

# WORLD METEOROLOGICAL ORGANIZATION

## WWRP POLAR PREDICTION PROJECT (WWRP-PPP) STEERING GROUP MEETING 6 (SG6)

GENEVA, SWITZERLAND  
15-16 JULY 2015  
WMO HEADQUARTERS  
7 BIS, RUE DE LA PAIX  
SALLE B / SALLE C2



(standing, left) Peter Bauer, Greg Smith, Barbara Casati, Matthieu Chevallier, Chris Fairall, Ian Renfrew, Thomas Jung, Paolo Ruti, Renee Tatusko, Michael Sparrow, Eugene Petrescu, Alexander Makshtas, Brian Mills, Jun Inoue, Alexander Baklanov, Chunhua Li, Peter Chen, Trond Iversen, Gunilla Svensson, Mikhail Tolstykh  
(front, left) Jonny Day, Dave Bromwich, Francisco Doblas-Reyes, Neil Gordon, Michael Ek, Michel Rixen, Phil Reid, Helge Goessling

### FINAL REPORT

## **1. OPENING**

The sixth meeting of the WWRP Polar Prediction Project Steering Group (PPP-SG) was opened at 2 p.m. 15 July 2015 at WMO Headquarters in Geneva, Switzerland, by PPP-SG Chairperson Thomas Jung.

All participants, listed in Annex I of this report, were welcomed and introduced. In particular, four new PPP-SG members (since autumn 2014) were welcomed: Matthieu Chevallier (France), Qinghua Yang (China; not present however represented by Chunhua Li), Alexander Makshtas (Russia), and Jun Inoue (Japan).

Thomas Jung outlined that the main goal of this SG6 meeting was to analyse and draw from the presentations and discussions that took place during the Year of Polar Prediction (YOPP) Summit (which formally was the fourth YOPP Planning Meeting), and to decide on urgent actions and follow-up steps. The YOPP Summit took place immediately prior to SG6, on 13-15 July 2015 at WMO Headquarters.

## **2. ORGANIZATION OF THE MEETING**

The meeting agenda, given in Annex II of this report, was adopted with minor amendments, and working arrangements were agreed.

### 3. YOPP SUMMIT FOLLOW-UP

In a 10-minute brainstorming some urgent discussion themes arising from the YOPP Summit were identified. The subsequent discussions were structured following these themes.

#### *Intensive Observing Periods (IOPs)*

The main reason for specifying IOPs is to constrain the time window for extra observations, because a sufficiently high density of extra observations, e.g., from more frequent radiosondes, is not feasible to be sustained for the entire two-year YOPP core phase (mid-2017—mid-2019). The anticipated use of data from IOPs falls into two main classes: (i) operational prediction, where real-time availability via the GTS is key, and (ii) process studies. The first kind of data use has the ultimate purpose to enhance and optimize the polar observing system for improved polar predictions. The process-study kind of data use is expected to be more self-determined; i.e., they might end up following the IOP timing less strictly due to practical constraints.

The determination of the IOP timing needs a mixture of bottom-up (what times are aimed at by individual YOPP activities?) and top-down (which seasons are best targeted in order to make progress with the YOPP mission, i.e., polar prediction?) planning approaches. Also, the IOP timing should ideally serve the needs of (i) process understanding, (ii) data assimilation, (iii) verification, and (iv) user relevance. It is however suggested to put emphasis on process understanding. Even so, different processes are best studied in different seasons, e.g., stable boundary layers during winter and mostly over land; melt-processes in spring; large-scale variability in early autumn; polar lows and snow effects in late winter/early spring. For the Arctic, the summer-to-freeze-up season is found to be crucial in many aspects, not only regarding process understanding but also regarding user relevance, e.g., related to shipping. It was suggested that two wider periods (“special observing periods”) with even more intense sub-periods (“intensive observing periods”) could be the best way forward. In fact, the two wider periods together could span almost all calendar months. It was stressed that modellers need to clearly communicate what are the most important observation types required to advance polar prediction.

Yet another factor in considering IOP timing is the seasonally varying feasibility to obtain certain kinds of observational data. Remote sensing of sea ice for example, has difficulties with the presence of melt ponds in summer, whereas field campaigns are obviously easier to conduct in summer compared to winter.

Considering data denial experiments, which will be one key application of the extra observations, the length of the IOPs needs to be a few months rather than a few weeks. The working assumption for the two “special observing periods” in the Arctic was agreed as:

- 1) Early summer to late autumn 2018
- 2) December 2018 to March 2019

It was decided to form an Arctic Observations sub-committee, dealing primarily with the Arctic IOP planning and coordination. Chris Fairall volunteered to take the lead; also Ian Renfrew and Jun Inoue will be part of this sub-committee.

IOPs in the Antarctic are largely independent of considerations that were important for the Arctic; see discussion below under the heading “Strengthening the Antarctic Component”.

