

# SAIHC18

## 10th SAIHC INT CHART COORDINATION WORKING GROUP (ICCWG)

Maputo

Hybrid VTC Meeting

9<sup>th</sup> – 12<sup>th</sup> May 2022

ICCWG Chair

Alfons Van Craeynest (South Africa)

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## **Membership**

**Angola, France, Kenya, Mauritius, Mozambique, Norway, Republic of South Africa, Seychelles,  
United Kingdom.**

## **Associate Members**

**Comoros, India, Madagascar, Malawi, Namibia, Portugal, Tanzania.**

# Agenda

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1. Opening
2. Approval of Agenda
3. Matters arising from Minutes of 9th ICCWG Meeting
  - 3.1 Actions – Action list to be updated
4. Region H Chart Scheme
  - 4.1 S-11 Status of INT Charting
  - 4.2 Status of ENCs
5. ENC Overlaps
  - 5.1 Overlapping ENCs
6. SAIHC ENC Scheme
  - 6.1 Gridded ENC Scheme
7. S-100 Implementation Roadmap
8. Marine Protected Areas
9. Matters Arising
10. Closure

# Actions Arising from the 9<sup>th</sup> ICCWG Meeting

Serial No	Subject	Action	Remarks
1	ICC-WG Coordinator to contact Russia and Australia to resolve ENC overlap.	ICC-Coordinator	
2	To define ENC scheme for SAIHC Region H.	ICC-Coordinator	
3	INT 7645 – the Scheme has been proposed and is in process. As soon as the limits have been established they are to be forwarded to the chairman for inclusion in S11.	Portugal Mozambique	
4	Member States to feedback comments on how CATZOC is to be used to DQWG.	Member States	



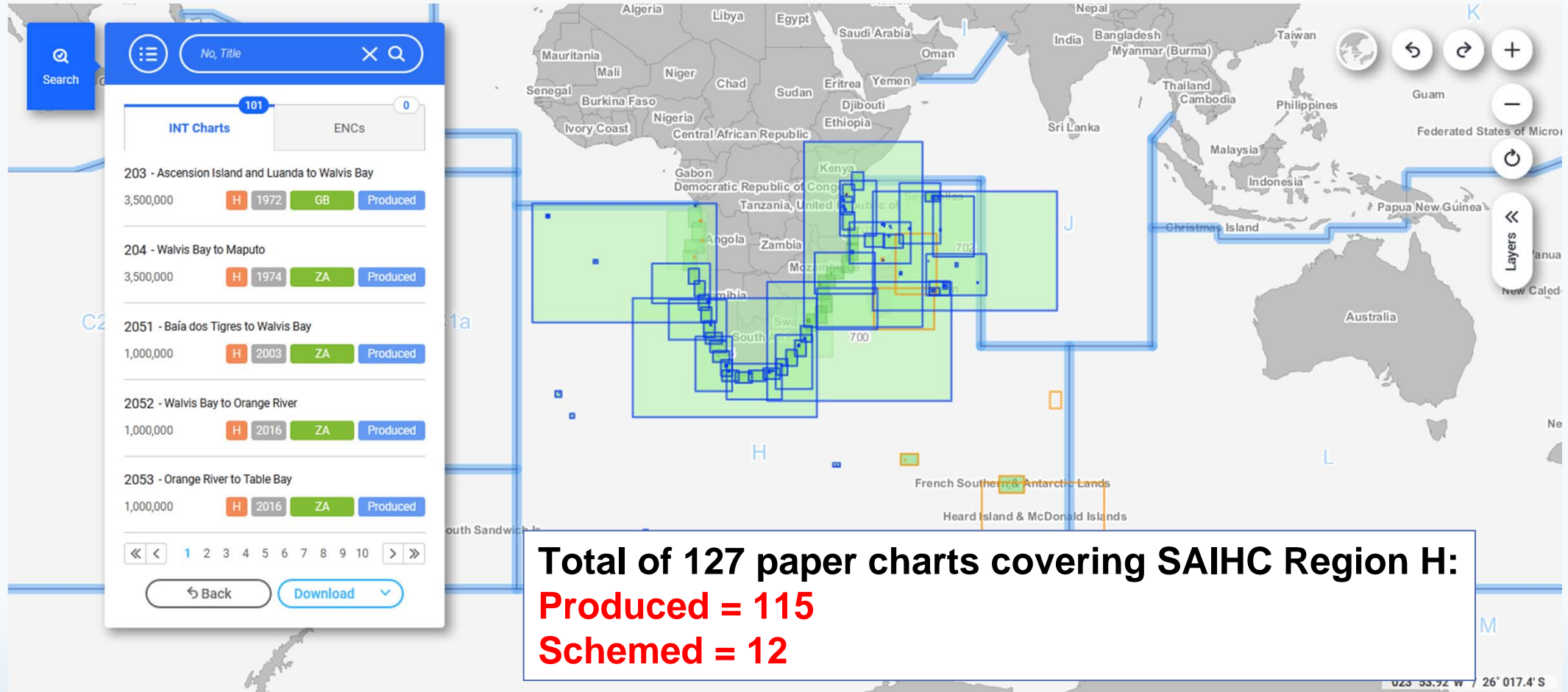
# Actions Arising from the 9<sup>th</sup> ICCWG Meeting

5	UK, Tanzania, Kenya, and India to coordinate ENC requirements to provide the latest data in a carriage compliant product for the Mariner and report back to ICCWG coordinator.	UK, Tanzania, Kenya, India	
6	India and UK to confirm when overlaps with GB ENCs have been removed in Seychelles, Tanzania and Mozambique.	India and UK	
7	INT 7583 (Maputo) - survey in progress and chart production to start as soon as possible.	Portugal Mozambique	

# Actions Arising from the 9<sup>th</sup> ICCWG Meeting

8	INT 7631 (Beira Harbour Approach) - chart production in progress.	Portugal Mozambique	
9	INT7641 ( <u>Quelimane</u> Harbour Approach) – new survey planned during first quarter of 2021. New edition of chart in discussion.	Portugal Mozambique	
10	South Africa and France to confirm when ENC overlap between ZA100030 and FR277980 has been resolved.	South Africa France	

# Region H - INT Chart Scheme



# Region H – Status of INT Charts – S11

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## Summary of changes to S-11 INT chart catalogue since last conference:

**INT 2050** - new edition published 2021

**INT 2550** - new edition published 2021

**INT 2551** - publication of new chart scheduled for May 2022.

**INT 2560** - new edition published 2021

**INT 2570** - new edition published 2021

**INT 2580** - new edition published 2021

**INT 2672** - new edition published 2022

**INT 2673** - new edition published 2022

**INT 7052** - new INT chart at scale of 1: 1000 000, co-production between MZ, PT and ZA published latter part of 2020

**INT 7580** - new INT chart at scale of 1: 300 000, co-production between MZ, PT and ZA published latter part of 2020

**INT 7583** - new chart, co-production between MZ/PT (related to action item 7)

**INT 7620** - new chart, co-production between PT and UK. Target date for publication scheduled for 2021-2022

**INT 7630** - new chart planned for production, co-production between Portugal and UK

**Related to next slide**

# Region H – Status of INT Charts – S11

INTRRegion	INTChartN umber	PanelID	Producers	NatChartNumber	INT TITLE / TITRE	S_Limit	N_Limit	W_Limit	E_Limit	1 <sup>st</sup> Ed Year	New Ed Year	Producing Status	Scale	PrinterN ation	Printer Nat. No.	Printer NE Year
H	2050		GB PT	PT 72102 GB 312	Luanda to Baía dos Tigres, Luanda à Baía dos Tigres	17°20.00'S	7°0.00'S	7°15.00'E	14°30.00'E	2010	2021	Produced	1,000,000			
H	2550		GB PT	PT 73202 GB 307	Cabeça da Cobra to Cabo Ledo, Cabeça da Cobra ao Cabo Ledo	9°52.50'S	6°25.00'S	11°4.00'E	13°26.00'E	2010	2021	Produced	350,000			
H	2551		PT	16303	Porto de Luanda	8°53.00'S	8°41.00'S	13°8.00'E	13°26.00'E	????		Schemed	15,000			
H	2560		GB PT	GB 308 PT 73203	Cabo Ledo to Lobito, Cabo Ledo ao Lobito	12°32.00'S	9°0.00'S	11°43.50'E	14°10.00'E	2010	2021	Produced	350,000			
H	2570		GB PT	GB 309 PT 73204	Lobito to Ponta Grossa, Lobito à Ponta Grossa	14°28.00'S	12°5.00'S	10°26.00'E	14°0.00'E	2009	2021	Produced	350,000			
H	2580		GB PT	GB 310 PT 73205	Ponta Grossa to Kunene River, Ponta Grossa à Foz do Kunene	17°28.00'S	14°0.00'S	10°9.00'E	12°35.00'E	2009	2021	Produced	350,000			
H	2672		ZA	SAN 1012	Saldanha Bay Harbour	33°4.70'S	32°59.60'S	17°56.70'E	18°1.15'E	1979	2022	Produced	10,000	GB	4142	2018
H	2673		ZA	SAN 1011	Entrance to Saldanha Bay	33°6.35'S	32°59.40'S	17°51.00'E	18°3.40'E	1977	2022	Produced	20,000	GB	1236	2018
H	7052		MZ PT ZA	SAN 95	Durban to Inhambane	31°40.00'S	22°50.00'S	30°30.00'E	37°8.00'E	2020		Produced	1,000,000			
H	7580		MZ PT ZA	SAN 88	Jesser Point to Boa Paz	27°37.00'S	24°50.00'S	32°25.00'E	34°20.00'E	2020		Produced	300,000			
H	7583		MZ PT	MZ (16401)	Porto de Maputo	26°2.00'S	25°51.00'S	32°29.00'E	32°47.00'E	2020		Schemed	30,000			
H	7620		GB PT	GB 2932	Cabo de Sao Sebastiao to Beira	22°25.00'S	19°30.00'S	34°30.00'E	36°35.00'E	1995	2021/2022	Schemed	300,000			
H	7630		GB PT	GB 2934	Beira to Rio Zambeze	20°15.00'S	18°20.00'S	34°35.00'E	37°40.00'E	1998	????	Schemed	300,000			

# Region H – Status of INT Charts – S11

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**INT 7631** - new INT chart, co-production between MZ and PT published 2021 (related to action item 8)

