

# OREGON DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

Vicki S. McConnell, State Geologist

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## New geologic maps of part of the Portland metro area released

**Urban volcanic fields, previously unmapped  
landslides are highlights of new, more accurate maps**

**Portland, Oregon:** The Oregon Department of Geology and Mineral Industries (DOGAMI) has released two new geologic maps of the Linnton and Dixie Mountain areas of the Portland metro area:

**Open-File Report O-08-06 Preliminary Geologic Map of the Linnton Quadrangle, Multnomah and Washington Counties, Oregon,** by Ian P. Madin, Lina Ma and Clark A. Niewendorp.

**Open-File Report O-08-07 Preliminary Geologic Map of the Dixie Mountain Quadrangle, Washington, Multnomah and Columbia Counties, Oregon,** by Ian P. Madin and Clark A. Niewendorp.

The new geologic maps of the Linnton and Dixie Mountain quadrangles provided a view of the geology of the NW Tualatin Mountains (Portland Hills) that is unprecedented in its detail and scope. These two maps are the first 7.5 minute quadrangle geologic maps ever released by the Oregon Department of Geology and Mineral Industries that were prepared using state-of-the-art high resolution lidar technology (a 7.5 minute quadrangle map covers an area of 49 to 70 square miles).

Lidar (Light Detection and Ranging) is similar to radar, but uses rapid pulses of laser light (150,000 pulses of light per second) instead of radio waves. During the past decade lidar has revolutionized mapping around the world.

A lidar survey system, mounted in an airplane, collects tremendous quantities of data where lasers have been reflected off opaque objects like buildings, trees, bushes, and the ground surface. These data provide high-resolution, three-dimensional models of the shape of, and what is on, the surface of the earth. This makes lidar data very useful for anyone wanting to know the true shape of the land surface or of the vegetation and buildings on the surface.

Currently, the spatial data gathered in lidar surveys are correct within a few inches of the true absolute elevation of the land's surface in space and to within

**800 NE Oregon Street  
Suite 965, Portland, OR 97232  
[www.oregongeology.org](http://www.oregongeology.org)  
(971) 673-1555**

**Media Contact: James Roddey  
Earth Sciences Information Officer  
[james.roddey@dogami.state.or.us](mailto:james.roddey@dogami.state.or.us)  
(971) 673-1543 (direct line)  
(503) 807-8343 (cell)**

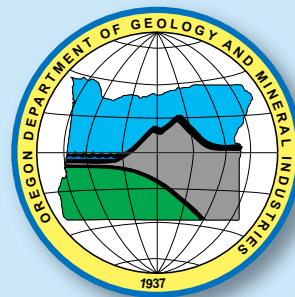
Mineral Land Regulation  
and Reclamation Program  
229 Broadalbin Street, SW  
Albany, OR 97321  
(541) 967-2039  
Gary W. Lynch, Assistant Director

Baker City Field Office  
1510 Campbell Street  
Baker City, OR 97814  
(541) 523-3133  
Mark L. Ferns, Regional Geologist

Coastal Field Office  
313 SW 2nd Street, Suite D  
Newport, OR 97365  
(541) 574-6642  
Jonathan C. Allan, Coastal  
Team Leader

Grants Pass Field Office  
5375 Monument Drive  
Grants Pass, OR 97526  
(541) 476-2496  
Thomas J. Wiley, Regional Geologist

The Nature of the Northwest  
Information Center  
800 NE Oregon Street, Suite 177  
Portland, OR 97232-2162  
(503) 872-2750  
Donald J. Haines, Manager  
Internet: <http://www.NatureNW.org>



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one foot laterally. For comparison, existing topographic maps can be off by tens of feet, both vertically and laterally.

These new lidar based geologic maps provided an incredibly detailed picture of the shape of the land, even under heavy forest, which in turn provides an accurate and detailed picture of the geology. The maps are also the first for which separate bedrock geology and surficial (surface) geology maps have been made.

The surficial geology consists of the thin deposits, like soil and alluvium, that almost completely cover the bedrock in the region. The bedrock map shows the rocks that are inferred to exist beneath the surficial cover based on scattered outcrops, roadcuts and well data.

The maps were produced as part of a cooperative agreement with the USGS National Earthquake Hazard Reduction Program (NEHRP) in an effort to find potentially dangerous active faults. While the mapping, and particularly the lidar data, suggest that the local faults are not active and pose little threat, the new mapping does reveal an even more widespread hazard in the area: landslides.

“Over 600 landslides were mapped on each quadrangle, ranging in size from a few hundred square feet to several square miles, many of which had never been seen or mapped before due to the dense ground cover,” said Ian Madin, Chief Scientist with DOGAMI. “Although most of the landslides mapped are currently inactive, the new mapping underscores how landslide prone the region is. This should help communities and residents avoid building unknowingly on existing landslides, or reactivating slides through unwitting construction or drainage changes.”

The Linnton quadrangle also tells the fascinating geologic story of ***Boring Lava volcanos*** that dot the area from Sylvan to Bonney Slope, some of which are only a few hundred thousand years old.

Portions of the Linnton and Dixie Mountain quads can be seen on DOGAMI's ***Pilot Lidar Project interactive map***, which shows a portion of the Portland metro area. This interactive map creates a “bare earth” digital elevation model (DEM) using lidar data and is searchable by street address. You can then compare and contrast lidar images with aerial photographs, topographic maps, and older style 10 meter DEMs derived from the topographic maps. Where earthquake and landslide hazard data are available, these hazard layers can be viewed as well.

**Open File Reports O-08-06 (Linnton) and O-08-07 (Dixie Mountain)** are available on CD-ROM for \$10 each. Maps are available for \$15 each. They can be purchased from the Nature of the Northwest Information Center (NNW), 800 NE Oregon Street, Suite 177, Portland, Oregon, 97232. You may also call NNW at (503) 872-2750 or order online at <http://www.naturenw.org>. There is a \$4 shipping and handling charge for all mailed items.

For additional information, please contact the Nature of the Northwest Infor-

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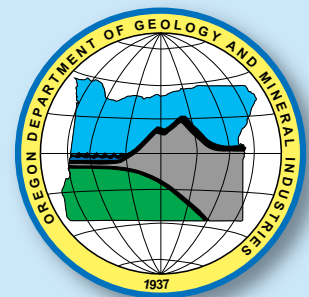
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mation Center. Additionally, these items as well as all department maps and publications can be purchased at DOGAMI Field Offices including 5375 Monument Drive, Grants Pass, (541) 476-2496 and 1510 Campbell Street, Baker City, (541) 523-3133.

The Oregon Department of Geology and Mineral Industries is an independent agency of the State, and has a broad responsibility in developing a geologic understanding of natural hazards. We then make this information available to communities and individuals to help reduce the risks from earthquakes, tsunamis, landslides, floods and volcanic eruptions. We assist in the formulation of state policy where an understanding of geologic materials, geologic resources, processes, and hazards are 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 about Oregon's fascinating geology by going online at:

<http://www.OregonGeology.org>

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