The Panama Canal and Suez Canal transit information
from AIS

A building block towards green corridors implementation

Data Caliber Group

CONTENT

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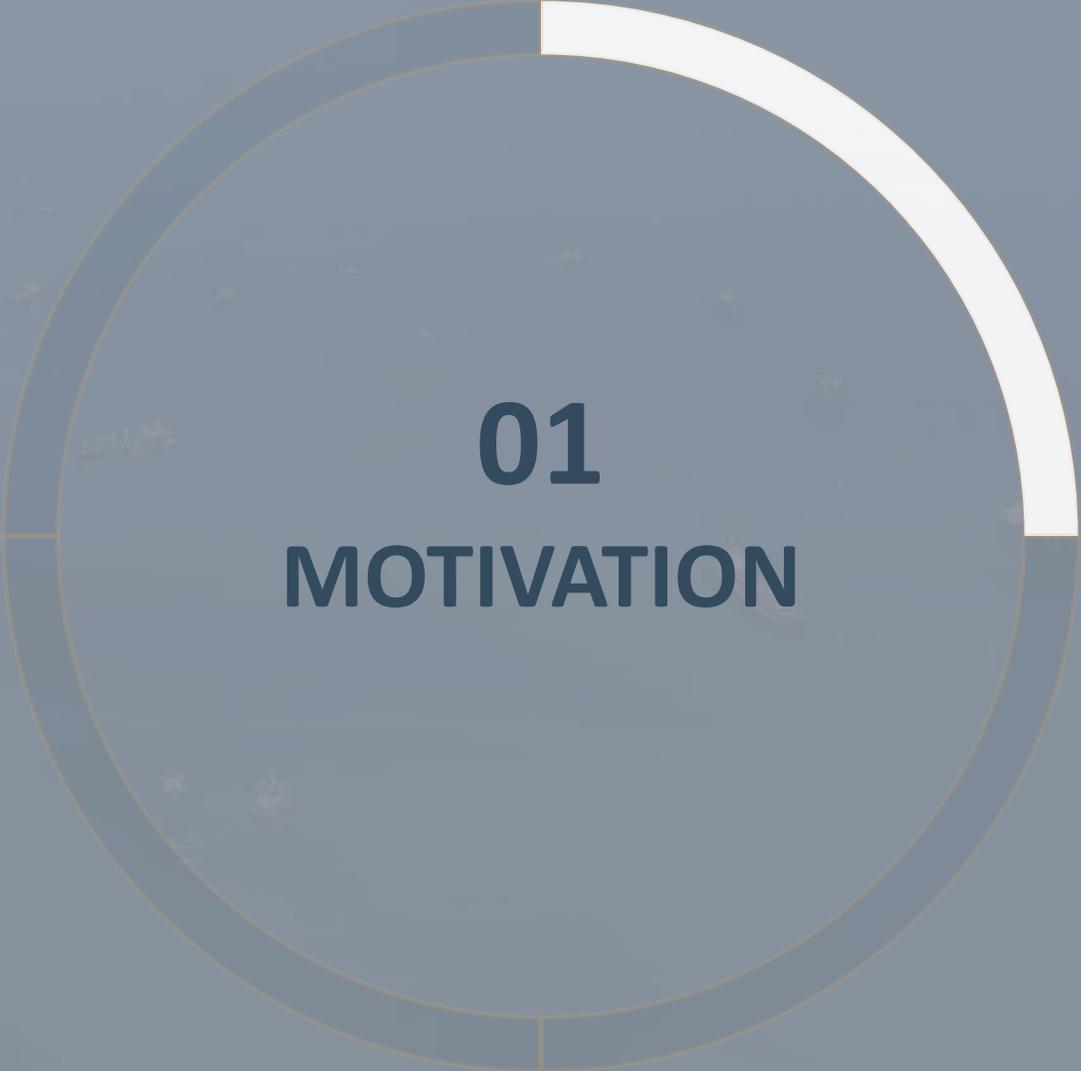
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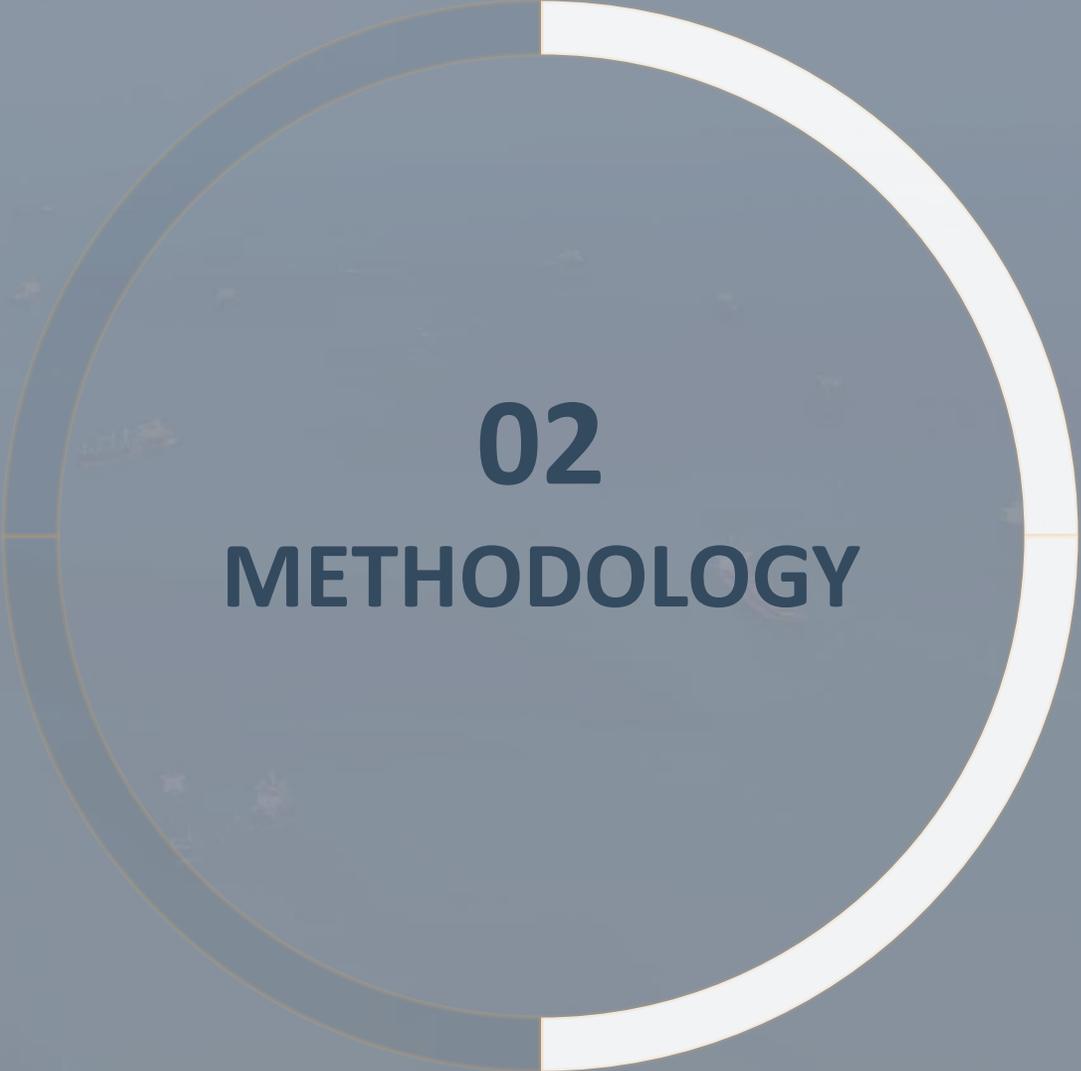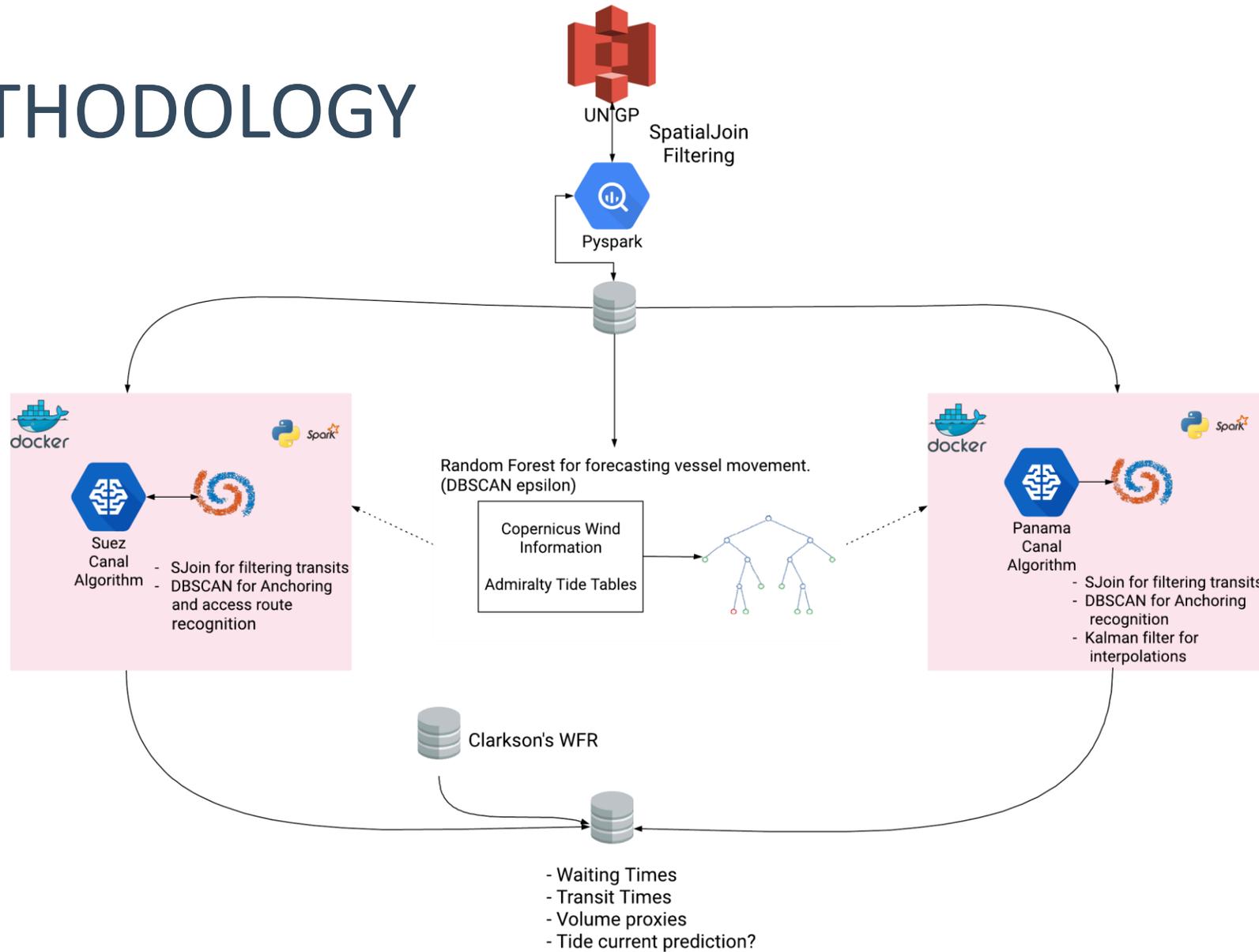
Thank you

