



18th Conference of the IHO Hydrographic Commission on Antarctica

National Report - United States

Agenda item 07.2A

HCA-18, Berlin, Germany (hybrid), 24 – 26 May 2022



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Surveys and charting progress in Antarctica since HCA-17 (June 2021)

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- Areas surveyed – No updates to report
- New charts produced (INT, national, ENC) – US standing by. Working on our polar grid and standing by to fill any gaps if needed. Will follow the grid as planned in the Arctic
- Risk assessment studies – US is providing GMTDS as a risk assessment tool across the entire globe
- Impact of ATCM Resolutions – all US marine data collections in the Antarctic region will be provided in the DCDB. Several initiatives are underway to improve capabilities, collect globally and make all data available to the public

*HCA Statutes, Appendix C3 refers



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United States continues to work on Antarctic issues with funding through organizations such as the **National Science Foundation** - an independent agency of the US government that supports fundamental research, and education in all the non-medical fields of science and engineering. <https://www.nsf.gov>

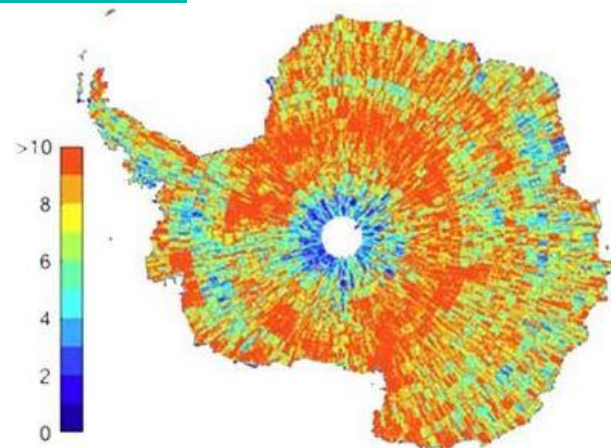
- One example is the multi agency supported Reference Elevation Model of Antarctica (REMA): A High Resolution, Time-Stamped Digital Elevation Model for the Antarctic Ice Sheet



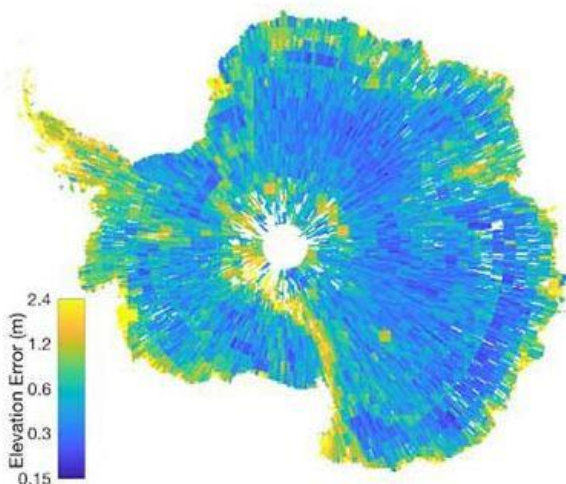
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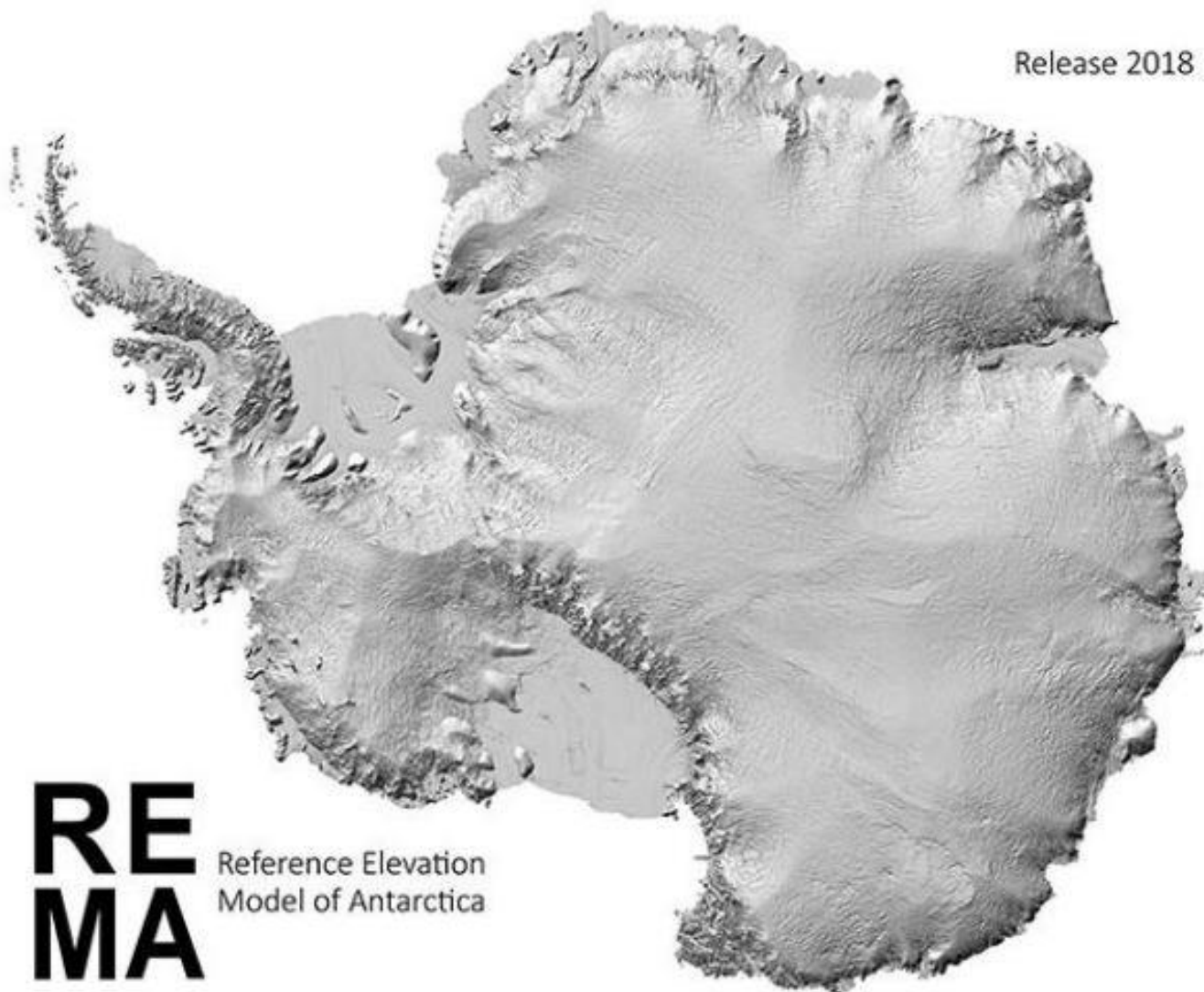


