

Know Your Lidar Data

Assessing the Accuracy/Quality
Integrating Other Sources of Data
Extracting Information and Features From
Lidar Data

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Today's Topics

- ▶ What does Lidar data look like?
- ▶ **Errors in the Lidar data**
- ▶ Integrating other datasets with Lidar
- ▶ Extracting Information from Lidar

Errors in the Lidar Data

- ▶ Very important to QC your data ASAP when you get it!
 - 3rd party QAQC
 - Pros – might not have time or care to do it yourself, wouldn't have to buy special software
 - Cons – might be expensive and might not know what you are getting.
 - QC in house
 - Pros – you really get to know the data and focus on what's important to you
 - Cons – might not know what you are looking at/for if this is new to you, might not have time or care to do it yourself
 - Accuracy Assessment
 - Need Survey Checkpoints
 - QC is just as important (more important) than AA

Errors in the Lidar Data

- ▶ Lidar Spec Reference Documents:
 - FEMA LiDAR Specs
 - **2003** Appendix A: Guidance for Aerial Mapping and Surveying of the Guidelines and Specifications for Flood Hazard Mapping Partners
 - **2010** Procedure Memorandum No. 61 – Standards for Lidar and Other High Quality Digital Topography
 - USGS
 - **2009** Base Lidar Specification for projects funded under ARRA of 2009
 - **2012** Lidar Base Specification Version 1.0

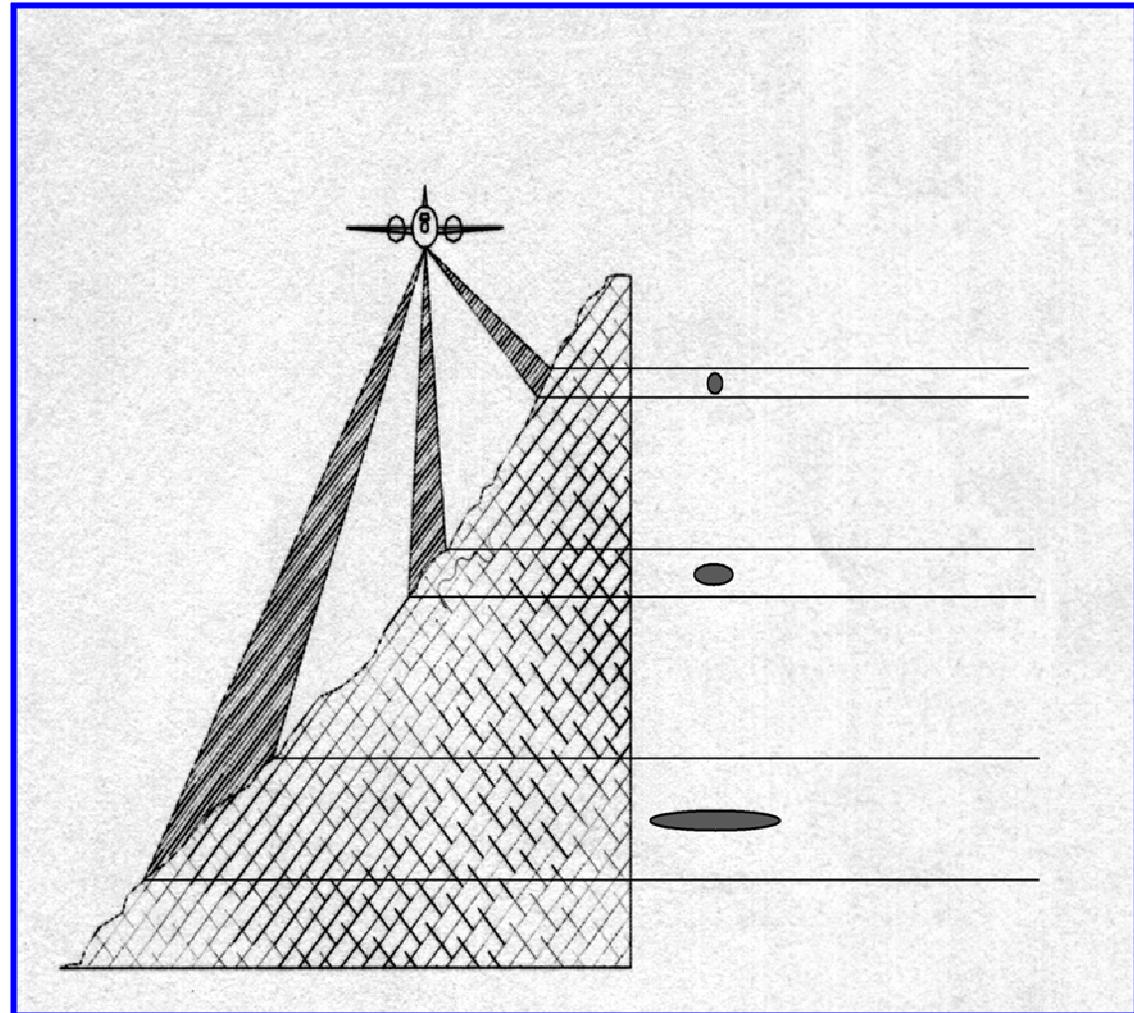
Errors in the Lidar Data

▶ Software Options

- Just need to view lidar points
 - Free Viewers
- Need to Classify Points
 - Just a few points here and there
 - Classify points for landcover categories
 - Need to be able to work with point data or just rasters
- What format do you want to work with
 - Compatibility with current software
 - GIS, CAD, Rasters, proprietary formats
- Automated tools for Accuracy Assessment
- Digitizing Breaklines

