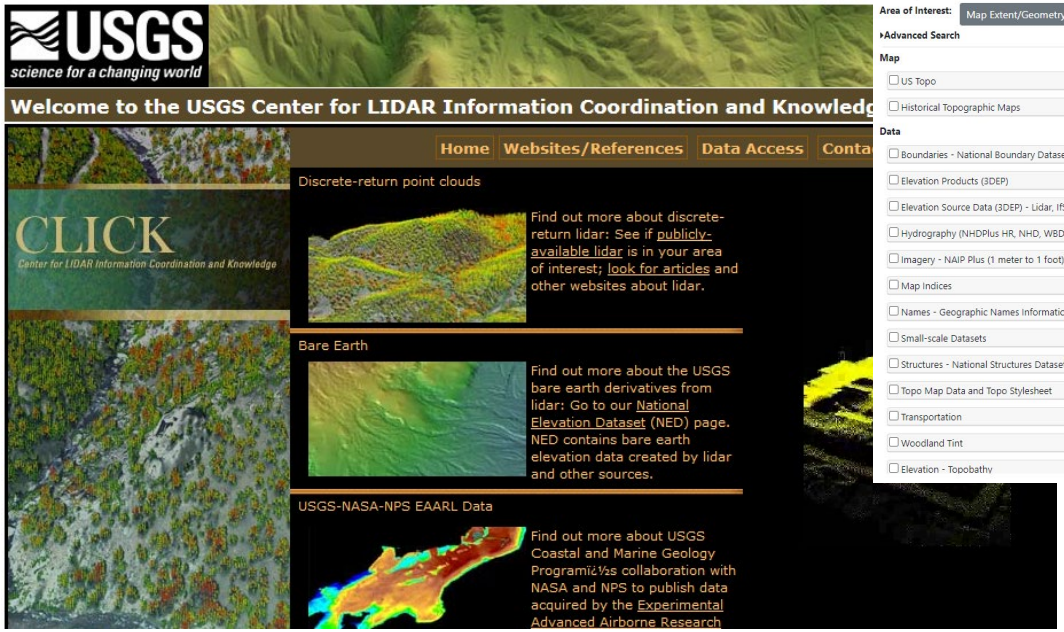
GEOG660
Advanced Remote Sensing using Lidar

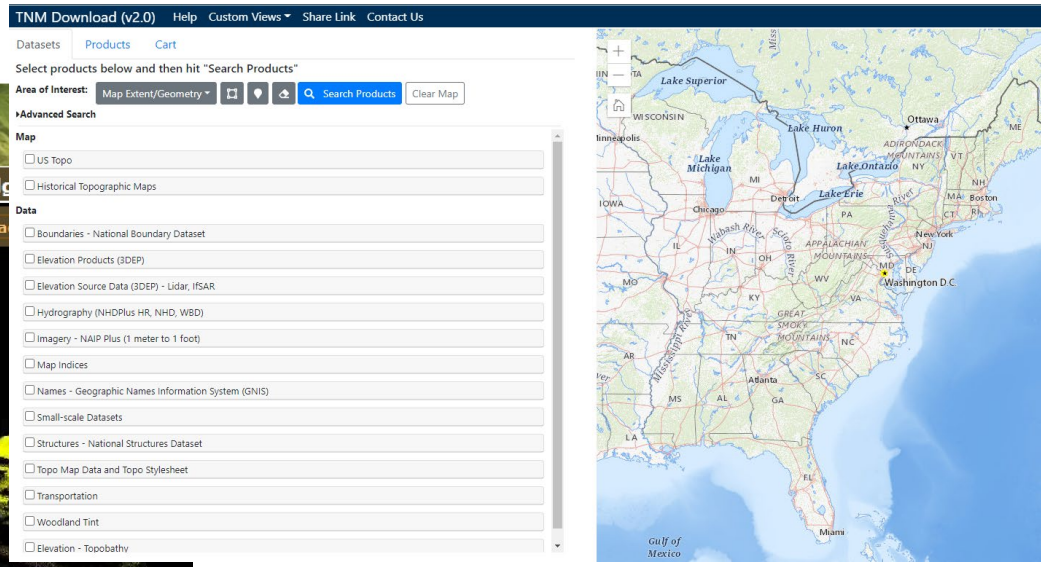
Lecture 1 Lab Demo

Intro to ArcGIS Lidar Tools

Demo 1 – Earth Explorer

- Free Online Lidar Data Source…
  - http://earthexplorer.usgs.gov/
  - https://viewer.nationalmap.gov/basic/#/

