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Assessing tsunami vulnerability: a pilot study in Seaside, Oregon, USA

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The results of a pilot study to assess the risk from tsunamis for the Seaside-Gearhart, Oregon region will be presented. To determine the risk from tsunamis, it is first necessary to establish the hazard or probability that a tsunami of a particular magnitude will occur within a certain period of time. Tsunami inundation maps that provide 100-year and 500-year probabilistic tsunami wave height contours for the Seaside-Gearhart, Oregon, region were developed as part of an interagency Tsunami Pilot Study. These maps provided the probability of the tsunami hazard. The next step in determining risk is to determine the vulnerability or degree of loss resulting from the occurrence of tsunamis due to exposure and fragility. The tsunami vulnerability assessment methodology used in this study was developed by M. Papathoma and others. This model incorporates multiple factors (e.g. parameters related to the natural and built environments and socio-demographics) that contribute to tsunami vulnerability. Data provided with FEMA's HAZUS loss estimation software and Clatsop County, Oregon, tax assessment data were used as input to the model. The results, presented within a geographic information system, reveal the percentage of buildings in need of reinforcement and the population density in different inundation depth zones. These results can be used for tsunami mitigation, local planning, and for determining post-tsunami disaster response by emergency services.