EMS Annual Meeting Abstracts
Vol. 15, EMS2018-449, 2018

The need for flexible selection of climate simulation sub-ensembles for impact assessment in a climate service

Ole B. Christensen (1), Marianne S. Madsen (1), Rasmus Benestad (2), Andreas Dobler (2), Kajsa Parding (2), Olle Räty (3), Jouni Räisänen (3), Kimmo Ruosteenoja (4), Peter Ukkonen (4), Harilaos Loukos (5), Elisabeth Viktor (6), Juliane Otto (6), Gabriella Zsebeházi (7), Péter Szabó (7), Antti Mäkelä (4), and Hilppa Gregow (4)

(1) Danish Meteorological Institute (DMI), Climate and Arctic, Copenhagen Ø, Denmark (obc@dmi.dk), (2) Met. Norway, Oslo, Norway, (3) University of Helsinki, Helsinki, Finland, (4) Finnish Meteorological Institute (FMI), Helsinki, Finland, (5) The Climate Data Factory, Paris, France, (6) Climate Service Centre Germany (GERICS), Hamburg, Germany, (7) Hungarian Meteorological Institute (OMSz), Budapest, Hungary

In the Copernicus Climate Change Service (C3S) project called Data Evaluation for Climate Models (DECM) we have investigated the challenges of optimally selecting useful climate model information in the Copernicus Climate Data Store.

Frequently, impact and regional climate modellers need to select a sub-ensemble out of a large main ensemble due to computational or other challenges. Such a selection should contain models of as high a quality as possibly, but should also represent the spread of calculated meteorological climate change as well as possible. The main problem of model selection in a climate change context is the fact that we cannot validate models based on the intended product, i.e. the future climate. Therefore we need to set up selection criteria based on the representation of current climate and also on the projected climate change of the individual models compared to the entire ensemble.

Regarding climate change, it is important to reproduce the variability of the grand ensemble as faithfully as possible in order to generate information on the spread of plausible climate change impacts. It will be illustrated that such a selection is not unique, and is not straightforward, but rather that it depends on the relevant set of climate variables, regions, lead times, and temporal resolutions of interest. Models, which reproduce the full ensemble spread with respect to one variable may be clustered far from the ensemble mean with respect to a different one.

We will report on this and other findings with respect to quality assurance and evaluation in DECM.