

# Year of Polar Prediction (YOPP)

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*Originally presented by Thomas Jung*  
Chair of the PPP steering group at  
Launch of YOPP May 2017

WEATHER CLIMATE WATER  
TEMPS CLIMAT EAU



WMO OMM

World Meteorological Organization

Organisation météorologique mondiale

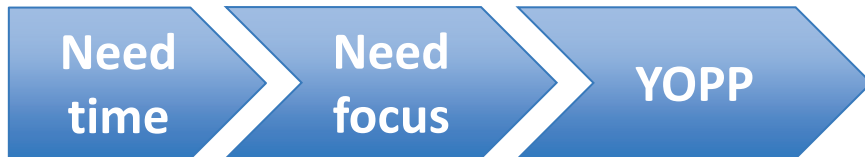
# Background

- In the late 2000s several aspects came together
  - Discussion on the legacy of the International Polar Year (IPY, 2007–2008)
  - Discussion of the future of the World Weather Research Programme (WWRP)
  - Arctic climate was changing rapidly
- Polar prediction moved into the focus
- *Polar Prediction Project* (PPP) was established

# PPP Kick-off Meeting

## 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*



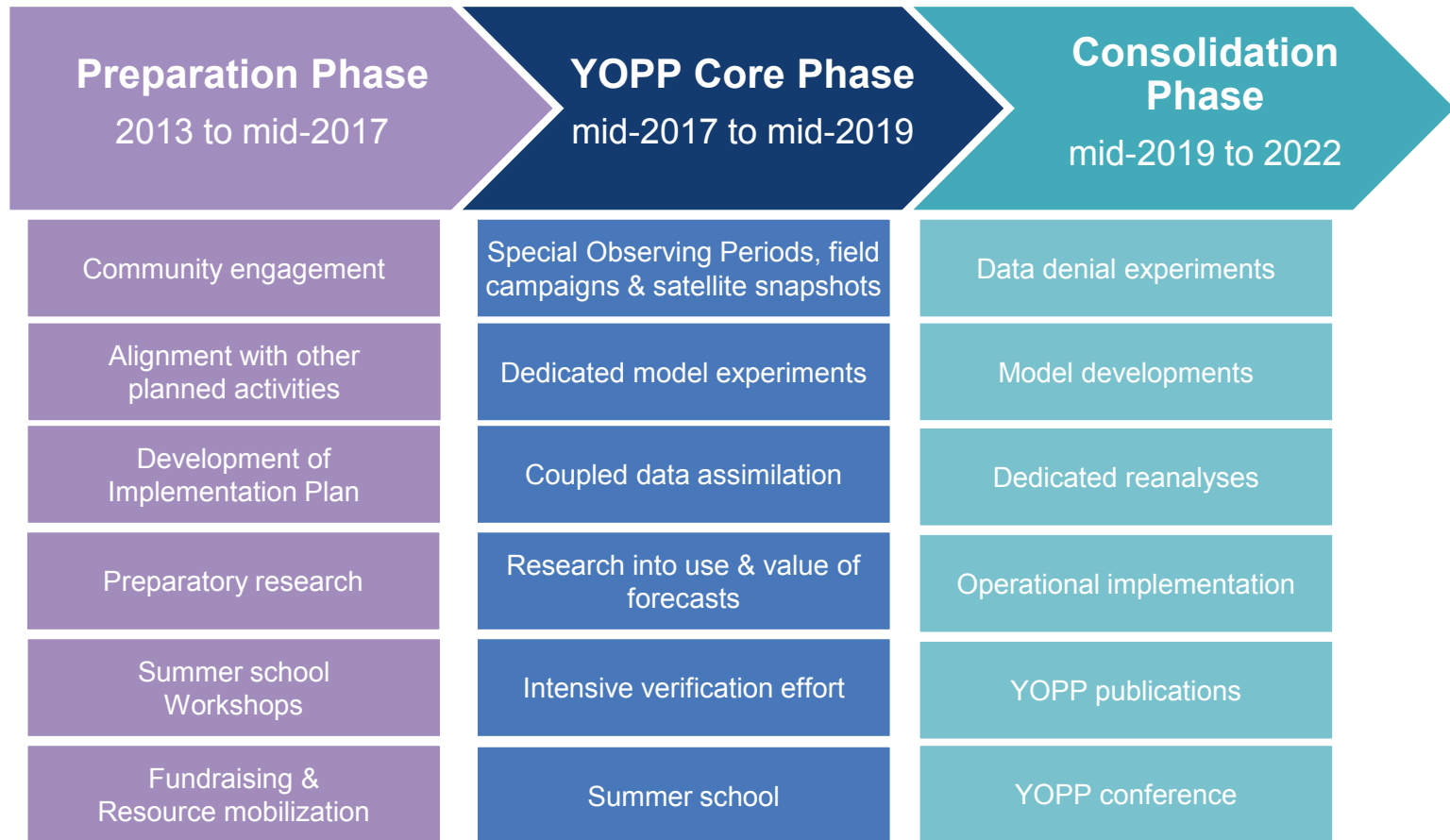
PPP Steering Group, WMO, Geneva, 2011

# Following PPP Steering Group Meeting

## **Year of Polar Prediction 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 Time Line



Jung et al. (2016), *Bull. Amer. Meteor. Soc.*



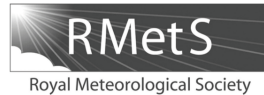
# Preparation Phase: Selected Highlights

## Community engagement – YOPP Summit



# Preparation Phase: Selected Highlights

## Preparatory research – Publications



### Editorial

#### Editorial for the Quarterly Journal's special issue on Polar Prediction

Peter Bauer<sup>a\*</sup> and Thomas Jung<sup>b</sup>

<sup>a</sup>ECMWF, Reading, UK

<sup>b</sup>AWI, Bremerhaven, Germany

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DOI:10.1002/qj.2639

[www.nature.com/scientificreports](http://www.nature.com/scientificreports)

