GSTS®

Navigate Tomorrow Today

AAPA

ESSENTIAL. RESILIENT. UNITED.

SEAPORTS DELIVER

# Enhancing Environmental Transparency Towards Sustainability With OCIANA®

**Krista Foster, Director of Products, GSTS**

**Scott MacPhee, Commercial Account Manager, GSTS**

May 1, 2025

GLOBAL SPATIAL TECHNOLOGY SOLUTIONS INC. ("GSTS") PROPRIETARY AND CONFIDENTIAL. The information which appears herein is proprietary and confidential and the property of GSTS. It is submitted for the sole purpose of enabling assessment thereof by the recipient and must be maintained in confidence, protected and not disclosed to any person or used for any other purpose without the prior written consent of GSTS.

# Agenda

01 About GSTS

02 About OCIANA®

03 Digitization, Collaboration & Decarbonization with OCIANA®

- Collaborative Optimisation Solution (COS)
- Environmental Performance Management (EPM) Toolkit

# About GSTS

# About GSTS

- Global maritime company spun out of a Canadian space company that developed the world's first commercial global maritime monitoring satellite.
- **FOCUS:** Delivering predictive AI-powered solutions to solve major challenges faced by the maritime industry
- **SPECIALTY:** Customer-focused technical team intent on developing solutions in support of maritime safety and security, supply chain resilience and climate change using innovative data collection and analysis techniques and leveraging advanced AI technologies to adapt to a dynamic maritime environment
- **SOLUTION:** Proprietary SaaS platform, OCIANA®, designed to enhance real-time decision making and enable collaboration across the maritime industry

# About OCIANA®

# OCIANA®: Maritime Collaboration Platform

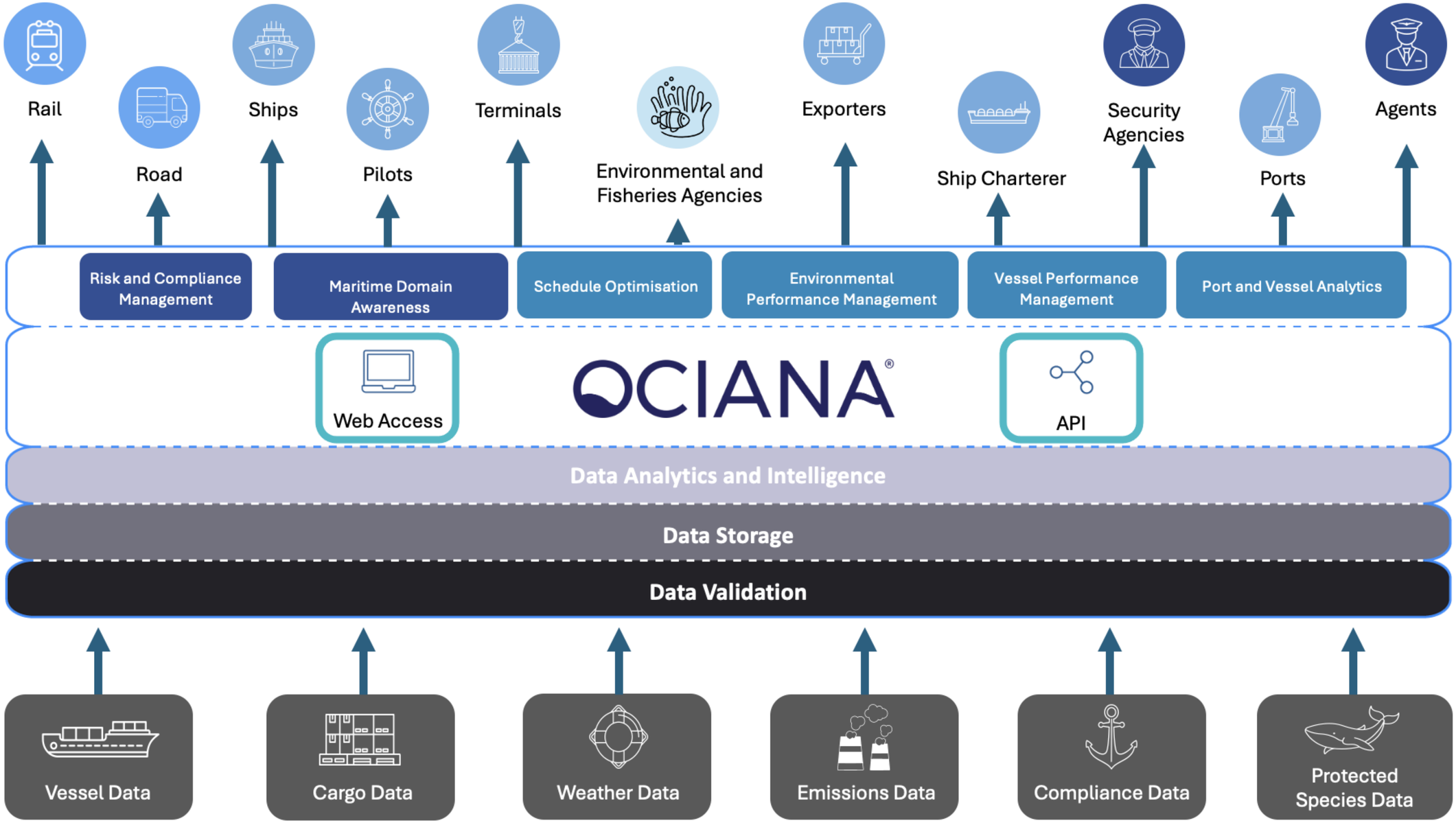
OCIANA® incorporates the latest developments in Artificial Intelligence and Big Data Analytics to improve maritime situational awareness and provide real-time decision-making intelligence.

## Multi-Source Data Analytics

- Designed to ingest a wide range of data sources including global AIS data, an array of satellite imagery and third-party datasets
- OCIANA® spatially and temporally correlates the data and employs AI algorithms
- Output from the AI/ML trained models can be accessed through the web-based UI or API supporting data interoperability

## Partner Communication

- Embedded communications channel enables multiple users to share information in real time
- Advanced chat and collaboration tools facilitate coordinated response
- Rooted in data governance - data quality, data stewardship, data protection and data management


Rail
Road
Ships
Pilots
Terminals
Environmental and Fisheries Agencies
Exporters
Ship Charterer
Security Agencies
Ports
Agents
Risk and Compliance Management
Maritime Domain Awareness
Schedule Optimisation
Environmental Performance Management
Vessel Performance Management
Port and Vessel Analytics
Web Access
OCIANA®
API
Data Analytics and Intelligence
Data Storage
Data Validation
Vessel Data
Cargo Data
Weather Data
Emissions Data
Compliance Data
Protected Species Data

Route Optimization

Emission Management

Anchor Management

Berth Optimization

Environmental Management

Compliance Management

Protected Species Management

Supply Chain Optimization and Resilience

Risk Management

OCIANA®

Maritime Collaboration Platform

- Vessel Data
- Cargo Data
- Weather Data
- Emissions Data
- Compliance Data
- Protected Species Data

- Ships
- Environmental & Fisheries Agencies
- Terminals
- Ports
- Pilots
- Exporters
- Security Agencies
- Forwarder

# Industry Collaboration

5+ years of successful collaboration with key maritime players resulting in several capabilities targeted at streamlining vessel berthing to support Just-in-Time Arrivals and Green Voyages.

