



UK Hydrographic
Office

WENDWG 13

UK ENC Data Improvement including the GB ENC Rescheme

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Jan 2023

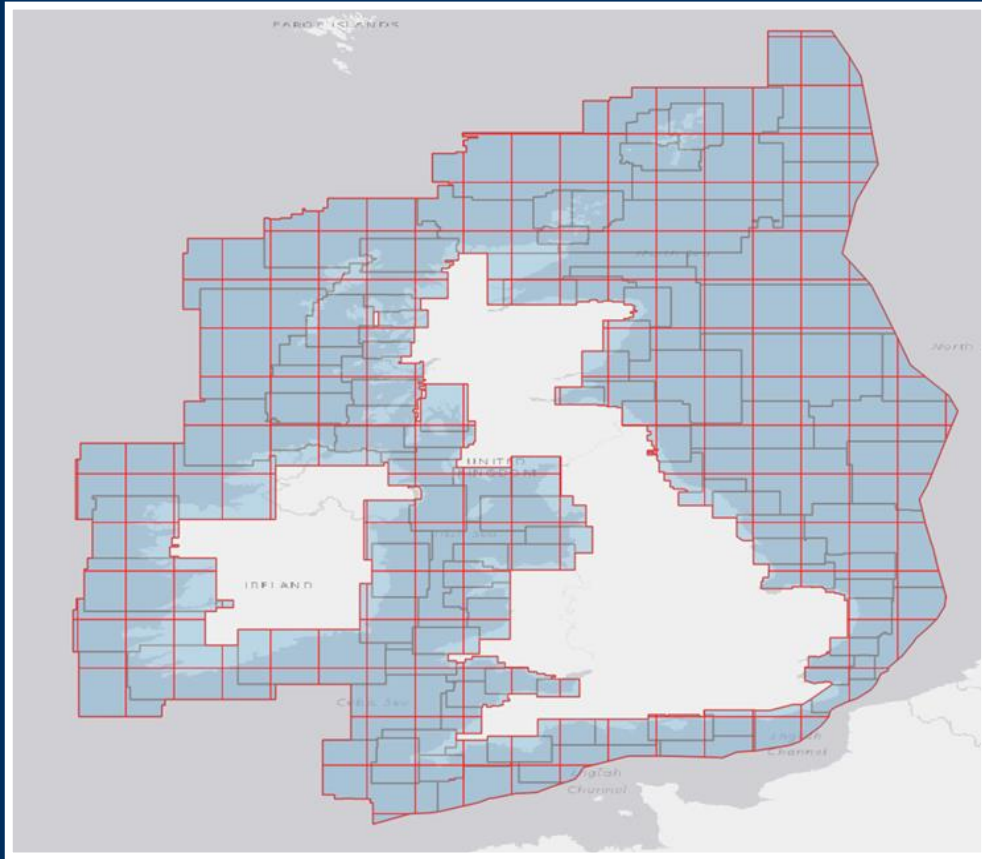


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Scope of Data

Improvement:
Rescheming,
improved and
enhanced content

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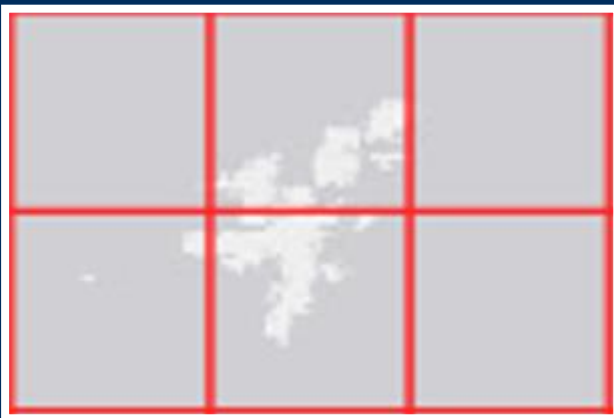
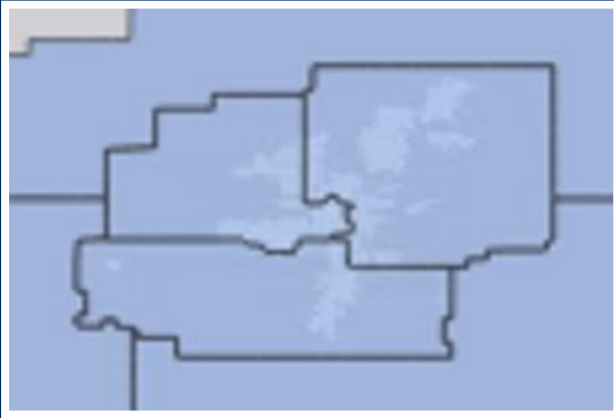
What is Data Improvement?

- Upgrading the ENC content to create consistency in scale and content, so the original footprint of paper charts is not visible in the reschemed data.
- The opportunity to incorporate user feedback to improve the user experience, address their pain-points, improve safety and or ensure future maintenance is more efficient.
- Preparing for and supporting S-101 conversion plus aligning limits with other S-100 Standards.

