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Abstract

Coastal planning requires detailed knowledge of future flooding risks, and effective planning must consider both short-term sea level variations and the long-term trend. We calculate distributions that combine short- and long-term effects to provide estimates of flood probabilities in 2050 and 2100 on the Finnish coast in the Baltic Sea. Our distributions of short-term sea level variations are based on 46 years (1971–2016) of observations from the 13 Finnish tide gauges. The long-term scenarios of mean sea level combine postglacial land uplift, regionally adjusted scenarios of global sea level rise, and the effect of changes in the wind climate. The results predict that flooding risks will clearly increase by 2100 in the Gulf of Finland and the Bothnian Sea, while only a small increase or no change compared to present-day conditions is expected in the Bothnian Bay, where the land uplift is stronger.

Keywords

Coastal flooding, flooding risks, sea level rise, sea level variability, Baltic Sea, EU floods directive

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