The Year of Polar Predicion

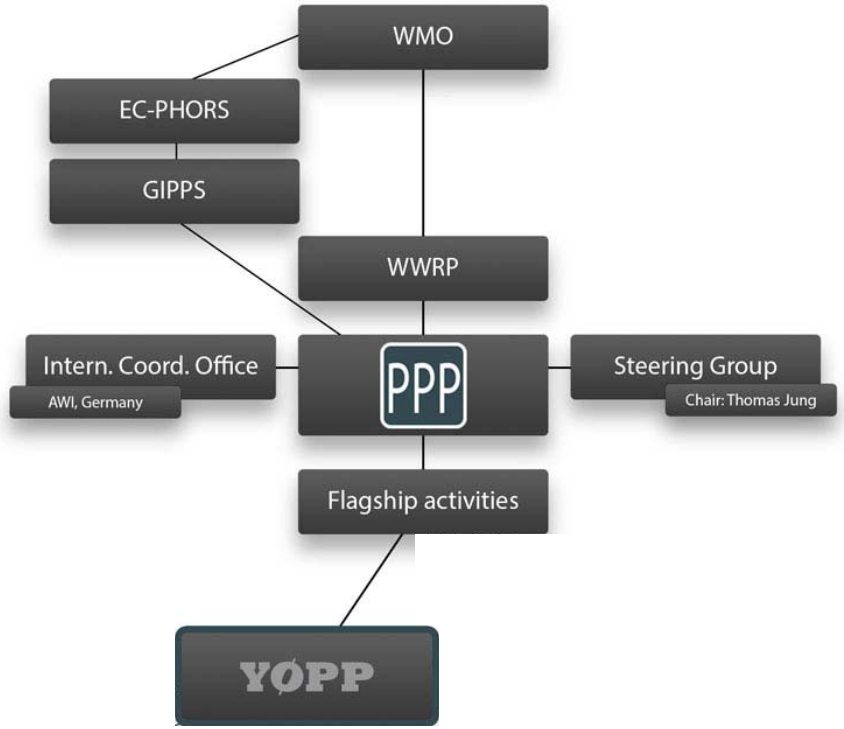
Overview and State of Planning

Photo: G. Dieckmann, AWI

Helge Goessling
PPP/YOPP International Coordination Office, Director

Alfred Wegener Institute, Bremerhaven, Germany
IICWG Meeting, 24-28 Oct 2016, Ottawa, Canada

PPP and YOPP



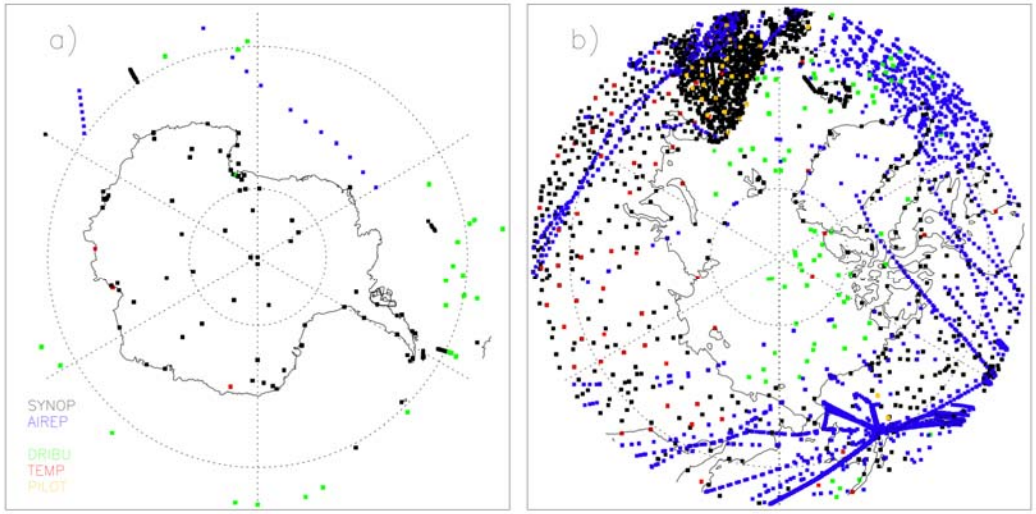
WMO = World Meteorological Organization
EC-PHORS = Executive Council – panel of experts on Polar and High mountains Observations, Research, and Services
GIPPS = Global Integrated Polar Prediction System
WWRP = World Weather Research Program
PPP = Polar Prediction Project
YOPP = Year Of Polar Prediction

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

Why?

- Significant gaps in the polar observing systems



Polar data coverage of conventional observations in the ECMWF operational analysis on 1 January 2012

P. Bauer (ECMWF)

- Emphasis of previous international efforts on lower latitudes
- Resulting deficiencies in polar forecasts
- Arctic opening
- Antarctic research logistics
- Potential benefits for mid-latitude predictions

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How?

YOPP
YEAR OF
POLAR
PREDICTION

Steering Group:

- Thomas Jung (Chair)
- Peter Bauer
- David Bromwich
- Barbara Casati
- Matthieu Chevallier
- Jackie Dawson
- Jonny Day
- Chris Fairall
- Jun Inoue
- Trond Iversen
- Daniela Liggett
- Alexander Makshtas
- Steffen Olsen
- Don Perovich
- Phil Reid
- Ian Renfrew

SG7 Meeting, May 2016, Beijing, China

- Gregory Smith
- Gunilla Svensson
- Mikhail Tolstykh
- Qinghua Yang

How?

PPP/YOPP International Coordination Office @ AWI:

Tasks:

- Inform
- Promote
- Coordinate
- Oversee implementation

Staffing:

- Thomas Jung (Chair PPP SG)
- Helge Goessling (Director)
- Kirstin Werner (Project Officer)
- Winfried Hoke (Outreach/Stakeholders)
- Katharina Kirchhoff (Admin)
- Richard Swinbank (WMO consultant)

How?

★ Develop Strong Linkages with Other Initiatives

★ Strengthen Linkages Between Academia, Research Institutions and Operational Centres