## Port Arrivals

- ETA Prediction – accurately predict ETA of all vessels arriving at port
- Intelligent Geofences – automatically receive alerts and updated ETA predictions when ships cross pre-defined checkpoints

## Port Performance and Optimisation

- Port Analytics – provide current wait times and traffic conditions
- Schedule Optimisation Planner – explore a set of feasible sequences to process operations based on the optimal allocation of port resources

## Environmental Performance Management

- GHG Emissions Calculator – calculate carbon footprint within port boundaries
- Digitized Trade Routes – tabulate emissions for all vessels globally; report on vessel voyages between two or more ports where Green Shipping Corridors are established

GSTS®
Navigate Tomorrow Today

# Customers & Collaborators

PORT MONTRÉAL

Transport Canada
Canada

GREAT LAKES
ST. LAWRENCE
SEAWAY SYSTEM

CSA ASC

CANADIAN SPACE AGENCY
AGENCE SPATIALE CANADIENNE

SALUTI PRIMUM AUXILIO SEMPER

Port of New York & New Jersey

CSL

PORT of vancouver
Vancouver Fraser Port Authority

PORT TROIS-RIVIÈRES

PORT QUÉBEC

NRC·CNRC Canada

CENTRE POUR LE TRANSPORT MARITIME RESPONSABLE
ClearSeas
CENTRE FOR RESPONSIBLE MARINE SHIPPING

Canada Border Services Agency

# OCIANA®

## Collaborative Optimisation Solution

# Ocean Supercluster Project

- Awarded a **$12M two-year contract** to advance the capabilities of OCIANA® to enable all stakeholders involved in the port call process to improve efficiency and sustainability of maritime operations

- OCIANA's latest capability, the **Collaborative Optimisation Solution** will connect ports, terminals, ships, waterways and pilotage authorities via a common platform to:
  - Bring together operational data – currently stored in separate systems – **to facilitate data sharing and empower maritime collaboration**

- Based on IMO standards, OCIANA will:
  - Enable seamless data exchange between various systems
  - Ensure interoperability with various systems
  - Streamline processes for vessel reporting

# OCIANA® Collaborative Optimisation Solution

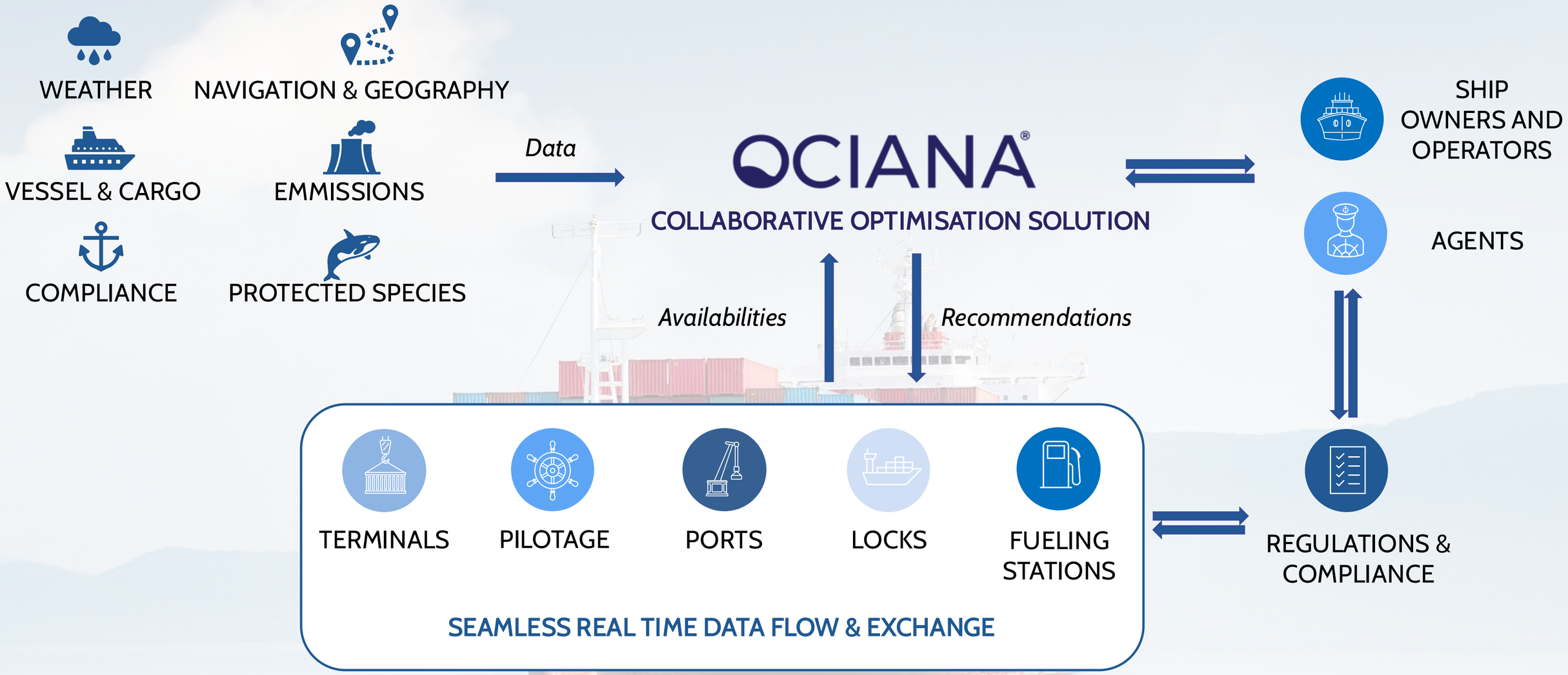
## Optimizing Ports Calls and Supply Chain Operations through AI Predictive Insights

- Allowing for the sharing of real-time data, coordinated planning and enhanced decision-making through Just-in-Time Port Call Open API specifications

Facilitating JIT Arrivals aimed at:

- Enabling ships to optimise steaming speed, thereby lowering fuel consumption and reducing emissions
- Minimizing waiting times and maximizing operational efficiency across the maritime industry

# OCIANA®: Maritime Ecosystem Optimization



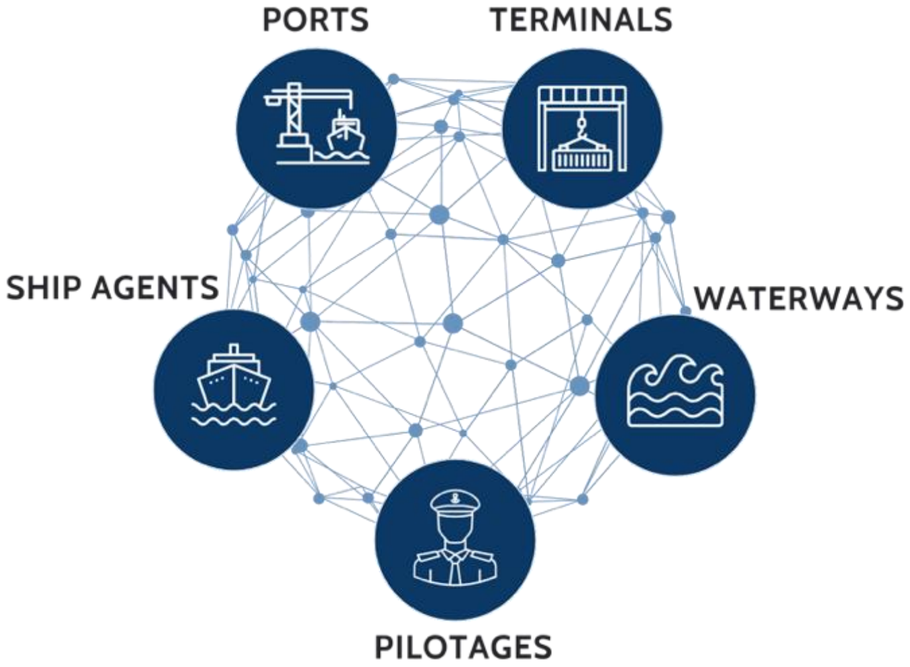
# Key Objectives

## Connect all stakeholders via a common platform, OCIANA® to:

- Receive more accurate information on vessel movements and resource delays in real-time
- Leverage data insights to enhance planning and coordination and streamlining vessel berthing
- Provide decision-making intelligence for dynamic environments
- Support route optimization toward green voyages

