



Stumbling through Lidar

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Where are we going with this?

- Overview
- What did we get in the box from the consultant.
- LAS Tool Bar and Tools
- Project Steps involved
- Products
- Contours
- Wrap up.

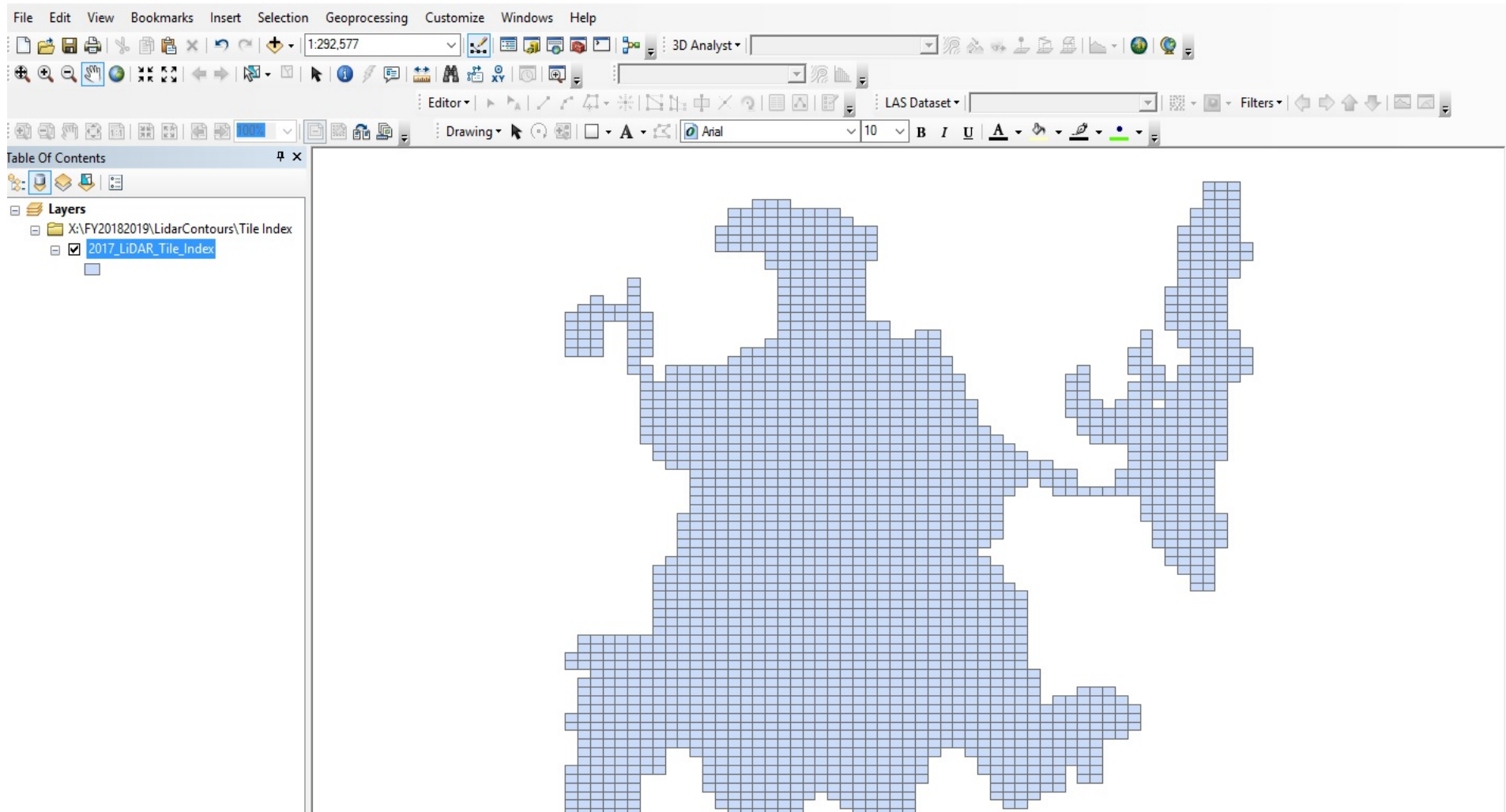
Overview

- Quick overview of what this presentation is all about:
 - Review the current project to make the tiled .LAS files available to the City of Dallas GIS consumers.
 - Construct a two foot contour map for the City of Dallas from the 2017 Lidar data.
 - Seems simple enough.

What we received from the consultant.

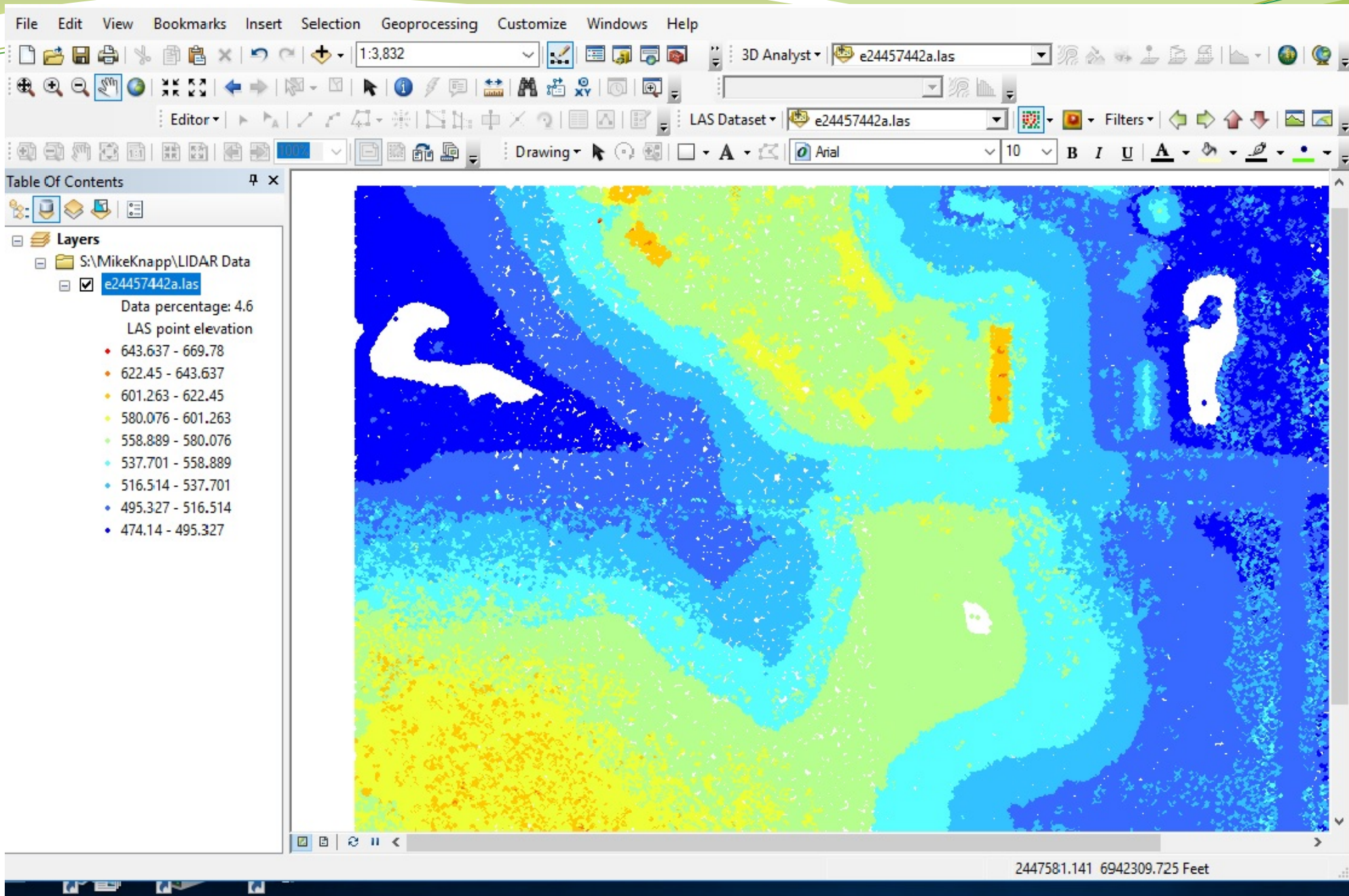
- The goodies from Woolpert. Our part of the 2017 Group Lidar Survey conducted by the North Central Council of Governments.
- 2167 .LAS files with All Returns
- 2167 .LAS files with Bare Earth only.
- Tile Index of the 2167 .LAS files

