Oregon Geology Fact Sheet | Oregon Lidar Consortium

What is the Oregon Lidar Consortium?

The Oregon Department of Geology and Mineral Industries (DOGAMI) has been involved in pilot efforts to collect high-resolution lidar in Oregon since 2003. In 2006-2007 we were successful in forming the **Portland Lidar Consortium**, which brought together 17 agencies ranging from the USGS to the City of Silverton to acquire 2,200 square miles of seamless, high-quality public domain lidar data.

Among the many benefits of the consortium approach are that large swaths of lidar data can be collected seamlessly, costs per unit area to collect the data are greatly reduced, expert quality assurance and quality control are uniformly applied to the data, statewide standardization of data can be assured, and partners with small areas get the cost and quality benefits of the large survey instead of having to buy a much more costly small survey.

In 2007 the Oregon 74th Legislative Assembly directed DOGAMI to extend lidar collection efforts throughout the state. Legislators approved the consortium model for data collection and data sharing, and provided modest seed money. The ultimate goal is to provide high-quality lidar coverage for the entire state. To achieve this goal DOGAMI has formed the **Oregon Lidar Consortium (OLC)**, which develops cooperative agreements for the collection of lidar data that benefit the public at large, the business community, and agencies at all levels of government.

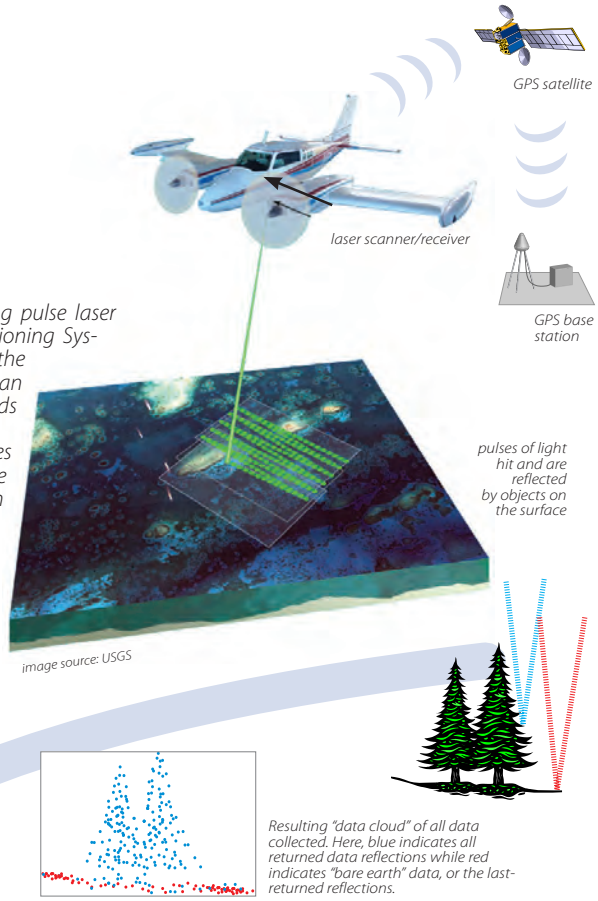
In 2008 DOGAMI established a state price agreement for lidar collection with Watershed Sciences, Inc. of Corvallis, Oregon, through a national competitive bidding process. Since then DOGAMI has developed over 20 projects using funds from 44 different partner organizations. As of the end of 2011, 26% of the land area and 91% of the population of Oregon are covered by public domain lidar data. To develop a new project, DOGAMI solicits seed money from a wide range of agencies and then builds on that core funding by reaching out to other partners who have a shared interest in the area. This strategy allows the program to collect large seamless blocks of data and ensures that the data are being collected where needed.

To make this amazing new data more widely available to the public, DOGAMI has developed a web-based lidar data viewer that allows users to view images of the data at a range of scales. The viewer also serves as a portal for those who wish to acquire a copy of the data.

