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A Compendium of Existing Vulnerability and Fragility Relationships for Flood

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In the last decade, probabilistic approaches for flood risk assessment have emerged, often as an extension of more consolidated methods used in probabilistic seismic risk assessment. Nonetheless, only a few studies deal with best-practice methodologies for flood vulnerability assessment and existing approaches lack of an appropriate guidance for their selection. These concerns underline the need for a rational, integrated and complete compendium of all the existing flood-related vulnerability and fragility relationships to be used in a comprehensive probabilistic flood risk assessment framework.

Following the same approach used in the guidelines recently developed by the Global Earthquake Model (GEM) Project, this study presents a preliminary review of the state-of-art regarding existing empirical vulnerability and fragility curves in the context of flood risk. In particular, a worldwide overview is intended in terms of data sources, assets features and also statistical techniques employed for data collection and fitting. The research aims at providing a complete and flexible guide for selection of vulnerability and fragility curves for building structures. A discussion on data sources, building classification and considered features, and damage scales is presented, in order to evaluate the reliability, and at the same time the limitations, of different approaches and provide recommendation for future studies.