



Assessing the vulnerability of buildings to tsunami – an application of the revised Papathoma Tsunami Vulnerability Assessment (PTVA-3) Model in Sydney, Australia

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Australia is vulnerable to the impacts of tsunamis and exposure along the SE coast of New South Wales is especially high. Significantly, this is the same area reported to have been affected by repeated large magnitude tsunamis during the Holocene. Efforts are under way to complete probabilistic risk assessments for the region but local government planners and emergency risk managers need information now about building vulnerability in order to develop appropriate risk management strategies. We use the newly revised PTVA-3 Model (Dall’Osso et al., 2009a, b) to assess the relative vulnerability of buildings to damage from a “worst case tsunami” defined by our latest understanding of regional risk – something never before undertaken in Australia. We present selected results from an investigation of building vulnerability within the local government area of Manly – an iconic coastal area of Sydney. We show that a significant proportion of buildings (in particular, residential structures) are classified as having “High” and “Very High” Relative Vulnerability Index scores. Furthermore, other important buildings (e.g., schools, nursing homes and transport structures) are also vulnerable to damage. Our results have serious implications for immediate emergency risk management, longer-term land-use zoning and development, and building design and construction standards. Based on the work undertaken here, we recommend further detailed assessment of the vulnerability of coastal buildings in at risk areas, development of appropriate risk management strategies and a detailed program of community engagement to increase overall resilience. Last, we propose the wider application of the PTVA-3 Model as a tool for building vulnerability assessment.

Dall’Osso, D., Gonella, M., Gabbianelli, G., Withycombe, G. and Dominey-Howes, D. (2009a). A revised (PTVA) model for assessing the vulnerability of buildings to tsunami. *Natural Hazards and Earth System Sciences*, 9, 1557-1565.

Dall’Osso, D., Gonella, M., Gabbianelli, G., Withycombe, G. and Dominey-Howes, D. (2009b). Assessment of the vulnerability of buildings to damage from tsunami (in Sydney). *Natural Hazards and Earth System Sciences*, 9, 2015-2026.