# Expected Outcomes

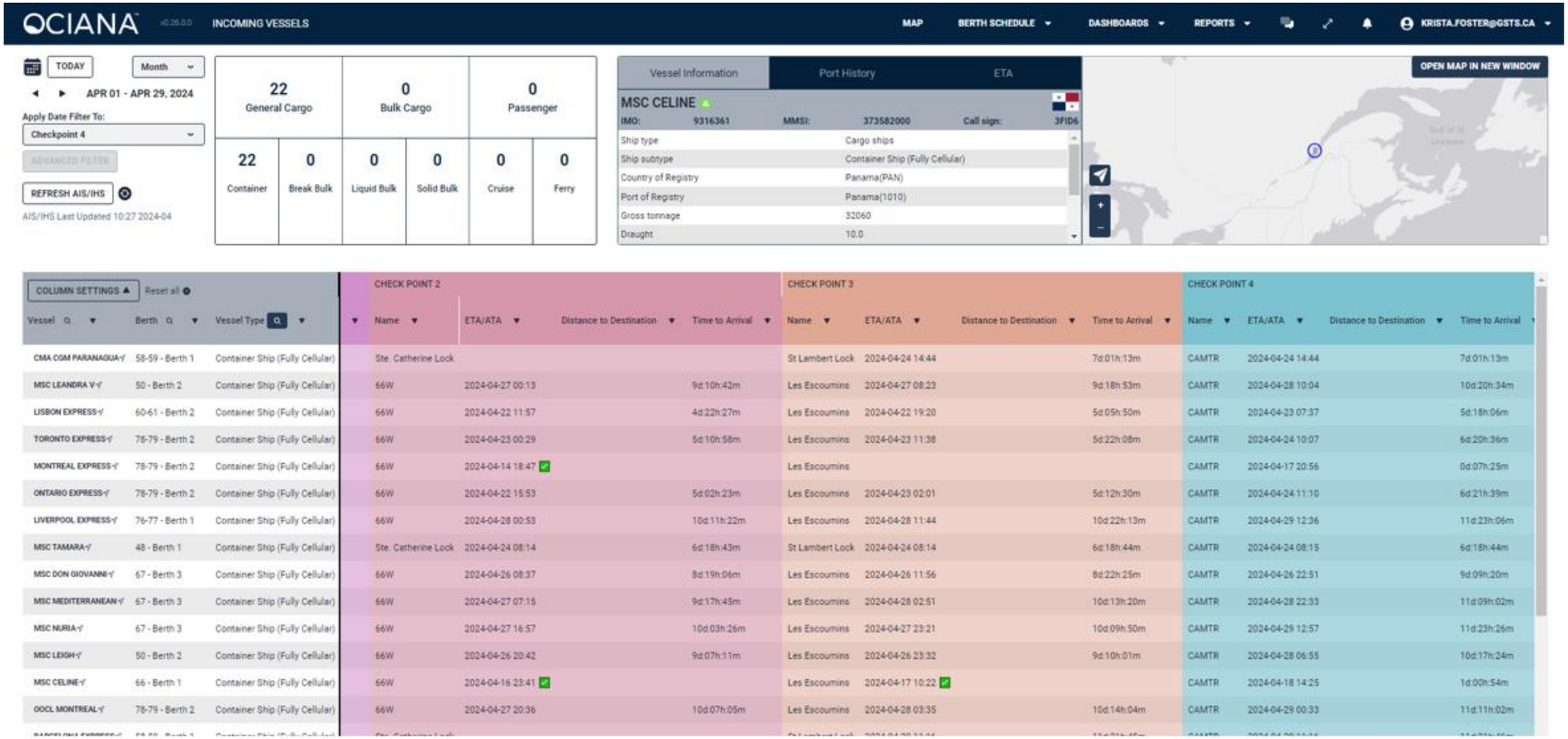
- Reduction of delays for all maritime stakeholders
- Improved transit times for ships
- Reduced fuel consumption and inherent reduction of GHG from JIT Arrival
- Human resource schedule optimization through improved planning and coordination
- Optimization of berth occupancy
- Long-term anticipated enhanced intermodal coordination