01

MOTIVATION

MOTIVATION

– The Panama Canal and the Suez Canal passes 6% and 13% of world trade by volume respectively

– Vessel transit information could serve as a proxy of global trade measured from a reduced space (smaller sample)

– Micro-level statistics on canal transits performance (waiting and transit times) are important in the efforts of:

   1. Optimizing operations. Leading to a boost in trade, increase in income and employment **(SDG 8)**

   2. Reducing inefficiencies helping in reducing emissions **(SDG 13)** by implementing real time booking for Just In Time (JIT) arrival

   3. Partnering with "competitors" and allies **(SDG 17)** to implement actions with the potential of having a global impact
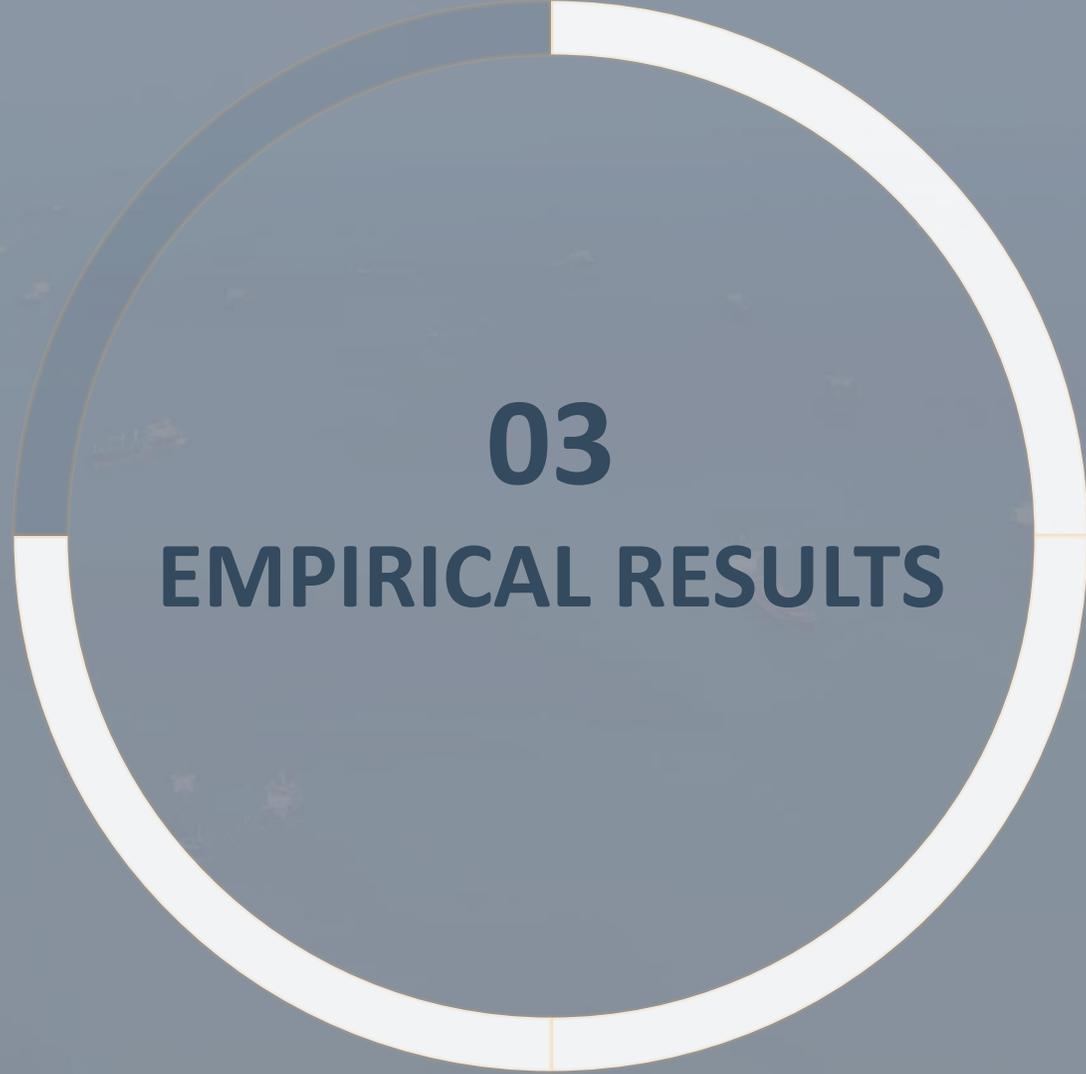
02
METHODOLOGY

