Nippon Foundation – GEBCO – Seabed 2030

Second Arctic, Antarctic & North Pacific Mapping Meeting

November 9-10 New Hampshire

THE NIPPON FOUNDATION

General Bathymetric Chart of the Oceans

GEBCO

United Nations Educational, Scientific and Cultural Organization

Intergovernmental Oceanographic Commission

Stockholm University

CCOM JHC

University of New Hampshire

AWI

Second, Antarctic & North Pacific Mapping Meeting, Nov 9-10, New Hampshire

IBCAO 4.0

Presented by:
Martin Jakobsson on behalf of Larry Mayer, Caroline Bringensparr, Carlos Castro, Rezwan Mohammad, Paul Johnsson and Tomer Ketter,

United Nations Educational, Scientific and Cultural Organization

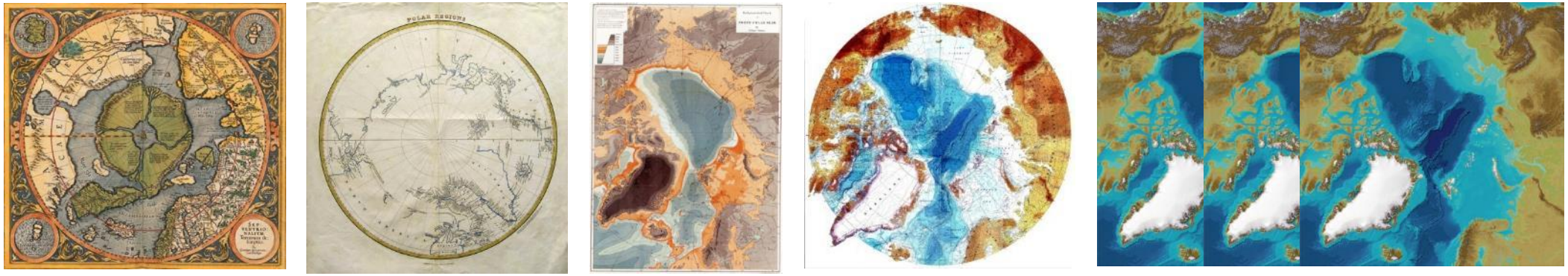
Intergovernmental Oceanographic Commission

Second, Antarctic & North Pacific Mapping Meeting, Nov 9-10, New Hampshire

International Bathymetric Chart of the Arctic Ocean (IBCAO):

Initiated 1997 as an IOC International Bathymetric Chart (IBC)

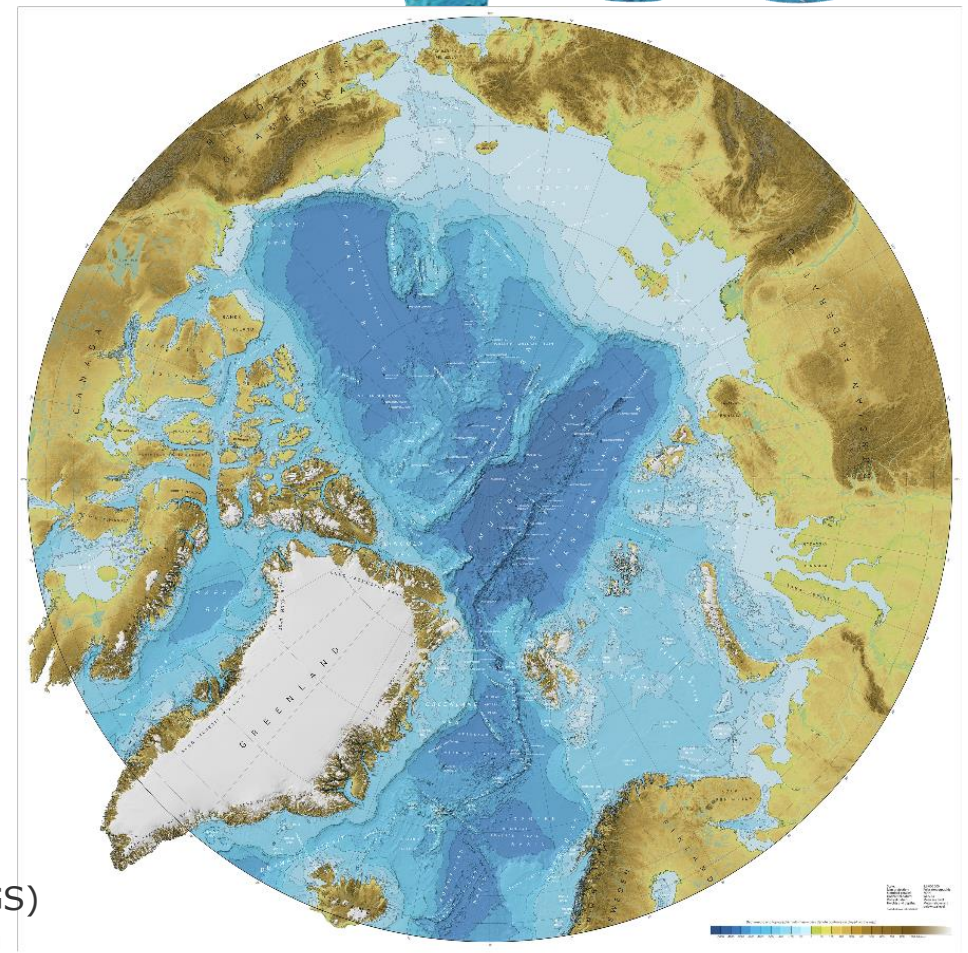
Became part of GEBCO as a Regional Compilation

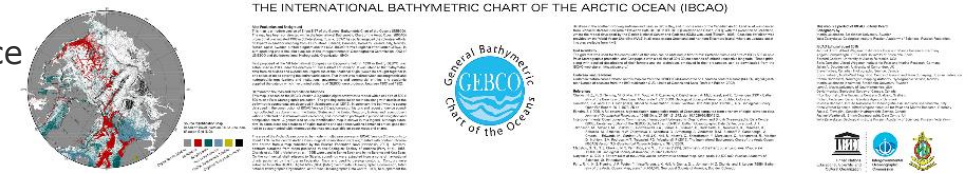


1500 1800 1900 2000 2008 2012

First Arctic, Antarctic & North Pacific Mapping Meeting, October 8-10, Stockholm

Current grid: Version 3.0, released Spring 2012
Resolution: 500 x 500 m, Polar Stereographic Projection
Release article: GRL, 2012 (689 citations, Nov 9, 2019)
Mapping Statistics: 11 % mapped with multibeam at the 500 x 500 m resolution, **6.6 % at Seabed 2030 resolutions**
Current map: Based on version 3.0, completed 2015





Editorial Board Version 3.0
Bernard Coakely (USA) University of Alaska Fairbanks
Julian A. Dowdeswell (UK) Scot Polar Research Institute, University of Cambridge
Steve Forbes (Canada) Canadian Hydrographic Service
Boris Fridman (Russian Federation) Moscow Aerogeodetic Company
Hanne Hodnesdal (Norway) Norwegian Mapping Authority, Hydrographic Service
[Chairman] Martin Jakobsson (Sweden) Stockholm University
Larry Mayer (USA) Center for Coastal and Ocean Mapping/Joint Hydrographic Center, University of New Hampshire
Riko Noormets (Norway/Svalbard) UNIS, University Center of Svalbard
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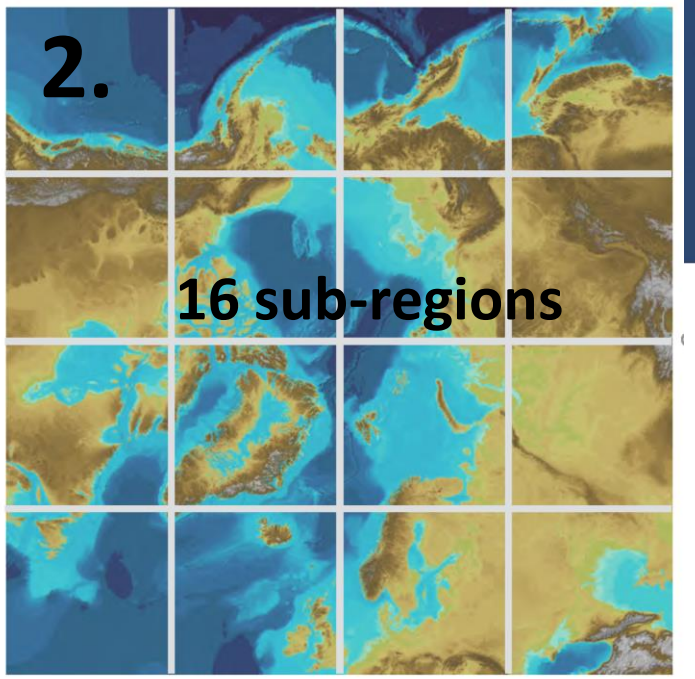
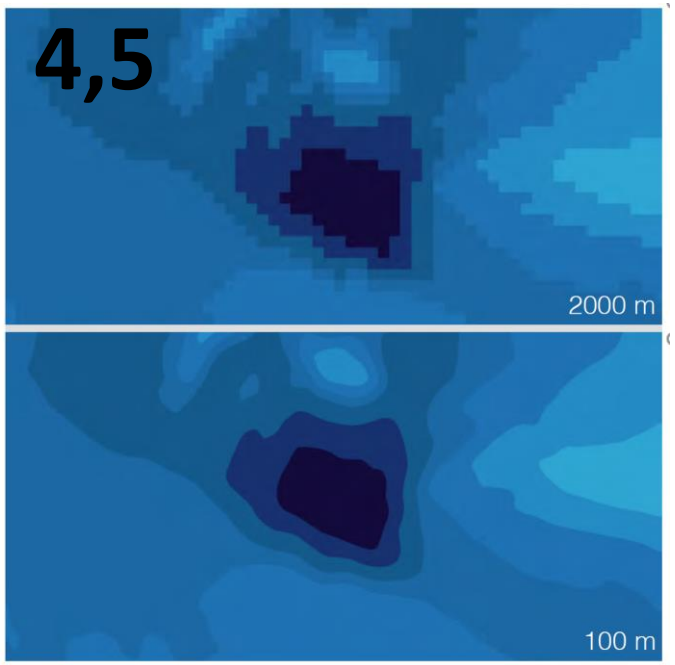
Michele Rebesco (Italy) Istituto Nazionale di Oceanografia e di Geofisica Sperimentale (OGS)
Hans-Werner Schenke (Germany) Alfred Wegener Institute for Polar and Marine Research (AWI)
Yulia Zarayskaya (Russian Federation) Geological Institute of Russian Academy of Science

Gridding

1. Process and format all data into XYZ on Polar Stereographic projection, MSL
2. Tile the domain into 16 sub-regions
3. Run block median filter (100 x 100 m cells)
4. Grid at 2000 x 2000 m resolution using GMT surface spline in tension
5. Resample to 100 x 100 m resolution
6. Add high-resolution data using Remove-Restore algorithm
    1. Block median at native resolution
    2. Resample at 100 x 100 m resolution
    3. Density filter
    4. Calculated the vertical difference between the 100 x 100 m resolution and 2000 x 2000 m grids
    5. **Grid the differences** at 100 x 100 m data with GMT surface spline in tension
    6. Add the gridded differences to the over sampled low resolution grid
7. Resample 100 x 100 m to 200 x 200 m





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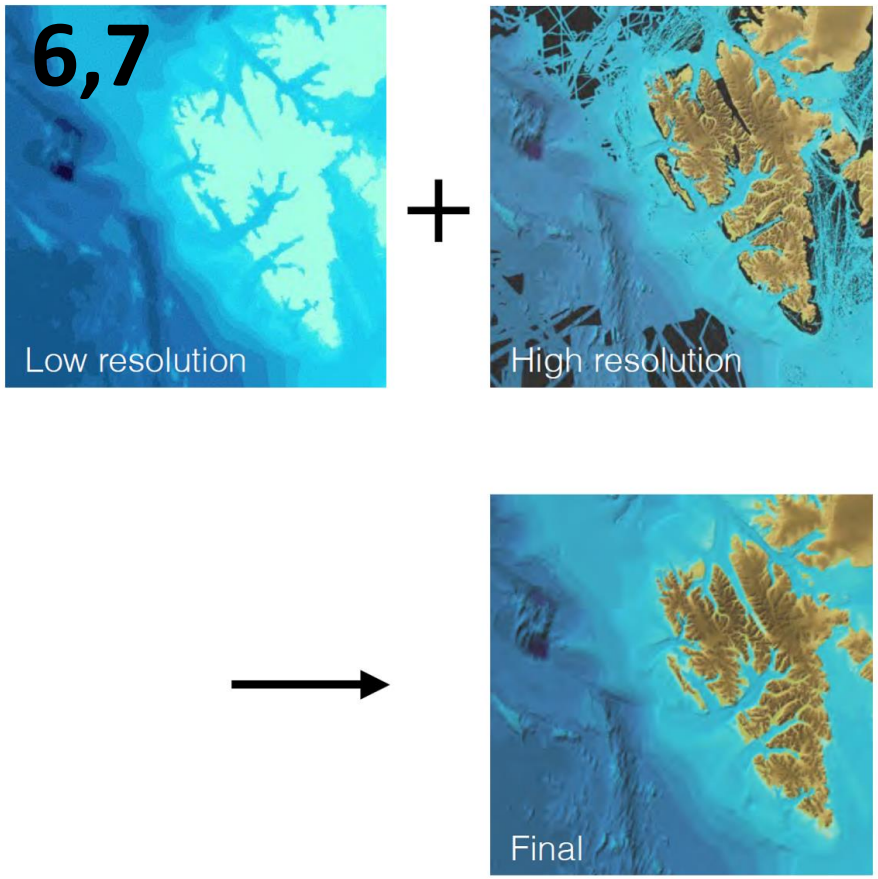


