Imagery-derived Bathymetry Validated

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Dear Sir,

I was startled by an article in the January/February 2013 issue entitled ‘Imagery-derived Bathymetry and Seabed Classification Validated’, which took me back to 25 years ago when I was busy validating our first official satellite chart following the launch of SPOT 1. Our ground survey had been preceded even earlier by a push-broom scanner simulation performed with a Navy P2 aircraft.

What disturbs me in this remarkable display of hydrographic excellence is that the authors are attempting to cajole readers into thinking that Satellite Derived Bathymetry (SDB) is a revolution, whilst it has been in use in national Hydrographic Offices for almost thirty years, whether for military application or nautical cartography. Hundreds of satellite-enhanced charts have been published and integrated into the regular chart series. The performances claimed by the authors in 2013 are consistent with the precision achieved in 1988 i.e. 10% of the depth between 5 and 20 metres and random dispersion between zero and 5 metres. But even this claim is subject to debate as a closer examination of the Corsican data, using customary Quality Check, is significantly less optimistic. Since these pioneering times, SDB has been subject to proper validation and extended to most Polynesian reefal areas, African coasts, the Arabian Gulf and as far as the Kerguelen in the roaring fifties.

SDB techniques are routine, both in the US and France, and in laboratories in the UK and Australia. The key publications are over 30 years old, e.g. amongst other, Lyzenga D.R. (1978) and Tanis F.J. (1982).

The article also neglects the large body of more recent literature, some of which is focused on understanding inherent uncertainties. However promising SBD is though, understanding why and when it can fail and qualifying/quantifying uncertainties are more important than repeating the demonstrations of thirty years previous.

SDB is indeed a promising method, not so much to speed up the production of fully QC nautical charts, although filling the Ocean blanks with S-100 compliant depth layers is an obvious improvement, but to meet the growing requirements of a new category of users, namely Coastal Zone managers, Environment Protection agencies, GIS providers, Cruising industries and the like.

For this reason it is necessary to bring a bit of discipline and standardisation to give confidence to the users. We are aware that an Ad-hoc Expert Study Group has been formed to this end, which includes some official hydrographic offices as founding affiliates and a number of private companies and laboratories specialised in hydrography and light propagation modelling. The International Hydrographic Bureau has been approached with a view to setting up an IHO Working Group on SDB open to Member States’ experts, Earth Observation /Remote Sensing specialists and other qualified partners.

As a lover of remote sensing, of geophysical survey techniques and of their outputs display on maps, whether databases or printouts, and an instigator of the standardisation effort, and with the permission of my peers, I shall be honoured in future to keep your readers informed of the current state of the art.

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