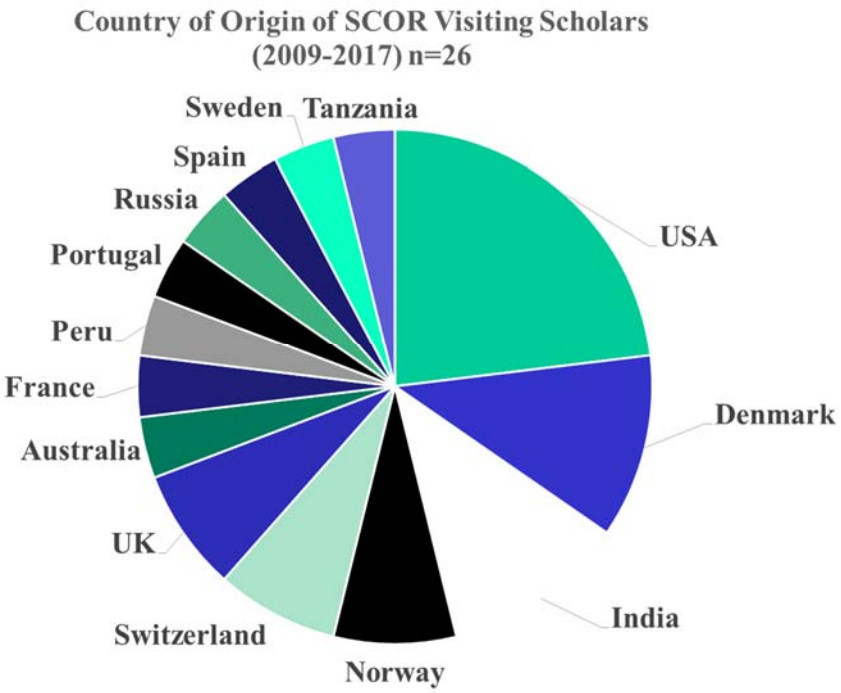
Hosting visiting scientists, whether retired or active, can have many benefits to host institutions also, such as inspiring, motivating, and informing students and faculty, and leading to future collaborations between the visiting scientist and the host institution.

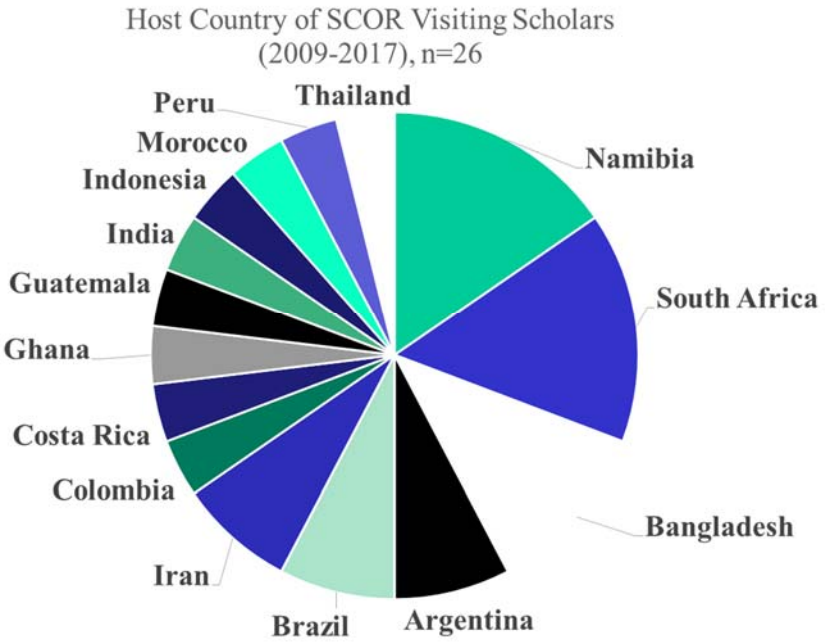
The idea of this program is to regularly send ocean scientists interested in short-term visits to developing countries. The program is a partnership, with the host institution providing local accommodation and SCOR finding resources to pay for airfares and other local expenses, as necessary. The participating scientists donate their time. SCOR Visiting Scholars might be onsite for as little as two weeks to as long as visa requirements would allow. Applicants may already have selected a host institution or SCOR will help identify hosts. Information about the program is available at http://www.scor-int.org/SCOR_Visiting_Scholars.pdf. The SCOR Visiting Scholars who are making their visits in 2017 are shown below. The call for applications for 2018 Visiting Scholars Will be made after the SCOR meeting in Cape Town.

2017 SCOR Visiting Scholars

Catherine Jeandel	France	Brazil	17 June – 16 July	marine chemistry, particularly trace elements and isotopes
Josep Pelegri	Spain	Colombia	18 May – 20 June	ocean circulation, emphasizing the basic dynamic processes in the ocean at multiple time and space scales
Sam Dupont	Sweden	Costa Rica	29 Oct.-12 Nov.	Experimental design for ocean acidification experiments
Janet Spintall	USA	Indonesia		introduction to physical oceanography, ocean currents, and tides
Julia Jabour	Australia	Iran	June 2017	Legal and policy status developments of the Southern Ocean in relation to the Antarctic Treaty System and the UN Convention on the Law of the Sea

The five SCOR Visiting Scholars for 2017 were supported by US$7,500 from the U.S. National Science Foundation, $4,745 from SCOR dues, and $255 from crowdfunding. We will attempt to increase the crowdfunding portion in 2018. The call for applications for 2018 SCOR Visiting Scholars will be issued after the SCOR meeting.


