

WORLD METEOROLOGICAL ORGANIZATION

WWRP POLAR PREDICTION PROJECT (WWRP-PPP) STEERING GROUP MEETING 7 (SG7)

23-25 MAY 2016

NATIONAL MARINE ENVIRONMENT FORECASTING CENTER
(NMEFC)

VENUE: BEIJING FRIENDSHIP HOTEL, BUILDING 8
1 ZHONGGUANCUN S ST, HAIDIAN,
BEIJING, CHINA, 100873



(back row, from left) Hui Shen, Fei Sheng, Beishen Zhang, Yong Wang, Xingren Wu, Daniela Liggett, Jun Inoue, Jiping Liu, Ian Renfrew, Zhongxiang Tian
(front row, from left) Kirstin Werner, Mikhail Tolstykh, Yao Jiao, Richard Swinbank, Alexander Makshtas, Hui Wang, Thomas Jung, Jun Wu, Steffen Malskaer Olsen, Paolo Ruti, Helge Goessling, Winfried Hoke, Jiechen Zhao, Chunhua Li

FINAL REPORT

1 Opening

Thomas Jung, chair of the Polar Prediction Project (PPP) steering group, opened the meeting at 9 am on Monday 23rd May 2016. He welcomed Hui Wang, the Director General of NMEFC, Paolo Ruti, Chief of WWR at WMO, and guests from China and elsewhere.

Prof Wang welcomed the steering group to Beijing. He explained that NMEFC is dedicated to marine forecasting, including global ocean & coastal forecasts, providing forecasts for all ship voyages to polar regions. In the last few years NMEFC has developed a global service, including sea ice forecasts. NMEFC has good links with CMA, and looks forward to working closely with PPP on polar prediction.

Dr Jun Wu from the Chinese Arctic and Antarctic Administration extended his warm welcome to the group. He stressed the high priority of improving prediction at high latitudes. Several recent polar expeditions have been seriously affected by severe weather and sea ice. He promised to support PPP and contribute to the project.

Paolo Ruti, from WMO, stressed the amount of work going on over the past year to prepare for the Year of Polar Prediction (YOPP). Many recent meetings have brought together stakeholders in polar prediction, including both social and ecosystem aspects.

Thomas Jung gave an overview of PPP, starting by giving a historical perspective. The project is a follow on both from the International Polar Year (IPY, 2007-8) and the THORPEX research programme (The Observing System Research and Predictability Experiment, 2005-2014). In the late 2000s it had become clear that the Arctic climate was changing rapidly, and more research effort to be focused on polar latitudes would thus be needed. So the PPP was initiated, and the first meeting of the SG was held in 2011. This meeting agreed on a mission statement that widened the scope of the project from weather into environmental prediction (sea ice, etc.), moved services into focus, and extended prediction timescales out to a season. The Year of Polar Prediction (YOPP) was conceived as the main focus of the project, with a particular focus on a core 2-year period. YOPP will cover the following phases: the current Preparation Phase, the Core Phase from mid-2017 to mid-2019, and the final Consolidation Phase. PPP is part of GIPPS (Global Integrated Polar Prediction System) which was initiated by the WMO EC-PHORS (Executive Council Panel of Experts on Polar and High Mountain Observations, Research and Services) under WMO. There are several PPP subcommittees, focused on YOPP and other flagship activities. This seventh meeting of the SG will get updates on recent activities, including scientific progress and high-level discussions on future activities, focused on YOPP. More detailed planning would be left to expert meetings.

The attendees then briefly introduced themselves. A group photo was taken for the record.

2 Organization of the meeting

Thomas Jung outlined the proposed meeting agenda, which was agreed. The practical working arrangements were also explained.

3 Status of PPP and YOPP and WWRP

1.1. Update on and review of recent PPP progress, developments and events

Thomas Jung outlined some recent developments. The polar prediction mailing list has been introduced to publicise PPP and PCPI activities, and 451 people have now subscribed, as at 9th May. The YOPP endorsement process has been launched. There have been several publications, with two meeting reports in the Bulletin of the American Meteorological Society (BAMS), a special issue on polar prediction in the Quarterly Journal of the Royal Meteorological Society (QJRMets), and a BAMS overview paper on polar prediction is currently in press. A Polar Prediction school was held in Abisko, Sweden, a workshop on High-Latitude Dynamics at Rosendal, Norway, plus a range of other meetings. The Polar RCC (Regional Climate Centre) could be linked to YOPP. Two relevant calls have been issued as part of the EU Horizon 2020 programme (see section 8); coordinators of relevant bids have been sent notification of the YOPP planning meetings in September. There is an overall budget of 30M Euros, though not all of that is associated with YOPP. The YOPP implementation plan (version 2.0) is essentially complete now, and will be handed over to WMO soon. Winfried Hoke and Kirstin Werner have recently joined the PPP international coordination office (ICO), and Richard Swinbank has joined the project as a WMO consultant.

Action SG7-01: Ian Renfrew to inform ICO when the report on the High Latitude Dynamics Workshop (Rosendal, Norway) is published in BAMS – for publication in a news item. [Done: 20 Jun 2016]

3.1. Update on WWRP developments

Paolo Ruti initiated the discussion of WWRP matters. PPP is part of the long-term vision, which dates back to the Global Atmospheric Research Programme (GARP) in the 1970s. Since then, there has been an impressive increase in prediction skill, of about 1 day per decade improvement in forecast range, which has saved many lives. Improving predictive skill has entailed improving resolution, the use of ensembles, increasing forecast range and enhancing observation networks. There is increasing appreciation of the importance of adopting a unified approach across both time and space scales, e.g., S2S (the Subseasonal to Seasonal prediction project). There has been a move towards impact forecasting, improving resilience and communications, e.g. the HIWeather (High-Impact Weather) project.

A new WWRP Implementation Plan is currently being developed, focusing on four societal challenges: Urbanization, High Impact Weather (wider than the HIWeather project), Water, and New Technologies. WWRP projects and

working groups will work together to address programmatic goals and specific activities. Two booklets will be produced: one giving an overview of the Implementation Plan, and the second more detailed information on activities. The plan will be updated every year, looking two years ahead. WWRP has a vision of a seamless community, including both weather and climate, transferring knowledge to services. The plan will entail international coordination, e.g., with European Commission, NOAA and NSF in US, and links with the private sector. WWRP is also working to develop links with Future Earth, a wide-ranging programme established by ICSU (International Council of Scientific Unions). WWRP appreciates the need to invest in young scientists, and is developing links with the YESS (Young Earth System Science) community, with a new position at WMO. WMO has initiated a polar communication plan – we need to develop compelling stories, going beyond brochures to other media, such as video, and get operational centres more involved in the project. We need to use the expertise in WWRP working groups, including DAOS (Data Assimilation and Observing Systems and PDEF (Predictability, Dynamics and Ensemble Forecasting), and improve interactions between the working groups and projects. There are several key areas for interaction: coupled data assimilation and ensemble prediction (also linking with the WCRP reanalysis group); and social and economic components. Links with the Global Data Processing and Forecasting System (GDPFS) are key to operational pull-through.

4 PPP Flagship activities and recent events

4.1. Education – Abisko prediction school

Helge Goessling reported on the Polar Prediction school held at Abisko research station, Sweden. The organization was led by Jonny Day and sponsored by PPP, PCPI and other partners. 30 students attended a combination of lectures, field observations and learning activities. While there was no formal obligation it is expected that many of the students will engage in YOPP activities. It was well received by participants, and it is planned to hold a similar school in 2018. Paolo Ruti encouraged the organisers to engage the WMO training department, and get other nations involved. While this training is aimed at the science community, it was also recognized that YOPP envisages engaging with the user community, too - that should be more explicit in the implementation plan text.

Action SG7-02: Helge Goessling to ask Jonny Day to check why there were only 21 survey responses out of 30 for the Abisko school? [Done: 24 May 2016. Not everyone completed surveys while there]

Action SG7-03: Jonny Day to inform the ICO when report on Abisko Polar Prediction School is published in BAMS.

4.2. Sea Ice verification workshop in Frascati

A Sea Ice Data Assimilation and Verification workshop was held at Frascati, Italy. It was led by the International Ice Charting Working Group (IICWG), and supported by JWGFVR (Joint Working Group on Forecast Verification

Research) and GODAE (Global Ocean Data Experiment) OceanView. Building on previous IICWG workshops, it covered sea ice observations and uncertainties, sea ice modelling, as well as verification. It brought together people from operational centres (focusing on nowcasting/analysis) with researchers focused on longer forecasts. The workshop highlighted that verification practices and interpretation need to account for observation uncertainties. Multi-model ensemble methods are becoming widespread, so ensemble verification methods are fundamental. Oral presentations from the workshop are available at congxprojects.com/2016-events/IICWG. The workshop report is currently being finalised.

