

A Comparative Analysis of Downscaled Multi-model Decadal Climate Predictions over West Europe

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Introduction

Statistical downscaling applied to increase the spatial resolution and provide users with regional climate information to support their local decision-making frameworks.

Aim of identifying the best downscaling method.

Data

- Variables: mean near-surface temperature (TAS) and precipitation (PR).
- DCPD multi-model: 133 members from 13 forecast systems.
- Evaluation period: 1961-2014.
- Forecast period: years 1-5.
- Reference period: 1981-2010.
- Reference datasets: ERA5 for daily data for analogs method and ERA5-Land for monthly data for the rest of methods.

Methodology

Downscaling methods

Interpolations

First order conservative
Second order conservative
Bilinear
Bicubic
Nearest neighbour

Analogs*

Linear regressions

Calibrations

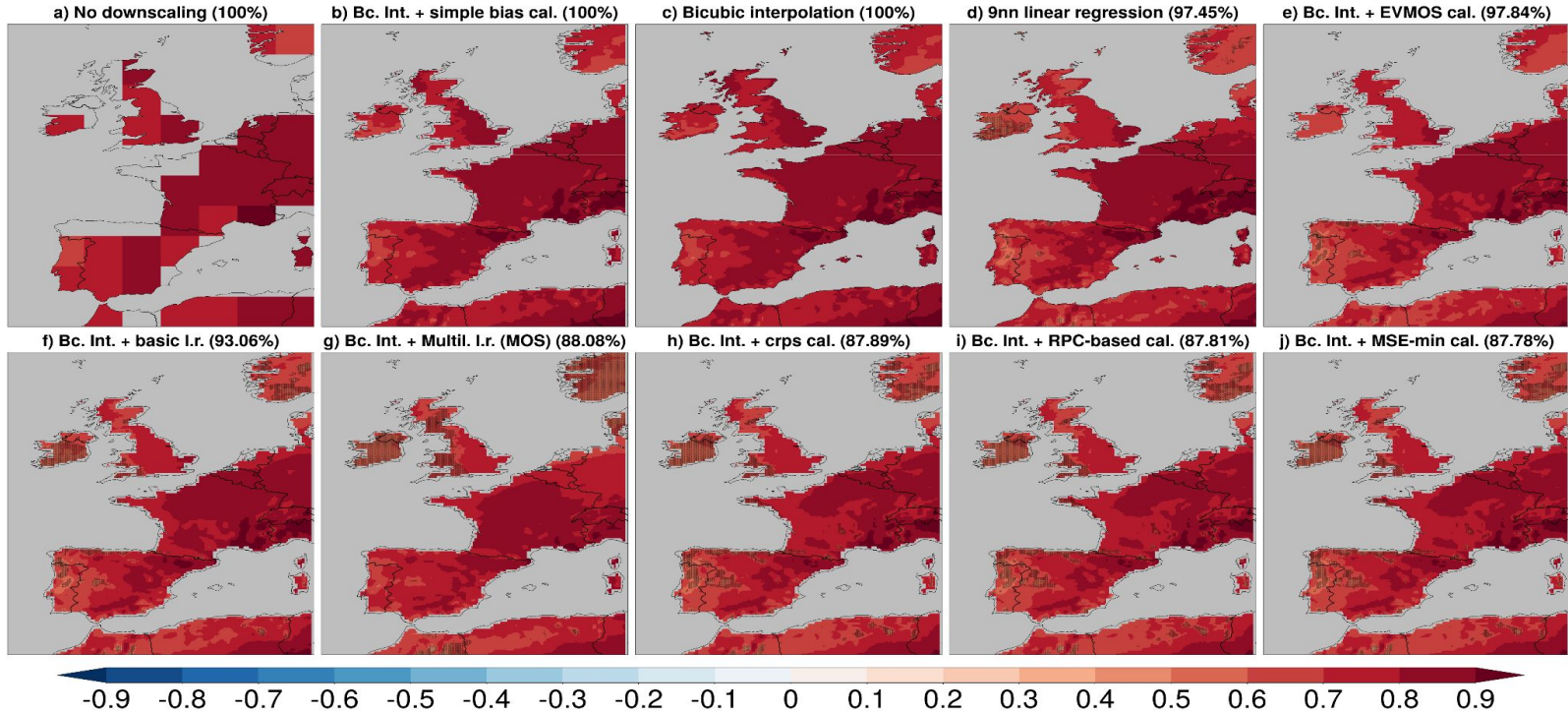
Simple bias adjustment
Bias adjustment (EVMOS)
Mean Square Error minimization (MSE-min)
Continuous Ranked Probability Skill (CRPS)
Ratio Predictable Component (RPC)

