

Year of Polar Prediction (YOPP) Summit

Meeting Report

**WMO Headquarters
Geneva, SWITZERLAND**

13–15 July 2015



SUMMARY – 03 September 2015



1. BACKGROUND

The Year of Polar Prediction (YOPP) Summit, a major event in the further planning of the Year of Polar Prediction, was held from 13–15 July 2015 at WMO headquarters in Geneva, Switzerland. The Summit was attended by 116 participants from 20 different nations including scientists, stakeholders, as well as representatives from operational weather and climate prediction centres, international bodies and funding agencies. Live streaming of the plenary sessions turned out to be very popular with up to 750 users online at the same time.

After welcoming statements by WMO representatives and the chair of the WWRP Polar Prediction Project (PPP), the Summit started with background presentations on the strategic relevance of enhanced polar predictive capacity and the present level of planning as outlined in version 1.0 of the YOPP Implementation Plan¹. This was followed by a series of plenary panel presentations and open discussions in sessions covering each of the following key YOPP themes:

- User-relevant aspects,
- YOPP observing component,
- YOPP modelling, data assimilation and forecasting component,
- YOPP data component, and
- YOPP education and outreach component,

Subsequently, a total of 26 representatives from partners such as international programmes, institutions and space agencies presented their expectations of YOPP, made suggestions on how they could contribute, and formulated specific recommendations to improve the programme. As part of the post-Summit process, the different commitments will be gathered and an endorsement process will be developed (see below).

The partner presentations were followed by discussions and formulation of recommendations in breakout groups (BOG) for each of the above-mentioned YOPP key areas along with the additional topic of YOPP funding.

The Summit finished with a plenary session that included statements from funding agencies, the presentation of BOG reports, and a general discussion on major issues and actions required to further the programme. These and other outcomes of the Summit will be used to update the YOPP Implementation Plan (from version 1.0 to 2.0) in northern autumn 2015. The Summit was closed following a short wrap-up and a brief overview of the next steps including an outline of the post-Summit process.

Throughout the remainder of the report, the key outcomes of the YOPP Summit will be briefly summarized and links to relevant documents will be provided. Several YOPP-related outcomes and issues were further deliberated during the 6th meeting of the PPP steering group (PPP-SG6

¹ <http://www.polarprediction.net/documents/implementation-science-plans.html>

hereafter) held immediately after the Summit from 15–16 July 2015—relevant decisions from PPP-SG6 and implications for YOPP are noted in the text.

2. KEY OUTCOMES

The Summit achieved its goal of bringing scientists (from different stages of their career), stakeholders, as well as representatives from operational weather and climate prediction centres, international bodies and funding agencies from different countries together who have a shared interest in advancing predictive capacity in polar regions and beyond. The Summit, therefore, provided an excellent opportunity for introducing the existing plans, as outlined in version 1.0 of the YOPP Implementation Plan, in some detail to the community.

In general, the discussions showed that the existing version of the Implementation Plan provides an excellent basis for the planning of YOPP. However, it was pointed out that some important topics should feature more prominently in the revised Plan, including land and the hydrological cycle. Furthermore, it was realized that the visibility of YOPP activities in the Southern Hemisphere needs to be increased, and that stronger coordination is needed to bring different interested parties together. At PPP-SG6, David Bromwich agreed to lead a YOPP-Southern Hemisphere planning group.

A number of important commitments and contributions to YOPP were offered at the Summit. The Climate and Cryosphere Programme (CliC) of WCRP, for example, in presenting their plans, identified the involvement of two new CliC fellows (Francois Massonnet and Alice Bradley) to define CliC's contributions to YOPP. Another high-level commitment was made by Met Norway, which offered to contribute to the development of a YOPP data portal based on the GCW experience. Furthermore, IASOA is in the process of designing a coordinated experiment plan for enhanced observations across their network during YOPP (e.g. 4xdaily radiosonde launches). A more comprehensive initial list of commitments will become available through the polarprediction.net website in autumn 2015.

The main YOPP period is scheduled from mid-2017 to mid-2019. Given the relatively high costs of taking observations in polar regions, it is necessary to agree on at least two intensive observing periods (IOPs), both for the Arctic and Antarctica.