**INT 7632** - new INT chart co-production between MZ and PT published 2021

**INT 7640** - new chart planned for production, co-production between PT and UK

**INT 7641** - new edition, co-production between MZ and PT published in 2022 (related to action item 9)

**INT 7662** - new INT chart in production, co-production between PT and MZ

**INT 7666** - new INT chart cancelled previous national chart, co-production between MZ and PT, published 2020

**INT 7736** - new chart published 2021

**INT 7747 & INT 7748** - new editions published in 2021

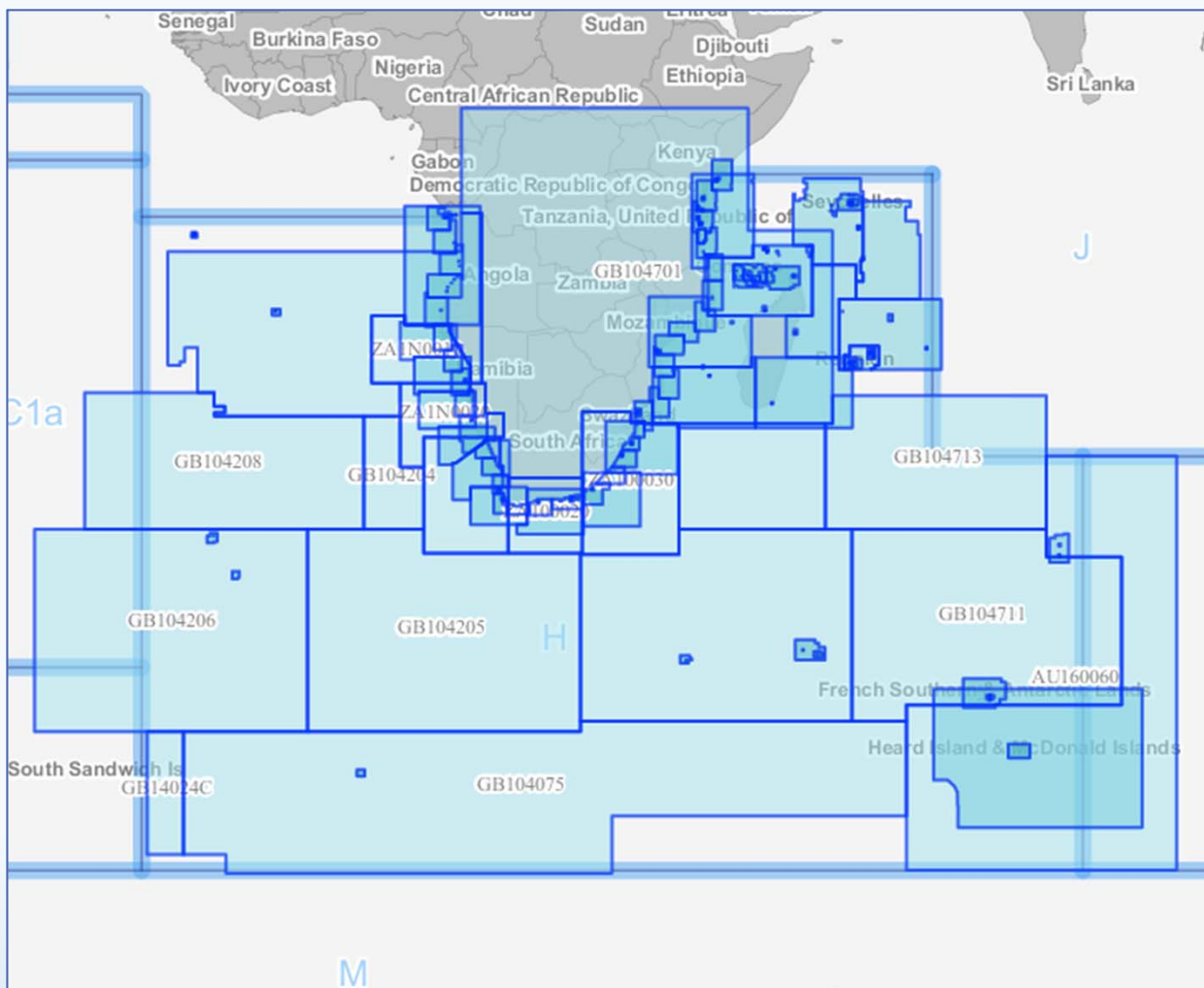
**Related to next slide**



# Region H – Status of INT Charts – S11

INTRegion	INTChartNumber	PanelID	Producers	NatChartNumber	INT TITLE / TITRE	S_Limit	N_Limit	W_Limit	E_Limit	1 <sup>st</sup> Ed Year	New Ed Year	Producing Status	Scale	PrinterN ation	Printer Nat. No.	Printer NE Year
H	7631		MZ PT	MZ (16204)	Approaches to Porto da Beira	20°0.00'S	19°48.60'S	34°45.40'E	35°2.60'E	2021		Produced	30,000			
H	7632		MZ PT	MZ16303	Porto da Beira	19°54.00'S	19°47.00'S	34°45.50'E	34°51.60'E	2021		Produced	15,000			
H	7640		GB PT	GB 2935	Rio Zambeze to Ilha Epidendron	19°0.00'S	17°0.00'S	36°5.00'E	39°10.00'E	1998		Schemed	300,000			
H	7641	PLAN-A	MZ PT	MZ 16402	Plan A - Quelimane					2001	2022	Produced	10,000	PT	485	2003
H	7641		MZ PT	MZ 16402	Aproximações a Quelimane	18°08.50'S	17°52.00'S	36°51.00'E	37°3.00'E	2001	2022	Produced	30,000	PT	485	2003
H	7662		MZ PT	16310	Porto de Nacala	14°35.50'S	14°26.30'S	40°35.00'E	40°42.00'E	2010		Schemed				
H	7666		MZ PT	MZ16206	Pemba (Porto Amelia)	13°3.00'S	12°51.00'S	40°23.00'E	40°39.00'E	2020		Produced	30,000			
H	7736		FR	7183	La Réunion - Partie Nord. De la Pointe des Châteaux à la Pointe de la Rivière du Mât	21°11.70'S	20°47.40'S	55°6.60'E	55°44.60'E	1990	2021	Produced	60,000	GB	1495	2017
H	7747	PLAN-A	FR	6498	A - Ile aux Cochons - côte Est , mouillage de la Meurthe	46°9.20'S	46°3.20'S	50°14.50'E	50°21.50'E	1967	2021	Produced	50,000			
H	7747		FR	6498	Iles Crozet	46°50.00'S	45°20.50'S	49°30.00'E	52°38.50'E	1967	2021	Produced	250,000			
H	7748		FR	7171	Approche des Iles Saint-Paul et Amsterdam	39°17.00'S	36°53.50'S	76°30.00'E	78°33.00'E	1991	2021	Produced	350,000			

# Region H – Status of ENC coverage



## Number of ENCs per Usage Band

Berthing UB6 = 21

Harbour UB5 = 68

Approach UB4 = 77

Coastal UB3 = 59

General UB2 = 21

Overview UB1 = 18

**Total of 264 ENCs covering Region H**



# Region H: ENC Overlaps

## Summary of live ENC overlaps in Region H

STATUS	RENC Membership	RHC	ENC 1	ENC 2	Usage Band	Overall Severity of Risk
LIVE	IC-ENC	SAIHC/HCA	RU1A2K00	AU160060	1	LOW
LIVE	IC-ENC - PRIMAR	SAIHC	GB54232A	IN52520A	5	LOW
LIVE	IC-ENC - PRIMAR	SAIHC	GB500722	IN52551A	5	MEDIUM
LIVE	IC-ENC - PRIMAR	SAIHC	GB500722	IN52552W	5	MEDIUM
LIVE	IC-ENC - PRIMAR	SAIHC	GB502758	IN52510B	5	MEDIUM
LIVE	IC-ENC - PRIMAR	SAIHC	GB502758	IN52511A	5	MEDIUM
LIVE	IC-ENC-PRIMAR	SAIHC	GB54232A	IN62516D	5/6	MEDIUM
LIVE	PRIMAR	SAIHC	ZA2N0010	ZA2N0020	2	-

# Region H: ENC Overlaps

## Summary of resolved ENC overlaps in Region H

STATUS	RENC Membership	RHC	ENC 1	ENC 2	Usage Band	Overall Severity of Risk
RESOLVED	IC-ENC	SAIHC	GB40718C	IN52555I	4/5	MEDIUM
RESOLVED	IC-ENC	SAIHC	GB50663A	IN62693T	5/6	MEDIUM
RESOLVED	IC-ENC	SAIHC	GB54231A	IN62524P	5/6	MEDIUM
RESOLVED	PRIMAR	SAIHC	ZA100030	GB104701	2	-

ENCs GB40718C, GB50663A, GB54231A withdrawn

# Region H: ENC Overlaps

**IHO Resolution 1 of 2018 (IHO CL 19/2018):  
Hydrographic Offices, ENC Producers, and Regional Hydrographic Commissions should take appropriate measures to eliminate all overlapping ENC data, particularly in areas of demonstrable risk to the safety of navigation.**





UK Hydrographic  
Office

# A Gridded Scheme and ENC Improvement Project

Nick Swadling - UKHO

2022

# UK Chosen Grid Size (in degrees)

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	S <sub>6</sub>
Grid	Aggregated Super -Small	Small General ENC	Medium	Large Aggregated	Large Berthing S102	Super-Large S102
UK1	20	5	1.25	0.25	0.125	0.0625
UK2	12	4	0.8	0.1	0.05	0.025
UK3	15	3	0.75	0.15	0.075	0.0375
UK4	12	3	0.6	0.12	0.06	0.03
UK5	20	4	0.8	0.2	0.1	0.05
UK6	24	6	1.2	0.3	0.15	0.075

