



NHH



Emissions and maritime
operations monitoring within
Panamanian waters

MTCC Latin America Pilot Project 3

Gabriel Fuentes

Agenda

- Overview of the monitoring system and its purpose
- Statistics as support to emissions reduction
- Next challenges



Source: straittimes.com

NHH



Highlights

Highlights

- A pioneering dashboard focused exclusively on port activities related to vessels (Scope 3)
- Vessel transiting the canal emitted approx. 30 million tonnes of CO₂e in 2020 (pre transit + transit + post transit emissions)



RESEARCH

- Emissions inventory per port
- Emissions benchmark
- Policy implementation



APPLICATION

- Updated daily
- Automatic feed from UN Global Platform AIS data



INFORMATION

- Measures from proprietary algorithms (based on big data and machine learning)
- Emissions estimation based on 4th IMO GHG report methods
- Tested methods for QA
- Filtered by date, vessel type, port, etc.



NHH



MOTIVATION



4th IMO GHG study domestic emissions not segregated at the country level



Analyze the effect of Panama being coordinator of just in time arrivals



Create solutions scalable on demand to other interested parties



Knowledge creation and knowledge transfer to other MTCC and UN Big Data partners



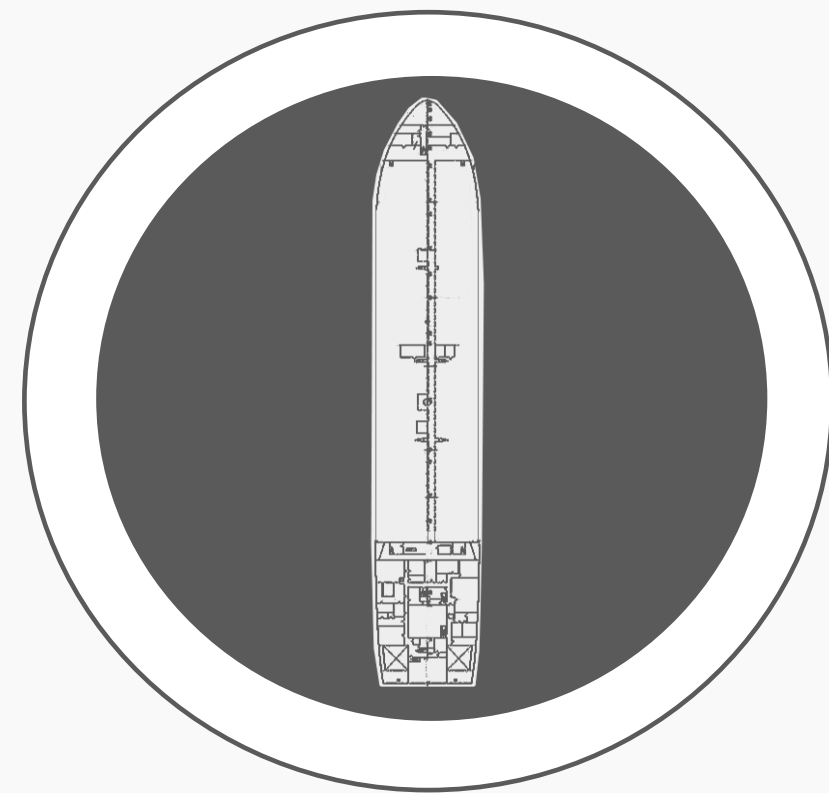
Use the generated statistics as a research resource