Country of Origin of SCOR Visiting Scholars
(2009-2017) n=26
Sweden
Tanzania
Spain
Russia
Portugal
Peru
France
Australia
UK
Switzerland
Norway
India
Denmark
USA


Host Country of SCOR Visiting Scholars
(2009-2017), n=26
Peru
Thailand
Morocco
Indonesia
India
Guatemala
Ghana
Costa Rica
Colombia
Iran
Brazil
Argentina
Bangladesh
South Africa
Namibia

5.3 POGO-SCOR Visiting Fellowships for Oceanographic Observations Urban
SCOR and the Partnership for Observation of the Global Oceans (POGO) have been co-funding a program of Visiting Fellowships for Oceanographic Observations since 2001. In 2016, five individuals were funded through the program.

www.ocean-partners.org

Report on the 2016 POGO-SCOR Fellowship Programme and summary of selected candidates for the 2017 POGO-SCOR Fellowship Programme

This year saw the seventeenth fellowship programme implemented using POGO funds with supplementary financial support from SCOR. As the POGO Members had to be consulted on this year's budget expenditure at POGO's annual meeting at the end of January 2017, the announcement was posted on 8 February 2016, with a closing date of 7 April 2017.

A total of 28 applications were received this year, which was significantly fewer than the previous year. Applicants were from 16 countries.

With the combined available budget from POGO and SCOR, 4 candidates were selected, from Chile, India, Morocco, and Nigeria.

The applications were screened independently by a committee of six, with representation from SCOR, POGO and partners of POGO (including host supervisors of fellows from 2016). 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.

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 for the 2016 cohort (the fellowship holder, the supervisor at the parent institute and the supervisor at the host institute) have been requested to submit short reports at the end of the training period. The reports that follow are from the 2016 fellowships that were completed. From previous fellowships, both host and parents supervisors, as well as the fellows themselves, have indicated that these exchanges should lead to effective capacity building at the host institute and facilitate longer term collaborations between the institutes concerned. All have previously concluded that the programme serves a useful purpose.

There is tremendous interest in the fellowship programme at all levels, both in oceanographic institutions of developing nations, as well as among leading scientists who are eager to contribute to this initiative. It is seen to fill 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 from 2017

Parent Institutions:

Chile	University of Concepción
India	ESSO-National Centre for Antarctic and Ocean Research
Morocco	Mohammed V university of Rabat
Nigeria	Federal University of Technology, Akure

Host Institutions:

Canada	University of Moncton
France	Laboratoire d'Etudes en Géophysique et Océanographie Spatiales (LEGOS)
Norway	University of Bergen
UK	The Scottish Association of Marine Science

Gender distribution

5-6

Male: 3
Female: 1
During 2016, five candidates were selected and they came from Argentina, Ivory Coast, Malaysia and South Africa. The host institutions included Helmholtz Centre for Ocean Research Kiel, GEOMAR (Germany), Hokkaido University (Japan), National Oceanography Centre (UK), Plymouth Marine Laboratory (UK) and University of East Anglia (UK).

Demography of Fellowships from 2016

Parent Institutions:

Argentina	Universidad Nacional del Sur
Argentina	Instituto Argentino de Oceanografía (IADO)
Côte d'Ivoire	Centre Universitaire de Recherche et d'Application en Télédétection (CURAT) /Université Félix Houphouët-Boigny (Côte d'Ivoire)
Malaysia	Universiti Malaysia Terengganu
South Africa	South African Environmental Observation Network

Host Institutions:

Germany	Helmholtz Centre for Ocean Research Kiel (GEOMAR)
Japan	Faculty of Fisheries Hokkaido University
UK	National Oceanography Centre
UK	Plymouth Marine Laboratory
UK	University of East Anglia

Gender distribution
Male: 4
Female: 1

Reports from 2016 Fellows and their Host Supervisors

Jethan d'Hotman – South Africa
Parent supervisor and institution: Dr. Juliet Hermes – South African Environmental Observation Network.
Host supervisor and institution: Dr. David Smeed – National Oceanography Centre, United Kingdom.
Fellowship period: 1-31 October 2016 (1 month)
Topic: Enhancing South Africa's sustained offshore observational capabilities through Argo and mooring arrays.

Report from Fellowship holder, Jethan d'Hotman:

My fellowship was split between two institutions, the National Oceanography Centre (NOC) in Southampton where I received training on moored Conductivity, Temperature and Depth (CTD) data processing and validation second part of the fellowship was spent at the British Oceanographic Data Centre (BODC) in Liverpool where I received training on Argo data management.

At the NOC I was given the processing routines and began work to apply them to South Africa's data sets. This enabled me to gain skills in IT coding as well as improving my knowledge of systems needed to process and validate data efficiently, this was mirrored during my training at the BODC.

Currently in South Africa methods for processing and validation of moored CTD's are still being developed. During the fellowship these methods were described in incredible detail and will be applied to local datasets in the future. The Argo training was an in depth overview of the BODC's Argo data centre. This training was aimed at showing me the full scale of operations to consider when setting up an operational data centre. This training will lead to the eventual setup of a South African Argo data centre.

This fellowship programme provided a great opportunity to learn and discuss interesting ideas on data processing and validation techniques with the international community and to gain invaluable skills not yet applied in the local oceanography community. The skills and knowledge gained through this fellowship will be extremely important in furthering my career in oceanography.

