
CIO+ StayAway
Detecting hidden Shoals from Space
ChartWorld
Group

CIO+

Brief background...

CIO+ was launched nearly 3 years ago as a unique service from ChartWorld for automated plotting of T&P NtM information for the ChartWorld eGlobe G2 ECDIS.

Since then, it has grown and is now one of our most popular services...

3 products:

- **CIO+ T&P,**
- **CIO+ NAVAREA,**
- **CIO+ ENVIRONMENTAL**

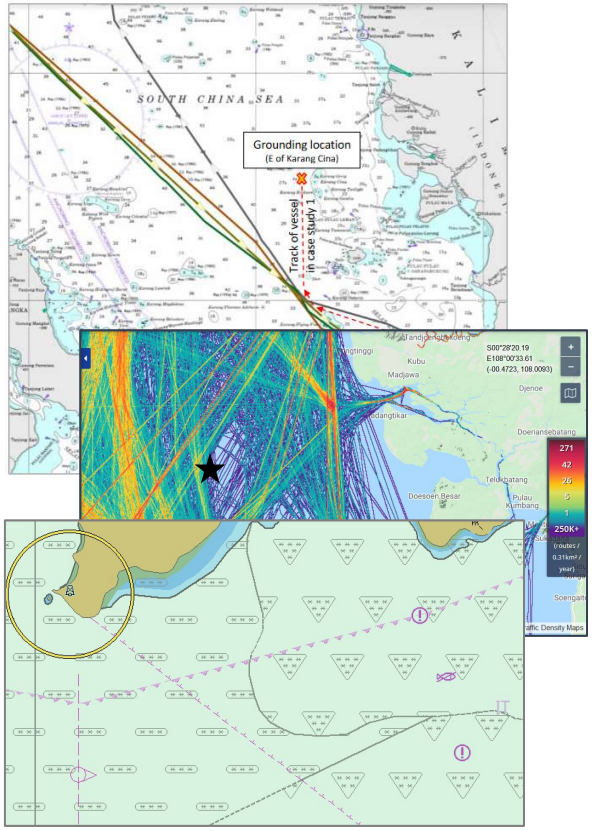
4 major ECDIS manufacturers - ChartWorld, Furuno, JRC, Wartsila - support this service

Over **1000** customers

Now we would like to present another totally unique addition to the CIO+ Family...

CIO+ StayAway

The Issue – Groundings due to inadequate charted areas



Groundings happen because:

- Outdate and not detailed enough chart data
- Misinterpretation of available data
- Negligence of the CATZOC values in the ENC
- The navigation officer is not adding the necessary safety margin

This issue causes millions in insurance claims

The Idea: Utilizing Earth Observation

CATZOC distribution: low CATZOC values => poor depth and position accuracy

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Technical feasibility: water clarity and mapping potential

+

Vessel traffic: significant vessel traffic activities

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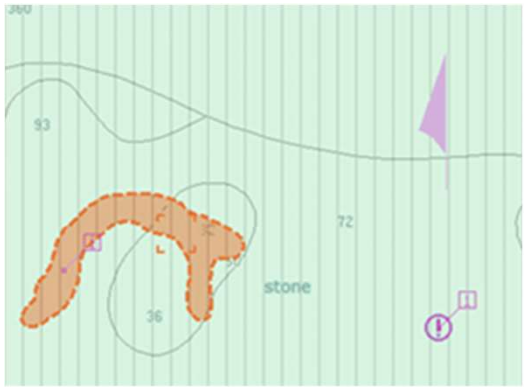
StayAway Areas



StayAway Areas in ECDIS can contribute to improve safe navigation in areas identified by the above criteria.