# OCIANA's Collaborative Optimisation Solution - Screens

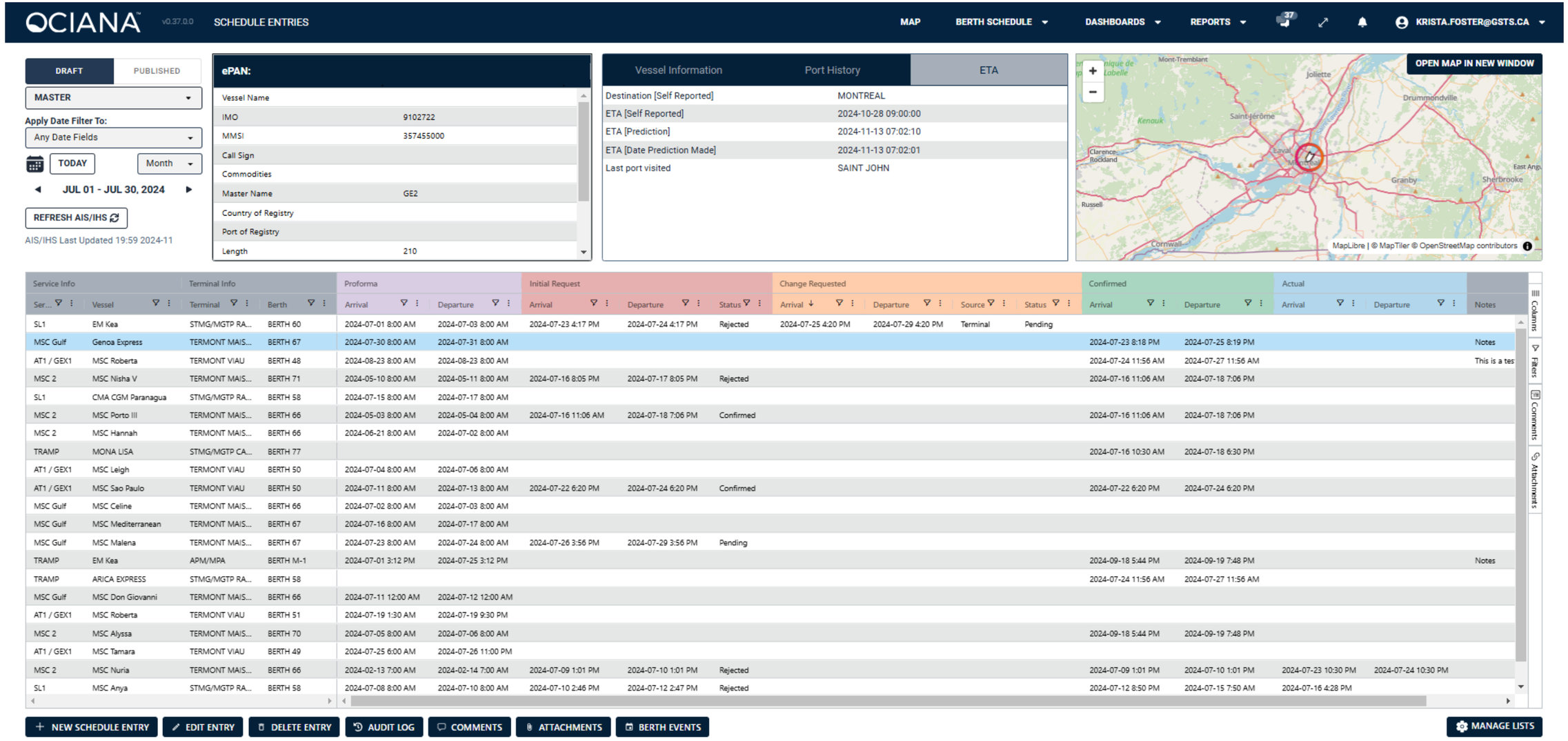
# Incoming Vessels Screen

## Leveraging OCIANA's ETA Prediction & Intelligent Geofences



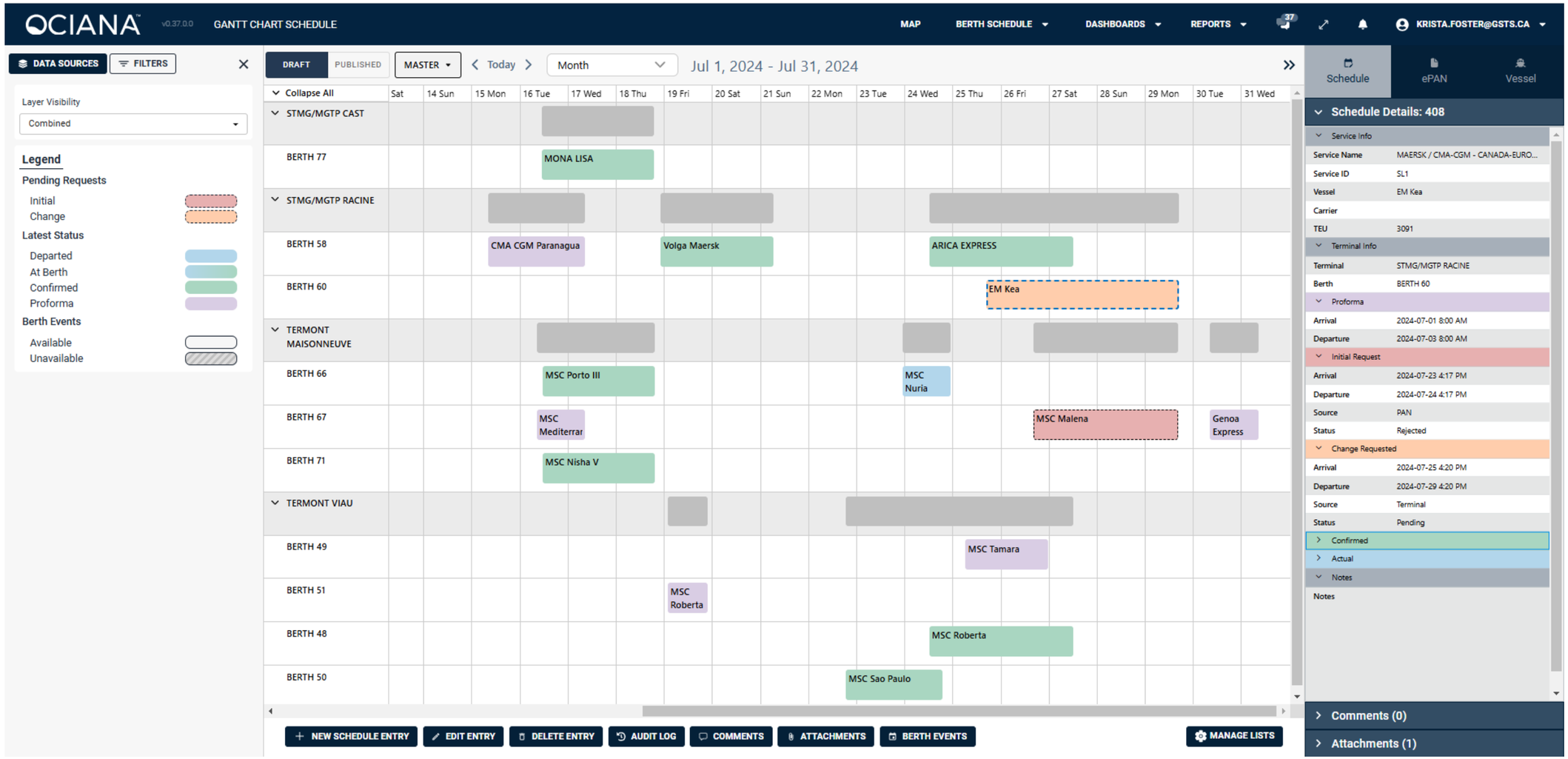
# Schedule Entries Screen

## Leveraging OCIANA's Port Analytics



# Gantt Chart View of Collaborative Optimisation Solution

## Leveraging OCIANA's Embedded Communications Channel and Advanced Collaboration Tools



# Enhanced Pre-Arrival Notification

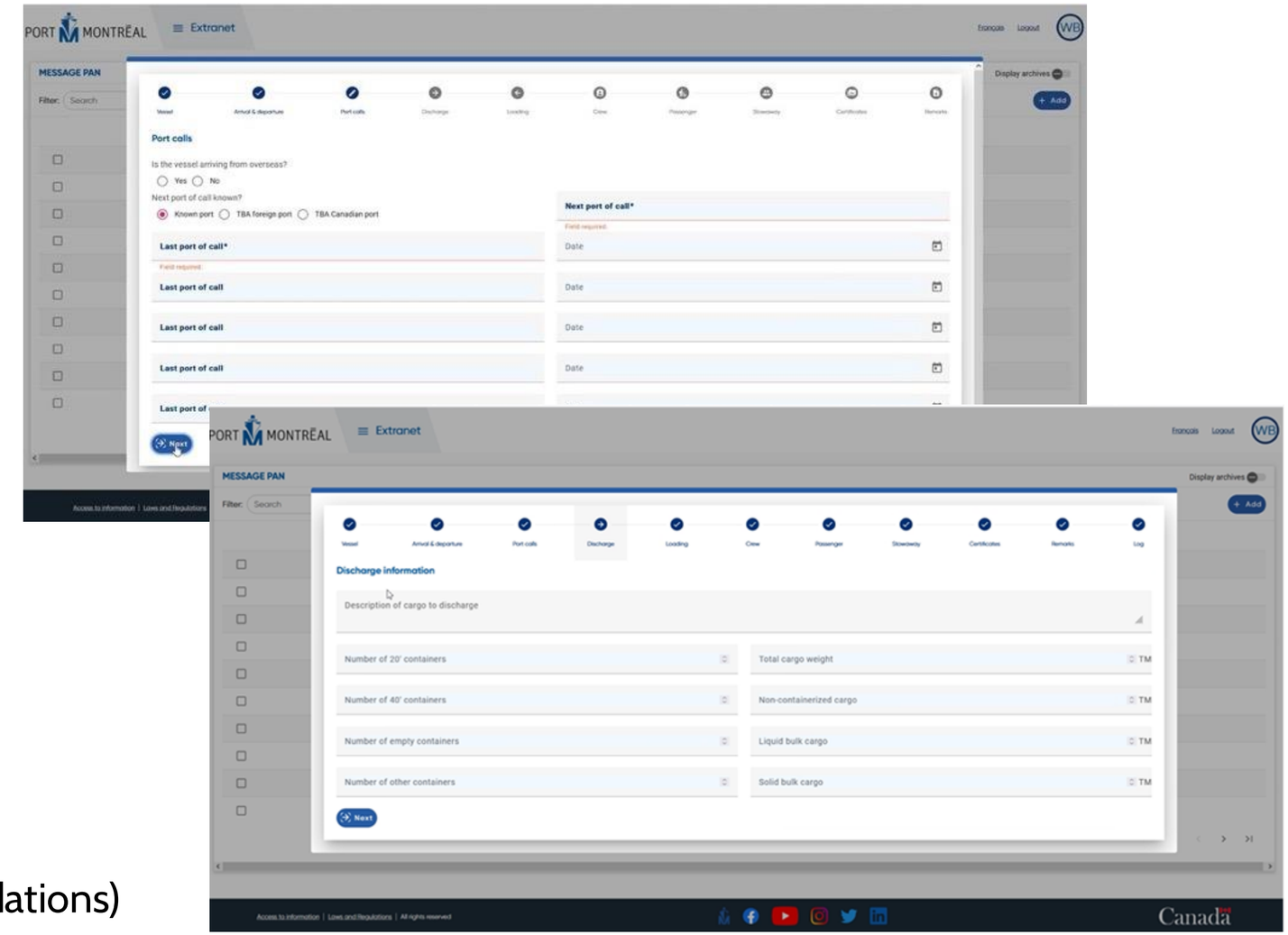
**Basic Booking Request:**

- Service Selector (if applicable)
- Vessel Information
- Arrival & Departure
- Notes & Submit

**Electronic Pre-Arrival Notice:**

- Port Calls
- Discharge  & Loading Information
- Crew
- Passengers
- Stowaways
- Certificates
- Notes & Submit

**Voyage Planning Form** (Pilot recommendations)



OCIANA®

# Environmental Performance Management (EPM) Toolkit

# OCIANA® Environmental Performance Management Toolkit

## Improving Global Decarbonization Efforts through Environmental Transparency

- Allowing for digital collaboration across all maritime stakeholders to action real time information to develop strategies for reducing emissions, improving fuel efficiency and enhancing overall vessel operations

Facilitating **Green Digital Shipping Corridors** aimed at:

