



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

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**Supported by:**

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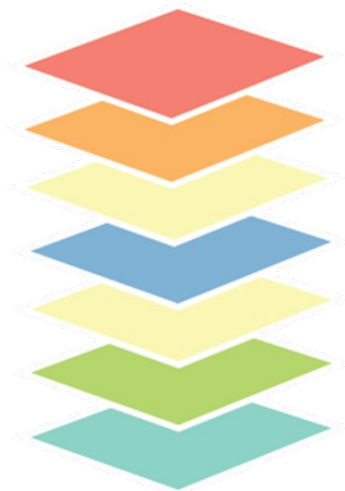
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# US Defining Mapped: Sounding Density Analysis

## Criteria for **Minimally** Mapped

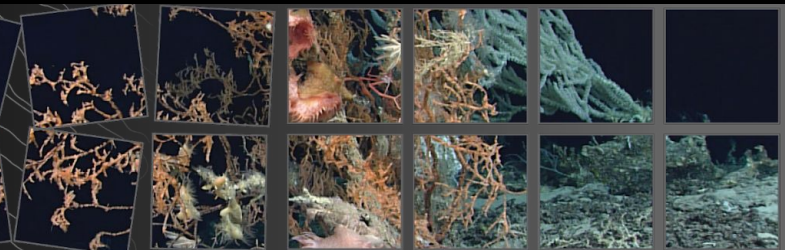
- Area must be surveyed after 1960
- Each 100 m cell must be supported by at least 1 sounding
- Publicly accessible **bathymetry** at IHO DCDB



## Bathymetry Layers

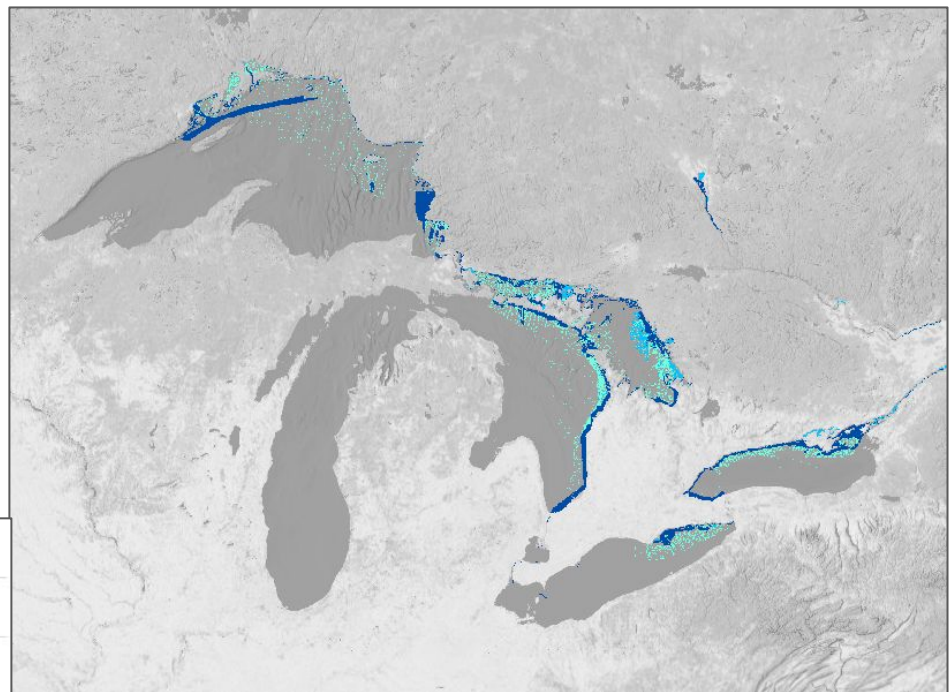
- Extended Continental Shelf Grids
- Bathymetric LIDAR
- NOS Hydrography (BAG-formatted + MB)
- Multibeam Bathymetry
- NOS Hydrography (> 1960)
- Single-beam Bathymetry (> 1960)
- Crowdsourced Bathymetry

