

# WCRP REPORT

World Climate Research Programme



ICSU  
International Council for Science



## Project report

Report of the 11<sup>th</sup> Session of the  
CLIVAR/CliC/SCAR Southern Ocean Region Panel

**17 – 18 September, 2016 Qingdao, China**

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## **ACTION ITEMS**

*ACTION: Isabelle Ansorge to inform SORP members when SCAR Review comes out.*

*ACTION: Inga Smith to call meetings of all the subcommittees.*

*ACTION: Inga to email Louise to ask for SOOS list on priority linkages (Inga; ASAP).*

*ACTION: Alexander Klepikov will email COMNAP Executive Secretary Antarctic Roadmap, connected with SCAR horizon. (Alexander; end of the year)*

*ACTION: Inga Smith and John Fyfe to work on nomination of YOPP representative. (Inga and John; by end of the year)*

*ACTION: Inga Smith to make a revised SORP poster for the Cryosphere Symposium 2017 in Wellington. (ASAP;Inga)*

*ACTION: Kats Katsumata, Inga Smith and John Fyfe to discuss the possible sea ice nominees with SOOS to OOPC. (Kats, Inga and John; ASAP)*

*ACTION: Isabelle Ansorge to send the town hall slides of Bernadette's on EOVs to Lei Han for distribution to SORP. (Isabelle; ASAP)*

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*ACTION: Inga Smith to talk to Lei Han about website updates. (Inga and Lei; ASAP)*

*ACTION: Riccardo Farneti and John Fyfe attended the OMDP joint session giving the SORP perspective on reanalysis products. (Ricardo and John)*

*ACTION: Inga Smith and John Fyfe to follow up the above points. (John and Inga; by early 2017)*

*ACTION: Inga Smith, John Fyfe, Lynne Talley and Joellen Russell to form subcommittee with any others interested to sort out a policy for national representatives: how appointed, term limits, what is required of them and how to keep them in the loop with SORP activities. (Inga, John, Lynne, Joellen; early 2017)*

*ACTION: SORP members to get update of conferences to Lynne's google docs.*

*ACTION: Inga to talk to other SORP members and work with John to set location for SORP-12. (Inga, John; end of the year)*

## 1. Introduction

The 11<sup>th</sup> session of CLIVAR/CliC/SCAR Southern Ocean Region Panel (SORP) was held on 17-18 September 2016 at Hyatt Regency Hotel in Qingdao, China. The session of SORP took place together with the sessions of other CLIVAR panels and Research Focus before the CLIVAR Open Science Conference (OSC) on 19-23 September at the same hotel. Three cross-panel meetings between SORP and other panels were also organized; one with the Atlantic Region Panel (ARP) on the carbon cycle; one on upwelling with the Atlantic Region Panel (ARP), Southern Ocean Region Panel (SORP) and Eastern Boundary Upwelling System Research Foci (EBUS); and one with the Ocean Model Development Panel (OMDP) on modelling initiatives relevant to the Southern Ocean.

The two co-chairs, John Fyfe and Inga Smith, welcomed the participation of the SORP members, Alexander Klepikov, Isabelle Ansonge, Lynne Talley, Riccardo Farneti, Joellen Russell, Kats Katsumata, and the invited participant, Neil Swart. Apologies for being unable to attend the panel session were received from Ben Galton-Fenzi, François Massonnet, Alberto Piola, Kenny Matsuoka, and Patrick Heimbach.

John Fyfe went through the SORP terms of reference first of all. To take lead on the issues concerning the panel, it was decided to form several subcommittees on:

- (1) National representatives  
Goal: to sort out how this links with SCAR. Lynne, Joellen, and John are keen to be on subcommittee.
- (2) Next panel meeting planning  
Goal: to sort out the time and place of next panel meeting. Isabelle suggested it being alongside of the Joint Assembly of IAPSO-IAMAS-IAGA 2017 in Cape Town, South Africa on 27 Aug – 1 Sep, 2017.
- (3) Session proposal on SCAR 2018  
Joellen suggested a joint session with “Antarctic Climate Change in the 21st Century” (AntClim21: One of the scientific research programs of SCAR, <http://www.scar.org/srp/antclim21> ).  
Isabelle mentioned that the SCAR Review will be published soon (<http://www.scar.org/about/reviews>), and she will inform SORP when the review comes out. Isabelle will put John on list for chairing joint session at IAPSO-IAMAS-IAGA 2017. Mike Sparrow and CliC are also working with the Polar2018 team on joint activities.

