

# nano news

nano shinbun ナノ新聞

- NF-POGO Alumni Network for Oceans -

*“Becoming Part  
of the  
Solution”*

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日本財団  
The Nippon Foundation



Partnership for  
Observation of the Global Oceans

## From the Editorial Board

It is with great pleasure and pride that we publish this inaugural e-newsletter “**nano news**”. The Editorial Board expresses its warm and heartiest congratulations to Venetia Stuart for winning the e-newsletter naming challenge by proposing the name “**nano news**”.

Alumni of the Nippon Foundation and POGO are a group of highly motivated and hard working young scientists (as well as not so young scientists) who like to enhance and broaden their research interests as well as to disseminate their well-founded knowledge to the society at large. One of the primary aims of this e-newsletter is to open up dialog, to share knowledge, to communicate research findings and to develop and exchange research ideas among the alumni. Communication of research enhances quality and leads to new and innovative avenues for landmark research. Also, this would be a platform for all alumni to share research and development activities that take place in their own institutions as well as in their home countries in the related fields of oceanography and marine science.

The editorial board is indebted to the patrons, Trevor Platt, Shubha Sathyendranath and Sophie Seeyave, for their persistent efforts in initiating NANO and for the invaluable input and support given throughout. Also, this would not be possible without the financial, moral and sincere support from Nippon Foundation and POGO. We are very grateful to Mr. Makoto Wada for his constant support and for sending his wishes through a message to this inaugural e-newsletter. We convey our gratitude to all those who sent messages, articles and short research communications to the e-newsletter. We received more research communications than we could include in one e-newsletter and thus, only a handful was selected randomly to publish in the inaugural publication. Others will be published in the up coming e-newsletters. **nano news** will be published thrice a year and we take this opportunity to invite all alumni to contribute to this e-newsletter, regularly. The Editorial Board extends its sincere thanks to Lilian Krug for designing the **nano news** for web publication.

The Editorial Board wishes **nano news** a bright and an enduring future.

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**Patrons:** Trevor Platt /Executive Director – POGO  
Shubha Sathyendranath /Assistant Executive Director – POGO  
Sophie Seeyave / Scientific Coordinator – POGO  
Makoto Wada/ Public Relations Officer, Nippon Foundation

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**Have any nice photos to share?** E-mail us your seascapes, underwater photos or photos of field work and we'll include them in NANO News.

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**NANO website:** [www.nf-pogo-alumni.org](http://www.nf-pogo-alumni.org)



## Message from the Public Relations Officer/Nippon Foundation

Mr. Makoto Wada

Congratulations on the launch of the NANO e-newsletter. As a program officer at The Nippon Foundation, I was involved with the POGO Visiting Professorship and the Centre of Excellence. When I saw the CoE fellows discussing their papers and research during the break at the Autumn 2010 London Meeting, I knew that this project would be indispensable for the oceanography field. I believe the launch of the NANO newsletter has confirmed my previous confidence in the project. I sincerely wish the very best of success for the e-newsletter in the years to come. Regrettably, I was reassigned from my post as POGO administrator on June 1. However, Mr. Unno, Mr. Ogiue, and Mr. Aoki will be doing all they can for this project and POGO.



From left, Mr.Ogiue, Mr.Unno, Mr.Wada, Mr.Aoki

With best wishes,  
Makoto Wada

## Message from the Executive Director/POGO

Prof. Trevor Platt FRS



It is an auspicious time as we launch the first issue of our infant e-newsletter: we are indebted to Kanthi Yapa, as Editor-in-Chief, and as midwife for this new baby.

The name of the network is NANO which as everyone knows has the Connotation of being small. It is true we are small and our members are relatively young. But small does not mean ineffective. Just consider the phytoplankton of the ocean a community of microscopic plants. Individually they are very small cells but very active ones. They are distributed over all the world's oceans and collectively (as a community) they have an enormous impact on the Earth's carbon cycle. Similarly, junior scientists tend to be full of energy active eager to make an impact.

As a community of young scientists, distributed worldwide (and increasing in numbers every year), the NANO network has the potential to make a strong impact on the future of ocean observations in the global oceans. It is up to the vision, creativity and dynamism of the members to make it happen. So although NANO is small, we should not see it as a limitation. Rather, it is an opportunity for us to show the world how much can be achieved with minimal resources. The key will be the sense of community that we can foster through the NANO network.

## Message from the Assistant Director/ POGO

**Dr. Shubha Sathyendranath**

For many years now, POGO and the Nippon Foundation have been working together to redress the acute deficiency in trained oceanographers, especially in the Southern Hemisphere. The capacity building, however, has not been limited to the Southern Hemisphere, or even to developing countries or to economies in transition: in fact, the NF-POGO Centre of Excellence hosted at the Bermuda Institute of Ocean Sciences is open to dedicated ocean scientists from anywhere in the world with a thirst for learning more. Just as the oceans recognize no political boundaries, our efforts at stewardship of the oceans must also go beyond national boundaries, and unite the whole world in a common cause. That is what we are trying to do here, through various NF-POGO initiatives.



