Seismic and Tsunami Hazard Projects at the Oregon Department of Geology and Mineral Industries.

Earthquake and tsunami mitigation are part of DOGAMI's statutory duties:

- Undertake cooperative studies or programs to reduce loss of life and property by understanding and mitigating geologic hazards
- Map and identify natural hazards statewide, and estimate likelihood and potential consequences
- Study the occurrence of prehistoric subduction zone and crustal earthquakes in Oregon
- Operate a state seismic network and geodetic network in cooperation with universities or federal agencies
- Provide information and advice to governments, the public and the private sector concerning geologic hazards

Earthquake and tsunami hazard mitigation are reflected in DOGAMI's 2009-2015 Strategic Plan

Mission:
"Provide earth science information and regulation to make Oregon **safe** and prosperous"

Objectives:

- *Effect **earthquake risk reduction** through hazard mapping and vulnerability assessments.*
- *Complete and update maps of shoreline variability, coastal erosion and **tsunami hazards**.*
- *Promote natural hazard information and risk mitigation products*

Where we have been

DOGAMI's earthquake program has been ongoing since 1987, when the first evidence was found that the Cascadia Subduction Zone had experienced very large earthquakes in the recent past. Projects and programs include:

•Geology-based earthquake hazard maps for Oregon cities

•Modeling and mapping Cascadia tsunami inundation

•Estimating vulnerability and risk statewide, for individual counties, and for partner agencies. A key effort was the Statewide Seismic Needs Assessment (SSNA) funded by the 2005-2007 legislature to evaluate the seismic vulnerability of Oregon public schools and emergency facilities

•Understanding faults and prehistoric earthquakes in all parts of Oregon

•Public outreach and education, policy and planning advice

These projects were carried out primarily with funding from USGS, FEMA, Oregon Cities and Counties, and some lottery funds.
Included partnerships with numerous Federal, state and local agencies and Oregon universities.

Current projects: Tsunami Hazard Mitigation Project

- Funded by the National Tsunami Hazard Mitigation Program through the National Oceanographic and Atmospheric Administration by a four-year, $2.89M grant which expires at the end of the current biennium
- Produced new state of the art tsunami inundation maps for the worst case distant tsunami and a range of Cascadia tsunamis for the entire coast
- Produced new evacuation maps for Oregon Coastal communities and simple exposure analysis
- Included an intensive community outreach program in partnership with Oregon Emergency Management

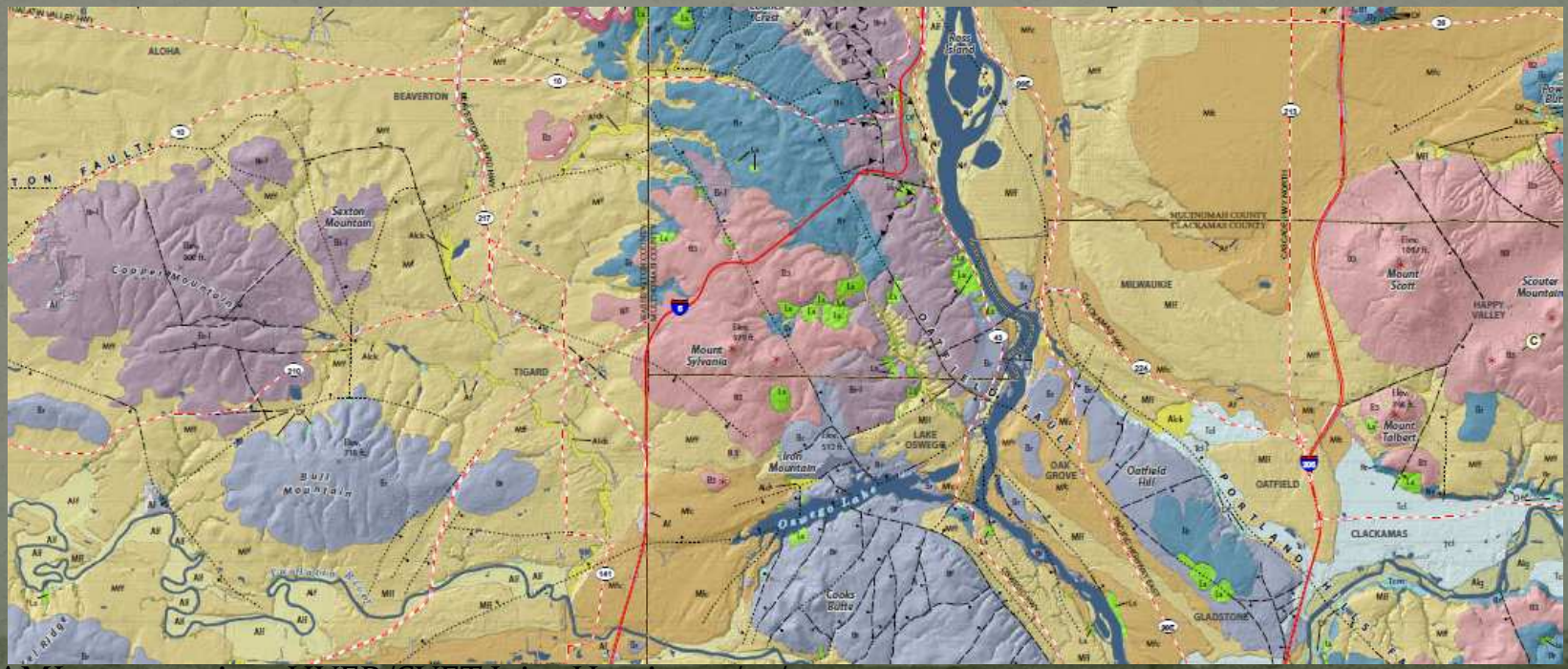
Current Projects:

Portland Urban Area Geologic Data

- ❖New state-of-the-art 3D geology/soil model with earthquake parameters
- ❖USGS will use for shaking models for Cascadia and local earthquake scenarios
- ❖ Covers the METRO UGB, includes 1/3 of Oregon's population
- ❖Multi-Year project ends in December, 2013, funded entirely by USGS

Clackamas County Risk study

- ❖Primarily landslide hazards, but includes earthquake damage and loss estimates
- ❖Funded entirely by FEMA via Clackamas County, contract ends December, 2013



Where we want to go

DOGAMI's primary role in increasing Oregon's resilience to a future Cascadia earthquake is to prepare, collect and disseminate the best possible information about the hazard, vulnerabilities and risk. Based on the recommendations of the resilience plan, we will work to find funding opportunities to:

- Model tsunami evacuation time for coastal communities
- Prepare tsunami hazard maps for the maritime community and ports
- Improve geologic data to model Cascadia shaking and earth movement
- Improve inventory and vulnerability data for significant buildings and lifelines
- Estimate losses and assess risk for Cascadia earthquakes using updated inventory
- Continue and expand outreach, in partnership with OEM, DLCD and Universities, targeted at institutions for general resilience issues, coastal residents and visitors for tsunami evacuation and hazard mitigation
- Provide policy advice and promote mitigation measures to Oregon agencies and institutions
- Continue collaboration and support of Federal and academic partners in areas such as improving seismic and geodetic networks, advancing geotechnical engineering research and tsunami dynamics research, and Earthquake Early Warning (EEW) systems