A modern Hydrographic Office

An appeal by RAFAEL PONCE

Hydrographic Offices and related organisations nowadays face a two-sided challenge: Survey and map the inland and offshore waters and position themselves as service-oriented partners in the maritime sector. The concept of Marine Spatial Data Infrastructures (MSDI) can help building up a platform to organise, produce and disseminate modern information products.

Hydrographic Office | Marine Spatial Data Infrstructure – MSDI | ENC | web app

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How true is that anonymous quote saying: »I'm all for a change, I just don't want to be there when it happens.« Nowadays, many people in our hydrographic family are talking about change, evolving their Hydrographic Offices (HO), including Inland Waterways Authorities and Port Authorities too, into the 21st century. But how many are really doing something to that effect?

I frequently hear comments about the need to »modernise« their systems, update their workflows, be more efficient, reach out to more people; but when the time comes to actually do something, they just stay in their comfort zone, status quo, doing what they have always been doing. Sometimes even with modern technology, they keep the old ways of doing business. I think that shouldn't be a big surprise since as human beings, in general, we tend to stay on the safe side of things, not taking many risks. Only a few are willing to »push the envelope« in pursuing a dream, a vision, something that would make a difference. Perhaps a generational change needs to happen.

I have said a few times in the recent past, that if a Hydrographic Office doesn't evolve to today's reality, it will disappear, either replaced or absorbed by a larger organisation or even by the private sector, despite the work and mission HOs have today, that are more relevant than ever. But that also represents a huge opportunity for HOs.

Traditional (backward) thinking vs innovative (forward) thinking

What I refer to as »backward thinking« is the traditional approach of making charts, performing hydrographic surveys just with the chart product in mind. I'm not trivialising these very important activities, there is a lot of knowledge and experience that hydrographers and nautical cartographers most have in order to do them well. But technology today provides the tools to accomplish that traditional mission with much less effort than never before, hence, having the possibility to expand their horizon towards other important things from today's needs. What other things? Well, think of it this way, most people these days have very little or no time to spend searching for what they need. They want to access their smartphones and tablets and get an answer now, otherwise the app doesn't work, or the product they are getting is useless. So, one of the main »new« challenges for HOs is how to enable their products and services to all potential users, not only the traditional mariner, but anyone.

And when I refer to ›anyone‹, I mean also to any purpose besides safety of navigation. In other words, using hydrographic data in a geospatial context. This is in essence for me the »forward thinking« of a Hydrographic Office. Aiming to become a geospatial agency; producing charts will of course continue to be important, but not their only purpose.

Marine Spatial Data Infrastructure within the Hydrographic Office of the 21st century

How to become a true geospatial agency? There is a general pattern that could be taken as a starting point, first of all, HOs need to understand the concept of a Marine Spatial Data Infrastructure (MSDI) and their role in it. An MSDI is a way to create, organise and manage datasets, make products and services, and connect with users, to exchange data with other agencies and enrich their mutual work, and to disseminate to anyone in need of your information. An MSDI should become the foundation of a modern HO, with the goal of becoming the marine authority in their National SDI. In build-
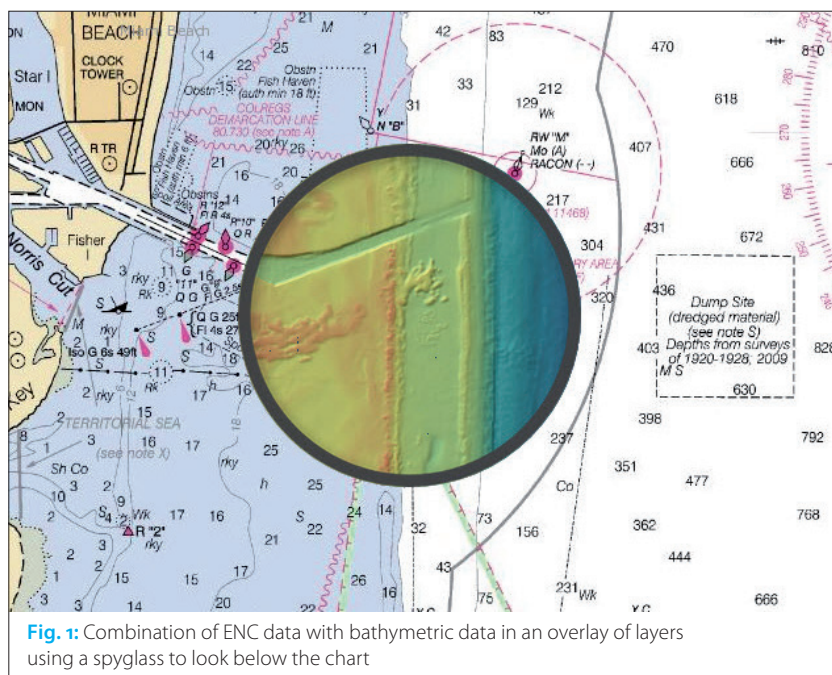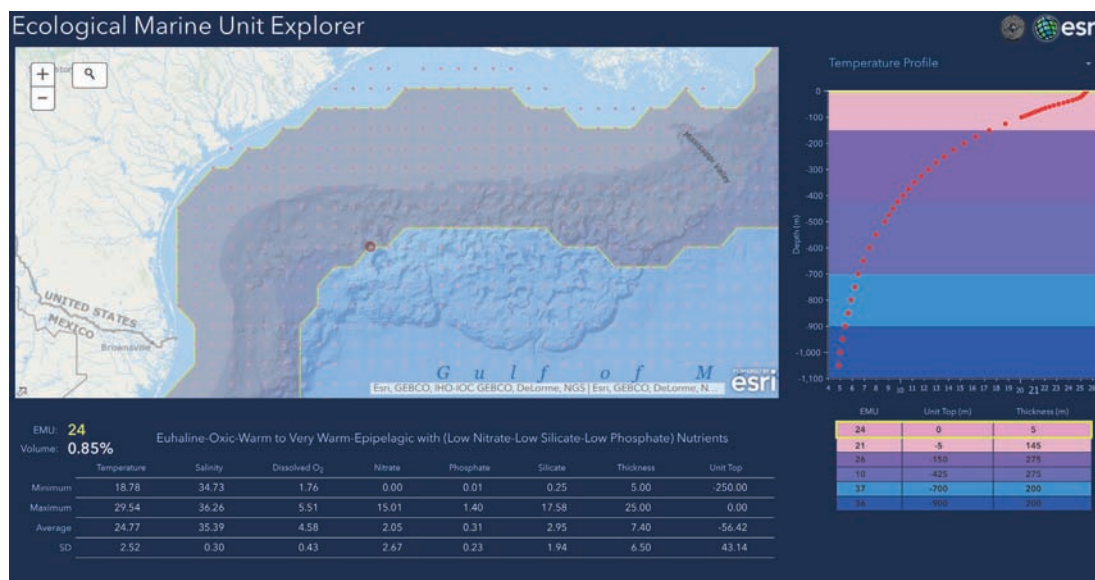