## SCIENTIFIC REPORTS

OPEN

### Additional Arctic observations improve weather and sea-ice forecasts for the Northern Sea Route

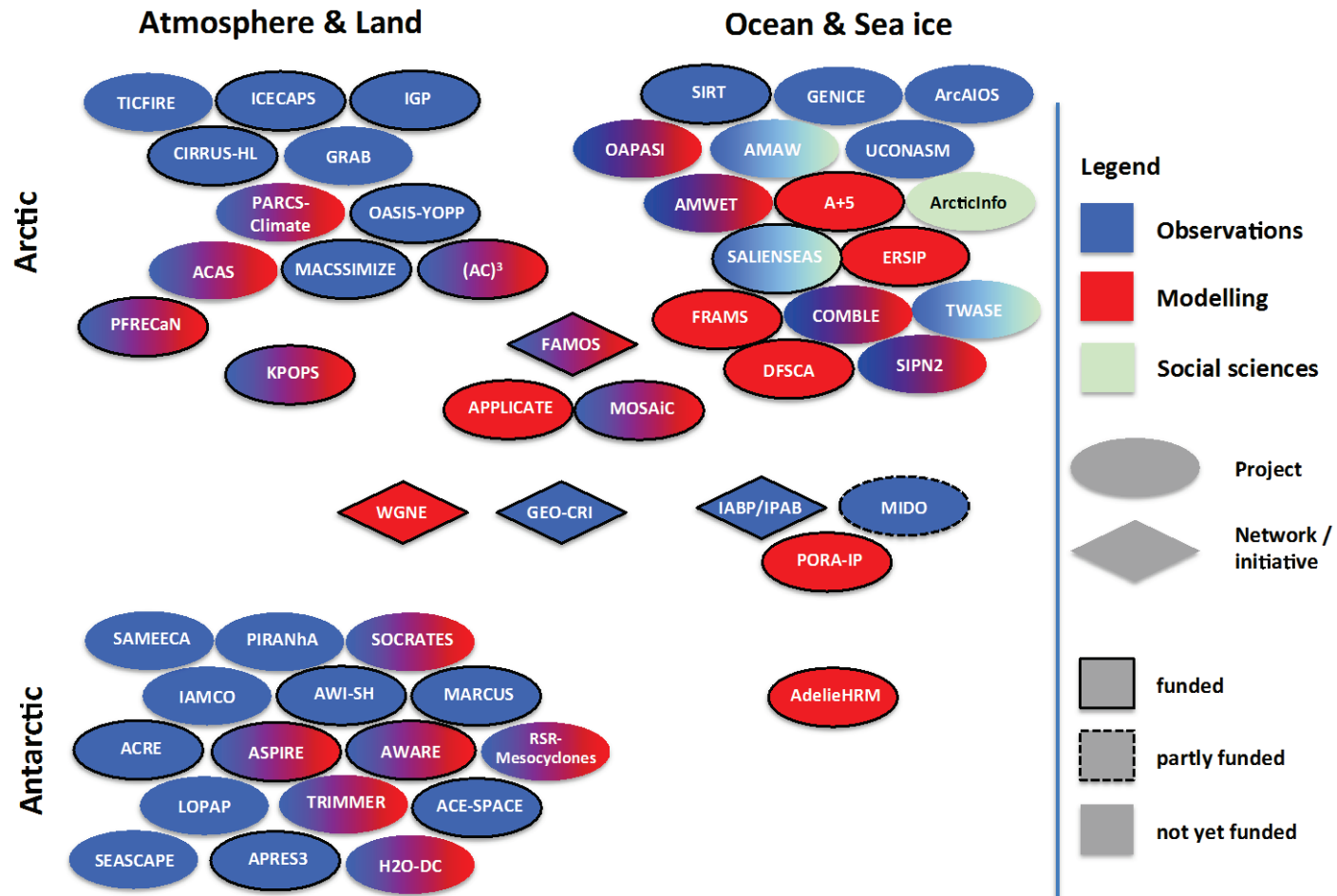
Received: 22 May 2015  
Accepted: 21 October 2015  
Published: 20 November 2015

Jun Inoue<sup>1,2,3</sup>, Akira Yamazaki<sup>2</sup>, Jun Ono<sup>2</sup>, Klaus Dethloff<sup>4</sup>, Marion Maturilli<sup>4</sup>, Roland Neuber<sup>4</sup>, Patti Edwards<sup>5</sup> & Hajime Yamaguchi<sup>6</sup>

During ice-free periods, the Northern Sea Route (NSR) could be an attractive shipping route. The decline in Arctic sea-ice extent, however, could be associated with an increase in the frequency of the causes of severe weather phenomena, and high wind-driven waves and the advection of sea ice could make ship navigation along the NSR difficult. Accurate forecasts of weather and sea ice are desirable for safe navigation, but large uncertainties exist in current forecasts, partly owing to the sparse observational network over the Arctic Ocean. Here, we show that the incorporation of additional Arctic observations improves the initial analysis and enhances the skill of weather and sea-ice forecasts, the application of which has socioeconomic benefits. Comparison of 63-member ensemble atmospheric forecasts, using different initial data sets, revealed that additional Arctic radiosonde observations were useful for predicting a persistent strong wind event. The sea-ice forecast, initialised by the wind fields that included the effects of the observations, skilfully predicted rapid wind-driven sea-ice advection along the NSR.