Errors in the Lidar Data

- ▶ Accuracy



Errors in the Lidar Data

- ▶ Accuracy Assessment
 - Need real survey checkpoints
 - 20 points per land cover type
 - Gives a decent picture of how accurate the lidar data is in different land cover types
 - Meeting accuracy specs does not necessarily equate to having quality data

Cover Type	RMSE (ft)	Average Elevation Difference (ft)	Standard Deviation (ft)	Maximum Elevation Difference Value (ft)	Minimum Elevation Difference Value (ft)	Number of Checkpoints Used in Analysis
All 4 Cover Types	0.312	0.069	0.306	0.956	-0.648	75
Subtypes:						
BareEarth	0.205	-0.016	0.210	0.410	-0.379	20
Brush	0.379	0.241	0.303	0.717	-0.436	16
Forested	0.391	0.192	0.351	0.956	-0.440	19
Urban	0.249	-0.100	0.234	0.310	-0.648	20

Errors in the Lidar Data

Quality Control

- ▶ Do you have all the data
 - Missing tiles
 - Tiles labeled correctly
- ▶ Elevation Values Reasonable
- ▶ Right Coordinate System
- ▶ Post Spacing meets spec
- ▶ Metadata
- ▶ Systemic Artifacts
- ▶ Localized Artifacts
 - Bridges left in
 - Culverts taken out
 - Divots
 - High Points
 - Buildings left in
- ▶ Voids
- ▶ Smooth surface transition between flight lines

FEMA

USGS

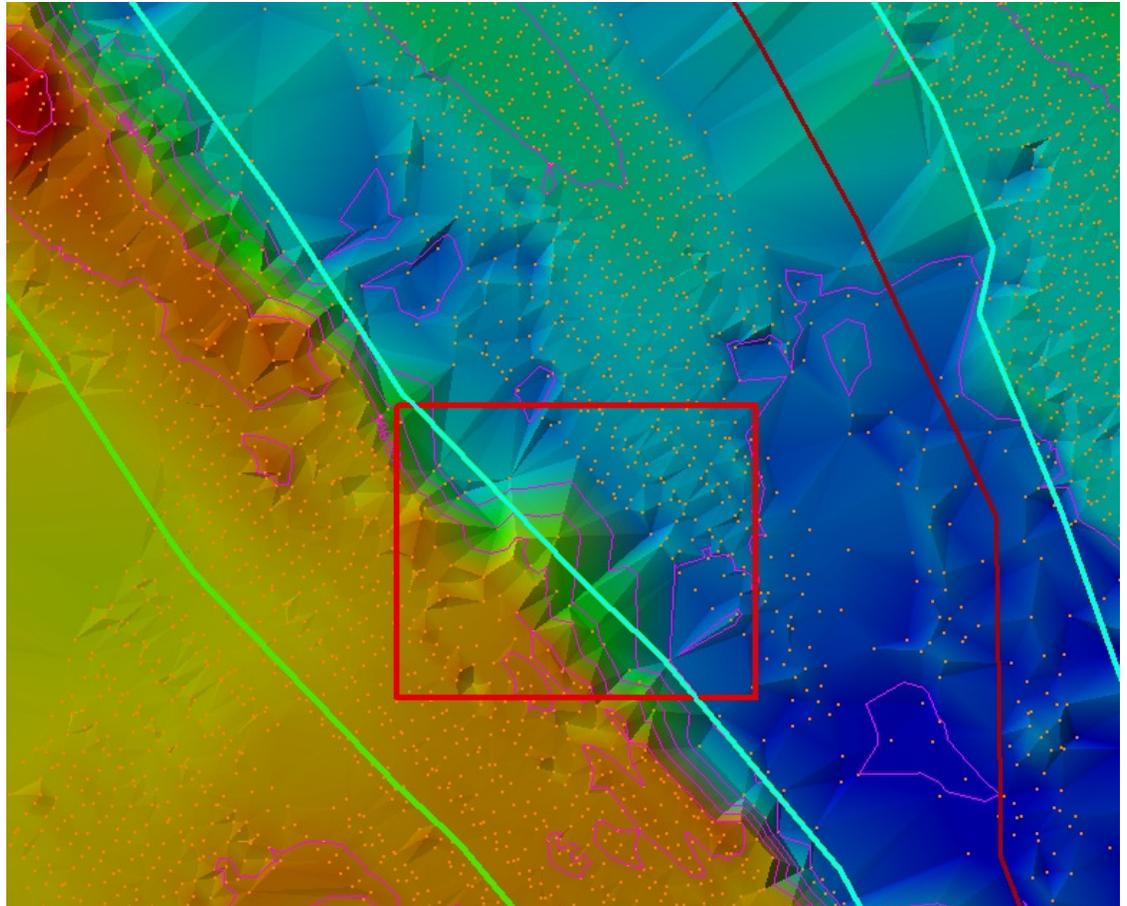
Errors in the Lidar Data

- ▶ Do you have all the data?
- ▶ Index of the Lidar Tiles
- ▶ Labelled Correctly?