Proof of Concept

The Pilot Project

Indonesian archipelago serves as test area

Selection of suitable multispectral satellite imagery of the area

Processing of satellite images to identify obstructions

Vectorize identified obstructions and create StayAway features

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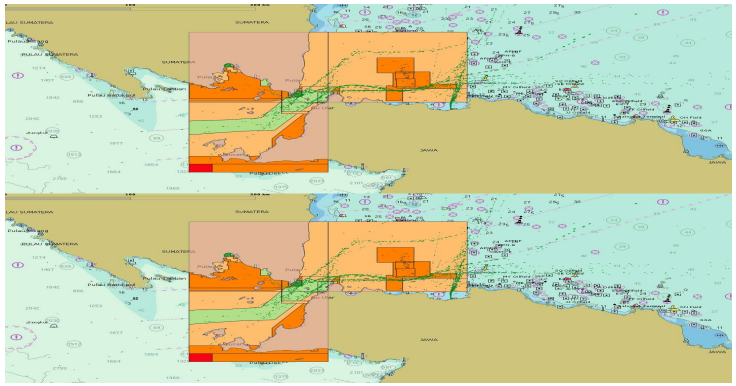
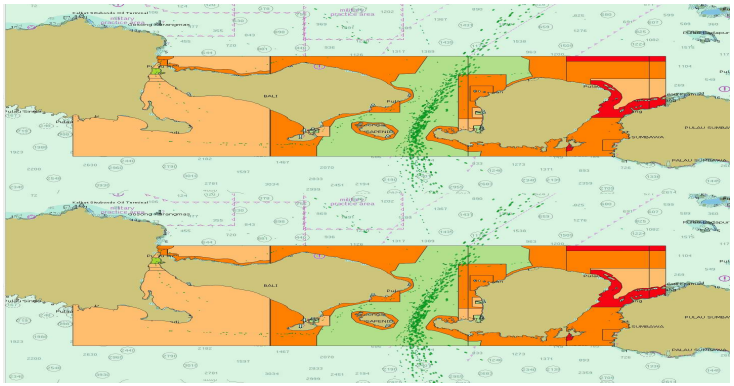
The Findings



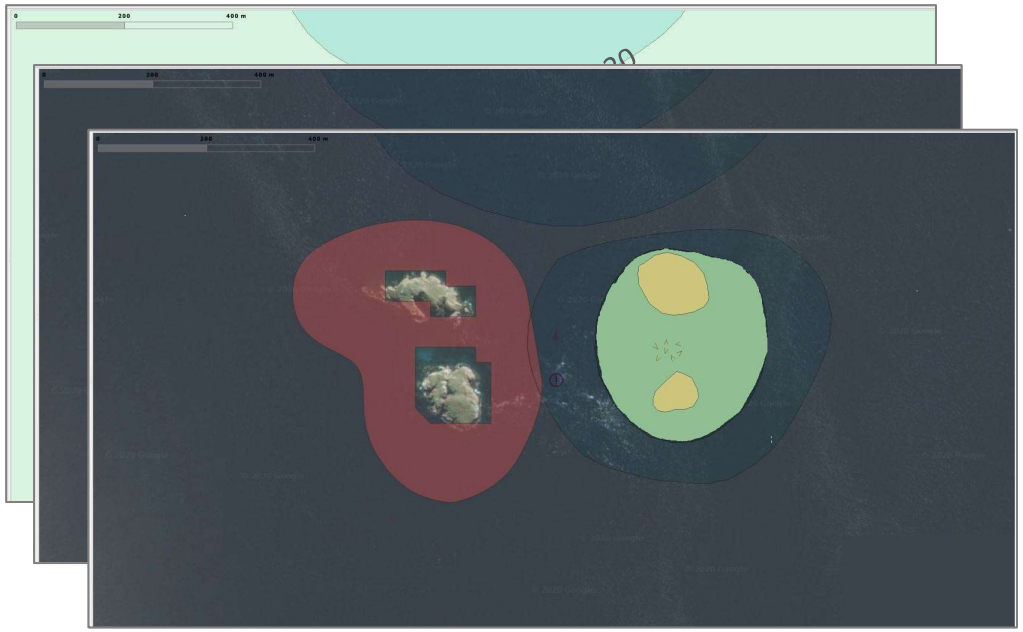


In total we reviewed 10 tiles of 1 x 1 degree.