The problems facing the oceans are many, our dependence on the oceans is huge, and the deficit in human resources is enormous. In the face of the magnitude of the issue we are trying to address, the achievements to date may appear modest. So how can we make a real difference? The answer depends on each one of you, who had the benefit of learning about the oceans from experts from all over the world. But the benefits of NF-POGO training go beyond that: you have had the opportunity to get to know each other, to make friends with each other, to share your visions and your dreams. If you can now work together towards a common goal, then your collective impact would be much greater than if you worked alone, in isolation. Furthermore, if you could take the time to pass on your knowledge and your passion to those around you, then the capacity for ocean stewardship will grow exponentially.

By working hard, working together and sharing your knowledge, you now have the potential to become an important part of the solution. The NF-POGO Alumni Network for Oceans (NANO) is yet another strand of the NF-POGO efforts to enhance the capacity for ocean observations for the common benefit of our society and of our planet. It brings together the teachers and the students who have been part of NF-POGO capacity-building efforts. It is a very important step, because it gives the former students the opportunity to become leaders, to become part of the solution, to find the way forward.

What NANO can achieve will depend very much on what you can put into it. I sincerely hope you will grasp this opportunity with both hands and work together to learn more about the ocean and to look after it for our collective good. The NANO newsletter is a key instrument to keep each other informed of our activities and to share our ideas. I thank Kanthi Yapa for taking the leadership to realize this vehicle of communication, and I thank all the contributors to this first issue. Please contribute actively to the future issues, so that we can keep them dynamic and informative. None of this would have been possible without the continued support and help from the Nippon Foundation. On behalf of POGO, the POGO Secretariat and the Alumni, I thank the Foundation sincerely for their grand vision and their long-term commitment.

## Message from Scientific Coordinator/ POGO

Dr. Sophie Seeyave

The organisation of the founding meeting for the NF-POGO Alumni Network was one of the first tasks assigned to me when I started working for the POGO Secretariat in July 2010. I have since then been deeply involved in the development of NANO, with invaluable help from two alumni, Lilian Krug and Olga Shatova, who were instrumental in gathering information from the other alumni and creating the NANO website. The most recent development has been the creation of this newsletter, for which we are greatly indebted to Kanthi Yapa. It has been an exciting project for me to be involved in and a great satisfaction to see the enthusiasm of some alumni to develop this network.



I strongly believe that international collaboration is vital for oceanographic research, and that scientists should be encouraged to participate in networks such as NANO from an early stage in their careers. NANO will bring together the new generation of top scientists from around the world, with participation from countries that have hitherto been under-represented in international programmes and organisations. In my view, this is what makes it so special.

I would like to acknowledge the Nippon Foundation for all their support over the years, as well as all the scientists who have devoted their time to capacity building, and who continue to provide support and enthusiasm for the development of NANO.

### NANO in numbers

by Lilian Anne Krug

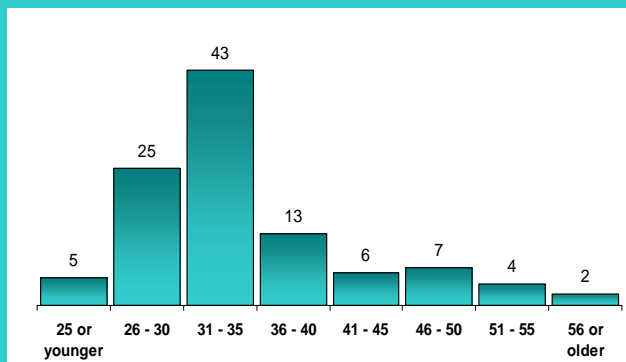
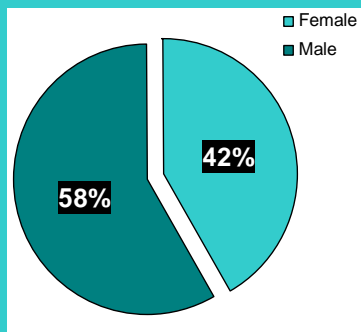


The NF-POGO Network of Alumni for Oceans (NANO) was launched less than a year ago with the positive feedback received from the NF-POGO scholars (participants of capacity building programmes held in the last several years, funded by Nippon Foundation and POGO). About 60% of the alumni returned their updated information and submitted a number of proposals for joint projects.

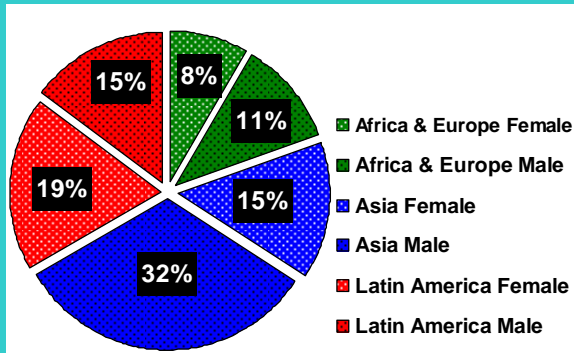
With the possession of more than 100 completed questionnaires, it was possible to obtain some important statistics about NANO, which we present here.

