Dear Colleagues!

It is my pleasure to welcome you to the fourth issue of PolarPredictNews. Among others, this latest issue provides you with a brief report from the first YOPP Online Conference. I thought that this event was important, given some interesting and valuable discussion and suggestions from the participants. A link to the recording of this event is provided in this newsletter; and I would like to invite you to join us on 1 December 2017 for the second YOPP Online Conference.

Another important element, described in this issue of PolarPredictNews, is the development of the YOPP Observations Layer, which allows you to check who will be doing what, when and where in terms of observations. Feedback from the community on how to improve the YOPP Observations Layer would be much appreciated.

Finally, I would like to point out two important milestones in terms of user-engagement highlighted in this issue—namely the establishment of the platform “Polar Prediction Matters” and publication of the scoping document entitled “Navigating Weather, Water, Ice and Climate”, which is a high-level document discussing research needs in relation to the use and provision of environmental forecast in the Arctic and Antarctic.

Happy reading,
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 takes 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.
01 YOPP Online Conference #01 | The first YOPP Online Conference took place on 17 October. During the first of a series of YOPP Online Conferences, the chair of the Polar Prediction Project Steering Group, Thomas Jung, has provided an update on the planning of the Year of Polar Prediction. He flagged activities such as extra routine observations that contribute to the planning of the upcoming YOPP Special Observing Periods (SOPs). SOPs will take place in winter (February–March) and summer (July–September) 2018 in the Arctic and during summer 2018/19 (mid November 2018–mid February 2019) in the Antarctic. The presentation by Thomas Jung was followed by a question and answer session, which allowed participants to engage in the planning.

This conference has been the first in a number of YOPP Online meetings that will be held during the coming months. To listen to the conference on YouTube, please click here. The next conference is scheduled for 01 December 2018, 4 pm (GMT). In order to register, please follow this link.

02 YOPP Observations Layer | In order to provide a better overview on observational activities that will take place during the Year of Polar Prediction, the International Coordination Office has developed a layer (kmz file) to be opened e.g., with Google Earth. This file displays information about extra observations such as buoys, automatic weather stations and radiosonde launches during the Special Observing Periods of the Year of Polar Prediction (YOPP SOPs).

Observations during YOPP: Extra radiosondes, buoys, and aircraft can be explored at a kml file to be downloaded from www.polarprediction.net (Figure: Google Earth)
Currently known details on airborne observations have also been included to the layer and can be browsed along different time slots. One of the main sources for this file has been information received from national weather centres replying to a letter WMO officially sent out early this year to inform Permanent Representatives of WMO Member States about YOPP SOPs. Observations taking place during field campaigns of YOPP-endorsed projects are also included. This file is available for download at the website and, as a living resource, will continuously be updated in response to any new information. A spreadsheet with information on planned airborne observations is currently under development and will soon be shared with the community for input. For any comments and updates, please contact the ICO at office@polarprediction.net.

**03 Polar Prediction Matters** | Together with partners APPLICATE, Blue-Action, and the PPP-SERA subcommittee, the YOPP Coordination Office has launched the Polar Prediction Matters dialogue platform at https://blogs.helmholtz.de/polarpredictionmatters/. Polar Prediction Matters aims to strengthen the dialogue between polar forecast providers and users. What kind of information is needed by the captain of a vessel navigating polar waters, or by the pilot of an aircraft operating in Antarctica? Our knowledge of what really matters at the end of the forecast chain is rather limited. One important goal of YOPP is to foster the dialogue between polar forecast providers and users, in order to guide research towards significantly improved and applied polar prediction capabilities in a way that is meaningful to the various stakeholder groups involved.

The dialogue platform Polar Prediction Matters which is hosted by the German Helmholtz Association specifically aims to foster the exchange between forecast users and experts on polar prediction by sharing individual insights of polar environmental forecast users. These user perspectives will be complemented with contributions by forecast providers, such as natural scientists working at meteorological and sea-ice services or at universities, but also by social scientists trying to shed light on how forecast information and products are created, delivered, and utilised.

In our first two contributions, a former master of the German research icebreaker Polarstern and two Icelandic coast guards provide their views on the role of available environmental information for practical planning of an ice passage and for managing a search and rescue situation in the harsh Arctic environments.

For any questions related to Polar Prediction Matters, please contact office@polarprediction.net.

**04 Operational Support** | A number of operational services, in particular related to weather and sea-ice information, offer support for Arctic field campaigns during the Year of Polar Prediction. A way to assist colleagues while working in the field is to provide and promote opportunities for operational support as delivered by different weather and ice services.
The YOPP Coordination Office is keen to facilitate operational support in particular for field campaigns that are going to take place during the Year of Polar Prediction, including those that have been endorsed by YOPP (for more information on YOPP-endorsed activities see the YOPP Explorer).

