



## Relating port performance to levels of capability maturity

A comparison of the performance of different ports at stages of vessel handling: How this can be related to a port capability maturity model to identify potential investment opportunities?

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19 Feb 2020

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Capability Maturity is a business model that helps people assess the current effectiveness of their business and ascertain what capabilities they need to acquire next in order to improve their performance.

# Presentation overview



The role of performance measurement in capability maturity

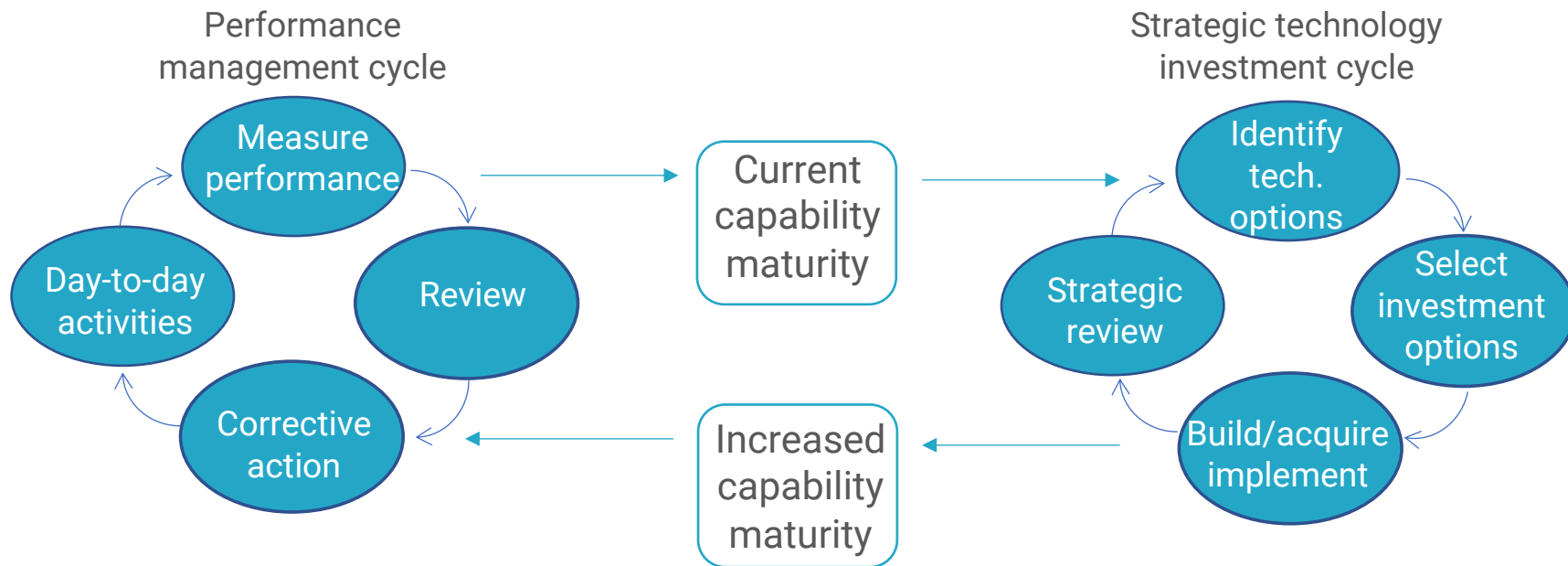


Overview of our work to measure port performance



Conclusions - Can the measures of performance be related to port capability and inform investment decisions?

# Performance measurement is integral to investment



# Different levels of performance measurement



## Level 1 - Initial

Typically operation is undocumented and in a state of dynamic change, tending to be *ad hoc*, uncontrolled and reactive

## Level 2 Repeatable

Process discipline is unlikely to be rigorous, but where it exists, ensures that processes are maintained during times of stress