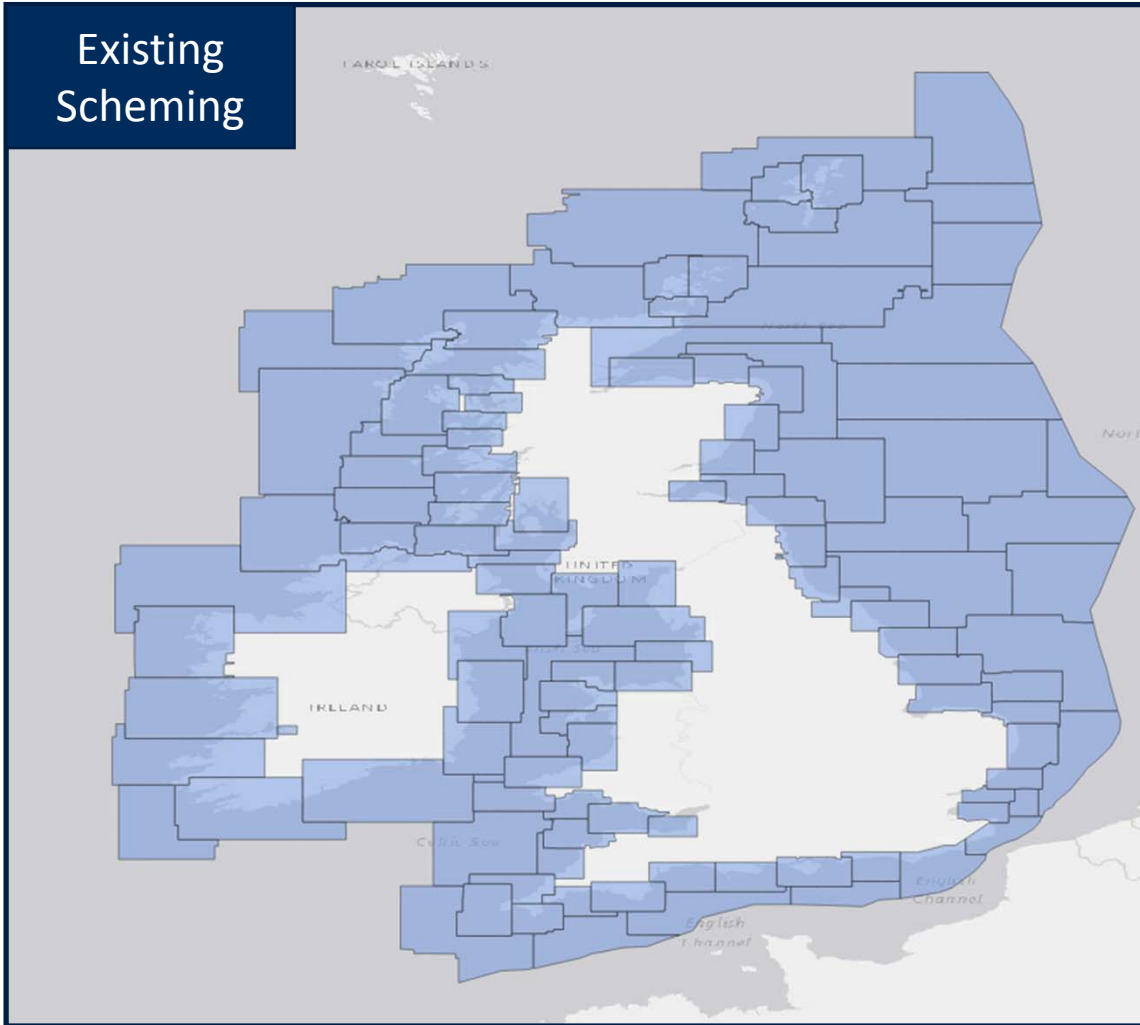
The 6 different options were trialled and tested, considering factors including the eventual number of ENCs which would be created and how the grid squares fits with the navigational data and scale of the source data

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

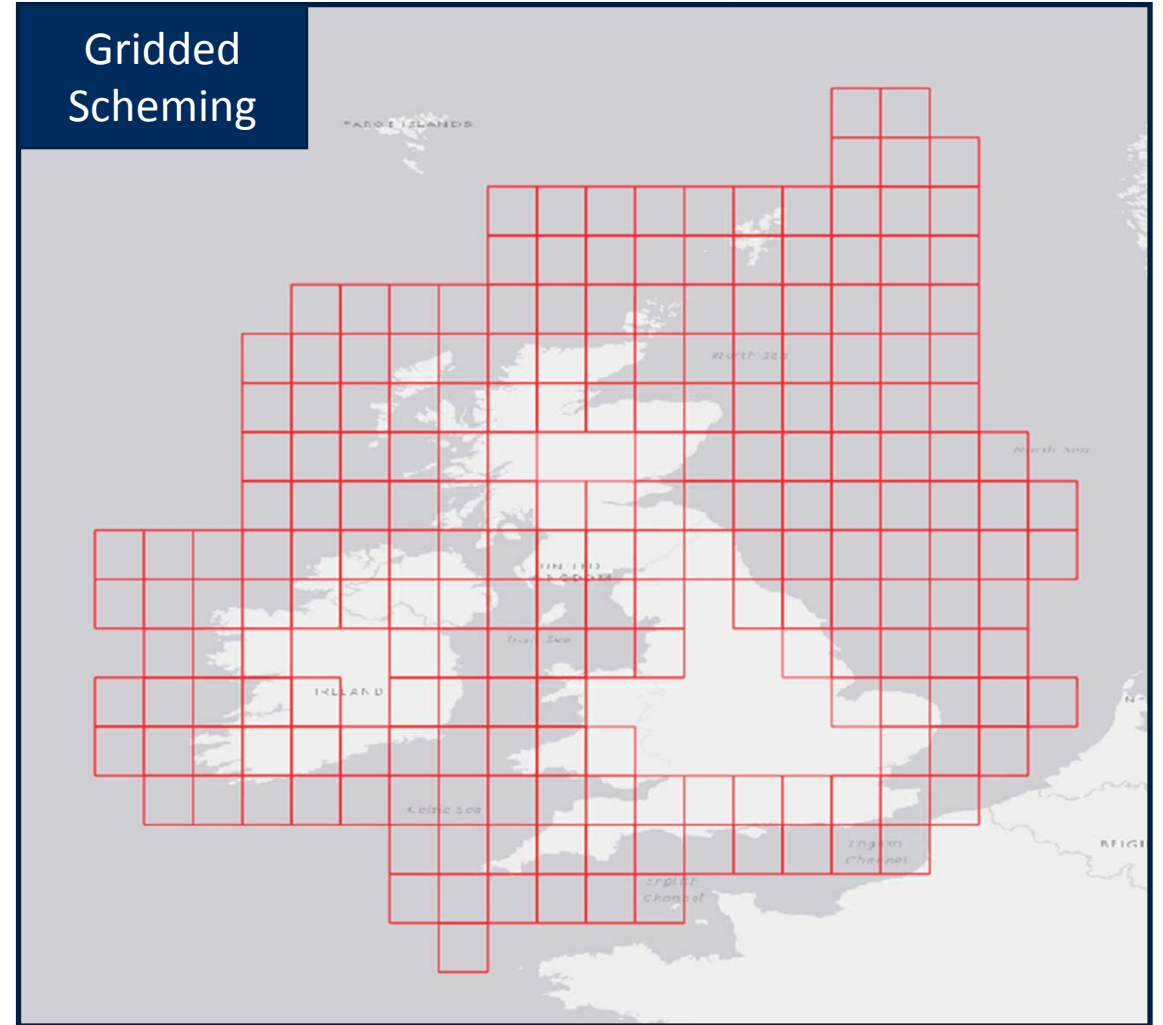
# How the gridded scheme will change the data, shown using the band 3