It was agreed that the revised YOPP-IP should more clearly communicate the above aspects of the IOPs, but leave out the exact timing which will be provided later as a separate (“living”) document on the PPP website.

### *MOSAiC*

Since very recently it was official that MOSAiC (Multidisciplinary drifting Observatory for the Study of Arctic Climate) will not be launched in 2018, but (most probably) in fall 2019. The general impression was that MOSAiC, which is a “once in a generation opportunity”, and YOPP must maintain a strong link and close coordination for the benefit of both YOPP and MOSAiC. Nevertheless it was decided that the YOPP Core Phase, scheduled for the period mid-2017—mid-2019, should neither be shifted nor prolonged to be re-aligned with MOSAiC. Instead, it was suggested that certain aspects of YOPP activities should be continued into the YOPP Consolidation Phase (beyond mid-2019) to include the MOSAiC time window. This would be relatively straightforward, for example, for the YOPP virtual component, i.e., YOTC-type experiments.

It was also discussed whether the DOE-ARM facility, which was planned to be used by MOSAiC in its original time window, could now still be used as part of YOPP. This and other potential activities like Russian drifting stations (a proposal for autumn 2018/spring 2019 has been submitted) and the Tara drift, starting in 2017, could give guidance for MOSAiC. Scientific hypotheses developed during the YOPP Core Phase could be tested independently as part of MOSAiC.

Based on the above reasoning it was agreed that MOSAiC should be considered as a very important aspect of the early YOPP Consolidation Phase. This needs to be communicated clearly in order to mitigate the potential false impression that YOPP and MOSAiC could become disjointed initiatives.

### *YOPP Endorsement Process*

After some discussion it was decided that some kind of endorsement process is needed for YOPP activities. Criteria for a project to be endorsed by YOPP could include: contribution to the YOPP mission; open accessibility of data in a timely fashion; real-time data transmission (mainly WIS/GTS) where possible; commitment for concise reporting to the ICO; reciprocal acknowledgement; and timing. The last point raises the question how strict the temporal alignment needs to be, and it was agreed that a not-too-strict criterion should be used. The IPY, SOOS, and CliVar endorsement policies should be used for guidance. It was further suggested that the PPP-SG should be informed about every application for endorsement to ensure that

the PPP-SG is kept well informed.

With the establishment of an endorsement process the activity contribution table appended in the current YOPP-IP will become obsolete; all contributors listed in the activity contribution table will be invited to submit their activities for YOPP endorsement.

It was also discussed whether one should aim for a very simple endorsement of YOPP by partners, i.e., the other way round, to display the large support for YOPP. On the other hand the broad representation of partners at the YOPP Summit was already a strong signal in this respect. It was concluded that a sub-page on the PPP/YOPP website displaying partner logos would be a simple and effective way forward.

### *Strengthening the Antarctic Component*

There is still generally a too strong bias towards Northern Hemisphere matters in the planning of YOPP. The fact that a large part of the modelling activity will be global in design is not sufficient to live up to YOPP's bi-polar mission. When it comes to coordinating Antarctic activities, it is an advantage that the Antarctic research community is smaller and, partly as a consequence of this, already better coordinated compared to those in the Arctic. Initiatives like SCAR, COMNAP, SOOS and SORP could be very important for Southern-Hemisphere (SH) matters of YOPP. Stronger coordination regarding SH matters with PCPI and AARI would also be beneficial.

David Bromwich volunteered to take the lead in a Southern-Hemisphere sub-committee (YOPP-SH) to strengthen the YOPP-SH component. Also identifying the IOP(s) will be one important matter of this sub-committee. It was suggested that the Byrd Polar & Climate Research Center could also host a YOPP-SH webpage, which needs further discussion.

### *Pre-YOPP Workshops and Subcommittees*

Discussions at the YOPP Summit revealed the necessity of a number of pre-YOPP workshops dedicated to important aspects of YOPP that need thorough preparation before the YOPP Core Phase commences. Leaders of sub-committees should ideally be PPP-SG members. The following (additional) sub-committees that should also organise pre-YOPP workshops were suggested:

- (i) Coordinated model experiments; lead by Thomas Jung
- (ii) Arctic observations/IOPs; lead by Christopher Fairall
- (iii) YOPP data component; lead by Oystein Godoy
- (iv) YOPP-SH; lead by David Bromwich

The (provisional) leaders of these sub-committees were commissioned to promote their respective aspects of YOPP with their to-be-established sub-committees, coordinated with and supported by the ICO.

### *Rolling Review of Requirements (RRR)*

As suggested by Lars-Peter Riishojgaard (WMO/WIGOS) at the YOPP Summit, it

needs to be checked whether the current RRRs are sufficient for polar prediction aspects, or where amendments are needed. It was discussed whether all YOPP-related observational data should also go into OSCAR (Observing Systems Capabilities Analysis and Review tool; part of RRR). Stephan Bojinski (WMO/Space programme) should also be asked for advice, in relation to satellite based observations.