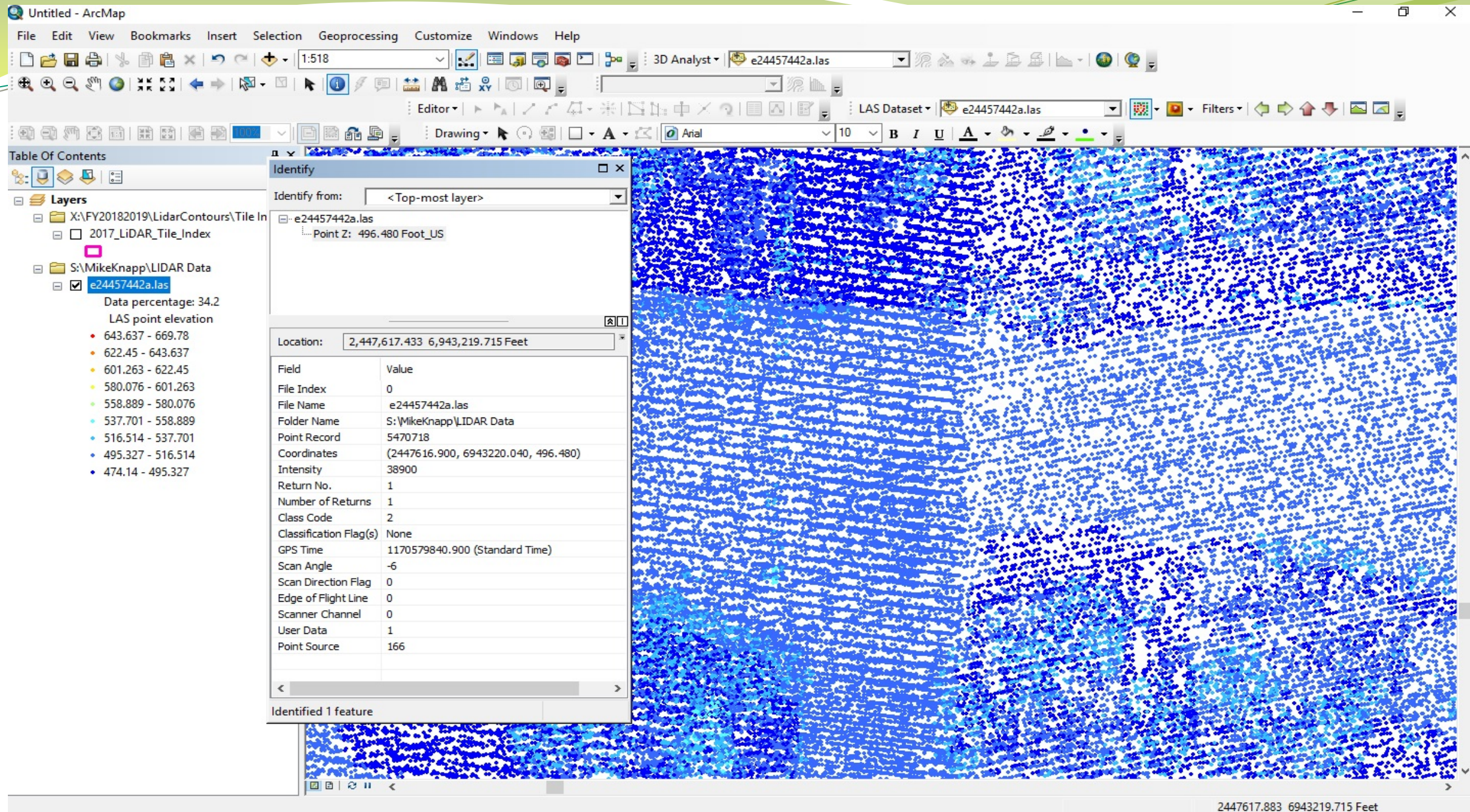
*Woolpert delivered 2167 .LAS files with 6,000,000 pixels per file.
Each tile is 3000 feet long(E-W) and 2000 feet wide (N-S).*