★ Establish and Exploit Special Research Datasets

★ Link with Space Agencies

★ Promote Interaction and Communication Between Research and Stakeholders

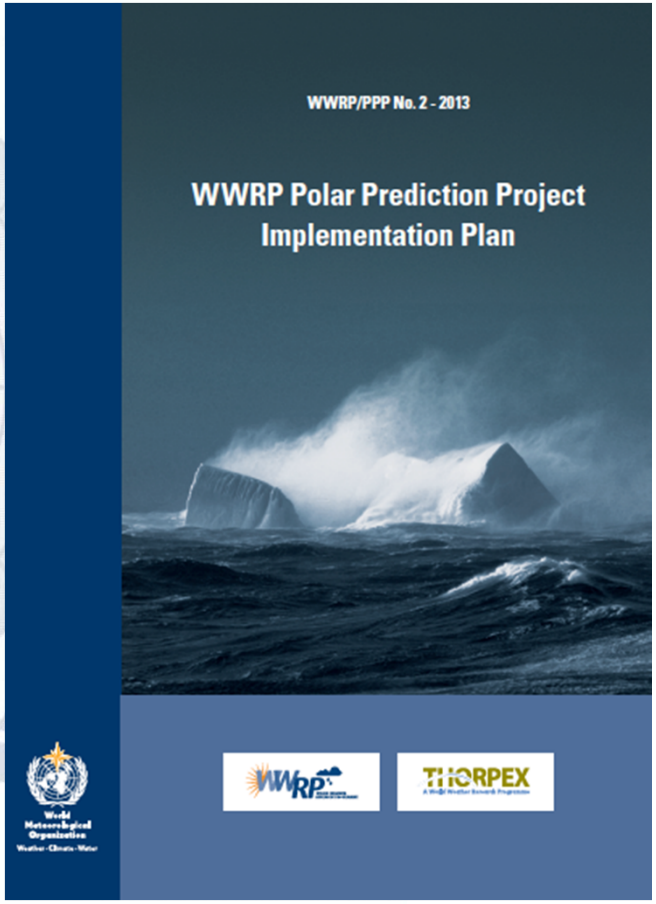
★ Foster Education and Outreach

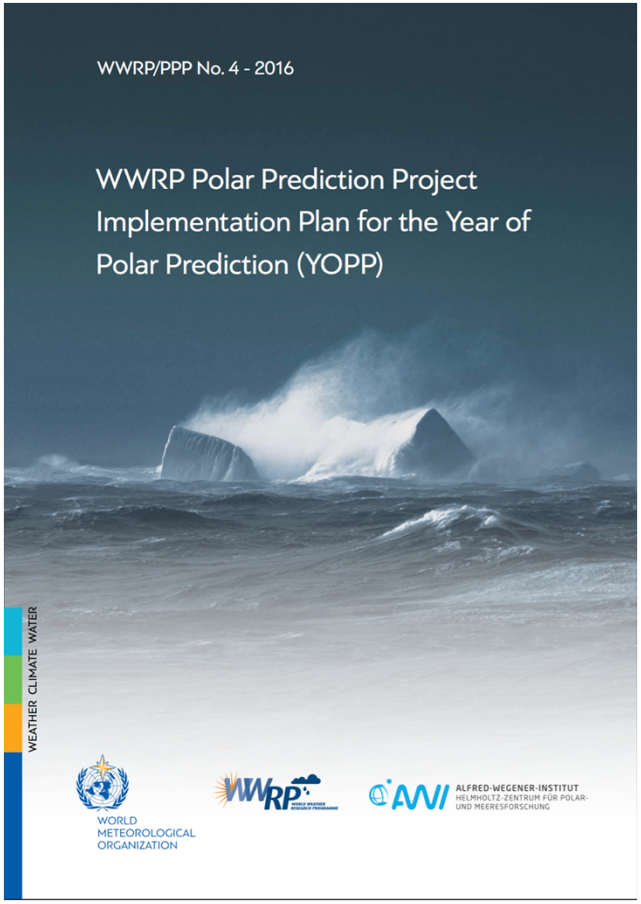
★ Link with Funding Agencies

succesful examples:

- EU Horizon 2020 calls "Arctic-lower lat linkages" & "Arctic Observing System"
- ESA Call
- Upcoming MEOPAR Call

How?





http://polarprediction.net

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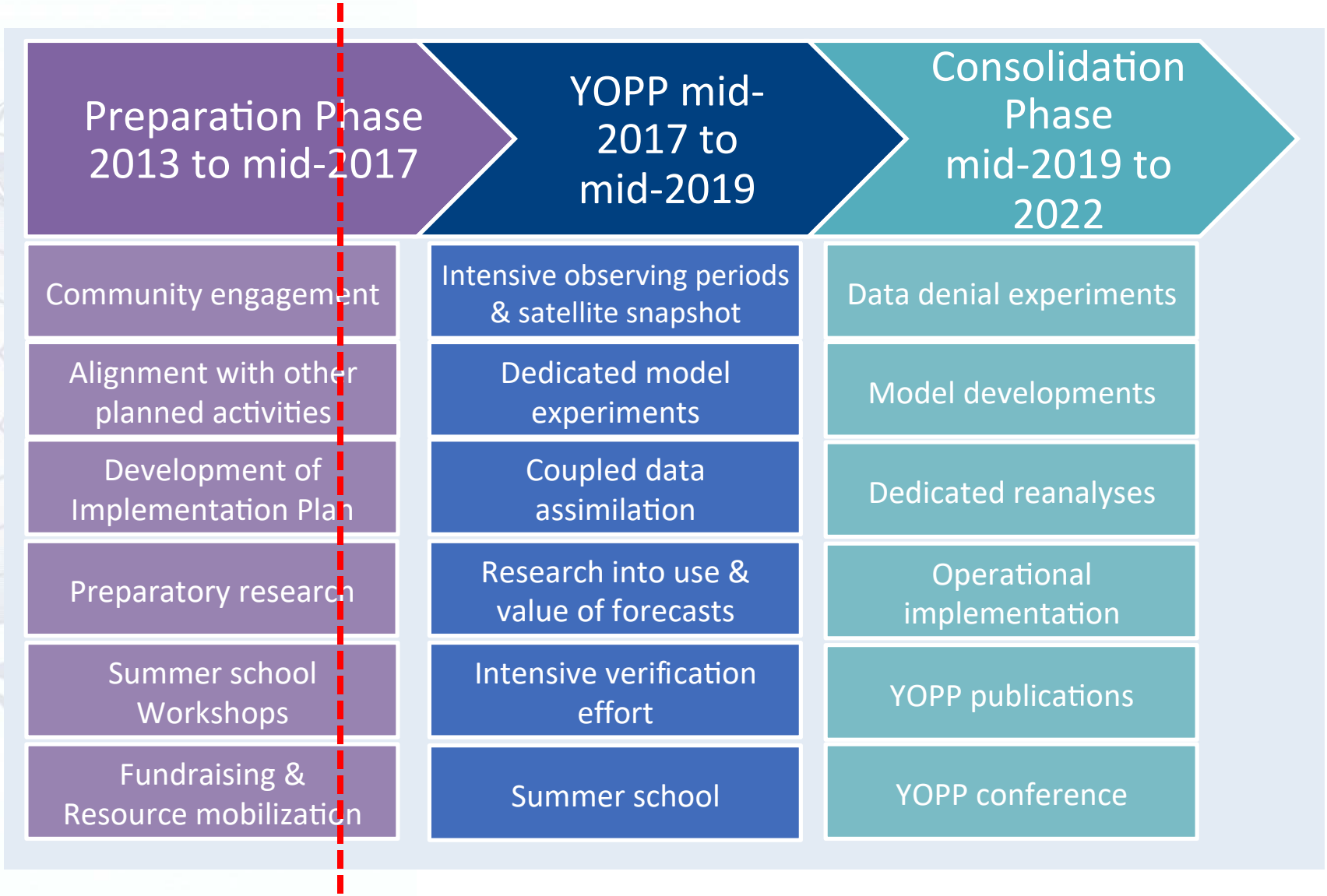
Year of Polar Prediction

