

Airborne LiDAR Bathymetry Operations in Challenging Environments as Experienced in Finland

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SUMMARY

Airborne LiDAR Bathymetry (ALB) systems are an efficient and cost effective tool to survey shallow water including rivers, lakes, estuaries and the coastal zone and has been used worldwide to support nautical charting and coastal zone management surveys since early 1990s. Predominantly used in benign environments with predictable weather conditions and water clarity, the operation and success of surveys utilising ALB technology becomes harder in areas above 60 degrees latitude where weather conditions, water clarity and seabed reflectivity are not as favourable.

In November 2015 Fugro operated their combination of a LADS HD ALB sensor operated simultaneously with a high density Riegl VQ-820-G sensor in Finland for the Finnish Transport Authority (FTA). The purpose of the survey was a pilot project for the FTA to assess the performance of ALB technology in these challenging environments for supporting their nautical charting program. The requirement was to survey a number of areas of interest spanning both coastal and inland waterway areas to IHO Order 1a specifications.

This paper will review the challenges of optimising ALB operations in these environmental conditions and developing an agile operational program to manage the environmental challenges particularly of low cloud, turbidity and ice formation at the start of winter as observed in Finland, and provides recommendations for the successful operation and application of ALB technology in Finnish waters.