



A new methodology for flooding risk assessment in coastal areas. Application to Ebro Delta (Spain)

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Global sea level rise projections for the XXI century may be translated in that, by 2100, it will be approximately 50% more deltaic areas in risk of flooding. Contingency, protection and adaptation measures will depend strongly on the regional wealth, but an accurate estimation of future flooding levels is the first thing stakeholders need before taking any decision. In light of this, a new workflow to better evaluate flood hazards in coastal areas has been developed. We have accounted for the combined effect of mean sea level rise, storm surge and waves extremes under RCP 4.5 and RCP 8.5 climate change scenarios. The methodology consists of three basic steps: a) mean sea level rise and variability is obtained from a combination of observations and regional/global ocean models; b) joint probability of storm surge and waves is retrieved from regional ocean models and observations; c) previous a) and b) estimated sea levels are projected onshore by computing the wave run-up. Ultimately, flooding risk maps with the associated uncertainty are given for return periods and scenarios of interest.

The proposed methodology is applied to the Ebro Delta, a muddy dominated delta located in the north-western Mediterranean Sea with a subaerial area of 320 km squares. It is considered an ideal laboratory because of its growing vulnerability, with common threats and an intensive anthropic influence directly translatable to other world's deltas.