

Arctic and North Pacific Regional Assembly and Coordination Center

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Overview

- Who we are
- 2019 Submission
- 2020 Submission
 - Data sets contributed
 - Data set identified
 - New assembly workflow
 - Results
 - Grid
 - Shapefile metadata
- 2021 Submission
 - What have we already identified for inclusion
- Web Services



North Pacific Bathymetry – RDACC



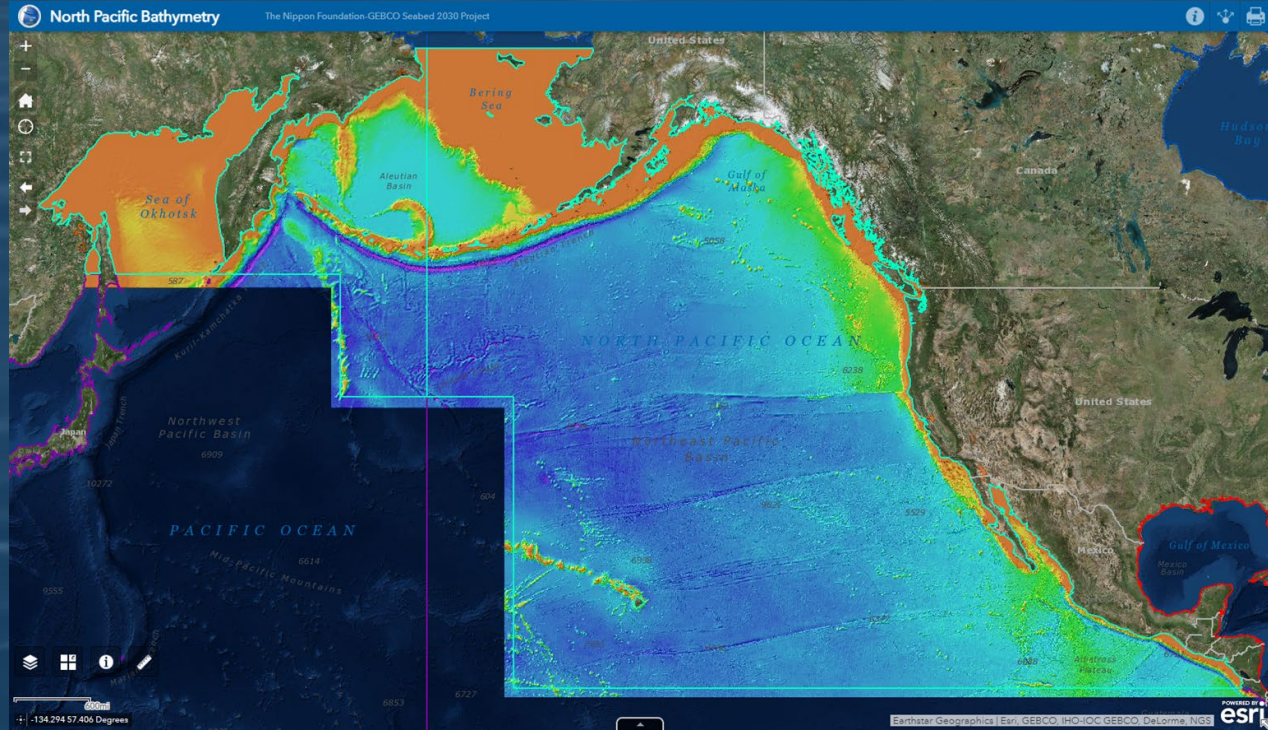
Larry Mayer



Tomer Ketter

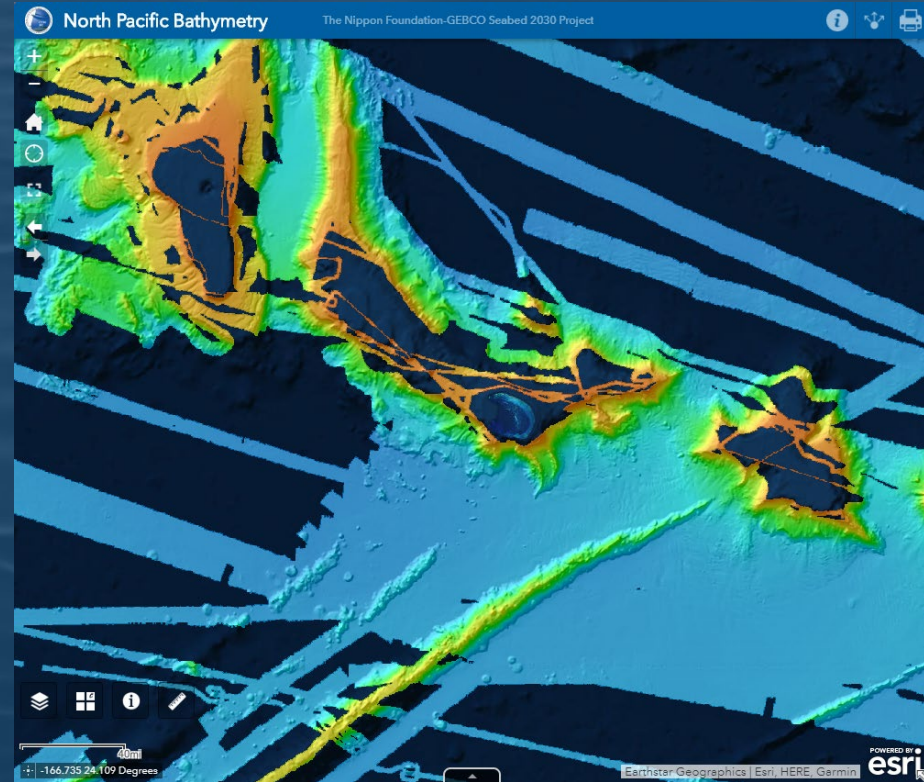


Paul Johnson

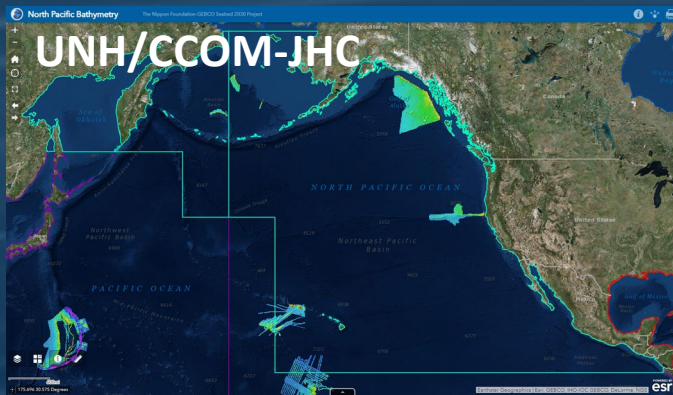
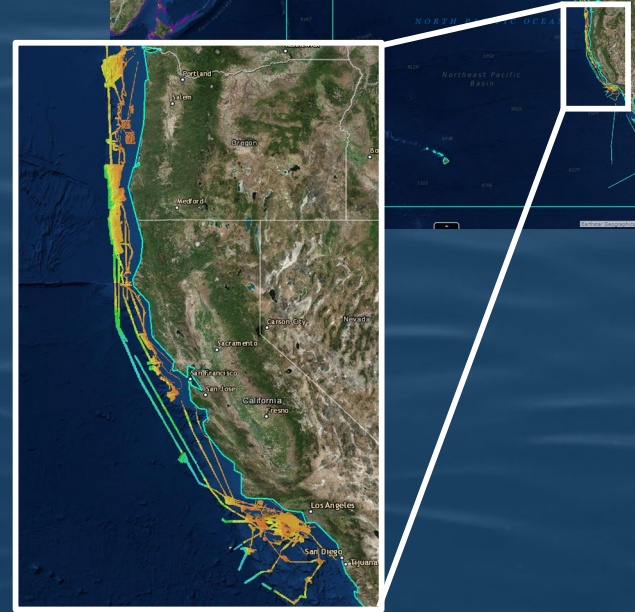
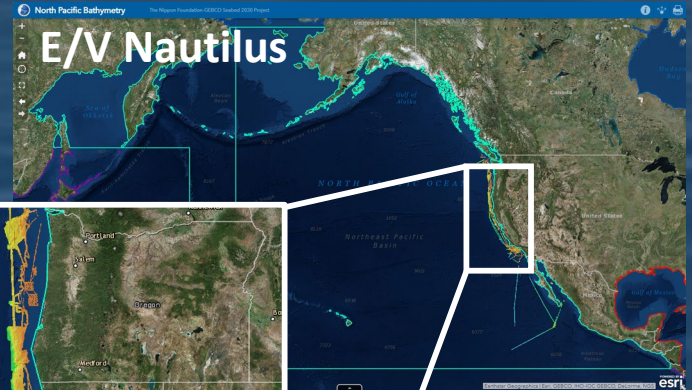
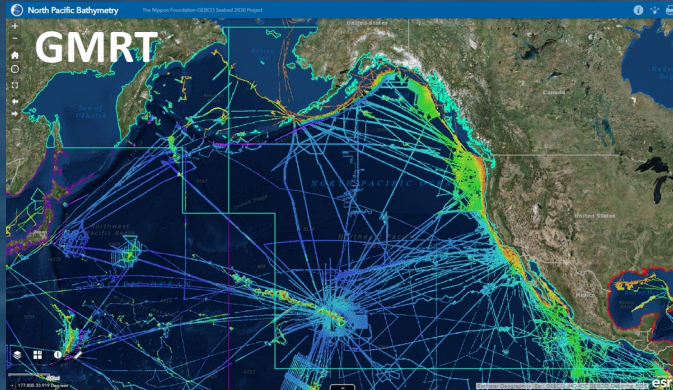