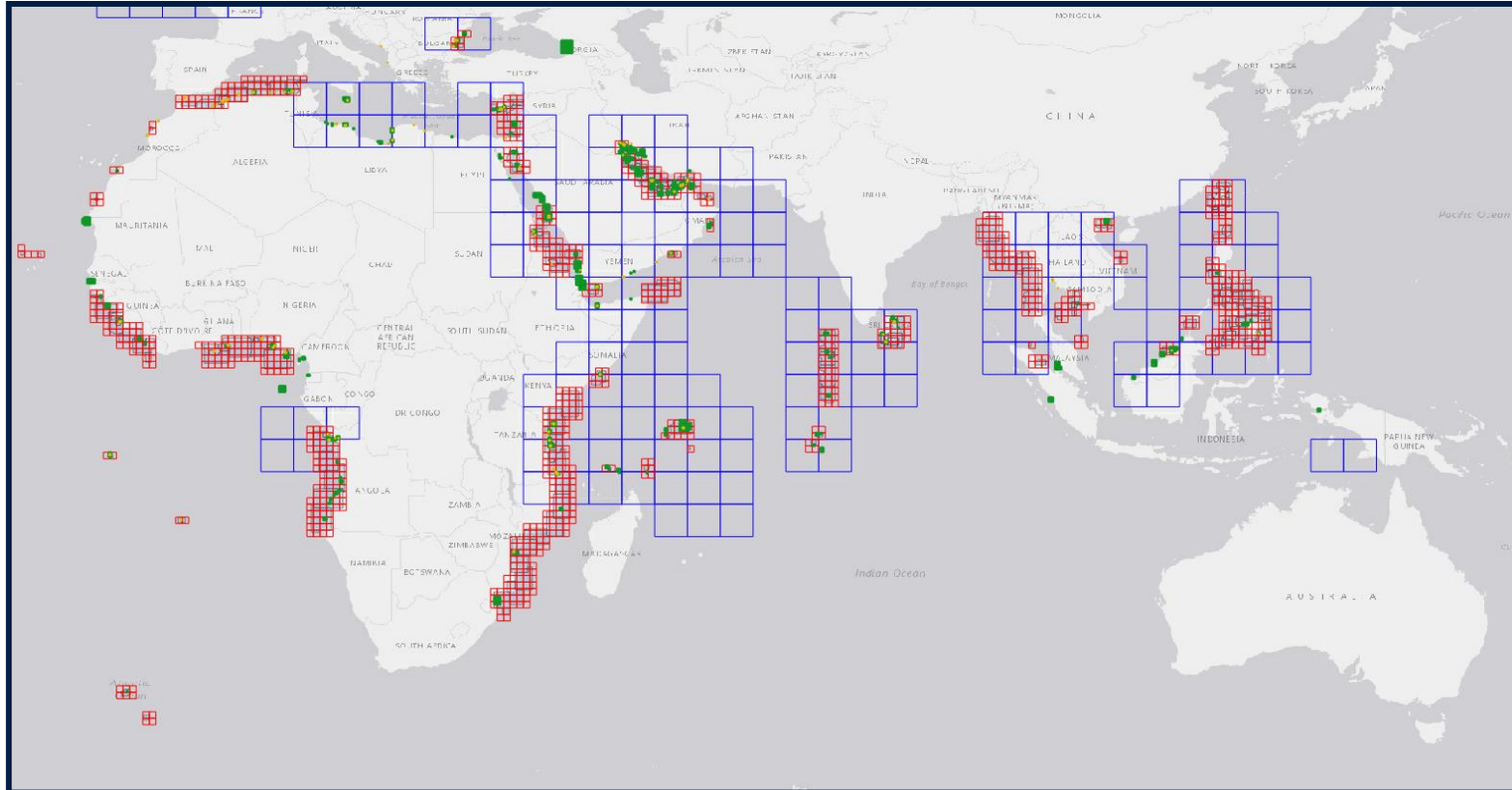


Why now?

- The top image is an example of the existing GB ENC's using a paper chart scheme, the bottom image shows how the data will look when reschemed into a gridded format.
- Whilst changing the data limits, it is the perfect opportunity to identify inconsistencies across the new gridded limits and resolve them, harmonising the dataset.
- During this time, we will also enrich the data, adding enriched detail where requested by the user i.e. additional bathymetric and topographic contours.



Developing a Global Gridded Scheme:



Define a grid which is flexible enough to support the global coverage of 1,800 GB ENC's at all scale bands for current and future S-1XX Products

Many Coastal States use a gridded scheme, they are all different from one another and are only applied on a country (not global) scale.

The chosen grid parameters

6 options were tested, the chosen solution aligns best with the GB ENC coverage. It is one of many solutions, you are welcome to trial and consider.

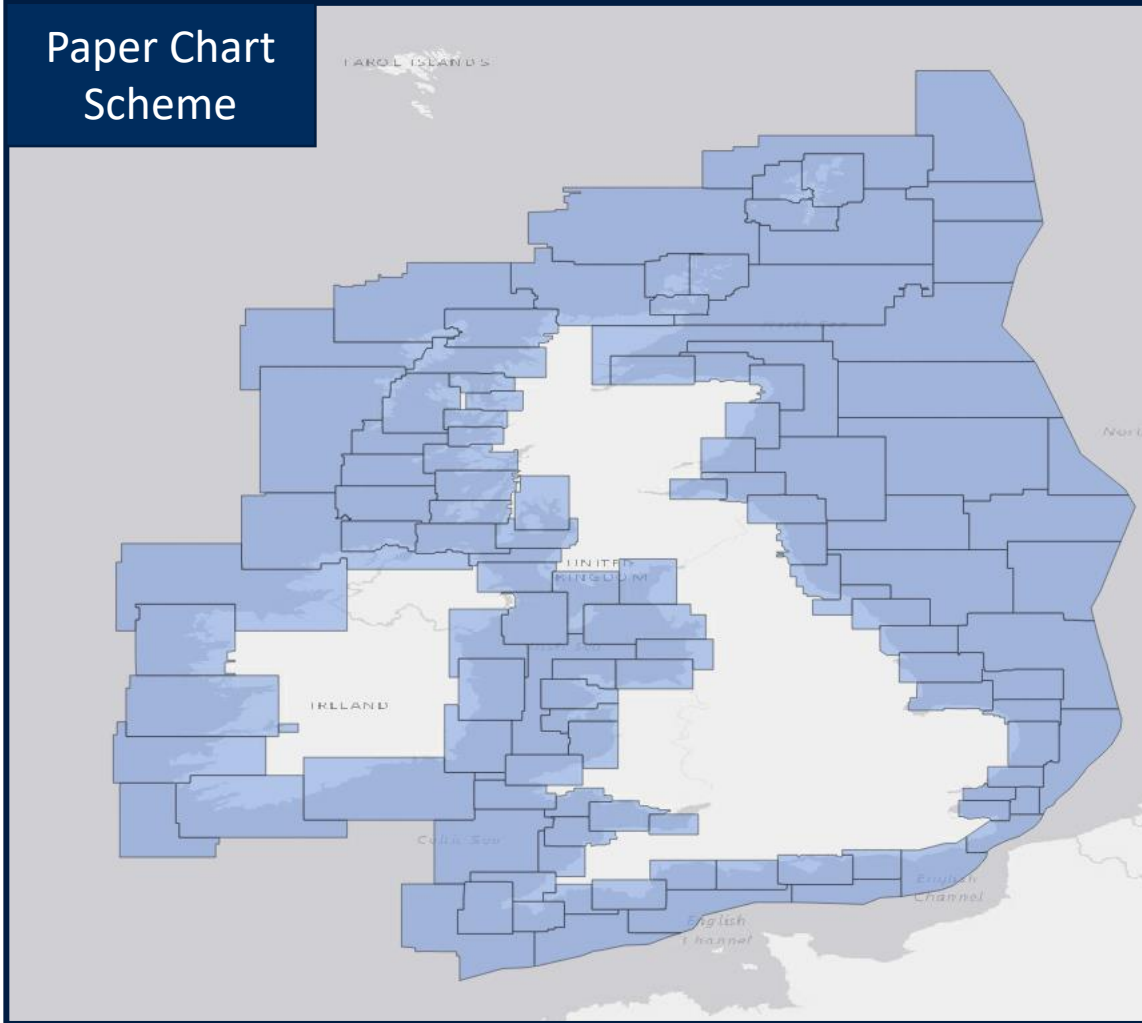
Band	1	2	3	4	5	6
Grid Size	20	4	0.8	0.2	0.1	0.05

