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Title: Simulation of climate variables using quantile matching and block bootstrapping

Abstract:
By utilising observed climate data effectively, statistical downscaling methods can produce accurate location-specific projections of a range of climate variables. Through this approach the distributional properties of the projected data will be influenced by both the observed trends and distributions as well as changes present in the Global Climate Models used as covariates in the statistical model development. In this paper we examine a block bootstrap simulation technique combined with a quantile prediction and matching method for simulating future daily climate data. We apply this method to observed data from several climate stations in Vanuatu and Fiji. We show that the approach is successful at projecting various climate characteristics, with the variability and auto-correlation of daily temperature and rainfall, the correlations between these variables and between spatial locations very similar to what is observed from the validation data.