

Outwrestling Cataclysmic Tsunamis at Hilo, Hawaii: Using Technical Developments of the past 50 Years to Improve Performance

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Abstract : The best practices for owners and urban planners to manage tsunami risk have evolved during the last fifty years, and related technical advances have created opportunities for them to obtain better performance than in earlier cataclysmic tsunami inundations. This basic pattern is illustrated at Hilo Bay, the waterfront area of Hilo, Hawaii, an urban seaport which faces the most severe tsunami hazard of the Hawaiian archipelago. Since April 1, 1946, Hilo Bay has endured tsunami waves with a maximum water height exceeding 2.5 meters following four severe earthquakes: Unimak Island (Mw 8.6, 6.1 m) in 1946; Valdiva (Mw 9.5, the largest earthquake of the 20th century, 10.6 m) in 1960; William Prince Sound (Mw 9.2, 3.8 m) in 1964; and Kalapana (Mw 7.7, the largest earthquake in Hawaii since 1868, 2.6 m) in 1975. Ignoring numerous smaller tsunamis during the same time frame, these four cataclysmic tsunamis have caused property losses in Hilo to exceed \$1.25 billion and more than 150 deaths. It is reasonable to foresee another cataclysmic tsunami inundating the urban core of Hilo in the next 50 years, which, if unchecked, could cause additional deaths and losses in the hundreds of millions of dollars. Urban planners and individual owners are now in a position to reduce these losses in the next foreseeable tsunami that generates maximum water heights between 2.5 and 10 meters in Hilo Bay. Since 1946, Hilo planners and individual owners have already created buffer zones between the shoreline and its historic downtown area. As these stakeholders make inevitable improvements to the built environment along and adjacent to the shoreline, they should incorporate new methods for better managing the obvious tsunami risk at Hilo. At the planning level, new manmade land forms, such as tsunami parks and inundation reservoirs, should be developed. Individual owners should require their design professionals to include sacrificial seismic and tsunami fuses that will perform well in foreseeable severe events and that can be easily repaired in the immediate aftermath. These investments before the next cataclysmic tsunami at Hilo will yield substantial reductions in property losses and fatalities.

Keywords : hilo, tsunami parks, reservoirs, fuse systems, risk management

Conference Title : ICGT 2022 : International Conference on Geosciences of Tsunami

Conference Location : Dubrovnik, Croatia

Conference Dates : October 06-07, 2022