### *Keeping the Momentum from the Summit*

The importance of keeping the momentum generated in the research community with the YOPP Summit was highlighted. Different means of how one could achieve this were discussed, and the following important elements were identified: (i) Involve participants in the digestion of the Summit, e.g., with contributions to the BOG reports and a timely meeting résumé, (ii) well communicate on-going YOPP activity, in particular connected to endorsed projects, via the website and a mailing list (either the existing one or a dedicated one for YOPP; the content could be a quarter-annual “newsletter”, good examples are the ones from CliC and ECRA), and (iii) continue promoting YOPP at other meetings and workshops and organise pre-YOPP workshops.

YOPP should also be further promoted among potential stakeholders. An efficient way for this is to have YOPP representatives at relevant stakeholder events; the attendance of Greg Smith at the recent Arctic Shipping Summit in Canada was very successful, which resulted with the attendance of Halldor Johannsson and Petter Meier at the YOPP Summit. The next ASSW (ICO to liaise with Larry Hinzman) and Arctic Circle (Paolo Ruti being involved in general WMO representation) meetings should be used to promote YOPP. It was agreed that relevant stakeholder events should be identified, with the ICO being responsible.

### *Miscellaneous*

While the engagement of some US partners, in particular NOAA, in YOPP is very strong, the considerable efforts to promote YOPP with US funding agencies did not show the desired results. There might be movement in the coming months, though, e.g., with the development of a US science plan for all THORPEX legacy projects (PPP / S2S / HIW). The strong international backing conveyed through the YOPP Summit might also help to promote YOPP with, e.g., the IARPC and the NSF geoscience program. David Bromwich agreed to follow up on this.

Mikhail Tolstykh presented on Russian plans for extra observations during YOPP. The first Russian satellite with vertical profiles for NWP data assimilation will hopefully become operational before the YOPP Core Phase. More satellite missions relevant for YOPP are planned, but the timing of these is less clear. There will most probably also be additional radiosondes during YOPP, but there is some uncertainty due to potential funding cuts. The research aircraft YAK-42D (presented at PPP-SG5) is also still an option. It was furthermore mentioned that a new Russian IASOA station is planned that will contribute valuable data for YOPP. Alexander Makshtas agreed to follow up on IASOA with the ICO.

## 4. HIGH PRIORITY ACTIVITIES

### 4.1 *Sea-Ice Prediction*

Greg Smith reported on recent progress in the high-priority activity sea-ice prediction. The field is advancing quickly, e.g., with new remote-sensing capabilities and improved model physics and resolution towards more accurate predictions. From a PPP perspective, one key element for future progress is the bridging between communities, in particular (i) between forecasting groups working on different time scales (climate vs short-range), (ii) between ocean/sea-ice modelling and operational groups, and (iii) between user and research groups. A cross-cutting goal is the development of improved and standardised sea-ice verification metrics that are relevant for and understandable by all these groups.

Very little has been published on sea-ice verification so far: the main peer-reviewed publications to date are Van Woert et al. (2004), Smith et al. (2015), and Lemieux et al. (2015), the latter two of which are part of the QJRMS special issue on polar prediction. Some more information can be found in technical reports by the MyOcean and NRL groups. Sea-ice verification remains a challenge due to small spatio-temporal scales, strong nonlinearities, observational uncertainties, and unclear user needs.

An important event will be the sea-ice verification workshop which will be held jointly with IICWG and Godae Ocean View on 5-7 April 2016 at ESA(ESRIN), in Frascati, Italy (by invitation only). The verification workshop will bring together operational centres, observations specialists, sea-ice analysis and forecasting groups working at different timescales, and JWGFVR representatives. Subjects will be: user needs, observation errors and retrievals, verification methods and challenges, and the relation to NWP verification methods. Discussions in break-out groups will further explore key issues. The anticipated outcome of the workshop is a stronger synergy between the groups and a special issue in a peer-reviewed journal. Funding of 12kCHF from the PPP Trust Fund are allocated to cover the costs for 3-5 key participants.

The dates of the verification workshop are coincident with the first three days of the Polar Prediction School 2016 (see below). As much as possible, the planning of the programme of school could accommodate the participation in both events for some people.

Greg Smith also reported on the extension of the GODAE Oceanview Intercomparison, which is a real-time observation-space intercomparison of ocean forecasting systems to sea-ice forecasts since January 2015. This is similar to the NWP intercomparison practices. Two groups (GIOPS and PSY4) are participating so far, but more groups are planning to join shortly. This intercomparison is a promising way to gain expertise in particular with sea-ice verification.