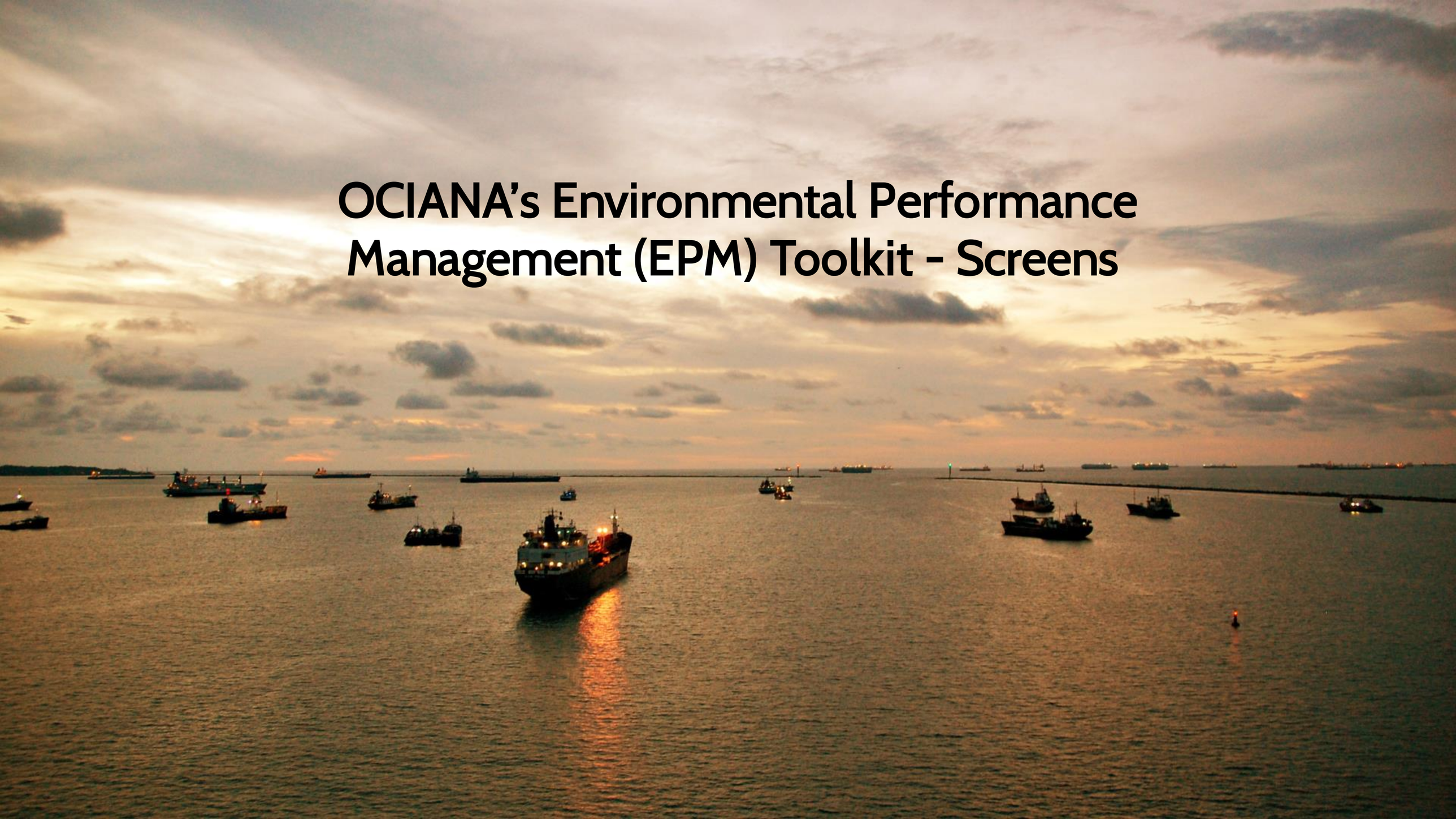
- Enabling real-time monitoring and optimization of shipping corridor performance.
- Identifying solutions to increase operational efficiency essential for achieving global sustainability goals and complying with IMO regulations.

# Key Benefits

## Emissions Measurement, Reduction, and Compliance

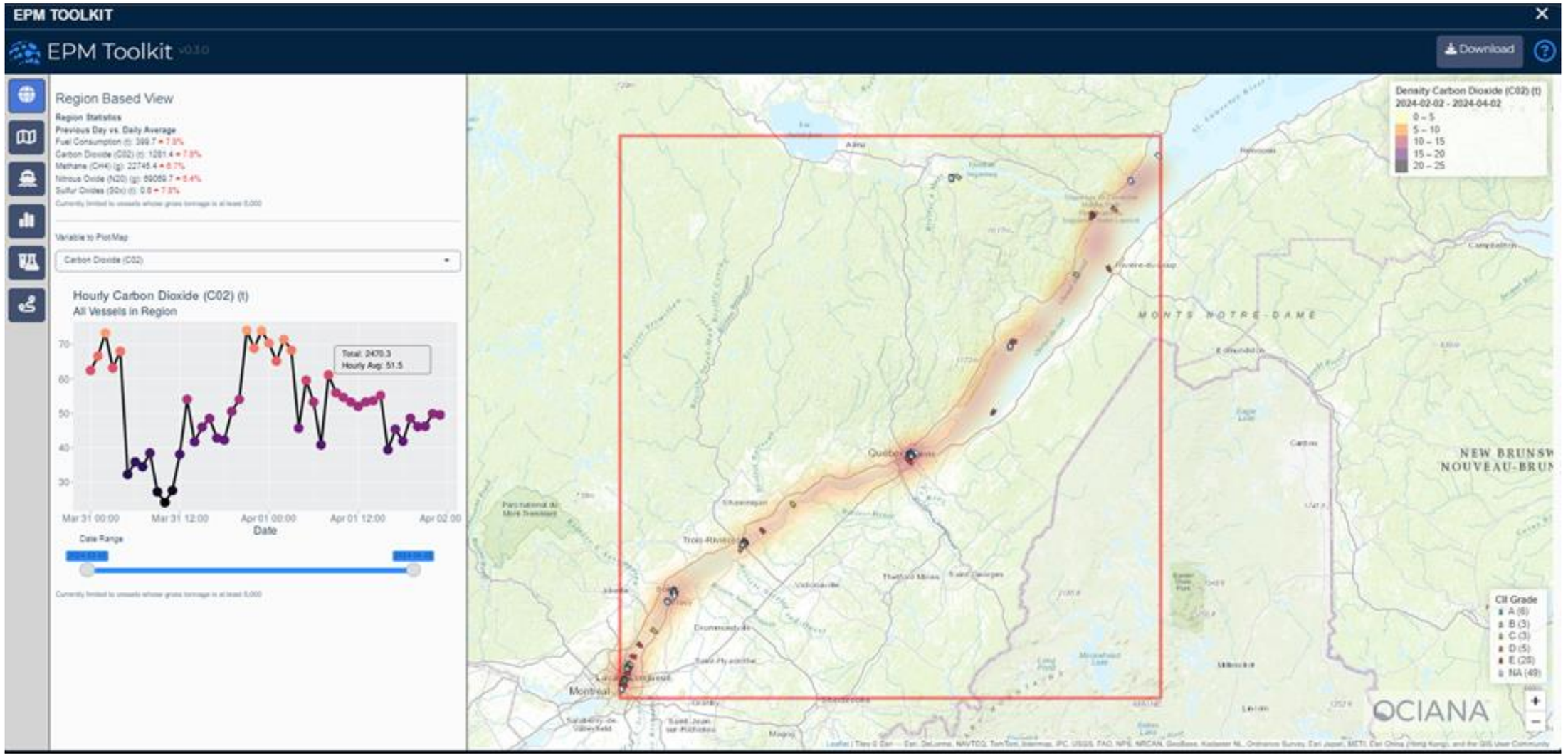
- Real-time, global monitoring and analysis of fuel consumption, greenhouse gas emissions and voyage performance
- Assess historical trends in efficiency and decarbonization and derive actionable insights to optimize vessel and port performance
- Leverage data visualization and machine learning to identify inefficiencies and implement emissions reduction strategies and optimize shipping corridor performance.
- Aggregate emissions at different levels and present them in the context of efficiency metrics (e.g., carbon intensity)
- Track compliance with regulations like the International Maritime Organization's Carbon Intensity Indicator (CII) and Energy Efficiency Existing Ship Index (EEXI)