Basic linear Regression
9 nearest neighbors Linear Regression
Teleconnection index (NAO, AMV, SPOD, TPI)**
Linear and Multilinear Regressions with Model Output Statistics (MOS) and Perfect Prognosis (PP)

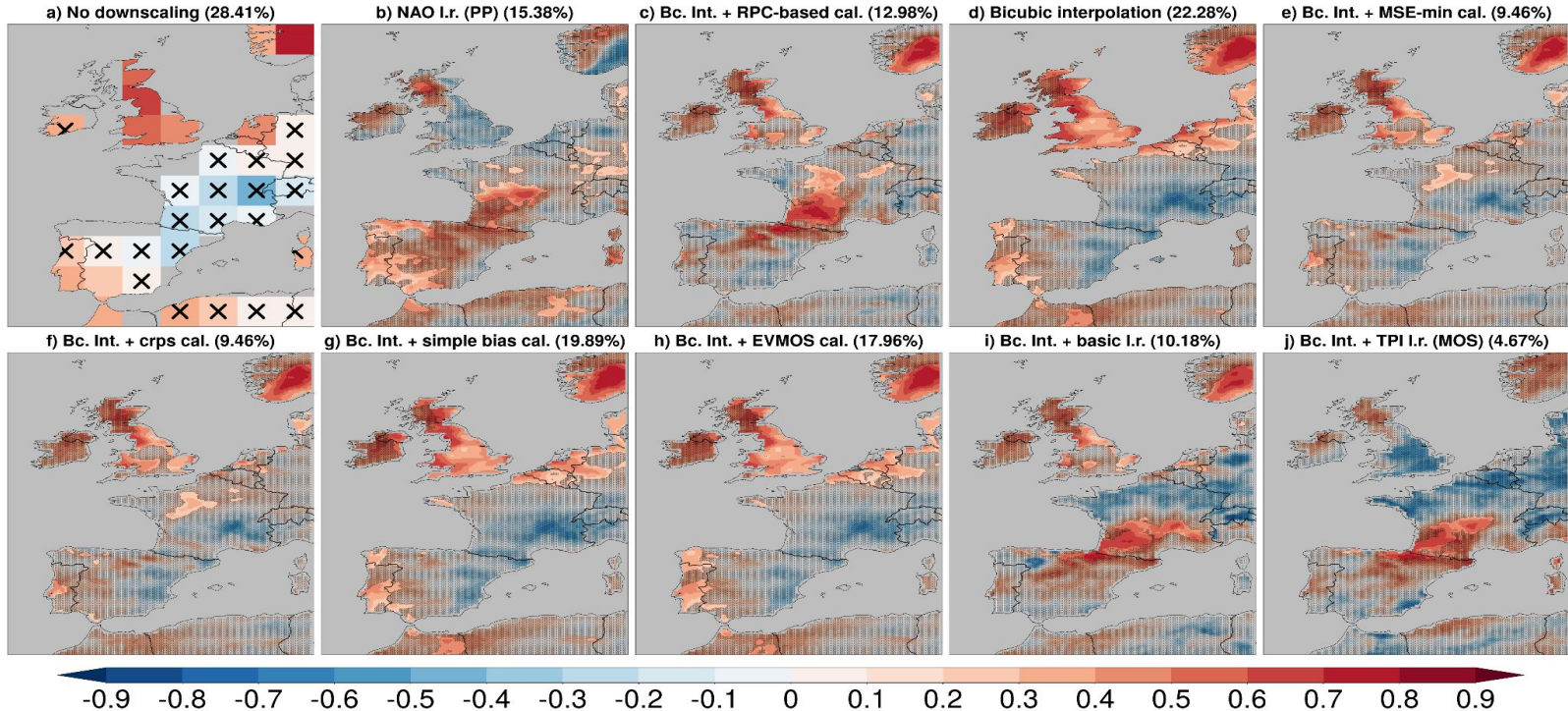
* just for precipitation

** NAO: North Atlantic Oscillation, AMV: Atlantic Multidecadal Variability, SPOD: South Pacific Ocean Dipole, TPI: Tripole Index

Temperature results



Precipitation results





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Thank you!