METHODOLOGY

UN GP

SpatialJoin Filtering

Pyspark

Random Forest for forecasting vessel movement.
(DBSCAN epsilon)

Copernicus Wind Information

Admiralty Tide Tables

Suez Canal Algorithm

- SJoin for filtering transits
- DBSCAN for Anchoring and access route recognition

Panama Canal Algorithm

- SJoin for filtering transits
- DBSCAN for Anchoring recognition
- Kalman filter for interpolations

Clarkson's WFR

- Waiting Times
- Transit Times
- Volume proxies
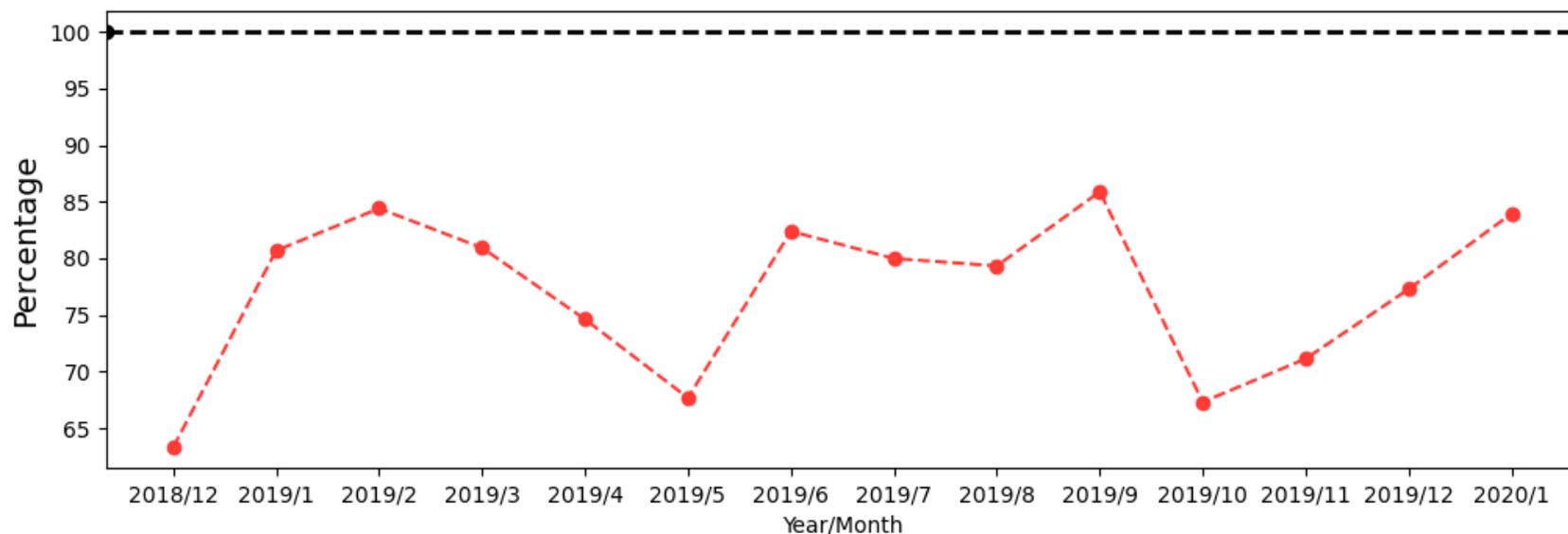- Tide current prediction?