The S-102 grid is 0.1 grid
This will align with the UK's chosen grid

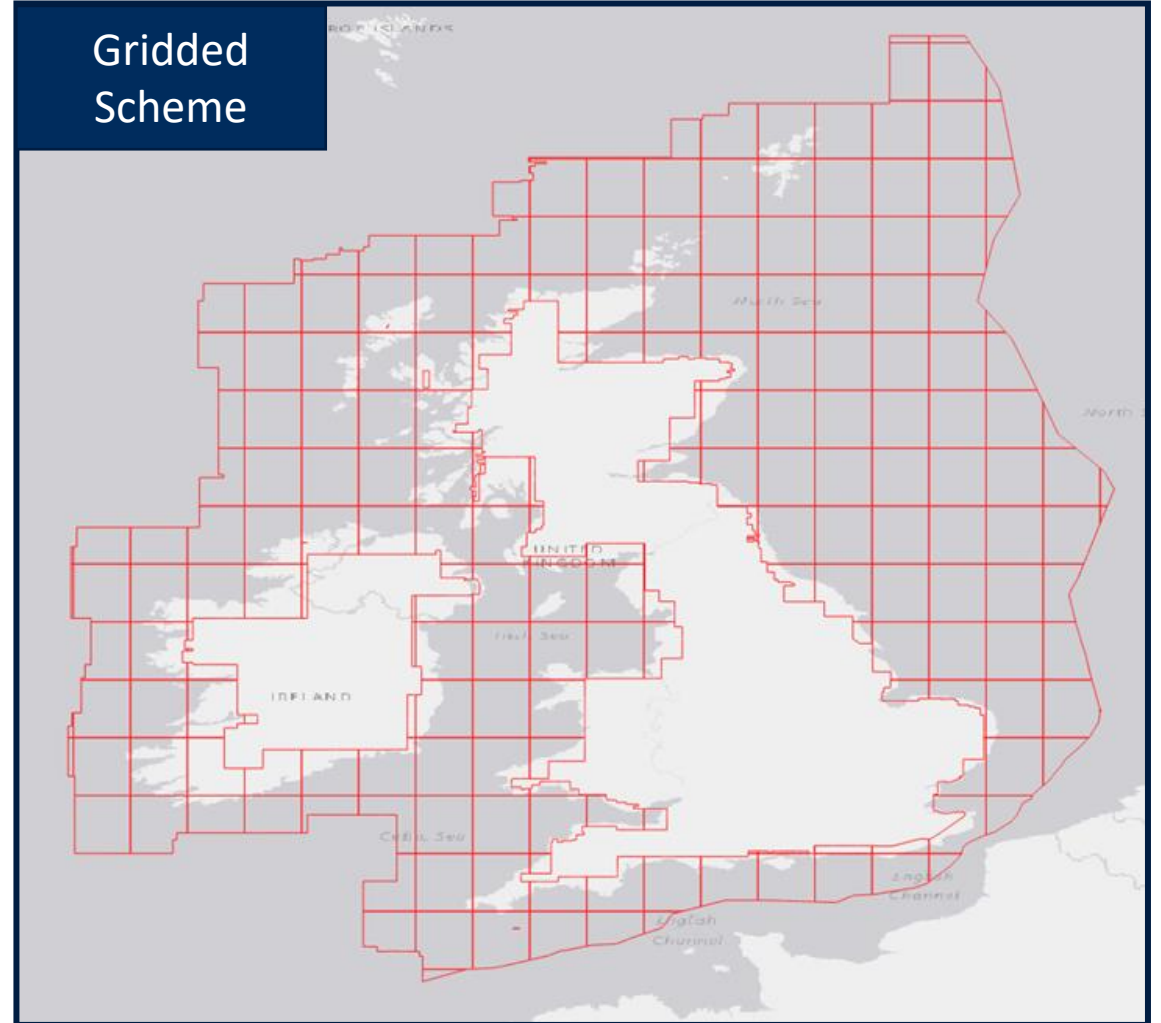


How the gridded scheme will change the band 3 GB ENC coverage

Paper Chart
Scheme



Gridded
Scheme





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Advantages

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The grid can be applied at all scales and scale bands



The UK grid has been specifically designed so it can be applied across the whole world



The grid can be flexibly applied to address concerns over safety and value for the user, to ensure too many ENC's are not created

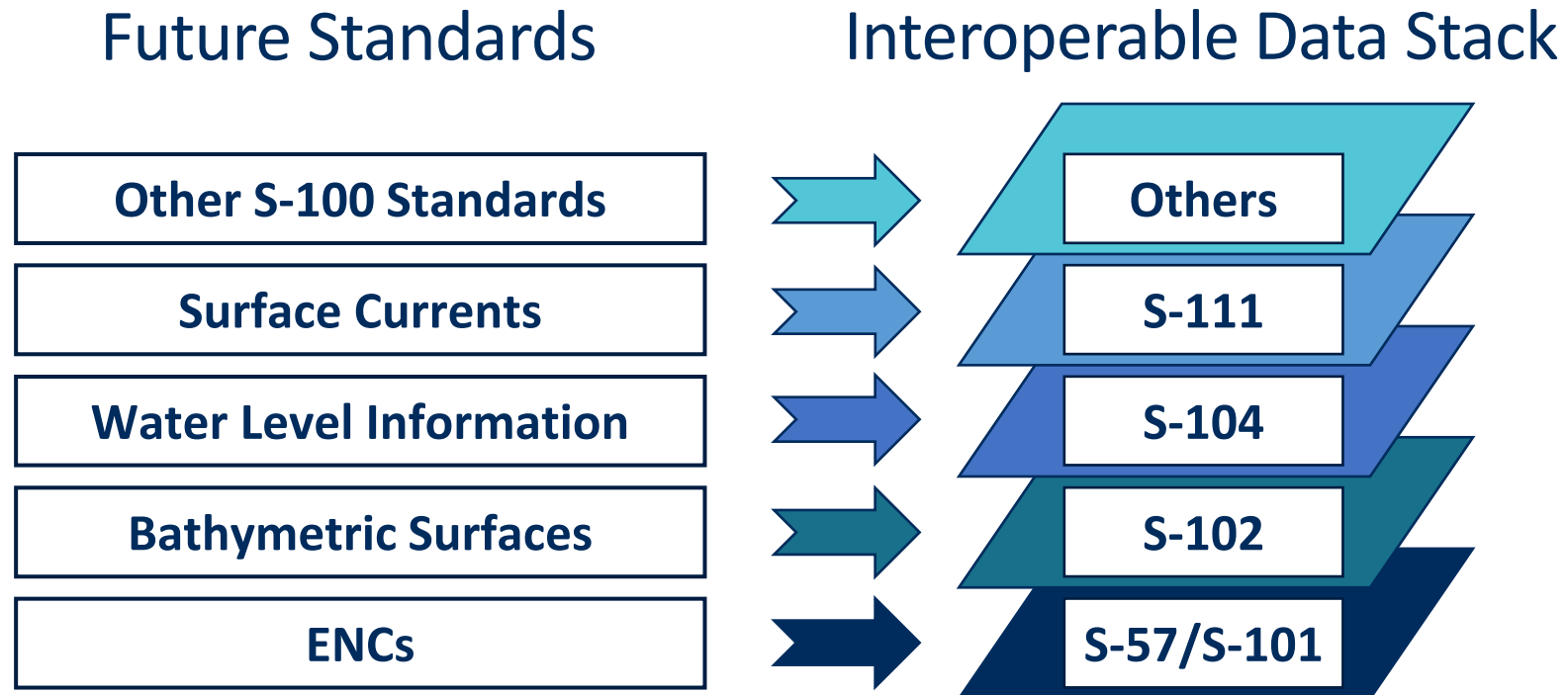


The grid will also align with S-102 and enable S-101 to be part of an interoperable layer of digital data including S-100 products and services



