

Southern African and Islands Hydrographic Commission

18-19 September 2012 (Mauritius)

Collection of Ocean Bathymetry

Introduction

IHO Member States are the primary contributors of data to the IHO Data Centre for Digital Bathymetry (DCDB). IHO Resolution 3/1929 as amended dealing with the “*Centralization of Oceanic Soundings*” states in Clause 2a that;

“Member States are requested to remind institutions and organizations within their own country of the desirability of collecting bathymetric data, whenever possible, in the course of oceanographic missions”.

Resolution 3 was amended by Circular Letter 85 of 2008 in order that;

“All bathymetric data collected should be forwarded by HOs to the IHO Data Centre for Digital Bathymetry (DCDB). Any format convenient to the individual HO may be used; but the data must be accompanied by comprehensive format documentation and metadata. The IHO DCDB should be notified of digital data that have been found to be in error; if possible, a corrected version should be submitted as well.”

Furthermore aim (d) in the SAIHC statutes encourages its members;

“To facilitate the exchange of information concerning surveys, research or scientific and technical developments, to aid in the planning and organisation of hydrographic activities in the widest sense of the term, but without interference in the national responsibilities of each Hydrographic Office”.

Collection of Ocean Survey Data

Many maritime states have carried out suitable surveys of their offshore coastal areas. However, the extent of the survey coverage often does not cover all areas of small and medium scale charts. Bathymetric data from other sources must then be used to supplement data for those areas which are (mostly) in deep water. Ocean mapping (which is an important prerequisite for scientific activities such as tsunami wave propagation), is also dependant on the availability of adequate bathymetry.

In the above context, the IHO DCDB is an important source of additional deep water bathymetry. It comprises data mainly from track line surveys collected by hydrographic and oceanographic vessels. The location and extent of the DCDB data holdings can be viewed via an online web map server, and can be freely accessed from the following web site; <http://maps.ngdc.noaa.gov/viewers/bathymetry/>

In the deep areas of the ocean, most mariners consider that there is little chance of a vessel running aground on a dangerous uncharted seamount. Unfortunately, this is a misconception.

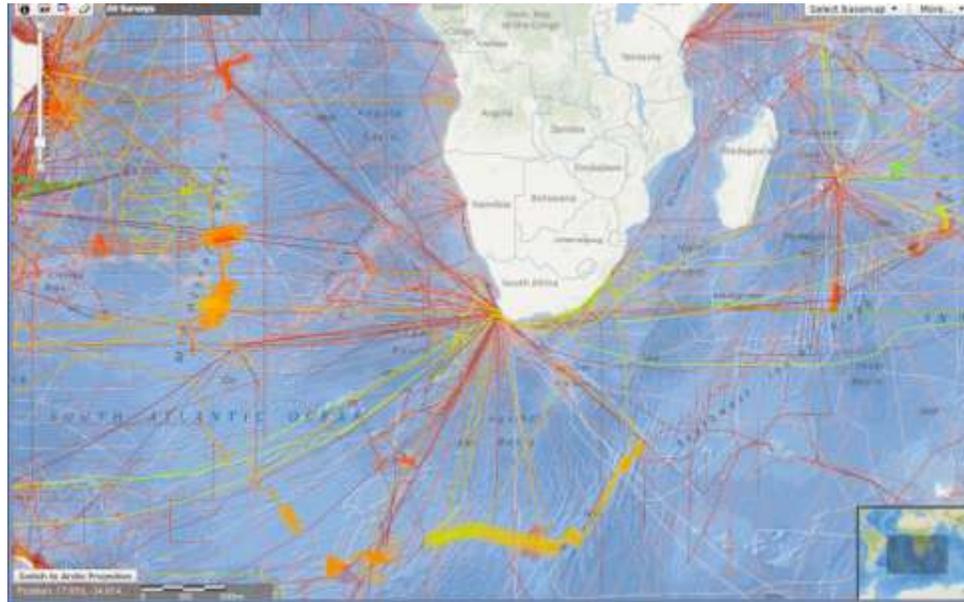


Figure 1 -IHO DCDB Surveys Covering the SAIHC Area

Two examples of navigationally significant seamounts discovered within the SAIHC area include Vema Seamount (with a charted depth of 11 metres - about 1,000 km west-north-west of Cape Town) and Walters Shoal Seamount (with a charted depth of 15 metres - about 400 nautical miles south of Madagascar). These seamounts rise up from ocean depths of about 4000 and 2000 metres respectively. According to an article published in *Oceanography*, Volume 23, Number 1 (by David T. Sandwell and Paul Wessel), more than 90% of all seamounts greater than 1-km in height (estimated to be more than 100 000) are unobserved by either ship soundings or satellite gravity. The reasons for this is that ship time is very expensive, and satellite-derived gravity is only able to reliably measure seamounts that are more than 2-km high, although smaller seamounts can be detected (Wessel, 2001).

With relatively little funding being made available for ocean surveys, the chances of detecting a dangerous seamount is very low. In order to better utilise available resources, SCRIPPS Institution of Oceanography have developed an easy-to-use tool that hydrographers, ocean scientists and other can use to pass over un-surveyed seamount by making minor deviations to their intended voyages. It is proposed that such deviations would have little impact on their vessels scheduled activities, but could result in valuable information being obtained. Based on Google Earth, the tool comprises an ocean map which highlights seamounts detected by satellite data, and for which no survey data exists. The tool can be downloaded from http://topex.ucsd.edu/marine_topo/mar_topo.html.

In a recent ocean crossing (Cape Town to Punta Arenas), the SCRIPPS oceanographic vessel R/V Melville used the tool to revise its planned route in order to directly pass over a series of very large and previously uncharted undersea mountains in remote areas of the South Atlantic Ocean. A number of significant seamounts were surveyed with the largest rising more than 4 480 metres from the seafloor.

In a SCRIPPS article, Melville's captain reported *"These particular seamounts are so steep that it was nerve-wracking to go from 3,000 metres of water to less than 500 metres in 15 or 20 minutes!"*

With less than 10 percent of the world's oceans having been surveyed to modern standards, it is important that information about the availability of bathymetric resources is made available for both marine charting and bathymetric mapping purposes.

Action Required of SAIHC Members.

SAIHC Members are invited to;

- Note this report,
- Make use of the SCRIPPS seamount discovery tool when planning ocean passage surveys.
- Ensure that the data from all ocean bathymetric surveys is forward to the IHO DCDB so that it can be included in this important bathymetric databank and made available for charting, ocean mapping and scientific purposes.