

Oregon State University
Marine Studies Building – Newport Oregon
Building Principles

In striving to expand marine studies research, education and outreach along the Oregon coast as part of its Marine Studies Initiative (MSI), Oregon State University is developing plans to build a new marine studies building at the Hatfield Marine Science Center (HMSC) located in Newport.

Placement of the building at this site is reliant and key to retaining a close connection to HMSC's world-class seawater facilities and proximity with our state and federal agency partners. Our planning for this new building is in the early stages. To reflect the reality of building along Oregon's coast with the Cascadia Subduction Zone (CSZ), we are in the process of developing *Building Principles* to guide the building's design.

First and foremost, we are committed to the safety of OSU students, staff, faculty, and guests. The *Building Principles* seek to demonstrate how to build responsibly in Newport and elsewhere along the Oregon coast, and to showcase earthquake readiness to coastal officials, business owners and the general public.

We are well aware of the seismic hazards at HMSC, including strong-shaking, liquefaction, and tsunami inundation. These same hazards are faced up and down the Oregon coast. We will build this facility to withstand the expected CSZ earthquake, and allow our building occupants to evacuate to safe higher ground before a tsunami inundation takes place.

Building Principles & Key Points:

With recognition of the specific hazards outlined above, OSU will construct the marine studies building to meet the following principles:

1. Safety will be the primary guiding principle.
2. The building will be designed to ensure that structural integrity is maintained for the expected CSZ earthquake. Our planning for the new building will be in cooperation with experienced architects, engineers and building officials with a focus on building a seismically-resilient structure. Occupants will be able to survive the seismic event, exit the building and follow the tsunami evacuation plan.
3. Core design features will serve to demonstrate state-of-the-art structural options for future building in such seismically active regions worldwide, as well as for earthquake and tsunami readiness.
4. The building will have a design occupancy of not more than 350 people, which is significantly lower than the current 500-person design code for building in

the inundation zone. The requirements for safe construction will ultimately dictate the square footage and occupancy of the facility.

5. Our earthquake readiness and tsunami evacuation planning will include not only this building, but the entire campus. OSU currently has a tsunami evacuation plan that is practiced twice per year, in cooperation with the City of Newport, Lincoln County and state agencies.¹ The frequency of these drills can be adapted to meet the needs of training for short-term occupants (e.g., students present for only a quarter term or shorter periods of time).
6. Student housing will be located off HMSC property and well out of the tsunami zone.
7. Current knowledge and models indicate that the expected water inundation height on the HMSC site will be significantly reduced from that of water initially encountering the coast. The building will be designed to minimize the hydraulic demands imposed by the tsunami. It is worth noting that several professors at Oregon State are among the world's leading experts in construction needs for coastal, tsunami, and earthquake zones and their participation in safety planning will facilitate a state of the art plan. State and federal partners at the Hatfield Marine Science Center will also be included in construction safety discussions.

We believe the building provides an opportunity to demonstrate how to construct and operate a seismically-safe building under these conditions. We believe that doing so is important, both to provide a land-water interface, and to serve as an example for the coastal community.

¹ **HMSC – Tsunami Evacuation Plan Partners:** Lincoln County Sheriff's Office - Department of Emergency Management; Newport Police and Newport Police Volunteers; Newport Fire Department; Newport Department of Community Development; Lincoln County School District; American Red Cross; CERT (Community Emergency Response Team); RACES (Radio Amateur Civil Emergency Service); Oregon Office of Emergency Management; Oregon Department of Transportation (ODOT); Oregon Department of Geology and Mineral Industries (DOGAMI); Port of Newport; Oregon Sea Grant; Oregon Coast Community College; OSU Emergency Preparedness, NOAA National Weather Service (Tsunami Ready program)