- For the Southern Hemisphere, the importance of accurate predictions during austral summer for key stakeholders such as the logistics community and the tourism industry together with enhanced research capacity during the summer season makes the period December 2018 to February 2019 a good starting point for further discussions.

For the Arctic the situation is different. Taking into account the discussions in the breakout groups of the Summit, at the PPP-SG6 meeting it was decided to have two IOPs in the Arctic, with one covering a full open-water season and one focusing on wintertime.

- The first IOP covers early summer to late autumn. There is clearly a need to start the IOP in early summer to ensure that sub-seasonal and seasonal predictions of summer time conditions, when most of economic activities take place, are well initialized. To improve summer predictions on shorter time scales (hours to days), on the other hand, it will be

important to enhance observational capacity from June to September. It was strongly argued for extending the first IOP to late autumn, since it is in late autumn that atmosphere-sea ice-ocean interactions are most vigorous with implications for sub-seasonal and seasonal predictions, both in the Arctic and lower-latitudes, and to capture the full open-water season for operational forecasting needs.

- The second IOP is shorter, covering the boreal winter (January to March). This IOP is intended to address topics such as polar lows, snow prediction and initialization of seasonal and longer-term predictions.

Within these IOPs, a number of special well-coordinated campaigns (e.g. aircraft) will be embedded, whose further planning will be a key element of the YOPP preparation phase. Following the Summit discussions, it was decided at PPP-SG6 to set up two IOP planning groups, one for the Arctic (lead by Chris Fairall and Ian Renfrew) and one for the Southern Hemisphere (lead by David Bromwich).

3. SELECTED BREAKOUT GROUP RECOMMENDATIONS

User-relevant aspects and verification

Several forecast and verification end-users and priority sectors were identified by BOG participants, and the complexity of user needs was recognized. Participants agreed that user-engagement and associated social science studies are necessary to serve the YOPP objectives. User-tailored products and services should be developed, hosted and evaluated within multi-disciplinary testbeds (e.g., the NOAA/NWS Arctic Test Bed, Alaska).

With regards to the YOPP IOPs, it was recommended that all GTS compatible observations during YOPP be utilized in data assimilation for NWP models, and not be held back for future verification studies. Data denial experiments and/or verification against observations not assimilated could be performed during the YOPP consolidation phase. User-relevant verification will reflect periods aligned with user activity, exposure and sensitivity (possibly corresponding with the IOP). However, end-user engagement and social science applications will operate independently of IOPs, starting in 2017 and extending into the YOPP consolidation phase.

Data management is a concern for all elements of YOPP. Participants strongly recommended the establishment of a mandatory standard format for all model and observation data. Ideally, all YOPP data would be stored in one single data archive with a structure designed in consideration of verification requirements. For social science applications, the group recommended developing and supporting a repository SERA-YOPP database of expertise and primary/secondary datasets or meta-data.

Recommendations specific to verification practices included encouraging real-time verification against GTS observations during YOPP by exploiting existing resources/facilities already available in major operational centers (e.g., ECMWF, CBS ET-OWFPS). During the YOPP consolidation phase, summary verification to monitor and compare pre- and post-YOPP prediction should be coordinated and centralized amongst few key centres (e.g., Environment Canada).

Research should focus to assess the impacts of YOPP enhanced prediction from the polar regions to mid-latitudes. Moreover, uncertainty associated with observations and analyses should be accounted for in verification practices, and compared with model uncertainties.

Observations

BOG participants recommended extending YOPP to include the MOSAIC campaign in addition to three IOPs. It was agreed that the synergy between MOSAIC observing capabilities and YOPP goals is too great to omit the MOSAIC campaign from the observational effort. At PPP-SG it was pointed out that the link between YOPP and MOSAIC could and should be established during the YOPP consolidation phase.

