1. Background

The Nippon Foundation, through its partnership with POGO, has provided professional training in observational oceanography to over two hundred young scientists from around the world, the majority from developing countries, between 2005 and 2011. Networking was always a priority for the joint NF-POGO initiatives and both the NF and POGO wanted the benefits of the training to extend beyond the formal training period.

The idea of forming a network of former scholars, or “alumni” thus emerged and matured into a plan to hold a meeting of selected alumni to formulate plans for the network. This meeting was held in London in October 2010 (see Appendix 1), involving selected scholars and instructors, and Nippon Foundation and POGO representatives. The vision for the Network established during this meeting was "Integrated Observations of a Changing Ocean" and the common thread that would hold the network together was a common interest in, and commitment to, ocean science, and the common will to communicate scientific results to the general public. The network was named NF-POGO Alumni Network for Oceans, or NANO.

2. Objectives

The main objectives of NANO are:
- to establish regular communication between the Nippon Foundation, POGO and their former scholars,
- to provide them with further support, and
- to organize new activities that will involve professional collaboration between the Alumni.

It is also expected that:
- Regional Coalitions will be established (initially Asia, Latin America and North Africa/Europe and sub-Saharan Africa) whose activities will include regional co-ordination, workshops, information exchange and assistance with placement for prospective graduate students.
- There will be a free and vigorous exchange of information between and within Coalitions.
- There will be research projects carried out by NF-POGO Alumni and coordinated by NANO. Regional proposals for these projects should be written with due regard for local culture and customs, engaging senior managers in the Region from the outset.
- Research projects will focus on global and regional monitoring of biological, chemical and physical changes in the ocean, aiming at better understanding of interactions and feedbacks in the ocean. The concept is to observe locally at selected time-series stations around the global ocean, and network the time-series stations to obtain a global vision.
- These projects are to be run in collaboration with existing projects and aim to contribute to, rather than compete with, existing research programmes in
developing countries.

3. Progress to date

Since the London meeting significant progress has been made in bringing the alumni into the network, establishing communication channels, and preparing for the future activities of the network. To undertake this work, it was essential to engage former scholars to assist the Secretariat. Thus, NF-POGO fellowships were awarded to former scholars from the second year of the Centre of Excellence: Lilian Krug (Brazil,) and Olga Shatova (Ukraine), who were identified during the London Meeting as enthusiastic and excellent contributors, and at the time were seeking opportunities to further their research careers. Lilian’s fellowship was for 8 months (Jan-Sept 2011, Appendix 2), and Olga’s for 3 months (April-June 2011, Appendix 3). In both cases, the fellowships ended once the fellows had found a research or postgraduate (PhD) position that would further their career development. Both are currently continuing their support of NANO through part-time (20% FTE) fellowships. These fellowships have been supported by residual funds carried over from previous years of the NF-POGO programme.

The first step was to contact the alumni and gather their contact and career information to create a database of alumni. In total 209 questionnaires have been sent out to date, to alumni of the six NF-POGO Visiting Professorships (India, Fiji, Sri Lanka, Brazil, Tunisia and Viet Nam), the four years of the CoFÉ, and the two regional CoFÉ programmes (Brazil and Viet Nam). As of Dec. 2011, nearly two thirds of the questionnaires have been returned, which is a very positive result considering that most of these alumni were trained 4-6 years ago and many will have moved on and changed e-mail address. There is a fairly good gender distribution among those who returned the questionnaire. The majority are from India, Brazil and Vietnam (VP host countries that had the best response). In terms of education, as of Sept. 2011, 84% had an MSc and 31% had a PhD. The most prominent research areas were Biological Oceanography and Remote Sensing.

The next major task was the creation of a website. Wikispaces was chosen as it is user-friendly, adopts a social networking approach (i.e. membership of the website, discussion forums, etc) and can easily include different types of media (e.g. maps and videos). The website was developed in Spring and announced in June. The URL is: http://www.nf-pogo-alumni.org. There are a number of pages open to the public, however all the pages containing personal information on the alumni are open to members only. Thus, the website is a virtual platform for communication within network, as well as providing information on NANO to the general public.

The website includes a private database of the alumni, whereby everyone who returned the questionnaire has a profile page (short CV) including education, professional achievements, research interests and publications. With the aim to facilitate collaboration, research theme pages were created as well as regional pages listing the alumni by research interest and by region, respectively. A page has also been created for “NANO friends”. The Opportunities page, where alumni can post jobs, scholarships, meetings and other announcements, is one of the most visited. As of Sept. 2011, nearly half of the alumni were members of the Wiki. This active response indicates a strong interest in participation in NANO projects. The website
receives an average of forty unique visitors per day and visitors are from all over the world (see Figure 1). This shows that the alumni are very keen to be active members of the network and can see the benefits that will accrue from being part of NANO.

Figure 1. Map showing locations of NANO website visitors. Size of red dots is relative to number of visitors.

The most recent development has been the creation of the NANO newsletter (Appendix 4). Once again, this initiative has been led by an alumnus, Kanthi Yapa from the Visiting Professorship in Sri Lanka. The idea for a newsletter was initiated at the London Meeting to open dialogue, develop and exchange research ideas and disseminate information to society at large. The first issue was released in September 2011, including articles by the newsletter “patrons” (from the POGO Secretariat and Nippon Foundation) and 6 articles by alumni outlining their research interests. An editorial board was nominated, and input was sought for a name and cover page ideas. See http://www.nf-pogo-alumni.org/NANO+Newsletter.

