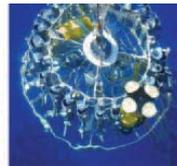




Partnership for Observation of the Global Oceans

Newsletter

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14th POGO Annual Meeting in Cape Town, South Africa

This year's POGO Meeting was hosted by the Marine Research Institute (Ma-Re) of the University of Cape Town, South Africa, from 22-24 January 2013. The meeting held at the Lagoon Beach Hotel Conference Centre was well attended, with over 60 participants from 16 countries coming together for POGO's 14th Annual meeting. In addition to POGO member institutions, key partner organisations including the Intergovernmental Oceanography Commission (IOC) and its project office for International Oceanographic Data and Information Exchange (IODE), the Global Ocean Observing System (GOOS), the Global Alliance of CPR Surveys (GACS) and Group on Earth Observations (GEO) attended the meeting. Additionally, representatives from the Nippon Foundation, a key partner supporting POGO's capacity building programmes attended the annual meeting and presented their vision and philosophy for the development of human resources and network building.

At the start of the meeting a keynote presentation was given by Prof. George Philander, the world renowned expert on ocean-atmosphere interactions who has made significant contributions to the understanding and modelling of large-scale climate variability, including the phenomenon of El Niño. He emphasised the need for capacity building in developing countries. The meeting was then officially opened by South Africa's Minister of Science and Technology, Hon. Mr Derek Hanekom.

In addition to reports on POGO activities from 2012 including capacity building programmes, presentations and discussions included the new GEO task "Oceans and Society: Blue Planet"; international programmes and activities supported by POGO; new developments in ocean observing and outreach; and South African Ocean Observing programmes. A visit to the CSIR/SANAP Glider facility gave an insight to the behind the scenes activities required for successful operation of the gliders, designed to measure oceanic properties autonomously over great distances in the ocean.

The meeting enabled discussion for ways in which to manage the plethora of data from ocean observations that are available and methods that could be considered to evaluate how the data are used and by whom. Additionally, the meetings allowed POGO members to share information and identify areas where international collaboration could be initiated. Ideas of ways in which POGO members could be involved in a celebration of the 500th year anniversary of the Magellan expedition were explored, comparing ocean observation as it was then with today's advanced technologies.

The penultimate plenary session included a series of presentations by POGO members on ocean observations carried out in various regions, including the Central Pacific, the South Pacific, the Southern Ocean, the Sea of Japan, the East China Sea, the Indian Ocean, the North Atlantic, the mid-Atlantic, the Mediterranean Basin and the Arctic.

The next POGO annual meeting will be hosted by CSIRO and IMAS in Hobart, Australia from 22-24 January 2014.



Attendees of the POGO-14 Meeting. Photo Credit: POGO

News from the POGO members

New state-of-the-art Antarctic research station becomes fully operational

British Antarctic Survey conducts research from Halley VI

Britain's newest research station in Antarctica became fully operational in February. Opening one hundred years after Captain Robert Falcon Scott's Antarctic expeditions, the new state-of-the-art research facility demonstrates the UK's ambition to remain at the forefront of scientific endeavour.

Halley VI has been built on the Brunt ice shelf for the British Antarctic Survey. From there scientists will be able to continue their studies of the Earth's atmosphere.

The station is made up of eight separate modules attached together in a straight line. To avoid them becoming snowed in, the modules are supported on giant skis and hydraulically driven legs. The legs allow the station to be raised above the snow line. The entire station can be relocated, which is essential for its future survival given the Brunt ice shelf is moving towards the sea at a rate of four hundred metres per year.



HalleyVI modules
Photo Credit: Antony Dubber/British Antarctic Survey

Hugh Broughton Architects were chosen to design the new station following an international competition. Construction work on the £25.8 m project was carried out over four Antarctic summers. The teams often worked around the clock to beat the onset of the harsh winters.

The modules contain laboratories as well as living quarters. There is also an observatory on top of one of them. The project was funded by the Natural Environment Research Council (NERC) and the Department of Business Innovation and Skills.

Professor Alan Rodger, Interim Director of British Antarctic Survey says,

"The long-term research investigations carried out at Halley since the 1950s have led to deeper understanding of our world. In half a century, society has been alerted to our changing climate, about the possibility that melting ice in the Polar Regions will increase sea-level rise, and that human activity can have an impact on the natural environment. The Polar Regions are the Earth's early warning system – it is here that the first signs of global change are observed."