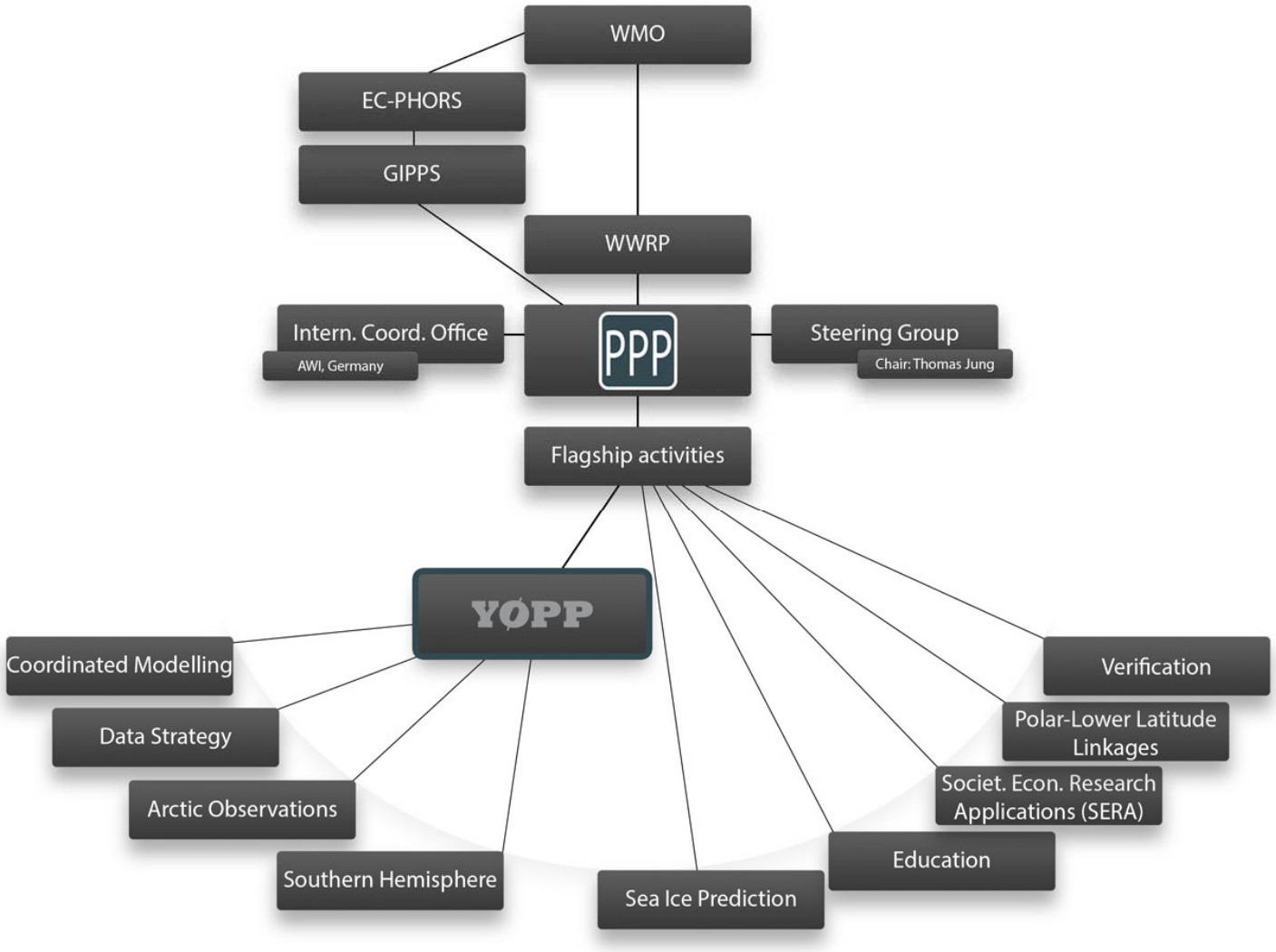
Goal:

„Enable 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.“

Year of Polar Prediction



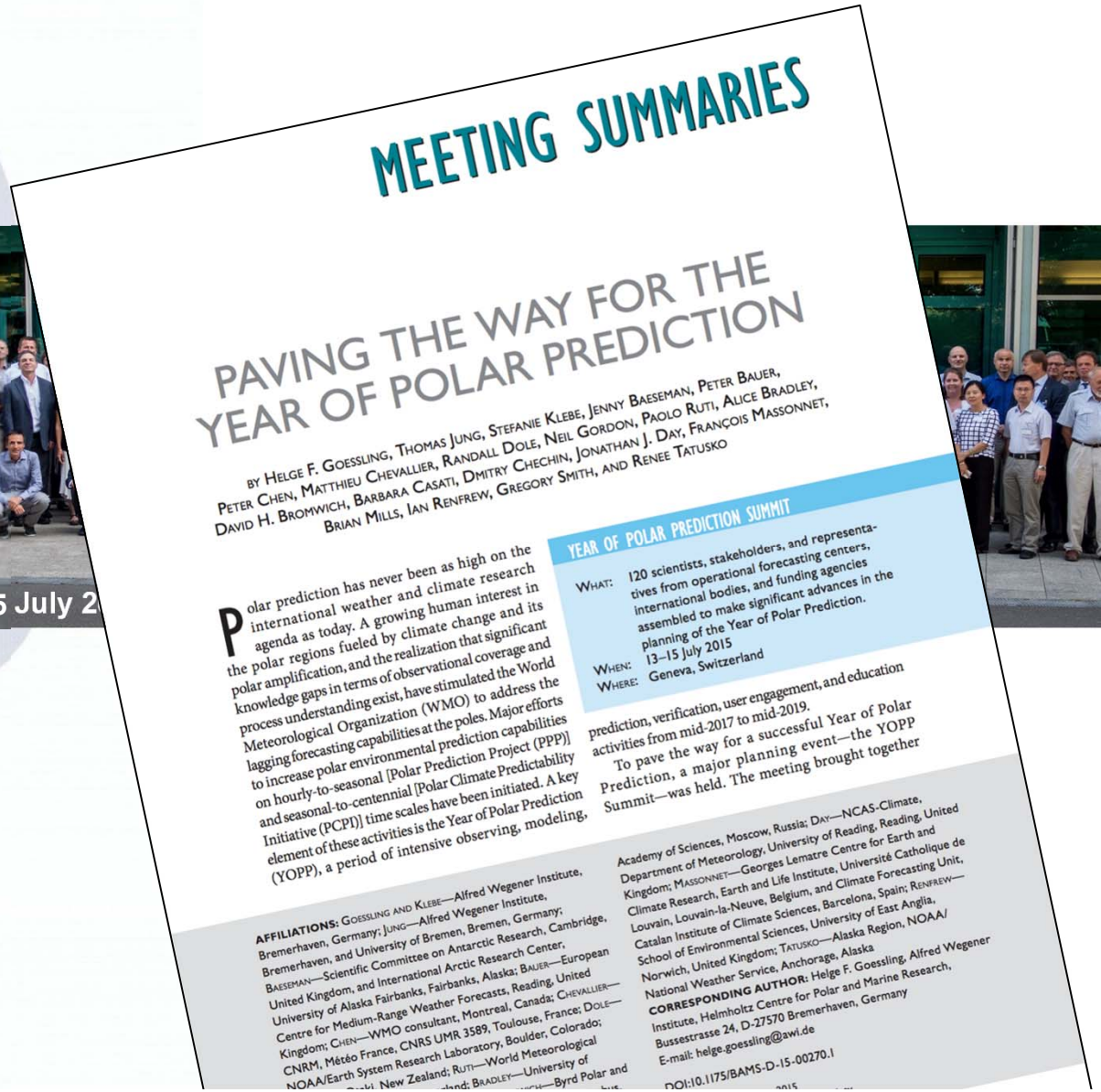
PPP/YOPP Organigram



... + a number of Task Teams currently being established to foster urgent key aspects of YOPP, e.g.:
enhanced buoy coverage +++ operational centres +++ satellite aspects +++ ...

Recent Events

YOPP Summit, 13-15 July 2



MEETING SUMMARIES

PAVING THE WAY FOR THE YEAR OF POLAR PREDICTION

By Helge F. Goessling, Thomas Jung, Stefanie Klebe, Jenny Baeseman, Peter Bauer, Peter Chen, Matthieu Chevallier, Randall Dole, Neil Gordon, Paolo Ruti, Alice Bradley, David H. Bromwich, Barbara Casati, Dmitry Chechin, Jonathan J. Day, François Massonnet, Brian Mills, Ian Renfrew, Gregory Smith, and Renee Tatusko

YEAR OF POLAR PREDICTION SUMMIT

What: 120 scientists, stakeholders, and representatives from operational forecasting centers, international bodies, and funding agencies assembled to make significant advances in the planning of the Year of Polar Prediction.

When: 13–15 July 2015

Where: Geneva, Switzerland

Polar prediction has never been as high on the international weather and climate research agenda as today. A growing human interest in the polar regions fueled by climate change and its polar amplification, and the realization that significant knowledge gaps in terms of observational coverage and process understanding exist, have stimulated the World Meteorological Organization (WMO) to address the lagging forecasting capabilities at the poles. Major efforts to increase polar environmental prediction capabilities on hourly-to-seasonal [Polar Prediction Project (PPP)] and seasonal-to-centennial [Polar Climate Predictability Initiative (PCPI)] time scales have been initiated. A key element of these activities is the Year of Polar Prediction (YOPP), a period of intensive observing, modeling, prediction, verification, user engagement, and education activities from mid-2017 to mid-2019.

To pave the way for a successful Year of Polar Prediction, a major planning event—the YOPP Summit—was held. The meeting brought together

AFFILIATIONS: Goessling and Klebe—Alfred Wegener Institute, Bremerhaven, Germany; Jung—Alfred Wegener Institute, Bremerhaven, and University of Bremen, Bremen, Germany; Baeseman—Scientific Committee on Antarctic Research, Cambridge, United Kingdom, and International Arctic Research Center, University of Alaska Fairbanks, Fairbanks, Alaska; Bauer—European Centre for Medium-Range Weather Forecasts, Reading, United Kingdom; Chen—WMO consultant, Montreal, Canada; Chevallier—CNRM, Météo France, CNRS UMR 3589, Toulouse, France; Dole—NOAA/Earth System Research Laboratory, Boulder, Colorado; [illegible], New Zealand; Ruti—World Meteorological [illegible]land; Bradley—University of [illegible]—Byrd Polar and Academy of Sciences, Moscow, Russia; Day—NCAS-Climate, Department of Meteorology, University of Reading, Reading, United Kingdom; Massonnet—Georges Lematre Centre for Earth and Climate Research, Earth and Life Institute, Université Catholique de Louvain, Louvain-la-Neuve, Belgium, and Climate Forecasting Unit, Catalan Institute of Climate Sciences, Barcelona, Spain; Renfrew—School of Environmental Sciences, University of East Anglia, Norwich, United Kingdom; Tatusko—Alaska Region, NOAA/National Weather Service, Anchorage, Alaska

CORRESPONDING AUTHOR: Helge F. Goessling, Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Bussestrasse 24, D-27570 Bremerhaven, Germany

E-mail: helge.goessling@awi.de

DOI:10.1175/BAMS-D-15-00270.1

Recent Events

g Group

Chair: Thomas Jung

Verification

Polar-Lower Latitude Linkages

Societ. Econ. Research Applications (SERA)

Education

Sea Ice Prediction

Southern Hemisphere

Arctic Observations

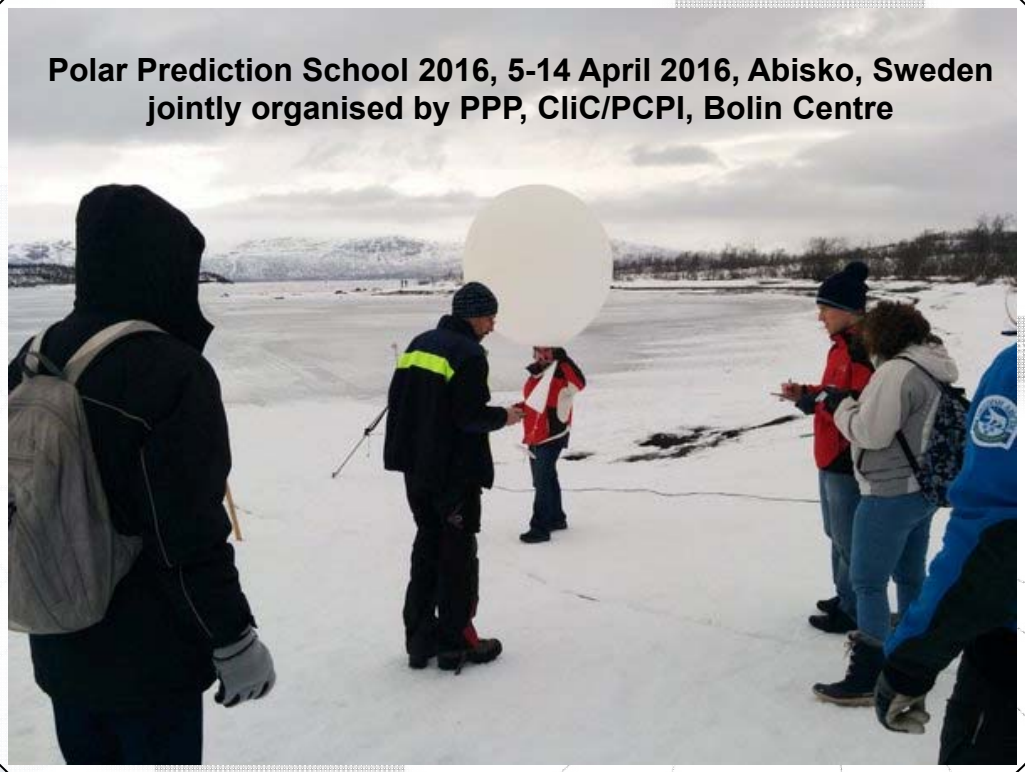
PPP

WWRP

WMO OMM

YOPP YEAR OF POLAR PREDICTION

Recent Events



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Recent Events

YOPP-SH Planning Meeting 6th June 2016, Ohio, USA
(in conjunction with AMOMF)

