Year of Polar Prediction – Few months left until the YOPP Southern Hemisphere (YOPP-SH) Special Observing Period Commences (Part I)

Kirstin Werner[1], David Bromwich[2], Thomas Jung[1], Helge Goessling[1], Katharina Kirchhoff[1]

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WEATHER CLIMATE WATER
TEMPS CLIMAT EAU

WMO OMM

World Meteorological Organization
Organisation météorologique mondiale

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.

See **polarprediction.net** for more introductory materials

WMO OMM

Polarprediction.net

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Preparation Phase
2013
2017
Core Phase
2019
Consolidation Phase
2022

Back to the Arctic

Antarctica

The Year of Polar Prediction (YOPP)

Improving Polar Weather and Sea Ice Forecasts

Predictive skill is lagging behind in polar regions. And what happens at the poles affects the entire globe. That is why the World Meteorological Organization and partners have launched the Year of Polar Prediction to advance polar prediction capabilities. During Special Observing Periods between mid-2017 and mid-2019, the polar observing gaps will be filled. Researchers and forecasting centres worldwide will analyse the unique data with the goal to better predict, navigate and protect the pristine polar environment and its inhabitants.

Observing Platforms

Open Water Buoy | Radio Sonde | Argo Float | Automatic Weather Station | Sea Ice Buoy | Satellites

Environmental Forecasting

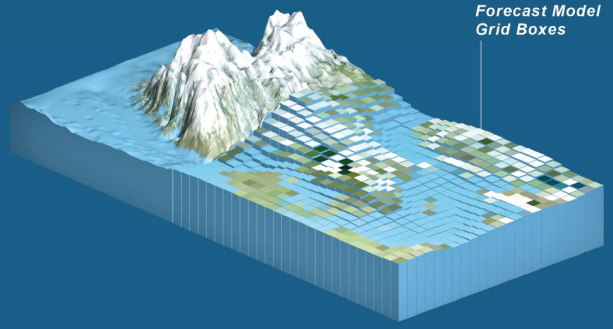
Forecasting Centres | Universities | Forecast

Forecast Users

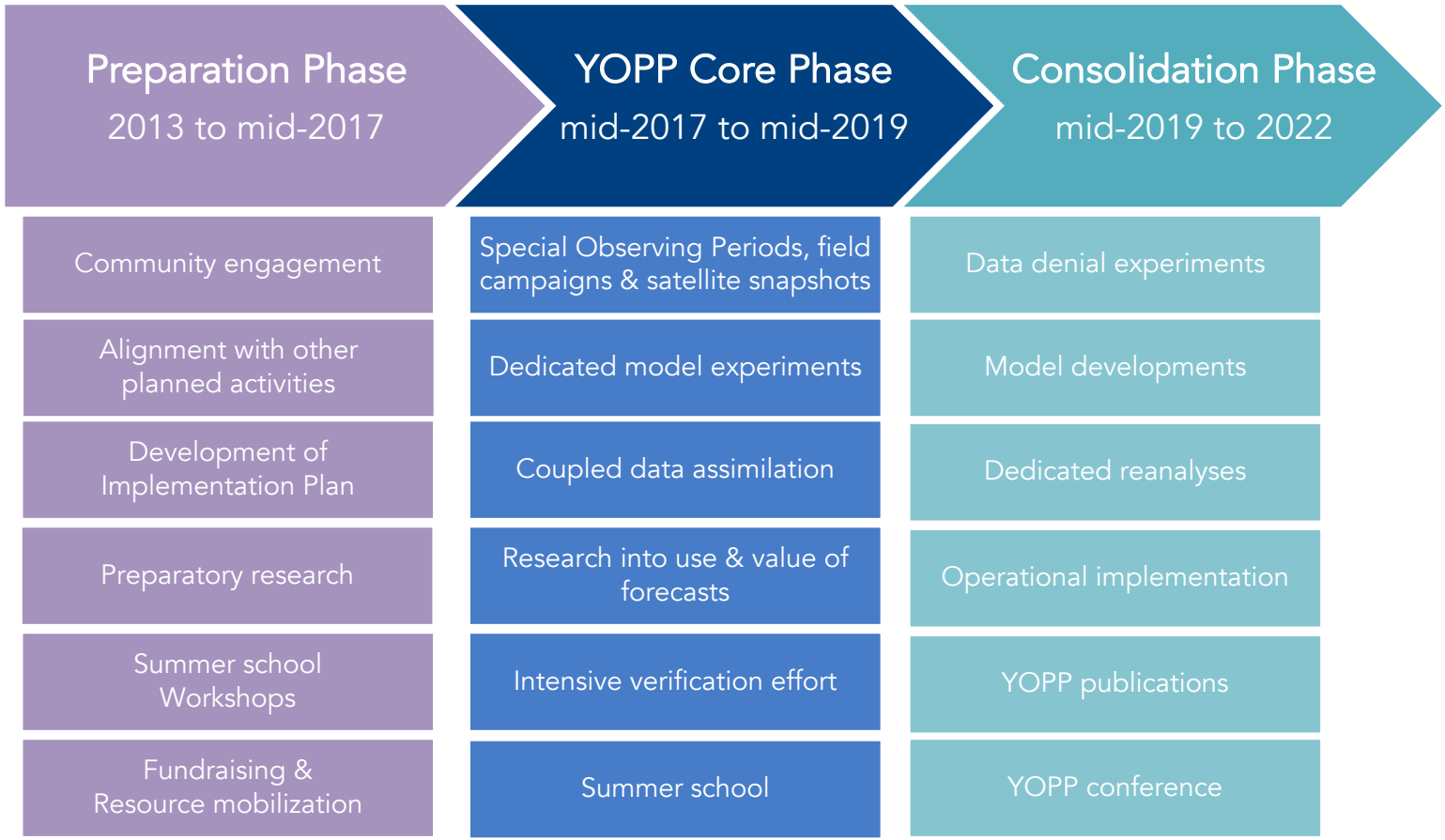
Commercial Ships e.g. Cargoliners and Icebreakers | Planes | Research Icebreakers | Local communities

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.