ACTION: Isabelle Ansonge to inform SORP members when SCAR Review comes out.

ACTION: Inga Smith to call meetings of all the subcommittees.

## 2. Discussion on the strategic mapping of panel activities

The panel went over the links with and the events organized by other groups/organizations/projects that are related with SORP, which include:

- (1) CLIVAR SSG:  
Questions/suggestions to find out with CLIVAR SSG: CLIVAR OSC is irregular. Regarding the next CLIVAR OSC, Mike Sparrow mentioned that the next OSC will be in 2020 and will be an “all of the WCRP” OSC. 2020 will be the same year as the SCAR OSC that is due to be held in Australia, and Mike will work to ensure that the conferences are not clashing in 2020. Suggest joint conference with SCAR and CliC. It is important to make connection of CliC with CLIVAR SSG;
- (2) Scientific Committee of Antarctic Research (SCAR):  
Necessary to increase the presence of SORP at SCAR Open Science Conferences. Current SORP members within SCAR are Isabella Ansonge (one of South Africa’s National Representatives in the Physical Sciences Group of SCAR) , Kenny Matsuoka (one of Norway’s National Representatives in the Physical Sciences Group of SCAR), Jiuxin Shi (one of China’s National Representatives in the Physical Sciences Group of SCAR),

- Alexander Klepikov (Russia's National Representative in the Physical Sciences Group of SCAR).
- (3) Year of Polar Prediction (YOPP, mid-2017~mid-2019, <http://www.polarprediction.net/yopp.html>):  
François Massonnet is involved in it. Southern Ocean is lacking. David Bromwich has been working on changing this by setting up YOPP-SH and talking to SORP. Inga and John will work on getting a YOPP representative to be nominated to SORP.
  - (4) COMNAP Antarctic:  
Alexander Klepikov will send around COMNAP Antarctic Roadmap, connected with SCAR horizon.
  - (5) PCPI/PPP/SIPN joint workshop:  
The 4th Polar Prediction Workshop is scheduled on 27-29 March 2017, in Bremerhaven, Germany. It is jointly organized by the Polar Climate Predictability Initiative (WCRP-PCPI), the Polar Prediction Project (WWRP-PPP), and the Sea Ice Prediction Network (ARCUS-SIPN).  
(<http://www.polarprediction.net/meetings-calendar/science-workshops/polar-prediction-workshop-2017/>)
  - (6) Cryosphere Symposium in Wellington, 2017:  
The International Symposium on the Cryosphere in a Changing Climate, organized by International Glaciological Society (IGS), International Association of Cryospheric Sciences (IUGG-IACS), and WCRP-CliC is scheduled on 12-17 February, 2017 in Wellington, New Zealand.  
A revised SORP poster for this symposium is needed.
  - (7) GOOS, GCOS, and OOPC:  
Ocean observations panel for climate (OOPC) reports to Global Ocean Observing System (GOOS), Global Climate Observing System (GCOS), and WCRP. Kats Katsumata represents SORP in an ex-officio capacity on OOPC, as every CLIVAR panel is asked to send a representative as ex-officio into OOPC. Kats suggested that SORP nominate a regular member with expertise on sea ice to OOPC.
  - (8) GSOP:  
Regarding the global sustained observation, need to learn more from GSOP about The Global Ocean Ship-based Hydrographic Investigations Program (GO-SHIP). Lynne Talley and Kats Katsumata are both in the GO-SHIP Executive Committee.
  - (9) Southern Ocean State Estimate (SOSE):  
Need to clarify the wording of "Ocean reanalysis and state estimation" in national reports template. It was suggested by Joellen Russell to ask Patrick Heimbach to set up a subcommittee to look at this theme. Riccardo is happy to help.
  - (10) Antarctic Sea-ice Processes and Climate (ASPeCt):  
ASPeCt is an expert group on multi-disciplinary Antarctic sea ice zone research within the SCAR Physical Sciences programme (<http://aspect.antarctica.gov.au/>).
  - (11) AntClim21:  
As a Scientific Research Program of SCAR, AntClim21 has a lifetime of 12 years, and it has been run for 5 years until now. Joellen Russell is an objective leader on the AntClim21 Steering committee. This is way to get SCAR more into modelling.
  - (12) SCAR OSC 2016:  
Joellen Russell represented SORP at the conference this August in Kuala Lumpur, Malaysia. Need to keep making sure SORP has presence at relevant conferences.
  - (13) CliC:  
The next CliC SSG meeting will be after IGS symposium in Wellington in 2017. SORP co-chairs have been invited to be there to talk to CliC about SORP.
  - (14) SOOS:  
Mauricio Mata, member of SOOS (Southern Ocean Observing System) SSC, presented the goals and objectives of SOOS. The motive of SOOS lies on the fact that the changing SO is important for carbon and heat uptake, and it is essential to know how the SO is evolving. But the lack of data impedes the understanding of what is driving changes of the SO. Regarding the structure of SOOS, its IPO has two staff: Executive Officer (Dr Louise Newman) and Data officer (Dr Phillipa Bricher), and coordinates the SOOS working