Q&A tool to analyze gridding results and report errors

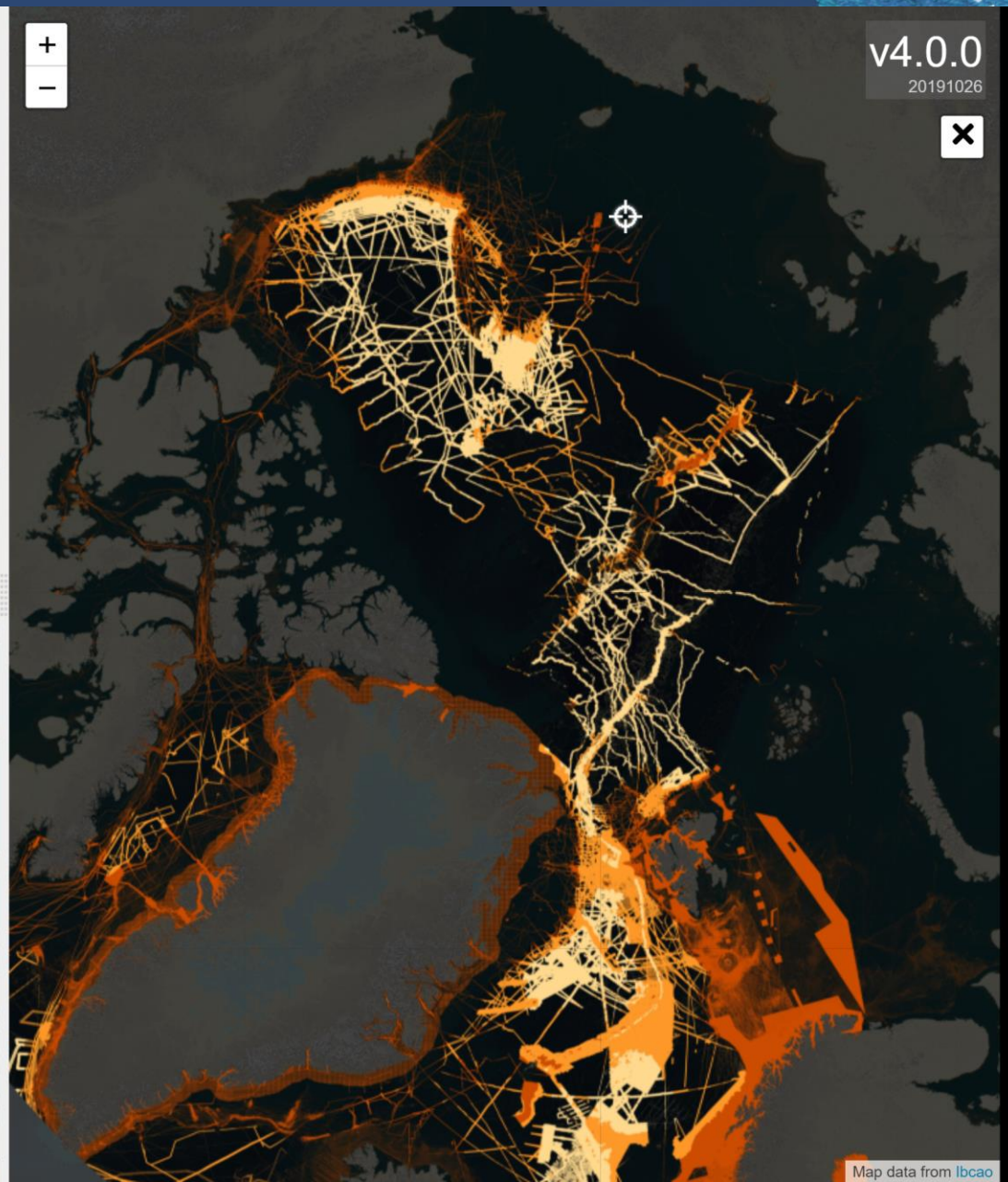
Developed by Rezwann Mohammand, Seabed 2030 Regional Centre, Stockholm University

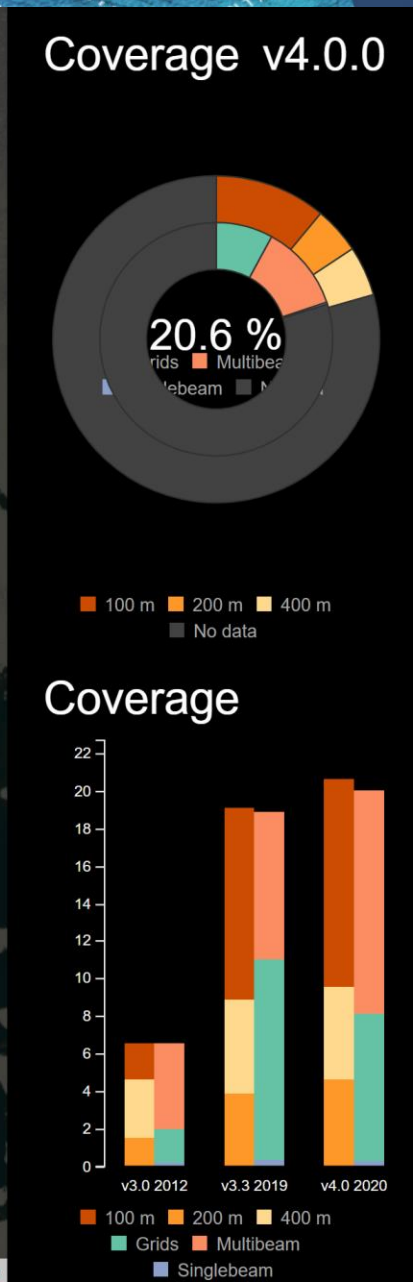
Functionality:

1. View and compare gridding results
2. Show data coverage
3. Report errors

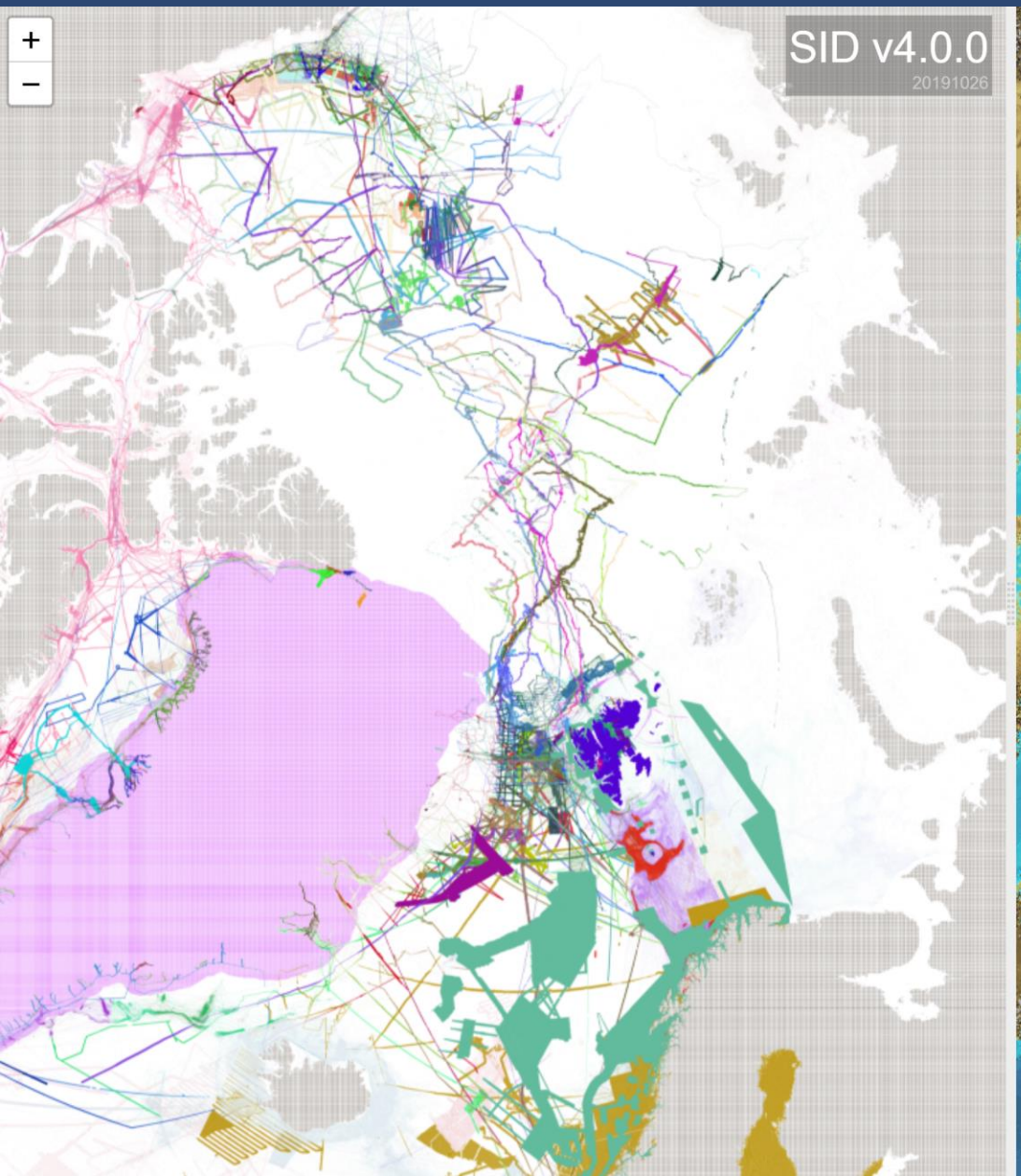
It is a tool developed to be used in the process of compiling new grids

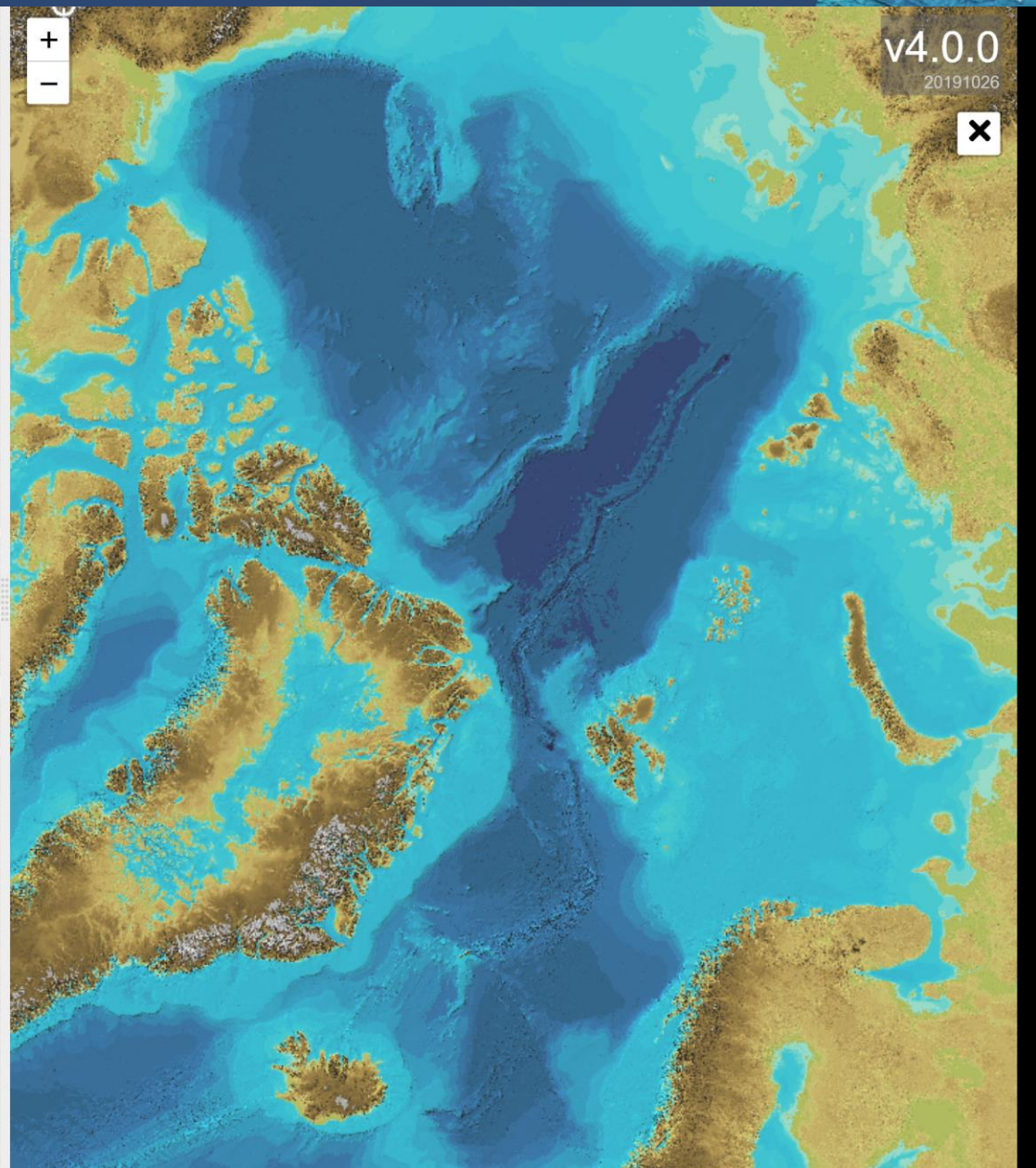
IBCAO Version 3.0 IBCAO Version 4.0





Source information





IBCAO devtool

Layers

- v3.0
- v3.2
- v3.3.0
- v3.3.1
- v3.3.2
- v3.3.3
- Geographic projection
- SID v4.0.0
- SID RR v4.0.0
- Variable resolution v4.0.0
- Difference v4.0.0
- Inversed gravity
- Number of datasets

v3.3.3

- L1 scale v3.3.3

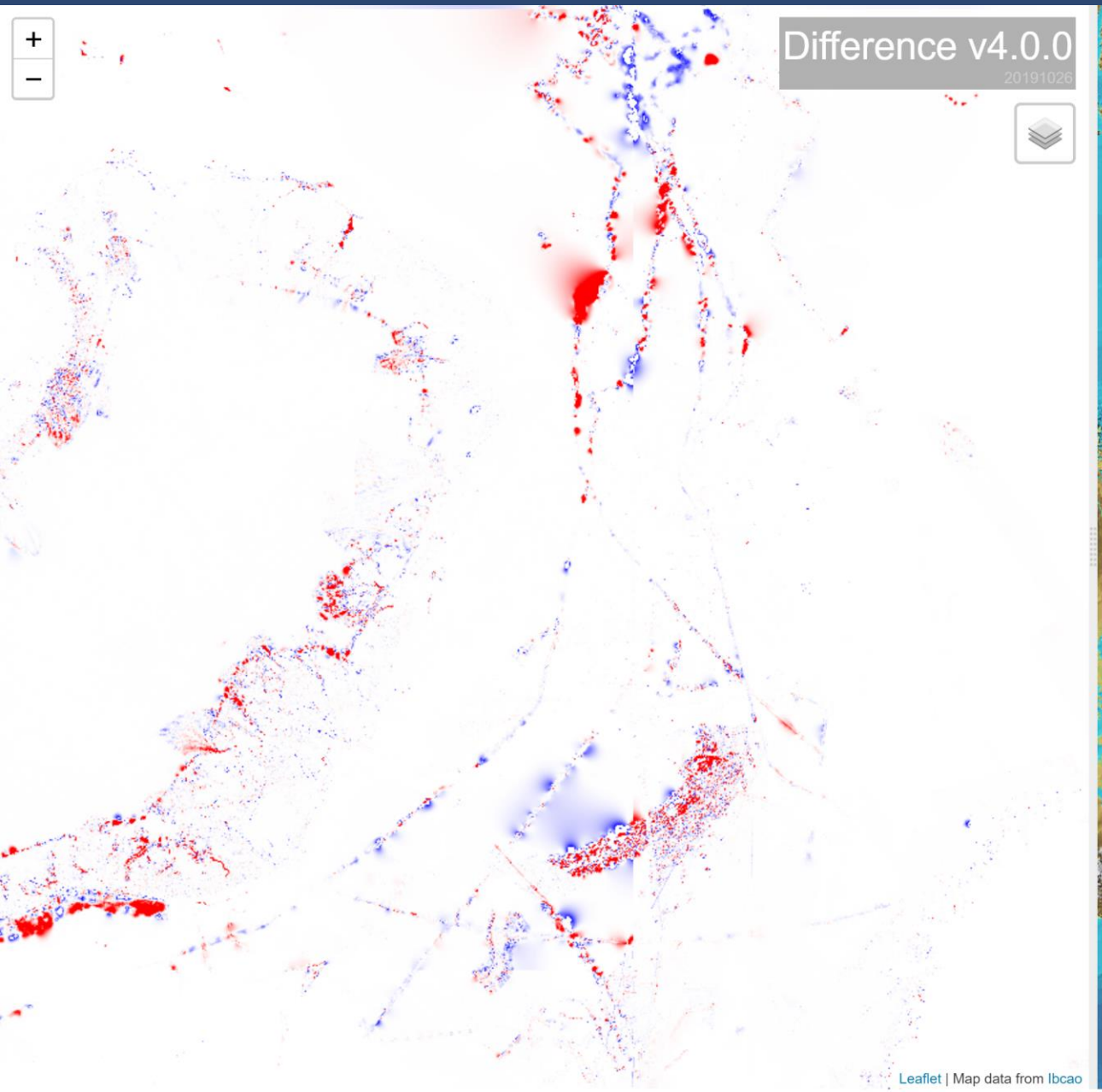
- Satellite imagery NASA
- Coast lines GSHHG
- Sub-regions
- Seabed 2030 regions

