

nano news

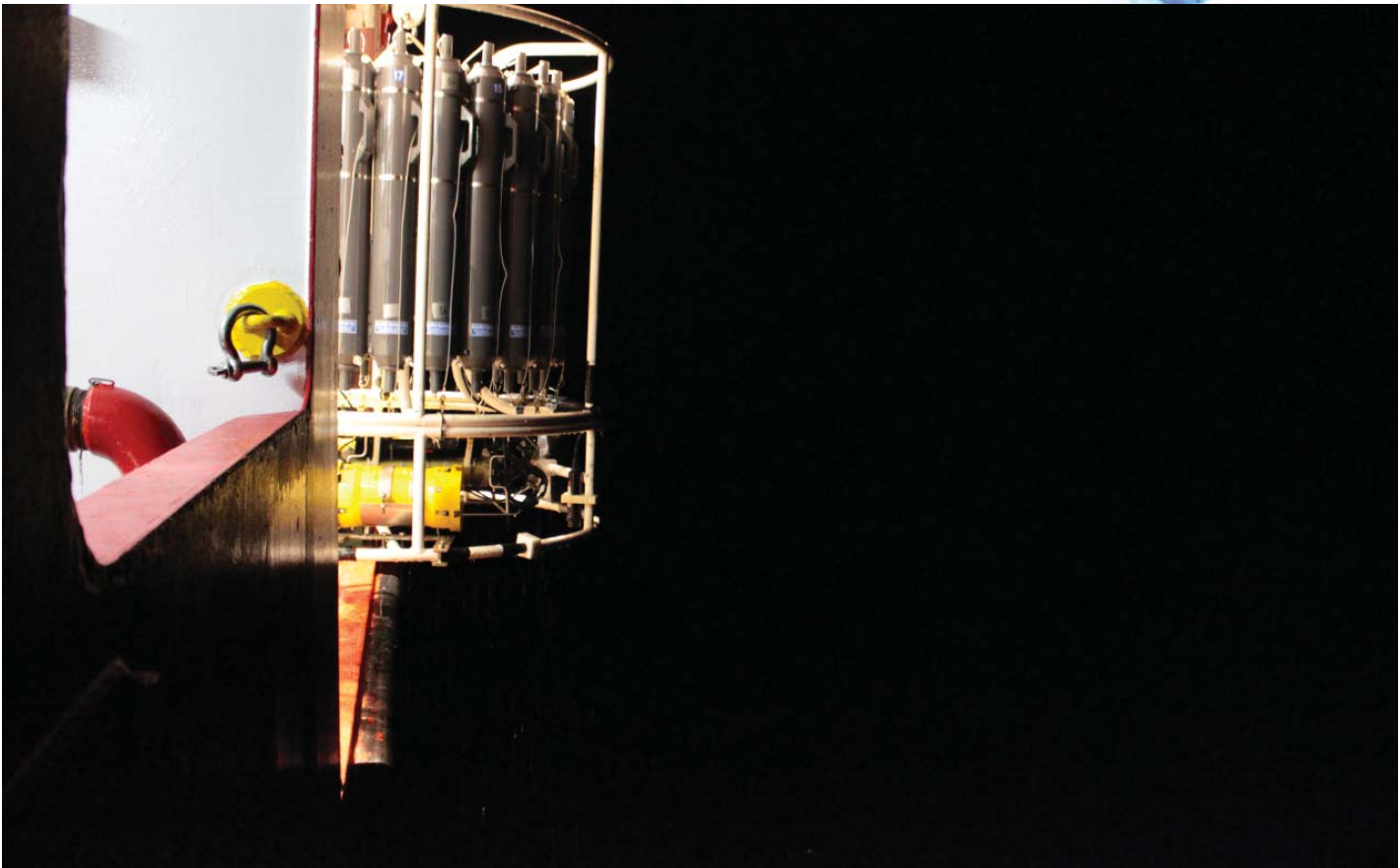
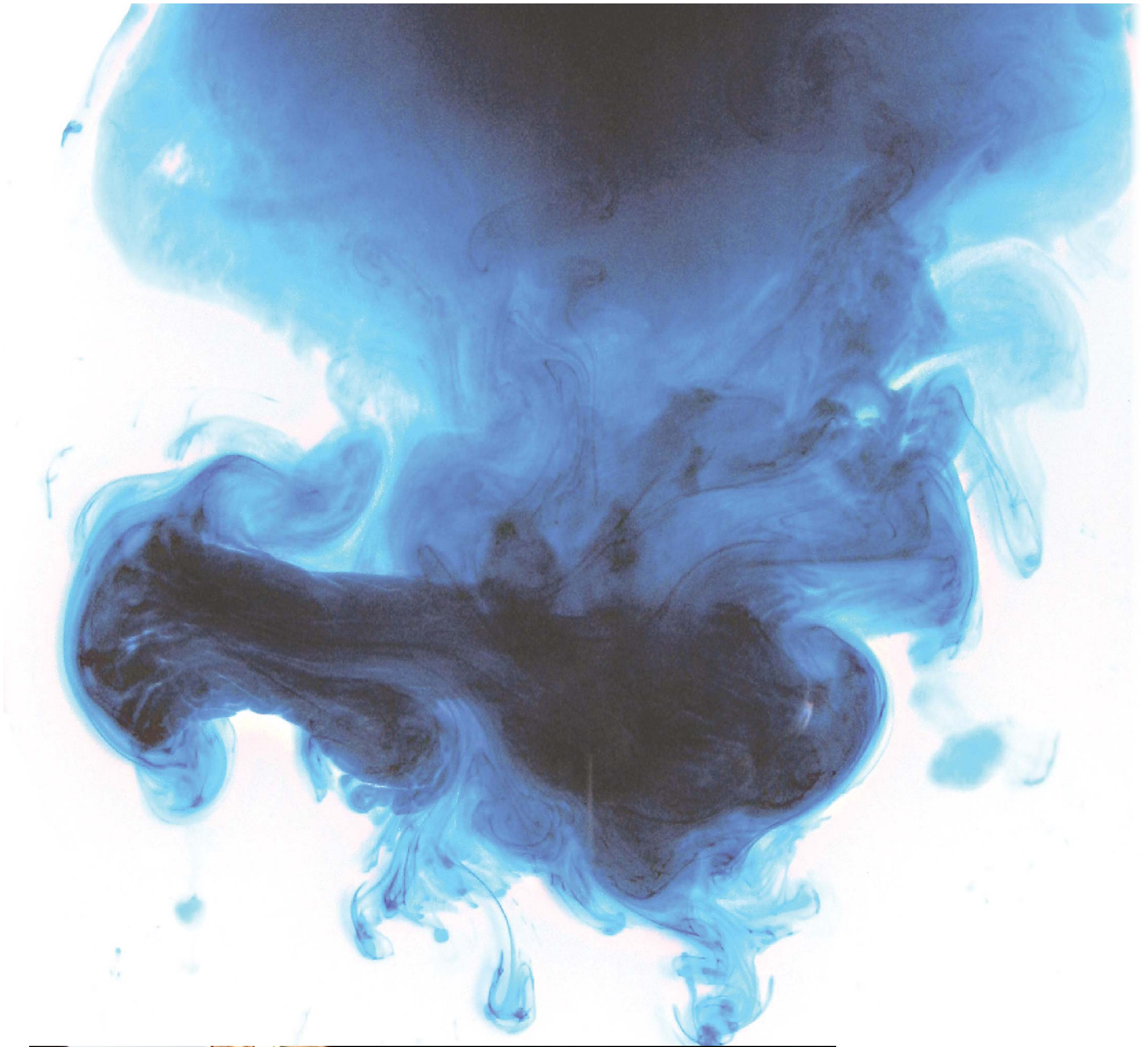
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- NF-POGO Alumni Network for Oceans -

NF-POGO Alumni E-Newsletter – Volume 12, May 2017



**Ocean observations
at all depths by all
nations**



Cover photo credits: Alumna Meri Bilan.

The CTD Rosette being cast onboard the Research Vessel Sarmiento de Gamboa during the MEDiterranean out flow Water and Vulnerable EcosystemS (MEDWAVES) Cruise. MEDWAVES project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement N° 678760 (ATLAS). This output reflects only the author’s view and the European Union cannot be held responsible for any use that may be made of the information contained therein.

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In this issue of NANO News, alumnus and environmental artist Holly Gittlein tells us her experience at the Selawik National Wildlife Refuge with the Inupiaq community. Here she shares about her fish sculpture (one piece of the mobile) with a student at Selawik Science-Culture Camp. Read all about at page 14.

LET US SHOW YOUR ART

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

From the Editorial Board

NANO newsletter issue 12 highlights what NANO is all about. It is about building capacity, carrying out research, applying the research and disseminating information about research.

We get to meet the new POGOnians 8 and learn about their different backgrounds, disciplines, and interests.

The latest NoSoAt scholars reflect on their Atlantic cruise experience and share their insights about the highly successful capacity building exercise.

We also get to know about progress of NANO regional projects with the learnings from the workshop conducted by the Latin American Project and the set up of the meteorological and hydrodynamic observatory in Mauritius.

An environmental artist shares with us what Inupiaq Eskimos have to share with the world.