Report from host supervisor, Dr. David Smeed:

During his visit Jethan completed three main activities:

- He attended the "7th EGO conference on autonomous gliders and their applications". This meeting hosted at NOC Southampton was an opportunity to learn about the current research and latest technical developments with underwater gliders.
- Next Jethan spent two weeks working within the RAPID team at NOC Southampton. In particular Jethan learnt about the procedures and software for calibrating Microcats (instruments used to measure temperature and salinity on oceanographic moorings). Jethan was able copy the relevant software packages and started to make the modifications necessary to implement the same procedures.to process data collected by SAEON in South Africa.
- In his final week Jethan worked with staff in the British Oceanographic Data Centre in Southampton to learn about data management best practice. He was then taught about the data processing stream at BODC, focussing in particular on delayed-mode and Near Real Time data management of the Porcupine Abyssal Plain fixed point observatory. Jethan then visited NOC Liverpool where he learnt about the processing, archiving and dissemination of data from the Argo program.

Jethan was an enthusiastic participant in all of the above activities. While work remains to be done to implement the procedures for Microcat processing at SAEON Jethan covered all of the necessary material and made a good start on the implementation.

There are many common scientific interests between NOC and South African scientists. In particular we share the goal of expanding and maintaining the SAMBA array for measuring the overturning circulation in the South Atlantic. The SAMBA array has much in common with the RAPID array in the subtropical north Atlantic and we hope that enduring collaboration will develop. We were very happy to have the opportunity to welcome Jethan to NOC and develop further our collaboration with marine scientists in South Africa.

Ahon Jean-Baptiste Kassi – Côte d'Ivoire
Parent supervisor and institution: Prof Kouadio Affian – Centre Universitaire de Recherche et d'Application en Télédétection (CURAT) / Université Félix Houphouët-Boigny (Côte d'Ivoire).
Host supervisor and institution: Dr. Marie-Fanny Racault – Plymouth Marine Laboratory.
Fellowship period: 12 September-12 December 2016 (3 months)
Topic: Characterization and monitoring of upwelling areas in Ivorian waters for fishery valorization using remote sensing data.

Report from Fellowship holder, Ahon Jean-Baptiste Kassi
During the training period, we worked with chlorophyll-a data product version 3 at 4x4km and 8-day resolutions from the European Space Agency Ocean Colour Climate Change Initiative (OC-CCI) project. We have also extracted and the temperature and wind data at 12.5x12.5km resolutions from the European Centre for Medium-Range Weather Forecasts (ECMWF). All biological and physical datasets are state-of-the-art products, and cover the period 1997 to 2014.

Indices of phytoplankton phenology (timings of initiation, peak, termination, and duration) were obtained from the host supervisor using an algorithm based on remote-sensing chlorophyll data. Upwelling index and turbulence have been calculated based on wind data components. In-situ data of Sardinella catch were obtained from the ministry of fisheries and Aquaculture for the period 1997 to 2014 for the fishing area in the waters front of Abidjan. In collaboration with the host supervisor and with PML remote-sensing colleagues, we have been able to provide better explanations of the phytoplankton phenology and its influence on the life of Sardinella aurita fish species in Ivorian waters.

The results show that the physical variables (upwelling index and turbulence) act on the phytoplankton. In turn, the growth of phytoplankton will influence the recruitment of the Sardinella fish larvae and the subsequent fish catch in the following year. Under conditions of medium turbulence, two conditions of recruitment of fish occur according to the timing of initiation: 1) if the timing of initiation of phytoplankton growth occurs early, then we have a low catch of Sardinella aurita (in year + 1) for a medium or low upwelling index. When upwelling is high, the catch in year+1 is medium; and 2) if the timing of initiation of phytoplankton growth is

delayed, then we observe high catch of Sardinella aurita in year +1. But if the upwelling index is low, the catch in year+1 is medium.

A model taking as input variables: timing of initiation of phytoplankton growth, concentration of chlorophyll, upwelling index and turbulence was created for the prediction of catches of Sardinella aurita in the year + 1. The selected model achieved an adjusted R2 (taking into account the reduced degree of freedom) of 69%. An article presenting the methods and results is being written.

Furthermore, during my stay, I have studied and practiced under Dr Marie-Fanny's supervision computer-based practical of Bilko software of phytoplankton seasonality from ocean-colour remote sensing, The lesson will enrich our courses at CURAT.

Finally, during my stay, I have been at sea for one-day to observe the sampling of water at the station L4 with the PML field sampling staff. The host supervisor also organised a visit with Dr. Priscilla Licandro to the Sir Alister Hardy Foundation for Ocean Sciences (SAHFOS) to see the Continuous Plankton Recorder.

The training received will be used to process data from the EUMETCAST receiving antenna received at the "Centre de Recherche et d'Application en Télédétection" (CURAT) during the Europe-Africa Marine Network EAMNET project. The codes of phenology algorithm (in Fortran programming language) and of the calculations of upwelling index and turbulence and for the mapping of the different variables (in Ferret programming language) have been obtained, and will be further used and developed with the data that we receive and process from the antenna at CURAT.

