

## Note

## The Role of Hydrographic Services with Regard to Geospatial Data and Planning Infrastructure

### The role of IHO and the view of IHB

By Vice Admiral Alexandros Maratos, President of the IHB,  
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- 1) Hydrographic data and information have historically been collected and used for the production of nautical charts. Any other uses were, in most cases, considered of little importance. However, in the recent past, the requirement to support the users of non-navigational data and services has increased in importance. Ocean modelling and circulation, coastal zone management, environmental protection, oil and gas exploration, delimitation of the continental shelf beyond 200 nautical miles in accordance with Article 76 of the Law of the Sea, especially the determination of the 2500 meters isobath, the laying of pipelines and cables, fishery and defence are some of the applications to which hydrographic data and information can be put by oceanographers, geologists, geophysicists, academic and government institutions, commercial firms, fishermen, military personnel and many others. The recent tsunami disaster in the Indian Ocean has shown that hydrographic data and information have a vital role to play not only for preparing tsunami warnings but also for research, simulation and coastal protection purposes.
- 2) The International Hydrographic Organization (IHO) has recognised the importance of Hydrographic data and information for purposes other than navigation in:
  - a) The new definition of 'Hydrography', approved by its Member States in November 2002, which states that, Hydrography is "That branch of applied sciences which deals with the measurement and description of the features of the sea and coastal areas for the primary purpose of navigation *and all other marine purposes and activities including (inter alia) offshore activities, research, protection of the environment and prediction services*";
  - b) Accepting, during its 2<sup>nd</sup> Extraordinary Conference in 2000, as one of its Strategic Issues, to "provide services other than for navigation" thereby ensuring that national hydrographic data are also satisfying the needs of scientists, administrators and others with interest in maritime issues and that the data are fully and conveniently available to them;
  - c) Its amended Convention, approved during the 3<sup>rd</sup> Extraordinary Conference in April this year, where its first new objective shall be "to promote the use of hydrography for the safety of navigation and all other marine purposes *and to raise global awareness of the importance of hydrography*".

- 3) Also the UN/GA with Resolution A/53/32 in 1998, 'The Year of the Oceans' invites States "to coordinate their activities so that hydrography and nautical information is made available on a worldwide scale" and Resolution A/59/24 in 2003 entitled 'Oceans and the Law of the Sea', invites the "IHO and IMO to continue their coordinated efforts, to jointly adopt measures with a view to encouraging greater international cooperation and coordination for the transition to electronic nautical charts and to increase the coverage of hydrographic information on a global basis".
- 4) It has thus been recognized at both national and international levels that data and information collected for the production of navigational charts and the support of safety to navigation are also important in many other aspects of ocean and marine environment, science and management. With the wide use of the application, these data and information are now part of a more general term encompassing both terrestrial and marine data known as "Spatial Data or Geospatial Data or Geo-data" which can be defined as "data concerning the location, shape and relationship amongst geographic features". It is evident that the importance of acquiring, managing and archiving marine geospatial data in a digital form is equally strong for both marine and terrestrial applications. This requires the establishment of an organisational and technological environment which will facilitate the marine Geospatial requirements, demands, activities and obligations, called a National Marine Spatial or Geospatial Data Infrastructure (NMSDI), which can also be further implemented at the regional, international or global level. It is important to understand that an SDI is not a 'data base' of its own. It must be considered as an infrastructure which links people to data and comprises policies, access technologies and standards. Data sharing is a key purpose of the spatial data infrastructure and thus compatibility between SDIs is necessary and this requires standards.
- 5) We have heard at this seminar and we all know that recently different initiatives and developments have been decided at national, regional and global level in order to study and support the requirements and demands for the implementation of the SDI that enable nations to better address social, economic, technical, environmental and other issues. The Global Spatial Data Infrastructure, the Open Geospatial Consortium (OGC), the European Umbrella Organization for Geographic Information, the Infrastructure for Spatial Information in Europe, the Joint board of the Geospatial Information Societies are some examples of regional or global developments on this issue; noting also that many States have already either established, or are in the process of putting together the appropriate arrangements for establishing National Geospatial Data Infrastructures. The IHO monitors very closely these international initiatives in order to co-operate and contribute in its areas of competence and to maintain awareness of the developments in this field.
- 6) In a demanding, globalised and constantly changing technical and financial environment, the establishment of a marine SDI must be considered as an 'obligation'. The HOs and the IHO must study and be prepared to respond to this 'obligation'. What does the implementation of this 'obligation' mean for the IHO and its Member States HOs? What will be the implications? What decisions and actions have to be put in place? I will try to highlight some issues that need to be considered from the HO and IHO perspective in establishing a marine SDI, without going into technical details or offering solutions to the different administrative, technical and financial issues.
- a) As a general observation it is important to recognise and accept that building and maintaining a MSDI is not an easy task even for well-developed States. It is a dynamic, complex at different levels, HI-TEC infrastructure, which requires funds, expertise and above all political commitment. This undoubtedly will have an effect on the way that different HOs will respond to the needs and requirements to establish such an infrastructure;
- b) There is a need to define what MSDI means for the HOs and the IHO. What kind of marine spatial data this infrastructure will include and whether hydrographic data other than for navigation will mean surveying areas outside those used for shipping and collecting data not needed for navigation;