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									NMSANJ027061.las	NMSANJ027062.las	NMSANJ027063.las	NMSANJ027064.las						
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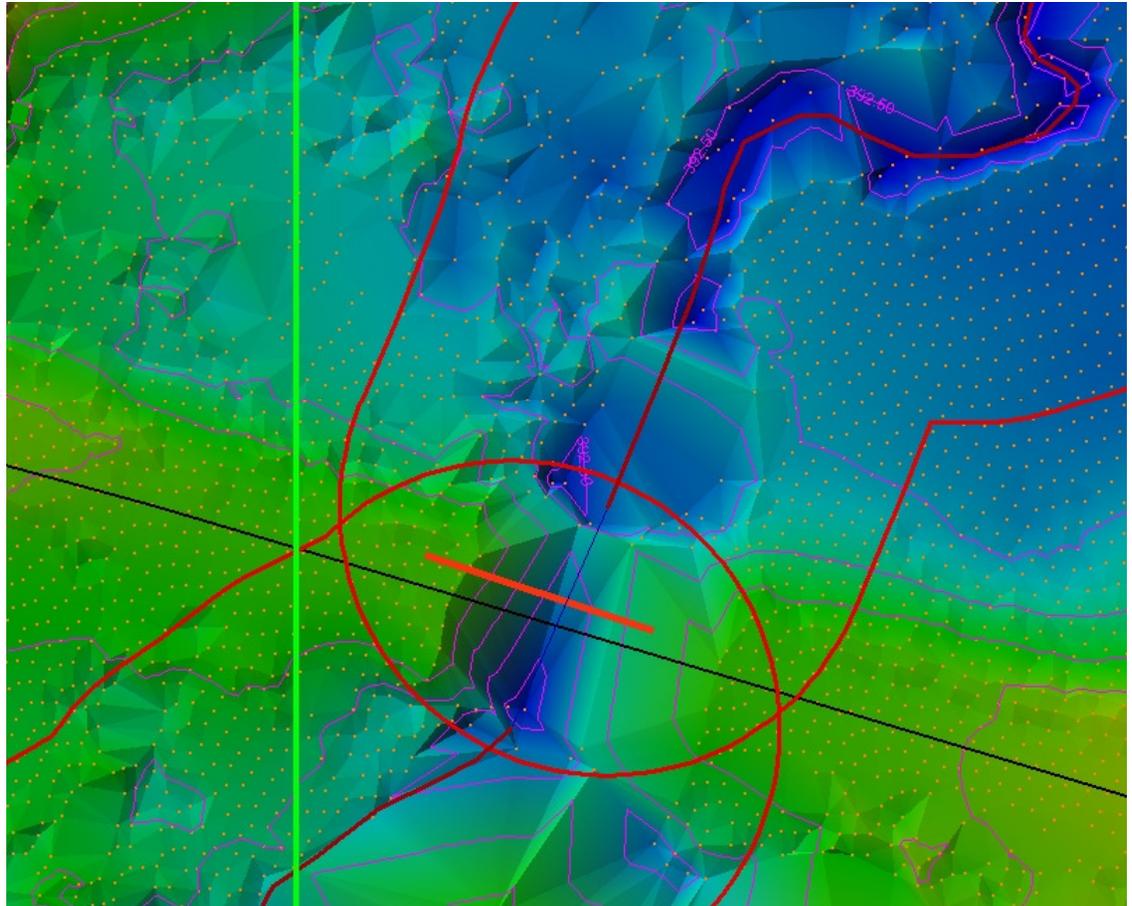
Errors in the Lidar Data