## Level 3 Defined

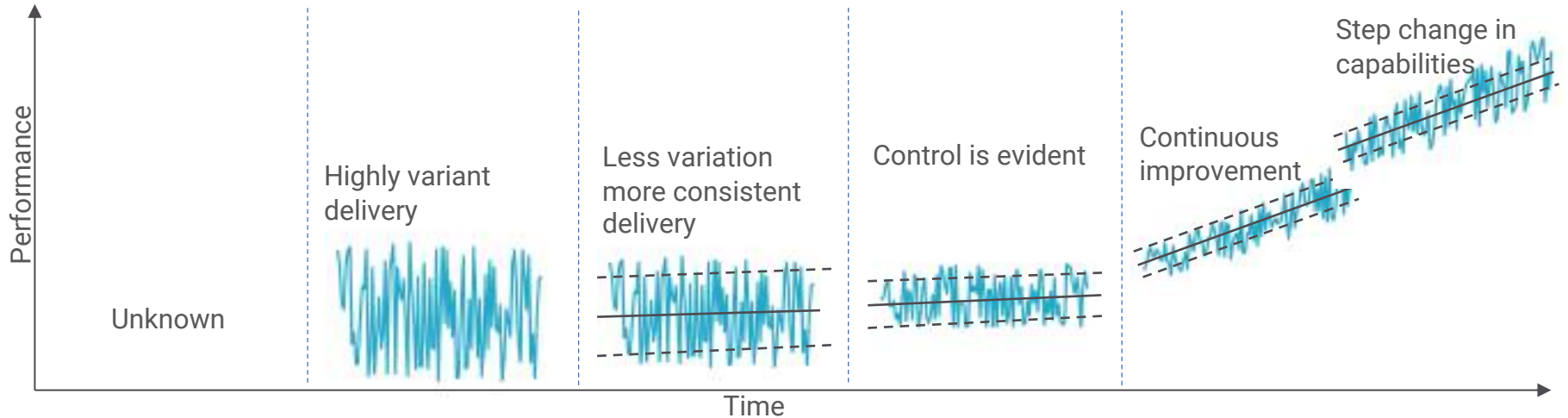
Sets of defined standard processes established and subject to some degree of improvement over time

## Level 4 Managed

Using process metrics, effective achievement of the process objectives evidenced across a range of operational conditions

## Level 5 Optimizing

Continually improving process performance through both incremental and innovative technological changes/improvements.



# Our work to measure port performance

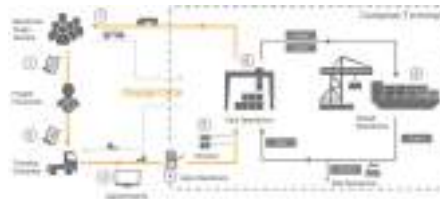


We are exploring how far we can go independently of any port involvement:

- what metrics can be produced?
- how reliable are the metrics?
- can they be related to port capability maturity?