CIO+ StayAway indicates **shallower than surrounding areas in a depth from 10-30 meters**

4.724 shoal areas were detected in satellite data

Findings in Detail

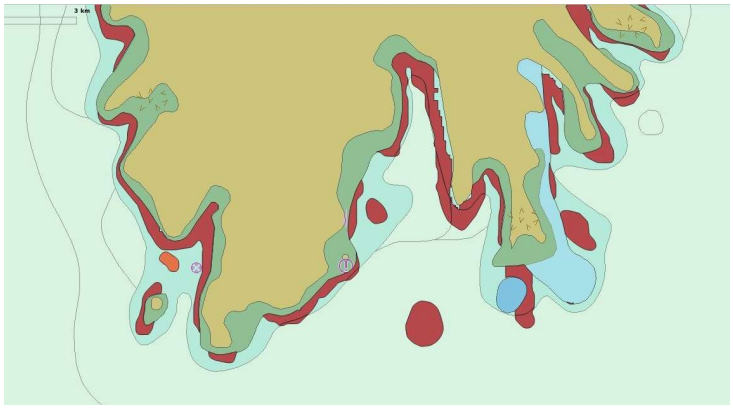


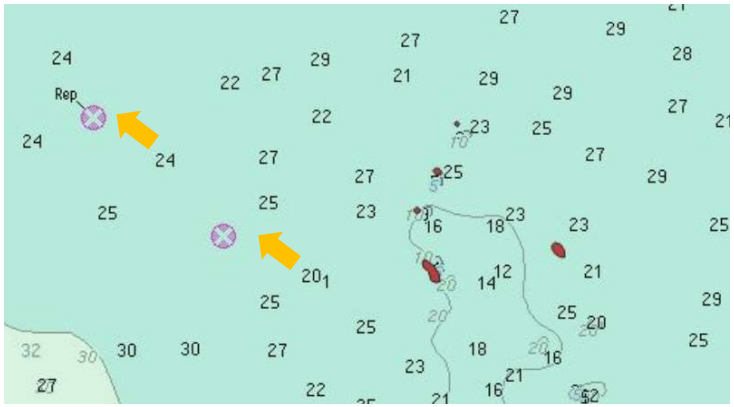
- Shallower than surrounding area
- No corresponding obstructions in ENC

Technologies exist that can provide us a new visual perspective from space...

In this example StayAway Areas are indicated where the satellite imagery is different to the position indicated on the corresponding ENC.

Findings in Detail





Depth value	Amount of obstructions shown in ENCs
> 20m	18
< 20m	14
unknown	349
Total	381

Of **381** isolated dangers in ENCs only **92** could be matched.

The remaining **289** isolated dangers are potentially at another location.

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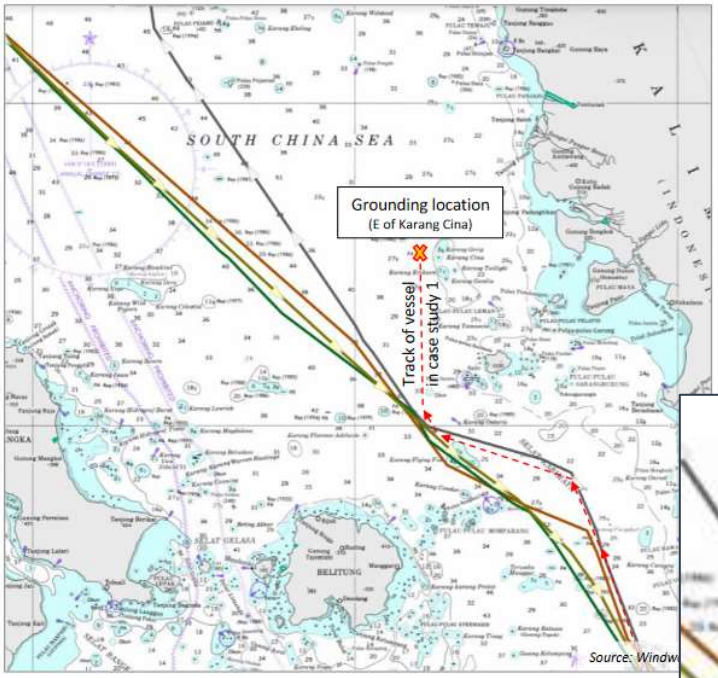
Case Study 1

