



# Global Maritime Traffic Density Service (GMTDS): Mapping Global Maritime Vessel Traffic

NGA Maritime Safety Office (SFH)

September 2022

The overall classification of this presentation is:

UNCLASSIFIED

Classified by: N/A

Derived from: N/A

Declassify on: N/A

## (U) Purpose

### Strategic Goal #2: Fuel and Drive the Entire Global GEOINT Community

GMTDS advances beyond unsophisticated visualizations to provide a high quality, pre-processed global data set of vessel densities to fuel the GEOINT Community's maritime safety mission.

- Expands access to critical maritime data for international partners and the public
- Utilizes internationally recognized best practices to characterize vessel activity
- Enables collaborative efforts to monitor and improve global safety of navigation and maritime domain awareness

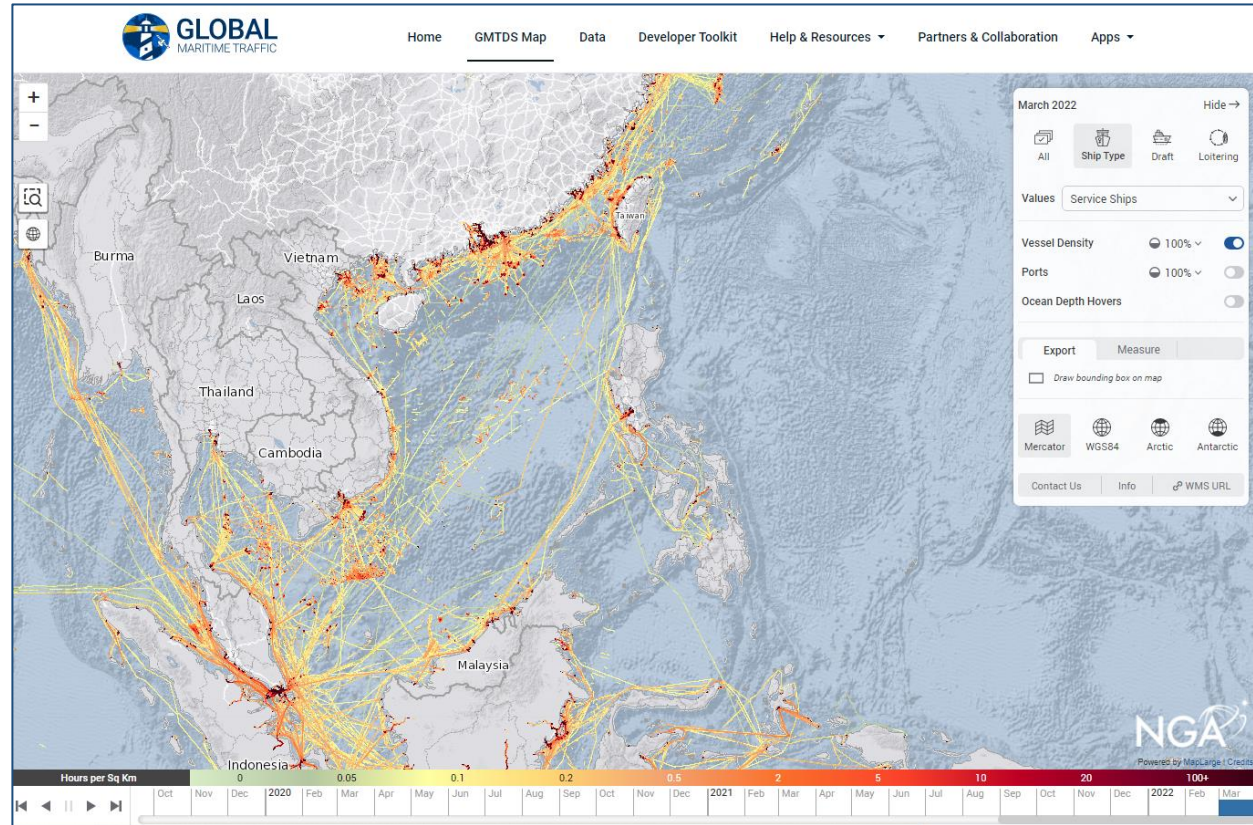
*GMTDS is a service that enables International Maritime Stakeholders to access tangible analysis of evolving marine traffic patterns and provides decision-makers with actionable information to help prioritize ocean areas for nautical product coverage.*



