

The Global Integrated Polar Prediction System (GIPPS) and the Year of Polar Prediction (YOPP)

Photo: S. Hendricks, AWI

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Alfred Wegener Institute, Bremerhaven, Germany
PRCC Scoping Workshop, 17 November 2015, Geneva

Global Integrated Polar Prediction System (GIPPS)

- Motivation: Increased need for predictive capacity in polar regions across time scales
- **Global:** International effort & poles have global impacts
- **Integrated:** Interconnection between systems and system will be integrated (research, observations, services)
- **Polar Prediction System:** Providing polar predictive capacity is key

Global Integrated Polar Prediction System (GIPPS)

Three time scales:

- Short-term (daily to seasonal) → **PPP/YOPP**
- Medium-term (seasonal to decadal) → **PCPI/CIiC**
- Long-term (multi-decadal to centennial) → **CIiC**

Polar Climate Predictability Initiative (PCPI)

Lead: Ted Shepherd and Cecilia Bitz

1. Improve knowledge and understanding of past polar climate variations (up to 100-years)

Lead: S. Gilles, J. Jones

2. Assess reanalyses in polar regions

Lead: D. Bromwich, J. Renwick

3. Improve understanding of polar climate predictability on seasonal to decadal timescales

Lead: J. Fyfe, E. Hawkins

4. Assess performance of CMIP models in polar regions

Lead: H. Goosse, J. Kay

5. Model error

Lead: M. Jochum, G. Svensson

6. Improve how jets and non-zonal circulation couple to the rest of the system in the Southern Hemisphere

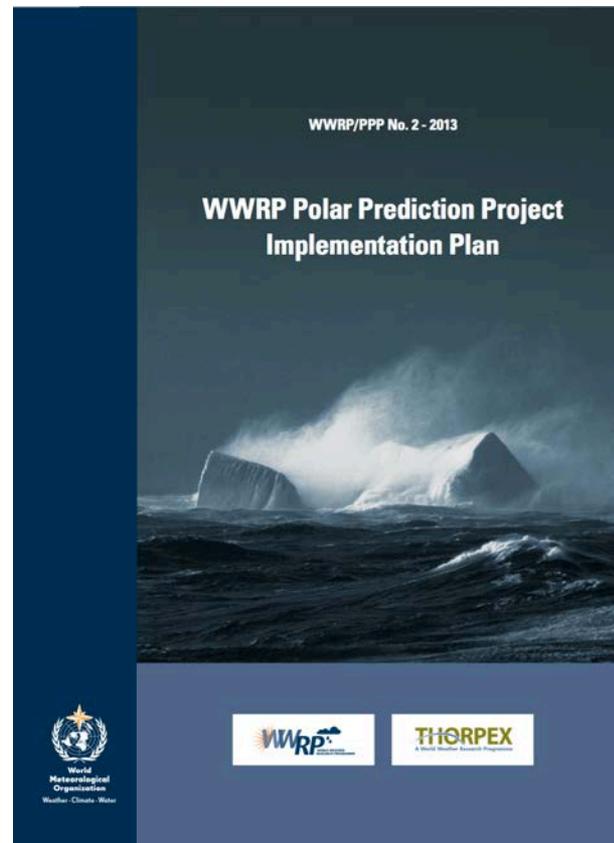
Lead: G. Marshall, M. Raphael

The Polar Prediction Project (PPP)

Mission statement:

Promote cooperative international research enabling development of improved weather and environmental prediction services for the polar regions, on time scales from hourly to seasonal