groups, task teams and the strategic partnerships in implementing the SOOS vision. The regional working groups cover WAP, Weddell Sea Indian Sector, Ross Sea, and Amundsen, and the capacity working groups study on a wide range of topics such as Essential Ocean Variables (EOVs) and design, Air-sea fluxes, Under ice, Tech advances, and Satellite validation. The EOVs build off Framework of Ocean Observations (FOO) which is foundation of GOOS. The SOOS data portal has details on SO data and actual data, including mooring data (soos.aq/activities/soos-at-sea/moorings). SOOS is keen to promote two-way communications such as inviting SORP to jointly look at SO EOVs templates, and inviting SORP to send an observer to the next SOOS SSC meeting that will likely be at AWI in May 2017. On the specific aspects that SORP may help with SOOS, Mauricio thought SORP provides science insights into what needs to be observed, which help SOOS to develop the observing system. Many suggestions on the closer cooperation between SOOS and SORP were proposed, such as adding an ex-officio member recommended by SOOS to SORP, joint workshop on capabilities, joint session at SCAR OSC 2018, and new capability working groups. Mike Sparrow mentioned that SORP always had one or two SOOS representatives in the past. Lynne suggested the discussion on national representatives between SOOS and SORP needs to be ongoing, and make sure SORP is involved in reviewing SOOS plans as they are available.

*ACTION: Inga to email Louise to ask for SOOS list on priority linkages (Inga; ASAP).*

As wrapping up the discussion, the co-chairs commented that SORP aims to have at least one expert/representative for each of these groups on SORP at any given time. The SORP members were asked to think about which they are already involved with, or are interested in being involved with in the future. The panel co-chairs are trying to appoint new members to fill known gaps, such as SOOS, and want to make sure they know what is already covered.

Joellen Russell gave a talk on the Southern Ocean Modelling Intercomparison Project (SOMIP). The CMIP3 to CMIP5 didn't get much improvement in Southern Ocean winds, and the winds are so far off getting bad results for ocean heat uptake. SOMIP is aimed to understand why models are so different. It will adapt FAFMIP wind for three branch experiments. So far, there are two modelling centres committed to running SOMIP: GFDL and NCAR.

Isabelle Ansonge presented the South Africa's Class Afloat: SEAmester. It was a 10 days' cruise last year. Next year SEAmester will touch the Southern Ocean, by revisiting Good Hope line to Southern Ocean sea ice in winter. The class is a mix of science research, science classes, and wider life skills classes. International scientists are welcomed on board on next year's class afloat. Isabelle welcomes people (including modellers) interested in lecturing to email her. Travel support to lecturers is available.