# (U) Development

## User-Centric Design: Beta Testing Feedback and Improvements

- Polar Projections
- Measurement Tools
- Base Map Selection
- Filtering Options
- Iconography
- Time Scale Bar
- Port Congestion App



GMTDS Solves Relevant Hard Problems:

1) Data Source Complexity; 2) Analytic Scaling; 3) Data Sharing

# (U) Stakeholder Collaboration

## OTHER MARITIME & MISSION STAKEHOLDERS

### ***CMTS***

Leverage GMTDS products for promoting Maritime Safety

### ***Navy, Coast Guard, etc.***

Understand how GMTDS fits into existing toolsets and data sources available for maximum mission benefit

### ***Other Fed. Orgs***

NOAA, US-HPC, and other Maritime relevant orgs

## IHO STAKEHOLDERS

### ***INT to GIS Team***

Falls under KHO & Data Centre for Digital Bathymetry. Providing Technical support for INT to GIS integration.

### ***RHCs***

Engagement with Regionally focused groups with specific interest on maritime traffic in various global areas

### ***Conferences & WGs***

Understand how GTMDS may be briefed and received by various conference & working groups within the IHO

## NGA STAKEHOLDERS

### ***GMTDS PMO***

Responsible for overall program execution and requirement prioritization for future missions

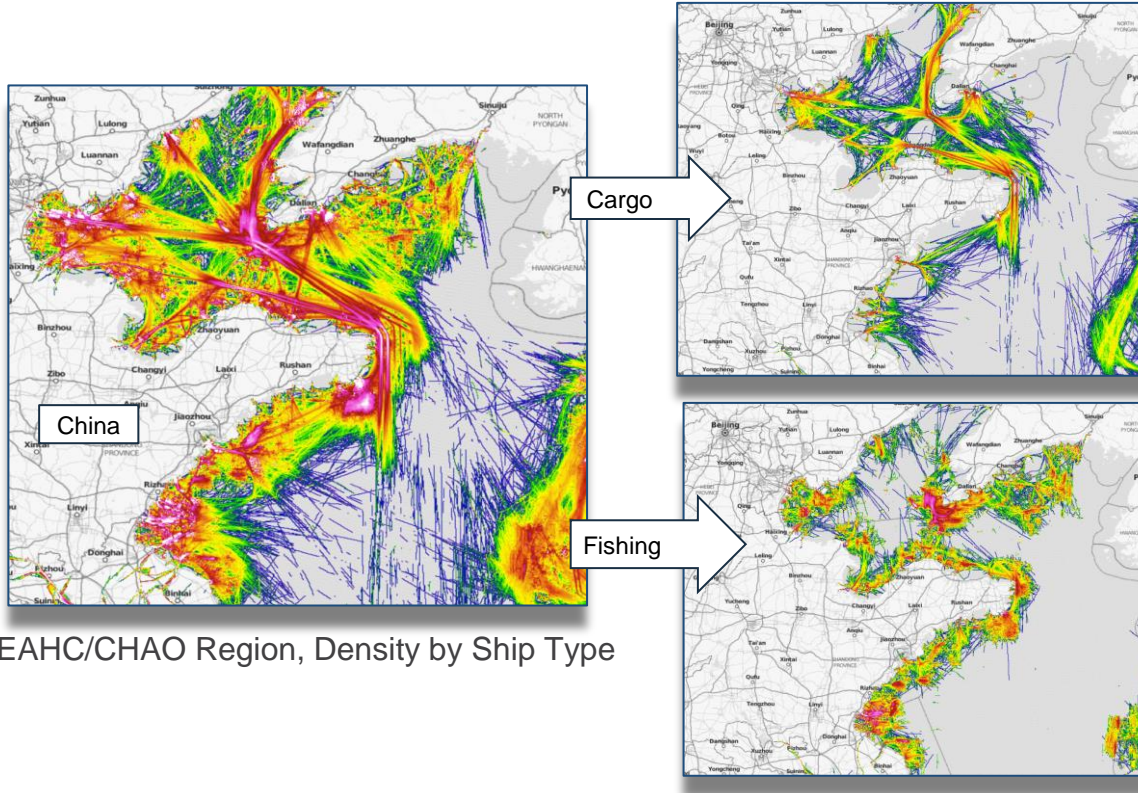
### ***SFH Mission Users***

Engage Analysts and Leads for NGA Maritime Safety Office organizations for product creation