GEBCO 2019 Grid

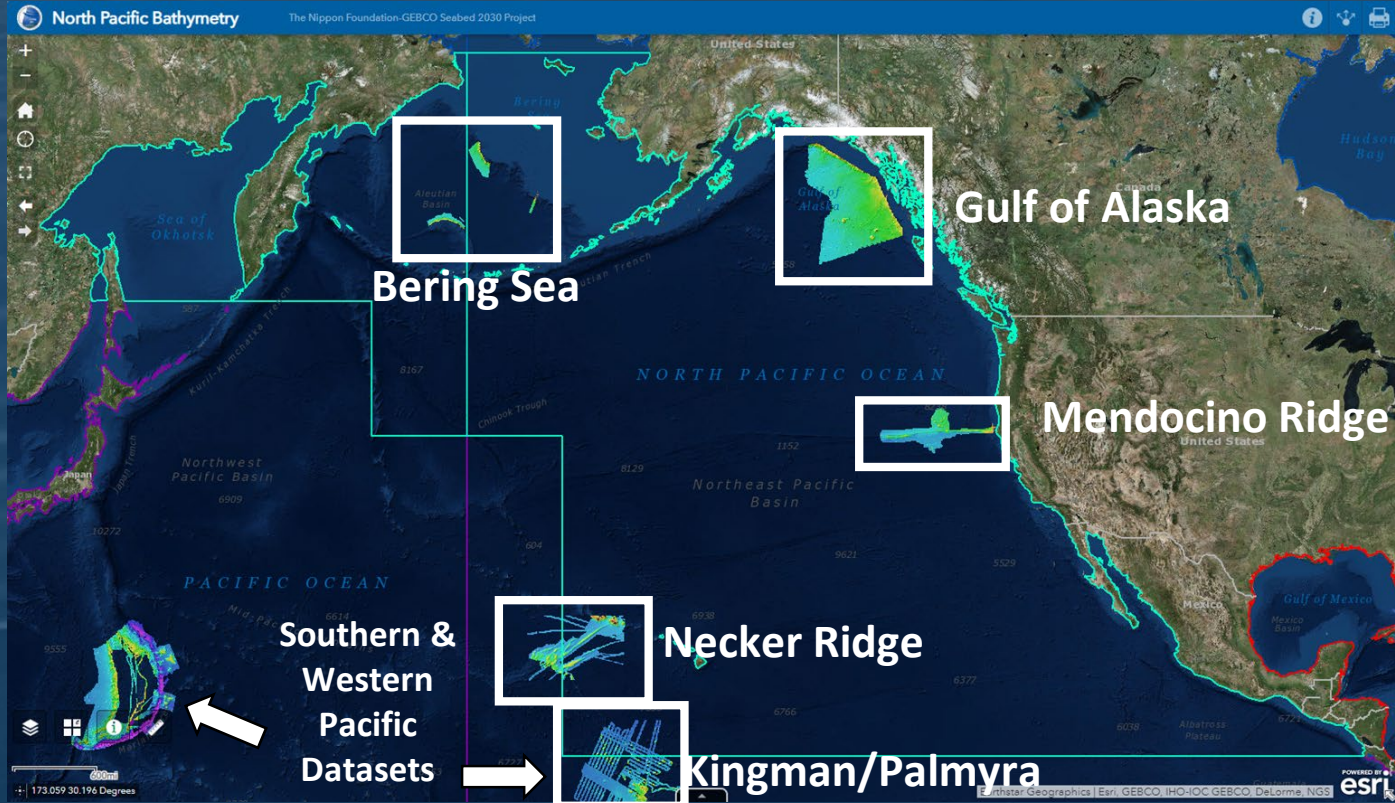
- Tomer Ketter joined the team
- Primary Focuses:
 - Data discovery
 - Data management
 - Cross-RDACC team building
 - Preliminary workflow
- Fall 2018 bathymetry grid delivery to the GDACC
- Beginning development of web services
- Attended Atlantic/Indian Ocean and South Pacific RDAC meetings