Age:

Gender:

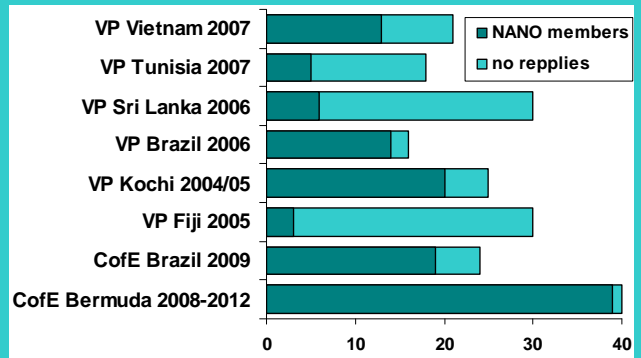


Distribution of the alumni by gender and region. Asians (male and female) represent about 47% of the alumni.



#### Geographical distribution:

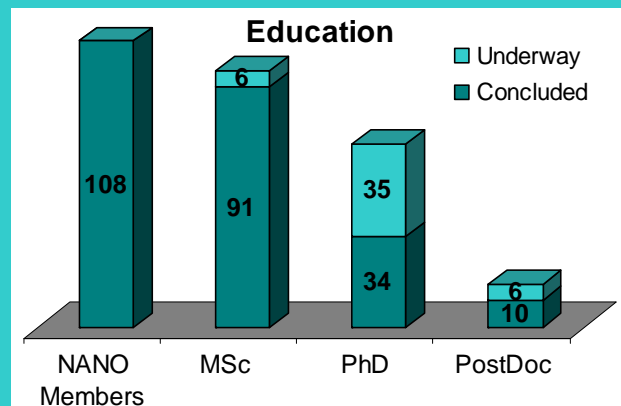
From five out of the eight NF-POGO courses, we had a satisfactory level of contribution, with more than 50% of attendees becoming members of NANO by now.



NANO has members from thirty two countries and the table below gives a geographical distribution of the current membership. Among the countries where the NF POGO visiting professorship courses were held, majority of the scholars from Brazil, India and Vietnam have become members of NANO already as opposed to the countries like Sri Lanka, Fiji and Tunisia.

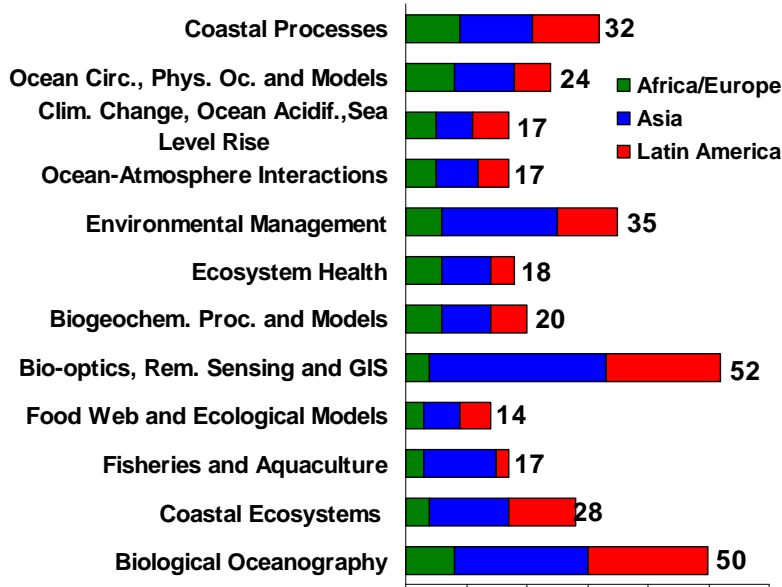
Angola	1	Pakistan	1
Argentina	5	Peru	1
Bangladesh	1	Philippines	2
Brazil	22	Poland	1
China	2	Portugal	1
Ecuador	1	Russia	3
Egypt	2	Senegal	1
Fiji	1	Solomon Islands	1
Ghana	2	Sri Lanka	5
India	19	Tanzania	1
Iran	1	Thailand	2
Ivory Coast	2	Tunisia	4
Japan	2	Turkey	1
Kiribati	1	Ukraine	1
Mexico	3	Venezuela	4
Nigeria	1	Vietnam	13

Education: The level of education of NANO members is very encouraging as 31% of them are having a PhD degree and another 32% are currently engaged in PhD programs. 84% of the members have a M.Sc. degree.



Research interests: Biological Oceanography and Bio-optics, Remote Sensing and Geographic Information Systems (GIS) are the most engaged areas of research among the NANO members. When observing the statistics according to geographical regions, similar predominance is found in Asia and Latin America. However, in general, there is a good balance of research expertise in other fields as well in all the three regions as seen below. This information could be used in the design of project proposals taking the advantage of our member expertise.

### Research Areas



In NANO wiki one can see lists of the alumni working on each of these individual research themes.