### ***Other Mission Users***

Engagement with Analysis and Technology stakeholders promoting NGA internal & external engagement

# (U) Access: GlobalMaritimeTraffic.org



EAHC/CHAO Region, Density by Ship Type

Region name and location as indicated by the IHO Online Catalogues, <https://iho.int/en/iho-online-catalogues>

Program is open access and the data can be shared with colleagues, academics, foreign partners, etc.

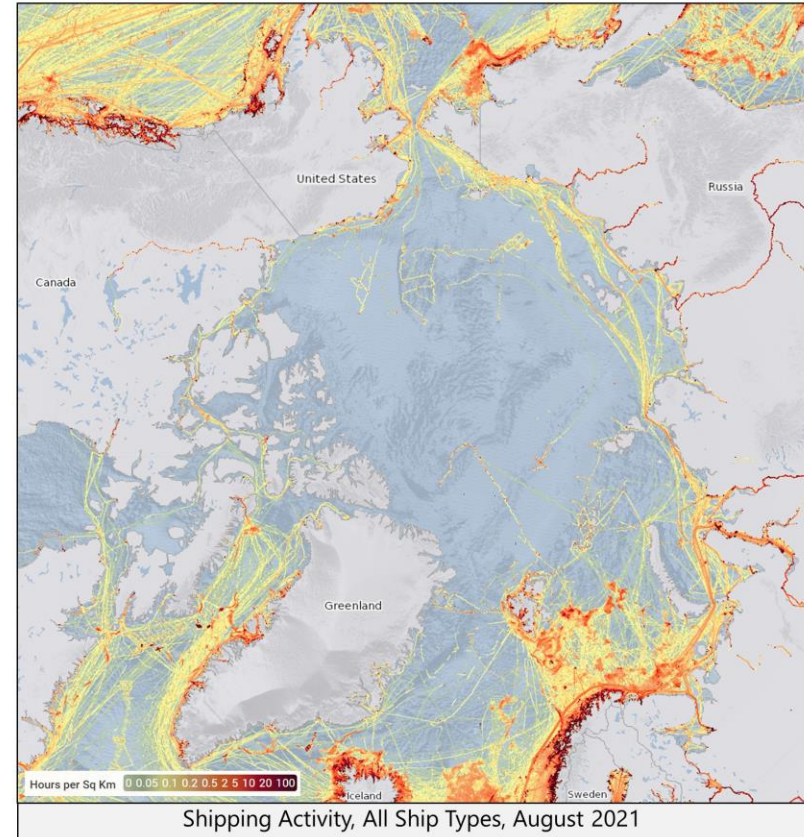
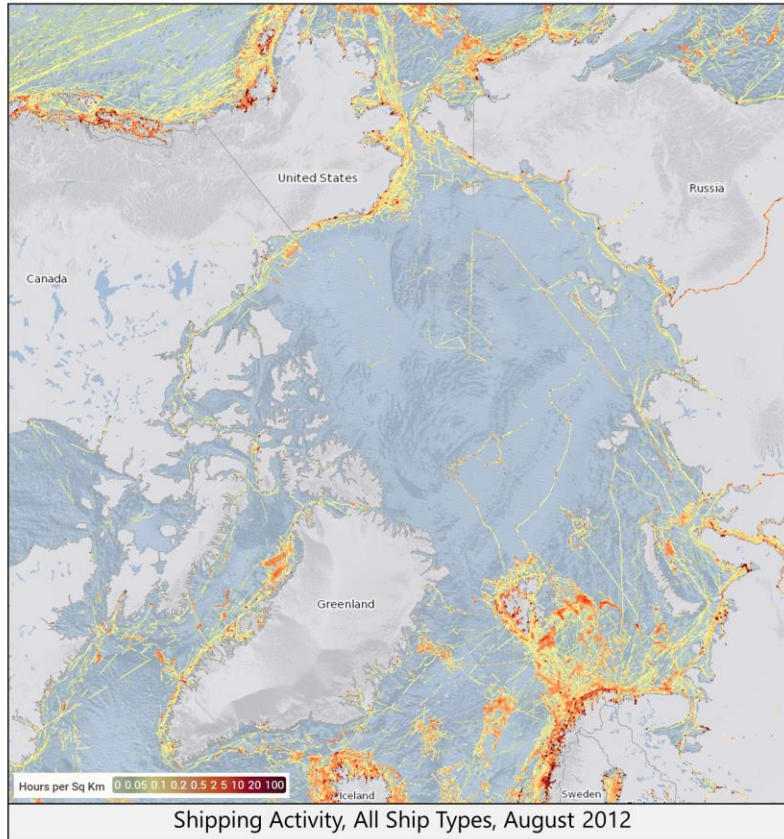
Beyond web map, data available for further analysis and GIS uses.