Map of REMA coverage of individual digital elevation models produced from stereo submeter imagery, with color indicating the number of repeats for all data.



Map of REMA elevation error, given by the errors in registration, or coregistration in the case of alignment

Release 2018



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Planned Activities for 2022-2023 – collection in Antarctica

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- Satellite Derived Bathymetry (SDB) – when appropriate ice conditions are met. Collection planned for 2023 based on ice conditions and water quality
- New surveys, coordination with other bodies - as US brings long range autonomous systems online, we will coordinate as appropriate – all data collected is intended for public use, and will be provided to the IHO DCDB
- New charts – NGA developing polar data grids – coordinated with WENDWG and ARHC (for polar)
- Coordinated development of S-100 services in the region* - all US products and services will be made publicly available

*Action WENDWG12/33 refers

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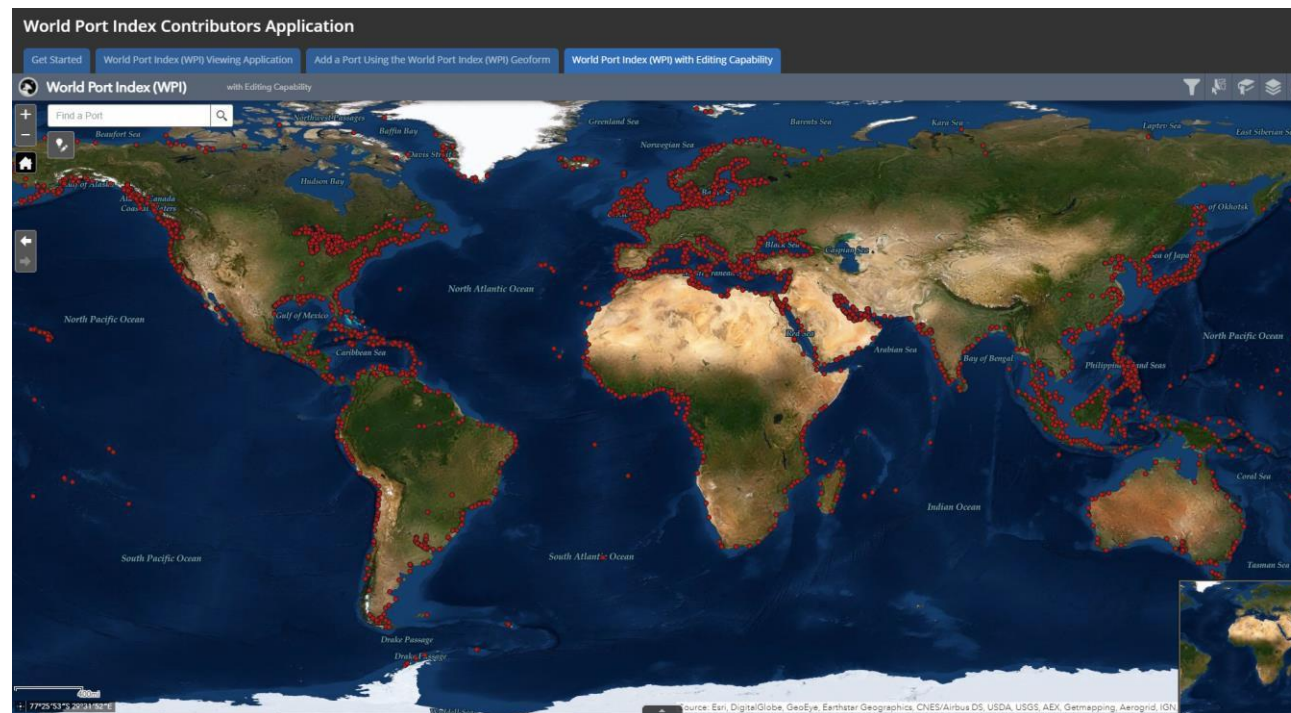
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Planned Activities for 2022-2023

