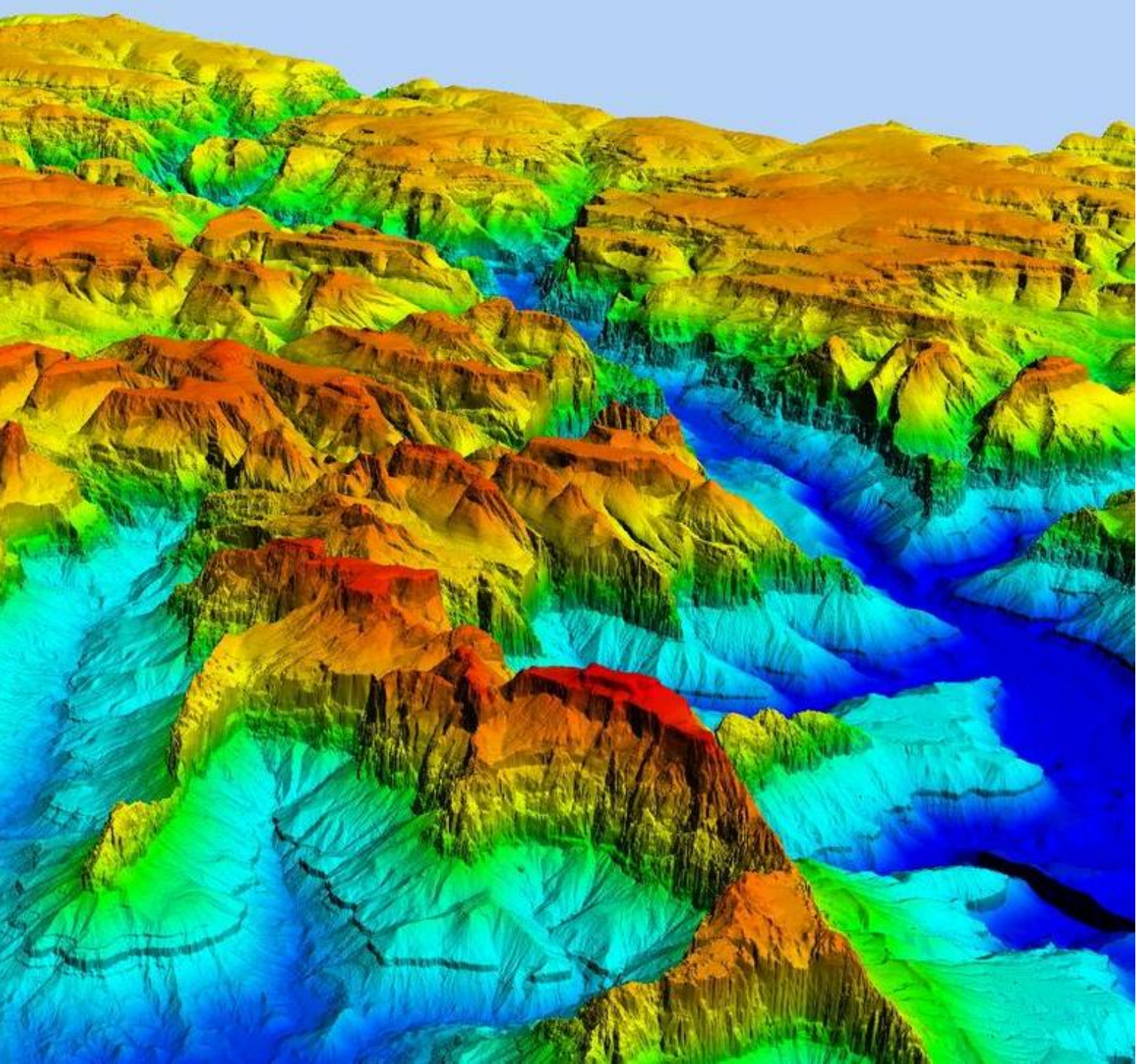
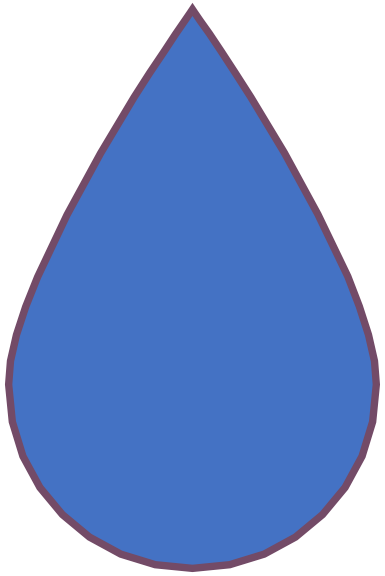