Action SG7-04: Helge Goessling to produce news item once the report on the Sea Ice Verification workshop in Frascati becomes available.

4.3. Polar Predictability Workshop

The Polar Predictability Workshop was held in early May, at the Lamont-Doherty Earth Observatory Columbia University, Palisades (NY), with an organising committee led by Cecilia Bitz. There were oral sessions on sea ice prediction and process studies. Andrew Robertson (co-chair of the S2S project) expressed a strong willingness to work with PPP, as well as PCPI. A follow-up workshop is planned from 27 to 29 March 2017 at AWI.

4.4. Linkages theme

H2020 bids should help contribute substantially to the theme on linkages between polar and lower latitudes, depending on which are funded. A related flagship activity is also planned by S2S, known as the Year of Tropical Mid-latitude Interactions and Teleconnections (YTMIT). Japanese scientists will lead a related initiative, known as the Year of the Maritime Continent. Later this year, we should also hear about the outcome of bids to NOAA in this area. Although these other initiatives have more of a focus on the tropics and MJO (Madden-Julian Oscillation), rather than sea ice, it is important that we liaise with these S2S and other projects to ensure that polar aspects are considered. A US CLIVAR workshop on linkages will be held from 1-3 February 2017 in Washington DC (<https://usclivar.org/meetings/2017-arctic-midlatitude-workshop>).

Action SG7-05: Thomas Jung to ensure that successful PIs of Belmont projects are invited to the US CLIVAR workshop on Feb 1-3, 2017 in Washington, DC. [Done: 15 July 2016]

4.5. PPP-SERA workshop and SERA planning

Daniela Liggett explained that the PPP-SERA (Societal and Economic Research Applications) subcommittee was formed since there was a need to add a human dimension to understand how people obtain, perceive, comprehend, and use (polar) weather information to facilitate decision-making. PPP-SERA was formed at an inaugural meeting in March 2015, Ottawa. The group engages with a wide range of stakeholders, both users and providers, including scientists.

The second PPP-SERA subcommittee meeting was held in April 2016, at Gateway Antarctica (University of Canterbury), Christchurch, NZ. Amongst other goals, the workshop intended to increase awareness around Antarctic issues and included discussion sessions with stakeholders (e.g., from fishing, tourism, the modeling community, research and operations/logistics). One key lesson is that Antarctic operators rely heavily on experience, rather than weather forecasts. Weather is just one factor in their decision-making process. However, in the context of a changing climate, operators' experience may become more unreliable. Better communication of data is important – there are serious technical limitations, such as low bandwidth. Efficient communication of accurate forecasts of wind direction and sea ice data is vital. There is a lack of funding to create platforms to provide nowcast and forecast data.

One of the main achievements of the workshop was to develop the outline of a document describing the scope of PPP-SERA. This will be produced before the Core Phase of YOPP. It will address human activity trends, the provision of weather and climate information, and the PPP-SERA response plan.

Three co-chairs – Jackie Dawson, Machiel Lamers and Daniela Liggett have replaced Brian Mills, who will continue to serve as a PPP-SERA member. Within the PPP-SERA, remaining gaps that may have to be filled on the subcommittee include expertise related to social psychology and economics. There are plans to enhance the visibility of PPP-SERA, by producing a brochure, collaborating with other PPP subcommittees, and utilising PPP activities for PPP-SERA research.

Daniela Liggett highlighted that human research ethics can be quite different from those in the physical sciences (e.g., in relation with dealing with confidential personal data, which generally cannot be made publicly available). There is scope for providing support to PPP-SERA, possibly via a consultancy.

An intense phase of PPP-SERA activities is envisaged during YOPP, including studying user and provider perspectives, carrying out ethnographic field research, and investigating the linkages between information and actions. As many of the PPP meetings of other PPP sub-committees involve either users or providers of weather-related information, PPP-SERA would appreciate opportunities to run short focus group discussions, mini-symposia or interviews at those meetings to collect data on aspects related to the use or provision of polar weather information.

PPP-SERA is seeking official support/endorsement from key international social science entities. PPP-SERA activities will cover the YOPP Core Phase, and continue into the YOPP Consolidation Phase. We need to ensure that the PPP-SERA component is flagged in high-level presentations and in the main PPP meetings. If endorsement requests are received for PPP-SERA-related projects, they should be passed on to PPP-SERA co-chairs to review (unless conflict of interests). Paolo Ruti pointed out that we need help from SERA to develop “compelling stories” to show the relevance of YOPP to the

public. We need to be clearer about the PPP-SERA requirements for data sharing – this will need to be linked with plans of the Norwegian Meteorological Institute (met.no) for developing the YOPP data portal.

Decision/Action SG7-06: Daniela Liggett to be the liaison person between PPP and COMNAP.

Action SG7-07: ICO to provide PPP-SERA co-chairs with details of upcoming PPP meetings until the end of 2017 so that PPP-SERA ensures opportunity for PPP-SERA-focused group discussions as part of relevant meetings. [Done: 16 June 2016]

Action SG7-08: ICO and Paolo Ruti to consider opportunities for how best the ICO can support PPP-SERA (through a consultancy or otherwise). [Due: 30 Sep 2016.]

Action SG7-09: All to ensure that PPP-SERA component is included in high-level presentations about YOPP and PPP to increase PPP-SERA's visibility (e.g., presentation slides, brochures). [Due: 30 Jun 2016.]

Action SG7-10: Kirstin Werner and Winfried Hoke to add paragraph to official Endorsement website, form and letter to ask PIs to be open to working with PPP-SERA. [Due: 30 Jun 2016.]

Action SG7-11: ICO and Paolo Ruti to consider a WMO letter to WMO Permanent Representatives (PRs) in support of PPP-SERA. PPP-SERA representatives may be in touch to request qualitative data on use and provision of services, as well as additional observational data during SOPs/IOPs with an "intensive societal research component to be added to SOPs/IOPs. [Due: Reading workshop, Sep 2016]

5 YOPP Planning

5.1. YOPP Observational component

Ian Renfrew made a presentation on YOPP observation planning, drawing on information supplied by the ICO and Chris Fairall. For the Arctic (the focus of this talk), it was confirmed there should be two Special Observing Periods (SOPs): early summer to late autumn (2018), then December 2018 to March 2019. The organization of Intensive Observing Periods (IOPs) within the SOPs is based on a bottom-up approach with PPP/YOPP playing a coordinating role. Although additional observations will be focused on IOPs as far as possible, we recognise that all data within the 2-year YOPP Core Phase is valuable. Planning of campaigns needs to consider the demands and drawbacks of current data assimilation (DA) systems. A list of national IOP coordinators is being compiled (so far, it is tentative). YOPP IOP coordination will be addressed at the YOPP Observation meeting which will be held at ECMWF in Reading, UK, from 5–7 September 2016.

Information about observational activities has been harvested from YOPP-endorsed projects and activities (this needs to be an ongoing process). The

following projects are expected to contribute: ACAS Arctic Climate Across Scales (funding decision autumn 2016), Arctic Union (H2020 bid), NECTAR Northern Hemisphere Weather and Climate influenced by a changing Arctic (H2020), GRAB Greenland Surface Albedo and Radiation Budget, MIDO Multi-disciplinary Ice-Based Distributed Observatory (new proposal), MOSAiC The Multidisciplinary drifting Observatory for the Study of Arctic Climate, CHASE Centre for High-Latitude Air-Sea ice Exchanges (but yet unfunded). There are also several satellite-based endorsed projects; satellite operators are encouraged to focus on the campaigns to the extent possible. Both in situ and satellite communities should be involved in the September planning meeting on Arctic observation during YOPP.

Several opportunities for additional observations have been identified. A co-sponsor is needed to support Russian aircraft observations — this may be a good opportunity to obtain observations in the Russian Arctic. Other possibilities include: Japan, USA (NOAA and/or NASA) and Finland (Sodankyla supersite enhancements). WMO should request additional radiosondes launches and other enhancements; we need to consider carefully what to include in a letter to PRs concerning additional observations. There are also some other projects in the pipeline, including the Iceland-Greenland Seas project, co-led by Ian Renfrew – they will ask for endorsement soon. Other non-endorsed projects include: APP Arctic Processes and Predictions; ICE ARC (probably over too soon); IAOOS – French (aware of YOPP); PAMARCMIP (ongoing air campaign). It was also noted that the historic data set of Russian drifting stations would be invaluable for model developers.

It was not clear how well the observational planning was on track. The SG discussed whether or not the meeting should be postponed, since considerable preparation is required and the timing does not fit so well with the US funding cycle (we need to engage better with the US community). On the other hand, a meeting in September could trigger more interest, and it should help move things forward in conjunction with the modelling meeting. It was decided to stick with the September plan.

