

5.0 CAPACITY-BUILDING ACTIVITIES

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5.0 CAPACITY-BUILDING ACTIVITIES

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. The approved terms of reference follow:

- 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:

Venu Ittekkot (Germany)

Other Members:

Hal Batchelder (PICES)

Sükrü Besiktepe (Turkey)

Missy Feeley (USA and SCOR Executive Committee)

Mike Lucas (South Africa)

Wajih Naqvi (India)

Ilana Wainer (Brazil)

Jing Zhang (China and IMBER)

The membership of the committee is designed to create a tight linkage with the SCOR Executive Committee. A subgroup of the committee can now meet in conjunction with annual SCOR meetings at little extra cost to SCOR, making it possible for any committee recommendations to SCOR to be acted on immediately. The committee will not meet at the SCOR meeting in Goa, to reserve funding for capacity building activities at the International Symposium on the Indian Ocean in Goa.

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

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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 call for applications for 2016 Visiting Scholars has already been issued and the deadline for applications is 4 December 2015. Five applications have already been received. The SCOR Visiting Scholars who are making their visits in 2015 are shown below and some written reports follow.

2015 SCOR Visiting Scholars

Year	Name	Home Country	Host Country	Dates	Purpose
2015	Nagappa Ramaiah	India	Bangladesh	June 2015	Teach biological oceanography
2015	Kunio Takahashi	Japan	India	To be scheduled	Training course on the Continuous Plankton Recorder
2015	Tony Koslow	USA	Peru	11 April–1 May 2015	seminars/lectures on the development of ocean observation systems for sustainable management of marine ecosystems
2015	Bill Burnett	USA	Brazil	27 July-7 August 2015	short course on “Applications of Isotopic Techniques for Coastal Studies”

Applications of Radioisotopes in Coastal and Environmental Sciences

Report to SCOR

William C. Burnett (Florida State University) and Vanessa Hatje (Universidade Federal da Bahia)

INTRODUCTION

The Scientific Committee on Oceanic Research (SCOR) awarded US\$2500 towards sponsoring a visit by W. Burnett to Salvador, Brazil in order to teach a course on uses of radioisotopes in coastal and environmental sciences. Additional funding for accommodation, hiring boats, equipment needs, etc. was met by funds from the Todos os Santos Bay Project (FAPESB) and the Brazilian Institute of Science and Technology (INCT). It was agreed that Burnett would work closely with V. Hatje to coordinate the course and collaborate with her and her students on a preliminary assessment of Baía Todos os Santos, a large bay in Salvador.

Burnett and Hatje agreed to run the course in two main parts: (1) a week-long series of classroom lectures, assigned readings and problem-solving exercises; followed by (2) a series of practical demonstrations and hands-on experience in the field. The 2nd portion of the course covered two full weeks and included 4 days in a hired boat on the bay, several days sampling groundwater wells on land and one full day making measurements of radon, radium and metals from a mooring at a marina near the famous church of Bonfim.

ACTIVITIES

Approximately 25 students from several different areas in Brazil attended the course. During the 1st week of the course we met each morning in a classroom in the Institute of Geosciences at the Federal University of Bahia and Burnett presented a wide range of applications of natural radioisotopes for coastal studies. We also went over basic laws of radioactivity and radioactive decay equations. After lunch each day, we reconvened and worked on problem sets representative of the types of calculations necessary for environmental applications. The students were also asked to read a series of 10 papers that covered the topics discussed in class.

During the 2nd week of the course, we rotated smaller groups of students through a series of hands-on training that included demonstrations of use of the equipment in the laboratory followed by field radon surveys along the shore of Todos os Santos Bay from a boat. In addition, another group of students deployed on land and sampled groundwater wells and analyzed the samples for radon concentration.

We emphasized radium sampling during the 3rd week using a boat to sample throughout the Paraguaçu Estuary and throughout the bay. While all the radon measurements were completed on site, the “Mn fibers” used for preconcentration of Ra isotopes will be analyzed by two separate laboratories in Brazil. We have plans to hold a Skype teleconference with all major players in approximately 4-5 weeks after the radium isotopes have been measured.