- ▶ Vegetation left in along stream bank



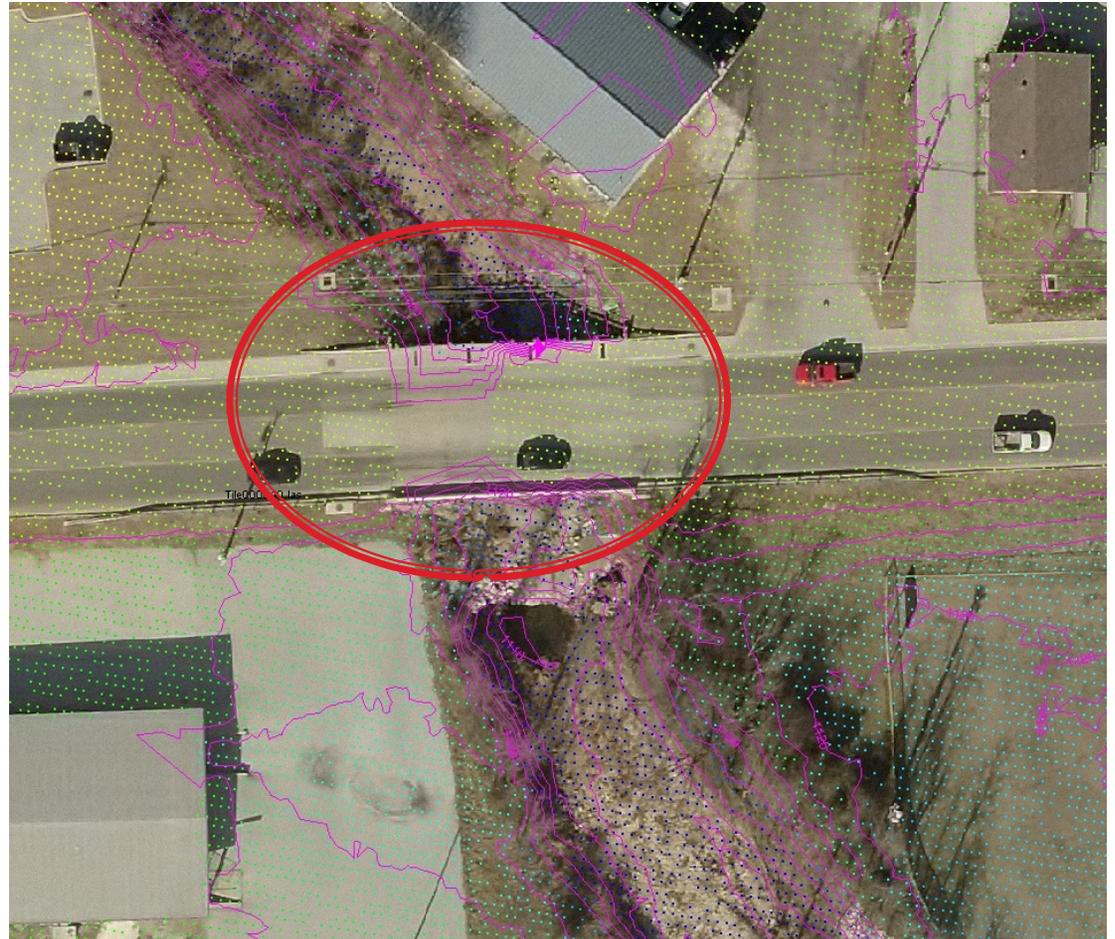
Errors in the Lidar Data

- ▶ Culvert.
Points need to be reclassified to Ground



Errors in the Lidar Data

- ▶ Bridge. Points need to be reclassified to Unclassified