A coordinating role of PPP and YOPP was stressed during the discussions. It was agreed that this is the way to make the bottom-up approach to observational campaigns, often focused on process studies, fit best the goals of YOPP. Namely, there was agreement on the following items:

- IOP planning will need to coordinate flights of research aircraft (including UAVs) during YOPP.
- A structured list of observations should be introduced into the Implementation Plan of YOPP dividing all possible/planned observations into categories like: i) observations going to GTS; ii) GTS-like observations; iii) process studies, etc. The aim of that is to provide a clearer view on the observational component of YOPP to a broad range of users, modelers, etc.
- Good coordination with the Satellite community is needed.
- Planning of the IOPs should primarily consider the demands and drawbacks of the current data assimilation systems, especially the coupled ones.

Modelling, data assimilation, linkages and prediction

BOG participants pointed out that a number of modelling activities are already taking place in projects closely related to YOPP. It will be important, therefore, to coordinate closely with existing and planned activities (e.g., WGNE, GABLS and S2S) in order to avoid duplicating efforts.

Regarding processes, participants indicated a desire to balance the emphasis in YOPP research on fundamental polar-non polar latitude process linkages with applications and analyses driven by specific user problems and prediction requirements. Participants also recognized the need to put more emphasis on microphysics and radiation modelling activities, since these play a key role for the YOPP.

Another suggestion emerged that following the virtual component implemented during of the Year of Tropical Convection (YOTC), modellers should strive to archive model tendencies during IOPs for detailed diagnostic studies.

Participants recognized that, both in the YOPP Implementation Plan and during the YOPP Summit, the design of coupled high-resolution prediction systems has garnered limited attention. A central question is whether one can expect to have at least one operational *coupled* system ready by the YOPP, covering a pan-Arctic domain and issuing forecasts at timescales of more than a few hours/days (with spatial resolution of ~10 km or finer). Such a system is currently the missing piece to bridge operational forecasting and seasonal climate forecasting.

The participants highlighted the need for leadership, with one or several “champions” for every modelling aspect. Finally, some participants made some commitments, mentioning global and regional model configurations they plan to use during YOPP. A few suggested they have some flexibility in the definition of their regional domain, which could enable the definition of common study areas. Some modelling centres are however concerned by a potential conflict of YOPP coordinated experiments with CMIP6, depending on the target period.

Finally, sea ice modelling was also discussed. A critical issue is the use of the classical (elastic) viscous-plastic (EVP) rheology in the sea ice momentum equation, and in particular the validity of such a scheme at very high-spatial resolution. A detailed study of how (un)realistic the EVP model is at resolutions of ~5 km or less should be undertaken.

Advancing data assimilation systems should be a key activity within YOPP. A key prerequisite for making progress will be knowing the error structure of models used for producing reanalyses, reconstructions, or initializations of predictions. Furthermore, it was strongly recommended that YOPP continues to rely on the activities of the World Weather Research Programme (WWRP) Data Assimilation and Observing Systems (DAOS) and data denial experiments in order to determine the value added from particular observations collected during the YOPP.

The topic of polar-lower latitude linkages was only discussed tangentially, given that an entire workshop was dedicated in December 2014 to this topic (<http://www.polarprediction.net/linkages.html>). Regarding recommendations for addressing polar-lower latitude linkages during YOPP, therefore, it was agreed that the following workshop report would be an exhaustive resource:

Jung, T., F. Doblas-Reyes, H. Goessling, V. Guemas, C. Bitz, C. Buontempo, R. Caballero, E. Jakobson, J. Jungclaus, M. Karcher, T. Koenigk, D. Matej, J. Overland, T. Spengler, and S. Yang, 2015: Polar-lower latitude linkages and their role in weather and climate prediction. Bull. Amer. Meteor. Soc. doi:10.1175/BAMS-D-14-00018.1, in press.

YOPP data legacy

There was agreement among the Summit participants that the lessons learned during the last IPY should feed into the development of the YOPP data legacy. It was recommended, therefore, to develop a YOPP data portal that exploits the expertise gained with the Global Cryosphere Watch (GCW) portal. This includes the use of consistent meta data and pointers to other online locations, where data can be retrieved. A small number of data centres that are willing to archive YOPP data (and support the process) and able to provide digital object identifiers (DOIs), such as PANGAEA, should be identified. Data sets must be open access and, where observations could facilitate real-time operational use, submission of data through the GTS/WIS should be mandatory. Special attention should be given to WMO standard including BUFR formats. Finally, all data sets should be published in data journals such as Earth System Science Data (ESSD), and it was argued that the YOPP data legacy could be improved by having a YOPP special issue in ESSD.

