Bi-National Bathymetry Coverage and Gap Analysis Pilot and Lakebed 2030

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US Defining Mapped: Sounding Density Analysis

Criteria for Minimally Mapped

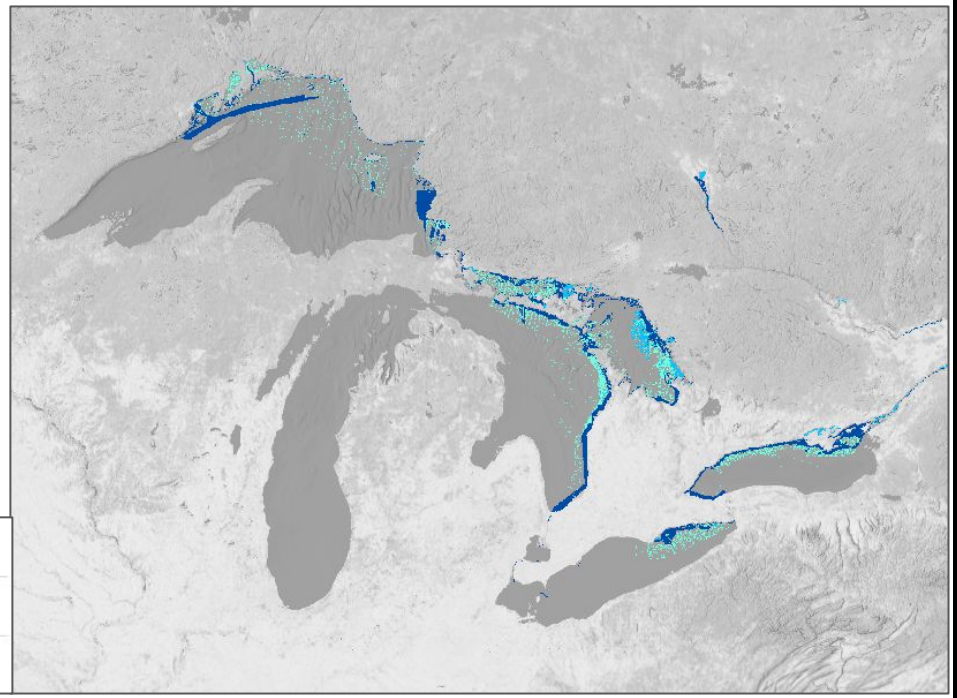
- Area must be surveyed after 1960
- Each 100 m cell must be supported by at least 1 sounding
- Publicly accessible **bathymetry** at IHO DCDB

Bathymetry Layers

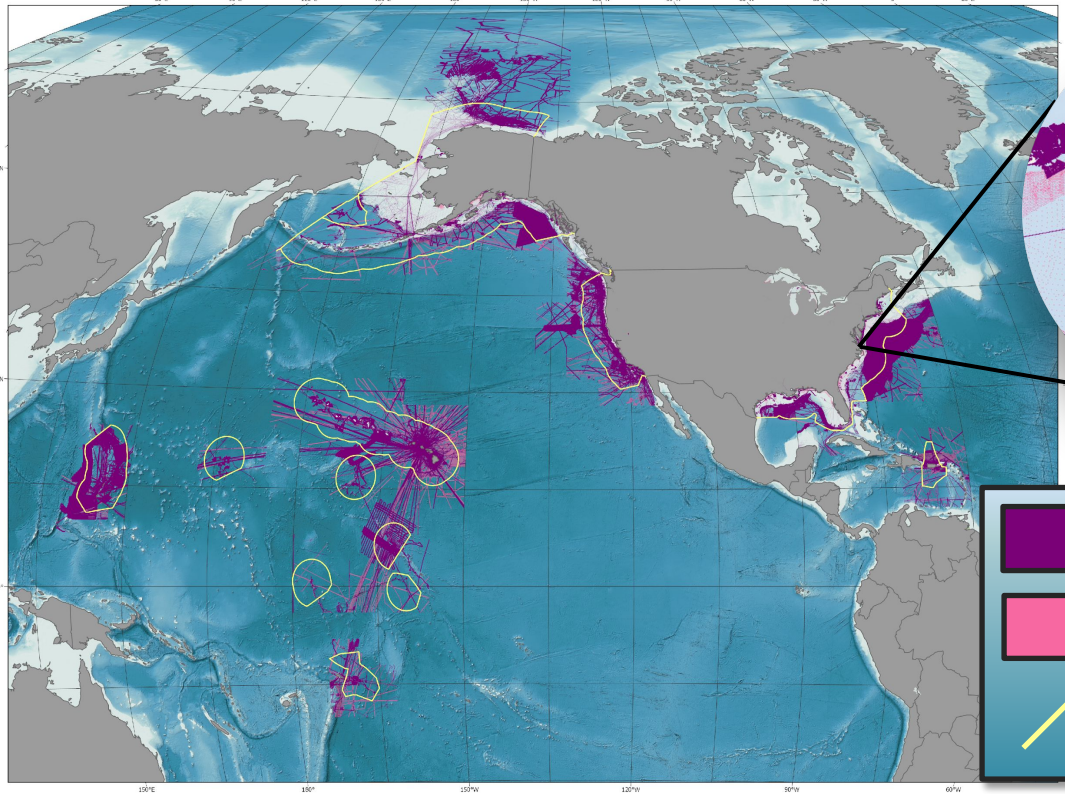
Extended Continental Shelf Grids
Bathymetric LIDAR
NOS Hydrography (BAG-formatted + MB)
Multibeam Bathymetry
NOS Hydrography (> 1960)
Single-beam Bathymetry **(> 1960)**
Crowdsourced Bathymetry