We can now better analyse the data with the training received, and this will allow us to develop several research projects at my home institution. I will share the knowledge acquired with the CURAT research colleagues of oceanography team in a seminar at CURAT in 05-06 January 2017. The Bilko software will be used to enhance our practical lessons about the use and applications of remote sensing data. The results of the research project will also improve our understanding of the Ivorian coastal dynamics to help the fishery. With this POGO-SCOR training at the PML, we will enhance student training through future collaborative supervision of undergraduate, masters and PhD projects.

This Fellowship Programme is an excellent opportunity offered to young African researchers. It gives them the possibility to extend their knowledge to the world of research. It allows capacity building by having access to equipped laboratories and to work with dedicated research scientists like Dr Marie-Fanny. These young African researchers like me have the opportunity to improve themselves in their fields and greatly expand their knowledge by discussing with other researchers. The training at the PML allowed me to acquire experience, to produce results for a research publication, to make contacts for future research projects, and to enrich our practical training course at the University. If the program's duration could be extended to longer periods, I would have gained further knowledge and completed/submitted the research article while at PML.

Report from host supervisor, Dr. Marie-Fanny Racault

During his training period at the PML, Dr Kassi has worked with state-of-the-art ocean-colour remote-sensing observations from the European Space Agency Ocean Colour Climate Change Initiative (ESA OC-CCI project), indices of phytoplankton phenology (bloom timing), and reanalysis data products of wind to improve understanding of the variability of catches of the fish species Sardinella aurita in Ivorian waters. In addition, the fellow has learned to work with the ESA Bilko module on the use of phenological metrics to monitor phytoplankton seasonality based on ocean-colour observations.

During his POGO-SCOR fellowship, Dr Kassi learned to use data visualisation tools such as Ferret NOAA PMEL and thus was able to make his own programming scripts to analyse large datasets (i.e., 17 years of weekly and monthly data at 9km resolution). Dr Kassi progressed rapidly in his understanding of remotely-sensed observations, he was very eager to learn and showed very high dedication to his project. He was very pro-active in the development of his research project and analyses. He brought with him local data of fisheries catch, which he analysed in relation to satellite and reanalysis products. He also interacted with other fellows at PML whose expertise were particularly valuable for his project. Dr Kassi successfully demonstrated coherent relationships between S. aurita catch and biophysical drivers in the waters off the coast of Abidjan. He made an original contribution to developing a novel multiple linear regression model to predict catch of S. aurita in the following year (i.e., year+1) based on two biological variables of phytoplankton Chlorophyll-a concentration and the timing of initiation of the phytoplankton bloom, and two physical variables of water column turbulence and coastal upwelling index.

The fellowship has permitted to lay the foundation for the development of collaborations between the Centre de Recherche et d'Application en Télédétection (CURAT) and PML based on common research interests on the development of remote-sensing applications and in particular, the study of climate impact on marine ecosystem resources (fisheries). Dr Kassi has started writing a publication about the "biophysical drivers of Sardinella aurita in Ivorian waters", which he has characterised during his stay at PML. Moreover, Dr Kassi, in collaboration with colleagues from the CURAT and the department for fishing regulation (DPH, Abidjan), will try to obtain and analyse fisheries observations of S. aurita catch back to ~1980 (at present he has analysed catch data from 1997 to 2015). This would allow further testing and validation of the predictive capabilities of the diagnostic model developed during his fellowship.

At his home institution CURAT, Dr Kassi aims to transfer knowledge on the use of remote-sensing data and visualisation tools. As a university lecturer, he will be able to use Bilko lessons and tools to enrich the teaching program in Oceanography at the Université Felix Houphouet-Boigny in Abidjan. In addition, the training offered to him at PML and the acquisition of new and tailored datasets (e.g., the phenology algorithm has been regionally tuned to Ivorian waters) have opened several project fields for students of Master and PhD in Oceanography at the University in Abidjan, with whom we hope to work collaboratively.

The program showed to be highly beneficial to Dr Kassi and should result in knowledge transfer in the parent institution of the trainee. It was also a very positive and stimulating experience for

the host supervisor at PML. The POGO secretariat at PML has been extremely helpful and supportive for the logistic support and overall welcoming of the trainee. During his stay, Dr Kassi gave short PowerPoint presentations about his results in front of a couple of colleagues from the remote sensing group, as well as a visiting colleague from the Mediterranean Institute for Advanced Studies (IMEDEA, Spain). The trainee beneficiated a lot from these presentations and short meetings as it helped him to organise and summarise his results, and to identify his next research steps. The diagnostic model developed during the project will provide a powerful tool to evaluate and monitor fishing activity in order to establish a Fisheries Information and Management System (FIMS) in Ivory Coast. The presentation of a seminar at the parent institution and the publication of the results in an international peer-reviewed journal will be excellent means to see the trainee's successful achievements, and to promote the POGO Fellowship Programme to the scientific and policy communities.

