

Tutorial Title: Topo-Bathymetric Lidar

Continuing Education Units and Professional Development Hours

**Instructor(s): Dr. Tim Webster ~ Applied Geomatics Research Group,
Nova Scotia Community College, Middleton NS,**

Overview:

This tutorial will introduce the audience to a new technology to acquire bathymetry and laser reflectance from the near shore seabed using a topo-bathymetric lidar sensor. Mapping the near shore of the coastal zone has been a challenge in the field of Geomatics. This highly productive and high energy interface between the deep ocean and land is difficult to map because of the risk to navigation and the reduced efficiency of ship borne multibeam applications and the lack of terrestrial approaches to map below the water line. Bathymetric lidar, which uses a near-infrared laser to map the sea surface and a green laser (530 nm) to map the seabed, is an ideal tool for mapping this zone and filling in the “white ribbon” of missing data that often is present on maps depicting coastal areas. The ability to generate a true seamless elevation model from the deep ocean to the land is important for many engineering projects as well as risk assessment from storms and sea-level rise and monitoring of critical infrastructure located in this region. The most recent generation of bathymetric lidars are smaller and require less power than traditional sensors that translate into savings on aircraft costs. Another limitation of sensors of the past was their lack of ability to survey shallow areas less than 2 m, where the sea surface could not be resolved from the seabed. In addition to mapping the bathymetry the backscattered reflectance of the green laser from the seabed offers the potential to map the bottom cover type of the seafloor. This workshop will highlight the Chiroptera II sensor produced by Airborne Hydrography from Sweden, part of Hexagon geospatial. The sensor is owned by the NSCC for applied coastal and aquatic research. The background theory of bathymetric lidar will be presented in addition to the specifics of this sensor including benefits and limitations. Examples of different research projects will be discussed and presented.

The course will include:

A series of power point lectures: Introduction: the problem of mapping in the coastal zone (0.5 hr), Introduction to topo and bathymetric lidar theory (1 hr), Break (0.25 hr), Introduction to the NSCC Chiroptera topo-bathy lidar sensor and 4 band camera (visible and NIR) (0.75 hr), Environmental constraints, data collection and processing procedures for information extraction and products (0.5 hr), Case studies of recent research projects (1 hr). Total time 4 hrs.

Biography:

Tim Webster has presented hundreds of lectures and conference presentations as well as organized and delivered several workshops on the topic of terrestrial lidar. He has been a research scientist with the Applied Geomatics Research Group, Nova Scotia Community College since 2000 and prior to that was a faculty member at the Centre of Geographic Sciences (COGS) where he taught in the Remote Sensing and GIS programs. He is an adjunct in the Earth science department of Acadia and Dalhousie University and continues to supervise graduate students. Dr. Webster expects to solicit the assistance of research associates who he supervises at AGRG to participate in delivering the workshop materials.