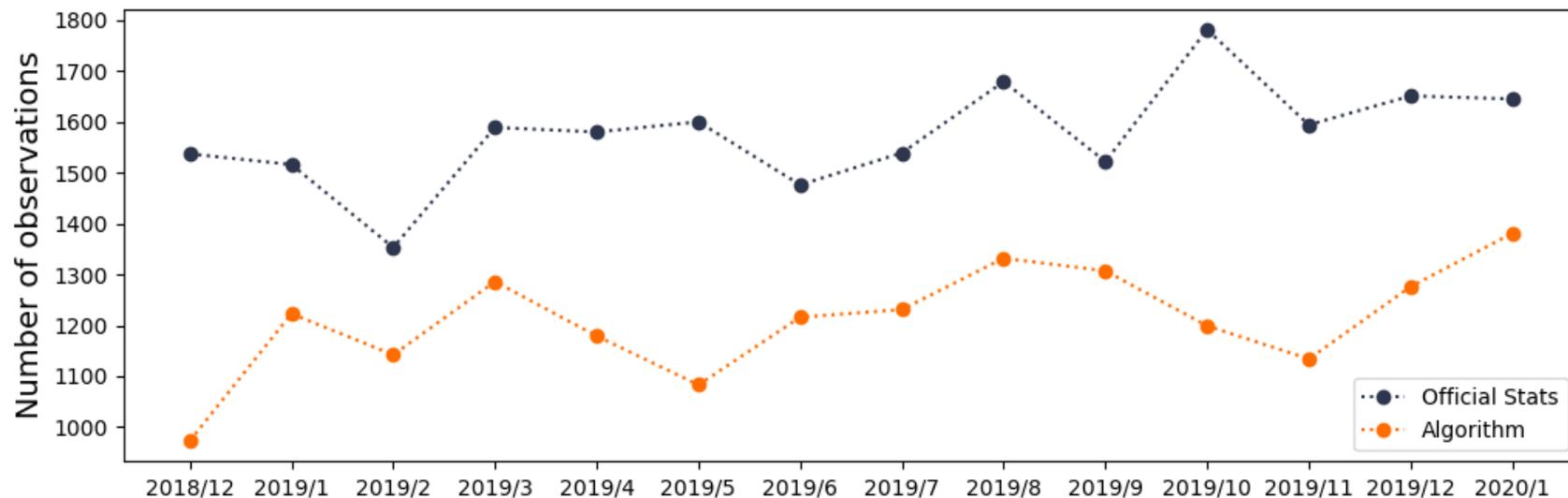# METHODOLOGY

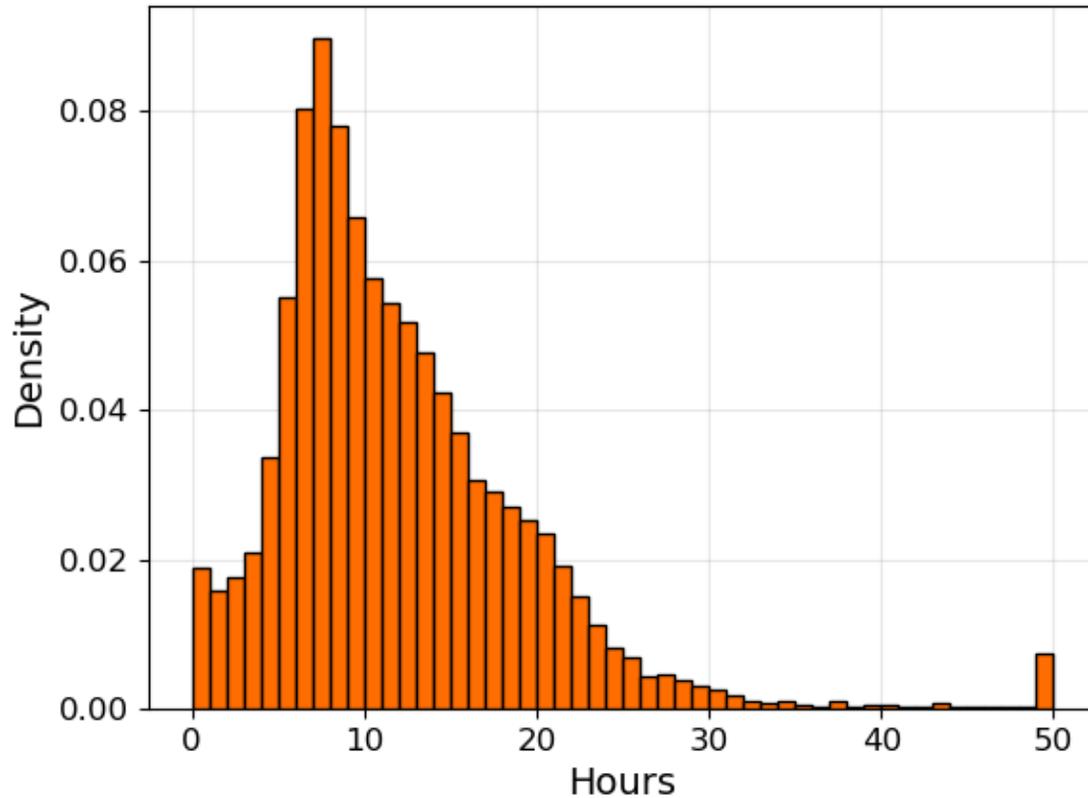# METHODOLOGY

03
EMPIRICAL RESULTS

SUEZ CANAL

Suez Canal algorithm performance
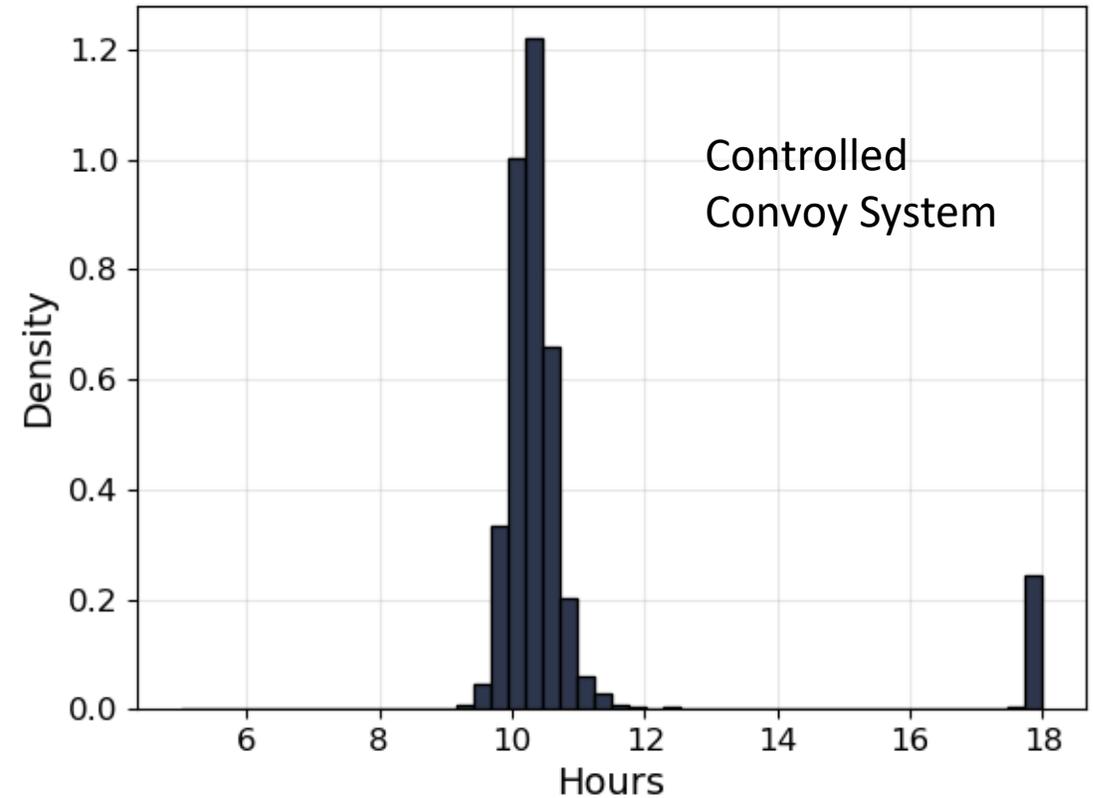
63% to 86%

SUEZ CANAL

Suez Waiting Time

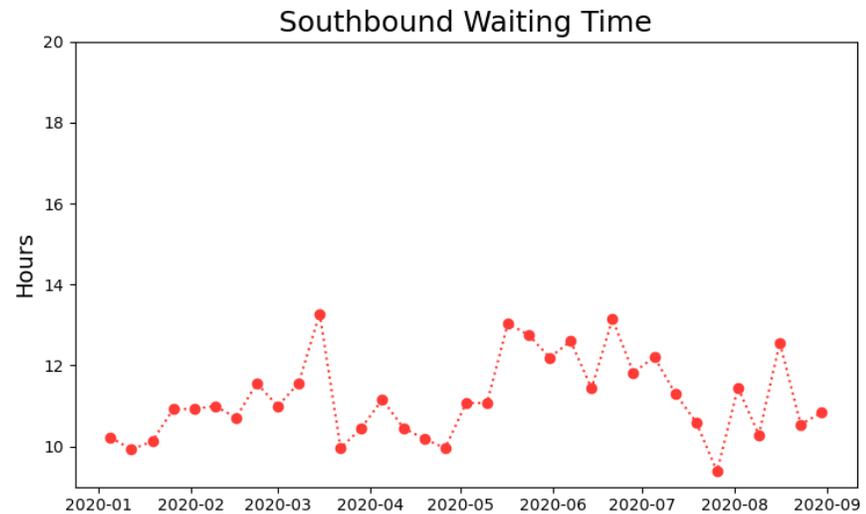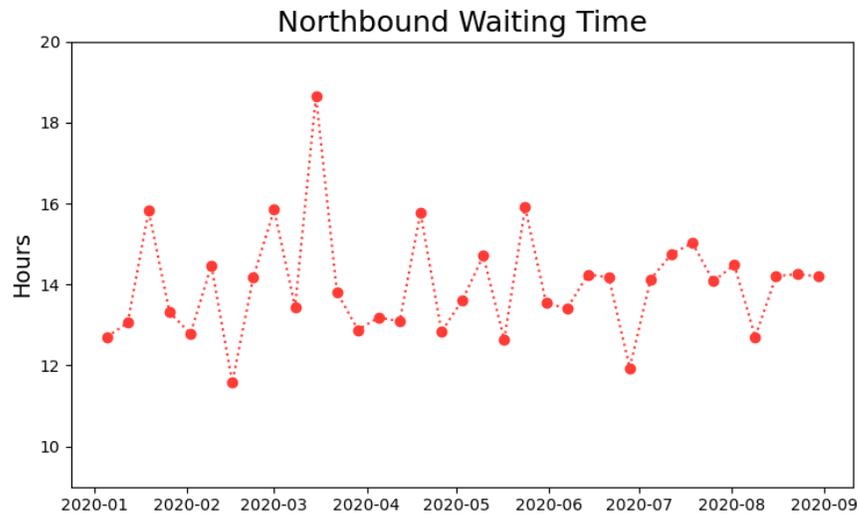*The last vertical bar includes all records larger than 50 hours