YOPP Time Line



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

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Preparation Phase: Selected Highlights

Community engagement – YOPP Summit

13-15 July 2015, WMO, Geneva, Switzerland

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Preparation Phase: Selected Highlights

Preparatory research – Publications

RMet S
Royal Meteorological Sc

Editorial
Editorial for the Quarterly Journal's spe

Peter Bauer[a]* and Tho
[a]*ECMWF, Reading,*
[b]*AWI, Bremerhaven, G*

*Correspondence to: P. Bauer, European Centre for Medium-Range Wea
E-mail: peter.bauer@ecn
DOI:10.1002/qj.263

ADVANCING POLAR PREDICTION CAPABILITIES ON DAILY TO SEASONAL TIME SCALES

BY THOMAS JUNG, NEIL D. GORDON, PETER BAUER, DAVID H. BROMWICH, MATTHIEU CHEVALLIER, JONATHAN J. DAY, JACKIE DA HELGE F. GOESSLING, MARIKA HOL MARTIN LOSCH, ALEXANDER MAKSH IAN A. RENFREW, GREGORY SMITH

This paper presents the argum users' needs and outlines possi

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SCIENTIFIC REPORTS

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The climate of the Arctic has been cl rapidly in recent decades than any of this planet. The rapid rise in near-air temperatures, about twice as fast as crease (Hansen et al. 2010), is called the fication (e.g., Holland and Bitz 2003). Its in terms of decrease in sea ice coverage p tunities, but at the same time new risks Using the Northern Sea Route, for exam reduce the distance of their journey be and the North Pacific region by more fact, journeys through the Arctic, which to become increasingly feasible as cli continues (Smith and Stephenson 2013), an opportunity for cutting greenhouse At the same time, the environmental co disasters in the Arctic, such as oil spill be worse than in other regions (Emmer 2012). To effectively manage the oppo risks associated with climate change,

AMERICAN METEOROLOGICAL SOCIETY

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

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

Jun Inoue[1,2,3], Akira Yamazaki[2], Jun Ono[2], Klaus Dethloff[4], Marion Maturilli[4], Roland Neuber[4], Patti Edwards[5] & Hajime Yamaguchi[6]

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.