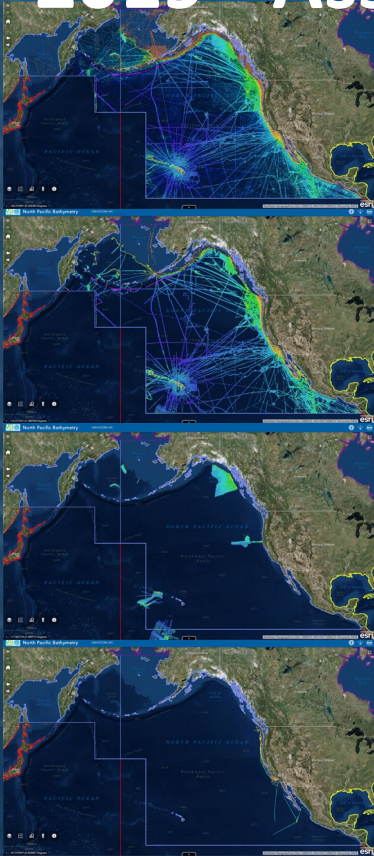
2019 North Pacific Bathymetry – Sources



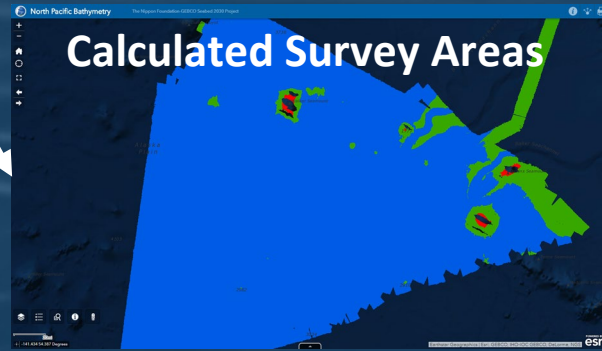
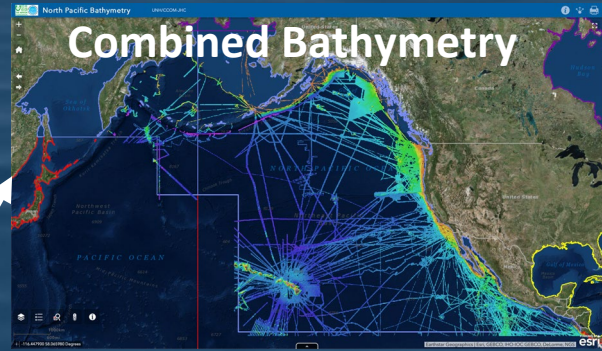
2019 North Pacific Bathymetry – CCOM



