

EGU23-14470, updated on 27 Apr 2024

<https://doi.org/10.5194/egusphere-egu23-14470>

EGU General Assembly 2023

© Author(s) 2024. This work is distributed under the Creative Commons Attribution 4.0 License.



A first look at the new PolarRES ensemble of polar regional climate model storylines to 2100

Ruth Mottram¹, Priscilla Mooney², Jose Abraham Torres¹, and the PolarRES Consortium*

¹Danish Meteorological Institute, Research and Development, København, Denmark (rum@dmu.dk)

²NORCE Research, Bergen, Norway (prmo@norce-research.no)

*A full list of authors appears at the end of the abstract

The Horizon 2020 project PolarRES is coordinating a large international consortium of regional climate modelling groups in building a new ensemble of regional climate projections out to 2100. The ensemble is built at very high resolution (~12km) and using common domains, and set-ups to give directly comparable model outputs. At the same time, all regional climate models have been upgraded to a next-generation set-up, producing an ensemble of unprecedented sophistication.

We use a storyline approach, focused on Arctic amplification and cyclones in the northern hemisphere and Southern Annular Mode variability in Antarctica, to select global climate models for forcing on the boundaries. Each regional climate modelling group will downscale ERA5 and multiple global climate models. The data produced from these simulations will be used to improve process understanding under present and future conditions as well as to identify impacts of climate change in the polar regions.

Here, we present the experimental protocol developed in PolarRES and give details of the different regional climate models used, their setup, processes and domains as well as an overview of the outputs and planned applications. We show preliminary analysis of hindcast outputs to assess the performance of the ensemble. We invite other regional climate modelling groups outside the PolarRES consortium to consider using the same CORDEX-compatible model set-up and we are happy to receive suggestions of further spin-off studies or requests for collaboration.

PolarRES Consortium: Oskar Landgren, Andrew Orr, Xavier Fettweis, Willem Jan van de Berg, Annette Rinke, Petteri Uotila, Denys Pishniak, Ella Gilbert, Christoph Kittel, Ole Bøssing Christensen, Fredrik Boberg, Martin Olesen, Jose Abraham Torres, Anastasiia Chyhareva, Cecilia Aijala, Clara Lambin, Damian Maure, Kristiina Verro, Lars Nieradzic, Raphael Koehler, Ryan Williams, Xavier Levine, Siv Lauvset, Srinidhi Gadde, Timo Vihma, Svitlana Krakovska, Tiina Nygård, Doerthe Handorf, Hanna Lee, Heidrun Matthes, Hilde Haakenstad, Yurii Batrak, Lise Seland Graff, Roberta Pirazzini, Ruth Price, Tuomas Naaka