# OCIANA's Environmental Performance Management (EPM) Toolkit - Screens



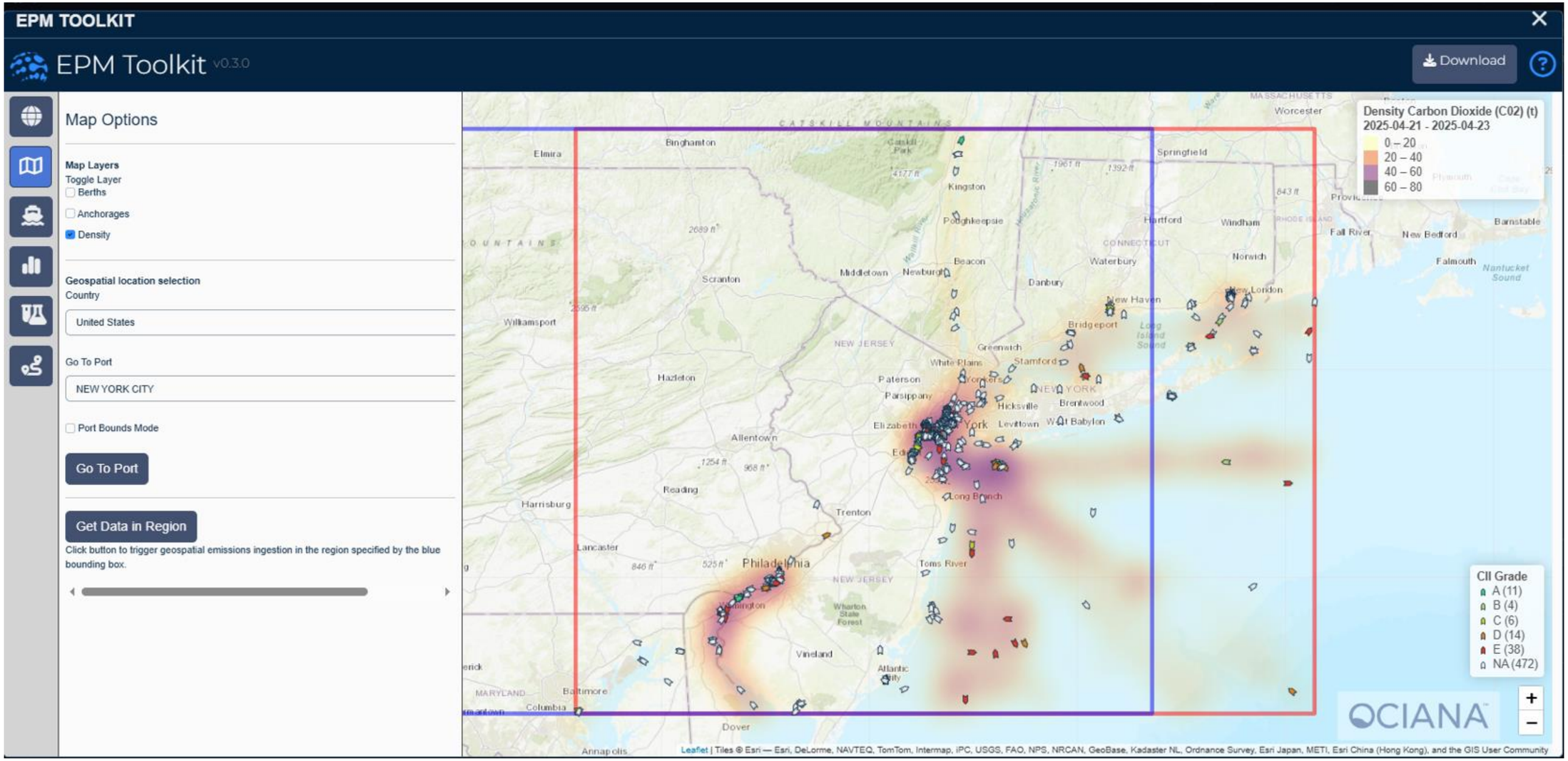
# OCIANA® EPM Toolkit: Region View

Current and historical emissions and fuel consumption for vessels in a geographic region, such as a port.



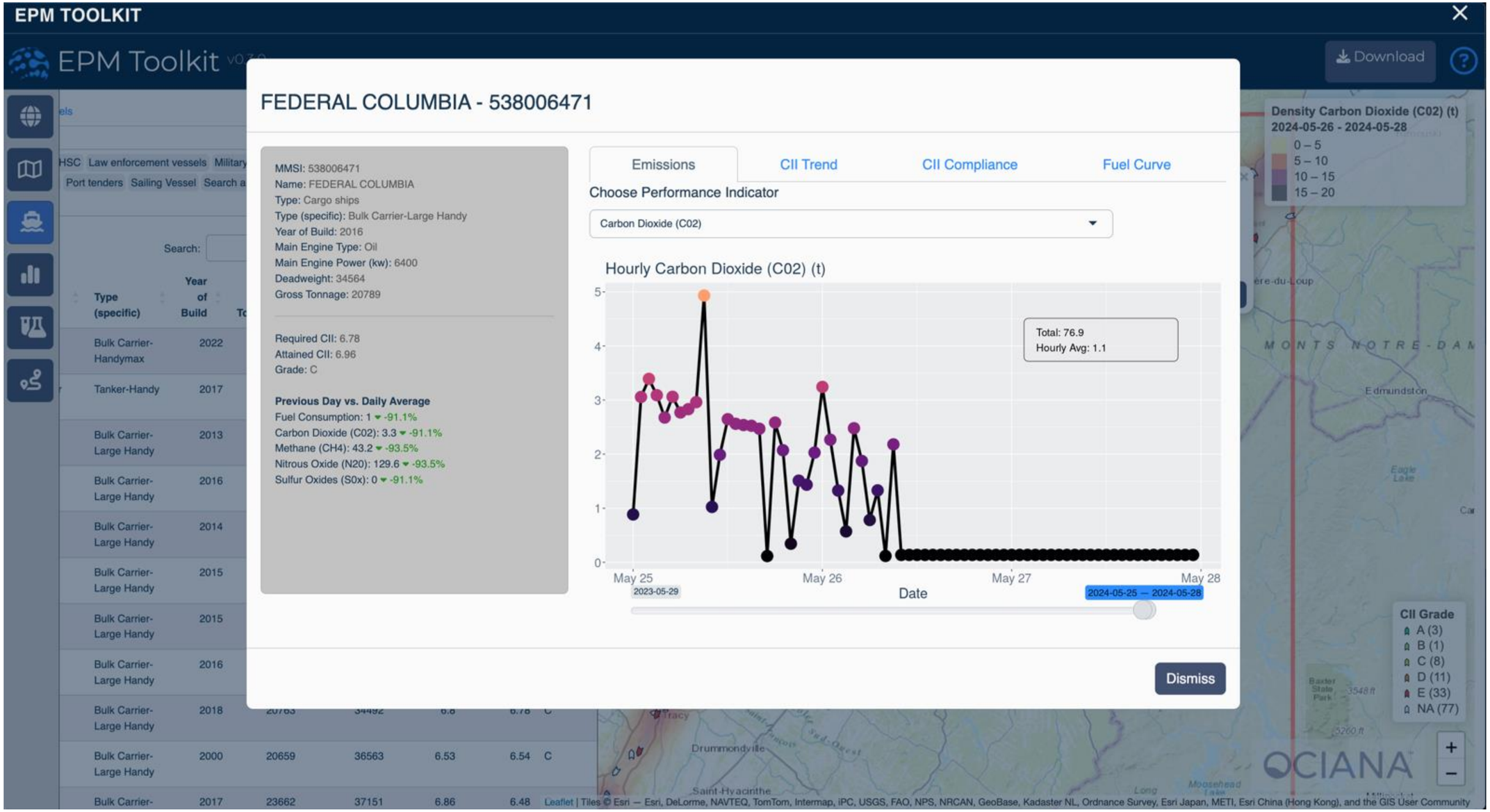
# OCIANA® EPM Toolkit: Map Options

Options for changing the data in the map or changing the Region of Interest.



