

Modelling for the Year of Polar Prediction (YOPP)

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On behalf of the Polar Prediction Project Steering Group



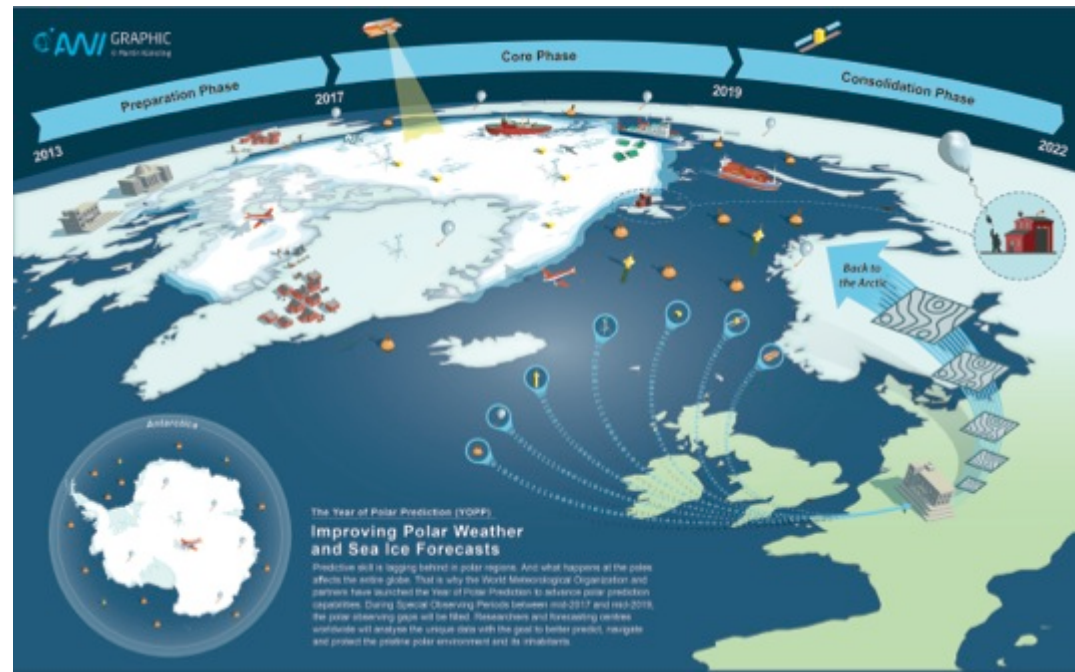
WMO OMM

World Meteorological Organization

Organisation météorologique mondiale

WEATHER CLIMATE WATER
TEMPS CLIMAT EAU

Year of Polar Prediction (YOPP)



Mission statement:

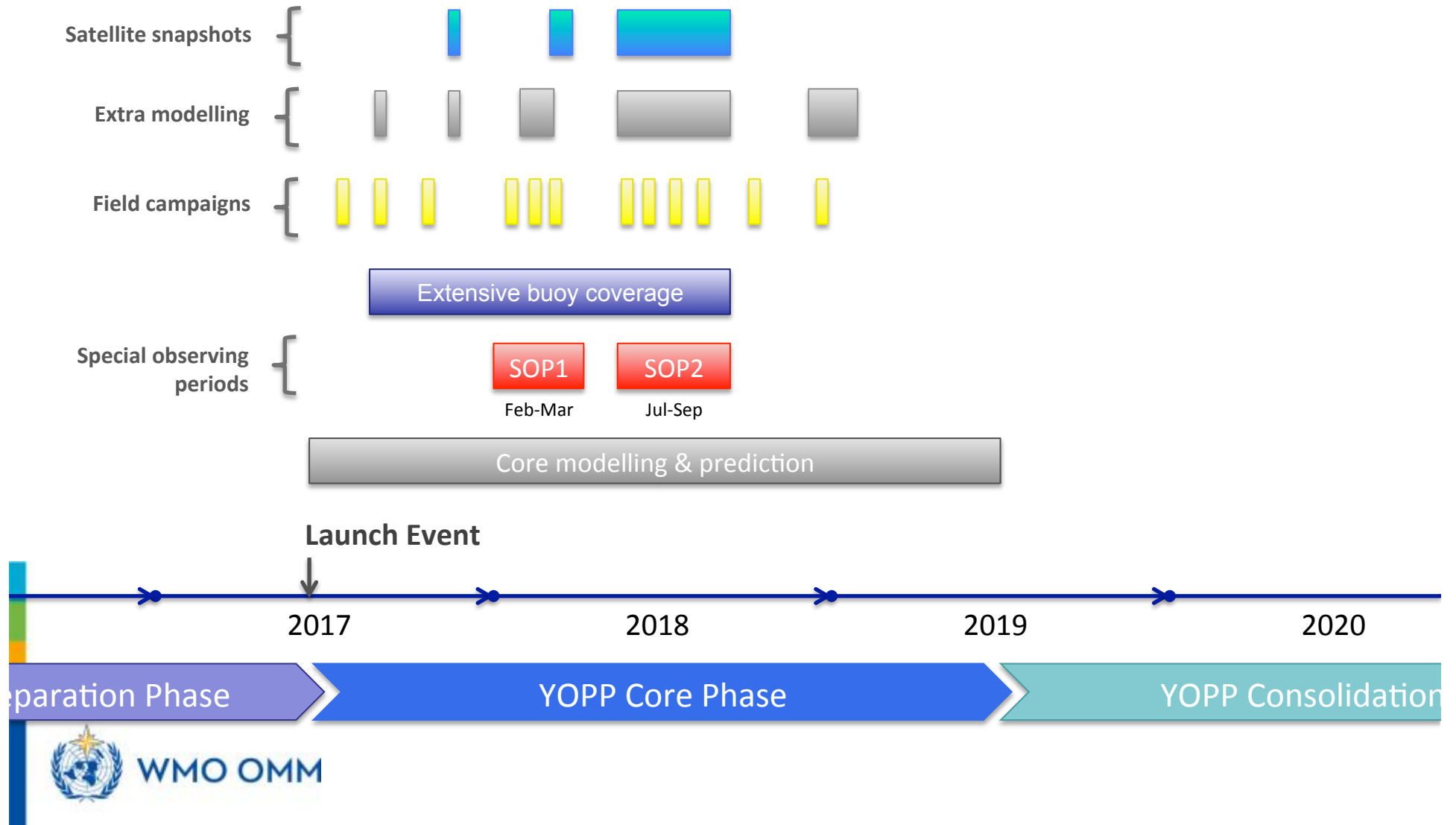
Enable a significant improvement in environmental prediction capabilities for the polar regions and beyond, by coordinating a period of intensive observing, modelling, prediction, verification, user-engagement and education activities.



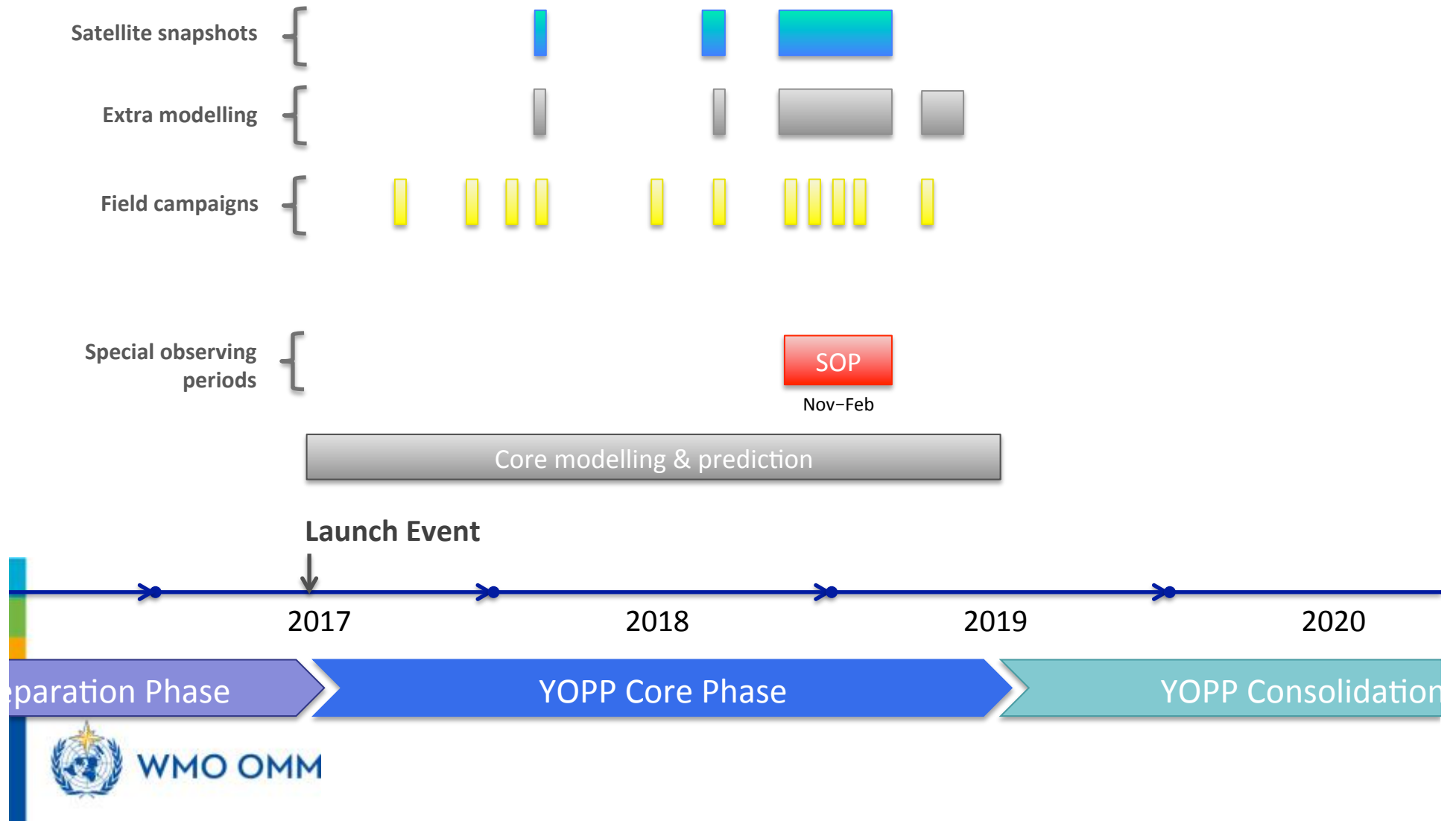
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www.polarprediction.net
[@polarprediction](https://twitter.com/polarprediction)