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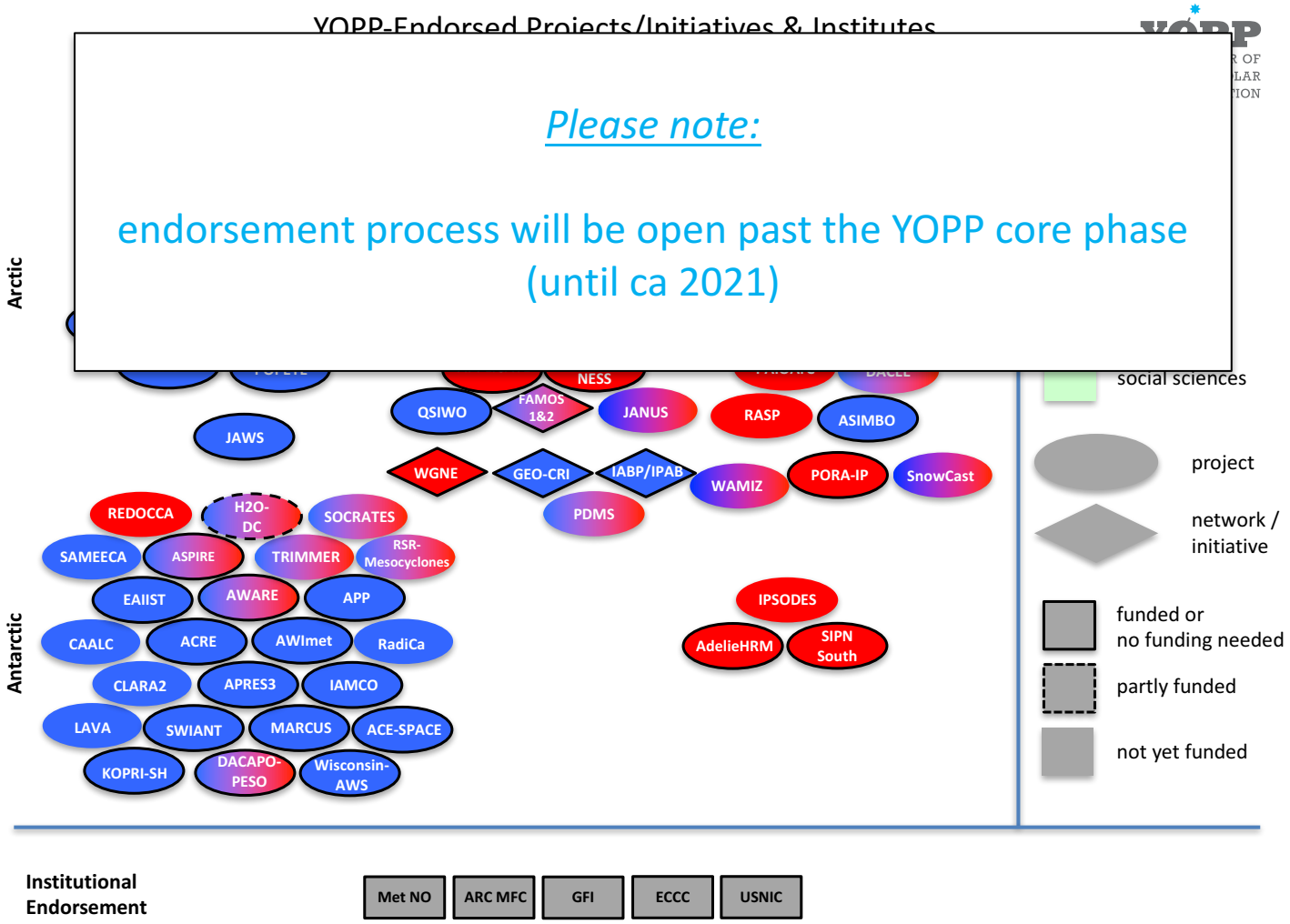
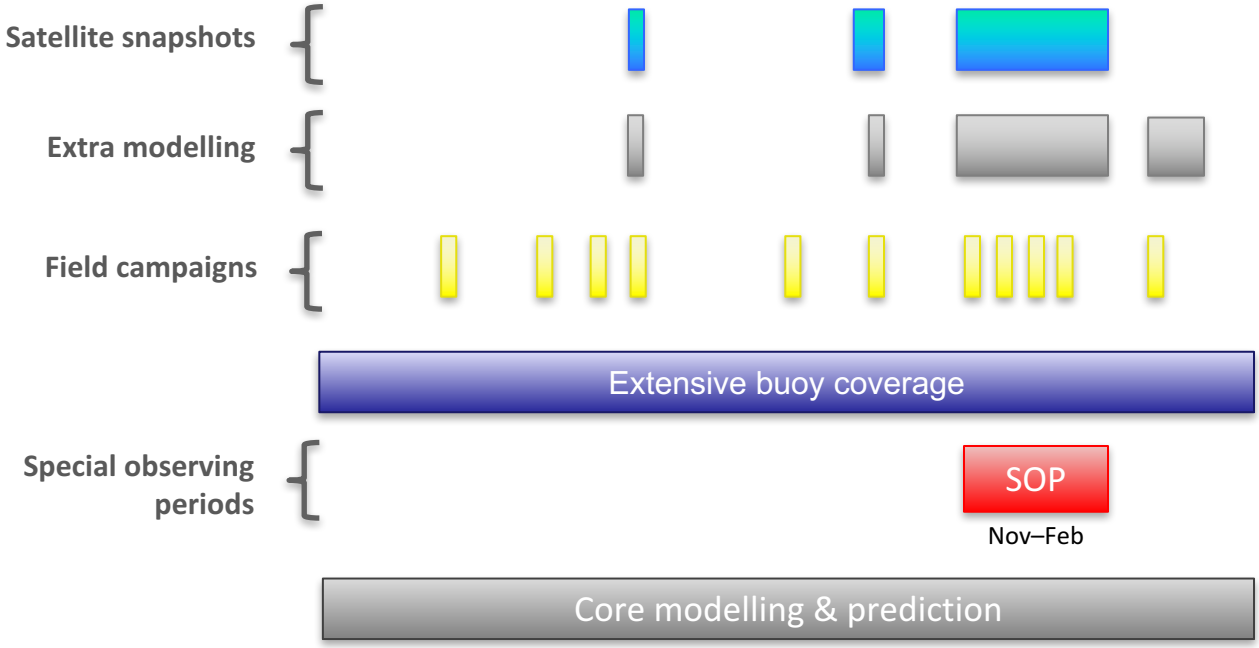
Preparation Phase: Selected Highlights



