

Alaska Division of Geological & Geophysical Surveys

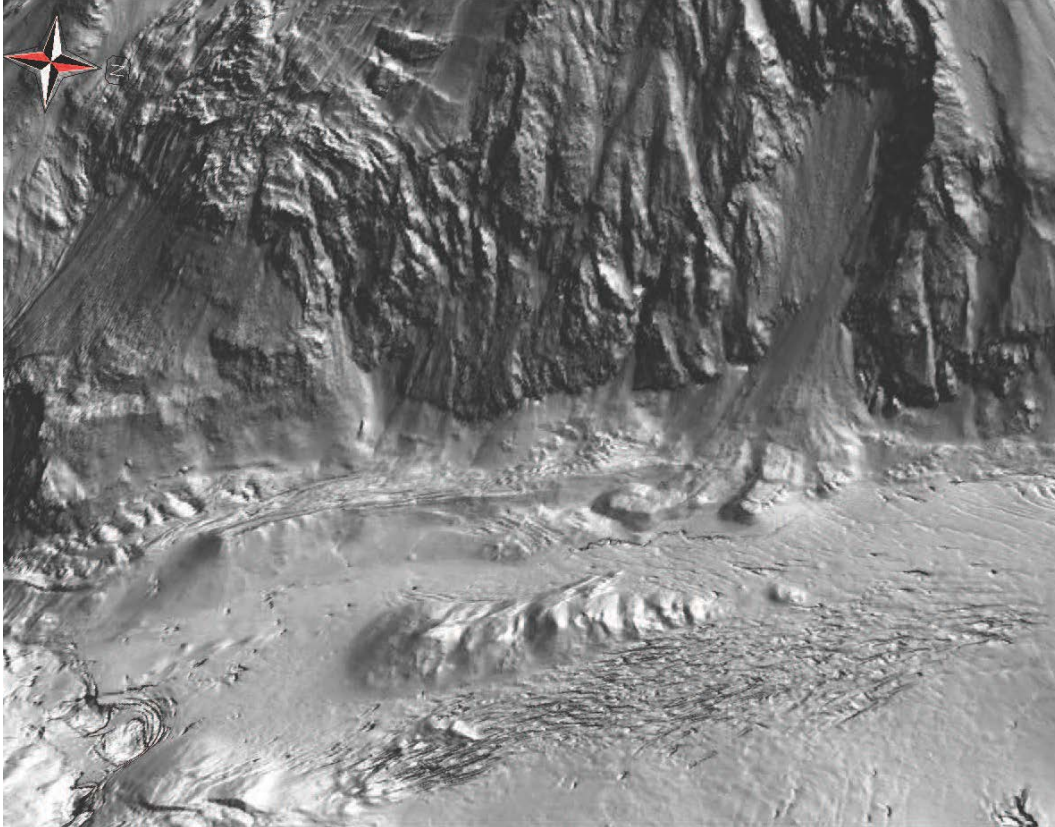
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**HIGH-RESOLUTION LIDAR DATA FOR THE WHITTIER AREA, PASSAGE CANAL, AND  
PORTAGE LAKE, ALASKA**

by

T.D. Hubbard, G.J. Wolken, D.S. P. Stevens, and R.A. Combellick

April 2013



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*Cover Image: Oblique lidar hillshade image showing landslide debris deposited on the surface of Learnard Glacier*

*Note: This report, including all digital lidar data, explanations, and tables, is available in digital format from the DGGS website ([www.dggs.alaska.gov](http://www.dggs.alaska.gov)) for free download.*



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T.D. Hubbard<sup>1</sup>, G.J. Wolken<sup>1</sup>, D.S.P. Stevens<sup>1</sup>, and R.A. Combellick<sup>1</sup>

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## Introduction

In support of geologic mapping and hazards evaluation in and near Whittier, Alaska, the Division of Geological & Geophysical Surveys (DGGS) acquired, and is making publicly available, lidar (light detection and ranging) data for an area along Passage Canal, Portage Lake, and Portage Glacier Highway (fig.1). Data will serve multiple purposes but were primarily collected to map geology and evaluate potential geologic hazards. Steep slopes with poor access, combined with dense vegetation and a thick moss ground-cover that obscures the bedrock surface, make the use of lidar one of the most effective ways to map the geology and evaluate unstable slopes and other hazards.

## Data acquisition

Lidar data, acquired and processed by Watershed Sciences, Inc. (WSI) consist of continuous coverage of approximately 50 mi<sup>2</sup> (~130 km<sup>2</sup>) encompassing an area extending from Portage Lake eastward to Logging Company Bay in Passage Canal in the Seward D-4, D-5, and D-6 1:63,360-scale quadrangles (fig. 1). Lidar data collected below 1,600 ft (488 m) elevation have a minimum average pulse density of 8 pulses/m<sup>2</sup> to penetrate the thick vegetation cover; above 1,600 ft (488 m), where vegetation is generally less dense, data were collected with an average pulse density of at least 4 pulses/m<sup>2</sup>.

Following lidar data collection and processing by WSI and their survey subcontractor, McClintock Land Associates, WSI submitted the data to the State of Oregon Department of Geology and Mineral Industries (DOGAMI) for independent quality control analysis. After addressing any concerns from DOGAMI, WSI submitted the revised data set to DGGS along with a technical report describing details about the lidar acquisition, accuracy, and quality. DOGAMI also provided a separate report summarizing their methodologies and the results of quality control checks. Both reports are available via the DGGS website, <http://www.dggs.alaska.gov/pubs/id/24976>.