Modernized World Port Index (WPI)

- Geospatial representation of the World Port Index (WPI) available on ArcGIS Online (AGOL) platform.
- Access AGOL platform two ways:
 - Maritime Safety Information (MSI) site: <https://msi.nga.mil/Publications/WPI>
 - Direct Link: <https://nga.maps.arcgis.com/apps/MapSeries/index.html?appid=f9515d53e3e24ae7919f02eb8f554c96>

- *VISION: Crowdsource contributions to the WPI to provide the most up-to-date information for mariners across the globe.*
- **NGA requests partners begin contributing data to the World Port Index**
- *The data is publicly available, API services available for use*



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Planned Activities for 2022-2023

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NGA DYNAMIC WORLD COASTLINE



A World-wide coastline collected at 1:50K (50m accuracy)

Dynamic World Coastline

Create and dynamically maintain a seamless fit between maritime and topo features along a common coastline of 1:50K or better accuracy utilizing in-house, and crowd-sourcing technology.

Public availability is TBD.



- ☐ World-wide coverage at 1:50K or better vector data with >50m (CE90) horizontal accuracy
- ☐ Coastline contributions from some countries
- ☐ Antarctica dataset from Scientific Committee on Antarctic Research (SCAR)



- ☐ Data available in geodatabase or shapefiles format
- ☐ Maintenance focused on port updates and customers requests



- ☐ Manually compiled from high-resolution satellite imagery
- ☐ Coastline collected at debris or wet/dry interface
- ☐ Coastline collected on outer extent of mangrove areas



- ☐ future plans for public release to replace World Vector Shoreline (WVS)
- ☐ Future public website with WMS service