Celeste López Abbate – Argentina
Parent supervisor and institution: Dr. Gerardo Perillo – Instituto Argentino de Oceanografía (IADO).
Host supervisor and institution: Dr. Juan Carlos Molinero - Helmholtz Centre for Ocean Research Kiel (GEOMAR).
Fellowship period: 1 July 2016–31 August 2016 (2 months)
Topic: Analysis and interpretation of coastal food webs exposed to growing synergistic effects of multiple stressors

Report from Fellowship holder, Celeste López Abbate
The first part of the training (from 06/07/2016 to 01/08/2016) consisted on the learning of different approaches for data screening and filtering and for the detection of structural changes in the time series as regime shift analysis, principal component analysis, piecewise linear regression, ordinary least square cusum (OLS-CUSUM) and wavelet analysis. The second part of the training (from 01/08/2016 to 06-09-2016) consisted on the application of multivariate analytical tools as multiple linear regression, generalised linear models (GLM), generalized additive models (GAM, GAMM, TGAM) regression trees and structural equation modelling. The application of theses analytical tools allowed to unveil long-term dynamics of plankton in the Bahía Blanca Estuary located in the Northern Argentinian Shelf. We analysed the response of phytoplankton and microzooplankton to multiple environmental drivers by using bio-climate data and records or historical anthropogenic pressure over the last three decades and found a significant decreasing trend on plankton biomass and an increasing interplay among environmental drivers derived from mounting anthropogenic stress and climate forcing. Part of these results will be submitted for publication in a peer review scientific journal in the next months.

The description of long term trajectories of plankton in the estuary and the identification of main environmental factors driving their dynamics, will allow the construction of new hypothesis and the development of specific experiments to expand our knowledge on target mechanisms mediating the relationship between plankton and multiple stressors. The received training will be shared with scientists of IADO. For this purpose, a workshop will be organised to review and

exchange analytical tools applied during my training at GEOMAR. Also, scientists from GEOMAR were invited to give a seminar through videoteleconference to share their expertise on the analysis of data series and ecosystem modelling. The positive results of the internship will further promote the bilateral collaboration between scientists from Germany and Argentina.

The POGO Fellowship provides a unique opportunity for students and early career scientists from developing countries to interact with key top scientists working on current topics of ocean sciences and learn about novel analytical techniques. It also promotes the development of international networks thus expanding the possibilities for multidisciplinary science. It is worth mentioning that the internship gave me the opportunity to attend the Hjort Summer School 2016 in Western Norway. The course was focused on microbial oceanography, and offered me a great academic benefit and allowed me to interact with scientists and students from different parts of the world targeting the same topics from different perspectives.

Report from host supervisor, Dr. Juan Carlos Molinero

The aim of the training program was to gain experience on the application of practical tools of data retrieval, temporal analysis and modelling of plankton and environmental data. The activities started early July and were divided in two main parts. During the first part, Ms. López Abbate learned data mining and time series techniques to depict time-varying features of climate signals and ecological responses (i.e. wavelet analysis, cumsum, eigen vector filtering). This allowed charcaterizing temporal patterns of both climate and ecological responses (e.g. phytoplankton dynamics). In a second step, multivariate techniques were implemented using data from the Bahia Blanca estuary located in the middle Argentine coast. In particular, we used principal components analysis and developed indices of anthropogenic forcing to detect main temporal patterns of external forcing on the phytoplankton communities over the last three decades. In addition, statistical models were implemented to quantify biotic and abiotic interactions in the environmental matrix. In particular, we used structural equation modeling, generalized additive and mixed models (GAM and GAMM) and regression trees, which allowed depicting direct and indirect effects driving ecological responses. These results offer novel insights on the long term dynamics of phytoplankton communities over the last three decades in the Bahia Blanca Estuary. They further contribute to the current discussion of the expectation that expanding climate and anthropogenic forcing, and their synergies, might foster ecological shifts in coastal marine ecosystems.

On behalf of the Marine Ecology/Food Webs Unit of GEOMAR headed by Prof. Ulrich Sommer, I can only be positive and say that we have been pleased to have had Celeste López Abbate as a POGO trainee. Ms. López Abbate is a talented and highly motivated scientist that stimulated a dynamic feedback in the group and challenged the quotidian training from new and enriching perspectives. The exciting findings of Ms. López Abbate stimulated the preparation of a manuscript that is ready for submission to Global Change Biology. I feel very confident that she will be extremely successful in her scientific career.

Definitively, during the training period Ms. Lopez Abbate encouraged the cooperation and the knowledge transfer between our institutes. In line with this, Ms. López Abbate has promoted a bilateral cooperation between our institutes by heading the preparation of a bilateral project

Argentine-Germany, which has been recently submitted to both Argentine and Germany funding agencies. The submitted proposal bridges a gap in oceanographic research in the Patagonian shelf and creates synergies with the Argentine Institute of Oceanography to: (1) investigate the mechanisms driving the inorganic carbon flux in the northern Patagonian shelf, (2) identify biogeochemical processes maximizing carbon sequestration, (3) study the architecture of the microbial food web network in areas previously identified as source and sinks of carbon, (4) assess the structuring role of nutrient stoichiometry regarding both the Biological Carbon Pump (BCP) and Microbial Carbon Pump (MCP), and their feedback on carbon sequestration in the northern Patagonian shelf.

I believe that the POGO-SCOR visiting fellowship is an excellent program to promote the training of young scientists from developing countries The experience gained by the trainees, as well as the expansion of their network throughout the training period, will definitively foster the capacity building of trainees leading towards a scientific observation scheme for the oceans.

Mohd Fadzil Akhir – Malaysia
Parent supervisor and institution: Prof. Wan Izatul Asma Wan Talaat - Institute of Oceanography and Environment, Universiti Malaysia Terengganu.
Host supervisor and institution: Prof. Tim Jickells - Centre for Ocean and Atmospheric Science, University of East Anglia.
Fellowship period: 1–30 November 2016 (1 month)
Topic: Data management and deployment planning for ocean glider and oceanographic buoy.

