

A Cost–Benefit Analysis for the Application of a Multi–Sensor Approach to Near Shore Hydrography

Andrew Waddington (United Kingdom)

Key words: Capacity building; Coastal Zone Management; Geoinformation/GI; Hydrography; Laser scanning; Remote sensing; Risk management; Spatial planning; Bathymetric, LiDAR, Satellite, Multibeam, Cost-benefit, Blue Economy, Coastal, Environment, Maritime, Charting

SUMMARY

Hydrography is about more than nautical charts. Increasingly an awareness of the full impact of developments, both manmade and natural, is vital to good decision making and the best decision making is in turn dependant on the best information. We have realised the importance and the potential of the Blue Economy and its vital part in our global economic system but are only slowly becoming aware that the critical component is the land/sea interface between the activities that take place in the Blue Economy and the land based market which it serves. Our awareness of the maritime element of global trade is still largely superficial. According to the IHO Hydrography is the branch of applied sciences which deals with the measurement and description of the physical features of oceans, seas, coastal areas, lakes and rivers, as well as with the prediction of their change over time, for the primary purpose of safety of navigation and in support of all other marine activities, including economic development, security and defence, scientific research, and environmental protection. Hydrography is the science of information about the sea and the waterways connected with it and it is the geospatial element included in hydrography that provides the common thread across these activities. This paper will examine the role of hydrography in the arenas of environmental management, civil engineering, economic and social development as well as nautical charting role with an emphasis on the shallow water coastal environment that characterises the critical interface between activities at sea and on land. It will present a cost-benefit analysis using a case study in the south west Pacific which will cover social, economic and environmental considerations with a view to providing a mechanism for assessing and presenting the value of near shore hydrography so that it may be considered alongside other capital projects and investment priorities. The role of multiple technologies in developing a layered approach to hydrographic data gathering will be presented and will include Satellite Derived Bathymetry, Bathymetric LiDAR and shipborne acoustic systems showing how these technologies can be considered complimentary and provide a value for money solution to data gathering in the near shore environment based on an assessment of the requirement for accuracy and the acceptance of risk. The conclusion will offer an approach to hydrography that places a value beyond the requirements of nautical charting and into the wider socioeconomic impact of a more complete understanding of the near shore environment.