

Intensity Analysis of Overlapping LIDAR Data Swaths, for Surveys Conducted at Different Heights in South Florida, 1999-2002

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Abstract

One of the capabilities of the LIDAR (LIght Detection and Ranging) sensor is to collect intensity returns from the ground. The LiDAR sensor measures intensity by recording the signal strength of the reflectivity emitted by the target. The return intensity might be affected by several factors one of which is the flying elevation. In this study, we analyzed and compared the relationship between LiDAR intensity and flying height for data collected over the same area but during different years, from 1999 to 2002, and calculated a coefficient factor to correct for the height differences of the overlapping data swaths.

In addition, from 1999 to 2002, the LiDAR system was upgraded several times which resulted in a change of the laser pulse rate, from 10 kHz to 33 kHz. In this project, we also considered the effect that this upgrade could have caused on the intensity returns and empirically calculated a intensity correction factor to account for the changes in the system.

After the corrections were applied, the differences between the intensity values of the overlapping data swaths were minimized, which demonstrated that flying height could definitely be used to correct future intensity data.