Grounding Karimata Strait

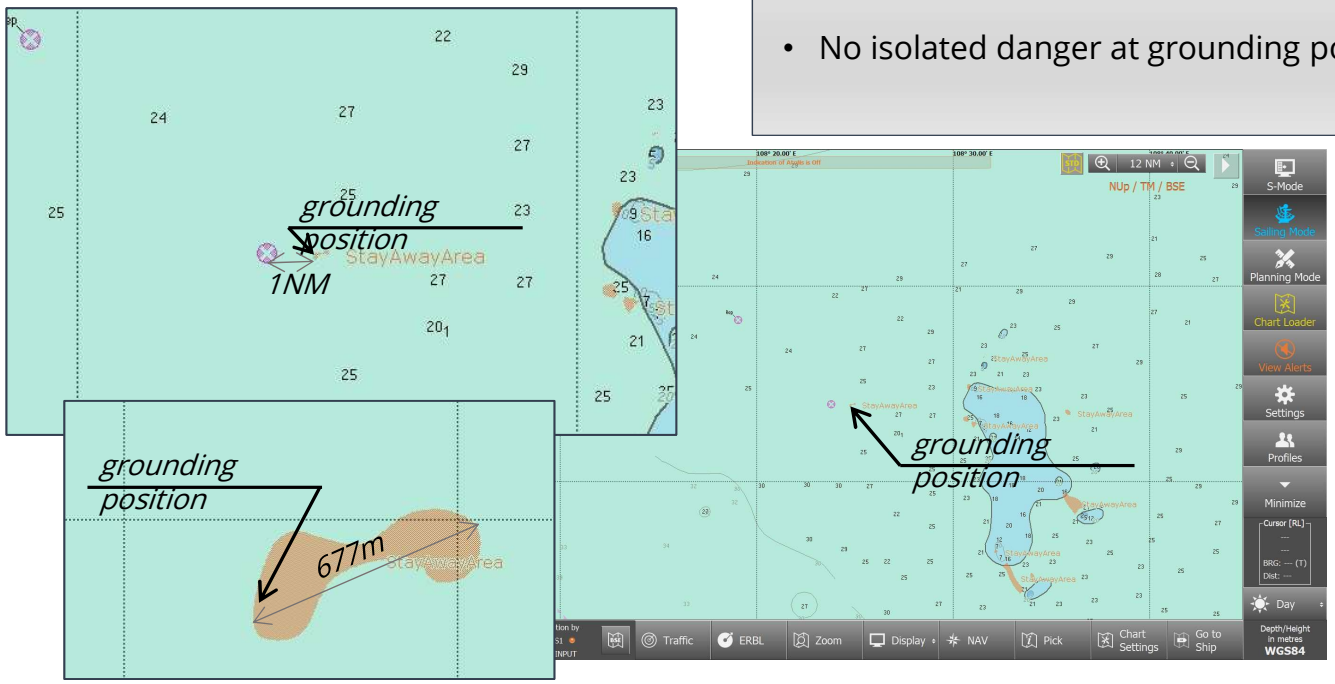
- Year:
- Vessel: Bulk Carrier
- Draft: 13 m
- Voyage: Indonesia to Japan via Karimata Strait



Case Study 1

Grounding Karimata Strait

- CATZOC: C (±500m positional accuracy)
- ENC: ID300284, Edition 5, Update 1 (uptodate – week 52/2020)
- No isolated danger at grounding position