NGA



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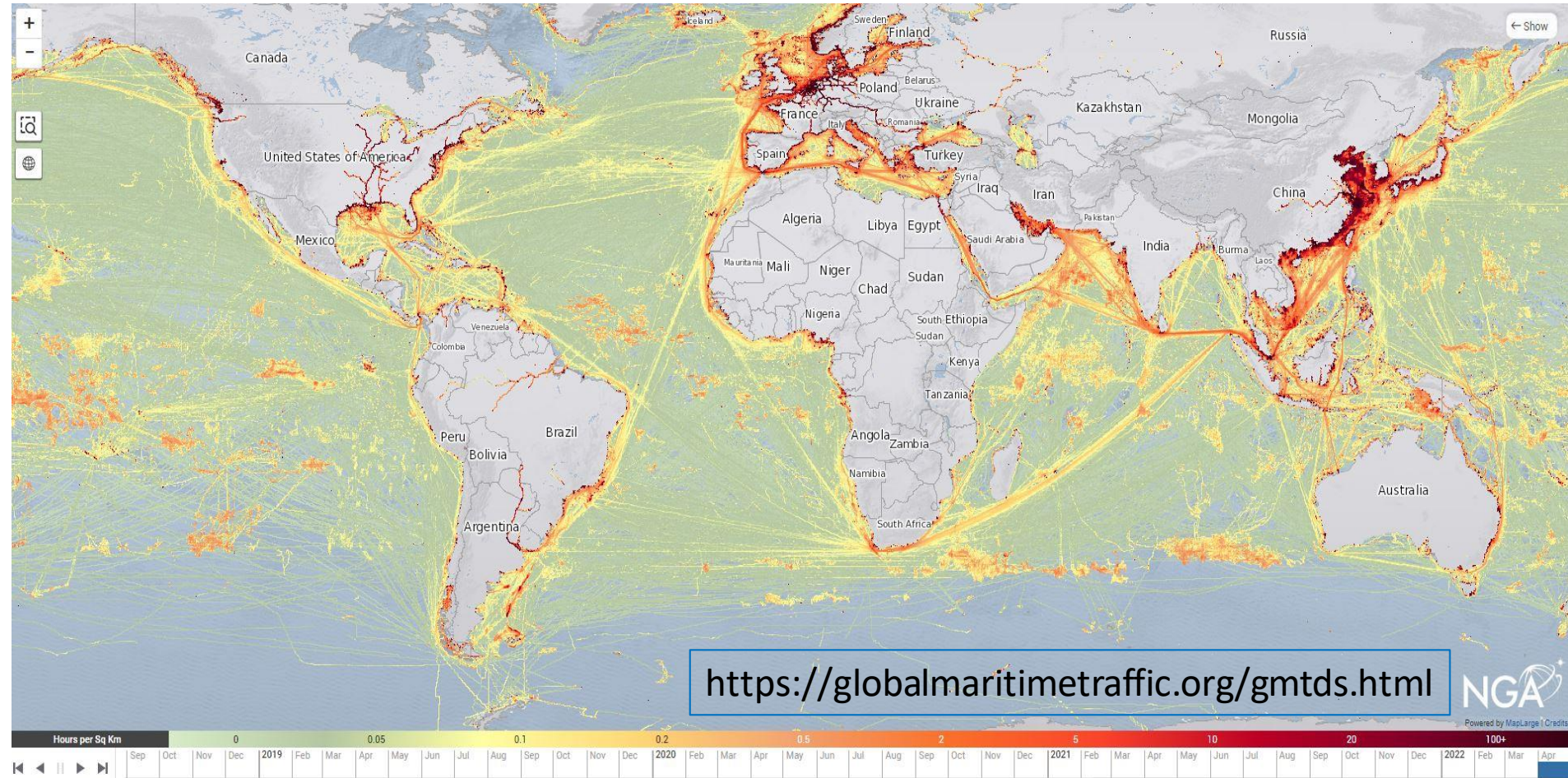
Planned Activities for 2022-2023

Global Maritime Traffic Density Service (GMTDS)