PPP and YOPP have been successfully promoted at a large number of events relevant to sea-ice forecasting, with the above described progress partly resulting from this activity. Apart from the sea-ice verification workshop, important upcoming events are the GOV Steering Team Meeting (November 2015), the FAMOS meeting (October 2015), special sessions at the Ocean Sciences meeting (February 2016) and the EGU general assembly (April 2016), a SIPN workshop (April 2016), and an ECMWF workshop on subseasonal to seasonal prediction (November 2015).

#### *4.2 PPP Education Component*

Jonny Day reported on recent progress in the high-priority activity education. An on-going webinar series had been established, with the next upcoming presentation by Matthew Lazzara on the Antarctic Automatic Weather Station (AWS) Network. Together with meeting and workshop recordings, including those from the YOPP Summit, the webinar recordings shall also form part of a planned APECS research feature. The major PPP education events are the planned Polar Prediction Schools.

Planning by a school planning group is well advanced for the 2016 School, to be held 5-15 April 2016 in Abisko, Sweden, jointly with CliC/PCPI and the Bolin Centre. A list of confirmed lecturers and instructors is in place. Practical lessons with OpenIFS, the NCAR-CESM large ensemble, radiosonde-launches, and the Lorentz-95 system are planned, as are daily weather briefings. It was noted that the planned content is quite dense, and that there should be sufficient time left for relaxing. The required funding had already been raised, including a recently announced contribution from IASC (to be confirmed). 10kCHF have been allocated from the PPP Trust Fund. The school will educate 30 PhD students and early-career postdocs. About 150 expressions of interest (i.e. pre-applications) have been collected, with additional pre-applications able until 27 July. Potential candidates will be selected from these pre-applications and invited to submit full proposals. Some of this will be discussed further at the sidelines of an upcoming PCPI meeting in Reading, UK.

It was discussed that it would also be good to start thinking about the 2018 School. A number of potential hosts was mentioned, and it was suggested that the school could be planned in conjunction with an AMOMFW meeting to facilitate a strong southern-hemisphere component. Another important suggestion was to link to other, 'regular' schools, and to try making the polar prediction theme also part of those schools.

### *4.3 PPP-SERA Component*

Brian Mills reported on recent progress in the high-priority activity Societal and Economic Research and Applications (PPP-SERA). Most importantly, a group of eight scientists, seven of whom were social scientists, was assembled in March 2015 in Ottawa, Canada, in a dedicated workshop to lay the groundwork for social scientific work on polar prediction in the coming years including YOPP. This meeting was a major initial step towards growing a core group with a surrounding network of scientists with active and planned polar social and interdisciplinary research programs and projects. Jackie Dawson (University of Ottawa) has agreed to co-chair the committee.

At the PPP-SERA workshop, a timeline for important PPP-SERA activities until mid-2017 (the transition from YOPP preparation to core phase) was drafted. A list of important stakeholder groups/benefit areas was compiled, of which three were identified as key groups: communities and indigenous societies; polar shipping and marine transportation; and tourism. It was noted that another theme listed, namely environmental emergencies (e.g. oil spills), could be considered key as well. It was further suggested that the list of benefit areas, actors, and decision problems could be complemented with the most relevant meteorological predictands and associated timescales for each of the groups; this means hard and complex work, but the suggestion was considered worthwhile, in particular to further the interdisciplinary aspects of PPP and for verification purposes.

Regarding shipping and tourism, two offers communicated at the YOPP Summit could be excellent opportunities also for SERA-related activities, namely opportunities for research (i) on Arctic icebreakers (Arctic Shipping), and (ii) on Antarctic touristic vessels (IAATO). Here one could aim at understanding the decision-making progress on board these ships, while keeping in mind that individual operators do not necessarily reflect the general opinion and behaviour. Working together with NOAA's Arctic Testbed and linking with social sciences in APECS were mentioned as further promising opportunities. It was also suggested to introduce a social science component to the Polar Prediction School 2018, and that an interdisciplinary workshop for young polar scientists could be organised.

A pressing need of particular importance is increasing the involvement of indigenous and local communities. In this context it was noted that local communities often have little trust in projects that do not sufficiently take traditional or local knowledge and values into account. Effort should be made to involve community members and expertise in a meaningful way, realizing that language and communication challenges present must be overcome.

It was mentioned that PPP-SERA should feed into the EC-PHORS white paper on services; Brian Mills will probably be part of the corresponding committee, to ensure a strong link.

More details on PPP-SERA can be found on a SERA subpage of the PPP website (<http://polarprediction.net>), which includes a report from the March 2015 workshop.

## 5. REVIEW OF PAST AND UPCOMING WORKSHOPS

The two major recent scientific workshops co-organised and co-sponsored by PPP were the Barcelona workshop on polar-lower latitude linkages (December 2014) and the Bergen (Rosendal) workshop on high-latitude dynamics (March 2015). It was reported that both workshops were very successful in terms of bringing together the relevant communities, reviewing the state-of-the-art, and formulating future recommendations for YOPP and the scientific field(s) generally. The outcomes from both workshops will be important input when it comes to updating the YOPP Implementation Plan.