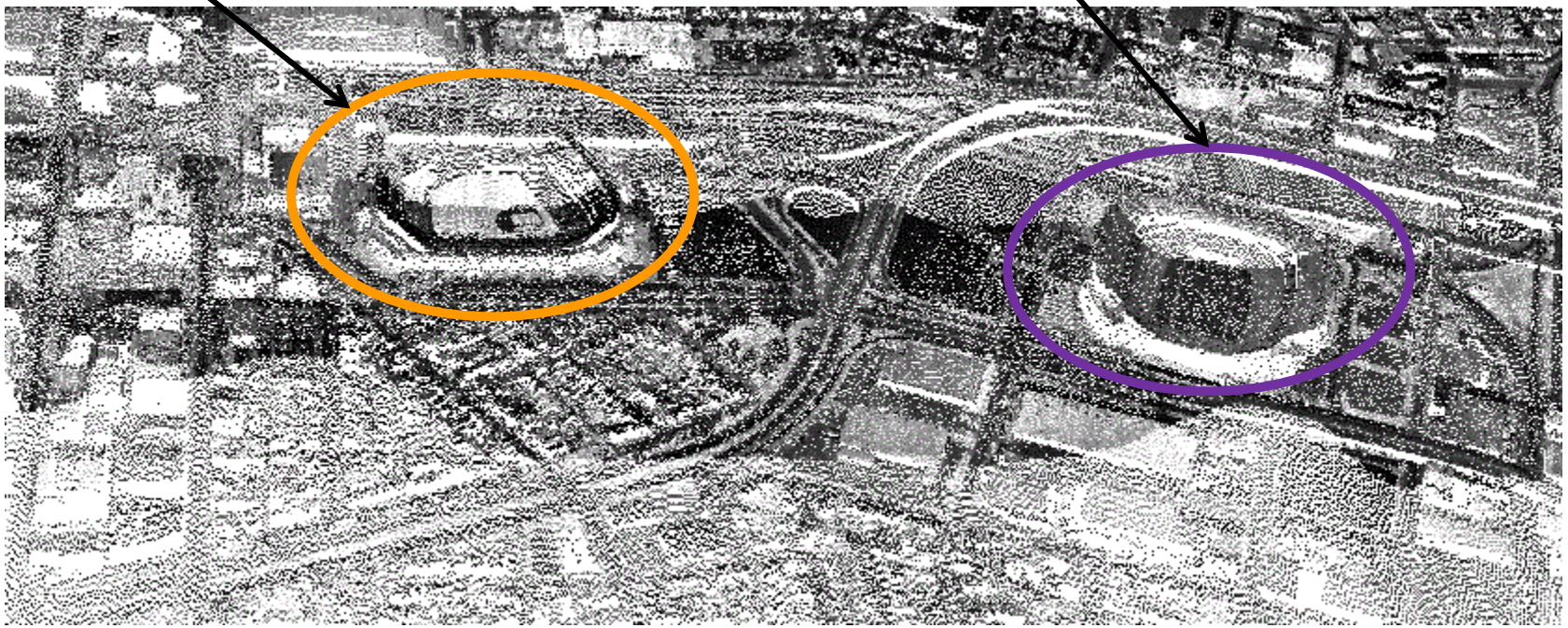




The National Map

Demo 1 – Study Site

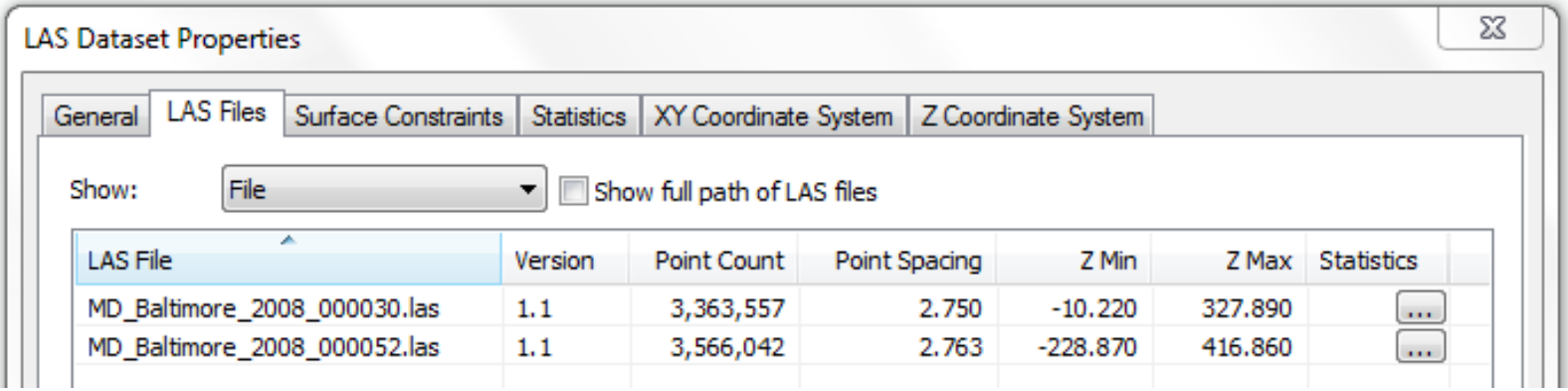
- Lidar point cloud of Baltimore, MD
  - Intensity image (8-bit, 0 to 255, grayscale)
  - Oriole Park at Camden Yards + Ravens Stadium