This article was provided by Paul Seagrove, Press & PR Manager, British Antarctic Survey.

The British Antarctic Survey (BAS) Appoints New Director

Professor Jane Francis has been appointed as the new Director of the British Antarctic Survey (BAS).

On 21st March, it was announced that Professor Jane Francis has been appointed as the new Director of the British Antarctic Survey (BAS). Chief Executive of the Natural Environment Research Council, Duncan Wingham said, "I am delighted to have Jane Francis join NERC as the new Director of the British Antarctic Survey. She joins us at a time in which our need to understand the polar regions has never been more important."

"Jane comes to us with an impressive track record of leadership and achievement in one of the outstanding UK university departments, and is a widely recognised and popular figure in the polar world. We very much welcome her to her new role."



Prof. Jane Francis

Jane Francis, a geologist by training, is Professor of Palaeoclimatology at the University of Leeds where she is currently Dean of the Faculty of Environment. She has research interests in ancient climates, particularly of the polar regions, and has undertaken numerous scientific expeditions to the Arctic and Antarctic, working in collaboration with research teams from many other countries. In 2002 she was awarded the Polar Medal in recognition of her contribution to British Polar Science.

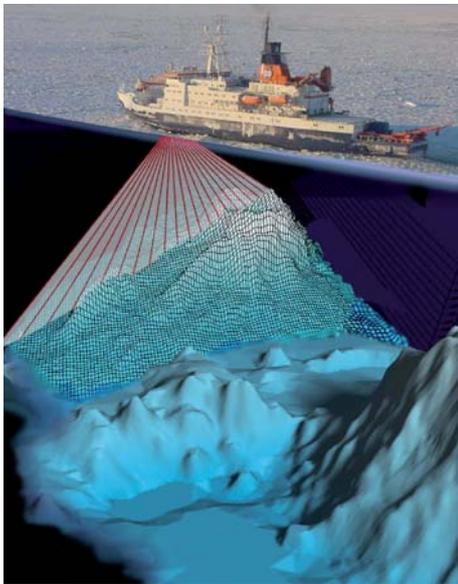
Jane will take up her new post on 1 October 2013, at which time the current interim Director BAS, Professor Alan Rodger, will stand down.

This article was sourced from NERC's website

News from the POGO members (cont'd)

Sharper view of the Southern Ocean: New chart shows the entire topography of the Antarctic seafloor in detail for the first time

Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research leads digital mapping of Antarctic seafloor



Simulation of the RV Polarstern collecting bathymetric data. Photo Credit: AWI

Reliable information on the depth and floor structure of the Southern Ocean has so far been available for only a few coastal regions of the Antarctic. An international team of scientists under the leadership of the Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, has for the first time succeeded in creating a digital map of the entire Antarctic seafloor. The International Bathymetric Chart of the Southern Ocean (IBCSO) for the first time shows the detailed topography of the seafloor for the entire area south of 60°S. An article presented to the scientific world by IBCSO has now appeared online in the scientific journal *Geophysical Research Letters*. The IBCSO data grid and the corresponding Antarctic chart will soon be freely available on the project website at www.ibcso.org and are intended to help scientists amongst others to better understand and predict sea currents, geological processes or the behaviour of marine life.

The new bathymetric chart of the Southern Ocean is an excellent example of what scientists can achieve if researchers from around the world work across borders. "For our IBCSO data grid, scientists from 15 countries and over 30 research institutions brought together their bathymetric data from nautical expeditions. We were ultimately able to work with a data set comprising some 4.2 billion individual values", explains IBCSO editor Jan Erik Arndt, bathymetric expert at the Alfred Wegener Institute in Bremerhaven.

To gather this amount of data the mappers did not just take the trouble to digitize old Antarctic nautical charts and to convert satellite data. They also used a mathematical trick by interpolating the data set. "We treated every existing measurement point like a tent pole to a certain extent and arithmetically covered these poles with a tarpaulin. In this way we obtained approximate values about the height of the tarpaulin between the poles", explains the AWI specialist for data modeling.

This work was worth it: the IBCSO data grid has a resolution of 500 times 500 metres. This means that one data point reflects the depth of a sea area of 500 times 500 metres – a feature that leads to impressive degree of detail.

This article was provided by Sina Löschke, Press Officer, Alfred-Wegener-Institut für Polar.

