



Extended Shared Socioeconomic Pathways for Coastal Impact Assessment: Spatial Coastal Population Scenarios

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This work extends the Shared Socioeconomic Pathways (SSPs) by developing spatial projections of global coastal population distribution for the five basic SSPs. Based on a series of coastal migration drivers, which were identified from existing literature, we develop coastal narratives for the five basic SSPs (SSP1-5). These narratives account for differences in coastal versus inland population development in urban and rural areas. To spatially distribute population we use the International Institute for Applied Systems Analysis (IIASA) national population and urbanisation projections and employ country-specific growth rates which differ for coastal and inland as well as for urban and rural regions. These rates are derived from spatial analysis of historical population data. We then adjust these rates for each SSP based on the coastal narratives. The resulting global population grids depict the projected distribution of coastal population for each SSP, until the end of the 21st century, at a spatial resolution of 30 arc seconds. These grids exhibit a three- to four-fold increase in coastal population compared to the basic SSPs. Across all SSPs, except for SSP3, coastal population peaks by the middle of the 21st century and declines afterwards. In SSP3 the coastal population grows continuously until 2100. Compared to the base year 2000 the coastal population increases considerably in all SSPs. The extended SSPs are intended to be utilised in Impact, Adaptation and Vulnerability (IAV) assessments as they allow for improved analysis of exposure to sea-level rise and coastal flooding under different physical and socioeconomic scenarios.