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ClimDown: Climate Downscaling in R

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Software

- Review
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Summary

The ClimDown R package publishes the routines and techniques of the Pacific Climate Impacts Consortium (PCIC) for downscaling coarse scale Global Climate Models (GCMs) to fine scale spatial resolution.

PCIC's overall downscaling algorithm is named Bias-corrected constructed analogues with quantile mapping (BCCAQ). BCCAQ is a hybrid downscaling method that combines outputs from Climate Analogues (CA) and quantile mapping at the fine-scale resolution. First, the CA and Climate Imprint (CI) plus quantile delta mapping (QDM) algorithms are run independently. BCCAQ then combines outputs from the two by taking the daily QDM outputs at each fine-scale grid point and reordering them within a given month according to the daily CA ranks, i.e., using a form of Empirical Copula Coupling.

The package exports high-level wrapper functions that perform each of three downscaling steps: CI, CA, and QDM, as well as one wrapper that runs the entire BCCAQ pipeline.

References