All participants agreed that the course was worthwhile and will stimulate increased activity concerning applications of radioisotopes for coastal studies.

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Applications of Radioisotopes in Coastal and Environmental Sciences

Course Overview

Instructors: William ('Bill') C. Burnett, SCOR Visiting Scientist, Professor (Emeritus) of Oceanography, Florida State University, wburnett@fsu.edu and Vanessa Hatje, Centro Interdisciplinar de Energia e Ambiente, Universidade Federal da Bahia, vanessahatje@gmail.com

Abstract: A short course that will serve as an introduction to the theory, measurement, and especially the application of natural uranium and thorium decay-series (^{210}Pb , ^{226}Ra , ^{222}Rn , etc.), cosmogenic isotopes (^{14}C , ^{10}Be , ^7Be , etc.) and artificial radionuclides (^{137}Cs , ^{239}Pu , etc.) to address problems in the earth, marine and environmental sciences. The use of ^{222}Rn ('radon') and ^{220}Rn ('thoron') for studies concerning groundwater discharge into surface water bodies will be emphasized. The course is directed towards advanced undergraduate and graduate students as well as interested faculty and researchers in Oceanography, Hydrology, Environmental Science and Geology.

Textbook: None, a list of recommended readings from the literature will be made available.

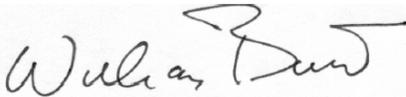
Schedule: Mornings: 2 lecture periods of about 1.5 hours separated by a break.
Afternoons: homework sets, reading references, preparation

Week-1/Day Topics

- 1 1. Radioactivity in the Environment
 2. Basics of radioactivity;
 3. Principles of radioactivity ingrowth and decay, U/Th-series equilibrium, disequilibrium (reading #1, problem set #1)
- 2 4. Radioactive isotopes for geochronology
 5. U/Th disequilibrium dating; U/Th-series dating: carbonates, other minerals (readings #2, #3; problem set #2)
- 3 6. Geochronology via Pb-210 dating (reading #4, problem set #3)
 7. Coastal mixing rates, ages via radium isotopes (readings #5, #6)
- 4 8. Use of Ra isotopes to assess groundwater discharge (reading #7)
 9. Use of Rn-222 to assess groundwater discharges (problem set #4)
- 5 10. Case studies of groundwater assessment via Rn and Ra isotopes
 Radon and thoron as groundwater tracers (readings #8, #9; problem set #5)

Weeks-2, -3: Practical experience, sampling and analysis of radon and radium isotopes from groundwaters and coastal waters. Complete preliminary Ra/Rn survey of Todos os Santos Bay.

Example of course certificate:

	<p>This is to certify that</p>	
<p>GABRIEL COTRIM</p>		
<p>Participated in and completed the</p>		
<p>Applications of Radioisotopes in Coastal and Environmental Sciences</p>		
<p>held in</p>		
<p>Salvador, Brazil July 27th to August 7th 2015</p>		
<p>The training course was organized by the Todos os Santos Bay Project (FAPESB) and Brazilian National Institute of Science and Technology (INCT) Energy & Environment, in cooperation with the Scientific Committee on Oceanic Research (SCOR). The programme of the training course consisted of lectures and practical exercises (40h) and field work at Todos os Santos Bay, Bahia (40h). The course covered the following topics:</p>		
<ul style="list-style-type: none"> • Radioactivity in the Environment • Principles of radioactivity ingrowth and decay, U/Th-series equilibrium, disequilibrium concepts • U/Th isotopes for geochronology • U/Th disequilibrium dating; U/Th-series dating: carbonates, other minerals • Geochronology of sediments via Pb-210 dating • Coastal mixing rates, residence times, ages via radium isotopes • Use of Ra isotopes to assess submarine groundwater discharge • Use of Rn-222 to assess groundwater discharges • Case studies of groundwater assessment via Rn and Ra isotopes • Radon and Thoron as groundwater tracers 		
		
<p>Vanessa Hatje Centro Interdisciplinar de Energia e Ambiente Universidade Federal da Bahia</p>	<p>Instructor William C. Burnet Professor (Emeritus) of Oceanography Florida State University</p>	

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Class photo, Salvador, Brazil:



Equipment and supplies used for the practical portion of the course were coordinated between FSU and 3 Brazilian universities.