Decision: It was confirmed that the observational planning meeting should take place from 5–7 September 2016 at ECMWF in Reading, UK.

Action SG7-12: Mikhail Tolstykh to prepare a description of the Russian aircraft observation opportunity (2 pages including costs and point of contact). [Done: 02 June 2016]

Action SG7-13: Ian Renfrew to explore possibility of using EUFAR network to publicise the Russian aircraft observation opportunity. [Due: after SG7-12, before YOPP Observation planning meeting at ECMWF in Reading, UK, September 2016]

Action SG7-14: Kirstin Werner to use PPP mailing list to publicise the Russian aircraft observation opportunity. [Due: after SG7-12]

Action SG7-15: ICO to contact IAOOS, PANARCMIP, etc., to encourage them to link with YOPP, and consider asking for endorsement. [Due: 30 Jun 2016]

5.2. YOPP Modelling Component

Thomas Jung led the discussion on the YOPP modelling component, based on a “mind map”. This component includes data assimilation, and prediction as well as numerical modelling. The modelling component has a similar status to observational component – both are at a relatively early stage. The main output from the September modelling meeting should be “YOPP Numerical Experimentation Plan”, with the following elements:

- Model development, including coupled single column models, process modelling (SCM, LES, etc.) and error diagnosis. We need to reach out to research community doing process modelling and invite a few representatives in September.
- Use of community datasets, including S2S and TIGGE databases (are changes needed to what is archived?) and Year of Maritime Continent.
- Virtual field campaign, similar to the Year of Tropical Convection (YOTC) dataset, a global analysis dataset with comprehensive model tendencies and forecast data.
- Reanalysis: David Bromwich is planning a higher-resolution Arctic Reanalysis, pending funding.
- Polar-lower latitude linkages, including use relaxation experiments to investigate linkages. This topic will be considered at the US CLIVAR meeting. It also links to the S2S Year of Tropical-Midlatitude Interactions and Teleconnections (YTMIT).
- Observing system experiments (data denial, etc.) – more for the Consolidation Phase.
- Coupled (atmosphere-ocean-sea ice) data assimilation.
- Impact models, e.g. hydrology. Show cases are needed

It was agreed to standardise parameters to be archived from numerical experiments, as far as possible. Ideally, we should also standardise data formats – this could potentially be achieved by developing converters to GRIB2 and NetCDF where required – could that be funded? Links to the model data should be provided via the YOPP data portal.

Action SG7-16: ICO to prepare draft list of model parameters and levels, and send out to community via mailing list for comments, for finalisation at September planning meeting. [Due: before Reading meeting, 15 Aug 2016]

Action SG7-17: Daniela Liggett to provide ICO with the summary report detailing the outcomes of the Antarctic Roadmap Challenges (ARC) survey (focused mainly on Antarctic science objectives but including information on observation and modeling technologies). [Done: Antarctic Roadmap Challenges report published at <https://www.comnap.aq/Projects/SitePages/ARC.aspx>.]

Action SG7-18: Paolo Ruti to explore status of Polar RCC. Paolo Ruti and ICO to consider inviting a WMO representative of Polar RCC to YOPP Modelling planning meeting. [Due: 30 Jun 2016]

Action SG7-19: Paolo Ruti and Helge Goessling to explore the inclusion of impact models in the modelling planning meeting. [Due: 30 Jun 2016]

5.3. YOPP Data Component

Again, it was recognised that planning of this component has to step up a gear. It had previously been decided that it would not be feasible to have a single YOPP data archive. Instead, a data portal would link to the various component datasets, via a common data portal. National points of contact need to be identified for the data component. It is likely that there will be a data planning meeting in Oct/Nov, maybe at met.no. (It was not feasible to fit all three planning meetings into the week in September. The meeting needs to consider observational, forecast, and verification data, and SERA.)

Data providers should distribute data via the GTS – they will need help from WMO (CBS). However, a simple “how to” document is unlikely to be feasible. Instead, the SG agreed that we should identify a champion, either within WMO or from a National Met. Service, to work with data committee on this (as a member of committee).

Action SG7-20: ICO to mail SG to identify/nominate national points of contact for data archiving (e.g., data centre representatives such as from PANGAEA) to be invited to meeting in fall. [Done: 04 Jul 2016]

Action SG7-21: Paolo Ruti to identify champion within WMO or a Numerical Weather Prediction (NWP) centre to assist scientists to get observational data onto the WIS/GTS. [Done: 16 Jun 2016]

6 MOSAiC

Markus Rex, coordinator of MOSAiC, gave a presentation via video link. It is anticipated that MOSAiC will make major contribution to PPP, although the campaign is now scheduled for the Consolidation Phase of YOPP. The Arctic is key region for global climate change, but it is not well simulated by state of the art Earth System Models. A major issue is that many processes are not well represented in weather and climate models. And the Arctic is not well represented by observations.

The MOSAiC central station will be the German research icebreaker RV Polarstern, which will drift with the sea ice. RV Polarstern will be supplied by rendezvous with icebreakers from MOSAiC partners. Main scientific foci of the campaign will be: boundary layer, energy & momentum fluxes; clouds, radiation & aerosol; sea ice; ocean ecosystem; ozone layer; and coupling processes in general. MOSAiC observations should lead to development and improvement of parameterizations for weather and climate models. There are five working groups: atmosphere, sea ice, ocean, biogeochemistry, and ecosystem. In addition to the central observatory, there will be a distributed

network of observing platforms, including sea ice stations, Unmanned Aerial Vehicles, and aircraft. The project has also developed linkages with collaborating research vessels, aircraft, satellites, data assimilation studies, and global and regional models. Measurements will include: sea-ice surface type distribution (pond, lead), ice thickness and snow depth; thermodynamics; physical properties; deformation. Ocean measurements will include ocean structure, heat flux, dynamics; gliders will be used for spatial transects. There will also be measurements for biogeochemistry (air composition, snow/ice samples) and ecosystems (nutrient sampling, plankton). More information is on the website: mosaic-expedition.org.

The MOSAiC team is currently working on contracts to ensure it all happens. Everything should be confirmed within the next year, and most of the required funding is already committed. Open data access is encouraged (once the data have been quality-controlled), on the basis that data providers will be co-authors of studies; in due course data will become totally public.

After the videoconference was finished, some SG members expressed the concern that, since almost all instruments are already funded, there is no real option for people to join in observing on the central station. Thomas Jung recommended that, if people are interested, they should contact Markus Rex ASAP. There might also be an opportunity to provide alternatives for any instruments that fail to be funded. SG members asked whether there were areas where MOSAiC was still looking for collaborators – and who are the relevant PIs? The SG also sought reassurance that any data embargo period is not too long.

Action SG7-22: ICO (Thomas Jung) to request Markus Rex to clarify the status of the various MOSAiC observatories (still possible to submit proposals?), and to give information on the PIs, including contact information as well as asking about the data policy in MOSAiC, recommendation by YOPP: making publicly available who are the PIs for various data sets. [Due 30 Jun 2016]

7 Science Session I

7.1. Verification report, latest status

Day 2 started with Barbara Casati's presentation, which was curtailed due to technical problems. The presentation was an overview of a scientific report on verification in polar regions. Thomas Jung noted it is important for the SG to give JWGFVR feedback on the draft report, which will be issued as a PPP report in due course.

Action SG7-23: Kirstin Werner to circulate the report on verification in polar regions to SG. [Done: Report has been circulated on 27 May 2016.]

Action SG7-24: SG members to provide feedback on the verification report to JWGFVR, via the ICO. [Due: 15 Jul 2016]

7.2. Arctic influence on mid-latitude weather and climate prediction

Thomas Jung introduced this topic by showing representative plots of observation distribution, highlighting that the Arctic high latitudes are very data sparse. He showed results from various relaxation experiments. He showed results from imposing the observed state in Arctic, compared with no imposed Arctic. The improvement in Arctic circulation lasted into the medium-range, and the benefit extended into mid-latitudes, more over land areas than sea. Compared with Tropical relaxation experiments, the Arctic has more influence on continental Asia. He had also studied of Antarctic relaxation experiments; here the flow is much more zonal, and the impact on mid-latitude skill is less than in northern hemisphere (<~5%).

