



Earthquake and tsunami hazard in West Sumatra: integrating science, outreach, and local stakeholder needs

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The Earth Observatory of Singapore (EOS) is building partnerships with local to provincial government agencies, NGOs, and educators in West Sumatra to inform their policymaking, disaster-risk-reduction, and education efforts.

Geodetic and paleoseismic studies show that an earthquake as large as M 8.8 is likely sometime in the coming decades on the Mentawai patch of the Sunda megathrust. This earthquake and its tsunami would be devastating for the Mentawai Islands and neighboring areas of the western Sumatra coast.

The low-lying coastal Sumatran city of Padang (pop. ~800,000) has been the object of many research and outreach efforts, especially since 2004. Padang experienced deadly earthquakes in 2007 and 2009 that, though tragedies in their own right, served also as wake-up calls for a larger earthquake to come. However, there remain significant barriers to linking science to policy: extant hazard information is sometimes contradictory or confusing for non-scientists, while turnover of agency leadership and staff means that, in the words of one local advocate, "we keep having to start from zero." Both better hazard knowledge and major infrastructure changes are necessary for risk reduction in Padang.

In contrast, the small, isolated villages on the outlying Mentawai Islands have received relatively fewer outreach efforts, yet many villages have the potential for timely evacuation with existing infrastructure. Therefore, knowledge alone can go far toward risk reduction. The tragic October 2010 Mentawai tsunami has inspired further disaster-risk reduction work by local stakeholders.

In both locations, we are engaging policymakers and local NGOs, providing science to help inform their work. Through outreach contacts, the Mentawai government requested that we produce the first-ever tsunami hazard map for their islands; this aligns well with scientific interests at EOS. We will work with the Mentawai government on the presentation and explanation of the hazard map, as well as assessment of its impact at the district and village levels. We are also providing science and teaching examples for an NGO-led program to integrate disaster-risk reduction into the Mentawai primary-school curriculum.

We are working with our partners to develop a participatory monitoring scheme. Indicators will include the degree to which policy is informed by science, whether communities develop and publicise evacuation routes based on hazard mapping, whether and how frequently communities practice evacuation simulations, and whether hazard information is incorporated into school curricula.