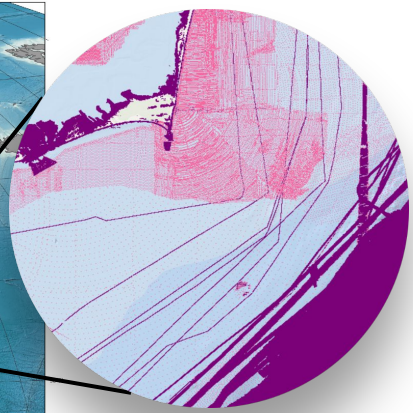
CAN Bathymetric Coverage

- Data used in this analysis represents the bathymetric digital holdings contained in the CHS' Bathymetric Database, both validated and non-validated data.
- The Canadian Bathymetric Gap Analysis covers Canadian waters only, to the outer extent of Canada's Exclusive Economic Zone (EEZ)
- 100-metre grid resolution in Canada Albers Equal Area Conic projection was used to calculate coverage



US Bathymetry Gap Analysis Web Service





See NOAA's GeoPlatform

Also, linked from https://iocm.noaa.gov/seabed-2030-bathymetry.html

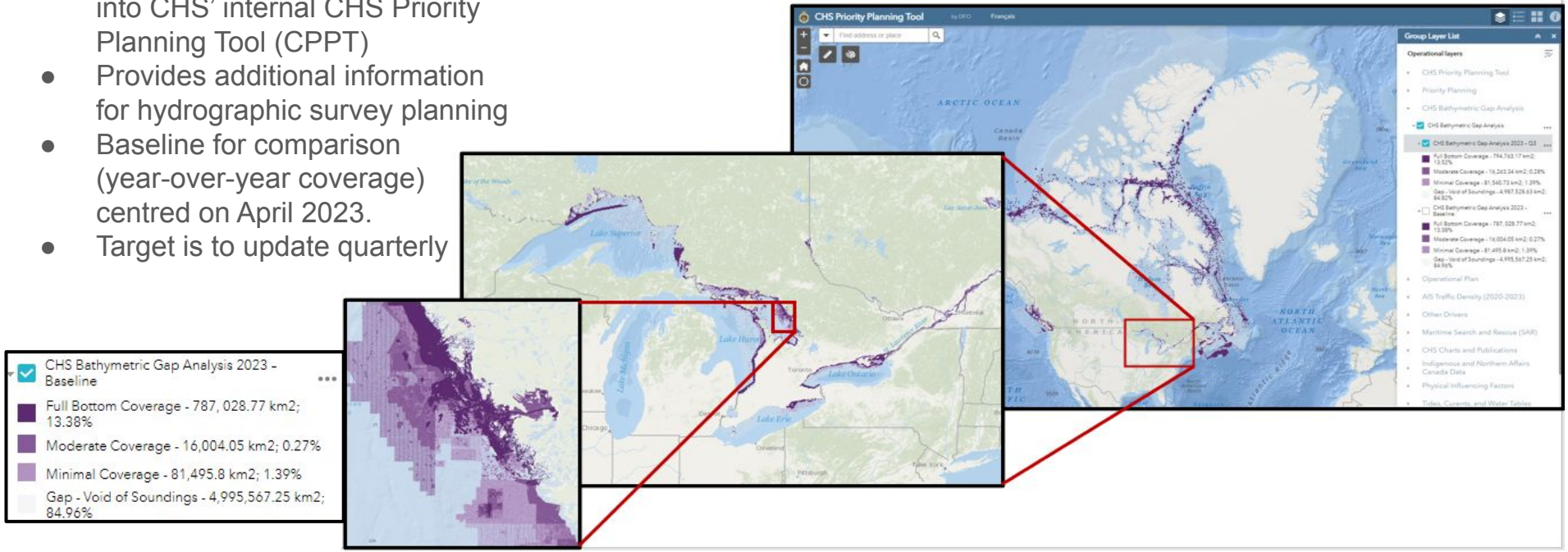
3 or more soundings per ~100 m cell

1-2 soundings per ~100 m cell

U.S. EEZ / Maritime Boundaries