Finally, we learn how to use a sediment trap to estimate particle fluxes followed by scientific events announcements.

I am grateful to the editorial board Edem Mahu, Marcio Silva de Souza, Sophie Seeyave, Victoria Cheung, Lilian Krug and Olga Shatova for making this issue possible. A big thank you to the contributors, without you, this would not have been possible.

Read and learn.

Thanks,

Ngozi Oguguah
Editor-in-chief



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Shubha Sathyendranath and Trevor Platt/ Former Executive Directors - POGO

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Editorial Board: Ngozi Oguguah, Edem Mahu, Marcio Silva de Souza, Olga Shatova, Vikki Cheung, Sophie Seeyave.

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Meet the new Pogonians

Pogonians year 8 (2016 - 2017)

Compiled by Sudheesh Valliyodan and Helen Soares

*Alumni profiles available at <http://nf-pogo-alumni.org/programs/centre-of-excellence/cofe-1617/>

One family, with 10 cultural and educational backgrounds; that is the meaning of being a POGOnian. This year, the 'ocean exploring family' includes members from Bangladesh, Brazil, Cameroon, Ethiopia, India, Indonesia, Iran, Sudan, Tunisia and Turkey. We started our journey as POGOnians from September 2016 at Alfred Wegener Institute (AWI), Germany. The four women and six men in this new POGO family speak different languages, have different habits but everyone has the same wish - To Explore the Ocean. The journey of 'exploring the ocean' is continuing. During the last 4 months, we explored the AWI stations at Bremerhaven, Sylt and Helgoland. Now we are at Helgoland again, this will be our home for the next 6 months. During the period of last four months, we studied a lot. We studied different subjects in ocean sciences, statistical tools and modelling aspects from the eminent professors in their respected fields. They taught us not only the subjects but also shared their experiences of being an oceanographer. It is a unique opportunity in life to be part of the NF-POGO Centre of Excellence in Observational Oceanography and we are sure that it will open many opportunities in our careers when we return to our home countries. Since then, we have observed the world, the ocean and the future with new eyes. Sharing our own personal experience, we want not just to be part of the Partnership for Observation of the Global Oceans now, or 10 months but for our whole lives. We are looking forward to a better understanding of the changing ocean in the future.



Ahmed Alkarory Abdalazeez (Sudan) Ahmed holds a B. Sc. (with honours) in Physics from Sudan University of Science & Technology and M.Sc. in Physical Oceanography from the University of Bergen, Norway. His Master's thesis title is "Wave run-up estimates at gentle beaches on the northern Indian Ocean". Ahmed worked as a researcher at the Institute of Marine Research (IMR), Red Sea University, Port-Sudan, Sudan, where he was involved in the monitoring programme which focused on the oceanographic coastal processes occurring in the Sudanese Red Sea. At present, Ahmed is a Ph. D student of Tallinn University of Technology (TTU), Tallinn, Estonia. He works on the research project: "Influence of seabed bathymetry and coastal topography on statistical characteristics of wave run-up on a beach". His main research aimed to bring the available formulas to one theoretical ground by considering different seabed bathymetry and coastal topography and different types of waves such as regular and irregular wave trains and using extensive numerical modelling. Ahmed believes that the NF-POGO CofE programme will improve his knowledge and helpful to develop new ideas to understand the coastal process. Furthermore, he is looking forward to meet and discuss his ideas with eminent scientists of his field of expertise.

Babette Christelle Tchonang (Cameroon) Babette studied Theoretical Physics for three years in the undergraduate programme, studied one year at Master's level in Environmental Physics (specially Atmosphere, Climate and remote sensing) and she completed her second year at Master's level in physical oceanography. As a part of her master's degree, Babette studied "Exchanges of passive tracers between subsurface and surface waters in the Gulf of Mexico". The study aimed to understand the role of mesoscale turbulence on exchanges of tracers (chlorophyll, SST and nutrient) between the surface and the subsurface, and their role in structuring the surface chlorophyll of the region. Babette would like to pursue a career as a physical oceanographer and is greatly interested in the numerical ocean modelling. For the NF-POGO programme, her aim is to better understand the various interwoven phenomena taking place in the oceanic environment (biological, physical, chemical, etc.). Babette would like to continue her studies in numerical ocean modelling and is looking for a PhD position in the same field. She is confident that the interdisciplinary approach of the NF-POGO programme would better equip her to face any challenges in the future.

Dr Forough Fendereski (Iran) Forough's studies has focused on the understanding of the relationships between biology (in particular, primary producers) and environmental drivers on large spatial and temporal scales with the ultimate goal of marine ecosystem-based management. Her Ph. D work focused on the determination of ecosystem boundaries of the Caspian Sea using physiologically relevant, remotely sensed and in situ observations of geophysical variables with the aim to assist the effective ecosystem management and conservation of this water body. She used long-term satellite-derived chlorophyll data and available information on species of marine plankton, fish, and benthic taxa, to validate the geophysical based ecoregions in terms of their biological relevance. A part of her PhD work had been dedicated to the quantification of potential biases in satellite chlorophyll estimates for the southern Caspian Sea. To this end, she developed an artificial neural network model using a set of explanatory environmental parameters and in-situ chlorophyll data to validate and improve chlorophyll estimation using satellite imagery in the southern Caspian Sea. Now, Forough works on the spatial

and temporal variability of the phenological features of phytoplankton blooms in the Caspian Sea using satellite estimated chlorophyll-a concentration. Forough sets her goal for the near future to develop her knowledge in the field of Marine Ecology. She is looking forward to learn more about physical oceanography, remote sensing and spatial and temporal modelling techniques, and to gain more experiences on handling large and complex datasets, data processing, and advanced statistical analyses from the NF-POGO programme.

Helen Aparecida Soares De Souza (Brazil) Helen holds her Bachelor (2013) and Master's degree (2016) in the Faculty of Oceanography at the Rio de Janeiro State University (UERJ), Brazil. Her Master's thesis focuses on biogeochemical process between the estuarine system and the adjacent ocean. During that period, she did an internship in France (2011-2012), where she completed the Master's degree in Ecology at the Université Lille 1 - Sciences et Technologies. Helen has work experience in biogeochemical analysis, in marine ecology with macroalgae community and mangrove forest. In February 2016, She had onboard experience on a Brazilian oceanographic ship (NPo Almirante Maximiano, H-41) near the Antarctic Peninsula with a multi-institutional project (Nautilus Project on OPERANTAR XXXIV). From the NF-POGO CofE-AWI programme, she is expecting to improve and update her theoretical background in marine sciences and to gain knowledge in operational oceanography and experimental marine ecology. Helen is interested in the marine carbonate system and would like to be introduced in current topics such as ocean acidification and climate change.

Jaya Kelvin (Indonesia) Kelvin is a BSc holder in Marine Science from Universitas Padjadjaran, Indonesia. He completed his bachelor with a thesis about tsunami run-up dynamics against coastal forest using the COMCOT model in Pangandaran, West Java, Indonesia. However, his first research experience had started during his undergraduate by an internship at Balitbang KP in Jakarta. His interest to physical oceanography was prompted when he was analysing time-series mooring buoy data during the internship for Kelvin wave signal identification. After graduating, he continued to do more research activities within the university (through KOMITMEN Research Group) and government institutions as well as working for private consultants as a freelancer. During this period, he was actively involved in the shoreline analysis, mapping of suitability areas for coastal protection and utility, wind-wave modelling, as well as time-series analysis. Recent inclined awareness for coastal protection related to climate change, natural disaster, and biological conservation, has unwittingly urged him to learn further on all the aspects of the ocean for which could give the recommendations for coastal management. These led him to learn about the interdisciplinary subject which not only to understand the theories but to learn about how to make sustainable observations as well. Kelvin believes the NF-POGO CofE program will not only give him access to the world-class facilities but could also have wider networks and the chance to learn within this amazing research environment. He is now planning to continue his study further to graduate school.

Md Masud-UI-Alam (Bangladesh) Masud completed his four-year undergraduate programme leading to the degree of Bachelor of Science in Fisheries from the Fisheries and Marine Resource Technology Discipline, Khulna University, Bangladesh. His bachelor project work was based on the molecular biology, especially RNA extraction, spectrophotometric analysis and PCR techniques. After his bachelor, his interest in oceanography lead him to Department of Oceanography, newly introduced subject in Bangladesh, at University of Dhaka, Bangladesh. He gained his Master's degree in physical oceanography in 2016. His Master's thesis was on "Mesoscale Variability: An Investigation into the Spatial and Temporal Scales in the Bay of Bengal". He had experienced a three-month training programme on "Oceanographic data (in-situ and remote sensing) processing, analysis and interpretation" at NIO, Goa, India. Furthermore, he also attended a training programme on "Geophysical Fluid Dynamics & Principal Component Analysis" at University of Dhaka, Bangladesh. Masud is interested in the effect of mesoscale eddies' on the shelf circulation and biogeochemical processes in the northern Bay of Bengal. He is also interested in satellite altimetry for the estimation of ocean productivity, oceanic and atmospheric coupling processes and application of satellites for ocean observation. Masud has a lot of expectations from the NF-POGO programme. He is very much interested in the ocean observational techniques from different satellites, ARGO floats and aerial photographs. He believes he could increase his knowledge in marine sciences especially in satellite altimetry and observational oceanography.