Data:  
GridFloat  
TIFF  
NetCDF  
WMS enabled  
API enabled



# (U) Use Example #1

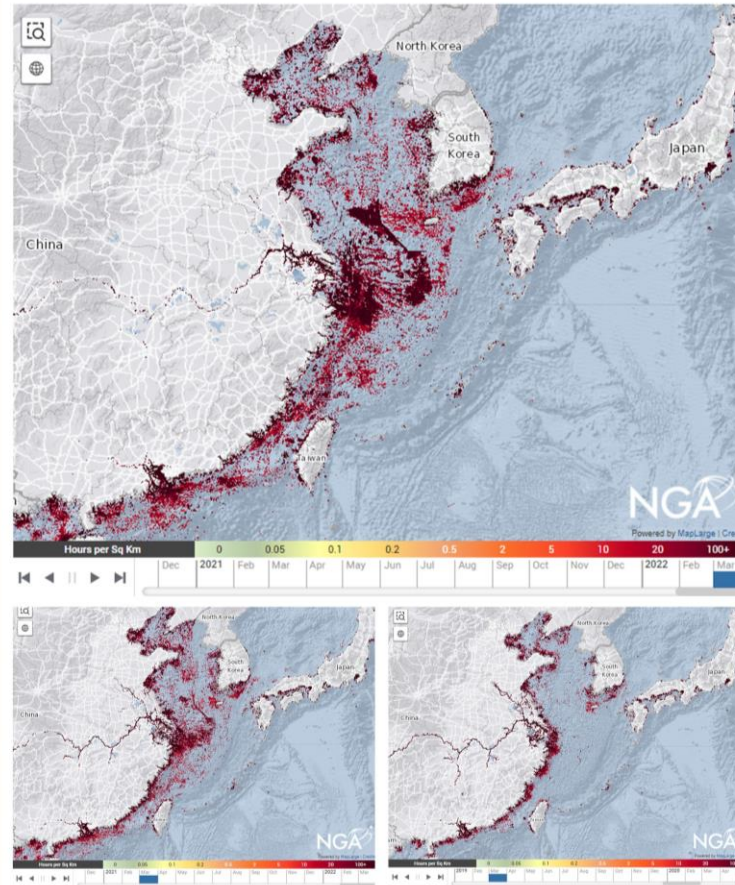
## Circumpolar Shipping, All Ship Types, August 2012 & August 2021



Map visualization depicts total ship hours (ShHr) of activity per square kilometer ( $\text{km}^2$ ), not absolute ship numbers or counts. The increase in  $\text{ShHr}/\text{km}^2$ , as well as geographic distribution of ship activity, is clearly identifiable between the circumpolar map from August 2012 compared to August 2021.

## (U) Use Example #2

### (U) Supply Chain Disruptions, Ship Loitering Behavior in East Asia



(U) Attributed mainly to COVID-responses, global supply chain disruptions have led to dramatic changes in ship loitering activity patterns. Processed AIS from the GMTDS indicates a clearly visible increase in ship loitering intensity and geographic distribution during March 2022 when compared to March 2021 (mid-COVID) and March 2019 (pre-COVID). The worsening of supply chain delays can be characterized by the changes to ship behavior.

