**POGO-15 Parallel Workshops**

Information sheets for the four parallel workshops can be found in the following pages.

**Session 1 (23 Jan, 9:15-11:15):**
Autonomous devices for deep-sea observations (p. 2)
Chair: Bob Weller (rweller@whoi.edu)

What can POGO do for SOOS? (p. 3-4)
Co-Chairs: Dosoo Jang (dsjang@kiost.ac) and Louise Newman (newman@soos.aq)

**Session 2 (23 Jan, 13:45-15:45):**
Data from observing systems (Time-Series) (p. 5)
Co-Chairs: Karen Wiltshire (Karen.Wiltshire@awi.de) and Alexandra Kraberg (Alexandra.Kraberg@awi.de)

Autonomous Observing System for Tropical Air-Sea Interaction –Tropical Moored Arrays (p. 6-8)
Chair: Yoshihisa Shirayama (yshira@jamstec.go.jp)
Information Sheet

**Background:** Ocean observing capabilities are being developed for the coastal and blue-water ocean. Over the last decade, tools such as Argo profiling floats, surface drifters, moorings, gliders, AUVs, and wind/wave-driven surface platforms have expanded our collection of data at the surface and in the upper ocean. More recently, there has been a growing awareness of the need for observing capability over the full water column and access to the deep ocean. The goals of this workshop are to discuss the needs for autonomous devices for deep-sea observations. Objectives of the discussion would be to identify what variables should be observed and how they should be observed (specifics of the sampling methodology), to outline the challenges faced in making the sought after observations, to summarize the present state of the art, and to point to the need for further development work. The session will be organized around these objectives:

**Objectives:**
1. To discuss the need for deep ocean observations by autonomous devices, identifying what variables should be observed and with what sampling.
2. To identify the challenges to be faced (e.g., calibration, stability, power consumption).
3. To summarize the present state of the art (what exists, what is needed).
4. To call out the need for further development.

**Invitees:** The session is open to all participants, but POGO member institutions that have responsibilities for making deep-sea observations are key to the success of the session, and we invite their participation in particular. These include: JAMSTEC (Japan); NOAA(USA); USP (Brazil); INCOIS (India); NIO (India); NIOZ (the Netherlands); LDEO, WHOI, and SIO (USA); CSIR and MA-RE (South Africa); KIOST (S. Korea); IOCAS and First Institute (China); CNRS and Ifremer (France); NOC, PML, and BAS (UK); CSIRO and IMAS (Australia); AWI and GEOMAR (Germany); and Shirshov Institute (Russia). We also invite participation from IOC/WMO/GOOS/IODE/GEO.

**Agenda:** From each of the contributors to the deep-sea autonomous devices workshop, we request brief (no more than ~3-5 minutes) presentations supportive of discussion of the identified objectives.

We have time on Thursday, January 23 for the workshop. Let’s here from each other and have general discussion of the topics. Then, while some attend the Partner’s Meeting later that day, we will summarize and synthesize.

**Anticipated Outcome:** We plan a brief written summary report. We see value in POGO identifying and calling out the need for these observations, both clarifying the scientific rationale for them and advocating the development of the appropriate technical solutions. This information will be of value to funding agencies, stakeholders, and instrument developers.
The Southern Ocean Observing System Workshop
POGO – 15, Hobart, Australia
23 January, 09:15 – 11:15

The Southern Ocean is key to the functioning of the Earth system, with global-scale impacts on climate, biogeochemical cycles and ecosystems. Limited observations indicate that the Southern Ocean is changing rapidly: it is warming faster than the global ocean average; there is wide-scale freshening, with potential impacts on global ocean circulation; and basin-wide ocean acidification is occurring due to uptake of anthropogenic CO$_2$. On the continent, ice-shelf collapse and regional warming are heightening the need for increased understanding cryospheric contributions to sea level rise. Further, all of these changes in the physical system are already having measurable impacts on the unique and vulnerable ecosystems of the Southern Ocean. Sustained observations are required now, to enable us to detect, interpret, and respond to these changes into the future.