86 endorsements
80 project endorsements
6 institutional endorsements

YOPP Core Phase in **Antarctica**



2017 2018 2019 2020

eparation Phase | YOPP Core Phase | YOPP Consolidation

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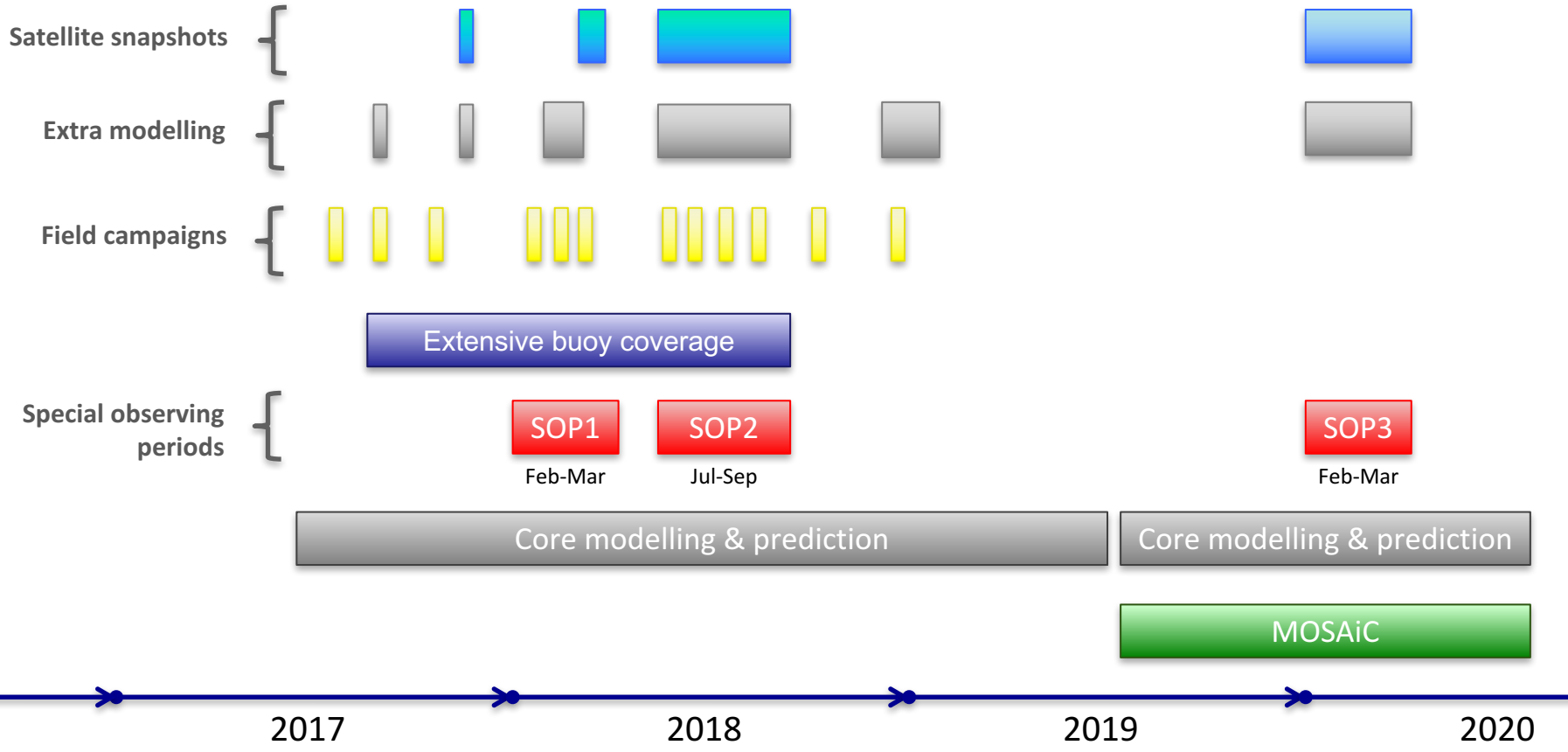
YOPP Core Phase in the **Arctic**



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Arctic Special Observing Periods SOP1 & SOP2)

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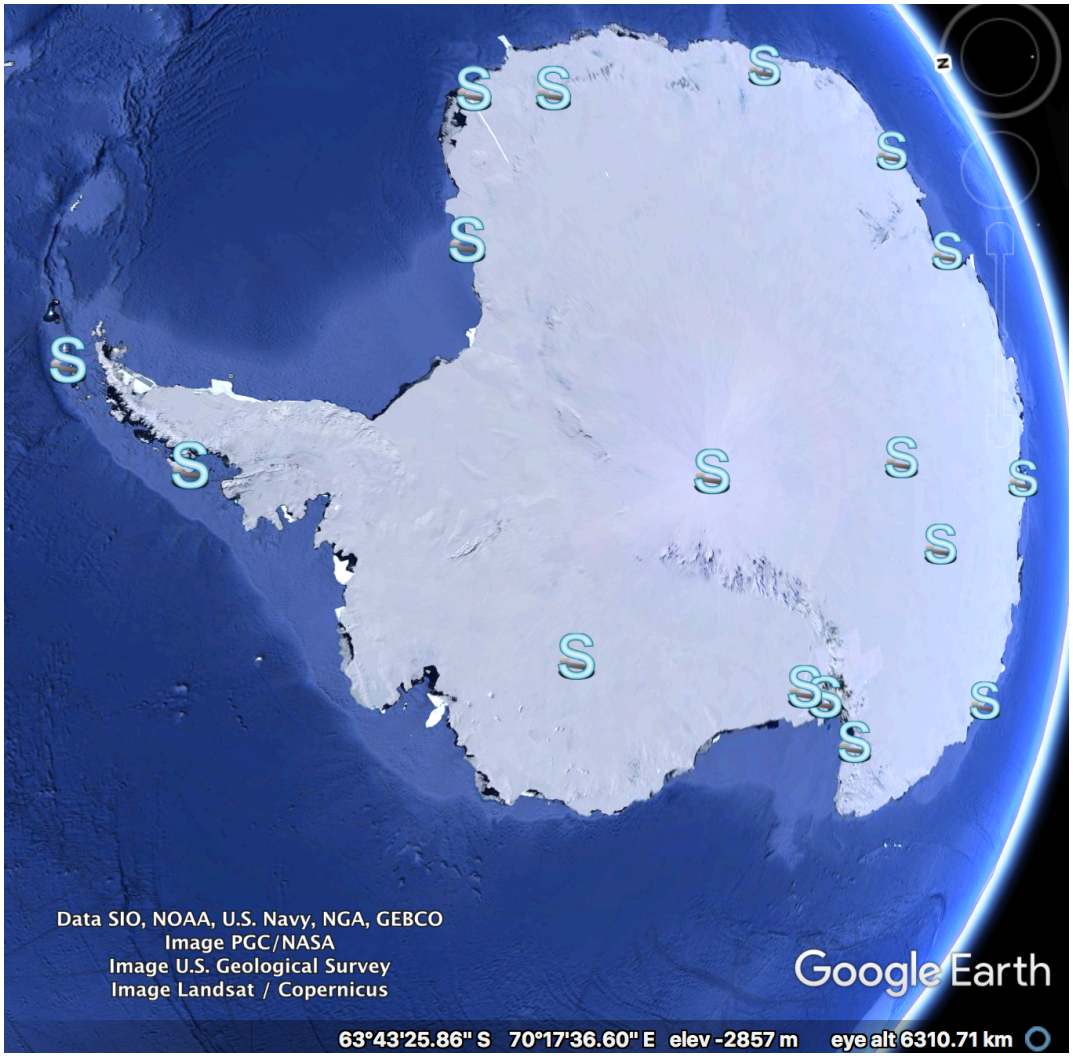
Core Phase: Selected Highlights

