



2016 SCOR Annual Meeting location at the Institute of Oceanology of the Polish Academy of Sciences in Sopot, Poland

SCOR Newsletter

August 2016 • #32

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Ocean Sciences 2016—Afterword

Thank you to those who stopped by the SCOR Booth at Ocean Sciences 2016! It was a pleasure to catch up with colleagues from around the world, meet people I had known only from email communications, and meet many new people who had questions about SCOR. Thank you to Elena Masferrer-Dodas, GEOTRACES Executive Officer, for managing the booth, and to many other volunteers from the projects who spent time greeting people at the SCOR Booth: Bob Anderson, Laurent Bopp, Pip Bricher, Mary Elena Carr, Greg Cutter, Vanessa Hatje, Eileen Hofmann, Stefan Konradowitz, Phobe Lam, Maeve Lohan, Louise Newman, Hajime Obata, Tatiana Rynearson, Reiner Schlitzer, Einar Svendsen, David Turner, and Michiel R. van der Loeff. The video loop put together by Elena attracted many people to the booth (see <https://www.youtube.com/watch?v=lx1cnNx2dhY>).

As expected, Ocean Sciences 2016 was a focus of SCOR activity, with many meetings of SCOR groups before, during, and after Ocean Sciences, and many SCOR-related special sessions at the meeting. Stay tuned over the next year for information about the SCOR Booth at Ocean Sciences 2018 in Portland, Oregon, USA. —Ed Urban

News from SCOR Working Groups

SCOR WG 140 on Biogeochemical Exchange Processes at the Sea-Ice Interfaces (BEPSII) held its final meeting in March 2016, an open meeting designed to attract early-career scientists. The focus of the meeting was to have a final discussion of the activities of the group, discuss the future activities of BEPSII, to be continued as a CLiC/SOLAS group, and discuss the final

papers to be submitted to the Special Feature of *Elementa: Science of the Anthropocene* (see Publications section of newsletter). Seven papers have been published online in this Special Feature so far.

BEPSII was also successful in obtaining financial support from the International Arctic Science Committee (IASC) as a cross-cutting activity. One of the planned activities for the coming years is the organization of a summer school on sea-ice biogeochemistry as a follow-up of the very successful first sea-ice summer school on Svalbard in 2007 during the International Polar Year. Engagement of a new generation of sea-ice scientists is an important goal for the next phase of BEPSII.



Based on various discussions during the past year the following goals and objectives were formulated:

- Develop dedicated consistent methodologies for sea-ice biogeochemical research.
- Establish effective sea-ice biogeochemical data archiving approaches and databases.

- Foster ecological process studies to determine their impact on biogeochemical cycles.
- Foster technological developments towards large-scale, autonomous and high-frequency sampling of sea-ice biogeochemical parameters.
- Improve the representation and evaluation of sea-ice biogeochemistry in regional and Earth System numerical models.
- Synthesize and integrate observational and modeling efforts.
- Continually revise and renew scientific foci, teams, and objectives.

SCOR WG 142 on Quality Control Procedures for Oxygen and Other Biogeochemical Sensors on Floats and Gliders

met in February 2016 in conjunction with the Ocean Sciences meeting. WG 142 is proposing to implement an in-air oxygen measurement routine on all future Argo oxygen floats. Such a routine may be the only way to constrain oxygen data accuracy over the lifetime of a float. The achievable accuracy is very close to the accuracy goal of $1 \mu\text{mol kg}^{-1}$. The group plans to meet one final time in 2017, in conjunction with Argo Science Team Meeting (AST-18) or the Argo Data Management Team Meeting (ADMT-18). This meeting will be used to combine all information available by then on the use of biogeochemical sensors on floats and gliders. It will decide on the form and content of the final WG product and will assign writing tasks on responsibilities to WG member for specific parts of the final document.

SCOR WG 145 on Modelling Chemical Speciation in Seawater to Meet 21st Century Needs (MARCHEMSPEC)

held its second meeting in New Orleans on 21 February, immediately prior to the Ocean Sciences Meeting. Following the first meeting, a subset of the Working Group had drafted a manuscript describing the aims and scope of the planned chemical speciation model. The draft manuscript was reviewed by the Working Group, and has now been submitted to the *Frontiers in Marine Science* Special Issue “Organic ligands - A key control on trace metal biogeochemistry in the ocean”, organized by Working Group 139. It is hoped that this publication will lead to feedback from the marine science community. A second area where the Working Group is keen to receive feedback concerns the requirements of different user groups for chemical speciation models. Currently available program packages had been reviewed by members of the Working Group. Discussion of these reviews was used to define the questions posed to a well-attended Town Hall meeting on 22 February. This gave valuable feedback, and has been followed up by a Survey Monkey questionnaire (see <https://www.surveymonkey.com/r/SGDQQG6>). The aim of this exercise is to ensure that the model design will meet the needs of the marine science community.

