NSHC31-C3D

Paper for information of the NSHC

[National status report on LIDAR activities]

Submitted by:	France
Executive Summary:	This note provides an overview on SHOM's LIDAR activities in the framework of the Litto3D project.
Related Documents:	-
Related Projects:	Litto3D project (French coastal mapping programme)

Summary

LIDAR is a remote sensing technology based on distance measurement by illuminating a target with a laser and analyzing the reflected light. It is usually operated in shallow waters areas and its performances mostly depends on water turbidity. This technique plays an important role in coastal surveying due to its cost-efficiency (around 1400€/km2 vs. 3000 to 4000€/km2 with MBES (when deeper than 10 m)) and time efficiency (counted in hours rather than days) compared to traditional surveys in the same kind of waters. The figures given above can vary a lot depending of various parameters (turbidity of water, depths, navigability of the area, etc.): the gain is even more obvious when it comes to steep and rugged coastlines, and in very shallow waters where survey vessels can hardly or can't be used.

Launched in 2004, SHOM's Litto3D® project aims at providing a high resolution coastal altimetry model, using mainly LIDAR technology and based on a partnership with the French National Mapping Agency (IGN).

SHOM has then developed a consistent expertise in airborne bathymetry for the last decade, which the present note tends to provide the key outlines.

Analysis

Since 2004, SHOM has achieved 15 LIDAR surveys, which covers 35% of the metropolitan coastline (2380 km) and 1300 km of French overseas coastline. In terms of coastal zone coverage, the data acquired on seaside represents more than 5000 km².

Nowadays, LIDAR sensors market is rather developed, each sensors being characterized by their proper sensitivity and characteristics. SHOM has then taken the path of building up its own technical expertise by releasing calls for tenders for each survey in order to select the most appropriate sensor depending on the area environmental properties (average water depth, water turbidity). So far, seven different LIDAR sensors have been used for Litto3D surveys: SHOALS 1000T and 3000 (Optech), HawkEye IIa and IIb (AHAB), LADS Mk2 and Mk3 (FugroLads), VQ820G (Riegl).

In addition, SHOM had the opportunity to test other LIDAR systems:

* CZMIL (Optech): SHOM invited by the USACE to participate, as observer, at the first CZMIL operational survey over the Great Lacs region (USA),
* Chiroptera (AHAB): dedicated test survey in St-Tropez.

Regarding survey performances, recent LIDAR systems comply with IHO S-44 order 1-b requirements. Moreover, the last high resolution bathymetric lidars can reach more easily (within standard economical flight pattern) IHO order 1-a standards; this last point still needs to be thoroughly confirmed on large real surveys. SHOM will take the opportunity during next Litto3D surveys planned in metropolitan France or overseas territories to assess the new systems target detection capability, and to confirm IHO standards that can be reached depending on real environmental conditions.

Action required by NSHC

The NSHC is invited to take note of this report.