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| Ulster, Dutchess, and Orange Counties NY-Sandy LiDAR  Delivery Report Produced for U.S. Geological Survey  USGS Contract: G10PC00013  Task Order: G13PD00855  Reporteport Date: 10/09/2012 | | |
| Report Date: August 14, 2015 | |
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**USGS Ulster, Dutchess, and Orange Counties NY LiDAR Delivery Report LiDAR Deliverables Overview Checklist**

**Raw Point Cloud Data**

LAS version 1.2

Georeferenced

GPS Times are included

Intensity values are included

Full swaths

1 file per swath, 1 swath per file, file size does not exceed 2GB

**Classified Point Cloud Data**

LAS Version 1.2

Correct Georeference Information

Contains GPS Times

Contains Intensity Values

Tile to 1500 x 1500 m Tile Grid

Classified with class 1 – unclassified, class 2 – Bare-earth Ground, 7 – Noise, 9 – Water, 10 –

Ignored ground

**Bare Earth Surface (Raster DEM)**

Cell size of 1 m

ERDAS .img File format

Georeference info included (xml files)

Tiled with no overlap

Reviewed for edgematching and artifacts

Free of void areas

Hydrographic features have been flattened according to SOW

**Survey Data**

Surveyed Quality Check point report, photos, and coordinate listing

Check points as a shapefile

**Calibration Points**

All points used by the LiDAR acquisition provider to calibrate and control the LiDAR data in shapefile format

Attribute table includes x, y, and z coordinates

**Metadata**

FGDC Compliant metadata for:

Deliverables (Boundary, Tile Grid, LAS Extent, LAS, DEM, Breaklines, Intensity Imagery, Lifts, Survey Checkpoints, Calibration Points, and Project)

**Project Reports**

Collection Report detailing mission planning, flight logs, acquisition, and calibration

Control Points used by Acquisition Partner are listed

Processing report

QA/QC Reports

**Extents**

Tile grid in Shapefile format derived from the LiDAR Deliverable

Tile grid according to USNG format, 1500 ft x 1500 meters, and in Shapefile format

Project Boundary buffered 100 meters and delivered as shapefile

**Breakline Data**

Breakline Data in GDB

Breakline Data as Shapefiles

**Intensity Imagery**

Intensity imagery in GeoTIFF format and 0.3 m (1FT) pixel size

# Raw Point Cloud Data

Raw Point Cloud Data has been included as part of this delivery. The Raw Point Cloud Data is delivered in LAS v1.2 with all required header information including: Georeference information, GPS times, and Intensity Values.

# Classified Point Cloud

Classified point cloud data has been delivered tiled to 1500 x 1500 m tiles that are named according to the USNG. The final delivery consists of 3465 LiDAR tiles that meet the project specified requirement.

# Bare Earth Surface (Raster DEM)

A total of 3465 1500 x 1500 meters tiled bare earth raster DEMs in ERDAS IMG format have been delivered for this project. All tiles have a cell size of 1 m and have been reviewed to ensure that they meet the project required specifications.

# Survey Data

All survey control data, reports and photos are included in this delivery. Accuracy assessment points are delivered in ESRI shapefile format.

# Calibration Points

All points used by the LiDAR acquisition provider to control and calibrate the LiDAR data have been delivered in ESRI shapefile format. X, Y, and Z coordinates are provided in the attribute table.

# Metadata

Project level metadata for each of the deliverables (Swaths or Lifts, fully classified LiDAR, breaklines, bare-earth DEMs, intensity imagery, project) has been delivered in XML format. Metadata has been reviewed through the USGS metaparser tool to ensure that it is FGDC compliant.

# Project Report

A comprehensive project report has been delivered in PDF format. This report includes the LiDAR acquisition and processing information along with detailed information on the production and quality control process used for the development of all deliverables.

# Extents

Three ESRI shapefiles are included with this delivery. One shapefile is the boundary of the project area buffered by 100 m and is the processing boundary for all project data. The second shapefile is the tile grid, created and named according to US National Grid format. The third shapefile is derived from the extents of the actual LAS deliverable to ensure that all delivered LiDAR have been accounted for. The extents have been verified against the project boundary to ensure that there is full coverage for the project.

# Breakline Data

Breaklines have been delivered in an ESRI file geodatabase and as shapefiles. Breaklines were derived to meet the project specifications as outlined in the SOW.

# Intensity Imagery

Intensity imagery is delivered tiled to 1500 x 1500 m tiles that are named to according to the project tile grid. The imagery is in GeoTIFF format with 0.3 m pixel size. The intensity imagery is created from the full point cloud LiDAR data. The final delivery consists of 3465 GeoTIFF tiles.