



Pic.: Gerhard Diekmann, AWI

NEWSLETTER #02 - 19 DECEMBER 2016

Dear Colleagues,

Welcome to our second issue of the ***PolarPredictNews***!

I am pleased to let you know that substantial progress has been made during the last few weeks regarding the planning of YOPP – the details of which will be outlined in this issue of the ***PolarPredictNews***. Importantly, task teams have been established that will be critical for ensuring progress in the coordination and planning of a number of high-priority YOPP activities. Furthermore, a final decision on the exact timing of the Special Observing Periods (SOPs) has been made, both for the Arctic and Antarctic. This will allow the observational community to take the planning for the YOPP Core Phase to the next level. Finally, this autumn detailed planning of the development of the YOPP Data Component – including the planning of the YOPP Data Portal – has started. Given that the YOPP Core Phase will be launched in mid-2017, it will be important to keep up the momentum.

I would also like to take the opportunity and draw your attention to the meetings advertised in this issue of the ***PolarPredictNews*** for the coming year. They will provide an excellent opportunity to engage in YOPP and contribute to shaping the YOPP Core Phase.

Merry Christmas and a Happy 2017!

Thomas Jung

The Year of Polar Prediction (YOPP) is a major international activity that has been initiated by World Meteorological Organization's World Weather Research Programme (WWRP) as a key component of the Polar Prediction Project (PPP). It will take place from mid-2017 to mid-2019. The overarching goal of YOPP is to significantly advance our environmental prediction capabilities for the polar regions and beyond. As an internationally coordinated period of intensive observing, modelling, prediction, verification, user-engagement, and education activities which involves various stakeholders, the YOPP contributes to the knowledge base needed to manage the opportunities and risks that come with polar climate change.

## ***PolarPredictNews***

www.polarprediction.net

### **Content**

- 01 YOPP Task Teams
- 02 YOPP Special Observing Periods
- 03 A Data Portal for the Year of Polar Prediction
- 04 NAWDEX – An airborne field campaign to improve jet stream forecasts over Europe
- 05 Polar Prediction Workshop 2017
- 06 YOPP Special Session at ICASS IX
- 07 YOPP Planning in 2017
- 08 Getting involved with YOPP
- 09 YOPP endorsed! (**AC**)<sup>3</sup> – Arctic Amplification
- 10 Upcoming Events

**01 YOPP Task Teams** | Polar prediction involves many different aspects such as observations from airborne platforms, numerical modelling and verification, as well as societal topics involving various groups of stakeholders. In order to advance the planning for specific activities during the Year of Polar Prediction it has been decided to establish **YOPP Task Teams**. An overview of the current task teams is available [here](#).

To give an example, the newly formed **Task Team on buoys** is developing plans for a strong YOPP Buoy Component for both the Arctic and the Antarctic. During its inaugural online meeting on November 22<sup>nd</sup> the task team, led by Don Perovich, discussed the pros and cons of having the Arctic winter Special Observing Period (SOP) in winter 2018 rather than 2019 (there is a clear preference for 2018, see next section). Moreover, it was agreed that there should be two components: A network of simple buoys, as dense and evenly distributed as possible, will be complemented by more comprehensive buoys and arrays of buoys, including Argo floats, at individual locations. More about the state of YOPP buoy planning will be soon posted [here](#).

**02 YOPP Special Observing Periods** | The core period of YOPP, which will take place from mid-2017 to mid-2019, will entail periods of enhanced observational and modelling campaigns in both the Arctic and the Antarctic. As a direct outcome of the YOPP planning meetings on “YOPP in the South-