2019 - Assembled Using the "Rez/Martin Method"



```
npac_seabed2030.csh
1 #!/bin/csh -f
2 # 1st run of the North Pacific Seabed 2030 Grid
3 cd ~
4 gmt defaults -Du ~/gmt.conf
5 gmt set FORMAT_GEO_OUT D
6 gmt set FORMAT_FLOAT_OUT %.12lg
7
8 # Directories
9 set dwork = "~/Projects/Seabed2030/Working"
10 set dxyz = $dwork/xyz
11 set dblock = $dwork/block
12 set dgrid = $dwork/grid
13 set dmask = $dwork/mask
14 set dgmt = $dwork/gmrt
15
16 # Cell Size
17 set cell = "15s" ; # final grid cell size
18 set bcell = "3m" ; # first evenly dividable division for arcseconds to make
19   sure grid cells line up
20
21 # Seabed2030 Tiles
22 # NE Pacific Tile (East of Dateline)
23 set west = -180
24 set east = -85.5
25 set south = 10
26 set north = 64
27 set sb_grid0 = "$west/$east/$south/$north"
28
29 # Block Median LOTS Data
30 # Gulf of Alaska
31 set cruise = "KM1718"
32 set cinfo = "gmt gmtinfo -C -D -r -I$bcell -V $dxyz/$cruise/*.xyz"
33 set cbounds = "$cinfo[1]/$cinfo[2]/$cinfo[3]/$cinfo[4]"
34 blockmedian -R "$cbounds" -Iscell -r -V -Q $dxyz/$cruise/*.xyz -bo | \
35 tee $dblock/"$cruise"_"$cell".bxyz" | \
36 xyz2rd -bl -R"$cbounds" -r -Iscell -V -G$dgrid/"$cruise"_"$cell".grd"
37 set mwest = "echo $cinfo[1] | awk '{print $1-360}'"
38 set neast = "echo $cinfo[2] | awk '{print $1-360}'"
39 grdedit $dgrid/"$cruise"_"$cell".grd -V -R$mwest/$neast/$cinfo[3]/$cinfo[4]
40   -G$dgrid/"$cruise"_"$cell".geo.grd
41 grdxyz $dgrid/"$cruise"_"$cell".geo.grd -bo | mbstripnan > $dblock/"$
42   cruise"_"$cell".map.bxyz"
```



2020 - New Contributed Data

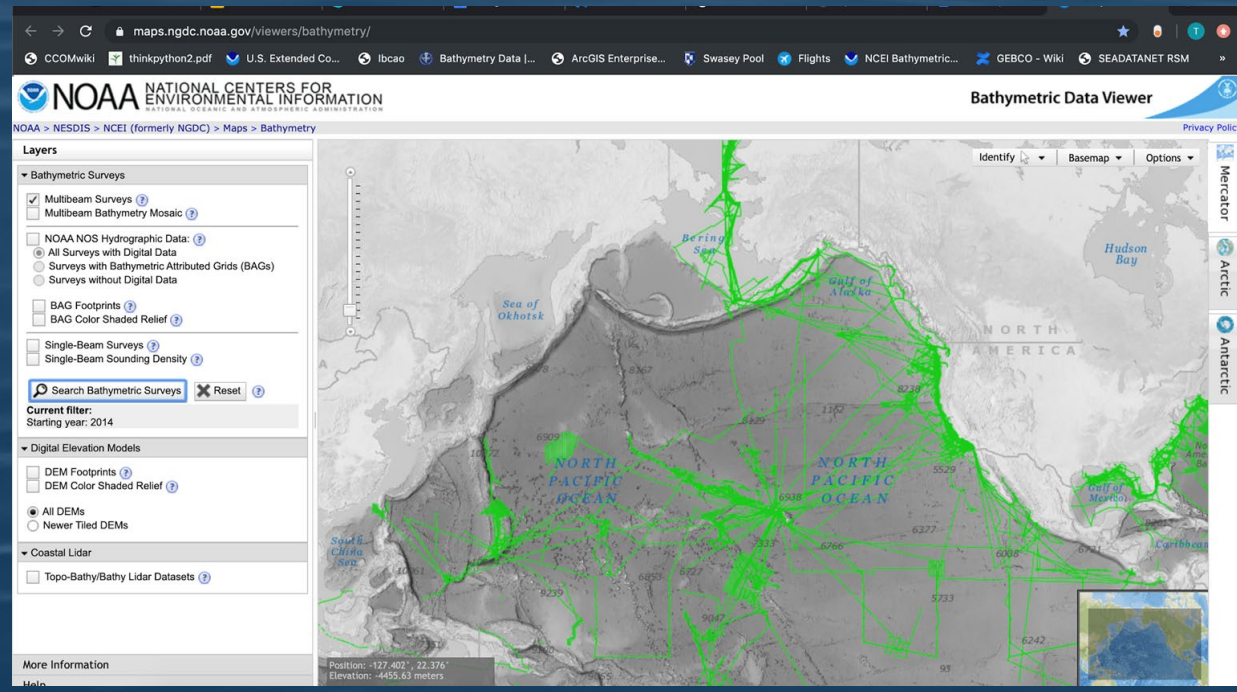
- Directly to RDACC:
 - Ocean Exploration Trust (OET - *E/V Nautilus*) processed multibeam grids from 2018-2019 seasons. 31 grids from NA093 to NA114
- Via GDACC:
 - OLEX
 - SHOM
 - GSR
 - NOAA Fisheries bathy compilation



