



# Canadian Hydrographic Service's (CHS) Approach to Bathymetric Gap Analysis

## USCHC45

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# WHY

- Understand extent of bathymetry coverage in Canada's waters
- Provide a baseline to measure progress of hydrographic data acquisition in Canadian waters
- Supports Seabed 2030 and Lakebed 2030 initiatives



# GAP ANALYSIS METHODOLOGY

- Multibeam, LiDAR or sweep acoustic acquisition considered full bottom coverage
  - Bounding polygon of these datasets used to define coverage area
- All other sources combined at 10m resolution
- Analysis performed at 100m resolution, categorizing cells into four categories:
  - **Full Bottom Coverage** - cells that fall entirely within the limits of datasets collected via multibeam echosounder, LiDAR or sweep acoustic sounder data acquisition techniques.
  - **Moderate Coverage** - cells that contain greater than 3 representative soundings or cells that are partially covered by the footprints of Full Bottom Coverage Cells
  - **Minimal Coverage** - cells that contain 1-2 representative soundings
  - **Void of Soundings (Gap)** - cells which contain zero soundings

*\*A **representative sounding** is a derived value to represent the depth in a 10m resolution grid as a result of the combine of all source data contained within the 10m grid cell.*



# COMPARISON TO OTHER METHODOLOGIES

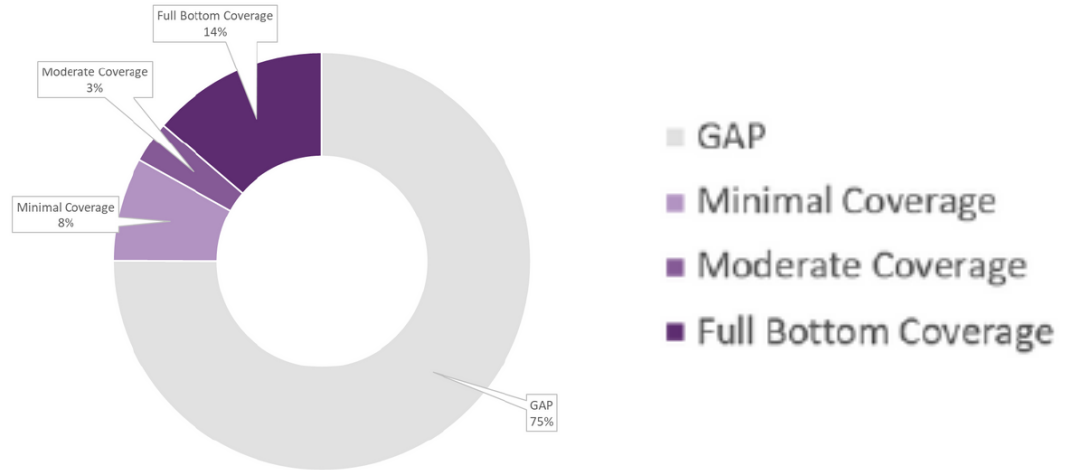
Classification Group	0		1		2		3	
Organization	CHS	NOAA	CHS	NOAA	CHS	NOAA	CHS	NOAA
Description	GAP	GAP	Minimal Coverage	Minimally Mapped	Moderate Coverage	Better Mapped	Full Bottom Coverage	N/A
Coverage	Void of Soundings	Void of Soundings	1-2 Rep. Soundings	1-2 Soundings	3 or more Rep. Soundings	3 or more soundings	100% MBES or LiDAR, or Sweep	N/A
Class Number	0	0	1	1	2	3	3	N/A
Density Count	0	0	1 - 2	1 - 2	≥ 3	≥ 3	N/A	N/A
Survey Date Constraint	CHS	No constraints						
	NOAA	Data acquired post 1960						
	GEBCO	No constraints						
Sources	CHS	CHS' Digital Holdings Only						
	NOAA	Extended Continental Shelf Grids, Bathymetric LiDAR, NOS Hydrography, MBES, NOS Hydrography (>1960), SBES, CSB						
	GEBCO	All contributing sources						
Extent	CHS	Shoreline to EEZ						
	NOAA	Shoreline to EEZ						
	GEBCO	World Oceans						
Grid Cell Size	CHS	100 metre x 100 metre grid regardless of depth						
	NOAA	100 metre x 100 metre grid regardless of depth						
	GEBCO	Depth Dependant   100 metre grid (0-1500m depth)   200 metre grid (1500-3000m depth)   400 metre grid (3000-5750m depth)   800 metre grid (5750-11000m depth)						

## EXAMPLE OF RESULTS

### GREAT LAKES AND ST. LAWRENCE

Classification Name	Number of cells	Square kilometres	Percentage
GAP	6,721,837	67,218.37	75.1%
Minimal Coverage	716,522	7,165.22	8.0%
Moderate Coverage	288,270	2,882.70	3.2%
Full Bottom Coverage	1,228,332	12,283.32	13.7%

## GREAT LAKES AND ST. LAWRENCE (ONT)





# NEXT STEPS

- Update the methodology to use actual data limits as opposed to bounding polygon limits (current approach).
- Phase 2: Automation of the gap analysis (2022/23)
- Phase 3: Web-based Interactive Dashboard (2023/24)
- Beyond 2024 – Investigate potential for combined Great Lakes interface for CHS & NOAA





# THANK YOU

## QUESTIONS / COMMENTS?

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