PPP Implementation Plan

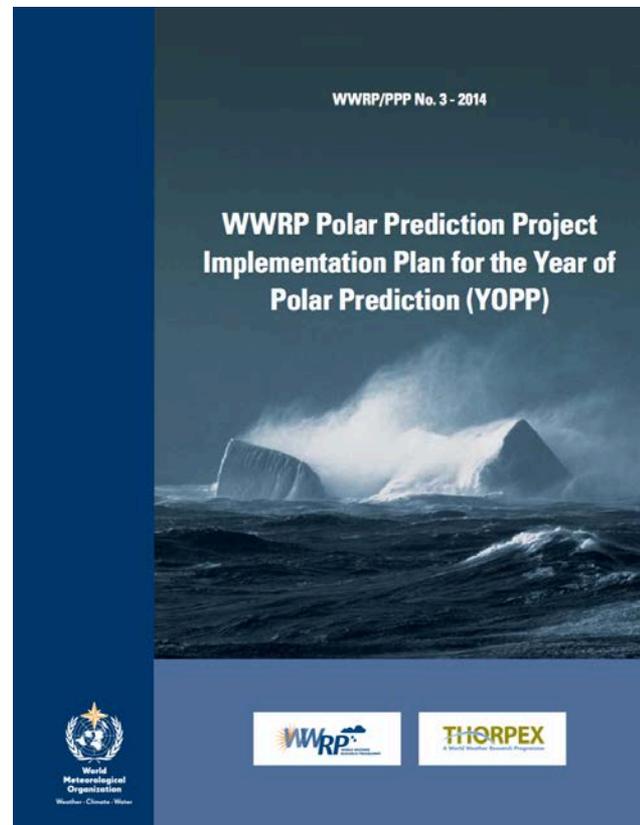


The Year of Polar Prediction

YOPP Implementation Plan 1.0

Mission statement:

Enable a significant improvement in environmental prediction capabilities for the polar regions and beyond, by coordinating a period of intensive observing, modelling, prediction, verification, user-engagement and education activities.



YOPP Objectives

- Improve the polar observing system to provide better coverage of high-quality observations in a cost-effective manner.
- Gather additional observations through field programmes aimed at improving understanding of key polar processes.
- Improve representation of key-processes in uncoupled and coupled models used for prediction.
- Develop improved data assimilation systems that account for challenges in polar regions (e.g. coupled processes, sparse data, steep orography).
- Explore the predictability of the atmosphere-cryosphere-ocean system, with a focus on sea ice, on time scales from days to a season.