Suez Transit Time

Controlled Convoy System
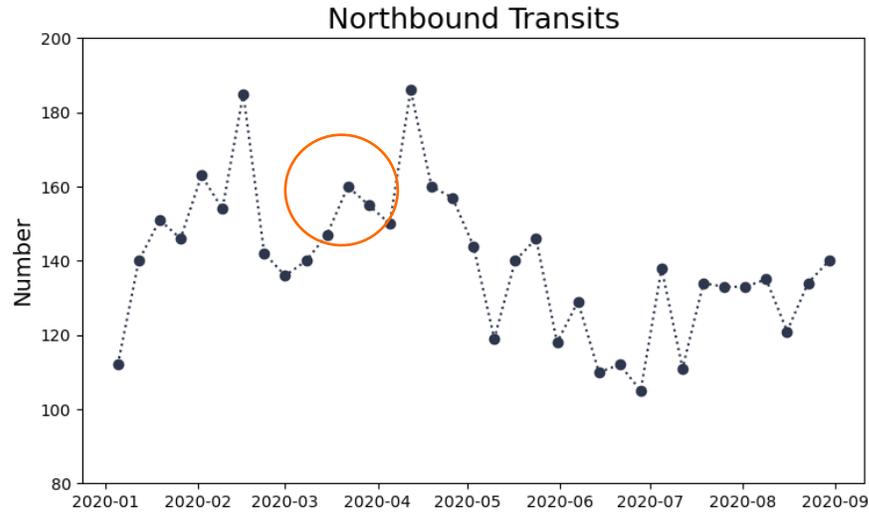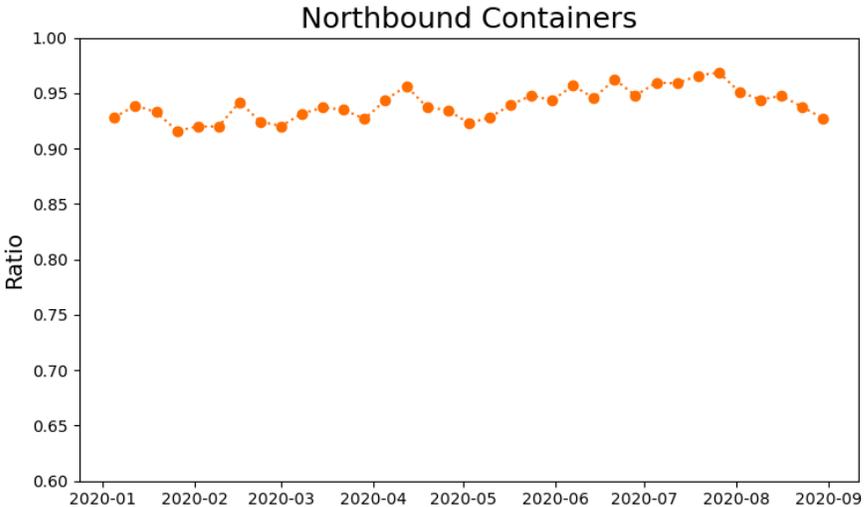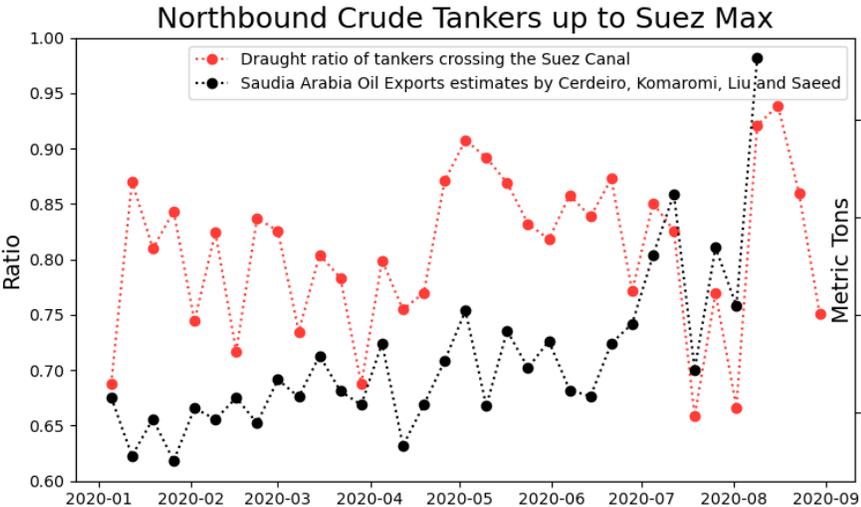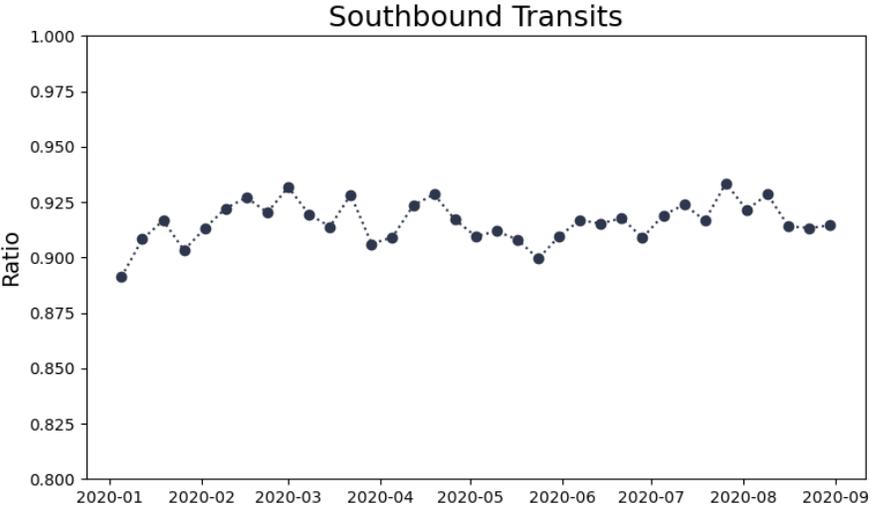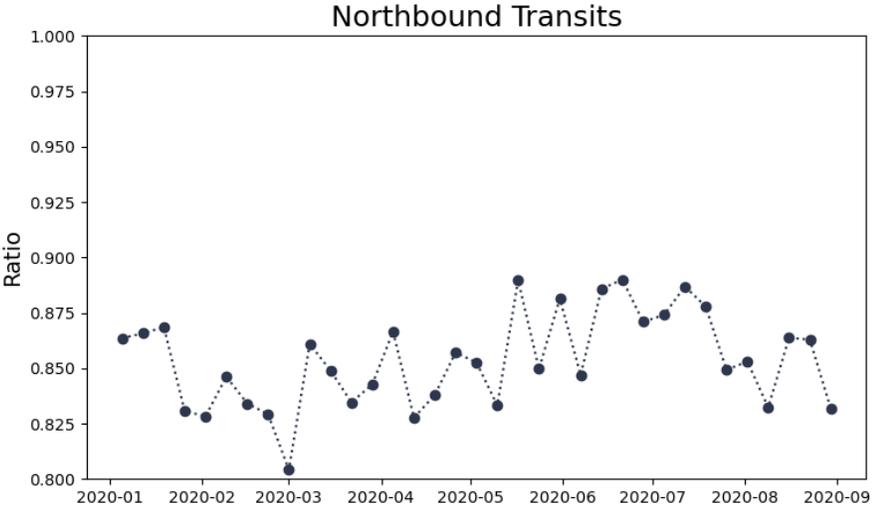
*The last vertical bar includes all records larger than 18 hours

SUEZ CANAL

SUEZ CANAL (Draught Ratio)

