UNIVERSITY *of* FLORIDA **GEOMATICS**

UAS Lidar Elevation Corrections in Mangals Using Machine Learning

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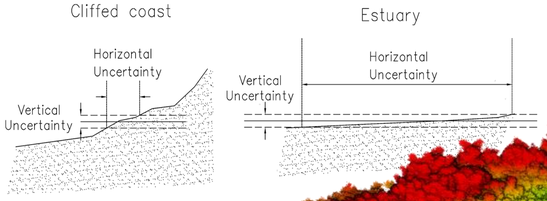
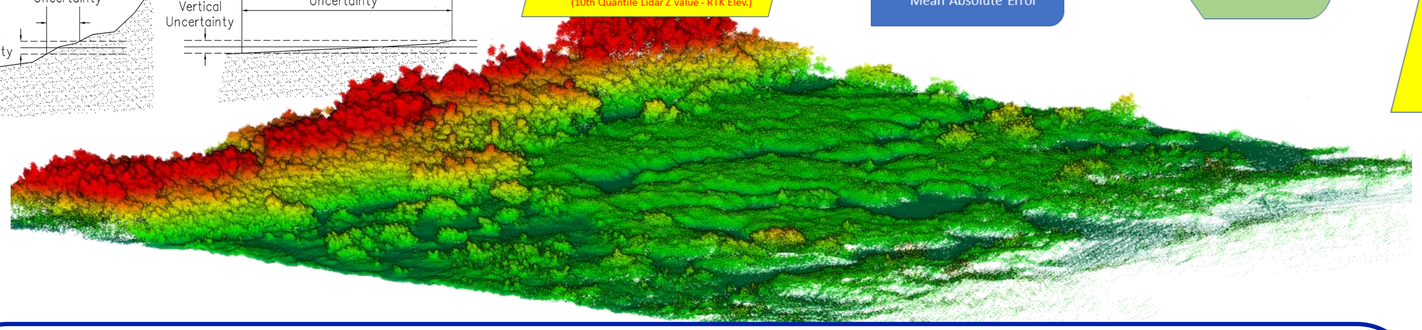
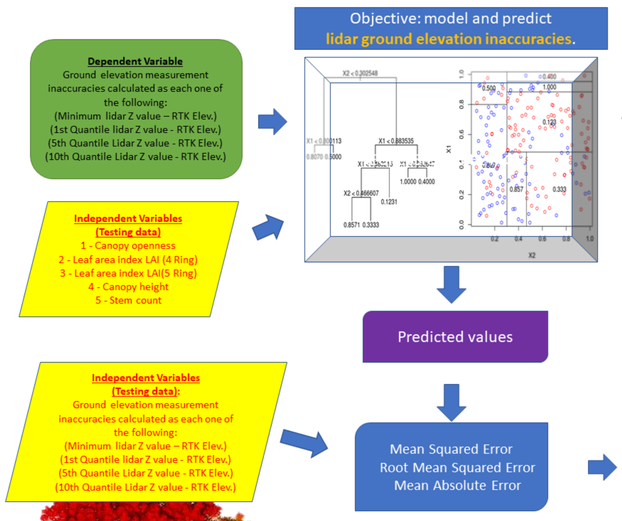
Introduction

- **Lidar** can acquire **geospatial information** of a coastal zone with high accuracy, but must be used with caution
- **The presence of mangroves presents unique challenges for creating accurate lidar digital products.**
- **The accuracy of the elevation measurements directly affects coastal monitoring and restoration.**