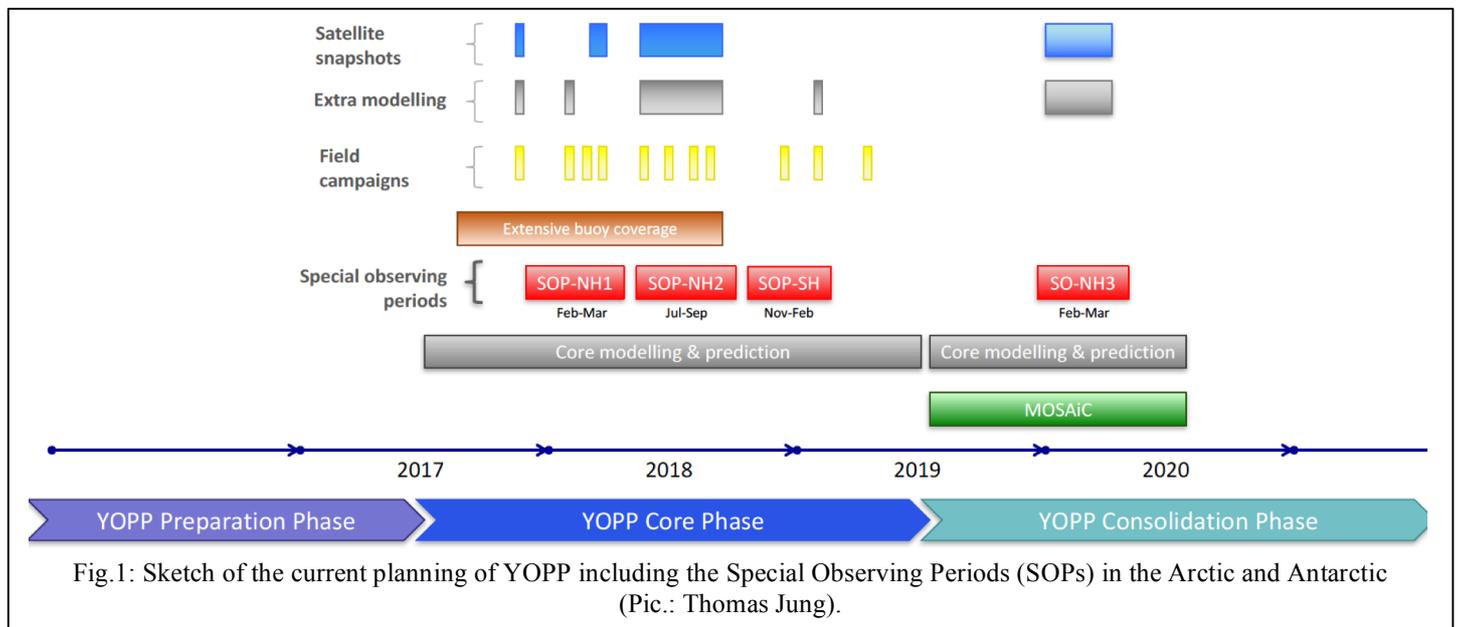
ern Hemisphere” (June 2016, Columbus, Ohio, USA), and on “Arctic Observations and the YOPP Modelling Component” (both in September 2016, Reading, UK), **Special Observing Periods (SOPs)** will be carried out during YOPP. The purpose of the SOPs is to **enhance the routine observations** in an attempt to **close the gaps** in the conventional **Arctic and Antarctic observing systems** for an extended period of time (several weeks). This will allow carrying out subsequent forecasting system experiments aimed at optimizing observing systems in the polar regions and providing insight into the impact of better polar observations on forecast skills in lower latitudes.

It has been decided to have the following three Special Observing Periods (Fig. 1):

- **February 1<sup>st</sup> to March 31<sup>st</sup>, 2018 in the Arctic,**
- **July 1<sup>st</sup> to September 30<sup>th</sup>, 2018 in the Arctic, and**
- **November 16<sup>th</sup>, 2018 to February 15<sup>th</sup>, 2019 in the Antarctic.**