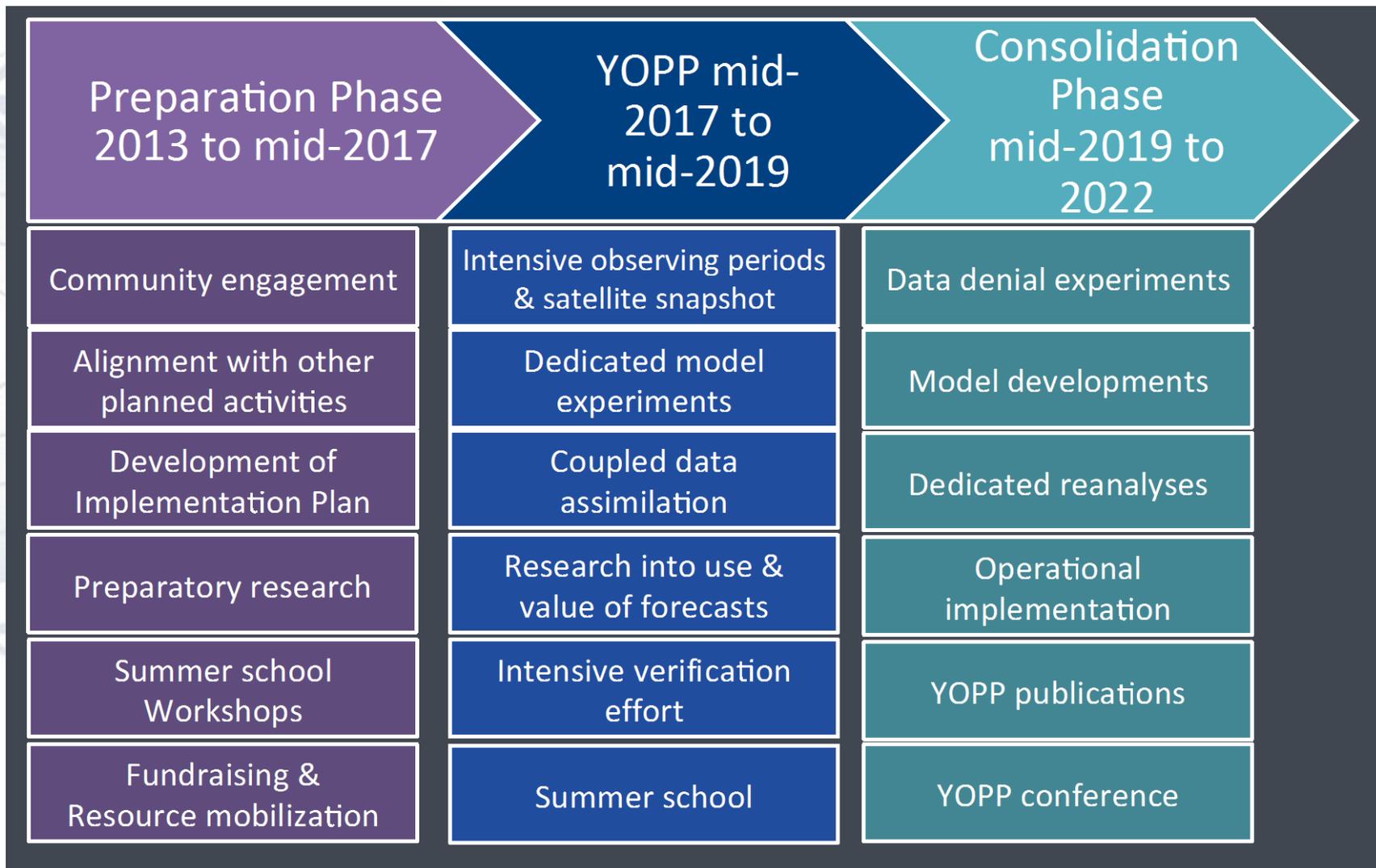
YOPP Objectives

- Improve understanding of linkages between polar regions and lower latitudes and assess skill of models representing these.
- Improve verification of polar weather and environment predictions to obtain quantitative knowledge on model performance, and on the skill of operational forecasting systems for user-relevant parameters; and efficiently monitor progress.
- Improve understanding of the benefits of using prediction information and services in the polar regions, differentiated across the spectrum of user types and benefit areas.
- Provide training opportunities to generate a sound knowledge base on polar prediction related issues.

YOPP Strategy

- Strengthen linkages between academia, research institutions and operational forecasting centres.
- Establish and exploit special research data sets that can be used by the wider research community and forecast product users.
 - Establish a common data strategy.
 - Link with space agencies.
 - Promote YOPP with funding agencies.
 - Develop strong linkages with other initiatives.
 - Promote interactions and communication between research and stakeholders.
 - Foster education and outreach.

Year of Polar Prediction



YOPP-Summit



WMO, Geneva, 13-15 July 2015

- 116 participants from 20 nations
- Live streaming: Up to 750 users online at the same time
- Decisions summarized in YOPP Summit report
- Meeting report published in BAMS