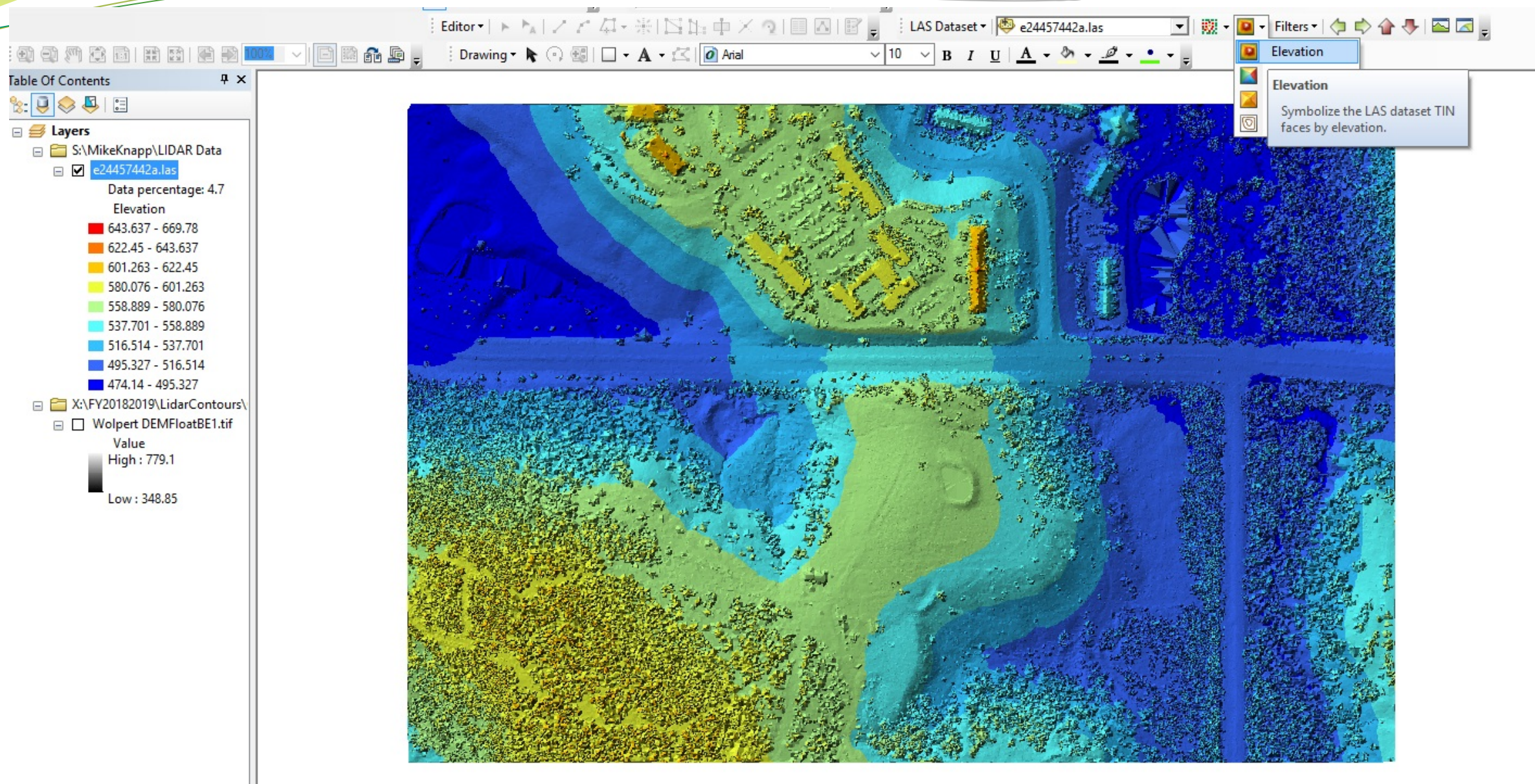


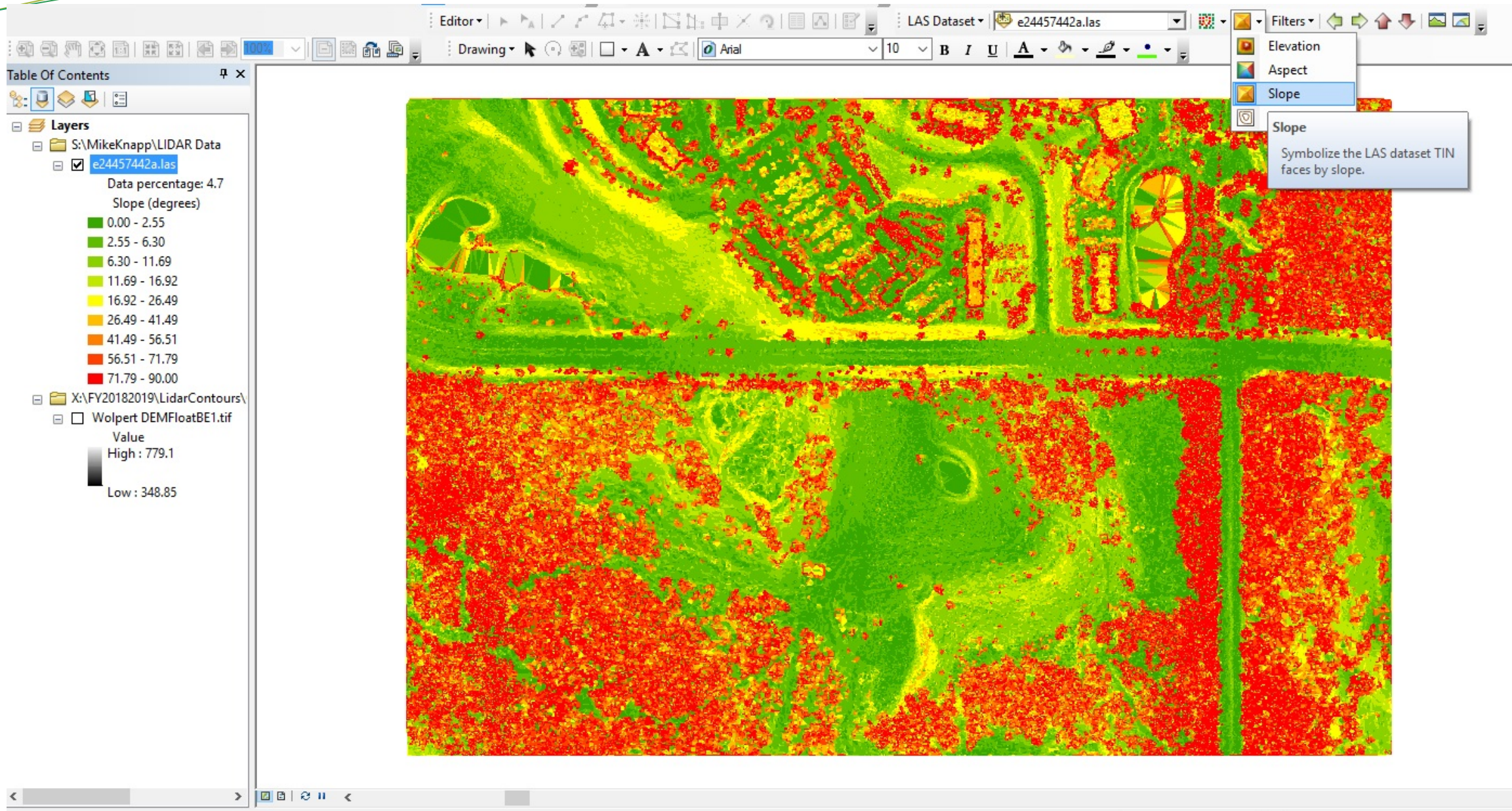
.LAS File Extension

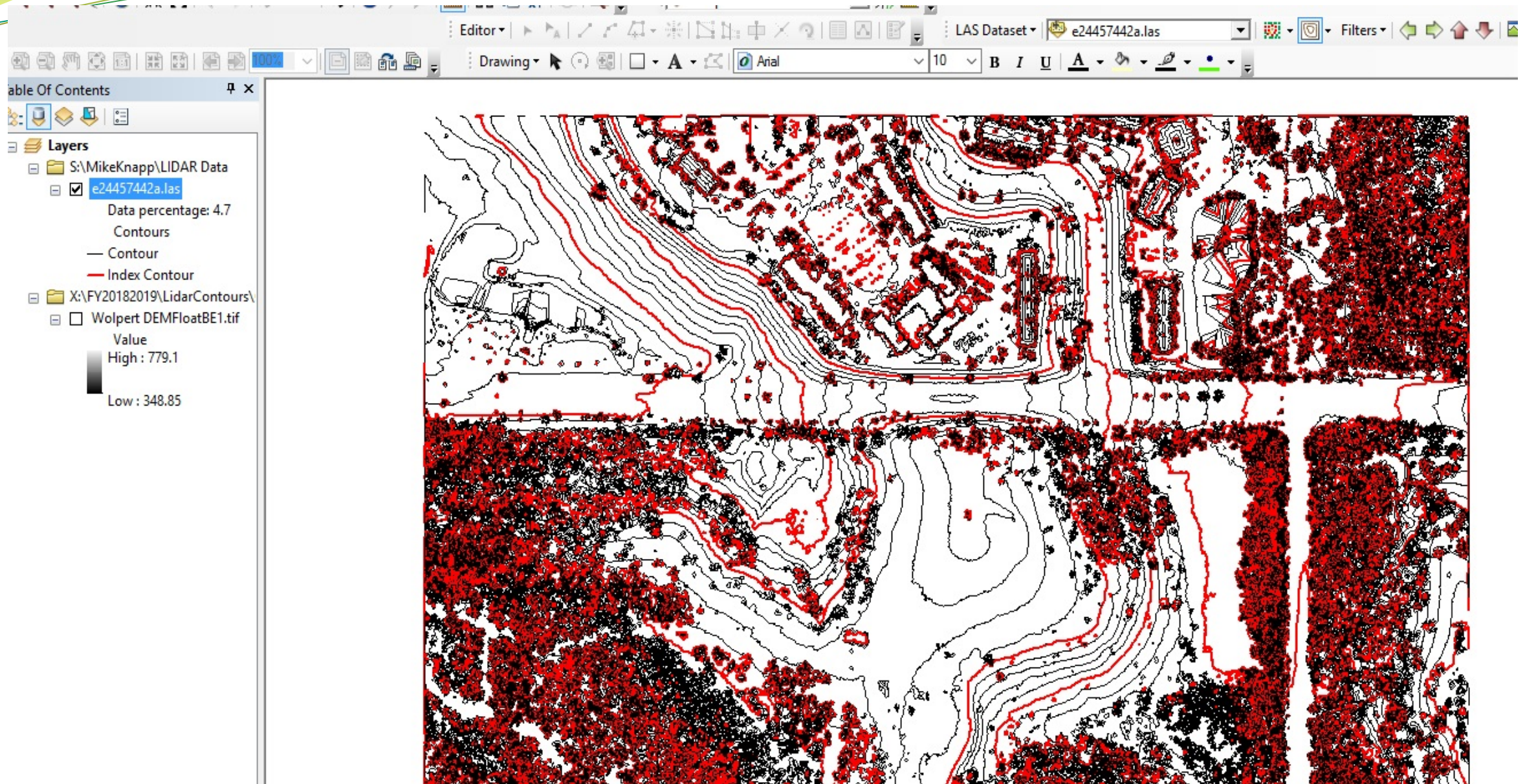
- File created in the standard LAS format, which was developed by the American Society for Photogrammetry and Remote Sensing (ASPRS); stores Light Detection and Ranging (LIDAR) data that is collected by optical remote sensors; used to exchange LIDAR data between data providers and data consumers.
- The LAS file format (LIDAR Data Exchange file type) was developed in response to the growing number of proprietary LIDAR file formats. It also was designed to overcome some of the complexities in existing LIDAR data. LAS files are stored in a binary format.

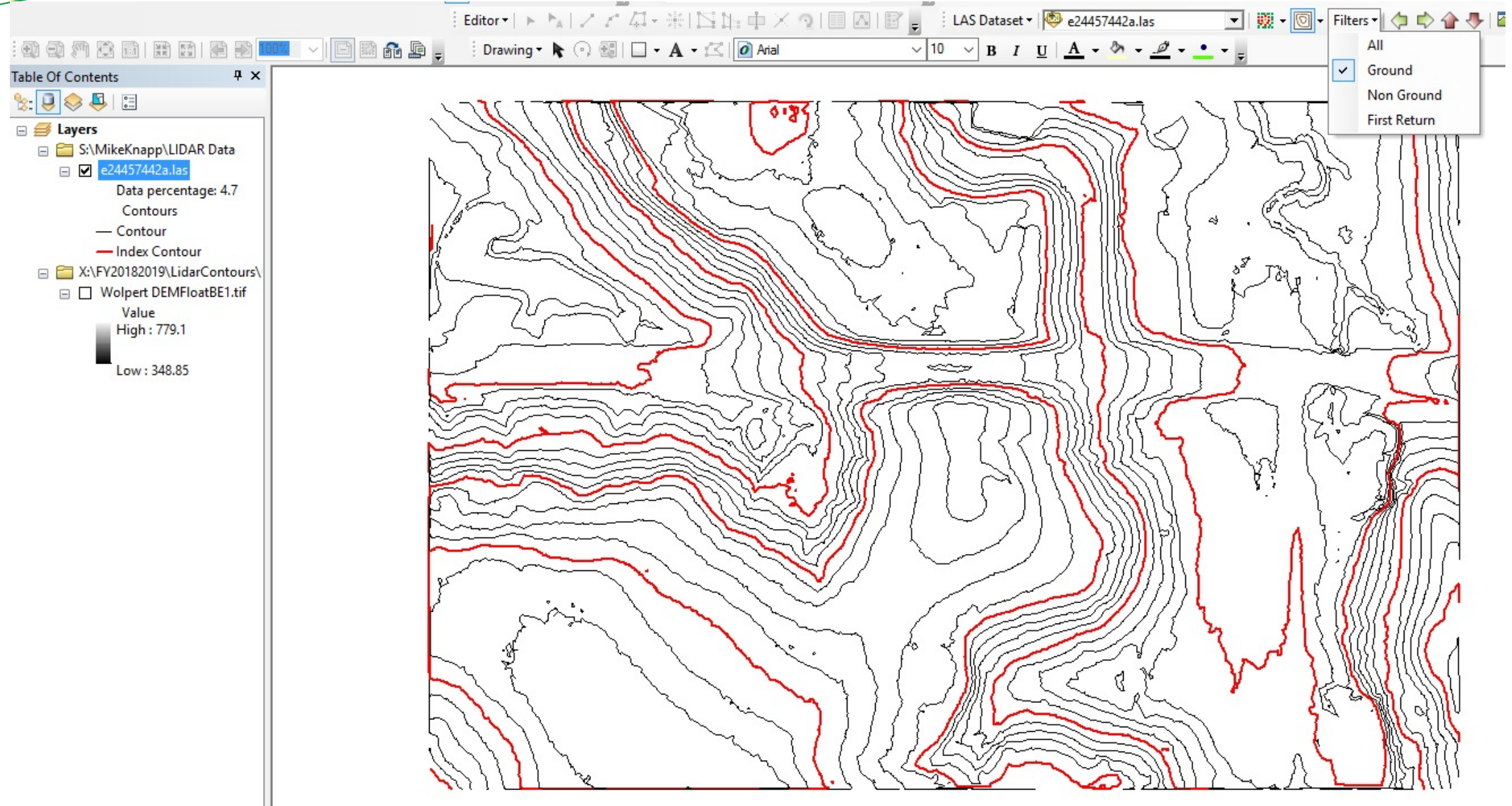












Factoid

The 2167 .LAS files that cover the City of Dallas contain roughly 13,002,000,000 points

Assignment

Make a replacement for the 2000 contour lines dataset using the 2017 Lidar.

Contour Interval will be 2 feet.

Let's think about this...make a plan

Explore toolbox and see what tools are available and how they work.

Do some Research.

Make a plan. Think BIG and try to Make it Easy and Simple.

Steps involved to Convert Lidar to Contours

- General Project Steps
 - .LAS to Rasters.
 - Rasters to Raster Mosaic(DEM)
 - DEM to Contours.
-
- Requires 3-D Analyst and Spatial Analyst Extensions.
 - Copy original .LAS data to working set. Seems obvious.