Over the last decade, the scientific community identified the need for an internationally-coordinated approach to observing the Southern Ocean, and worked together to produce a strategy for a Southern Ocean Observing System (SOOS). POGO was integral in the development of SOOS, and is a key stakeholder community in both the provision of logistics and support for SOOS objectives, and users of SOOS data and data products.

Since its initiation in 2011, SOOS has moved through a developmental stage—identifying governance, policies and developing its long-term vision. SOOS is now moving into Implementation and needs the involvement and support of all stakeholders and communities.

In 2013, SOOS developed a list of priority observations that the scientific community have identified as being key observations gaps that need addressing over the next few years. There are several key obstacles to filling these gaps that need to be overcome, such as the lack of cohesion between funding schemes of different nations, and the need for flexibility in funding to enable prioritisation and direction of funds towards priority observations.

This workshop will provide a platform for interested parties to discuss the planned activities and priorities, identify ways to involve key organisations, and overcome structural and procedural obstacles.
**Detailed Workshop Objectives:**
1. To inform delegates of current SOOS activities and identified Priority Observation Gaps.
2. To discuss the challenges and issues facing SOOS implementation, and develop mechanisms to tackle these issues.
3. To encourage and identify those institutes and organisations with the capability and interest to contribute resources to fill the identified priority observations gaps.
4. To develop further the POGO commitment to SOOS, by implementing the existing relevant POGO action items and developing new ones.

**Planned Agenda:**
*Chairs: Dosoo Jang (KIOST), Louise Newman (SOOS IPO)*

1) The Science and Vision of SOOS (15 min) – Bronte Tilbrook (CSIRO, SOOS SSC)

2) The data vision for SOOS (15 min) – Kim Finney (AAD, SOOS SSC)

3) Current and Future Priorities (30 min) – Louise Newman

4) Discussion Session (60 min) – Dosoo Jang and Louise Newman

**Expected Outcome:**
The expected outcome is a written report on the discussion that takes place, and a recommendation to POGO to form a POGO-SOOS Working Group. This Working Group will comprise any institutes and organisations that are interested in interacting with SOOS to achieve key objectives and/or fill priority observation gaps, and will have the remit of helping negotiate the structural and funding issues that require addressing as part of its implementation.

**Participants:**
SOOS and POGO invite all those with an interest in collecting or using observations of the Southern Ocean, including both those with logistic capabilities and those with scientific, educational or commercial interest.
POGO Timeseries workshop

At the AWI we are currently working on a timeseries station GIS visualization for global timeseries stations. We will include all POGO stations (those reported on the website) in the general set-up and station list. Since we are using a general WEB GIS interface developed at the AWI we can include a range of layers and sub-layers (see Figure 1) to visualize and sort stations by e.g. geography, parameters measured, length of the timeseries, or even governance structures and any other information that POGO might find useful and that can be provided for all stations (location of NANO members, ship tracks etc). This would be a way of:

1. Summarizing data,
2. Revealing gaps in distribution of information and,
3. Provide exposure to individual timeseries and their operators as well as to POGO.

Importantly: with this tool no data would have to be submitted in a repository, with each institution continuing to host their own data (or archive them in their chosen repository). The data would just have to be described properly and their metadata reported in the GIS resource. POGO already has a non-dynamic online list of sites with timeseries and this can be expanded easily by additional timeseries information from the AWI, and other affiliates have surely collated to publish on their own web resource. Collections of metadata often already exist but the professional visualization is usually lacking.

This resource could therefore provide enormous added value and be a very useful particularly in the early stages of setting up new ocean studies requiring timeseries information. Collaborations could be set up with already existing resources to maximize visibility of the timeseries (harvesting protocols, sharing technical analysis tools etc.).

Fig. 1: Example of a WEBGIS resource produced for the Lena Delta with options for modifying layers (top left), zoom function and access to different metadata.
We could use a global base map with:

points for each station (could include pop-ups with the most important information)

Different layers, e.g., for different parameters measured, frequency of sampling, data availability (data repositories etc.)

