

**WILLIAM J. TEMPLETON**

**MS PLAN A THESIS PRESENTATION & DEFENSE**

**FRIDAY, JANUARY 24, 2014**

**MSB 114**

**2:00 PM**

**TSUNAMI HAZARD ASSESSMENT OF AMERICAN SAMOA**

**ABSTRACT**

A preliminary probabilistic tsunami hazard assessment (PTHA) was conducted for American Samoa. The pilot study utilized NEOWAVE to model propagation of tsunamis across the ocean and inundation at the shores of Pago Pago, which is home to key infrastructure of the territory. While the framework is compact and computationally efficient, it takes into account important near-field sources along the Tonga-Kemadec trench that significantly influence the 100 and 500-year inundation. The annual exceedance probability of the earthquake is determined from either the moment magnitude,  $M_w$ , or the observed rate of occurrence. The regional rate of  $M_w$  9+ earthquakes is derived from observed global values scaled by local tectonic parameters such as the relative length, convergence rate, and obliquity of convergence of the fault; the rate of  $M_w$  7.3-8.9 earthquakes is based on the global Gutenberg-Richter rate scaled by local tectonic parameters except for  $M_w$  7.3-7.4 and 8.0-8.4, which are functions of the local observed values in historical events. A sensitivity analysis shows that tsunami inundation from far-field, Pacific Rim sources only have secondary effects in the probabilistic framework. The modeled far-field tsunamis with the most impact on American Samoa can provide a basis for emergency response in the case of large  $M_w$  9+ earthquakes in the those regions. The 100 and 500-year inundation zones provides a rational account of the exposure to tsunamis and the analysis lays for the groundwork for conducting a full regional PTHA of American Samoa.