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Downscaling of RCM outputs for representative catchments in the Mediterranean region, for the 1951-2100 time-frame

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Within the activities of the EU FP7 CLIMB project (www.climb-fp7.eu), we developed downscaling procedures to reliably assess climate forcing at hydrologically relevant scales, and applied them to six representative hydrological basins located in the Mediterranean region: Riu Mannu and Noce in Italy, Chiba in Tunisia, Kocaeli in Turkey, Thau in France, and Gaza in Palestine. As a first step towards this aim, we used daily precipitation and temperature data from the gridded E-OBS project (www.ecad.eu/dailydata), as reference fields, to rank 14 Regional Climate Model (RCM) outputs from the ENSEMBLES project (http://ensembles-eu.metoffice.com). The four best performing model outputs were selected, with the additional constraint of maintaining 2 outputs obtained from running different RCMs driven by the same GCM, and 2 runs from the same RCM driven by different GCMs. For these four RCM-GCM model combinations, a set of downscaling techniques were developed and applied, for the period 1951-2100, to variables used in hydrological modeling (i.e. precipitation; mean, maximum and minimum daily temperatures; direct solar radiation, relative humidity, magnitude and direction of surface winds). The quality of the final products is discussed, together with the results obtained after applying a bias reduction procedure to daily temperature and precipitation fields.