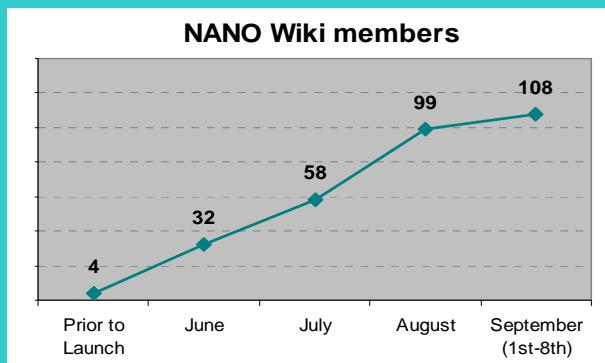
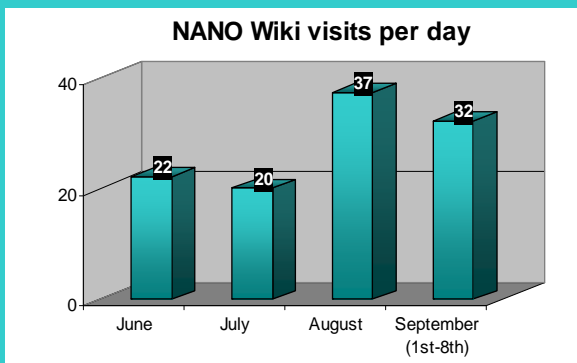
We encourage you to share announcements, publications and other useful information on the discussion tabs.

(Go to <http://www.nf-pogo-alumni.org/NANO+Research+Themes> and click on the research theme of your interest).

In the left figure, colors represent research areas and numbers (given as percentages) represent members from a particular region engaged in a particular research area.

**NANO Wiki spaces:** The main purpose of NANO Wiki ([www.nf-pogo-alumni.org](http://www.nf-pogo-alumni.org)) is to offer a virtual space where the alumni can interact with each other, with POGO and invited scientists, also known as NANO Friends. There are descriptions of the network, the Nippon Foundation, POGO, the NF-POGO courses, alumni profiles, list of alumni per region, research thematic pages, alumni publications and an opportunities page where advertisements of fellowships, funding and other interests of alumni are posted on daily basis.

One can navigate through the Wiki by following the navigation tree. However, access to personal information is available exclusively to members associated with the NANO Wiki. Members are encouraged to post any comments on the discussion tabs of any page within NANO Wiki. Currently, 84 alumni and 19 NANO friends are members of NANO Wiki. Since the launch of the network, there has been a monthly average of about 30 visits to our website (figures are given below).





## ChloroGIN Meeting – Halifax, Nova Scotia

*By Trevor Platt*

ChloroGIN is a globally-integrated network devoted to chlorophyll measurements (in situ and from satellites) and related in situ bio-optical measurements. ChloroGIN held a plenary meeting in Halifax (Canada) from August 9 to 11, 2001. A total of 25 participants from fourteen countries attended the three-day ChloroGIN workshop.

Participants were updated on the status of the seven regional ChloroGIN nodes: ChloroGIN-Europe, ChloroGIN-Indian Ocean, ChloroGIN-Antares, ChloroGIN-Africa, ChloroGIN-Canada, ChloroGIN-SE Asia and ChloroGIN-NE Asia as well as Global ChloroGIN. The new Fisheries Applications of Remotely Sensed Ocean Colour (FARO) initiative which is funded by the Canadian Space Agency, and overarches both the ChloroGIN and SAFARI (Societal applications in Fisheries and Aquaculture using Remotely-sensed Imagery) projects. It provided support for the ChloroGIN workshop.

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The status of the proposal submitted to the Group on Earth Observations (GEO) for additional funding for various ChloroGIN activities, was reviewed by GEO secretariat. The expansion of the ChloroGIN network to new countries (such as the Philippines) and other regions of the globe was discussed. Proposed ChloroGIN lakes initiative, related GEO/GOOS initiatives and relevant ESA initiatives were also discussed. The group also considered: i) Development of Southeast Asia node; ii) Further development of ChloroGIN Africa; iii) Future development of Antares; iv) Improving in situ data availability and sharing; v) How to improve the ChloroGIN website. Recently, the group has published a Handbook of Satellite Remote Sensing Image Interpretation (293 pages) with many case studies. It is in the IOCCG Report Series. ChloroGIN has subscribed to the new Blue Planet initiative, an umbrella Task for Oceans in GEO, established under POGO leadership.

**ChloroGIN provides an ideal basis for research projects such as might be undertaken within the NANO network. It encourages the development of local time series for in situ chlorophyll and bio optical measurements that can be carried out at relatively modest expense.**



Attendees of the 2011 ChloroGIN Meeting.



## Some Experiences in Capacity Building

how I came to be involved in international training for marine science

by Trevor Platt FRS

*Executive Director /POGO, Scientist, Plymouth Marine Laboratory  
& Scientist Emeritus, Bedford Institute of Oceanography*

Teaching has never been my official job, but it has always been enjoyable to me. Over the years, I have been a Visiting Professor at Université Laval, Scripps Institution of Oceanography, the Academy of Sciences in Estonia, the University of Messina (Sicily), the State University of New York at Stony Brook, the University of Puerto Rico, the University of Mallorca, the National Institute of Oceanography Regional Centre in Cochin (India), and the University of Bristol.