GB ENC coverage

Existing  
Scheming

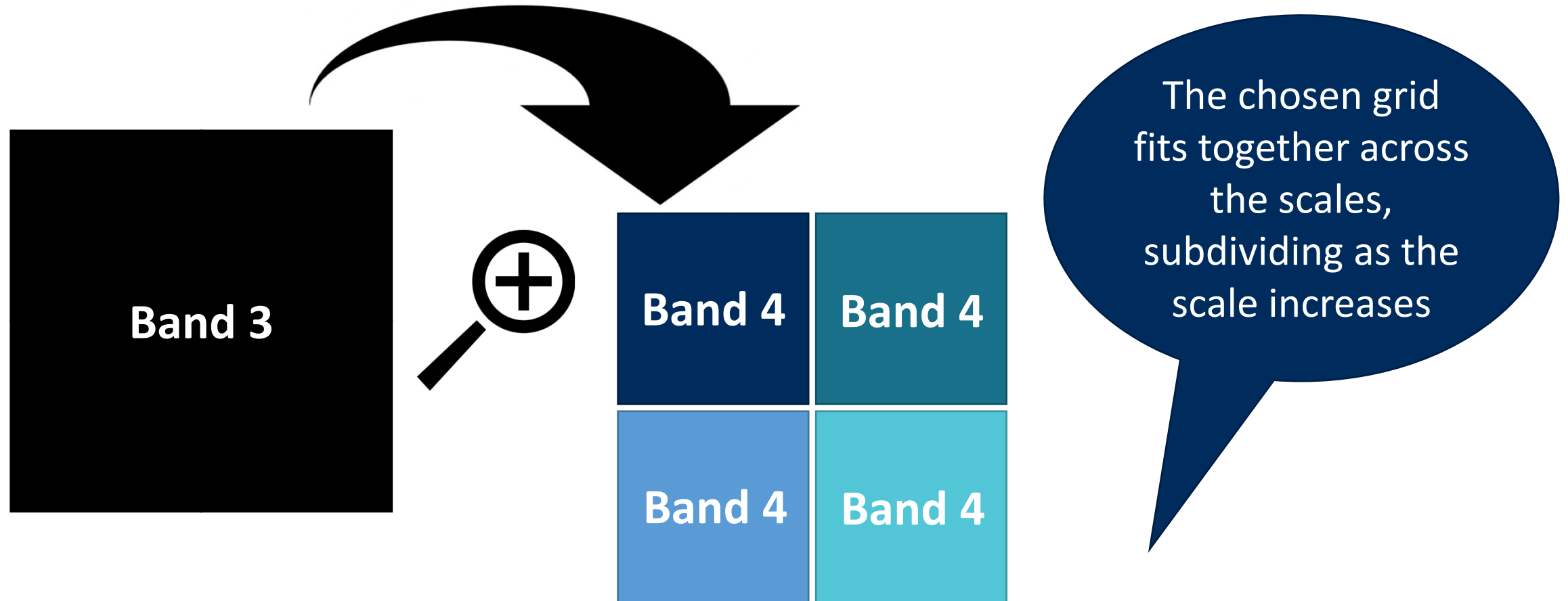


Gridded  
Scheming



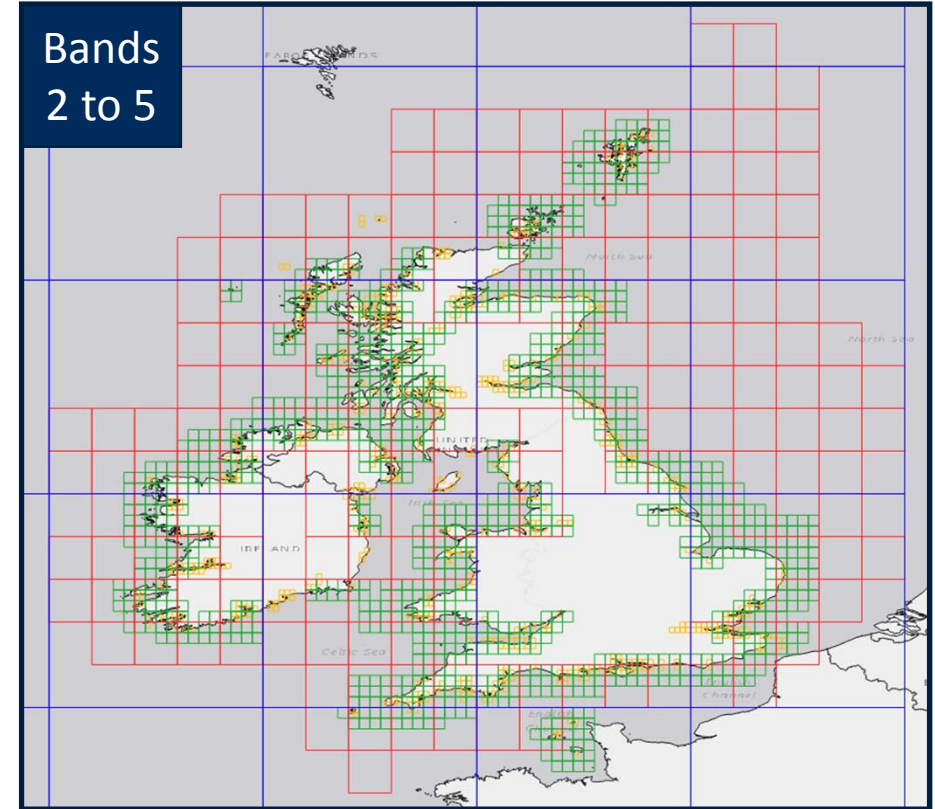
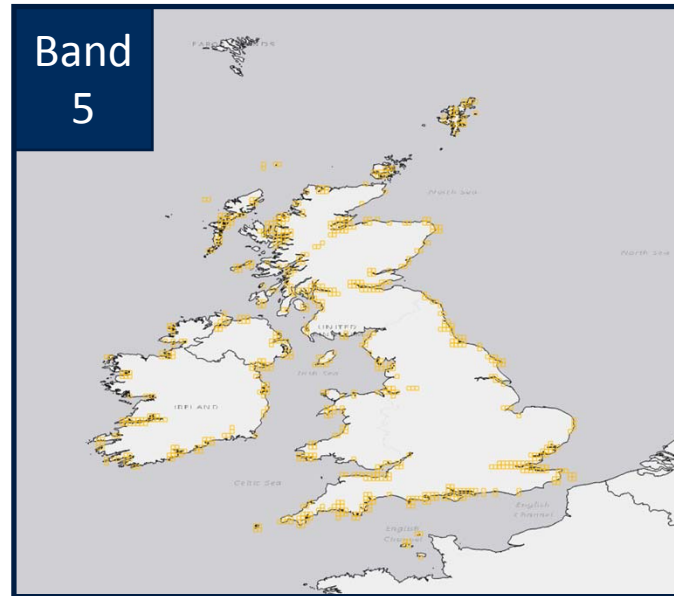
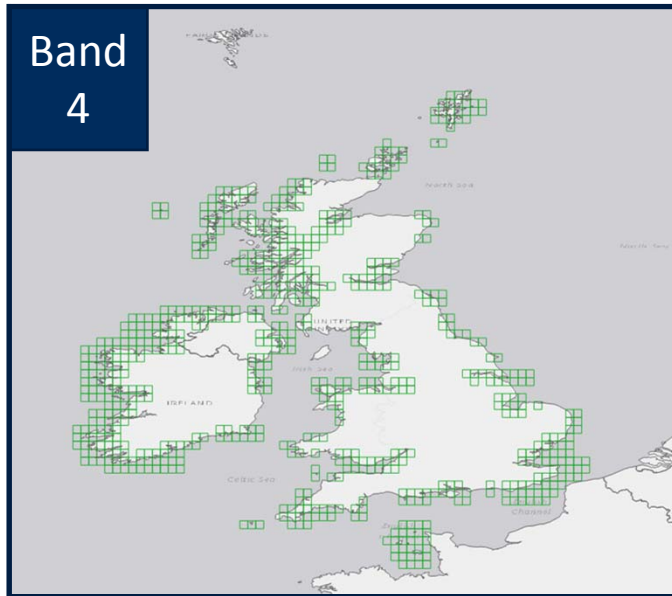
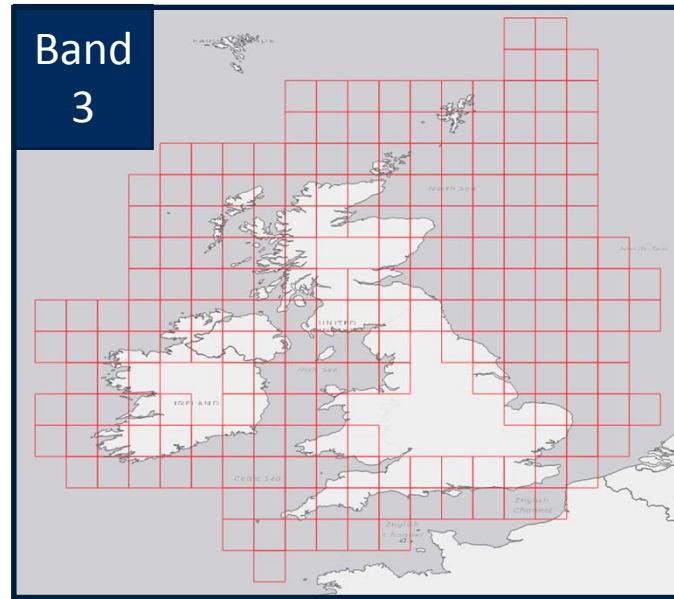
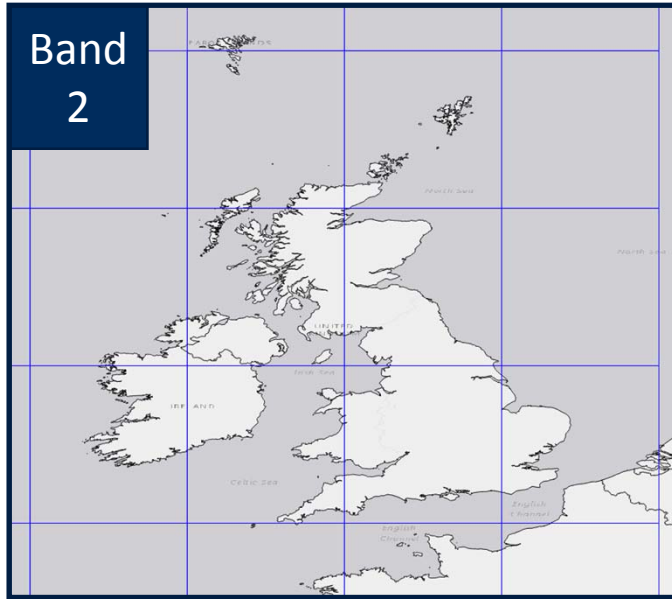