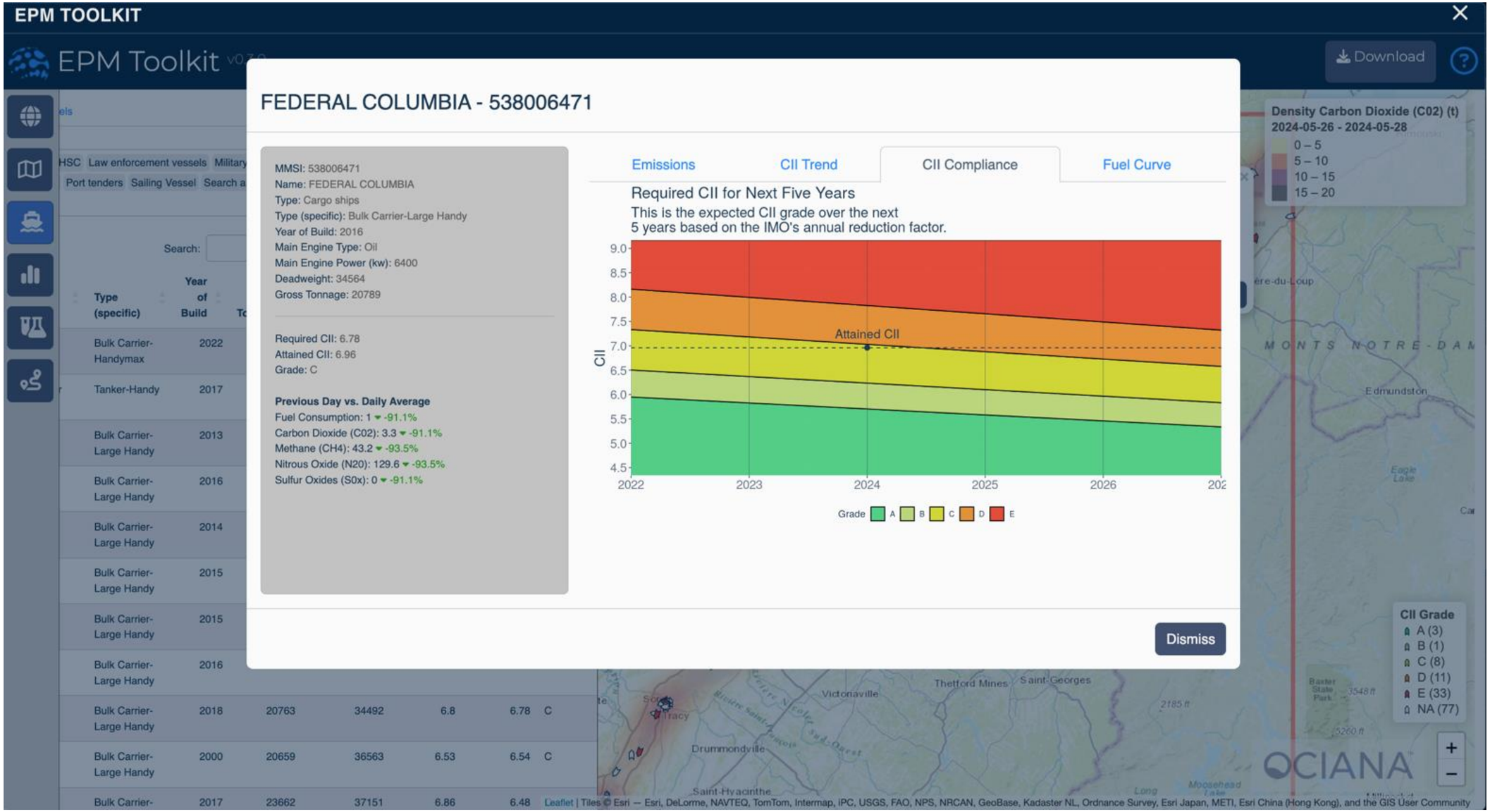
# OCIANA® EPM Toolkit: Vessel View

Enable stakeholders to quickly identify practical solutions to increase operational efficiency.



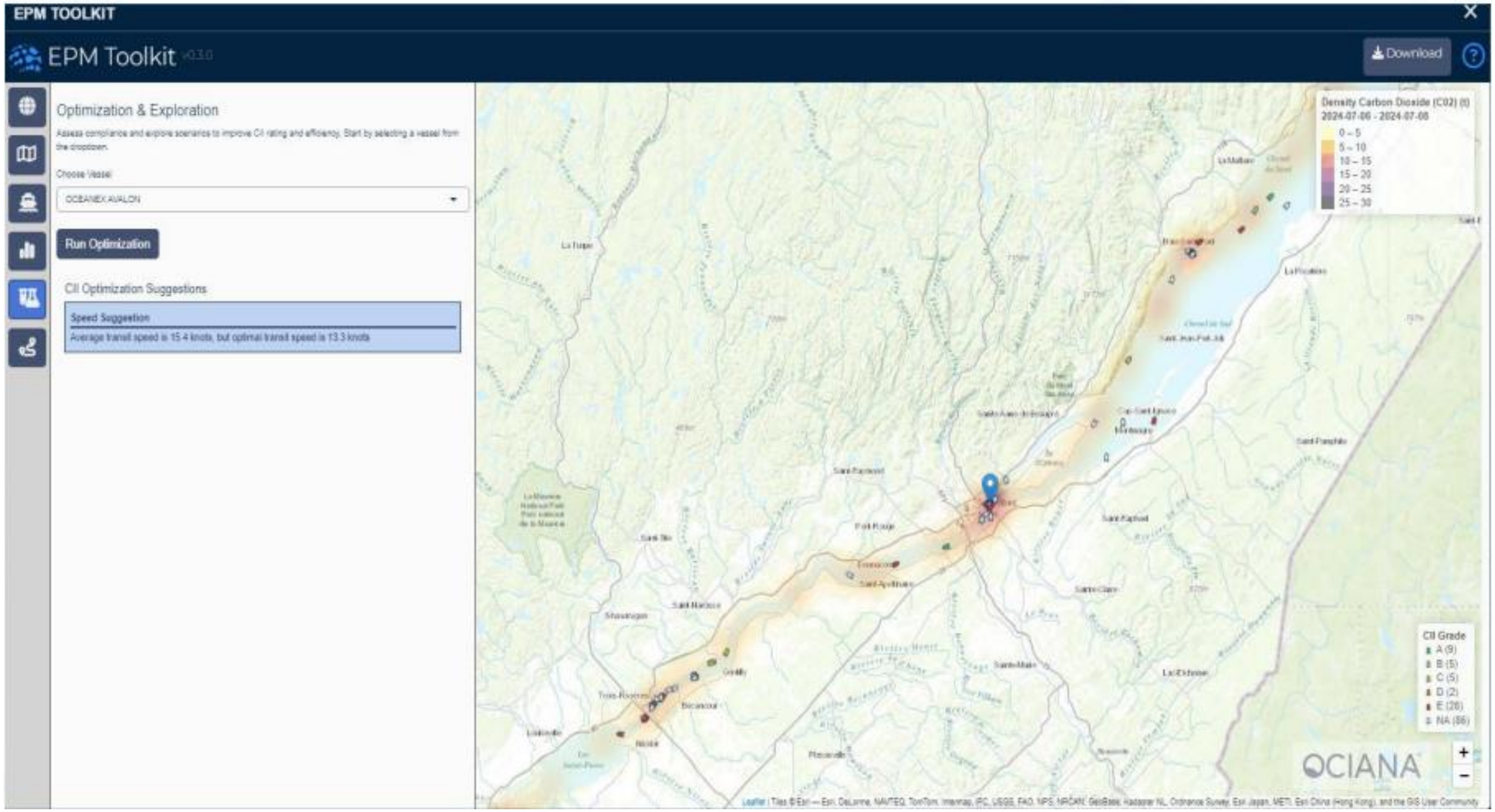
# OCIANA® EPM Toolkit: Vessel View

Enable vessel operators to determine and forecast CII compliance as well as identify ways to improve CII.