In 1980, I was invited to participate in teaching international courses in Chile, at the University of Talcahuano and at the University of Concepción. The students were from across Latin America. It was during the Pinochet regime, when things were generally not very good for students. A couple of years later, I was asked to go there again for teaching. A surprising number of the students in these courses went on to make a good career in marine science. Some became my graduate students in Canada and returned to Latin America to become professors. But these were courses organized by other people. In November, 1992, Shubha and I had the idea to offer a course in ocean-colour theory and applications, including the estimation of primary production. The intent was to provide a broad view of the field that was internally consistent, rather than to give a comprehensive and exhaustive survey. It was to be held at the Bedford Institute of Oceanography (not a teaching institution). We had a budget of exactly zero. We advertised the course through the internet and were somewhat astonished by the response. We had some fifty participants from nineteen countries. There was clearly a demand for this kind of course. It lasted a week, consisted only of lectures, and was taught entirely by Shubha and me, taking turns.

Around this time, I founded the International Ocean-Colour Coordinating Group (IOCCG) to build a working link between the providers of ocean-colour data (the space agencies) and the users of the data. The IOCCG also filled a need: it is still

going, stronger than ever, and has become an authoritative voice in the marine community, well-known for example for its series of monographs on topics related to ocean colour. A major goal of the IOCCG was to broaden the user base for ocean-colour data. One way to accomplish this was to provide training courses. It was decided that they would be modeled on our earlier course at the Bedford Institute, except that in future we would have a budget.

The series of courses still exists to this day. Through it, some 400 students, coming from 85 countries have been taught. The courses have been held in Argentina, Australia, Canada, Chile, China, Germany, India, Indonesia, Italy, Kenya, New Caledonia, South Africa, Tanzania, Thailand, Turkey, Venezuela, Uruguay and aboard the Japanese vessel *Mirai* on its circumnavigation of the Southern Hemisphere. Many graduates from IOCCG courses now hold influential positions in the ocean-colour community.

The Joint Global Ocean Flux Study was also running at this time, and I chaired its Scientific Steering Committee for three years. One of the activities was an international training course in biogeochemical modelling, which Shubha and I organized in Bangalore (India) in 1999. We were also invited several times by the Indian Space Research Organisation to give training courses in ocean colour (Ahmedabad, Bangalore, Hyderabad).

The Partnership for Observation of the Global Oceans (POGO) was created in 1999. Shubha became its first Executive Director. One of its goals is to increase the number of skilled professionals in the field of ocean observation. Under Shubha's guidance, POGO decided to accomplish this with the aid of a Fellowship Programme and, in cooperation with the Nippon Foundation, a Visiting Professor Programme. I had the privilege to serve as the first of the NF-POGO Visiting Professors, teaching for three months at the National Institute of Oceanography Regional Centre in Cochin (India). Eventually, this programme metamorphosed into

the NF-POGO Centre of Excellence in Marine Observations, run by the Bermuda Institute for Ocean Sciences, an outstanding success. POGO still maintains the Visiting Professor Program, using its own funds.

During one IOCCG-POGO training course, held in Concepción (Chile) in 2002 for participants from Latin America, we discussed how the trainees might use their new knowledge when they went back to their home institutions. It was clear that they were not short of ability, but were short of resources to help them apply it. Also, we saw the value that the contacts the students had developed during the two weeks of training would be maintained into the future. In short, the idea of a network was born. With money contributed by POGO and by the IOCCG, we organized a meeting the following year in Mar del Plata (Argentina) with the express purpose of making a Latin American network for ocean colour and related in situ measurements. The network became known as the Antares network. It is still very active.

Meanwhile, the Group on Earth Observations (GEO), an intergovernmental initiative, had been founded to promote the societal value of Earth observation. Through her position in POGO, Shubha made GEO aware of Antares and was able to persuade GEO to co-sponsor (jointly with GOOS) a meeting at which an international network for ocean ecosystems would be formed, to be modeled on Antares, and also on the remote-sensing time series programme that Shubha and I were running for the North West Atlantic Ocean. The meeting took place in Plymouth in 2006, leading to the creation of the ChloroGIN network, an important GEO Task, which is now funded by the Canadian Space Agency.

Another GEO Task using ocean-colour data is SAFARI, which is concerned with applications of remote sensing in fisheries and aquaculture. It has been funded by the Canadian Space Agency from the outset. In 2010, SAFARI organized the first international symposium on Fisheries and Aquaculture, which was held in Cochin (India). It was preceded by a three-day international training course, which attracted some sixty participants.

After several years of collaboration between POGO and the Nippon Foundation in capacity-building activities, it was decided to create a network of former scholars of these initiatives, with the goal of nurturing a community of young, energetic and excellent scientists, distributed world wide, who would work together to help secure into the future the use of ocean observations for the benefit of society. This is the origin of the NANO network.

It has been a source of continuing interest to be involved in the planning and teaching of international training courses in marine science. Shubha and I have done our best to maintain contact with the stronger students from each course, to re-invite them to later courses, and to look out for opportunities for them to advance their careers. It has been endlessly rewarding. The network whose newsletter is issued for the first time now provides tangible evidence that something positive has been achieved.

Although this short account has been a personal one, it should be made clear that what has been accomplished would not have been possible without the excellent and continuing professional collaboration and help contributed by Shubha Sathyendranath and Venetia Stuart, for which I am eternally grateful. We have undertaken many things together, most recently the raising of funds from the Canadian Space Agency to support SAFARI and ChloroGIN.