Selected Summit highlights

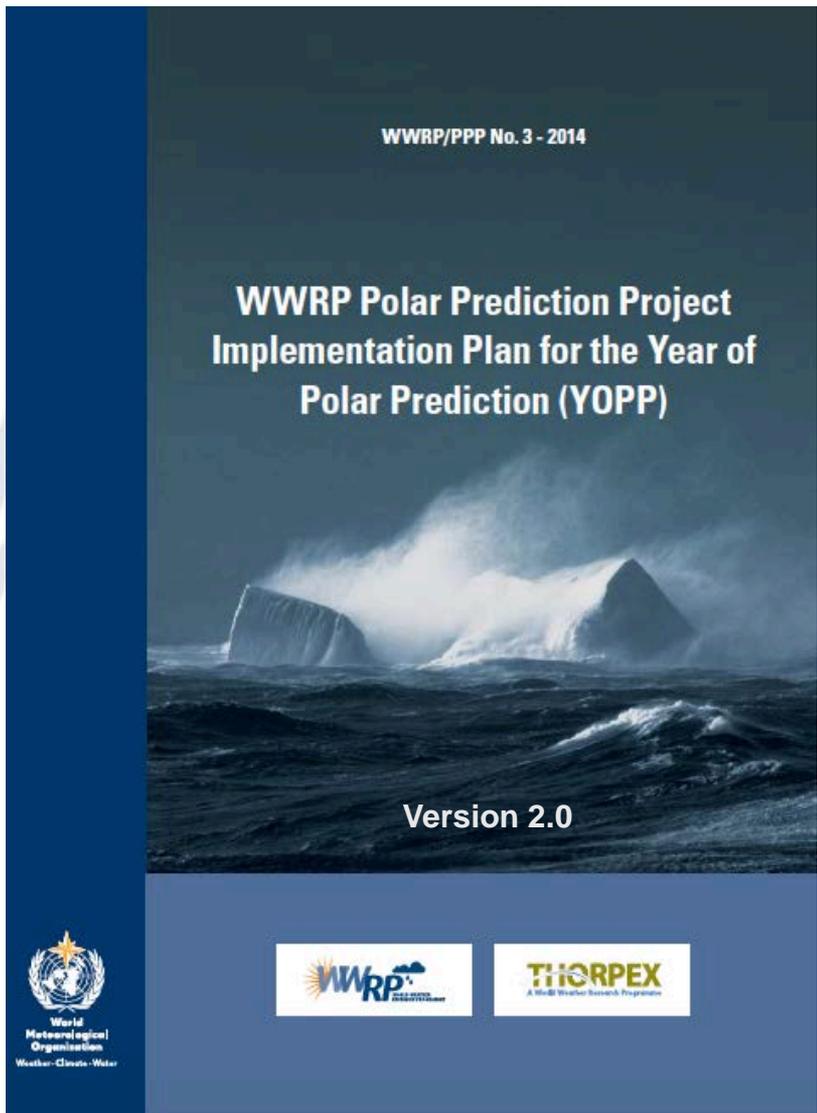
- Strong stakeholder involvement
- A number of high-level commitments
- Formation of planning groups (e.g. Southern Hemisphere planning team)
- Agreement on intensive observing periods (IOPs)
- Identification of gaps in the existing plans (e.g. hydrological cycle)
- Agreement on YOPP data strategy
- Effective means of communication
 - polarprediction@climate-cryosphere.org
 - YOPP newsletter
- YOPP endorsement has been established

PPP

YOPP Implementation Plan 2.0



WWRP



WMO
OMM

Services

- Services play an important role in GIPPS and YOPP
- Services in YOPP:
 - Large visibility in YOPP planning documents
 - Has a large research component attached to it
 - Implementation is overseen by PPP-SERA sub-committee
- PPP-SERA sub-committee
 - Led by Brian Mills and Jackie Dawson
 - Report from kick-off meeting available
 - Next meeting to be held in April 2016
 - Support through PPP Trust Fund and EC GFCS contribution (high priority!)

Training

- Plays an important role as well
- Upcoming: *WWRP/WCRP/Bolin Centre Polar Prediction School for Polar Prediction*, Abisko, Sweden, 5-15 April 2016
- Target students and early career scientists
- Strong collaboration with the Association of Polar Early Career Scientists (APECS)

Summary

- Increasing need for predictive capacity in polar regions
- Emphasis of previous efforts on lower latitudes
- International activities have been set up to make a difference (PPP, YOPP, PCPI, SIPN etc.)
- YOPP provides the opportunity of bringing the different partners together
- Arctic PRCC excellent opportunity to strengthen transfer of knowledge between operations, research and users
- Also good point of contact to the operational community
- Make sure to align Arctic PRCC with ongoing activities (YOPP, joint meetings, involvement of PPP-SERA etc.)