Report from Fellowship holder, Mohd Fadzil Akhir
I conducted intensive discussion and exchange ideas with researchers that were using the Sea Glider facility in UEA. Among details discussion were regarding the deployment preparation, methods and planning. These also included hands on data analysis and data management work based on previous glider data conducted by the team.

In CEFAS, I went through the whole deployment methods of Smart Buoy and later the Wave Rider buoy. I was given a special tour and met with responsible persons that in charge of each department that involves from preparation of the buoy until the data management task where the data being shared with public.

I paid a short visit to Southampton University, National Oceanographic Centre (NOC) to get some ideas on different types of glider facility that they use. Discussion involves the different strength of each different gliders facility i.e. WaveGlider, SeaGLider, Sloccum Glider and in-house developed AutoSub.

I focused my training into 2 main objectives which is equipment deployment that consist of glider and buoy facility, and data management.

Our Institutions has been working on Wave Glider and ocean buoy for observational work in the South China Sea. The training has allowed me to see the better picture of glider and buoy deployment from more experienced institutions. In our institutions, we always knew that there is some improvements which we can make on our ocean observation practices. These two facilities (gliders and buoys) are part of our observation network program, however most of our deployments are only based on trial and error. So far we have lost 2 of our buoys and a wave glider but fortunately, we managed to retrieve the wave glider using our GPS system. Hopefully, the experience I gained from my training will allow me to improve our previous shortcomings, especially things related to deployment planning and methods. Incorporating fresh ideas into the existing practices will hopefully make things more efficient and effective in our future works. Secondly, since long term datasets and continuous observation data provide a lot of information, it requires specific systems that can manage such datasets in a very efficient way. Based on my training, I believe there is much room to improve in our existing data management system. Since our intention is to make data available for sharing, we should use similar systems to that of the UEA Glider Team and CEFAS which are good examples for the improvements we intend to make in my institution.

I believe this effort will not only last during the period of visit but will continue afterwards. The technical skills and data management set-up will always be work in progress, thus I will initiate continuous communication with the host institution and hopefully this initiative will turn into research collaborations. The overall outcome will surely benefit my country ocean observation networks. Through this improved skills and technical empowerment, we hopefully can plan better and provide good datasets so we will gain more understanding of our seas.
The fellowship program is very important financial assistance for researchers especially from developing countries to learn new things from advance institutions abroad. On the other hand, it has opened up opportunities for a wider research network and collaborations. Being able to create new network with leading institutions in oceanography is vital in keeping up with the technology and research advancement in the field. I believe such program is not only a platform to learn new things or new skills, but also connecting yourself to the much wider oceanographic community.

Report from host supervisor, Prof. Tim Jickells
Fadzil worked at UEA with our glider group and also visited colleagues at the nearby government CEFAS laboratory in Lowestoft. This allowed Fadzil to enhance his skills in all aspects of work around ocean gliders and buoys from deployment, through management, data recovery and data processing. We also arranged for Fadzil to visit NOC Southampton and see their autonomous vehicle facility and discuss their work. Fadzil also arranged for himself a visit to an oceanography laboratory in France which he already had some collaborations with. Fadzil also gave a seminar here at UEA on his own existing research programme in Malaysia.
It was a pleasure to host Fadzil for this fellowship. He worked hard here and took considerable initiative to make sure that he got from the visit as much as he possibly could both in terms of operational aspects of working with gliders and buoys, but also in terms of developing contacts with oceanographers in the UK and France. There are already plans for continuing collaborations.

I think the POGO Fellowship Programme is an excellent mechanism for developing skills in oceanography around the world and in building better collaborative links between oceanography institutions around the world.

Juan Manuel Molina – Argentina
Parent supervisor and institution: Dr. Andrea Lopez Cazorla - Universidad Nacional del Sur.
Host supervisor and institution: Dr. Akihide Kasai - Faculty of Fisheries Hokkaido University.
Fellowship period: 3 July–26 September 2016 (3 months)
Topic: Application of NEMURO modeling frame in Argentinean fisheries.

Report from Fellowship holder, Juan Manuel Molina
During the training period I was mentored in the use of models like NEMURO and bioenergetic models by Akihide Kasai and his postdoctoral student Seokjin Yoon. I was introduced to FORTRAN and Visual basic programming and given specific bibliography along with a source code to program with. We used biological information on *Mustelus schmitti*, an Argentinean shark with which I've worked with, to calibrate and tune the models for a demersal chondrichthyan. We are still in communication and working on these models. We believe the work carried out so far merits publication after more work is done to incorporate variations in water temperature as an ocean warming scenario.

Currently at the Universidad Nacional del Sur, work with environmental and bioenergetic models have not been carried out. If the application of the models developed during my stay in Japan are successful, it will mean opening a new research line and eventually will lead to capacity building in these subjects.

At our laboratory in the Vertebrate Zoology chair we have biological datasets of many fish species which would be suitable candidates for modelling, hence the possibility of starting undergraduates thesis projects on this subject is very likely.

The fellowship provided an outstanding opportunity for me. Were it not for this program, I would have been unable to accomplish this training, and obtained these skills. Additionally, the work I started with Professor Kasai is bound to continue as we have both expressed our will to continue working together in this line of research. I hope to be able to put these skills to good use in the future, and be able to train students in the use of these models.

Lastly, the people at the POGO secretariat were always very helpful and kind in replying my questions and dissipating my doubts, my compliments to them.