Carbon Dioxide and Plankton: A New Look at the Chemistry of Ocean Life

Bigelow Laboratory Senior Research Scientist Dr. Mike Lomas co-authors a new study

Recent oceanographic research is challenging a central principle that has been the basis of scientists' understanding of ocean productivity in the surface ocean for over 75 years, including the amount of carbon dioxide that may be consumed by marine plankton.

Bigelow Laboratory Senior Research Scientist Dr. Mike Lomas is a co-author of a new study published online in *Nature Geoscience* recently (Martiny, A.C., Pham, C., Primeau, F., Vrugt, J., Levin, S., Lomas, M.W. 2013. Strong latitudinal patterns in elemental composition of marine plankton and organic matter. *Nature Geoscience*. DOI: 10.1038/NCEO1757). This study shows that the elemental ratios of marine plankton and organic matter exhibit a clear latitudinal trend, with large spatial differences and a global average that can vary substantially from a standard formula, known as the Redfield Ratio, that has traditionally described the relative proportions of carbon, nitrogen, and phosphorus in plankton.



Marine Plankton. Photo Credit: NOAA

(continued on next page)....

News from the POGO members (cont'd)

A research team including scientists from the University of California-Irvine, Princeton University, and Bigelow Laboratory collected and analysed the chemical composition of marine plankton from thousands of ocean samples across the globe, including the waters of the North Atlantic, the Caribbean, and the Bering Sea. The team, whose work was funded by the National Science Foundation, found that the chemical composition in marine plankton communities was significantly influenced by latitude and temperature, and related to changes in the abundance of different plankton groups.

According to the paper's lead author Dr. Adam Martiny, Associate Professor of Earth System Science and Ecology and Evolutionary Biology at University of California-Irvine, "The Redfield Concept remains a central tenet in ocean biology and chemistry," but the team's research shows that elemental ratios in plankton follow a strong latitudinal pattern that differs from the Redfield Ratio.

These findings suggest that the coupling between oceanic carbon, nitrogen, and phosphorus cycles via plankton varies systematically by ecosystem, "with subtropical and tropical ecosystems, regions hypothesized to expand in a future ocean and dominated by smaller plankton, potentially taking up more carbon dioxide than previously thought." said Lomas.

This article was provided by Tatiana Brailovskaya, Director of Communications, Bigelow Laboratory for Ocean Sciences.

New Study Reveals How Sensitive U.S. East Coast Regions May Be to Ocean Acidification

Woods Hole Oceanographic Institution (WHOI) Scientist leads OA study



Wang, far right, and his students and lab members at sea around a CTD rosette
Photo Credit: Taylor Crockford, WHOI

A continental-scale chemical survey in eastern U.S. waters and the Gulf of Mexico is helping researchers determine how distinct bodies of water will resist changes in acidity. The study, which measures varying levels of carbon dioxide (CO₂) and other forms of carbon in the ocean, was conducted by scientists from 11 U.S. institutions and was published in Jan. 2013, in the journal *Limnology and Oceanography*.

"Before now, we haven't had a very clear picture of acidification status on the east coast of the U.S.," says Zhaohui 'Aleck' Wang, the study's lead author and a chemical oceanographer at Woods Hole Oceanographic Institution (WHOI). "It's important that we understand it, because increase in ocean acidity could deeply affect marine life along the coast and has important implications for people who rely on aquaculture and fisheries both commercially and recreationally."

According to the survey, different regions of coastal ocean will respond to an influx of CO₂ in different ways. "If you put the same amount of CO₂ into both the Gulf of Maine and the Gulf of Mexico right now, the ecosystem in the Gulf of Maine would probably feel the effects more dramatically," Wang says. "Acidity is already relatively high in that region, and the saturation of calcium carbonate—the mineral that many organisms need to make shells—is particularly low. It's not a great situation."

The atmosphere is a source of CO₂ in coastal waters, as is nutrient-rich runoff from land, which causes an explosion of biological activity that can lead to decreased oxygen and increased CO₂ and acidity.

Wang and his colleagues collected samples from Texas to Maine along nine different transects that ran from the coast to deep ocean off the shelf break. The researchers measured seawater for total dissolved inorganic carbon (DIC) and compared this to the water's total alkalinity. The ratio of the two is a marker for water's ability to "buffer" or resist changes in acidity.

