

Thomalla, F., J. Brown, I. Kelman, I. Möller, R. Spence, and T. Spencer. 2002. "Towards An Integrated Approach for Coastal Flood Impact Assessment", pp. 142-158 in Proceedings of the Solutions to Coastal Disasters Conference, American Society for Civil Engineers (ASCE), San Diego, California, 24-27 February 2002.

Abstract:

Human settlements along coasts and estuaries are increasingly at risk from flooding due to a combination of inappropriate development, rising sea level, insufficient investment in the maintenance of flood defences, and the interaction of rising sea levels with storm surges. This paper describes the development of a dynamical storm surge and inundation model in combination with an analysis of residence vulnerability for two case study sites along the English east coast to investigate the consequences on residential areas of a major sea defence failure. The model is developed to provide detailed information about floodwater depths and velocities that can be expected for different storm conditions and defence failure scenarios. At the same time, failure in residences due to floodwater loading is examined by investigating load characteristics along with damage and failure load parameters for a range of residences. Drawing on historical accounts, field surveys and insurance loss data, those features of residential buildings which govern the structure's vulnerability to flood damage are identified. The examination of the impact of floodwater forces represents a new approach to damage assessment and enables a more accurate prediction of potential losses, both for the case study sites and for larger spatial scales. With this knowledge, sustainable risk management strategies are developed.