NSF Sponsored
NATIONAL CENTER FOR AIRBORNE LASER MAPPING

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Airborne Laser Swath Mapping Project

Plum Island, Massachusetts, USA
PI: Vinton Valentine
Date Flown: April 18th and 19th, 2005

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 DEM.
4. Raw laser point data (9 columns), ASCII format.
5. Last and first return point data (xyzi), per flightline, ASCII format.
6. Filtered and unfiltered last return laser point data (xyzi), tiled with overlap, ASCII format.
7. Shaded Relief Maps and Contour Maps 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 previously received. We suggest you use these new data 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" directory
- <u>Digital Elevation Models</u>, in ESRI GRID file format
    "**filtered_grd**" – bare-earth grid
    "**unfil_grd**" – unfiltered "last-return" grid

    Grid Parameters
    Cell Size: 1m
    Griding Method: Kriging
    Kriging parameters:
        Variogram: Linear
        Nugget Variance: 0.07 meters
        MicroVariance: 0.00 meters
        SearchDataPerSector: 10
        SearchMinData: 5
        SearchMaxEmpty: 1
        SearchRadius: 40m
    Projection: MA-Mainland State Plane, with orthometric heights in NAVD88 computed using NGS GEOID03 model.

- <u>Shaded Relief Maps</u>, in ESRI GRID file format
    "**ground_shd**" – bare-earth shaded relief map
    "**unfil_shd**" – unfiltered "last-return" shaded relief map

    Cell Size: 1m. The shaded relief maps were generated from the 1m seamless DEMs.

- <u>Contour Map</u>, in ESRI Coverage file format
    "**ground_cnt**" – bare-earth contour coverage

    Contour Spacing: 1m. The contour map was generated from the 1m seamless DEM.

Images – this folder contains high resolution images for quick visualization

Point Data – Filtered Tiles
- "**filtered_LR_xyzi_sp_tiles.zip**" – ZIP archive containing filtered last return laser point data (xyzi, MSP projection) split in 2km x 2km tiles with 100m overlap.
    Tile naming convention:
    f<min_easting>_<min_northing>.xyzi (ex. f248098_941623.xyzi), where:
    "f" stands for "filtered",
    <min_easting> and <min_northing> are the coordinates of the lower left tile corner, ignoring the overlap.

    The format is 4-column space delimited X Y Z I:
    X = Easting last return
    Y = Northing last return

Z = Elevation last return
I = Intensity last return

The projection is MA-Mainland State Plane Coordinates with orhtometric heights in NAVD88 computed in using the NGS GEOID03 model.

Readme.pdf – this document

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

DVD2

Point Data – Unfiltered Tiles
− "**unfil_LR_xyzi_sp_tiles_part1.zip**" and
   "**unfil_LR_xyzi_sp_tiles_part2.zip**" - ZIP archives containing unfiltered last return laser point data (xyzi, MSP projection) split in 2km x 2km tiles with 100m overlap. Tile naming convention:
   u<min_easting>_<min_northing>.xyzi (ex. u248098_941623.xyzi), where:
   "u" stands for "unfiltered",
   <min_easting> and <min_northing> are the coordinates of the lower left tile corner, ignoring the overlap.

DVD3

Point Data – Flight Lines FR
− "**FR_xyzi_sp_flines_part1.zip**" and
   "**FR_xyzi_sp_flines_part2.zip**" - ZIP archives containing unfiltered first return laser point data (xyzi, MSP projection), one file per flight strip.

DVD4

Point Data – Flight Lines LR
− "**LR_xyzi_sp_flines_part1.zip**" and
   "**LR_xyzi_sp_flines_part2.zip**" - ZIP archives containing unfiltered last return laser point data (xyzi, MSP projection), one file per flight strip.

DVD5

Point Data – Raw 9 col
The folder contains ZIP archives with raw laser point data files in 9-column ASCII format, one file per flight strip.
- "**raw_9col_05_108.zip**" – data collected on the first day of the survey (April 18th)
- "**raw_9col_05_109_1.zip**" – data collected on the morning of the second day of the survey (April 19th)
- "**raw_9col_05_109_2.zip**" – data collected on the afternoon of the second day of the survey (April 19th)

   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 4-column (xyzi) output or in the 1-meter DEM grid nodes. The UTM zone code (19) is appended to the Easting coordinate in this nine-column format.

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.