Education and outreach

The participants of the YOPP Summit recommended that effective cross-disciplinary communication among scientists would be key to make the Year of Polar Prediction effective and successful. The need for keeping and further building on the momentum generated by the Summit was stressed through active communication (e.g. website, mailing list, workshops, project endorsement) and further promotion of YOPP (representation at high-level events).

The participants strongly supported the ongoing and planned efforts to engage in the education of early-career scientists, including the planned Polar Prediction Schools in 2016 and 2018, webinars, and online educational materials. It was also recommended to develop a broader outreach plan (science-stakeholders and science-public) for the YOPP launch event in mid-2017 at WMO for suitable campaigns during the Intensive Observing Periods (e.g. videos of icebreaker and aircraft campaigns).

Funding

Integrating and fostering international research activities and working in strong collaboration with all funding agencies and donors will be the main role of WMO and the PPP steering group during the YOPP preparation phase. Towards this end, the BOG recommended preparing a configuration management plan for YOPP, with a clear definition of “Who is it for?” and a detailed list of “What do we need?” (well-defined actions with a quantification of the costs) taking into account the experience from IPY. This plan, which maps all YOPP activities from partners to the YOPP objectives, should be used to manage all components of YOPP such as logistics during IOPs, data management, outreach and communications, and stakeholder engagement. The development of the plan should have a bottom-up component involving key users and stakeholders (e.g. tourism and shipping) right from the beginning, promoting a public-private partnership.

4. NEXT STEPS AND FUTURE COORDINATION

The outcomes of the YOPP Summit will be taken into account as the PPP steering group and the International Coordination Office (ICO) revise the YOPP Implementation Plan. A draft version of the revised Plan will be sent to all YOPP Summit participants, as well as the broader community, in October 2015 for review. It is expected that the final YOPP Implementation Plan (version 2.0) will be published in December 2015.

To sustain the momentum generated by the YOPP Summit and to ensure strong coordination for YOPP, it is important to devise effective means of communication. The most detailed source of information regarding YOPP and its further planning will be available from the ICO website (<http://www.polarprediction.net/yopp.html>). At a minimum this website will: (i) provide an archive of all YOPP-related news items, (ii) host all relevant documents, (iii) list all endorsed YOPP projects, and (iv) keep track of all relevant upcoming meetings. Updates to the community on recent developments concerning polar prediction matters in general, and YOPP in particular, will be distributed via the mailing list polarprediction@climate-cryosphere.org, which was recently established jointly with CliC. If you wish to subscribe to or unsubscribe from this list please contact office@polarprediction.net.

The next large YOPP-related conference will be the official launch of the main YOPP phase during the 69th session of the WMO Executive Council in June 2017. In the meantime, the emphasis will

be on smaller, and more focussed meetings on the different components of YOPP (e.g., the YOPP observing component). At PPP-SG6 it was decided to initiate sub-groups composed of PPP SG members and interested “external” champions to continue planning for each of the different YOPP key areas.

Following the strong interest in YOPP expressed by the Summit participants it was decided at PPP-SG6 to launch an endorsement process for YOPP-related activities and projects. Endorsement through the PPP steering group will help to promote YOPP activities with funding agencies and other decision makers. Furthermore, it provides the steering group with a detailed overview of ongoing and planned activities, which will be key for effective coordination. The endorsement process is currently being developed, and further information (including endorsement forms) will become available in due time through the following link: <http://www.polarprediction.net/yopp/yopp-endorsement.html>

5. FURTHER INFORMATION

All relevant information regarding the YOPP Summit is available through the ICO website: <http://www.polarprediction.net/yopp/yopp-summit.html>

Live streams of all plenary sessions: <http://www.polarprediction.net/yopp/yopp-summit-video-recordings.html#c534>