REPORT: SCOR Visiting Fellowship to Peru, April 11 – May 1, 2015
Julian Anthony (Tony) Koslow, Scripps Institution of Oceanography, University of California,
SD, La Jolla, CA 92093

I undertook a SCOR Visiting Fellowship with the Instituto del Mar del Peru (IMARPE) in Callao, Lima (Peru) from April 11 to May 1, 2015. Overall, the fellowship was highly successful. During these three weeks, I delivered a series of three lectures to Dr. Dimitri Gutierrez's Biological Oceanography course at Universidad Peruana Cayetano Heredia in Lima. Dr Gutierrez is Director of Oceanography at IMARPE and Research professor and coordinator of the Master's program in Marine Science at UPCH. My lectures covered:

- Ocean observation systems: our window on a changing global ocean
- The meso- and bathypelagic: Ecology and biogeochemistry
- Seamount ecosystems and deepwater fisheries

At IMARPE, I provided a seminar on ocean observation programs and my own research based on the CalCOFI ichthyoplankton time series. This seminar covered some of the same ground as my first lecture at UPCH, but focused more on current research and in particular on the use of ichthyoplankton data to assess the impacts of changing ocean conditions on marine communities, the subject of my collaboration with IMARPE scientists.

The major focus of my visit was my collaboration with Ms Patricia Ayon, head of IMARPE's zooplankton and ichthyoplankton laboratory, to prepare her laboratory's data set on larval fishes for multivariate community time-series analysis. This would enable us to examine the response of the fish community in the Humboldt Current to ocean variability and change. Her laboratory, following the practice of CalCOFI and other ichthyoplankton laboratories around the world, identifies and enumerates a number of ichthyoplankton taxa besides those used directly in current stock assessments (e.g., for anchovetta). Mean annual larval abundance can serve as a proxy for adult stock biomass, so the IMARPE time series potentially provide a window onto broad fish community changes in the Humboldt Current over decadal time scales, much as the CalCOFI time series point to major changes in fish communities in the California Current (Koslow et al. 2011, 2013, 2014).

The IMARPE time series is characterized by greater spatial and temporal sampling variability than the CalCOFI surveys, which for many years have followed a fixed survey pattern at monthly or seasonal intervals. Identification of less-common taxa has also evolved over the period of IMARPE plankton surveys. As a result, the fellowship period primarily entailed assembling the ichthyoplankton data set and evaluating the spatial and temporal sampling variability and level of taxonomic identifications over time. This has now been achieved for the data up to 2004; over the coming months, Ms Ayon will update her database for the last 10 years (2005-2014), at which time we plan to initiate further analyses in relation to community responses to climate. Given the complexity of the Peruvian ichthyoplankton data set and the changes it has encountered over the years, we believe the fellowship period was highly productive, insofar as the groundwork was laid for further teaching and collaborative research to carry the project forward. Dr Gutierrez has invited me to participate in future teaching at UPCH,

and Ms Ayon and I have discussed future visits either by her to Scripps or me to IMARPE to build on the work initiated in during this fellowship period.

I should add that Ms Ayon, Dr Gutierrez, members of the zooplankton and ichthyoplankton laboratory and other scientists at IMARPE were wonderfully hospitable. I always felt most welcome and truly enjoyed my stay. My accommodation in Miraflores, provided by IMARPE, was quite suitable, and because the accommodation was a considerable distance from the IMARPE laboratory in Callao, they provided a driver and transport to and from the lab each day. Peru is an interesting country with warm and friendly people, a wonderful cuisine and a deep and fascinating history. All these factors contributed to a marvelous stay.

