

## **Report on the 2018 POGO-SCOR Fellowship Programme and summary of selected candidates for the 2019 POGO-SCOR Fellowship Programme**

This year the nineteenth fellowship programme has been launched, jointly supported by POGO and 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 2019, the announcement was posted on the 6 March 2019, with a closing date of 30 April 2019.

A total of 29 valid applications were received this year (exactly the same number was received in 2018). Applications were received from 18 countries (15 countries in 2018). The highest number of applications (5) was received from India.

With the combined available budget from POGO and SCOR, 5 candidates were selected from: Cameroon, Cote d'Ivoire, India, Iran and South Africa.

The applications were screened independently by a committee of four, with representation from SCOR, POGO and partners of POGO (including host supervisors of fellows from 2018). 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 2018 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 here follow are from the 2018 fellowships. Both host and parents supervisors, as well as the fellows themselves, have indicated that these exchanges lead to effective capacity building at the host institute and facilitate longer term collaborations between the institutes concerned. All have concluded 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 for 2019**

### **Parent Institutions:**

Cameroon	The University of Yaoundé
Cote d'Ivoire	Centre Universitaire de Recherche et d'Application en Teledetection (CURAT) / Universite Felix Houphouet-Boigny
India	National Centre for Coast Research (Ministry of Earth Sciences)
Iran	Iranian National Institute for Oceanography and Atmospheric Sciences
South Africa	Nelson Mandela University

### **Host Institutions:**

France	Laboratoire d'Etudes en Géophysique et Océanographie Spatiales
Canada	Université du Québec à Rimouski
UK	Scottish Association for Marine Science
France	Université de Bretagne Occidentale (UBO)
UK	National Oceanography Centre

### **Gender distribution**

Male: 3

Female: 2

## Demography of Fellowships from 2018

During 2018, four candidates were selected and they came from Turkey, India, Colombia and Indonesia. The host institutions included:

Helmholtz-Zentrum Geesthacht, Institute for Coastal Research, Germany

Plymouth Marine Laboratory, UK

Mediterranean Institute for Advanced Studies (IMEDEA), Spain

Lamont-Doherty Earth Observatory, Columbia University, USA

## Reports from 2018 Fellows and their Host Supervisors

### **Sevil Deniz Yakan Dündar - Turkey**

Parent supervisor and institution: Prof.Dr. Oya Okay, Istanbul Technical University.

Host supervisor and institution: Dr. Rüdiger Röttgers – Helmholtz-Zentrum Geesthacht, Institute for Coastal Research, Germany.

Fellowship period: 4 October - 31 December 2018

Topic: The effect of local currents and eddies in the Istanbul Strait by means of the bio-optical parameters of phytoplankton collected from the coastal waters.

### **Report from Fellowship holder, Sevil Deniz Yakan Dündar:**

#### **A brief description of activities during the training period:**

SNAP (Sentinel Application Platform) software is used to evaluate the images of OLCI sensor installed on Sentinel 3A satellite. Bio-optical parameters of the region of interest were examined. Absorption measurements, an important parameter of inherent optical parameters, were followed at the laboratory. General preparation for the ship campaigns, equipments used on board and experiments performed afterwards were investigated.

#### **What applications of the training received do you envision at your parent institution?**

To mention about the SNAP software at the under-graduate level oceanography lectures; to prepare homeworks about remote sensing and its applications like evaluation of the general characteristics of the marine environment by using the satellite images; to propose collaboration projects with the researchers in other institutes of my university (e.g. Euroasia Earth Sciences Institute), with the researchers in other universities (e.g. Middle East Technical University, Marine Sciences Institute), and with the researchers of the host institute (Helmholtz Zentrum Geesthacht).

#### **Your comments on the Fellowship Programme:**

I have benefited from many advantages of the fellowship. I got familiar with observational aspects of marine sciences; I have seen different research environments and working styles. I have contacted with many researches, and that gave me the opportunity to have future collaborations. I have gained lots of information about the

subject I have trained, and I would like to transfer this knowledge to the younger generation. Thus, I believe that the number of the projects and interested people related with the observational oceanography will increase each year.