Presentations from the YOPP Summit: <http://www.polarprediction.net/yopp/yopp-summit-presentations.html>

WMO press release: <https://www.wmo.int/media/content/year-polar-prediction-takes-shape>

YOPP Summit on Twitter: <https://twitter.com/hashtag/polarpredict?src=hash>

A high-resolution version of the group photo on the front page of this report is available here: <http://www.polarprediction.net/yopp/yopp-summit.html>

More on the endorsement of YOPP-related projects and activities can be found here: <http://www.polarprediction.net/yopp/yopp-endorsement.html>

6. ACKNOWLEDGEMENTS

On behalf of all participants, the Summit Planning Group, SSG, and ICO staff acknowledge the generous financial assistance provided by the PPP Trust Fund contributors, GFCS, AWI, CliC, and ESKP to support the Summit. Thanks are also extended to the Summit co-organizers (WMO, AWI and CliC) and to WMO for hosting the event.

APPENDIX I

Table of participants

APPENDIX II

Summit agenda

YOPP-Summit 13 - 15 July 2015
List of participants



ALLARD	Richard	US Naval Research Laboratory	USA
BAKLANOV	Alexander	WMO	Switzerland
BARTON	Neil	US Naval Research Laboratory	USA
BAUER	Peter	ECMWF	UK
BEROD	Dominique	Group on Earth Observations GEO	Switzerland
BIEBOW	Nicole	Alfred Wegener Institute Bremerhaven	Germany
BLANCHARD- WRIGGLESWORTH	Edward	University of Washington	USA
BLOCKLEY	Ed	Met Office	UK
BRACEGIRDLE	Thomas	British Antarctic Survey	UK
BRADLEY	Alice	University of Colorado Boulder / CliC	USA
BROMWICH	David	Byrd Polar and Climate Research Centre / Ohio State University	USA
BUCH	Erik	EuroGOOS	Belgium
CARDINALI	Carla	ECMWF	UK
CARLSON	David	WCRP	Switzerland
CASATI	Barbara	Environment Canada	Canada
CHARPENTIER	Etienne	WMO	
CHECHIN	Dmitry	Obukhov Institute of Atmospheric Physics RAS, Moscow	Russia
CHEN	Peter	WMO consultant	Canada
CHEVALLIER	Matthieu	CNRM-GAME, Météo-France	France
COELHO	Emanuel	NATO/STO CMRE	Portugal
CRANE	Kathleen	NOAA	USA
CROSBIE	Kim	IAATO	UK
DAY	Jonathan	University of Reading	UK
DETHLOFF	Klaus	Alfred Wegener Institute Bremerhaven	Potsdam
DOBLAS-REYES	Francisco	ICREA, BSC, IC3	Spain
DOLE	Randall	NOAA ESRL Physical Sciences Division	USA
EK	Michael	NOAA/NWS/NCEP/EMC	USA
ENOMOTO	Hiroyuki	National Institute of Polar Research	Japan
FAIRALL	Christopher	NOAA	USA
GAMBARDELLA	Attilio	European Commission	Belgium
GASCARD	Jean-Claude	UPMC/CNRS	FRANCE
GODØY	Øystein	Norwegian Meteorological Institute	Norway
GOESSLING	Helge	Alfred Wegener Institute Bremerhaven	Germany
GORDON	Neil	International Coordination Office for Polar Prediction	New Zealand
GRABAK	Ola	European Space Agency	Italy
GRIMES	David	Environment Canada	Canada
HAAPALA	Jari	Finnish Meteorological Institute	Finland
HARLOW	Chawn	Met Office	UK

