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Applying the new spatially distributed Added Value Index and Climate Change Downscaling Signal for Regional Climate Models to high-resolution EURO-CORDEX and convection permitting scale simulations

James Ciarlo[1,2], Erika Coppola[1], Emanuela Pichelli[1], Jose Abraham Torres Alavez[1], and the FPS-Conv Team[*]

[1]International Centre for Theoretical Physics, Earth System Physics Section, Trieste, Italy (jciarlo[at]ictp.it)
[2]National Institute of Oceanography and Applied Geophysics (OGS), Borgo Grotta Gigante 42/C, 34010 Sgonico, Italy
[*]A full list of authors appears at the end of the abstract

Downscaling data from General Circulation Models (GCMs) with Regional Climate Models (RCMs) is a computationally expensive process, even more so running at the convection permitting scale (CP). Despite the high-resolution products of these simulations, the Added Value (AV) of these runs compared to their driving models is an important factor for consideration. A new method was recently developed to quantify the AV of historical simulations as well as the Climate Change Downscaling Signal (CCDS) of forecast runs. This method presents these quantities spatially and thus the specific regions with the most AV can be identified and understood.

An analysis of daily precipitation from a 55-model EURO-CORDEX ensemble (at 12 km resolution) was assessed using this method. It revealed positive AV throughout the domain with greater emphasis in regions of complex topography, coast-lines, and the tropics. Similar CCDS was obtained when assessing the RCP 8.5 far future runs in these domains. This paper looks more closely at the CCDS obtained with this method and compares it to other climate change signals described in other studies.

The same method is now being applied to assess the AV and CCDS of daily precipitation from an ensemble of models at the CP scale (~3 km) over different domains within Europe. The current stage of the analysis is also looking into the AV of using hourly precipitation instead of daily.

FPS-Conv Team: Marianna Adinolfi, Sophie Bastin, Ségolène Berthou, Susanne Brienen, Cécile Caillaud, Rita M. Cardoso, Steven Chan, Ole Bøssing Christensen, Belusic Danijel, Hylke De Vries, Andreas Dobler, Hendrik Feldmann, Øivind Hodnebrog, Giorgia Fosser, Klaus Görgen, Klaus Keuler, Namendra Kumar Shahi, Torge Lorenz, Paola Mercogliano, Hans-Jürgen Panitz, Jan Polcher, Pedro M. M. Soares, Stefan Pieter Sobolowski, Samuel Somot, Paolo Stocchi, Merja Toelle