

Airborne LiDAR vs. Shipboard Acoustic Data in Complex Shallow Water Environments: Which one can better fill in the white ribbon zone?

Abstract

For any scientific endeavour, it is important to be able to conduct accurate measurements. In the field of geomatics, those measurements seek to describe the very surface of the Earth. One of the tools that has been developed to conduct those measurements is LiDAR. By emitting thousands of laser pulses per second, and measuring their returns, it is possible to create an accurate virtual representation of the ground. The physics behind LiDAR is designed to make measurements when transmitted through the atmosphere, but is now being applied to measurements through water. Being able to accurately measure the area where land meets water, called the white ribbon zone, is important for studying water systems. Traditionally, the depths of bodies of water have been measured using acoustic sonar to record water depths. In some cases, LiDAR can be used to measure the bottom depth in areas that are too shallow for boats to travel, but they are limited by how well the laser is transmitted through the water. Additionally, the surface of the body of water can vary in ways that make the measurements unreliable. By comparing the measurements made by sonar with those made by LiDAR under a variety of different conditions, it should be possible to determine which tool is best suited to map out the white ribbon zone.