

Towards an automated chart-ready cartographic sounding selection

Dyer, Noel^{1,2}, Kastrisios, Christos³, De Florian, Leila²

¹ Office of Coast Survey, National Oceanic and Atmospheric Administration, USA

² Department of Geographical Sciences, University of Maryland – College Park, USA

³ Center for Coastal & Ocean Mapping, University of New Hampshire, USA

Noel.Dyer@noaa.gov

Cartographic sounding selection, the process of identifying navigationally relevant soundings for chart-display, is a time-consuming generalization process in the chart production workflow. Advances in bathymetric data collection and processing techniques are resulting in higher resolution data, which compounds the bottleneck of sounding selection. Thus, a comprehensive algorithm for generating a chart-ready set of soundings that adheres to cartographic constraints could vastly decrease the time from data collection to chart dissemination. Towards this goal, this work presents enhancements to our label-based hydrographic sounding selection (Dyer *et al.*, 2022) and methods for identifying soundings for chart display.

Enhancements to the hydrographic sounding selection algorithm include a method for cartographically generalizing Category Zone of Confidence (CATZOC) polygons (MQUALs), utilizing said generalized polygons for a constrained triangulation during validation, and an adjustment procedure to eliminate functionality (safety) constraint violations. This results in a hydrographic selection with zero functionality violations, albeit at the expense of legibility, where the introduced overlapping labels are handled later when deriving the chart-ready selection.

The hydrographic sounding selection results serve as input to our cartographic sounding selection process that begins with defining the types of soundings found on nautical charts: least depth, critical, deep, supportive, and fill soundings. We present a method to extract these soundings based on analyzing the surface model of the hydrographic selection, the associated survey CATZOC value, and existing chart features (Figure).

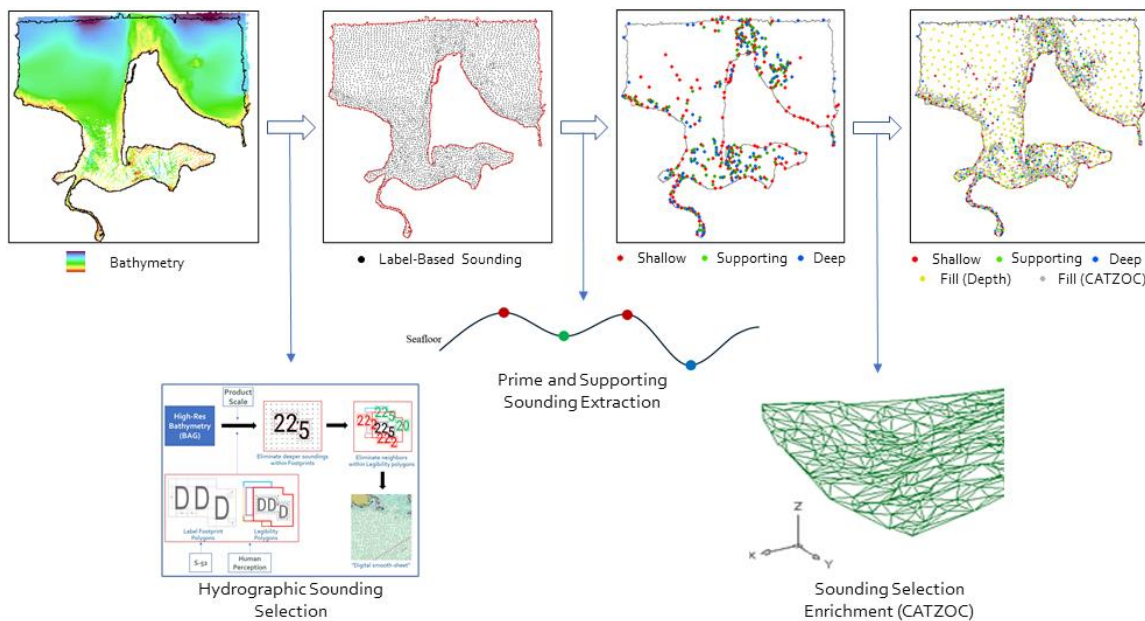


Figure. Example of current workflow.

Reference

Dyer, N., Kastrisios, C., De Florian, L. (2022). Label-based generalization of bathymetry data for hydrographic sounding selection. *Cartography and Geographic Information Science*, 1–16. <https://doi.org/10.1080/15230406.2021.2014974>