HIK	David	University of Alberta/Polar Knowledge Canada	Canada
HOOD	Robbie	NOAA UAS Program	USA
HUGHES	Nicholas	Norwegian Meteorological Institute	Norway
INOUE	Jun	National Institute of Polar Research	Japan
INTRIERI	Janet	NOAA	USA
IVERSEN	Trond	MET Norway	Norway
JOHANSSON	Halldor	Arctic Portal	Iceland
JOHANSSON	Margareta	Lund University/Royal Swedish Academy of Sciences	Sweden
JUNG	Thomas	Alfred Wegener Institute Bremerhaven	Germany
KARCHER	Michael	Alfred Wegener Institute Bremerhaven	Germany
KAUKER	Frank	Alfred Wegener Institute Bremerhaven	Germany
KIM	Seong-Joong	Korea Polar Research Institute	Republic of Korea
KLEBE	Stefanie	Alfred Wegener Institute Bremerhaven	
KLEIN	Birgit	Federal Maritime and Hydrographic Agency of Germany	Germany
KÖNIG-LANGLO	Gert	Alfred Wegener Institute Bremerhaven	Germany
KRINNER	Gerhard	LGGE/CNRS	France
KRISTIANSEN	Jørn	Met Norway	Norway
LALOYAUX	Patrick	ECMWF	UK
LAMERS	Machiel	Wageningen University	Netherlands
LI	Chunhua	National Marine Environmental Forecasting Center	China
LI	Zhiqiang	National Marine Environmental Forecasting Center	China
LUCAS	Sandy	NOAA Climate Program Office	USA
LYKOW	Ivan	Russian Federation Permanent Mission	Russia
MACELLONI	Giovanni	IFAC - CNR	ITALY
MAKSHTAS	Aleksandr	Arctic Antarctic Research Institute	Russia
MARKUS	Thorsten	NASA	USA
MASSONNET	François	Université catholique de Louvain, Belgium / Catalan Institute of Climate Sciences, Barcelona	Belgium/Spain
MEIER	Petter	Norwegian Ministry of Transport and Communications	NORWAY
MERRYFIELD	William	Environment Canada/CCCma	Canada
METHVEN	John	University of Reading	UK
MILLS	Brian	Environment Canada	Canada
MONTAGNER	Francois	EUMETSAT	Germany
MÜLLER	Malte	Norwegian Meteorological Institute	Norway
MUSCARI	Giovanni	INGV	Italy
NULLIS-KAPP	Clare	WMO	Switzerland
NURMI	Perti	Finnish Meteorological Institute	Finland
OLSEN	Steffen Malskær	Danish Meteorological Institute	Denmark
PAASCHE	Øyvind	Bergen Marine Research Cluster and UArctic	Norway
PEROVICH	Don	Dartmouth College	USA

PETRESCU	Gene	NOAA/NWS Alaska	United States
PITHAN	Felix	University of Reading	UK
POLVORINOS	Fausto	AEMET	Spain
PROSHUTINSKY	Andrey	Woods Hole Oceanographic Institution	USA
RACHOLD	Volker	IASC	Germany
REID	Phillip	Bureau of Meteorology, Australia	Australia
RENFREW	Ian	University of East Anglia	UK
RICHARDSON	David	ECMWF	UK
RIISHOJGAARD	Lars Peter	WMO	Switzerland
RIXEN	Michel	WMO/WCRP	Switzerland
RUSSO	Aniello	NATO/STO CMRE	Italy
RUTI	Paolo	WMO	Italy
RYAN	Barbara	GEO Secretariat - Director	Switzerland
SALTZMAN	Eric	National Science Foundation	USA
SCARCHILLI	Claudio	ENEA	ITALY
SFRAGA	Michael	University of Alaska	United States
SHI	Peiliang	WMO	Switzerland
SHUPE	Matthew	University of Colorado	USA
SMITH	Gregory	Environment Canada	Canada
SNORRASON	Árni	The Icelandic Meteorological Office	Iceland
SPARROW	Michael	SCAR/WCRP	UK/Switzerland
SPENGLER	Thomas	University of Bergen	Norway
STØYLEN	Eivind	MET Norway	Norway
SVENSSON	Gunilla	Department of Meteorology, Stockholm University	Sweden
SZAPIRO	Nicholas	University of Oklahoma	USA
TATUSKO	Renee	NOAA National Weather Service Alaska Region Hq	USA
TERBLANCHE	Deon	WMO	Switzerland
TOLSTYKH	Mikhail	Institute of Numerical Mathematics RAS and Hydrometcentre of Russia	Russia
TOURNIER	Nathalie	WMO	Switzerland
VAURASTE	Tero	Arctia Shipping Ltd	Finland
VITALE	Vito	ISAC-CNR	Italy
VITART	Frederic	ECMWF	United Kingdom
WACKER	Ulrike	Alfred Wegener Institute Bremerhaven	Germany
WANG	Hui	National Marine Environmental Forecasting Center	China
WANG	Wanqiu	CPC/NCEP/NWS/NOAA	USA
WENDISCH	Manfred	Universität Leipzig	Germany
WILKINSON	Jeremy	BAS	UK
WILSON	Aaron	Byrd Polar and Climate Research Center	United States of America
ZADRA	Ayrton	Environment Canada	Canada

