TW-1A

East Atlantic Hydrographic Commission
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THE IMPORTANCE OF HYDROGRAPHY.

Before we proceed with the presentation on "The Importance of Hydrography", we need to set a frame or boundary conditions on what do we mean by hydrography. In the literature we might find many definitions but the one that concerns us is the one that has been agreed with within the IHO. Sorry for starting from such a basic level, but we think we need to set a strong basement from were to start. We are convinced that Hydrography is important but we need to follow a systematic approach to convince anybody that this fact is absolutely true.

For the IHO, Hydrography, " *is that branch of applied sciences which deals with the measurement and description of the features of the seas and coastal areas for the primary purpose of navigation and all other marine purposes and activities, including –inter alias- offshore activities, research, protection of the environment, and prediction services"*.

Let us review the content of this definition:

- It is a branch of the *"applied sciences*": by saying so, we are agreeing that has a scientific component as well as a practical component. We are not talking about pure science but referring to its application for a very specific objective.

- It *"deals with measurements and description*": in brief it encompasses the determination of some characteristics and a written/graphical representation of those measurement. Both these activities require some standardize procedures of universal application.

- By referring to *"features of the seas and coastal areas*" it makes it clear the geographic sector involved. Part of this sector is clear to us as we see it daily with all its details and points of reference, but most of the area, the larger one, is not at our sight and no matter the information we have from it we need to imagine its appearance.

- The primary purpose is "*Navigation*": therefore the main objective is to facilitate the transport from one place to another in a safely manner.

- But also refers to *"and all other marine purposes and activities*" providing some examples of concerning fields, just to give a general scope.

In concrete, the measurements and description we have indicated have an unlimited scope and application, as wide as our human imagination.

The issue is that the seas and oceans covering nearly 2/3 parts of the globe exercise a strong influence on mankind, from many different points of view, as we will see in this presentation.

The traditional uses of hydrography have been a key factor to go in support of naval operations of warships. Historically, the proper knowledge of the hydrographic characteristic of the war theatre has influenced in the result of the battles. The second main use of hydrography has been a key factor to go in support of shipping, allowing the safe transport of goods between ports. The knowledge acquired of the oceans and seas characteristics was kept as precious information by maritime nations. In general, other parts of the society in the past did not give great attention to the "salt water".

Today Coastal Zone Management and Offshore activities call the attention to different segments of the society concerned mainly on its use and misuse of the seas. In doing so, we have learnt about the influence of hydrography and how important is to know and make proper use to this knowledge, seen from different perspectives than naval operations and maritime transport.

In the Coastal Zone, by the way a very limited resource, several activities take place and some of them compete for the same space. Among other activities we have all those associated with the ports, tourism, sports, fisheries and farming, all introducing in one way or another environmental concern. Being this zone subject to pressure, the real state can become expensive and its administration and control quiet difficult. On the other side it is not exempted from the effects of natural hazards. Clearly to make a good management of the coastal zone, a full knowledge of the hydrographic characteristics is mandatory. Decisions taken in relation to the use and exploitation of the coastal zone might have a strong social – economical influence on the society.

Offshore activities start by establishing the maritime delimitation of the different zones recognized in the United Nations Convention of the Law of the Sea (UNCLOS). Hydrography plays a crucial role in the definition of these delimitations. They allow countries to extend their land territory far beyond the coastline. The Territorial Waters, the Contiguous Zone, the Exclusive Economic Zone and the Continental Shelf provide countries with the opportunity to explore through scientific research exploit and make use of the water and sea floor and the existing living and non-living resources. These opportunities must be supported with a clear knowledge of the associated hydrographic characteristics of the environment. Important decisions must be taken in the light of the hydrographic characteristics, such as the establishment of dumping areas and pipe or cable laying operations. Without the proper hydrographic knowledge, the success of these operations cannot be assured.

From the practice, it is clear that the society gives more attention to the land. But why if in both, the activities and problems are very similar? Let us have a look to some of these activities:

Land	**Sea**
We use it to transport persons/goods	We use it to transport persons/goods
It gets dirty and needs cleaning	It gets dirty and needs cleaning
We practice sports	We practice sports

We have delimitation problems	We have delimitation problems
We grow food	We grow food
We defend its integrity	We defend its integrity
We manage property	We manage property

In brief, we naturally extend our land activities to the sea, and to be successful in its use, we need to know its characteristics, one of which is its hydrographic characteristics. As we administer the land we should administer the sea.

Hydrography has evolved as all sciences and technologies have done. Three main aspects are highlighted. The first one is the evolution experienced in the positioning at sea (and elsewhere); the drastic change occurred in depth determination methodologies and mainly, due to these two firsts aspects, the emerging need to manage huge amount of data. From tapes and angle measurements instruments we have moved to the Global Positioning Systems (GPS) that provides a permanent and dynamic positioning, independent of visibility, weather conditions and other limiting factors affecting positioning in the past. As regard to depth determination, the single data obtained by a lead line has moved to systems gathering enormous quantity of data, normally absolutely difficult to manage. Databases of different parameters have emerged as the solution to be able to take advantage of such information.

The traditional expression of the hydrographic data has been always the nautical chart. Its evolution, from totally manual processes, to those computer assisted ones, continuing with the digital methodologies, has reached a product known as the ENC that can be visualized on an ECDIS systems. Clearly ENC is an end product, but to produce it, several intermediate steps have taken place at earlier stages, generating useful secondary products for other applications.

All these new elements have generated new challenges. On one side hydrography that was an activity mainly executed by HOs, nowadays have captured the attention of the private sector and a different approach is needed, as a percentage of these activities has a commercial interest meanwhile others do not.

The application and use of hydrographic data has been diversified and new clients have identified new products, specially tailored to contribute directly to their activities.

It also can be said that a cultural change is needed as the technology evolves too quickly and there is a need for a permanent effort to keep hydrographic infrastructure and capabilities abreast of these changes. New products, in a different format and worked with partners need to be accepted.

For Hydrographic Offices to enter in a re-engineering process might be absolutely necessary, to adopt the needed changes considering their own particularities. An analysis of the strengths, opportunities, shortcomings and threat seems to be a good starting point. Countries where no hydrographic infrastructure exist should considerer the experience of existing HOs and decide on the way that development should take place.

In conclusion,

1) All Maritime States should be aware of the social-economic benefits of having a specialized governmental agency to handle Hydro-Cartographic and Aids to Navigation matters. One authority is needed to coordinate this national effort. The establishment of a National Hydrographic Committee should be strongly considered as a matter of high priority.

2) National hydro-cartographic and aids to navigation planning and programming should be worked out with the participation of all end users of these products. The participation of the academia as well as the private sector is recommended.

3) Those Maritime States with a certain degree of hydro- cartographic and aids to navigation capabilities, should consider running a S.O.S.T. analysis to identify ways to improve present situation. Those Maritime States without a national structure should consider developing one with the advise of both, the IHO and IMO.

4) The development of hydrographic surveying and nautical charting capability needs to follow a systematic approach. This workshop is oriented to present relevant phases making especial emphasis on Phase One, "Collection and Circulation of Nautical Information".

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