Onur Karakuş (Turkey) Onur has a Bachelor's degree in Mathematics in the Middle East Technical University (METU). Onur is really interested in the natural sciences which led him to choose an Oceanography Master's programme in the Institute of Marine Sciences (IMS) of METU.

In addition to introduction courses about marine geology, he also studied biology, chemistry and physics. He is mainly interested in applying basic tools of modelling and data analysis in marine science such as R and MATLAB. Onur is interested to learn more about how ecosystem functions and the different habitats all over the ocean. He would like to focus more on biogeochemical modelling of marine environment. Onur believes that the NF-POGO CofE programme provides a chance to become acquainted with scientific works and oceanographers to build his ideas to understand the ocean processes and for

seeking the bigger picture. He is looking forward to gain a lot of knowledge from all the subject of marine sciences. After all, he wants to use the knowledge for modelling of the marine environment.

Dr Sonia K. M. Gueroun (Tunisia/France) Sonia completed her Ph. D degree in Marine Biology from the Laboratory of Aquatic Systems Biodiversity and Functioning (BFSA), Carthage University, Tunisia. She worked on jellyfish dynamics, growth and predation impact on zooplankton community in lagoon and coastal ecosystems in Southwestern Mediterranean Sea. Her main research includes the Medusozoa taxonomy, ecology and trophic-ecology. Her PhD was part of a European project: "MED-JELLYRISK: Integrated monitoring of jellyfish outbreaks under anthropogenic and climatic impacts in the Mediterranean Sea (coastal zones): trophic and socio-economic risks" (ENPI CBCMED Project; Ref: I-A/1.3/098). Moreover, Sonia was actively involved in the IRD (Institute for the Research and the Development) program: JEAI ECOBIZ, under the thematic research "Anthropogenic impact on the diversity and functioning of the first links in the pelagic food web in Bizerte lagoon (Tunisia)". She also gave lectures at workshops and trainings for stakeholders, environmental associations and for schools promoting the citizen sciences. Sonia's research interest belongs to ecological studies of the community structure and response(s) and/or adaptation(s) to environmental change (related to Global change). She would like to gain knowledge in the times series analyses as well as in modelling from the NF-POGO CofE programme.

Sudheesh Valliyodan (India), Sudheesh has his master's degree in Hydrochemistry from Cochin University of Science and Technology (CUSAT), Kerala, India. Sudheesh is currently pursuing his doctoral studies in the same university. During the past 4 years, after obtaining his M. Sc. degree, Sudheesh had been associated with several ocean-related scientific research projects and has thus gathered diverse exposure on various aspects of biogeochemical studies. He is currently involved in investigations on Kochi-Time series (KoTS), on the biogeochemistry of south-eastern Arabian Sea shelf, with a special emphasis on potential greenhouse gases (CO_2 , N_2O and CH_4)- all of which is expected to provide valuable insight into the biogeochemical changes that characterise the southeastern Arabian Sea. He is also keen to focus on how the global changes will influence the planktonic food web. Sudheesh believes that under the supervision of eminent scientists of the NF-POGO CofE at AWI he will be provided with precious exposure that would enable him to realise his cherished dream of establishing himself as a competent and able marine biogeochemist well equipped to tackle scientific challenges of particular interest to the ocean system around the Indian peninsula.

Zerihun Senbeto Woldeyohannes (Ethiopia) Zerihun has a B.Sc. in Applied Biology from Addis Ababa University and did his master's in International Studies in Aquatic Tropical Ecology (ISATEC) at Bremen University, which is given in collaboration with the Leibniz center for tropical marine ecology (ZMT). During his master's thesis, Zerihun was involved in the bilateral Indonesian-German research (SPICEIII-topic 4) project of ZMT Ecological Biogeochemistry working group. Accordingly, he studied "Spatio-temporal distribution of amino acids on the surface sediment of the Segara Anakan lagoon, in Java, Indonesia". Zerihun is interested in terrestrial influences on aquatic systems – natural as well as anthropogenic factors, land use changes and nutrient inputs, thereby, environmental conditions and ecosystem processes. Apart from these research experiences and interests, Zerihun has worked as an instructor in the Biology department of Arba Minch University, Ethiopia. Zerihun is expecting to expand his knowledge from the NF-POGO CofE programme. He would like to learn more about the different analytical methods and thereby try to understand how biogeochemical cycles function and how they can be influenced by natural and/or anthropogenic changes across time and space. He is also keen to learn the atmosphere-ocean interactions and how these affect our climate, oceanic and terrestrial productivity, the oceanic uptake of anthropogenic carbon and its influence on global carbon budget.



Pogonians Year 8 (2016-2017): Top row, from left to right, Sudheesh, Sónia, Ahmed. Middle row,: Onur, Forough, Masud , Jaya. Front row: Babette, Helen, Prof. Dieter Wolf-Gladrow and Zerihun. Photo credits: Sudheesh Valliyodan

Our shared ocean: NoSoAT 2016 scholars reflect on their Atlantic cruise experience

*Alumni profiles available at <http://nf-pogo-alumni.org/programs/shipboard-training/nosoat-2016b/>

In a world where the consequences of climate change are inevitable, scientist training is extremely important. The acquisition and processing of data on board research vessels is crucial in understanding the impacts of climate change and to predict natural disasters. The Intergovernmental Panel on Climate Change (IPCC) has been reporting during the last decades, the increase in global temperature, ocean acidification and sea level rise as well as possible consequences of these phenomena. Towards this goal, research is absolutely necessary. The acquisition of scientific data from the ocean and the atmosphere are of primary importance. The capacity building of young researchers especially on-board research vessels will have a substantial impact on achieving this goal.

The North South Atlantic Training Transect 2016 (NoSoAT 2016) was organized by the Alfred Wegener Institute, the Strategic Marine Alliance for Research & Training (SMART) and funded by the Nippon Foundation/POGO Centre of Excellence. The NoSoAT 2016 trained 25 young scientists aboard RV Polarstern from Bremerhaven, Germany to Cape Town, South Africa. It was an opportunity to train students from different countries on practical work at sea.

Diving into science began in the AWI Building in Bremerhaven (Germany) with our first lecture on climate system by Professor Peter Lemke. Remarkably, the most interesting experience happened in the next four weeks where we covered five different modules - Climate and Meteorology, Remote Sensing, Oceanography, Ocean Governance, and Art and Science. Each group worked with each module for 5 days, wherein we took part in classes and practical implementation of these theories. Our group became our second family for a month, our cabin mates became our close friends and our new knowledge has opened doors to many more opportunities and scientific endeavors.

The main objective of the training was to train the students on the principles of oceanography and atmospheric interactions and their impacts on climate. We received practical skills on sampling, data acquisition and analysis,

in addition to the lectures on the role of ocean on climate systems, and ocean governance. During the Climate and Meteorology course, we had classes on the impact of climate change on the oceans and environment, as well as studied IPCC reports on climate change. In the remote sensing module, we were taught the fundamentals of remote sensing, acquisition and interpretation of satellite data. In addition, we made measurements of ocean colour using RAMSES instrument, and compared this data with in-situ measurements of ocean chlorophyll-a concentrations. The Oceanography module was more practical based learning through performing in-situ measurements using a Rosette sampler with Conductivity, Temperature and Depth (CTD) sensors, Expendable Bathythermographs (XBT's) and Underway CTD. During the Ocean Governance module, we learned the importance of translating scientific results into comprehensible materials for the benefit of the legislators and the public. In this module, we are given a glimpse on how to translate scientific results into rules and regulations. On the last module, the Art and Science module, we were encouraged to unleash our artistic side. We were able to sketch seascapes, people in motion and our immediate environment. We then applied these skills to create our own personal art project. The sessions were very much interactive to say the least. At the end of each module we were given the chance to analyze the data and present our findings to the whole scientific crew. Finally, at the end of the cruise, we were given the opportunity to utilize all data generated to answer a particular scientific question that we find interesting.

After the four amazing weeks, we felt that we were ready to face the world. Equipped with new knowledge, we were very hopeful and eager to contribute to understanding the science of climate change, potentially mitigate its impact and ultimately, to build a better future. Through data analysis, we come to appreciate the intricacies of data collection and the value of method validation. For example, data derived from remote sensing should be compared to in-situ measurements. To be meticulous on methods and analysis is very important when making inferences at any stage of scientific process. Another important thing we learned in the cruise was cooperation which we acquired through group interactions. The cruise underscores the importance of international cooperation among scientists from different nations. It helps us understand that today's challenges should not only be addressed regionally but also globally. International collaboration among various fields makes it easier to work on solutions and to raise awareness of marine issues in a much larger scale. Some of us returned home to start our very own interdisciplinary team, searching for collaborators with different backgrounds (e.g. marine biologist, meteorologist and marine geologist). We were beyond excited to share the knowledge we learned with our colleagues. True to our calling, we are hopeful to engage more in collaborative projects with international partners, provide tools for policymakers and essentially contribute putting forward solutions to global environmental problems.