.LAS Files to Raster

In Toolbox > Conversion Tools > To Raster > LAS Dataset to Raster.

Be sure to have the Output Data Type(optional) to be FLOAT.

If you chose INT(Integer) you will be sorry.

(Do you remember in 9th Grade Algebra when you asked your teacher, "When will we ever use this ? ")

Results in 2167 individual Rasters.

Make a Raster Mosaic

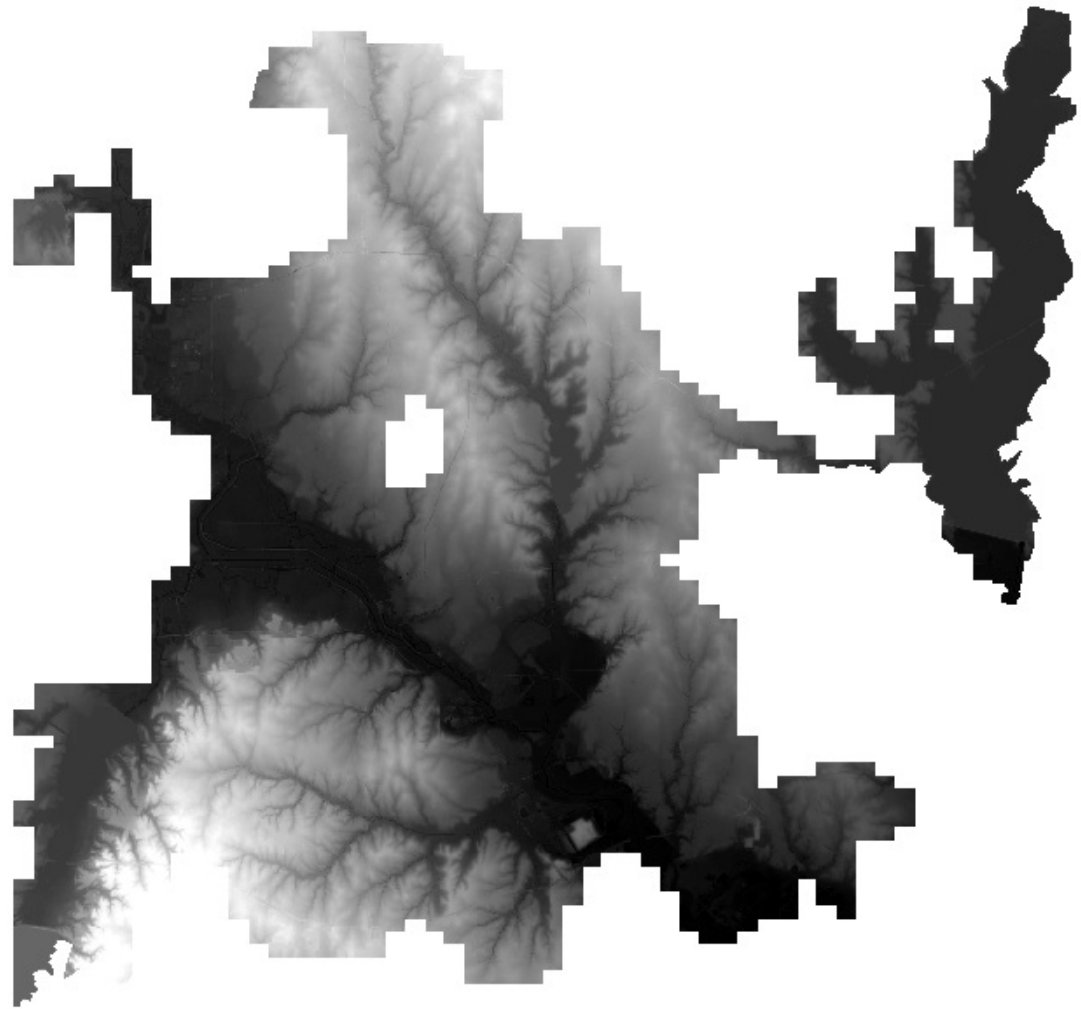
- Make a Raster Mosaic of the 2167 rasters that you converted from the .LAS files. This will make one GIANT raster from all of the smaller tiled rasters. It will become a DEM (Digital Elevation Model)
- In Toolbox: Data Management Tools > Raster Mosaic Dataset > Create Mosaic Dataset.
- In Toolbox: Data Management Tools > Raster Mosaic Dataset > Add Rasters to Mosaic Dataset.
- Let it run over night....this will take some time .

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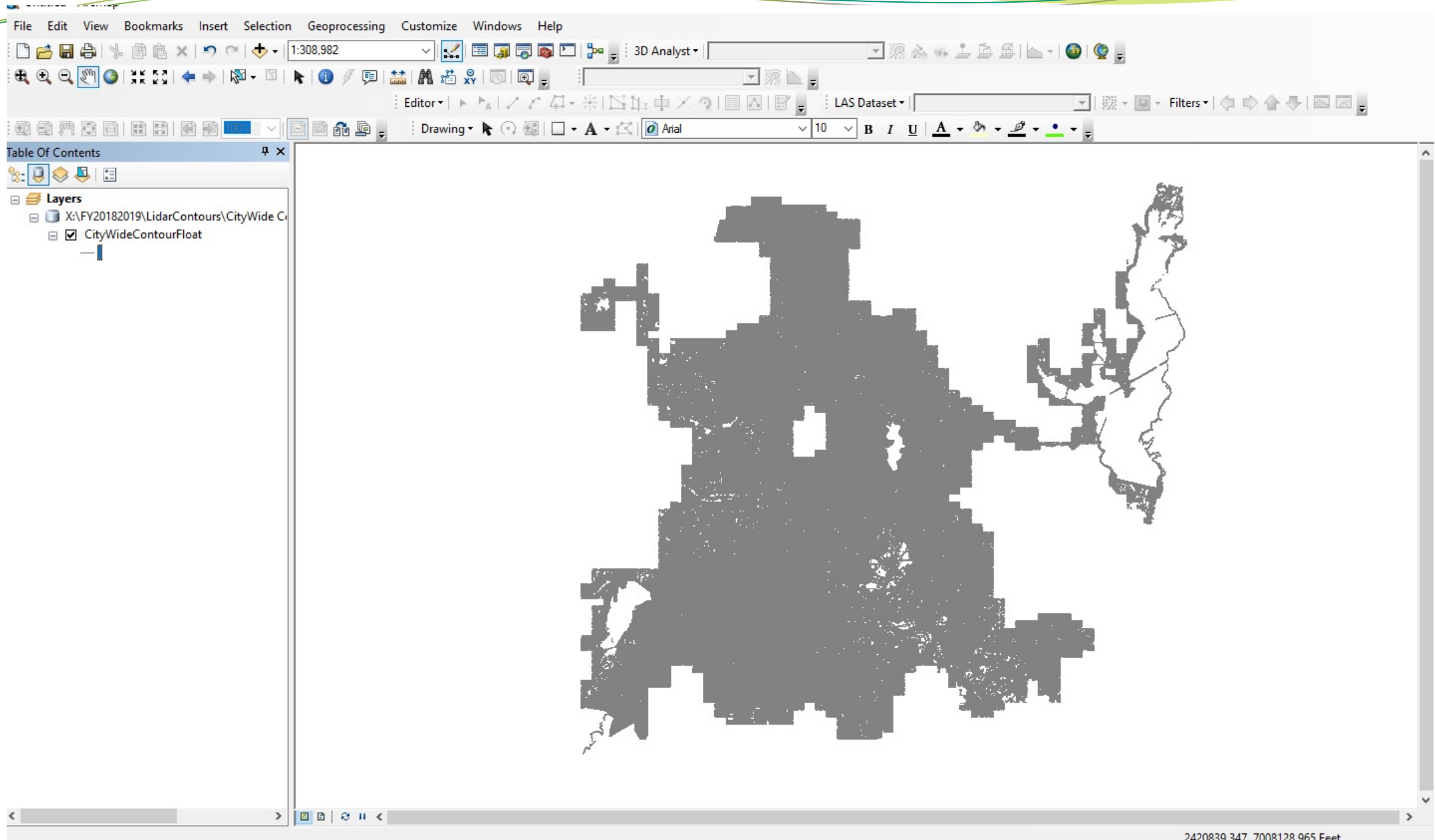
Layers

