



Dynamic modelling of coastal flooding hazard risk management

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Coastal flooding hazard events have increased in frequency and severity in recent decades in Denmark, and rising sea levels and more extreme storms due to climate change are expected to increase these risks. In the context of the experiences from Danish coastal flooding events during the last decades, we are presenting a methodological framework for integrated assessment of storm surge risks based on a detailed spatial assessment of storm surges, hydrological modeling, damage costs, and societal coping capacities. The perspective is that hazard damages will develop dynamically over time, despite storm surges can be more frequent and severe, adaptation options and human response capacities including physical measures, adaptive learning, and disaster risk management could help to drive down costs. The methodological framework is interdisciplinary and integrates climate physics, hydrology, spatial modelling, economics, and social science perspectives.

The framework is applied to the assessment of coastal flooding hazard costs in Denmark including damages in terms of traffic delays, impacts on property prices, psycho-social impacts, and business disruptions. The coping capacities of local societies, which have been- or could be exposed to coastal flooding events are assessed based on insurance based damage cost data and experiences from the operation of emergency management units. The data is based on case studies from flooding risks and experienced events in the Danish city of Aabenraa and Jyllinge.

The approach is here to assess the development trends over time in damage costs of specific flooding events over time, and to add information about disaster risk management planning, hazard management, and implemented physical adaptation measures.