7.3. Data from drifting stations and polar observatories

Aleksandr Makshtas gave a presentation about data from drifting stations. The domain covered by the observations included almost all Arctic Ocean. He showed measurements of sensible and latent heat fluxes, compared over time and between Canadian and Eurasian basins. The measurements highlighted shortcomings in model parameterizations – this historical dataset is invaluable for model validation. He also discussed measurements from Cape Baranova, where the main goal is to identify causes and consequences of weather and climate variability. These measurements are done in conjunction with IASOA (International Arctic System for Observing the Atmosphere). Observations showed Arctic Ozone losses above Cape Baranov in winter 2016. Measurements were also made of black carbon studies of ice morphology and variability. A Russian centre has recently been established at Svalbard. A possible drifting station is planned in vicinity of Cape Baranova. Alexander confirmed that it is hoped to make the historical drifting station data available in due course. SG members also asked what kind of support do Russia need from us to enable additional radiosonde launches?

7.4. Verification of Sea ice forecasts

Helge Goessling presented on sea ice verification, picking up spatial verification topic introduced by Barbara Casati. Sea ice has a big impact on Arctic shipping routes, so there is a need to focus on spatial information of the ice edge position. Experimental Arctic sea-ice predictions were run with a coupled model (ECHAM6-FESOM), spinning off 9-member ensembles of 3-year predictions. The sea ice forecast errors, known as integrated ice-edge error (IIEE) can be split into absolute extent error (AEE) and misplacement error (ME). On seasonal time scales, misplacement error is larger on average (sea-ice extent is only 20-50% of the total error), whereas AEE grows more slowly than ME. In order to evaluate the spatial skill of ice forecasts, Helge Goessling used the Spatial Probability Score (SPS) – this is a spatial integral of Brier Score (and a spatial analogue of CRPS). Both ensemble and deterministic forecasts can be handled using this framework. The forecast data is compared with alternative reference data, either the median of climatology, or persistence (from the start of the forecast). The results confirm the benefit of using the full ensemble.

7.5. Plans for modelling experiments in Russia during YOPP

Mikhail Tolstykh gave a presentation on modelling in Russia. Although Russia has some background in global NWP, there is no significant activity in mesoscale modelling, so Russia joined the COSMO consortium led by Germany. The COSMO-RU-ARCT model is based on 2 nested domains, with 6.6 km and 2.2 km grids. This is a research system, with much of the focus on data denial experiments. Russia has some background in coupled modelling, now making progress in seasonal coupled prediction. They have now developed a global semi-lagrangian atmospheric model. There are some problems with the model under-estimating the daily temperature range, especially over Siberia. They plan some model improvements (resolution and physics) that should address the issue. They hope to install a 1Pflop computer in 2017, enabling sub-seasonal to seasonal reforecasts with a coupled model.

Action SG7-25: Mikhail to confirm contact information for lead of COSMO-RU-ARCT. [Done: the head of the laboratory running COSMO-RU is Gdaly Rivin gdaly.rivin@mail.ru.]

8 Funding opportunities/projects

8.1. Horizon 2020

Two relevant calls have been issued as part of the EU Horizon 2020 programme: first “An integrated Arctic observation system” (BG-09) – with contribution to YOPP being a key part, and second “Impact of Arctic changes on the weather and climate of the northern hemisphere” (BG-10). One consortium, led by Thomas Jung has bid for funding from BG-10, with components including a YOTC-type dataset, daily forecasts and diagnostics. One of the other of the other competing consortia, led by Steffen Olsen, includes some similar components. There are also two competing bid for the Arctic observing system (BG-09), focused on observing system design using OSSEs etc.

“Save the dates” emails have been sent to all consortium leaders for the September planning meeting.

8.2. National funding opportunities

Various national funding opportunities have been reviewed as outlined by Ian Renfrew, Gunilla Svensson, and Daniella Liggett. Thomas Jung suggested focusing on Climate services. Daniela Liggett also asked if there was a poster to advertise PPP – it was confirmed that a poster has been produced by the ICO, along with a presentation (although the latter needs updating).

Thomas Jung also noted that the White House is holding a ministerial meeting on Arctic Science in September. The goals of the event are to advance promising, near-term science initiatives and create a context for increased international scientific collaboration on the Arctic over the longer term.

Action SG7-26: Paolo Ruti and PPP SG members to lobby for YOPP and related activities to be raised at White House ministerial meeting. [Done: 21

June 2016. Following Paolo Ruti's suggestion, ICO has filled the Call for Action of the White House Ministerial meeting as a YOPP/PPP contribution.]

Action SG7-27: Following the Arctic ministerial White House meeting, ICO and Paolo Ruti to inform SG members about the outcome, to help with securing national funding.

9 Endorsement for YOPP projects

Kirstin Werner gave a presentation on the status of the YOPP endorsement process. The benefits of endorsement include increasing the visibility of research activities, and demonstrating high-level support for the research. For YOPP, it helps coordination between projects and raises awareness of YOPP in the wider community.

Endorsement proposal forms are available on the website, and submitted via email, although we will soon be moving to online submission. Two SG members review each proposal. If endorsed, a formal letter is sent to the PI. Currently, there are more proposals for SH projects than NH, but that is biased because there is currently an Italian bid process targeted at the SH. There are 5 endorsed projects that have been funded so far, and 21 have been endorsed but not yet funded. We do not yet have information on the size/cost of the endorsed projects, but that is something to ask once projects are funded. It was confirmed that we ask to be kept updated with progress – perhaps a newsletter could publicise project updates? We sometimes ask for revisions to make projects more relevant to YOPP, but there have been no rejections so far. Thomas Jung said that we should say in the endorsement letters what aspects of projects are relevant to YOPP, since projects can be very wide ranging. We need to increase the awareness of YOPP endorsements within the scientific community and funding agencies. Although the questions on the form need to be limited, the online form will include whether the proposal uses either in situ or satellite observations. Endorsement is also open to projects already running, and we will need to obtain additional information about funded projects.

Action SG7-28: Consider a newsletter on the progress of YOPP endorsed projects. [Due: 15 Aug 2016]

Action SG7-29: ICO to develop a powerpoint slide to advertise YOPP and endorsement process for inclusion in presentations. [Due: 30 Jun 2016]

Action SG7-30: ICO to consider adding binary box on the use of GTS to the endorsement interface for observational proposals. Consider two-step form (before and after funding). [Due: 30 Jun 2016]

Action SG7-31: Thomas Jung to help speeding up process of endorsement website formation (Wolfgang Hiller, AWI).

Action SG7-32: ICO to re-publicise the endorsement process via mailing list, including advertising new developments. [Due: once electronic form goes live.]

Action SG7-33: Qinghua Yang to explore possibility of Thomas Jung meeting with Chinese funding agencies, in conjunction with him attending the AOGS meeting. [Due: 15 Jun 2015]

10 Reanalysis for the YOPP period

Thomas Jung gave a presentation on Reanalysis that had been prepared by Dave Bromwich. ECMWF plans to produce 2 years output from global coupled reanalysis system (including sea ice). However, coupled DA still an issue.

Dave Bromwich is currently pursuing funding for version 3 of the Arctic System Reanalysis (ASR v3). This would be based on a high resolution of the Polar WRF model, with a 5 km grid, 121 levels ranging from 2 m above the surface to 1 mb. It will include with hybrid atmospheric DA and land surface DA. It was suggested extending to cover MOSAiC, if possible? Should PPP offer a letter of support? It was noted that there was no specific reanalysis for the SH.

The list of parameters to be output is linked to Monday's discussion, but additional tendency data should also be included. The verification group should also be consulted over the parameters. We should also agree the output time-steps. While we don't want to forget anything, we should not overburden the system.

Action SG7-34: Thomas Jung to forward Dave Bromwich's email about reanalysis plans to SG for feedback. [Done, 26 May 2016]

Action SG7-35: Paolo Ruti to inform WCRP about YOPP reanalysis, and invite an expert on coupled reanalysis to the September planning meeting. [Due: 30 Jun 2016]

Action SG7-36: ICO to contact Dave Bromwich to ask for a recommendation on how to include YOPP data that doesn't get onto GTS for use in (future) reanalysis. [Done – D. Bromwich's answer pending]

11 Science Session II

The sessions on Tuesday afternoon were held at NMEFC.

11.1. Impact of extra observations

Jun Inoue described an observing system experiment (OSE) to assess the impact of extra radiosonde observations in the Arctic. The experiment used the JAMSTEC ETKF (Ensemble Transform Kalman Filter) DA system to produce ensemble analyses. He showed results from a case study to forecast

a strong Arctic cyclone on 6th Aug 2012 – there was a clear divergence between the ensemble forecasts with and without the additional observations. Sea ice was also better predicted. The ARCROSE 2013 and 2014 campaigns entailed additional launches during September of each year from several Arctic stations. During 2015 pre-YOPP ARCROSE activities, additional radiosondes were launched from RV Lance, Eureka, Jan Mayan and Bear Island. The ARCROSE dataset is a good basis for predictability studies of cold extremes over northern continents. Research cruises are planned for 2016, plus a wintertime campaign at Ny Alesund. Other planned cruises by RV Mirai are: September-October 2017 (Chukchi and Beaufort seas), November-December 2018 (Bering Sea), October-November 2019 (Chukchi Sea). The Japanese flagship Arctic project ‘Arctic Challenge for Sustainability’ runs from Sep 2015 to Mar 2020. Mio Matsueda has added sea-ice cover data to S2S museum. Data are also available from the Arctic Data Archive System (ADS).