Alignment with Future S-100 Standards

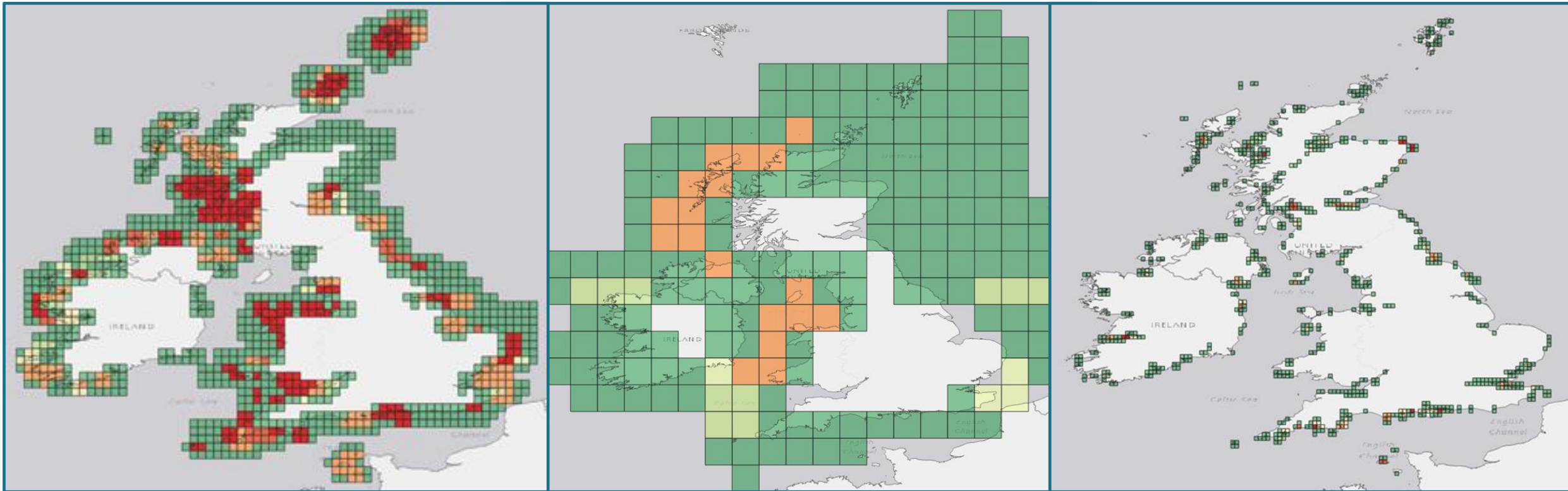
UKHO is already producing test datasets for many S-100 related standards, which will be schemed using the same grid parameters



Data Improvement: Harmonising Scale

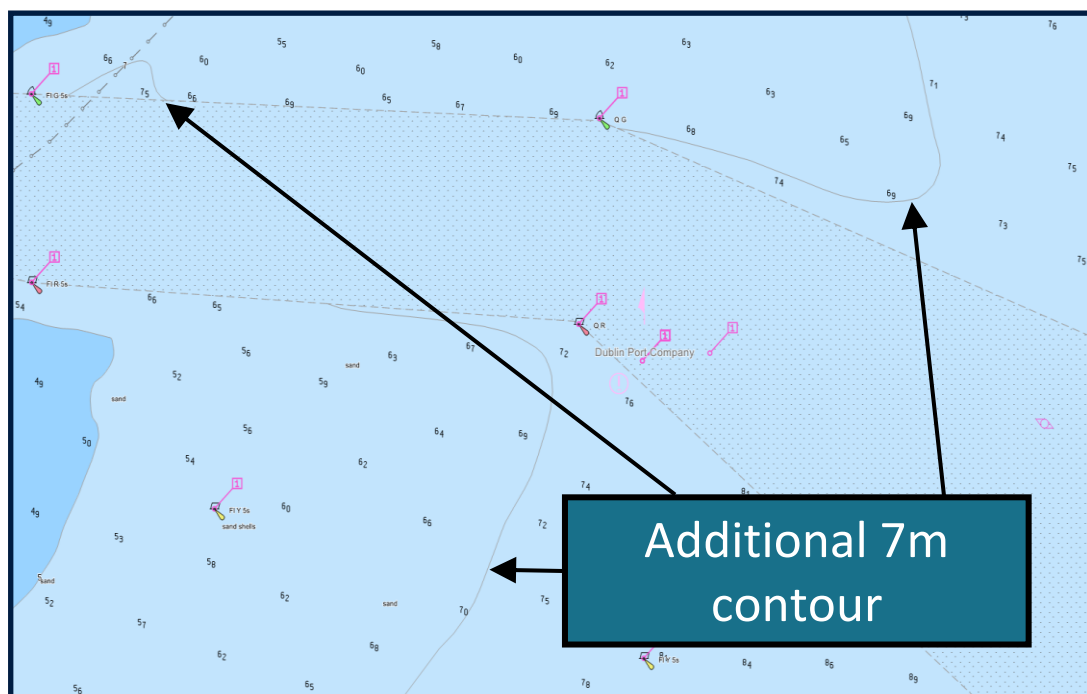
Scale differences between ENCs will be combined within the same grid square when applying the gridded scheme

Green = Scale match closely
Amber = minor scale discrepancy
Red = significant scale discrepancy



Safety Enhancements and Voyage Optimisation

HD ENC and additional contours facilitate safety enhancements and voyage optimisation by providing more accurate visualisation of safe water to the user



Standard ENC



**ENC containing
HD bathymetric data**



Provision of additional bathymetric contouring has many benefits for safer and more efficient navigation.

High Density (HD) ENC's are contoured at 1 metre intervals, providing the user with the ability to choose the most appropriate Safety Contour and clearly visualise the safe water relative to the draught of the vessel.

- 1, GB6H0003 = Kyleakin Pier, Scotland
- 2, GB6H0001 = Oban, Scotland
- 3, GB5H0002 = Lima Anchorage, Firth of Forth
- 4, GB4H0005 = Shipway Channel, Orford Ness
- 5, GB6H1176 = Bristol Bridge Patch