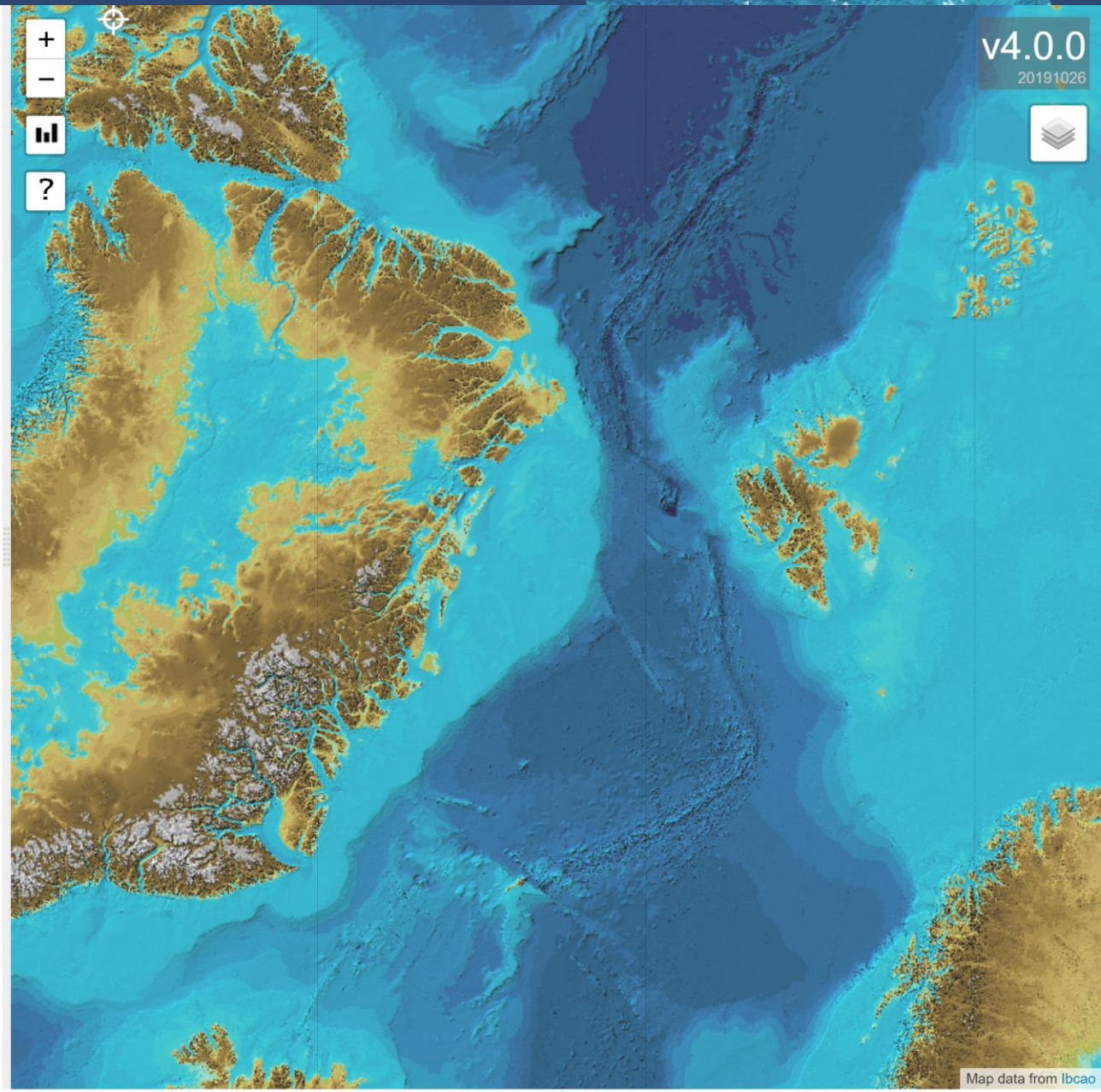
Datasets

Stats

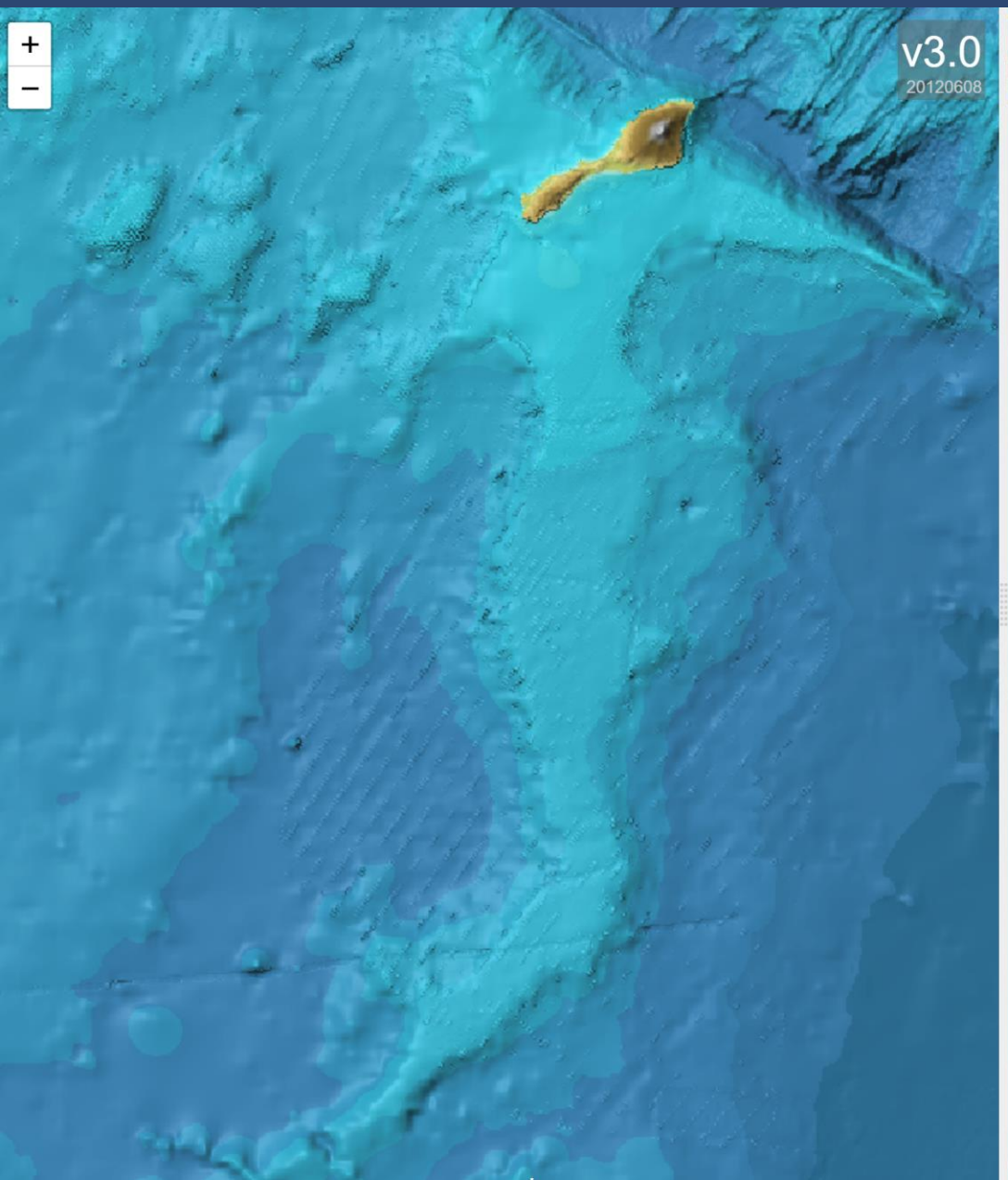
Issues

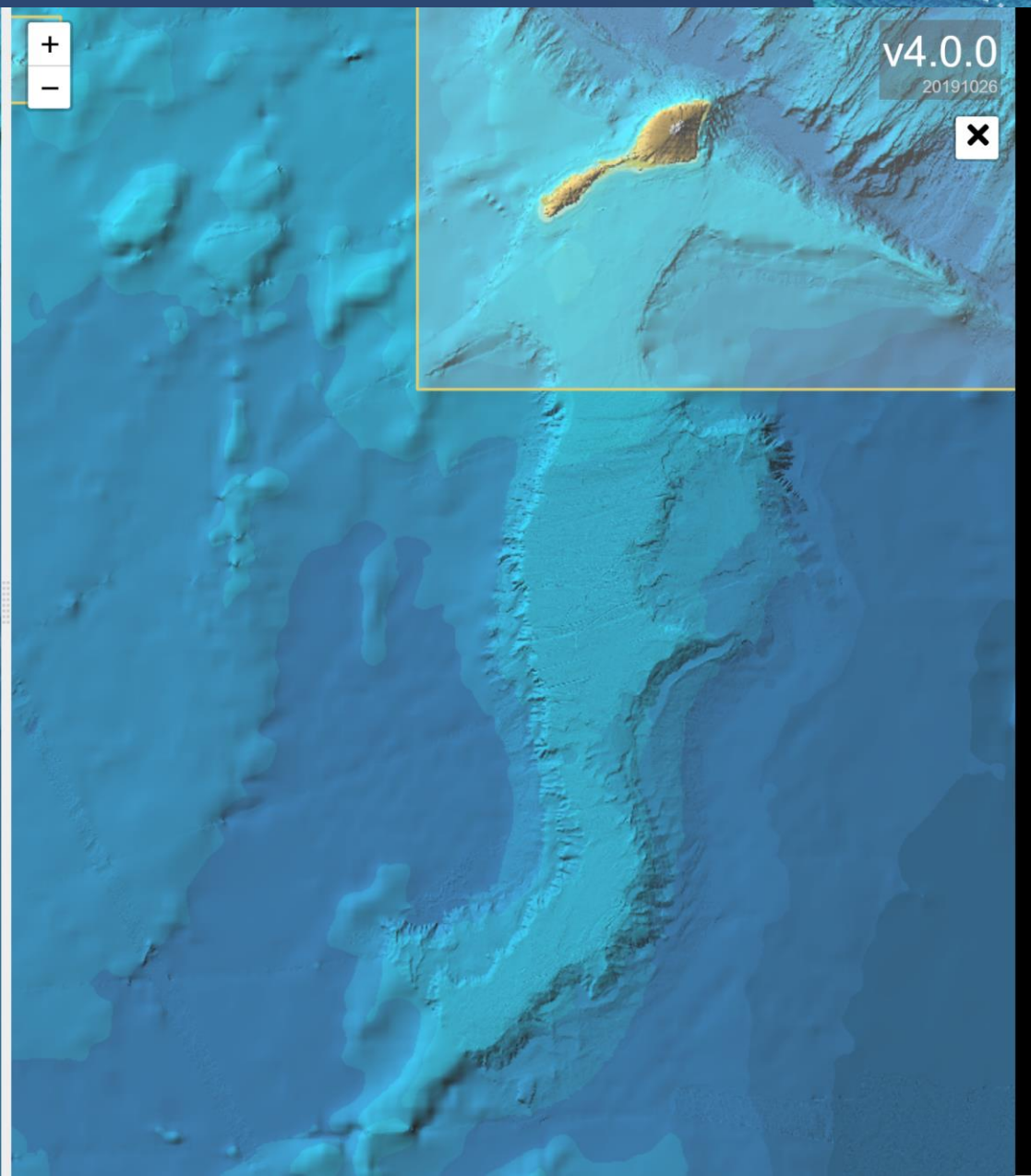
Comparison


Difference v4.0.0
20191026
Leaflet | Map data from Ibcao


v4.0.0
20191026
Map data from Ibcao

Annotation tools



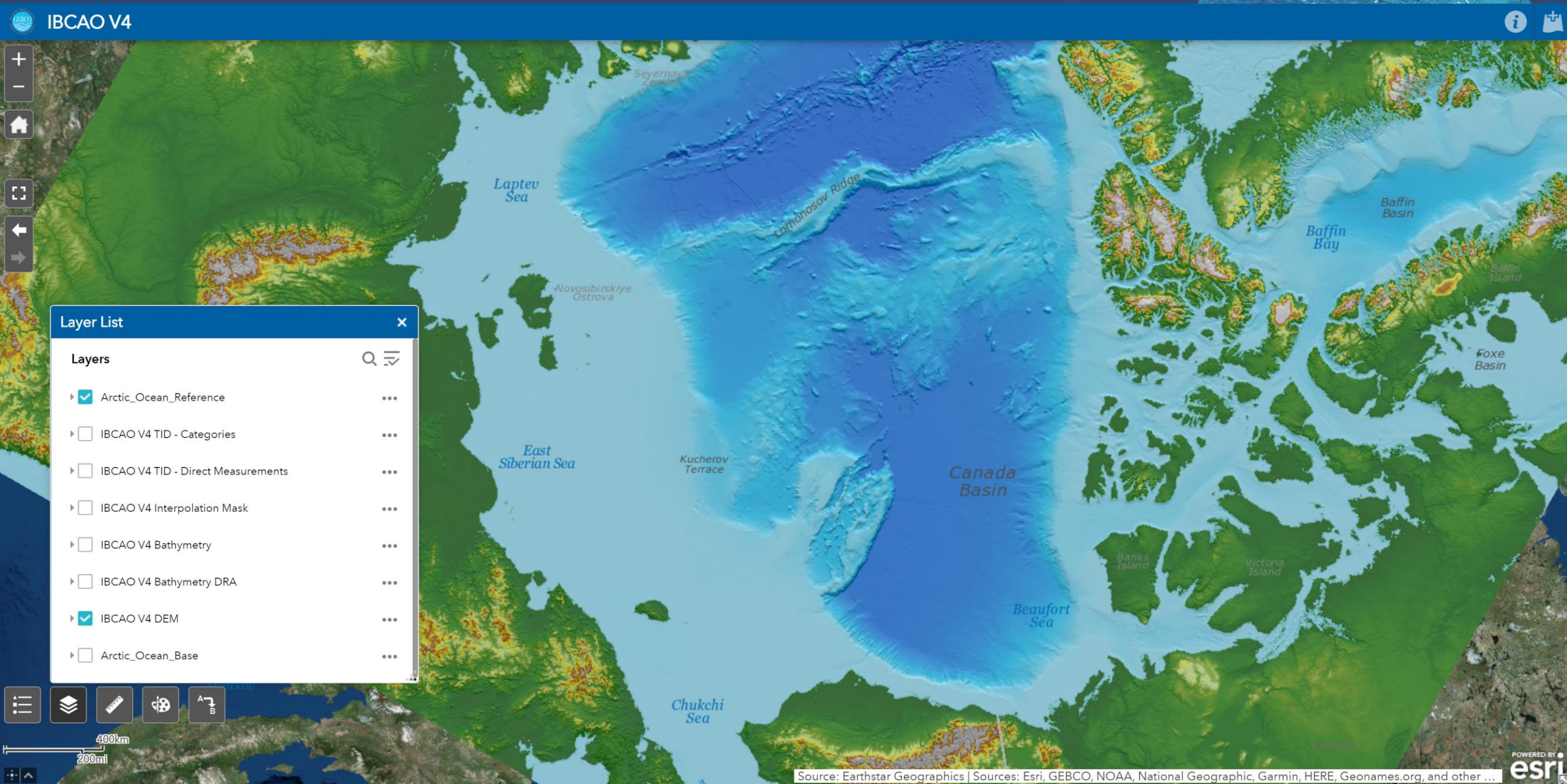


Issues

Add issue

1. Canadian Island missing #272
2. Bedmachine problem? #271
3. Igloolik Island missing #270
4. Spicer Islands missing #269
5. Russian Island missing #268
6. Islands missings #267
7. Islands missing in Sherard Osborn Fjord #266
8. Bad track ark14 #252
9. Land leakage #248
10. Interference #229