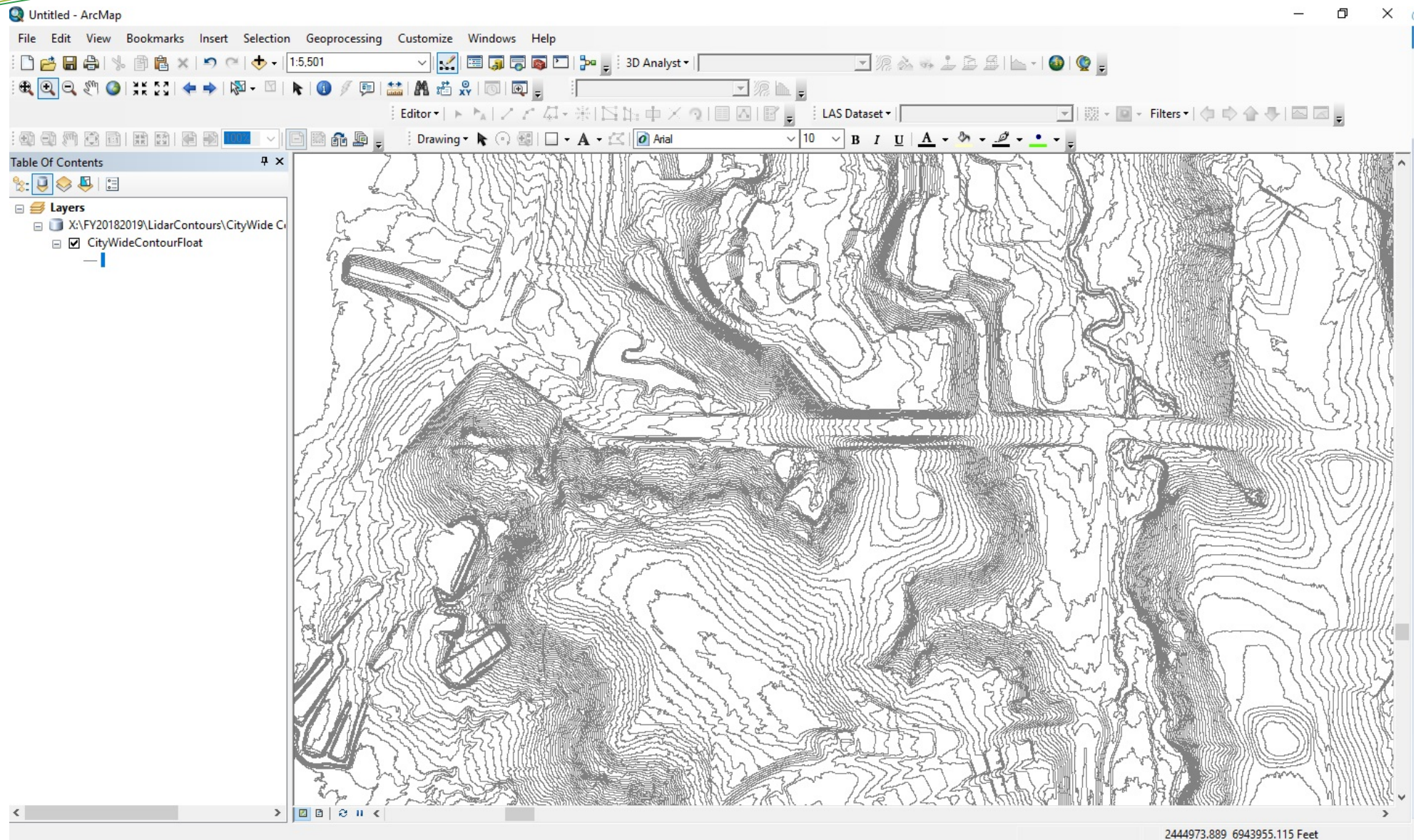
- [-] S:\MikeKnapp\LIDAR Data
 - ☐ e24457442a.las
 - Data percentage: 4.6
 - Contours
 - Contour
 - Index Contour
- [-] X:\FY20182019\LidarContours\
 - ☒ Wolpert DEMFloatBE1.tif
 - Value
 - High : 779.1
 - Low : 348.85

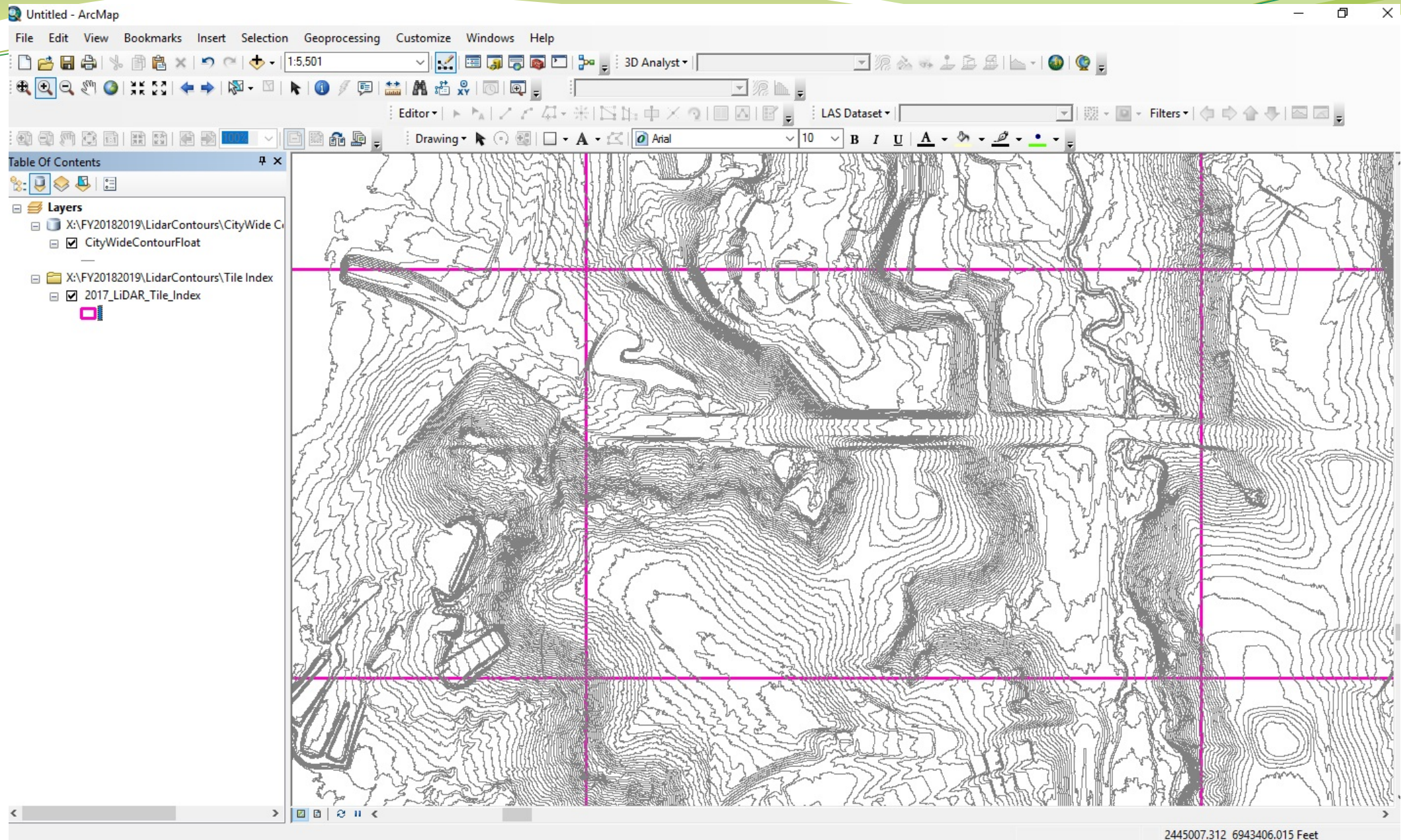


Contours

- *To build contours from a raster...*
- *Toolbox > Spatial Analyst Tools > Surface > Contour Tool or Contour with Barriers Tool. Go to lunch.*







Smooth Contour Lines

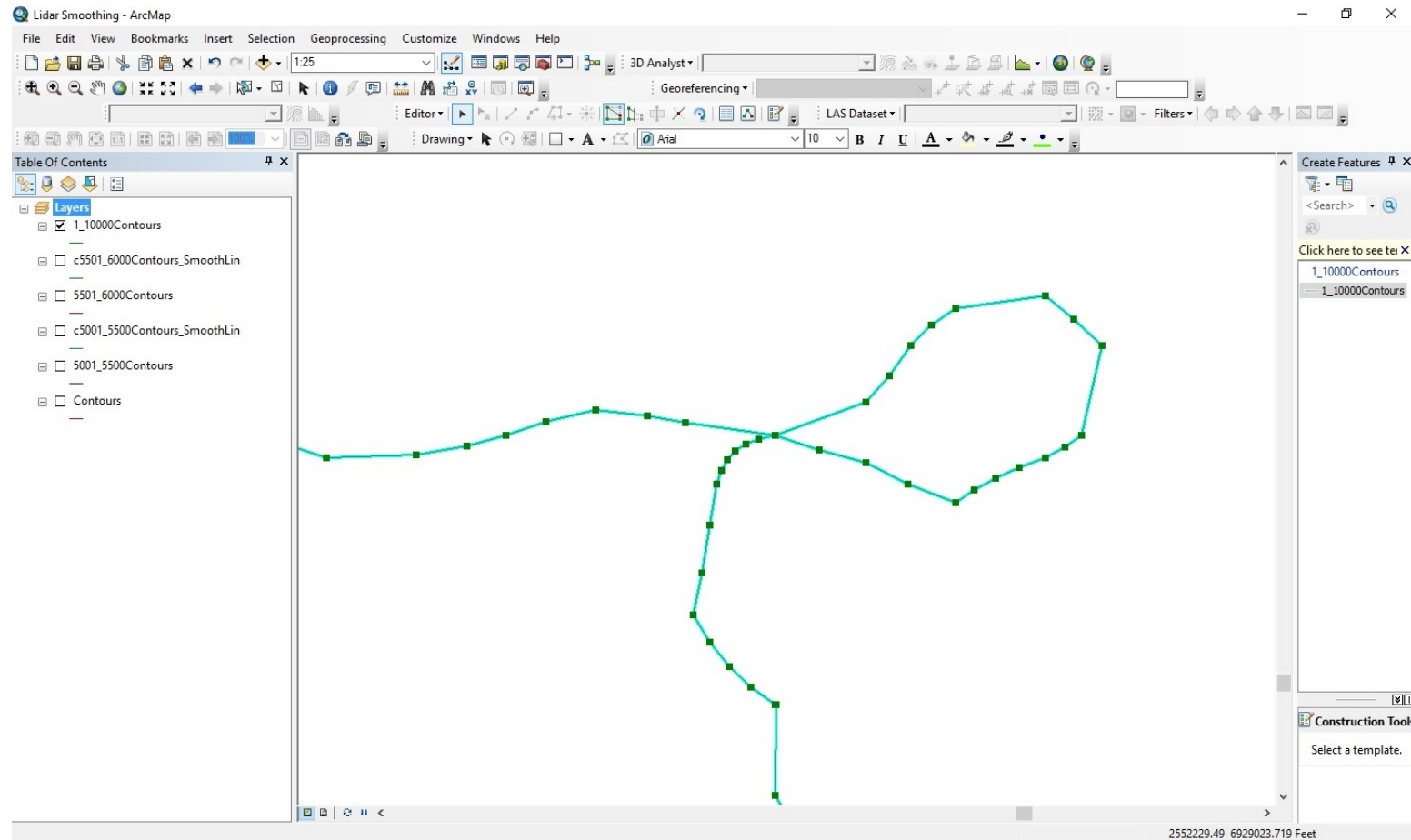
Next BIG Idea....