Important upcoming workshops (to be) co-organised/co-sponsored by PPP include:

- (i) the sea-ice verification workshop (5-7 April 2016, Italy, lead by Greg Smith),
- (ii) the second PPP-SERA workshop (April 2016, lead by Brian Mills/Jackie Dawson),
- (iii) the YOPP modelling workshop (TBD, lead by Thomas Jung/Helge Goessling),
- (iv) the YOPP data workshop (TBD, lead by Oystein Godoy (to be confirmed)),
- (v) the Arctic Observations/IOP workshop (TBD, lead by Chris Fairall),
- (vi) the YOPP-Southern Hemisphere workshop (TBD, lead by David Bromwich).

It was decided that each of these topics should in fact be organised by a corresponding sub-committee that generally takes the lead in these important topics within YOPP (see also section: "YOPP Summit Follow-up -> *Pre-YOPP Workshops and Subcommittees*"). The possibility to use the ICO's GoToMeeting platform to hold online meetings, e.g., for planning these workshops, was suggested. In this context it was mentioned that also a subcommittee on Education, Outreach, and Communication had been established and was holding online meetings as required.

The following other important future meetings/sessions were mentioned:

- (i) CRAICC-PEEX workshop (Arctic climate change and shipping 24-25 August 2015, Copenhagen; Alexander Baklanov attending),
- (ii) SOOS air-sea flux meeting (Frascati, 21 September 2015; Chris Fairall attending),
- (iii) AMS Southern Hemisphere conference in Santiago, Chile (October 2015; Neil Gordon to present on PPP/YOPP),
- (iv) Next IICWG Workshop (October 2015, Neustrelitz, Germany; Jonny Day to present on PPP/YOPP),
- (v) Workshop on sub-seasonal predictability (2-5 November 2015, ECMWF, UK; Matthieu Chevallier attending),
- (vi) Session on polar reanalyses at the AGU Fall meeting (December 2015; David Bromwich is the lead convener, 18 abstracts were submitted),
- (vii) Arctic Science Summit Week 2016 (March, Fairbanks; Renee Tatusko to reach out to Larry Hinzman),
- (viii) Next SIPN workshop (4-6 May 2016; Matthieu Chevallier will probably attend),
- (ix) Next AMOMFW meeting (6-8 June 2016; David Bromwich will host this in Columbus, Ohio, USA at the Byrd Polar & Climate Research Center),
- (x) Workshop on stable boundary layers (Int. Com. on Polar Met. / IAMAS, 9 June 2016 in Columbus, Ohio right after the AMOMFW meeting; representative to be identified).

## 6. OUTREACH AND COMMUNICATION

Following up on discussions held at the YOPP Summit, it was stressed that the science-to-science communication would be key for a successful YOPP. This includes many different aspects including the promotion of PPP and YOPP at workshops, the organisation of dedicated special workshops, an effective website, news distributed via the polar prediction mailing list (maybe a newsletter), and also an appropriate endorsement process that ensures maximum synergy between all involved parties. See also above in section “YOPP Summit Follow-up -> *Keeping the Momentum from the Summit*”.

Regarding outreach beyond the scientific community, it was agreed that some opportunities should not be missed, for example a launch event in mid-2017 (in combination with an Executive Council meeting at WMO; there could be one or several radiosonde launch(es) by overwinterers in Antarctica, and similar actions, e.g. buoy deployments, in the Arctic) and the collection of different materials (including video) during IOPs (this could be made part of the endorsement process) which, in addition to direct publication e.g., on Facebook, could be used for the later production of a short documentary.

Paolo Ruti reported on current plans to promote WMO activities, including YOPP, at the upcoming Arctic Circle conference; a BBC journalist might be involved. Also, the Arctic Council is currently thinking of ways to undertake effective outreach regarding polar-lower latitude linkages, where YOPP could play a role.

## 7. SG ACTIONS AND BUSINESS ARISING

The action items from the last steering-group meeting (SG5) were reviewed. Those items identified to be still relevant and not yet completed were highlighted.

The concern that data assimilation might not be getting sufficient attention to date was raised. The solution still seems to be a strong link with DAOS.

Another concern mentioned was whether additional buoys will actually be deployed. There should be more promotion of YOPP with the Argo programmes. Don Perovich will follow up using the outcomes of the YOPP Summit as a promotional argument.

Barbara Casati and a few co-authors have drafted a white paper on polar region verification. The paper aims to provide recommendations for different classes of users and purposes, such as: diagnostics for model developers, summary scores for monitoring and comparing, end-user meaningful verification metrics. Particular emphasis is given to sea-ice verification (cf Section 4.1). When finalised, this report will be published in the WMO-PPP publication series.

