

THE CANADIAN HYDROGRAPHIC SERVICE

1.0 HISTORY

The first charting of Canadian waters was carried out by early French and English explorers with some charting by the Portuguese and some by the Spanish. After Canada became a colony of Britain, detailed charting became the responsibility of the British Admiralty. The Canadian government did not assume responsibility until 1883 when the Georgian Bay survey was established. In 1904 when the Admiralty requested that self-governing colonies assume responsibility for their coastal surveys, the Canadian Hydrographic Service (CHS) was established by Order-in-Council 461.

The British Admiralty continued to maintain responsibility for the surveys of the Labrador and Newfoundland coasts until 1949, when Newfoundland and Labrador joined Confederation. A large number of the Canadian charts of the Atlantic provinces are still reproductions of Admiralty charts. As modern surveys are being completed, the Admiralty charts and reproductions are being replaced by up-to-date Canadian charts.

2.0 ORGANIZATION

The Service first operated solely out of Ottawa with hydrographers joining charter vessels on the coasts and in the inland waters. A seasonally staffed regional office of CHS was opened in Victoria, B.C. in 1907 and was established on a full time basis in 1938. The region was moved to Sidney, British Columbia in 1977 and now forms part of the Institute of Ocean Sciences. The Atlantic Region was formed in 1959 in Halifax, N.S. and moved to Bedford Institute of Oceanography in Dartmouth when it was opened in 1962. The Central Region was formed in Ottawa in 1964 and moved to the Canada Centre for Inland Waters in Burlington when it opened in 1972. In 1975, as part of the departmental buildup in Quebec, it was decided to form a Quebec Region of the Canadian Hydrographic Service. This region was formed by moving staff from headquarters and the other three regions, and by obtaining additional new person-years. In 1976, a decision was made to decentralize the chart production process, and cartographers were decentralized from Ottawa over the period 1977 to 1979. The Quebec Region has existed at Gare Maritime in Quebec

City since its formation but will be moved to Ste-Flavie and will form a part of the Maurice Lamontagne Institute when it opens in October 1986. All four regions now have active survey and chart production programs.

The tidal and current metering program began in 1893 and the precise water level gauging of the Great Lakes began in 1912. These two programs were integrated in Ottawa in 1960. All regions now have capabilities for tidal and current measurements. This capability is most important because tidal data are essential to the mariner and are required for the establishment of vertical datum for nautical charts. It is also of paramount importance to have a good knowledge of tidal and residual currents especially when navigating confined coastal waters and manoeuvring in rivers and harbours. The tidal datum is also used to monitor crustal movement and for levelling ties to the national vertical control network.

Hydrography in Canada is a national program with priorities and program activities linked on a national basis. The hydrographic management team consists of the Dominion Hydrographer, Regional and Headquarters Directors.

The role of the Dominion Hydrographer and Headquarters is to ensure that all charts and associated navigational documents are available to the user on demand; to maintain national program planning and priorities; to maintain international liaison; to establish national standards and to approve all charts and publications before release; to provide basic and advanced training in hydrography and cartography; to publish sailing directions; to maintain coordination with DOT on Notices to Mariners; to provide specialist services for nautical geodesy, tides, currents and water levels, nomenclature and cartographic development.

The role of the regions is to carry out hydrographic, tidal and current surveys to meet regional and national priorities; to process CHS survey data and data from other agencies into New Charts, New Editions, Reprints, and chart patches; to coordinate surveys with the geologists and geophysicists of the Department of Energy, Mines and Resources and to deal interdepartment-

tally on a regional basis. The Regional Directors are responsible for the adequacy of the surveys and the accuracy of the survey data.

The coordination of the CHS program is provided through CHS management meetings which are held biannually. Headquarters/Regional responsibilities are documented in Policy Statement No. 3, Allocation of Responsibility Between Headquarters and the Regions.

The current person-year strength of the Canadian Hydrographic Service, including all the support services is approximately 600 person-years and the budget is approximately \$50 M.

3.0 TASK OF THE HYDROGRAPHIC SERVICE AND STATUS OF SURVEYS

The CHS is primarily concerned with gathering and publishing hydrographic data and marine navigation information of Canada's navigable waters and adjacent international waters. This information is essential for the safe, orderly and efficient conduct of commercial, recreational and defence shipping. The Service also has the operational responsibility for integrated geophysical/hydrographic surveys of the continental margin and inland seas. Such surveys are essential to obtain a comprehensive description of the extent of the continental land mass and for the control, management, and development of mineral and petroleum resources in these areas.

The Service publishes just over 1,100 nautical charts, more than any country in the world, except for the six (USA, Britain, France, USSR, FRG, Japan) that maintain worldwide coverage. Twelve volumes of Sailing Directions, seven Small Craft Guides and six volumes of Tide and Current Tables are also published. Additionally, Territorial Sea and Fishing Zone Charts, Natural Resource Maps and charts in the General Bathymetric Chart of the Oceans (GEBCO) series are produced.