YOPP Supersites

Model centres provide **model output** for **comparison** with high-frequency **observations** at **YOPP Supersites** (remote talk by Barbara Casati Thursday)



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Core Phase: Selected Highlights

YOPP model datasets

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Advanced prediction in polar regions and beyond

U.S. NAVAL RESEARCH LABORATORY

ECMWF Operational Ensemble Forecasts

- Period: July 2017 to June 2019
- Analysis fields (fc step 0)
- Coupled forecasts out to day 15
- Tco639 (≈18km) + 91 levels
- Data available on native mesh
- Available through the YOPP Data Portal: yopp.met.no

Sea Ice Forecasts (Arctic and Antarctic) from U.S. NRL

- Period: 1 Feb 2018 to 15 Feb 2019
- Navy Earth System Model (NESM): fully coupled atmosphere-ocean-sea ice model
- Each week, a time-lagged 4 member ensemble starting on Sat-Sun-Mon-Tue is run out 45 days

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Core Phase: Selected Highlights

2nd Polar Prediction School

17-27 April 2018, Abisko, Sweden

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Advanced prediction in polar regions and beyond

APECS Association of Polar Early Career Scientists

WORLD METEOROLOGICAL ORGANIZATION

WCRP World Climate Research Programme

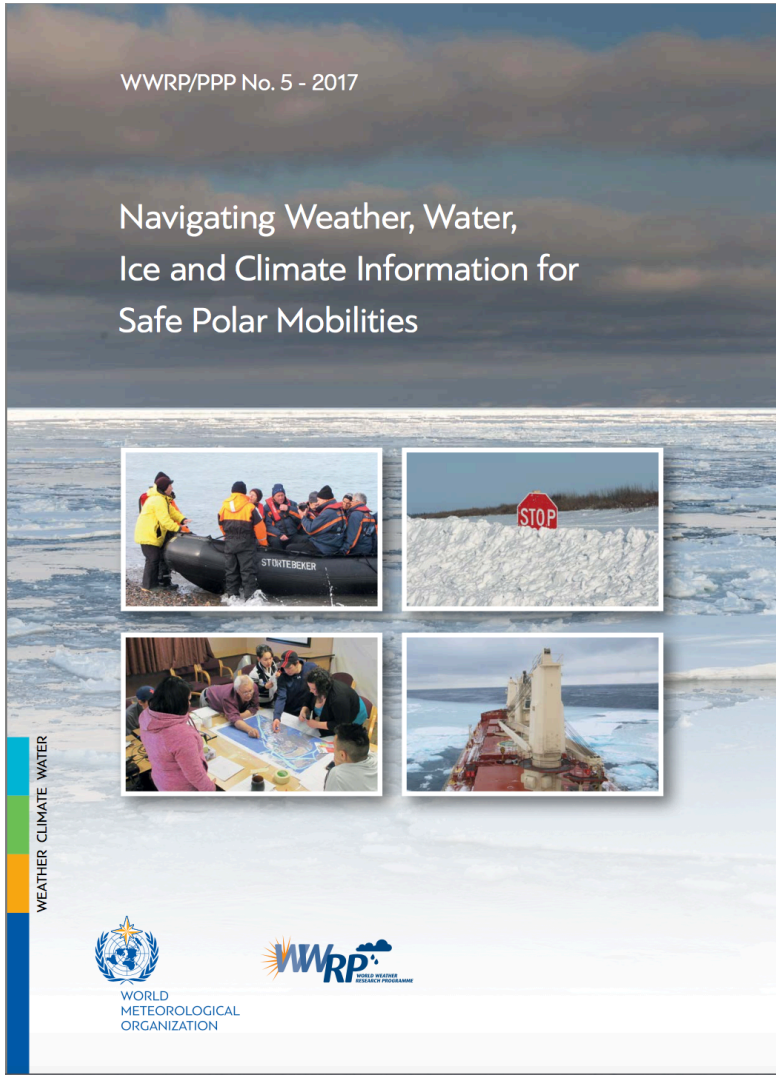
IASC

SCAR

Core Phase: Selected Highlights

YOPP User Engagement: PPP-SERA Scoping Document

- „This report ... aims to explore how weather, water, ice and climate (WWIC) information is currently being used and produced in the Polar Regions, by whom, and for what reasons.“
- „The report also identifies, frames and articulates important areas of research related to the use and provision of environmental prediction services that should be prioritized and further developed during, and beyond, the Year of Polar Prediction (YOPP, 2017–19).“