Action SG7-37: Helge Goessling to contact Mio Matsueda to clarify what is on S2S museum, especially regarding sea-ice verification, and to advertise the S2S museum and ADS on mailing list. [Done – Sea-ice verification is not included.]

Action SG7-38: ICO to add S2S museum and Arctic Data Archive System into news and mailing. [Done]

11.2. Coupled single column modelling

Gunilla Svensson described coupled single column model (SCM) studies carried out as part of GABLS (GEWEX Atmospheric Boundary Layer Study). Operational models produce systematically different results in BL structure, with stronger ageostrophic flow, compared with LES (Large Eddy Simulations), which are close to observations. However, if BL scheme is adjusted to give better structure, that results in poorer scores from global NWP models. This sensitivity is higher in the current model than in the 1994 model version. The GABLS4 experiment in Antarctic plateau Dome C/Concordia is now being written up.

Gunilla Svensson talked about the airmass transformation process, considering maritime air transported over sea ice in winter. Clouds form over ice, then precipitate and clear. The transition from opaque cloud to clear can be really fast. Studying how well this transformation is simulated is helpful for diagnosis of model error. Ian Renfrew pointed out that we should have several models involved in these studies. The technical development of a coupled SCM for IFS/EC-Earth is almost complete; it includes OpenIFS, LIM and NEMO components. It will be an ideal test bed for IAOOS and MOSAiC observations.

Action SG7-39: ICO and PPP SG to promote observations of the coupled atmosphere-sea-ice-ocean system during field campaigns, and promote accompanying coupled process modelling. [Ongoing]

11.3. Momentum exchange over the marginal ice zone

Ian Renfrew presented results from a recently published study (Elvidge et al., 2016: Observations of surface momentum exchange over the marginal ice-zone and recommendations for its parameterization, *Atmospheric Chemistry and Physics*, **16**, 1545-1563. doi:10.5194/acp-16-1545-2016). Sea ice is complex and variable, and is crudely parameterized. We aim to come up with drag coefficient for a grid square (combining both skin drag and form drag), and how it varies with ice concentration. This is achieved by flying a plane within surface layer to measure fluctuations and hence turbulent fluxes determining the drag coefficient C_{DN10} . The ice concentration is inferred from albedo and SST. The results confirm that there is higher drag in marginal ice zone. The conclusion is that models need to be changed to use an improved formulation of C_{DN10} that a function of sea ice concentration.

11.4. Sea ice prediction and progress of the SOOS programme

In a two-part talk, Jiping Liu first talked about result from the Arctic Sea Ice Prediction Network (SIPN). The median sea ice prediction deviates significantly from observations (in September). First year ice allows a lot more light through to the ocean. Sea ice prediction needs to take into account melt ponds. MODIS melt pond fraction data shows an increase, then decay, between late May and mid August. However, Models show a bigger increase and decay, increasing year by year. Late spring to summer melt pond information is required to improve the prediction skill of the seasonal ice minimum.

Jiping Liu then went on to show results from sustained observations with the Southern Ocean Observing System (SOOS). The rate of warming exceeds that of the global ocean as a whole. There is a freshening of seawater around the Antarctic, consistent with faster hydrological cycle, and growing evidence of critical state of Antarctic ice shelves. The detection and attribution of changes to the Southern Ocean requires coordinated international effort. A set of Essential Ocean Variables that need to be monitored has been identified. Data from tagged seals significantly complements the observing system in sub-polar areas.

12 Overview Presentations

12.1. Prediction Research at NMEFC

Qinghua Yang presented an overview of prediction research at NMEFC. They use a range of polar observations, including radiosondes, sea ice albedo, atmosphere-sea ice turbulent fluxes. They use the Polar WRF model on a 3.3 km grid in interesting areas, with nudging data assimilation. For operational sea-ice forecasting they plan to use a sea-ice ensemble Kalman Filter (EnKF) DA system. NMEFC provides a forecasting service for Arctic shipping; their forecasts were particularly valuable when the ship Xuelong became stuck in the Antarctic in 2014.

NMEFC will contribute to YOPP and PPP by providing surface and radiosonde observations using RV Xuelong – that includes in situ and buoy

observations of the sea-ice and ocean. The timing is to be confirmed, but 2018 would be ideal. They plan to run high resolution (4 km) weather and ice-ocean coupled forecasts. A sea ice seasonal outlook will be produced by NMEFC in conjunction with NCEP. The atmosphere-sea-ice-ocean model development is in conjunction with IAP-CAS. NMEFC need an official letter requesting additional YOPP observations, and for data sharing. They will also need to meet with funding agencies.

Action SG7-40: Paolo Ruti to note the desirability of an icebreaker deployment in 2018, as part of the letter from WMO to the China Permanent Representative (PR). [Due: Letter to be sent after Reading meetings in Sep 2016.]

Action SG7-41: Thomas Jung and SG to write letter from YOPP/PPP to China agencies including mentioning possibility of making use of Chinese icebreaker.

12.2. Polar Research at DMI

Steffen Olsen pointed out that the responsibility of DMI covers the Kingdom of Denmark, including Greenland. A new Cray XC30 HPC facility has been established in Iceland, with IMO (Iceland Meteorological Office), and there is a joint IMO-DMI model covering Iceland and South Greenland. There are many DMI stations around Greenland, including 5 radiosonde stations (2 launches per day), plus the observatory at Thule. DMI produces satellite-derived surface temperature analysis, operational sea ice products for Arctic, monitoring icebergs around coast. Data are available from the polar web portal polarportal.dk/en/home and from isaafik.dk (Arctic Gateway).

12.3. Overview of Chinese Arctic Observations

Beichen Zhang noted that there was apparently a link between Arctic Sea Ice and severe weather events over China, although the scientific basis needs to be clarified. They have run six national Arctic expeditions since 1999. The Yellow River station at Ny Alesund, Svalbard makes a range of measurements, including space physics, terrestrial, atmospheric marine environment. The main gateway to polar data is www.polar.gov.cn. It was noted that a lot of data are not yet on GTS; it would be highly desirable to do that for YOPP and IOPs. It was agreed that we should encourage the launch of radiosondes etc., from ships, even if the main focus of an expedition is not meteorological.

13 Visit to NMEFC

Xiaolei Yi, Deputy Director of NMEFC, formally welcomed the steering group to NMEFC, and gifts were exchanged.

The group was shown a video outlining the work carried out at NMEFC, and then given a tour of the NMEFC facilities.

14 Preparation of pre-YOPP workshops

14.1. YOPP Southern Hemisphere

Thomas Jung started day 3 by outlining progress with YOPP-SH. Dave Bromwich has taken the lead in this subcommittee, and a YOPP-SH planning meeting will be held on 6th June at Columbus Ohio. About 40 people have registered. Talks will present plans from Japan, Korea, UK, USA, Germany, and tentative plans from Australia and Italy.

Action SG7-42: Kirstin Werner and meeting organisers (David Bromwich) to compile summary report of the YOPP-SH planning meeting for SG with key findings, e.g. a table with contributions of different partners. [Due: 30 Jun 2016]

Action SG7-43: Kirstin Werner to mention to David Bromwich to promote YOPP activities at upcoming SCAR meeting in Kuala Lumpur. [Done at Ohio meeting.]

Action SG7-44: YOPP-SH to decide on Southern Hemisphere special and intensive observing periods (SOPs and IOPs) at the YOPP-SH planning meeting. [Done at Ohio meeting. It was decided to focus on the austral summer period 2018/2019 as the main period for intensified observation activities]

Action SG7-45: Kirstin Werner to report to YOPP-SH about planned WMO letters to permanent representatives about planned activities during YOPP, asking about certain activities. [Done at Ohio meeting.]

14.2. YOPP Observational and Modelling planning meetings

Ian Renfrew initiated a discussion of the YOPP special observing periods (SOPs) in the Northern Hemisphere. Two periods have been proposed: early summer to late autumn 2018, then Dec 2018 to March 2019. Intensive observation periods (IOPs) will be shorter and more intense periods within the SOPs. There is a good possibility of enhanced Greenland radiosondes, but not for whole period. Thomas Jung advised that observations should be scheduled within SOPs/IOPs when feasible, although this is not always going to be possible. It was suggested that an alternative would be to have one long SOP, from early summer 2018, through to March, with embedded IOPs. It was agreed that the SOPs and IOPs should be defined at the September meeting, and then the information should be included in WMO letters to PRs.