PANAMA CANAL

Panama Canal algorithm performance
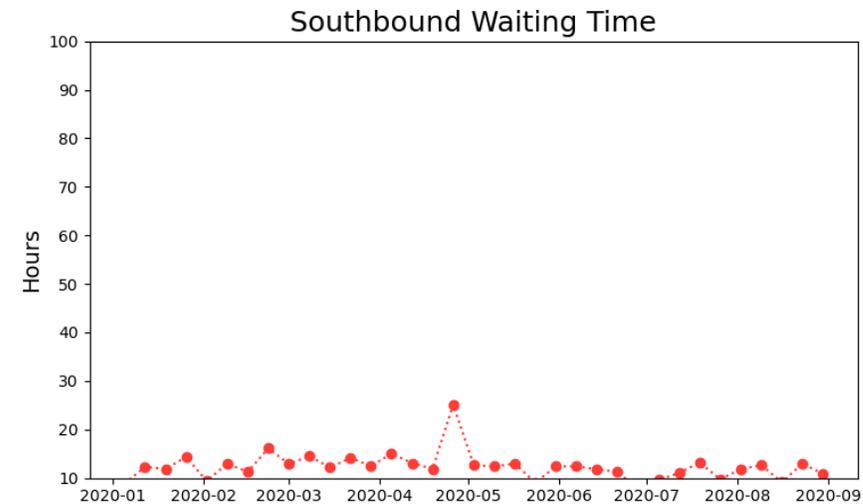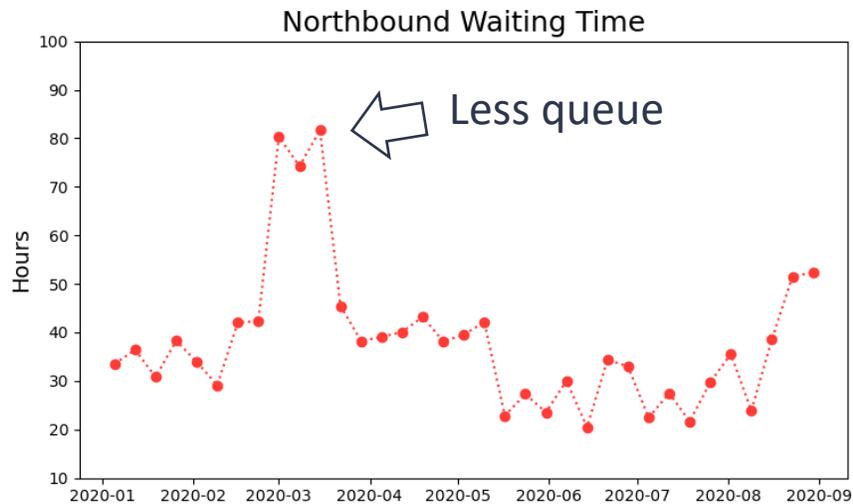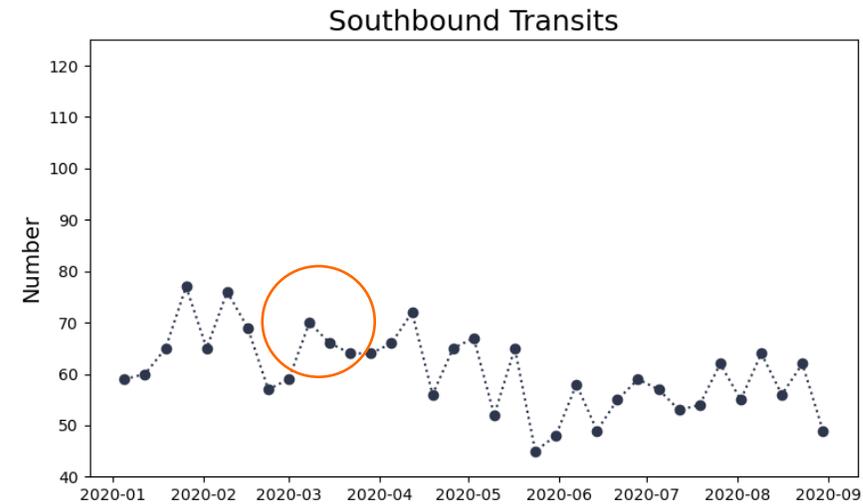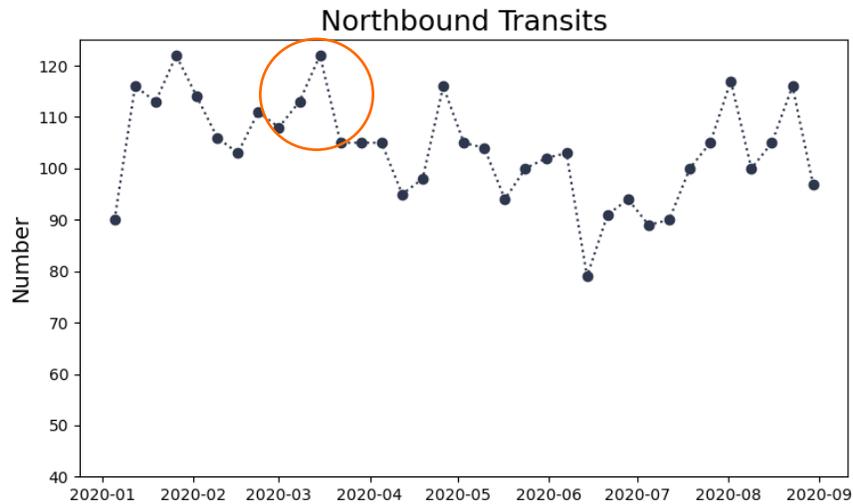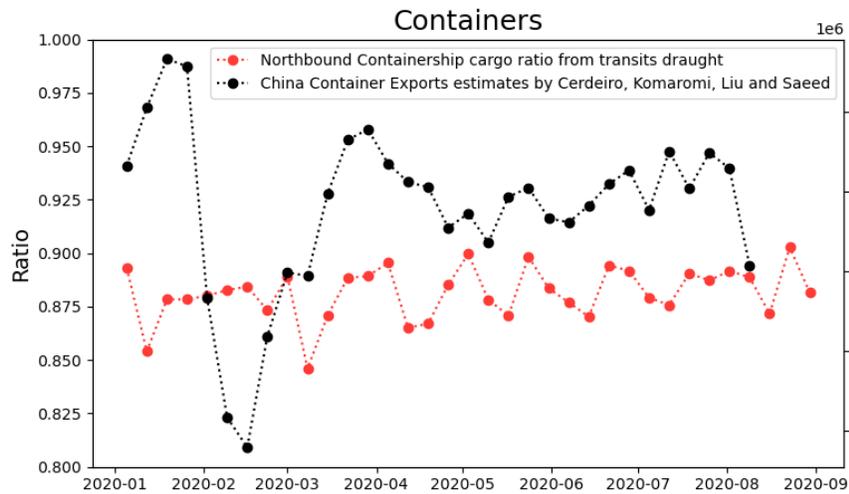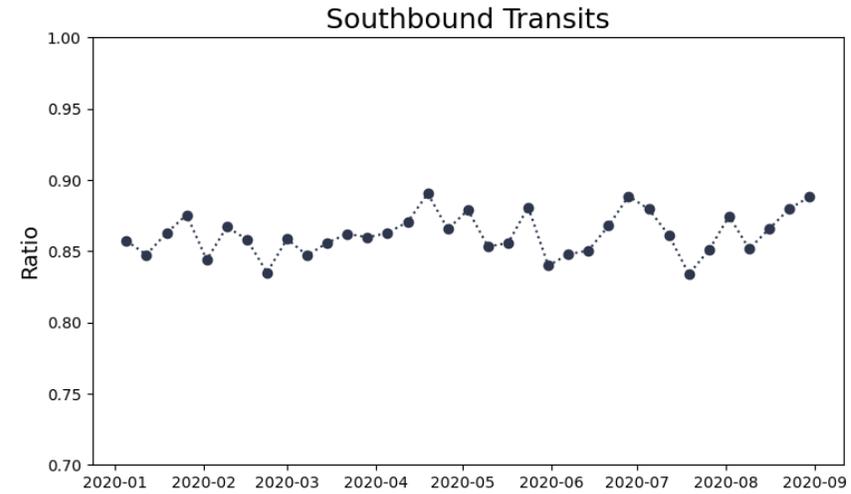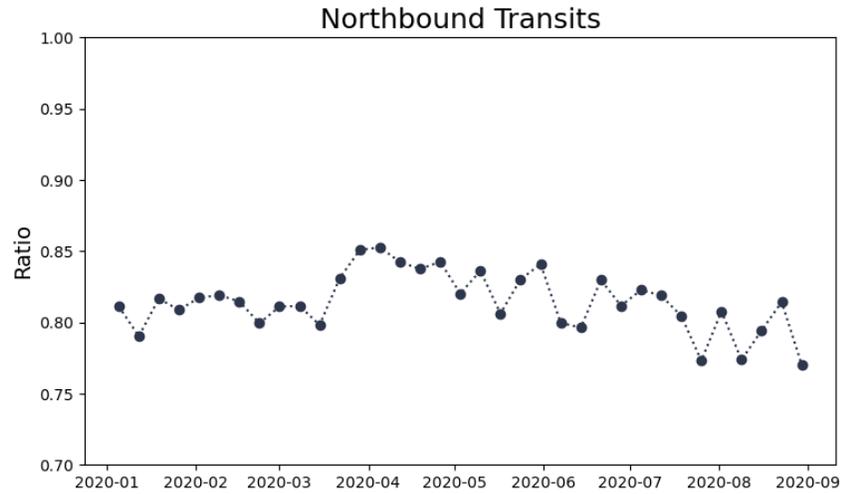