YOPP Core Phase in the Arctic



YOPP Core Phase in Antarctica



YOPP Modelling

A variety of modelling work will be carried out for the Year of Polar Prediction (YOPP). The modelling includes two broad categories:

- Production of Reference Datasets to support a range of YOPP scientific investigations.
- Modelling experiments to study particular scientific issues, in order to improve forecasting in polar regions in the future.

YOPP modelling datasets

Reference datasets

Experimental datasets

YOPP Core

Datasets of opportunity

e.g., TIGGE,
S2S, ORA

Dedicated

e.g., ECWMF
YOPP dataset

Operational

e.g., AMPS,
ECCC

Modelling and process
studies

Predictability studies

Teleconnections and
linkages

Observing System
design

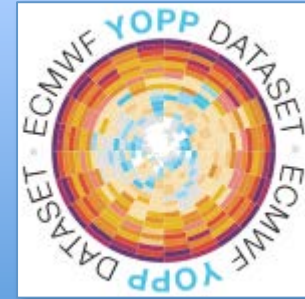
Reference Datasets

- YOPP core datasets
 - Analysis and forecast datasets produced specifically to support YOPP, e.g., ECMWF YOPP Dataset
 - Operational analyses forecasts made available to YOPP by operational forecast centres, e.g., ECCO, AMPS.
- Datasets of opportunity
 - Model datasets produced outside YOPP that will provide valuable data for YOPP investigations, e.g., TIGGE, S2S, reanalyses