Report from host supervisor, Dr. Akihide Kasai
During the training period Juan tried to learn how to use the model, which is a bioenergetic model developed by my laboratory. He worked hard to try to use it, by the aid of Dr. Seokjin

Yoon, who is my postdoctoral student. At first, I provided him source codes of FORTRAN and Visual Basic. He finally managed to apply the program to a shark Mustelus schmitti. Juan and I are keeping touch with each other to proceed the model.

Juan worked with energy for his purpose.
I hope this exchange will lead to future collaboration with the trainee's parent institution, on the condition that his supervisor wants to.

The POGO-SCOR Fellowship Programme is very nice, especially for young scientists in advancing countries.

5.4 NSF Travel Support for Developing Country Scientists Urban

SCOR has received support from the U.S. National Science Foundation (NSF) since 1984 to provide funding for SCOR capacity building activities. Most of the funds are used for travel grants for scientific meetings, although a portion are used for SCOR's contribution to the POGO-SCOR Fellowship Program and the SCOR Visiting Scholars program. Travel grants are awarded to ocean scientists from developing countries and the former Soviet Union, Eastern Europe, and other countries with economies in transition, to enable them to attend international scientific meetings. The most recent three-grant ended on 30 June 2017. Here are some statistics:

- 161 individuals from 35 countries received support to participate in 45 different meetings and programs.
- The average grant size was US$1114.89.

A new three-year grant was approved in July 2017, running from 1 August 1 2017 to 31 July 2020.a

The amount of the award from NSF is $75,000 per year. Recipients of SCOR travel awards are always chosen in consultation with the organizers of meetings that SCOR has agreed to cosponsor; direct applications from individuals are not accepted by the SCOR Secretariat. Priority is given to applicants who are presenting a paper or poster at the meeting or to those who have some special expertise or regional knowledge to bring to a workshop or working group. Preference is also given to younger scientists. In general, care is taken to ensure that the recipients of SCOR/NSF funds are *active* scientists, and that they have not received similar support from SCOR in the previous two years. All travel grant recipients are informed that their support comes from SCOR and that it is made possible through NSF funding.

Requests come in throughout the year and the SCOR Committee on Capacity Building considers new requests between meetings. The following requests have been approved since the 2016 SCOR annual meeting:

Meeting/Program	Dates	Place	Amount
POGO-SCOR Fellowships	Various	various	$10,000
SCOR Visiting Scholars	Various	various	$7,500

GEOTRACES Training in Japan	16-18 January 2017	Japan	$3,000
WAP Working Group Workshop	15-26 May 2017	Cambridge, UK	$2,500
IOI	24 May-21 July 2017	Halifax, Canada	$3,000
PICES early career scientist symposium	30 May–2 June 2017	Busan, Korea	$2,500
2017 Edition of the Ramon Margalef Summer Colloquia – Spatial and temporal patterns in physical-biological oceanic processes: from scale interaction to the rise of the living ocean	3-12 July 2017	Barcelona, Spain	$3,000
Regional Sea Level Changes and Coastal Impacts	10-14 July 2017	New York City, New York	$3,000
1st GEOTRACES Summer School	20-25 August 2017	Toulouse, France	$5,000
IMBER IMBIZO V	2-6 Oct. 2017	Woods Hole, Mass., USA	$7,500
GODAE International School: New Frontiers of Operational Oceanography	2 -13 October 2017	Mallorca, Spain	$3,000
2017 PICES annual Meeting	22 Sept.-1 Oct. 2017	Vladivostok, Russia	$2,500
Tenth WIOMSA Scientific Symposium	30 October – 4 November 2017	Dar es Salaam, Tanzania	$4,000
CODATA 2017	8-13 October 2017	St. Petersburg, Russia	$3,000

The Committee on Capacity Building developed a new request form, which has been used for new requests.

Additional requests will be approved by the SCOR Committee on Capacity Building before the SCOR annual meeting and will be reported on at the meeting.