# Preparation Phase: Selected Highlights

## YOPP endorsement





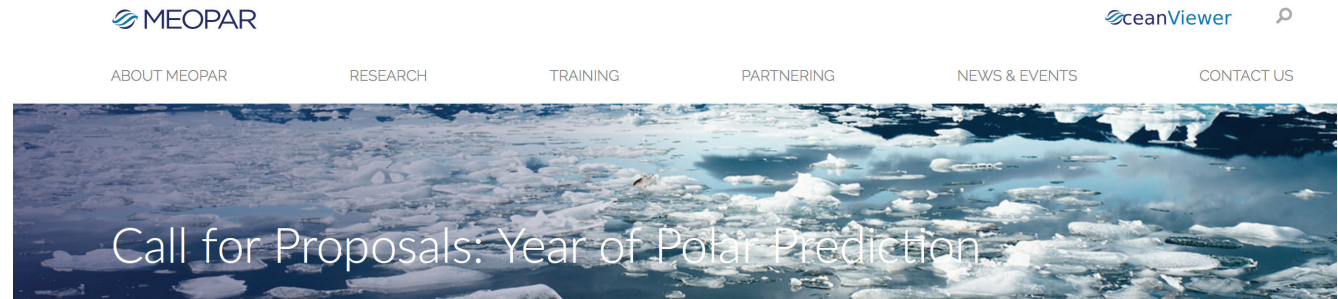
# Preparation Phase: Selected Highlights

## Research funding