EFFECTIVENESS OF LIDAR IN WATERSHED DELINEATION

- Presenter: Tapiwa Chabikwa
- Digital Terrain Analysis 593.
- Portland State University

ABSTRACT

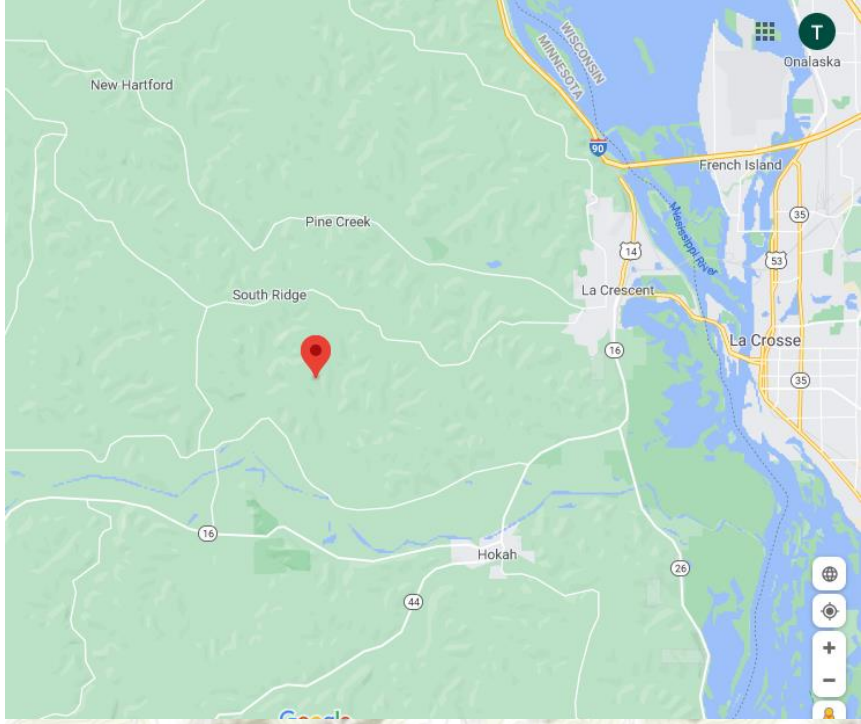


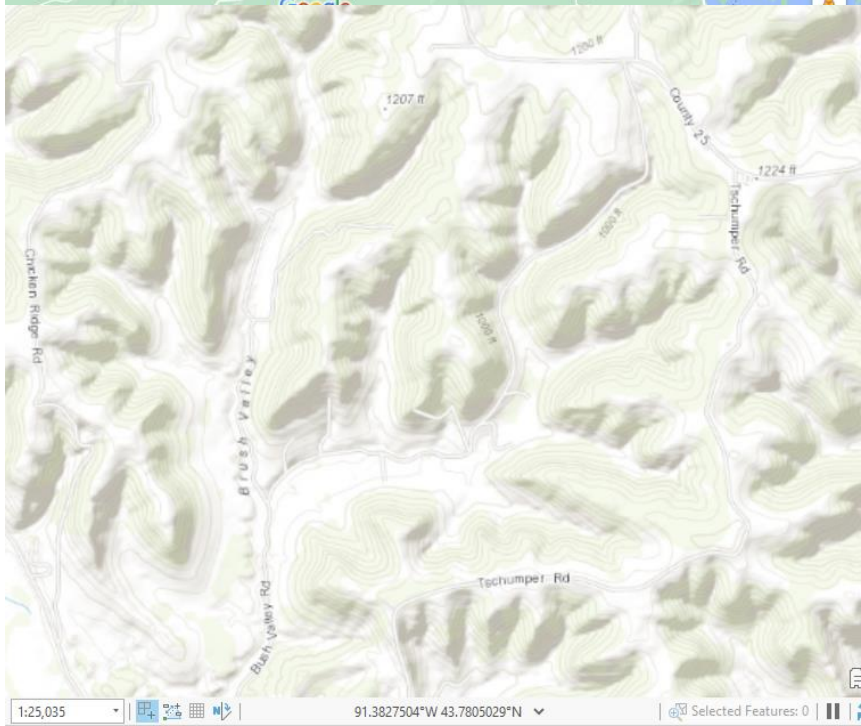
- Watershed delineation has transformed in recent times with the emergence and adaptation of technology in the Hydrology field. In the past water bodies were delineated using manual methods which used contour lines on maps to map the flow of water and to create boundaries along points of high elevation along a water body. These boundaries become known as the watershed. In the advent of tools like ArcGIS and Streamstats watershed delineations has become accessible, more accurate and less tedious. In this, study as comparison of using lidar derived DEM, Photogrammetric derived DEM and the Streamstats tool were used to analyse which data set and tool is more accurate in and has better analytical accuracy in watershed delineation.