CAN Bathymetric Coverage

- Canadian Bathymetric Gap Analysis has been incorporated into CHS' internal CHS Priority Planning Tool (CPPT)
- Provides additional information for hydrographic survey planning
- Baseline for comparison (year-over-year coverage) centred on April 2023.
- Target is to update quarterly



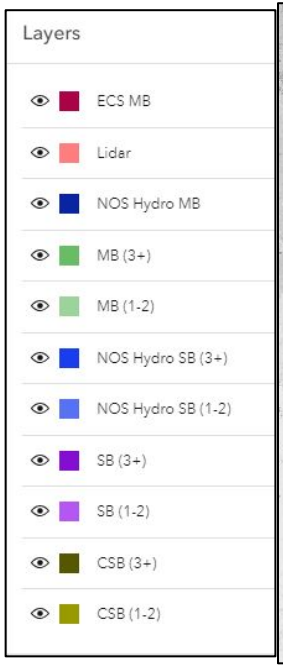
US Bathymetric Coverage Report Tool

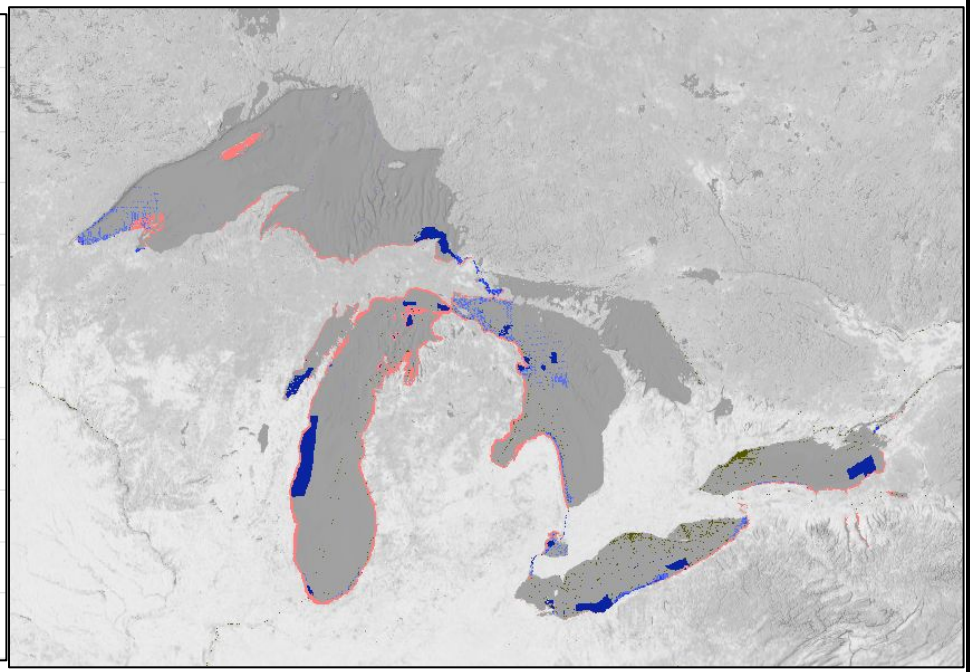
https://gis.charttools.noaa.gov/bathy-coverage-report/

US Bathymetry Layers
Supersession Order

Extended Continental Shelf Grids
Bathymetric LIDAR
NOS Hydrography (BAG-formatted + MB)
Multibeam Bathymetry
NOS Hydrography (> 1960)
Single-beam Bathymetry **(> 1960)**
Crowdsourced Bathymetry

