A Spatial representation of an Added Value Index for Regional Climate Models

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In the past decades, Regional Climate Models (RCMs) have undergone substantial development, resulting in increasingly reliable high-resolution simulations. Despite this, Global Climate Models (GCMs) can sometimes perform better in regions of low topographic complexity and thus, it is important to quantify the added value of a RCM. While a number of studies describe different methods to quantify this added value, here, a new quantification method for the added value of RCMs is introduced and tested.

This method compares the Probability Distribution Function of a RCM, a GCM, and a high-resolution observation source for any parameter. The comparison is performed using the sum of probability difference, and repeating the method on every grid cell in order to obtain a spatial representation of the added value. An ensemble of RCMs is used to demonstrate and test this method on the EURO-CORDEX region. The analysis focuses on air temperature, daily maximum temperature, and precipitation, comparing the added values obtained with extreme indices of the corresponding parameters.