

# NSF Sponsored NATIONAL CENTER FOR AIRBORNE LASER MAPPING

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## Airborne Laser Swath Mapping Project

### Landsliding and the Evolution of Mountainous Landscapes

**PI: Joshua Roering, University of Oregon**

Date Flown: September 24-26, 2006 (days 267-269)

## List of products – quick view

1. 1m DEMs in ESRI GRID file format, based on the filtered (“bare-earth”) and unfiltered last return laser point datasets.
2. 1m Shaded Relief Maps in ESRI GRID file format.
3. 1m Contour Map in ESRI Coverage file format, based on the bare-earth DEMs.
4. Raw laser point data (9 columns), ASCII format.
5. Last return laser point data projected to NAVD88 (Geoid03), ASCII format, one file per flight-line.
6. Filtered and unfiltered last return laser point data (xyz), tiled with overlap, ASCII format.
7. Shaded Relief Maps and Contour Map high resolution JPEG images for quick visualization.
8. Report on the data processing.

## Comments

- The bare-earth classification (filtering) was performed using Terrasolid’s TerraScan Lidar processing software. Details about the filtering process can be found in the Processing Report. Please note that these data are what we consider an improvement over the “first look” data you may have previously received. Please use this new dataset for all your analysis.
- You may observe a periodic fine scale elevation variation throughout the dataset (about 5 to 20 cm, similar to a “corduroy” pattern), which is a property of the Optech LIDAR system, and it’s within the machine’s error limits. This variation can be removed by using

a smoothing routine, but this process could smooth other features as well and we feel that the decision is best left with the PI.

## What's on the DVD(s)

### DVD1

**GIS\_Data.zip** – this archive contains the ArcInfo datasets and the associated “info” directory

- Digital Elevation Models, in ESRI GRID file format
  - “flt\_grd” – 1m bare-earth grid
  - “unflt\_grd” – 1m unfiltered “last-return” grid

Projection: UTM zone 10N, with orthometric heights in NAVD88 computed using NGS GEOID03 model.

- Shaded Relief Maps, in ESRI GRID file format
  - “flt\_shd” – bare-earth shaded relief map
  - “unflt\_shd” – unfiltered “last-return” shaded relief map

The shaded relief maps were generated from the 1m DEMs.

- Contour Map, in ESRI Coverage file format
  - “flt\_cnt” – bare-earth contour coverage (1m contour spacing)

The contour map was generated from the 1m bare-earth (filtered) DEM.

**LR\_NAVD88.zip** – This is the first part of a multi-volume archive containing unfiltered last return point data, one file per flight strip. *Note: You'll need to copy on your local drive all zip volumes to successfully extract the data. The second and last volume of this archive is on DVD2.*

The flight strip number is the ID number as generated by Optech's REALM software. The numbering scheme may not start from 1 and the numbers are not necessarily consecutive. The flight strip ID numbers in this archive match the ID numbers in the 9-column archive.

The format is 3-column space delimited X Y Z:

X = Easting last return  
Y = Northing last return  
Z = Elevation last return

The projection is UTM zone 10N with orthometric heights in NAVD88 computed using the NGS GEOID03 model.

**Images** – This folder contains high resolution images for quick visualization. The images follow the same naming convention as the ArcInfo datasets.

**Readme.pdf** – this document

**ProcessingReport.pdf** – detailed report describing how the data was processed

## DVD2

**LR\_NAVD88.Z01** - second and last part of the unfiltered last return flight-line point data archive.

## DVD3

**Filtered\_Tiled\_PointCloud.zip** – ZIP archive with filtered last return laser point data split in 2km x 2km tiles with 60m overlap.

The tile filenames start with the letter “f” (indicating the tile contains *filtered* data) followed by the lower left grid node coordinates (without taking into account the tile overlap).

The format is 3-column space delimited X Y Z:

X = Easting last return  
Y = Northing last return  
Z = Elevation last return

The projection is UTM zone 10N with orthometric heights in NAVD88 computed using the NGS GEOID03 model.

**UnFiltered\_Tiled\_PointCloud.zip** – This is the first part of a multi-volume archive containing unfiltered last return laser point data split in 2km x 2km tiles with 60m overlap. *Note: You'll need to copy on your local drive all zip volumes to successfully extract the data. The second and last volume of this archive is on DVD4.*

The tile filenames start with the letter “u” (indicating the tile contains *unfiltered* data) followed by the lower left grid node coordinates (without taking into account the tile overlap).

The format is 3-column space delimited X Y Z:

X = Easting last return  
Y = Northing last return  
Z = Elevation last return

The projection is UTM zone 10N with orthometric heights in NAVD88 computed using the NGS GEOID03 model.

## DVD4

**UnFiltered\_Tiled\_PointCloud.z01** – second and last part of the unfiltered tiled point cloud archive.

## **DVD5 - DVD7**

The last 3 DVDs contain ZIP archives with raw laser point data files in 9-column ASCII format, one file per flight strip. The files were individually compressed using the Unix version of the GNU GZip software. On Windows, WinZip can be used to extract these files. The 9-column is the most complete format.

The nine columns are as follows:

1. GPS time (seconds of week);
2. Easting last return;
3. Northing last return;
4. Height last return;
5. Intensity last return;
6. Easting first return;
7. Northing first return;
8. Height first return;
9. Intensity first return.

**Note** that in these 9-column files no geoid model has been applied - height values are ellipsoid heights and these height values will NOT match orthometric heights (elevations) found in the 3-column (xyz) output or in the 1-meter DEM grid nodes. The UTM zone code (10) is appended to the Easting coordinate in this nine-column format.

You'll need all three ZIP archive parts in order to extract the files.

### **Software required for using the data**

The ESRI Grids and Coverages can be viewed with all ESRI software, such as ArcGIS, ArcMAP, and ArcView 3.xx. Please contact NCALM if alternative formats are needed.

All ZIP archives were created with WinZip v.10.0. Large dataset were compressed to multi-volume ZIP files in order to limit the file sizes to 2GB.