We have used a variety of data sources

Process models of Port Activity

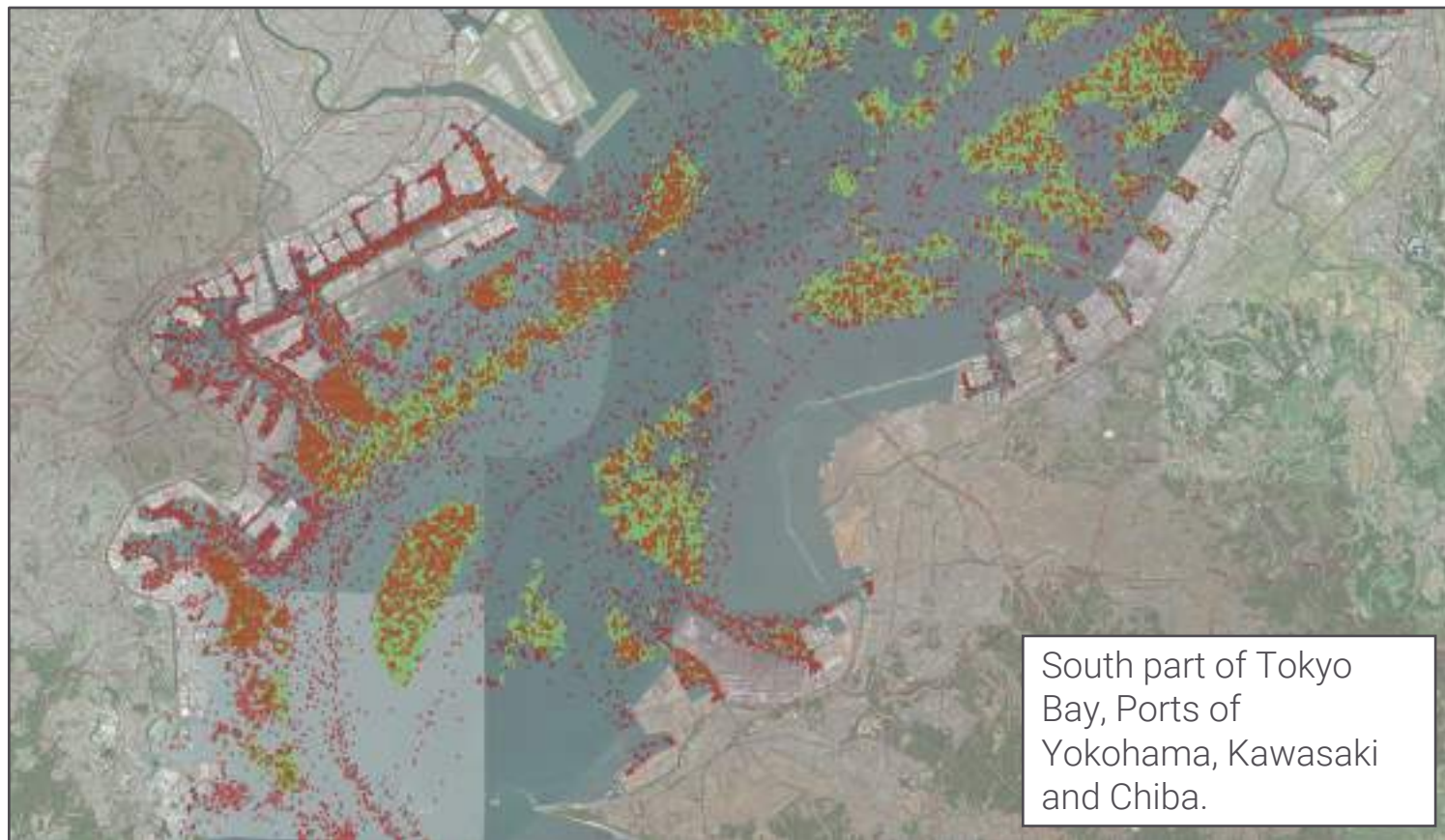


Geofenced top 2500 ports, berths, terminals anchorages, globally



Over 5 years of detailed vessel voyage data for each vessel in the global fleet

