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## **Coastal Settlements at Risk: A Study of England's East Coast**

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### **Abstract**

A number of large-scale losses have recently been sustained in the UK through the impact of extreme weather events on human settlements. This project aims to make a substantial contribution to the understanding of risks to the built environment from natural hazards by focusing on the low-lying, densely-settled part of England's East Coast.

The largest risk to East Coast settlements is flooding associated with overtopping of sea defences resulting from the combination of high tide and storm surge. This risk combines with other risks, such as windstorm damage, coastal erosion, ground settlement, river flooding and cold weather damage. Each of these risks will be quantified independently, the interaction between them examined, and the probabilities of much increased losses through combined effects estimated.

At the centre of the estimation of risk will be a detailed examination of the building stock in the areas at risk, through sample surveys and vulnerability analyses. The study seeks to identify those features of the building stock which govern the vulnerability to each of the main hazards and to determine a form of classification or zoning which can be used to identify risks more precisely.

At the case study scale, the physical risk of flooding will be defined in relation to the local flood climate and environmental vulnerability (e.g. coastal topography, morphology, bathymetry, inland hydrology, aspect, land-cover/use). Flood scenarios will be investigated with a 3-D numerical model capable of representing both the generation of a flood wave and its propagation inland.

The study will also consider possible mitigation options, study their feasibility through interviews with various stakeholders and make some preliminary estimates of the costs and benefits of each option.

**Keywords:** Risk, natural hazards, flooding, building stock, vulnerability, mitigation, risk management, insurance, East Coast, England.