Increasing HD ENC Coverage

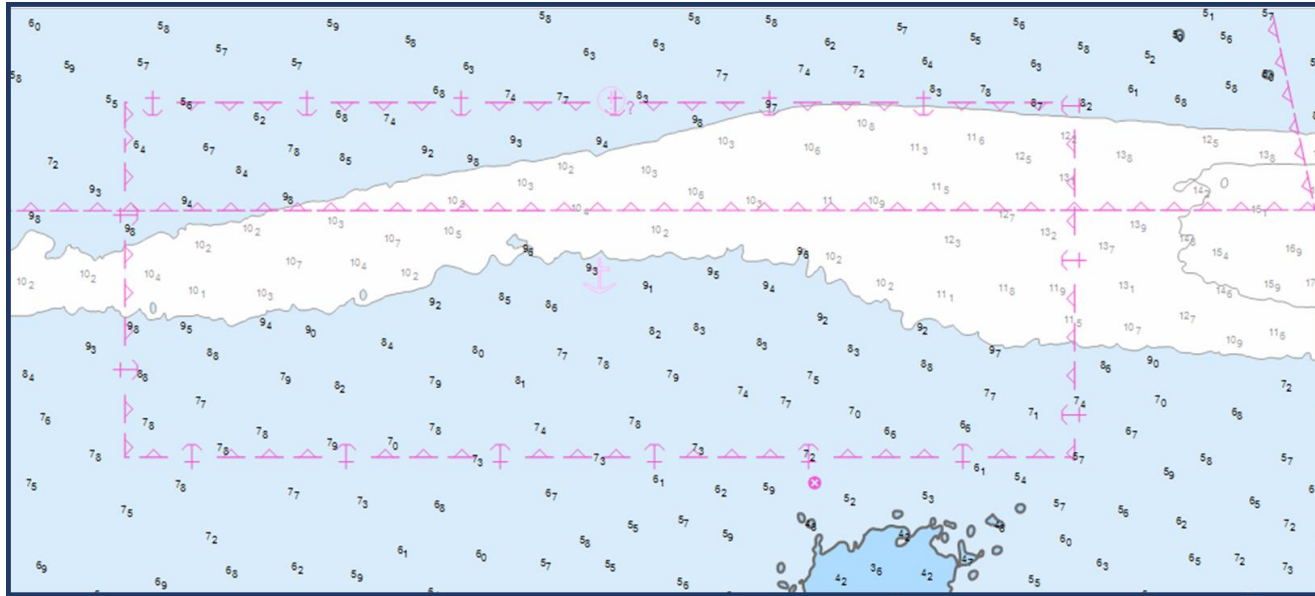
HD ENC's provides the safety enhancements which can be displayed in the current ECDIS using the current standard (S-57).

3 test HD ENC's were published and following positive feedback.

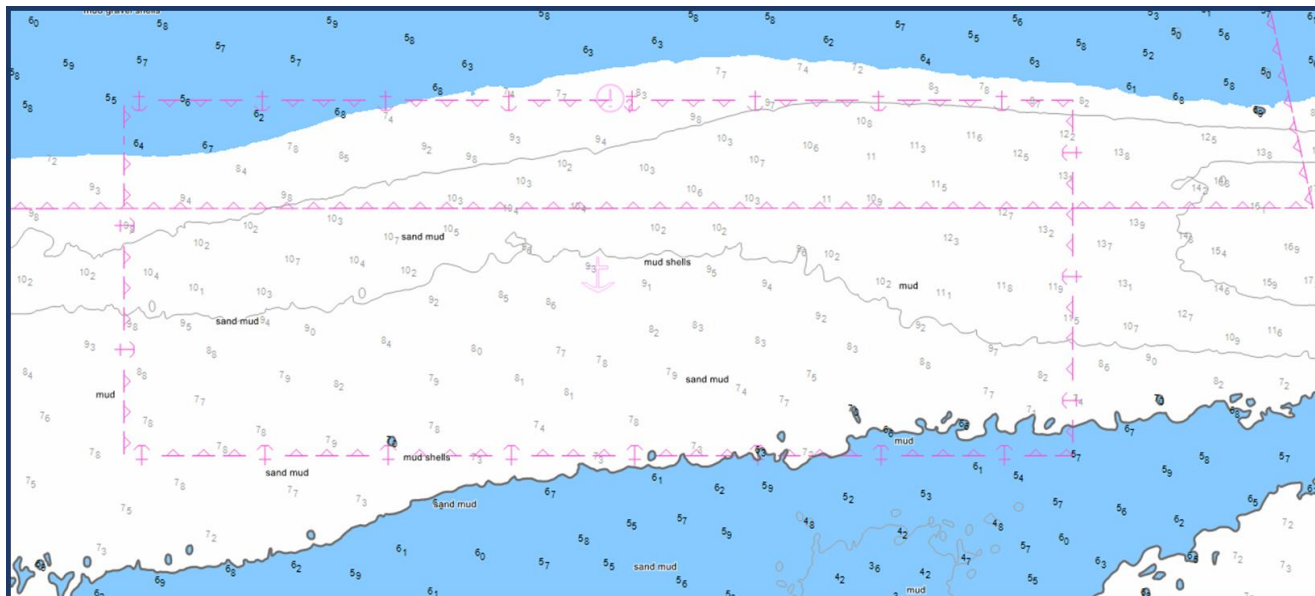
An additional 7 HD ENC's containing 1m contouring are now published with more being prepared for future release.

- 6, GB4H0002 = Sunk DWR, Thames Estuary
- 7, GB4H0003 = Long Sand Head, Thames Estuary
- 8, GB4H0001 = Inner Sunk DWR, Thames Estuary
- 9, GB4H0004 = Tail of the Falls, Dover Strait
- 10, GB6H0002 = Port Villa, Vanuatu

Visualising Safe Water

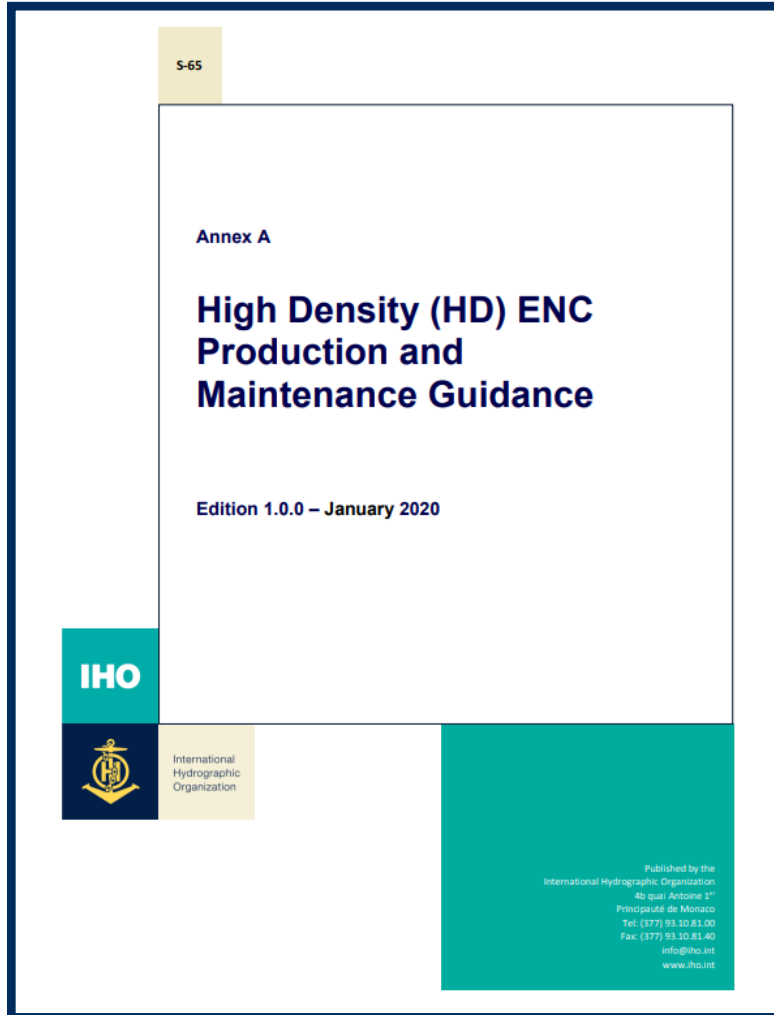


Screenshot of the HD coverage at Lima Anchorage in the Firth of Forth using standard contours. For a vessel with a draught of 7 metres, the default safety contour will be the 10m contour.