Demo 2 – ArcGIS Lidar Analysis

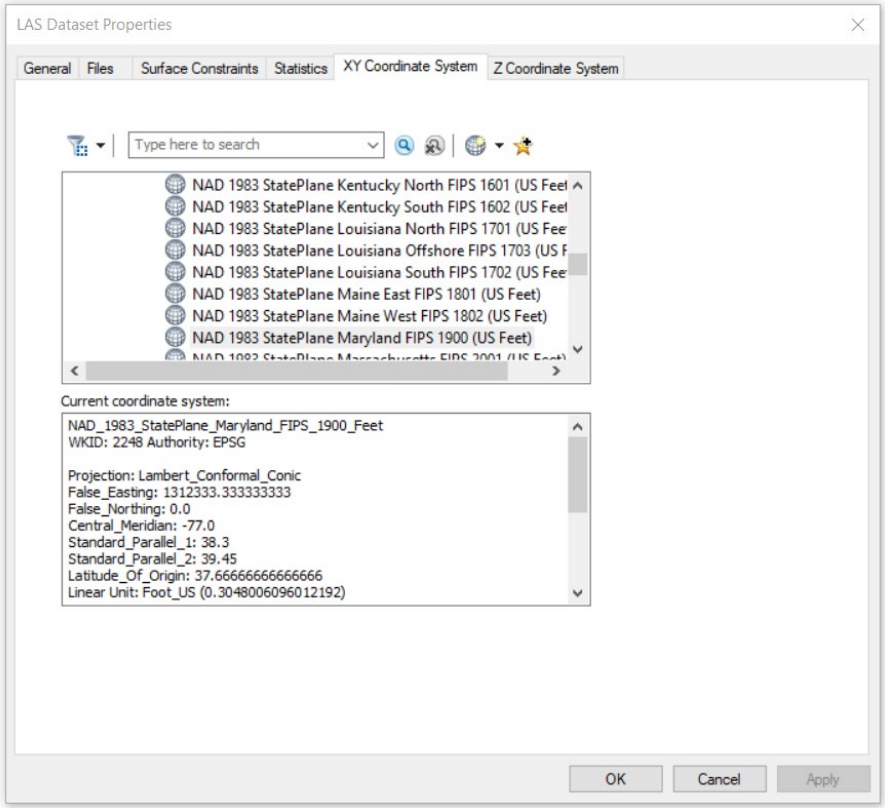
Lidar Data Management

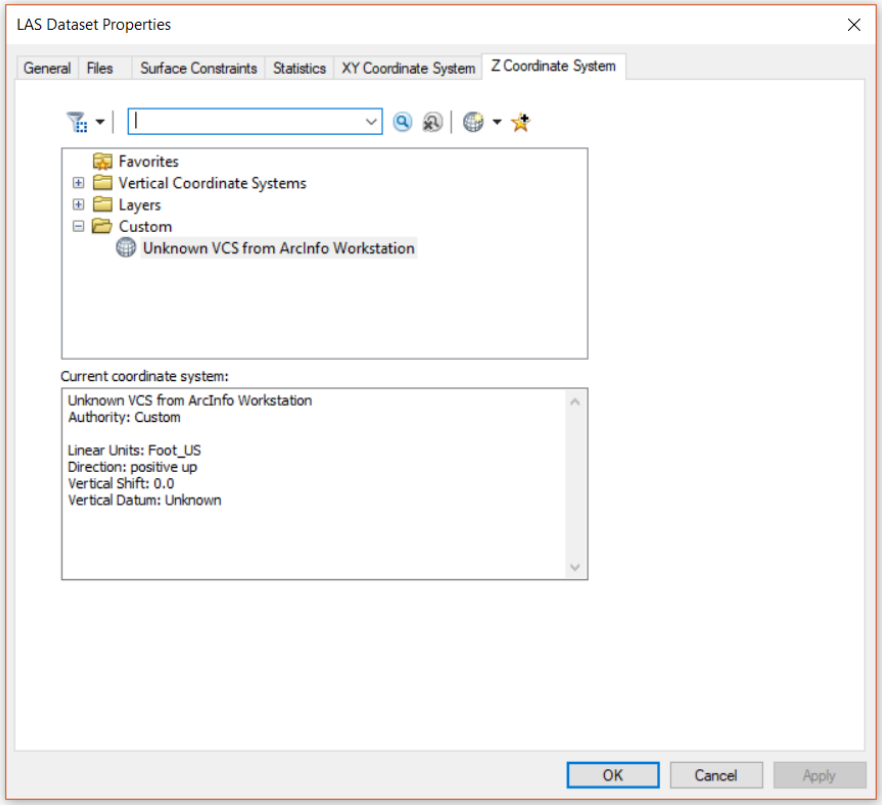
1. Creating a new LAS dataset in ArcGIS
2. Adding LAS files to a LAS dataset
3. Verify the coordinate system
4. Calculate lidar data statistics



Demo 2 – ArcGIS Lidar Analysis