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 2013, four individuals were funded through the program.



Report on the 2015 POGO-SCOR Fellowship Programme

This year saw the fifteenth 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, the announcement was posted on 2 February 2015, with a closing date of 31 March 2015.

This year saw a total of 50 applications, which was slightly greater than the previous year. This was possibly a result of a wide distribution of the announcement for applications as the POGO network widens. Applications were received from 21 countries.

Since the budget from POGO was reduced this year, four candidates were selected, from Chile, China, Ivory Coast and India. This year's host institutions included Georgia Institute of Technology (USA), Colorado Center for Astrodynamic Research (CCAR) - University of Colorado at Boulder (USA), NorthWest Research Associates (NWRA) in collaboration with NOAA/Pacific Marine Environmental Laboratory (PMEL) (USA) and Plymouth Marine Laboratory (UK).

The applications were screened independently by a committee of six, with representation from SCOR, POGO and partners of 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.

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) have been requested to submit short reports at the end of the training period. Many of the fellowships are currently in progress or yet to be completed and their reports are expected to be received by the end of the year. 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 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.

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Demography of Fellowships

Parent Institutions of Successful Candidates:

Chile	University of Concepcion
China	South China Sea Institute of Oceanology (SCSIO), Chinese Academic of Sciences (CAS)
Ivory Coast	Centre Universitaire de Recherche et d'Application en Télédétection (CURAT) / Université Félix Houphouët-Boigny (Côte d'Ivoire)
India	Inter University Centre for Development of Marine Biotechnology, School of Marine Sciences, Cochin University of Science and Technology

Host Institutions:

USA	Georgia Institute of Technology
USA	Colorado Center for Astrodynamics Research (CCAR) - University of Colorado at Boulder
USA	NorthWest Research Associates (NWRA) in collaboration with NOAA/Pacific Marine Environmental Laboratory (PMEL)
UK	Plymouth Marine Laboratory

Gender distribution

Male: 4

2015 Fellows



Jose David Donoso – Chile

Parent supervisor and institution: Prof. Ali Belmadani – Department of Geophysics, University of Concepcion.

Host supervisor and institution: Prof. Emanuele Di Lorenzo – Georgia Institute of Technology.

Fellowship period: 22 August-20 November 2015 (3 months)

Topic: Advanced numerical ocean modeling by means of high-performance computing.

David Donoso is currently working as a research assistant on the project “Dynamics of striations and eddies off central Chile” (www.chilejets.com) lead by Dr. Ali Belmadani, assistant professor at the Department of Geophysics (DGEO), University of Concepcion (UDEG), Chile. His duties are to process and analyze atmospheric and oceanographic data from the Eastern South Pacific (ESP) in order to get the forcing and initial conditions for a series of high-resolution numerical simulations using the Regional Ocean Modeling System (ROMS). While the control simulation that has been developed is comparable to the real ocean, future sensitivity experiments will reveal the contributions of various generation mechanisms for a new kind of oceanic currents called striations. The large number of sensitivity runs to be carried out requires an extensive

computational resource. Thus, the training requirements are to acquire the necessary skills to configure, use and take advantage of high-performance computing (HPC) applied to ROMS. The training will be on data assimilation and the advanced use of ROMS in the framework of Partnership for an Advanced Computing Environment (PACE), which is a HPC environment located at the Georgia Institute of Technology (GATech), Atlanta, USA. It will benefit the current research by using the central Chile ROMS model configuration as a benchmark to run and contrast the sensitivity experiments on the PACE cluster at GATech. In the medium-term future, the acquired skills would allow the fellow to implement data assimilation of ESP regional observations in ROMS at the National Laboratory for High Performance Computing (NLHPC), located at the Center for Mathematical Modeling (CMM), Universidad de Chile, Santiago, Chile. In addition to the benefits of this visit for the long-term research partnership between Dr. Di Lorenzo and Dr. Belmadani, it will also reinforce the institutional collaboration between GATech and UDEC.



