



The impact of global sea-level rise on tides: a revisit

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As a result of climate change sea level rise is expected globally. However, the predicted change in sea level is unlikely to be linear or uniform along our coastlines, with some regions more at risk than others. A number of papers have recently highlighted how regional tides may change with relatively large levels of future sea-level, but global estimates of the impact of SLR on tides are sparse, or have shown that the models at the time were not accurate enough to reproduce existing signals in the tide gauge record. The tide gauge record in many places now span a century or more, and thus observe both relative sea level rise and trends in tidal amplitudes. It is thus possible, with the latest global tidal models, to investigate if the models capture the observed signals when subject to realistic levels of SLR. To ensure enough resolution we investigated the response of the tides to sea-level change in a number of shelf seas around the globe. The trends in the tidal amplitudes were then compared to those seen in the PSMSL long-term tide gauge record, and shown to agree fairly well. The main conclusion is that in order to accurately capture change in tidal amplitudes in the future we must simulate tidal changes for each individual shelf sea – only then can we predict and mitigate future change.