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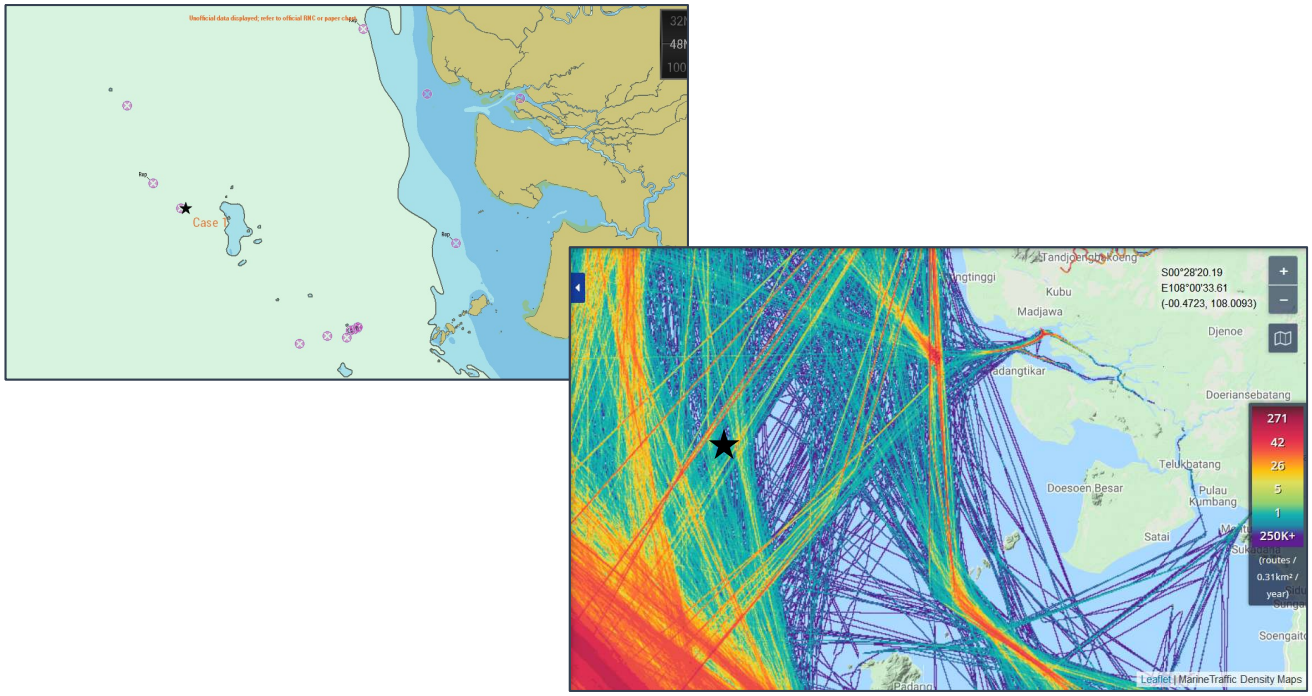
Case Study 1