Scenes from
NoSoAt 2016



The Scholars



Inge Deschepper

Inge obtained her B.Sc. in Marine Biology, Oceanography and Environmental and Geographical Science in 2012 from the University of Cape Town. She then completed her B.Sc. (Honours) in Ocean and Atmospheric Science in 2013 where she worked on a project using the Apex Predator Ecosystem Model (APECOSM) to assess the effects of advection and diffusion on the distribution of different ocean communities. During her honours year, she had the opportunity to join the 2013-2014 SANAE 53 Antarctic cruise to perform oceanographic observations and deployments. She began her Masters in the EMBC+ Master's Programme in Marine Biodiversity and Conservation and obtained her M.Sc. in 2016. Her final thesis was working on the Lagrangian ichthyop model to determine the effect of currents and tides on herring larvae movement in the Celtic Sea. She is currently starting her Ph.D.

at Laval University in Quebec, Canada, working on the biogeochemical cycles in the Hudson Bay and how they are affected by climate change and changing hydrological inputs into the Bay.

Adeleye Adedayo

Adedayo graduated from the University of Agriculture Abeokuta, Nigeria with B.Sc. in Chemistry class of 2006. In 2009, he joined the Department of Physical/Chemical Oceanography, Nigerian Institute for Oceanography and Marine Research (NIOMR) Lagos, Nigeria as a marine scientist. He received his M.Sc. degree in Environmental Chemistry and Pollution Control from University of Ibadan, Nigeria in 2012 and became a senior marine scientist at NIOMR. He was among four Nigerian marine scientists that participated in SINO-Nigeria marine scientific cruise 2012 on Atlantic Ocean where he was very active and contributed significantly to the success of the scientific cruise. He is currently, a doctoral candidate at Ocean College Zhejiang University (OC-ZJU) and Second Institute of Oceanography, Hangzhou China in recognition of his outstanding contributions to the success of SINO-Nigeria scientific cruise collaboration. While at NIOMR, OC-ZJU and SIO, he has published four scientific papers on marine pollution, and also attended workshops, seminars, and conferences that attracted international participants in marine geosciences and environmental pollution. His current research interests vary from land-sea soil organic carbon transport dynamics, to the reconstruction of past climate change, as well as to method development and validation. The occurrence, distribution, and isotopic composition of specific molecules derived from plants and/or microorganisms, or so-called lipid biomarkers, are the most important tools for this work.



Valentina Giunta

Valentina is from Buenos Aires, Argentina. She studied physical oceanography in the University of Buenos Aires and conducted her undergraduate thesis in the National Hydrographic Service in Buenos Aires. Her thesis focuses on the different methods to estimate the mixed layer depth and its characterization in the Argentinian shelf. Currently, she's doing a PhD in the National University of Ireland in Galway. She is currently involved in studying the relationship between the mixed layer depth and the mixing layer depth.

Elena Shestakova

Привет! Elena is from St. Petersburg, Russia and now doing her Master study at Russian State Hydrometeorological University in the field of Environmental management with a focus on climate change and its impact on Arctic freshwater resources. She is also working in Arctic and Antarctic Research Institute on the same topic, trying to find interconnections among ocean and atmosphere processes and Siberian rivers hydrological regime.



Philip Sagero

Philip is a PhD student at Geography Department at Kenyatta University, Nairobi, Kenya. He is working on a research topic on climate change specifically downscaling the future climate change scenarios using regional climate models and analysis of its likely impacts on the marine environment. He also has a great interest in air-sea interaction and its influence on regional climate.



Walaa Thabet

Walaa is a researcher at National Institute of Oceanography and Fisheries (NIOF) in Egypt. She gained her Masters degree in the Chemical Oceanography Department at Alexandria University and her PhD in the Environmental Studies Department from the Institute of Graduate Studies and Research at the same university. Her scientific interests are water quality, surface treatment, industrial effluents treatment, marine spatial planning, and coastal and environmental management. She is a member of International Ocean Institute committee in Egypt which makes events for environmental awareness (related to oceans), also she has organized several conferences and workshops in the field of marine environment and water treatment at NIOF. She really appreciates the chance that NF-POGO gave to her in that cruise for learning more about marine environment and relations to climate change as well as to interact with great professors and teachers with different backgrounds and nationalities in a well-equipped research vessel especially that it gives seven scholars from Africa and the Middle east a great opportunity to learn.



Shipboard Training

The Scholars

Daniel Gebregiorgis Yirgaw

Daniel recently gained his PhD from Christian Albrechts Universität in Kiel. His PhD work examined the link between the South Asian Monsoon (SAM) climate and orbital insolation, and provided a working hypothesis with regard to the response of SAM to interhemispheric insolation changes.



Andrian Gajigan

Andrian Gajigan is a MSc Marine Science student at the University of the Philippines Diliman. He completed his Bachelors in Biochemistry at the University of the Philippines Manila. His current research interest is on marine molecular biology and microbial oceanography. He hopes to advance our understanding of marine life and ocean biogeochemistry by integrating observations from the gene level to ocean scale processes.

Rabie Maarouf

Rabie is one of the marine chemistry lab staff and teaching assistants of Marine Chemistry and Pollution Aspects, Oceanography Department, Faculty of Science, Alexandria University, Egypt. He obtained his Master Degree in (Chemical) Oceanography with a thesis entitled, "Determination of Concentration Levels of Aluminum and Some Trace Metals in Water of a Semi-enclosed Bay (Eastern Harbor of Alexandria, Egypt)". His research interests are carbon, nitrogen and metals biogeochemistry, its various forms (organic, inorganic, dissolved and particulate), distribution, behavior, origin and role of biological factors. Currently, he has great interest in searching boundary layer conditions and the supply mechanisms of iron from shelf waters and the Oxygen Minimum Zones (OMZ) to surface waters and the open ocean, specifically the impact of (i) Fe fluxes from the bottom boundary layer to overlying waters, (ii) Fe stabilization by organic ligands and colloids, (iii) rates of Fe scavenging. He enjoys working as a member of a team and he is hopeful to start and build up his future career as aquatic chemistry expert.



Carla Espinosa Lagunes

Carla is a student from Mexico studying for her Masters at Bremen University, Germany. Her background is in oceanography and now she studies marine geosciences focusing on climate change and paleoceanography.

LA-NANO members participants of the workshop at IMARPE dock



NANO REGIONAL PROJECTS

Measuring bio-optical variables in Lima, Peru

Progress on the Latin America Project

Guillermina Ruiz¹, Adriana Gonzalez Silvera² and Jesus Ledesma³

¹National Council for Scientific and Technical Research, Argentina

Alumnus profile: <http://nf-pogo-alumni.org/profile/mruiz/>

²Universidad Autónoma de Baja California, Mexico

Alumnus profile: <http://nf-pogo-alumni.org/profile/agonzal/>

³Instituto del Mar del Perú, Peru

Alumnus profile: <http://nf-pogo-alumni.org/profile/Jesus%20Ledesma/>



The Latin-American NANO Regional Project (LA-NANO) began in 2012 as a part of the ANTARES Network (see NANO News issues 7 and 8). Since its beginning, the union among its members has not stopped growing. Without any doubts, the “capacity building” objective that was guiding the first phase of the LA-NANO project has been achieved successfully. In February 2017, 10 members of the network plus local fellows gathered in Lima, Peru, to carry out a five-days “hand-on” workshop on the topic of the determination of the spectral absorption of particulate matter and discuss the future of their activity as a network. Far from seeking a common protocol as an ultimate goal, we acknowledged that keeping our diversity is the source of our permanent enrichment and building capacity.

This time the host institution was IMARPE, the Peruvian National Institution on sea affairs (52 years old, sited just south of the Equatorial Pacific Ocean) and the host, the chemical engineer Jesús Ledesma and his team. Jesús became a NANO

Alumnus in 2015 after his participation in the CofE Regional Training Programme in Ensenada 2015, but he has been engaged with the LA-NANO project since the first phase of it in 2012, when the network’s first set of phytoplankton pigment samples was sent to NASA for HPLC analysis. He told us: “I have enriched myself a lot with the experience of all of you on the biological and oceanographic domains. Now I wish to take the responsibility of leading the new proposal and share my experience on ocean chemistry with you”. The workshop took place at the Chemical Laboratory (Chemical Oceanography Area) and involved the participation of all of its members, who participated actively in the classes and laboratory activities. Until now, among the bio-optical properties, only chlorophyll concentration is being measured routinely at the Peruvian Antares station. “Our plan is to start measuring spectral absorption of particulate and chromophoric dissolved organic matter as soon as the new spectrophotometer with an integrating sphere arrives into our lab; we will start the periodical sampling of this variable on the next cruise to Callao station” explained Jesús.