*AIS Historical Data +
Ongoing Live Feeds*

+500 Billion cleaned AIS
Historical Records
+ New Records Added
Every Month

*Fully Operational and
available to the public
via portal and API
services*

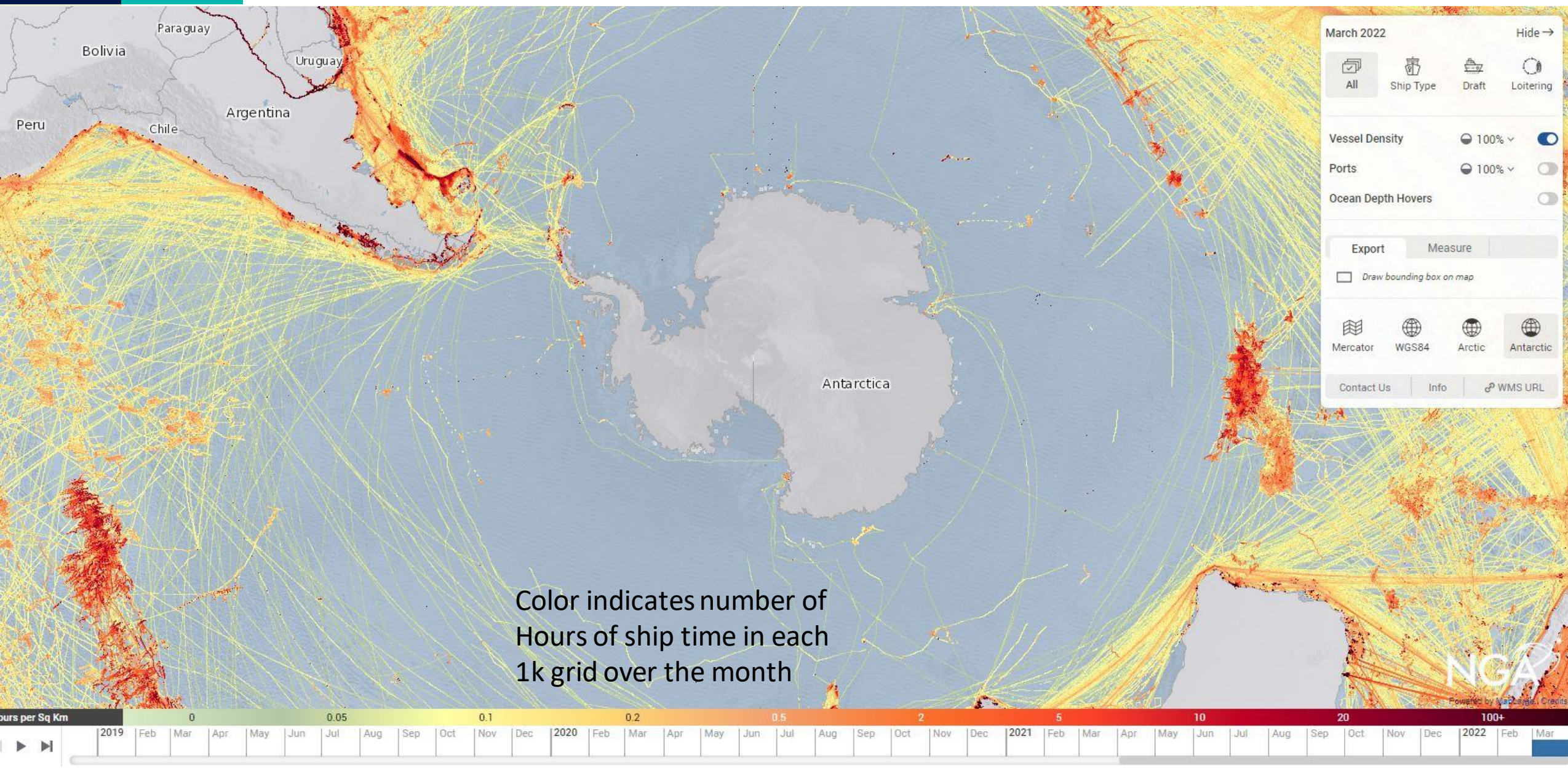


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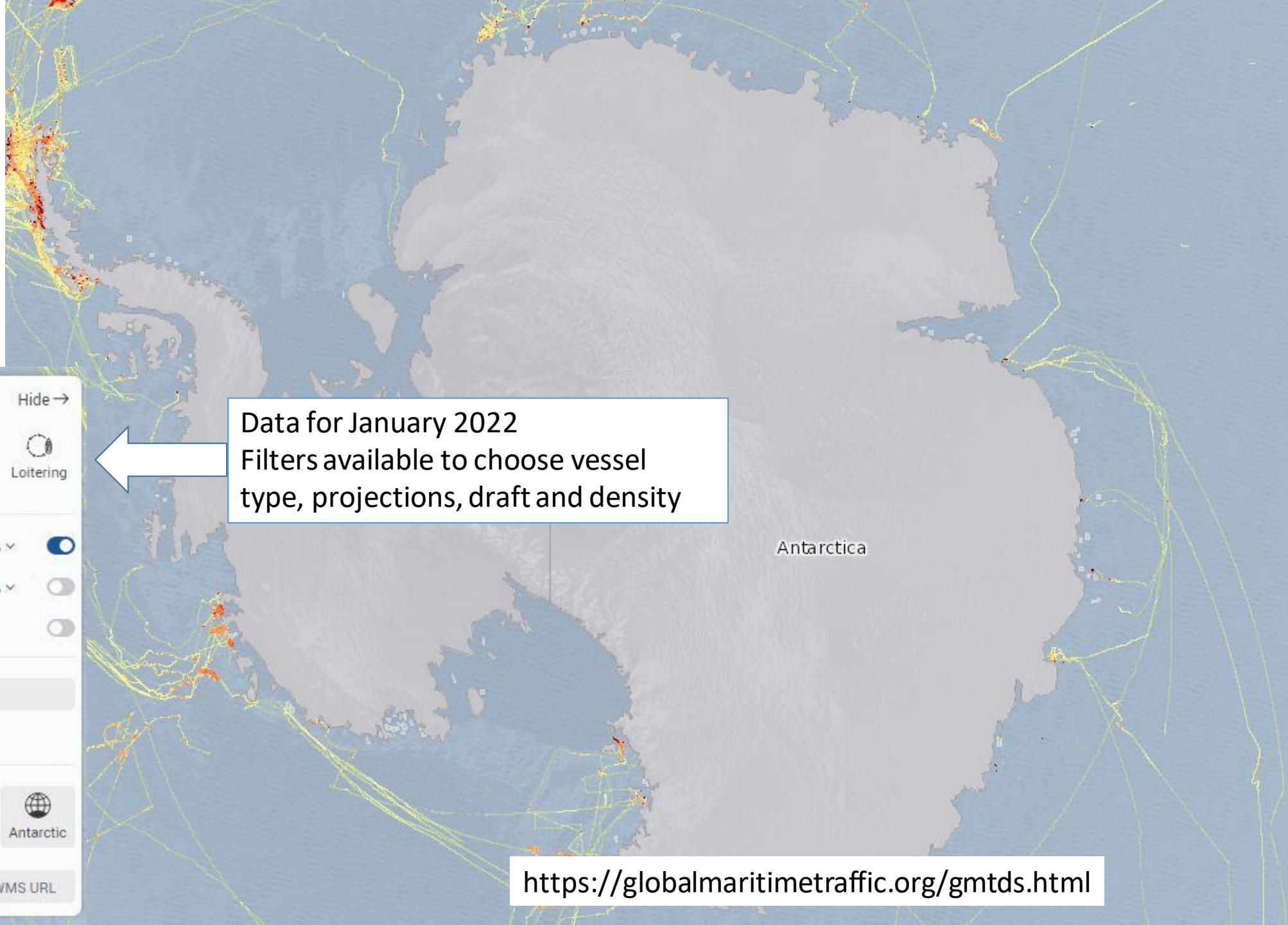
Planned Activities for 2022-2023 – Polar Projections