Lidar Data Coordinate Systems





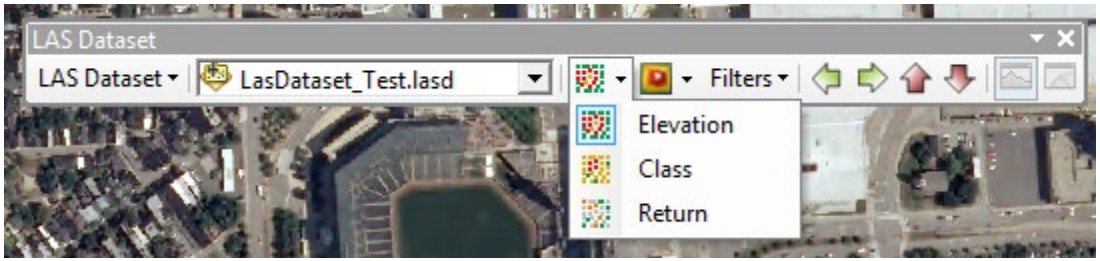
Demo 2 – ArcGIS Lidar Analysis

Lidar Data Preprocessing

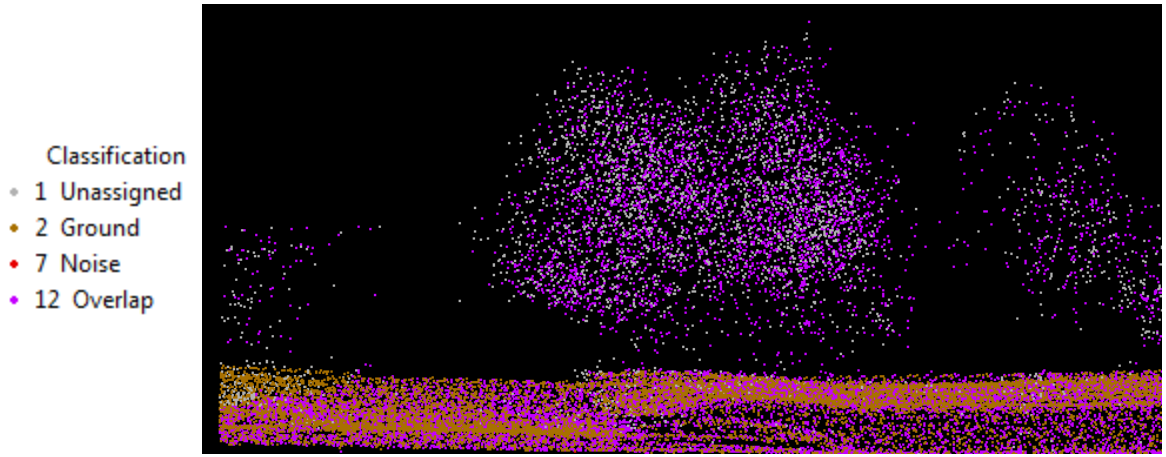
1. View LAS files in ArcGIS
2. Introduce the Lidar Toolbar
3. Explore different data properties
4. Filter lidar data in various ways
5. Profile and 3-D viewing modes

