



A cost-benefit framework for adaptation to sea level rise

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The estimation of costs due to climate change and the identification of possible adaptation measures are of particular interest at coastal regions threatened by sea-level-rise. In terms of cost-benefit analysis one wants to quantify how efficient adaptation measures are and when their investments are amortized. We study damages due to storm surges and estimate the resulting costs. Based on extreme value statistics, we propose a probabilistic approach to calculate not only the expected cumulative damages after a chosen period, but also its entire probability distribution. This enables us to deduce confidence intervals and thereby the extent of uncertainty. The framework allows to consider (i) different protection levels, (ii) discounting of future damages, and (iii) different sea level rise scenarios. Finally, we apply the framework to a case study region in Kalundborg (Denmark).