Identification and Depiction of Submerged Rocky Area Features in HCells for Application to NOAA Charts

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Abstract

The Navigation Surface is a powerful tool in chart compilation. There is tremendous potential with Surfaces to depict the nature of the seafloor, but until recently this potential was not realized in NOAA charting. The higher resolution Surfaces are especially useful in defining nearshore rocky areas which are of particular navigational importance in terms of charting anchorage areas, harbor approaches and traffic separation schemes. Rough seafloor classification is of interest to various other entities, as well, including commercial and recreational fishing, habitat studies and management, and cable survey route planning.

The NOAA Pacific Hydrographic Branch (PHB) is where west coast US and Alaska hydrographic survey data is processed through "HCells" to create updates for the ENC and RNC. The HCell process, a GIS-based method for creating chart updates for individual hydrographic survey areas, has now evolved to the point where additional enhancements and efficiencies are sought. Ignored in this regard in the early HCell development years, the Navigation Surfaces are now being used to address one of the most problematic of nearshore features, the rocky seabed.

In the steep, deep and often rocky environs of Alaska, an inordinate amount of time is spent in field collection, S-57 attribution, and compilation of rock features to the HCell for creation of the chart update. The inclusion of Lidar data into PHB's hydrographic survey processing pipeline highlighted the need for a new means of managing these often extensive areas which include numerous discrete rock features. PHB sees generalization of areas rife with exposed and submerged rocks, as early following collection as practical, as a means to reduce time in features management.

The high resolution Surfaces, from both Lidar and hydrographic surveys, lend themselves particularly well to locating and delineating these submerged rocky areas. By defining the extents of the rocky area, and identifying only the most significant individual rock features within it, time and energy resources are conserved over identifying and encoding numerous discrete point features. In addition to the added efficiency and time savings an improved charting product is generated which contains more information of value to the mariner and other chart users.

Implementation of this approach is in its early phase, but our results so far show that less time is spent in the field and processing center in examining and encoding individual rock features. The feedback from NOAA's Marine Charting Division, responsible for application of the HCell to the chart, has been positive; the prospects for improvement to our nautical charting products are good, with no anticipated issues with integrating the rocky seabed areas into the existing chart products. With further refinements this method shows great promise as a time and resource saving tool.