The idea of a “Business Plan for YOPP” was explained by Paolo Ruti. Such a document would explain the project, to describe how much funding and support will be needed, when and for what activities, and which funding sources will become available in the future. It was also discussed whether, beside a business plan, also business cases need to be better formulated. It was agreed that more discussion on this was required.

## **8. YOPP IMPLEMENTATION PLAN UPDATE**

The following responsibilities were identified for the IP update, to be finalised in November 2016:

- (i) Update of SERA section: Brian Mills with support from PPP-SERA members,
- (ii) Update of IOP information: ICO
  - > The timing of IOPs will be outsourced to a separate (“living”) document
- (iii) Info on MOSAiC (now starting after the end of the YOPP Core Phase): ICO
- (iv) Info on data aspects: Thomas Jung with Oystein Godoy
- (v) Info on verification: Barbara Casati
- (vi) Info on EOC: Helge Goessling
- (vii) Info on the YOPP endorsement process: ICO
- (viii) Info on modelling: Thomas Jung (with Peter Bauer’s material)
- (ix) Info on observations: Alice Bradley and Dmitry Chechin

The importance of the executive summary was stressed because actually many relevant people will read just this.

## **9. STEERING GROUP MATTERS**

### *9.1 PPP Budget*

The PPP budget was reviewed. After the YOPP Summit and SG6, approximately 80-90kCHF remain in the PPP Trust Fund, which is a good basis for the large number of upcoming workshops and other events that need support from the PPP Trust Fund. It is not clear, how much money in addition to the annual ~38kCHF from Canada, which are essential, will become available in the coming years.

### *9.2 Membership*

It was decided that Thomas Jung shall invite Oystein Godoy to become a PPP Steering Group member. If he agrees, he would lead the YOPP data legacy theme. It was also decided to invite Barbara Casati to the PPP-SG as expert on polar region verification in 2016. Finally, two Steering Group members were leaving, namely Francisco Doblas-Reyes and Marika Holland (not present), as was Neil Gordon who helped with the formulation and planning of PPP and YOPP from the beginning as ICO consultant. Thomas Jung thanked all three of them for their substantial contributions to PPP and YOPP.

## **10. WRAP-UP AND CLOSING**

All members and participants welcomed the offer from NMEFC to host the next PPP-SG (SG7) meeting at their offices in Beijing, China. A date between May and June 2016 should be found within the coming weeks. The opportunity to organize side-meetings for the (now numerous) PPP subcommittees was mentioned.

Thomas Jung closed the meeting and thanked all attendants at 1:30 pm, 16 July 2015.

## ANNEX 1: LIST OF PARTICIPANTS

Name	Email Address	Affiliation	Connections
<b>STEERING GROUP</b>			
Thomas JUNG (Chair)	<i>Thomas.Jung@awi.de</i>	Alfred Wegener Institute, Germany	PPP-SG EC-PORS Arctic ECRA
Peter BAUER	<i>Peter.Bauer@ecmwf.int</i>	ECMWF, UK	PPP-SG THORPEX
David BROMWICH	<i>Bromwich.1@osu.edu</i>	The Ohio State University, USA	PPP-SG PCPI SCAR SSG-PS
Peter CHEN	<i>peterchen1974@gmail.com</i>	WMO	Consultant
Matthieu CHEVALLIER	<i>matthieu.chevallier@meteo.fr</i>	Météo France, F	PPP-SG
Jonathan DAY	<i>J.J.Day@reading.ac.uk</i>	National Centre for Atmospheric Science, UK	PPP-SG APECS
Francisco Javier DOBLAS-REYES	<i>f.doblas-reyes@ic3.cat</i>	ICREA and IC3, Barcelona, Spain	PPP-SG WGSIP
Chris FAIRALL	<i>chris.fairall@noaa.gov</i>	NOAA Earth System Research Laboratory, US	PPP-SG
Helge GOESSLING	<i>helge.goessling@awi.de</i>	AWI, Germany	Director ICO
Neil GORDON	<i>Neil.D.Gordon@gmail.com</i>	Consultant supporting ICO for Polar Prediction	Consultant
Jun INOUE	<i>inoue.jun@nipr.ac.jp</i>	NIPR, JP	PPP-SG
Trond IVERSEN	<i>trond.iversen@met.no</i>	Met Norway	PPP-SG
Alexander MAKSHITAS	<i>maksh@aari.ru</i>	AARI, Russia	PPP-SG
Brian MILLS	<i>bmills@uwaterloo.ca</i>	University of Waterloo, Canada	PPP-SG SERA
Pertti NURMI (represented by Barbara Casati on day2)	<i>Pertti.Nurmi@fmi.fi</i>	Finnish Meteorological Institute, Finland	PPP-SG JWGFVR
Phillip REID	<i>p.reid@bom.gov.au</i>	Bureau of Meteorology (CAWCR), Australia	PPP-SG SCAR
Ian RENFREW	<i>I.Renfrew@uea.ac.uk</i>	University of East Anglia, UK	PPP-SG
Paolo RUTI	<i>pruti@wmo.int</i>	WMO	WWRP
Gregory SMITH	<i>Gregory.Smith@ec.gc.ca</i>	Environment Canada	PPP-SG
Gunilla SVENSSON	<i>gunilla@misu.su.se</i>	Stockholm University, Sweden	PPP-SG PCPI GEWEX-GABLS
Deon TERBLANCHE	<i>dterblanche@wmo.int</i>	WMO	
Mikhail TOLSTYKH	<i>tolstykh@inm.ras.ru</i>	Russian Academy of Sciences & Hydrometcentre, Russia	PPP-SG
Qinghua YANG represented by Chunhua LI	<i>lichunhua0214@hotmail.com</i>	NMEFC, China	PPP-SG (representative)
<b>INVITED EXPERTS</b>			
Renee TATUSKO	<i>renee.l.tatusko@noaa.gov</i>	NWS, USA	NOAA
Randall DOLE	<i>randall.m.dole@noaa.gov</i>	NOAA Earth System Research Laboratory, US	WWRP JSC
Michael SPARROW	<i>msparrow@wmo.int</i>	WMO WCRP	
Michel RIXEN	<i>mrixen@wmo.int</i>	WMO WCRP	
Stefanie KLEBE	<i>stefanie.klebe@awi.de</i>	Alfred Wegener Institute, Germany	ICO for Polar Prediction
Barbara CASATI	<i>Barbara.Casati@ec.gc.ca</i>	Environment Canada, Canada	JWGFVR
Alexander BAKLANOV	<i>abaklanov@wmo.int</i>	WMO	
Michael B. EK	<i>michael.ek@noaa.gov</i>	NOAA	GEWEX