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Data for January 2022
Filters available to choose vessel
type, projections, draft and density



January 2022

Hide →



All



Ship Type



Draft



Loitering

Vessel Density

100% ▾



Ports

100% ▾



Ocean Depth Hovers



Export

Measure



Draw bounding box on map



Mercator



WGS84



Arctic



Antarctic

Contact Us

Info

WMS URL

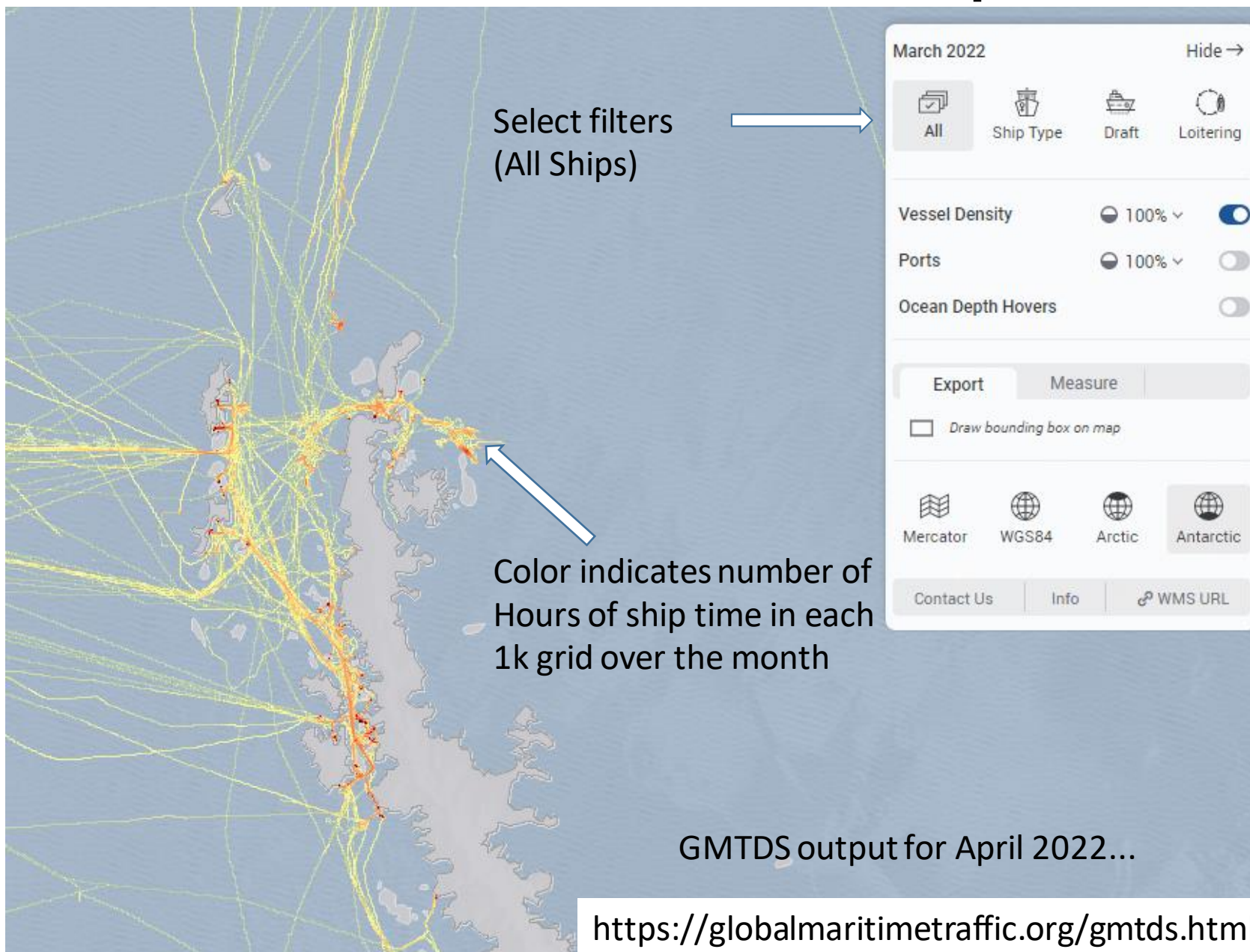
<https://globalmaritimetraffic.org/gmtds.html>