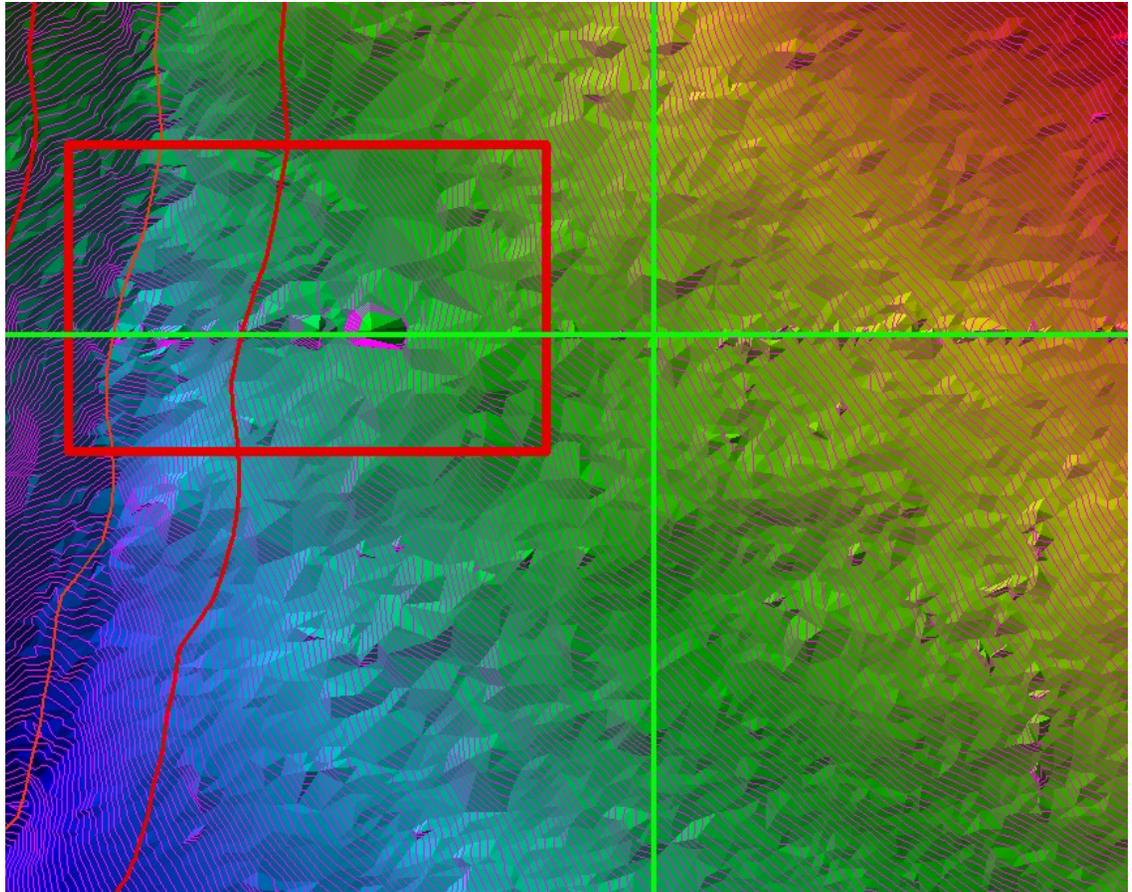
Errors in the Lidar Data

- ▶ Bridge. Points reclassified



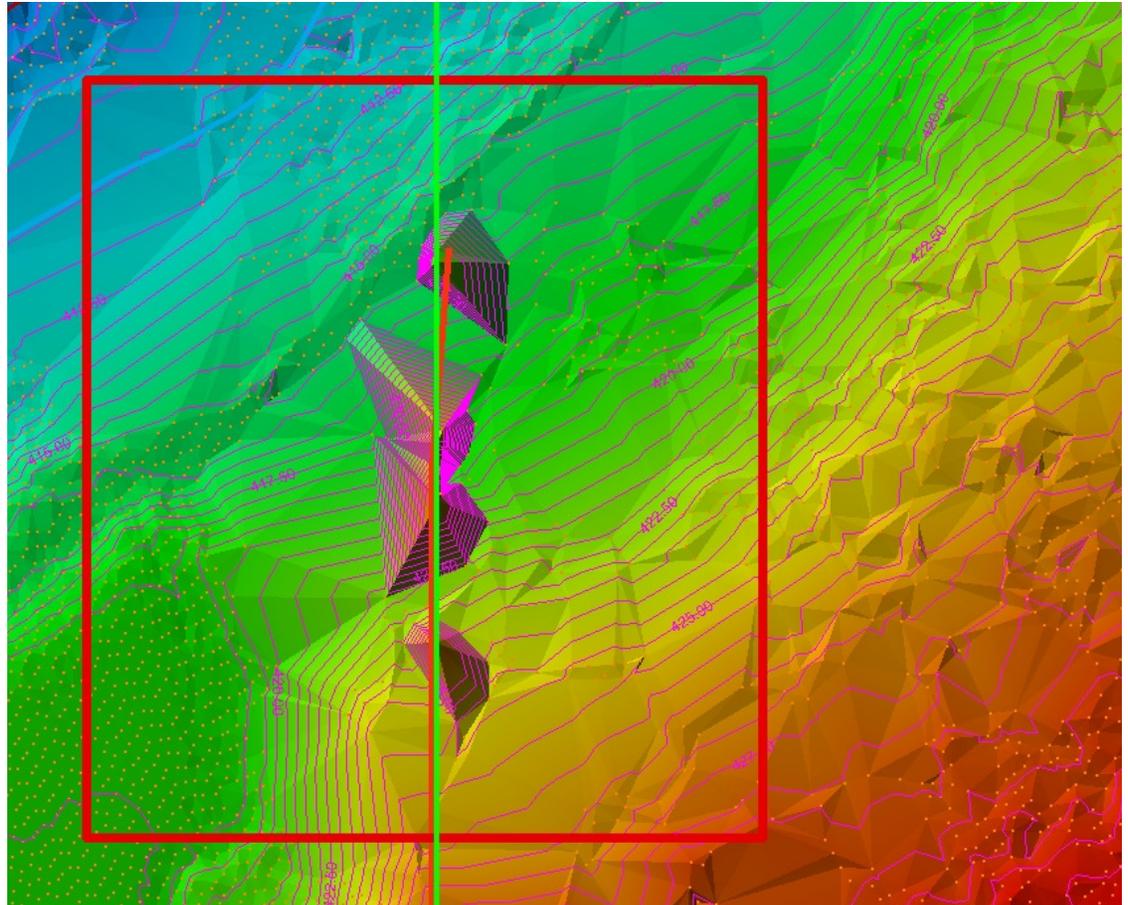
Errors in the Lidar Data

- ▶ High Points along lidar tile edges