60% to 83%
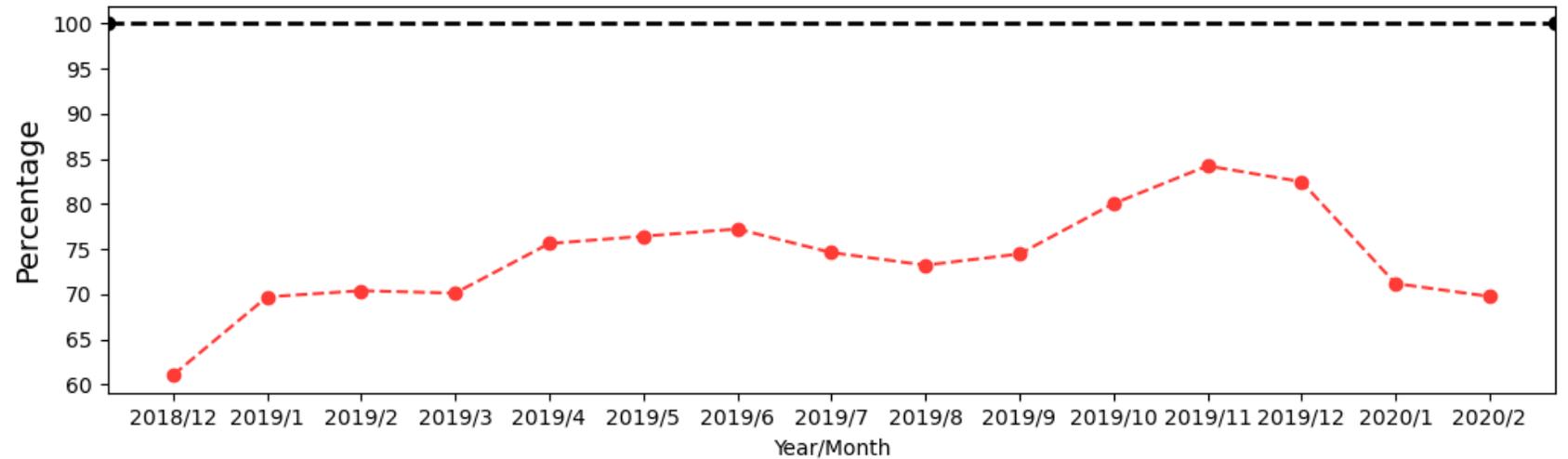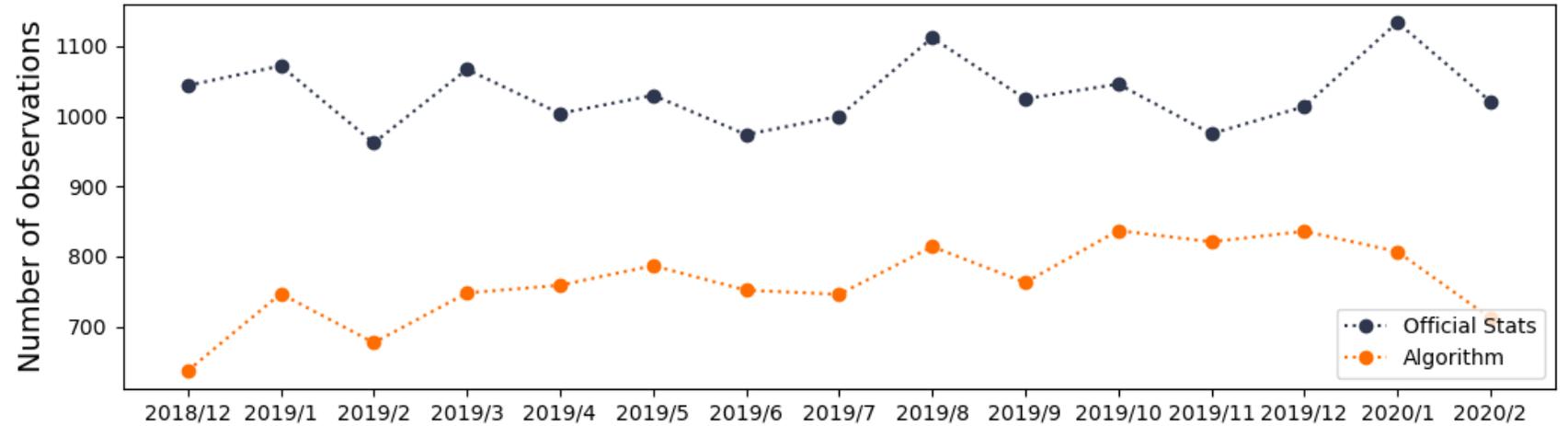
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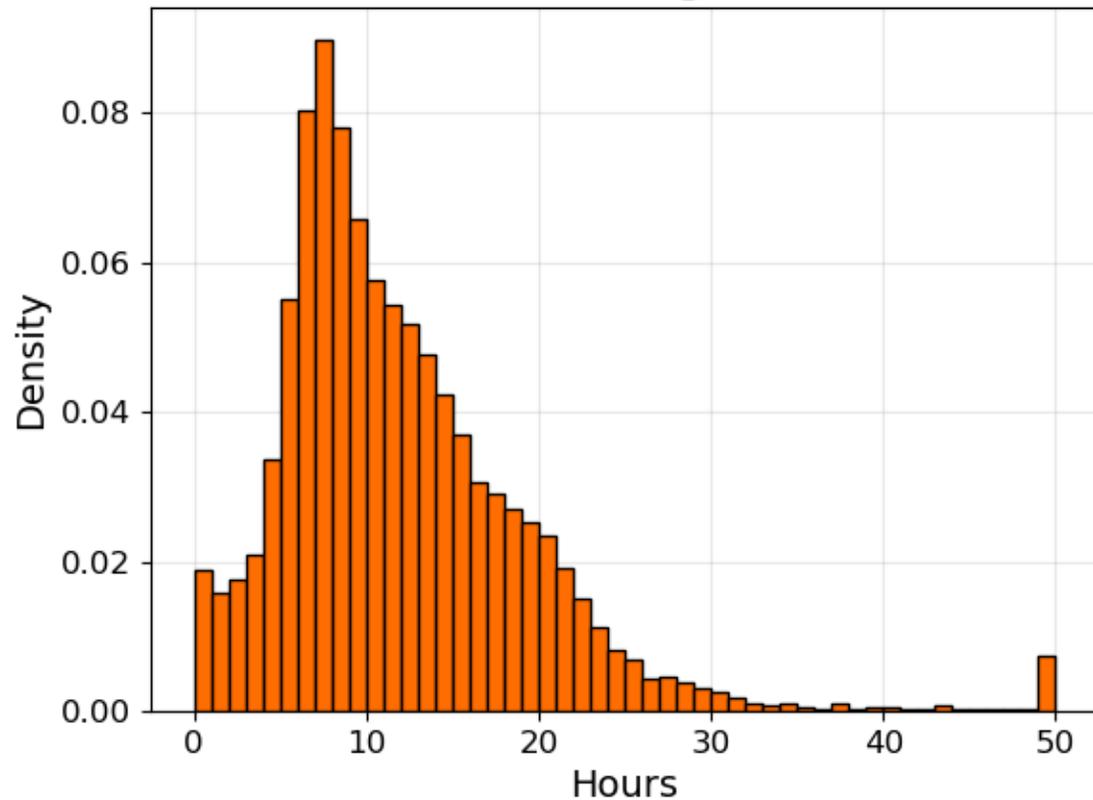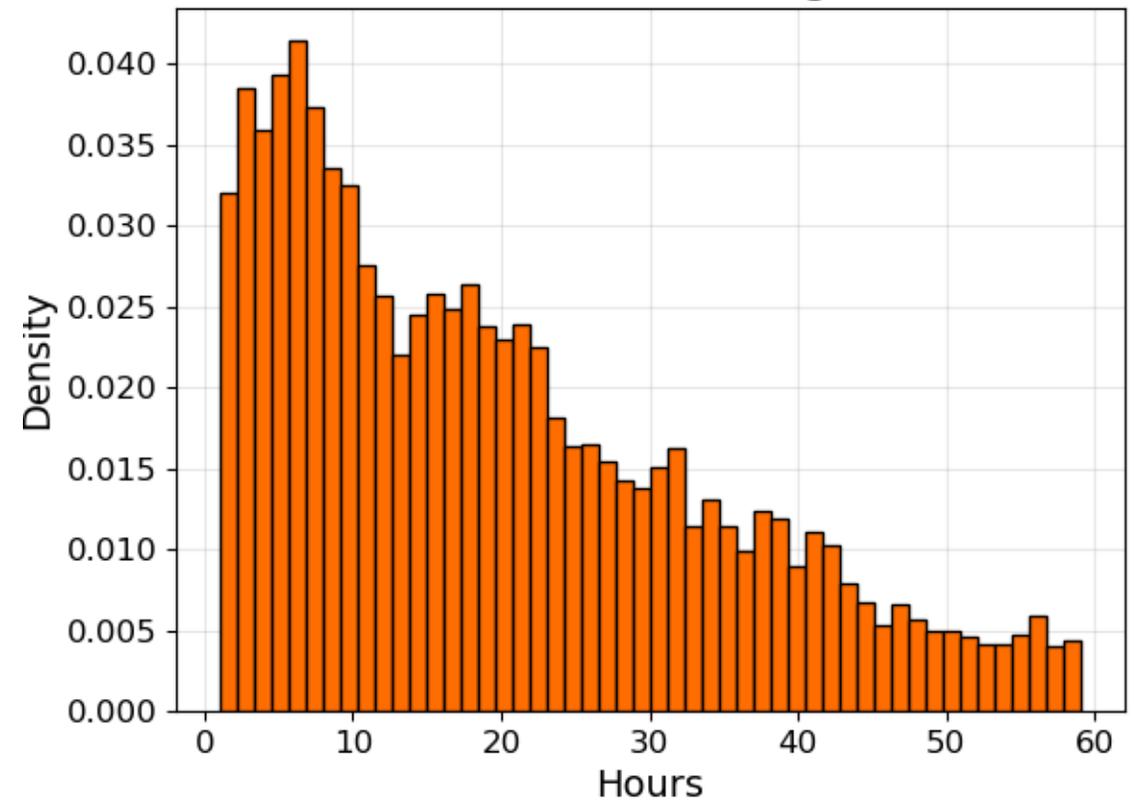
WHO declares a COVID 19 pandemic