This is the same area but where the user made use of the 1m contouring and has selected the 7m contour as their safety contour, enabling them to better visualise the safe water for their vessel.

HD ENC Production Guidance



1, Current HD ENC Production guidance excludes many surveys supplied directly by ports

2, Reconsider content of Edition 1 of the IHO HD ENC Production Guidance ✓

3, Define how use of a wider range of surveys for HD ENCs will not create a danger/risk ✓

4, Draft proposed alternate wording for the IHO HD ENC Production Guidance ✓

5, Final updated copy provided to ENC WG rep for review at the next meeting in November ✓

6, The 2nd Edition supports safe production of HD ENCs from a wider range of sources ✓



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Preventing overlaps with adjacent Coastal States

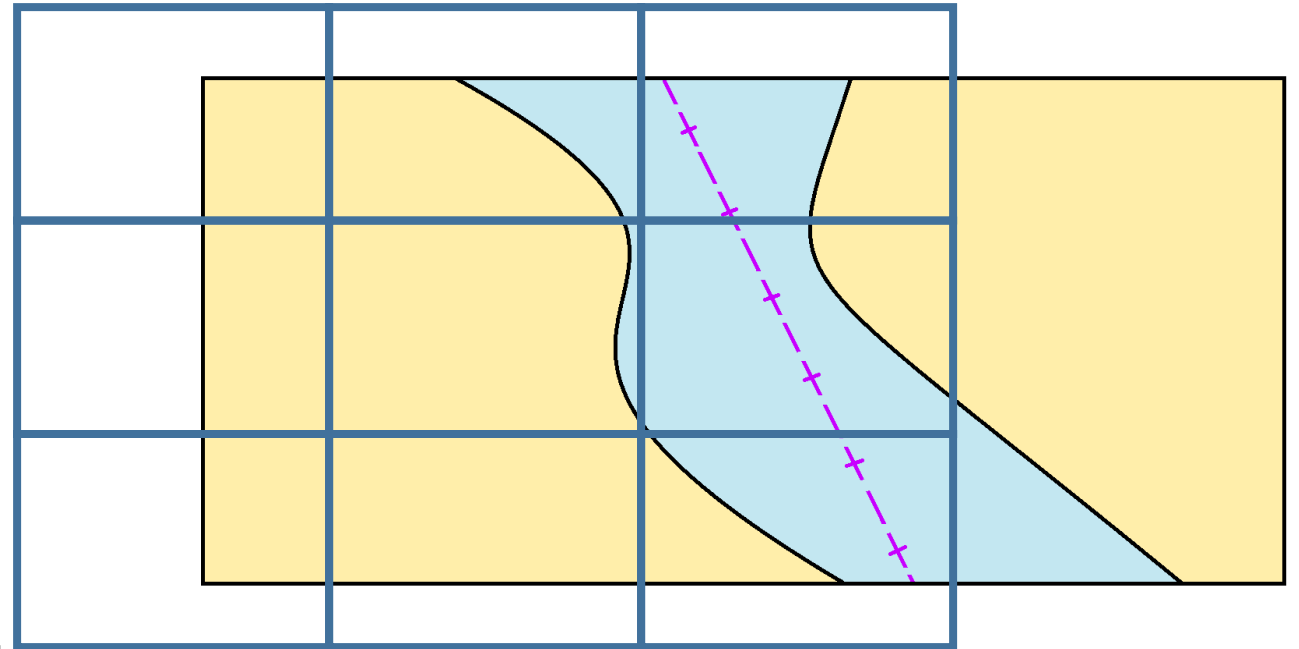
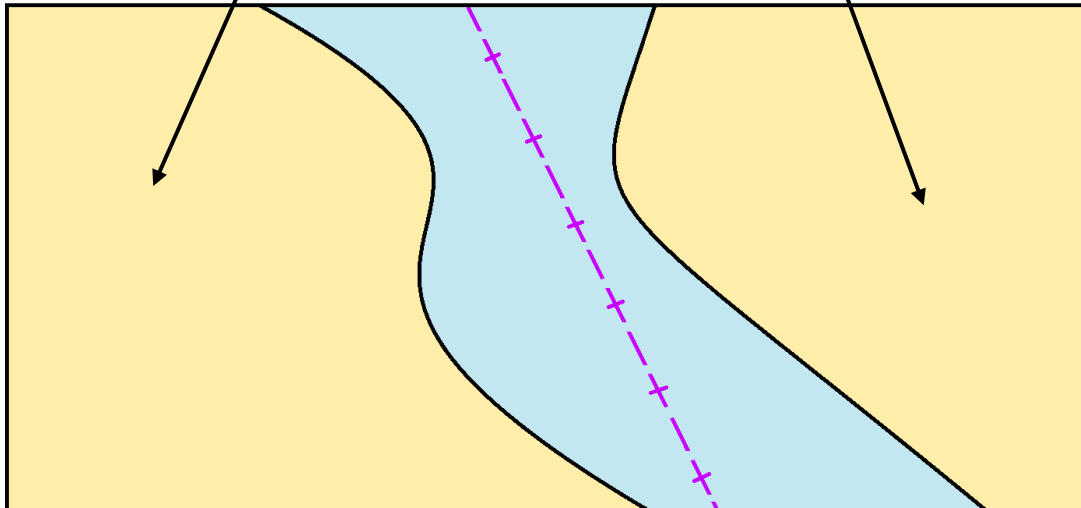
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Preventing overlaps I

Each Coastal State is responsible for creating it's own coverage within their maritime limits. Coastal State A is rescheming, using a gridded scheme