We see the NANO network as one of the keys to the future, a way to mobilise the former scholars in a coordinated manner. In finding ways to establish the network, we have been very fortunate to have the outstanding collaboration of Sophie Seeyave, to whom much credit for the success of the network is due. The network offers the first chance we have had to nurture the former scholars as a group. Collectively, they represent enormous scientific capability: the future is in their hands.

### Muhammed Fatih Sert (Reading for Ph.D.)

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**Research Interests:** *Biogeochemical cycles of marine nutrients with emphasis on nitrogen and phosphorus.*



During my M.Sc., I studied total nitrogen (TN) and total phosphorus (TP) fractions in the North Eastern Mediterranean Basin. I tried to develop a method for simultaneous determination of TN and TP. Also, DON and DOP distributions were assessed at the sea surface and in the water column at the study site.

**Master's Thesis Title:** Determination of total nitrogen and total phosphorus in the North Eastern Mediterranean water column

Regional and temporal variations of principal hydrophysical (temperature, salinity, density) and hydrochemical (nutrients, chl-a, dissolved oxygen) properties were examined at fifty selected stations on the shelf zone of the Northeastern Mediterranean between September 2008 and October 2009. TP and TN in the collected samples were analyzed by a pH-controlled Wet Chemical Oxidation (WCO) method.

Seasonal and spatial distributions of the hydrophysical parameters in the NE Mediterranean water column were dominated by general circulation pattern of the basin. Thermohaline properties of the bay were highly influenced by the river discharges, surface water heating/cooling and wind-induced coastal processes.

Nutrient-replete Seyhan and Berdan discharges markedly enhanced the nutrients and algal biomass (in terms of Chl-a) concentrations in the shallow zone (<15 m depth) of the bay. However, this regional effect appeared to weaken during the dry summer-autumn period due to significant decreases in flow regimes of the major rivers in the region. The mean concentration of TN varied regionally between 4.82 and 8.19  $\mu\text{M}$ , having the greater values in the near shore zone. TP concentrations were markedly high in the surface waters of the near-shore zone (0.20-0.70  $\mu\text{M}$ ); the offshore values were lower (0.10-0.12  $\mu\text{M}$ ), displayed vertically uniform distribution in the euphotic zone and increased slightly towards the bottom.

**NF-POGO programme:** "POGO Observational Oceanography" program at the Bermuda Institute of Ocean Sciences (BIOS) in August 2010 (completed in May 2011)

**Research project:** Biological controls of the ocean C:N:P ratios"

**Ph.D. study:** biogeochemistry of Eastern Mediterranean - key processes that govern current conditions in terms of primary production and nutrient compositions.

### Lailah Gifty Akita (Reading for Ph.D)

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**Research Interests:** Benthic Ecology/Biological Oceanography, Chemical Oceanography,  
Palaeoclimatology/Palaeoceanography



### **PhD-Project: “Holocene and Late Glacial Monsoon and Lake System Changes on the Tibetan Plateau” -**

This is part of the project entitled “Lake Systems Response to Late Quaternary Monsoon Dynamics on the Tibetan Plateau” is in joint cooperation with the Institute of Tibetan Plateau Research and Chinese Academy of Sciences.

The Tibetan Plateau is located in the interaction zone of the Indian summer monsoon, Asian winter monsoon, and the Westerlies. Owing to its average elevation of 4.5 km above sea level, it is considered to be a major driver of the global climate system. Also, the ecosystems of the plateau are highly sensitive to changes in the water balance.

Ostracods (small bivalve crustaceans; 0.5 -2.0 mm) are environmentally sensitive organisms which are readily preserved as fossils because of their calcitic shells. Ostracoda are far the most abundant calcareous organism remains on the Tibetan Plateau, although other organisms (such as cladocerans, diatoms mollusks) are also present. Their calcite shells provide a discrete source of biogenic carbonate, extremely valuable Quaternary palaeoenvironmental indicators.

Our study will explore the climatic history of lake systems in central Tibetan Plateau by examining Ostracoda assemblages, developing and using Ostracoda-based transfer function, coupled trace element and stable oxygen and carbon isotope signatures of their valves from Tangra Yumco, and /or Taro Co lakes in the Tibetan Plateau.

The main objective is to obtain the geochemical records on environmental/ hydrological and climatic variations on the Southern Tibetan Plateau over late Glacial and Holocene period and the onset of modern climate in the study areas.

#### **Specific objectives:**

- Increasing bioindicator’s potential of microfossils (especially ostracods) for palaeolimnological work on the Tibetan Plateau.
- Palaeoenvironmental reconstructions for lake systems of the Southern Tibetan Plateau.
- Palaeoclimatological synthesis for the Late Glacial to Holocene.

It is anticipated that analysis of trace element and stable isotope records from Ostracoda shells within the Holocene sediment of Southern Tibetan Plateau would provide further insight into the environmental and/or hydrological changes of this region for the last glacial and postglacial cycle. Reconstruction of the environment history of southern Tibetan during the Late Quaternary may thus lead to better knowledge of variations in monsoon strength. Finally, we also hope that this study would serve to deepen our understanding of global environmental/climatic change for the Late Quaternary.