(U) Top: East Asia, all ship-types, March 2022; Bottom Left: East Asia, all ship-types, March 2021; Bottom Right: East Asia, all ship-types, March 2019

(U) Sources: Global Maritime Traffic Density Service (<https://globalmaritimetraffic.org/gmtds.html>); Financial Times

**“About 12 percent of all goods shipped worldwide were stuck on stationary ships [in March 2022.]”**

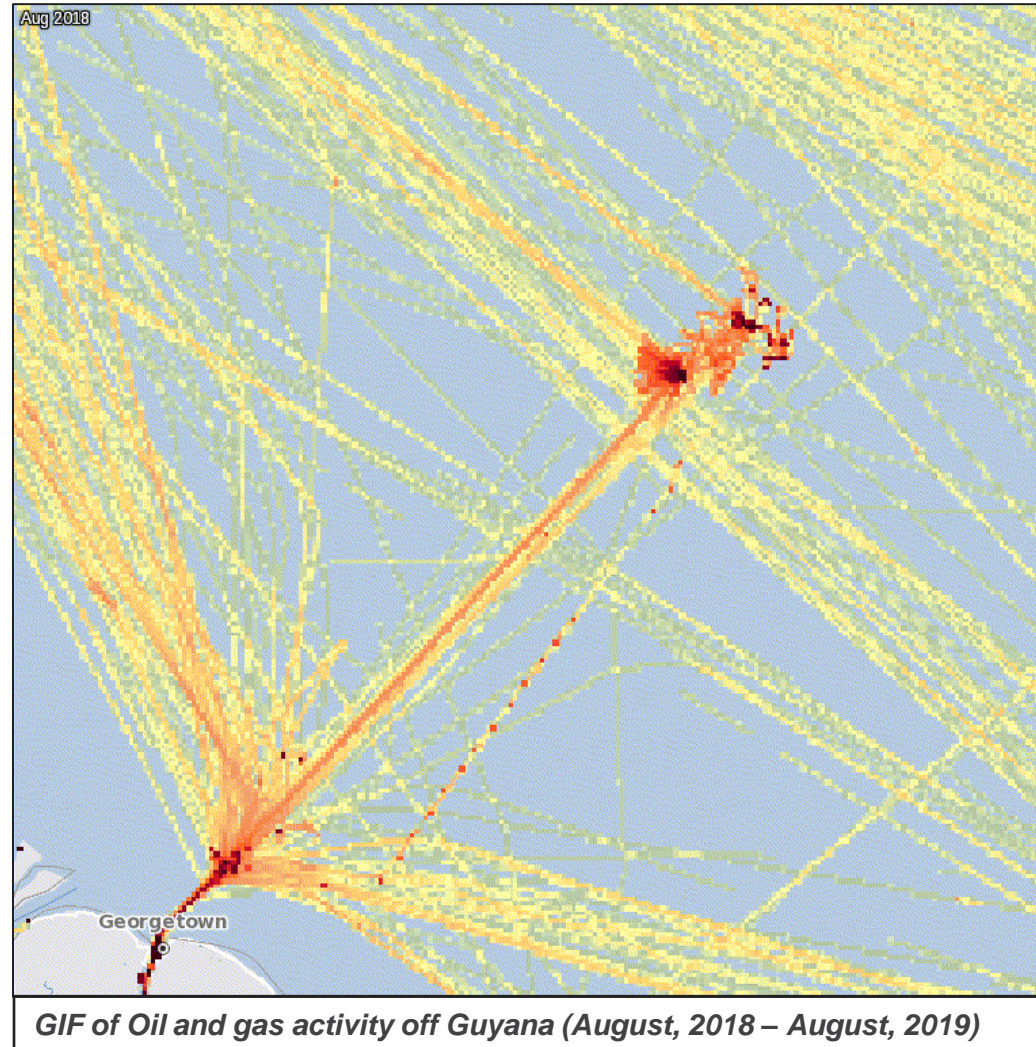
- Financial Times, Trade Secrets newsletter



## (U) More than a product

- **User-informed features continue to be explored and incorporated**
- **GMTDS is under constant improvement with diverse sources of funding both internally and externally.**

GMTDS is a living proof of concept for NGA that AGILE development methods can be implemented into contracts. The GMTDS development/sustainment model is scalable and can be leveraged to create dynamic GEOINT enterprise solutions in support of NGA strategic goals, evolving rigid processes.





## (U) Questions?



Access GMTDS at: <https://globalmaritimetraffic.org>

Contact the team at: [GMTDS@nga.mil](mailto:GMTDS@nga.mil)