# Our work to measure port performance

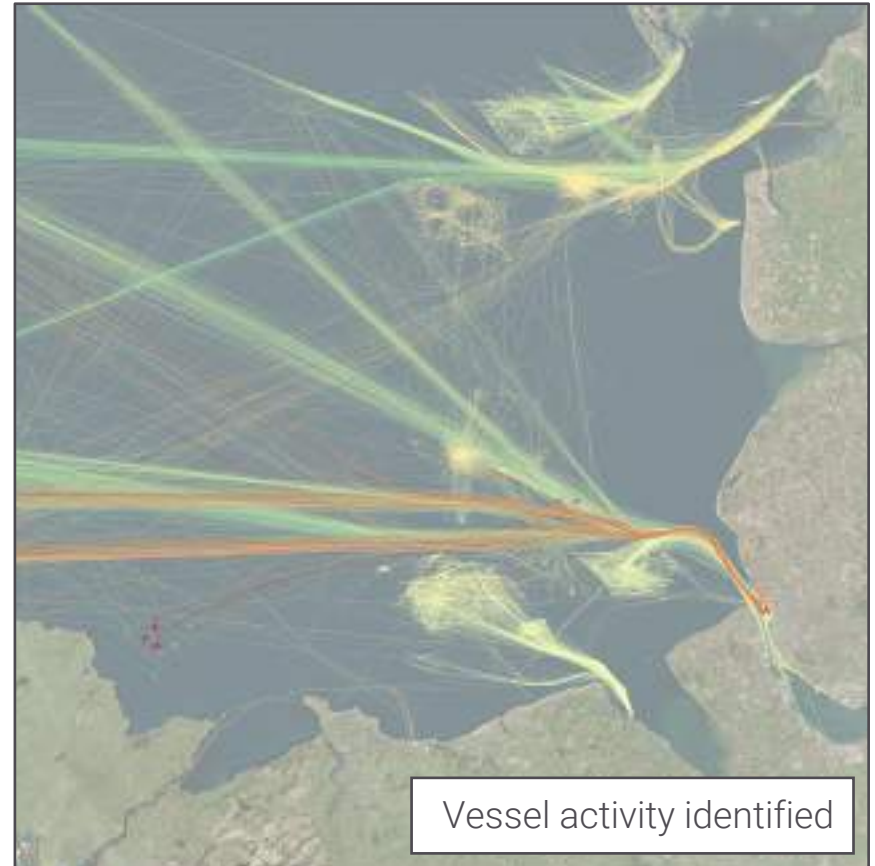
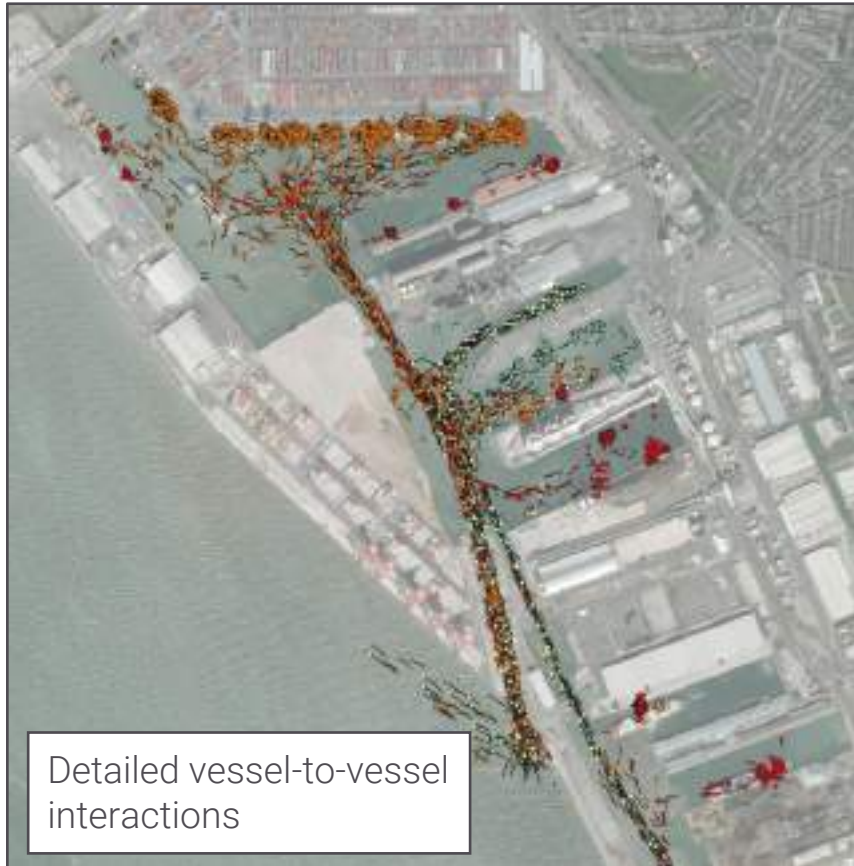


Data has been gathered globally for every vessel every day for over five years.

Artificial intelligence was used to identify geographic areas of interesting activity

