Thomalla, F., J. Brown, I. Kelman, and R. Spence. 2002. "Storm Surge Flooding on Canvey Island, UK: An Integration of Urban Flood Modelling and Assessments of Residential Building Vulnerability." Presentation abstract in Journal of Coastal Research, SI 36, Proceedings from the International Coastal Symposium, Templepatrick, Northern Ireland, 25-29 March 2002.

Presentation abstract:

During a major storm surge on 31 January to 1 February 1953, 58 people were killed on Canvey Island (CI) following a breach in the sea defences. The defences were raised and strengthened in response to this event, encouraging a substantial increase in development which persists today. Despite its highly exposed location, flood risk management on CI continues to rely heavily on structural solutions, which are unlikely to be sustainable in the long-term, especially in the context of sea level rise and climate change. Crucially, it is important to acknowledge that a defence failure may occur in the future, hence investment in alternative means of disaster prevention needs to be an integral part of flood risk management on CI. Most notably, the establishment of a long-term flood management strategy requires a sound understanding of the potential impacts of a storm surge and, in particular, the flood depths and velocities that are likely to be experienced inland for a range of defence failure scenarios. This paper describes the development of an integrated flood model for CI, based on the combination of a 3-D storm surge model and a 2-D inundation model. The output from these models is discussed in the context of flood evacuation plans, which are fundamentally important for effective disaster prevention and preparedness. At the same time, potential damage to residential buildings is explored through a detailed analysis of residence vulnerability. An innovative system of building classification is used to identify key potential weaknesses for each type of housing. The water depths and velocities predicted are used to calculate the failure of brickwork and windows as well as floodwater infiltration rate. With this knowledge, mitigation strategies such as retrofitting and new building regulations are examined.