Demo 2 – ArcGIS Lidar Analysis

- Symbolization Options in LAS Toolbar

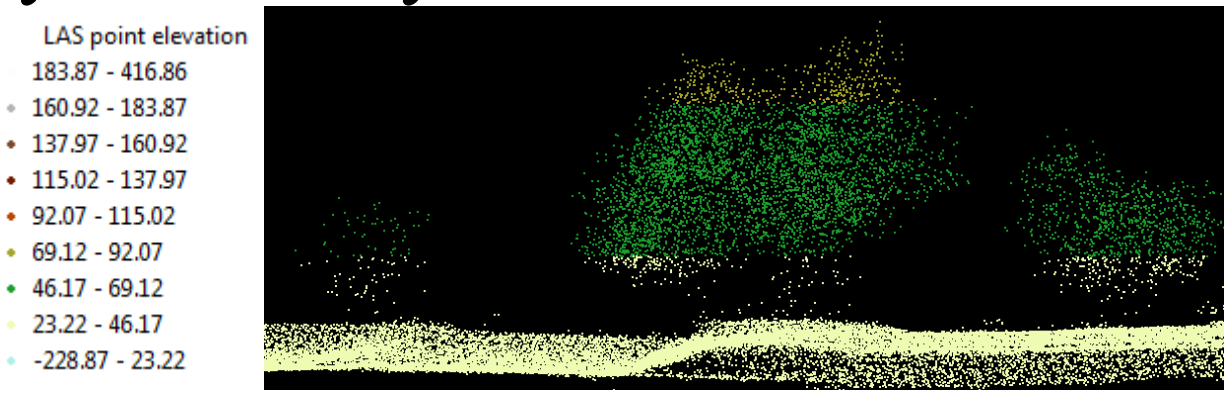


- Symbolize by Classification

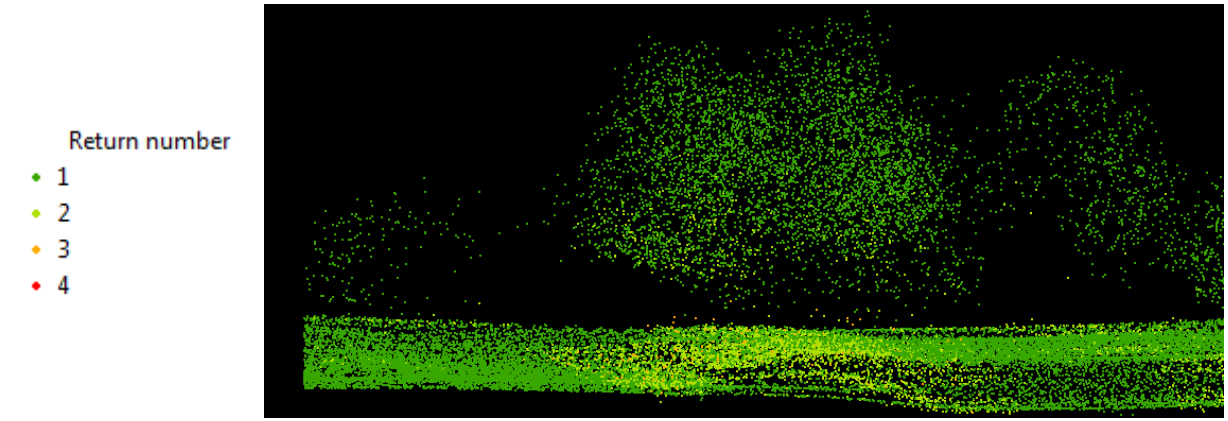


Demo 2 – ArcGIS Lidar Analysis

- Symbolize by Elevation



- Symbolize by Lidar Point Returns



ArcGIS Lidar Tools

- Lidar Tools Available in ArcGIS
  - **Search for "LAS"**
  - ArcGIS 10.1 LAS Tools
    - Create LAS Dataset
    - Add Files to LAS Dataset
    - Change LAS Class Codes
    - Set LAS Class Codes Using Features
    - LAS Point Statistics as Raster
    - LAS Dataset to Raster
    - LAS Dataset to TIN
  - We'll explore these more this Lecture…