# CAN Bathymetric Coverage

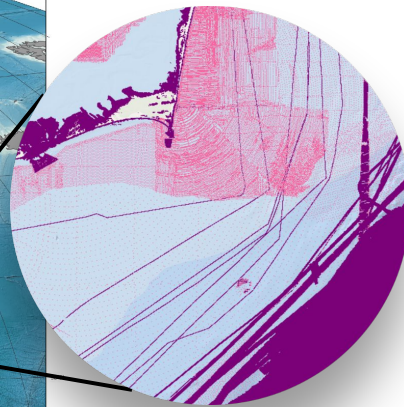
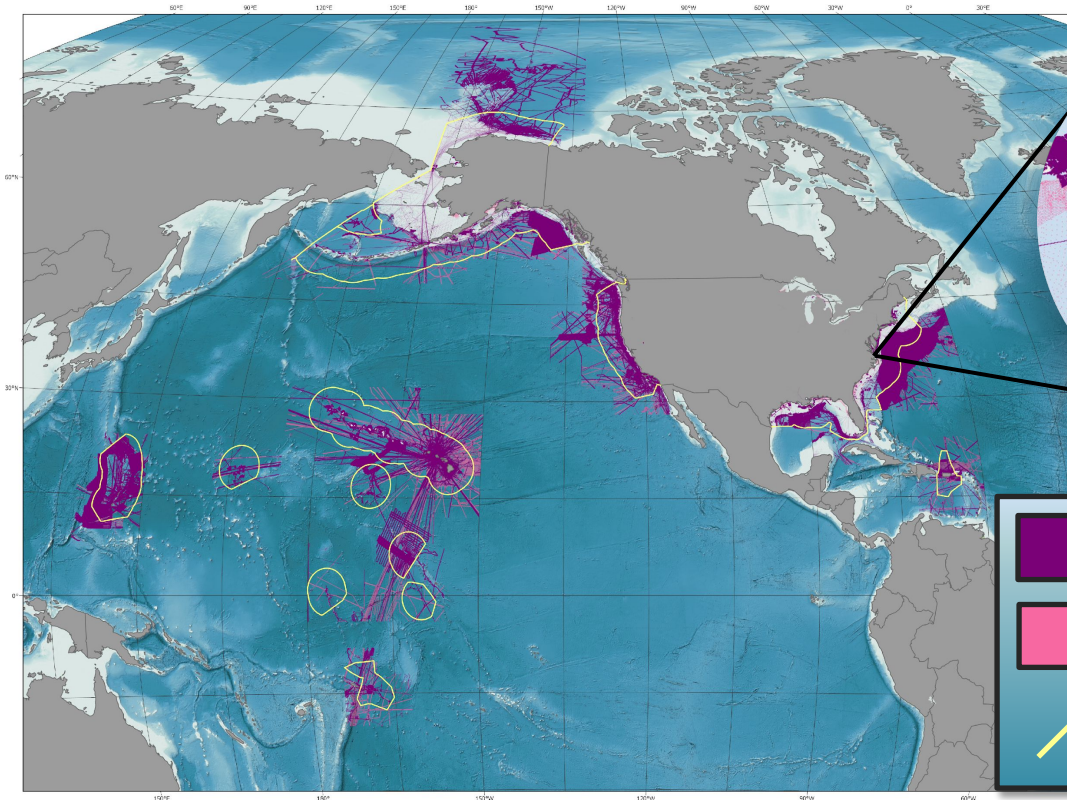
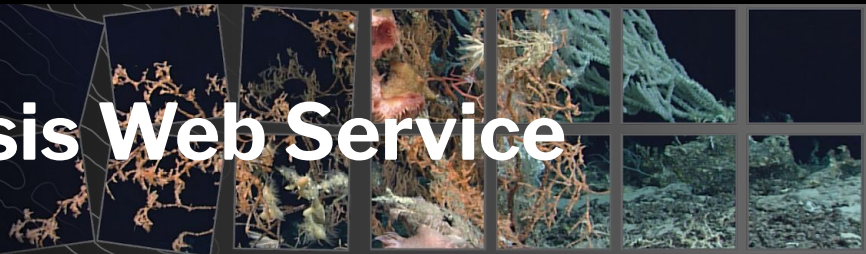


- Data used in this analysis represents the bathymetric digital holdings contained in the CHS' Bathymetric Database, both validated and non-validated data.
- The Canadian Bathymetric Gap Analysis covers Canadian waters only, to the outer extent of Canada's Exclusive Economic Zone (EEZ)
- 100-metre grid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