PANAMA CANAL
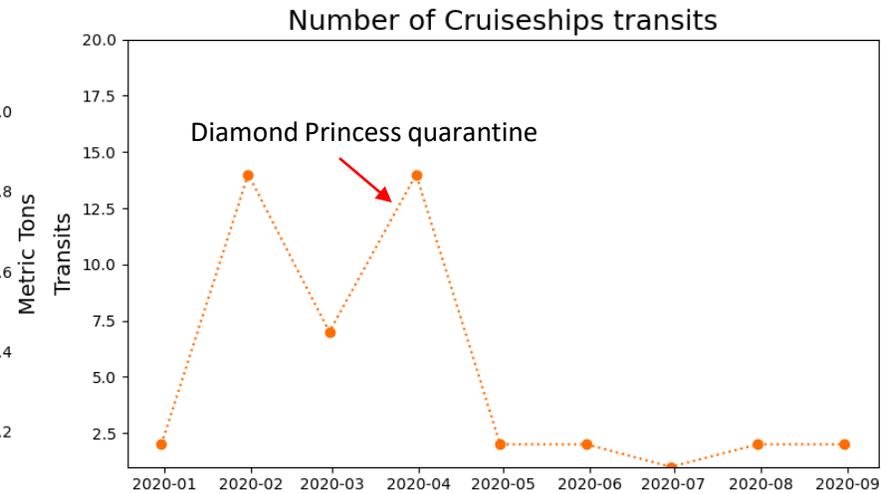
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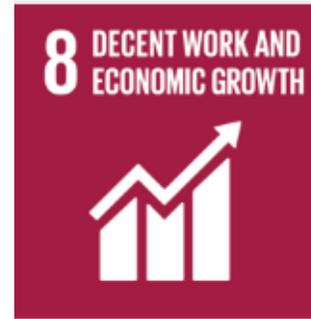
JUST IN TIME ARRIVAL FRAMEWORK

– Just in time Arrival Guide was recently launched (August 2020) by GEF-UNDP-IMO GloMEEP and members of GIA

– Main barrier of implementation is the exchange of information between stakeholders

– What if the only stakeholders involved are the vessel and the Port and what they need is to build information supplied by AIS?

– Panama Canal manages the vessel transiting assignment and can clear vessels for transit under a Single Window platform without interaction of the country's authorities

– For the Panama Canal booking system, JIT exists under demand. However, for better utilization, "green slots" assignments could be implemented to reduce emissions and water utilized by lockage.

– Vessels waiting time as supplied by our algorithm serves as measurement of implementation success

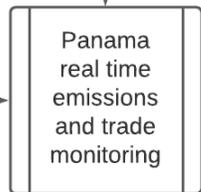– Ship-owners benefits in terms of voyage planning and fuel cost management
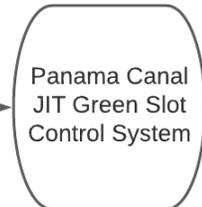
GREEN CORRIDORS FRAMEWORK
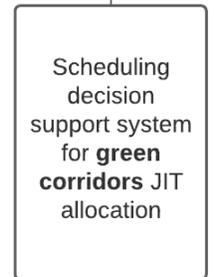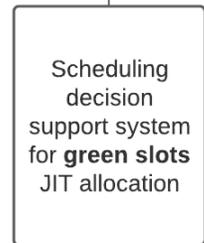
04
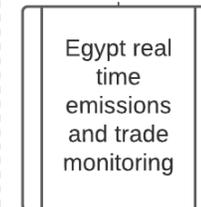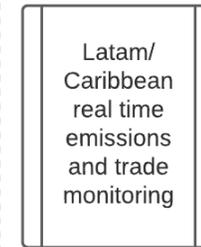# CONCLUSIONS

CONCLUSIONS

- We demonstrated that more granular statistics can be obtained from higher AIS frequency and feature engineering of the Canal operations. Well defined interpolation methods and parameters selections are paramount for accurate calculations.

- Both the Panama and the Suez Canals shows signals of being gauges of global trade health. Additional experiments such as econometric and time series analysis will help in testing these hypothesis

- The statistics built from AIS and the few barriers affecting the JIT policy implementation, signals that the Panama Canal might have an incentive to be among the early implementers of "green" slot policies for JIT arrivals

- The methods presented by this group could ease the implementation of policies which requires continuous and in real time monitoring

- Our team benefited from the continuous exchange of information between members from academia, industry and government from three different countries. Moreover, the exchange gave us a direct taste of the benefits of cooperation to design tailor made solutions to attend global issues.

THANK YOU

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