

Component Level Flood Vulnerability Framework for the United Kingdom

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Abstract : Catastrophe modeling has evolved significantly over the last four decades. Verisk introduced its pioneering comprehensive inland flood model tailored for the U.K. in 2008. Over the course of the last 15 years, Verisk has built a suite of physically driven flood models for several countries and regions across the globe. This paper aims to spotlight a selection of these advancements tailored to the development of vulnerability estimation, which forms an integral part of a forthcoming update to Verisk's U.K. inland flood model. Vulnerability functions are critical to evaluating and robust modeling flood-induced damage to buildings and contents. The subsequent damage assessments then allow for direct quantification of losses for entire building portfolios. Notably, today's flood loss models more often prioritize enhanced development of hazard characterization, while vulnerability functions often lack sufficient granularity for a robust assessment. This study proposes a novel, engineering-driven, physically based component-level flood vulnerability framework for the U.K. Various aspects of the framework, including component classification and comprehensive cost analysis, meticulously tailored to capture the distinct building characteristics unique to the U.K., will be discussed. This analysis will elucidate how the cost distribution across individual components contributes to translating component-level damage functions into building-level damage functions. Furthermore, a succinct overview of essential datasets employed to gauge building regional vulnerability will be highlighted.

Keywords : catastrophe modeling, inland flood, vulnerability, cost analysis

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