**Only a Matter of Time: Earthquakes & Tsunamis in Cascadia & the Salish Sea**

Synopsis: Owing to the shocking videos that brought them into our living rooms, devastating earthquakes and tsunamis in Sumatra (in 2004) and Japan (2011) have brought the destructive power of tsunamis to our attention as never before. These events are nowadays explained by Plate Tectonics, the notion that the surface of the Earth is a mosaic thin "plates" in (very) slow motion. Most earthquakes occur in the circum-Pacific "Ring of Fire", a girdle of earthquakes, deep-sea trenches and volcanic arcs, where several plates are drawn into the Earth's interior, recycled by the process of subduction. Cascadia, a region extending 1100 km from northern California to southern British Columbia, has its very own complete plate system, including a trench (now buried by glacial sediments) and a well-known volcanic arc – but it has no record of historic subduction zone earthquakes, even small ones, let alone tsunami-generating monsters. For many years our pet subduction zone was thought to be incapable of generating large earthquakes, but careful and determined research (not mine) has proven that wrong. Once discounted Native American stories of flooding by the sea are now supported by evidence of drowned forests, tsunami deposits in coastal marshes, and offshore landslides (turbidites), all caused by great earthquakes. A well-documented tsunami struck Japan more than 300 years ago, well beyond the reach of western history. There was no local earthquake, but today we know that the "orphan" tsunami was spawned by the last great Cascadia earthquake, at 9 PM on January 26, 1700. In Cascadia, great earthquakes happen on average every 500 years, but not at regular intervals. The question is not "if", but when and how large the coming tsunami will be. It will surely wreck the coast. It will also reach heights from 1 to 5 meters (as much as 17 feet) in the waters around Lopez Island.

Biographical Sketch: Though he has spent a career in Texas, Richard Carlson describes himself as a "native moss-back". Born in Oak Harbor, and raised in Tacoma, he received a Ph.D. in Geological Sciences from the University of Washington in 1976. He has a long-standing connection to the islands, too; his Master's Thesis was a gravity study centered on Cypress Island. In 1977 he joined the faculty of Texas A&M University, where he is now Regents Professor of Geology & Geophysics. A marine geophysicist, he has spent more than 2 years at sea on research cruises, most recently off the coast of Washington in August 2013. From 2008 to 2012, he served as a Program Director for the Marine Geology & Geophysics Program of the National Science Foundation. There, a major part of his portfolio was the Cascadia Initiative, a multi-year study of earthquake seismicity in the Pacific Northwest.