STATE OF OREGON
DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
IAN P. MADIN, INTERIM STATE GEOLOGIST
www.OregonGeology.org

Detailed Map of the Bull Run Lake Landslide

2015

DOGAMI SPECIAL PAPER 46

Surficial and Bedrock Engineering Geology, Landslide Inventory and Susceptibility, and Surface Hydrography of the Bull Run Watershed, Clackamas and Multnomah Counties, Oregon

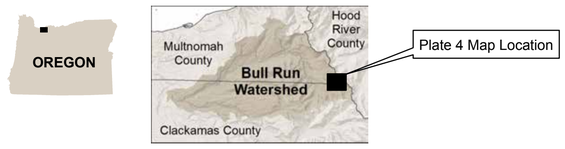
by William J. Burns, Katherine A. Mickelson, Cullen B. Jones, Mathew A. Tilman, and Daniel E. Coe

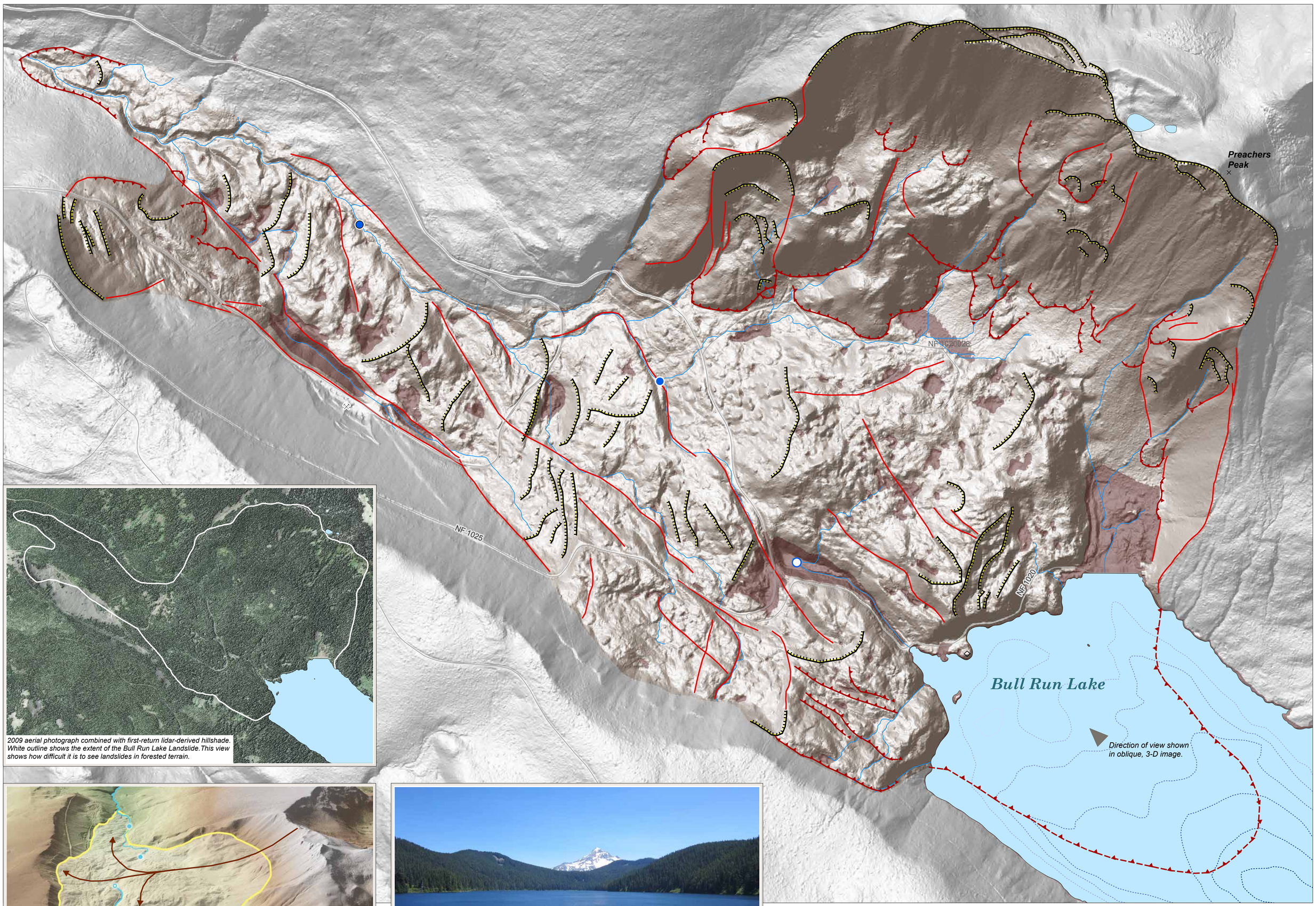
Funding for this project was provided by the City Portland Water Bureau (intergovernmental agreement IGA #12122012).