The study found a high ratio of alkalinity to DIC in the Gulf of Mexico, making it more resistant to acidification, and a steady decrease in that ratio north of Georgia. The Gulf of Maine waters had the lowest alkalinity to DIC ratio, and would be especially vulnerable to acidification should CO₂ levels rise in those waters.

Since the waters of the northeast U.S. are already susceptible to rising acidity, Wang says this raises big questions about how species of marine life—many of which are important to the commercial fishing and shellfish industry there—will fare in the future.

This article was provided by Stephanie Murphy, Manager of Public Information, Woods Hole Oceanographic Institution.

News from the POGO members (cont'd)

Drilling Ship Honors Scripps Oceanography Legend Walter Munk

Science room aboard record-setting vessel now bears renowned geophysicist's name



JAMSTEC President Asahiko Taira with Walter Munk on the deck of D/V Chikyu. Photo Credit: JAMSTEC

Already recognized as the "world's greatest living oceanographer," Walter Munk of Scripps Institution of Oceanography at UC San Diego is adding a new accolade to his lengthy list of lifetime achievements and recognitions. But while his name has been bestowed upon everything from buildings to ocean science awards, the new honor will take his name to locations around the world's seas.

The Japanese deep-sea drilling vessel Chikyu recently renamed its science room the "Walter Munk Library"

in honor of the 95-year-old scientist, known around the world for groundbreaking investigations of wave propagation, tides, currents, circulation, and other aspects of the ocean and Earth.

Launched in 2002, the 210-meter- (688-foot-) long Chikyu features a marine riser and other designs first used by the offshore oil and gas industry to drill deeply on behalf of scientific discovery. Geologists and geophysicists use this capability to extract rarely accessible rock and sediment samples. Such materials carry clues about the planet to help understand its past and more clearly investigate its current motions, chemistry, structure, and microbial communities. Last September Chikyu set a world record by drilling 2,111 meters (6,925 feet) below the seafloor off Japan's Shimokita Peninsula, a depth unmatched by previous scientific missions.

"Visiting the Chikyu was an exciting adventure," said Munk, who received his Ph.D. from Scripps in 1947. "I had not been on a drilling vessel since we drilled aboard the CUSS1 off Guadalupe Island fifty years ago. The work aboard the Chikyu is most impressive, and so is the presence of scientists from fifteen countries collaborating on a challenging venture. I was greatly honored to have the ship's library named for me. It is nice to know that Scripps is being remembered half way around the world."

This article was provided by Cindy Clark, Director of Scripps Communications

Maria Island joins international ocean monitoring network

Key facility detects increasing ocean acidification monitors carbon cycling in the Tasman Sea

The \$150,000 mooring with its suite of environmental sensors is one of three in Australia's Integrated Marine Observing System (IMOS) that are included in the international network in which scientists at CSIRO and the Australian Institute of Marine Science are playing a central role.



New Mooring off Maria Island Photo Credit: CSIRO

The mooring, built at CSIRO's Hobart Marine Laboratories was deployed late last year at Maria Island, bringing the number of IMOS instruments at the Maria Island site to four. The instruments are managed and operated by CSIRO and the data is available free to the public at <http://www.csiro.au/tasman/nrsweb/> or <http://imos.aodn.org.au/webportal/>

The observations made by the new mooring will provide data to determine the ocean acidification change and will fill a key need in assessing how the marine ecosystems of our region might be impacted. Leading the acidification

research is Dr Bronte Tilbrook from CSIRO's Wealth from Oceans Flagship, who said the uptake and storage of carbon dioxide by the ocean is causing changes in the seawater chemistry and increasing acidity levels of surface waters.

Dr Tilbrook said the Australasian region contains some of the world's most extensive carbonate-based ecosystems, ranging from the coral reefs of the Great Barrier Reef and Indo-Pacific, to the earth's largest cool-water carbonate platform along the southern Australian shelf. Predicted impacts range from a decline in the growth of shells and skeletons of important species including corals and some shellfish, to shifts in the structure and dynamics of ecosystems.

The surface waters of the Southern Ocean are where some of the most profound shifts in carbonate chemistry will occur by mid-century, potentially influencing the survival of deep-sea coral communities and calcifying pelagic species. Areas where deeper waters seasonally upwell are expected to have higher carbon dioxide concentrations that could accelerate the exposure of ecosystems to acidification earlier than in other regions.

