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UNHARMED – spatial decision support system for long-term disaster risk reduction and resilience planning

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Abstract: The UNHaRMED (Unified Natural Hazard Risk Mitigation Exploratory Decision support system) has been developed through a collaborative approach including policy makers from multiple government departments, researchers and software developers. The resultant software framework and tailored application process allow stakeholder groups to explore how urban and regional development interacts with disaster risk over extended planning horizons in a spatial manner. This enables strategic capacity and improved understanding of risk to be developed, and subsequently for more effective intervention strategies to be developed.

The paper will present an overview of the software, including the interactions between external drivers of economic and population trends, influencing the exposure components of disaster risk through land use and building stock models, the hazard models including flooding (riverine and coastal), earthquake, and bushfire, and vulnerability functions to allow for damage calculations. The integrated application approach process will also be presented highlighting the need for stakeholders to be involved in the application of such a software tool ensuring the scale it operates on, and its outputs, are relevant to their contexts. There is also a need for 'sensemaking' where facilitators work with stakeholders in making connections between the software's risk data analysis and their own individual and institutional framing. This step is vital in bridging the policy-science gap, and allowing quantitative analysis to sit within a broader context of urban risk and resilience understanding. Examples will be taken from UNHaRMED's application with three state governments in Australia.

***Keywords**:* Disaster Risk Reduction; Decision Support System*;* Sensemaking; Stakeholder Engagement