

# NSF Sponsored NATIONAL CENTER FOR AIRBORNE LASER MAPPING

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## **Airborne Laser Swath Mapping Project**

### **Great Smokey Mountains, NC**

**PI: Matt Jungers, University of Vermont**

Date Flown: November 14, 2006

## **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. Topography Map (1m contour interval) in ESRI Coverage file format.
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. 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** – this folder contains the ArcInfo datasets and the associated “info” directories.

- "unflt\_grd" - ArcInfo unfiltered elevation grid, 1m cell size;
- "unflt\_shd" - ArcInfo unfiltered shaded relief grid, 1m cell size;
- "flt\_grd" - ArcInfo filtered elevation grid, 1m cell size;
- "flt\_shd" - ArcInfo filtered shaded relief grid, 1m cell size;
- "flt\_cnt" - ArcInfo contour coverage, 1m interval.

Projection: UTM zone 17N, with orthometric heights in NAVD88 computed using NGS GEOID03 model.

**Point\_Data** - this folder contains laser point datasets

**LR\_NAVD88.zip** – ZIP files with unfiltered last return point data, one file per flight strip.

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 17N with orthometric heights in NAVD88 computed using the NGS GEOID03 model.

**Filtered\_PointCloud\_Tiles.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 17N with orthometric heights in NAVD88 computed using the NGS GEOID03 model.

**Unfiltered\_PointCloud\_Tiles.zip** – ZIP archive with unfiltered last return laser point data split in 2km x 2km tiles with 60m overlap.

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 17N with orthometric heights in NAVD88 computed using the NGS GEOID03 model.

**9\_col.zip** - ZIP archive containing raw laser point data files in 9-column ASCII format, one file per flight strip. The 9-column is the most complete laser point data 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 (17) is appended to the Easting coordinate in this nine-column format.

**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

### 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 archives (>2GB) may not be compatible with other ZIP applications.