	Full Coverage
	Moderate Coverage
	Minimal Coverage

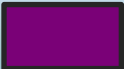




# US Bathymetry Gap Analysis Web Service



See NOAA's  
GeoPlatform

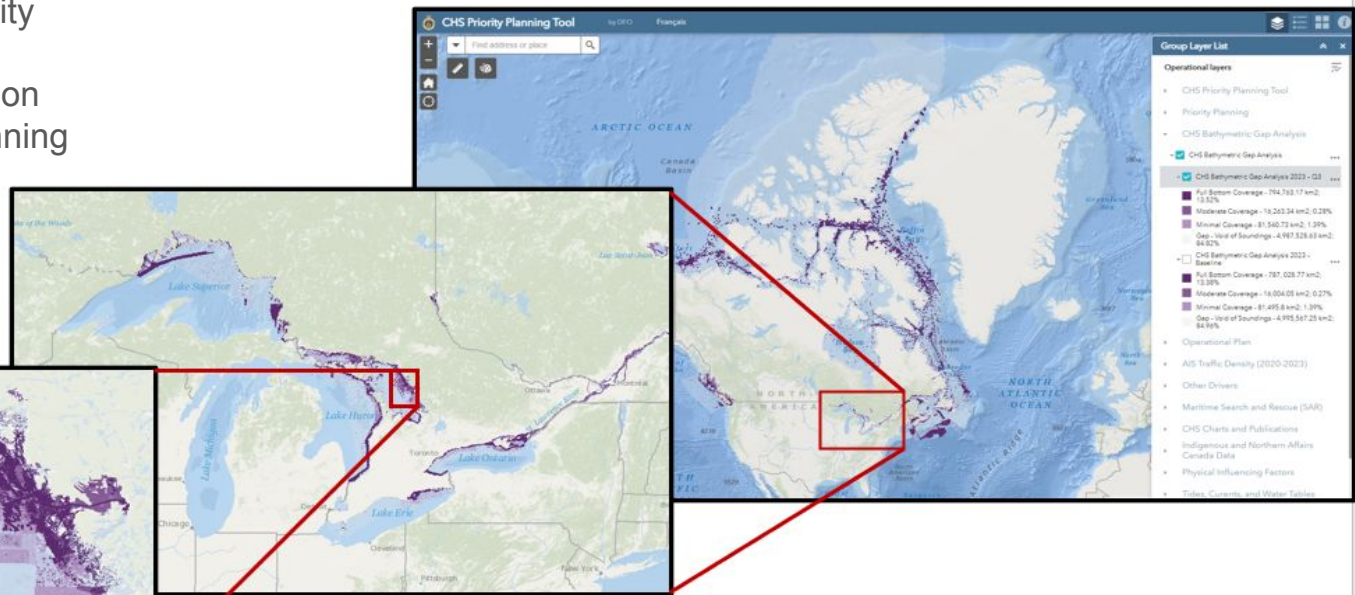
Also, linked from  
<https://iocm.noaa.gov/seabed-2030-bathymetry.html>

	<b>3 or more soundings per ~100 m cell</b>
	<b>1-2 soundings per ~100 m cell</b>
	<b>U.S. EEZ / Maritime Boundaries</b>

# 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



Legend	CHS Bathymetric Gap Analysis 2023 - Baseline
Dark Purple	Full Bottom Coverage - 787,028.77 km <sup>2</sup> ; 13.38%
Medium Purple	Moderate Coverage - 16,004.05 km <sup>2</sup> ; 0.27%
Light Purple	Minimal Coverage - 81,495.8 km <sup>2</sup> ; 1.39%
White	Gap - Void of Soundings - 4,995,567.25 km <sup>2</sup> ; 84.96%