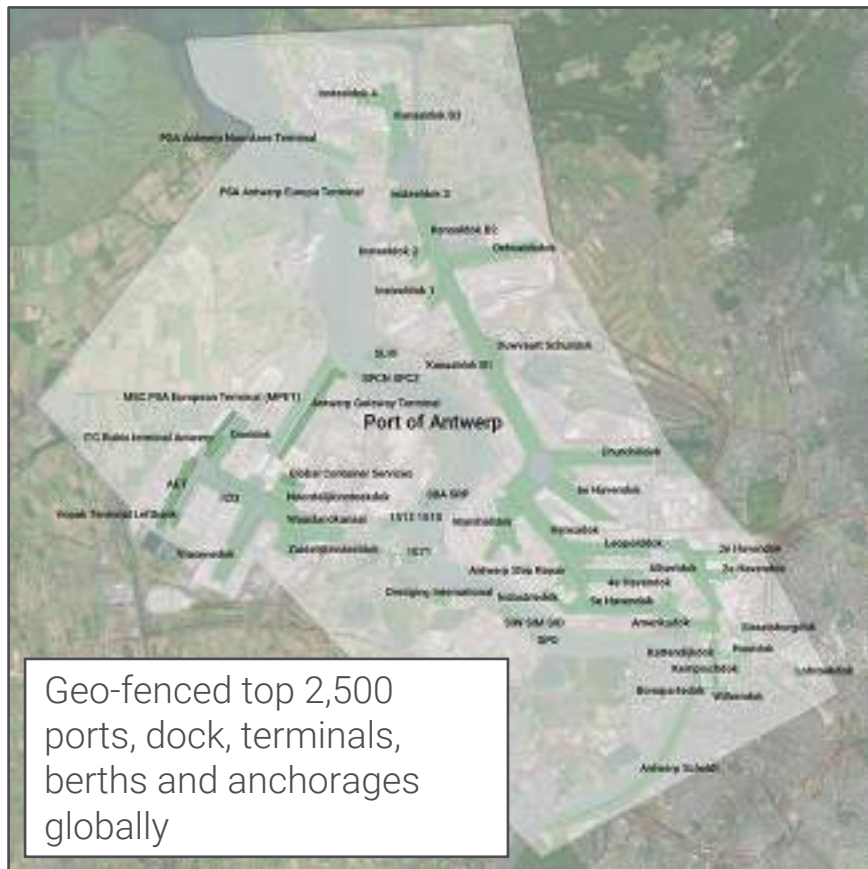
- Anchorages
- Terminals
- Berths
- Windfarms
- Holding patterns