Further classified as
1-2 or 3+
soundings per 100m cell





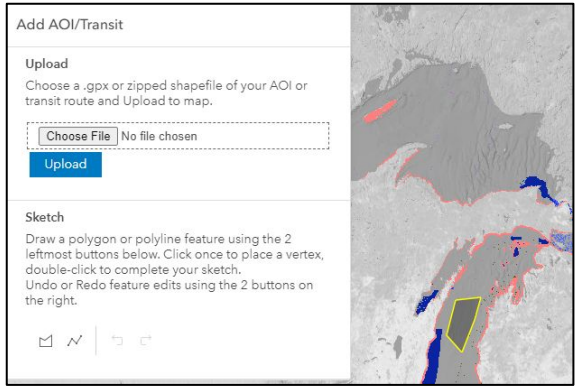
US Bathymetric Coverage Report Tool

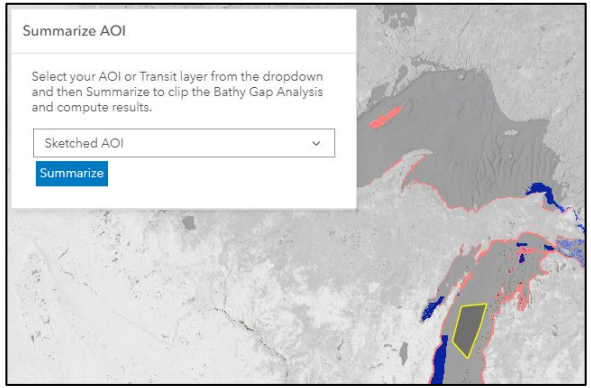
Three Steps

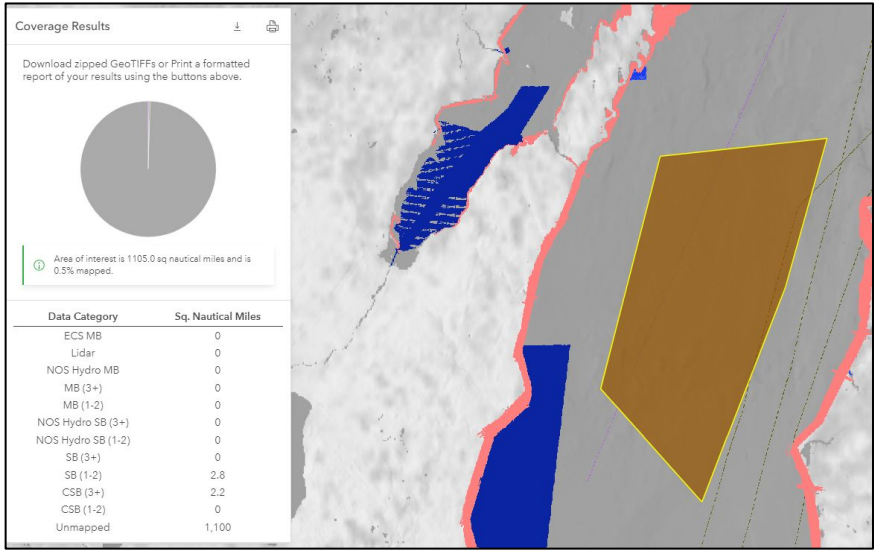
1.) Add AOI/Transit

2.) Summarize AOI

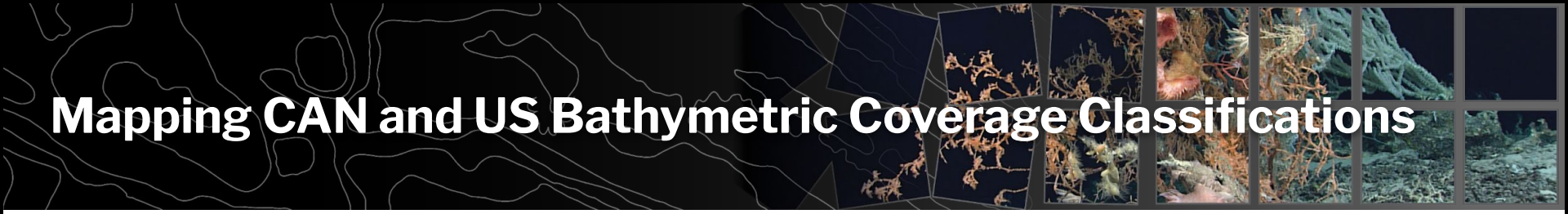
3.) Coverage Results







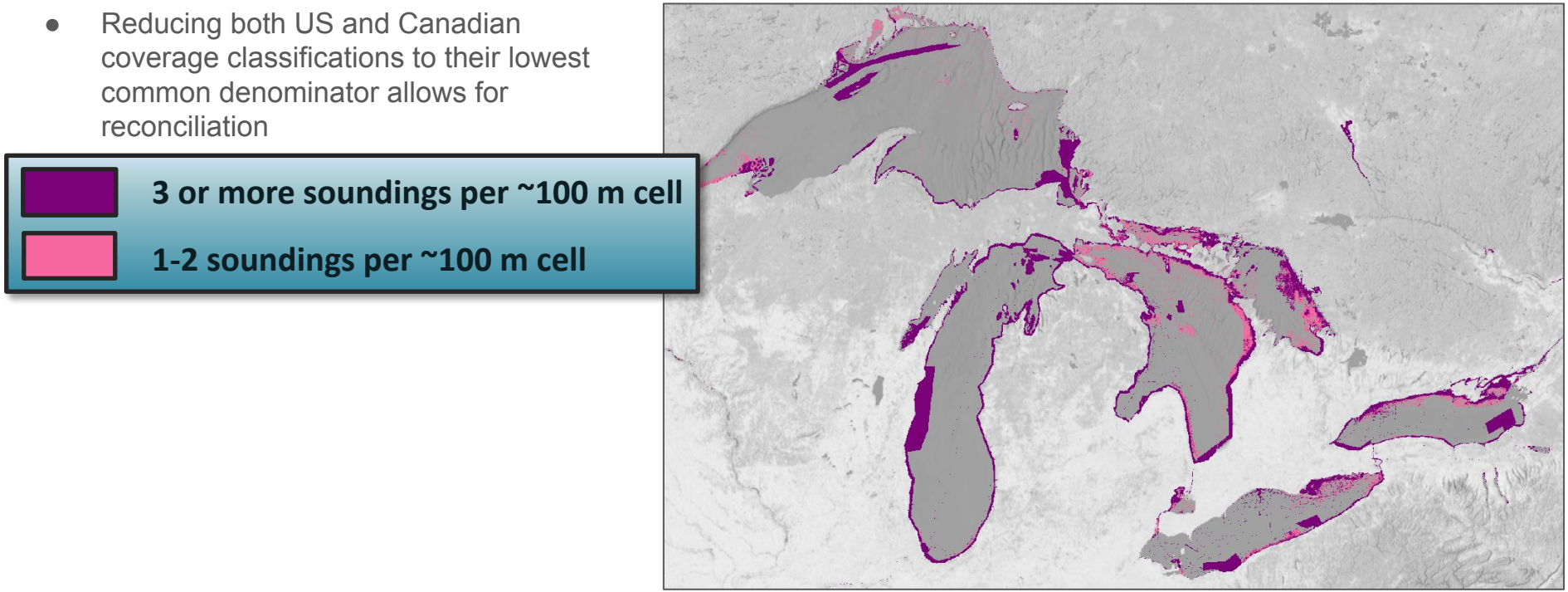
Mapping CAN and US Bathymetric Coverage Classifications



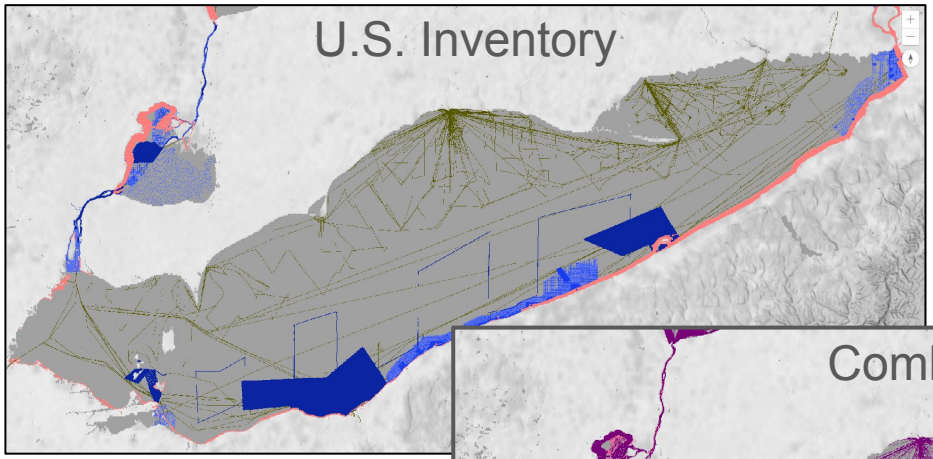
CAN classifications - covers CAN waters only	US classifications (nearest equivalent) - spans both CAN and US waters
Full bottom coverage: cells that contain certain data acquisition techniques: Multibeam echosounder, LiDAR or sweep acoustic sounders.	LIDAR + NOS Hydro MB (BAG) + MB (3+)
Moderate coverage: cells that contain greater than 3 representative soundings	LIDAR + NOS Hydro MB (BAG) + MB (3+) + NOS Hydro SB (3+), SB (3+), CSB (3+)
Minimal coverage: cells that contain 1-2 representative soundings	MB (1-2), NOS Hydro SB (1-2), SB (1-2), CSB (1-2)
Void of Soundings (Gap)	0