During the first day of the meeting Prof. Adriana Gonzalez Silvera shared with the participants the theoretical concepts of light absorption by particulate and dissolved material and its relation with ocean colour variability. What followed was field and laboratory work. Once more, the “hands-on” modality of the workshop proved to be highly fruitful for everyone. During the laboratory activities, IMARPE’s fellows Wilson Carhuapoma and Avy Bernales followed carefully the instructions of Prof. Adriana González Silvera and assisted her with the manipulation of the old spectrophotometer and glass material. Liseth Arregocés (collaborator from Cartagena, Colombia) could check her protocol for several practical “details” and go back to Cartagena having resolved some important doubts. She said: “Now I understand why some of my particulate absorption samples were noisy, I learnt how exactly to position the filter on the spectrophotometer (stuck to the light detector and not to the light source). Also, I will follow Wilson’s way to warm up the methanol, he made it really easy and avoided generating dangerous gases”. In fact, until now none of us used a bottle with a lid and a water bath to warm up the methanol required for



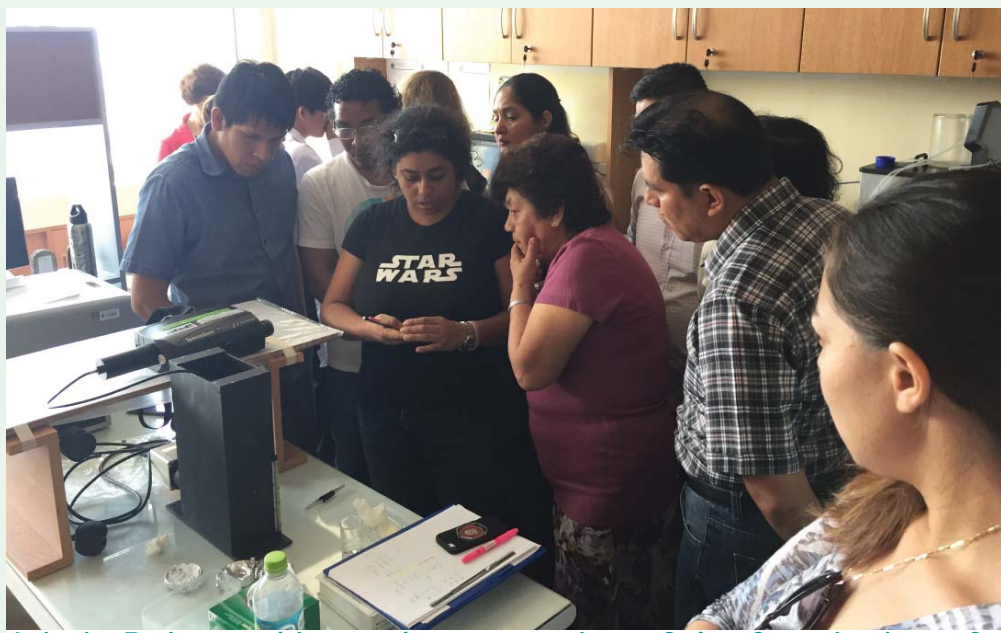
Working at laboratory with samples filtration.

pigment extraction. In the classroom, Mayza Pompeu explained to us in detail her modification to the current protocol based on a local need: “At Ubatuba station we have the presence of small phytoplankton cells which are known to have pigments that are not completely extracted with hot methanol. Instead, bleaching the pigments with sodium hypochlorite is working perfectly for our cell types”. This lesson was of special relevance to Liseth, who acknowledged the similarities of some cell types at Cartagena station. “I will pay attention to this, and if necessary, I will try to apply this modification”.

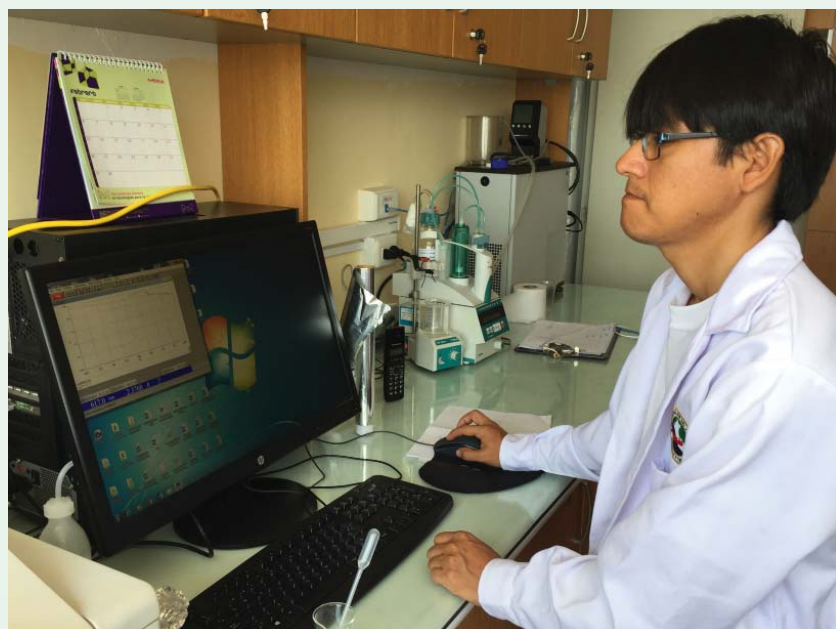
Jamie Rojas (Venezuela) is an active member of the LA-NANO; she became a NANO Alumnus in 2009, when she assisted to the CofE Regional Training Programme in Brazil. Her aim at this workshop was to measure and compare replicates samples using a Spectrascan radiometer regularly used at her laboratory (see picture below) and the spectrophotometer to make sure she will be able to continue measuring with the same accuracy as usual. Jaimie told us “after 17 years, CARIACO project is over now. Many of the equipment that we have been using so far will no longer be on loan in our laboratory. Therefore, I will have to start applying the spectrophotometric method again”. The current political and economic context in Venezuela together with the finalization of the project to monitor CARIACO station is driving the exit of many of the experts and young scientists from La Salle Foundation of Natural Sciences in Margarita Island. “My plan is to write a project to continue with some monitoring activities; I hope to visit the station at least twice a year”.

Alumni with more experience in the group gave short presentations of their current work. For example, Guillermina Ruiz (Argentinean Alumnus since 2015 but also active participant since 2012) presented her recent results on spectral absorption by CDOM modelling. She is about to submit an article on this topic. “I wish one day I could organize a workshop on CDOM determination. Meanwhile, I think I can make a big contribution to the group sharing my short experience in programming and absorption spectra analysis”.

Finally, we all agree that the support given by NANO, POGO and the Nippon Foundation have been essential for maintaining the collaboration among members and at the same time building capacities that will result in a better comprehension of the functioning of our coastal waters not only under a local but also in a large-scale view.



Jaimie Rojas making a demonstration of the functioning of the Spectralon radiometer.



Wilson Carhuapoma (IMARPE, Peru) setting up the spectrophotometer for particle light absorption measurements.



Maria Elena Tapia and Christian Naranjo (Ecuador)

The workshop held at IMARPE (Peru) was very useful to understand the relationship between water optical properties and remote sensing. After learning about theoretical aspects and laboratory procedures a second phase of reading papers and interpretation of the data suggested a series of scenarios which could arise in different marine ecosystems and in particular in waters off Ecuador. The linkage between researchers of the ANTARES Network is helping to strengthen the bonds of friendship, solidarity and, above all, the interest in understanding the dynamics of the ocean with the study of the bio-optical properties in different parts of Latin America. For us this experience with professionals from Argentina, Brazil, Colombia, Mexico and Peru has been rewarding, fruitful and pleasant in aspects of scientific, cultural and social development. Having these kinds of opportunities allow you to open your eyes to the fascinating world of the marine sciences and guidance to young researchers to increase the knowledge, love the ocean and the wealth that it provides.



Table 1 - LA-NANO participants and respective ANTARES stations

Name	ANTARES station	Country
Adriana Gonzalez	Ensenada	Mexico
Abraham Saavedra	Ensenada	Mexico
Mariana Larios	Ensenada	Mexico
Mayza Pompeu	Ubatuba	Brazil
Jaimie Rojas	CARIACO	Venezuela
Liseth Arregoces	Cartagena	Colombia
Guillermina Ruiz	EPEA	Argentina
Christian Naranjo	Manta	Ecuador
Maria Tapia	Libertad	Ecuador
Jesús Ledesma	IMARPE	Peru
Sonia Sanchez	IMARPE	Peru
Luis Escudero	IMARPE	Peru
Avy Bernales	IMARPE	Peru
Wilson Carhuapoma	IMARPE	Peru
Elcira Delgado	IMARPE	Peru
Victor Aramayo	IMARPE	Peru
Georgina Flores	IMARPE	Peru
Michelle Graco	IMARPE	Peru
Jose Mendosa	IMARPE	Peru
Mario Polar	IMARPE	Peru



Participants of the workshop

Mariana Stephanie Larios (Mexico)

My participation in the “Workshop on particle light absorption measurement in seawater” has grown in me a welcoming and refined personal and academic experience. The course was executed at the Instituto del Mar del Perú (IMARPE) located inside the city of Callao, Perú. When I arrived, I got to meet the members of the Latin-American ANTARES group. As the week passed by, we performed different activities; the objective of the course was stated and samples of water from the dock that is located in front of IMARPE were taken and used for laboratory analysis. The main outcome from this workshop was that sharing research results and experience between nations eases and stimulates the study, understanding and monitoring of the oceans all around the world.



Photo by alumnus Ana Carolina Peralta.