A number of operational services, in particular related to weather and sea-ice information, offer operational support for YOPP-related campaigns in the Arctic. Possible services include the dissemination of existing services, open data, operational and site-specific forecasts, or aviation briefings. More details can be found here.

Operational services that would like to offer similar products or services are invited to contact the YOPP office at office@polarprediction.net. A list of weather and ice services that offer operational support during YOPP in the Southern Hemisphere will be following.

05 Workshop on Arctic Airborne Observations | During 5–6 October, the “Workshop on Airborne Activities in the Arctic: Science and Prospects” took place in Leipzig, Germany. It brought together about 40 scientists and 30 PhD students from around the world in order to discuss and coordinate upcoming aircraft missions in the context of YOPP, MOSAiC, and (AC)³.

During the workshop, it was recognised that YOPP, MOSAiC, and (AC)³ provide a unique opportunity for concerted efforts of the polar aircraft research community in the years to come. As logistical hurdles are taken and funding decisions are made, the coordination of airborne activities will be a “moving target” that requires continuous exchange within the community. Consequently, a major outcome of the workshop is the development of a “living document” that summarises all relevant information on planned campaigns. The document will soon be shared with the community in order to continuously be updated, and content will be incorporated into the YOPP Observations layer to facilitate coordination.

A follow-up meeting is tentatively scheduled for spring/summer 2018, to be held at AWI in Bremerhaven, Germany. Contact: Manfred Wendisch m.wendisch@uni-leipzig.de

06 Navigating Weather, Water, Ice and Climate Information | A high-level document discussing research needs in relation to the use and provision of environmental forecasts for the Arctic and Antarctic regions during the Year of Polar Prediction has just been published.

“Navigating Weather, Water, Ice and Climate Information for Safe Polar Mobilities” is the fifth document published as part of the WMO WWRP/PPP series. The authors of the document – the PPP Societal and Economic Research and Applications (PPP-SERA) Subcommittee – argue that environmental forecasting systems are only of societal benefit if they are being used widely. This entails that they can be accessed...
by stakeholders in the polar regions, are designed in such a way that users without a scientific or technical background can interact with them and, first and foremost, that they provide the kind of information that the users need to make their field operations safer, more efficient or more productive. PPP-related research initiatives should “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” in order to help better understand decision-making processes when operating in the Arctic and Antarctica. The document is also available for download. Contact: Daniela Liggett daniela.liggett@canterbury.ac.nz; Jackie Dawson Jackie.Dawson@uottawa.ca

07 In Operation! – Medical Evacuation from South Orkney Islands | (by Alvaro Scardilli, Argentinian Ice Service) For the first time, medical evacuation was successfully performed from the South Orkney Islands by coordinating joint efforts of Southern Hemisphere international ice services and making use of the International Ice Charting Working Group’s (IICWG) Emergency Response Contact List.

On 24 July, the Argentinian Ice Service received a call to initiate an urgent assessment on ice conditions around the South Orkney Islands due to the injury of a crew member at the Argentinian-operated naval station Orcadas. Medical evacuation was requested for which a ship operation seemed the best option. However, sailing can be very difficult since during this time of the year compact ice extends up to 40 miles north of the South Orkney Islands.

In order to assess the prevalent ice conditions for the rescue ship to penetrate the ice on its way to Orcadas Base (see title picture), the staff at the Argentinean Ice Service collected all available satellite images and photographs of ice taken from different heights of the base. At the same time, the Argentinean Ice Service called the U.S. National Ice Center for support and coordination of incoming information. The communication between the two ice services went very well; the U.S. National Ice Center for example provided information extracted from satellite images which enabled the Argentinean Ice Service to reinforce its own analyses.

One of the major challenges of this operation was to combine the ice information with the probable ice drift during the movement of low pressure systems in the area. There were several storms ongoing which regularly modify the position of the marginal ice zone and change the pressure characteristics of the ice fields. Finding the right position for a ship to enter the ice field was thus challenging, particularly when considering the limited amount of Synthetic Aperture Radar (SAR) images available in the Southern Hemisphere, which in other areas are routinely used for planning operations in the ice.