YOPP-Summit 13 - 15 July 2015

WMO Headquarters
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AGENDA as of 11 July 2015

Monday 13 July 2015			
1200 - 1245	Registration		
1300 - 1320	Session I Welcome and Introduction <ul style="list-style-type: none"> Welcome from Secretary General Welcome from Director Atmospheric Research and Environment Branch Purpose of the Meeting Local Arrangements 	Chair Paolo Ruti Secretary general representative Deon Terblanche Thomas Jung Paolo Ruti	Salle Obasi
1320 - 1400	Session II Background <ul style="list-style-type: none"> The Strategic Relevance of Advanced Predictive Capacity YOPP Overview Discussion 	Chair Paolo Ruti David Grimes Thomas Jung	Salle Obasi
1400 - 1600	Session III User Relevant Aspects <ul style="list-style-type: none"> Societal Dimensions and Considerations for YOPP Arctic shipping Knowledge Driven Arctic Shipping - Data Intelligence for understanding, predicting and acting Tourism in Polar Regions The Maritime Safety and Oil Spill Preparedness and Response Systems in the Arctic. Why Reliable Prediction Systems are so important? The NOAA/NWS Arctic Testbed Verification 	Chair Neil Gordon Brian Mills Tero Vauraste Halldór Jóhannsson Kim Crosbie Petter Meier Eugene Petrescu Pertti Nurmi/Barbara Casati	Salle Obasi
1405 - 1415			
1415 - 1425			
1425 - 1435			
1435 - 1445			
1445 - 1455			
1455 - 1505			
1505 - 1515			
1515 - 1600	Discussion		
1600 - 1630	GROUP PHOTO / COFFEE		
1630 - 1830	Session IV YOPP Observing Component <ul style="list-style-type: none"> Integrated Global Observing System and rolling reviews Impact of Extra Observations from Existing Platforms Autonomous Observing Systems Ocean Observations MOSAic The Role of Research Aircraft in YOPP Voluntary Observing Ships ESA contribution to YOPP 	Chair Peter Bauer Lars Peter Rijshojgaard Jun Inoue Don Perovich Erik Buch Matthew Shupe Chawn Harlow Etienne Charpentier Ola Grabak	Salle Obasi
1635 - 1645			
1645 - 1655			
1655 - 1705			
1705 - 1715			
1715 - 1725			
1725 - 1735			
1735 - 1745			
1745 - 1755			
1755 - 1830	Discussion		
1835	ICEBREAKER		Attic