### Sebastian Krieger

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#### Research work carried out:

I have been involved with ocean remote sensing during last few years and increasingly interested in climate change and its impacts. I analyzed remotely sensed sea surface height data from the TOPEX/Poseidon and Jason-1 satellites to verify the spectral variability of Rossby waves. Preliminary results indicate that these waves are globally significant, contribute about 48% of the total observed spectral power.

Depending on the scales and study areas, one or more wave type can become more important. In estuarine regions, for example, currents are dominated by tides, river discharge and by cold fronts. Recently, I have been involved in studying variability of speeds of surface currents in the Itajaí-Açú river estuary in southern Brazil using wavelet analysis. As expected, the surface currents are governed by the semi-diurnal tide and show peak spectrum with periods of approximately 12 hours. The spectrum also indicates modulation every 16 days, associated with the spring and neap tidal cycle.

On a larger scale, I have also analyzed the spectrum of the sea surface height (SSH) anomaly from the merged multi-sensor dataset provided by Aviso. Also applying modern wavelet analysis and selecting events with periods centered at 3, 6, 12, and 24 months, I calculated the relative contribution of each range to the total spectra in the Atlantic Ocean. At this scale, only the events with periods of more than 10 days could be observed, mainly due to inherent limitations of the instrument. Applying wavelet analysis to a time-series enables us to construct a new time-series of its spectral power content.

#### Other interests: Bio-physical interactions

During my NF-POGO training at BIOS, I tried to identify if Rossby waves influence the nutrient availability in the Sargasso Sea and their effect on the primary production. I used time-series of *in situ* measurements of the BATS study as well as remotely sensed SSH and chlorophyll-a estimates.

In future, I expect to extend my knowledge in the field of marine bio-optics and try to understand the biological response to the effects associated with climate change. Since a major part of my work has been analyzing continuous measurements, I would be interested in contributing to strengthening the established time-series of ocean-colour data.

### Rafael Rasse

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**Research work:** *Influence of river discharge and atmospheric deposition on the water column total dissolved nitrogen content of the Cariaco Basin, Venezuela*

River discharge of total dissolved nitrogen (TDN) to the coastal ecosystems has been increasing in the last century as a consequence of human activities. As a result of this discharge, eutrophication is increasing and 'dead zones' have been extending along the coastal areas at regional, continental and global scales. The scenario is more complicated in developing countries because wastewater discharges are largely untreated and thus, wastewater enhances the supply of nitrogen and other nutrients to coastal areas. Also, anthropogenic atmospheric deposition of total nitrogen in the ocean has increased by 10 fold and its influence can alter ocean primary productivity on regional scales.

For the Cariaco Basin in Venezuela, little information is available on how the river discharge could affect the primary production and the total suspended sediment export. We measured TDN fluxes from the atmosphere and four tropical rivers (Tuy, Unare, Neveri and Manzanares) and tributaries of the Cariaco Basin. River water samples were collected from September 2008 until September 2009. Atmospheric deposition samples were collected during wet and dry seasons for one month period in each season. Total annual river TDN discharge ranged from 11400 to 15200 Ton-N and Tuy River had the largest contribution (94.3%). Atmospheric TDN wet deposition was between 2400 to 4800 Ton-N/year and the relative contribution of dissolved organic nitrogen (DON) was between 60% and 80%, indicating a low atmospheric anthropogenic influence. The elevated TDN fluxes observed from the Tuy River are associated with the urban and industrial untreated wastewater discharges from Caracas metropolitan area.

The large export of TDN from Tuy River is likely producing changes in water quality in marine ecosystem near the river mouth. Therefore, it is necessary to develop mitigation actions to decrease the export of TDN from urban and industrial wastewater and prevent eutrophication processes in these coastal ecosystems.

## F. Guamán-Guevara

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**Research work done:** *Seasonal variability of seawater pCO<sub>2</sub> and coral Calcification rates at two sites in the Bermuda coral reef*

Ocean acidification (OA) results in a reduction in surface seawater pH, carbonate ion concentration [ $CO_3^{2-}$ ], and saturation state with respect to carbonate minerals. Potential impacts include a decline in calcification rates of corals and coral reef communities, which could decrease the production of  $CaCO_3$  in reef environments. However, most of the evidence stems from laboratory experiments and few studies have been conducted in the natural environment. Consequently, there is a lack of understanding on how *in situ* coral calcification rates are linked to seawater  $CO_2$  chemistry and other environmental parameters.

The aim of this study was to evaluate the seasonal variability of seawater  $pCO_2$  and environmental parameters such as temperature, salinity and light, in conjunction with coral calcification rates at Hog Reef (rim; 32.46°N, 64.83°W) and Crescent Reef (inshore; 32.40°N, 64.79°W) on the Bermuda coral reef. *In situ* calcification experiments with the corals *Porites astreoides* and *Diploria labyrinthiformis* were conducted at both locations. Calcification rates were determined using the buoyant weight technique based on measurements every 2-3 months. Surface seawater physico-chemical properties (temperature, salinity,  $pCO_2$ , pH, and dissolved oxygen) were measured by two  $pCO_2$  buoys every 3 hours.