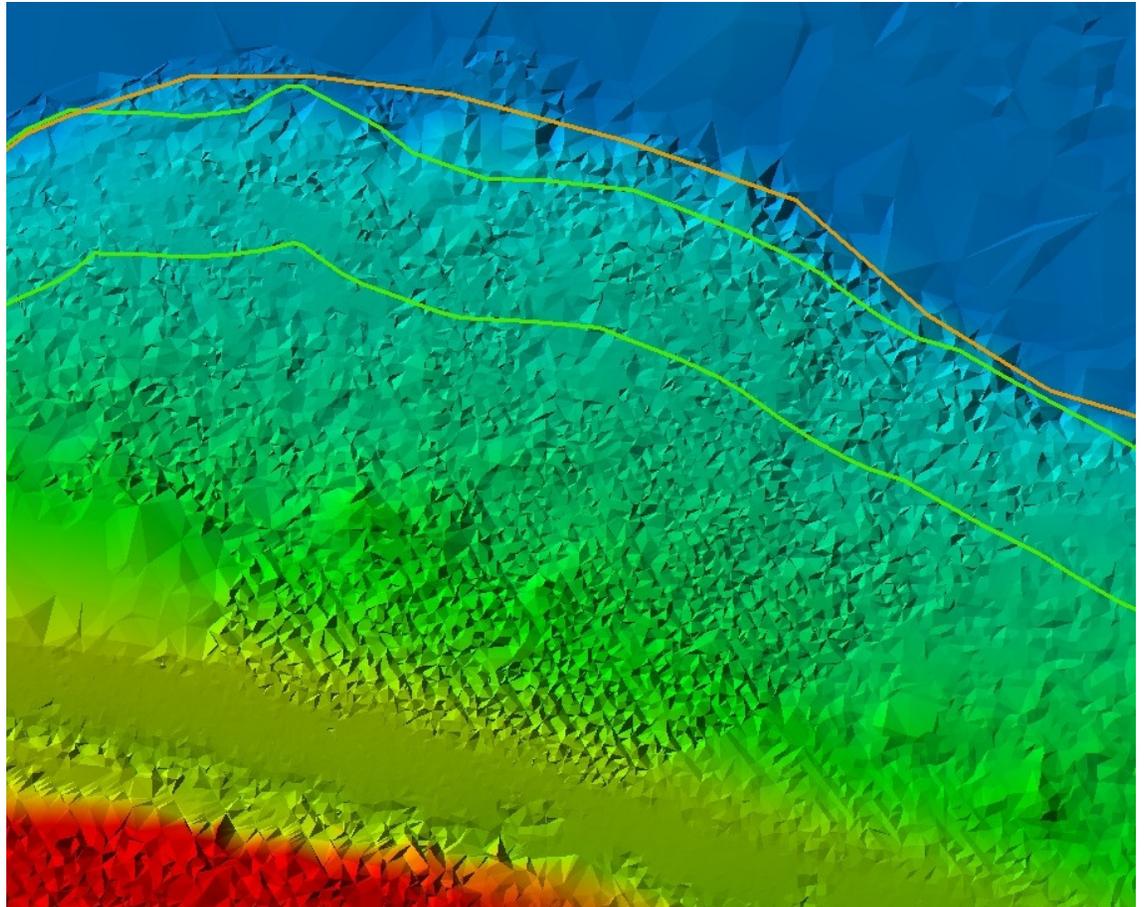
Errors in the Lidar Data

- ▶ High Points along lidar tile edges



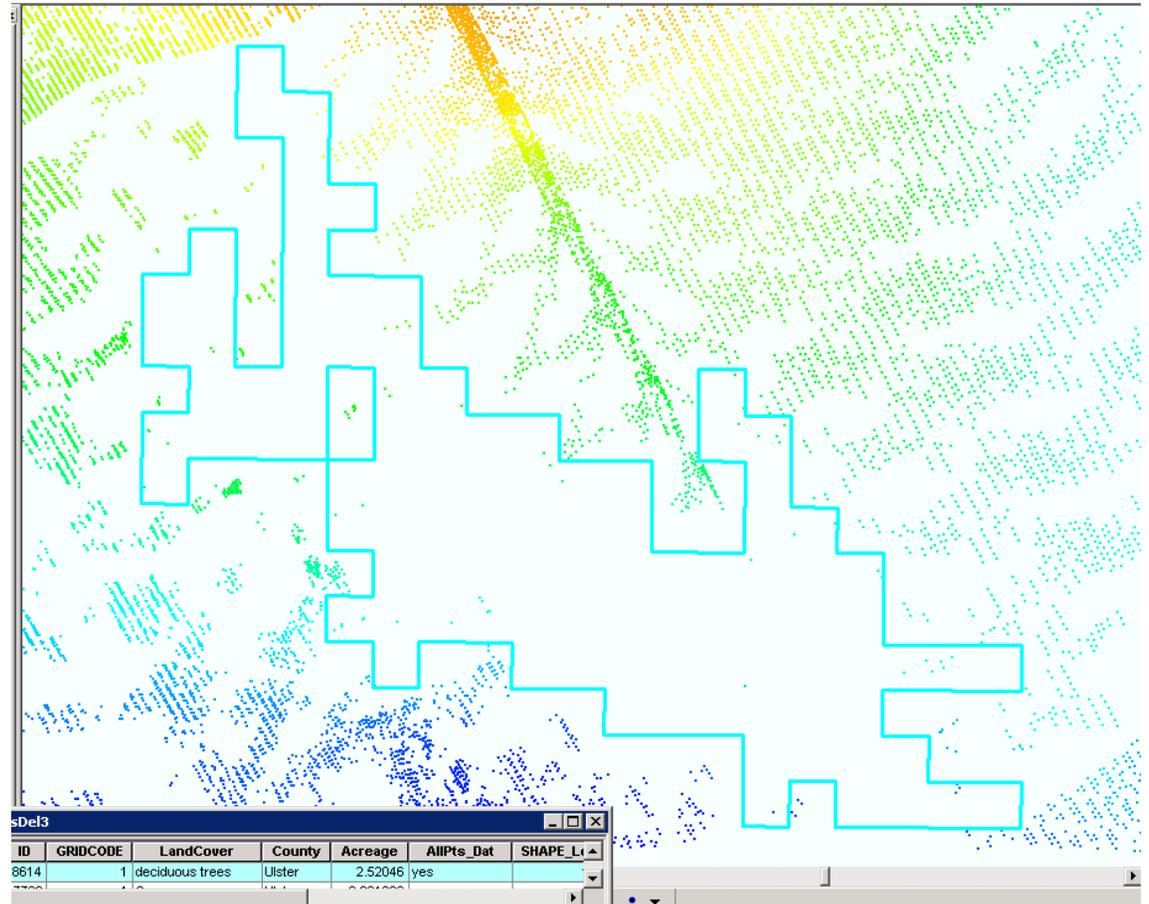
Errors in the Lidar Data

- ▶ Poor Ground Classification
– used overlap points during classification process