PLATE 4

ABOUT THIS PUBLICATION

The Bull Run Watershed (BRW) is the primary drinking water supply for the City of Portland and several suburbs and is cooperatively managed by the Portland Water Bureau and the U.S. Forest Service. The watershed is located 25 miles (40 km) east of downtown Portland on the western slopes of the Cascade Range. The BRW is a surface water collection system, so the risk of landslide impact directly to the water and the infrastructure is relatively high. Because landslides are one of the most widespread and damaging natural hazards in Oregon, it is important to map and assess the risk in the BRW. The purpose of this study is to assist the Portland Water Bureau in understanding the landslide hazard better and thus increase their ability to reduce future risk. The study publication consists of a text report, five map plates, and three geodatabases.





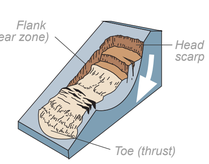
2009 aerial photograph combined with first-return lidar-derived hillshade. White outline shows the extent of the Bull Run Lake Landslide.This view shows how difficult it is to see landslides in forested terrain.

Oblique view of the area created with lidar imagery. View looking northwest from outlet of Bull Run Lake. This view shows that the Bun Run Lake Landslide is a complex landslide. Complex landslides are combinations of two or more types of slides. Here slump features occur in the upper region and earth flow features occur near the toe.

Photograph of Bull Run Lake from the landslide dam looking southeast.

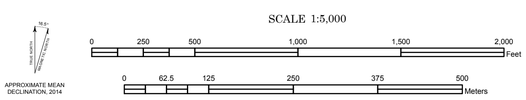
MAP SYMBOLS

- Thrust Feature
- Thrust Feature, Location Approximate
- Shear Zone
- Scarp
- Lake / Reservoir
- Stream
- Summit
- Road
- Contour (10-ft interval)
- Spring
- Captured Stream
- Closed Depression



EXPLANATION

Plate 1 of this publication is an inventory of 1,068 landslide deposits mapped in study area. The Bull Run Lake Landslide shown here on Plate 4 is unique because it is a natural dam that impounded water in the upper part of the watershed and formed Bull Run Lake. Identifying how a landscape formed can be tricky. For example, this area has been mapped as a glacial moraine (Allen, 1989) and as a landslide (Sherrod and Pickthorn, 1989). However, the precise extent and detailed mapping of the landslide was made possible only by imaging bare-earth lidar data collected in 2007. Lidar allows us to identify landslide scarps, fault shear zones, thrust faults, closed depressions, springs, and even a captured stream in this area. A captured stream occurs when a stream is diverted from its original surface course to underground.



NOTICE

This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. This publication cannot substitute for site-specific investigations by qualified practitioners. Site-specific data may give results that differ from the results shown in the publication. See the accompanying text report for more details on the limitations of the methods and data used to prepare this publication.

Source Data:
Lidar data from DOGAMI Lidar Data Quadrangles LDQ-2010-45121-D7-Bull Run Lake and LDQ-2010-45121-D8-Hickman Butte.

Roads, streams, and waterbodies from the City of Portland and the Oregon Department of Geology and Mineral Industries (2013). Additional physical and cultural locations from the Geographic Names Information System, U.S. Geological Survey (2013). Bathymetry digitized from Snyder and Brownell (1996).

Projection:
North American Datum 1983, HARN Oregon Statewide Lambert International Feet

Primary Cartography:
William J. Burns

REFERENCES

Allen, J.E., 1989, Ice-age glaciers and lakes south of the Columbia River Gorge: Oregon Geology, v. 51, no. 1, p. 12-14.

Highland, L., compiler, 2004, Landslide types and processes: U.S. Geological Survey Fact Sheet 2004-3072 (ver. 1.1), 4 p.

Sherrod, D.R., and Pickthorn, L.B.G., 1989, A note on the origin of Bull Run and Lost Lakes, Western Cascades, Oregon: Oregon Geology, v. 51, no. 3, p. 60.

Snyder, D.T., and Brownell, D.L., 1996, Hydrogeologic setting and preliminary estimates of hydrologic components for Bull Run Lake and the Bull Run Lake drainage basin, Multnomah and Clackamas Counties, Oregon: U.S. Geological Survey, Water-Resources Investigations Report 96-4064.

Nature of the Northwest

For copies of this publication contact:
Nature of the Northwest Information Center
800 NE Oregon Street, Ste. 965
Portland, Oregon 97232
telephone (971) 673-2331
http://www.naturenw.org