- The hydrology tool in ArcGIS was used to run the watershed delineation process for Blue Lake Watershed on the border of Minnesota and Wisconsin. The Streamstats tool developed by USGS was also used to analyze the Blue lake Watershed. The aim of the study was to find which data and tool offers the best analytical edge in the watershed delineation process.

AREA OF STUDY.

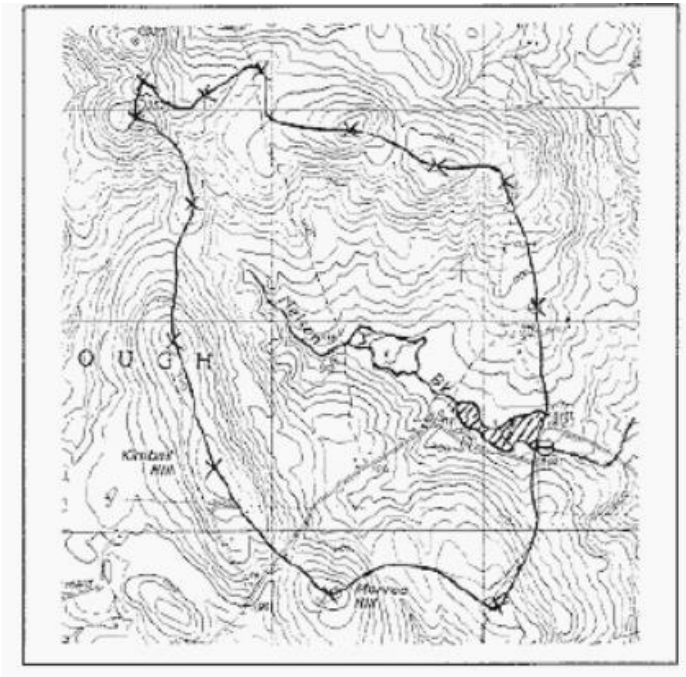
- La Crescent watershed, Minnesota.
- Lies west of Blue Lake, Minnesota.



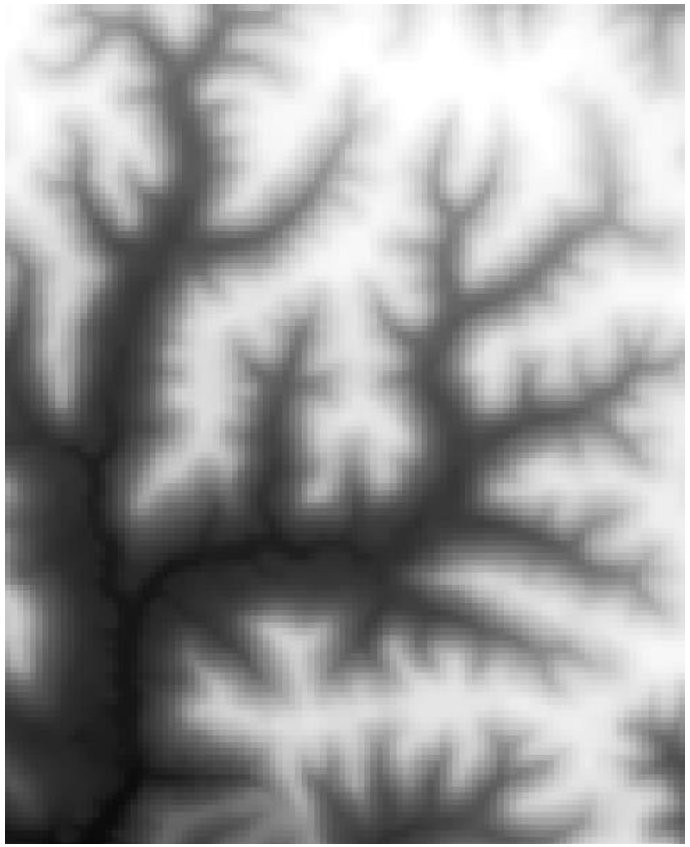


MANUAL WATERSHED DELINEATION.