# US Bathymetric Coverage Report Tool

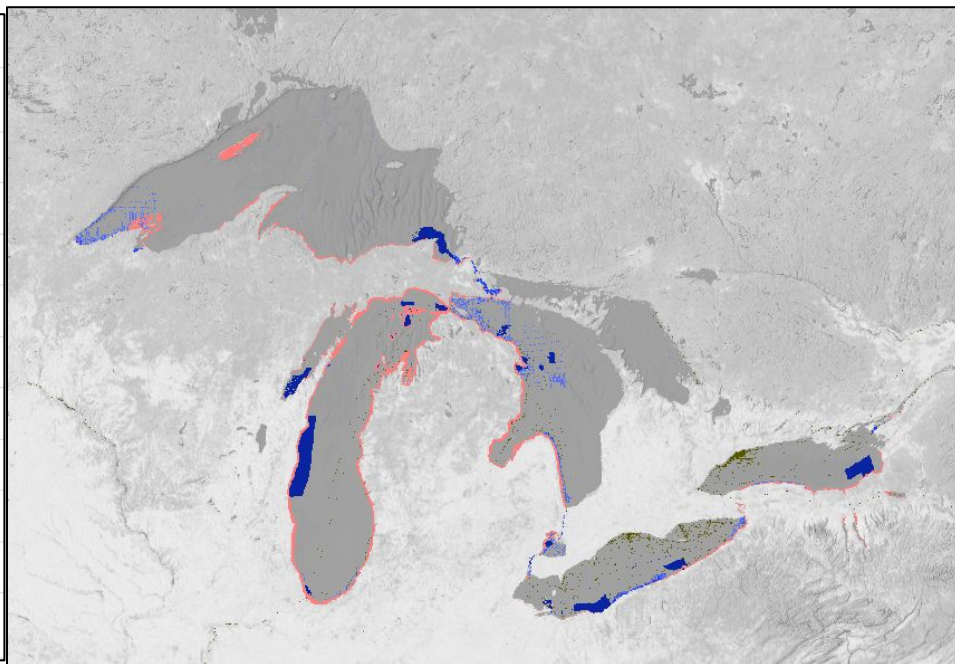
<https://gis.charttools.noaa.gov/bathy-coverage-report/>

## US Bathymetry Layers Supersession Order



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

Layers	
<input type="checkbox"/>	ECS MB
<input type="checkbox"/>	Lidar
<input type="checkbox"/>	NOS Hydro MB
<input type="checkbox"/>	MB (3+)
<input type="checkbox"/>	MB (1-2)
<input type="checkbox"/>	NOS Hydro SB (3+)
<input type="checkbox"/>	NOS Hydro SB (1-2)
<input type="checkbox"/>	SB (3+)
<input type="checkbox"/>	SB (1-2)
<input type="checkbox"/>	CSB (3+)
<input type="checkbox"/>	CSB (1-2)



# US Bathymetric Coverage Report Tool



## Three Steps

1.) Add AOI/Transit

2.) Summarize AOI

3.) Coverage Results

**Add AOI/Transit**

**Upload**  
Choose a .gpx or zipped shapefile of your AOI or transit route and Upload to map.

No file chosen

**Sketch**  
Draw a polygon or polyline feature using the 2 leftmost buttons below. Click once to place a vertex, double-click to complete your sketch. Undo or Redo feature edits using the 2 buttons on the right.

**Summarize AOI**

Select your AOI or Transit layer from the dropdown and then Summarize to clip the Bathy Gap Analysis and compute results.

Sketched AOI

**Coverage Results**

Download zipped GeoTIFFs or Print a formatted report of your results using the buttons above.

Area of interest is 1105.0 sq nautical miles and is 0.5% mapped.

Data Category	Sq. Nautical Miles
ECS MB	0
Lidar	0
NOS Hydro MB	0
MB (3+)	0
MB (1-2)	0
NOS Hydro SB (3+)	0
NOS Hydro SB (1-2)	0
SB (3+)	0
SB (1-2)	2.8
CSB (3+)	2.2
CSB (1-2)	0
Unmapped	1,100