Sensors on the Maria Island mooring take measurements of temperature, salinity, oxygen, chlorophyll and turbidity, while water samples are taken each month for plankton and nutrients. Basic measurement samples have been collected at Maria Island by CSIRO technicians monthly since 1944, providing scientists with an enviable ocean monitoring record.

This article was provided by Craig Macaulay, Communication Advisor, CSIRO Environment Group

News from the POGO members (cont'd)

The first meeting of JAMSTEC Advisory Board

POGO Members Participate in the 1st meeting of JAMSTEC Advisory Board



Attendees of 1st JAMSTEC Advisory Board Meeting. Photo Credit: JAMSTEC

The first meeting of JAMSTEC Advisory Board was held at Yokosuka Headquarters and Yokohama Institute for Earth Sciences of JAMSTEC from 18th to 20th March 2013. It was the first time for JAMSTEC to organise an international advisory board on the whole activities of JAMSTEC.

The board was chaired by Dr. Susan Avery, the president of Woods Hole Oceanographic Institution (WHOI), and consisted of top leaders of major oceanographic institutions and scientists from Australia, France, Germany, Japan, the Republic of Korea, the United Kingdom, and the United States.

After being briefed on an overview of JAMSTEC and its major research and technological development activities, and observing facilities and equipments including the Earth Simulator and submersibles, the board members very actively discussed future direction on JAMSTEC's research and technological development, its management, and partnership with universities and overseas institutions. A full list of the attendees can be seen at http://www.jamstec.go.jp/e/jamstec_news/20130418/

This article was provided by Aska Vanroosebeke, International Affairs, JAMSTEC.

Update on POGO capacity building

POGO-SCOR Visiting Fellowships 2013

The 9 successful candidates for the 2013 programme have now been selected and notified. They hail from Argentina, Brazil, Chile, China, Croatia, India, Nigeria and Tanzania. This year institutions that will host fellows are GEOMAR, LOCEAN, Plymouth Marine Laboratory, University of East Anglia, University of Maryland and University of South Florida.



Smitha Ammamkuzhiyil,
"Satellite data processing, interpretation and the modelling of primary production"



Marina Azaneu,
"Using seagliders as an important tool for observing ocean shelf regions"



Zhiyu Liu,
"The Study of Internal Wave-Submesoscale Eddy Interactions"



Olubunm Nubi,
"Analysis and interpretation of oceanic data and their interconnectivity"



Žarko Kovač,
"Modeling primary production of the Adriatic Sea"



Joeline Ezekiel,
"Seasonal and spatial variations of phytoplankton in Rufiji Delta, Southern Tanzania"



Gungan Motwani,
"Phytoplankton pigment analysis by HPLC and its application in the development of phytoplankton functional type algorithms"



Ezequiel Cozzolino,
"Advanced training in the processing of remote sensed oceanographic data for the Argentine Sea"



Dubrava Kirievskaya,
"The Chukchi Sea benthic data synthesis: contribution to the assessment of a potential vulnerability of the ecosystem"

Update on POGO capacity building (cont'd)

POGO-PAP GreenSeas Fellowship 2013

Following the success of, and high demand for the POGO-AMT fellowship programme, POGO has set up a new fellowship in partnership with the Porcupine Abyssal Plain (PAP) cruise programme and the EU project GreenSeas. The first successful fellows will join the PAP cruise this summer. The PAP Observatory is coordinated by Dr Richard Lampitt and Dr David Billett (National Oceanography Centre, Southampton, UK).

The PAP sustained observatory has been the focus of repeated study of the entire water column and seabed since 1989. It is at an open ocean location with water depth of 4800m and is thought to be influenced little by the adjacent continental shelves and the mid Atlantic ridge. It is subject to less vigorous hydrographic influence than many open ocean sites and as such processes occurring in the euphotic zone exert a direct influence on the underlying water and seabed. The observatory comprises a variety of sensors, which make meteorological, biogeochemical and physical measurements on the properties of the lower atmosphere, the water column and the seabed, some of the data being transmitted every few hours to shore via satellite. This provides data on the time varying properties of the location but in addition to this they provide the temporal context for ship based research cruises which visit the site once or twice per year.

This fellowship programme is open to scientists, technicians, graduate students (PhD/MSc) and post-doctoral fellows involved in oceanographic work at centres in developing countries and countries with economies in transition.

