IRCC5-11C

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Paper for consideration by IRCC5

The use of bathymetric data from 3rd parties

Submitted by:	Arctic Regional Hydrographic Commission
Executive Summary:	This paper discusses the utilization of bathymetric data collected by third parties and a policy for deployment of ships of opportunity.
Related Documents:	None
Related Projects:	None

Introduction/Background

1. Large sea areas, like the Arctic Ocean, are poorly surveyed. The number of survey vessels belonging to the Hydrographic Offices worldwide is decreasing, resulting in further delay of systematic surveying of uncharted areas.

2. During the last few years the concept of crowd-sourcing has gained momentum. In some areas like the Norwegian Sea, fishing vessels, equipped with echo sounder and adequate data storing systems, have collected a substantial amount of bathymetric data. The data is shared among the fishing vessels to the benefit of all. In Antarctica UKHO together with industry and cruise line companies have run a pilot where cruise ships have gathered bathymetric data during their cruises to Antarctica. In most cases data collection takes place without any coordination and cooperation with HOs.

3. The data collected by third parties has to a very limited extent been utilized by Hydrographic Offices for derived products. There might be several reasons for not taking advantage of data collected by third parties. One obvious reason is related to the lack of knowledge about the quality of the data. Another reason might be the lack of arrangements with third parties that make possible for an efficient data exchange with HOs.

Analysis/discussion

4. Crowd-sourced data is expected to grow substantially the coming years and so is its

potential for use. Most of the commercial vessels (cruise liners, cargo etc) are equipped with single beam echo sounder system (SBES). This is of course a limitation compared to data derived from modern multibeam echo sounder systems (MBES). On the other hand a SBES can easily be operated by non-professional if some simple precautions are ensured. The quality of the data will among other things depend on proper sound velocity setting and correction for tidal variation. A high number of research vessels are equipped with MBES and normally also have trained staff for a proper operation of the systems. Commercial Off-The-Shelf (COTS) solutions for collection, storing and managing of bathymetric data are available at low cost.

5. With the existence of commercial systems, like the Olex system, the data collection might take place without any preceding involvement from a HO. All vessels with this system installed have the opportunity to contribute to a shared database. On the other hand it might be beneficial for a HO to have agreements in advance with the most relevant groups of vessel. Especially for operation in remote areas like the Arctic and the Antarctica a coordinated effort is likely to generate the most useful results.

6. A key issue with respect to third parties data is the utilization. The HO will in most cases have limited possibilities for quality control both with respect to horizontal and vertical accuracy. In shallow water the mariners expect published depth to be reliable. Due to the legal responsibilities a HO will normally refrain from including information in a navigational chart that is not verified to a given standard. This is especially true for bathymetric information when under keel clearance is an issue.

7. In the present situation, with an overall reduction in survey capacity, we should aim at finding ways of utilizing third parties data to a greater extent. With appropriate standards and procedures in place, combined with any technological improvements, it is realistic to expect quality assured data from ships-of-opportunity. A closer cooperation between IHO/HOs and third parties will be a prerequisite for an improved data collection in shallow water.

8. In deeper waters third party data can more readily be accepted as adequate information. Increased data acquisition from deeper waters is becoming more and more demanded in line with the higher exploitation of marine resources, extraction of mineral resources, oil and gas activity, offshore wind mills etc.. The bathymetric data from third parties could also be a valuable contribution to the GEBCO and subordinate regional cooperation.

Conclusion

9. The hydrographic community could take advantage of a closer cooperation with third parties for enhancing coverage of bathymetric data, especially in remote areas which is seldom visited by hydrographic vessels. The technical solutions for an adequate outfit of ships-of-opportunity are available. The main constraints for an increased utilization of data from third parties are related to:

- the lack of organized cooperation between HOs and third parties

- the verification of the quality of the collected data.

Recommendations

10. The recommendations of this paper are to:

    a. **acknowledge** that an increased cooperation with ships-of-opportunity may be a way to increasing the coverage of bathymetric data,

    b. **encourage** IHB and Member States to prepare standards and procedures that contribute to quality assured data at a level acceptable for utilization in navigational products or to develop better ways of showing that bathymetric data in certain areas of a nautical chart is based on third party data collection which could not be qualified by the issuing HO.

Action Required of IRCC

11 . The IRCC is invited to:

    a. Note the content of this paper,
    b. Agree to the recommendations
    c. Take any other action as it consider appropriate