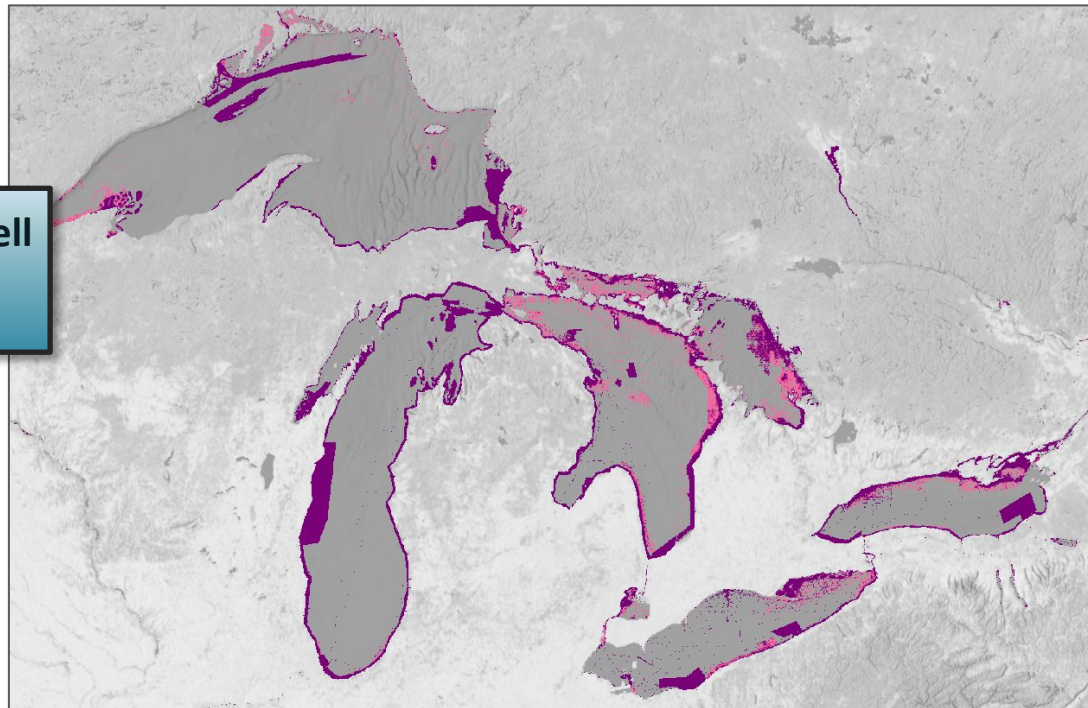
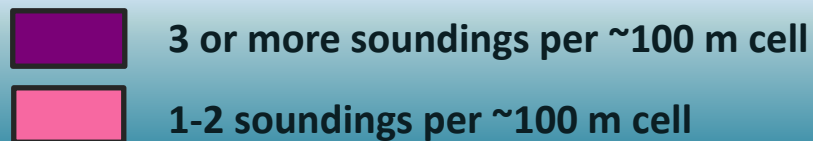
# Mapping CAN and US Bathymetric Coverage Classifications

<b>CAN classifications - covers CAN waters only</b>	<b>US classifications (nearest equivalent) - spans both CAN and US waters</b>
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

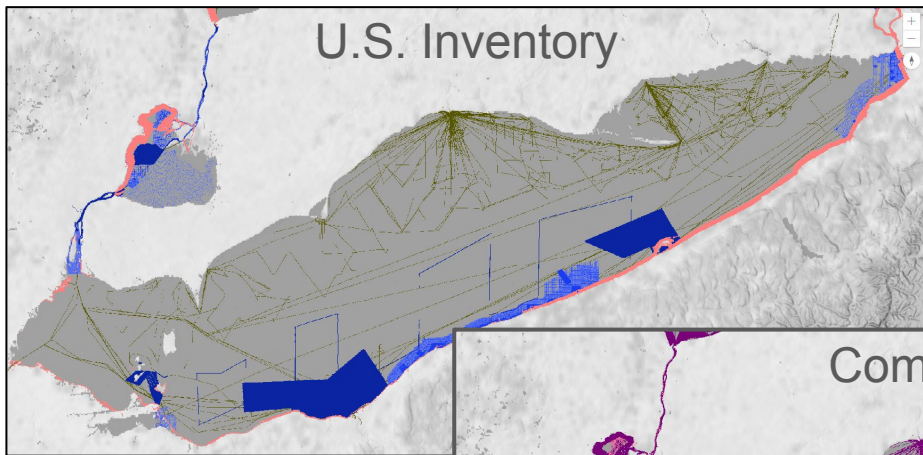
- Reducing both US and Canadian coverage classifications to their lowest common denominator allows for reconciliation