Traffic Density 2019 Map



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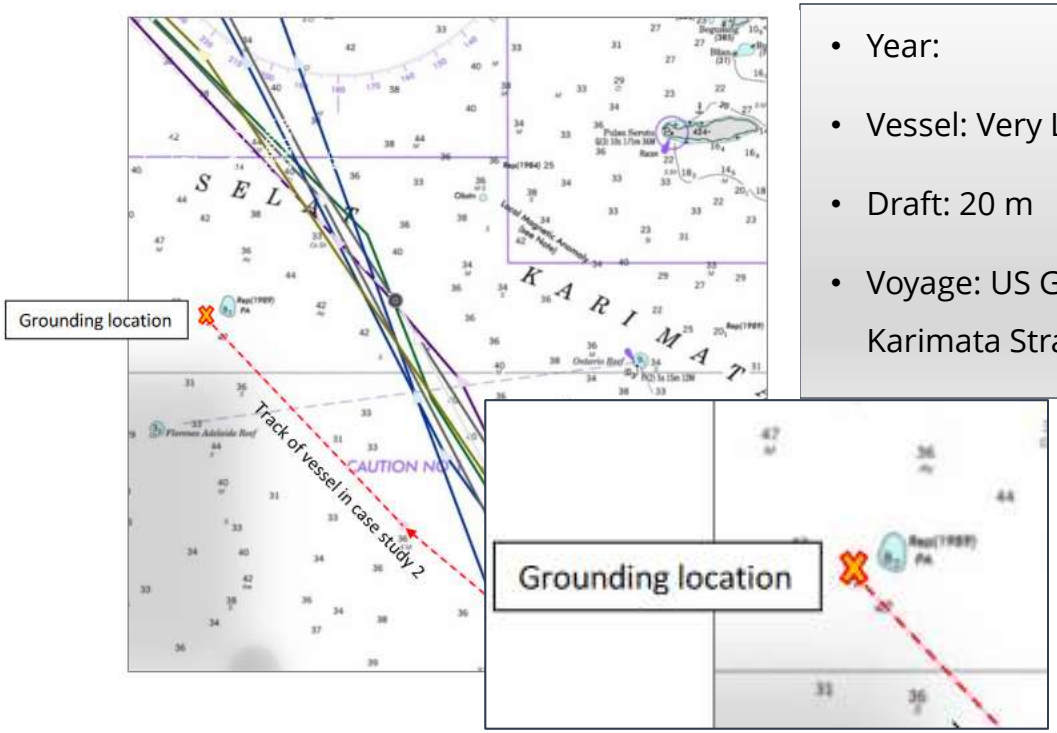
Case Study 2