Support with evidence for policy creation



METHODOLOGY



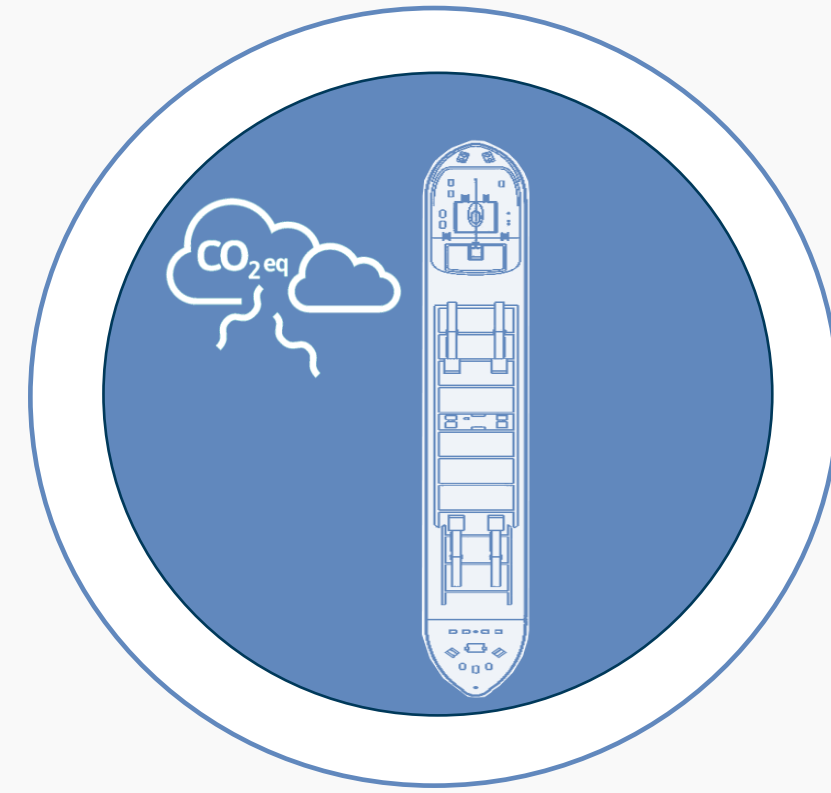
VESSELS VISITING PANAMA

AIS BIG DATA HANDLING
UN Global Platform



ANCHORING, STOPS AND TRANSITS RECOGNITION

MACHINE LEARNING
ALGORITHM



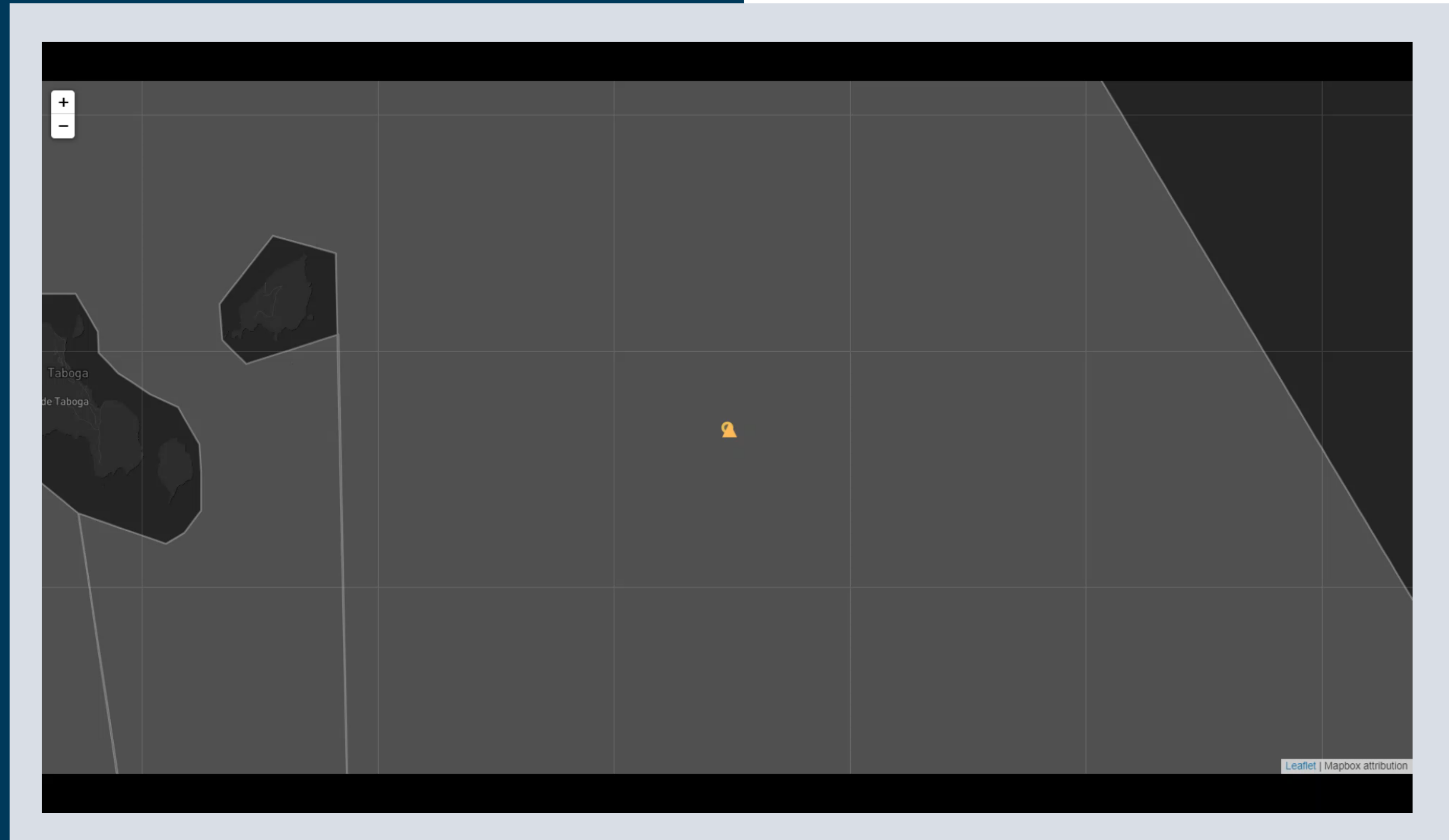
GHG EMISSIONS ESTIMATION

4th IMO GHG REPORT
METHOD

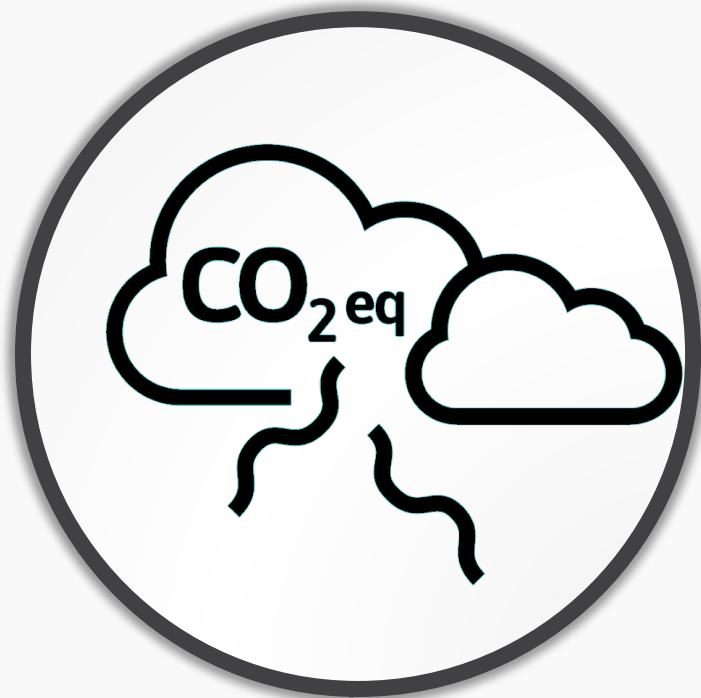
NHH



POWER OF ONE VESSEL INFORMATION



RESULTS



CO₂, CH₄ and N₂O emissions



Service times



Waiting times



Emissions heatmap



PANAMA CANAL CASE STUDY

The study looks at the impact of reducing speed on GHG emission on maritime chokepoints

Main findings

- A simple change in their scheduling policy could reduce up to 2 million tonnes of CO₂e annually, utilizing four distinct strategies.
- Speed reduction implemented by a canal leverages some of the barriers of implementation documented for ports (i.e., split incentives, rush to wait, utmost dispatch, etc.)
- The Panama Canal has the potential to join the Green Corridor (Getting to Zero Coalition) with Busan Port and NY/NJ and would rank 6th in terms of carbon footprint impact.



