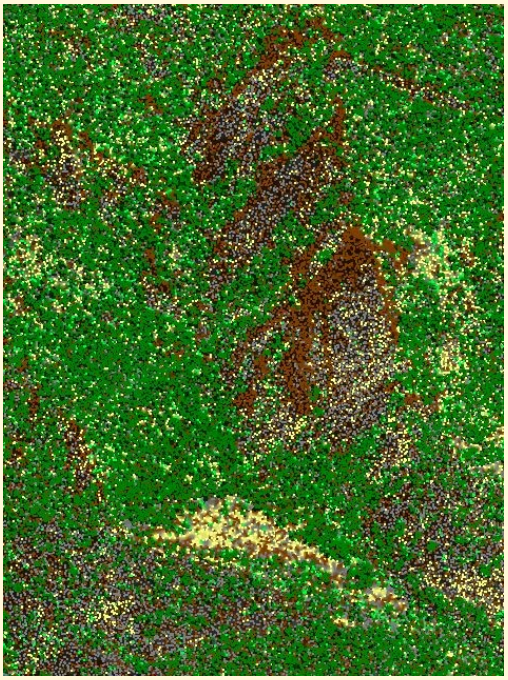
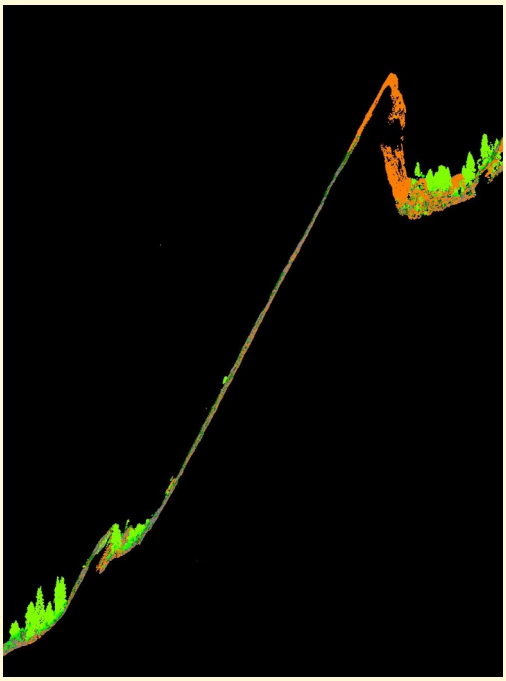
LIDAR - Light Detection and Ranging - Fact Sheet



LAS (LiDAR file format) data

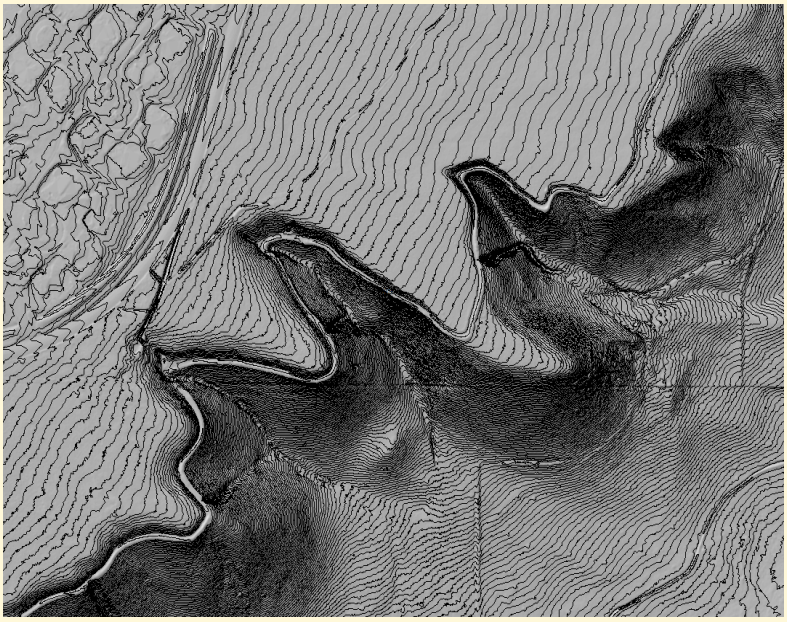


Profile derived from LAS information

Ortho-photo of area

In the spring of 2013, the City of Boulder Public Works/Utilities and Open Space & Mountain Parks departments collaborated on a LiDAR data collection project. The purpose of the project was to update our existing topographic dataset, and acquire new high resolution aerial photography.

LiDAR uses light waves to collect 3D information for a project area. The data is a very dense "point cloud" that contains elevations and classification categories such as ground, vegetation, buildings and transmission lines.



2' Contours — Shanahan Ridge Area

- **Collection Dates:**
  Data collection occurred between 4/21/2013 and 5/30/2013

- **Data Specifications:**
  Point density– 16-24 pts/m^2
  Vertical accuracy- .34'
  Horizontal accuracy- .6'
  Aerial photography– 3" in city, 6" in foothills
  Coordinate system- NAD 1983 HARN State Plane Colorado North FIPS 0501 Feet
  Vertical datum– NAVD88 GEOID 12A

- **Viewing the LiDAR data:**
  LiDAR data can be viewed using ESRI's ArcGIS software v 10.1 or later (ArcMap or ArcScene). The data can also be viewed in AutoCAD Map 3D or AutoCAD Civil 3D. Other free LiDAR viewers are available for download via the internet.

