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Evaluation of a simple similarity index method for estimating global runoff

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The development of a similarity index-based model of catchment runoff has been presented previously (see Advances in Water Resources 26(3): 295-309), and global predictions of mean runoff have been presented at previous meetings, but not formally assessed. Here we quantify the reliability of predictions from that model for land elements (cell size 1/6th degree), by aggregating the modeled runoff over large catchment areas and comparing with measured values of mean annual runoff and monthly mean runoff. We also make a preliminary assessment of model uncertainty by estimating the magnitude of the uncertainty in precipitation, potential evaporation and soil water holding capacity. While we expect the monthly comparisons to diagnose significant uncertainties due to errors in model structure, it is unlikely that we will quantify the model structural error accurately, because of our current limited understanding of the other errors.

Since this approach does not use measured runoff to estimate model parameters, the predictions are a contribution to Prediction in Ungauged Basins, and may potentially contribute to a benchmark of current prediction methods for global mean runoff.