- c) When we have accepted to "provide services other than for navigation" we need to define "what those services will include" and of course what impact they will have on HOs and the IHO, from the financial, technical and administrative point of view; do we mean services based on existing data or services for which new data need to be collected or both;
- d) Will this MSDI be under the responsibility of the HO or will the HO simply provide the hydrographic component to the MSDI, for which another agency, be it governmental or private, will be responsible for developing and maintaining. Peter Ehlers in his keynote address at the CARIS 2004 Conference entitled "Marine Geospatial Information and HSS" has presented the German approach, where the marine part of a nation-wide GIS should be promoted under the responsibility of the BSH. This is of course a national position and I am sure that other nations may approach this issue in a different way;
- e) Do we need to standardize the coverage area for the MSDI? Will it cover the territorial waters, the continental shelf, the EEZ, or something different based on national strategy, priorities and requirements;
- f) Funding for the development, maintenance and dissemination methods adapted to user needs and new technology of this Infrastructure, is a very crucial issue for many HOs, which of course will depend on national policies for recovery or not of the necessary funds. Asking for free marine geo-data without securing funds to pay for it, is sure to have long-term negative effects for everyone;
- g) Common standards and well documented metadata are essential for the data discovery, management and compatibility within a SDI. These must be developed using the international procedures and practises in order to cover not only the national needs but also cooperation at an international level. In this respect the IHO has an important role to play in developing the appropriate standards needed for its hydrographic and cartographic applications, in close cooperation with appropriate Organizations responsible for the Standardization, such as ISO.
- h) As an example the IHO S-57 standard, although limited in scope and implementation, provides important compatibility for data sharing in the hydrographic information community. The next edition of the standard will not be a standard just for hydrography, but will have manageable flexibility that can accommodate change and facilitate interoperability with other GIS standards. It will also allow HOs to use other sources of geospatial data. The next edition of S-57 (which will become S-100), is being based on the ISO/TC211 base standard and will make provision for imagery and gridded data in addition to the existing vector data, defined in the present version. This will facilitate the development of additional products and services "other than for navigation" requirements.
- 7) The need for marine data and information has never been greater, especially the need for interoperability with land data and information through a common shoreline for the support of marine spatial planning, strategic environmental and sustainable assessment. Many nations are establishing national geo-spatial data infrastructures, bringing together the services and data sets of major national geo-spatial data providers, for example topography, geodesy, geophysics, meteorology and bathymetry. The Hydrographic Service is an important part of the national geo-spatial data infrastructure and of course the IHO has an important role to play in coordinating the requirements and demands for data collection, interoperability, dissemination, access, standards, security, pricing policy and possible funding models. Not forgetting that the primary mission of the HOs and the IHO is the support for the safety of navigation, this seminar will provide the first opportunity to listen to different positions on the topic of marine geo-spatial data infrastructure and provide guidance on the way that the IHO and its Member States HOs may approach this subject.



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