11. Contours to be fixed #210
12. Big hole 2, Nansen #207
13. Missing land #197
14. Bad track #161
15. Land problem? #139
16. CHS edge effect #129
17. CHS edge effect #125
18. Interference, new data? #120
19. Interference #112
20. Outliers? + Interference #97
21. Land data error #39
22. Gammal kustlinje i BM? #22
23. Topography problem #209
24. Bad track #141
25. Land leakage. #257
26. Land leakage/missing land #256
27. More missing land #254

IBCAO in online GIS, developed by Paul Johnson



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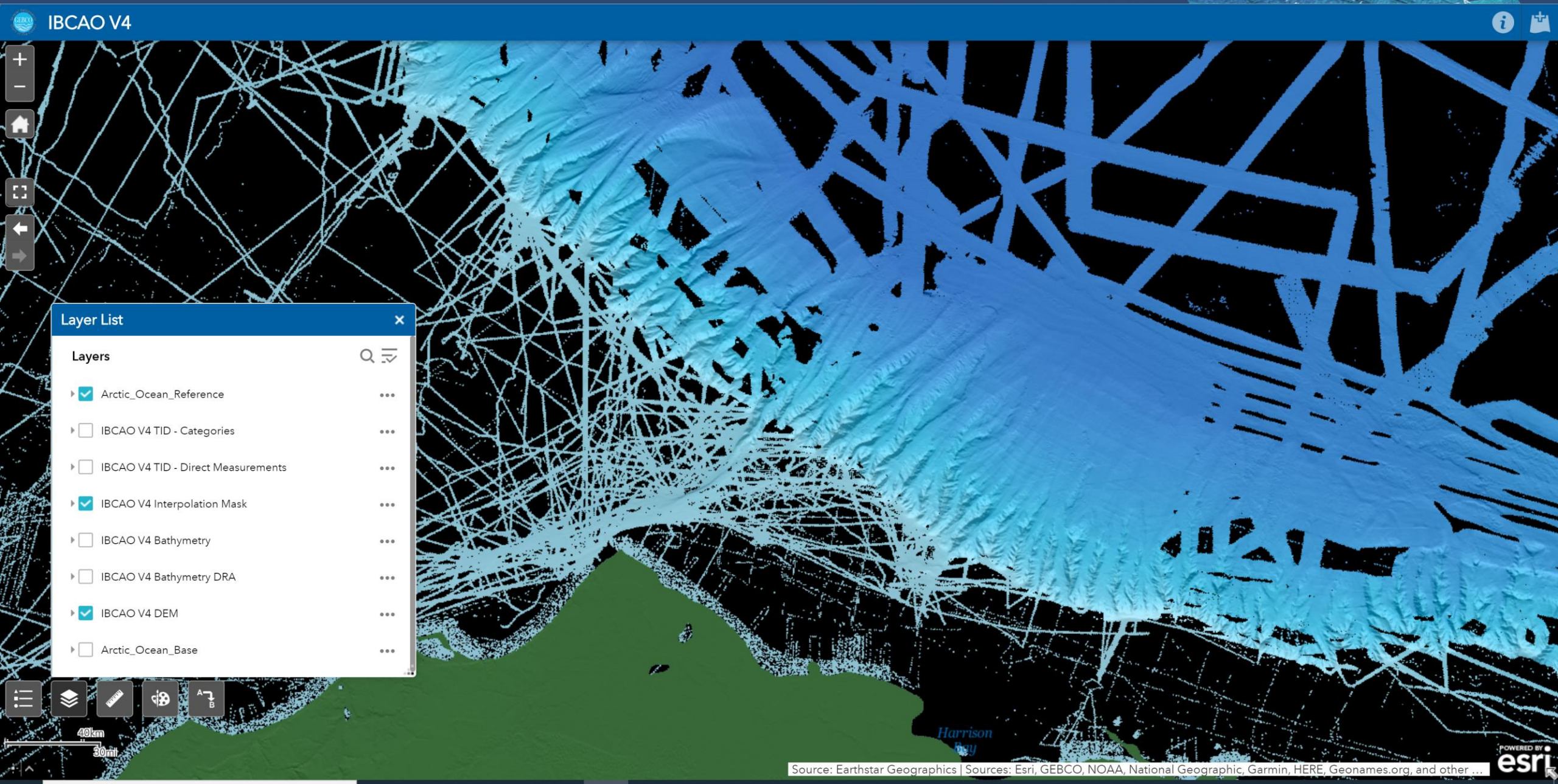
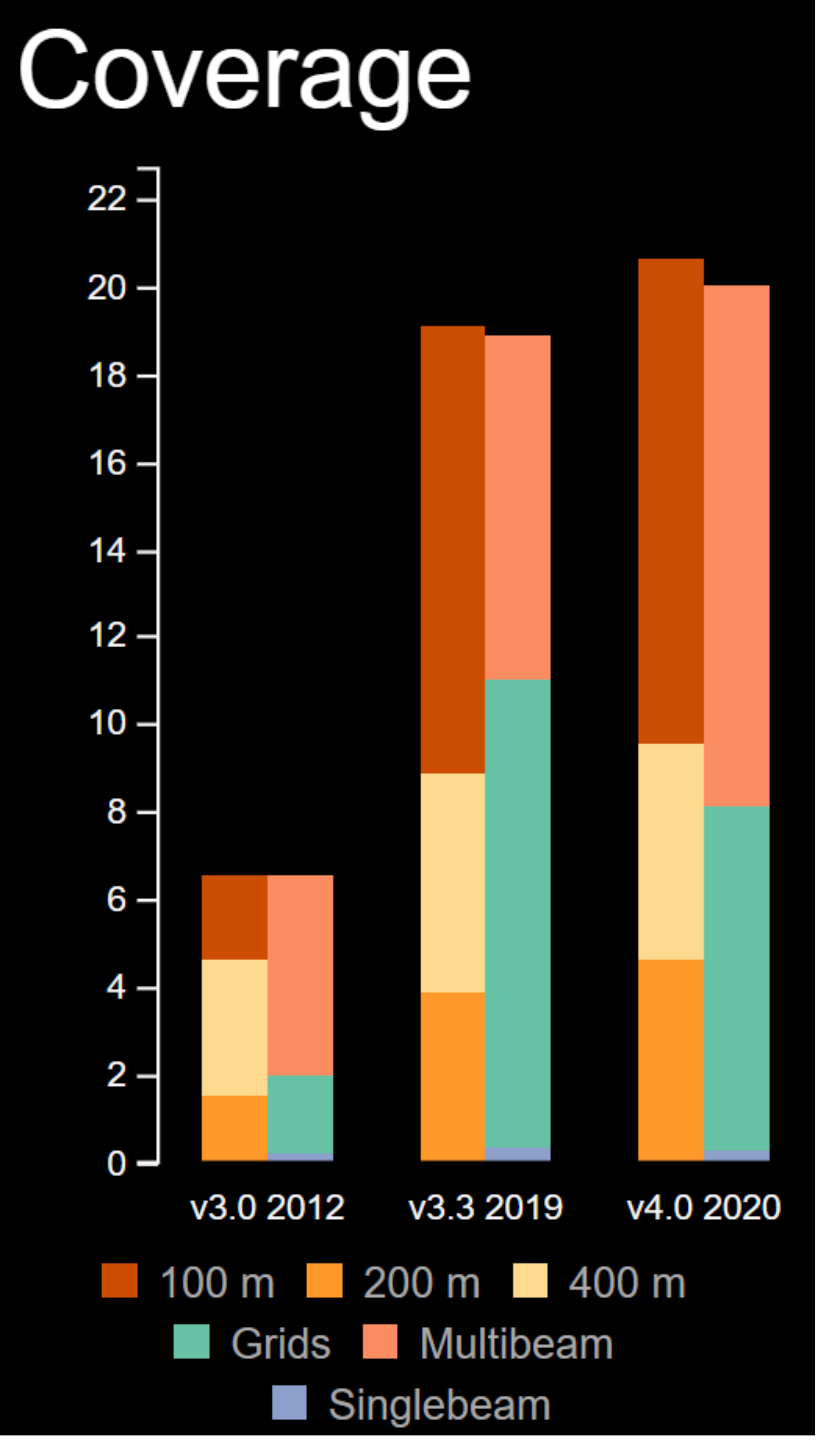


