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Sea Extremes: Integrated impact assessment in coastal climate adaptation

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We investigate effects of sea level rise and a change in precipitation pattern on coastal flooding hazards. Historic and present in situ and satellite data of water and groundwater levels, precipitation, vertical ground motion, geology, and geotechnical soil properties are combined with flood protection measures, topography, and infrastructure to provide a more complete picture of the water-related impact from climate change at an exposed coastal location. Results show that future sea extremes evaluated from extreme value statistics may, indeed, have a large impact. The integrated effects from future storm surges and other geo- and hydro-parameters need to be considered in order to provide for the best protection and mitigation efforts, however. Based on the results we present and discuss a simple conceptual model setup that can e.g. be used for 'translation' of regional sea level rise evidence and projections to concrete impact measures. This may be used by potentially affected stakeholders –often working in different sectors and across levels of governance, in a common appraisal of the challenges faced ahead. The model may also enter dynamic tools to evaluate local impact as sea level research advances and projections for the future are updated.