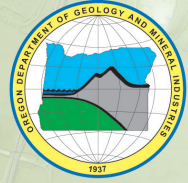


# OREGON DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

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## Geologic database, models released for Portland area

*New information can help assess risk from earthquakes and landslides*

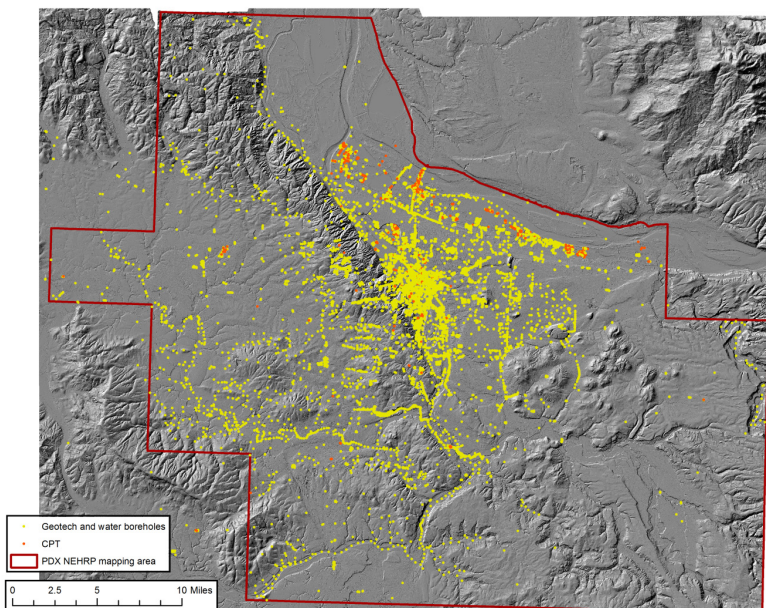
PORTLAND, Ore. – The Oregon Department of Geology and Mineral Industries (DOGAMI) has released **Open-File Report O-13-12, 3D geology and shear-wave velocity models of the Portland, Oregon metropolitan area**, by Warren P. Roe and Ian P. Madin.

In 2004, DOGAMI began collecting new surface and subsurface geologic data for the Portland metro area. These include geotechnical boring logs, water well logs, and lidar, a laser-mapping technology that allows for amazingly detailed and accurate mapping of the earth's surface.

"Our new 3D models give us a new way to visualize the earth beneath our feet," says co-author Warren Roe. "They build upon mapping already done, except now we're expanding it underground using drill hole data."

The data will be essential to future understanding of hazards caused by local or offshore earthquakes. It can also aid our understanding of landslide hazards, drinking water supply protection, and surface water quality.

The project created three-dimensional (3D) models of shallow geology and a shear-wave velocity model of the uppermost 100 feet, which is an important value for modeling earthquake shaking and damage. These models provide a better understanding of what to expect in an earthquake, including ground shaking, soil liquefaction, and earthquake-induced landslides.



*This project map shows the 10,075 drill holes used to model the subsurface geology in the Portland area. Yellow dots are conventional drill holes and orange dots are cone penetrometer tests. The project area is outlined in red.*

To preview this publication, visit:  
[www.oreqongology.org/pubs/ofr/p-O-13-12.htm](http://www.oreqongology.org/pubs/ofr/p-O-13-12.htm)

**DOGAMI's mission** is to provide earth science information and regulation to make Oregon safe and prosperous.

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"This project lays a foundation that others can build on," says co-author Ian Madin. "We'd like to see existing water wells added to the database, as well as future geotechnical drill holes. Projects like ours may also be feasible elsewhere in Oregon."

The report describes modeling parameters and assumptions, geologic observations, the 3D and Vs30 models, the drill hole database built to support them, and the overall modeling process. Digital results of the project are in an accompanying ArcGIS files, an ArcGIS file geodatabase, an Access database, and an Excel spreadsheet. The database design, geologic interpretation, and 3D and Vs30 modeling were largely created and managed using ArcGIS desktop mapping software along with Microsoft Excel and Access.

Funding for this study and the preceding work was provided by the U.S. Geological Survey's National Earthquake Hazards Reduction Program (NEHRP).

To preview this publication, visit: [www.oregongeology.org/pubs/ofr/p-O-13-12.htm](http://www.oregongeology.org/pubs/ofr/p-O-13-12.htm)

The report can be purchased on DVD for \$30 each from Nature of the Northwest Information Center, 800 NE Oregon Street, Suite 965, Portland, Oregon, 97232. You may also call (971) 673-2331 or order online at <http://www.NatureNW.org>. There is a \$4.95 shipping and handling charge for all mailed items.

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The Oregon Department of Geology and Mineral Industries is an independent agency of the State and has a broad responsibility in developing an understanding of the state's geologic resources and natural hazards. The Department then makes this information available to communities and individuals to help inform and reduce the risks from natural hazards, such as earthquakes, tsunamis, landslides, floods and volcanic eruptions. The Department assists in the formulation of state policy where an understanding of geologic materials, geologic resources, processes, and hazards is key to decision-making. The Department is also the lead state regulatory agency for mining, oil, gas and geothermal exploration, production and reclamation. Learn more at [www.OregonGeology.org](http://www.OregonGeology.org).

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