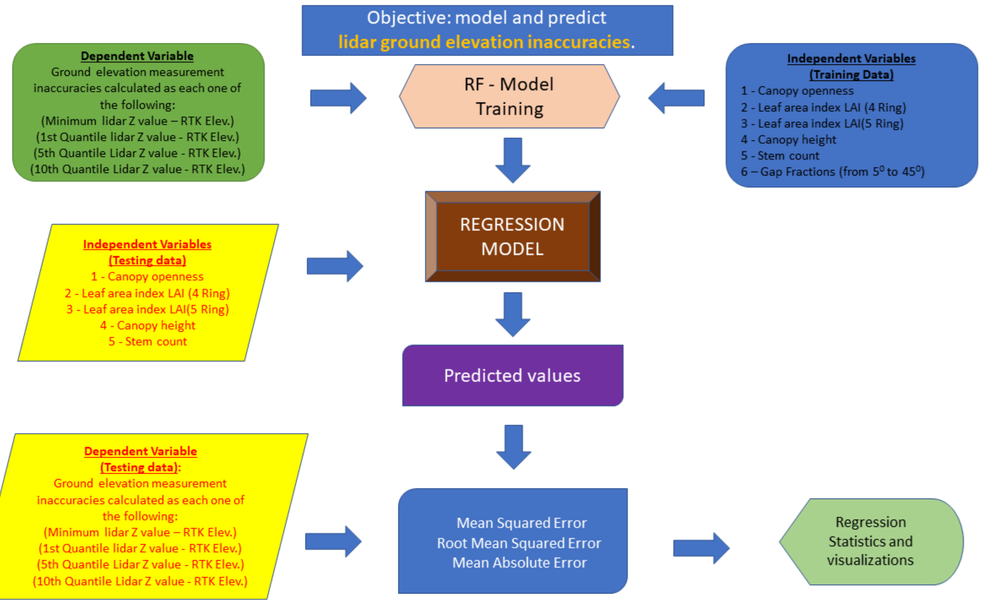




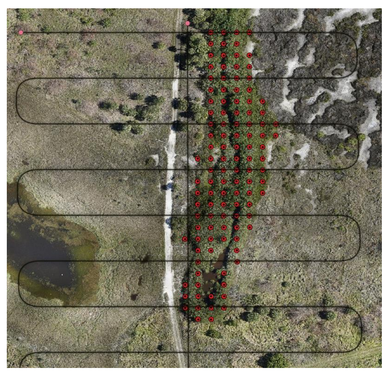
Approach: Decision Trees.
Factors affecting measurements



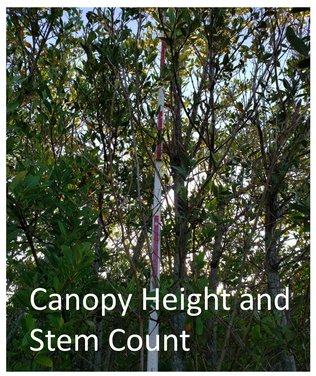
Approach: Random Forest Regression.
Correction model

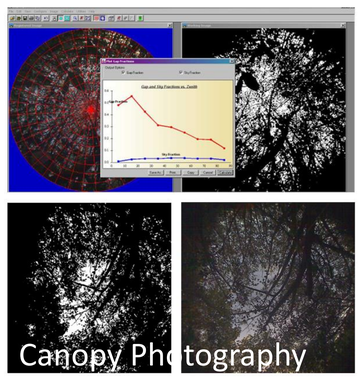


UAS Survey



Ground Survey





Expected Results

- Compilation of the key factors influencing UAS lidar elevation beneath canopies.
- Determination of coefficients required to adjust UAS lidar based canopy traits
- Identification of coefficients for correcting UAS cloud elevation using lidar metrics
- Determination of the impact of the lidar angle of incidence on elevation through canopies.

References

J. N. Rogers, C. E. Parrish, L. G. Ward, and D. M. Burdick, "Improving salt marsh digital elevation model accuracy with full-waveform lidar and nonparametric predictive modeling," Estuar Coast Shelf Sci, vol. 202, pp. 193–211, Mar. 2018, doi: 10.1016/j.ecss.2017.11.034

C. Hladik and M. Alber, "Accuracy assessment and correction of a LIDAR-derived salt marsh digital elevation model," Remote Sens Environ, vol. 121, pp. 224–235, Jun. 2012, doi: 10.1016/j.rse.2012.01.018

Future work

- UAS Lidar Elevation Corrections in Coastal Grasslands Using Machine Learning.