Further progress (selected)

PPP-SERA Sub-committee

WORLD METEOROLOGICAL ORGANIZATION
COMMISSION FOR ATMOSPHERIC SCIENCES
(CAS)

**World Weather Research Program (WWRP) Polar
Prediction Project (PPP)
Societal and Economic Research and
Applications Meeting**

Ottawa, Canada (12-13 March 2015)

CAS/WWRP-PPP-SERA-Meeting 1-
report
(updated 9-April 2015)

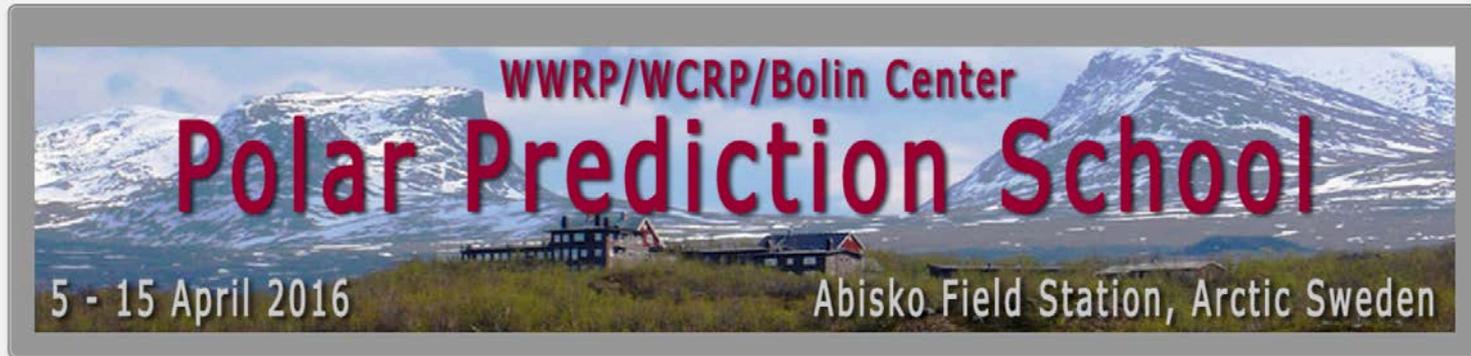
Report summarizing the First PPP-
SERA Meeting

This report summarizes the items discussed and presentations prepared for the inaugural organizing meeting of the Societal and Economic Research and Applications (SERA) Sub-committee of the Polar Prediction Project (PPP), coordinated and managed through the World Weather Research Programme (WWRP), an Open Programme Area Group (OPAG) of the World Meteorological Organization (WMO). The meeting was held at the Faculty of Arts, University of Ottawa, in Ottawa, Canada from 12-13 March 2015.



Meeting participants, from left: Emma Stewart, Brian Mills, Daniela Liggett, Gita Ljubicic, Peter Chen, Jackie Dawson, Machiel Lamers, Lindsay Matthews (not pictured).

Training



5-15 April 2016 at the [Abisko Scientific Research Station, Sweden](#) (10 days duration)

The polar regions are experiencing a rapid change that opens new opportunities for the business sector and at the same time increases the risks of environmental disasters and impacts the life conditions of local communities including indigenous peoples. Prediction of weather and climate will be the cornerstone of efficient environmental services systems that are urgently needed in the polar regions. Such regional prediction systems will be imbedded in the corresponding global systems. However, the complexity of the polar climate system is high and the observing systems there are difficult to set up and maintain. The challenge of developing an effective seamless polar-prediction across timescales from days to decades should therefore involve training and development of a new generation of polar prediction researchers.

This WWRP/WCRP/Bolin Centre School on Polar Prediction will provide training for 30 post graduate and early career post-doctoral polar scientists, focusing on topics such as: polar mesoscale atmospheric processes; sea ice prediction, near term ensemble prediction, and seasonal-to-decadal climate variability and prediction in the polar regions. The program will combine lectures on key areas relevant for polar prediction and a number of field observation and modelling exercises to foster an interactive learning environment.

Pre-applications to the 2016 Abisko Polar Prediction School are now closed.

For more information contact [Jonny Day](#).