# How the grid subdivides and interacts across the scales



The S-102 grid is 0.1 grid. This will tessellate with chosen the UK grid.

# How the grid fits together and interacts across scale bands





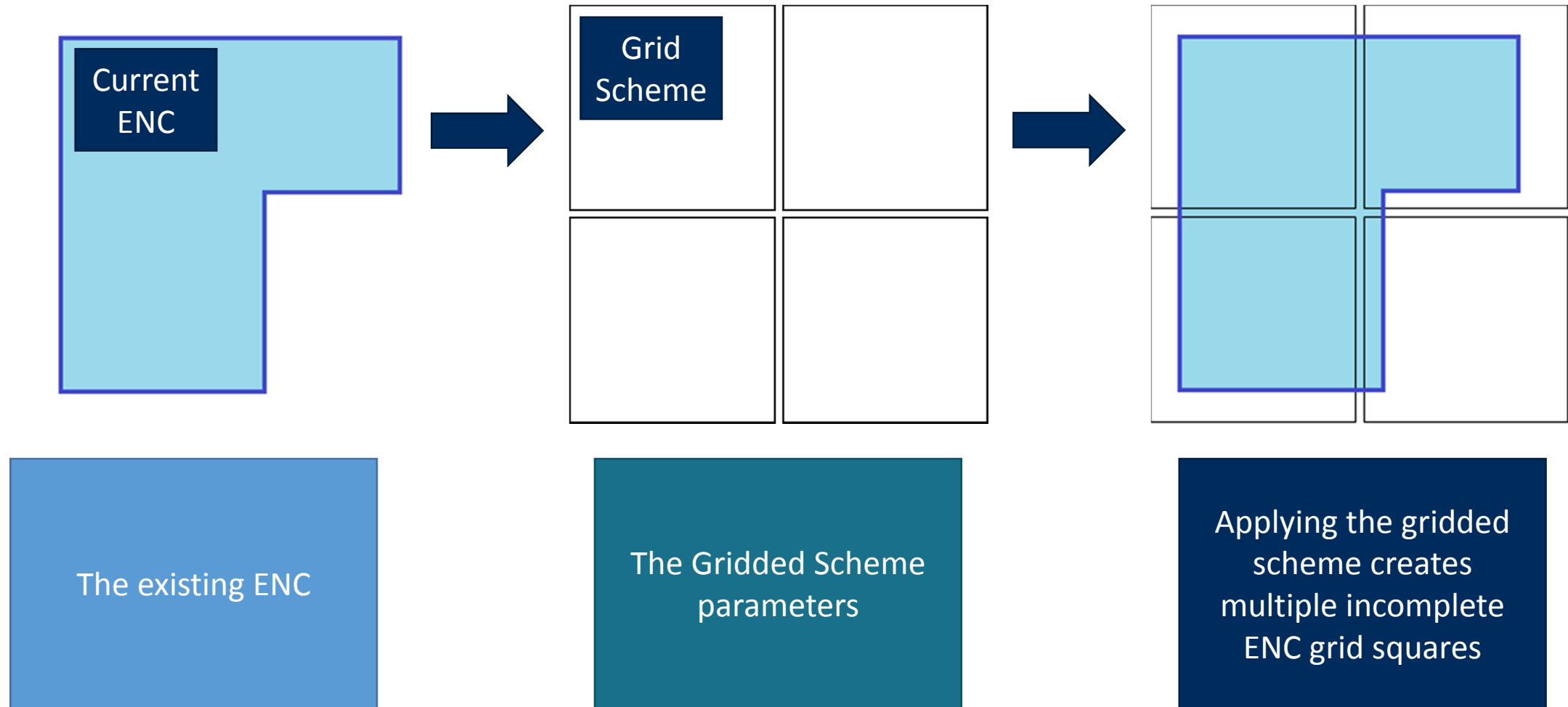
The UK gridded scheme will be applied within the limits of the current GB data coverage.

