



Can Quantile Mapping be Used for Downscaling?

Douglas Maraun

GEOMAR Helmholtz Centre for Ocean Research, Ocean Circulation and Climate Dynamics, Kiel, Germany
(dmaraun@geomar.de, +49-(0)431-6004052)

Quantile mapping is routinely applied to correct biases of regional climate model simulations compared to observational data. If the observations are of similar resolution as the regional climate model, quantile mapping is a feasible approach. But if the observations are of much higher resolution, quantile mapping also attempts to bridge this scale mismatch. Here I show for daily precipitation, that such quantile mapping based downscaling is not feasible but introduces similar problems as inflation of perfect prog downscaling: the spatial and temporal structure of the corrected time series is misrepresented, the drizzle effect for area means is over-corrected, area mean extremes are over-estimated and trends are affected. To overcome these problems, stochastic bias correction is required.

D Maraun, Bias Correction, Quantile Mapping and Downscaling.
Revisiting the Inflation Issue. J Climate, in press, 2013