Coverage


22
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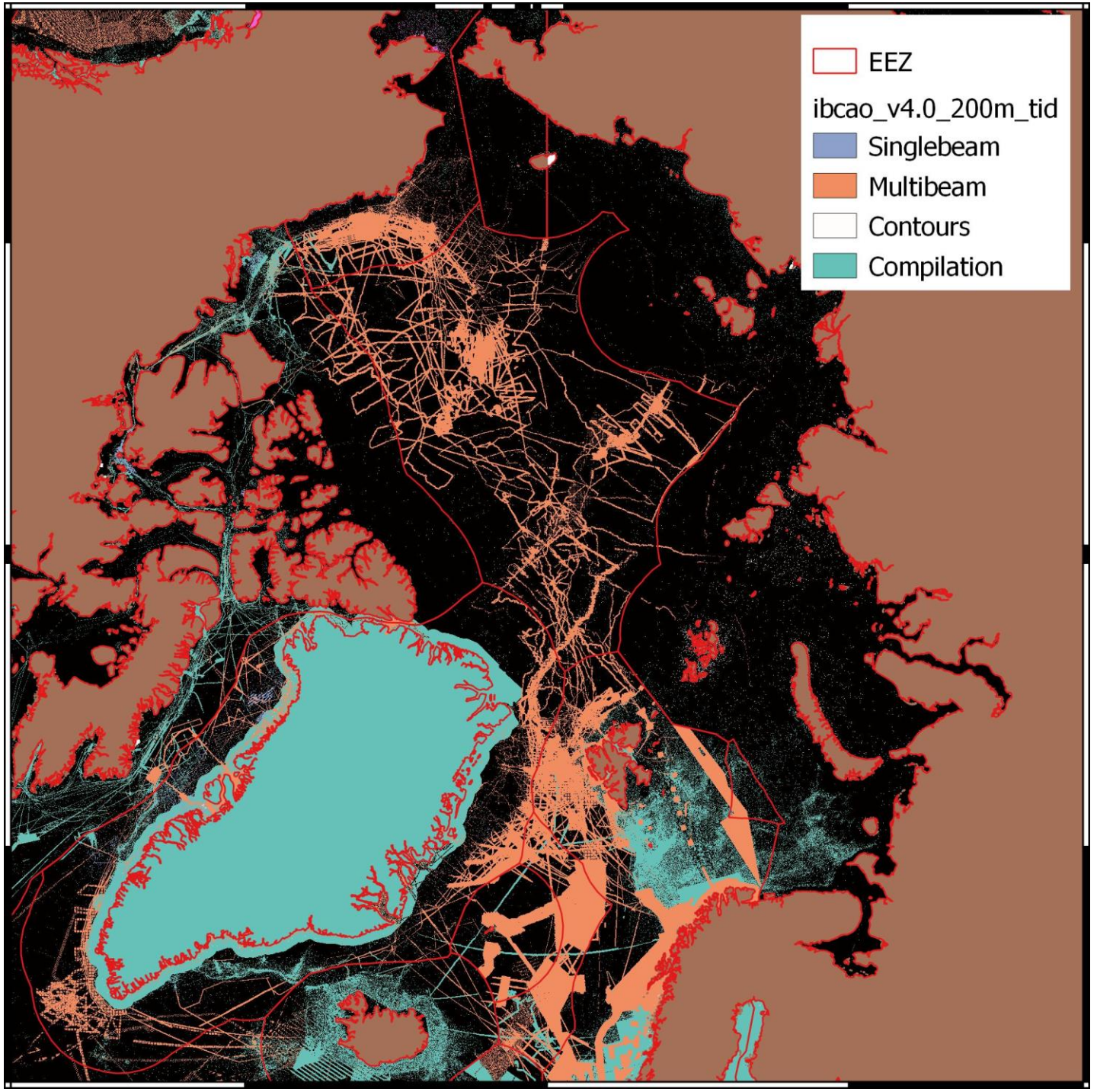
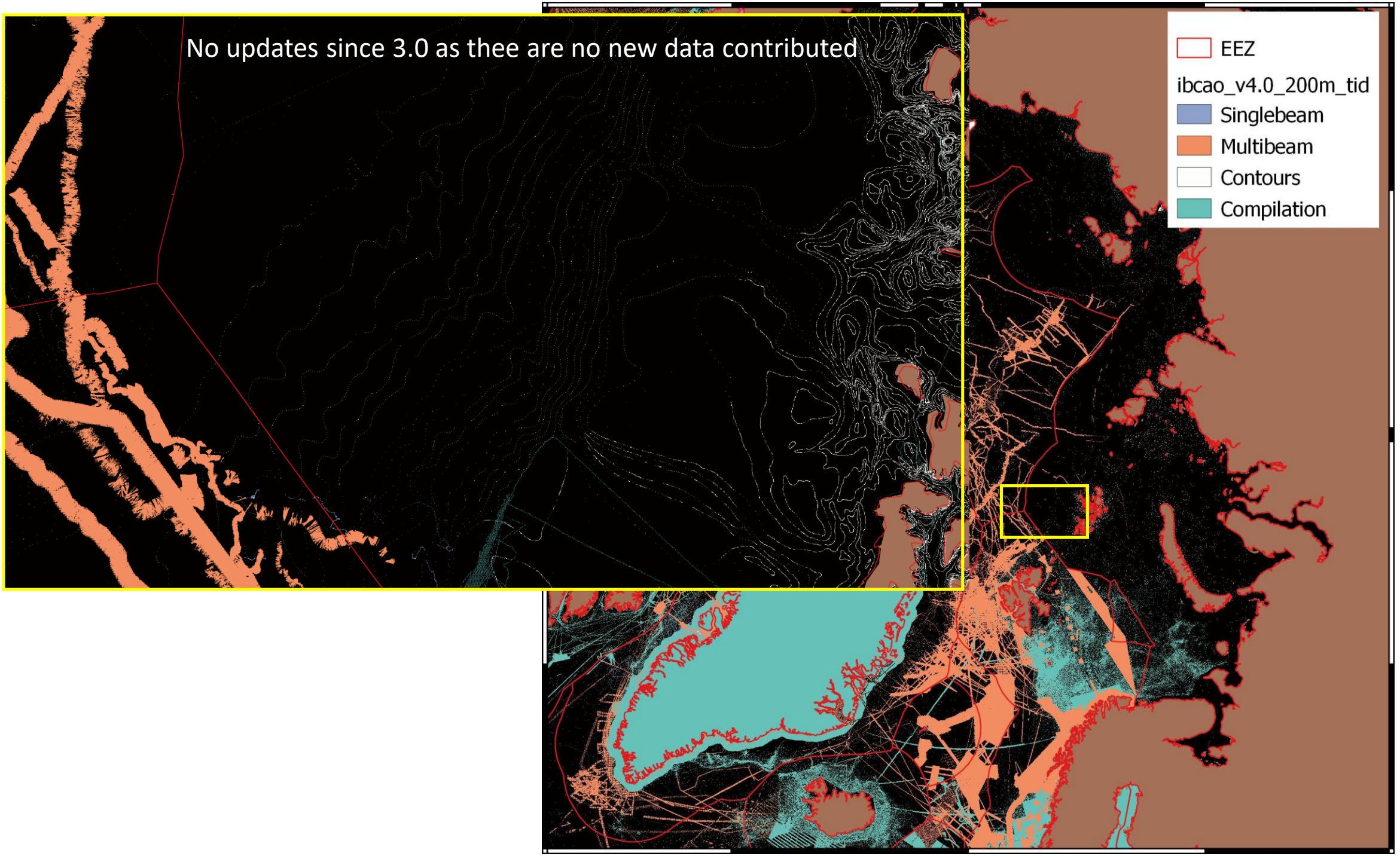
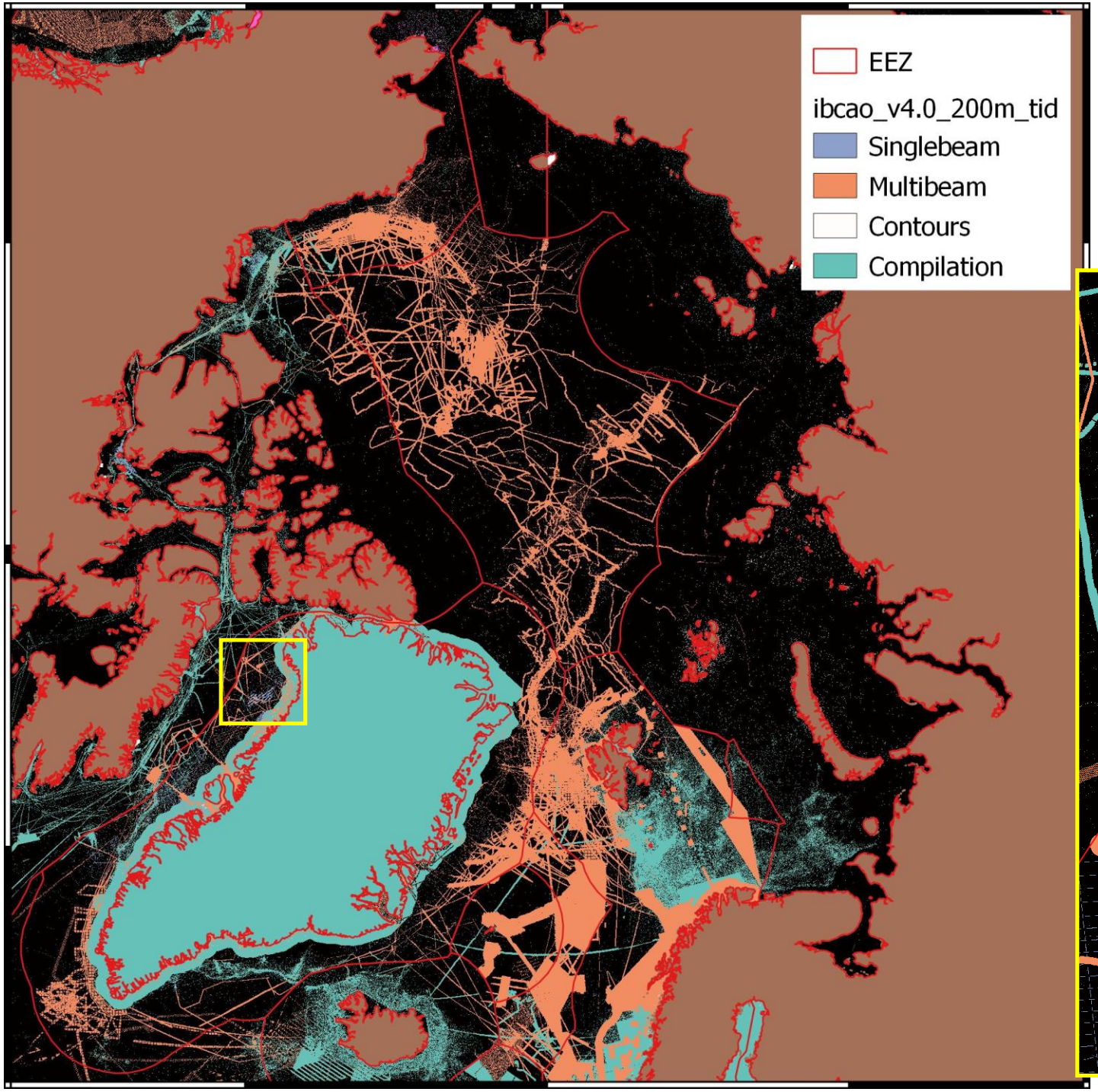
v3.0 2012
v3.3 2019
v4.0 2020
100 m
200 m
400 m
Grids
Multibeam
Singlebeam


EEZ
ibcao_v4.0_200m_tid
Singlebeam
Multibeam
Contours
Compilation


No updates since 3.0 as thee are no new data contributed
EEZ
ibcao_v4.0_200m_tid
Singlebeam
Multibeam
Contours
Compilation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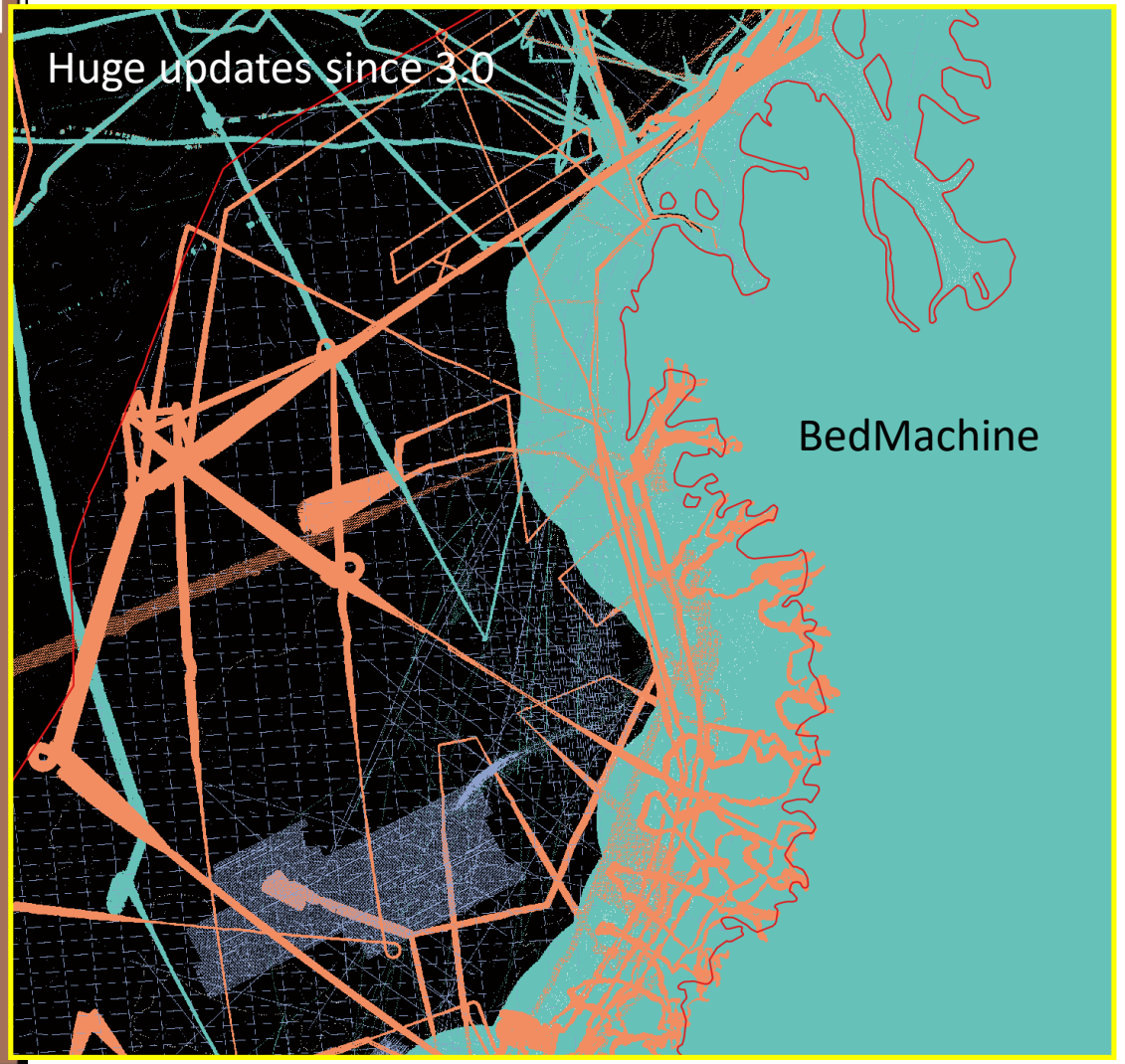
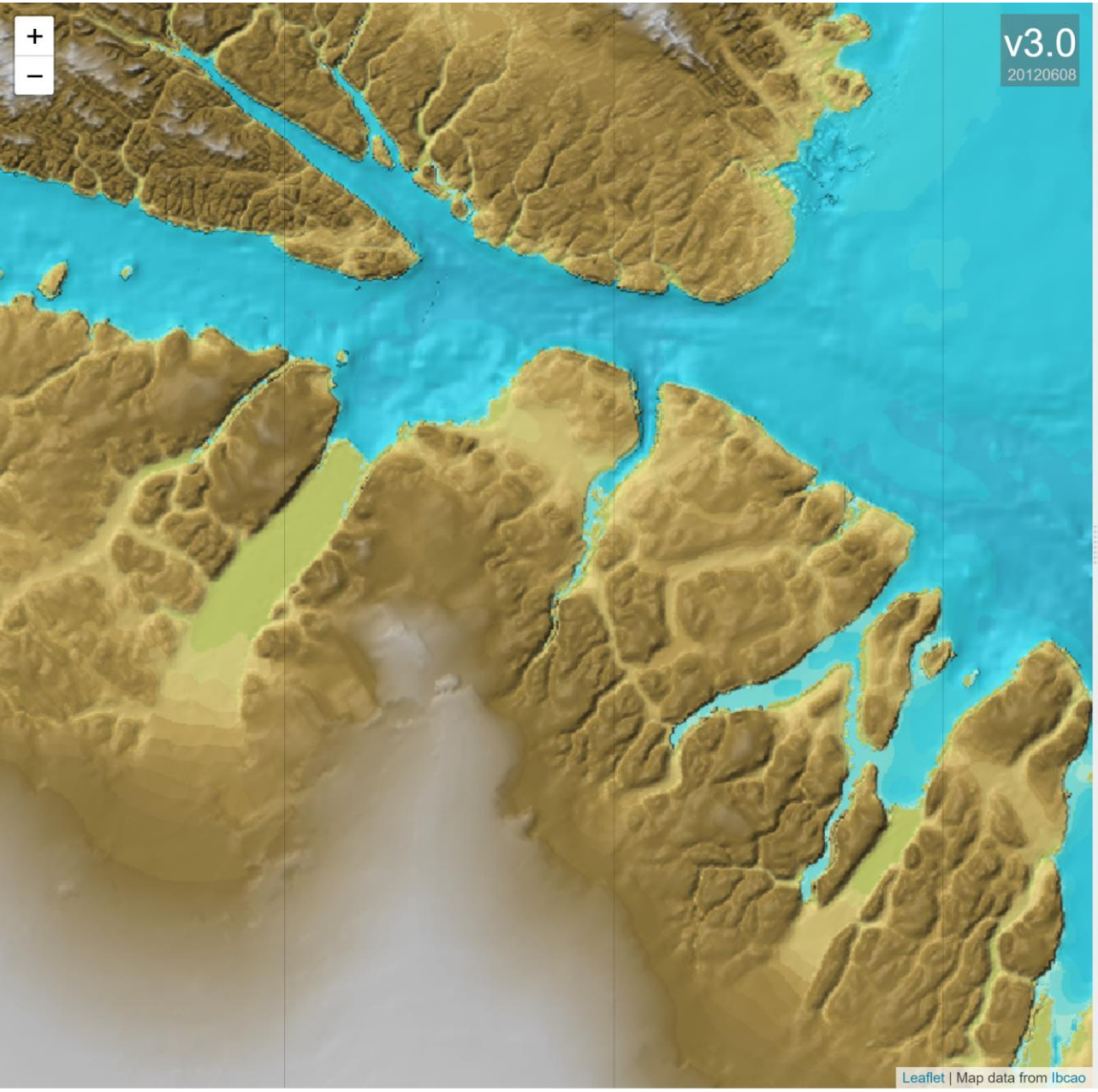
Singlebeam
Multibeam
Contours
Compilation