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### **Coordinated Ocean-Ice Reference Experiments (CORE):**

Riccardo Farneti introduced the updates in the Coordinated Ocean-ice Reference Experiments (CORE). The CORE project is coordinated by CLIVAR's Ocean Model Development Panel (OMDP) and deemed by OMDP as the "most successful coordinated global ocean-sea ice project ever". The idea of CORE project is to test whether models with similar forcings produce similar results. Around 15-20 modelling centres participated in CORE-II, which uses interannually varying atmospheric forcing from 1948 to 2007. The next phase of CORE will be an OMIP participating in CMIP6.SORP-related applications and studies include, among others:

1. The evaluation of current iceberg melting, as a collaboration between OMDP and SORP expertises.
2. The analysis of CORE-II data still largely unexplored. There is an opportunity to compare Southern Ocean dynamics under CORE-II and the new JRA-55 dataset.
3. What can and should be done for liquid and solid water flux over Antarctica?

*ACTION: Riccardo Farneti and John Fyfe attended the OMDP joint session giving the SORP perspective on reanalysis products. (Ricardo and John)*

### **Scientific talk from Neil Swart:**

In the scientific talk on "Making sense of historical trends in the SH atmosphere and ocean", Neil Swart went through previous research looking at trends across reanalysis and satellite datasets and found that the Southern Hemisphere westerly jet in the atmosphere had shifted south in the Austral summer, but not in the annual mean. The fronts of the Southern Ocean, as measured by Mean Absolute Dynamic Topography contours from altimetry adjusted for sea-level rise, have also not shifted in the of zonal mean. In some areas where the ocean fronts are not locked to topography, they have experienced shifts, which may be poleward or equatorward depending on the location.

### **Russian SO study:**

Alexander Klepikov introduced "Russian studies of physical oceanography of the Southern Ocean", and introduced the Russian efforts and achievements in the Southern Ocean investigation, including AARI Southern Ocean Oceanography Data Base with around 100,000 stations, among which 50% came from USSR/Russia, finding of the supercooling and ISW layer (100-700 m thick bottom layer) along front of Amery Ice Shelf, Synoptic Ant Shelf-Slope Interaction (SASSI), Good Hope Project as part of IPY CASO, AARI's Prydz Bay physical oceanography studies, Prydz Bay Bottom Water, Shelf-slope sections west of Prydz Bay show substantial variability. The new research and support vessel, Akademik Treshnikov, took a testing cruise in Antarctica near King George VI glacier in 2013. Alexander also mentioned the PP Shirshov Institute of oceanology of RAS (Moscow) works in Drake Passage and Scotia Sea, the new RV Akademik Treshnikov will start from Cape Town an Antarctic Circumnavigation Expedition during 20 Dec 2016-18 March 2017. The following discussions on how SORP could help include:

- (1) SOOS database linkage for fieldwork coordination
- (2) Session at SCAR 2018 OSC on hidden/lost data and papers (e.g. in non-English journals).
- (3) Circulate all national reports to all national representatives
- (4) Ask SOOS and others about resources to get papers translated.

*ACTION: Inga Smith and John Fyfe to follow up the above points. (John and Inga; by early 2017)*

#### **National representatives and national activity reports**

Inga Smith summarized the response of national representatives to writing reports. The depth and breadth were really useful. Not all national representatives responded, and some asked to be replaced. There is necessity to involve SOOS in discussions on national reps, national reports, and how this fits with the SOOS database plan.

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### **3. Cross-Panel Meeting of ARP–SORP–EBUS**

The CLIVAR Atlantic Region Panel (ARP), Southern Ocean Region Panel (SORP) and Eastern Boundary Upwelling System Research Foci (EBUS) had a joint meeting on the eastern boundary upwelling.

Sabrina Speich introduced the observing progresses in the Atlantic Ocean. She also made a point on the role of ocean eddies in the ocean circulation and interocean exchanges as well as on their possible role in air-sea interactions. There is indeed emerging evidence that energetic ocean eddies are critically important in affecting regional climate variability, such as the NAO, as well as carbon cycle. There is also emerging evidence that ocean mesoscale eddy – atmosphere feedback can affect both eddy energetics and ocean circulations.