# Our work to measure port performance





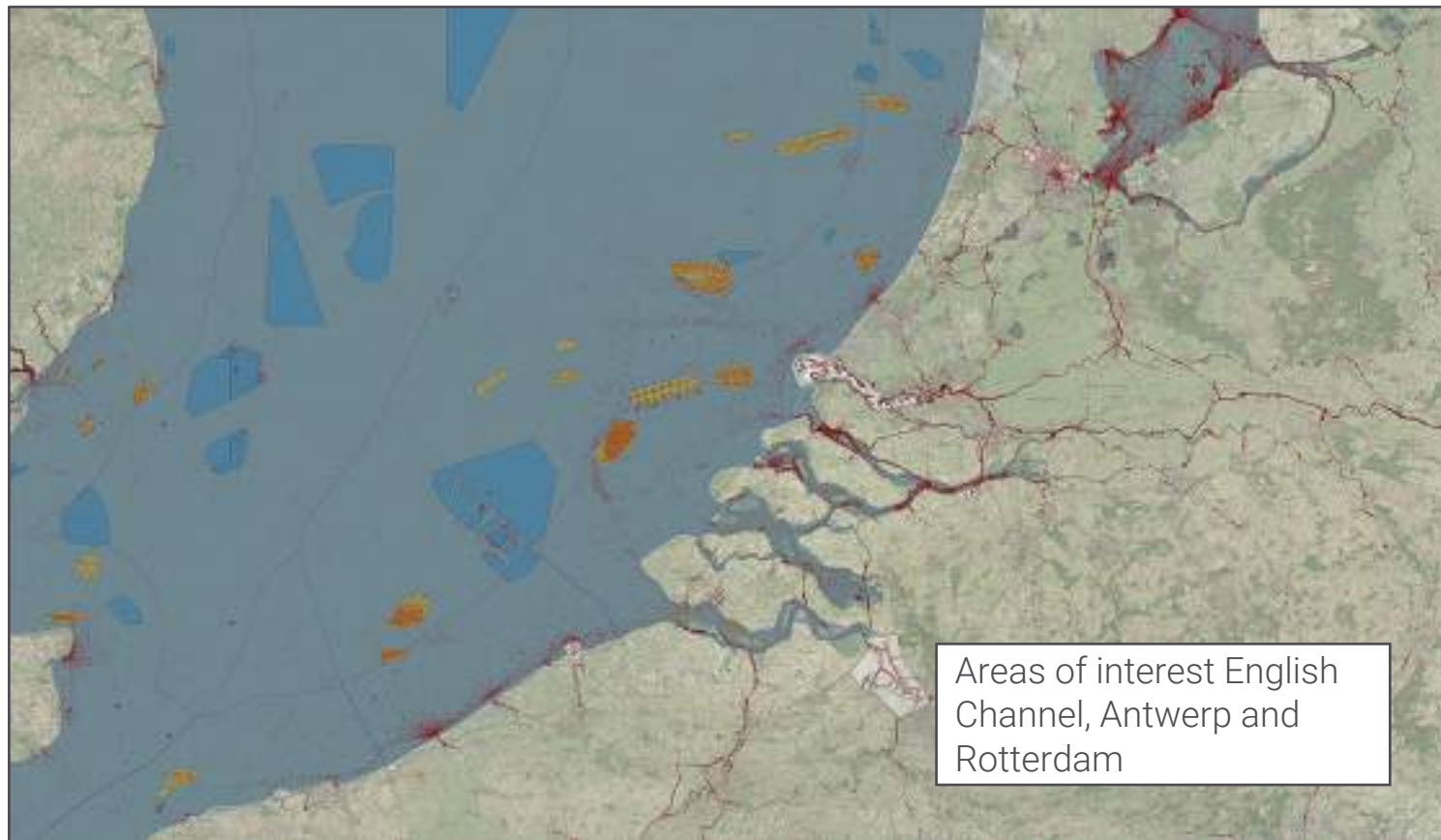
# Our work to measure port performance



Geo-fenced top 2,500 ports, dock, terminals, berths and anchorages globally



# Review of our research into port performance



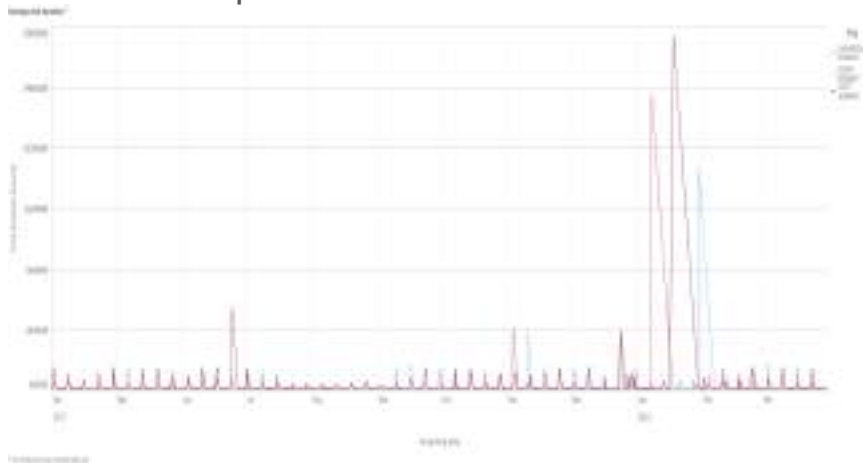
Further Artificial intelligence generated geographic areas where interesting activity occurs

# Example – Dover and Dunkerque RoRo service

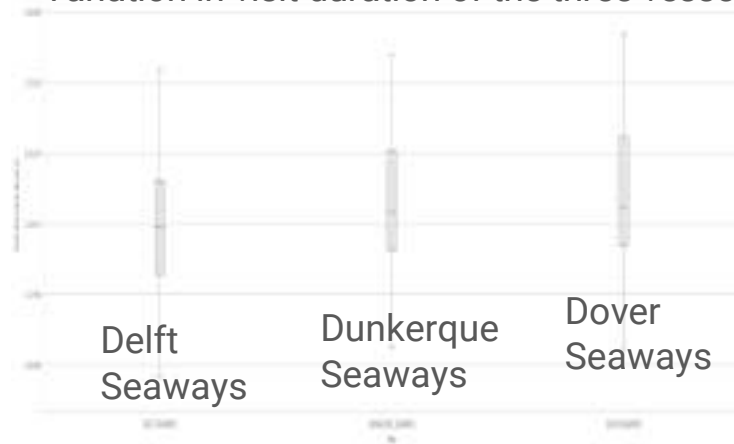


- We will look at the vessel Delft Seaways, one of the three vessels running the service
- Time period April 2017 to March 2018
- Metric is visit duration