The week of September 5-9 has been set aside for YOPP observation and modelling planning meetings. The following schedule was agreed: YOPP observation planning from Monday noon to Wednesday noon; Wednesday morning joint session, and YOPP modelling Wednesday noon to Friday noon. The observations meeting will be led by Ian Renfrew and Chris Fairall, modelling led by Thomas Jung, Peter Bauer, and Gunilla Svensson. The outcome of the meeting will be plans for both YOPP observations and YOPP modelling

Chris Fairall has compiled a list of national contacts for YOPP which is a mix of programme managers and scientists. However, in order to make preparations for the September meetings in Reading, UK, we need lists covering different categories: a high-level list comprising the SG plus a few key managers; a list of observation experts; and a list of modelling experts.

Action SG7-46: Paolo Ruti to explore the possible funding of intensive observations by EUCOS. [Due: 30 Jun 2016]

Action SG7-47: PPP SG members to identify contact points for both additional routine and research observations in their respective countries. [Due: 30 Jun 2016]

Action SG7-48: Kirstin Werner to ask YOPP-SH meeting to compile a list of SH national contacts. [Done at Ohio meeting.]

Action SG7-49: Helge Goessling to urgently compile list of key observation and modelling experts to notify about the September meetings, using the mailing list as a starting point. [Due: 8 Jun 2016, and ongoing.]

Action SG7-50: Thomas Jung to ensure that CMA representative is invited to September meetings. [Due: 30 Jun 2016]

15 Outreach

Winfried Hoke introduced plans for PPP/YOPP outreach activities. The activities involve cooperation between AWI PR department, PPP-ICO and WMO PR department. Our target audience includes: the scientific community (e.g., YOPP endorsed projects), a broad public audience, policy and decision makers, and users of forecast services. Current outreach activities include the project website, the polarprediction mailing list and twitter (@polarprediction). Endorsed projects will also help spread news about YOPP.

A launch event for the opening of the YOPP Core phase is planned during the WMO Executive Council session in May 2017. Our aim is to raise public awareness of YOPP, including international journalists and social media. It was suggested that we stream the launch event on our website. The event could include short presentations from three stakeholder groups: policy makers, local community, and the scientific community. The presentations would be followed by an official opening ceremony, then a reception, including an informal talk.

We need to develop a communication strategy to address specific needs – for a start, we need to engage support from WMO members. WMO is currently developing a general communication plan for polar regions (broader than YOPP). In the YOPP Core Phase we will need to include outreach activities from and to the scientific community, and provide information to the public via website, twitter, and other social media. Paolo Ruti pointed out that a communication plan needs ownership as well as a goal. The ICO, WMO and SERA-PPP need to discuss now best to coordinate communication activities.

We need to get the scientific community, and other stakeholders, involved and excited.

Action SG7-51: ICO to review outreach information, particularly for non-specialist audience. Poster and presentation needs updates. [Due: 30 Jun 2016]

Action SG7-52: ICO to invite PI from Japanese ADS to data planning meeting in fall. [Due: 30 Jun 2016]

Action SG7-53: Generate four lists with national point of contacts for 1) observations, 2) modelling, 3) data, and 4) Southern Hemisphere.

Action SG7-54: In order to find point of contact for US aircraft observations invite people to the YOPP Observation Planning Meeting in Reading, September. [Due: 30 Jun 2016]

Action SG7-55: ICO to complete list of countries participating in YOPP (e.g., Denmark, The Netherlands, Iceland, Belgium) [Due: 30 Jun 2016]

Action SG7-56: ICO and PPP-SERA to collaborate on Communication and Outreach activities for YOPP. [Ongoing]

Action SG7-57: ICO to define multipliers and individual countries/national organisations sharing ownership in terms of communication of YOPP/PPP.

16 Steering Group Matters

16.1. Membership

The following changes were agreed:

Brian Mills has stepped down, but remains involved in PPP-SERA group.

Thomas Jung suggests Jackie Dawson and Daniela Liggett be invited.

Denmark is keen to be involved, and Denmark Meteorological Institute has nominated Steffen M. Olsen.

Barbara Casati, suggested for her expertise on verification, to replace Pertti Nurmi.

Action SG7-58: Paolo Ruti to find out about Barbara Casati's status. Confirm whether she can be listed on the website as a current SG member. [Done: Barbara Casati is now appointed as official member of the PPP SG and can be listed on the website accordingly.]

Action SG7-59: Thomas Jung to ask Sarah Jones to confirm new PPP SG members: Jackie Dawson, Daniela Liggett, Steffen Olsen, (and Barbara Casati, see action item SG7-58). [Done: Paolo Ruti and Sarah Jones have confirmed new PPP SG members.]

16.2. Budget

All the WWRP projects have trust funds. Germany, Norway, Canada, UK, Australia have contributed to PPP, with some regular contributions. Currently funds are over 100000 CHF. PPP also receives some support from an element of the GFCS (Global Framework for Climate Services) fund that supports polar activities. Expenditure is currently around 100.000 CHF/year, in the Preparation Phase for YOPP. The financial position is healthy for the next couple of years. Ian Renfrew asked whether the trust fund could be used to support additional radiosondes, if other funding could not be found. The answer was possibly yes, but this would need further discussion, and funds for that would be very limited.

Upcoming meetings that need to be supported include YOPP Coupled DA (funding for 1 PPP person); US CLIVAR WG on linkages; EGU2017 polar session (CHF 7.500); Polar Prediction Workshop 2017; PPP-SERA meeting (April 2017); PPP-Outreach (to be discussed); YOPP Data; YOPP observations; YOPP modelling; YOPP-SH follow-on meetings from 2016, probably in 2017, possibly into 2018).

Action SG7-60: Paolo Ruti to check the possibility of spending the WMO trust fund, or other funds from EUMETNET, EUCOS, etc., on additional radiosonde observations during YOPP phase. [Due: 30 Jun 2016]

16.3. Next meeting

The date and location of the next SG meeting was discussed. The favoured option is to meet at NCEP between March and May 2017.

Action SG7-61: Xingren Wu to check with NCEP whether they could host SG-8 in Spring 2017 in Maryland, USA. [Done: 17 Jun 2016. NCEP kindly agreed but we are still seeking for a date.]

16.4. Any Other Business:

It was agreed that a proposed user feedback forum should be addressed outside the meeting.

The SG briefly discussed how best to link with APECS. There are good connections in both physical sciences and PPP-SERA.

The SG also discussed possible links with PEEX (Pan-Eurasian Experiments), which is very wide-ranging programme. It was agreed that we should talk to them, and invite a PEEX representative to the observation meeting.

Action SG7-62: Thomas Jung to invite PEEX representative to September observational planning meeting. [Done]

Action SG7-63: Contact Barbara Casati about having data meeting later in fall. [Done; whole SG informed.]

Action SG7-64: ICO to ask David Bromwich if he needs a formal letter for Arctic System Reanalysis Version 3 dedicated for YOPP. [Done, answer pending.]

Action SG7-65: ICO and PPP-SERA consider incorporating a user feedback forum on the PPP website. [Due: 31 Aug 2016]

Action SG7-66: ICO and Oystein Godoy to consider social-science data as part of the YOPP data portal. [Due: before and at autumn data planning meeting]

Action SG7-67: ICO to discuss how to handle the Ethics aspect with publication of credentials.

Action SG7-68: ICO and Paolo Ruti to follow up on YOPP as „WIS case study“ find someone who knows about WIS. [Due: 30 Jun 2016; partly related to SG7-21]

Action SG7-69: ICO to write SG7 Report and List of Action Items (this list) and publish/distribute. [Due: 8 Jun 2016]

Action SG7-70: Thomas Jung and Helge Goessling to reach out to research community doing process modelling and invite a few representatives in September [Due: 30 Jun 2016]

17 SG Action items

The new action items agreed at SG-7 were reviewed.

18 Closure

Thomas Jung thanked Paolo Ruti and the WMO, SG members, and guests. He offered special thanks to our hosts, and presented gifts of behalf of the SG to Qinghua Yang and colleagues.