2020 - New Identified Data

110 cruise datasets with new multibeam data harvested via NCEI from US research vessels:

- Atlantis
- Falkor
- Healy
- KiloMoana
- Langseth
- Melville
- Okeanos
- Revelle
- Siquliak
- Thompson



2020 - Trial Workflow

- Raw multibeam data downloaded from NCEI and unpacked/extracted.
- Almost all data is in .mb57 or .all formats which are readable by Qimera
- In Qimera, spline filter and cleaning of obvious noisy soundings
- Gridded at 100m with 3x3 Weighted moving Average
- Exported to 32-bit floating point geotiff



2020 - Importing Data to BIS

- ArcMAP desktop environment 10.6 or 10.7 (not compatible with ArcGIS Pro)
- ArcGIS geodatabase on local machine
- Define metadata schema
- Ingest geotiff grids
- Input metadata for each grid or dataset



2020 - Metadata

- unique cruise/survey identifier
- spatial reference system
- vertical datum
- measuring instrument
- Start date
- End date
- Originator
- Distributor
- TID

Extended Metadata Configuration Editor

Field Name	Type	Required	Searchable
IHO Survey Order	Enumeration	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Measuring Instrument	Enumeration	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Vessel	Enumeration	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Data Type	Enumeration	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Survey_ID	Text	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Spatial Reference System	Enumeration	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Vertical Datum	Enumeration	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Start Date	Date	<input type="checkbox"/>	<input checked="" type="checkbox"/>
End Date	Date	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Originator	Enumeration	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Distributor	Enumeration	<input type="checkbox"/>	<input checked="" type="checkbox"/>
TID	Integer	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Show retired fields



2020 - Rules Based Assembly

Compose Surface

Active Model: NorPac2020_v5_East*

Surface rules

Attribute	Rule
Ext.Data Type	▼ Multibeam, Single beam, Indirect, Unknown
Ext.Measuring Instrument	▼ EM124, EM122, EM120, EM304, EM302, EM300, ...
Ext.Start Date	▼ Maximum, Minimum
Add Rule	▼

Load Rules Save Rules

Clear Rules Apply Rules

Sorted Datasets *174 datasets in BIS*

- NA089_overall_Socorro_transit_60m.tif
- NA089_overall_transit_south_75m.tif
- NA090_20171021_GuaymasBasin.tif
- NA091_20171102_PescaderoBasin.tif
- NA092_overall_60m.tif
- NorPac2020_100m_AT37-07_EPSG-3857.tif
- NorPac2020_100m_RR1612_EPSG-3857.tif
- NorPac2020_100m_HLY16TC_EPSG-3857.tif
- NorPac2020_100m_HLY15TC_EPSG-3857.tif

(1 out of 158 selected)