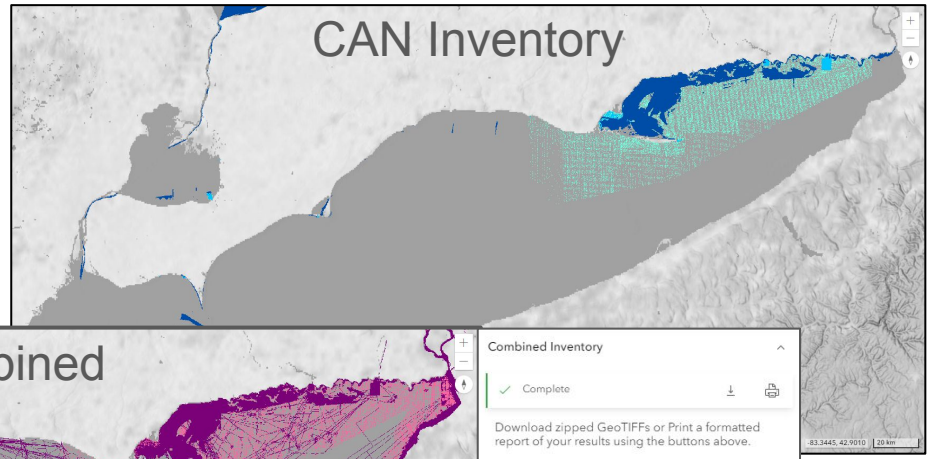
US and CAN Bathymetric Coverages in the Report Tool

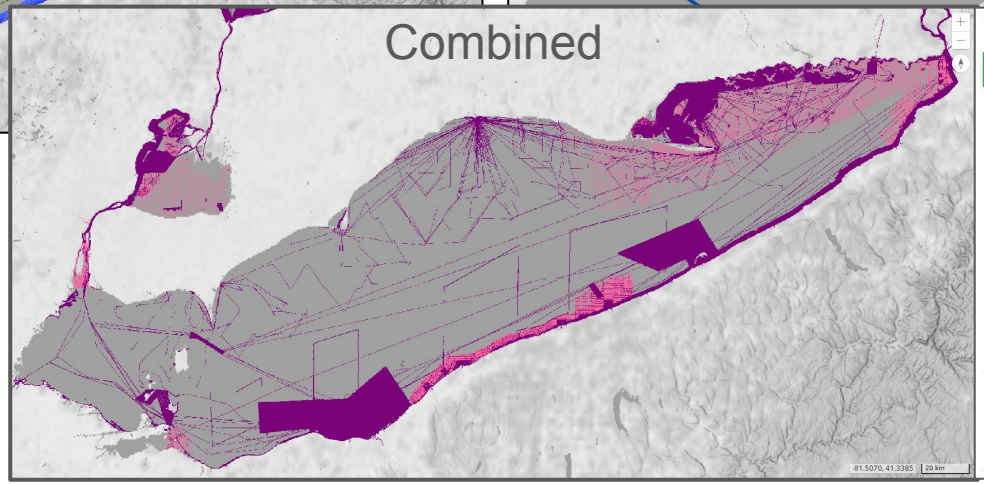
- Reducing both US and Canadian coverage classifications to their lowest common denominator allows for reconciliation



Test Reporting: Lake Erie







Potential Future Bi-national Collaboration

- Submit an abstract to Lakebed 2030 (deadline is June 7, 2024)

- Other Ideas
  - Share US/CAN bi-national bathy coverage report tool pilot and demonstrate how US and CAN hydrographic offices might use it to inform future projects in support of Lakebed 2030, e.g., TJ and TJ DriX operations in Great Lakes in 2025?
  - Discuss US vs. CHS approach to crowdsourced bathymetry may be processed for use in hydrographic products