Finally, the medical evacuation was successfully performed on 29 July by landing a Twin Otter aircraft on a glacier of the island as it was the quickest and safest way to evacuate the injured person from the base. The mission in particular has been successful thanks to the excellent work by Commander Gabrielle McGrath who had led the establishment of the IICWG Emergency Response Contact List where all ice services are now listed and can be contacted to provide support in case of emergency. This operation therefore constitutes a great improvement for the development of ice services in the Southern Hemisphere and demonstrates the possibility to establish internationally coordinated actions in cases of emergency. Contact: Alvaro Scardilli asscardilli@hidro.gov.ar

08 Project ARICE Funded | (by Veronica Willmott, Alfred Wegener Institute, Germany) With ARICE (“Arctic Research Icebreaker Consortium”), a new member project joins EU Arctic Cluster. It will offer transnational access to four European and two North American icebreakers in the Arctic Ocean. The new EU infrastructure project ARICE joins the efforts of 14 partners from twelve different countries. The pro-
ject will start on the 01 January 2018 and will run for four years. ARICE will provide Europe with better capacities for marine-based research in the ice-covered Arctic Ocean. It aims at reaching this goal by:

1) **Developing strategies** to ensure the optimal use of the existing polar research vessels at a European and international level, working **towards an International Arctic Research Icebreaker Consortium** which shares and jointly funds operational ship time on the available research icebreakers.

2) **Providing transnational access** to a set of six key European and international research icebreakers for European scientists, based on scientific excellence of submitted proposals:
   - PRV Polarstern, Germany
   - IB Oden, Sweden
   - RV Kronprins Haakon, Norway (under construction, to be operative in 2017)
   - RRS Sir David Attenborough, United Kingdom (under construction, to be operative in 2018)
   - CCGS Amundsen, Canada
   - RV Sikuliaq, United States of America.

   ARICE will provide **transnational access to a unique winter experiment** carried out on board the PRV Polarstern, the **MOSAiC** (Multidisciplinary drifting Observatory for the Study of Arctic Climate) initiative.

3) **Improving the research icebreakers’ services** by partnering with maritime industry on a “ships and platforms of opportunity” programme and by exploring into new key technologies that could lead to an improvement of ship-based and autonomous measurements in the Arctic Ocean. ARICE will also implement virtual and remote access of data via an innovative 3D Virtual Icebreaker.

**Contact:** Nicole Biebow – Project Coordinator [Nicole.Biebow@awi.de](mailto:Nicole.Biebow@awi.de);
Verónica Willmott – Project Manager [Veronica.Willmott@awi.de](mailto:Veronica.Willmott@awi.de)

09 Chukchi Sea Radiosondes Help Detecting Hurricane Irma | (by Jun Inoue, Japan National Institute of Polar Research) **During this summer’s cruise of the Japanese research vessel RV Mirai extra radiosondes have been launched as a contribution to YOPP.** As part of the Japanese research project “Arctic Challenge for Sustainability” (ArCS), extra radiosondes were launched every six hours over the ice-free Chukchi Sea during September 2017 aboard the RV Mirai. In addition to radiosoundings, a global cloud-resolving model (“Non-hydrostatic Icosahedral Atmospheric Model” NICAM) was run to provide a quasi-real time forecast for the operational support of navigating RV Mirai through Arctic waters. Although NICAM still needs to be tuned for specific meteorological phenomena occurring in the Arctic, certain weather events were well detected and helped to improve their forecasts.

Being associated with a developing low pressure system evolving over the Chukchi Sea, precipitation detected by a shipboard scanning Doppler radar and surface wind recorded at 20 m/s on 13 September could for example already be well predicted two days earlier by the model-driven forecast initialized at 0000 UTC.

The hurricane Irma that took place from 5–11 September has been of wide international interest and has proven to be catastrophic. The storm is likely to have been affected by many factors and among them the role of the Arctic System. The extra radiosondes from RV Mirai (see dots north of Alaska) likely contributed to improve the forecast of the catastrophic hurricane Irma in September 2017 (**Figure: ECMWF**).
awareness due to its powerful damaging impact to the Caribbean Sea and the South of the United States. With regard to activities on board RV Mirai, Irma can be taken as a suitable case showing that the impact of YOPP observations together with the tropical special dropsondes close to the hurricane can reveal much improved forecast precision.

Since the hurricane was associated with a deep atmospheric trough that extended from the north of Alaska to the south of the United States, extra radiosondes from RV Mirai probably contributed to detecting the event well in advance and thus helped to improve the hurricane forecast. Extra radiosondes from this summer’s RV Mirai cruise are also going to be implemented in the YOPP Observations Layer.

By using an ensemble data assimilation system developed by the Japan Agency for Marine-Earth Science and Technology (JAMSTEC), data denial experiments will be carried out in the near future in order to estimate the particular degree of improvement to the forecast of events as such these two examples.

