NPS Remote Sensing Research (PH)

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ASSESSING ACCURACY IN VARYING LIDAR DATA POINT DENSITIES IN DIGITAL ELEVATION MAPS

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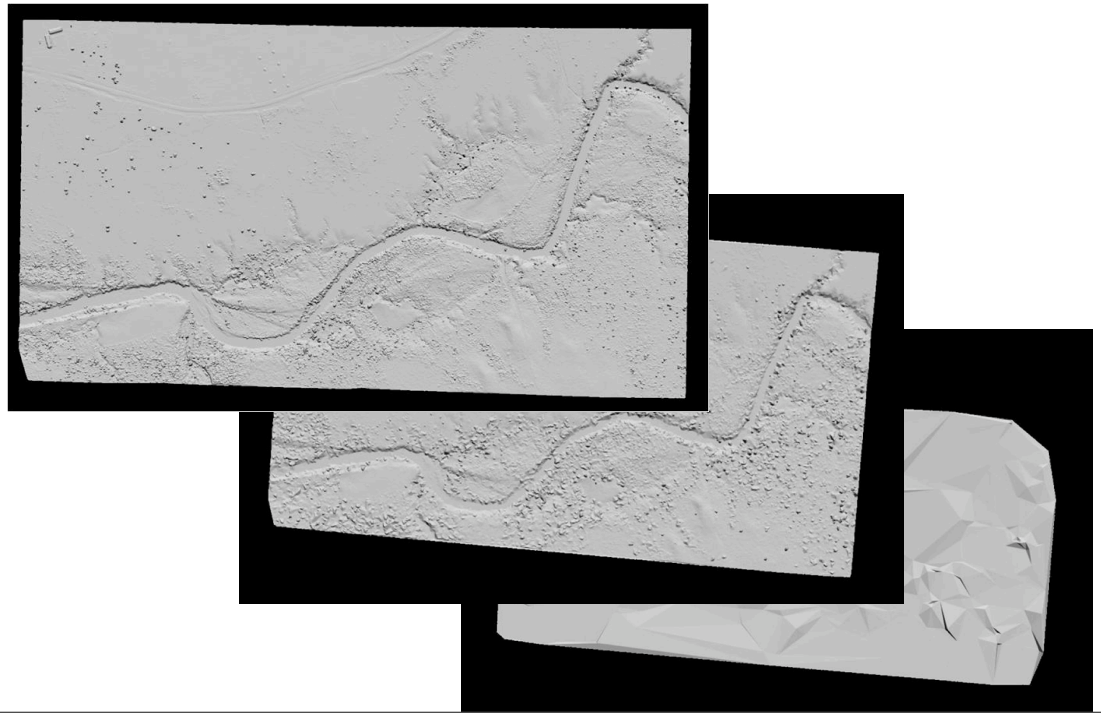
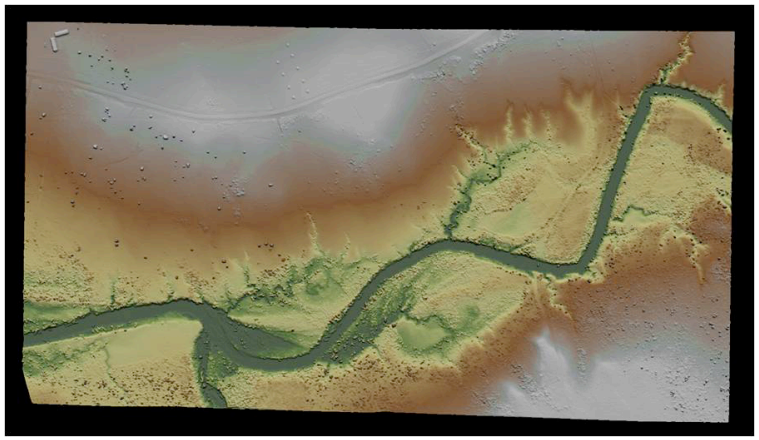
This thesis discusses the production of Digital Elevation Maps (DEM) using varying density of data points from a Lidar (Laser or Light Detection And Ranging) collection. Additionally, this thesis contains information on the multiple space missions that use laser altimetry or Lidar to gather data about planet earth, the moon, asteroids, Mars and Mercury.





The thesis covers the accuracy of different amounts of data used when generating a DEM in Quick Terrain Modeler software package and the ILAP Bare Earth Extraction Plug-In and discusses the error analysis when comparing the different DEMs built by randomly selecting 90%, 66%, 50%, 30%, 10%, 5%, 3%, 1%, 0.5%, 0.3%, 0.05%, 0.03% and 0.01% of the data from an airborne Lidar collection from Honduras in 2008. Analyzing surface DEMs created in QTM, the results of the point reduction experiment indicate that a collection cloud point density of 60,000 points per square kilometer are required for an accurate surface DEM in this environment.

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