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# Correlation of tsunami efficiency and earthquake magnitude; implications for hazard analysis

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The rate of tsunami generation is a primary input for probabilistic hazard analysis. Given the low occurrence rate, it is difficult to make reliable estimates of tsunami frequency directly from historical data. An alternative approach is to link tsunami frequency to causative earthquake rates. This paper presents an example case study for Eastern Indonesia. Tsunami efficiency (TE), the percentage of earthquakes causing tsunami, is studied through catalog analysis. The analysis confirms that there is a strong dependence of efficiency on earthquake magnitude. In this region, earthquakes with magnitude 5 to 6 cause a negligible number of tsunamis. Larger magnitude shocks are much more effective. Incremental efficiency increases from 5% for magnitude 6 to 7 earthquakes to over 90% for events larger than magnitude 8. A methodology to incorporate incremental tsunami efficiency in hazard analysis is presented.