Metric explored is visit duration from



Variation in visit duration of the three vessels



# Example – Delft Seaways - Dunkerque

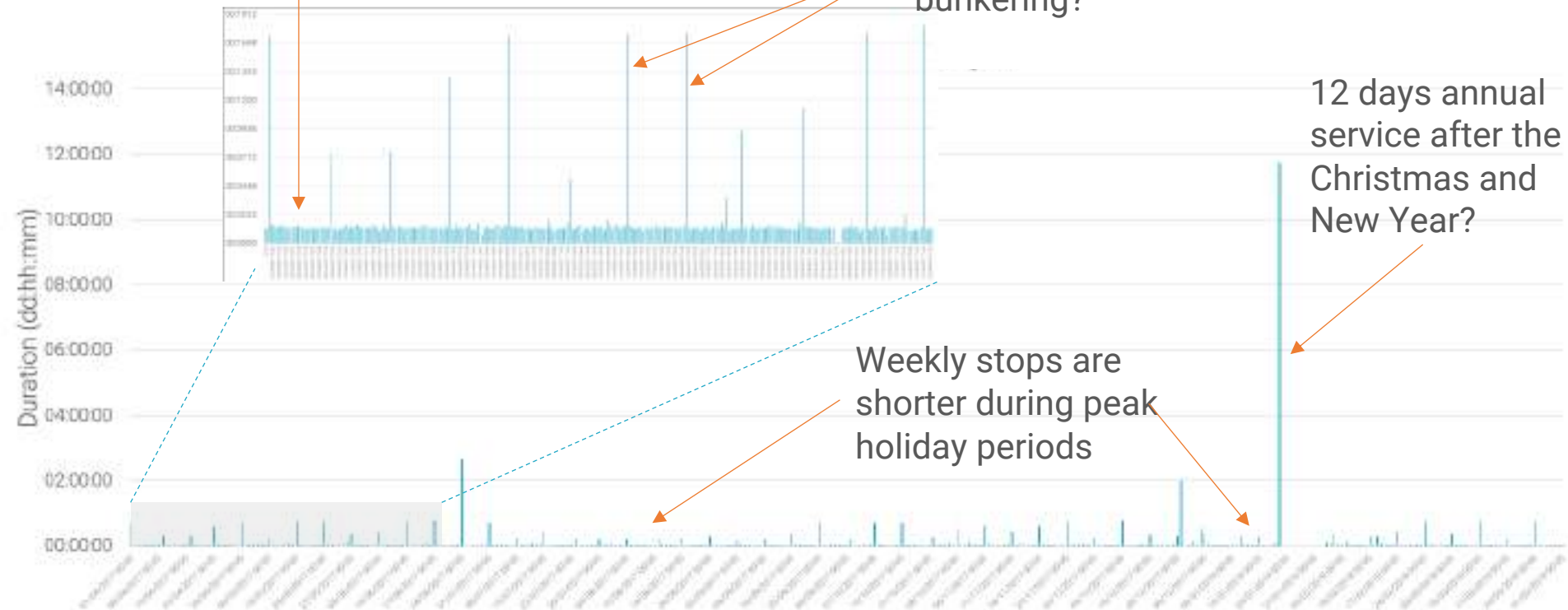


Standard RoRo turnarounds

Longer regular weekly stops – bunkering?

12 days annual service after the Christmas and New Year?