*To Smooth Lines: Toolbox > Cartography Tools >
Generalization > Smooth Line Tool(?)*

Smooth Lines

- Didn't Work
- It made the contour lines more “Angular” and added dead end “Stems”
- NEXT

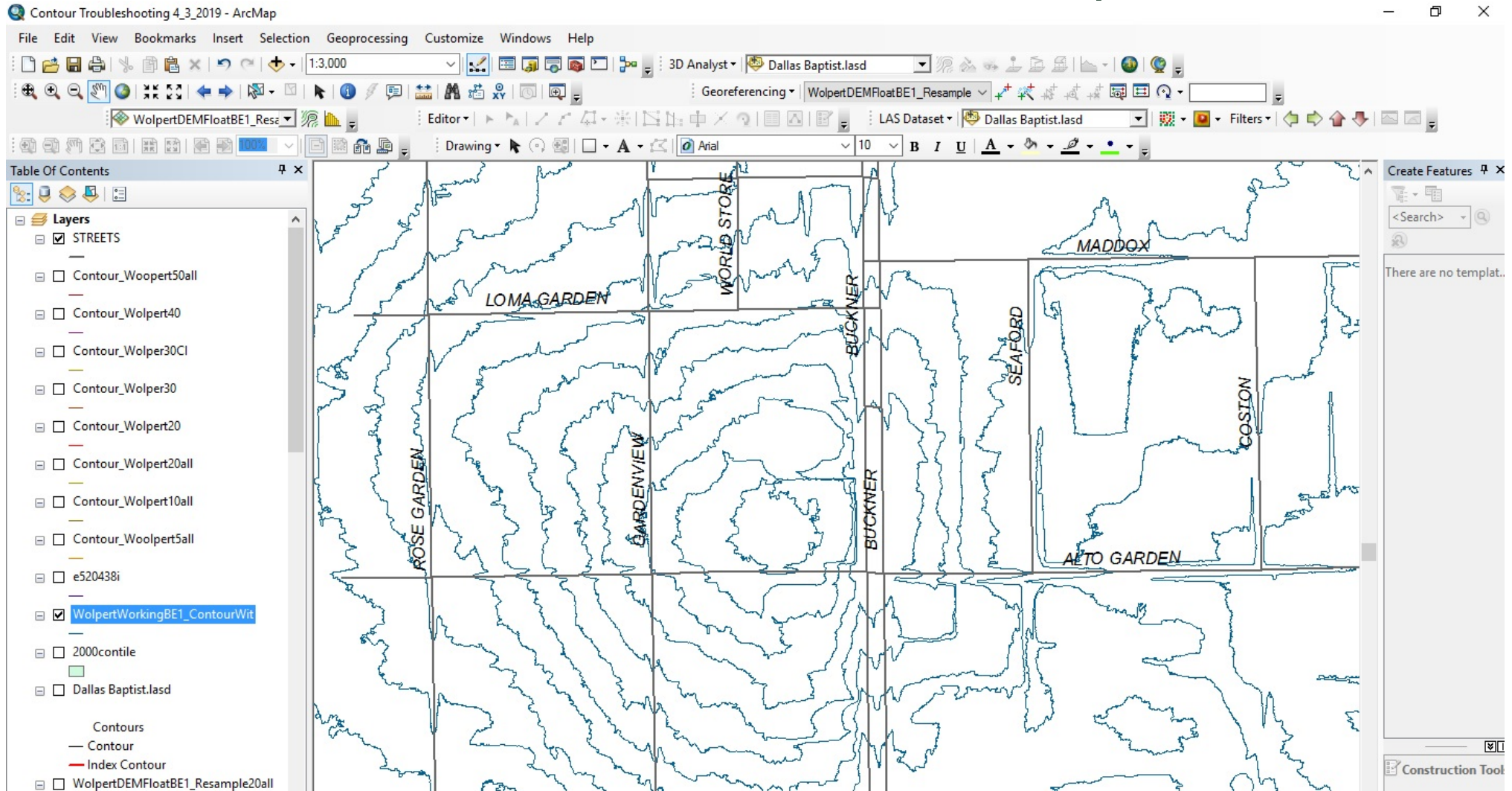
Quality Control



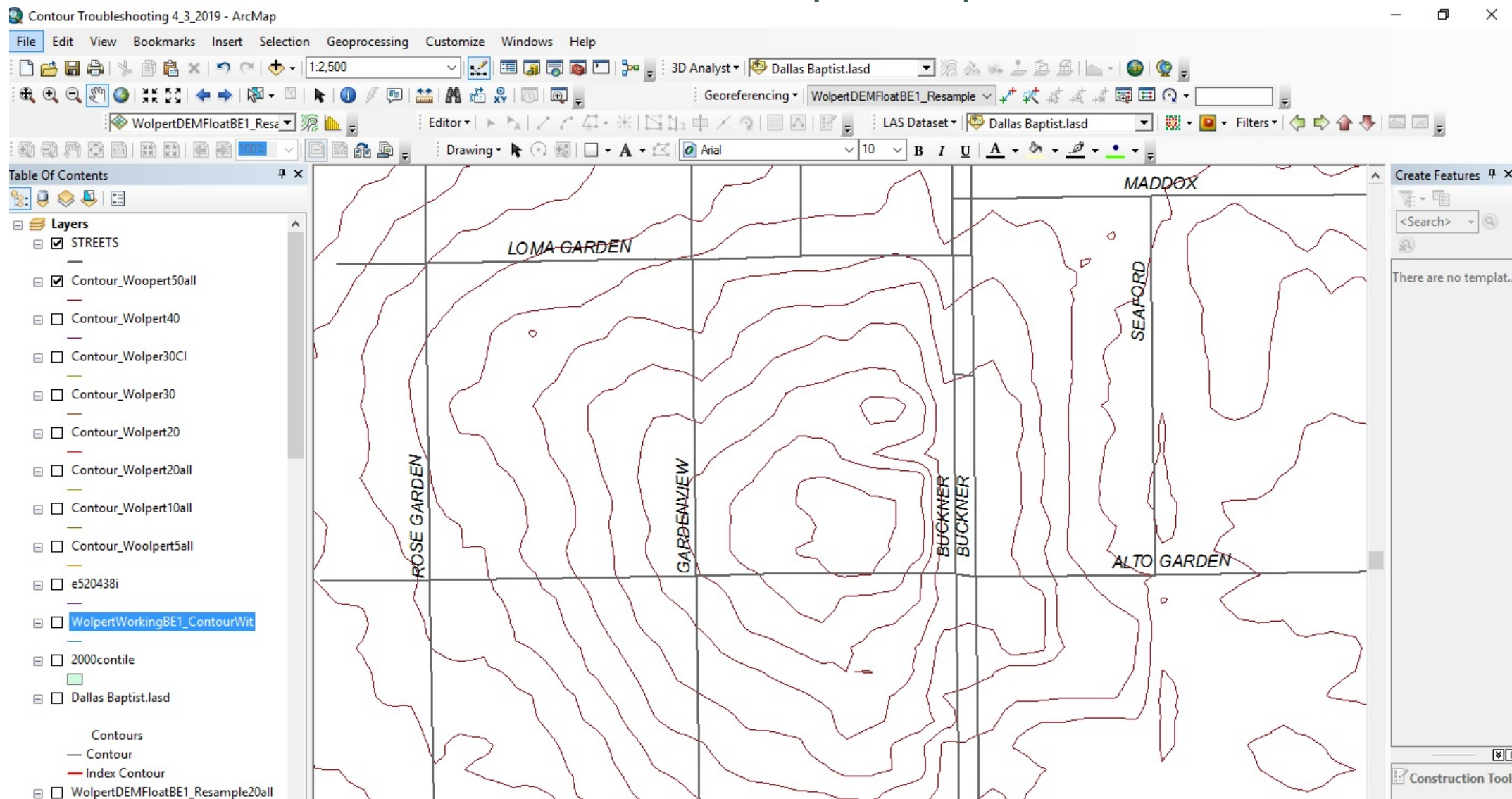
More Research

- One forum on a QGIS contour looping problem suggested that it could be eliminated by resampling the raster and contouring the results.
- Tool Box > Data Management > Raster > Raster Processing > Resample Tool. I selected various Raster Resample sizes and made new rasters.
- Tool Box > 3D Analyst > Raster Surface > Contour Tool.
Recontoured the Resampled rasters