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Planned Activities for 2022-2023 – improved filtering



Hover over display
Switch on/off and
Opacity control

Integrated with
World Port
Index – on/off



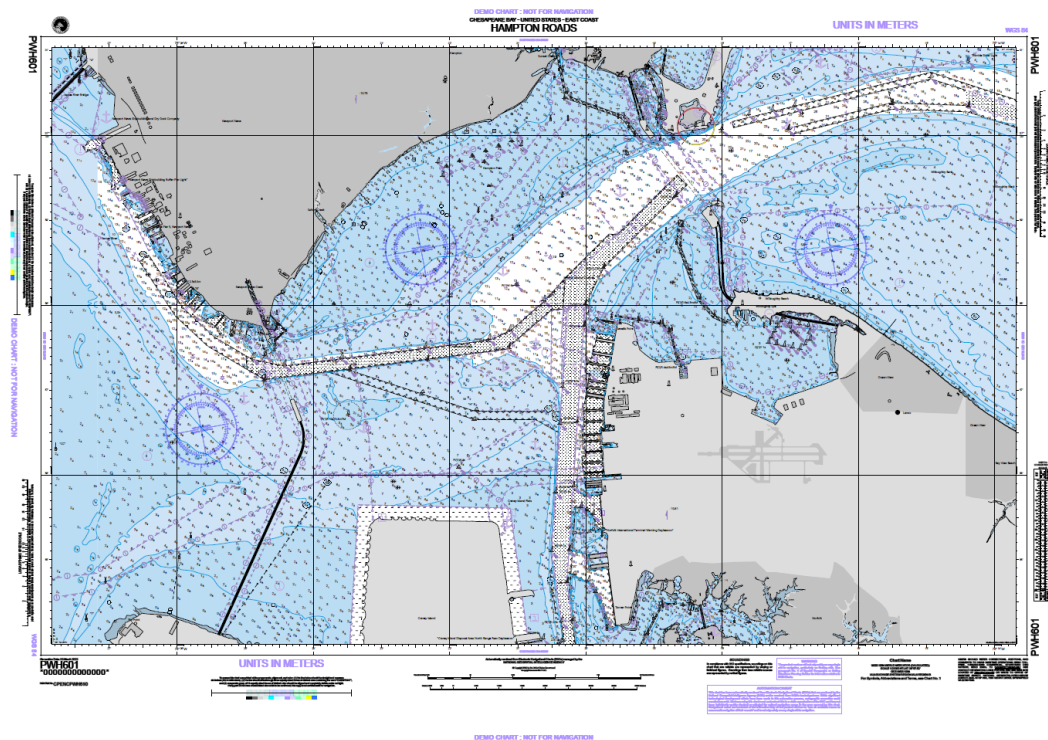
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Planned Activities for 2022-2023

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Certified Printed ENC (CPENCs)

- ▶ The Chart On Demand (COD) capability symbolizes **S-57 *Electronic Navigational Charts (ENC)*** with a **S-52 *Presentation Library*** of **S-4 *INT1 Symbols***
- ▶ Automatic **georeferenced PDFs** of a nautical chart-like hardcopy product known as **Certified Printed ENC (CPENC)**, for hydrographic office-maintained **Fixed Areas of Interest (AOIs)**
- ▶ Requires: **ArcGIS Server -- Maritime Chart Service & Custom Chart Builder, ArcGIS Pro** (.pagx templates, Fixed AOI extents), **ENCs**