### Arctic calls in 2016

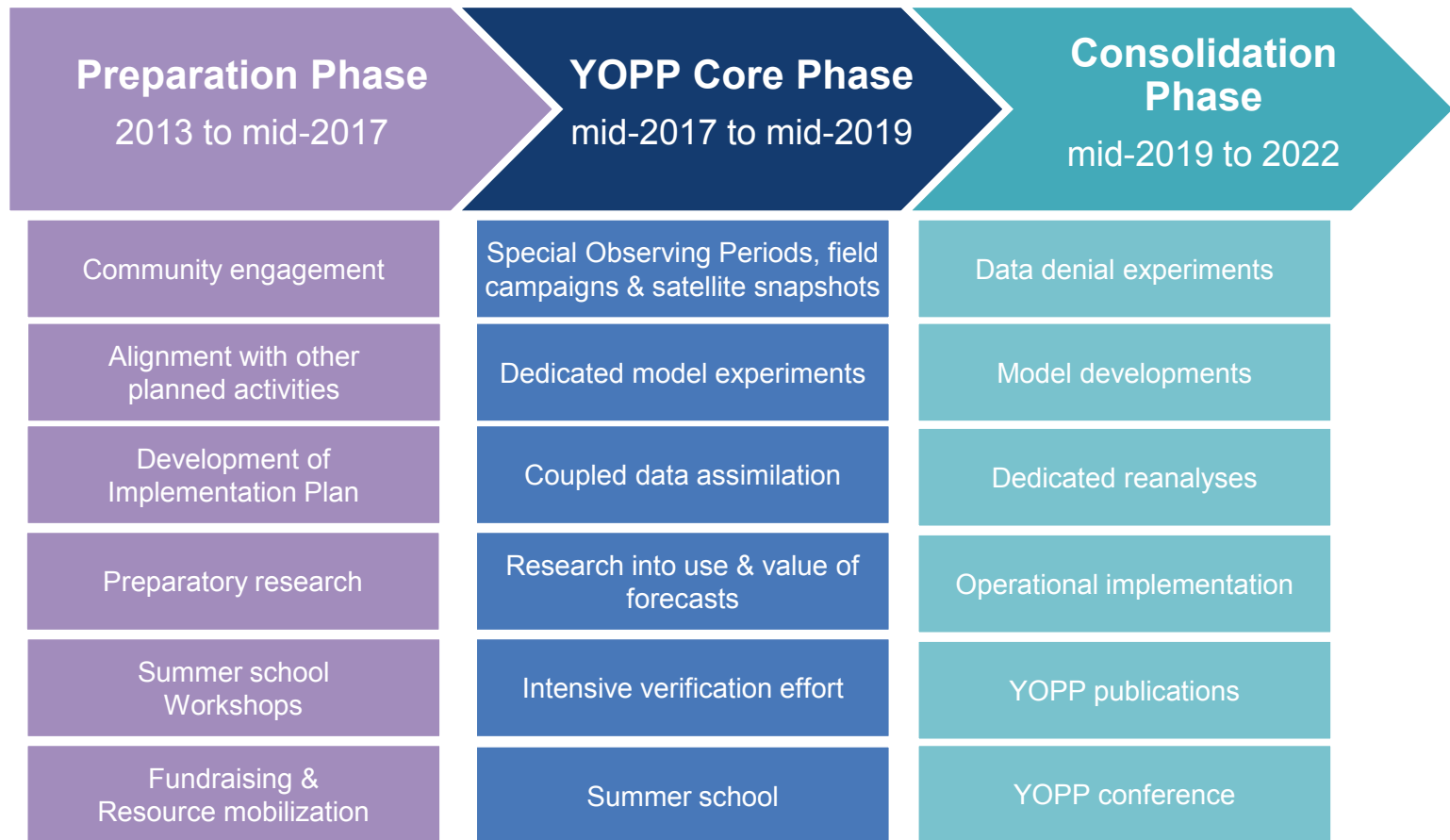
- 40 Mio Euro budget
- 2 calls explicitly mentioning YOPP
- INTAROS, Blue-Action and APPLICATE