Huge updates since 3.0
BedMachine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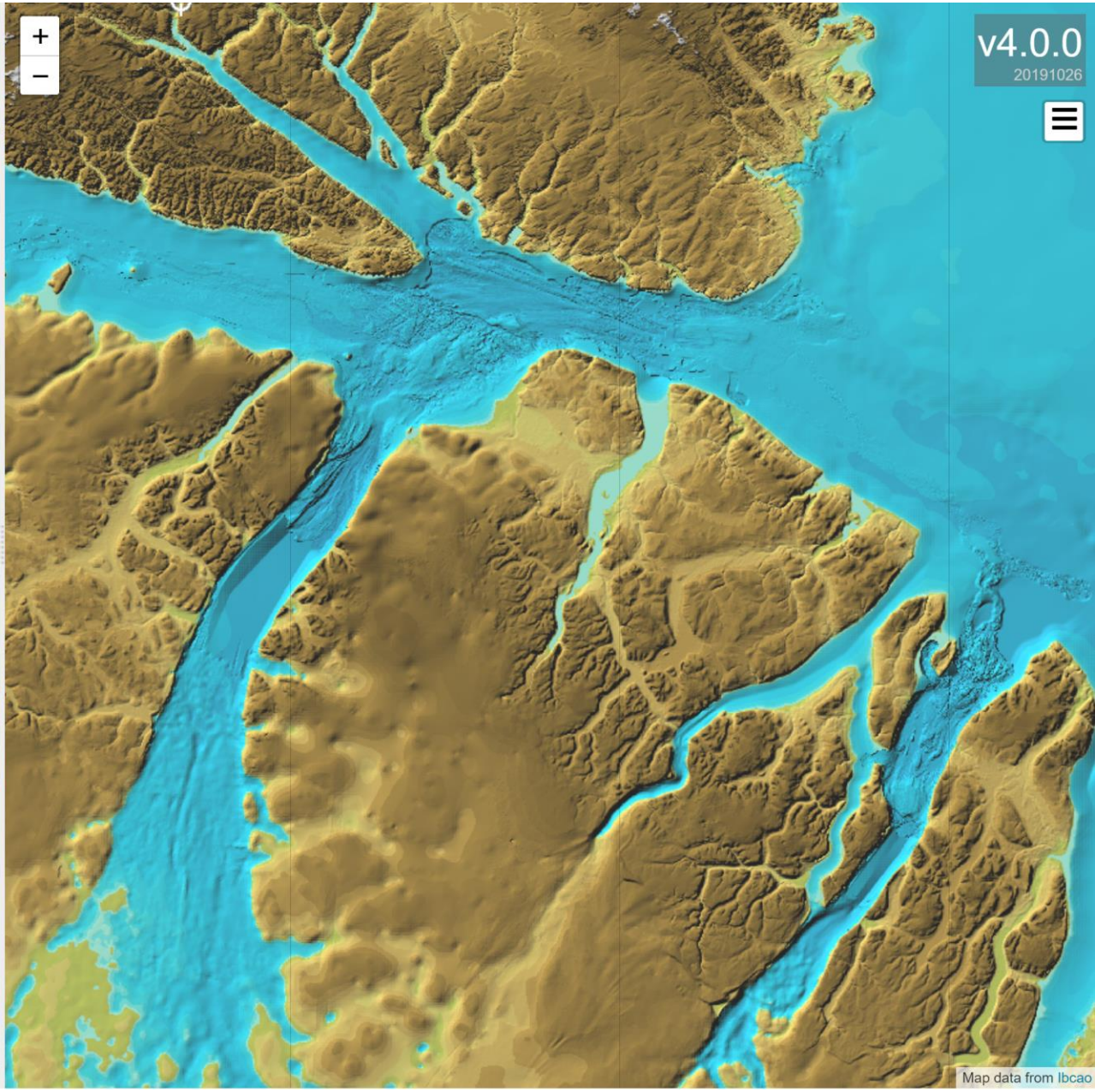
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v4.0.0
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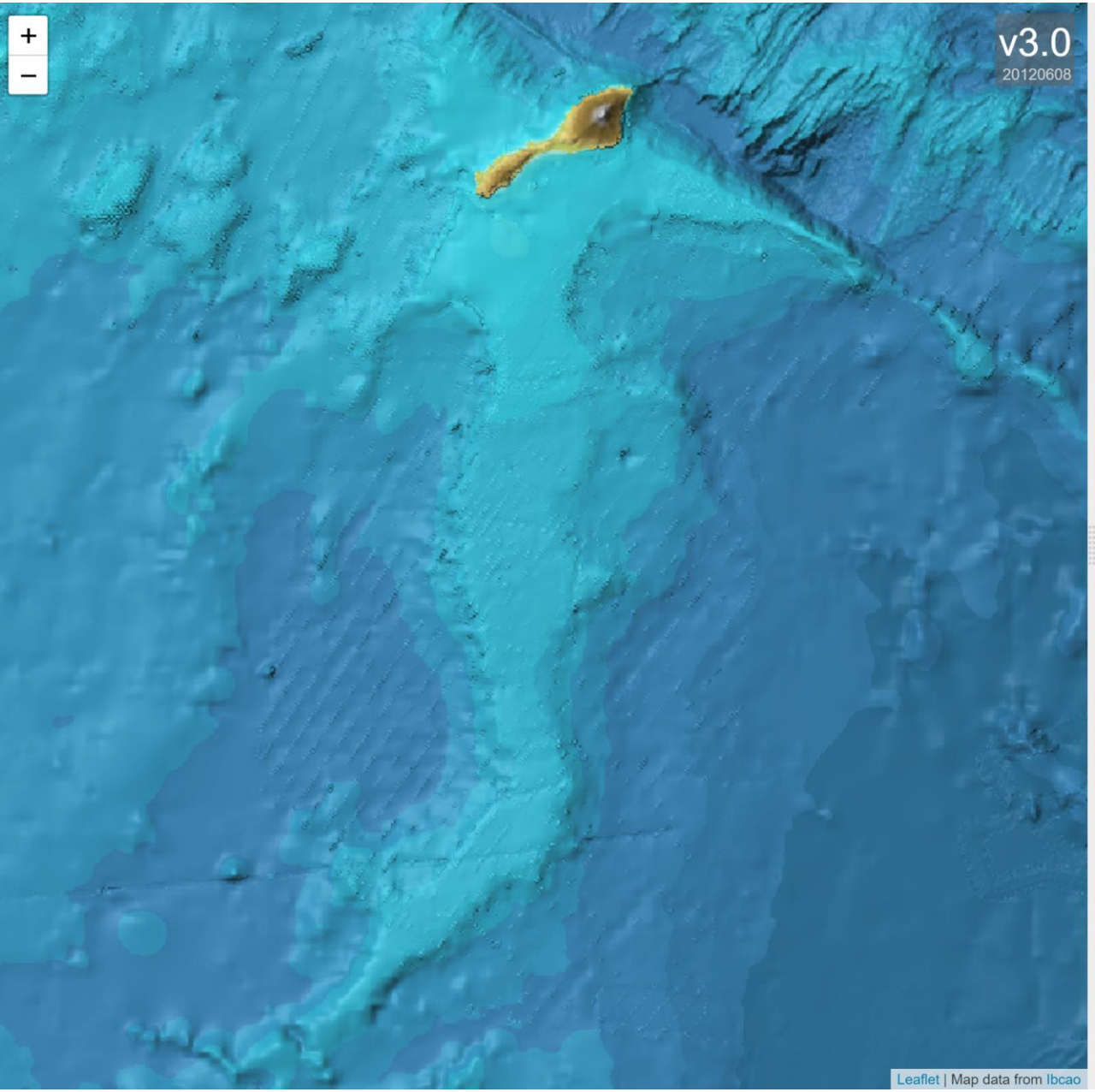
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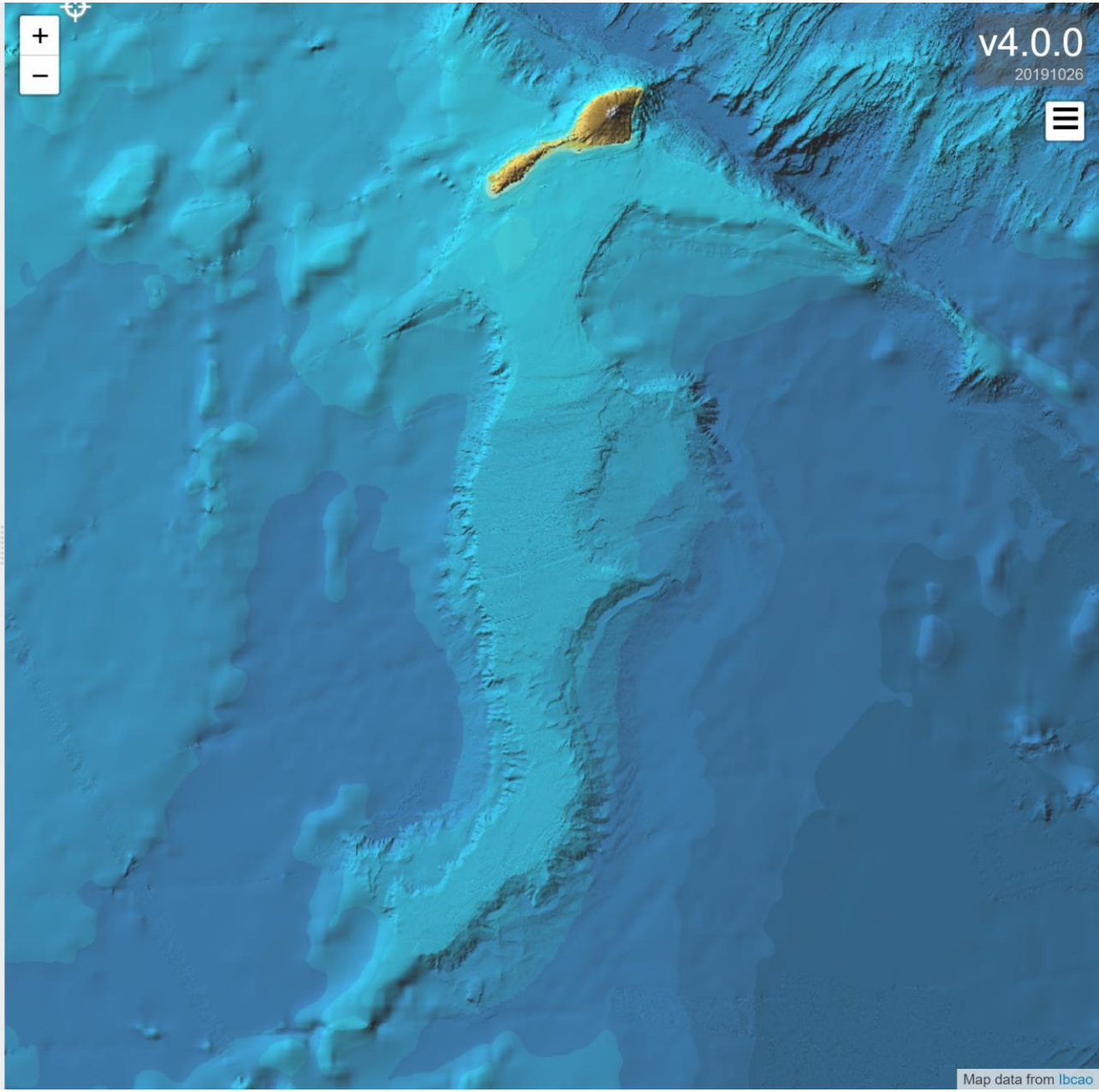
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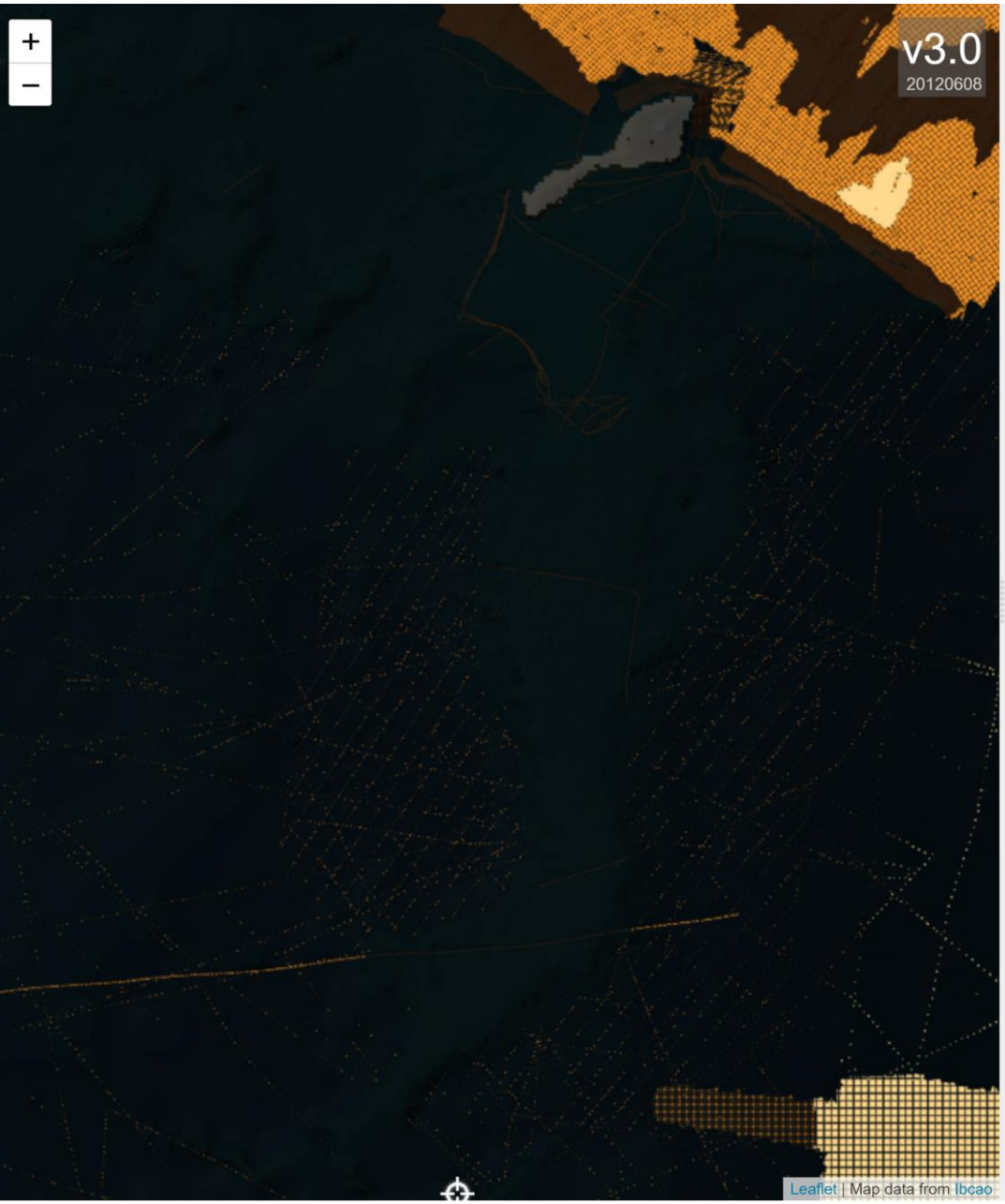
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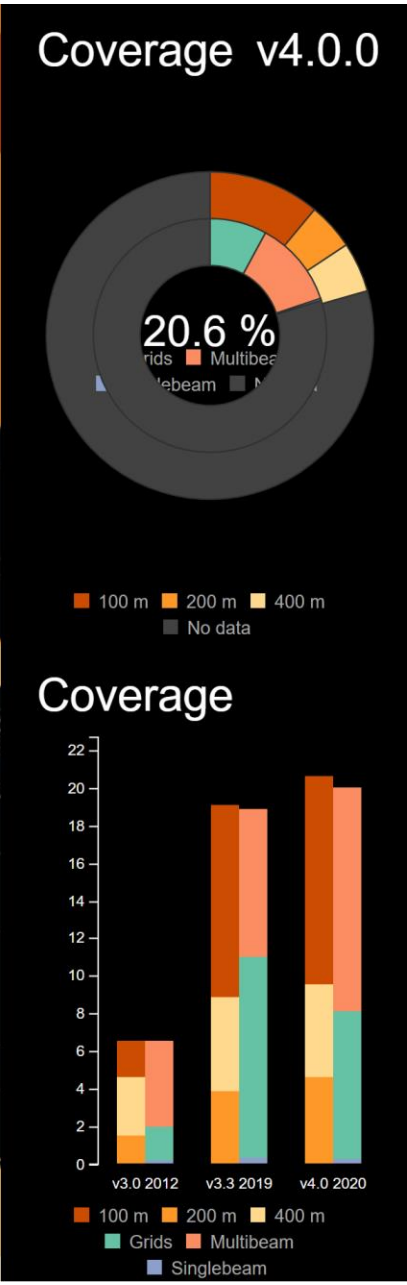