Jean-Paul Gaudechoux	<i>jpgaudechoux@wmo.int</i>	WMO ressource mobilisation	
Nathalie TOURNIER	<i>ntournier@wmo.int</i>	WMO	

## **ANNEX 2: AGENDA**

- 1. OPENING**
- 2. ORGANIZATION OF THE MEETING**
- 3. YOPP SUMMIT FOLLOW-UP**
- 4. HIGH PRIORITY ACTIVITIES**
  - 4.1** SEA ICE PREDICTION
  - 4.2** PPP EDUCATION COMPONENT
  - 4.3** PPP SERA COMPONENT
- 5. REVIEW OF PAST AND UPCOMING WORKSHOPS**
- 6. OUTREACH AND COMMUNICATION**
- 7. SG ACTION ITEMS AND BUSINESS ARISING**
- 8. YOPP IMPLEMENTATION PLAN UPDATE**
- 9. STEERING GROUP MATTERS**
  - 9.1** PPP Budget
  - 9.2** Membership
- 10. WRAP-UP AND CLOSING**

### ANNEX 3: ACTION ITEMS

ACTION Number	ACTION	RESPONSIBLE	DUE	Comments	DATE CLOSED
SG6-01	YOPP-IP 2: State more clearly what IOPs are, in particular what IOPs mean for different data types and how data outside IOPs, but within the YOPP core phase, are treated	ICO	Nov 15		
SG6-02	Take lead in YOPP coordinated modelling sub-committee and start organising a dedicated pre-YOPP workshop dealing with the subject	Thomas Jung / Helge Goessling	Oct 15		
SG6-03	Take lead in YOPP-SH sub-committee, draft a concrete suggestion for the timing of IOP(s) in the Antarctic (see discussion in SG6 report), and start organising a dedicated pre-YOPP workshop dealing with the subject	David Bromwich	Oct 15		
SG6-04	Take lead in Arctic observations/IOPs sub-committee, draft a concrete suggestion for the timing of IOP(s) in the Antarctic (see discussion in SG6 report), and start organising a dedicated pre-YOPP workshop dealing with the subject	Chris Fairall	Oct 15		
SG6-05	Arrange a YOPP-SH workshop (when?)	David Bromwich	Oct 15		
SG6-06	Take into account, and provide feedback to, SOOS/SORP comment on YOPP (the document Mike Sparrow provided)	David Bromwich	Oct 15		
SG6-07	Follow up on Finnish icebreakers	Gunilla Svensson	Sep 15		
SG6-08	Follow up on DOE-ARM site	Gunilla Svensson	Sep 15		
SG6-09	Letter of support for Russian drifting stations	Alexander Makshtas / ICO	Aug 15		
SG6-10	Check BAMS paper on YOPP for mention of MOSAiC and correct timing info if required	Thomas Jung	Jul 15		Jul 15
SG6-11	Convey SG6 discussion outcome concerning MOSAiC at upcoming Potsdam workshop	Jun Inoue	Jul 15		
SG6-12	Develop endorsement process with advice from IPY and SOOS procedures	ICO	Sep 15		
SG6-13	Ask partners if their logo may be displayed on a partner-subpage of the YOPP website; put logos onto website when a sufficient number of OKs has been collected	ICO	Sep 15		
SG6-14	Discuss YOPP-SH webpage at BPCRC	David Bromwich / ICO	Aug 15	Up and running	Aug 15

