The Expanding Role of Hydrography

Traditionally the hydrographer, interested primarily in measuring the precise depth for charting purposes, suppressed acoustic â€˜noiseâ€™ in the water column; now we realise what the â€˜noiseâ€™ can tell us.

Technology developments have helped to increase the efficiency and capacity of hydrographic offices to collect, process and distribute the quality data necessary to provide charts and related publications to support a safe and efficient marine transportation system. In the process, non-traditional clients, coastal zone managers, marine scientists, fisheries managers, engineers, environmentalists and others have become interested in the hydrographerâ€™s tools such as GPS, ECDIS and multibeam echo sounders. They are also attracted to the hydrographerâ€™s modern capabilities in areas such as seabed mapping, bottom classification and fish habitat identification.

Geologists, using the signal strength of the backscatter on the multibeam return, group areas of like signal strength over the bathymetry plot, then using ground-truth sampling, produce a composite image of sediment type. Enhanced acoustic images of this nature resemble conventional aerial photographs and are sometimes referred to as â€˜acoustic photographsâ€™. Computer enhanced displays of these images, including 3-D effects, can produce startling â€˜picturesâ€™ of the seabed, and in the process reveal complex geological features. This precise information is invaluable to the geologists who want to see the seabed and the processes at work, to engineers wishing to dredge, to lay underwater pipelines and communication cables and to the military for mine countermeasures.

Multibeam echosounding technology is also seen as a potential fish stock assessment tool which can detect, quantify and assess biomass in the water column and benthos in the benthic habitat. A good example of the latter can be found in the scallop fishery off the coast of Eastern Canada. A combination of GPS, ECDIS and multibeam imagery came together to produce a measured increase in efficiency coupled with significant reduction in environmental damage normally caused by the heavy fishing equipment.

This technology and harvesting technique has been further refined using ground-truth sampling, to the point that the preferred habitat of the juvenile and mature scallops can be defined and the harvest focused on the mature animals. In this way the harvest can be made more sustainable. Studies continue to apply the technology to assess the state of stocks of salmon, herring, crab, lobster, sturgeon and whales in different parts of the country.
Jacques Cousteau once said we know more about the dark side of the Moon than we know about the portion of the Earth covered by water. Jacques would be pleased with the progress that hydrographers are making.