

EGU2020-2611, updated on 29 Oct 2020

<https://doi.org/10.5194/egusphere-egu2020-2611>

EGU General Assembly 2020

© Author(s) 2020. This work is distributed under the Creative Commons Attribution 4.0 License.



A new spatially distributed Added Value Index for Regional Climate Models: the EURO-CORDEX and the CORDEX-CORE highest resolution ensembles

James M. Ciarlo^{1,2}, Erika Coppola¹, Adriano Fantini¹, Xuejie Gao^{3,4}, Yao Tong⁵, Russell H. Glazer¹, Jose Abraham Torres Alavez¹, Taleena Sines¹, Emanuela Pichelli¹, Francesca Raffaele¹, Sushant Das¹, Moetasim Ashfaq⁶, Eun-Soon Im⁷, Thanh Nguyen-Xuan⁷, Claas Teichmann⁸, Armelle Remedio⁸, Thomas Remke⁸, Katharina Bülow⁸, Torsten Weber⁸, Lars Bunttemeyer⁸, Kevin Sieck⁸, Diana Rechid⁸, and Daniela Jacob⁸

¹The Abdus Salam International Center for Theoretical Physics (ICTP), strada costiera 11, 34135 Trieste, Italy

²National Institute of Oceanography and Experimental Geophysics (OGS), Trieste

³Climate Change Research Center, Institute of Atmospheric Physics, Chinese Academy of Sciences, Beijing, China

⁴University of Chinese Academy of Sciences, Beijing, China

⁵Yingkou Meteorological Bureau, Yingkou, China

⁶Oak Ridge National Laboratory, Oak Ridge, TN, USA

⁷Hong Kong University of Science and Technology, Hong Kong, China

⁸Climate Service Center Germany (GERICS), Helmholtz-Zentrum Geesthacht, Hamburg, Germany

Regional Climate Models (RCMs) have undergone substantial development, resulting in increasingly reliable high-resolution simulations. Despite this, the added value of these simulations compared to their driving General Circulation Models (GCMs) has been a recurring issue. Past studies have used different techniques to quantify the added value of a RCM. A new method is now being presented, based on these past studies, that quantifies the added value and presents it spatially. The method was also adapted to assess the Downscaling Signal (DS) in climate change simulations and compare this to the added value.

This new method has been used to assess the daily precipitation of the 55-model EURO-CORDEX ensemble and the CORDEX-CORE ensemble, focusing especially on the higher-end of the PDFs. This revealed an overall positive added value across all domains, especially in areas of complex topography, coast-lines, and tropical regions. This DS was similar to that of the added value when looking at RCP 8.5 far-future simulations.