Online DOGAMI Lidar Data Viewer

http://www.oregongeology.org/sub/lidardataviewer/index.htm

How are lidar maps made?



1. Collect data

A lidar system consists of a scanning pulse laser scanner and receiver, a Global Positioning System (GPS), including base stations on the ground within the survey area, and an Inertial Navigation System that records the exact orientation of the scanner.

The laser emits up to 200,000 pulses of light per second and measures the distance from the scanner to the earth below.

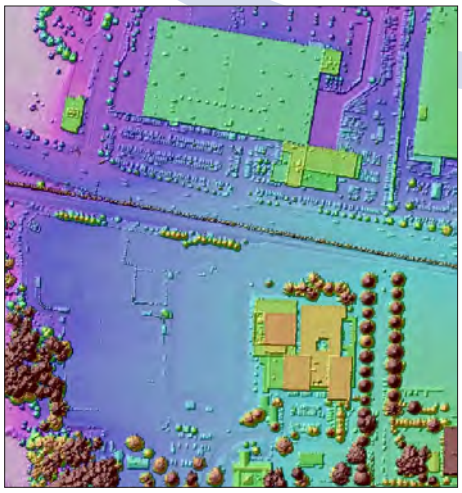
Resulting "data cloud" of all data collected. Here, blue indicates all returned data reflections while red indicates "bare earth" data, or the last-returned reflections.

2. Process data

Lidar data are recorded as a cloud of X, Y, Z points. Computer processing selects out ground points that are turned into a regularly sized surface grid. The grid data set is known as a digital elevation model (DEM). A DEM can be built of everything that is on the surface (highest hit) or only the points that represent the last reflections (bare earth).

3. Display data

Hill shading and coloring are applied to the DEM to create the final map. A DEM from highest-hit lidar data of the Beaverton, Oregon, area is shown below. For comparison, an aerial photograph of the same area is also shown.



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What can I do with lidar?

- Find landslides, old cuts and grades
- Measure and estimate fills and cuts
- Find stream channels, measure gradients
- Measure the size and height of buildings, bridges
- Locate and measure every tree in the forest
- Characterize land cover
- Model floods, fire behavior
- Locate power lines and power poles
- Support archeological investigations
- Map wetlands and impervious surfaces
- Define watersheds and viewsheds
- Model insolation and shading
- Map road center and sidelines
- Find law enforcement targets
- Map landforms and soils
- Assess property remotely
- Inventory carbon
- Monitor quarries, find abandoned mines
- Enhance any project requiring a detailed and accurate 2-D or 3-D map

What kind of data can I get?

All data acquired by the OLC will be in the public domain and copies will be provided to all OLC funding partners. Data distribution systems for the public are being developed and will include a fee for copying and delivering data. The data may include actual lidar elevation points, both bare earth and classified all-returns (LAS format), along with 3-ft DEMs (ESRI grid format) and intensity images (GeoTiff format).

How do I get my area included in an upcoming survey?

The first step for interested parties is to contact DOGAMI and provide a map of your area of interest along with an estimate of your available funding.

How do I contact the Oregon Lidar Consortium?

For more information, contact:

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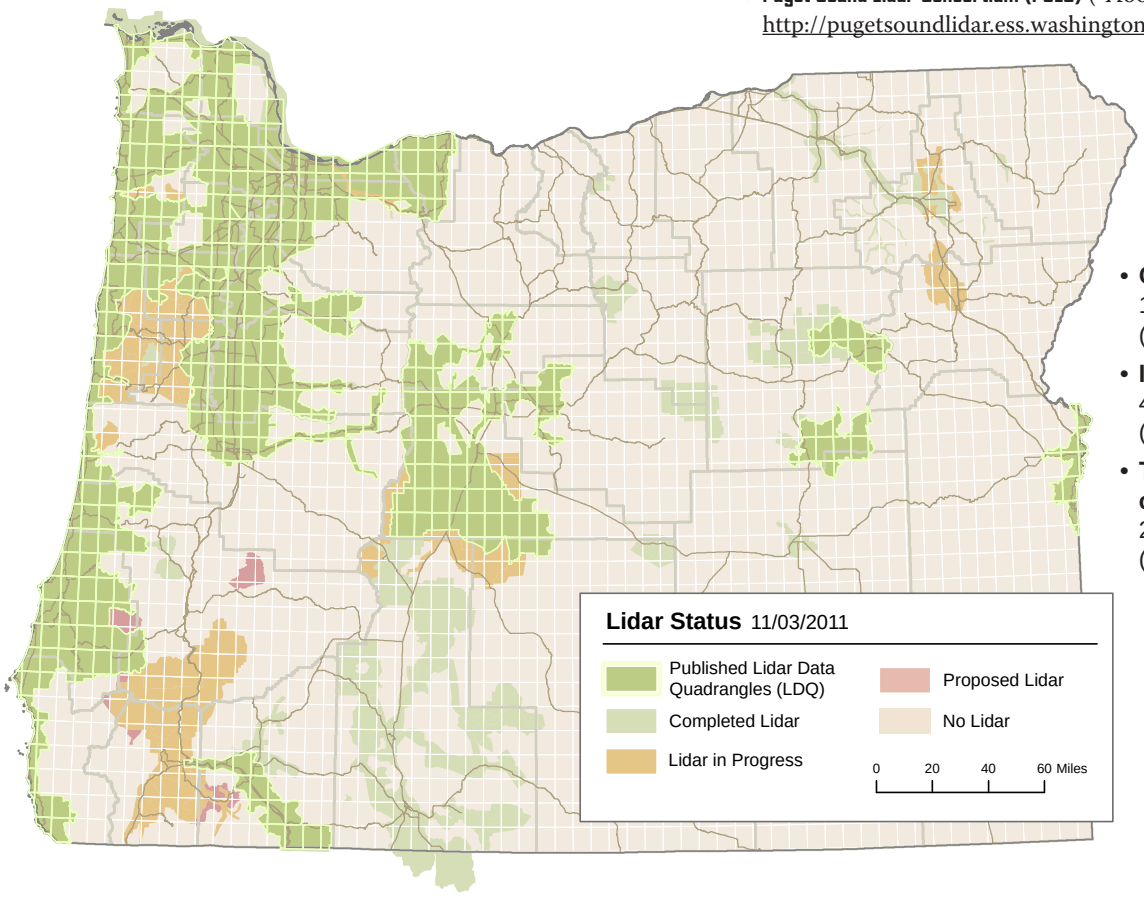
email: Ian.Madin@dogami.state.or.us

RESOURCES – Where can I get additional information?

- **Oregon Lidar Consortium** http://www.oregongeology.org/projects/olc/
- **Online DOGAMI Lidar Data Viewer** http://www.oregongeology.org/sub/lidardataviewer/index.htm
- **Nature of the Northwest Information Center** (http://www.naturenw.org),
- **NOAA Digital Coast lidar data collection** http://www.csc.noaa.gov/digitalcoast/data/coastallidar/index.html
- **State of Oregon Geospatial Enterprise Office (GEO) spatial data library** (DEM) http://www.oregon.gov/DAS/EISPD/GEO/sdlibrary.shtml
- **OpenTopography** (high-resolution topographic data and tools) http://www.opentopography.org/
- **USGS National Elevation Dataset (NED)** (DEM) http://ned.usgs.gov/
- **METRO (Portland area only)** http://www.oregonmetro.gov/index.cfm/go/by.web/id=24876
- **Puget Sound Lidar Consortium (PSLC)** ("Hood to Coast" area only http://pugetsoundlidar.ess.washington.edu/index.htm



- **Collected and delivered:** 19,243 square miles (12,316,129 acres)
- **In progress:** 4,453 square miles (2,850,427 acres)
- **Total project areas contracted:** 23,696 square miles (15,165,440 acres)