Coordinated Modelling

Data Strategy

Arctic Observations

Southern Hemisphere

Sea Ice Prediction

Education

Societ. Econ. Research Applications (SERA)

Polar-Lower Latitude Linkages

Recent Events

YOPP Modelling & Arctic Observations Planning Meetings 5-9 Sep 2016, Reading, UK

WMO

Regions

YOPP

Coordinated Modelling

Data Strategy

Arctic Observations

Southern Hemisphere

Sea Ice Prediction

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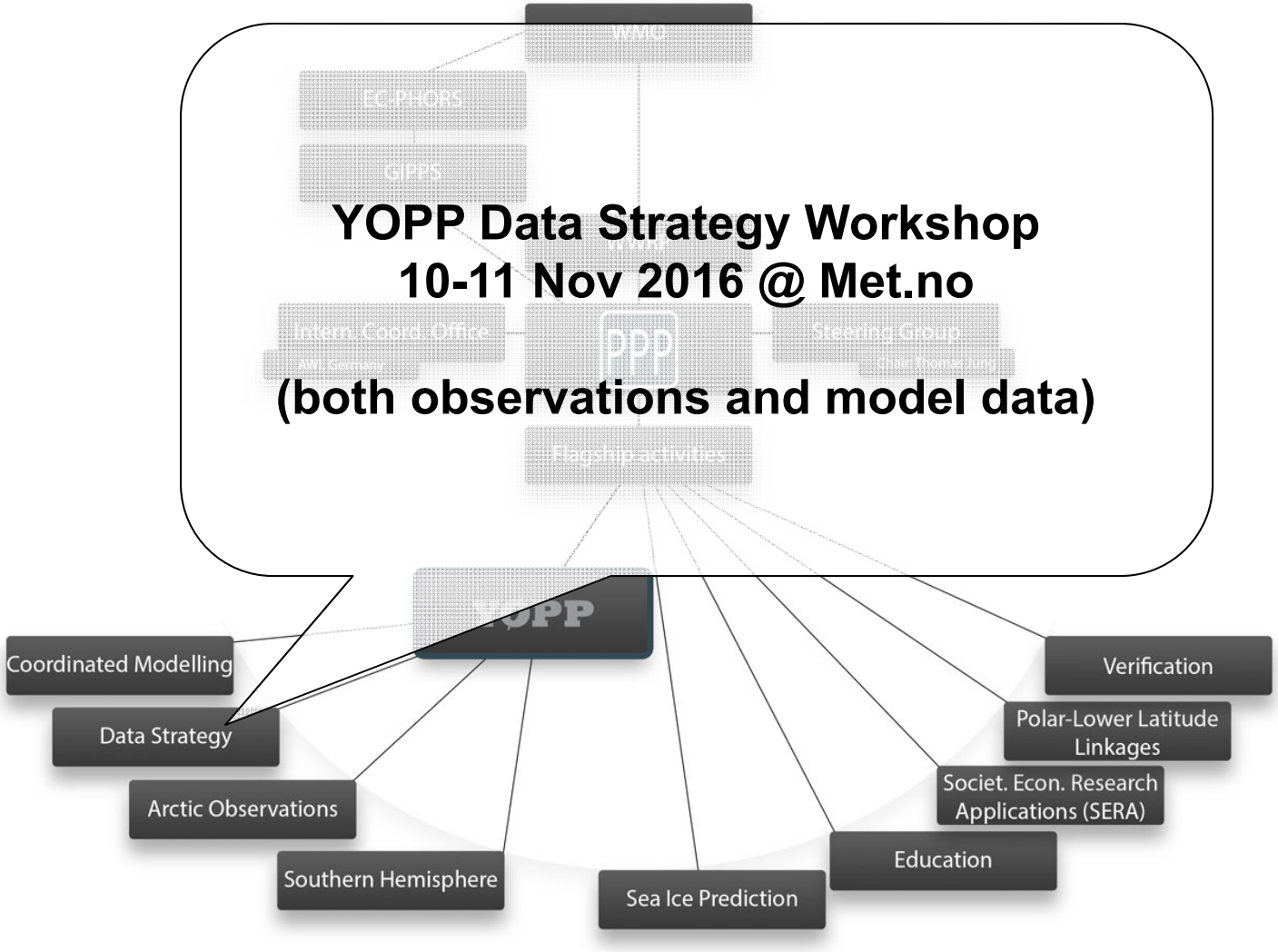
Upcoming Event

YOPP Data Strategy Workshop
10-11 Nov 2016 @ Met.no
(both observations and model data)



YOPP Endorsement

Who can get YOPP endorsement?

- Projects, programmes, and initiatives that plan to contribute to the aims of the Year of Polar Prediction (YOPP)