NANO REGIONAL PROJECTS

Setup of meteorological and hydrodynamic observatory in Mauritius

Progress of the NANO Africa regional project

Houssem Smeti¹ and Arnaud Nicolas²

¹Postdoctoral Scholar, National Institute of Marine Sciences and Technologies, Tunisia

Mediterranean Institute of Oceanography, France

Alumnus profile: <http://nf-pogo-alumni.org/profile/hsmati/>

²Mauritius Oceanography Institute, Mauritius

Alumnus profile: <http://nf-pogo-alumni.org/profile/jnicola/>

The Mauritius Oceanography Institute (MOI) joined the NANO-Africa regional project in March 2016. During the third trimester of the 2016-2017 project; the observation equipment provided to the NANO-Africa team in Mauritius was deployed in the vicinity of the city of Albion, near the MOI.



Figure 1 - Location of Albion and deployment site of the weather station (white arrow) and the wave recorder (red dot).

Deployment of the wave recorder

The NHG team in Mauritius successfully deployed the pressure sensor wave recorder on the 20th December 2016 offshore, about 240m from the MOI building located at Albion in the west of the island. The team members that participated in the fieldwork were: Mr. A. Nicolas, Ms. K. Modoosoodun, Mr. C. Samyan and Mr. S. Sunnassee. Several test deployments were carried out in the laboratory and one in the field at the deployment site to ensure that the instrument is recording properly. The location of Albion and exact deployment site of the pressure sensor wave recorder is shown in Fig. 1. Some pictures taken during the fieldwork are shown in Fig. 2.

Setup of the weather station

The weather station was installed on the 5th November 2016 at Albion on the rooftop of the MOI building. Some pictures taken during the installation of the weather station are shown in Fig. 3.



Alumnus Holly Gittlein and a Selawik River sheefish. Male sheefish were harvested and their ear bones (otoliths) collected for aging (page 14).



Figure 2 - Pictures taken during the fieldwork that led to the deployment of the sea level and wave recorder.

Setup of the weather station

The weather station was installed on the 5th November 2016 at Albion on the rooftop of the MOI building. Some pictures taken during the installation of the weather station are shown in Fig. 3.



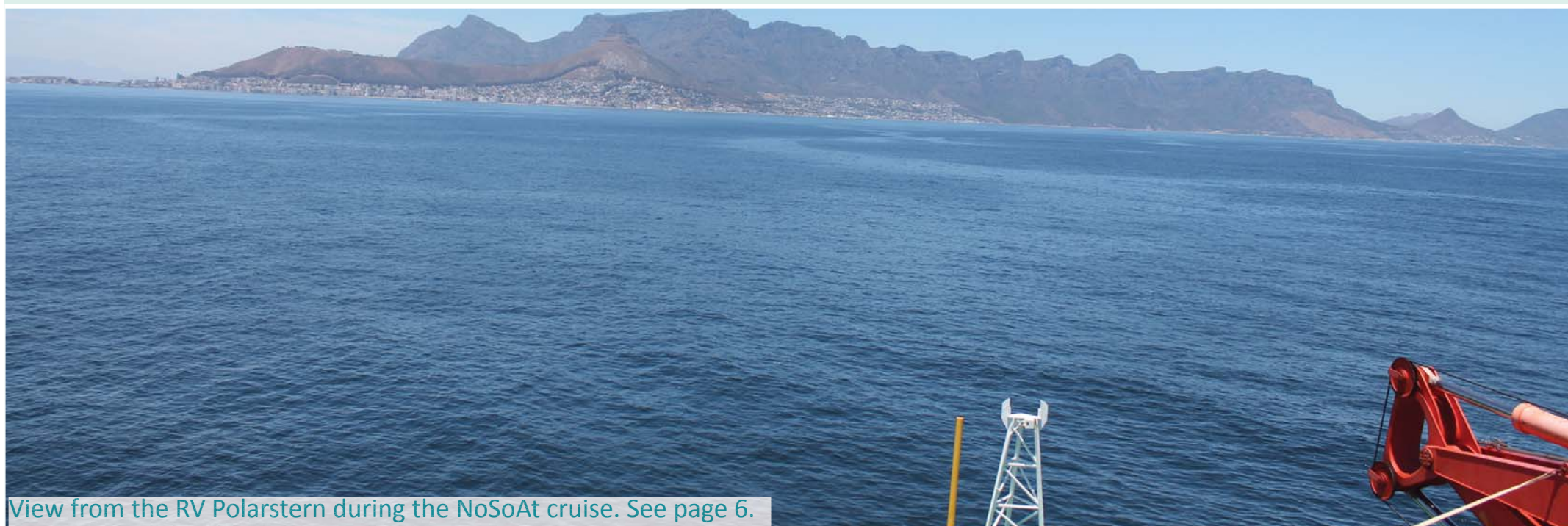
Figure 3 - Installation of weather station at the MOI.

Networking between NANO-Africa project participant institutions

The NANO-Africa project coordinator (Houssem Smeti) visited the Mauritius Oceanography Institute on 12 January. During the visit, the project coordinator gave a 30 minute talk about the NANO-Africa project (with an emphasis on the work being carried in Mauritius), NF-POGO capacity building activities, NANO and briefly exposed his doctoral and postdoctoral work. The project participants in Mauritius and the project coordinator visited the deployment site of the weather station provided by NANO, where they worked on resolving a communication issue between the weather station sensors and its data logger. A few photos taken during the visit to MOI are shown in Fig. 4.



Figure 4 - NANO-Africa project participants from Mauritius and Tunisia in front of the MOI in Albion (upper left); The MOI director Dr. Ruby Moothien introducing NANO-Africa coordinator (upper right); H. Smeti talking about NANO and his past and present research interests (bottom left); NANO-Africa project participants A. Nicolas and H. Smeti performing setup procedures on the weather station (bottom right).



View from the RV Polarstern during the NoSoAt cruise. See page 6.

What the Inupiaq Eskimos have to share with the world

Holly Gittlein

Entrepreneur, environmental artist and post graduate student

Marine Studies from University of South Pacific, Fiji

Alumnus profile: <http://nf-pogo-alumni.org/profile/Holly%20Gittlein/>



In a remote corner of northwestern Alaska lies Selawik National Wildlife Refuge, a special place of extreme climate, free-flowing rivers, and abundant wildlife. Here the boreal forest of Interior Alaska meets the arctic tundra and thousands of waterfowl, shorebirds, fish, insects and other creatures rest, breed and feed in the vast wetlands complex that is the heart of the Selawik Refuge. This is also the homeland of the Iñupiaq Eskimo, where local people hunt, fish and gather food just as their ancestors have done for thousands of years. Over two million acres of land make up the refuge, which straddles the Arctic Circle with the Western Arctic Caribou Herd as one of the most spectacular resources for subsistence. Numbering around 201,000 animals, the herd is the largest in Alaska, roaming an area of 140,000 square miles. Tuttu, as caribou are known in Iñupiaq, have been a vital element of Iñupiaq life for millennia (<https://www.fws.gov/refuge/selawik/>).



Holly with Iñupiaq Eskimo crew Sonny and Kip-mailuk

As I flew over the refuge I knew I was entering into another world. I had been to other Alaskan Villages both as an artist installing my public artwork and also working as a

fisheries technician for the Alaska Department of Fish and Game, but I could sense, even from the air, that this place was different. I was flying out to remote Selawik Village way up above the Arctic Circle on a two-week artist in residency programme with the US Fish & Wildlife Service. I was with education specialist Brittany Sweeney who had been working in this village for several years, doing various research and community outreach in the Selawik National Wildlife Refuge. Selawik National Wildlife Refuge chose to participate as a host site in the 2015 “Voices of the Wilderness” artist residency programme. From their description:

“The Voices of the Wilderness artist residency is a unique opportunity and has been described by the indigenes as a unique opportunity. It is modeled after traditional residencies in the national parks...with a twist. Instead of staying at a remote wilderness cabin, participating artists are paired with a wilderness specialist and actively engaged in stewardship projects, such as research, monitoring, and education. The idea is to give artists a sense of the stewardship

behind America’s public lands, fostering an artistic exploration of these natural and cultural treasures. The hoped-for result is artwork that communicates something of the meaning of these lands.”