Lynne Talley updated the panel on the US SOCCOM project activities and preliminary results, focussing on the multiple upwelling phases of deep-water in the Southern Ocean in relation with the float observed carbon fluxes. The study is based on analyses of the 1/10° GFDL CM2.6 global coupled model, the 1/10° CESM global coupled model, and the 1/6° Southern Ocean State Estimate (SOSE), all with sea ice models. A first phase, that brings deep waters from deep layers in the upper 1000m of the water column, happens essentially along the Antarctic Circumpolar Current (ACC) downstream of steep topographies and islands. These deep upwelling sites are therefore intense, localized geographically and seem to be well identified, consistent across the three models. The physical processes responsible for these deep upwelling cells correlate well with the intense eddy activity that develops within the ACC downstream of steep topography and islands. These cells originate by the strong interaction of the ACC with the steep topography giving rise to intense submesoscale/mesoscale dynamics and the related vertical motion. The second phase of the deep-water upwelling, which conveys the upwelled waters to the sea surface and therefore in contact with the atmosphere, happens more broadly along the southern ACC fronts and south of the ACC as an Ekman-pumping related geographically homogeneous processes.

Thomas Toniazzo exposed the latest achievements on EBUs observing and theoretical understanding in ocean-atmosphere interactions and variability.

Discussions were initiated.

The question arising at this point is the similarities of this phase of the upwelling with that of Eastern Boundaries Upwelling systems. As the resolution of CM2.6, CESM, and SOSE are eddy-resolving or eddy-permitting but not submesoscale (1/10° and 1/6°, therefore eddy permitting), it is difficult to look at very small scales in this context. [However, it was noted that submesoscale modelling of various important Southern Ocean hotspots – Kerguelen, Drake Passage, Scotia Arc - has or is being carried out and could readily be incorporated in general work on circumpolar upwelling.] The frontal processes should be very similar and it would be interesting to assess and compare the submesoscale role on both Southern Ocean upwelling and EBUs.

The discussion was then concentrated on the points below that would be four possible common themes of interest:

- "Climate" teleconnections between the SO and EBU regions
  - a) Global thermocline and water mass properties in coastal and open-ocean upwelling, including source of upwelled waters
  - b) Changes in wind forcing and consequences on upwelling under changes in large-scale circulation (climate change and/or interannual variability)
- Mesoscale (and sub-mesoscale) "mixing" and restratification processes responsible for the surface effects of wind-driven upwelling.
- Importance of spatio-temporal variability of wind forcing field and its consequences for the spatio-temporal distribution of upwelling.
- Related to all of the above, model systematic biases and underlying process representation in open ocean and in coastal upwelling systems, in particular dependence on resolution, representation of mixing processes (e.g. near-inertial waves or Langmuir turbulence) and coupling frequency.

#### **4. Cross-Panel Meeting of OMDP–SORP**

SORP members, John Fyfe, Inga Smith, Lynne Talley, Riccardo Farneti, Alexander Klepikov, Joellen Russell, Kats Katsumata attended the cross panel meeting with OMDP. John Fyfe first introduced SORP and the modelling interests from the panel. OMDP co-chair, Simon Marsland, introduced the several main issues the panel is working on, CORE-II (mature), OMIP (underway), JRA-55 forcing (future). Sea ice MIP is one of the diagnostic MIP for CMIP6. For the ocean-ice model, the land-ice runoff from Antarctic and Greenland to the ocean is problematic. CORE doesn't distinguish liquid from solid. In JRA-55 dataset, the runoff from Antarctic and Greenland are currently left blank. CORE climatology is one option to fill the blank.

Riccardo Farneti from SORP gave a talk on assessing water mass properties and sea ice processes across a range of ocean-sea ice models using CORE-II forcing. The problem of excessive surface heat gain in summer and excessive heat loss in winter was identified. According to his analysis, all models had poor representation of CDW and AABW. Problems with sea ice extent and trends for all models and with changes in ACC in GCMs.

John Fyfe mentioned after Petteri Uotila's presentation on Southern Ocean sea ice that the sea ice is right if only assimilate tropical observations, and is wrong if assimilate all observations. It is thought to be an interesting case, which is worth further investigation.

Joellen Russell introduced the SOMIP. It is a numerical experiment with freshwater perturbation of 0.1 Sv. There are two modelling groups who agree to run it, with one already running. The reason why choose the unrealistically large 0.1 Sv and uniform distribution is to try to get starting point that all modelling centres could cope with. Regarding the science question of the freshwater perturbation experiment, Joellen explained it is known from literature that some models will crash with 0.1 Sv and some will mix it away almost instantly. Joellen also pointed out that if being approved for CMIP6, SOMIP will be the first approved regional MIP.