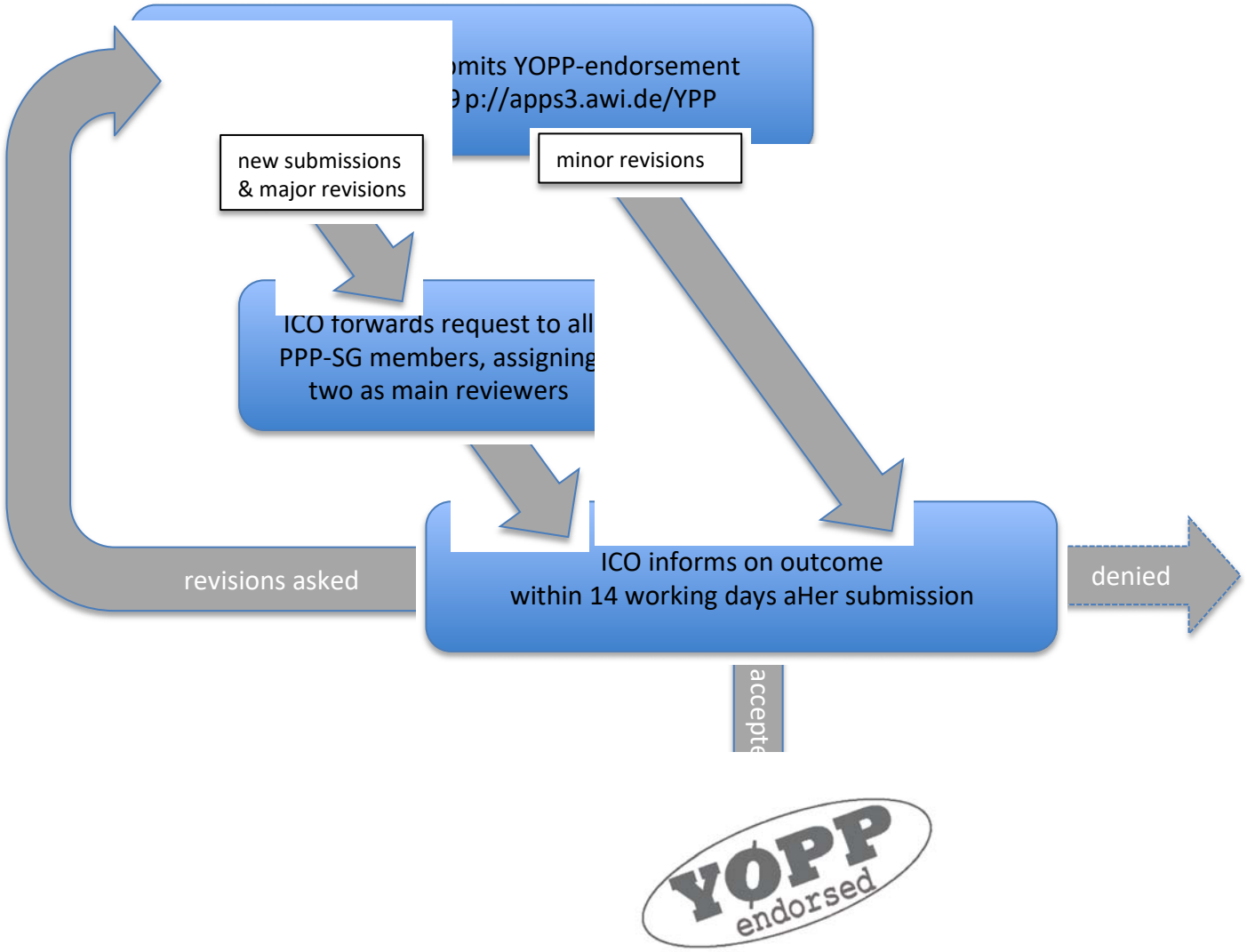
What are the benefits for YOPP-endorsed projects/initatives?

- Visibility of research activities (networking and communication)
- High-level support for research (increase funding chances)

What are the benefits for YOPP?

- Support of YOPP-relevant research
- Knowledge of, and coordination between different activities
- Promotion of YOPP policy, such as real-time and open data

YOPP Endorsement



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YOPP YEAR OF POLAR PREDICTION

Endorsed projects

Arctic Climate Across Scales
Principal investigator: Michael Tjernström

The project seeks to improve our understanding of physical processes in the Arctic and specifically to explore what it would take to reduce the risk of summer sea-ice completely disappearing within this century. The tools to achieve this will be improved modeling across the scales from hemispheric to local and especially for the surface energy balance and clouds, and improved process-level research-grade observations by building a semipermanent atmospheric observatory on the Swedish icebreaker Oden.

Show all information

ASPIRE
Antarctic Meteorology and Snow Research: from Process Understanding to Improved Predictions

Project website: http://polar-meteorology.fmi.fi/

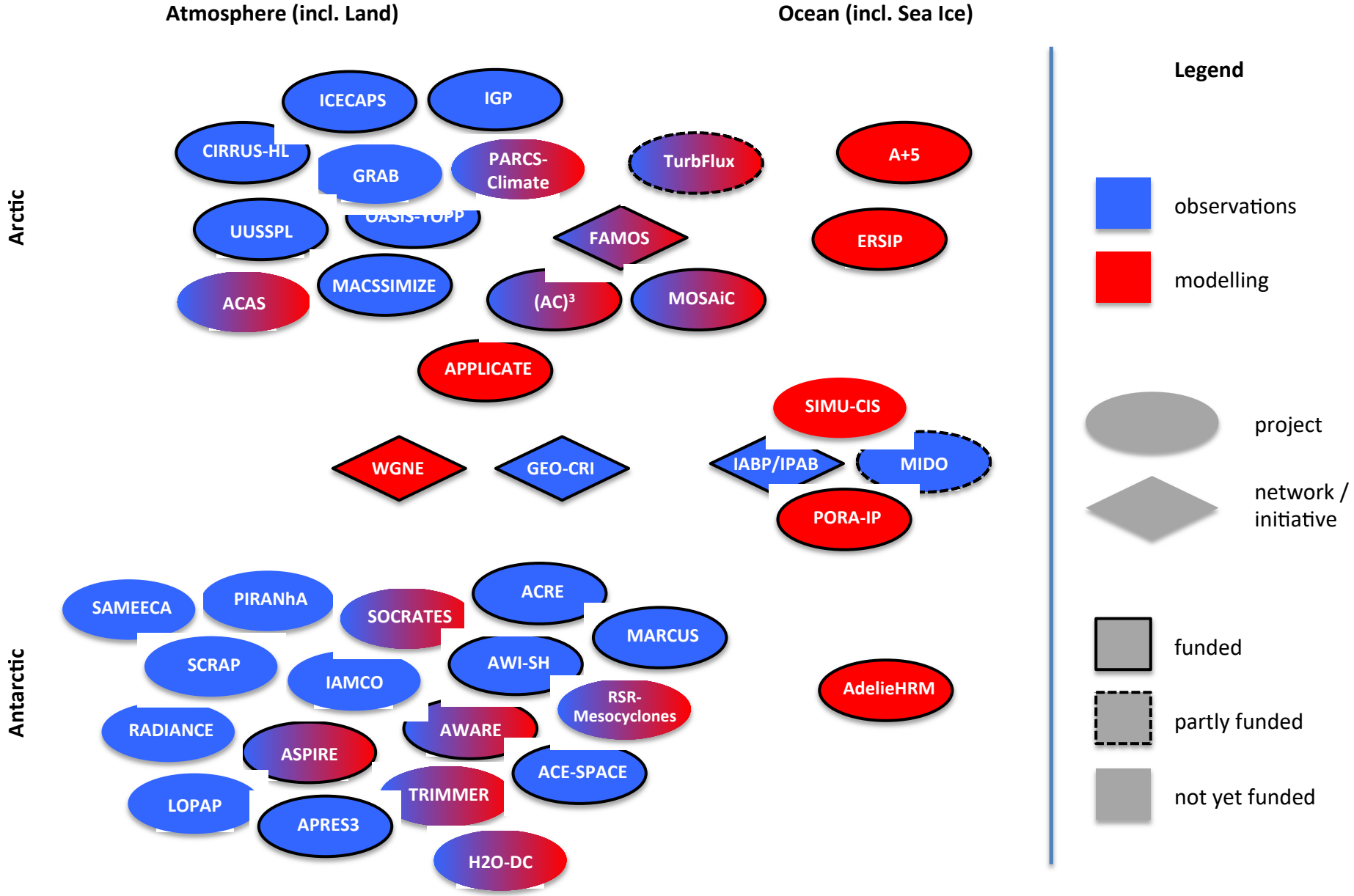
Principal investigator: Timo Vihma

ASPIRE will address the Antarctic atmosphere and snow. The work will result in better understanding of physical processes as well as in parameterizations and post-processing methods applicable in weather prediction.