As an environmental artist, I create art addressing the things that I hold most important; nature, community and wellbeing. I have spent a lot of my life learning about nature. In fact, all my education is in science. I have a BA in biology and my graduate work at the University of the South Pacific focused on traditional environmental knowledge and subsistence cultures. I have worked all over the world in conservation, sustainability and development. But at my core I am a creator. For this reason, over the past 13 years I have focused my time and energy on art. Often, the language used to share research results and management procedures with the public are too academic and not relative to the masses. This lack of communication can potentially cause misunderstandings and even conflict. Art can help facilitate the transfer of knowledge and understanding between the two groups. For these reasons, I feel artists play a major role in this changing world. www.hollygittlein.com

For the first part of the trip we took a five hour open boat ride during a snow storm deep into the refuge to meet with Fisheries Biologists and Iñupiaq Eskimos to collect biological samples and population demographics of one of the main subsistence food in the region the Sheefish (*Stenodus nelma*). “Siilvik” is the Iñupiaq name for Selawik, meaning “place of sheefish.” We stayed in a winter camp with snow greeting us each morning as we traveled up river to spawning sites to sample male Sheefish with hook-and-line and collect their otoliths (ear bone) for aging and population data. During my five days stay in the Refuge, we harvested 200 fish all of which were then sent down river to the villagers for food. The three Iñupiaq Eskimos I worked with were hard working fishermen, superior naturalists and elders of their communities. At night, I would stay up late with them in our canvas tent huddled around the wood stove and listen to their stories about their culture, their traditions and the vast changes and challenges they are facing. Climate



The Sheefish biological sampling team.

change and capitalism-globalization have created a difficult situation for the Iñupiaq. Their children and grandchildren are more and more reliant on government subsidies of food, their diets are suffering and they are becoming more disconnected from traditional ways. Like many subsistence cultures around the Pacific, Coca-Cola, Snickers and potato



Being a matriarch society the woman play a strong leadership role. Here we see an Elder teaching a young girl to prepare fish for drying.

chips are replacing the once healthy, robust diet of the Iñupiaq Eskimo. They also shared their spirituality with me and the challenge of having a shamanic-traditional approach to Spirit coupled with Christianity that was placed on them. These villagers even lost their connection to music, as it was taken away from them and considered unholy. As I played my Navajo flute for them at night they expressed their longing and love of musical expression. They told me stories of past Shamans, ghost of elders on the tundra and the little people who lived in the wild.

All too soon I was headed down the river and back to the village where each fall for the past 15 years, students, elders, teachers and community members have celebrated their connection to land and culture at a Science-Culture Camp. Every morning for two weeks, rain or shine, students from 1st -12th grades eagerly climb aboard boats for the 15-minute ride to the camp. At camp I was thrown right into the mix and learned from elders how to process fish for drying into paniqtuq (a local food staple), and how to use the 'ulu' knife of the Iñupiaq. I ate all their local foods; every fish species and their eggs, seal, walrus, two types of whale skin, caribou and drank seal oil! The elders would speak to the



Otoliths are hard bones found in the fishes head and used to age and review migration patterns between salt and fresh water.



Crew leader and local elder Sonny hanging harvested sheefish for drying and local food staple paniqtuq.

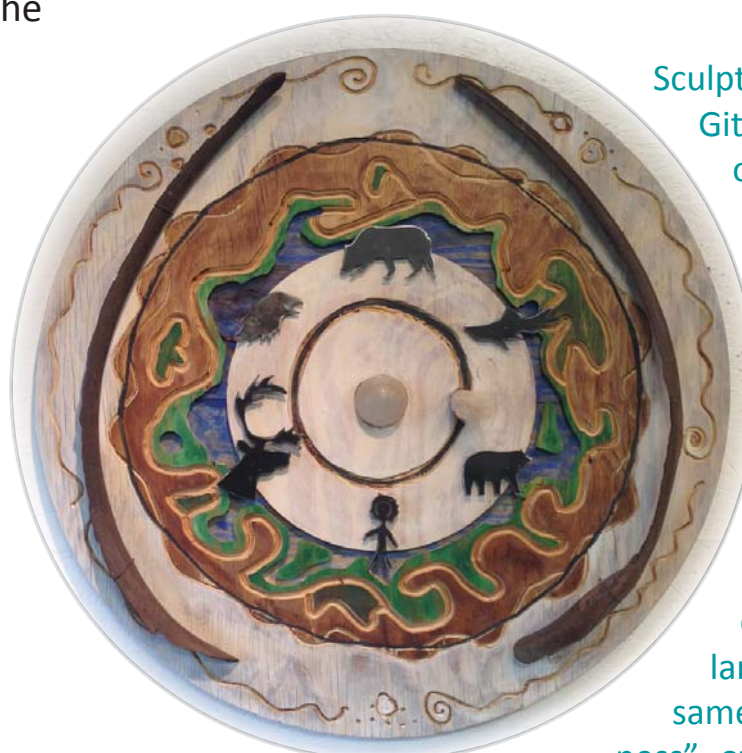


children about their their early days where some of them grew up nomadic and living in animal skins. The elders talked about tradition, safety and survival skills, exploring the area's ecology, community ideals, sexual activity and God. I worked with the 4th grade class to gather natural found objects like bones, sticks, feathers and leaves to create a mobile art piece to hang in their school. Additionally, Selawik is a place full of dinosaur bones and you can stumble across them in the tundra. I befriended the culture and arts teacher of the village school Miss Norma Ballot of the black fish clan. Both of us being artists, we really hit it off and she invited me to her home for a few nights of deep artistic philosophy and creation. She gifted me with the small rib bone of a mammoth, not that small measuring over one meter in length, which I used in a multi-media sculpture that was donated to the Wildlife Refuge Headquarters.

Like most subsistence cultures I have had the blessing of working with, from the South Pacific Fiji Islands to my home Alaska, a common theme emerged: The struggle to maintain identity in a high speed, technology-based society that generally, focuses more on resource consumption than conservation, a loss of transfer of knowledge to younger generations and a management system run by a government that knows very little about the traditional methods of indigenous peoples. It is my personal belief however, that it will be these cultures who have been suppressed, forced to change and still have been able to maintain their connection to the land that will be our saving grace as humans. They will lead an awakening and help us remember our direct connection to Mother Earth and the oneness that binds all living and non-living things. I thank you Selawik for your teachings. Blessings, Love and Peace.

Dedicated to Norma Ballot of the Black Fish Clan of Selawik Village, Alaska.

Thank you for the bone, the kinship and your teachings.



Sculpture created by Holly Gittlein Description: "Eye of Awareness" Wandering waters sculpt the land bringing bones of the ancients to the surface. Migrating caribou, sheefish and wandering wolf live with Inupiaq, bear and eagle. Sharing their knowledge and love for the land, all coming from the same "Eye" and its "Awareness" of the ancient connection,

the unity of all things, and the selfless recognition that the other is you. The symbol of a circle with a dot inside is an Inupiaq symbol for spirituality. Materials: Dinosaur rib, wood, selenite, steel, caribou fur, magic, love. Created by: Holly Gittlein 2016

Sediment trap to estimate particle fluxes

Alessandra D'Angelo

University of Siena and National Research Council, Italy
Alumnus profile: <http://nf-pogo-alumni.org/profile/Ale/>

Background

I am a Ph.D. Student at the Doctoral Programme in Earth, Environmental and Polar Sciences at University of Siena, Italy. My Ph.D. project is part of a wider project under the title "Sensor Network for Oceanography in Shallow Water" and its aim is to elucidate the main processes involved in the particle sedimentation for the inner Kongsfjorden, Svalbard. I am developing this work at the Marine Sciences Institute of the National Research Council (CNR-ISMAR) in Bologna, Italy, with my supervisors: Dr. Leonardo Langone, Dr. Stefano Miserocchi and Dr. Federico Giglio.

The sample collection and mooring maintenance activities take place once a year at Svalbard Islands. We fly to Ny-Ålesund and next we make the oceanographic campaign along the fjord, on board M/B TEISTEN KB. In Ny-Ålesund there is the Italian research station of National Research Council and we stay there for the whole period; usually it lasts about 15 days.

Project work

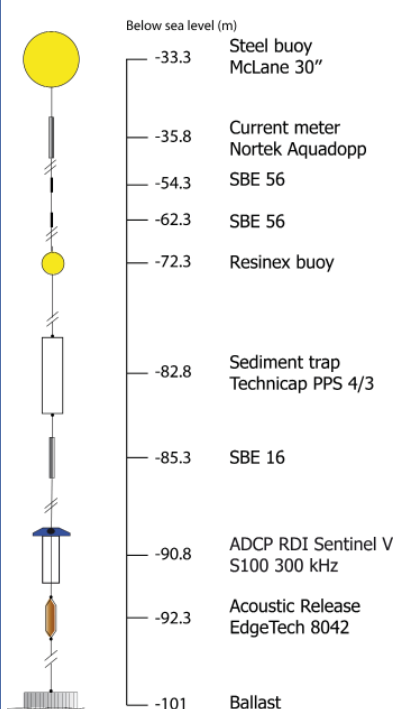
Kongsfjorden is a small fjord in the western part of Spitsbergen region, 26 km long and 14 km wide, it is extended in SE-NW direction at 79° N.

I am currently processing the analysis of samples collected by an automatic sediment trap in the inner fjord, with a view to estimate vertical fluxes of biogenic material sinking in the water column. I also identify the occurrence of zooplankton (swimmers) in samples to better understand their role in the carbon cycle.

In 2010, we installed an instrumented mooring (Mooring Dirigibile Italia, left) in the inner part of the fjord; the site was chosen according to the maximum amount of deposition.