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, so this will be achieved using M\_COVR CATCOV 1 (coverage available) and M\_COVR CATCOV 2 (no coverage available)

# Slivers, aggregating ENC data and capturing additional Information 1





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

# S-57 & S-101 Guidance for scale & usage bands

Selectable Range	Standard Scale (rounded)
200 NM	1:3000000
96 NM	1:1500000
48 NM	1:700000
24 NM	1:350000
12 NM	1:180000
6 NM	1:90000
3 NM	1:45000
1.5 NM	1:22000
0.75 NM	1:12000
0.5 NM	1:8000
0.25 NM	1:4000

The S-57 UOC states that HO's should use 1 of these scales (left). UKHO chose the next largest scale to the scale of the paper chart from which the ENC was derived.

Nav Purpose	Name	Scale Range
1	Overview	<1:1499999
2	General	1:350000-1:1499999
3	Coastal	1:90000-1:349999
4	Approach	1:22000-1:89999
5	Harbour	1:4000-1:21999
6	Berthing	>1:4000

S-57 Ed 3.1 does not define max and min comp scales for each Nav Purpose, above is an example of how scale ranges may be assigned to Nav Purposes.

S-101 does not give any guidance on scale ranges and navigational purpose is only for cataloguing purposes.

UK are taking a flexible approach to scales within the scale bands, generally following the standardised scales, potentially flexing depending on the coverage and features being depicted in the ENC. These decisions will be informed by the ongoing trials. The scale at which a grid square is subdivided effects the overall number of ENCs created by applying a gridded scheme.

Nav Purpose	Standardised S-57 Scale example	Alternate scale 'Cut-off' option	Alternate scale 'Cut-off' options	Alternate scale 'Cut-off' option
Scale band 1	1:1500000+			
Scale band 2	1:350000-1:1499999			
Scale band 3	1:90000-1:349999	Cut-off between bands 3 and 4 to 1:75000	Cut-off between bands 4 and 5 to 20,000, 1:25000 or 1:30000	
Scale band 4	1:22000-1:89999			
Scale band 5	1:4000-1:21999			Cut-off between bands 5 and 6 to 1:6000
Scale band 6	>1:4000			

