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Communicating uncertainties of future coastal impacts for decision making

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Abstract content

As sea-level rises, coastal hazards and risks such as extreme flooding or erosion are changing. For accurate assessments, several factors must be considered, such as the variability of sea-level rise and storm surge patterns. We proceed to a global sensitivity analysis of future coastal impacts of sea-level rise, in order to provide quantitative insight into the relative importance of contributing uncertainties over the coming decades. The method is applied for typical coastal settings of high- and low-energy coasts. Storm surge propagation processes, then sea-level variability, and, later, global sea-level rise scenarios become successively important source of uncertainties over the 21st century. This defines research priorities that depend on the target period of interest. On the long term, scenarios RCP 6.0 and 8.0 challenge local capacities of adaptation for the considered sites. For decision makers concerned with adaptation to climate change in coastal areas, this approach provides quantitative insight into three key issues related to: (1) the timeliness of coastal adaptation planning (2) the identification of periods by which rising sea-levels cause rapid obsolescence of regular adaptation measures (3) the constraints imposed by different future climate change scenarios for long-term adaptation planning.

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