Qingyang Sun – China

Parent supervisor and institution: Prof. Danling Tang – South China Sea Institute of Oceanology, Chinese Academic of Sciences.

Host supervisor and institution: Dr. Gad Levy – NorthWest Research Associates (NWRA) in collaboration with NOAA/Pacific Marine Environmental Laboratory (PMEL) (POC Dr. Nicholas Bond).

Fellowship period: 8 July to 24 September 2015 (2.5 months)

Topic: Data analysis, assimilation, and integration of Fixed-Point Time-Series Observations (floats, moorings and buoys) with new satellite ocean observations.

Qingyang Sun's current work focuses on air-sea carbon dioxide (CO_2) interaction in response to typhoons and on the variability of the aerosol optical thickness (AOT) over the ocean due to monsoon evolution using ship-collected and satellite data. Basing his research on ship-collected and satellite datasets poses some problems, especially for typhoon research as the ship data can only be collected after the typhoon passage and the satellite data are then not available (due to cloud cover and precipitation). To extend this work beyond case studies to climate applications, globally, to model implementation, and for comparing oceanic changes between pre- and post-typhoon passage, sustained, long time-series ocean observations are needed and their integration with ship-collected and satellite data is required. Training in data analysis, assimilation, and integration of long time-series observations with ship-collected and with new satellite ocean observations is required for the fellow's current work and future research.

The fellow will receive training in data acquisition, requirements and management of long time series of fixed-point observations (floats, moorings and buoys), including their analysis, assimilation and integration with new satellite ocean observations, as well as the data management and model implementation aspects of such observations. The training would provide a good opportunity to discuss these topics and learn from the expert scientists and engineers at NWRA and PMEL, and to gain experience and develop Qingyang's understanding of the global observational data process and model implementation, which would both the fellow and the parent institution tremendously in future work. The training would lead to more cooperation between SCSIO and NWRA/PMEL on (1) applying of the technology (especially for the pCO_2 mooring)

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in the observing system in SCSIO, (2) developing the oceanic CO₂ products in SCS through cooperation and integration of datasets with the Global Ocean Observing System.



Abaka Brice Hervé Mobio – Ivory Coast

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: Prof. William J. Emery – Colorado Center for Astrodynamics Research (CCAR) - University of Colorado at Boulder.

Fellowship period: 1 September 2015 – 29 November 2015 (3 months)

Topic: Spatial and temporal monitoring of the Ivorian continental shelf surface current fronts: Maximum Cross-Correlation (MCC) technique application

Brice Mobio is currently a researcher and lecturer in remote sensing and oceanography at CURAT at Université Félix Houphouët-Boigny (Cote d'Ivoire). Brice is a member of the oceanography staff of CURAT. Since his thesis, he has dealt with estimation and mapping of ocean surface currents (Ivorian continental shelf). The Maximum Cross-Correlation (MCC) technique used to estimate ocean surface current has provided interesting results. However, better understanding and control of the Maximum Cross-Correlation (MCC) technique is needed to efficiently understand the Ivorian continental shelf surface current system. Training at the Colorado Center for Astrodynamics Research (CCAR) will allow the fellow and his parent institute to reach that goal. W. Emery at CCAR originated this method and has considerable experience applying MCC to different types of satellite data (Sea Surface Temperature, Ocean Color, Synthetic Aperture Radar) to estimate sea surface currents, thus building capacity in that field.

During training, the fellow will perform MCC program with better understanding in order to estimate more precisely the two currents of the Ivorian continental shelf and locate more accurately the area where the two currents meet. He will monitor those convergence areas spatially and temporarily, and carry out an analysis of temperature, chlorophyll, salinity and wind data on this area. This training will allow Brice to develop skills to conduct studies on variability of oceanic parameters, especially in areas where the eastward current meets the westward current. This study will then be extended to the entire Gulf of Guinea to allow regional study. At CCAR, skills will be developed for modelling surface currents to predict and assist economic activities such as fisheries. CURAT and CCAR will establish collaboration with common research programmes. They will involve students and researchers exchange along with experience in ocean surface currents monitoring.