At the end of the joint meeting, Gokhan asked John Fyfe and other SORP members to evaluate the JRA55 dataset before its imminent release, and pointed out that type of freshwater runoff (solid/liquid) and amount makes a difference to response in different models. Lynne Talley noted SOSE with applied forcing has a paper published which is available on the web (<http://dx.doi.org/10.1038/ngeo2749>).

#### **5. Cross-Panel Meeting of ARP–SORP–PRP–IORP joint meeting on carbon**

Attendance: SORP members, John Fyfe, Inga Smith, Lynne Talley, Joellen Russell (taking notes), Kats Katsumata, and Jiuxin Shi; 6 ARP members. PRP and IORP didn't have carbon people to attend.

A few topics were discussed on ocean carbon cycle:

- Paths for carbon into deep ocean:  
Sabrina Speich introduced in her talk that both Argo observations and ROMS modeling were used to study ocean water masses pathways and mixing. Those rings such as 600m Alghas deep ring and the more well-defined eddies identified by coupling WRF and ROMS were thought to be the paths for carbon into deep ocean.  
Those deep rings have seasonal stratification, and the cold dense rings will eventually disappear from altimetry because they sink. The modeling tried to find out the processes that lead to deep injection of carbon in super-gyre. Eddies coincide with where high carbon value were found. The longest tracking time with altimetry is 7 years.
- Locations of carbon uptake and storage.  
Location of uptake of carbon not necessarily where it ends up. Understanding where the carbon uptake occurs and where it ends up is an important aim for carbon research.
- Southern Ocean Carbon and Climate Observations and Modeling (SOCCOM):  
SOCCOM is a mix of modelling and observation, with particular focus on carbon. There are around 200 BGC floats sample in winter and under ice. A total of around 1000 floats are needed for global coverage of ocean carbon and climate observations and modeling (GOCCOM), with 200 in SO. Measurements should include DO, pH, nitrate, bio-optics in addition to normal ARGO floats.
- Southern Ocean anthropogenic acidification.  
SO anthropogenic acidification is an alarming scenario, and is realistic. Upwelling of 7.6 pH deep waters reaches very close to the surface.
- Suggestions on best measures for carbon.  
Best measures for carbon are pH and alkalinity (better even than PCO<sub>2</sub>), but no good alkalinity sensor for floats yet. Sensors of T, S, nitrate and oxygen are needed for carbon measurement in profilers. The pH measurement would help reduce errors. Gliders are ideal carrier for more sensors can be mounted, but the maintenance is quite expensive. The combination of Argo at open ocean and glider around coast is a suggested method.
- Including carbon expertise into CLIVAR panels.  
CLIVAR SSG could ask IOCCP to nominate people to CLIVAR panels. Jointly sponsored event with IOCCP is also suggested.
- Ocean Reanalysis data and modeling:  
BGC is now incorporated into Southern Ocean State Estimate (SOSE). MITgcm is still the basis of most ocean state estimations. But there are some problems such as underperforming in AABW formation and in carbon fluxes. The next version will include full BGC (BLING model).  
The GFDL-CM2.6 is about to apply 0.1 degrees. There will be 300 TB of data to be served by University of Arizona servers (supported by state of Arizona funding).  
Verification of emissions would be eventual outcome.

## 6. Planning for 2016-2017 and Polar 2018

Discussion on the planning of SORP-12 in 2017 talked about IAPSO in Aug, SOOS-POGO meeting with SOOS SSG meeting in May, Antarctic Circumpolar Expedition meeting in June/July, AntClim21 SCAR workshop in October in Scripps, IGS Boulder in Aug, and so on.

*ACTION: SORP members to get update of conferences to Lynne's google docs.*

*ACTION: Inga to talk to other SORP members and work with John to set location for SORP-12. (inga, John; end of the year)*

Regarding the SCAR/IASC OSC in 2018, the SORP-13 is likely to be at this conference. Some ideas of the SOOS-SORP joint session were raised like under ice observations to improve climate models (oceanography): review strategy document, GCM, RCM interactions; Open ocean observation in the Southern Ocean to improve climate models.

