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# Towards regional projections of twenty-first century sea-level change using IPCC SRES scenarios

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Sea-level change is often considered to be globally uniform in sea-level projections. However, local relative sea-level (RSL) change can deviate substantially from the global mean. Here, we present maps of twenty-first century local RSL change estimates based on an ensemble of coupled climate model simulations for three emission scenarios. In the Intergovernmental Panel on Climate Change Fourth Assessment Report (IPCC AR4), the same model simulations were used for their projections of global mean sea-level rise. The contribution of the small glaciers and ice caps to local RSL change is calculated with a glacier model, based on a volume-area approach. The contributions of the Greenland and Antarctic ice sheets are obtained from IPCC AR4 estimates. The RSL distribution resulting from the land ice mass changes is then calculated by solving the sea-level equation for a rotating, viscoelastic Earth model. Next, we add the pattern of steric RSL changes obtained from global climate models and a model estimate for the effect of Glacial Isostatic Adjustment. The resulting ensemble mean RSL pattern reveals that many regions will experience RSL changes that differ substantially from the global mean. While the RSL amplitude changes, the spatial patterns are similar for all three emission scenarios. For the A1B scenario, local RSL change values range from -3.65 to 1.01 m, with an ensemble global mean of 0.46 m. The range in the projections is dominated by the spread in the steric contribution, at least for the processes considered in this study. For individual sites, we find that one standard deviation for the combined contributions is approximately 10 cm, regardless of emission scenario.