The workshop agenda would be:

Introduction

1. Some talks on timeseries data that want to be included in such an online resource

1a. Discussion of parameters, meta information type that we consider as core to provided by all data providers.

1b. Discussion of a possible concept for the data visualization

2. Discussion/Gap analysis: What is it in terms of time series information that we are still lacking or would like to synthesize that cannot be achieved in the short term and might require resources?

3. Agreement on a timing outline
To whom it may concern

Dear colleague,

I have agreed to organize and chair a breakout session on Tropical Moored Arrays at the upcoming POGO-15 meeting in Hobart. I now write to invite you to the session and to request a short (no more than 5 minutes) presentation to frame the discussions to follow. Please see the attached information sheet for additional information on the background, objectives and anticipated outcome from the session to plan your presentation.

If you would accept this request and make a presentation at the workshop, please contact with Ms. Aska Vanroosebeke (v-aska@jamstec.go.jp) by the 7th of January, 2014 for further information.

If you are not attending the meeting, could you please send her a written input (no more than one page) and/or presentation(s) to the session in advance of the meeting.

Thanking you, and looking forward to seeing you in Hobart in January,

Sincerely,
Yoshihisa Shirayama

Background:
Climate variations such as El Niño, the Indian Ocean Dipole and Atlantic Niño phenomena in the tropics are caused naturally by large scale air-sea interactions in the Earth’s ocean and atmosphere. To understand and monitor these recurring phenomena, tropical mooring systems as well as other observing systems have been deployed. Recent scientific reports suggest that global warming affects these oscillations and vice versa; however, the current existing systems are facing serious challenges for sustainable atmosphere and ocean record.

The tropical moored arrays are currently implemented at ~50% of requirement. Continued funding to sustain and enhance the arrays remains problematic. At the same time, there are persistent threats to existing arrays from vandalism in all oceans; and piracy is a major hindrance to implementation and maintenance in the western Indian Ocean. It is therefore important to communicate aspects of science needs and engineering challenges for sustainable air-sea interaction observation, to facilitate use and exploitation of the data for societal benefits.

In this context, it is proposed that the session will be organized around three major objectives:

Objectives:

1. To share information on the challenges that the existing observing systems are facing to sustain the air-sea interaction data.

2. To identify the scientific needs and technological challenges, which foster development of air-sea interaction research and predictable research associated with societal benefits.

3. To explore possible partnership for fostering air-sea interaction study

Invitees: The session is open to all participants, but POGO member institutions that have responsibilities for maintaining tropical moored arrays in the three oceans and relevant international organizations are key to the success of the session, and we invite their participation in particular. These include: CSIRO(Australia); USP (Brazil); FIO(China); IOCAS(China); COPAS(Chile); IFREMER(France); GEOMAR(Germany); INCOIS (India); NIO (India); OGS (Italy); JAMSTEC(Japan); NIOZ (the Netherlands); KAUST(Saudi Arabia); MA-RE(South Africa); ACCESS(South Africa); KIOST (South Korea); NOC (UK); LDEO(USA); SOEST(USA); SIO(USA); WHOI(USA); NOAA(USA). We also invite participation from IOC/GOOS/IODE.
**Agenda:** From each of the contributors to the moored arrays, we request brief (no more than 5~6 minutes) presentations addressing some of the following points:

1. Review current situations of the mooring systems, the challenges they are facing and identify possible successful methods to deal with

2. Discuss and identify scientific needs in tropical observation, especially expectations in moored systems.

3. Discuss and identify technical and engineering challenges the systems need

4. Discuss and identify mechanisms for development of partnership

The presentations will be followed by open discussion among all participants. Time permitting, the session may be opened to other, related issues.

**Anticipated Outcome:**
Recommendations to POGO and to participating organizations on strategies to be followed to facilitate maintenance and expansion of moored tropical buoy arrays and a new direction of future tropical observation.