(Selected) YOPP Core Datasets

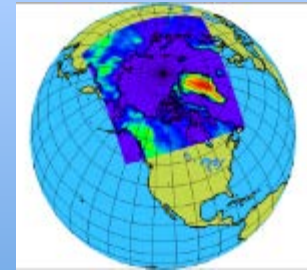
ECMWF YOPP dataset

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



ECMWF YOPP datasets

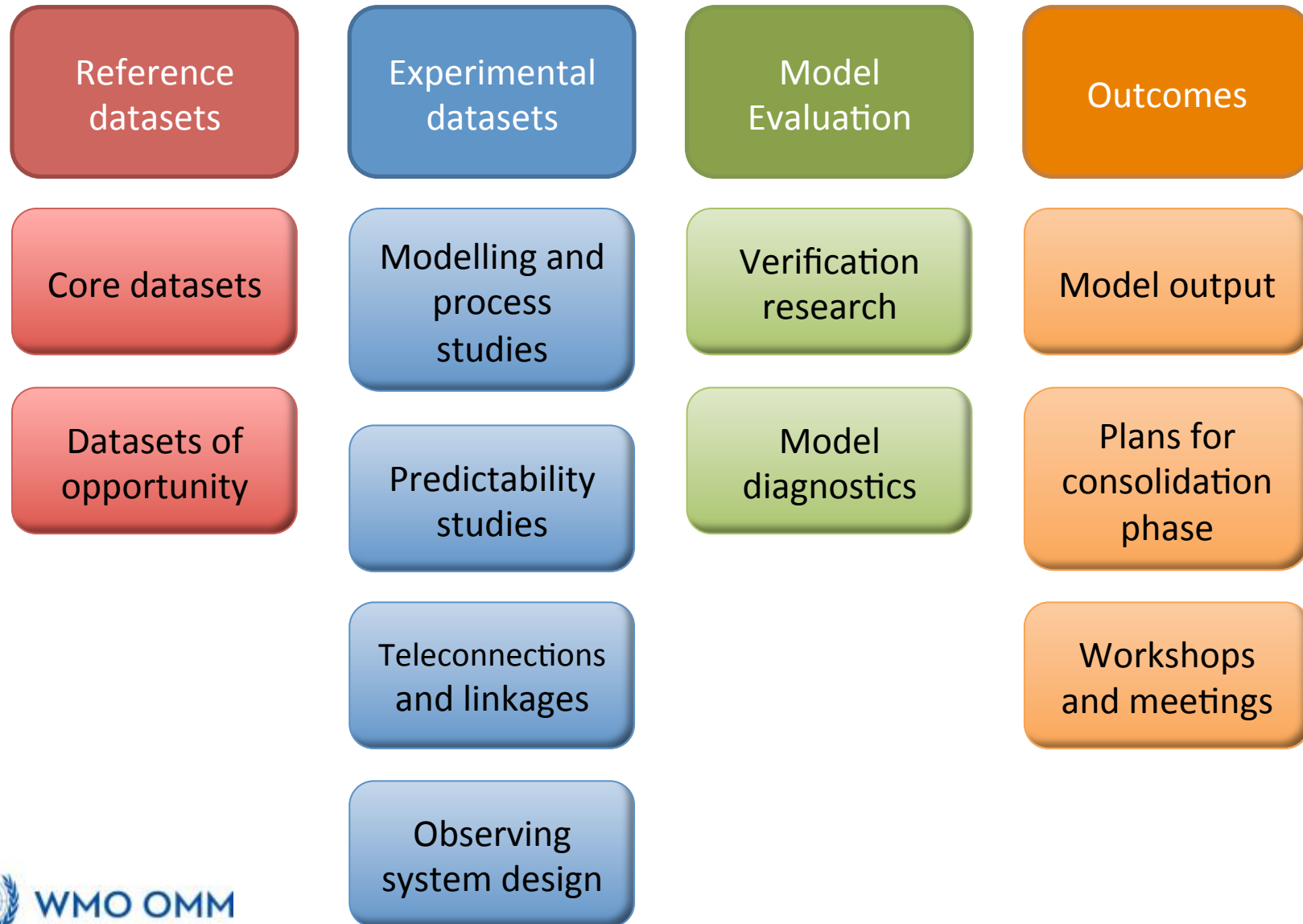
- CAPS-RIOPS (A:2.5 km, IO: 3-8 km, 2 days)
- GDPS-GIOPS (A: 25km, IO: 1/4°, 10 days)
- GIOPS ensemble (32 days, 20 members)
- Seasonal predictions (1°, 20 members)
- Available through World Mapping Service (WMS)



Experimental Modelling

- Modelling and Process Studies
 - Experiments aimed at improving numerical models and their representation of physical processes. The main focus is on the lower atmosphere, sea ice and ocean modelling, and coupling processes.
- Predictability studies
 - Studies of the predictability of weather systems in polar regions.
- Teleconnections and linkages
 - Studies of the influences of polar regions on lower latitudes, and vice versa.
- Observing System Design
 - The aim is to make recommendations to WMO and national meteorological services on the future configuration of the observing system in polar regions.

YOPP Modelling Plan - Components



High-resolution model output @ YOPP Supersites

- Provide high-resolution model data at selected supersites
- Thorough model evaluation and verification
- List of sites available in YOPP Modelling Plan
 - Criteria: Location, extra observations etc.
- Period
 - Ideally mid-2017 to mid-2019 or
 - Special Observing Periods in both hemispheres
- Points of contact: Barbara Casati and Gunilla Svensson

Model Evaluation

Modelling teams are requested to output a core set of fields from their experiments in order to facilitate comparisons between models and consistent objective verification of forecasts against observation data, using WMO CBS standards.

To support process studies, output should include more detailed high-frequency output at key observation sites, including designated super-sites and the MOSAiC drifting laboratory.

- Verification Research
 - In polar regions, observations are sparse and inhomogeneous. YOPP provides an opportunity for research into new verification approaches. It is important to develop verification measures that account for the needs of users.
- Model diagnostics
 - Investment in development of diagnostics, including studies of physical tendencies, will make an invaluable contribution to future model development.

Conclusions

- WGSIP member centers are welcome to provide the output of the models
- Possibility of data denial experiments, especially during special observation periods.



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Thank you for attention!



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