

The Olex view on crowd-sourced bathymetry

Submitted by Olex AS

SUMMARY

Executive Summary: This document provides emailed comments and observations on Crowd-Sourced Bathymetry gained from the experiences of Olex AS.

Action to be taken: 2

Related documents: None

Dear Lisa et al,

1. Based on our experience of 7,000 Olex systems delivered the last 18 years, and several thousands contributed bathymetric datasets, I risk this email to all attendees on some aspects of how I imagine crowdsourced bathymetry should be organized...

TYPE OF VESSELS TO BE EMPLOYED

- * In general, all vessels can partake in the mapping, but some categories are more useful than others
- * Yachts and leisure crafts may spend most of their time in harbour, so really not very useful
- * Commercial freighters may sail along well-trodden and fixed routes, so neither too useful
- * Professional fishing vessels spend most of their time at sea, scurrying around for new grounds, so are very useful
- * Tourist ships, expeditionary vessels, and research vessels may specifically seek out new grounds, so are also very useful
- * Naval vessels, SAR boats, maintenance work boats may also go where few others venture, again being very useful
- * Fishing vessels may have the most advanced sensors, while commercial freighters and passenger ships often use too simple "navigational" echosounders of reduced functionality
- * Boats may be motivated to partake simply for being recognized for their contribution; maybe just given an IHO flag?

ONBOARD THE VESSELS

- * Data collection should be automatic, no user interaction desired
- * The systems should continuously update a terrain map while recording, so that skippers may keep tab on the progress
- * Use off-the-shelf hardware and evolving software to collect the recordings, so as to keep up as the years passes

- * The minimum suite of sensors should be GPS and echosounder; true heading is also desirable
- * Sound velocity is hard, so should be normalised at 1500 m/s
- * The shipborne systems should do as much computation and filtering as possible, to reduce the post-processing workload
- * Vector arms, echosounder draft, GPS delay should be configured for each vessel, and data adjusted accordingly while recording
- * Tides, noise filtering, and quality of positions and soundings should also be handled while recording
- * Only record data points deemed good enough; sparse data of good quality is better than lots of dubious data
- * Recorded datasets should be kept compact and compressed, with a minimum of metadata
- * If possible, pitch and roll, and GPS-based height above ellipsoid at 10Hz or more, should be employed in concert with DTU10 or similar for even better bathymetry

ON LAND AT PROCESSING CENTRE

- * Processing all the recorded data is a continuous and time-consuming project
- * Maintain records of all contributions, so as to ignore future duplicates
- * Every dataset will be different in regards to draft errors, sound velocity settings, and amount of mapping errors
- * Even if each boat aim to use correct draft and sound velocity, there will inevitably be errors
- * When cleaning a dataset, only remove errors; never add assumed or smoothed datapoints
- * If more than one datapoint occupies some small spot, retain the shallowest; never average
- * Unless a height-GPS is employed, there will be heave artifacts
- * After a dataset is cleaned for obvious errors, the whole set should be adjusted for draft and sound velocity, to fit a common model
- * At first, it may be hard to judge if some data is in error; after more data is collected, a consensus will emerge
- * Thus, as more data amasses, older data may be removed

FINAL WORDS

Naturally, our Olex system has all these aspects. I unabashedly propose IHO simply standardizes on our well-proven technology. Olex AS may perform the data post-processing, just as we handle our current users; or we may transfer necessary tools and methods to some other entity.

Best regards,

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 Managing director Olex AS

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2. The CSBWG is requested to note the information contained and take whatever action is deemed appropriate.