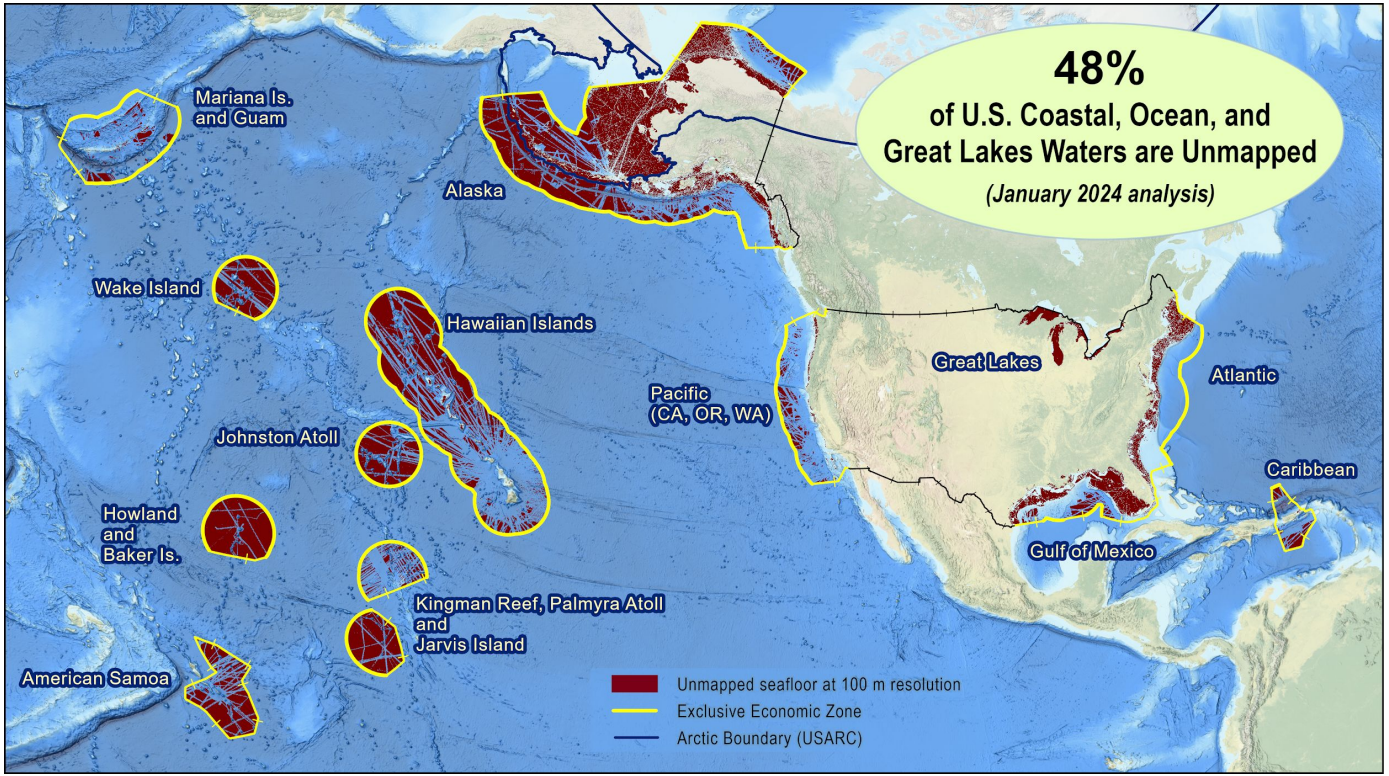
- Transit Mapping/Trackline Navigation best practices

Progress Report on Unmapped U.S. Waters

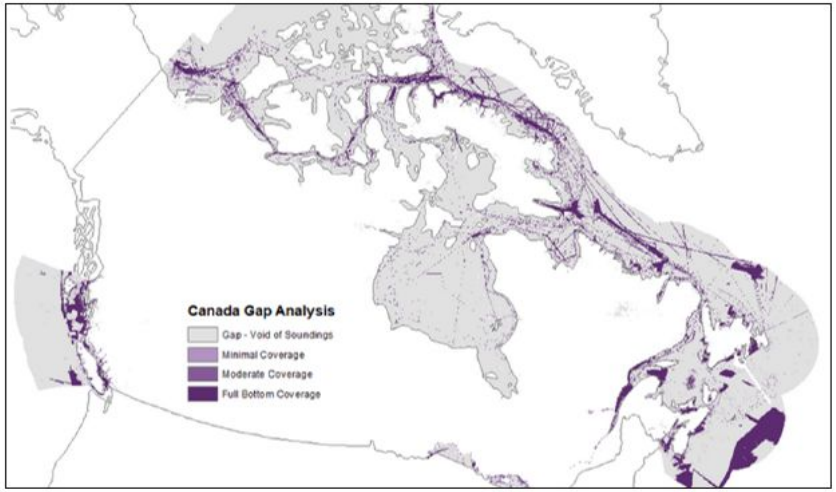
Recently Published!
5th annual report covering progress up to December 2023

Last year, we were at 50% unmapped.