Show all information

YOPP-endorsed projects & initiatives

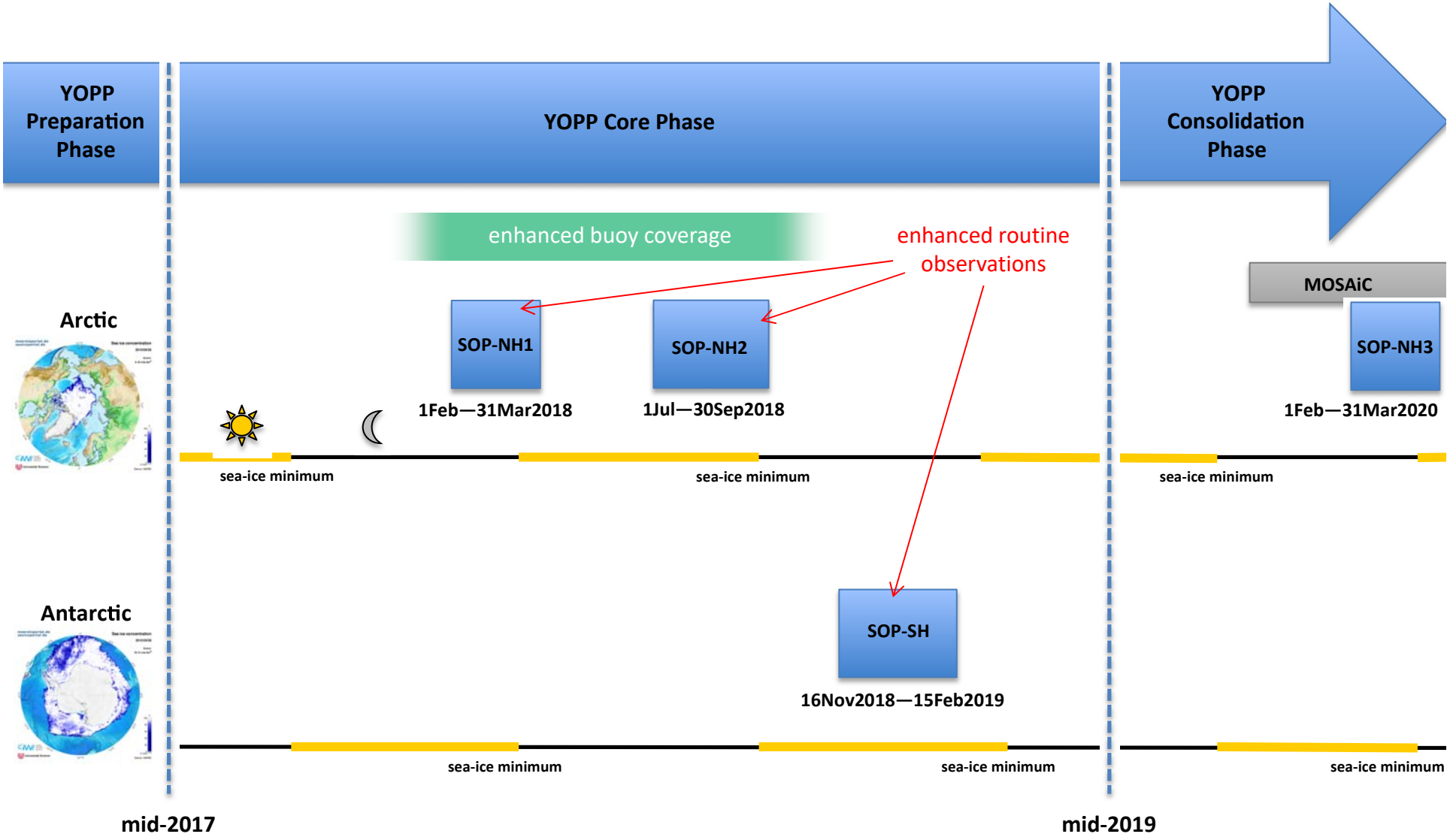
state 23 October 2016



Year of Polar Prediction

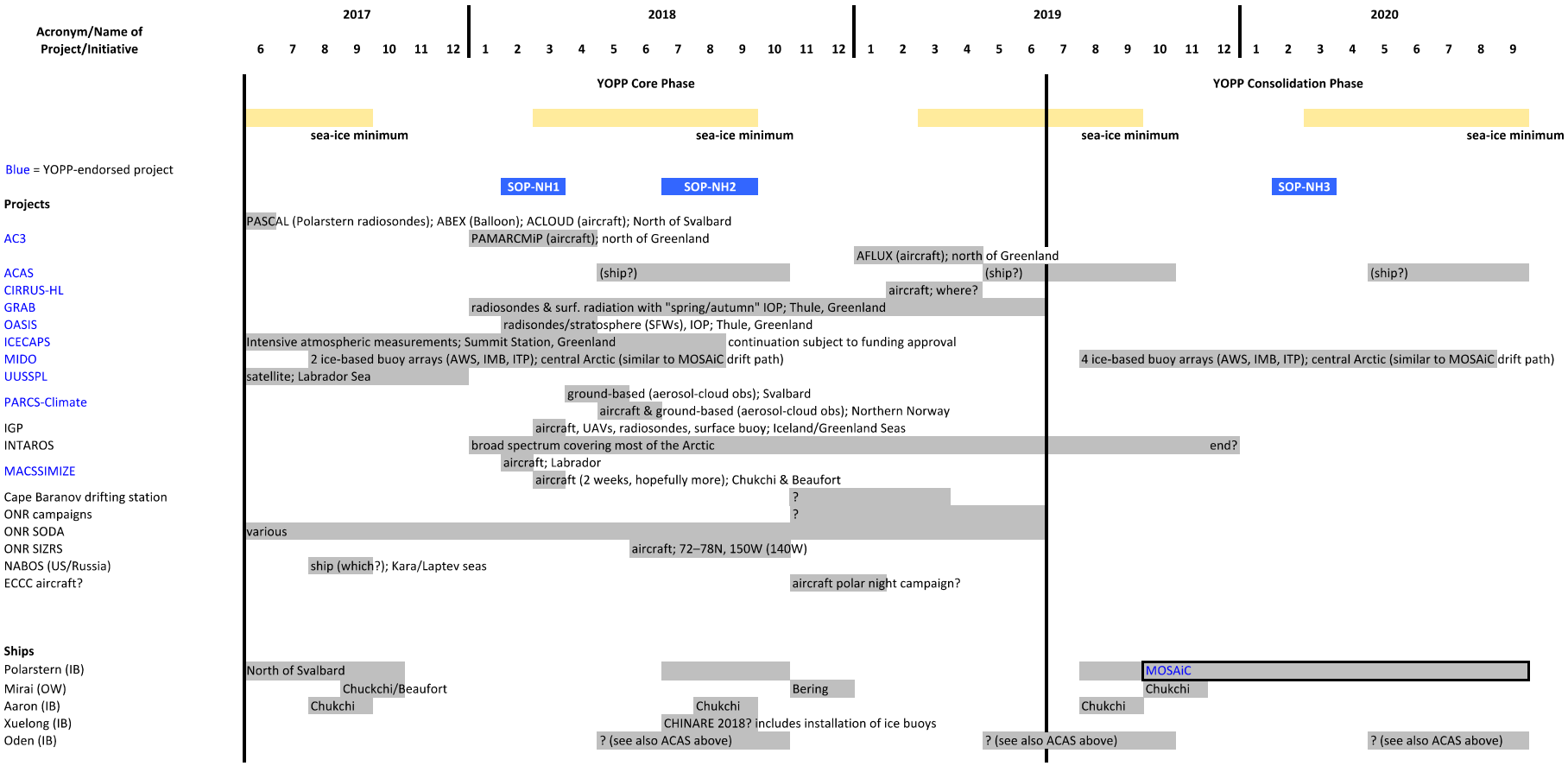
Special Observing Periods (SOPs)