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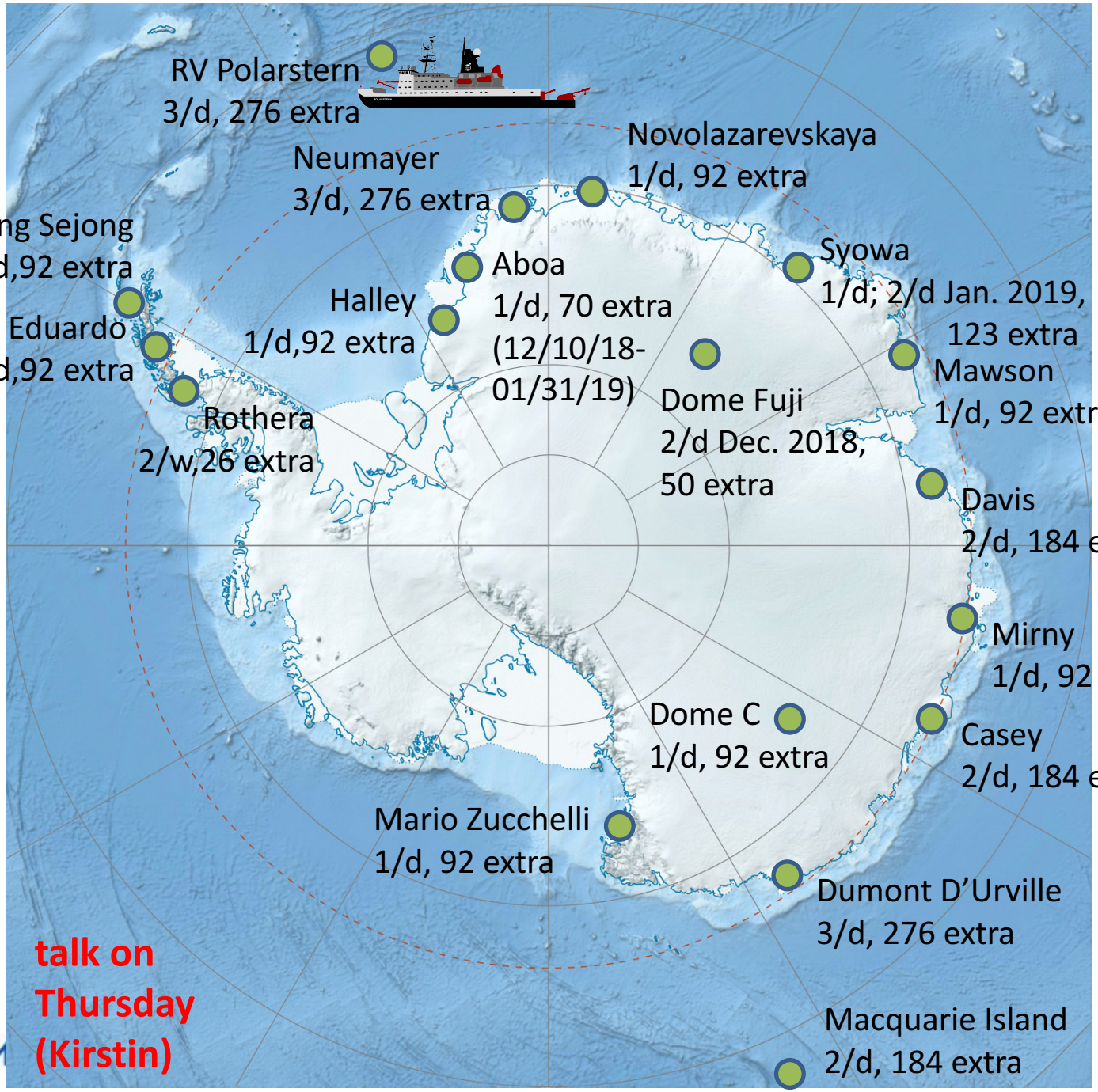
YOPP Southern Hemisphere

- Coordination Committee consists of representatives from Argentina, Australia, Brazil, Chile, Germany, Italy, Japan, New Zealand, Russia, UK, USA, SOOS, SORP, lead: Dave Bromwich
- Antarctic Special Observing Period:

  November 16, 2018 to February 15, 2019

- Website: http://polarmet.osu.edu/YOPP-SH/

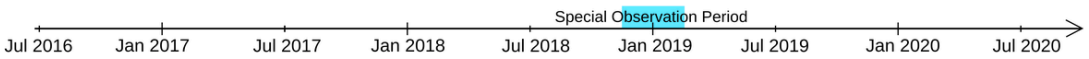
YOPP YEAR OF POLAR PREDICTION WMO OMM



ca 2,380 extra radiosonde launches during YOPP-SH Special Observing Period

talk on Thursday (Kirstin)

YOPP-Endorsed Project Campaigns



Field campaign period

Project period

ACRE	AdelieHRM	AEMET	APP	APRES3	ASPIRE	AWImet
BOM	CAALC	COMNAP	DACAPO-PESO	DMC	EAIIST	ENEA
FMI	GEO-CRI	H2O-DC	IAMCO-YOPP	INMET	IPAB	KOPRI-SH
LAVA	MetOffice UK	MetService-NZ	NOAA	PIRANhA	REDOCCA	RSR-Mesocycl.
SAMEECA	SIPN South	SnowCast	TRIMMER	WGNE		

Display projects with a project period in a certain time span or observations during the Special Observation Period:
SOP-SH: 16. Nov. 2018 - 15. Feb. 2019.