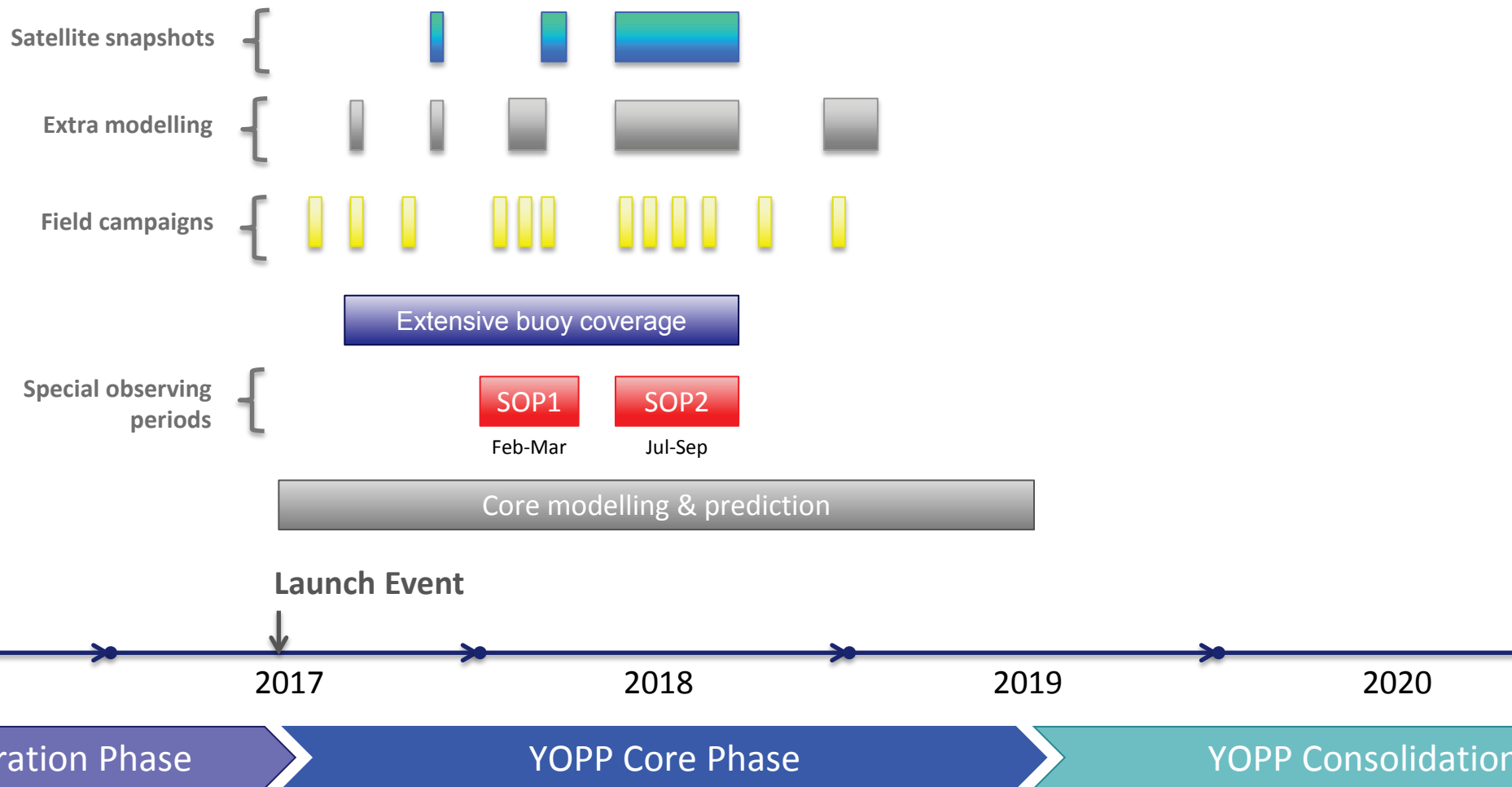
## CALL FOR RESEARCH PROPOSALS: YEAR OF POLAR PREDICTION

NAVIGATION  
[Back to Research](#)