Coastal State A

Coastal State B



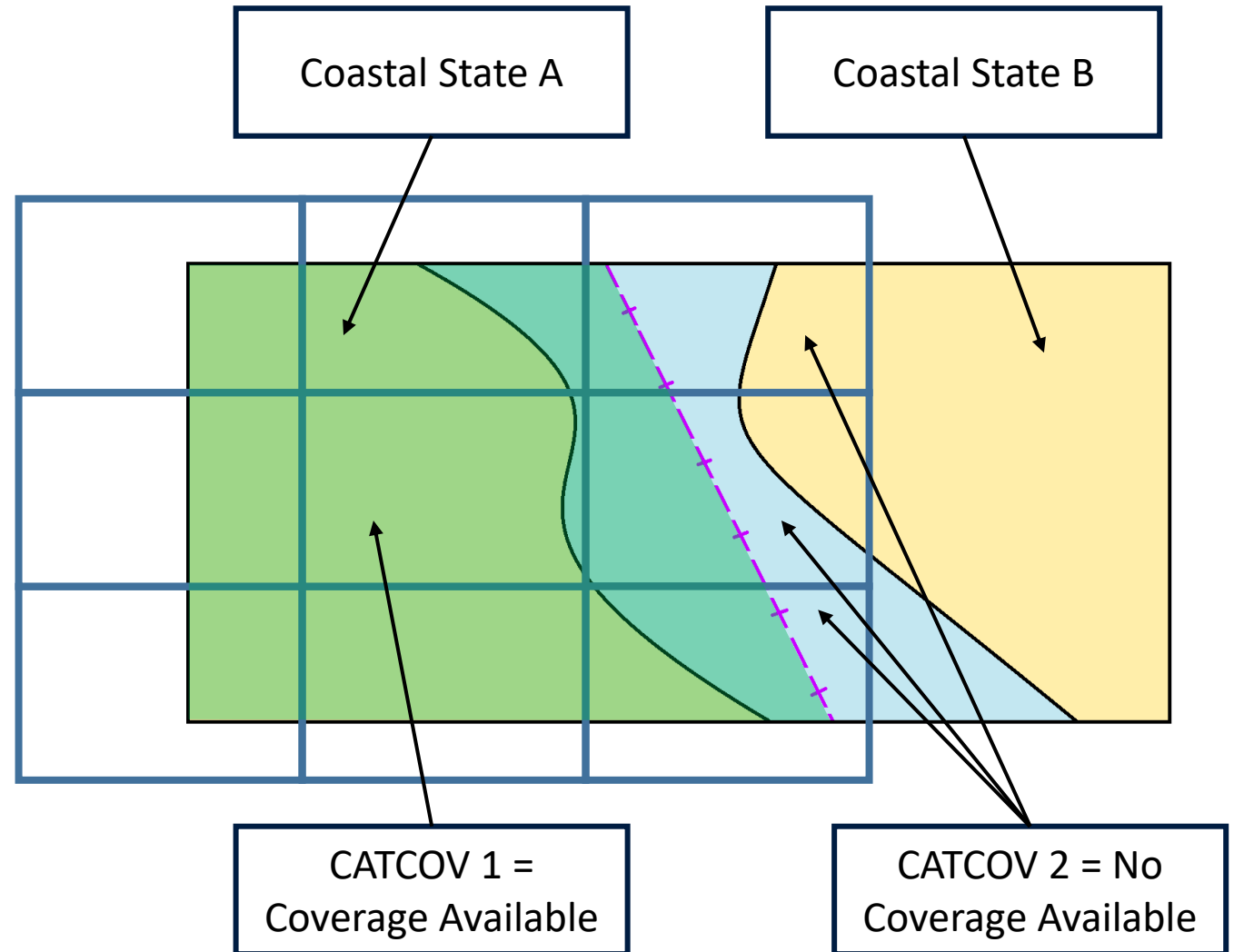
All ENC's must be rectangular but Coastal State A cannot overlap into Coastal State B when the gridded scheme is applied

Preventing overlaps 2

It is standard practice for Coastal States to use the 2 different M_COVR categories to distinguish where there is data while maintaining seamless coverage

CATCOV 1 = Coverage Available

CATCOV 2 = No Coverage Available





Preventing overlaps Summary

The UK gridded scheme will be applied within the limits of the current GB data coverage. Where grid squares are only partially filled with data, they may be merged with adjoining grid squares or, at larger scale bands, additional data could be captured to fill the grid square.

There will be no change to coverage limits where GB cells border with ENC's created by other producer nations.

ENCs must be rectangular, this is achieved using M_COVR CATCOV 1 (coverage available) and M_COVR CATCOV 2 (no coverage available).

Gridded ENC's will use the M_COVR CATCOV 1 coverage for the End User Catalogue, therefore the cells do not appear to infringe on neighbouring countries coverage

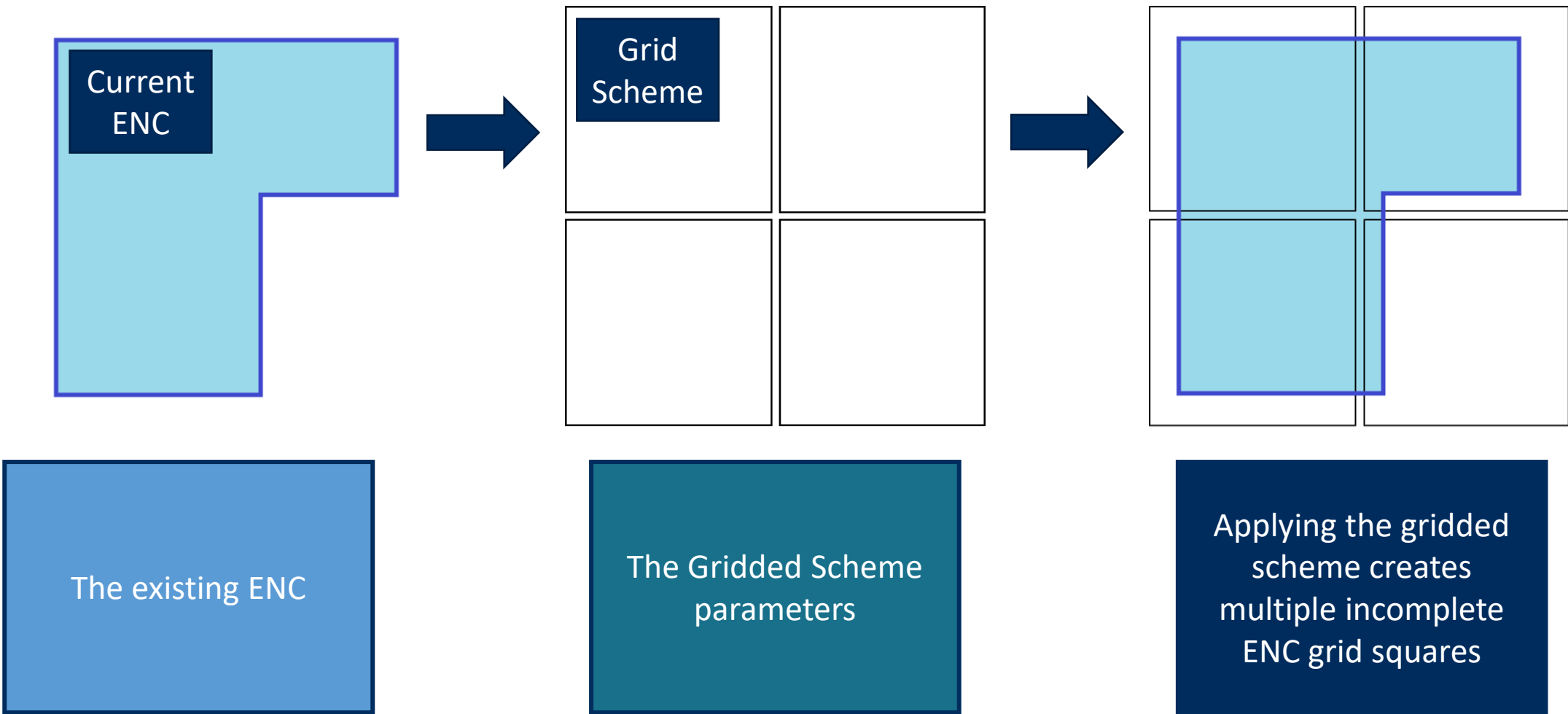


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A flexible approach to the gridded scheme: addressing concerns over safety and value