Grounding Karimata Strait

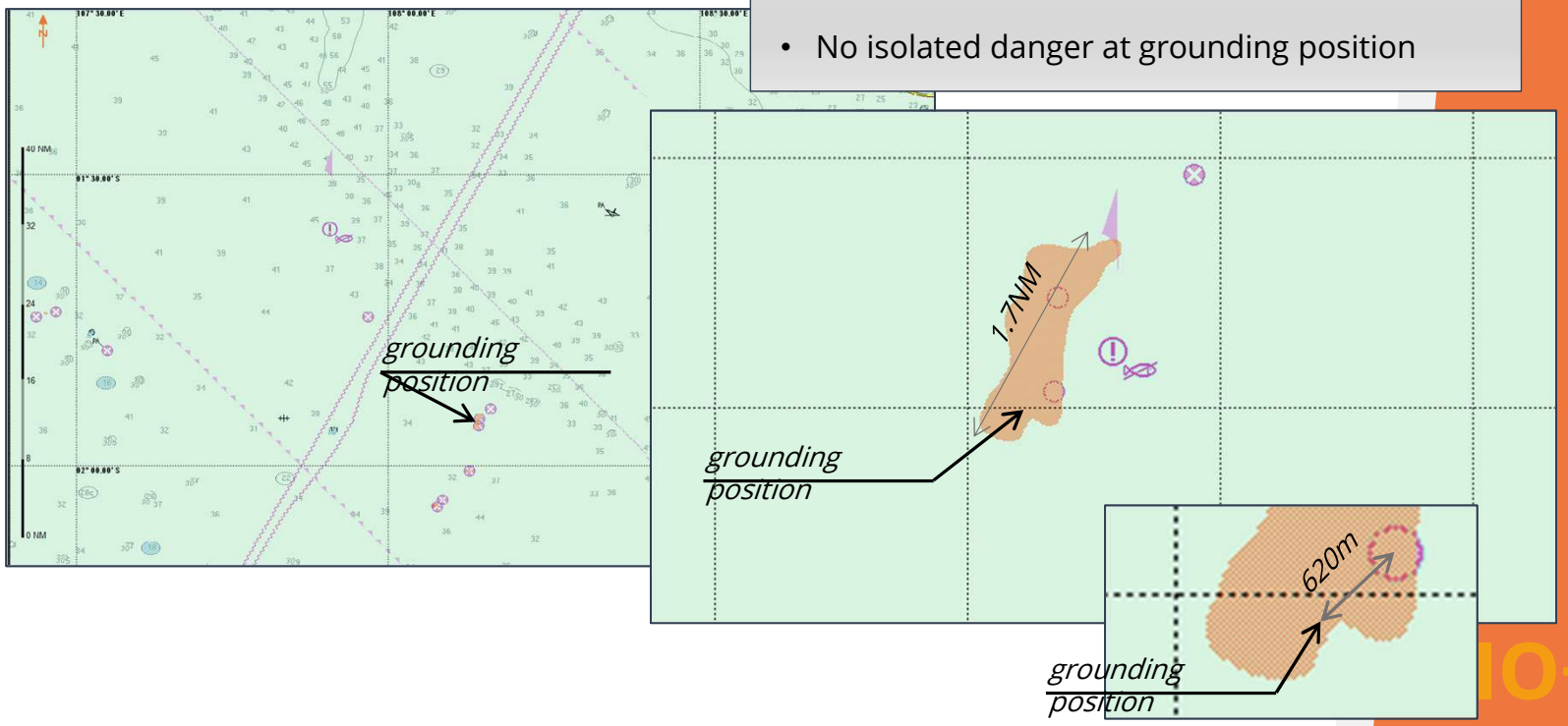


- Year:
- Vessel: Very Large Crude Carrier
- Draft: 20 m
- Voyage: US Gulf to Japan via Sunda Strait – Karimata Strait

Case Study 2

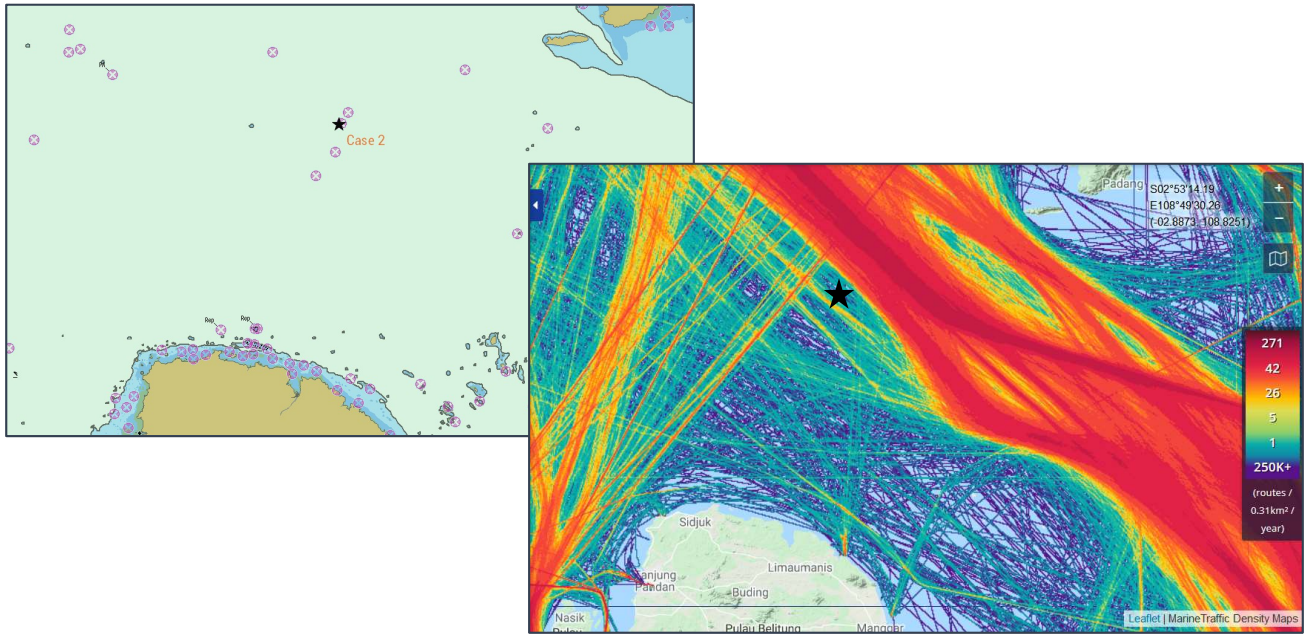
Grounding Karimata Strait

- CATZOC: B (±50m positional accuracy)
- ID300426, Edition 4, Update 14 (uptodate – week 52/2020)
- No isolated danger at grounding position



