# *HYDRO INTERNATIONAL INTERVIEWS MICHAEL CASEY*

# Hydrography to Fill in the 'I' in ECDIS

Hydrographers need to step up and fill the I in ECDIS, says Michael Casey, vice president Geospatial Systems at IIC Technologies and prior to that director for Nautical Charting at the Canadian Hydrographic Service. Casey sees hydrography and hydrographers playing a big role in enabling the marine industry to ship goods all over world in a more energy efficient way. Hydro International talks to him about this importance of energy efficient shipping and the role of hydrography in this development, the Northern Route as alternative for saving costs, carbon fuel and the I for information in ECDIS, in which this role basically comes together.

*First of all, can you briefly describe your career?*
I began my career with the Canadian Hydrographic Service (CHS), first in the survey department but later in the R&D group. At one point I became the director of Planning & Development at the Canadian Hydrographic Service and then director Nautical Cartography towards the end of my career. I retired from CHS in 2004 and consequently joined IIC Technologies in 2005 as vice president for Geospatial Systems. During my career, I saw the complete transition towards electronic charts, working with and on the implementation and development of techniques that supported that transition with, among other, GIS systems and GPS, making it very exciting.

*You have served both the public and the private sector. What is the biggest difference you encountered?*
Obviously the biggest difference is that in the private sector you don't do anything unless you can get something out of it financially whereas in the public sector you are creating certain public goods without the direct need to make money but rather to fill some general need in society : in our case nautical charts and supporting products. I think that decisions in the private sector regarding priorities are often more easily made, simply by answering the question: does it lead to a profitable income stream or not? Deciding on what public good to create and how much to invest in it when there may not be any revenue, makes that aspect of working in the public sector more difficult. It is the hidden challenge for the public sector: what to focus on and what not.

*Amongst Hydrographic Offices there is some crossover now as well. HOs that are becoming active in the private sector.*
Yes, and that must be twice as difficult. They have to serve two masters which I assume must be difficult to manage.

*What will the Hydrographic Office of the future look like?*
Looking at an HO fifty years ago and one today, the core function hasn't changed. An HO still holds the basic responsibility for approving nautical charts, in order for seafarers to know that they can trust these charts for safe navigating. And as long as there is marine navigation there will be a requirement for HOs. But where HOs of the past did the majority of the data-acquisition, processing, analysis and cartography resulting in a set of charts themselves, much of this can now be contracted to third parties in a competitive marketplace. I don't see the HOs becoming just a service bureau though as they need to be a smart buyer and retain a core competence as a basis for judgment of bids. To me, they should carry out a certain percentage of the work themselves and contract the remainder (e.g. 30/70 or 20/80). That way they retain core competence and still have a lot of flexibility.

*You advocate different roles for hydrography besides just supporting and producing nautical charts. Can you explain what other role you envisage?*
A few of the major problems of our society and our planet are climate change and the looming lack of carbon fuels. It is therefore essential to ensure that the transport of goods and people is as energy efficient as possible in order to save carbon fuels and decrease $CO_2$ emissions. Under the existing Kyoto protocol there are no restrictions however for the emission of greenhouse gases for the marine sector. Shipping is already the least polluting way to transport goods, but still we need to make it more energy efficient. The UN has assigned that

task to the IMO. They did some absolutely fantastic work showing how the marine industry can go from its current state to a far more energy efficient sector. I strongly believe there is a big role for hydrography in assisting the marine industry in making each passage as energy efficient as possible.

*How would this role be filled practically? And by whom?*
There is no magic solution to make shipping more energy efficient at once. It will always consist of many small solutions that combined make more energy saving passages. Within the hydrographic community there is already a wealth of data available that could contribute to this goal: tidal and river current data, precise bathymetry for Dynamic Under Keel Clearance and bridge clearance data for optimum air gap. All of these will assist shipping companies in voyage planning and planning of ideal tonnage. It now comes down to working with the industry to find the right and suitable formats. Questions to be answered are, for example, do we need to reformulate old data, are there other areas to be identified where we need better data, are there new ways of data capture, for instance on currents, to make it even more easy to work with. Together with the individual hydrographers and the commercial parties, there's a new role here for the HO as authoritative source. They need to reach out to assist the marine industry in becoming more energy efficient by doing more than just supplying nautical charts.

*Do you see good examples in the community?*
There are many interesting experiments going on, particularly in the US, for example, in San Francisco harbour there are high resolution current predictions with a grid density of 100 metres that give a very accurate model of the harbour in which one can predict micro currents and where sailing in the harbour, San Francisco Bay, is made much easier. This one example shows it is all doable and that it is not rocket science. It all depends on gathering the right data and releasing it so that some clever people can make sophisticated models with it.

*You have talked about crowdsourcing earlier, how does that come into this new role of hydrography?*
It's a way of getting the general public and the professional community involved in data- acquisition and evaluating data. But it serves well in promoting innovative ways to add information to the chart. I believe that we need a way to allow the general public to add comments on sailing routes, for example, so that pleasure boaters can make a more pleasant voyage, or also on the appearance of new shoals - we are adding value and we can experiment linking different kinds of data. We need to innovate through trial and error, but we certainly need to try and bring the nautical chart into a modern multi-dimensional product.

*What will the effect of experimenting with crowdsourcing and linking other kinds of data mean for ECDIS?*
It means that we will give a different - more substantial - meaning to the ‘I' of information in ECDIS. This new role of hydrography discussed needs to have an outlet to the seafarer, through ECDIS. The information on top of the chart could consist of so much more: currents, weather, comments of navigators who were there before etc. in order to make it a more valuable instrument. But to date, we are being held back by the rigid process of ECDIS type approval. We have to experiment with all these new ideas in Electronic Charting Systems (ECS) designed primarily for yachting and pleasure boating, because the ECDIS doesn't allow us to try these experiments. ECDIS is simply not an innovation platform. The world of ECS is less rigid, much more competitive and right now a better environment to experiment. We need to bubble up the best market tested ideas from ECS to ECDIS and in the end we will succeed in changing ECDIS.

*Do you have a message for the hydrographic community at large and its institutions in particular, that follows your vision?*
The big barrier for making the shipping industry more energy efficient at this moment is the hard wall we're hitting in type approval of ECDIS. That's a shame, because the world is experiencing a severe climate crisis and marine navigation needs to play a contributing role. I think the hydrographic community needs to address this climate issue and all HOs, IMO and IHO should use ever better ways to make shipping increasingly energy efficient as part of their mandate. Canada and Russia should develop shipping through the Northern Route as soon as possible as there are very substantial emission reductions that can occur . I know people argue that this may be dangerous and risky, but we have to look at all possible avenues to address climate change because we won't change the way the world's globalised economy is operating. Marine shipping is essential today and in the future. ‘Green' marine transportation, supported and made possible by new hydrography is part of the solution.

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