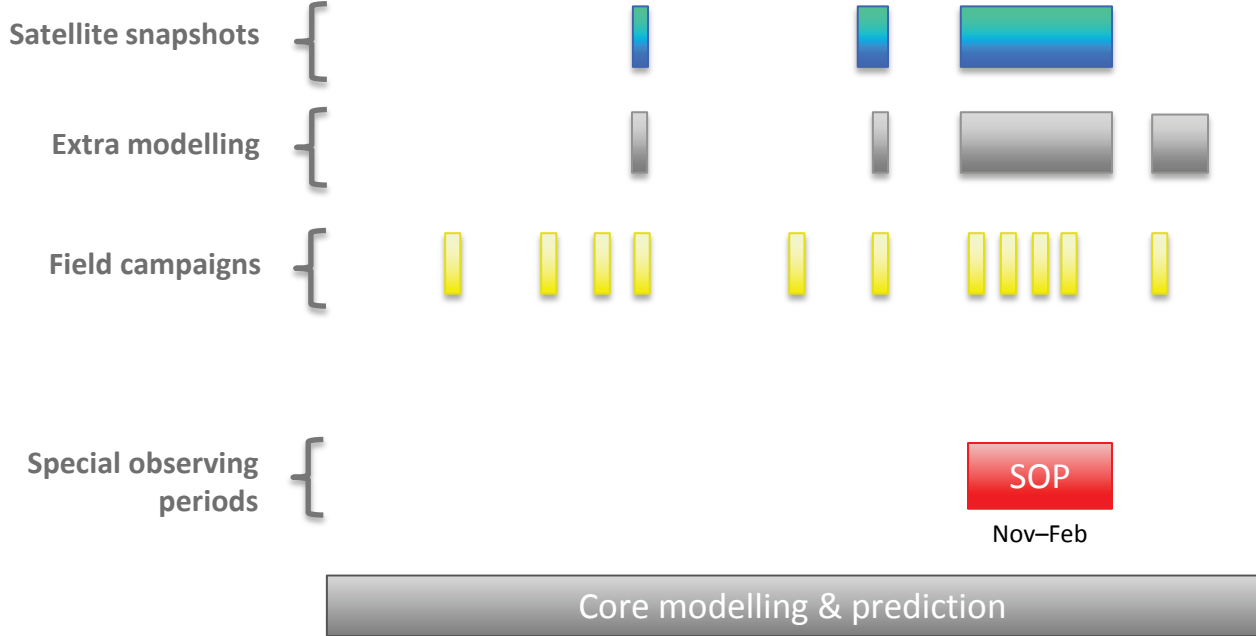
# YOPP Time Line



# YOPP Core Phase in the Arctic



# YOPP Core Phase in Antarctica



Launch Event

2017

2018

2019

2020

Preparation Phase

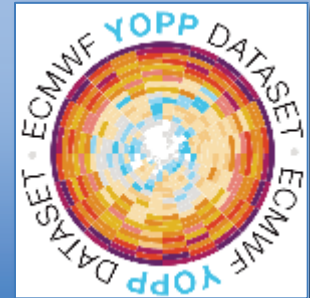
YOPP Core Phase

YOPP Consolidation

# YOPP Modelling & Forecasting Datasets

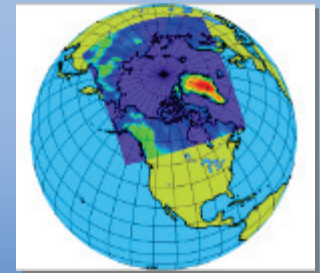
## ECMWF YOPP dataset

- EPS control forecasts (18 km)
- Coupled model from autumn (9 km)
- Process tendencies will be provided
- <http://apps.ecmwf.int/datasets/data/yopp/>



## ECCC YOPP datasets

- CAPS-RIOPS (A:2.5 km, IO: 3-8 km, 2 days)
- GDPS-GIOPS (A: 25km, IO: 1/4°, 10 days)
- GIOPS ensemble (32 days, 20 members)
- Seasonal predictions (1°, 20 members)
- Available through World Mapping Service (WMS)





# YOPP Data Portal



## Data Portal

[YOPP HOME](#) [DATA PORTAL NEWS](#) [FIND DATA](#) [DOCUMENTS](#) [TASK TEAM](#) [CONTACT US](#)

[Home](#) / [Find Data](#) / [Metadata search](#)

### Metadata search

#### ▼ Topics and variables

Science keyword

#### ▼ Data collection period

**Start date:**

**End date:**

▶ Bounding box

▶ Institutions

▶ Investigator

▼ Full text search

#### ▼ Geographical search



# YOPP SERA Scoping Document

## NAVIGATING WEATHER, WATER, ICE AND CLIMATE INFORMATION FOR SAFE POLAR MOBILITIES

Report prepared by the Polar Prediction Project's  
Societal and Economic Research and Applications Working Group (PPP-SERA)  
of the World Meteorological Organization (WMO)



May 2017



# YOPP SERA Scoping Document

Purpose of the report:

- Scoping how WWIC information is currently being used and produced for the Polar Regions, by whom, and for what reasons, and
- Identifying, framing and articulating important areas of research related to the use and provision of environmental prediction services that will be addressed in the context of YOPP