Case Study 2

Traffic Density 2019 Map



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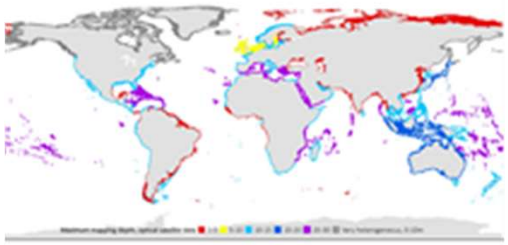
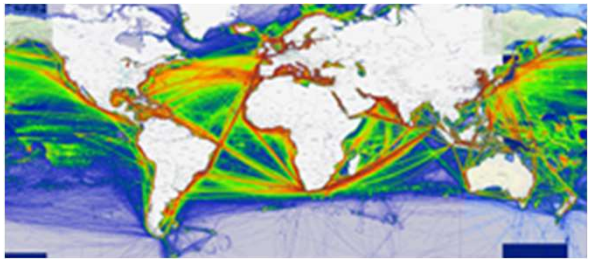
Feasibility





ENC CATZOC C, D & U + WATER CLARITY + VESSEL TRAFFIC = StayAway Areas

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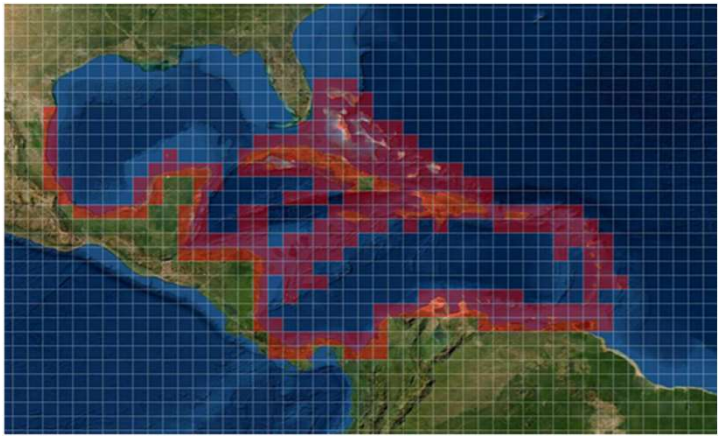
Matching the Criteria

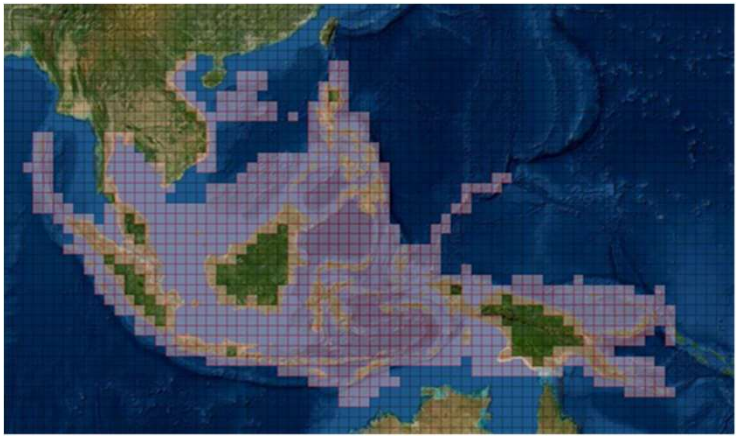
Areas identified:

- Caribbean
- South East Asia
- South Pacific

1000 Tiles.

Projected **400k** shoal areas to be detected





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Thank you!