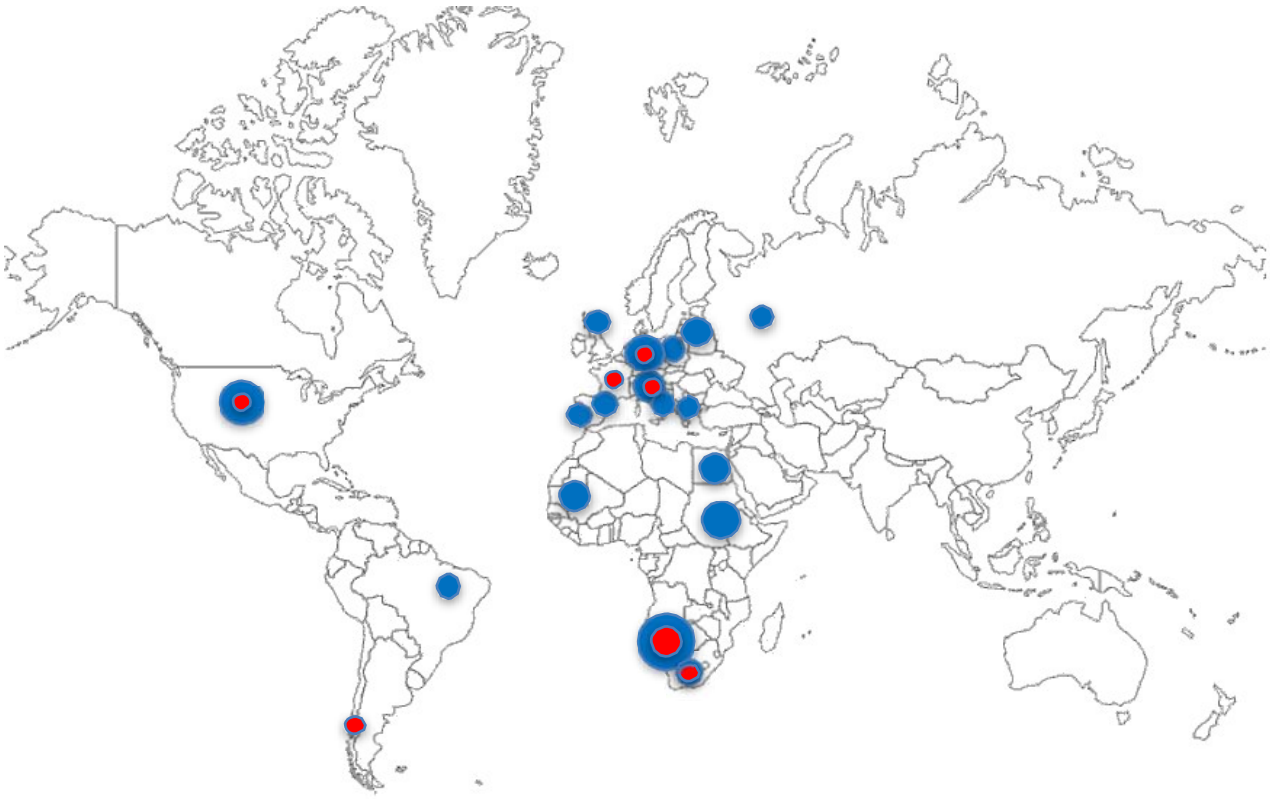
5.5 Research Camps at University of Namibia Urban

SCOR has supported "Research Camps" at the University of Namibia Henties Bay campus for the past 4 years, through funding from the Agouron Institute. The 4th Camp was held on April 13-May 12, 2017. These camps have brought together graduate students, post-docs, and instructors from Namibia, other African countries, and other countries of the world to learn ocean science through doing research together. The camps bring together resources from the University of Namibia, the national fisheries agency, participants, and the Agouron Institute.

We are in the process of evaluating the results of the first 4 years of the program to determine whether to continue and, if so, any changes that should be made. At the end of August 2017, Venu Ittekkot and Ed Urban will visit individuals in Windhoek, Henties Bay, and Swakopmund who have had responsibility for the camps to discuss their views on the results of the program and their interest in continuing it.

Who participated in Research Camps (2014–2017)

Students ( ): Namibia, Kenya, South Africa, Senegal, Egypt, USA, Greece, Switzerland,



Poland, Portugal, Brazil, Estonia, Germany, Italy, Spain, Scotland, Russia

Instructors ( ): Namibia, South Africa, USA, Switzerland, France, Chile, Germany

UNAM
UNIVERSITY OF NAMIBIA

RGNO - Regional Graduate Network in Oceanography

RGNO

Integrated Earth Systems Sciences - Oceans

Biogeochemical Oceanography in Upwelling Ecosystems

4th African Ocean Discovery Camp for research-based Training on the Sustainable Use and Scientific Management of Marine Ecosystems

April 13 – May 12, 2017
at the University of Namibia's Sam Nujoma Research Center in Henties Bay and Namibia's National Marine Information and Research Center in Swakopmund

For dedicated early career researchers who care about the Oceans: PhD candidates and honors MSc students majoring in one of the ocean science fields, professors, lecturers and active young scientists holding an equivalent advanced degree with specialization in oceanography.

What are Ocean Discovery Camps	Opportunities to collaborate in an interdisciplinary research project with guidance and supervision by local and international scientists at the Sam Nujoma Campus and possibly in internships abroad.
Goals	To learn about current research projects and to develop future research directions for a better understanding of the consequences of local and global environmental alterations for the functioning of the Benguela Current Upwelling Ecosystem.
Scope	Interactions between chemical, biological, physical and geological topics related to marine biogeochemistry and ecosystem research. Molecular and other modern techniques applied to understanding biogeochemical processes. Environmental variability and regulation of microbiologically driven geochemical nutrient cycles and consequences for ecosystem sustainability.
Course Structure	Work at sea and along the coast and analyses in the laboratory. Sampling, sample preservation, designing and executing experiments, computer-supported exercises, lectures, paper discussions, model development. Symposium day: Presenting research findings, sharing knowledge, collaborating in further project developments.
Course Location	One week "Floating University" on the R/V MIRABILIS (operated by the Namibian Ministry of Fisheries and Marine Resources). Three weeks on land at the Sam Nujoma Campus, the University of Namibia's regional Center for Research and Training in Oceanography in Henties Bay, and at Namibia's National Marine Information and Research Center in Swakopmund.
Language	English
Course Costs	9500 NAM$ or equivalent in US$. A limited number of fellowships is available for qualified and passionate applicants from economically developing countries.
Application	Follow instructions given on the Course Website. http://www.microeco.ethz.ch/rgno_namibia_17/RGNO_Namibia_17.html
Application Deadline	**March 10, 2017**. Acceptance letters will be sent electronically within 10 days.
Further Information	From the Course Website (see above)
	From the Course Coordinator Dr. Chibo Chikwililwa cchikwililwa@unam.na or from the Course Directors: See Course Website

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