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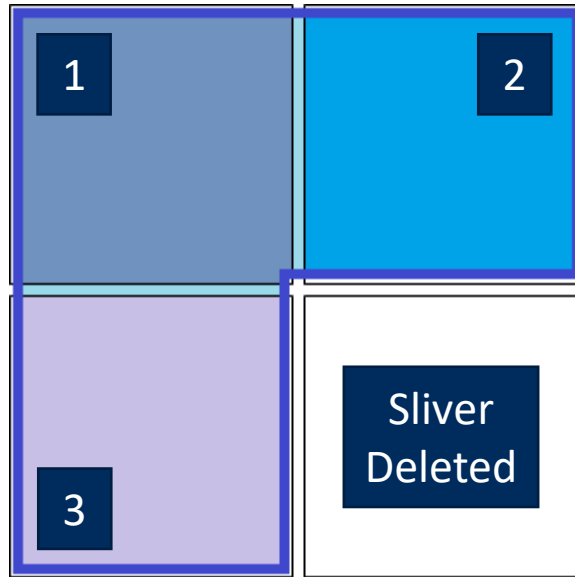
Slivers, aggregating ENC data and capturing additional Information 1



Slivers, aggregating ENC's and capturing additional Information 2



Or



Or



Here, the data sliver is required and joined to the adjacent ENC but there is no suitable data or user requirement to extend

The sliver is deleted as there is no user requirement to retain the sliver

There is suitable quality data to extend the coverage to fill the grid square and there is a user requirement



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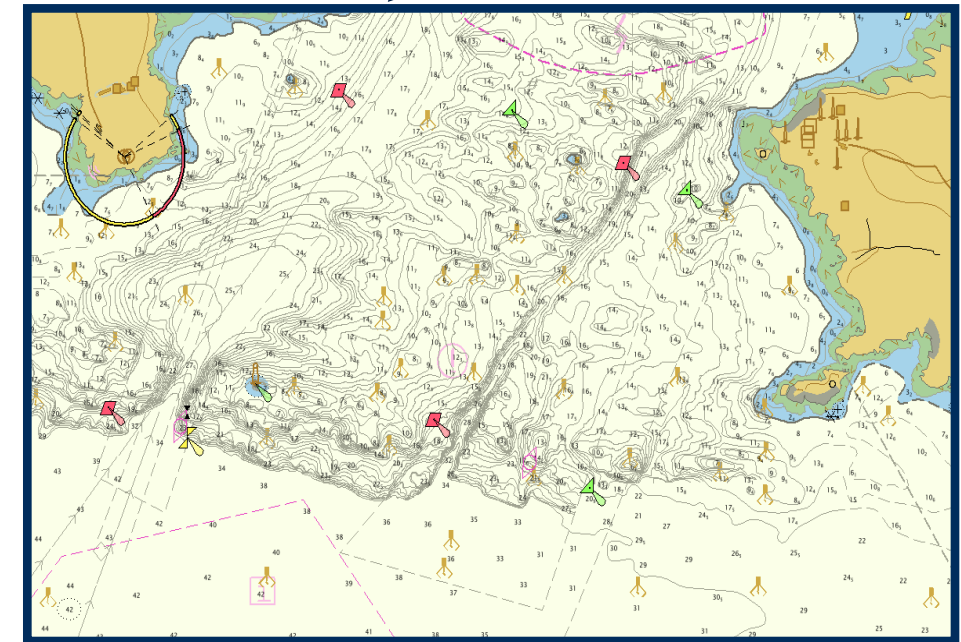
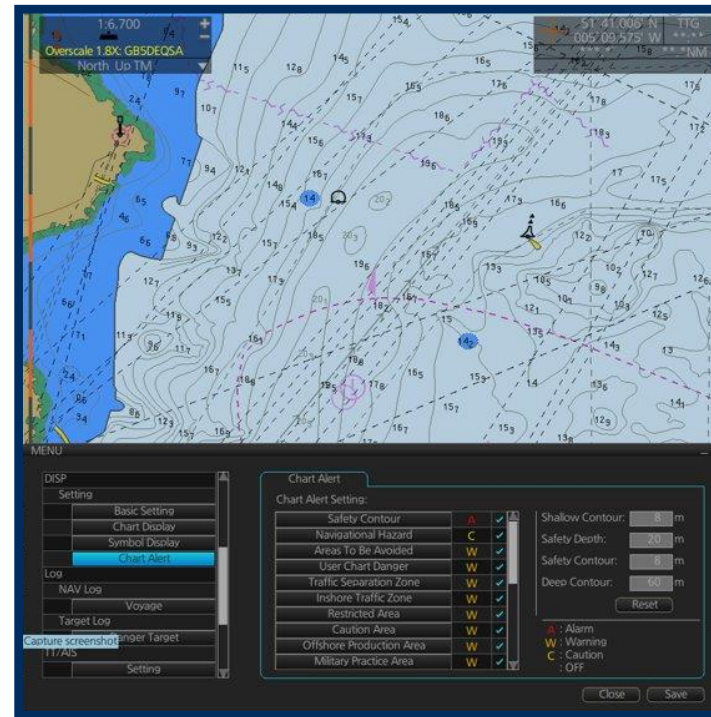
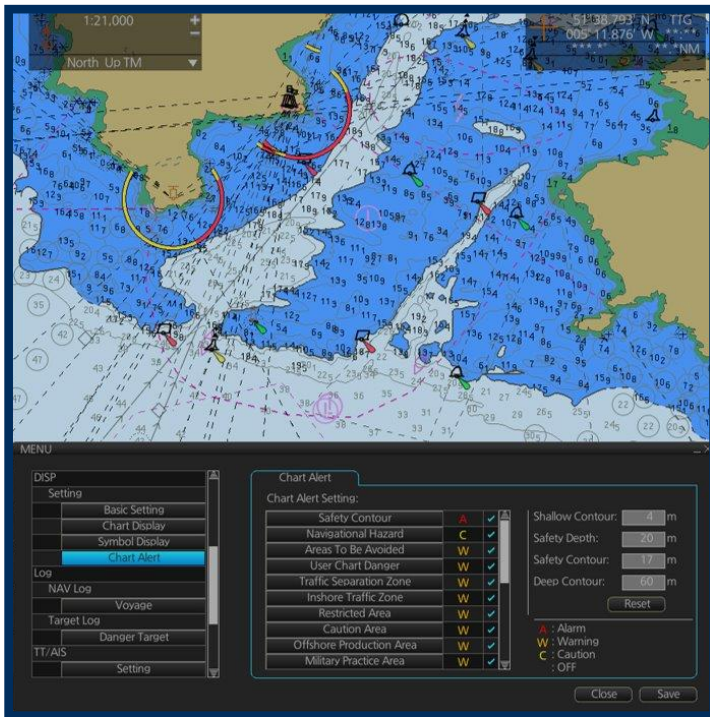
Our Results and Successes

Jan 2023

Milford Haven Test Data

The reschemed Milford Haven ENC's including HD contouring and enriched topo published in January 2023

'I have used them for 2 shifts so far and find them excellent. The anticipated monitoring of water space is vastly improved. I have shown the charts to captains who have visited and all look forward to the utility to monitor safety depth more accurately'





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Thank you.

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