Deepulal Parenkat Mony – India

Parent supervisor and institution: Prof. Chandramohanakumar N.– Inter University Centre for Development of Marine Biotechnology, School of Marine Sciences, Cochin University of Science and Technology.

Host supervisor and institution: Dr. Mingxi Yang, Plymouth Marine Laboratory, UK.

Fellowship period: 15 September to 15 December 2015 (3 months)

Topic: How variability in atmospheric CO₂ and CH₄ concentrations impact the air-sea fluxes of these Greenhouse Gases in a coastal region.

Deepulal Parenkat Mony is currently working on the carbon sequestration potential and methane fluxes in the mangrove ecosystem and adjacent coast zones. The proposed work at PML focuses on the atmospheric variability of CO₂ and CH₄, and their impact on the air-sea fluxes in coastal regions. So the data validation and interpretation will help to develop skills and give hands-on experience with latest instruments installed at host institute.

Observations of CO₂ and CH₄ in the ocean and in the overlying atmosphere are important for understanding the carbon cycle. Globally, the open ocean is a net sink of atmospheric CO₂ and a small source of CH₄. Coastal regions are often influenced by estuarine inputs (which carry elevated dissolved CH₄ concentrations) and demonstrate large seasonality in biological productivity. CO₂ and CH₄ in the coastal atmosphere are influenced by terrestrial emissions and uptake as well as meteorology and dynamics of the marine boundary layer. These factors are expected to cause rapid changes in air-sea CO₂ and CH₄ fluxes in the coastal region. The proposed study will focus on the atmospheric variability of these two greenhouse gases and its impact on the air-sea fluxes. The main aims of study are as follows: 1) Evaluating of the performance of two state-of-the-art CO₂/CH₄ analysers installed at the field station of Penlee Point Atmospheric Observatory (PPAO); 2) Explaining the atmospheric variability of CO₂ and CH₄ with co-collected environmental parameters; 3) Estimating the air-sea fluxes of CO₂ and CH₄ in this coastal environment based on dissolved concentration measurements at the nearby L4 station. This training will help the fellow to understand the rapid changes in the air-sea fluxes of CO₂ and CH₄. After successful completion of training, with the help of Plymouth Marine Laboratory, the fellow would like to do more research on the air-sea fluxes of CO₂ and CH₄, which have not been studied in the south west coast of India.

FINANCIAL SUMMARY

Surname	First Name	Country of origin	Flight paid by SCOR (US\$)	Stipend paid by SCOR (US \$)
Ammamkuzhiyil	Smitha	India	888.61	99.14*
Cozzolino	Ezequiel	Argentina	1289.42	2271.00
Liu	Zhiyu	China	2065.51	3386.32
		Subtotals	4243.54	5756.46
		Total contribution		10,000.00

*This was a contribution towards the total stipend of 1245.19 USD.

5.4 NSF Travel Support for Developing Country Scientists

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 current three-year grant runs from 1 July 2014 to 30 June 2017.

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.



INTERNATIONAL OCEAN INSTITUTE



REPORT ON SCOR FUNDING FOR 2015 IOI TRAINING PROGRAMME

1. INTRODUCTION

This report provides an account of the use of the SCOR funds which were awarded to IOI-Canada for its 2015 training programme on *Ocean Governance: Policy, Law and Management*. The course was conducted at Dalhousie University, Halifax, Nova Scotia from 20 May to 17 July, and SCOR's financial support of US\$4,900 helped enable two marine professionals in their 30s to attend by contributing towards their expenses. The grant-holders were: **Ms Dysi Polite Dyspriani**, Coastal Community Empowerment Analyst, Directorate of Coastal Community Empowerment and Business Development, Ministry of Marine Affairs and Fisheries, Jakarta, Indonesia and **Ms Cheryl Rita Kaur Dalbir Singh**, Senior Researcher, Centre for Coastal and Marine Environment, Maritime Institute of Malaysia, Kuala Lumpur, Malaysia.