ArcGIS Lidar Tools

- Lidar Tools Available in ArcGIS
  - **Search for "LAS"**
  - ArcGIS 10.3 LAS Tools
    - Extract LAS
    - Classify LAS Ground
    - Classify LAS by Height
    - Classify LAS Building
    - LAS Point Statistics By Area
  - We'll explore these more in Lecture 6…

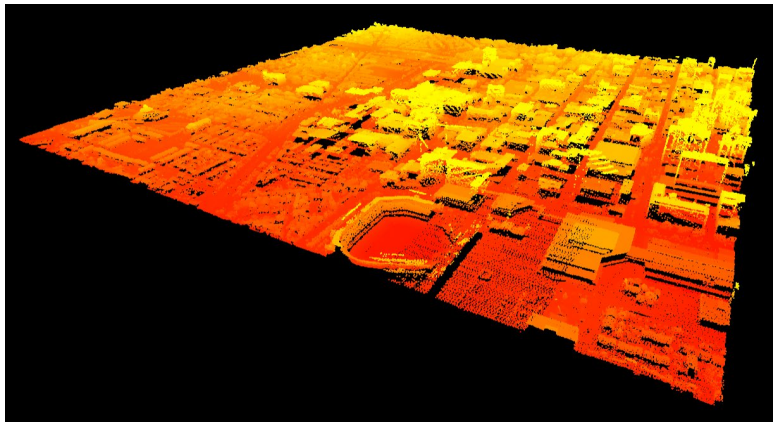
Future Labs…

- Preprocessing lidar data…
  - LAStools (Lecture 2)
- Postprocessing lidar data…
  - Creating DEMs (Lecture 3)
  - Data Fusion (Lecture 4)
  - Change Detection (Lecture 5)
  - Feature Extraction (Lecture 6)

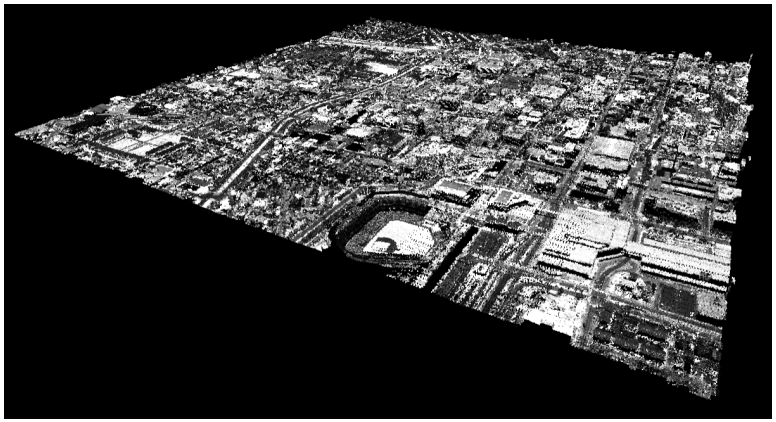
Demo 3 – Online LAS Viewer

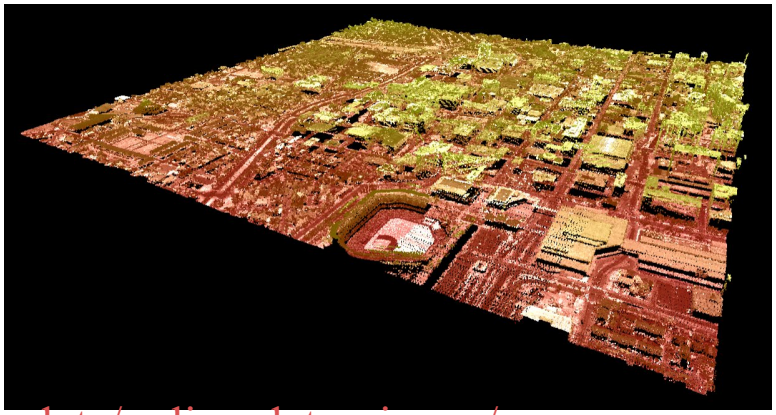
- http://plas.io/

Symbolized by Elevation



Symbolized by Intensity





Blended Elevation and Intensity

http://neondataskills.org/lidar-data/online-data-viewer/

Lab Assignment 1 Review

- Part 1 – Annotated Review
  - Select any lidar related scientific paper of interest
  - Google Scholar search is the best way to go
  - Post a link to your paper on the discussion forum
- Part 2 – Lidar Data in ArcGIS
  - Browse through ESRI's online documentations
  - Answer the questions that I added at the end
- Part 3 – LAS Datasets
  - Create the LAS Dataset that I demoed today
  - Play around with the LAS Dataset Toolbar