Final approval pending (12 Oct 2016)



YOPP Arctic Observations – Timelines

state 27 September 2016



YOPP Modelling Dataset Categories

Core Datasets:	Main modelling datasets produced primarily to support YOPP. Covering YOPP Core Phase (mid-2017 to mid-2019) but could be extended to cover MOSAiC period
Supplementary Datasets:	Outside YOPP, but providing valuable resources to support YOPP scientific studies.
Experimental Datasets:	Experiments running during YOPP aimed at studying and improving model performance for polar prediction. This will include contributions from a wide range of YOPP scientists.

YOPP Modelling Core Datasets

Main Datasets produced primarily to support YOPP
YOPP Dataset: extended output (more levels, tendencies) from the operational ECMWF global NWP system.
Arctic System Reanalysis v3: high resolution coupled reanalysis for the Arctic.
Reanalysis using ECMWF global coupled system: CERA-SAT (extension)
CBHAR: high-resolution reanalysis for the Pacific Arctic

YOPP Modelling Supplementary Datasets

Outside YOPP, but providing valuable data to support YOPP
TIGGE: global medium-range ensemble predictions (~2 week range)
S2S: subseasonal to seasonal predictions (~2 month range)
GOV: GODAE Ocean View sea-ice forecasts
AMPS: Antarctic Mesoscale Prediction System
Sea-ice / ocean reanalyses (PORA-IP)
Other operational NWP data

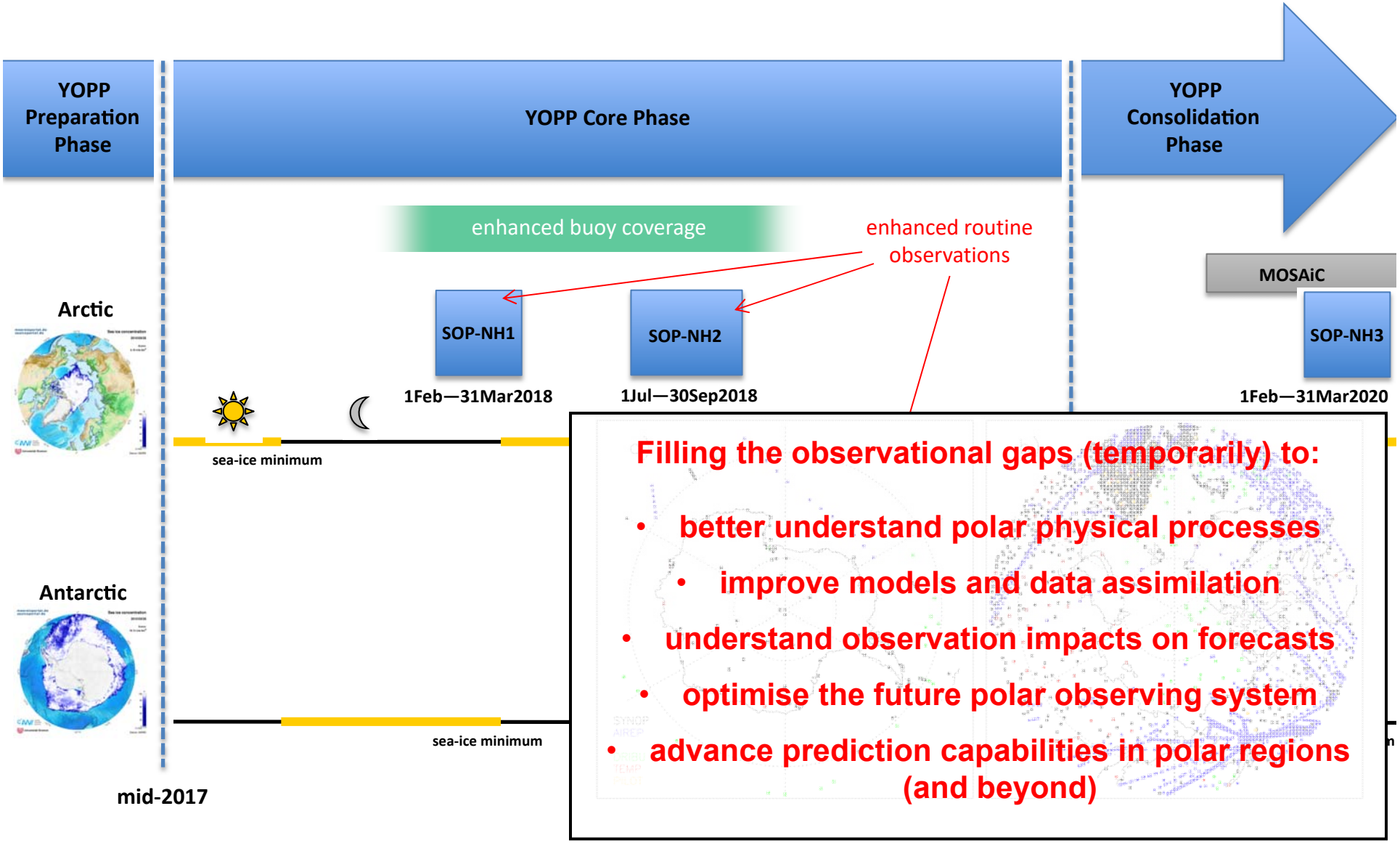
YOPP Modelling Experimental Datasets

Experiments running during YOPP aimed at studying and improving model performance for polar prediction.
Sea-ice, ocean and coupled modelling
Atmospheric processes, including boundary layer, clouds, snow & orographic effects.
Data assimilation and use of observations
Predictability studies, latitude linkages and tele-connections
Model evaluation: diagnostic methods and verification
YOPP/MOSAiC Drift Forecast Experiment
Sea Ice Outlook (including Southern Hemisphere!)
This category includes contributions from a wide range of YOPP scientists (many of which are part of YOPP-endorsed projects)

Year of Polar Prediction

Special Observing Periods (SOPs)

Final approval pending (12 Oct 2016)



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end of presentation