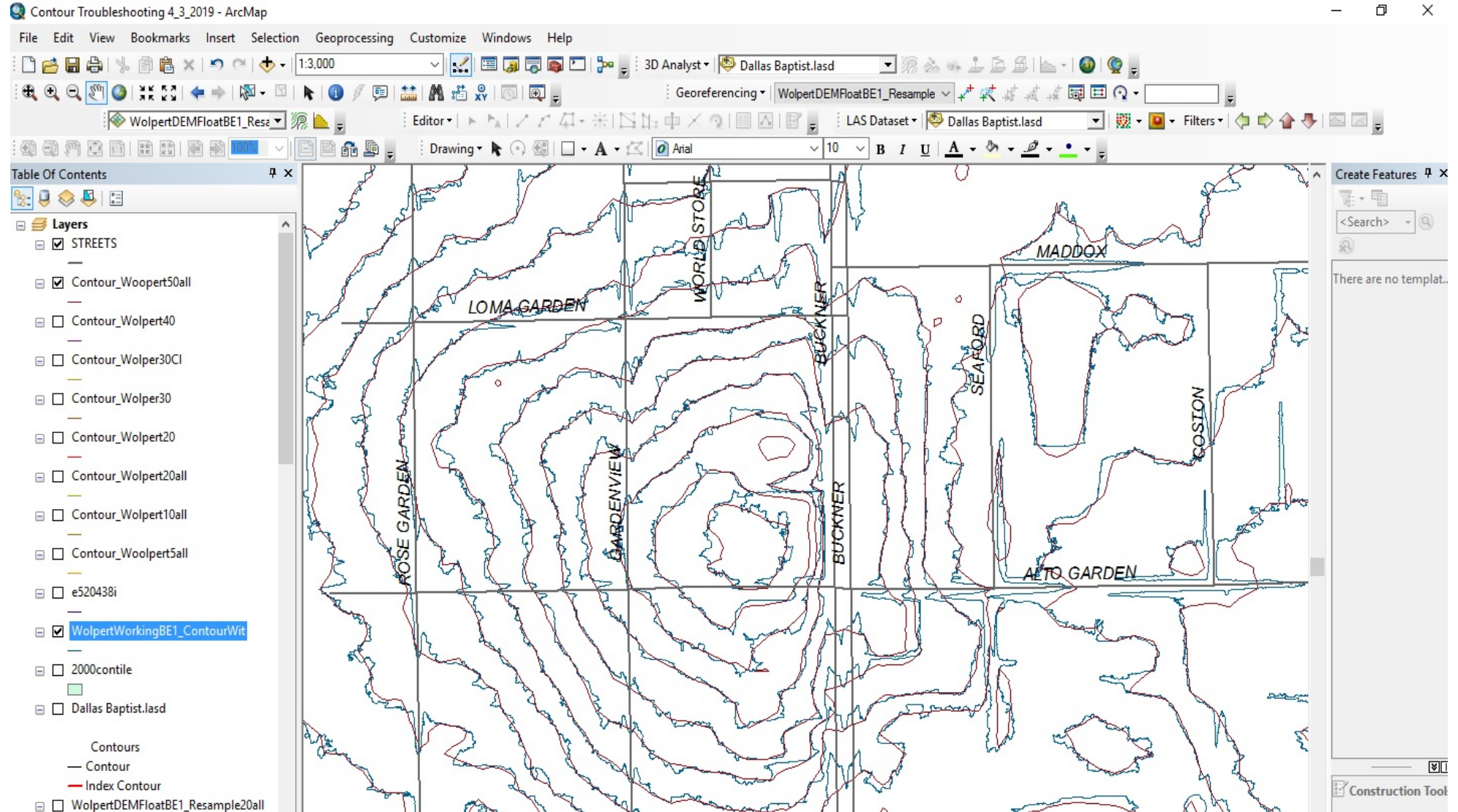
Bare Earth Processed by Woolpert Contoured on one foot pixels



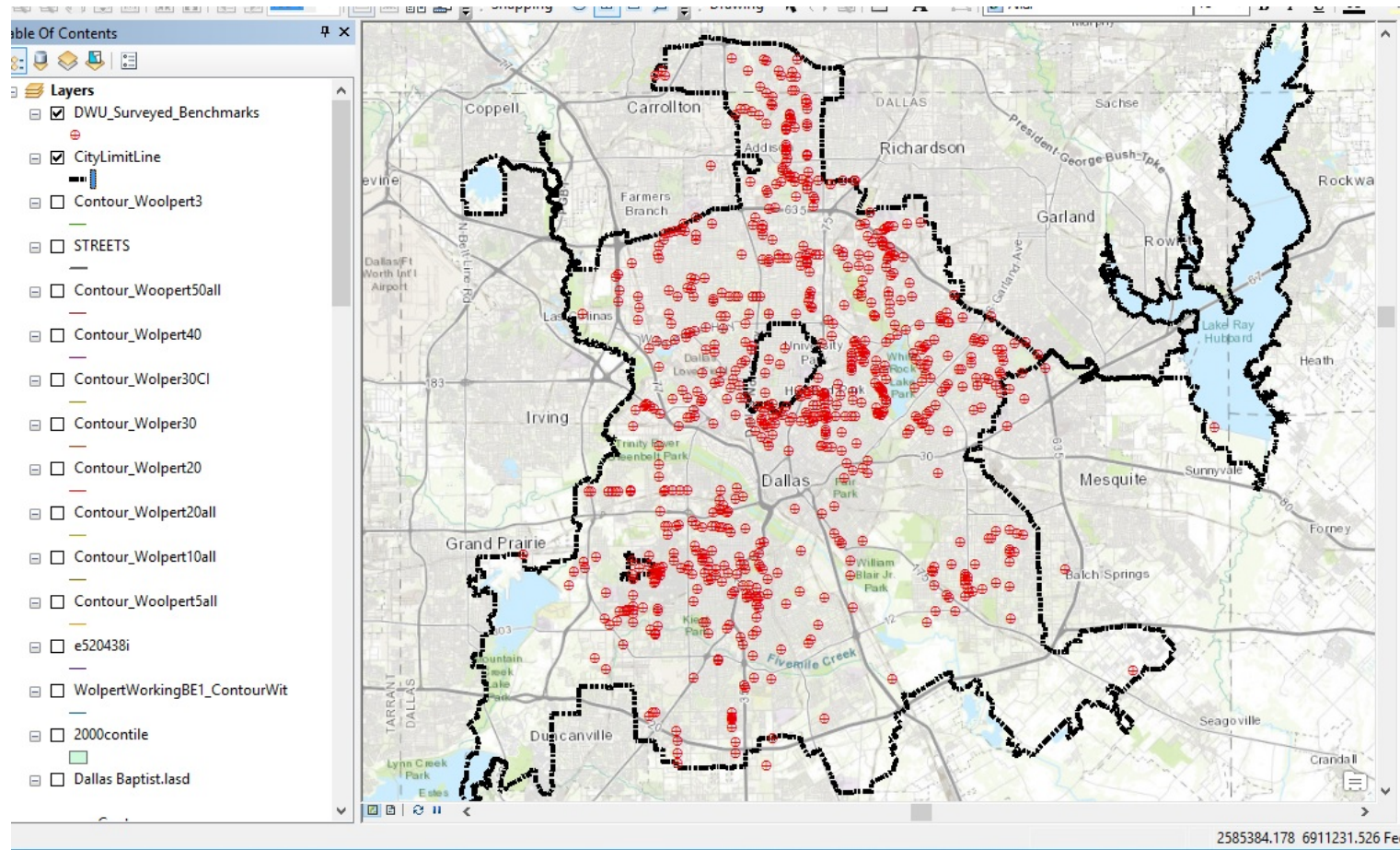
Contoured on Resampled pixels of 50 Feet