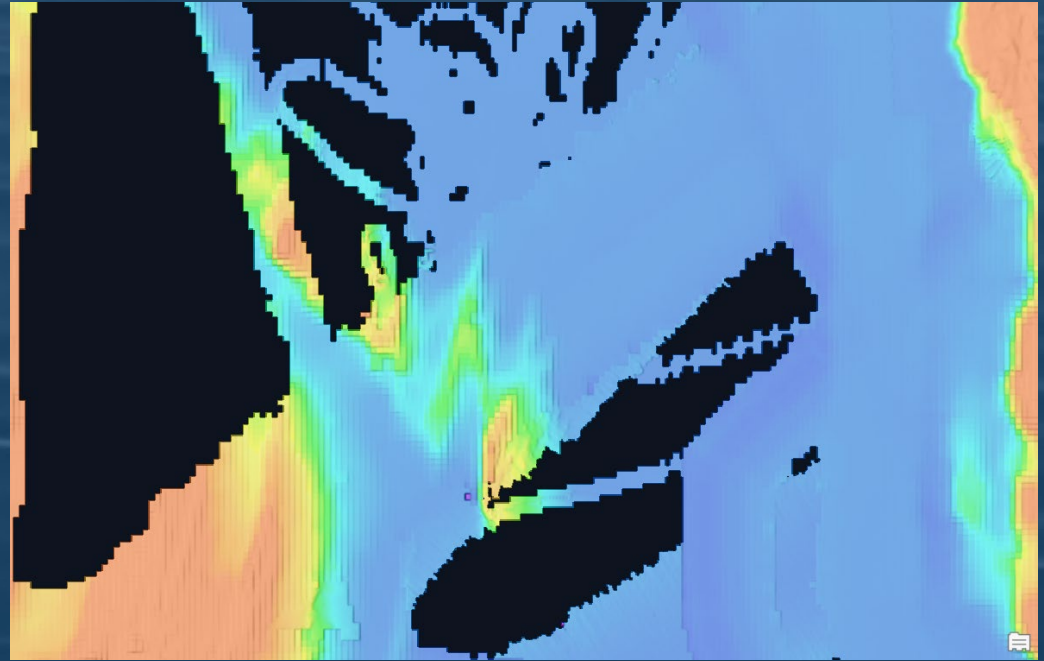
2020 - Metadata Shapefile

- BIS model can export “Deconflicted Polygons” shapefile
- Shapefile attribute table is then joined with Full metadata table
- Unnecessary columns cleaned out
- Can be rasterized with TID field

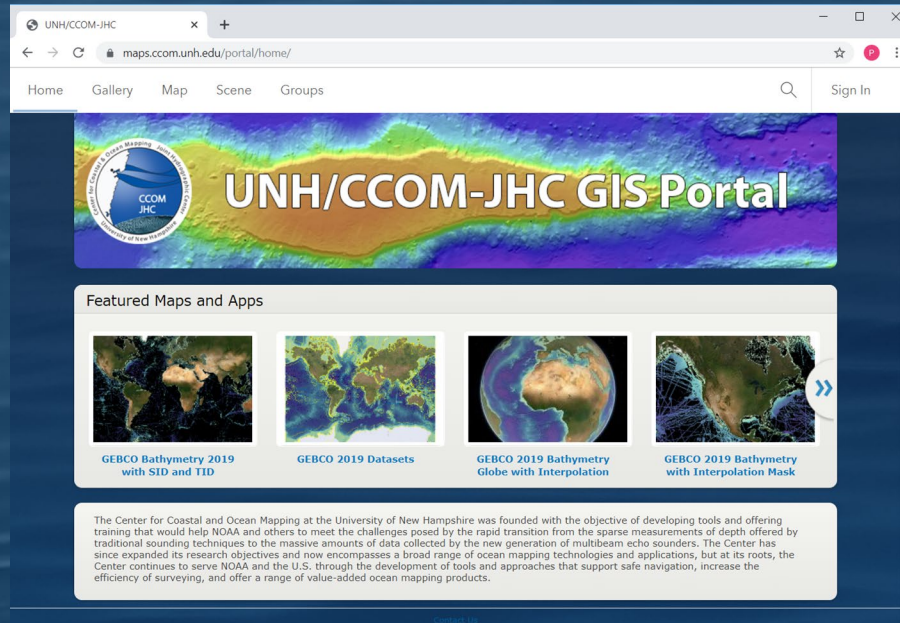


2020 - Grid Output

- Export is taking very long and sometimes crashes half-way
- We're looking into hillshading artifacts