SCOR WG 146 on Radioactivity in the Ocean, 5 decades later (RiO5) held its second meeting in Xiamen, China in June. The group updated its progress on its terms of reference and products.

The group is working on four e-lectures that will be made widely available. Also discussed was the group’s efforts to create a database of radionuclides in the ocean, and communication and outreach efforts, including the major review paper that has recently been published online (see Publications section below).

News from Large-Scale Ocean Projects

GlobalHAB— The GlobalHAB Scientific Steering Committee (SSC) met for the first time at the Scottish Association of Marine Science in Oban, Scotland on 8-10 March. In addition, the meeting involved representatives from groups of the Intergovernmental Oceanographic Commission (IOC) of UNESCO, the International Council for the Exploration of the Seas (ICES), the International Society for the Study of Harmful Algae (ISSHA), and the North Pacific Marine Sciences Organization (PICES) to help plan GlobalHAB activities.



SCOR/POGO International Quiet Ocean Experiment (IQOE)

— IQOE’s Science Committee was formed in early 2016 and met for the first time in London, UK in March 2016. The meeting was attended by representatives from several stakeholder groups and the Science Committee agreed to develop six working groups, on (1) Standards and Intercalibration, (2) Data Management and Data Access, (3) Arctic Acoustic Environment, (4) Acoustic Measurement of Biodiversity on Coral Reefs, (5) Acoustic Location of Spawning Aggregations of Fish, and (6) Stakeholder Relations. The terms of reference and memberships of these working groups are being developed. A Web site has been set up for the project, at www.iqoe.org. Thank you to the Institute of Marine Engineering, Science and Technology (IMarEST) for hosting the meeting!

SCOR/Future Earth Integrated Marine Biogeochemistry and Ecosystem Research (IMBER)

— IMBER has been in transition for the past several years, from having IGBP as a co-sponsor to having Future Earth as a co-sponsor, and in transition from the first to second phase of IMBER. The IMBER Science

Plan/Implementation Strategy has been reviewed and reviewers' comments are being considered by IMBER. IMBER will be holding its 5th CLIMECO Summer School in Natal, Brazil in August 2016 and will hold its 5th Imbizo open science meeting in Woods Hole, Massachusetts, USA on 2-6 October 2017. Funding for the IMBER International Project Office has been extended to 2020 and IMBER is in the process of selecting a new Executive Officer.



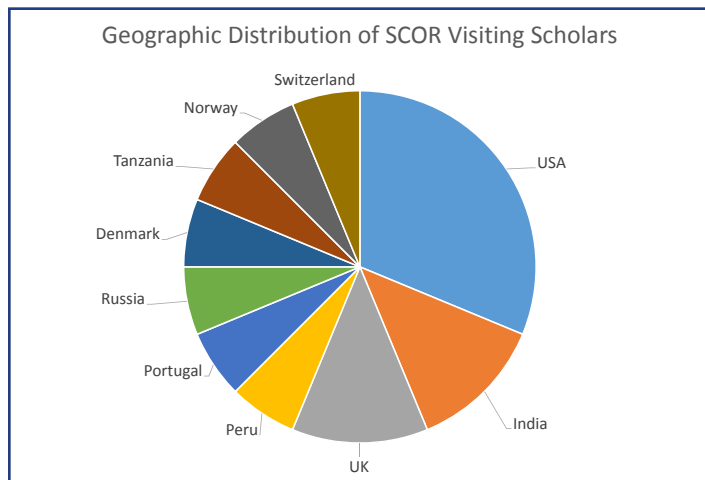
GEOTRACES— GEOTRACES continues its systematic exploration of the chemistry of the ocean. The major activities for the past year have been (1) four cruises in the Arctic Ocean region, (2) preparation for the 2017 Intermediate Data Product, and (3) mid-project synthesis activities. Eighty-six GEOTRACES cruises have been conducted (including 11 International Polar Year cruises) with 946 section stations completed and about 683 peer-reviewed papers published. Planning is underway for Pacific and Indian ocean cruises. The 2017 Intermediate Data Product will be released at the 2017 Goldschmidt Meeting on 13-18 August 2017, in Paris, France. GEOTRACES held two synthesis meetings in the United Kingdom in December 2015, sponsored by the Royal Society, and another synthesis meeting in the United States will be held in August 2016.