- Use contour lines.
- Find points of highest elevation around stream .



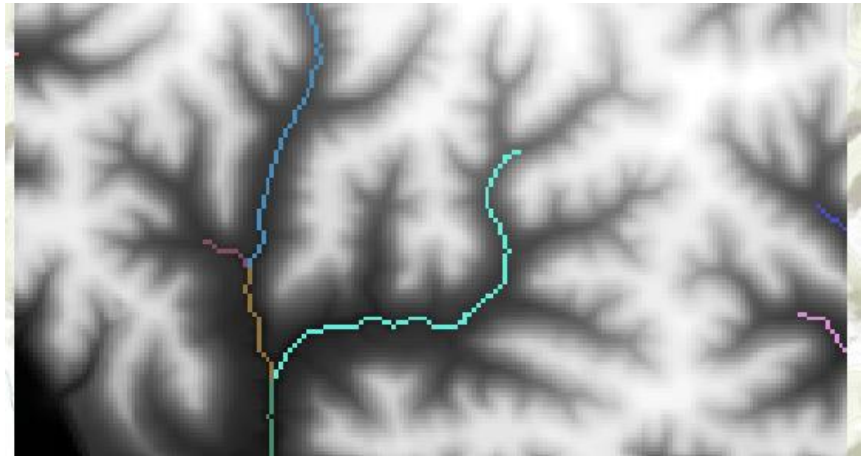
ARCGIS ANALYSIS

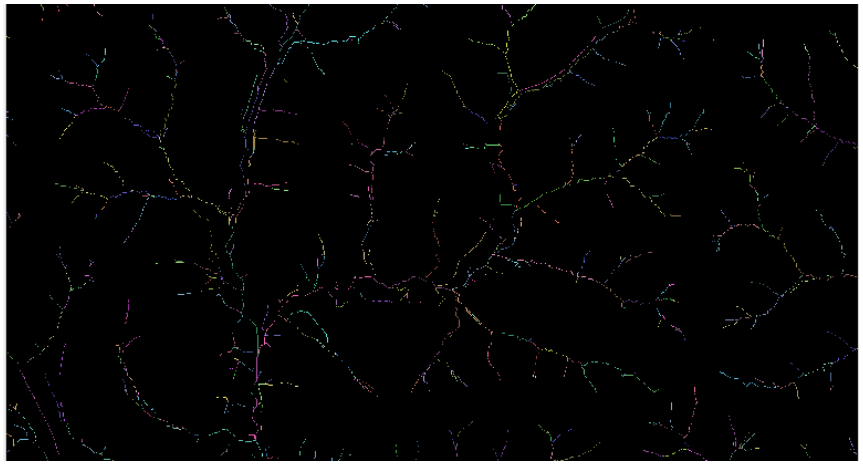


- DEMS- Lidar DEM and Raster DEM
- Hydrology Tool.
- Fill
- Flow Direction
- Flow accumulation
- Con Tool (lidar Value > 50k and 100k pixels . Raster Dem threshold > 1000)

AERIAL RASTER VS LIDAR RASTER STREAMS.

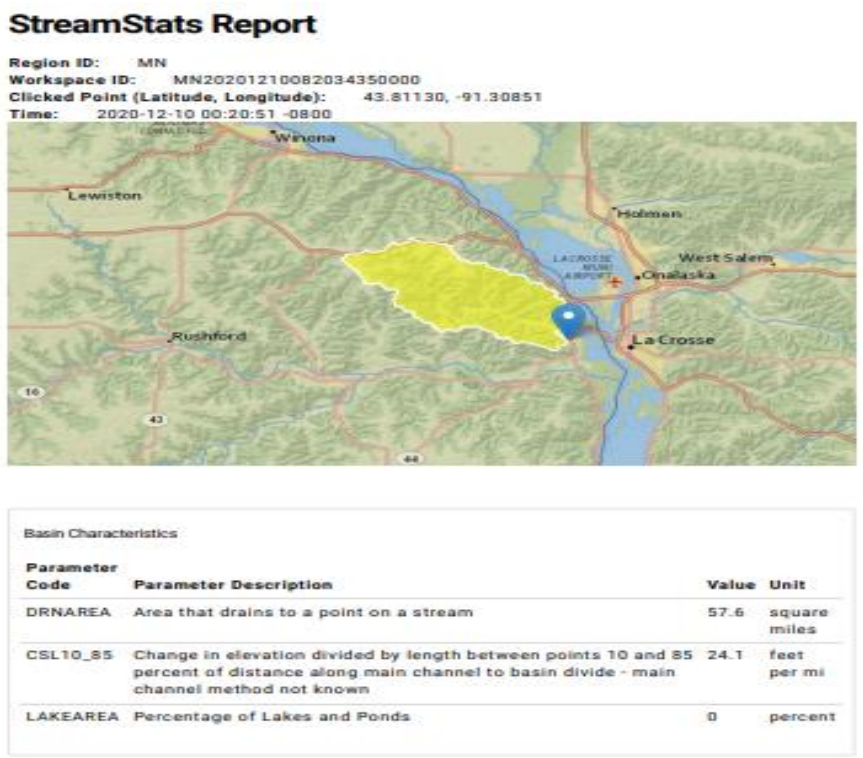
- Aerial DEM has 14 streams.
- Lidar had 43 at streams at 50k and 14 Streams at 100k threshold





