Future climate emulations using quantile regressions on large ensembles

Objective

We present a comprehensive statistical method to compare climate projections from large ensembles that is well-suited for examining changes in the tails

Approach

We present a quantile mapping/regression method to compare daily temperature distributions from two different CESM ensembles and observations.

The resulting quantile maps illuminate substantial differences between the climate model ensembles, including differences in warming in the Pacific Northwest that are particularly large in the lower quantiles during winter

Impact

Results shed light on how temperature distributions are changing within large climate model ensembles, including spatiotemporal patterns.



Figure: Quantile maps of temperature changes between 1989 and 2099 in two different CESM ensembles. Temp change is shown as function of day of year and probability.

Haugen, M. A., Stein, M., L., Sriver, R., L., and Moyer, E. L. (2019), Future climate emulations using quantile regressions on large ensembles, Advances in Statistical Climatology, Meteorology, and Oceanography, doi:10.5194/ascmo-5-37-2019.