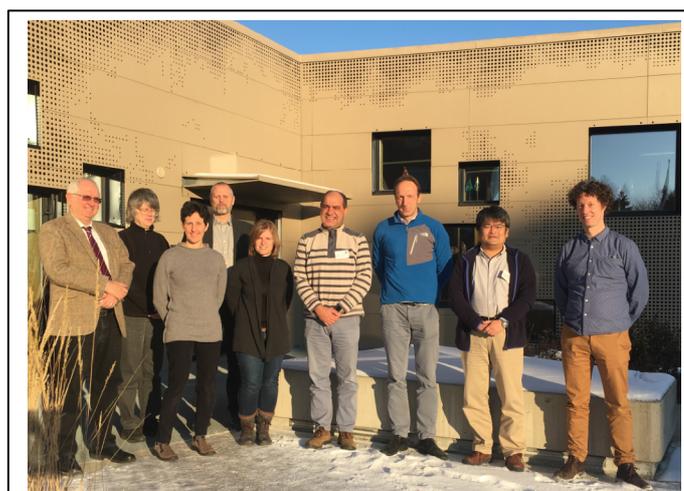
A fourth Special Observing Period in the Arctic is also under consideration for winter/spring 2020 to complement the *Multidisciplinary drifting Observatory for the Study of Arctic Climate (MOSAIC)* – the first year-round expedition in the central Arctic that will provide a quantum leap in our understanding of critical Arctic processes and their representation in weather and climate models.

What can be done during the SOPs? Firstly, it is critical that as many observations as possible will be shared through the **WMO Global Telecommunication System (GTS)** to make them accessible to operational prediction centres. Secondly, it will be important to **enhance the current observation network** by: a) **more frequent observations** from existing platforms and/or b) **adding observations** in regions where the observation network is not sufficiently dense.



**03 A Data Portal for the Year of Polar Prediction** | A data portal will be developed for the Year of Polar Prediction. In order to identify the elements needed to make the **YOPP Data Portal** a valuable and long-term source for users of YOPP data sets, experts from various backgrounds (data experts, users etc.) convened in Oslo, Norway, from No-

vember 10<sup>th</sup> to 11<sup>th</sup>, 2016. The YOPP Data Portal relies on discovery metadata provided by contributing data centres. These metadata records contain information on the content of YOPP data sets, responsible PIs, institutions, use and access constraints etc. as well as the available mechanisms for accessing the data.



Participants of the planning meeting of the YOPP Data Component at the Norwegian Meteorological Institute, Oslo, Norway, 10-11 November 2016 (Pic.: Met Norway).

The data portal will be developed taking into account the various requirements of different users working with the YOPP data collection. The development will be overseen by a task team (YOPP Data Component) that has been established during the Oslo meeting.

**04 NAWDEX – An airborne field campaign to improve jet stream forecasts over Europe** | From September 16<sup>th</sup> to October 18<sup>th</sup>, 2016, the international experiment NAWDEX (The North Atlantic Waveguide and Downstream Impact Experiment) took place **examining the jet stream and its role** in guiding large-scale waves which connect weather events near North America with their downstream consequences for the prediction of weather across Europe. Recent research has shown that forecast busts (where skill is much lower than usual) for

## ***PolarPredictNews***

www.polarprediction.net

Europe share a common precursor five to six days beforehand; there is a distinct Rossby wave pattern with a more prominent ridge (northwards displacement of the jet stream) across the eastern USA. The reasons for these forecast busts are not known but it is hypothesized that diabatic (cloud and radiative heating) processes, over the USA and Atlantic, increase the forecast uncertainty in this situation.

Four research aircraft – the HALO and Falcon from the German DLR, the French SAFIRE aircraft and UK FAAM aircraft – were equipped with lidar, radar and dropsondes for measuring high-resolution cross-sections of winds, temperature, humidity and cloud during **15 Intensive Operational Periods (IOPs)**. Aircraft were based in Keflavik, Iceland, and the UK to intercept developing weather systems crossing the North Atlantic, while the NOAA SHOUT program was dropping sondes into tropical cyclones near the USA east coast as they tracked into mid-latitudes. More than eighty researchers worked at the operational base in Iceland during the experiment. A comprehensive network of ground-based radar and lidar profiling stations ran continuously in the UK and France, plus **584 additional radiosondes** were launched across northern high latitudes (40-80°N) from Canada to western Europe.