**Report from host supervisor, Dr. Rüdiger Röttgers, Helmholtz-Zentrum Geesthacht Institute for Coastal Research Remote Sensing, Germany.**

**A brief description of the activities during the training period:**

In the first weeks, the trainee learned to use a common software tool (BEAM/SNAP) to process, view and work with optical satellite data. In the second period she learned to access the different satellite data from a number of independent sources (NASA, ESA, Eumetsat) and collected and downloaded data for her area of interest (Marmara Sea, Black Sea, Strait of Istanbul). Here the focus was on Sentinel-2 and Sentinel-3 Level 1 and Level 2 data. Further on she processed data for different, common parameters like chlorophyll, suspended matter and CDOM and checked plausibility of obtained concentrations and possible local oceanographic structures and patterns. She also looked for and compared with level-3 and level-4 ocean colour data from the GlobColour project and Ocean-Colour CCI with regard to climatological annual cycles in her regions of interest. In a second phase she went through most of our laboratory methods, measuring optical and radiometric properties and familiarized herself with common optical in situ instrumentation, with a focus of future applicability at the home institution.

**Please provide your comments on the performance of the trainee.**

The trainee was very eager to learn all new aspects of optical remote sensing in coastal waters. Most of the time she worked independently after the basic information and sources were given to her. Beside daily discussions, she was giving bi-weekly short talks to the working group on her own initiative, and showed what she had done so far and to discuss further steps. During her time here she was an active part of the working group and member of the institute.

**Is this exchange likely to lead to future collaboration with the trainee's parent institution?**

Yes, I think there is a very good chance for future collaboration, and exchange of students.

**Please provide your comments on the Fellowship Programme:**

It was a nice experience with the trainee and a rather easy way to take part on the Fellowship programme from our side. I will be happy to do it again

**Dr. Martin G.D – India**

Parent supervisor and institution: Dr. Anu Gopinath – Kerala University of Fisheries and Ocean Studies, India.

Host supervisor and institution: Dr. Andy Rees, Plymouth Marine Laboratory, UK.

Fellowship period: 24-09-2018 – 21-12-2018.

Topic: Regulation of Greenhouse gases (N<sub>2</sub>O and CH<sub>4</sub>) at a coastal time series station (Western Channel Observatory, UK): Stable Isotopic approach.

**Report from Fellowship holder, Dr. Martin G.D – India:****A brief description of activities during the training period:**

The main objective of the training was sample preparation and analysis of stable isotopes <sup>15</sup>N and <sup>18</sup>O in N<sub>2</sub>O in sea water using Stable Isotope Mass Spectrometry (SI-MS) and N<sub>2</sub>O & CH<sub>4</sub> by Gas Chromatography. We conducted different experiments in sea water and in air samples (outside atmospheric air) for standardizing the method. Analytical hardware and software were used for data processing. During the training period we visited Rothamstead Research at North Wyke, an agricultural research centre, which too is working on similar measurements and calibrations. We developed a reliable system of work and collected samples of sea surface water, weekly from the Western Channel Observatory. We also conducted a study in different estuarine regions like Millbrook, River Lynher, Cargreen, Tauy, Davis Point and Plym from the Western Channel.

**What applications of the training received do you envision at your parent institution?**

I got training to use SI-MS and gas chromatography for greenhouse gas measurements. I also gained knowledge on, how to process and interpret data from these instruments. These instruments and methodologies are entirely new for my institution and me. I will share this experience and knowledge to the researchers in my university. In the near future, I will try to develop new studies in the university.

**Your comments on the Fellowship Programme.**

POGO-SCOR visiting fellowship is an excellent programme that gives opportunity to visit and acquire knowledge from the leading oceanographic and marine sciences institutes from around the world. It is a very useful programme for the early career researcher to gain knowledge from leading scientists in the oceanographic research. I was very glad to work with Dr. Andy Rees, who was my host supervisor. Working under him was enjoyable as he was an extremely helpful and patient supervisor with profound subject knowledge. I also thank Ian Brown, Lisa Al-Moosawi and Dr. Rachael Beale, our team members for all their help. I would also like to thank the Pogo Secretariat, particularly Dr. Sophie Seeyave, and Ms. Laura Ruffoni for giving me this wonderful opportunity and for their help during my stay in PML.