Creates Nautical Chart in 2 mins from Vector data

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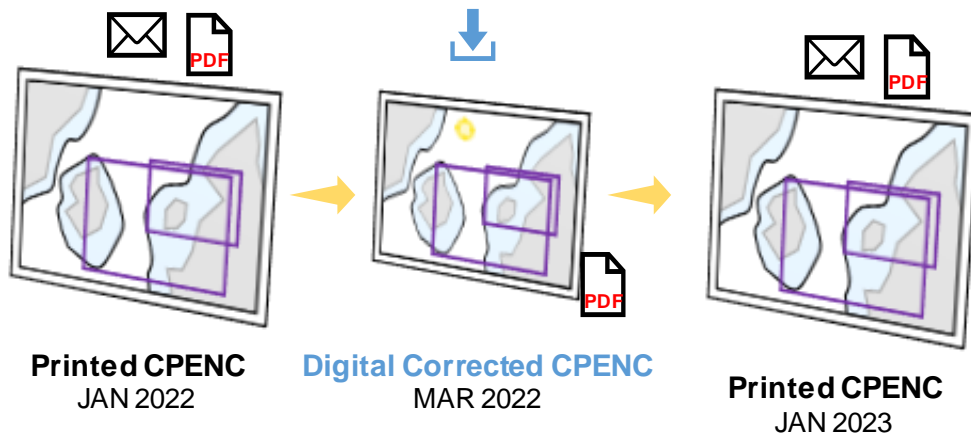
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Certified Printed ENCs (CPENCs) Correction Process

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Rather than receive a list of traditional, textual corrections, that need to be converted to a human-readable (textual), NtM format, and interpreted and plotted by a mariner—

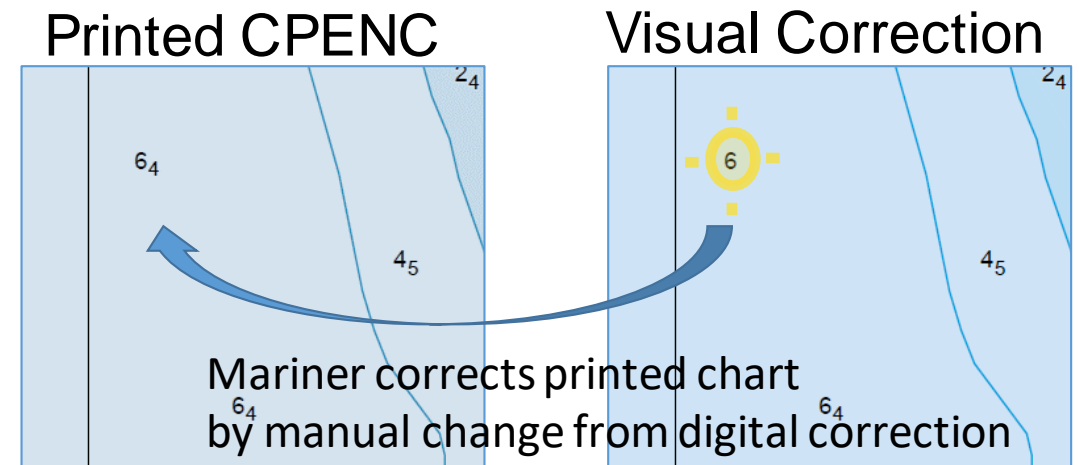
NGA will provide digital Corrected CPENCs with symbolically highlighted changes directly on the most up-to-date view of the ENC between printed CPENC versions.



Graphical/Symbolic Corrections Process

Mariner has the latest view of the ENC in the digital correction CPENC, they always have the latest data for decision making, both critical or non-critical.

Eliminate the separate textural NtM correction production processes – creating HO efficiencies



*Printed CPENC shows sounding of 6.4; **CHANGE** to 6 is highlighted on Digital Corrected CPENC.*



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Planned Activities for 2022-2023

OGC – IHO Federated Marine Spatial Data Infrastructure (FMSDI)

<https://www.ogc.org/projects/initiatives/fmsdi#CFP>

- U.S. supports the OGC - IHO FMSDI-PILOT project
- Project showcasing federated MSDI for the Land/Sea use case in Arctic or other region
- OGC and IHO Standards - testing of relevant S-100 based standards to accelerate the process for adoption and implementation
- Integrating data from multiple sources, authorities, and domains, and evaluating the data interoperability
- Documenting the ease and/or difficulty of discoverability/findability and accessibility of web-based, geospatial data services for the Land/Sea use case
- Evaluating available metadata for its suitability and usability
- Developing a model for federating MSDIs/SDIs

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Other matters of relevance to HCA, particular issues that may require HCA consideration and/or may need to be reported to A-3 (3-year IHO Work Programme, IHO Strategic Plan,...)

- **Recommendations, Actions to be considered by HCA:**
 - Task the ICCWG to consider the work done by the WEND and the ARHC regarding polar grids for S-10x data products and services
 - Note the new U.S. data services in region
 - Note the digital World Port Index (WPI), update as appropriate
 - Provide any comment/feedback on CPENC process
 - Encourage HCA Member States to participate in the OGC Pilot