Coverage v4.0.0
20.6 %
100 m
200 m
400 m
No data
Coverage
22
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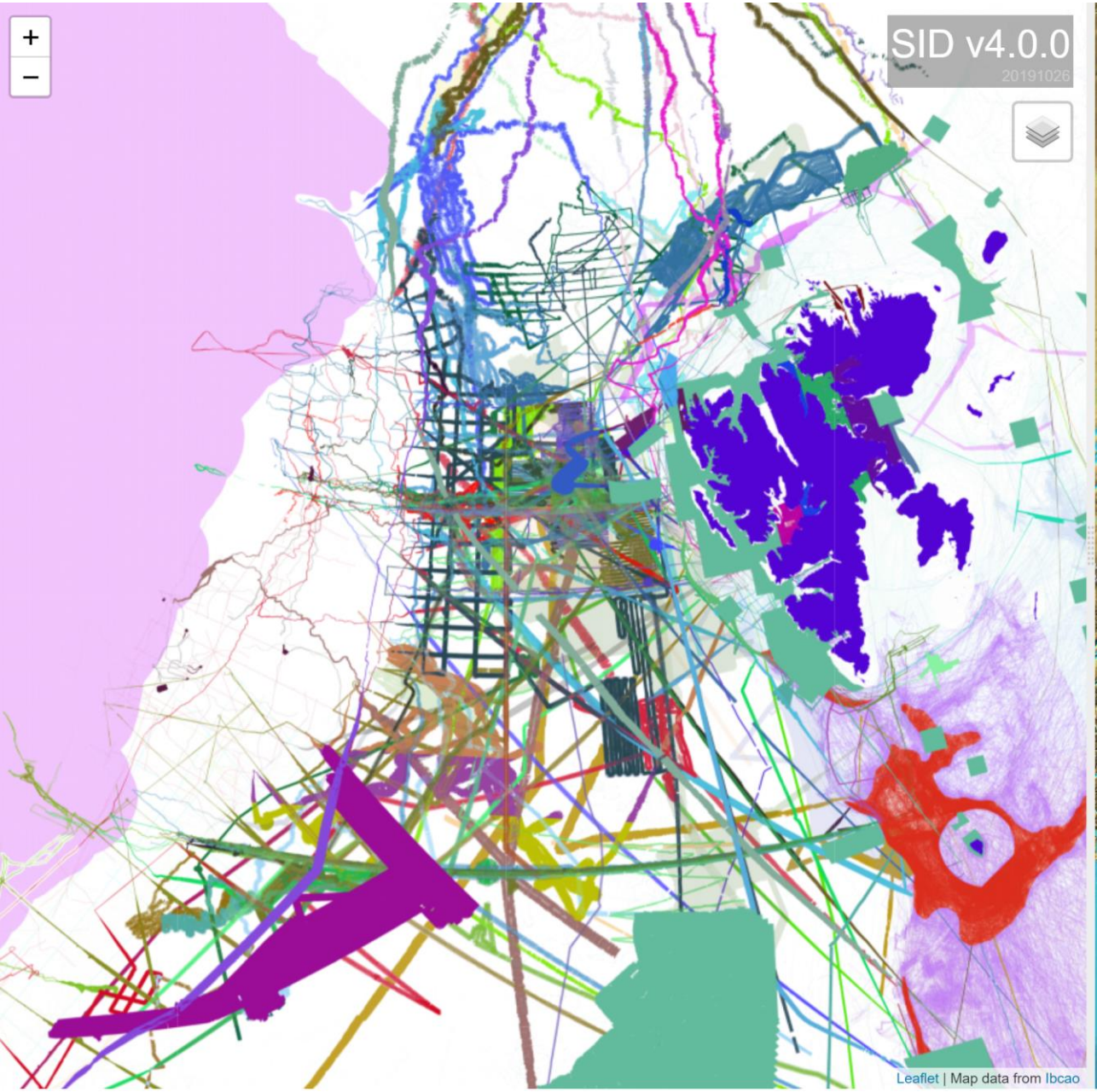
v3.0 2012
v3.3 2019
v4.0 2020
100 m
200 m
400 m
Grids
Multibeam
Singlebeam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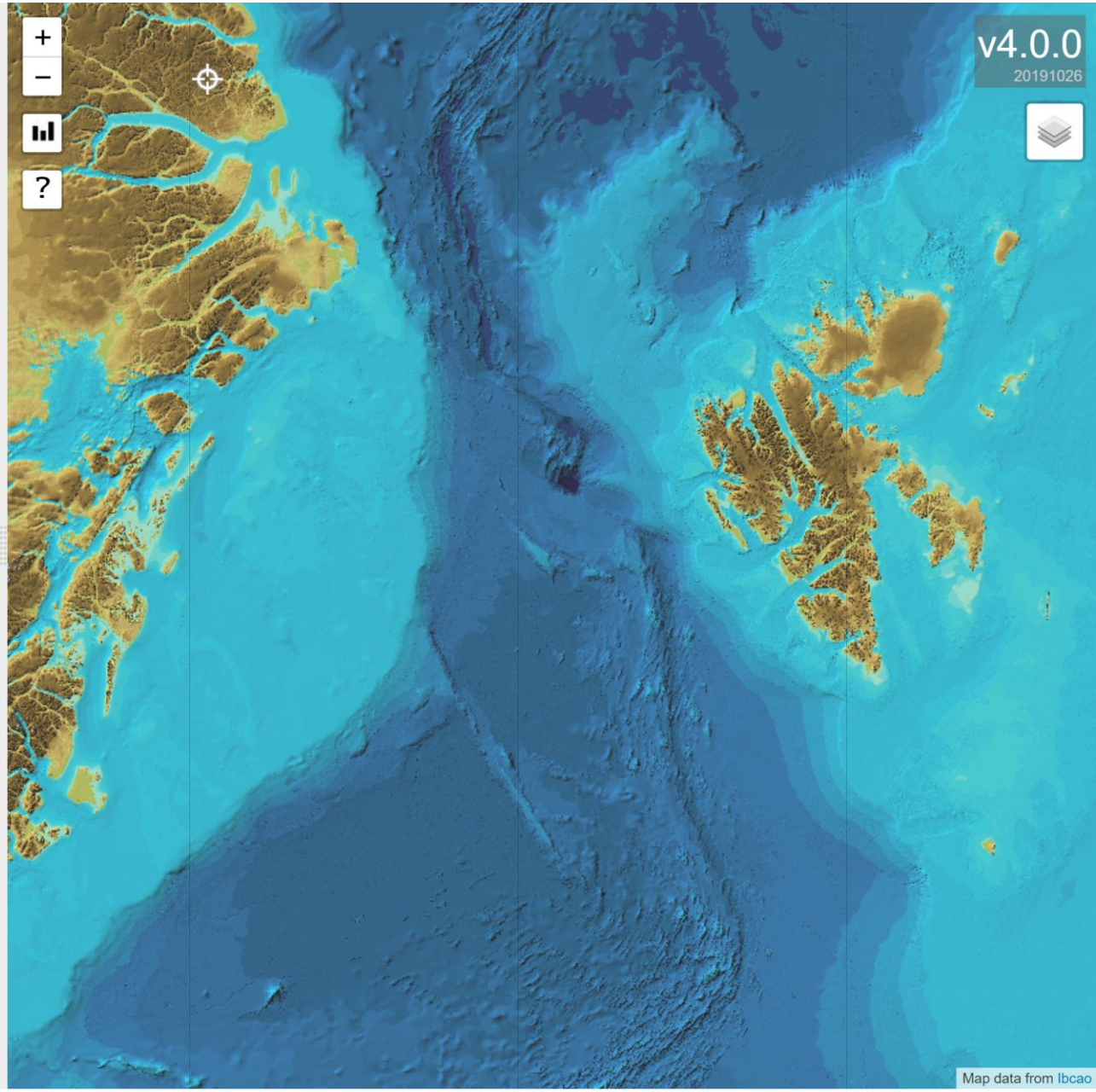
Leaflet | Map data from Ibcao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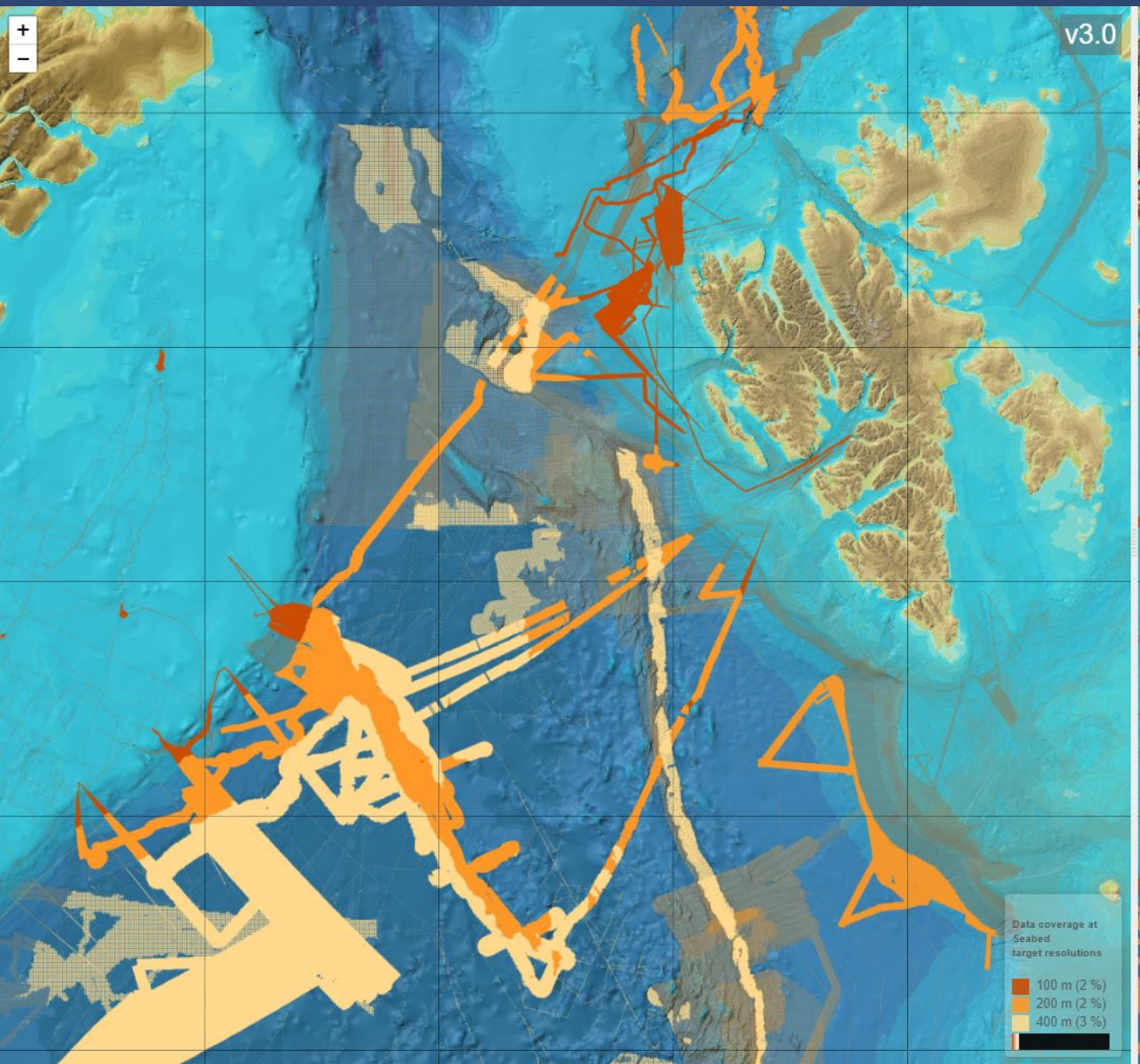
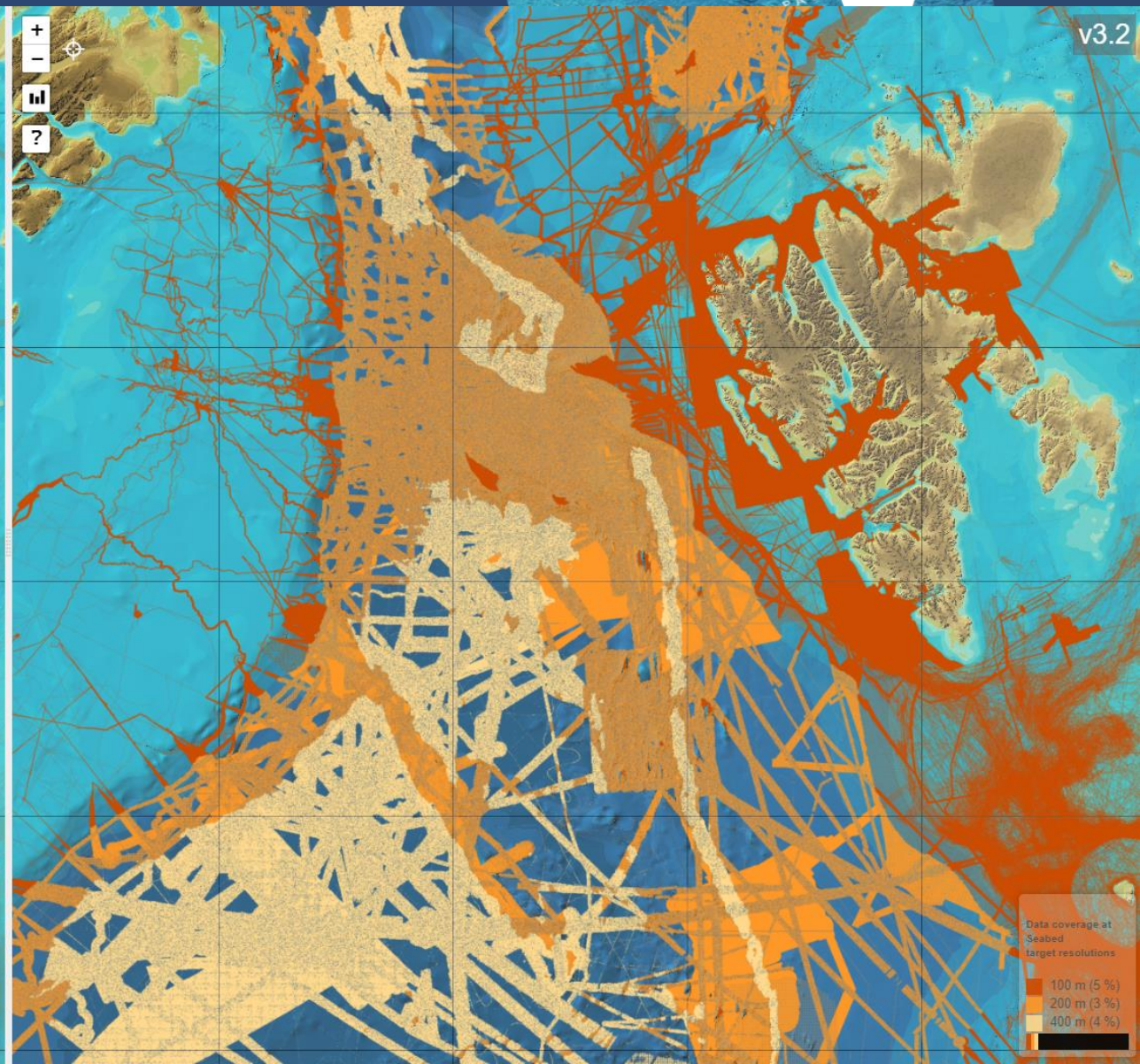
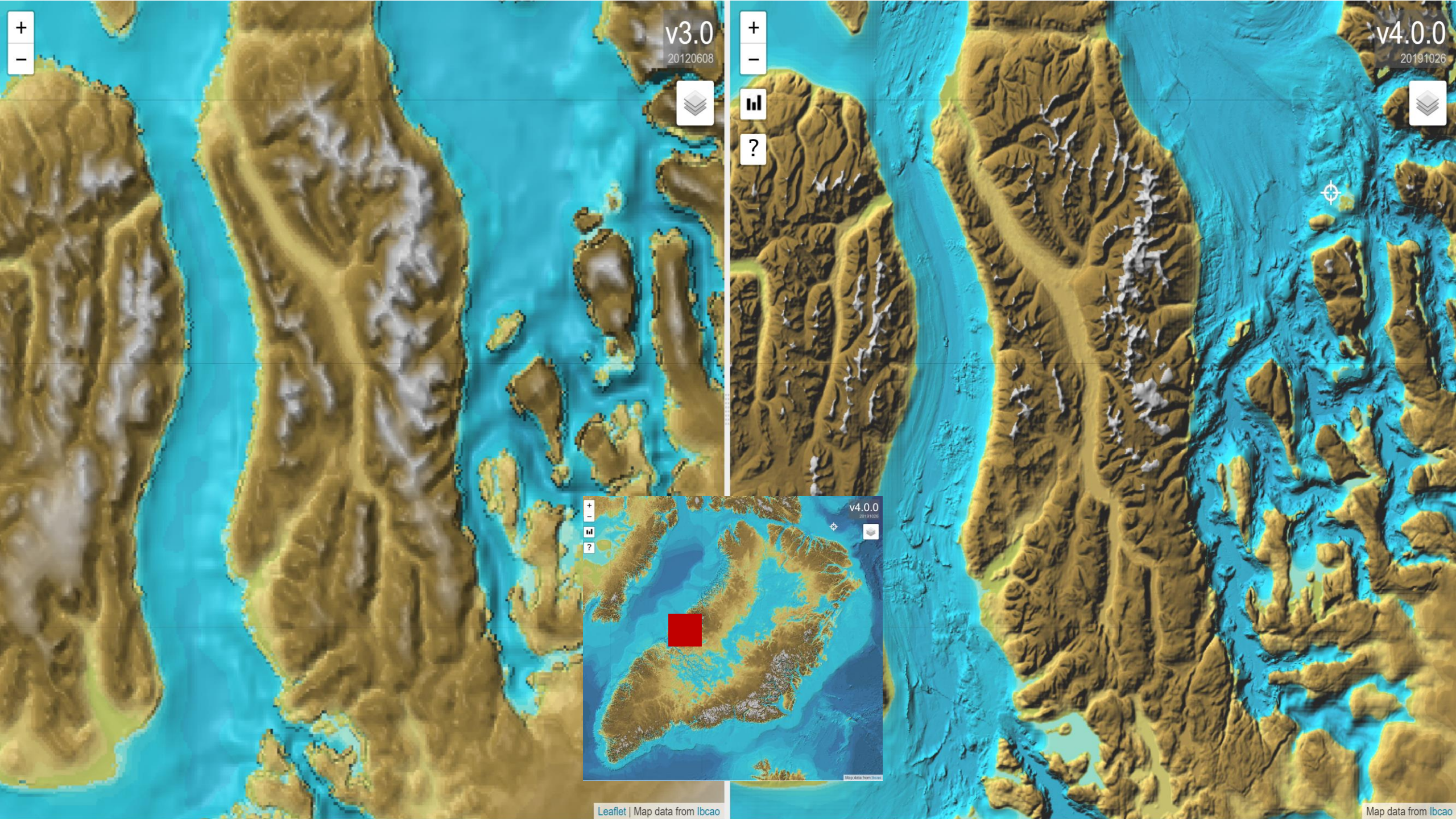
20191026
Map data from Ibcao