## **Report from host supervisor, Dr. Andy Rees, Plymouth Marine Laboratory, UK:**

### **A brief description of the activities during the training period:**

The training was organised into 3 components:

- a) Familiarisation with stable isotope mass spectrometry (SI-MS) and gas chromatography and sample preparation. During which time Martin was instructed in or shadowed PML colleagues in the use of these instruments with respect to analytical hardware and the software used to control them and for data processing. During this time we visited Rothamstead Research at North Wyke, an agricultural research centre where colleagues were working on similar measurements and introduced myself and Martin to their procedures and calibration regime.
- b) Method development. The SI-MS system is designed to provide analyses of N<sub>2</sub>O in gaseous samples. Martin spent a good part of his time at PML in refining our existing methodology in order to develop a protocol that provides high precision analyses of <sup>15</sup>N and <sup>18</sup>O in N<sub>2</sub>O dissolved in seawater.
- c) Sample analysis. Once a reliable system of work was developed Martin then spent time in the collection and analysis of samples from the local River Tamar and Plym estuaries and coastal waters forming the Western Channel Observatory. For the time that he was here Martin found that the isotopic signature of coastal waters was very much in equilibrium with the overlying atmosphere, though samples collected in local estuaries showed great peculiarity in terms of river and position sampled.

### **2) Please provide your comments on the performance of the trainee.**

Martin was a pleasure to host, his background knowledge and experience was highly appropriate to the topic and his enthusiasm and dedication to the project was commendable. My colleagues (and family and friends) all enjoyed Martin's company and found the manner in which he conveyed his expertise as an environmental scientist very engaging. I look forward to reading Martins account of his time at PML as unfortunately there was not time for Martin to produce a detailed report or summary of his experiences whilst he was here.

### **3) Is this exchange likely to lead to future collaboration with the trainee's parent institution?**

I would like to think that Martins visit has provided a great opportunity for the two institutes to collaborate in the future. Certainly the research arenas of both have overlapping concerns and there should be great potential for shared expertise to be used in addressing future research projects. On a personal basis I wholeheartedly offer my mentorship and support to Martin whenever this may be required.

### **4) Please provide your comments on the Fellowship Programme.**

This experience proved what a great opportunity the fellowship programme offers. Not only to the fellow who I believe learned and experienced a great deal but hopefully to

the capacity building potential that he might now offer to his university and greater geographic region. There is also considerable benefit to myself and host institute who learned and grew from this shared experience.

**Juan David Osorio-Cano – Colombia**

Parent supervisor and institution:– Dr. Andrés F. Osorio, Universidad Nacional de Colombia at Medellín, Colombia.

Host supervisor and institution: Dr Alejandro Orfila Förster - Mediterranean Institute for Advanced Studies (MEDEA), Spain.

Fellowship period: 08/09/2019 to 18/11/2019

Topic: Observation and Modeling of hydrodynamic processes along Balearic Islands.

**A brief description of activities during the training period:**

In order to deal with different observing approaches to understand the main physical processes at different scales from the nearshore to the shelf, the main activities during the training period were focused on field activities as follows:

- Maintenance of tidal sensor at Pollensa port: Cleaning and re-installing of the tidal sensor to allow on-line data of tidal level and water temperature. Communication system was also checked to verify data transmission.
- Assistance in a mooring line recovery using the vessel from SOCIB. The activity was complemented with the measurement of several CTD profiles close to Cabrera Island to allow the calibration of the data provided by the sensors attached to the mooring line.
- Maintenance of the wave buoy at Palma Bay: Assistant as a scuba diver during the wave-buoy revision as part of the protocol to confirm that all the components from the structure (buoy, CTD sensor, ADCP sensor, weather station, mooring line) were working properly.
- Field campaign at Cala Millor as part of the Beach Risk project where different activities were carried out: bathymetry using a Multihaz ecosounder, sediment sampling and habitat mapping to determine areas where *Posidonia* is located, HF-radar measurements and recovery and deployment of a new ADCP sensor to measure waves and currents.
- Cruise SOCIB-Canales: Assistance during CTD measurements across the Ibiza and the Mallorca Channel. The purpose of those profiles was seasonal calibration points for the near continuous Glider monitoring of the Ibiza Channel. Measurements were made with the SeaBird SBE9 + instrument and the oceanographic Niskin bottle rosette for water samples at different depths. The collected water was used to: salinity analysis with a PORTASAL salinometer, analysis of dissolved oxygen using the Winkler titration method (on board), Nutrient analysis, determination of chlorophyll concentration and study of the

phytoplankton community. The cruise also included the deployment of a glider and a drifter as a support of a Lagrangian experiment.