# YOPP Verification

WWRP 2017 - 1

## Verification of Environmental Prediction in Polar Regions: Recommendations for the Year of Polar Prediction

WEATHER CLIMATE WATER

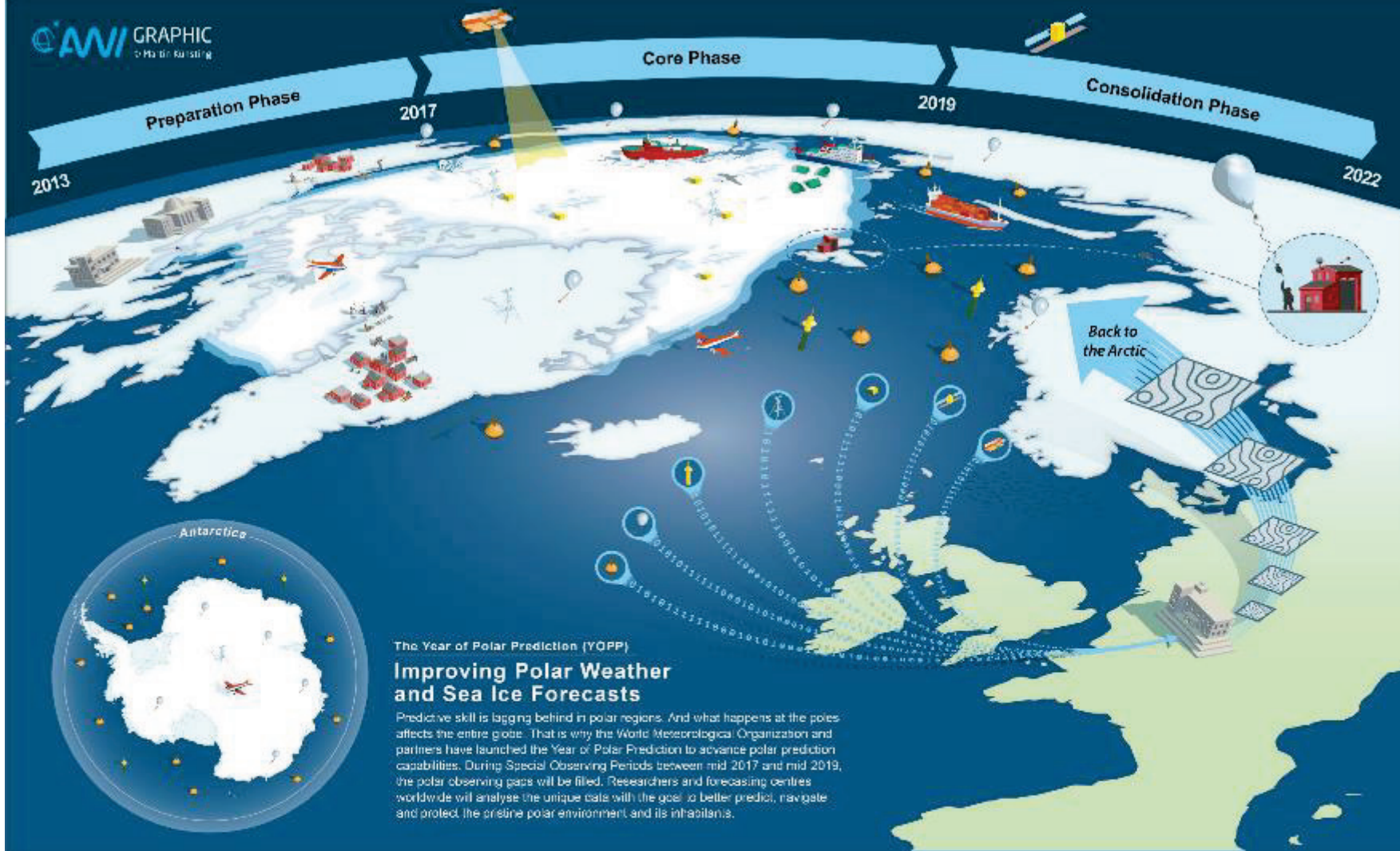


# Getting Engaged with YOPP

- Contribute to YOPP activities
- Seek YOPP endorsement (institutional endorsement process soon to be launched)
- Contribute to the PPP Trust Fund
  
- Upcoming Events
  - YOPP-SH: June 28-29, 2017 @ NCAR Foothills Lab  
(<https://www.mmm.ucar.edu/workshop-antarctic-meteorology-climateyopp-sh-meetingsorp-meeting>)
  - Second Polar Prediction School: April 17-27, 2018 @ Abisko Scientific Research Station in Sweden
  
- Further Information: [polarprediction.net](http://polarprediction.net)



# Discussion



### Observing Platforms



### Environmental Forecasting



### Forecast Users



### Weather and Sea Ice Modeling

To predict weather and sea ice, scientists use weather and climate models computer programs that divide the Earth's atmosphere, ice, land and oceans into a network of grid boxes. After being fed with actual meteorological and oceanographic observations, the models calculate how the physical state changes step by step into the future.