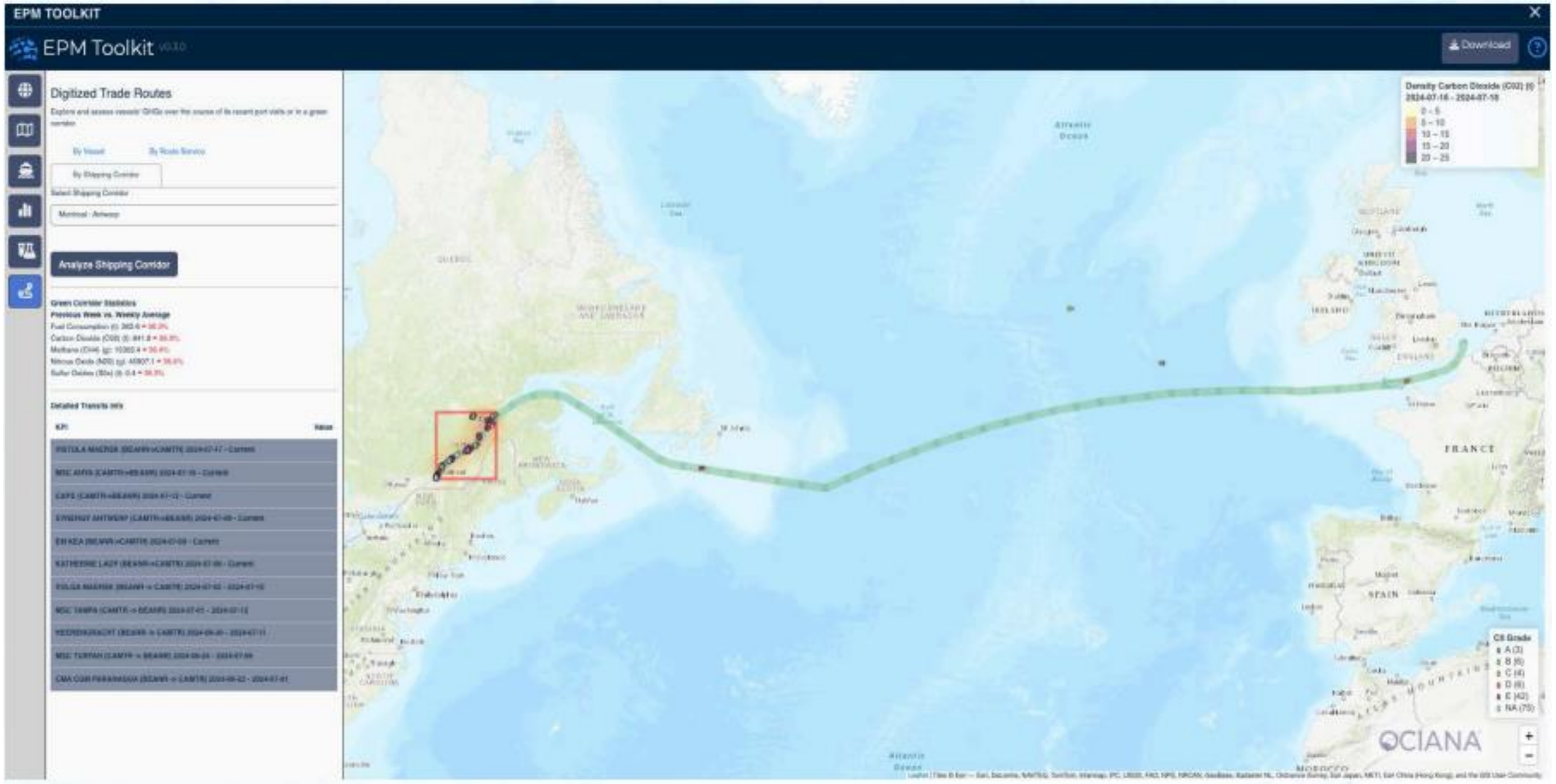
# OCIANA® EPM Toolkit: Optimisation & Exploration

Assess compliance and explore scenarios to improve CII ratings to optimise efficiency.



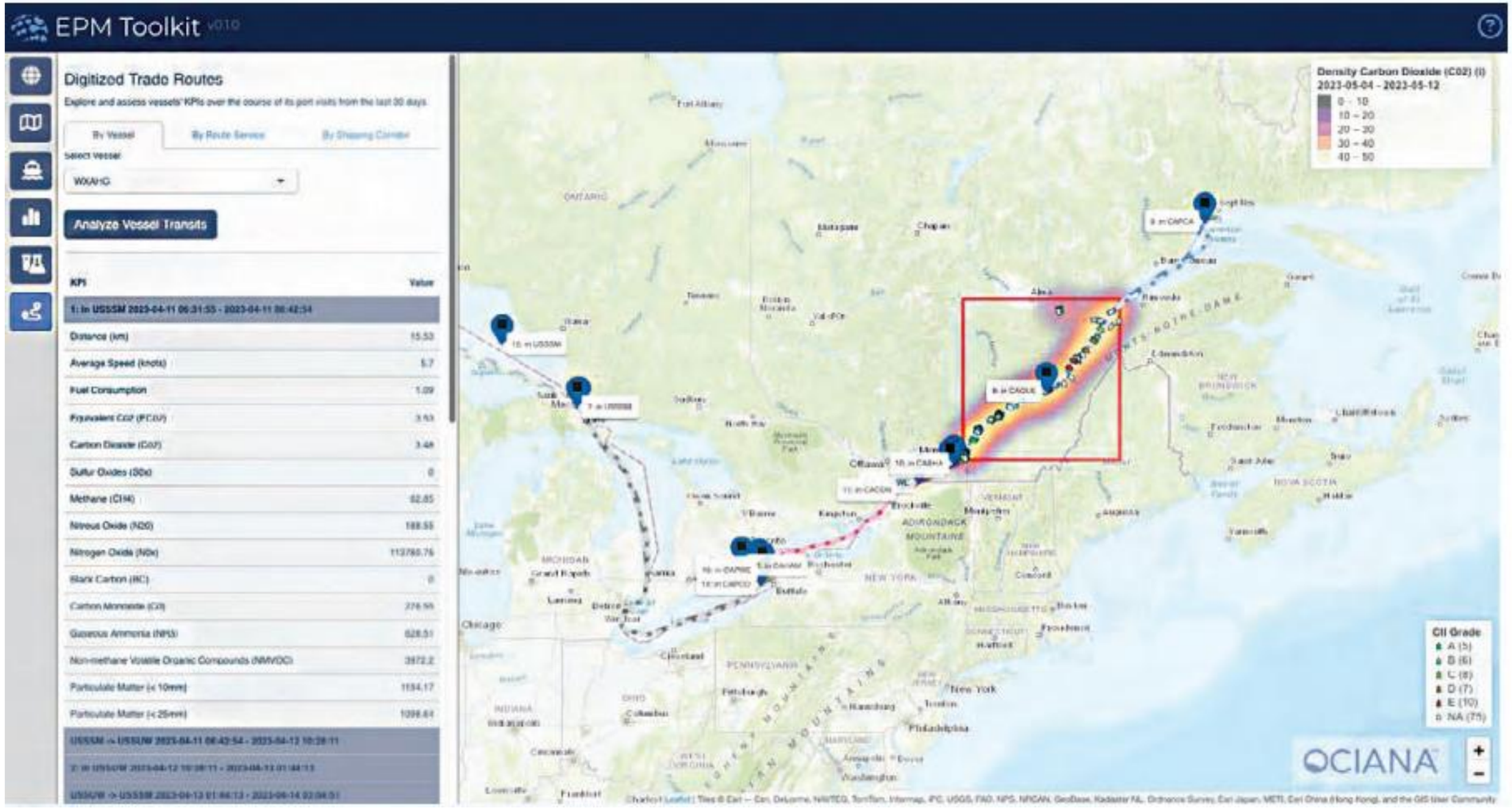
# OCIANA® EPM Toolkit: Route View

Analyze Green Shipping Corridor performance and facilitate identification of vessels supporting green incentive programs.



# OCIANA® EPM Toolkit: Route View

Analyze vessel route performance and facilitate identification of trip segments that are underperforming.



GSTS®

Navigate Tomorrow Today

Krista Foster
krista.foster@gsts.ca

Scott MacPhee
scott.macphee@gsts.ca

www.gsts.ca

GSTS®

Navigate Tomorrow Today

# THANK YOU!

GLOBAL SPATIAL TECHNOLOGY SOLUTIONS INC. ("GSTS") PROPRIETARY AND CONFIDENTIAL. The information which appears herein is proprietary and confidential and the property of GSTS. It is submitted for the sole purpose of enabling assessment thereof by the recipient and must be maintained in confidence, protected and not disclosed to any person or used for any other purpose without the prior written consent of GSTS.