Mooring Dirigibile Italia is equipped with:

Mooring Dirigibile Italia (MDI)



a. Two buoys (1 resinex and 1 steel McLane 30'');

b. Two current meters recording current speed and direction, temperature and pressure measurements with a sampling interval of 1 hour (Aquadopp at ~27m depth and DVS at ~93m depth);

c. One Technicap PPS4/3 sequential sampling sediment trap (12 collecting cups, 0.125 m² opening) at 15 m above the bottom depth. It collects one sample per month with

an acoustic release at 5m from the bottom. Prior to deployment, we filled up sample cups of sediment traps with a buffered 5% (v/v) formaldehyde solution in 0.45 µm filtered arctic seawater;

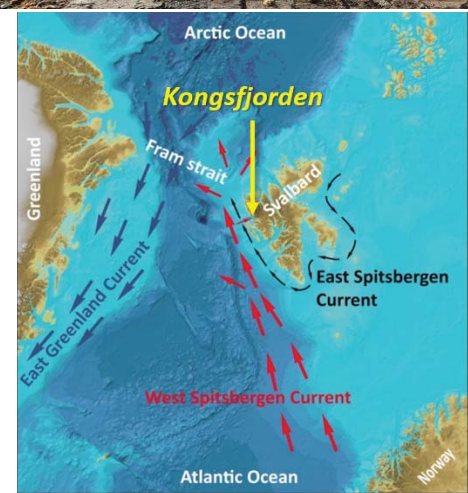
d. Three SBE (56, 56 and 16) which record temperature, salinity and pressure at 20-minute intervals at the sediment trap depth. The SBE thermometers are recording data in front of the coast at four different depths: 87 m (sediment trap setting), 69 m, 58 m and 37 m. There are no thermometers at the surface due to safety issues.

The sediment trap samples are preliminarily treated in the laboratory, according to the procedure of Chiarini et al. (2014). We remove the bigger elements, such as swimmers and ice rafted detritus (IRD) and then they are filtered and split into subsamples to obtain the weight of the filters. The result will be the quantitative estimation of the mass flux along the water column (g m⁻² day⁻¹). Samples are analyzed following the methods of Tesi et al. (2007) and Fabres et al. (2002) to quantify the total and organic Carbon content, the total nitrogen and biogenic silica contents and stable isotope compositions. Through this, we can estimate the composition of the organic and inorganic particles. Swimmers are picked from the samples as non-passive flux as they were entering actively in the sediment trap. Hence, we identify organisms according to the order just to observe which ones are most abundant. The long time series of mooring data will be compared with meteorological data as proxy for the runoff and the permafrost thaw; furthermore, sea ice coverage and chlorophyll-a concentration data will be utilised as a proxy of autochthonous marine organic matter contribution, in order to explain which is the main input of particle flux in the fjord system.

References:

- Chiarini et al (2013). A revised sediment trap splitting procedure for samples collected in the Antarctic sea. *Methods Oceanogr.* 8, 13-22.
- Fabres et al (2002). Composition and spatio-temporal variability of particle fluxes in the Western Alboran Gyre, Mediterranean Sea. *J Marine Syst.* 33-34, 431-456.
- Tesi et al. (2007). Organic matter origin and distribution in suspended particulate materials and surficial sediments from the western Adriatic Sea (Italy). *Estuar Coast Shelf S.* 73, 431-446.

Italian station Dirigibile Italia (top, photo credit Ny Ålesund) and map of Svalbard, the study site (bottom)



Scientific events announcements

1st International Conference on Maritime Sciences and Advanced Technology Denpasar, Bali 3 – 5 August 2017

The conference is aiming at understanding a new thinking of advance science and technology for maritime nations. A number of well-known scientists will be invited to give a keynote talk or lead a specific topic at each mini-symposium. Compilation of selected oral and poster presentations is planned for a review in an indexed and registered proceeding/journal by SCOPUS. The conference will take place in the beautiful Bali Islands and the summer season in August is one of the perfect time to enjoy the sunset horizon in a nice mild weather of Bali.

Deadline
15 May 2017

Contact: msat@itb.ac.id.
<http://msat.fitb.itb.ac.id/>

5th ESA Advanced training on ocean remote sensing and synergy Porto, Portugal 11 - 15 September 2017

As part of the EO Science For Society – scientific exploitation programme element, the European Space Agency (ESA) is organising an advanced Remote Sensing Training Course devoted to train the next generation of Earth Observation (EO) scientists to exploit data from ESA and operational EO Missions (e.g. Copernicus Sentinels) for science and application development.

Deadline
16 June 2017

Contact: eotraining@esa.int
<http://oceantrainingcourse2017.esa.int/index.php>

2017 International Work-Conference on Time Series (ITISE 2017) Granada, Spain 18 – 20 September 2017

The ITISE 2017 seeks to provide a discussion forum for scientists, engineers, educators and students about the latest ideas and realizations in the foundations, theory, models and applications for interdisciplinary and multidisciplinary research encompassing disciplines of computer science, mathematics, statistics, forecaster, econometric, etc, in the field of time series analysis and forecasting.

Deadline
5 June 2017

Contact: congresosgranada@viajeseci.es
<http://itise.ugr.es/>

11th Indian Fisheries and Aquaculture Forum Cochin, India 21 - 24 November 2017



The 11th IFAF objectives are to provide a scientific platform to deliberate on the current research outputs and identify the research and development needs of the sector, nurture innovation skills to address issues of sustainability and safety of fish, encourage scientists to think, develop and undertake need-based research to address core issues affecting fisheries sector and to review the research developments in fisheries science and develop strategies for transfer and refinement of these technologies.

Deadline
30 May 2017


Contact: 11thifaf@gmail.com
<http://www.11ifaf.in/contact.php>

For more opportunities in Ocean Sciences visit <http://nf-pogo-alumni.org/about/opportunities/>


Have any opportunity you would like to announce here? Contact lilian.krug@nf-pogo-alumni.org

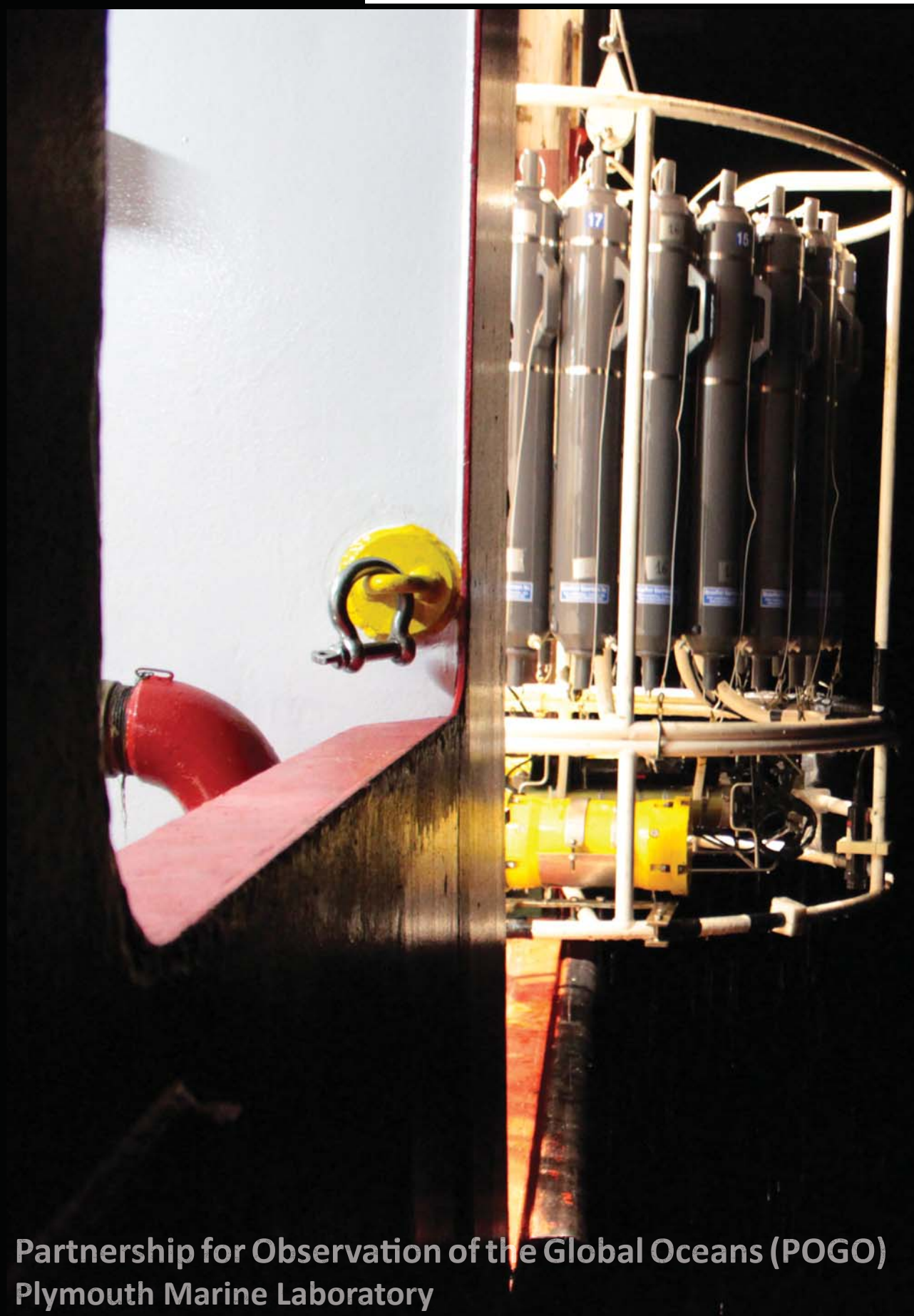
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