Data Exploration & Web Services



- Website: <https://maps.ccom.unh.edu>
- REST: <https://maps.ccom.unh.edu/server/rest/services>



Data Management

UNH/CCOM-JHC x GEBCO 2019 Datasets x +

maps.com.unh.edu/portal/apps/webappviewer/index.html?id=2e531ab7eff94687997104afee1e76ec

GEBCO 2019 Datasets https://www.gebco.net/

Layer List

Layers

- Maritime Boundaries v10
- ESRI World Ocean Reference
- SmartMap RTOF QF
- NOS Hydro Surveys
- IHO-DCDB Multibeam
- IHO-DCDB Singlebeam
- NOAA - Bathymetry Gap Analysis
- GEBCO 2014 SID

(2 of 4)

Multibeam Bathymetric Surveys: MRTN04WT

Survey ID	MRTN04WT
Platform Name	Thomas Washington
Survey Year	1,984.00
Source	University of California, Scripps Institution of Oceanography (UC/SIO)
NCEI ID	15040126
Chief Scientist	Menard, W. and Hey, R.
Instrument	SeaBeam
File Count	25.00
Track Length (km)	12,849.00

[Zoom to](#)

1000mi
-105.494 8.974 Degrees

Geographics | NOAA National Centers for Environmental Information ...

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Data Sharing

Home Gallery Map Scene Groups Content Organization

GEBCO 2019 Depths Image Service

Overview Settings

Edit Thumbnail

GEBCO 2019 Bathymetry Grid - Image Service. Edit

Imagery Layer by agsmanager

Created: Apr 17, 2019 Updated: Nov 7, 2019 View Count: 169

Open in Map Viewer

Open in Scene Viewer

Open in ArcGIS Desktop

Share

Metadata

Description

The GEBCO_2019 Grid is a continuous, global terrain model for ocean and land with a spatial resolution of 15 arc seconds.

The grid uses as a 'base' Version 1 of the SRTM15+ data set (Olson *et al*, 2014). This data set is a fusion of land topography with measured and estimated seafloor topography. It is largely based on version 11 of SRTM30+ (Becker *et al*, 2009; Sandwell *et al*, 2014), augmented with the gridded bathymetric data sets developed by the four Seabed 2030 Regional Centers. The published data were recalculated on a cell-registered grid for use by GEBCO.

The Regional Centers have compiled gridded bathymetric data sets, largely based on multibeam data, on a sub-set of the global grid for their areas of responsibility. These regional grids were then provided these to the Global Center. For areas outside of the polar regions (primarily south of 60N

Seabed2030/GEBCO_2019_Depths_IS (ImageServer)

View In: ArcGIS JavaScript ArcGIS Online Map Viewer ArcGIS Earth ArcMap

View Footprint In: ArcGIS Online Map Viewer

Service Description: Seabed2030/GEBCO_2019_Depths_IS

Name: Seabed2030/GEBCO_2019_Depths_IS

Description:

Single Fused Map Cache: false

Extent:

XMin: -2.003750784278824667
YMin: -3.02410285416138587
XMax: 3.0037508115721175487
YMax: 3.02409714583861587
Spatial Reference: 102100 (3857)

Initial Extent:

XMin: -2.003750784278824667
YMin: -3.02410285416138587
XMax: 3.0037508115721175487
YMax: 3.02409714583861587
Spatial Reference: 102100 (3857)

Full Extent:

XMin: -2.003750784278824667

This XML file does not appear to have any style information associated with it. The document tree is shown below.

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<?xml version="1.0" encoding="UTF-8" ?>
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  xsi:schemaLocation="http://www.opengis.net/omg http://schemas.opengis.net/om/1.3.0/capabilities_1_3_0.xsd">
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    <![CDATA[ IMS ]]>
  </name>
  <title>
    <![CDATA[ Seabed2030_GEBCO_2019_Depths_IS ]]>
  </title>
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    <![CDATA[ IMS ]]>
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Source: Image Service

Size: 1 KB

Shared with: Everyone (public)

Demonstration