NEXT CHALLENGES

MTCC LatinAmerica Dashboard



Expand the monitoring area



Create an API system, reduce latency and user sessions (GDPR or similar under study)

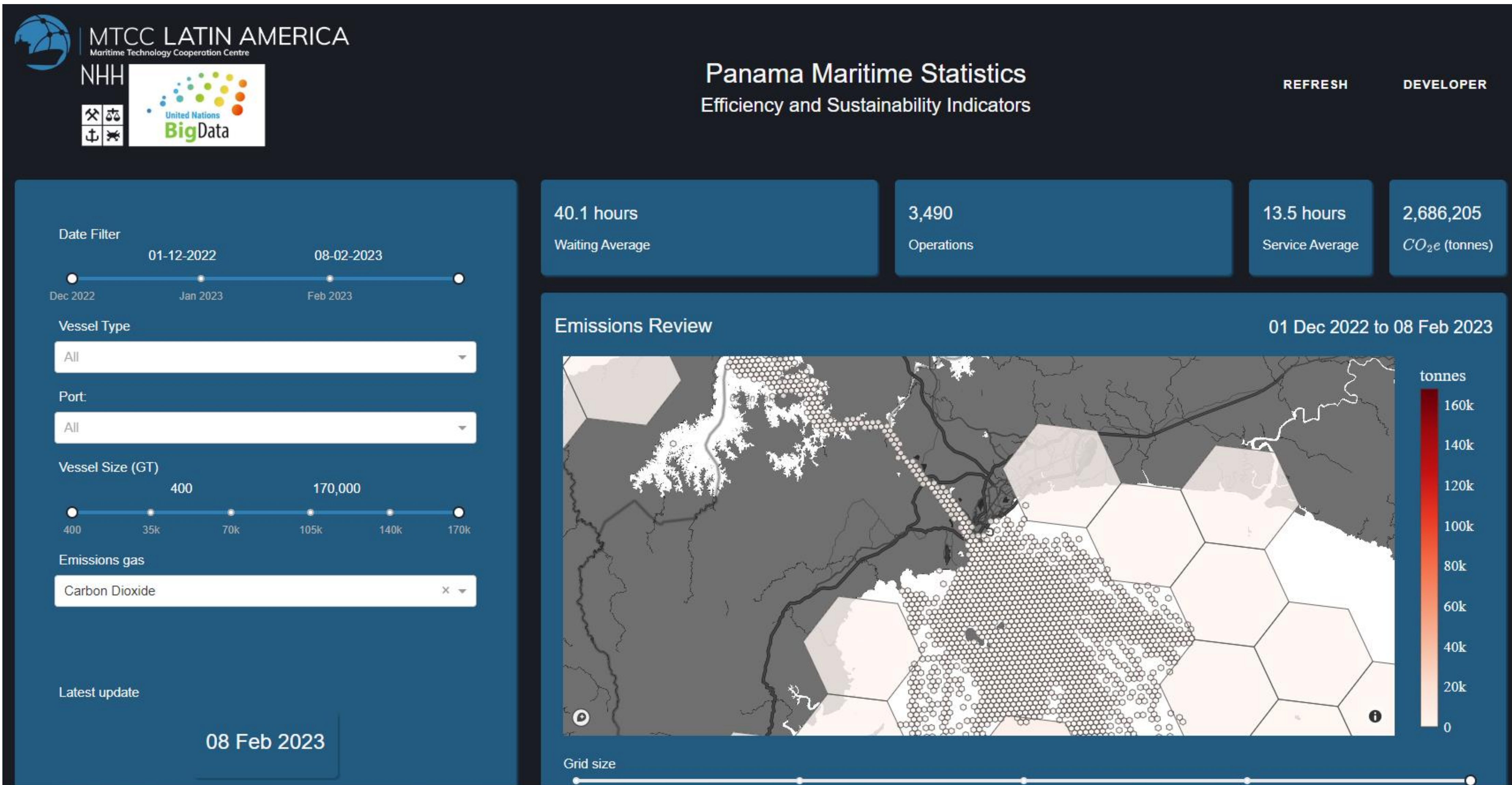


Voyage optimization

NHH



For additional information visit:



<https://stats.mtcclatinamerica.org>

NHH



This project stems from the cooperation of UN Big Data,
MTCC Latin America and the Norwegian School of
Economics

THANK YOU

gabrielfuentes.org