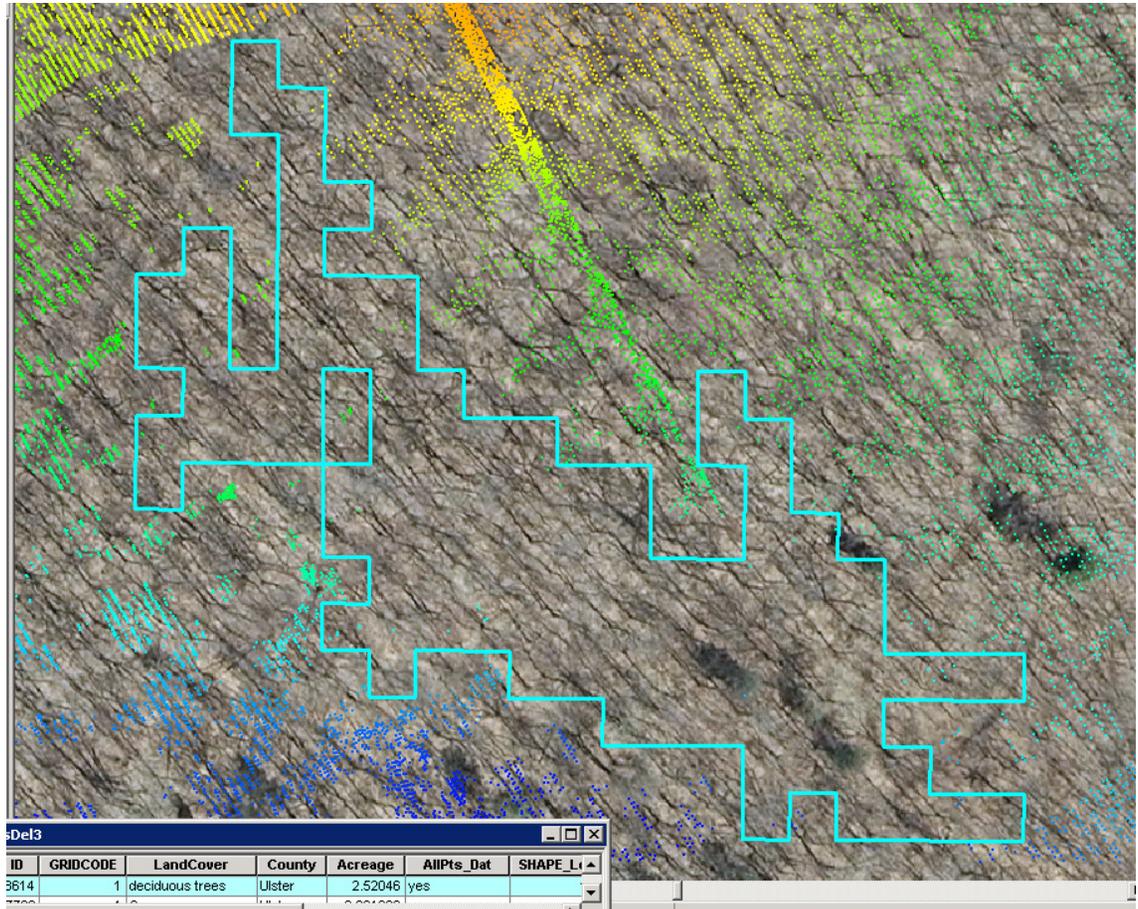
Errors in the Lidar Data

- ▶ Void Areas
~ 2.5 acres



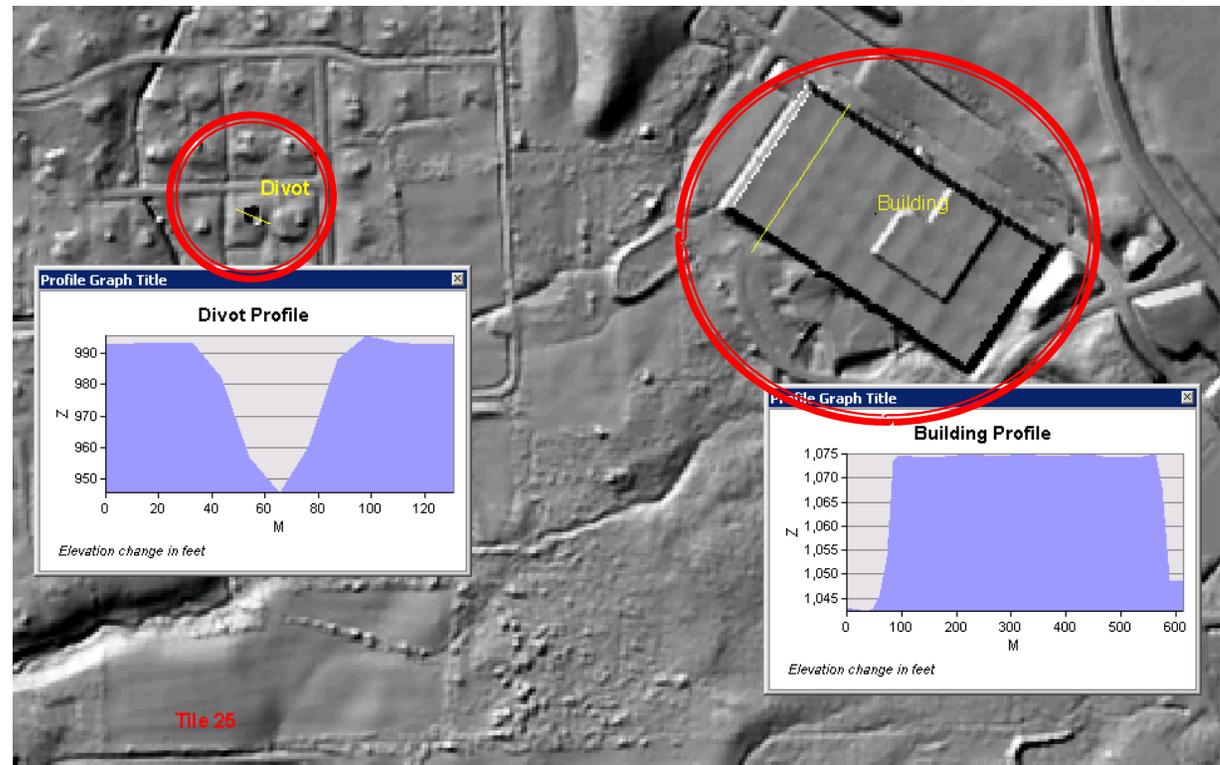
Errors in the Lidar Data

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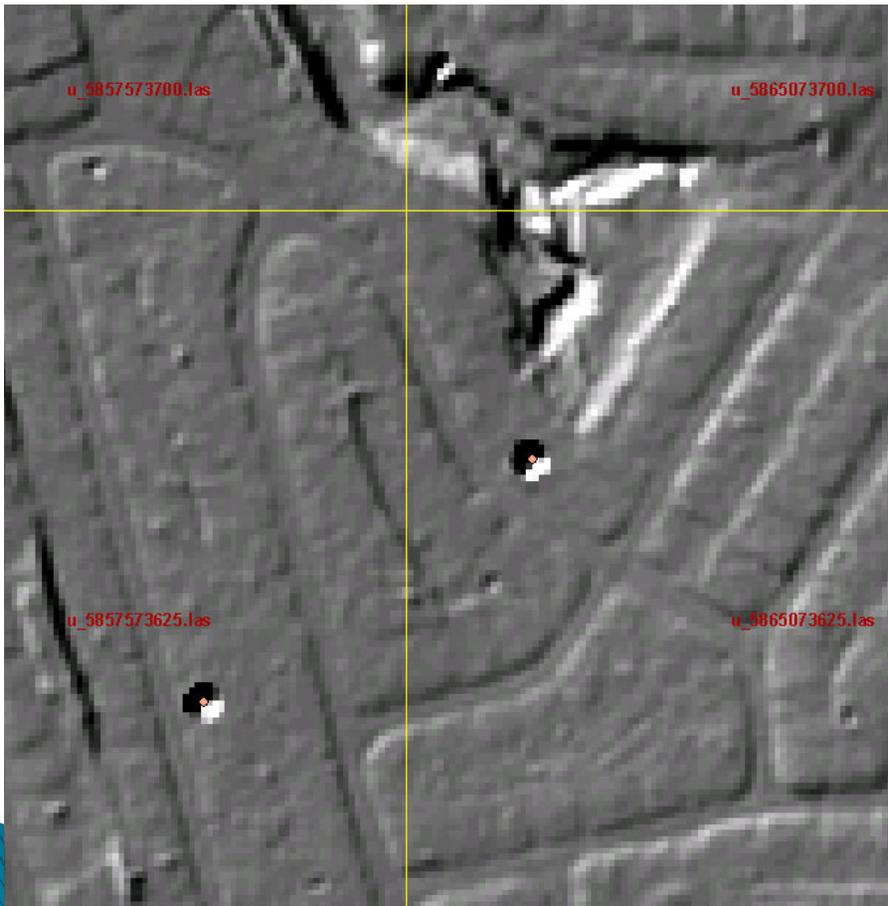
Errors in the Lidar Data

