

OREGON DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

Vicki S. McConnell, State Geologist



NEWS RELEASE: December 19, 2012

Thousands of landslides mapped in Lane and Lincoln counties

Portland, Oregon: The Oregon Department of Geology and Mineral Industries (DOGAMI) has completed lidar-based landslide inventory mapping for the North Fork Siuslaw River watershed in Lane County and the Big Elk Creek watershed in Lincoln and Benton Counties. DOGAMI located 2,840 landslides in these two watersheds.

The study, released as **DOGAMI Open-File Report O-12-07, Lidar data and landslide inventory maps of the North Fork Siuslaw River and Big Elk Creek watersheds, Lane, Lincoln, and Benton Counties, Oregon**, was funded by the United States Environmental Protection Agency (US EPA) and the State of Oregon. The purpose of the study is to assist US EPA and the Oregon Department of Environmental Quality (DEQ) in understanding potential landslide sources and to improve ability of these agencies to identify other potential sources of stream sedimentation and warming by using high-resolution lidar data.



(top) North Fork Siuslaw River watershed; (bottom) Big Elk Creek watershed

For the study DOGAMI combined newly acquired lidar data with existing lidar data and examined previous landslide studies before beginning new mapping. Although lidar data were acquired for seven watersheds in the Coast Range, landslide mapping focused on North Fork Siuslaw River and Big Elk Creek watersheds as examples.

“Using lidar imagery as a base map allowed us to accurately map an astounding number of slides,” said Bill Burns, DOGAMI engineering geologist.

“Prior to this study, only 261 slides had been located in these two watersheds. But with the lidar and a landslide mapping protocol developed here at DOGAMI, we were able to quickly and precisely map landslides, even in heavily forested areas.”

Burns cautioned that these data and maps are designed for regional applications and that the data and maps should not be used as an alternative to site-specific studies in critical areas.

The sources of small shallow debris flows (<1,000 ft²), which are common in mountainous areas of the Pacific Northwest, are likely not captured in this study.

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

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Besides landslide mapping, the study provides examples of methods that can be used to identify both landslide and nonlandslide sources of sediment and stream warming.

“This is just the tip of the iceberg in showing what lidar can do,” said Ian Madin, DOGAMI Chief Scientist. “As the lead agency in the state acquiring and imaging lidar we are finding new and exciting ways to use this amazing technology every day.”

Open-File O-12-07 consists of two Esri ArcGIS v. 10 landslide inventory geodatabases, two thematic map plates, a 15 page report, and appendices detailing the landslide mapping protocol, Watershed Sciences, Inc., lidar collection, and DOGAMI lidar quality assurance.

To preview this publication, visit:

<http://www.oregongeology.org/pubs/ofr/p-O-12-07.htm>

DOGAMI Open-File Report O-12-07 can be purchased on CD-ROM for \$15 each from the Nature of the Northwest Information Center (NNW), 800 NE Oregon Street, Suite 965, Portland, Oregon, 97232. Color plots of the map plates are available for \$40 each. You may also call NNW at (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 about Oregon's geology online: <http://www.OregonGeology.org>

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