Abstract

The Washington coast lies adjacent to the Cascadia subduction zone, where a magnitude 9 earthquake and ensuing tsunami could likely impact coastal communities throughout the state. They could destroy structures and routes of evacuation, leaving residents no choice but to evacuate inland. The National Tsunami Hazard Mitigation Program (NTHMP), a federal-state partnership administered by NOAA, sought to reduce the amount of damage and loss of life to coastal communities from tsunami through mitigation strategies. The NTHMP established a National Tsunami Hazard Mitigation Program (NTHMP), a federal-state partnership administered by NOAA, which aims to reduce the risk and loss to lives, homes, and property from tsunamis. The NTHMP has established a series of goals, including the development of tsunami hazard maps, the creation of warning systems, and the establishment of evacuation structures. The Washington state Department of Natural Resources (DNR) and Emergency Management Division (EMD) along with other state and federal agencies have been working to implement these strategies to ensure the safety of Washington's coastal communities.

In the early 1990's, a school called for making part of the new school a tsunami vertical evacuation structure that could host as many as a thousand people. The gym is designed to be 30 feet above grade and 55 feet above sea level following earthquake-induced subsidence. The roof of the school gymnasium will be the designated safe refuge and it resulted in a refuge which is 55 feet above sea level and 28 feet above grade. The details of the structural system are shown above. The gym will be pile-supported, with concrete shear walls and columns, piles and moment frames with moment resisting connections. This design resists the maximum considered hydrostatic, hydrodynamic, and impact loads. The structural lateral system includes walls w/ relief opening, roof, floors, and columns and the structural gravity system includes the roof, floors, and columns. The design includes a Degenkolb Engineers was retained to design the structural system for the site of Ocosta Elementary School. A consistent theme in the Safe Haven process was protecting children by placing vertical evacuation in places very large, likely to block escape, can be multi-purpose, least expensive option.