Member of the NAWDEX Steering Group, John Methven (University of Reading, UK) is delighted with the success of the campaign saying, “*NAWDEX was nine years in the making and it is fantastic to see it come to fruition with such commitment and cooperation between countries. This is the first time that the jet stream and associated weather systems have been observed from one side of the Atlantic to the other with measurements that have high resolution coverage in altitude. It is hypothesized that the sharpness of the jet stream and the vertical structure in humidity, cloud and temperature matters to large-scale wave dynamics. The observational dataset collected during NAWDEX provides unique insight into that structure and the processes associated with the triggering, propaga-*

*tion and downstream impact of disturbances along the North Atlantic waveguide.”*

The value of widespread enhancement to the northern hemisphere high latitude observation network, in terms of reducing uncertainty in the analysis and improving forecast skill, will also be assessed using data denial experiments in several global operational systems in preparation for the WWRP Year of Polar Prediction (mid-2017 to mid-2019).

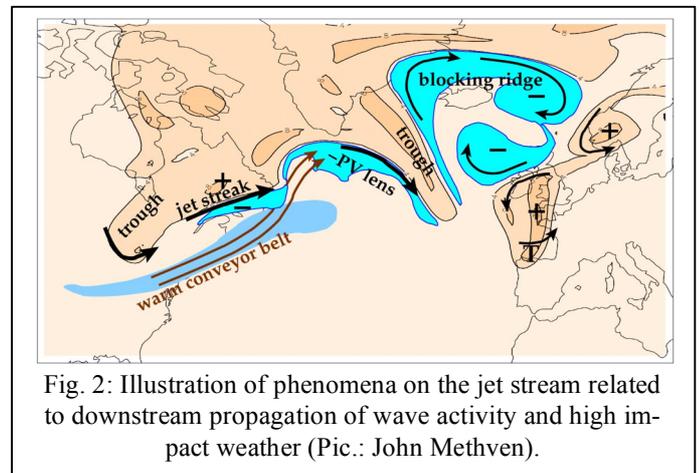


Fig. 2: Illustration of phenomena on the jet stream related to downstream propagation of wave activity and high impact weather (Pic.: John Methven).

More information on the NAWDEX campaign including details on the synoptic setup, the status of the observation facilities and the data collected during the IOPs can be found [here](#). For daily reports on NAWDEX see [here](#).

**05 Polar Prediction Workshop 2017** | The Polar Climate Predictability Initiative (WCRP-PCPI), the Polar Prediction Project (WWRP-PPP), the Sea Ice Prediction Network (SIPN), and the Sea Ice Model Intercomparison Project (SIMIP) are pleased to announce the **4th Polar Prediction Workshop** being held at Deutsches Schiffahrtsmuseum (<http://www.dsm.museum/>) in Bremerhaven, Germany from **March 27<sup>th</sup> to 30<sup>th</sup>, 2017**. The International Coordination Office for Polar Prediction is hosting the meeting that builds on a series of international workshops held in Boulder, USA (2014), Reading, UK (2015), and Palisades, USA (2016). As in previous years, the focus will be on environmental prediction in the polar regions on subseasonal to interannual timescales, thereby helping to

## ***PolarPredictNews***

www.polarprediction.net

build a “seamless” polar prediction community. Sea ice prediction will again play a central role, with one desired outcome being the compilation of recommendations for the 2017 Sea Ice Outlook season. With regards to the Year of Polar Prediction, which will be officially launched in May 2017, the workshop also aims to stimulate discussion about other relevant predictands of the polar weather and climate system. Abstract submission will be open from January 4<sup>th</sup> to 30<sup>th</sup>, 2017. More information can be found on the [workshop’s website](#).