Tuesday 14 July 2015			
0830 - 1020	Session V YOPP Modelling Component	Chair Randall Dole	Salle Obasi
0835 - 0845	• Numerical Experimentation during YOPP	Peter Bauer	
0845 - 0855	• Coupled Modelling	Gregory Smith	
0855 - 0905	• Data Assimilation for Arctic Ice and Ocean Models	Richard Allard	
0905 - 0915	• The ECMWF Prototype Coupled Reanalysis	Patrick Laloyaux	
0915 - 0925	• Polar-lower latitude linkages	Paco Doblás-Reyes	
0925 - 0935	• Polar weather prediction	David Bromwich	
0935 - 0945	• Sea ice forecasting	Matthieu Chevallier	
0945 - 1020	Discussion		
1020 - 1050	COFFEE		
1050 - 1150	Session VI YOPP Data Component	Chair Peter Chen	Salle Obasi
1055 - 1105	• A YOPP Data Archive (PANGAEA)	Thomas Jung	
1105 - 1115	• GCW Experiences with Distributed Data Management	Øystein Godøy	
1115 - 1125	• Data Journals: YOPP Special Issue	David Carlson	
1125 - 1135	• WIS/GTS How-to for Adding Research Data	Phil Reid	
1135 - 1150	Discussion		
1150 - 1300	Lunch		
1300 - 1330	Session VII - YOPP Education and Outreach Component	Chair David Carlson	Salle Obasi
	• The YOPP Educational Component	Jonathan Day	
	• The YOPP Outreach Plan	Helge Goessling	
	Discussion		
1330 - 1500	Session VIII Partner Initiatives	Chair Renee Tatusko	Salle Obasi
	• Brief presentations from YOPP partners WWRP-DAOS (C. Cardinali), WWRP-PDEF (J. Methven), WGNE (A. Zadra), S2S (F. Vitart), CliC (G. Krinner), SOOS/SORP (M. Sparrow), WCRP Polar challenge (M. Rixen), IASC (T. Spengler), GEO (D. Bérode), FAMOS (A. Proshutinsky), INTERACT (M. Johansson), IICWG (N. Hughes), IAOOS (J.-C. Gascard), IASOA (C. Fairall)	[5 minutes per partner 10 minutes CliC (WCRP-Cluster)]	
1500 - 1520	COFFEE		
1520 - 1620	Session VIII Partner Initiatives (cont'd)	Chair Renee Tatusko	Salle Obasi
	• Brief presentations from YOPP partners SIOS/SAON (V. Vitale), SIPN (E. Blanchard-Wrigglesworth), NOAA YOPP (R. Dole), NOAA-UAVs (R. Hood), BAS (T. Bracegirdle), NMEFC (H. Wang), CMRE/NURC (A. Russo), ENEA (C. Scarchilli), EUMETSAT (F. Montagner), NASA (T. Markus), KOPRI (S.-J. Kim)	[5 min per partner]	
1620 - 1625	Introduction to breakout groups sessions	Thomas Jung	

1625 - 1815	Breakout Groups A		
1625 - 1815	<ul style="list-style-type: none"> Group 1: User Aspects & Verification 	Brian Mills / Barbara Casati	Salle Obasi
1625 - 1815	<ul style="list-style-type: none"> Group 2a: Observations 	Ian Renfrew / Dmitry Chechin	Salle 6 Lake
1625 - 1815	<ul style="list-style-type: none"> Group 2b: Observations 	Peter Bauer / Alice Bradley	Salle 6 Jura
1625 - 1815	<ul style="list-style-type: none"> Group 3a: Modelling, Data Assimilation, Linkages and Prediction 	Gregory Smith / Matthieu Chevallier	Salle C1
1625 - 1815	<ul style="list-style-type: none"> Group 3b: Modelling, Data Assimilation, Linkages and Prediction 	David Bromwich / François Massonnet	Salle C2
1625 - 1715	<ul style="list-style-type: none"> Group 5: Education and Outreach 	Helge Goessling / Jonathan Day	Salle 7 Lake
1715 - 1815	<ul style="list-style-type: none"> Group 6: Funding 	Paolo Ruti	Salle 7 Lake
End of Day			

Wednesday 15 July 2015

0830 - 1000	Breakout Groups B		
	<ul style="list-style-type: none"> Continuation of Tuesday's Sessions (Groups 1-3) Final Discussion Preparation of Recommendations for Final Planning Session 		same rooms as Tuesday
0830 - 1000	<ul style="list-style-type: none"> Group 4: Data 	Thomas Jung	Salle 7 Lake
1000 - 1030	COFFEE		
1030 - 1230	Session IX Final Planning Session	Chair Thomas Jung	Salle Obasi
	<ul style="list-style-type: none"> Statements by Funding Agencies Breakout Group Recommendations Commitments for and planning of the Year of Polar Prediction (YOPP) General Discussion of Actions Wrap-up and Next Steps 		
End of Day			