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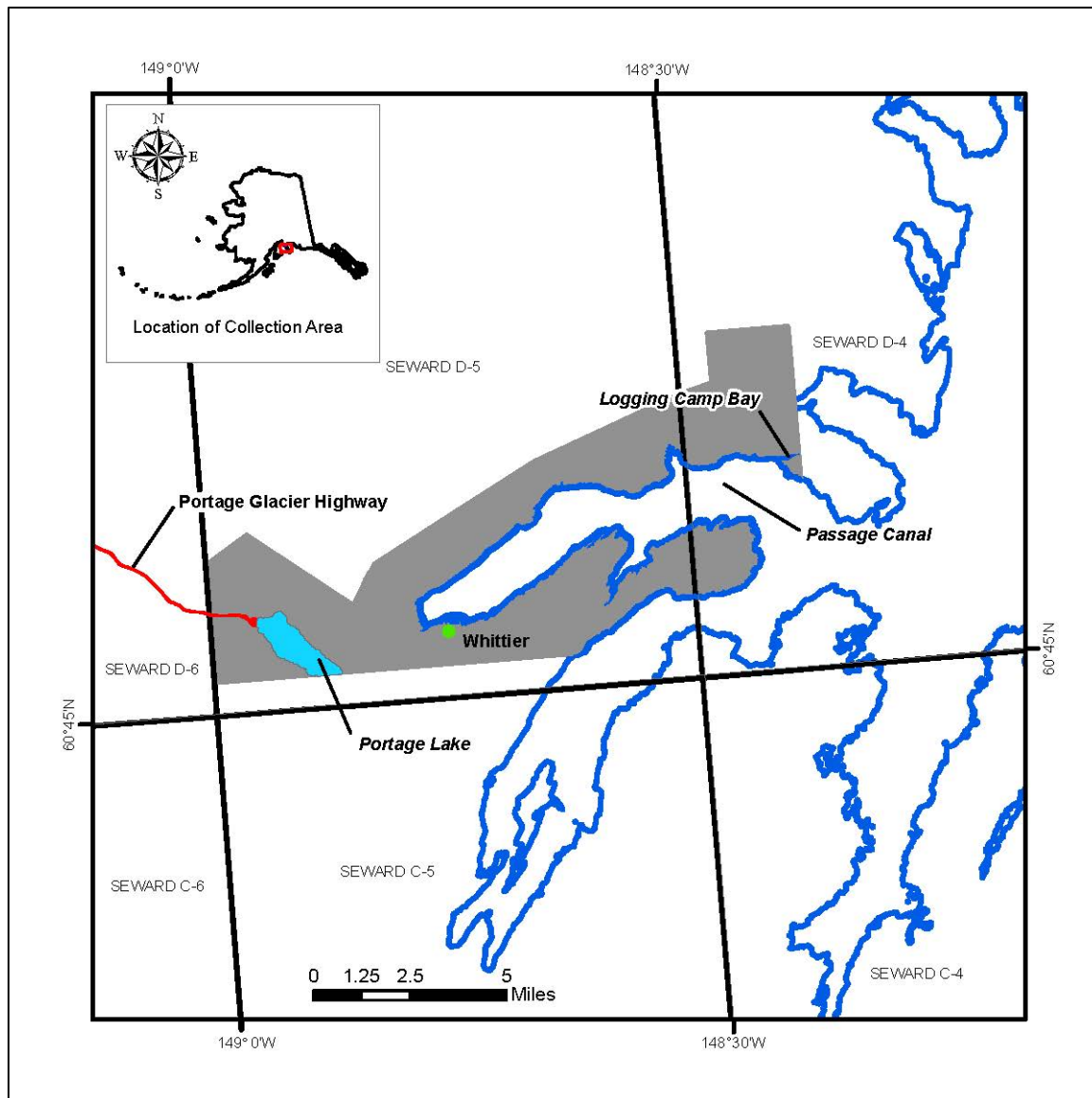


Figure 1. Map of study area; lidar data collection area shown by gray shading.

## File Naming Convention and Organization

DGGS organizes its lidar data download packages by 1:250,000-scale quadrangle. The Whittier lidar package includes data for a portion of the Seward Quadrangle. The names of geospatial data files (tiles) in each download package identify both the lidar data type and name of the 1:250:000-scale or, where applicable, the 1:63,360-scale quadrangle in which the data are located. The general format for file names is *x\_y* where *x* is the data type abbreviation and *y* is the abbreviated quadrangle name. Table 1 lists the abbreviations used for each available data type. Quadrangle abbreviations follow USGS standards.

Data type	Data type abbreviation (x)
Bare-earth digital elevation model (DEM)	be
Bare-earth DEM hillshade image	hs
Lidar intensity image	in
Highest-hit DEM	hh
Hydro-flattened waterbody polygons (includes lakes, canals and rivers)	water
Vegetation digital surface model (DSM)	veg

*Table 1. Abbreviations used in file names to designate different data types.*

### File naming examples:

1. A file with the name “be\_sewd4” is a bare-earth DEM for the Seward D-4 1:63,360-scale Quadrangle.
2. A file with the name “water\_sew” includes data for hydro-flattened water bodies in the Seward 1:250,000-scale Quadrangle.

Point-cloud data (all returns and ground-classified returns) are available for order from DGGS. Contact our staff at [dggsgis@alaska.gov](mailto:dggsgis@alaska.gov) for more information.

In addition to the above data files, DGGS is also providing index files, available for free download, showing the location of LAS (point-cloud data), vector, and raster files.

## Acknowledgments

Financial support for this work came from State of Alaska capital-project funding. The authors are grateful for support from several staff members of the Division of Geological & Geophysical Surveys. Jim Weakland helped process data and create the hillshade images; Lauren Southerland helped organize the data for distribution; Susan Seitz created the programming by which the data are offered online; Simone Montayne assisted with metadata; and Ken Woods manages data on the server.