**06 YOPP Special Session at the International Congress on Arctic Social Science 2017** | The Societal and Economic Research and Applications (SERA) sub-committee of PPP will hold a special session at the **9th International Congress on Arctic Social Science (ICASS IX)**. The conference takes place from **June 8<sup>th</sup> to 12<sup>th</sup>, 2017** in **Umeå, Sweden**. During the session entitled *Exploring the user-producer interface of weather and sea ice information in support of Arctic marine mobilities: defining social and interdisciplinary science contributions to the Year of Polar Prediction (YOPP)* participants will explore the complexities of actors, information needs and systems as well as infrastructures, funding structures, data management approaches, and applications of weather and sea-ice prediction services in the polar regions. For more information see [here](#) and on the [conference website](#).

**07 YOPP Planning in 2017** | In preparation for the Year of Prediction the following planning meetings are scheduled for 2017:

During a side meeting at the **Arctic Science Summit Week (ASSW2017)** on March 31<sup>st</sup>, 2017 in Prague, Czech Republic, an update on the current level of YOPP planning will be presented and discussed with the community.

To further coordinate the forecasting activities planned in the Southern Hemisphere during YOPP, the **YOPP-SH #2 planning meeting** will be held from June 28<sup>th</sup> to 29<sup>th</sup>, 2017 at NCAR, Boulder, Colorado, USA, in conjunction with the Antarctic Meteorology and Climate Workshop. Modelling

efforts such as the Antarctic Mesoscale Prediction System, observations both at Antarctic stations and during various field campaigns, as well as the collection of Southern Ocean data to feed into the YOPP Data Portal will be discussed. Effective participation of the oceanographic community in YOPP will be a key goal of the meeting. Abstract submission is now open until May 12<sup>th</sup>, 2017. For more information see the [workshop’s website](#).

The PPP-SERA group will hold their **PPP-SERA #3 planning meeting** from April 5<sup>th</sup> to 9<sup>th</sup>, 2017 at the University of Fairbanks, Alaska, USA. The purpose of the meeting will be to finalize the PPP-SERA strategic and implementation document and to lay the foundations for the implementation of an action and research response plan envisaged for social science contribution to the Year of Polar Prediction. Also, further steps such as the preparation of a joint grant proposal based on the PPP-SERA research response plan will be discussed. The latter will be crucial for further activities during the core phase of YOPP and beyond.

**08 Getting involved with YOPP** | People who are interested in YOPP but new to the field may wonder how to get involved. In the following, different ways of getting involved in YOPP are summarized:

**YOPP Task Teams** have been recently formed in order to make progress in certain areas such as airborne observations, buoy and float observations, and model experimentation. In order to get engaged in one of the task teams, detailed on our [website](#), please contact the task team leads directly or the ICO at [office@polarprediction.net](mailto:office@polarprediction.net).

Projects, programs, and initiatives contributing to the aims of the Year of Polar Prediction are invited to **request YOPP endorsement**. Learn more about [YOPP endorsement](#).

Researchers taking observations in the field are encouraged to make observations available in (near-)real-time – ideally via the **WMO Global Telecommunication System (WMO Information System WIS)** – and to make data visible through

## ***PolarPredictNews***

www.polarprediction.net

the YOPP Data Portal. Another great way of contributing to YOPP is to share deployment opportunities for instruments such as buoys and floats. A more comprehensive list of ways of getting involved is given [here](#).

**09 YOPP endorsed! (AC)<sup>3</sup> – Arctic Amplification** | As of mid-December, 49 projects, programs and initiatives have received YOPP endorsement. We have met Manfred Wendisch (University of Leipzig), who is the coordinator of the (AC)<sup>3</sup> project, at ECMWF in Reading, UK, in September during the YOPP Planning Meeting on Arctic Observations. (AC)<sup>3</sup> or ‘Arctic Amplification’ is one of the Transregional Collaborative Research Centres funded through the German Research Foundation (DFG). Manfred Wendisch also leads the YOPP Task Team on Airborne Platforms and was so kind to tell us some interesting facts about his project.