**Contact:** Jun Inoue
inoue.jun@nipr.ac.jp

---

**10 Feeling the Arctic to Better Understand – Arctic Circle 2017 Assembly**
(by Marta Terrado and Dragana Bojovic, Barcelona Supercomputing Center, BSC-CNS)

For three busy days of dialogue, interactions and learning on priority issues affecting their lives and businesses, international government representatives, statesmen, organizations, corporations and universities, think tanks, indigenous communities and many other actors interested in the Arctic have come together in Reykjavik, Iceland, for the Arctic Circle 2017 Assembly. No doubt, Iceland’s Harpa Centre was an appropriate venue allowing participants to feel being part of the vast, diverse and extremely complex region that is the Arctic.

Maybe to remind attendees that there is no simple solution to a changing Arctic, the Finnish MSV Nordica icebreaker has been situated just a few steps away the conference centre. Tough but magnificent.

**Variety of Interest**
The event gathered a plethora of stakeholders representing different types of organizations, ways of life – from big city dwellers to reindeer herders and nomads, and regions all over the Arctic and beyond. People with diverse professional roles – from owners of big corporations interested in financial planning to whale hunters concerned with the subsistence of their community – were shoulder to shoulder in this annual appointment.

Participants had also different connections and stakes in the Arctic, ranging from economic interests linked to resources exploitation, over nature conservation to spiritual links to the Arctic territory based in indigenous people’s traditions.

**Researchers Meet Stakeholders**
The Arctic Circle Assembly also provided a good opportunity for researchers to meet certain stakeholders who help defining priorities in future Arctic research. For projects and initiatives such as APPLICATE and the Year of Polar Prediction, the Arctic Circle provided an excellent platform to link with relevant initiatives focusing on the Arctic.

One of these initiatives with high relevance for APPLICATE and YOPP is the Arctic Council – the leading intergovernmental forum promoting cooperation, coordination and interaction among the Arctic states, indigenous communities and other inhabitants. Zooming in on Europe, different European H2020 Arctic Projects, including APPLICATE which is part of the EU Arctic Cluster had the opportunity to discuss the future coordination strategy for user engagement and dissemination.
Merging Science and Tradition
Some priorities identified in discussions during the assembly pointed at the need for reliable sea ice modelling for shipping planning. The use of future scenarios developed in conjunction with shipping companies was especially stressed. Prediction of the snowpack was mentioned to be relevant for reindeer herding, security and skiing, whereas prediction of ocean temperature, acidity and salinity changes could be used for sustainable management of fish stocks contributing to food security. The added value of merging scientific knowledge with traditional knowledge was a commonplace in many speeches.

Global Opportunities but Challenging
A clear outcome of the Arctic Circle Assembly was that climate change in the Arctic will bring many challenges but also many opportunities. We should accept that there is a need for continuous and profound adaptation, trying to make the most of these opportunities, while minimizing negative impacts and preserving Arctic identity above all.

The outreach of the impact is global. Just as the motto of the Arctic Circle assembly was: “What happens in the Arctic doesn’t stay in the Arctic”.

Contact: Dragana Bojovic dragana.bojovic@bsc.es; Marta Terrado marta.terrado@bsc.es

12 YOPP-endorsed! – CAALC
YOPP endorsement is available for projects, programmes and initiatives that contribute to the aims of the Year of Polar Prediction. More than sixty projects, programmes and initiatives already received project endorsement from YOPP.

The YOPP-endorsed project “Characterization of Low Clouds and the Atmosphere over the Antarctic Peninsula and West Antarctic Ice Sheet” (CAALC) is led by the physical chemist Penny Rowe from the NorthWest Research Associates (NWRA, USA) and the University of Santiago, Chile. In close collaboration with Chilean and Korean colleagues who launch weather balloons from the neighbouring station King Sejong, Penny Rowe will carry out radiosonde launches, surface-based radiometry measurements, and balloon-borne in situ cloud property measurements at Escudero station to learn about the atmospheric characteristics over Antarctica. Just before flying out for the upcoming campaign this November, Penny Rowe was so kind to tell us about her project.

Dr. Rowe, what are you going to find out with CAALC?
We hope to improve understanding of clouds and the lower atmosphere above the Antarctic Peninsula and Southern Ocean by making measurement from weather balloons, lidar, and radiation instruments during three summer campaigns at Escudero Station, Antarctica. We also hope these measurements can help determine the degree to which launching weather balloons over Escudero Station (located near the end of the Antarctic Peninsula) will help improve weather forecasting.