Start date: 01/11/2018 End date: 28/02/2019 Display Display all SOP-SH

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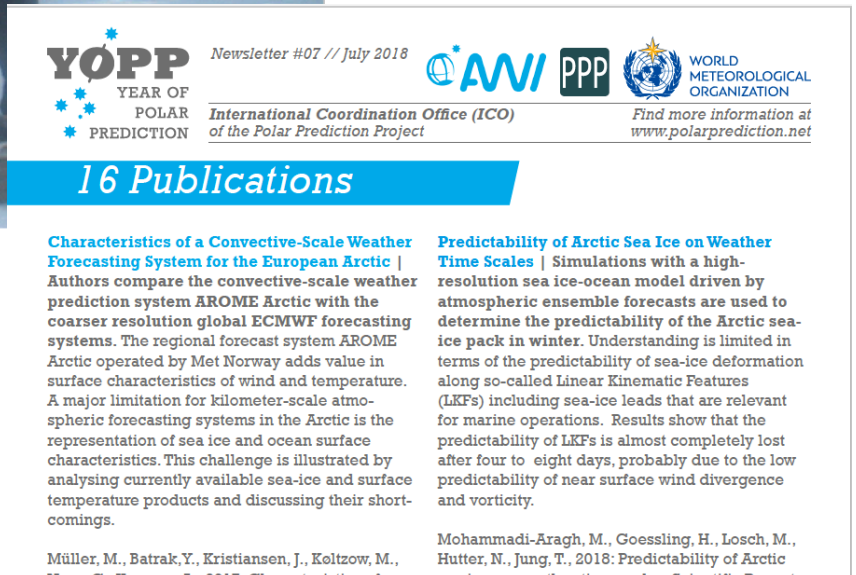
Observational Commitments for YOPP-SH SOP

(more on Thursday during YOPP-SH #03 meeting)

- Drifting buoy deployments in the Southern Ocean (remote talk Ignatius Rigor)
- Ship observations from the Southern Ocean (presentation Isa Rosso)
- Ocean Observatories Buoy at 55S, 90W (west of Drake Passage) will continue through YOPP-SH SOP. Surface weather, fluxes, water column observations.

YOPP Newsletter: PolarPredictNews

- Featured Research Publications (*send your papers!*)
- YOPP-endorsed projects



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Please use:

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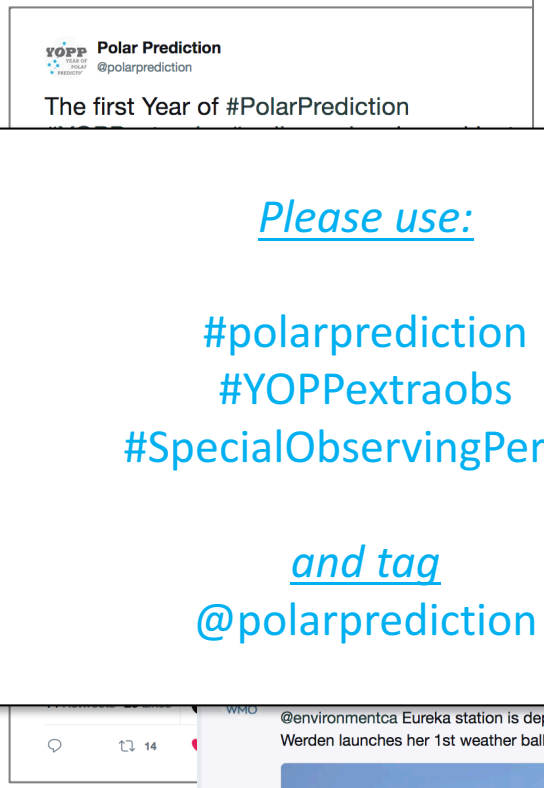
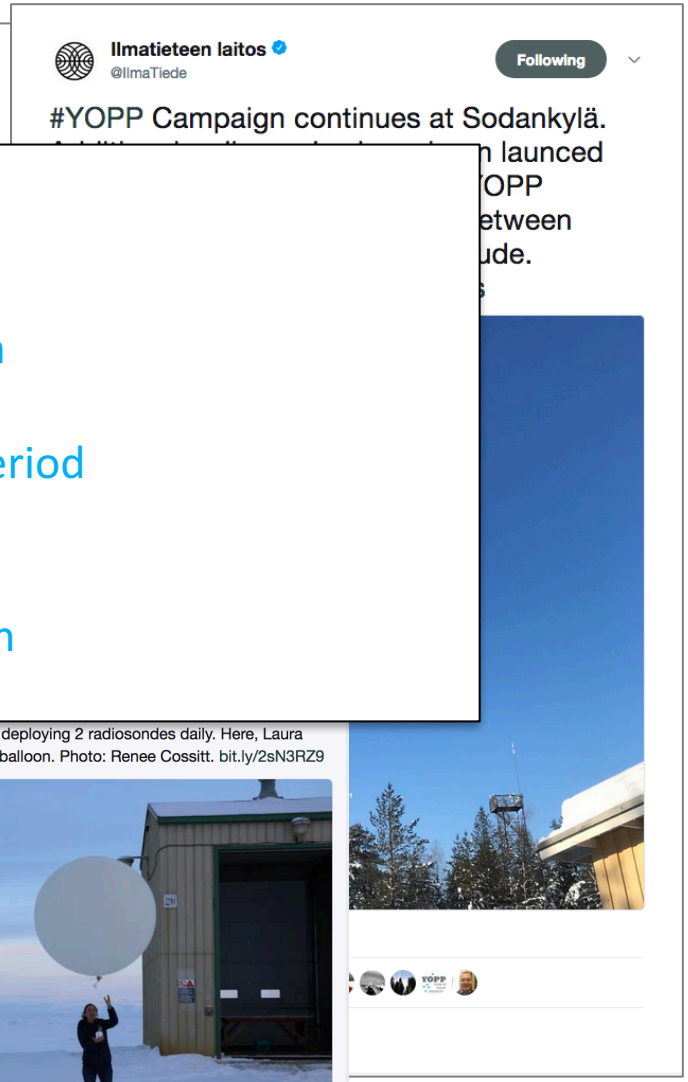
#YOPPextraobs
#SpecialObservingPeriod

and tag
@polarprediction





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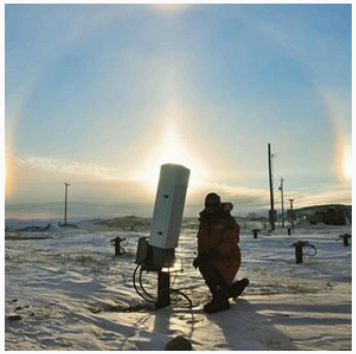