### **What applications of the training received do you envision at your parent institution?**

After the training programme, new methodologies and innovative measuring techniques were identified in order to improve the amount and quality of marine data at my parent institution and country. The ones I envision the most are related with:

- Glider measurements including web based glider command-control and a real time data delivery system.
- Real-time monitoring platforms including HF-radar systems, wave buoys and weather stations. All this sensors must be measuring in real time bringing data to all the community, which is missing so far at my parent institution and even my country since not all the information taken by DIMAR (Maritime General Division from the Army) is available.
- The acquisition and use of a Multihaz Eco sounder to get more accuracy and useful information of the sea bottom surface to help understand the role of the coastal ecosystems (e.g., coral reefs, sea beds) and the ecosystems services provided by them.

It is clear that this envision will require a very big investment from the government and to look for external resources, but also the transfer of knowledge to our students and colleagues in order to have more people in Colombia prepared to face future challenges in combination with marine technologies.

### **Your comments on the Fellowship Programme.**

I'm very satisfied with the Fellowship programme since the terms and conditions were very clear from the beginning and the financial support was good enough for traveling and maintenance. The communication by email was also very fluid and all the doubts were clarified in a timely manner. In conclusion, I'm very happy to have had the opportunity to be part of the Fellowship Programme and all the experience within IMEDEA/SOCIB which definitely helped me to gain more knowledge about ocean observations system, opening the possibility to stablish cooperation with other colleagues from Spain. At the moment I'm still in contact with Professor Alejandro Orfila from IMEDEA and the idea is to keep this collaboration in future, looking for new opportunities of researching/working together.

### **Report from host supervisor, Dr Alejandro Orfila Förster, Mediterranean Institute for Advanced Studies (MEDEA), Spain:**

#### **A brief description of the activities during the training period:**

The main activities performed by the Trainee have been:

- Development of software for bottom type-classification. Data from a multi-beam echo sounder.



- Introduction to the use of gliders.
- Maintenance of in-situ tidal sensors.
- Assistance in a mooring line recovery in a NSF Project.
- Maintenance of the wave buoy at Palma Bay: Assistant as a scuba diver during the wave-buoy revision as part of the protocol to confirm that all the components from the structure (buoy, CTD sensor, ADCP sensor, weather station, mooring line) were working properly.
- Risk Beach experiment in Cala Millor. Multisensory implementation using video cameras, microwave radar, ADCP, ADV and echo-sounding. Processing of data and data filtering.
- SOCIB-Canales experiment. CTD measurements and water sample analysis.
- Introduction to Lagrangian techniques: drifting buoys and Finite Size Lyapunov exponents.

**2) Please provide your comments on the performance of the trainee.**

Dr Juan D. Osorio's performance has been very satisfactory. He has been working in different topics related with ocean and coastal data acquisition and data analysis working with different instruments and techniques. He was able to apply different approximations to solve complex problems both in real experiments as well as at the lab. I strongly think that he can take profit from all the knowledge that he has acquired to his future career in Colombia. At the personal level I found him a very pleasant person.

He was always able to interact with different scientist at all levels (pre, postdocs and senior researchers) in many different topics. I am convinced that we will continue collaborating in the future in many scientific problems.

**Is this exchange likely to lead to future collaboration with the trainee's parent institution?**

Yes.

**4) Please provide your comments on the Fellowship Programme.**

This is the first time that we hosted a Trainee from this Programme and the results are better than expected. We will host in the future Fellows from POGO-SCOR since this is a unique opportunity to teach foreign pre and post-doctoral researchers for short term periods in a different environment. The economic conditions for the trainee were good for the period of his stage. I would like to have more information for future calls.

**Arief Wibowo Suryo – Indonesia**

Parent supervisor and institution: Nelly Florida Riama, M.Si (Center of Meteorology Maritime of Indonesian Agency for Meteorology, Climatology, and Geophysics/BMKG), Indonesia.

