WEATHER CLIMATE WATER
TEMPS CLIMAT EAU

WMO OMM

World Meteorological Organization
Organisation météorologique mondiale
Organización Meteorológica Mundial
Всемирная метеорологическая организация
المنظمة العالمية للأرصاد الجوية
世界气象组织

Secrétariat
7 bis, avenue de la Paix – Case postale 2300
CH 1211 Genève 2 – Suisse
Tél.: +41 (0) 22 730 81 11
Fax: +41 (0) 22 730 81 81
wmo@wmo.int – public.wmo.int

Ref.: 30385/2019-L12 RES-ARE

Our ref.: 30385/2019/RES/YOPP

10 December 2019

Subject: Year of Polar Prediction (YOPP)/MOSAiC Targeted Observing Periods and Support for YOPPsiteMIP Data

Action required:
(1) Indicate willingness to contribute to the additional YOPP Targeted Observing Periods (TOPs) during 2020, associated with the MOSAiC year-long ice drift with additional radiosonde launches;
(2) Indicate whether your institution is able to contribute resources to assemble Merged Observatory Data Files (MODF) and/or Merged Model Data Files (MMDF) to support process evaluations.

Dear Sir/Madam,

I wish to express my appreciation for your support of the Year of Polar Prediction (YOPP) in 2018/2019 and update you on new planned activities in 2020. Your support resulted in more than 7,000 additional radiosondes being launched combined across both poles; these are currently being assessed for impact on polar predictability and observing system design.

In September 2019, the MOSAiC (Multidisciplinary Drifting Observatory for the Study of Arctic Climate) project (https://www.mosaic-expedition.org/) was started; the resulting central Arctic Ocean MOSAiC observations, together with the ongoing measurements at the surrounding Arctic terrestrial observatories will provide an unprecedented opportunity to document the intricacies of the entire Arctic system for one year. To capitalize on this opportunity, I would like to recommend the following: (1) On-demand radiosonde launches in the Arctic during late Spring 2020 to complement the MOSAiC Drifting Observatory radiosonde launches and (2) support for a developing framework for increasing data uptake and decreasing data latency that will be achieved through data management and coding strategies that facilitate coordinated process-based evaluation of Numerical Weather Prediction (NWP) output.

The main objective of the earlier YOPP Special Observing Periods (SOPs) during 2018/19 was to assess the impact of the increased frequency of observations in the polar regions. Preliminary results from the observing system experiments (OSEs) suggest that on average this led to only minor improvements in prediction skills but there were larger impacts during certain large-scale flow situations. Therefore, the PPP Steering Group decided, at its tenth meeting in Helsinki in January 2019, to revise the concept for additional observations and to target episodes of particularly strong Arctic-mid-latitude linkages and their associated air mass modifications. This approach will capitalize on the increasingly strong partnership that has been built between YOPP and MOSAiC observing assets.

Targeted Observation Periods (TOPs)

The focus of the YOPP TOPs planned during the MOSAiC experiment is on an increasing radiosonde frequency only during episodes of strong interactions between the Arctic and mid-latitudes, i.e. warm air intrusions and cold air outbreaks.

To: Permanent Representatives (or Directors of Meteorological or Hydrometeorological Services) of Members of WMO

cc: Hydrological Advisers to Permanent Representatives

The proposed strategy is:

- to select events for targeted observations between early March 2020 until melt season based on the atmospheric flow situation, aiming at air masses expected to undergo a significant transformation that will pass over existing YOPP supersites, areas probed by aircraft (e.g. AWI Aircraft campaigns with Polar 5), the ARM mobile facility at Northern Norway and Bear Island supporting the Cold Air Outbreaks in the Marine Boundary Layer (COMBLE) project and the MOSAiC ice-camp;

- to focus on additional radiosonde launches on the Atlantic sector of the Arctic where the majority of warm air intrusions and cold air outbreaks occur; this could be extended to the Pacific side if a critical mass of contributors can be found;

- the execution of a decision system to request the launch of additional radiosondes which will be taken by a committee appointed by the YOPP Process Task Team. It is anticipated that participating countries/institutions/ stations would be notified of a Targeted Observing Period (TOP) five days ahead of time with details of requested launches 24 to 48 hours ahead of time.

Development of Integrated Observation/Model Data Files

To support the TOPs, it will be important to facilitate intercomparison of observations from densely instrumented observation sites with the high frequency output in the immediate area around each of the identified supersites. This work is organized within the YOPP Supersite Model Intercomparison Project (YOPPsiteMIP). The intercomparison concept is based on developing a well-defined file format and compatible semantics applicable across models and observations: Merged Model Data Files (MMDFs) and Merged Observatory Data Files (MODF). In recognition of the complexity of this task for both observers and modellers, not only will a scheme be developed defining formatting requirements, but work is ongoing under the direction of the YOPP Data Task Team on developing an open source community Python toolbox to expedite the creation of these (NetCDF) files. For each supersite and model, it will be necessary to identify and support representatives to apply the toolbox (and likely support development) to create MODF/MMDFs from each unique assemblage of data sets. A MMDF/MMDF workshop is planned for April 2020 to bring together Observatory and Model specialists to utilize the toolkit to create a foundational, interoperable dataset that not only supports the aligned MOSAiC and YOPP research activities, but will also result in a detailed legacy dataset that will constitute a one-year snap-shot of the Arctic environment. It is in this spirit that we ask for your support for the often-overlooked efforts for data stewardship, usability and product development that go beyond just archival and accessibility. The intent will be to accelerate research, understanding and resulting services for the rapidly and perhaps catastrophically changing Arctic region.

Summary

I would like to reiterate my appreciation for the significant support you and your organization have already provided to YOPP and I do not make these additional requests lightly.

It would be most valuable if you could let us know by **18 December 2019** how you could contribute towards the additional Targeted Observing Periods and/or the workshop for the development of the open community toolbox and the resulting creation of MODF and MMDF NetCDF files from as many supersites and models as possible. This deadline is important to enable conclusive discussions on this topic in the Polar Prediction Project Steering Group meeting shortly thereafter.

In addition, WMO would also appreciate the nomination of a possible contact person in your National Meteorological and Hydrological Service (NMHS) to act as a focal point for the further planning of the TOPs of the Year of Polar Prediction.

Mr Paolo Ruti, Chief of the World Weather Research Programme (email: pruti@wmo.int) would be pleased to provide any additional information, if needed.

I would like to express my appreciation for your continued support in promoting the Programmes and activities of WMO.

Yours faithfully,

(E. Manaenkova)
for the Secretary-General