<b>SG6-15</b>	Ask Oystein Godoy if he would be willing to become a PPP-SG member, to take the lead in the YOPP data sub-committee	Thomas Jung	Aug 15		
<b>SG6-16</b>	Take lead in YOPP data sub-committee and start organising a dedicated workshop dealing with the subject	Oystein Godoy (to be confirmed)	Sep 15		
<b>SG6-17</b>	Decide how to go forward with the Polar Data Forum meeting in Canada	Oystein Godoy / ICO	Aug 15		
<b>SG6-18</b>	Letter to EC-PHORS (?)	ICO	Aug 15		
<b>SG6-19</b>	Promote YOPP in IARPC teleconference on US science plan for THORPEX legacy projects	David Bromwich	Jul 15		Jul 15
<b>SG6-20</b>	Ask John Eyre regarding polar aspects in RRRs	Peter Bauer	Jul 15		Jul 15
<b>SG6-21</b>	Follow up on RRR/OSCAR with input from Peter Bauer / John Eyre; also liaise with Stefan Bojinski	ICO	Sep 15		
<b>SG6-22</b>	Promote YOPP in high-latitude hydrology session at AGU 2015	Michael Ek	Dec 15		
<b>SG6-23</b>	Promote YOPP in polar prediction session at EGU 2016	Matthieu Chevallier	May 16		
<b>SG6-24</b>	Ensure promotion of YOPP at Arctic Circle Meeting; also discuss with Mary Powers	Paolo Ruti / ICO	Aug 15		
<b>SG6-25</b>	Liaise with Larry Hinzman regarding ASSW	Renee Tatusko	Aug 15		
<b>SG6-26</b>	Systematically identify relevant stakeholder events	ICO	Aug 15		
<b>SG6-27</b>	Send IASOA statement to ICO	Alexander Makshtas	Aug 15		
<b>SG6-28</b>	Flyer and webpage for sea-ice verification workshop	Greg Smith / ICO	Sep 15		
<b>SG6-29</b>	Follow up on offers by Arctia Shipping and IAATO for on-board research to understand decision-making on polar ships	Brian Mills	Dec 15		
<b>SG6-30</b>	Find and invite key stakeholder to participate in sea-ice verification workshop (5-7 April 2016, ESA/ESRIN, Italy)	Brian Mills / Greg Smith	Sep 15		
<b>SG6-31</b>	Establish link to social sciences in APECS	Brian Mills / Jonny Day	Apr 16		
<b>SG6-32</b>	Move forward idea to have a PPP-SERA expert visiting Anchorage (Arctic Testbed)	Brian Mills / Eugene Petrescu	Apr 16		
<b>SG6-33</b>	Move forward idea to identify important predictands for each of the benefit areas	Brian Mills / Barbara Casati	Dec 15		
<b>SG6-34</b>	Ensure representation of PPP/YOPP at important upcoming workshops (see report)	ICO	Sep 15		

<b>SG6-35</b>	Follow up on Halldor Johannsson's offer to support EOC matters	Helge Goessling	Sep 15		
<b>SG6-36</b>	Promote YOPP with Argo programs to ensure additional buoy deployments	Don Perovich	Sep 15		
<b>SG6-37</b>	Finalise white paper on polar verification and publish in WMO-PPP series	Barbara Casati	Oct 2015		
<b>SG6-38</b>	Follow up on "YOPP Business Plan"	Paolo Ruti / ICO	Sep 15		
<b>SG6-39</b>	YOPP-IP 2: Update SERA info	Brian Mills	Sep 15		
<b>SG6-40</b>	YOPP-IP 2: Update info related to MOSAIC	ICO	Sep 15		
<b>SG6-41</b>	YOPP-IP 2: Update info on data aspects	Thomas Jung / Oystein Godoy	Sep 15		
<b>SG6-42</b>	YOPP-IP 2: Update info on polar verification	Barbara Casati	Sep 15		
<b>SG6-43</b>	YOPP-IP 2: Update info on EOC	Helge Goessling	Sep 15		
<b>SG6-44</b>	YOPP-IP 2: Update info on YOPP endorsement process	ICO	Sep 15		
<b>SG6-45</b>	YOPP-IP 2: Update info on modelling	Thomas Jung / François Massonnet	Sep 15		
<b>SG6-46</b>	Fix date for SG7 in Beijing, China	ICO	Jul 15		Jul 15
<b>SG6-47</b>	YOPP-IP 2: Update info on observations	Alice Bradley / Dmitry Chechin	Sep 15		