ANNEX 1: LIST OF PARTICIPANTS

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ANNEX 2: AGENDA

MONDAY, 23 MAY [0900-1700]

1. OPENING [0900-0930]

- 1.1. Welcome from the Host (Hui Wang, Director general of the National Marine Environment Forecasting Center) [0900-0905]
- 1.2. Welcome from Chinese Arctic and Antarctic Administration (Jun Wu) [0905-0910]
- 1.3. Welcome from WMO (Paolo Ruti) [0910-0915]
- 1.4. Welcome and introductions from PPP-Steering Group Chair Thomas Jung [0915-0920]
- 1.5. Purpose of the Meeting (T. Jung) [0920-0925]
- 1.6. Introductory Round [0925-0930]

2. ORGANIZATION OF THE MEETING [0945 - 0950]

- 2.1. Adoption of the Agenda (T. Jung)
- 2.2. Working Arrangements (Q. Yang)

3. STATUS PPP/YOPP/WWRP [0950 - 1020]

- 3.1. Update on and review of recent PPP progress, developments and events (T. Jung) [0950-1005]
- 3.2. Update on WWRP developments (P. Ruti) [1005-1020]

4. PPP FLAGSHIP ACTIVITIES AND RECENT EVENTS [1040-1230]

- 4.1. Education – Abisko prediction school (H. Goessling) [1040-1045]
- 4.2. Sea Ice verification workshop in Frascati (H. Goessling) [1045-1050]
- 4.3. Polar Predictability Workshop (H. Goessling) [1050-1055]
- 4.4. Linkages theme (T. Jung) [1055-1100]
- 4.5. PPP-SERA Workshop and SERA Planning (D. Liggett) [1100-1230]

5. YOPP PLANNING I [1230-1300]

- 5.1. YOPP Southern Hemisphere (D. Bromwich/T. Jung) [1230-1300]

6. YOPP PLANNING II [1415-1615]

- 6.1. YOPP observational component (I. Renfrew) [1415-1500]
- 6.2. YOPP modelling component (T. Jung) [1500-1545]
- 6.3. YOPP data component (T. Jung) [1545-1615]

7. MOSAiC (M. Rex, video call) [1630-1715]

TUESDAY, 24 MAY [0900-1800]

8. SCIENCE SESSION I [0900-1040]

- 8.1. Verification report, latest status (B. Casati, per video call) [0900-0920]
- 8.2. Arctic influence on midlatitude weather and climate prediction (T. Jung) [0920-0940]
- 8.3. Data from drifting stations (2003-2013) and polar observatories Tiksi and Cape Baranova - possible source for YOPP (A. Makshtas) [0940-1000]
- 8.4. Verification of sea ice forecasts (H. Goessling) [1000-1020]
- 8.5. Plans for modelling experiments in Russia during YOPP (M. Tolstykh) [1020-1040]

9. FUNDING OPPORTUNITIES/PROJECTS [1100-1130]

- 10.1. Horizon 2020, etc. round the table (T. Jung) [1100-1130]

10. ENDORSEMENT FOR YOPP PROJECTS [1130-1200]

- 10.1. Status and next steps (K. Werner) [1130-1200]

11. REANALYSIS FOR THE YOPP PERIOD [1200-1230] (D. BROMWICH/T. JUNG)

12. SCIENCE SESSION II [1400-1520]

- 12.1. Impact of extra observation (J. Inoue) [1400-1420]
- 12.2. Coupled single column modelling (G. Svensson) [1420-1440]
- 12.3. Momentum exchange over the marginal-ice-zone (I. Renfrew) [1440-1500]
- 12.4. Potential of melt ponds in seasonal Arctic sea ice prediction and progress of the Southern Ocean Observing System (SOOS) Program (J. Liu) [1500-1520]

13. OVERVIEW PRESENTATIONS [1520-1600]

- 13.1. Prediction research at NMEFC (Q. Yang) [1520-1540]
- 13.2. Polar research at DMI (S. Olsen) [1540-1600]
- 13.3. Overview on the Chinese Polar Scientific Observations (Beichen Zhang, Polar Research Institute of China) [1600-1620]

14. VISIT TO NEARBY NMEFC

WEDNESDAY, 25 MAY [0900-1200]

15. PREPARATION OF PRE-YOPP WORKSHOPS [0900-1015]

16. OUTREACH [1015-1045]

16.1. Outreach activities and YOPP Launch Event (W. Hoke) [1015-1045]

17. SG ACTION ITEMS [1100-1115]

Review of pending action items from previous meetings (T. Jung)

18. STEERING GROUP MATTERS [1115-1150]

18.1. PPP Budget (P. Ruti) [1115-1130]

18.2. Membership (T. Jung) [1130-1145]

18.3. Any other business (T. Jung) [1145-1150]

19. WRAP-UP AND CLOSING [1150-1220]

19.1. Wrap-up (T. Jung)

19.2. Next Steps (T. Jung)

19.3. Closure (T. Jung)

ANNEX 3: ACTION ITEMS

closed (done or obsolete)
partly open / ongoing
open
unknown

ACTION Number	ACTION	RESPONSIBLE	DUE	COMMENTS	DATE CLOSED
SG7-01	Inform ICO when the report on the High Latitude Dynamics Workshop (Rosendal, Norway) is published in BAMS – for publication in a news item	Ian Renfrew	Publication date		06/20/2016
SG7-02	Ask Jonny Day to check why there were only 21 survey responses out of 30 for the Abisko school?	Helge Goessling	24 May 2016	not everyone completed surveys while there	05/24/2016
SG7-03	Jonny Day to inform the ICO when report on Abisko Polar Prediction School is published in BAMS.	Jonny Day			
SG7-04	Produce news item once the report on the Sea Ice Verification workshop in Frascati becomes available	Helge Goessling			
SG7-05	Ensure that successful PIs of Belmont projects are invited to the US CLIVAR workshop on Feb 1-3, 2017 in Washington D.C.	Thomas Jung (SG modelling)	Subsequent to Belmont outcome announcement		07/15/2016
SG7-06	Daniela Liggett to be the liaison person between PPP and COMNAP	Daniela Liggett	ongoing		
SG7-07	Provide PPP-SERA co-chairs with details of upcoming PPP meetings until end of 2017 so that PPP-SERA ensures opportunity for PPP-SERA-focused group discussions as part of relevant meetings	ICO	15 June 2016 (and ongoing)		06/16/2016

SG7-08	Consider opportunities for how best the ICO can support PPP-SERA (through a consultancy or otherwise)	ICO & Paolo Ruti	30 Sep 2016		
SG7-09	Ensure that PPP-SERA component is included in high-level presentations about YOPP and PPP to increase SERA's visibility (e.g., presentation slides, brochures)	All	30 June 2016 (and ongoing)		
SG7-10	Add paragraph to official Endorsement website, form and letter to ask PIs to be open to working with PPP-SERA	Kirstin Werner & Winfried Hoke	30 June 2016		
SG7-11	Consider a WMO letter to WMO Permanent Representatives in support of PPP-SERA. PPP-SERA representatives may be in touch to request qualitative data on use and provision of services, as well as additional observational data during SOPs/IOPs with an "intensive societal research component" to be added to SOPs/IOPs	ICO & Paolo Ruti	Reading Workshop, Sep 2016	Discuss during Reading Workshop. After agreement on IOPs WMO letter	
SG7-12	Prepare a description of the Russian aircraft observation opportunity (2 pages including costs and point of contact)	Mikhail Tolstykh	15 June 2016	point of contact: Mikhail Strunin (Central Aerological Observatory): mikhail_strunin@mail.ru	06/02/2016
SG7-13	Explore possibility of using EUFAR network to publicise the Russian aircraft observation opportunity.	Ian Renfrew	after action item SG7-12, before YOPP Observation planning meeting at ECMWF in Reading UK, Sept 2016		
SG7-14	Use PPP mailing list to publicise the Russian aircraft observation opportunity	Kirstin Werner	after action item SG7-12	we wait for some more details (Ian to find out)	
SG7-15	Contact IAOOS, PANARCMIP, etc., to encourage them to link with YOPP, and consider asking for endorsement	ICO	30 June 2016		

SG7-16	Prepare draft list of model parameters and levels, and send out to community via mailing list for comments, for finalisation at September planning meeting	ICO (Helge Goessling)	before Reading meeting, 15 Aug 2016	feedback needed before Reading workshop in order to discuss "wishlist" in September meeting	
SG7-17	Provide ICO with the summary report detailing the outcomes of the Antarctic Roadmap Challenges (ARC) survey (focused mainly on Antarctic science objectives but including information on observation and modeling technologies.	Daniela Liggett	30 June 2016	Antarctic Roadmap Challenges report published at https://www.comnap.aq/Projects/SitePages/ARC.aspx	06/27/2016
SG7-18	Explore status of Polar RCC (Paolo Ruti). Consider inviting a WMO representative of Polar RCC (with data expertise) to YOPP planning meeting (ICO & Paolo Ruti)	Paolo Ruti & ICO (Helge Goessling)	30 June 2016		
SG7-19	Explore the inclusion of impact models in the modelling planning meeting	Paolo Ruti & Helge Goessling & Thomas Jung	30 June 2016	ask Greg and Steffen for advice	
SG7-20	Mail to SG to identify/nominate national points of contact for data archiving (e.g., data center representatives such as from PANGAEA) to be invited to meeting in fall.	ICO	30 June 2016		07/04/2016
SG7-21	Identify champion within WMO or a Numerical Weather Prediction (NWP) centre to assist scientists to get observational data onto the WIS/GTS	Paolo Ruti	30 June 2016	partly related to SG7-68; David Thomas as WMO focal point on GTS related matters	06/16/2016
SG7-22	Request Markus Rex to clarify the status of the various MOSAiC observatories (still possible to submit proposals?), and to give information on the PIs, including contact information as well as asking about the data policy in MOSAiC, recommendation by YOPP: making publicly available who are the PIs for various data sets	ICO (Thomas Jung)	30 June 2016		
SG7-23	Circulate the report on verification in polar regions to SG	Kirstin Werner	27 May 2016		05/27/2016