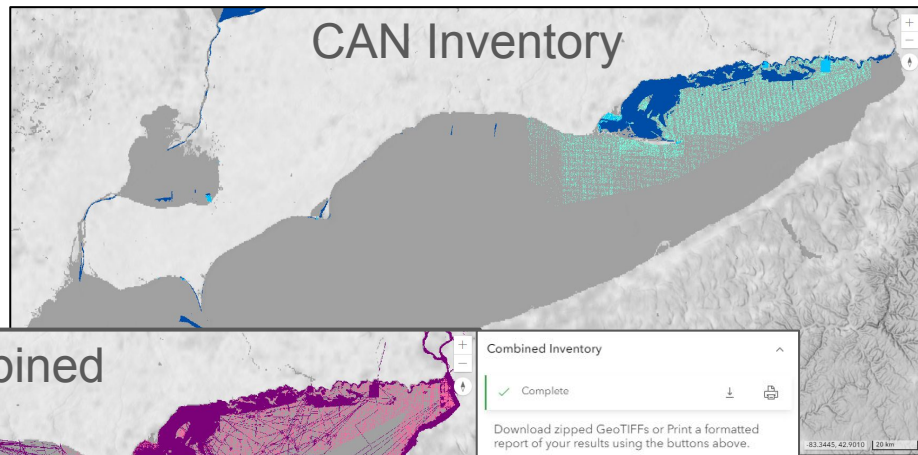
# Test Reporting: Lake Erie



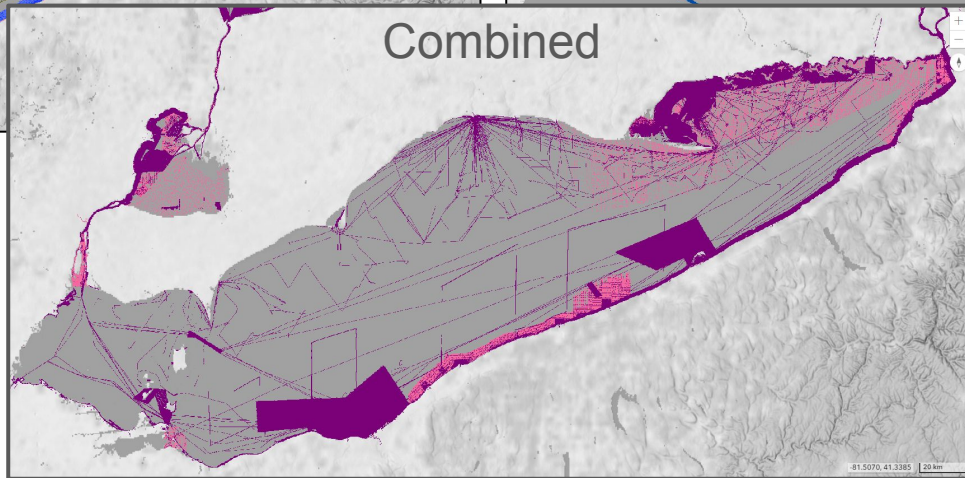
U.S. Inventory



CAN Inventory



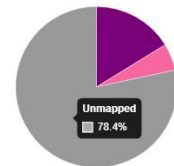
Combined



Combined Inventory

✓ Complete

Download zipped GeoTIFFs or Print a formatted report of your results using the buttons above.



Area of interest is 7400.0 sq nautical miles and is 21.6% mapped.

Data Category	Sq. Nautical Miles
Full Coverage (3+)	1,200
Minimal Coverage (1-2)	400
Unmapped	5,800

