

Apply MCMC inference on hierarchical model to obtain estimates of $\phi_Y(\mathbf{s}_y)$ and $\phi_Z(\mathbf{s}_z)$, as well as estimates of the hyper-parameters θ_Y and θ_B for the generating spatial processes.

Sample from the posterior predictive distribution $P(\phi_Y(\mathbf{s}_z)|\mathbf{y}, \mathbf{z})$ to get estimates of the unbiased PDF parameters at the climate model grid cells.

Use the samples of $\phi_Y(\mathbf{s}_z)$ and $\phi_Z(\mathbf{s}_z)$ to apply quantile mapping to the climate model time series at each grid cell, resulting in a bias corrected output with uncertainty bands.