IRCC9-08C

Paper for Consideration by IRCC
[Satellite derived bathymetry – risk assessment]

Submitted by:	Canada, France, and United States of America
Executive Summary:	The IHO Assembly tasked the IRCC to encourage the Regional Hydrographic Commissions to consider using satellite derived bathymetry and risk assessment methodologies in uncharted or poorly charted areas in their respective regions as a way of developing survey priority areas as part of attracting donor funding. To achieve this goal it could be efficient to set up projects to be carried at a regional level. Possible content and organization of these projects are proposed. Such projects should be triggered in pilot regions in order to obtain a first feedback.
Related Documents:	IHO assembly list of decisions: A.1/MISC/03
Related Projects:	

Introduction / Background

At the 1ST IHO assembly (24-28 April 2017), Canada, France and USA submitted "Pro 5 - development of an IHO satellite-derived bathymetry (SDB) assessment and charting program for as yet uncharted or poorly charted areas".

Indeed, used in conjunction with risk assessment methodologies (identifying where greatest shipping traffic is located within poorly charted areas, for example), the SDB would be of considerable value in giving coastal States a clearer view of the status of hydrography in the waters under their responsibility.

A focused hydrographic program for obtaining certified quality data could follow on, based on priority requirements.

IHO A1 decided to *task the IRCC to encourage the RHC to consider using satellite derived bathymetry (SDB) and risk assessment methodologies in uncharted or poorly charted areas as part of attracting donor funding.*

Analysis/Discussion

To carry out the decision of IHO-A1 related to PRO-5 it is considered that an efficient way to proceed would be to set up projects at the regional level.
A possible content and short description of the organization of a generic project is given hereafter.

Proposed breakdown of a SDB projects

In our view the projects should cover three themes: R&D, SDB, and complementary surveys.

Theme 1, R&D
This theme will seek to evaluate and improve the performance of SDB. Whereas SDB is not S-44 compliant (at least for the moment), there is still a requirement for better assessing its accuracy and better defining its limitations. Several HOs have taken initiatives in that field that should be shared. Canada has volunteered to organize, with the support of France and US, a workshop for that purpose. The Hydrographic Survey Project Team that has just been set up under the HSSC, should be associated for its work on SDB and standards S-44.

Industry has also produced results that will, of course, be considered but we believe that it is important that HOs have their own assessment of SDB performance based on hydrographic criteria that they master the best.

Another issue that should be tackled in theme 1 is the SDB data representation on charts. It is a responsibility of IHO to ensure that common standards are adopted amongst chart producers when it comes to represent information from SDB on charts: the group should consider how SDB will be depicted on nautical charts and should consider characteristics like color shades, soundings, delimited areas. For that issue the lead should be to NCWG.

Theme 2, SDB

Based on risk assessment, areas where surveys must be carried out in priority will be determined. The risk assessment will take into consideration safety of navigation criteria of course but also might consider stakes like economic development, change detection, spatial planning, and environmental protection for example.

The applicability of SDB based on imagery types and resolutions availability as well as physical characteristics such as water turbidity and surface roughness will be also tested.

As a result a prioritized scheme will be set up and resources required to carry out the scheme will be evaluated.

Finally SDB operations will be carried out.

Theme 3, complementary surveys

After SDB has provided an initial analysis of the charted bathymetry, it would be possible to assess where additional surveys, using S-44 compliant means, can be carried out.The focus should be on areas where SDB indicates a possible passage for safe navigation or identify uncharted risks to navigation.

The resources required for the additional surveys (MBES and/or Lidar) will be assessed and prioritized using again risk assessment considerations.

Finally the field surveys will be carried out by HOs and/or contractors.

Resources, organization:

Theme 1 will be mainly supported by leading HOs eager to invest in SDB and to share their experience and plans for future developments.

For themes 2 and 3, the scheme will be presented, with the support of CBSC, to donor organizations (UN Development Program for example) for funding requests. The perspectives for economic development of the region considered will be an important lever for raising funds.

For themes 2 and 3, a regional approach will be more efficient because the coastal states have the most acute analysis of priorities and of associated risks with traffic and other stakes in their region on one hand and the best appreciation of the state of knowledge on the other hand.

RHC should endeavor to set up a project team with motivated members ready to invest some time and expertise to support a SDB project. For saving travel money the project meeting could be organized back to back with regular RHC meeting in the preparation phase. Once funds will be raised it will be possible to organize dedicated meeting for the operational phase (surveys).

Conclusions

SDB associated with risk assessment carried out at a regional level is considered a powerful mean to progress significantly on the knowledge of hydrography in poorly known areas.

Recommendations

SDB projects should be set up at the regional level for efficiency. These projects should be organized according to the breakdown presented in para. “Analysis/discussion” and funds should be raised using the support of the CBSC.

Justification and Impacts

C-55 testifies the poor knowledge of hydrography in vast areas and justifies the urgent need for improvement. The area is so vast that it must be prioritized.
The impacts will be on the progress of hydrographic knowledge in areas where priorities will be assessed according to stakes assessed by coastal states themselves. Economic development (through the development of passages for navigation), environmental protection, maritime spatial planning will benefit the most of a better hydrographic knowledge.

Action Required

The IRCC is invited to:

a. note this report;
b. encourage the Regional Hydrographic Commissions to consider using satellite derived bathymetry and risk assessment methodologies;
c. recommend to do it using the project rationale as presented in this paper or amended after discussion;
d. take any other action as appropriate.