# Appendix A: Agenda

Hyatt Regency Qingdao. September 17-18, 2016.

## Day 1 – Saturday 17 September 2016

09:00 – Welcome, introductions, new members, and meeting logistics (Fyfe/Smith/Han)

09:30 – Terms of reference (Fyfe)

– Meeting goals (Fyfe/Smith/Han)

– Last minute agenda additions (All)

10:00 – Break

10:30 – Strategic mapping of panel activities (Smith)

Informal briefings from relevant panel members on:

CLIVAR; CliC; PCPI/SPARC; SCAR; COMNAP Antarctic Roadmap;

YOPP (PPP - WWPP); GCOS and GOOS: EOVs and ECVs; SOOS: ECVs, pilot projects;

GSOP intercomparison projects; SOSE; CMIP6 endorsed MIPS; Others

[Everyone: We aim to have at least one expert/representative for each of these on SORP at any given time. So please think about which you are already involved with, or are interested in being involved with in the future. We are trying to appoint new members to fill known gaps, such as SOOS, and want to make sure we know what is already covered].

11:30 – Southern Ocean Modelling Intercomparison Project (SOMIP, Russell)

11:45 – SEAmester-South Africa's Class Afloat (Anson)

12:00 – Lunch

13:00 – Update in the Coordinated Ocean-ice Reference Experiments (CORE, Farnetti)

13:30 – First science talk, “Making sense of historical trends in the SH atmosphere and ocean” (Swart)

14:00 – Second science talk, title TBD (Klepikov)

14:30 – National representatives and national activity reports (Smith/Talley/Han)

14:45 – Open discussion: Science topics and ideas emerging from the day's discussions

15:00 – Break

15:30 – Joint panel meeting: ARP/Upwelling/SORP: Upwelling and BGC (Talley/Russell & others)

All SORP members are welcome (space permitting) in Salon 3

17:30 – End of day

## Day 2 – Sunday 18 September 2016

09:00 – Joint panel meetings but none with pre-planned SORP involvement. If they care to, panel members are free to camp out in Salon 1 which has been reserved for the SORP

10:00 – Break

10:30 – Joint panel meeting: SORP/OMDP representatives: SOMIP (Russell/Farnetti/Fyfe & others)

All SORP members are welcome (space permitting) in Salon 5

12:00 – Lunch

13:00 – ARP with SORP/PRP/IORP: Joint carbon/ocean-climate research (Russell/Talley & others)

All SORP members are welcome (space permitting) in Salon 5

15:00 – Break

15:30 – SORP-11 reconvenes in Salon 5: Welcome to Mauricio Mata (SOOS) and Petteri Uotila (new national representative for Finland and member of OMDP (Smith/Fyfe)

15:45 – Southern Ocean Observing System (SOOS) presentation (Mauricio Mata)

16:15 – SOOS planning and structure; data management; coordination of SORP and SOOS (Talley)

17:15 – Planning for 2016-2017 and Polar 2018 (SCAR and IASC) sessions; next teleconference (Fyfe/Smith) just to think of Polar 2018 sessions? (Deadline is 30 November); sub-committee to be set up to look at national representatives.  
17:30 – End of day and SORP-11

## Appendix B: List of participants

Name	Affiliation, Country	Role
John Fyfe	Environment Canada, Canada	Co-chair
Inga Smith	University of Otago, New Zealand	Co-chair
Lynne Talley	Scripps Institute of Oceanography, USA	member
Joellen Russell	University of Arizona, USA	member
Kats Katsumata	JAMSTEC, Japan	member
Jiuxin Shi	Ocean University of China, China	member
Isabelle Ansoerge	University of Cape Town, South Africa	member
Riccardo Farneti	ICTP, Italy	member
Alexander Klepikov	Arctic and Antarctic Research Institute, Russia	member
Mauricio Mata	Federal University of Rio Grande, Brazil	SOOS SSC member
Petteri Uotila	FMI, Finland	OMDP member, National representative of Finland
Mike Sparrow	WCRP JPS, Switzerland	Senior Scientific Officer, Liaison to both CLIVAR and CLIC
Neil Swart	Environment Canada, Canada	Invited participant
Lei Han	International CLIVR Global Project Office	SORP liaison

# Group Photo