SCOR/Future Earth/WCRP/iCACGP Surface Ocean – Lower Atmosphere Study (SOLAS)— SOLAS has added Future Earth as a co-sponsor, in place of IGBP, and is awaiting approval of the response to review of its Phase II Science Plan from co-sponsors. SOLAS is working with Future Earth, IMBER, and other projects to develop an Oceans Knowledge Action Network (KAN). SOLAS is funding two important workshops in June and October 2016. The first workshop was a SOLAS/ESA workshop on concurrent remote-sensing inversions of ocean and atmosphere, which took place at the ESA facilities in Frascati, Italy on 13-15 June. A second workshop will be held in Brussels, Belgium in late October on “SOLAS and Society”.

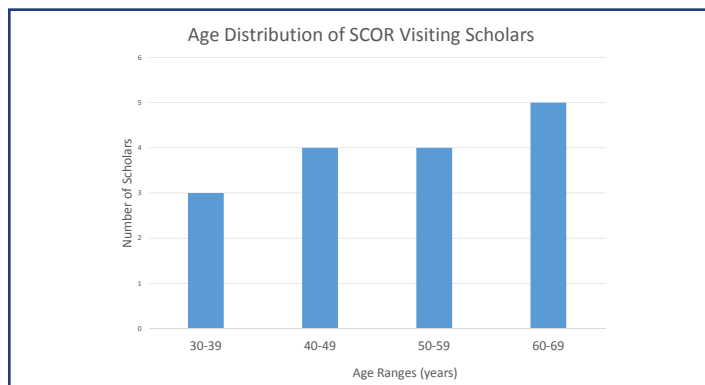
SCOR/IOC/IOGOOS Second International Indian Ocean Expedition (IIOE-2)— The three co-sponsoring organizations—SCOR, the Intergovernmental Oceanographic Commission, and Indian Ocean Global Ocean Observing System—issued a call for nominations of chairs of 6 Science Theme teams and 7 working groups, and the organizations are in the process of selecting chairs of these groups. A call was also put out for members of the groups. A Joint Project Office has been set up, with offices in Perth, Australia and Hyderabad, India. An endorsement process has been developed to increase coordination among individual research projects and cruises in the Indian Ocean see <http://www.iioe-2.incois.gov.in/IIOE-2/EndorsementForm.jsp>.

Capacity Building

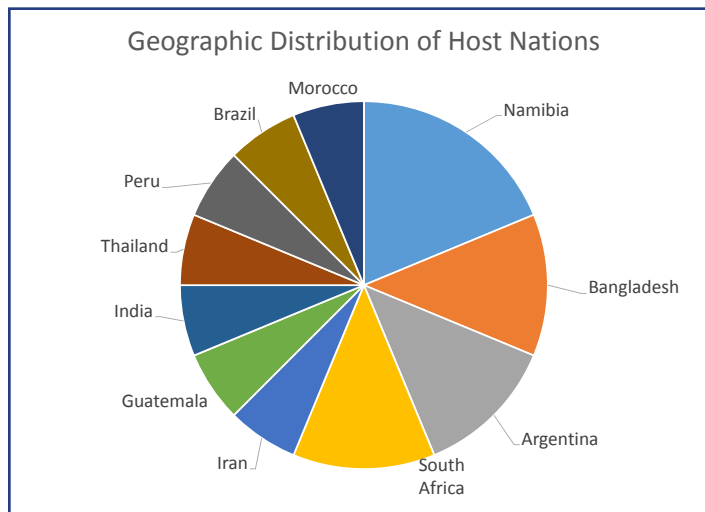
SCOR's Visiting Scholar program is in its 8th year, thanks to funding from the U.S. National Science Foundation. The 16 Visiting Scholars from the first 7 years of the program were sent a questionnaire to assess some demographics of the pool of Scholars and to solicit feedback about the program. Scientists from 10 different countries have served as Visiting Scholars so far:



Most Scholars have been mid- to late-career scientists:



The Scholars have served in 11 developing countries:



SCOR Visiting Scholars have interacted with approximately 200 students and other trainees. Support from SCOR and host

institutions was generally adequate and Scholars appreciated the experience of teaching and mentoring in a developing country. Since most of the host institutions were not in countries that are currently participating in SCOR, it was not surprising that only 65.25% of the institutions were aware of SCOR before the visit of a SCOR Visiting Scholar. So, SCOR Visiting Scholars make SCOR more visible in institutions and countries where SCOR is not well known. Previous Scholars made a variety of recommendations to improve the program, including:

- Increase the number of SCOR Visiting Scholars so that many more people who are genuinely interested to teach/mentor/impart knowledge can use their skills.
- Encourage students for short visits for training/internship.
- Maintain linkages of SCOR Visiting Scholars and host institutions and ensure that they receive SCOR news and opportunities by email.
- Better identify the countries/institutions that can benefit from the program.
- Make grants for longer stays.
- Prepare some specific goals for all scholars.
- Build a database of the Visiting Scholars to make use of their expertise in any other countries needing such expertise.
- Collect the Lecture notes and place them on the SCOR Web site to help showcase SCOR support under the Visiting Scholars program.
- Provide a larger financial grant.
- Foster mentoring partnerships between early career researchers and senior scientists.

The SCOR Committee on Capacity Building will evaluate these suggestions and determine how they could be implemented.

Publications

Buesseler, K., M. Dai, M. Aoyama, C. Benitez-Nelson, S. Charmasson, K. Higley, V. Maderich, P. Masqué, D. Oughton, and J.N. Smith. 2017. Fukushima Daiichi-Derived Radionuclides in the Ocean: Transport, Fate, and Impacts. *Annu. Rev. Mar. Sci.* 2017. 9:1.1–1.31. <http://www.annualreviews.org/doi/abs/10.1146/annurev-marine-010816-060733> – SCOR WG 146

Constable, A.J., D.P. Costa, O. Schofield, L. Newman, E.R. Urban Jr., E.A. Fulton, J. Melbourne-Thomasa, T. Ballerini, P.W. Boyd, A. Brandt, B. de la Mare, M. Edwards, M. Eléaume, L. Emmerson, K. Fennel, S. Fielding, H. Griffiths, J. Gutt, M.A. Hindell, E.E. Hofmann, S. Jennings, H.S. Las, A. McCurdy, B.G. Mitchell, T. Moltmann, M. Muelbert, E. Murphy, T. Press,

B. Raymond, K. Reid, C. Reissy, J. Rice, I. Salter, D.C. Smith, S. Song, C. Southwell, K.M. Swadling, A. Van de Puttecc, and Z. Willis. 2016. Developing priority variables (“ecosystem Essential Ocean Variables” - eEOVs) for observing dynamics and change in Southern Ocean ecosystems. *Journal of Marine Systems* 161:26–41. <http://dx.doi.org/10.1016/j.jmarsys.2016.05.003>

Additional papers in the special Research Topic of *Frontiers in Marine Science* from SCOR WG 139 on Organic Ligands – A Key Control on Trace Metal Biogeochemistry in the Ocean: <http://journal.frontiersin.org/researchtopic/3981/organic-ligands--a-key-control-on-trace-metal-biogeochemistry-in-the-ocean>

Additional papers in *Elementa* from SCOR WG 140 on Biogeochemical Exchange Processes at the Sea-Ice Interfaces (BEPSII): <https://home.elementascience.org/special-features/biogeochemical-exchange-processes-at-sea-ice-interfaces-bepsii/>

ACRONYMS

GOOS	Global Ocean Observing System
IASC	International Arctic Science Committee
iCACGP	Commission on Atmospheric Chemistry and Global Pollution
IGBP	International Geosphere-Biosphere Programme
IIOE-2	Second International Indian Ocean Expedition
IMBER	Integrated Marine Biogeochemistry and Ecosystem Research project (co-sponsored by SCOR and Future Earth)
IOC	Intergovernmental Oceanographic Commission
IQOE	International Quiet Ocean Experiment
POGO	Partnership for Observation of the Global Oceans
SCOR	Scientific Committee on Oceanic Research
SOLAS	Surface Ocean – Lower Atmosphere Study (Co-sponsored by SCOR, Future Earth, WCRP, and iCACGP)
WCRP	World Climate Research Programme
WG	working group