

15th MEETING OF THE CAPACITY BUILDING SUB-COMMITTEE

Information Paper for the consideration of the CBSC15 (7-9 June 2017, Suriname)

The Canadian Ocean Mapping Research and Education Network (COMREN): Possible contributions to capacity building efforts.

<i>Submitted by:</i>	CANADA
<i>Executive Summary:</i>	This paper focuses on the COMREN competences in capacity building, based on its experience in the NORDREG area.
<i>Related Documents:</i>	a) <i>IHO Strategic Plan (2009)</i> b) <i>IHO Capacity Building Strategy, 10 Oct 2014, EIHC5</i>
<i>Related Projects:</i>	1) <i>IHO Work Programme 2016</i>

Introduction and Background

- The COMREN (Canadian Ocean Mapping Research and Education Network) is composed by the following members:
 - Centre Interdisciplinaire pour le Développement de la Cartographie des Océans (CIDCO)
 - Applied Research Nova Scotia Community College (NSCC)
 - Fisheries and Marine Institute of Memorial University (MUN/MI)
 - Université Laval, Dép. des Sciences Géomatiques (Uaval/SCG)
 - University of New-Brunswick, Department of Geodesy and Geomatics Engineering (UNB/GGE)
 - University of Ottawa, Department of Geography, Environment and Geomatics (UOttawa/GEG)
 - British Columbia Institute of Technology (BCIT) School of Construction and the Environment
 - York University, Dept of Earth and Space Science and Engineering
- The purpose of the COMREN is to develop research activities, achieve technology transfer to the Industry, develop and run educational programs, in liaison with government agencies, to increase Canada's capacity in research and education in Ocean Mapping. This includes opportunities for High Qualified Personnel (HQP) to develop their capacity in, and specialized knowledge of, ocean mapping.
- COMREN is currently developing a crowdsourcing bathymetry in cooperation ("*Crowd-Sourced Bathymetry in the Northern Canada area*") with Northern Canada communities, aiming at :
 - Developing hydrographic data collection tools (integrated and pre-qualified systems), that can be operated by non-qualified in hydrographic survey personnel; These data collection tools are mainly based on integrated single beam/attitude/GNSS receivers in a robust envelope.

They can be used for marine survey, GNSS water level measurement or ground control points surveys.

- Training of personnel from Northern communities who will deploy the data collection systems;
- Automated data processing tools, based on specific software and freeware (RTKLib, QGIS)
- Automated data cross-validation tools for quality assurance;
- Data storage, enabling access, dissemination and visualization tools.

This project is conducted by CIDCO, Memorial University, University of New Brunswick and York University.

4. The concept and the systems developed through the *Crowd-Sourced Bathymetry in the Northern Canada area* project will be deployable for any capacity building initiative in Hydrography. The COMREN will use portable and pre-qualified systems, black-boxes, associated processing software tools, and a web-service for data dissemination. This system can be deployed in North Canada, or in any developing country.

5. COMREN members have a capacity to develop e-learning tools, that can be used to deliver remotely introductory modules to Hydrography and the underlying principle of integrated and pre-qualified system, in order to progressively enhance the level of competence of the on-site operators. COMREN members (Memorial University and CIDCO run FIG/IHO/ICA IBSC recognized Category B programmes) have the experience of delivering training and educational programmes in Hydrography by e-learning, as well as to contribute to IHO capacity building programmes.

Capacity building strategy and potential contribution of COMREN

6. According to principle 3.7 of Ref. b) “ *Funding of equipment shall be limited to those cases, where it is embedded into a comprehensive programme (see Chapter 5) requesting such equipment to remain in-country to complete the project, and insuring a sustainable effect and ongoing support. Whenever possible, external funds should be included, taking into account the relatively high costs of equipment and assuring a reasonable cost-benefit-ratio for the improvement of the hydrographic capacity*”;
7. The cost of “classical” survey equipment, including survey platforms, survey sensors, is relatively high, and require a higher minimum level of competence than the used of pre-qualified systems. The costs of survey data is highly dependent of the cost of data processing. Both acquisition and processing of “classical” systems require a certain level of competence, than can be estimated to the one of a Category B surveyor, for survey at relatively small scale.
8. The IHO created the Crowd-Sourced Bathymetry working group, CSBWG in 2014. The CSBWG examines how best to incorporate, manage and use bathymetric data acquired by non-conventional means and develop principles and guidelines to enable the appropriate collection and use of crowd-sourced bathymetry for the benefit of all stakeholders interested in knowing the shape and nature of the seafloor and its depths.