Host supervisor and institution: Prof. Arnold L. Gordon (Lamont-Doherty Earth Observatory of Columbia University).

Fellowship period: 05/11/2018 - 06/01/18- 6/12/2018

Topic: "Investigate the relationship of the eastern tropical Indian Ocean surface mixed layer to MJO events in February – April, 2015, 2017 and 2018".

**Report from Fellowship holder, Arief Wibowo Suryo:****A brief description of activities during the training period:**

I received several phase of training during my stay in Lamont-Doherty Earth Observatory. First phase was familiarizing with the CTD data of INAPRIMA cruise that I brought. The raw data need to be processed and changed to format that readable in MATLAB and ODV. With guidance from Arnold and his PhD student, I created the script in MATLAB to make the files imported to MATLAB and ODV.

After all the data successfully imported, then I check the quality of each cruise using TS diagram. Because it spikes showed different shape than the previous years, it appears that 2018 data was fault due to the error in CTD equipment. So I only focused on the 2015 and 2017 CTD data.

The next phase was looking into the ARGO float data near the area and the time of INAPRIMA cruise. Also from Arnold suggestion, I looked into the GO-SHIP data from CLIVAR program and found the IO9N ship was collecting CTD data near the INAPRIMA cruise in 2016.

Then in the last place I discussed with Arnold what to do with the data I've collected. We conclude that I will look into the water mass analysis during cruises of 2015 to 2017. Soon this will lead to paper publication in Indonesia.

**What applications of the training received do you envision at your parent institution?**

The skill I gathered during the training will be really useful for myself and my colleagues at work. I intend to do small training to my colleagues on how to use MATLAB and ODV. The training I will conduct in a week to all my colleagues. Besides that, in 2-3 months I will look more into the water mass analysis in eastern tropical Indian Ocean and write paper about it. For the next projects, I will look into the relationship between ITF and MJO or IOD. As these phenomena affecting weather and climate in Indonesia, I'm hoping we can enhance our Ocean Forecast System that was in initial development in BMKG.

**Please provide your comments on the Fellowship Programme:**

I'm very grateful to POGO-SCOR to give me opportunity to train with some of the best minds in oceanography fields in Lamont-Doherty Earth Observatory. It was the best experience learning from Arnold and his team. The insights I got from them was invaluable as I was in early stage learning about oceanography. I intend to pursue higher degree in oceanography field, and this training is perfect opportunity for me to experience first-hand studying with a professor and experts in oceanography. The

program that Arnold and his team laid out for me to follow during the training was easy to follow. I was able to finish my training in time with their guidance.

**Report from host supervisor, Prof Arnold L. Gordon, Lamont Doherty Earth Observatory, USA:**

**A brief description of the activities during the training period.**

The primary activity was to quality control the CTD oceanic data set obtained by BMKG within the period 2017-2018 in the eastern tropical Indian Ocean. This included comparison of those data with historical archived data sets, mainly the data collected as part of the WOCE and CLIVAR programs. We began the task of comparing the BMKG data to the Makassar Strait throughflow time series. Arief Suryo plans to expand on that task upon his return to BMKG.

**Your comments on the performance of the trainee.**

During the ~1 month visit to Lamont-Doherty, Arief Suryo made great progress in applying the methodology of quality controlling the BMKG ocean CTD data and working with software for plotting those data along with archived data. He began looking into relating the eastern tropical Indian Ocean stratification to the Makassar Strait throughflow time series. The Makassar Strait throughflow comprises ~80% of the total Indonesian Throughflow (ITF) and is expected to have a strong impact on the eastern Indian Ocean stratification, with a time lag, estimated to be ~2 years. He began evaluating the role of the eastern tropical Indian Ocean in governing Madden-Julian Oscillations (MJO), intraseasonal atmospheric events that then pass over the Indonesian Seas affecting the ITF.

**Is this exchange likely to lead to future collaboration with the trainee's parent institution?**

Yes, the plan is to relate the BMKG data in the eastern tropical Indian Ocean to ITF variability

**Please provide your comments on the Fellowship Programme:**

I really think the POGO-SCOR model is very effective, not just during the period of the visit, but in building longer term collaborative activities.