

OREGON DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

Vicki S. McConnell, State Geologist

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New website looks at Portland area using maps made with LIDAR

Portland, Oregon: The Oregon Department of Geology & Mineral Industries (DOGAMI) has launched a new interactive website that showcases the innovative use of LIDAR (Light Detection and Ranging) in creating more accurate and detailed elevation and topographic maps.

The new pilot LIDAR project website can be found at:
<http://www.oregongeology.com/sub/lidar/index.htm>

Most people are familiar with RADAR (Radio Detection and Ranging). RADAR is a system that uses radio waves to detect, determine the direction and distance and/or speed of objects such as aircraft, ships, terrain, or rain, and map them.

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.

DOGAMI's new interactive website maps create a "Bare Earth" digital elevation model (DEM) using LIDAR data available and searchable on the web by street address. You can then compare and contrast these LIDAR images against 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 are also available for viewing.

"This pilot project website using LIDAR data for the Portland metro area is our first chance to showcase this technology in Oregon," said Vicki McConnell, State Geologist and Director of DOGAMI. "For example, the landslide hazard data for Oregon City are the most accurate and precise in the state because of LIDAR."

A LIDAR survey system, mounted in an airplane, collects tremendous quantities of three-dimensional point data where lasers have been reflected off opaque objects like buildings, trees, bushes, and the ground surface. The dense amounts of spatial data provide surprisingly high-resolution, three-dimensional models

**800 NE Oregon Street
Suite 965, Portland, OR 97232
www.oregongeology.com
(971) 673-1555**

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

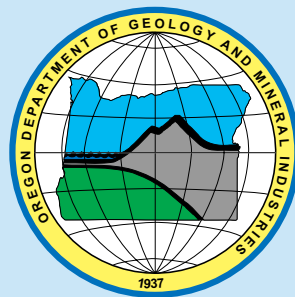
Mineral Land Regulation
and Reclamation Program
229 Broadalbin Street, SW
Albany, OR 97321
(541) 967-2039,
Gary W. Lynch, Assistant Director

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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of the shape of, and of what is on, the surface of the earth. Currently, LIDAR data are correct within a few inches of their true absolute elevation in space and to within a few feet laterally.

“We’ll be adding over 2,300 square miles of LIDAR data over the winter by flying over an area from Tillamook and Clatsop Counties to Hood River,” said McConnell. “A consortium of Federal, State and local users has come together to fund the collection of this new data that will be used for everything from hazard mapping to forest management. We’re also very excited that the Governor’s recommended budget includes \$4.3 million in LIDAR data gathering for areas of interest in western Oregon,” added McConnell.

LIDAR is very versatile data. In the past it has been used to look at clouds, and plumes of gas and pollution, to detect stealthy submarines, to nab speeders, to identify new sewer line routes and to prepare topographic elements for land maps. Other uses include 3-D modeling, dam breach analysis, wildfire hazard assessment, soil type delineation and erosion, wetland delineation and floodplain management, transportation issues, public works and engineering, fire-fighting, urban search and rescue and public safety and security issues.

“DOGAMI uses LIDAR data to identify existing natural hazards like earthquake faults and landslides that normally are very difficult to detect in forested terrain, as well as to construct accurate, precise, and high-resolution hazard maps and risk assessments. We also use LIDAR data to track coastal changes, and create more accurate tsunami inundation hazard assessment maps,” said McConnell.

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The website development team includes Paul E. Staub, Ian P. Madin, Mark Sanchez, and Deb Schueller, all with the Oregon Department of Geology and Mineral Industries; David Percy, Research Faculty, Geospatial Data Manager, Department of Geology, Portland State University; and Tim Welch, computer programmer, Academic & Research Computing Center, Portland State University. The software was developed as part of the Oregon Sustainable Community Digital Library (OSCDL) by Academic & Research Computing at Portland State University.

Another new web-based resource is DOGAMI’s Oregon Geologic Data Compilation (OGDC) at: **<http://www.oregongeology.com/sub/ogdc/index.htm>**. OGDC brings together the best available geologic mapping and data from all relevant published and unpublished sources: state and federal agencies, university thesis work, and other documents. On the website, users can view a subset of this data that includes colored geologic unit polygons overlaid on topographic and hillshade images. Map zoom and pan controls along with an info-click function will allow users to view stratigraphy, lithology, and rock property map types.

Learn more about and Oregon’s geology by going online at:
<http://www.OregonGeology.com>

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