Analysis

9. The concept developed by Canada and implemented by the COMREN Network in the NORDREG region illustrates the combination of Crowd-Sourced bathymetry using integrated and pre-qualified systems for Capacity Building purposes. This concept may contribute to an innovative concept of capacity building in a sense that the used of crowdsourced prequalified system do not require a recognized level of hydrographic education, but a limited training on systems operation. In a further phase, operators can be trained, based on their motivation and qualification to operate these systems. At this stage e-learning can be provided, which can mix practical experience (from the use of pre-qualified system) and theory at the same period of time.
10. This concept is therefore a combination of crowdsourced bathymetry, training to use pre-qualified systems and hydrographic education. It is foreseen that this type of capacity building scenario will be efficient, as it do not suppose any pre-requisite from the communities, the surveys with integrated system and the associated hydrographic products will motivate the development of hydrography, and the final phase of hydrographic education will consolidate the practical and theoretical knowledge.

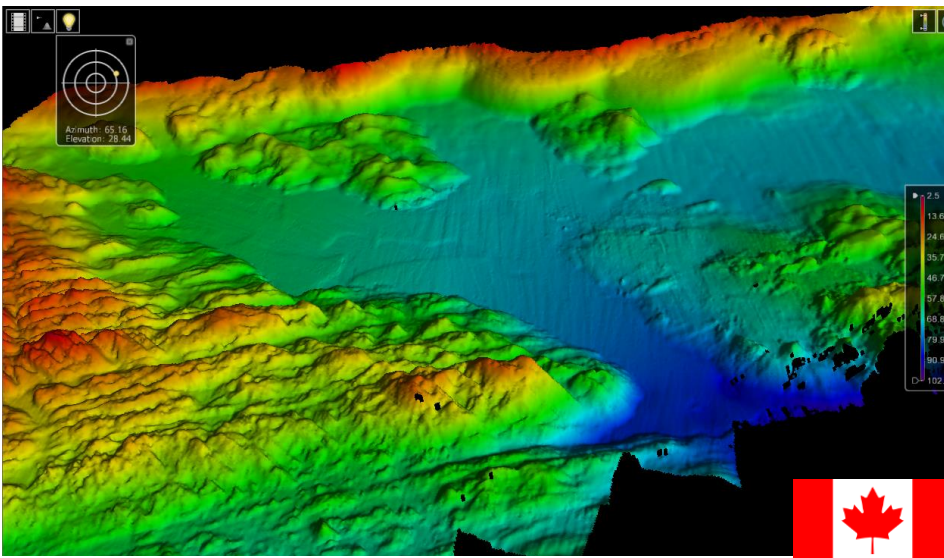
Conclusion

11. Canada proposes to develop and promote the concept of combined crowdsourcing, training and use of pre-qualified systems and e-learning in Hydrography for capacity building purposes. Thanks to its experience in Northern communities, the COMREN can share and offer its experience for pilot projects, and contribute to the IHO effort in capacity building.

Action Required of CBSC

12. The CBSC is invited to:
 - a. note this report;
 - b. diffuse this information to capacity building coordinators; and
 - c. take any other action as appropriate.

Annex: Flyer of the Programme "Diploma of Technology (Ocean Mapping) - Bachelor of Technology



DIPLOMA OF TECHNOLOGY (OCEAN MAPPING) BACHELOR OF TECHNOLOGY

IHO CAT B Recognized Bachelor program

Program Overview

Canada is pleased to promote a program that will cultivate solid technical skills to collect, manage, analyze and disseminate ocean data. Students are trained in marine surveying equipment, optical and acoustic remote sensing technologies, oceanographic instrumentation and geographic information systems. By the end of the program, you will have had the opportunity to delve deep into the ocean to examine the ocean surface, the water column, and the wonders of the seabed.

Program Recognition and Accreditation

International: FIG/IHO/ICA – S-5 (Hydrographic Surveyor) – Cat B

National: CTAB – Surveying and Geomatics – Technologist Level Provincial:

MUN – Bachelor of Technology Degree

Program Pricing

\$17,500.00 USD/year

includes housing, meal plan and tuition with fees.

(subject to change)

Graduate Characteristics

Successful graduates of the Ocean Mapping Program will have a proven work ethic and an excellent understanding of all aspects of ocean mapping technology, preparing them for employment within a variety of fields within ocean mapping



School of Ocean Technology
155 Ridge Road, St. John's NL, Canada A1C 5R3
<http://www.mi.mun.ca/oceanmapping>



8 Academic Terms
3 Technical Sessions
1 Work Term





CANADIAN OCEAN MAPPING RESEARCH AND EDUCATION NETWORK (COMREN)

About COMREN

The Canadian Ocean Mapping Research and Education Network (COMREN) is a new initiative formally established within Canada designed to offer the structure and enhancements necessary to provide an avenue for sharing research interests and educational activities in the field of Ocean Mapping.

The Marine Institute of Memorial University is an active member of COMREN and presents one option to education in Canada.

Purpose of COMREN

To develop research activities, achieve technology transfer to the Industry, develop and run educational programs, and in liaison with government agencies increase Canada's capacity in research and education in Ocean Mapping. This includes opportunities for HQP to develop their capacity in, and specialized knowledge of, ocean mapping.



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COMREN

Improving ocean mapping capacity

Providing New Frameworks

Advising the Hydrographic Community

Facilitating Collaboration

Developing National Expertise