# 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

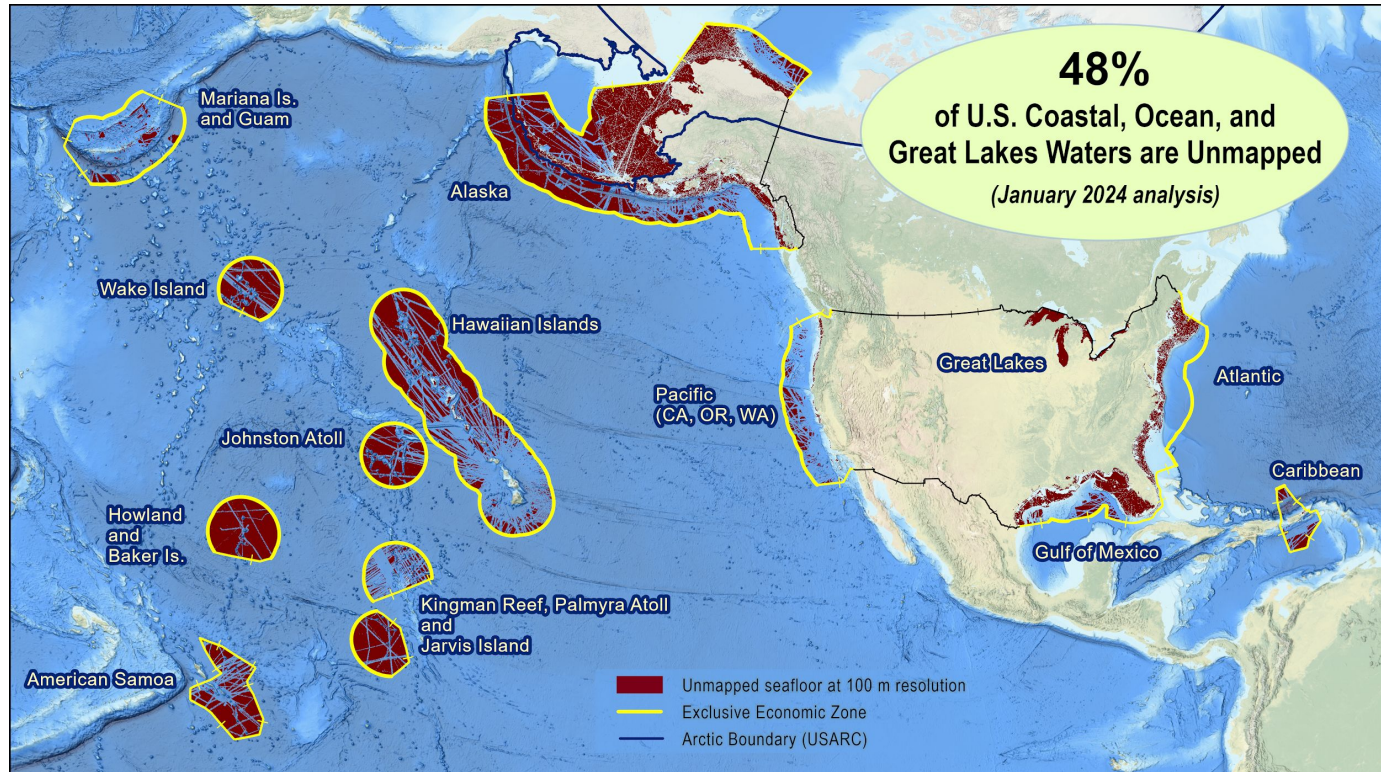
# Progress Report on Unmapped U.S. Waters

## Recently Published!

5th annual report covering progress up to December 2023

Last year, we were at 50% unmapped.

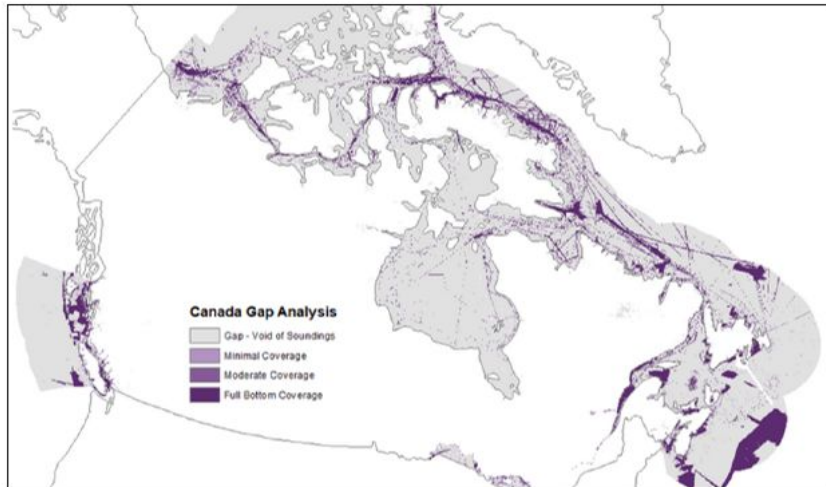
Reports located at <https://iocm.noaa.gov/seabed-2030-status.html>