IOI-Canada, Dalhousie University, Halifax

2. IOI-CANADA

IOI-Canada (www.dal.ca/ioihfx) is a leading member of the International Ocean Institute's network of centres and focal points (www.ioinst.org) operating worldwide in over 30 countries. Based at Dalhousie University, IOI-Canada is a not-for-profit organisation, federally incorporated under the Canada Corporations Act. Its mission is to promote responsible ocean governance and the stewardship and sustainable use of coastal and ocean resources in Canada and around the world. In pursuit of this, IOI-Canada aims to encourage and develop the potential and capacity of individuals, institutions and communities to foster:

- a network of individuals dedicated to effective coastal and ocean governance;
- management, education, training, research and outreach; and,
- sustainable and prosperous coastal communities.

Interdisciplinary training is its major focus, and an IOI course has been held at Dalhousie each summer since 1981. Through this flagship programme, nearly 670 individuals from over 100 countries have been trained (www.internationaloceaninstitute.dal.ca/alumni/index.php).

3. TRAINING PROGRAMME ON OCEAN GOVERNANCE: POLICY, LAW & MANAGEMENT

The 2015 programme was attended by 12 participants from Africa, Asia, the Caribbean, Europe and South America. They were drawn from a range of disciplines and backgrounds,

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and emphasis was placed on having strong female representation among the group, with equal numbers of women and men in the class.

During two months of interactive studies, the participants were challenged to:

- deepen their understanding of the complexity and role of ocean-related issues in sustainable development;
- strengthen and update their academic knowledge, while also being exposed to practical lessons drawn from actual experience in integrated coastal and ocean management;
- develop relevant skills and networks to help them apply their new knowledge on their return home; and
- assist their countries towards maximising benefits to be derived from the UN Convention on the Law of the Sea, through the proper integration of coastal and ocean management into national and international development strategies.



The course consisted of approximately 200 hours of intensive learning. While it was primarily lecture-based, it also included lively discussions, participant presentations, exercises and simulations involving both individual and group work, several field trips and an international round table. Content was organised thematically as follows, with the detailed syllabus available online (www.internationaloceaninstitute.dal.ca/2015Syllabus.pdf).

- Module 1:** Orientation and Introduction to the Training Programme
- Module 2:** Ocean Sciences
- Module 3:** Integrated Coastal and Ocean Management
- Module 4:** Fisheries and Aquaculture
- Module 5:** Law of the Sea and Principled Ocean Governance
- Module 6:** Communication and Negotiation
- Module 7:** Maritime Security
- Module 8:** Marine Transportation
- Module 9:** Energy
- Module 10:** International Round Table and Conclusion of Training Programme

Lectures and presentations were delivered by about 90 speakers, and included local and international experts and practitioners. Details are available online at: www.internationaloceaninstitute.dal.ca/lecturers.htm.

4. BENEFITS AND OUTPUTS

At the individual level, these SCOR-funded professionals benefited as follows.

Attendance at lectures and presentations led to:

- Enhanced understanding of integrated coastal and ocean management issues;
- greater knowledge of relevant legislation, policy and experience;
- the development of practical skills in areas such as information management, project cycle management, performance management, and communication (including presentations and media interviews);
- valuable networking potential with lecturers and presenters in Canada and internationally.

Making presentations and participating in group exercises, including the course-long simulation, helped:

- facilitate the assimilation of the subject matter;
- strengthen the participants' ability to work co-operatively in groups;
- develop their confidence while providing an opportunity to practice new skills.

Taking part in field trips:

- provided them with increased exposure to a range of oceans-related activities within coastal communities;
- offered opportunities for them to meet practitioners at the grass-roots level, and compare theory with reality.