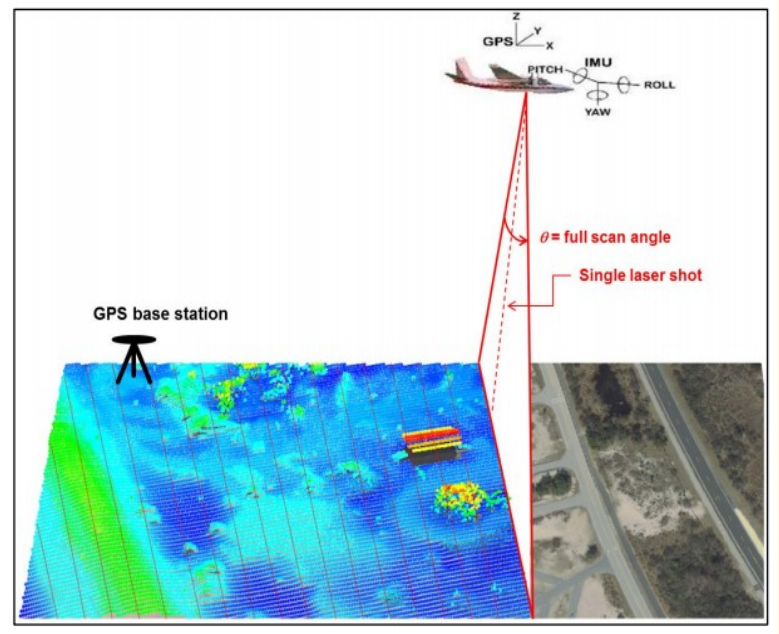
- **Sharing the data with consultants:**
  The City of Boulder's LiDAR data is available for download at the State of Colorado's GeoData Portal https://geodata.co.gov/

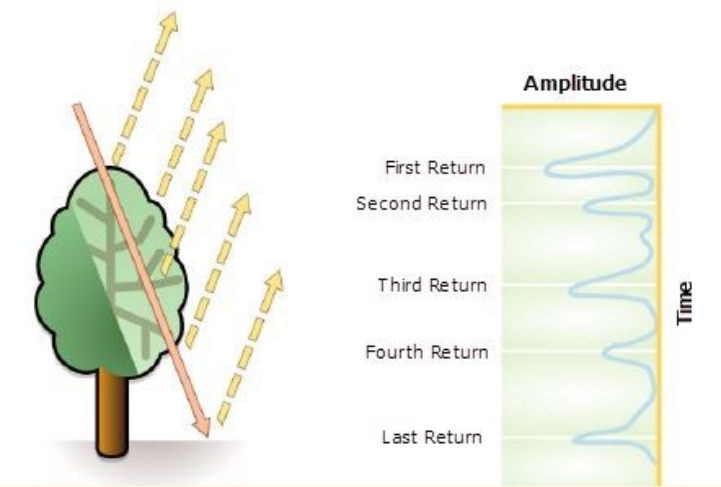
- **Post-flood LiDAR data:**
  In October 2013, FEMA, USGS, DRCOG and the CWCB collected post-flood LiDAR for a large area of the Front Range. The data was collected in UTM meters and is available on the State of Colorado's GeoData Portal https://geodata.co.gov/

LIDAR - Light Detection and Ranging - Frequently Asked Questions

How was the LiDAR data collected ?

LIDAR equipment, which includes a laser scanner, a Global Positioning System (GPS), and an Inertial Navigation System (INS), is mounted on a small fixed wing aircraft. The scanner transmits brief laser pulses to the ground surface which are reflected back to the scanner. The equipment records the time it takes for the returning pulses to go from the scanner to the ground and back. The distance between the laser scanner and the ground is then calculated based on the speed of light. The airplane's position is determined using GPS, and the direction of the laser pulses are determined using the INS. Because one laser pulse may reflect back from multiple surfaces, such as the top of a tree, a house, and the ground surface, there are multiple returns from each pulse that can be used to map such things as the top of the tree canopy, buildings, and the ground.





What products were derived from the LiDAR data?

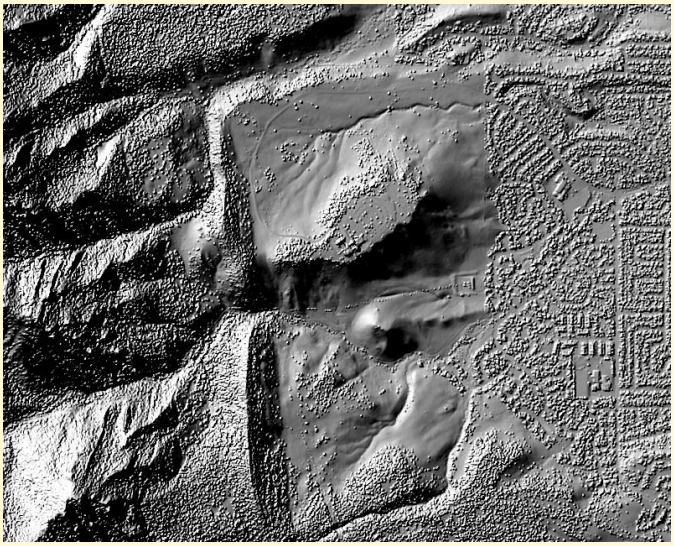
The LiDAR data was used to produce the following products:

- Classified LiDAR Point Cloud
- Bare Earth Digital Elevation Model (DEM)
- Digital Surface Model (DSM)
- Contours
- Tree Canopy Height Model
- Individual Tree Polygons

The datasets can be found on either the city's open data catalog or on the State of CO's GeoData Portal https://geodata.co.gov.

What can the LiDAR data be used for?

- Building Footprint Generation
- Floodplain Mapping
- Change Analysis
- Fire and Fuel modeling
- Viewshed Analysis
- Least Cost Path Analysis
- Urban Planning
- Solar Potential Mapping



DSM with Hillshade — NCAR area