# Progress Report on Gaps in Canadian Waters

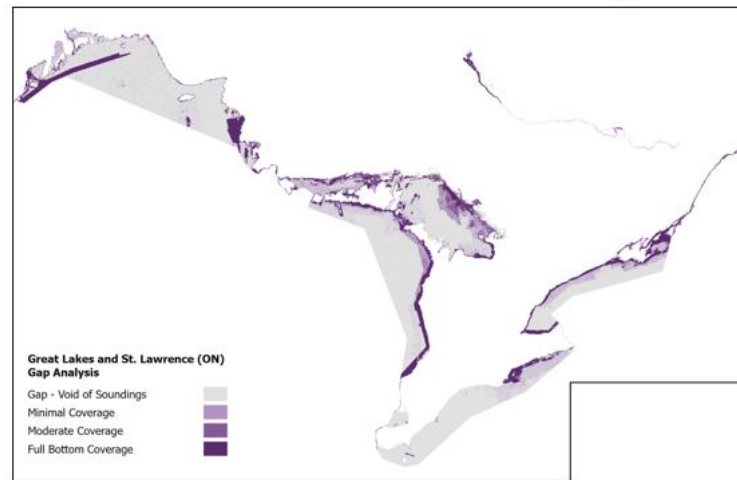
## Great Lakes (Canadian Waters Only)

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

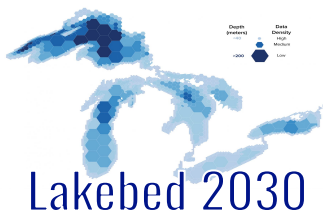


**Published January 2024**

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



# Progress Report on Unmapped U.S. Waters



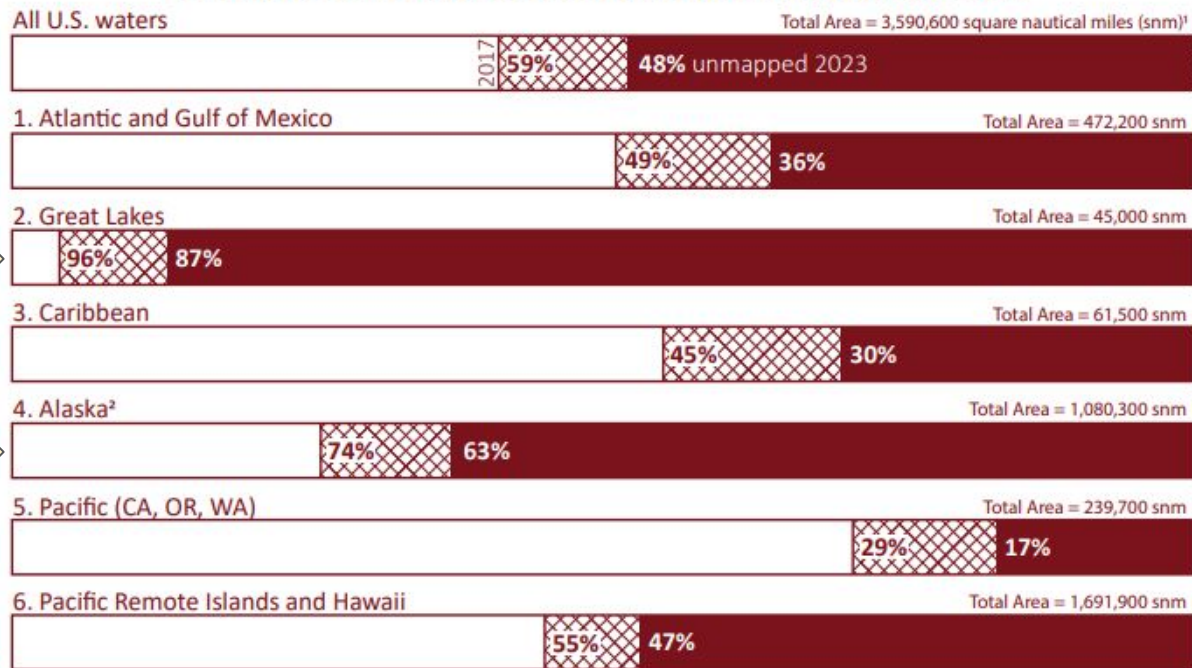
Great Lakes jumped from 92% to 87% unmapped

*\*Both campaigns are UN Decade Actions in support of Seabed 2030\**



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

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



<sup>1</sup> Total does not include the U.S. Extended Continental Shelf declared in [88 FR 88470](#).

<sup>2</sup> 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