Figure 2. Inaugural issue of the NANO Newsletter (Sept 2011).
NANO research proposals

A call for proposals was sent out to the alumni in July 2011. 20 proposals were received, and these were examined during a NANO Meeting that took place in Abingdon in September 2011, attended by selected alumni, NANO friends and representatives from the Nippon Foundation and POGO Secretariat (Appendix 5). The ideas from the different proposals were combined where possible to formulate four regional proposals for joint research to be carried out by the alumni in 2012.

It was agreed that the proposals should focus on global/regional monitoring rather than local problems, focusing on changes, interactions and feedbacks and on operational oceanography rather than “blue skies” research. There should be an emphasis on time-series measurements. A global vision should eventually be achieved through combination of in situ data, satellite remote sensing and modelling. Themes should include societal benefit angles such as coastal pollution, hazards, climate change, and management of coastal resources.

The four proposals that were drafted during the Abingdon Meeting are outlined below. The total budget for the projects (including a Project Coordination Meeting) is 100K USD, with an additional 25K requested for administration, web maintenance and oversight by the Secretariat (see Budget section). The proposals all focus on ocean observations for societal benefit, with an emphasis on different aspects of coastal water quality (i.e. harmful algal blooms and coastal pollution).

- Indian Sub-Continent

Harmful Algal Blooms (HABs) and their related consequences on fisheries and human health are a global concern. This incites every maritime country to adopt regular monitoring programmes in their territorial waters. In view of this, coastal waters of India and Sri Lanka will be monitored for the occurrence of HABs. Biological and chemical methods will be adopted for taxonomic and toxin characterisation of HAB species, respectively. Remote Sensing and mathematical modelling approaches will also be used to further understand HAB dynamics at larger scales.

Objectives:

(a) Study of the dinoflagellates community structure with reference to HAB species and dissolved phytotoxins in the coastal waters of Indian and Sri Lankan subcontinent.

(b) Use of remote sensing and bio-optical properties to understand HABS in this region.

- South-East Asia

In the Philippines, a remote sensing model has been developed to forecast the onset of algal bloom events, based on chlorophyll and temperature trends during the development of a bloom. The basic requirements of the model are the confirmed occurrences of algal blooms and availability of satellite images of the site. Currently, the model is at the stage of testing on different sites to further enhance and determine range limits from different environmental scenarios. Although principally a stand-
alone model, it is also used in combination with a biophysical model for organism response mechanisms and monitoring, to develop a robust forecasting model. An advantage of this remote sensing model is that it addresses some technical and logistical limitations such as inaccessibility of site, minimal in situ data, and it can provide rapid assessments. Vietnam previously had a time-series project in Mekong Delta that collected a suite of physico-chemical parameters that, if continued, and with biological parameters added, would render Mekong Delta a good candidate as a test site for the HABs remote sensing model.

These complementing circumstances pave the way for collaboration between the two countries, which would be mutually beneficial to both, enabling continuation of the Mekong Delta time-series and validation of the model, and eventually expansion of the model to the whole region. The success of the project will serve as an initial step for an operational monitoring and response system for the management of harmful algal blooms in the two countries.

**Objectives:**

(a) Validate, refine and apply the RS-HAB model
(b) Continuation of the Mekong Delta time-series.

- **Latin America**

High Pressure Liquid Chromatography (HPLC) allows the description of pigment concentrations in water samples and is an effective method for Phytoplankton Functional Types (PFT) studies. ANTARES is a successful Latin American network of nine coastal time series stations in which several NF-POGO alumni and instructors are involved. The current proposal suggests the addition of a new parameter to be measured at five selected stations: pigment concentration estimated through HPLC analysis.

**Objectives:**

The main objective of the current proposal is to quantify pigment concentrations using advanced High Pressure Liquid Chromatography in five selected ANTARES stations as an initial step for the future implementation of Phytoplankton Functional Types studies. Another objective is to complement HPLC studies with the use of remotely sensed ocean colour measurements.

- **North-West Africa**

Monitoring of coastal chemical pollution and erosion in Northern and Western Africa can benefit from inter-calibration of the methods that are being used by young scientists working in these fields. Presently, heavy metal pollution of coastal regions is on the rise as a result of urbanization, industrial development and agricultural run-off into coastal sea waters causing major ecological problems, such as eutrophication. However, research in the fields of coastal pollution and erosion lacks research facilities, cooperation between institutions, professional training of personnel and modern data management tools. The current proposal aims to tackle some of the
problems listed above. In particular, the first component, revision of methods and data exchange, will contribute to the establishment of connections between institutions and the creation of a common database, while the second component, the Workshop, will be devoted to professional training and inter-calibration of methods to ensure inter-comparability of results. The benefits of the implemented activities will include scientific progress in the field and aim to contribute to the reduction of pollution at the land-sea interface.

Objectives:
Characterization of coastal chemical pollution and erosion of Northern and Western Africa:

(a) Define the problems in the field of monitoring of chemical pollution and erosion in Northern and Western Africa.
(b) Develop common guidelines for monitoring erosion and pollution in coastal areas that will include basic measurements relevant to resources available in the region.
(c) Extend the techniques to 'Alumni countries' in Western and Southern Africa by involving more alumni in the project.
(d) Gather the available data on sediments and chemical pollutants in Tunisia, Ivory Coast, Ghana, Nigeria, Senegal and Burkina Faso with the prospect of adding data from other 'Alumni countries' where similar type of measurements are performed.
(d) Compare levels of coastal erosion and chemical pollution in the regions mentioned above.