v3.0
Data coverage at Seabed target resolutions
100 m (2 %)
200 m (2 %)
400 m (3 %)


v3.2
Data coverage at Seabed target resolutions
100 m (5 %)
200 m (3 %)
400 m (4 %)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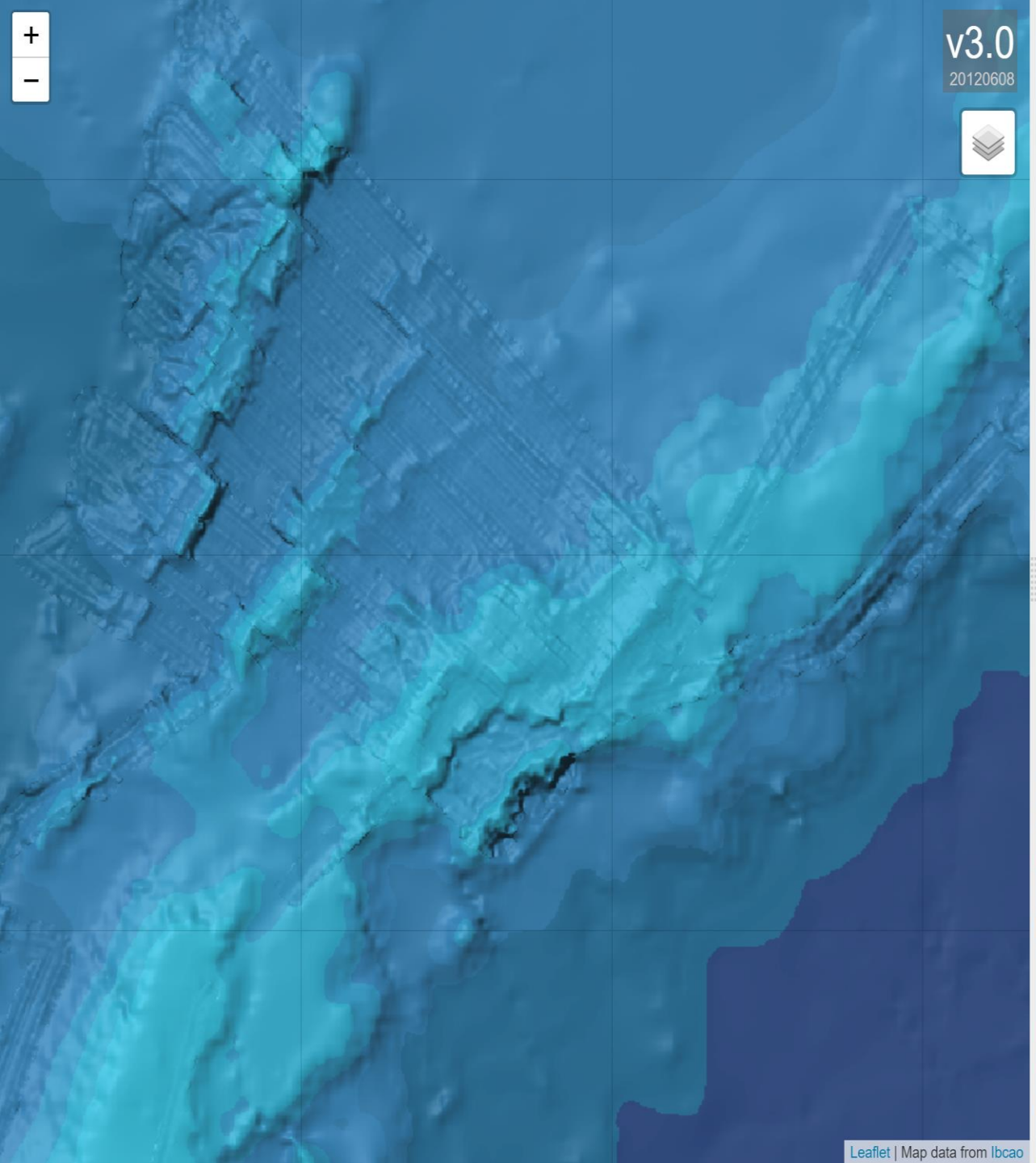
Leaflet | Map data from Ibcao
Map data from Ibcao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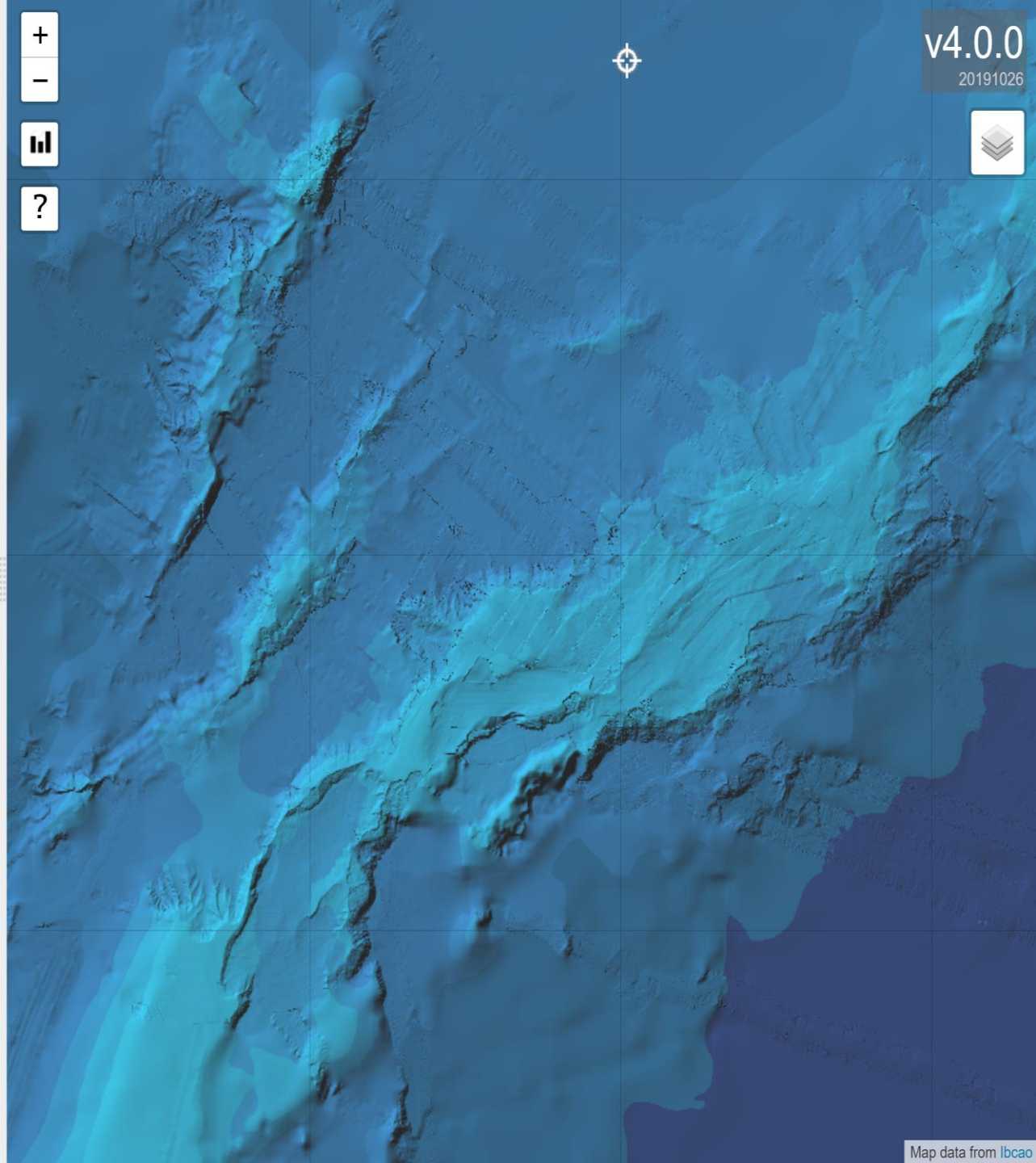
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