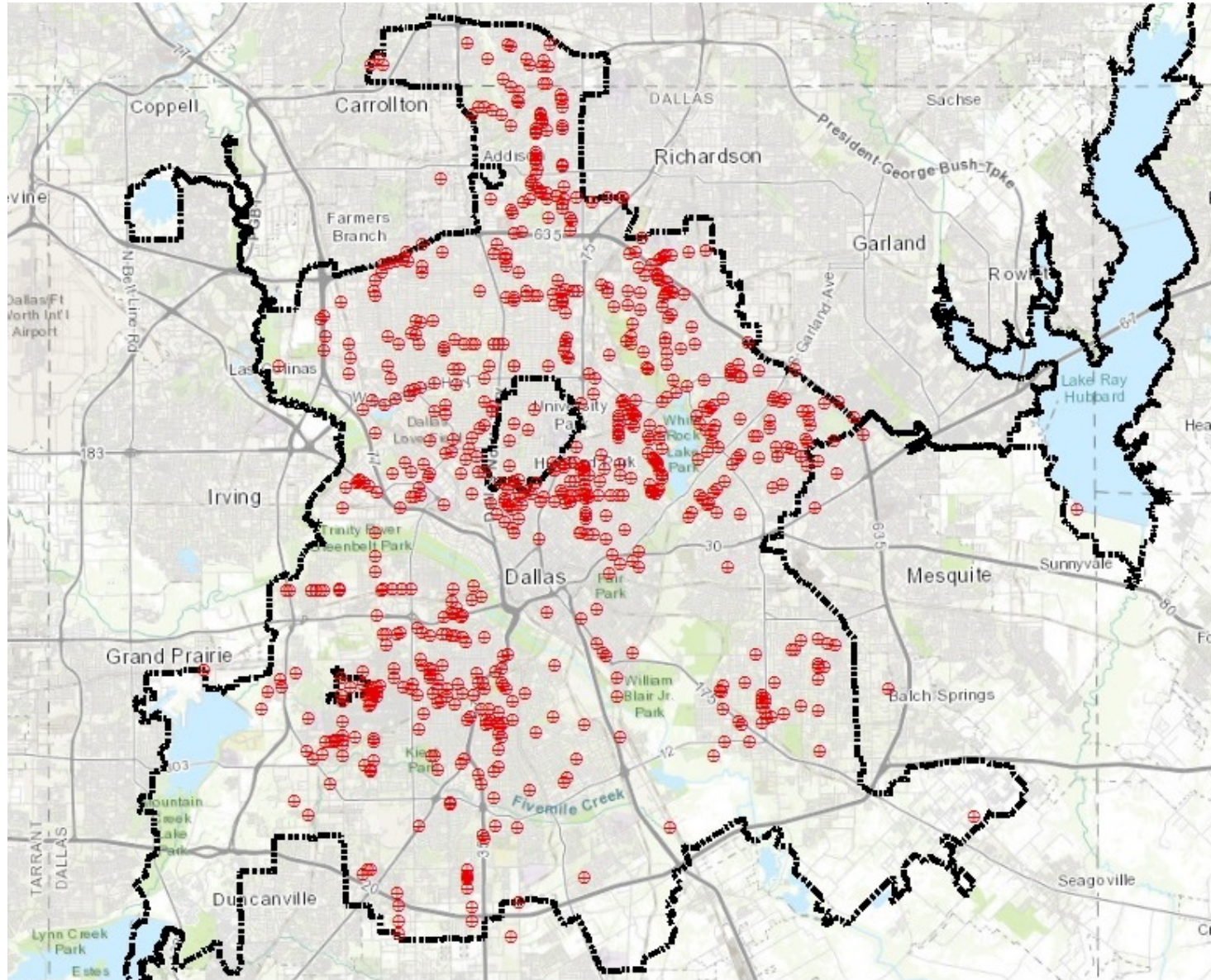
Combined for Comparison



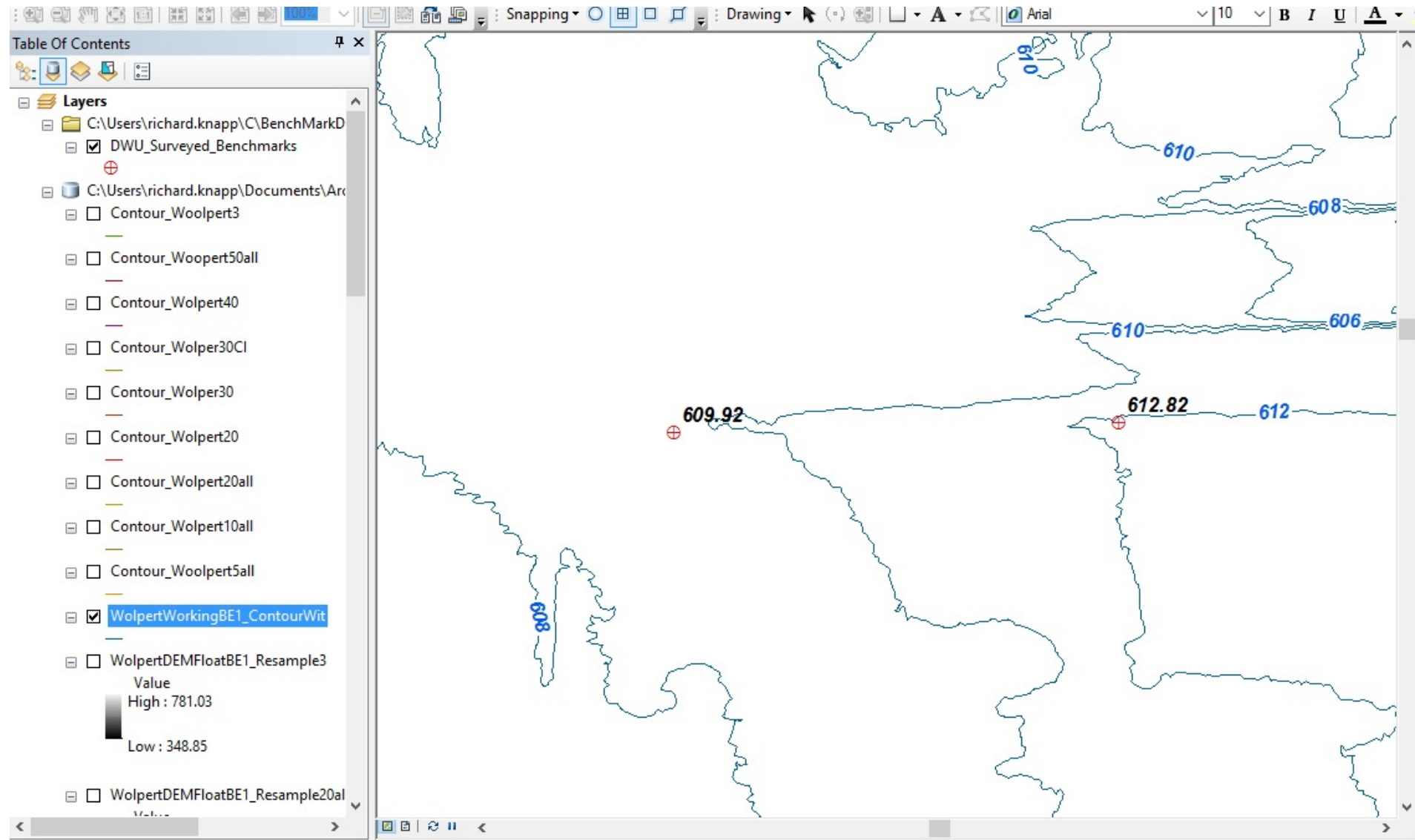
One More Ingredient



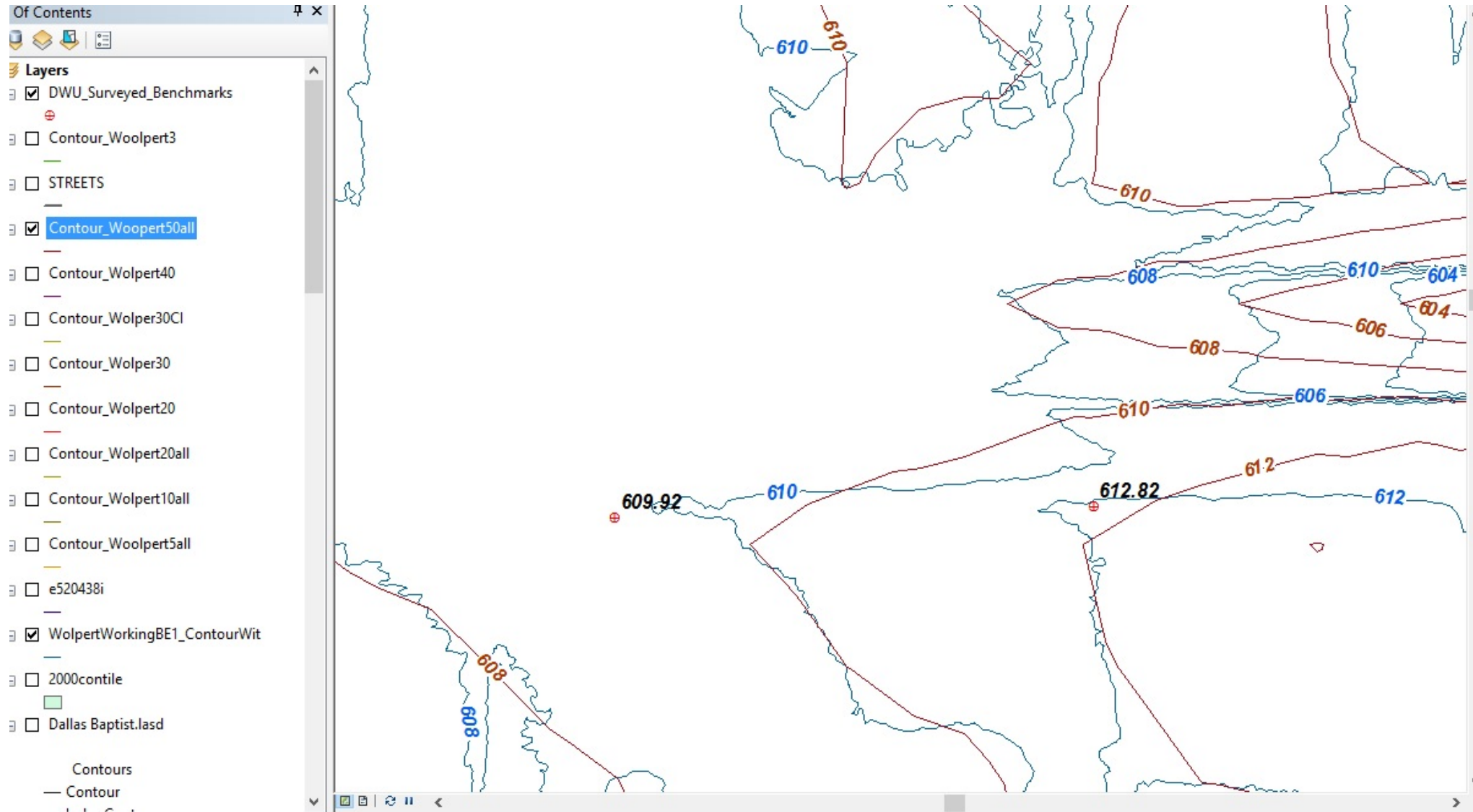
City Wide Benchmark Survey Data



Compare Benchmarks with Contours



Compare Bare Earth(Blue) and 50' Pixels(Maroon)



If I knew then.....Summary

- Get more RAM. Memory Issues Slowed the Project.
- Added 8GB DDR4. Still not quite enough.

The total of 32 GB RAM added to run the project was adequate.



Questions?
Prequntas?





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