

Canadian Hydrographic Service's approach to bathymetric gap analysis

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The Canadian Hydrographic Service (CHS) is undertaking a concerted effort to conduct a bathymetric gap analysis of all digital bathymetric holdings in CHS' portfolio. A gap is being defined as a space on the seafloor void of soundings at a 100-metre resolution. The objective of this analysis is to provide the CHS with a comprehensive understanding as to the extent of bathymetry coverage in Canadian waters, to create an additional tool for hydrographic survey planning, and to support other external initiatives such as Seabed 2030 and Lakebed 2030.

CHS's methodology is a GIS raster based analysis, whereby Canadian waters are delineated into 100-metre x 100-metre cells and CHS's bathymetric data holdings within these cells are classified into four categories: Void of Soundings (Gap), Minimal Coverage, Moderate Coverage, and Full Bottom Coverage. The highest level of classification group, Full Bottom Coverage, is derived from cells that fall entirely within the footprints of certain data acquisition techniques, namely multibeam echosounder, lidar or sweep acoustic sounders. The Minimal Coverage and Moderate Coverage classifications are derived from the sounding densities at a 10 metre resolution within the 100x100-metre cell.. Minimal Coverage is classified on cells that contain 1-2 representative soundings while Moderate Coverage is classified on cells that contain greater than 3 representative soundings or cells that are partially covered by the footprints of Full Bottom Coverage Cells.

Preliminary results for the Great Lakes and for the Pacific region have shown to highlight significant gaps in CHS' digital holdings. The benefits of this gap analysis include a mechanism that allows CHS, crowd sourced bathymetry data contributors and trusted node partners to focus data acquisition efforts and provide a platform to communicate the extent of bathymetric coverage in Canadian territorial waters to the broader science communities.