At the present time approximately 50% of southern waters are surveyed adequately, as are 18-20% of northern waters. Because of changing shipping patterns and changing ship drafts, hydrography is an iterative activity and

this figure can only be increased by 2 to 3% yearly. At the present time we respond to less than 50% of our requests for survey in a timely manner.

4.0 LEGISLATIVE MANDATE

4.1 Mandate - Hydrographic Surveys, Nautical Charts and Publications

- (i) Constitutional Basis. The British North America Act, 1867 - (presently incorporated into the Constitution Act) provides in section 91 that: "The exclusive Legislative Authority of the Parliament of Canada extends to ...

10) Navigation and Shipping"

The Department of Marine and Fisheries was organized to assume these responsibilities in 1868 (31 Vic Ch 57). In 1892 (by 55-56 Vic Ch 17) the Department was reorganized and assigned the responsibility for tidal observations and hydrographic surveys.

- (ii) Order-in-Council 461 of March 11, 1904, passed under the authority of the Management and Control of Public and Other Works Act (3 Edward VII C53) provided that:

"With a view to systematizing, and facilitating the work in connection with hydrographic Surveys, the administration of which branch of the public service is assigned to the Department of Marine and Fisheries under the provisions of 55-56 Vic Ch 17 ... that the Department alone be charged in future with the management and control of such surveys."

- (iii) The current statutory mandate of the CHS is derived from Government Organization Act, 1979, Part I of which is cited as the Department of Fisheries and Oceans Act. Section 5 of the Act provided inter alia that:

- 5. The duties, powers and functions of the Minister of Fisheries and Oceans extend to and include

- (a) all matters over which the Parliament of Canada has jurisdiction, not by law assigned to any other department, board or agency of the Government of Canada, relating to ...

- (iii) hydrography and marine sciences,

- (iv) The Charts and Publications Regulations, made pursuant to the Canada Shipping Act, provides as follows:

- 4.(1) Every ship shall have on board, in respect of each area to be navigated by the ship, at least ...

- (a) the latest edition of the Canadian Hydrographic Service charts.

- 6.(1) Every ship shall, ... make proper navigational use of

- (a) the following Canadian Government publications:

- (i) tide and current tables

- (ii) sailing directions

- (b) the catalog ...

- 7. Every ship shall ensure that any chart or publication ... on board the ship is, before being used in the navigation of the ship, corrected up-to-date from information that may affect the safe navigation of the ship and that is contained in a Notice to Mariners ..."

- (v) 1958 Convention on the Territorial Sea and Contiguous Zone provides in Article 15, para. 2 that:

"The coastal state is required to give appropriate publicity to any dangers to navigation of which it has knowledge, within its territorial sea."

4.2 Territorial Sea and Fishing Zone Charts

- (i) The 1958 Convention on the Territorial Sea and Contiguous Zone, to which Canada is a party, provides in Article 3, that

"... the normal baseline for measuring the breadth of the territorial sea is the low-water line along the coast marked on large-scale charts officially recognized by the coastal state."

In para. 6 of Article 4, the Convention provides that "The coastal state must clearly indicate straight baselines on charts, to which due publicity must be given."

- (ii) The foregoing provisions are incorporated into Canadian legislation through the Territorial Sea and Fishing Zones Act, R.S.C. 1970, c.T-7, as am. by S.C. 1978-79, c.13, which provides in section 6 that

"The Minister of Fisheries and Oceans may cause charts to be issued delineating the territorial sea of Canada and the fishing zones of Canada or of any portions thereof as may be delineated consistent with the nature and scale of the chart."

- (iii) The provisions of the 1958 Convention on the Territorial Sea and Contiguous Zone referred to above are carried forward into the United Nations Convention on the Law of the Sea, 1982. (UNCLOS)

Article 5 of UNCLOS is identical to Article 3 of the former Convention. Article 16 of UNCLOS provides as follows:

1. The baselines for measuring the breadth of the territorial sea determined in accordance with Articles 7, 9 and 10, (Straight Baselines, Mouths of Rivers, and Bays, respectively) or the limits derived therefrom, and the lines of delimitation drawn in accordance with Articles 12 and 15 shall be shown on charts of a scale or scales adequate for ascertaining their position. Alternatively, a list of geographical co-ordinates of points, specifying the geodetic datum, may be substituted.
2. The coastal State shall give due publicity to such charts or lists of geographical co-ordinates and shall deposit a copy of each such chart or list with the Secretary-General of the United Nations.

4.3 Mandate - Natural Resource Mapping and the General Bathymetric Chart of the Oceans (GEBCO)

- (i) Multidisciplinary Surveys and Natural Resource Maps

Under an agreement with the Department of Energy, Mines and Resources, dated 30 June 1975 the Canadian Hydrographic Service is jointly responsible for determining the priorities and planning, and the publication and distribution of the results of multidisciplinary offshore surveys.

- (ii) General Bathymetric Chart of the Oceans (GEBCO)

To fulfill its obligation to the International Hydrographic Organization, the Service maintains the master compilation drawings of fourteen GEBCO plotting sheets covering Canadian waters. The Service also published the eighteen sheets of the 5th Edition of GEBCO in April, 1982.