Fig. 1: Combination of ENC data with bathymetric data in an overlay of layers using a spyglass to look below the chart

ing this infrastructure, the work can be divided in phases, the first one being something we can call an »initial operating capability« (IOC) that would take advantage of your existing resources, products and services, independently of how large or small they are, you would prioritise and arrange them in a way that can be easily served to the users in a relatively short period of time and with a small investment.

It is quite common to find an HO in a kind of isolation from the rest of their land counterparts and from the geospatial world in general. This is not necessarily because of the nature of their maritime business that used to be centred solely on safety of navigation, but rather due to limitations in the technology they use. The main reason to be connected is the coastal zone, the area where land and sea converge, interacting in a complex environment that requires powerful tools to analyse and understand it. Hydrography doesn't happen in isolation, and nautical charts are one more of many derived product types HOs can produce. Actually, existing Electronic Navigational Charts (ENCs) can be a source for other derived products and services (Fig. 1). ENCs can be used as a rich content base map to give better context to other marine information. And for HOs core business, ENCs can be (and already are) the source for paper chart products, not the other way around. So, what would be the immediate and direct connection of HO data with an MSDI? The ENC. This product originally designed and produced for safety of navigation is extremely useful for many other applications. The enablement of ENCs into an MSDI would be the realisation of the IOC concept described above. Taking your ENCs and publishing them online, through whatever business mechanism you like (from freely accessible, such as the US NOAA ENC Online, to secure and private servers through different protection mechanisms); users would start adding their data layers and applying web apps for analysis. You could also create your own web apps. This would give your users,
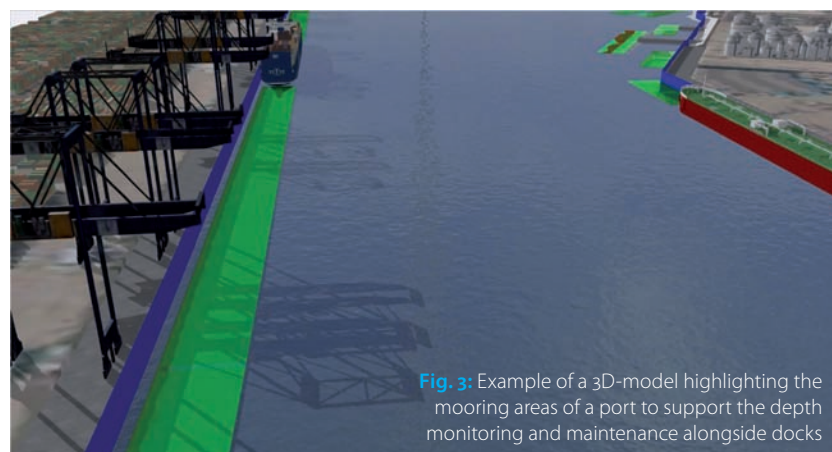
your customers, that answer they were looking for a moment ago, through their mobile device.

Examples of innovative approaches

Once you establish your IOC, you can grow as far and as wide as you want. You could take ENC data apart, create and publish special layers (shipwrecks, hazards to navigation, aids to navigation, bathymetry, etc.) to combine with other datasets. You could start adding high-density bathymetric surfaces, maritime boundaries, marine protected areas, tidal information, sound velocity profiles (water column analysis), sediment classification (habitat mapping), currents and many more oceanographic parameters that will enrich your MSDI. While the NOAA ENC Online is an excellent example of an IOC, the NOAA GeoPlatform, the Canadian Hydrographic Service MSDI and the Ecological Marine Units (EMUs, Fig. 2) are excellent examples of that potential grow.

Another example for an innovative approach is the Port of Rotterdam who introduced PortMaps featuring an improved ENC production and update process (Fig. 3). PortMaps allows the Port of Rotterdam to produce a wide variety of information products in less than 48 hours.

So, the question is: do you want to be there (and be part of) when the change happens? //

Links
US NOAA ENC Online
www.nauticalcharts.noaa.gov/ENCOnline/enconline.html
NOAA GeoPlatform
https://noaa.maps.arcgis.com/home/index.html
Ecological Marine Units
https://esrioceans.maps.arcgis.com/apps/Cascade/index.html?appid=729999d5959d4c6db7dbe69a5ca276da
PortMaps
www.hydro-international.com/content/article/port-of-rotterdam-innovative-hydrography

Fig. 3: Example of a 3D-model highlighting the mooring areas of a port to support the depth monitoring and maintenance alongside docks