Who is working with you, and where do the funds come from?
I’m fortunate to be part of a hard-working and amazing team from the Universidad de Santiago de Chile (USACH), including Raul Cordero, Edgardo Sepulveda, and Alessandro Damiani. This also includes a number of students from USACH that support our project by helping with the instrumentation on our science platform, led by Raul Cordero, at Escudero Station, on King George Island. The funding comes from FONDECYT (Preis
1161460), a grant program of Chile, with support from ANILLO ACT1410, and we receive vital logistical support from the Chilean Antarctic Institute (INACH RT_32-15). We’re also collaborating with Sang-Jong Park, who will launch weather balloons from the nearby Korean station, King Sejong Station, and with the British Antarctic Survey, who will fly a research aircraft over the station.

**When does the campaign start and how long will it take?**

Our first field season was last Austral summer, in January 2017. We will have another field season during November 2017 – February 2018, and the final season will be in November 2018 – February 2019.

**What measurements are you carrying out, and how will they help achieving the project’s goals?**

We plan to launch weather balloons to measure atmospheric temperature, humidity, pressure and winds. We also have a suite of instruments on our platform that will take continuous measurements, including an instrument we are very excited about called a Mini Micro Pulse LiDAR, or MiniMPL. The MiniMPL sends up a laser, which reflects off the clouds and can be used to determine cloud height and whether the cloud is made of liquid drops or ice crystals. We also have instruments that measure infrared and shortwave radiation, which are useful for understanding how clouds warm the Earth by trapping infrared radiation (contributing to the greenhouse effect) and cool the Earth by reflecting shortwave radiation (originating from the sun). These measurements can also be compared to results from models to better understand these processes.

**How does CAALC contribute to better forecasts in the Antarctic?**

The main goal of our project is to improve our understanding of clouds over Antarctica. Clouds are an important part of forecasting as they can impact visibility and weather conditions. However, the most immediate contribution will be the additional measurements from weather balloons that will be used in real-time weather forecasting. King George Island has an airstrip that is operated by Chile. However, in addition to the Chilean station it also supports the Chinese, Russian, Korean, and Uruguayan stations on the island, as well as providing refuelling for research airplanes. Despite this, there are currently no routine weather balloon measurements at the station. We hope our measurements will help understand how routine weather balloons at this location can improve forecasting.

**What is the most exciting part you like in CAALC?**

The most exciting part is working with an excellent team in the environment of Antarctica. Antarctica is a truly unique and awe-inspiring place, and I feel fortunate to have the opportunity to live and work there. It is also a wonderful experience working together with the other dedicated members of our team from USACH in the common goal of improving our understanding of Antarctica. CAALC involves extensive collaboration, including international, interdisciplinary, and young scientists, working at high latitudes and extreme conditions.

**What should the polar prediction community remember on CAALC?**

Our goal is improving our understanding of clouds and the lower atmosphere above King George Island, near the terminus of the Antarctic Peninsula. We hope that this will lead to improvement in Antarctic forecasts and our understanding of the climate and its evolution.
13 Upcoming Events

13–16 November 2017
MOSAiC Implementation Workshop
Arctic and Antarctic Research Institute, St. Petersburg, Russia

11–15 December 2017
Arctic Change Conference 2017
PPP-SERA co-chairing sessions NAV01 and NAV03 (see more)
Quebec City, Canada

15–18 January 2018
5th International Symposium on Arctic Research (ISAR-5)
Session S 2: Synergies for “New Arctic” Climate Prediction, Observation and Modeling with focus on YOPP and MOSAiC. Main convener: Jun Inoue (PPP Steering Group), co-conveners: Yusuke Kawaguchi, Benjamin Rabe, Daiki Nomura
Tokyo, Japan

23–25 January 2018
Arctic Frontiers Conference 2018
Tromsø, Norway

15–26 June 2018
POLAR2018 SCAR/IASC Conference
Session AC-3 “High-Latitude Boundary Layers and Model Evaluation” co-convened by Ian Renfrew (PPP Steering Group)/Timo Vihma (YOPP-endorsement)
Davos, Switzerland

19 July 2018
Third YOPP in the Southern Hemisphere meeting (YOPP-SH#03)
In conjunction with 13th Workshop on Antarctic Meteorology and Climate (16–18 July 2018)
Madison, Wisconsin, USA

Any upcoming events to be announced to the community? The next issue of PolarPredictNews is expected to be out in December/January. Send your dates and events to office@polarprediction.net

Contact
International Coordination Office (ICO) for Polar Prediction

E-mail: office@polarprediction.net
Phone: +49 471 4831 1588

Address:
Alfred Wegener Institute Helmholtz Centre for Polar and Marine Research
Klußmannstraße 3, 27570 Bremerhaven, Germany

Follow us on Twitter @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