SG7-24	SG members to provide feedback on the verification report to JWGFVR, via the ICO	ICO	15 July 2016		
SG7-25	Confirm contact information for lead of COSMO-RU-ARCT	Mikhail Tolstykh	31 May 2016	The head of the laboratory running COSMO-RU is Gdaly Rivin gdaly.rivin@mail.ru	05/2016
SG7-26	Lobby for YOPP and related activities to be raised at White House ministerial meeting. [confirm wording with Paolo]	Paolo Ruti & SG members		Following Paolo Ruti's suggestion, ICO has filled the Call for Action of the White House Ministerial meeting as a YOPP/PPP contribution.	06/21/2016
SG7-27	Following the Arctic ministerial White House meeting, inform SG members about the outcome, to help with securing national funding.	ICO & Paolo Ruti	Following the Arctic ministerial White House meeting		
SG7-28	Consider a newsletter on the progress of YOPP endorsed projects	ICO	15 August 2016		
SG7-29	Develop a powerpoint slide to advertise YOPP and endorsement process for inclusion in presentations	ICO	30 June 2016		
SG7-30	Consider adding binary box on the use of GTS to the endorsement interface for observational proposals. Consider two-step form (before and after funding).	ICO	30 June 2016		
SG7-31	Speed up process of endorsement website formation (Hiller).	Thomas Jung & ICO	8 June 2016		
SG7-32	Re-publicise the endorsement process via mailing list, including advertising new developments.	ICO (Kirstin Werner)	After electronic form goes online		
SG7-33	Explore possibility of Thomas meeting with Chinese funding agencies, in conjunction with him attending the AOGS meeting.	Qinghua Yang	15 June 2016		
SG7-34	Forward Dave Bromwich's email about reanalysis plans to SG for feedback	Thomas Jung	31 May 2016		05/26/2016

SG7-35	Inform WCRP about YOPP reanalysis, and invite an expert on coupled reanalysis to the September planning meeting	Paolo Ruti	30 June 2016		
SG7-36	Contact Dave Bromwich to ask for a recommendation on how to include YOPP data that doesn't get onto GTS for use in (future) reanalysis.	ICO	15 June 2016	Dave's answer pending ...	06/02/2016
SG7-37	Contact Mio Matsueda to clarify what is on S2S museum, especially regarding sea-ice verification, and to advertise the S2S museum and ADS on mailing list	Helge Goessling	30 June 2016	Sea-ice verification is not included	05/2016
SG7-38	Add S2S museum and Arctic Data Archive System into news and mailing system	ICO	15 June 2016		
SG7-39	Promote observations of the coupled atmosphere-sea-ice-ocean system during field campaigns, and promote accompanying coupled process modelling	ICO and PPP SG	ongoing		
SG7-40	Note the desirability of an icebreaker deployment in 2018, as part of the letter from WMO to the China PR.	Paolo Ruti	To be included in the letter that will be sent after the Reading meetings		
SG7-41	Letter from YOPP/PPP to China agencies including mentioning possibility of making use of Chinese icebreaker	Thomas Jung and SG			
SG7-42	Compile summary report of the YOPP-SH planning meeting for SG with key findings, e.g., a table with contributions of different partners	Kirstin Werner & meeting organisers YOPP-SH (David Bromwich)	30 June 2016		
SG7-43	Mention to David Bromwich to promote YOPP activities at upcoming SCAR meeting in Kuala Lumpur	Kirstin Werner	at Ohio meeting		06/06/2016

SG7-44	Decide on Southern Hemisphere special and intensive observing periods (SOPs and IOPs) at the YOPP-SH planning meeting	YOPP-SH participants, to be confirmed later by PPP-SG	at Ohio meeting	It was decided to focus on the austral summer period 2018/2019 as the main period for intensified observation activities	06/06/2016
SG7-45	Report to YOPP-SH about planned WMO letters to permanent representatives about planned activities during YOPP, asking about certain activities	Kirstin Werner	at Ohio meeting		
SG7-46	Explore the possible funding of intensive observations by EUCOS	Paolo Ruti	30 June 2016		
SG7-47	Identify contact points for both additional routine and research observations in their respective countries.	PPP SG members	30 June 2016		
SG7-48	Ask YOPP-SH meeting to compile a list of SH national contacts.	Kirstin Werner	at Ohio meeting	will be part of YOPP-SH report, pending	06/06/2016
SG7-49	Urgently compile list of key observation and modelling experts to notify about the September meetings, using the mailing list as a starting point	Helge Goessling	8 June 2016		
SG7-50	Ensure that CMA representative is invited to September meetings	Thomas Jung	30 June 2016	Added following Paolo's visit to CMA	05/2016
SG7-51	Review outreach information, particularly for non-specialist audience, poster and presentation needs updates	ICO	30 June 2016		
SG7-52	PI from Japanese ADS to be invited to the data meeting in fall	ICO	30 June 2016	generally, list of invitees to be compiled in the course of June	
SG7-53	Generate four lists with national point of contacts for 1) observations, 2) modelling, 3) data, and 4) Southern Hemisphere.	PPP SG members	30 June 2016		
SG7-54	In order to find point of contact for US aircraft observations invite people to the YOPP Observation Planning Meeting in Reading, September	ICO (Helge Goessling, Thomas Jung)	30 June 2016		

SG7-55	Complete list of countries participating in YOPP (e.g., Denmark, The Netherlands, Iceland, Belgium)	ICO	30 June 2016		
SG7-56	Interact in terms of Communication and Outreach activities for YOPP	ICO and SERA	ongoing		
SG7-57	Define multipliers and individual countries/national organisations sharing ownership in terms of communication of YOPP/PPP	ICO (Winfried Hoke & Kirstin Werner)	ongoing		
SG7-59	Find out about Barbara Casati's status. Confirm whether she can be listed on the website as a current SG member.	Paolo Ruti	8 June 2016	Barbara Casati is now appointed as official member of the PPP SG and can be listed on the website accordingly.	07/13/2016
SG7-59	Ask Sarah Jones to confirm new PPP SG members: Jackie Dawson, Daniela Liggett, Steffen Olsen (and Barbara Casati, see SG7-58).	Thomas Jung	15 June 2016	Paolo Ruti and Sarah Jones have confirmed new PPP SG members.	07/12/2016
SG7-60	Check the possibility of spending the WMO trust fund, or other funds from EUMETNET, EUCOS, etc., on additional radiosonde observations during YOPP phase	Paolo Ruti	30 June 2016		
SG7-61	Check with NCEP whether they could host SG-8 in Spring 2017 in Maryland, USA	Xingren Wu	30 June 2016	NCEP kindly agreed but we are still seeking for a date.	06/17/2016
SG7-62	Invite PEEEX representative to September observational planning meeting	Thomas Jung	31 May 2016		05/25/2016
SG7-63	Contact Barbara Casati about having data meeting later in fall	ICO (Helge Goessling)	8 June 2016	informed whole SG	06/02/2016
SG7-64	Ask David Bromwich if he needs a formal letter for Arctic System Reanalysis Version 3 dedicated for YOPP	ICO	After SG7		06/02/2016
SG7-65	Consider incorporating a user feedback forum on PPP website	ICO + PPP-SERA	31 Aug 2016		
SG7-66	Consider social-science data as part of the YOPP data portal.	ICO & SERA & Oystein Godoy	before and at autumn data meeting		

SG7-67	Discuss how to handle the Ethics aspect with publication of credentials	ICO		Will be considered into YOPP data strategy	06/03/2016
SG7-68	Follow up on YOPP as „WIS case study“ find someone who knows about WIS	ICO & Paolo Ruti	30 June 2016	partly related to SG7-21	
SG7-69	Write SG7 Report and List of Action Items (this list) and publish/distribute	ICO	8 June 2016		
SG7-70	Reach out to research community doing process modelling and invite a few representatives in September	ICO (Thomas Jung & Helge Goessling)	30 June 2016		