Reports located at https://iocm.noaa.gov/seabed-2030-status.html



Progress Report on Gaps in Canadian Waters

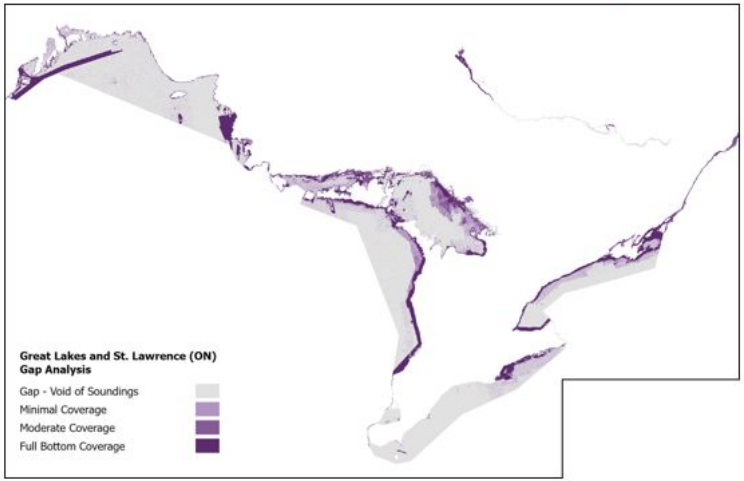


Published January 2024

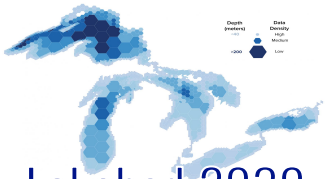
84.8% of Canadian Waters are void of soundings – A decrease of 1.6% from the previous year.

Great Lakes (Canadian Waters Only)

73.7% are void of soundings;
14.1% have full bottom coverage (mainly in shallow critical near shore areas)



Progress Report on Unmapped U.S. Waters



Lakebed 2030

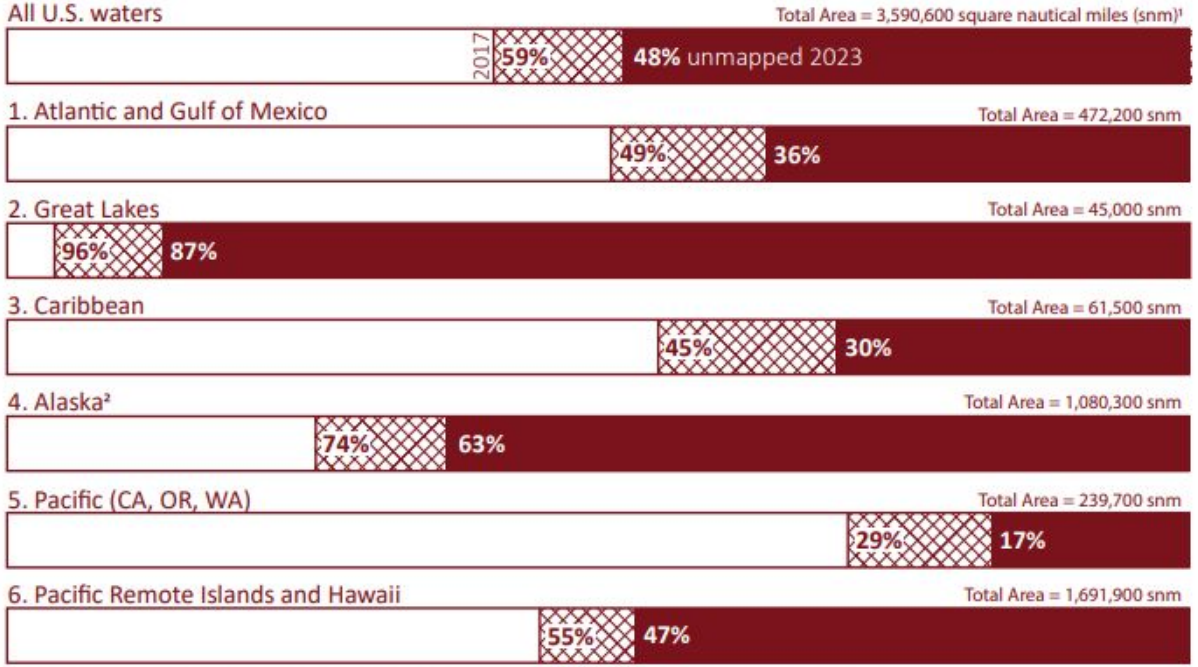
Great Lakes jumped from 92% to 87% unmapped

Both campaigns are UN Decade Actions in support of Seabed 2030

Seascape Alaska

Roughly half of the total coverage gains are in the Alaska region

Percent of U.S. unmapped seafloor at 100-meter resolution in 2023



[1] Total does not include the U.S. Extended Continental Shelf declared in 88 FR 88470.

[2] The Arctic portion of U.S. waters in the Alaska region is 583,800 snm and 73% unmapped at the end of 2023.

Progress Report on Gaps in Canadian Waters

Recent efforts to map Canada's seafloor has focused on the Canadian Arctic as part of Ocean Protection Plan (OPP) Initiative