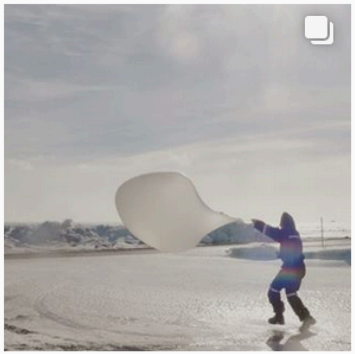


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http://blogs.helmholtz.de/polarpredictionmatters/

Polar Prediction Matters –
A Dialogue Platform to Engage with Forecast Users

Team:

Helge Goessling, Kirstin Werner, Thomas Jung (YOPP International Coordination Office for Polar Prediction)

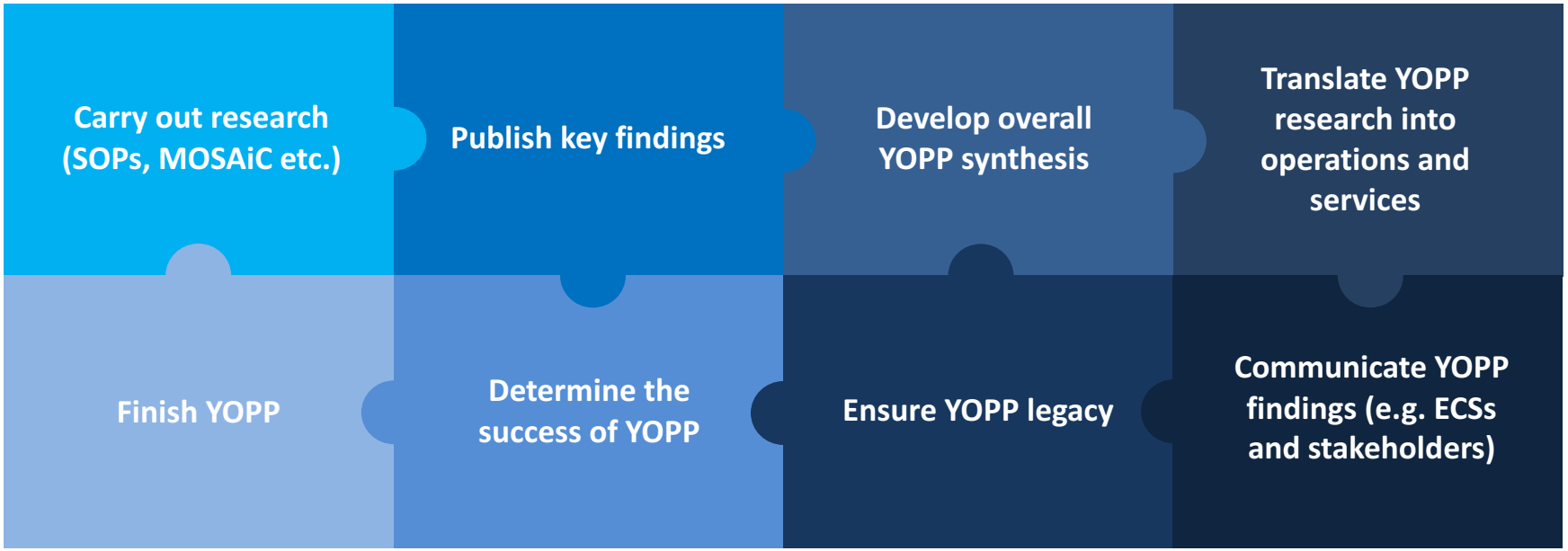
Machiel Lamers, Daniela Liggett, Jackie Dawson

(PPP Societal and Economic Research and Applications)

Dragana Bojovic, Marta Terrado, Luisa Cristini, Gerlis Fugmann, Halldór Jóhannsson (APPLICATE)

Raeanne Miller (Blue Action)

YOPP Consolidation Phase



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Advances in Atmospheric Sciences

Special issue:
Antarctic Meteorology and Climate: Past, Present and Future

Call for papers

Lead Editor:

Jiping Liu, *Department of Atmospheric and Environmental Sciences, University at Albany, State University of New York, Albany, NY, USA.*

Guest Editors:

David Bromwich, *Polar Meteorology Group, Byrd Polar and Climate Research Center, The Ohio State University, Columbus, OH, USA.*

Dake Chen, *State Key Laboratory of Satellite Ocean Environment Dynamics, Second Institute of Oceanography, Hangzhou, China.*

Raul R. Cordero, *Departamento de Física, University of Santiago, Santiago, Chile.*

Thomas Jung, *Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Bremerhaven, Germany.*

Marilyn Raphael, *Department of Geography, University of California - Los Angeles, Los Angeles, CA, USA.*

John Turner, *British Antarctic Survey, Natural Environment Research Council, Cambridge, UK.*

Associate Guest Editor:

Qinghua Yang, *School of Atmospheric Sciences, Sun Yat-sen University, Zhuhai, China.*

Scope:

The Antarctic, including the continent of Antarctica and the Southern Ocean, is a critically important part of the Earth system. Scientific research in the Antarctic has always been, and remains, a challenging endeavor. The ongoing effort of the Year of

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