- ▶ Divot
 - 45 ft deep
- ▶ Building
 - 30 ft tall



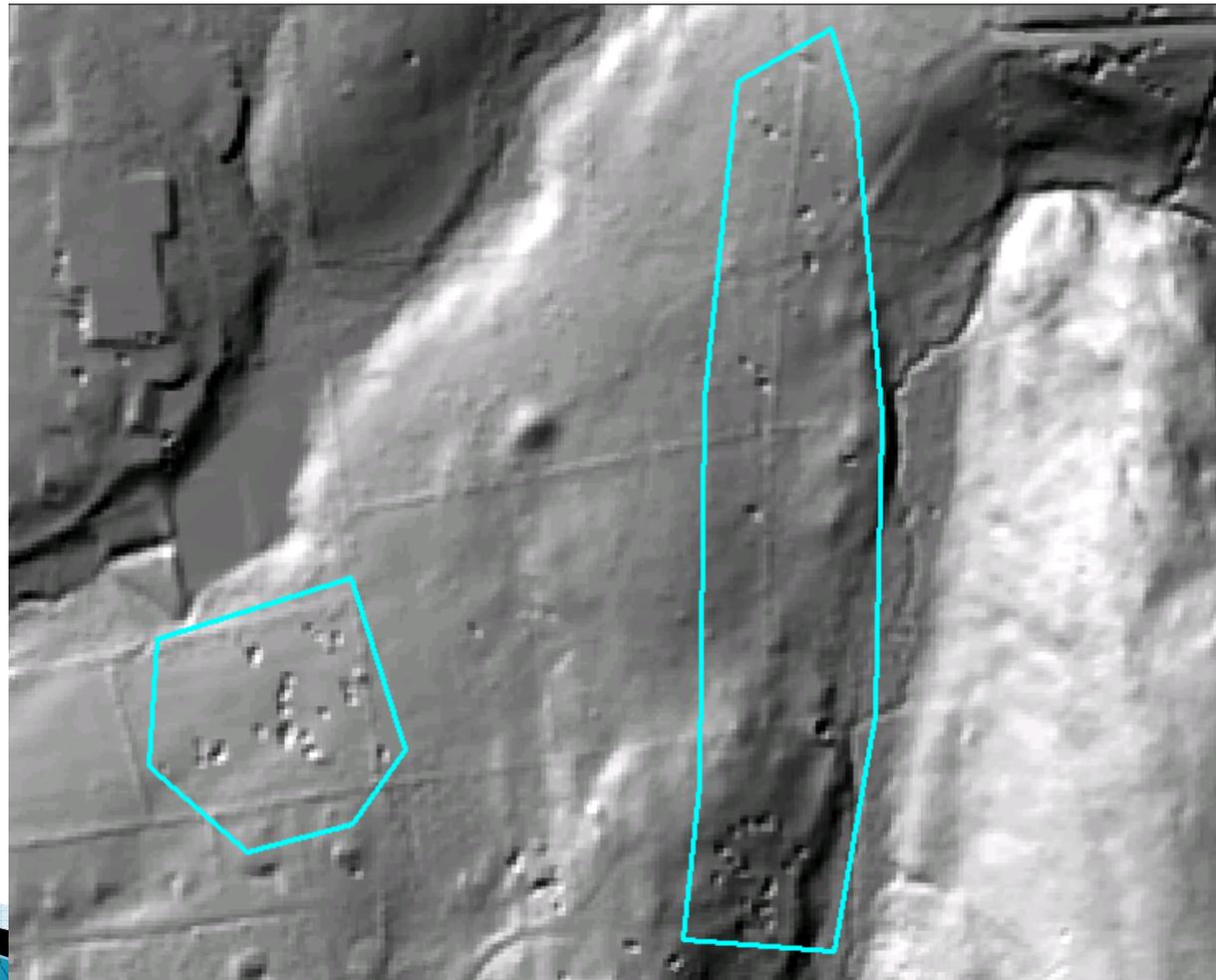
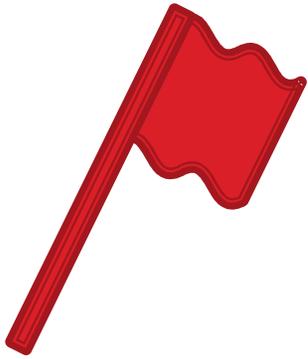
Errors in the Lidar Data

▶ Divot Artifacts



Errors in the Lidar Data

- ▶ Divot Artifacts



Errors in the Lidar Data

- ▶ Divot Artifacts