Two successful candidates were selected in the inaugural year of the initiative. In 2013, one candidate from Columbia will have the opportunity to visit Denmark and a second candidate from Turkey will visit the UK, for one month prior to the start of the cruise, to participate in cruise preparation and planning. The candidates will then participate in the cruise (29 May to 18 June 2013) to make hydrological, biogeochemical and ecological observations. After the cruise they will spend one additional month at the host institution, learning to run statistical analyses on the data and interpret them.



Bellineth Valencia,

"Copepods grazing and pellet production: there are changes in particle production according to the sexual condition and vertical distribution?"



Veli Çağlar Yumruktepe,

"Model-Data Integration of Key Nitrogen Cycle Processes"

POGO-AMT fellowships

POGO is pleased to announce that it will once again offer a Visiting Fellowship for training on-board an Atlantic Meridional Transect (AMT) cruise in 2013. This programme, now in its 6th year, has proved to be a very successful in providing sea-going experience to young scientists from developing countries, and the opportunity for them to be involved in an internationally renowned scientific programme.



The selected candidate will visit Plymouth Marine Laboratory (PML), UK, for 1 month prior to the start of the cruise to participate in cruise preparation and planning; will go on the cruise (17 Oct-30 Nov 2013, from UK to South America); and after the cruise will spend one additional month at PML, learning to analyse the results statistically and interpret them.

The programme is open to scientists, technicians, graduate students and post-doctoral fellows involved in oceanographic work at centres in developing countries and countries with economies in transition. The application deadline is **3rd May 2013**. Visit <http://ocean-partners.org/training-and-education/research-cruise-training/pogo-amt-fellowships> for further details.

Update on POGO capacity building (cont'd)

Austral Summer Institute (ASI XIII)

The Austral Summer Institute takes place every year to contribute to capacity building in Latin America, allowing the development of networks among local and visiting scientists and students. This year, POGO provided support in the form of travel grants and contributions towards lodging for at least sixteen students to enable them to participate from neighbouring countries.

Nearly one hundred students comprising of undergraduate and postgraduate students were trained in specialised aspects of oceanography this year at the Austral Summer Institute of the UNESCO IOC Chair in Oceanography. The target groups were graduate and senior undergraduate students from Latin American countries. Students registered in Graduate programs also received two credits per course from the Graduate School at University of Concepcion. The participants were from Argentina, Brazil, Canada, Colombia, Cuba, Ecuador, France, Peru and Uruguay.

Since this inception, the Chair was devoted to building capacity at the graduate level in the region. The success of the activity is indicated by the high number of applications received, the interest shown by the student participants, and the willingness of renowned scientists worldwide to spend time with students of the South-American region. This has resulted in the first interaction of future scientists with senior researchers and has led to further opportunities for graduate studies.

ASI XIII was devoted to the following themes: Understanding physical, chemical and biological processes in the marine environment. Many of the teaching, training

and research activities were conducted at the Main Campus of the University of Concepcion.

In December 2012, a symposium was held on the subject of UV radiation and marine ecosystems involving scientists from Argentina, Chile, France and the United States. The last day of this symposium was devoted to practical activities and included poster presentations by groups of local high school students. In early January, the ASI continued with a series of courses on physical and biological oceanography, each of which lasted 5 days, with the exception of the course "Análisis de series de tiempo en ecología y oceanografía" which lasted 10 days.

The courses encompassed a variety of topics including:

- Why do diseases emerge in marine aquaculture? And what can we do to limit this?"
- Circulación y masas de agua en el Atlántico Sudoccidental" (Circulation and water masses in the Southwest Atlantic)
- Trace metals in the oceanic carbon cycle
- Coastal Antarctic ecosystems and the case of the Larsen ice shelf system
- Análisis de series de tiempo en ecología y oceanografía (times series analysis in ecology and oceanography".
- The final course focused upon the "Chemical and biological characteristics of the oceanic phosphorus cycle.

The content for this article was provided by Monica Sorondo and Silvio Pantoja (UNESCO IOC Chair Oceanography), COPAS Sur-Austral, University of Concepcion.

POGO Visiting Professorship 2013



Dr. Declan Schroeder

The 2013 POGO Visiting Professorship has been selected and this year Dr. Declan Schroeder will be visiting the Institute of Ocean Research, Department of Environmental Affairs and the Molecular and Cell Biology Department of the University of Cape Town, South Africa. The Professorship will be hosted by Dr. Hans Verhaye.

The title of the proposed training course is "MoM-CPR: Molecular Mining of the Continuous Plankton Recorder and other archived datasets".



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