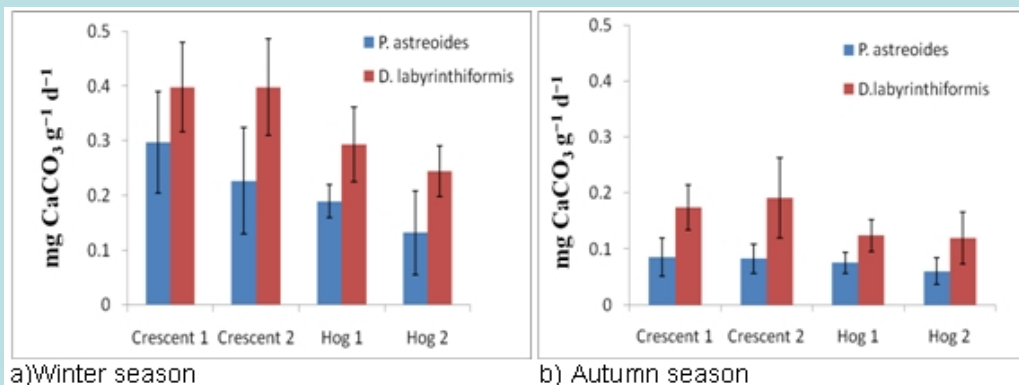


Fig. 1 *in situ* coral calcification rates for *Porites astreoides* and *Diploria labyrinthiformis* at Crescent and Hog Reef on the Bermuda coral reef. (a) Winter season, for the period from November to March (b) Autumn season, for the period from August to November

Preliminary results suggest that during winter the two coral species investigated grow at significantly different rates with small differences observed between the locations (Figure a). Additionally, coral calcification rates during wintertime (110 days during November-March) at both sites were compared with that of during autumn (81 days during August-November) to observe any change in coral skeletal mass growth over time (Figure b). Our results indicate that coral calcification rates vary considerably in autumn and winter seasons. As the project is still in its early stages, these data will provide critical information on how coral calcification rates vary as a function of natural variability in physico-chemical parameters.

### **Ravidas K. Naik** (Ph.D. in Marine Science)

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**Research interests:** Phytoplankton taxonomy and biogeography, Harmful algal blooms



#### **Research work carried out:**

During my PhD work, I observed nineteen potentially harmful species, in the Bay of Bengal (BOB). Among those, *Ceratium furca*, *C. fusus*, *Dinophysis sp.*, *Noctiluca scintillans* and *S. trochoidea* occurred frequently but low in abundance ( $\leq 40$  cell L<sup>-1</sup>). Though occurring in low numbers, these species may serve as inocula for future blooms if coupled with population-triggering physical processes like eddies and cyclones in the region. In fact, the predominance of *C. furca* and *N. scintillans* in the BOB during cyclone-prone months, strengthen their candidature for future blooms in the region.

Pigment studies indicated that oceanic stations in the BOB were dominated by prokaryotes whereas near coastal stations were dominated by flagellates. I also reported, and studied the ecological dynamics of two new *Skeletonema* species - *Skeletonema tropicum* and *S. grevillei* and one potentially toxic, non-thecate dinoflagellate - *Karlodinium veneficum*).

#### **Research Goals:**

I like to improve my understanding about phytoplankton taxonomy, biogeography, the interaction between diatoms and dinoflagellates, allelopathy and bloom dynamics. This would help to understand their role in coastal and oceanic ecosystems.

In addition to publishing the findings in research journals, I would like to take a step further and communicate this new information to the general public - especially to the fisheries community in using simple and non-scientific language.

## Meeting Announcements

### **NF-POGO Alumni Network Meeting, Abingdon, UK, 26-28 September 2011**

This meeting will involve a small number of alumni representing the different NANO regions, as well as instructors from past NF-POGO training programmes, and staff from the Nippon Foundation and POGO. The aim of the meeting will be to write proposals for regional research projects to be undertaken by the alumni. These will be submitted to the Nippon Foundation at the end of the year. The alumni will be kept informed of progress via the NANO website where we hope to post updates during the meeting.

### **WIOMSA Scientific Symposium - Mombasa, Kenya from 24-29 October 2011**

*Organized by The Western Indian Ocean Marine Science Association (WIOMSA) and the Kenya Marine and Fisheries Research Institute (KMFRI)*

#### **SYMPOSIUM STRUCTURE:**

The symposium takes place from Monday 24th October 2011 to Saturday 29th October 2011 at Whitesands Hotel. The week is divided into the following:

- 24th to 27th October 2011 - this part will include: keynote presentations, oral and poster presentations.
- 28th October 2011 - has been set aside for programmes/projects and organizations to organize special sessions. These sessions will provide participating programmes/projects and organizations the opportunity to share information about their activities.
- 28th October 2011 – The formal closing of the Symposium will take place during the social event to be held in the evening of 28th October 2011.
- 29th October 2011- Excursions and tours to different places of interest

### **13th POGO Annual Meeting, Hawaii, USA, 9-11 January 2012**

The POGO annual meetings bring together the POGO members to discuss progress made during the year, administrative issues and strategic plans for the coming year. Each meeting is hosted by a member, and the next one will be hosted by the School of Ocean and Earth Science and Technology (SOEST), University of Hawaii. The POGO Secretariat will be reporting on capacity building activities and on progress with the development of NANO.



**Have any nice photos to share?** E-mail us your seascapes, underwater photos or photos of field work and we'll include them in NANO News.

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