***Dear Dr. Wendisch, what are you going to find out with the project?***

M.W.: Global warming is amplified and thus more extreme in the Arctic than in lower latitudes (by a factor of 2 to 3) – the existence of the so-called Arctic Amplification is well-proven but not yet fully understood. (AC)<sup>3</sup> was initiated to further investigate the various and complex processes involved in the overall warming and climatological changes. One of the general goals is to quantify the relative contribution of the different processes causing Arctic Amplification. Examples for these feedback processes are the surface-albedo feedback, interactions of water vapor and clouds, aerosol-cloud interactions, and the impact of energy fluxes and turbulence, as well as biological interactions. Furthermore, the teleconnections with mid-latitude extreme weather events are in the spotlight of our project. This actually demonstrates the importance of our research project also for our everyday life in Europe.

***Who is working with you in the project?***

M.W.: In total, we are 27 principal investigators within 19 specific scientific projects in five German institutions, focusing on five core topics. The team is very international and includes forty PhD students and Post-Doc positions.

***When does the project start and how long will it last?***

M.W.: The project has already started in January 2016; the hiring has just been completed. Our funding is secured until end of 2019. The German Research Foundation (DFG) has approved a budget of almost 10 Million Euro for this first phase. If we prove to be successful, we have a change for two more four-year phases of similar funding.

***How does the project contribute to improve polar prediction skills?***

M.W.: In the project we will carry out observations to understand the above-mentioned processes and issues. The various sub-projects will be connected with modelling at the same spatial resolution as most of the observations (up to 150 m), which will contribute to the understanding of processes and thus provide new input for improvements of weather predictions and climate projections in the Arctic.

***What else would you like the polar prediction community to know about your project?***

M.W.: The project website is <http://ac3-tr.de/>. It provides information to interested members of the community. We are highly interested in coordinating and collaborating with other projects, and of course with the Year of Polar Prediction.



Manfred Wendisch, University of Leipzig (Pic.: private).

## ***PolarPredictNews***

[www.polarprediction.net](http://www.polarprediction.net)

### **10 Upcoming Events**

01 <sup>st</sup> to 03 <sup>rd</sup> February 2017	Arctic Change and Its Influence on Mid-Latitude Climate and Weather, Washington, DC, USA.
27 <sup>th</sup> to 30 <sup>th</sup> March 2017	4 <sup>th</sup> Polar Prediction Workshop and 2 <sup>nd</sup> SIMIP Workshop, Bremerhaven, Germany.
31 <sup>st</sup> March 2017	YOPP side meeting at the Arctic Science Summit Week, Prague, Czech Republic.
05 <sup>th</sup> to 09 <sup>th</sup> April 2017	PPP-SERA meeting #3, Fairbanks, Alaska, USA.
May 2017	Launch of the Year of Polar Prediction, Geneva, Switzerland.
8 <sup>th</sup> to 12 <sup>th</sup> June 2017	YOPP SERA session ICASS IX, Umeå, Sweden.
28 <sup>th</sup> to 29 <sup>th</sup> June 2017	YOPP-SH #2 planning meeting held in conjunction with 12 <sup>th</sup> Workshop on Antarctic Meteorology and Climate & Southern Ocean Regional Panel (SORP) meeting, NCAR, Boulder, Colorado, USA.

### **Contact**

International Coordination Office of the Polar Prediction Project

mail: [office@polarprediction.net](mailto:office@polarprediction.net)

tel: +49 471 4831 1760

address: Alfred Wegener Institute, Bussestrasse 24, 27570 Bremerhaven, Germany

Follow us on Twitter [@polarprediction](https://twitter.com/polarprediction)

Signing up for the PolarPrediction Mailing List, a mailing list for anyone interested in polar weather and climate predictability and prediction, please send an email to [office@polarprediction.net](mailto:office@polarprediction.net).