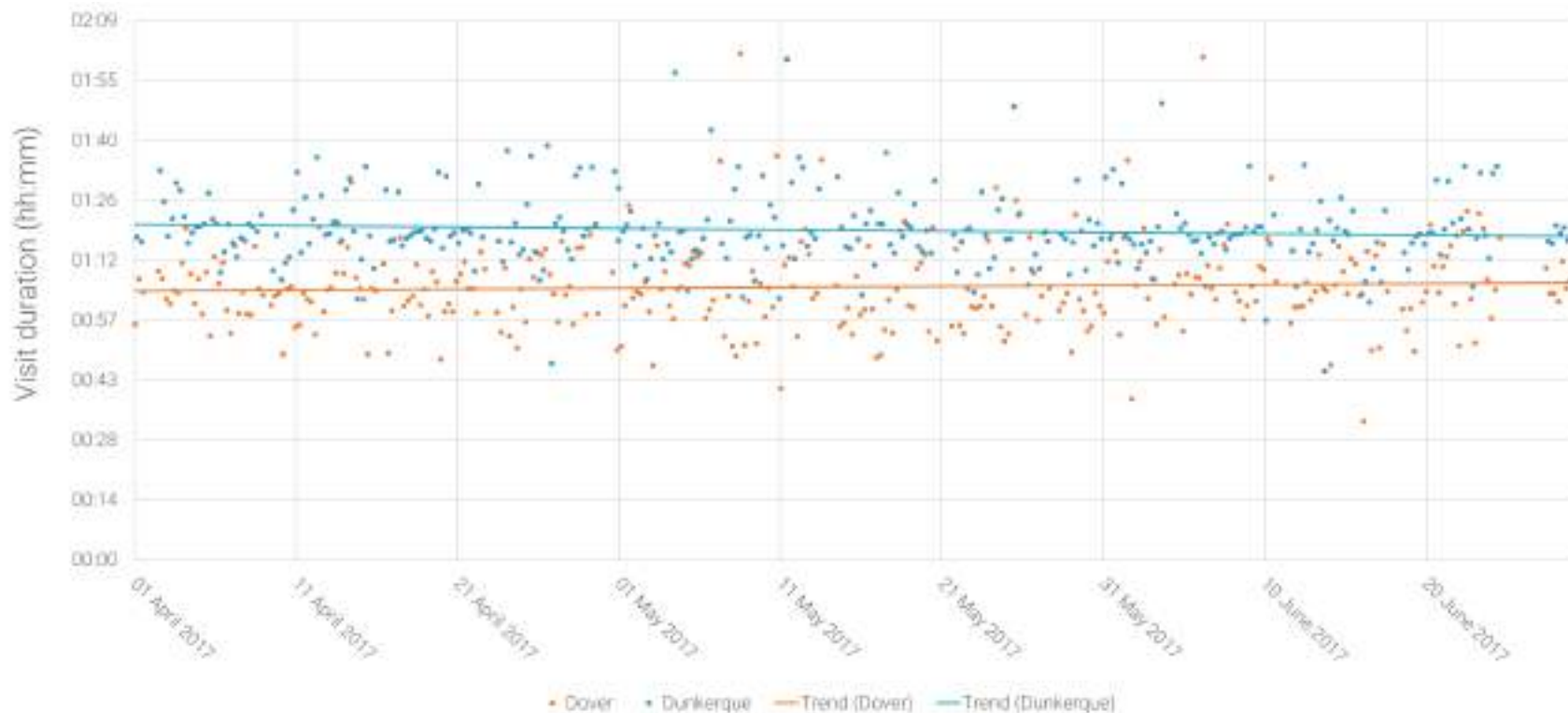
Weekly stops are shorter during peak holiday periods



# Example – Delft Seaway - Dover and Dunkerque



Comparison of the regular Delft Seaway visit durations in Dover and Dunkerque



# Conclusions - What have we found so far?



Using open sources of data, earth observation data and satellite AIS, it is possible to create objective and comparative metrics on port operations down to the individual berth.

We can:

- see a range of vessel handling activities: towage and pilotage
- see how consistently each terminal and berth operates
- compare the handling of each vessel, type and size of vessel
- track and replay stages of an operation eg windfarm construction into operation and maintenance
- identify similar port operations handling the same and similar vessels and we can rank the turnaround times at each stage
- produce comparative indexes despite the inherent structural differences between ports
- detect step changes in performance and in some cases associate this with publicized investment

We cannot see information private to the operations:

- the root causes or further detailed information to explain the differences
- the details of the quantity of the cargo unloaded/loaded

NB. These gaps in knowledge are similar in nature to the gaps in independently produced benchmark measures in other sectors.

Next steps:

1. Increase the information we have on past and current investment projects
2. Look to team up with other interested organisations

# Q&A

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Thank you for your time

If you are interested in any further information then please contact:

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