Studying and living with the other international participants provided:

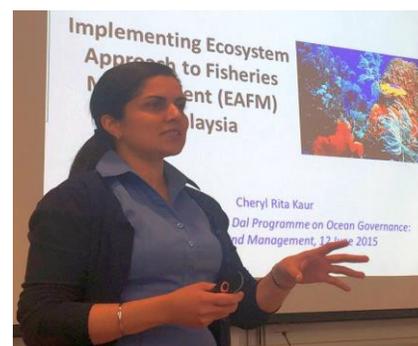
- a unique experience of being part of a group from diverse cultures and backgrounds, sharing different perspectives and examining issues from different viewpoints.

Focusing on how to use their new knowledge and skills on their return home encouraged them to maximise the impact and multiplier effect of the training.

The immediate beneficiaries of this training were therefore the two grant-holders themselves who would not have been able to attend the course without



Dysi P. Dyspriani: *my institution will have a good human resource in applying the knowledge and skills acquired, formulating ocean strategy, law, policy and management, creating good ocean governance*



Cheryl Dalbir Singh: *I am already applying some of the experiences that were obtained from the course into my current role especially in coming up with feasible action plans and strategies to influence environmental and conservation policies in Malaysia.*

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financial support, and the immediate outcomes were increased knowledge, skills, networks and confidence. The grant-holders' organisations and countries also benefited by gaining newly trained professionals aware of, and capable of dealing with, complex ocean issues. Since this training has proved over the last 35 years to give increased potential for alumni advancement, it is hoped that the participants will rise to significant positions of responsibility in their countries and thus be able to influence future policy and management decisions.

5. GRANT EXPENSES

As outlined in the original invoice, the SCOR funds were used to help cover the expenses incurred by Ms Dyspriani and Ms Dalbir Singh. Details are as follows:

<i>Item</i>	<i>COST (USD)</i>
Living Allowance x 2 participants	1,602
Lunch Allowance x 2 participants	513
Group Lunch x 2 participants	179
Dinners, first week x 2 participants	122
Accommodation x 2 participants	2,268
Ground transportation x 2 participants	216
TOTAL RECEIVED AND DISBURSED	\$4,900

6. CONCLUSION

Both the SCOR grant-holders were intelligent, hard-working and committed professionals who made very good use of this unique training opportunity. They participated well in the course and were excellent members of the group. They were keen to learn, contributed to discussions, put in long hours, and co-operated collaboratively with others from a range of backgrounds, countries and cultures. As indicated above, they benefited from their experiences here in a range of ways, and IOI will be following up with them six months after the end of the course to see how they have continued to use and share their new knowledge and skills. Given the importance of creating a multiplier effect with this kind of training, we hope and expect to hear that not only they but also their colleagues and organisations are continuing to benefit from SCOR's generous support. We therefore join Ms Dyspriani and Ms Dalbir Singh in expressing our sincere thanks for helping make their participation possible.

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 2014 SCOR annual meeting:

Activity Name	Dates	Location	Amount granted
SCOR Visiting Scholars	Various	various	\$7500
Polar GRC	15-20 March 2015	Italy	\$4900
International Ocean Colour Science meeting	16-18 June 2015	San Francisco	\$4,900
SOLAS Open Science Conference	7-11 Sept. 2015	Kiel, Germany	\$7,500
SCOR-related workshops at 2015 PICES meeting	16-26 Oct. 2015	Qingdao, China	\$4,900
IMBER Imbizo	26-30 October 2015	Trieste, Italy	\$7,500
Fisheries meeting in Senegal	November 2015	Dakar, Senegal	\$3,000
IIOE-2 Symposium in Goa	30 Nov.-4 Dec. 2015	Goa, India	\$10,000
WG 146 training	9-11 June 2016	Xiamen, China	\$5,000
41st COSPAR Scientific Assembly	30 July-7 August 2016	Istanbul, Turkey	\$3,000

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.