WATERSHEDS AERIAL DEM VS LIDAR DEM

STREAMSTATS

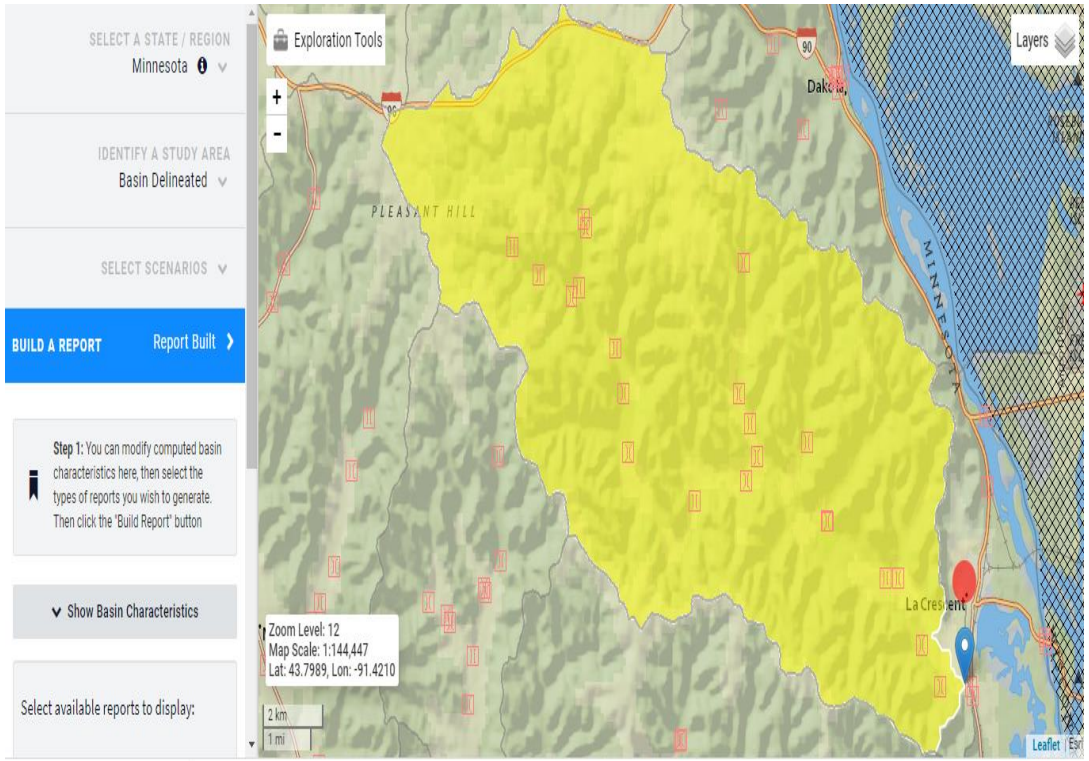


StreamStats Report

Region ID: MN
Workspace ID: MN20201210082034350000
Clicked Point (Latitude, Longitude): 43.81130, -91.30851
Time: 2020-12-10 00:20:51 -0800

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	57.6	square miles
CSL10_85	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known	24.1	feet per mi
LAKEAREA	Percentage of Lakes and Ponds	0	percent



DISCUSSION.

Aerial DEM and Lidar DEM provide in depth analysis .

Zoom into more streams and sub watershed.

Lidar is as good as Aerial DEM, can zoom into more in depth.

Streamstats has limited watershed size output.

Streamstats is less cumbersome.

REFERENCES.

- https://giscourses.cfans.umn.edu/fnrm3131