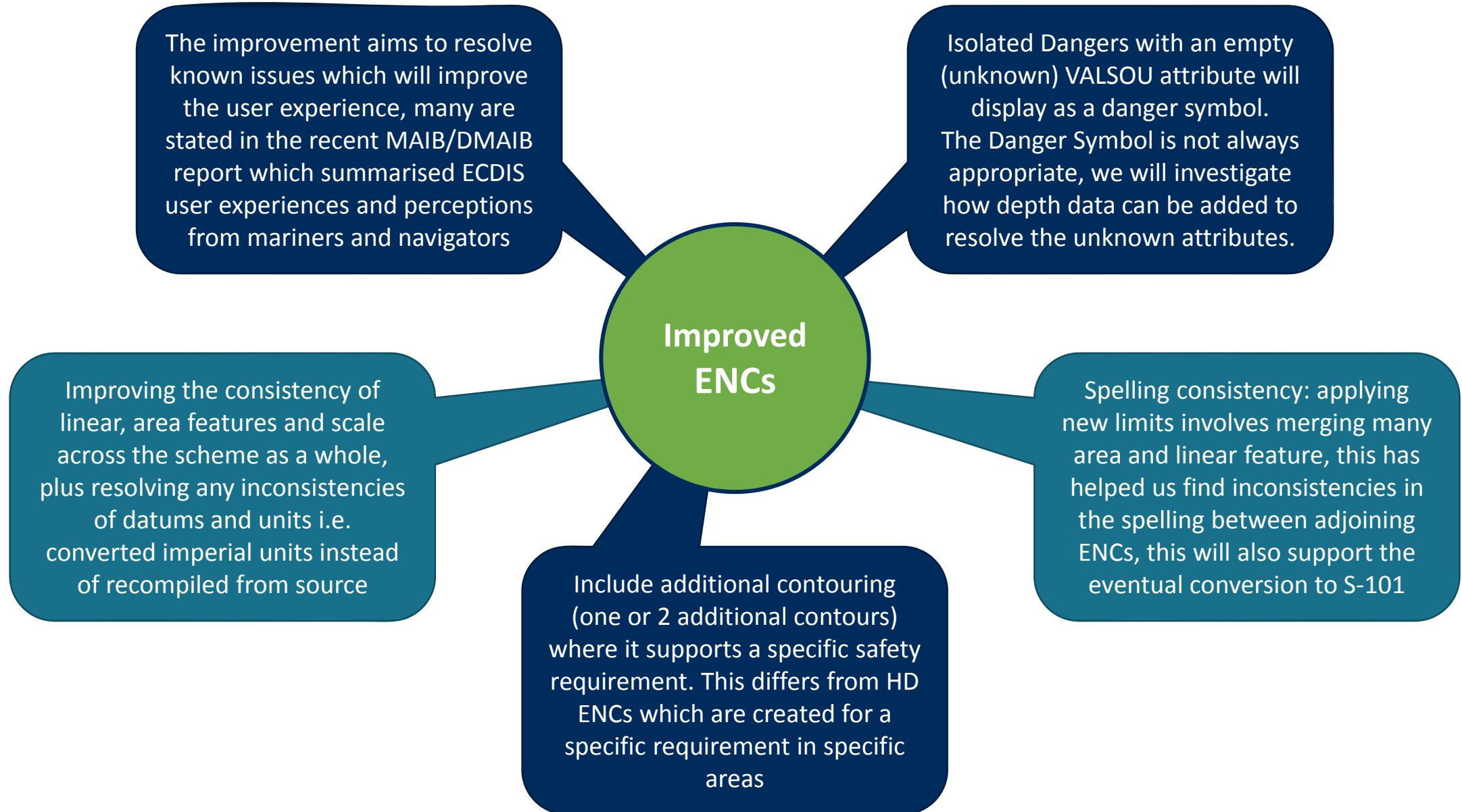




UK Hydrographic  
Office

# ENC Improvement Themes

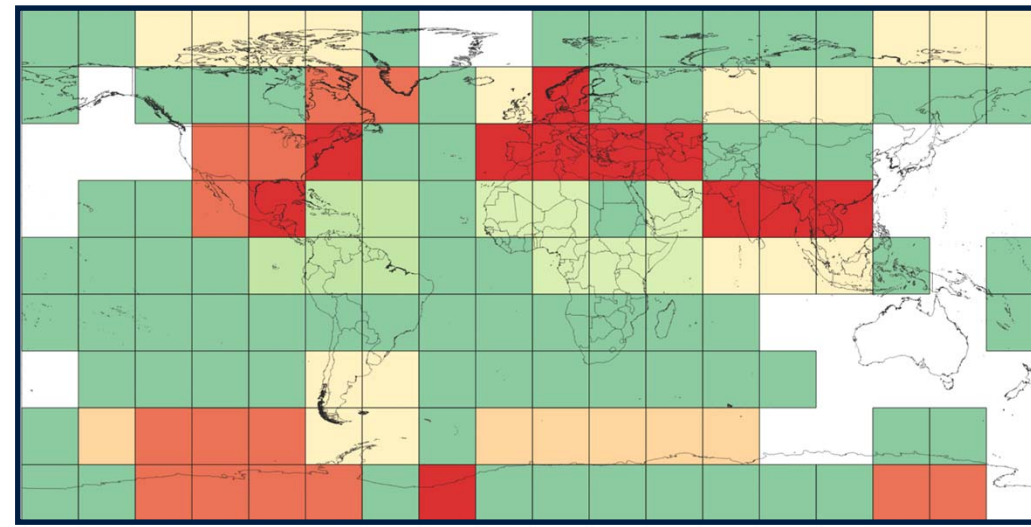
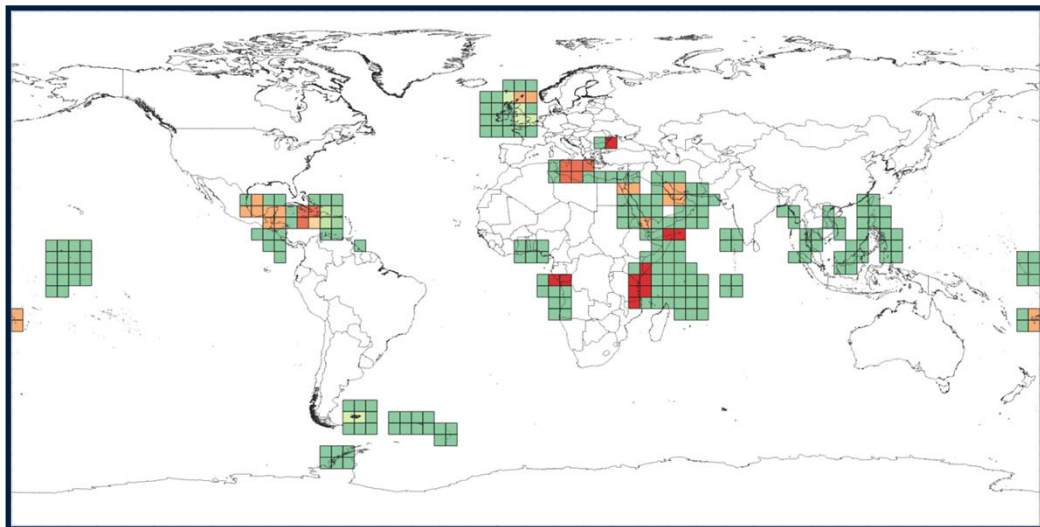
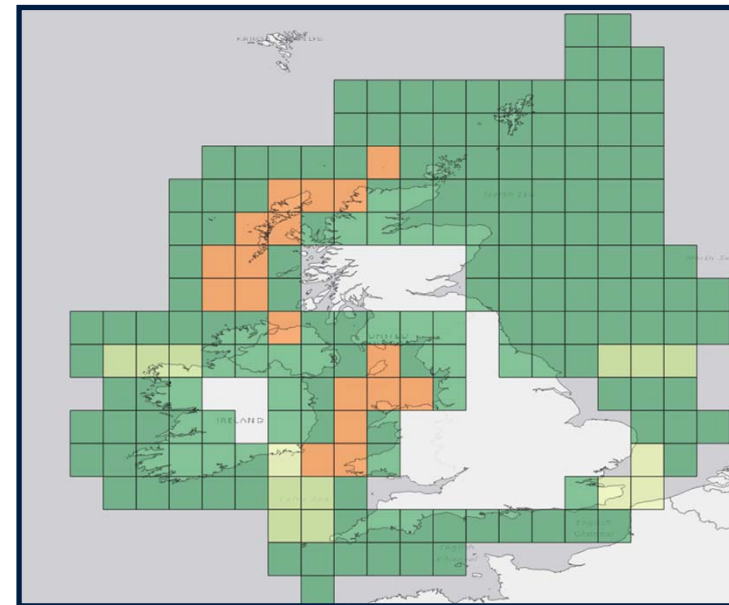
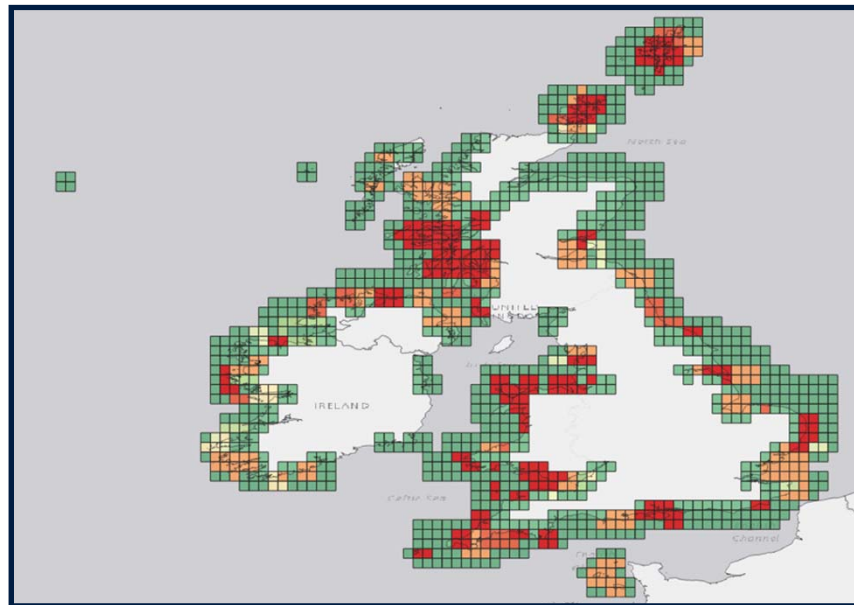
# Targets for Data Improvements





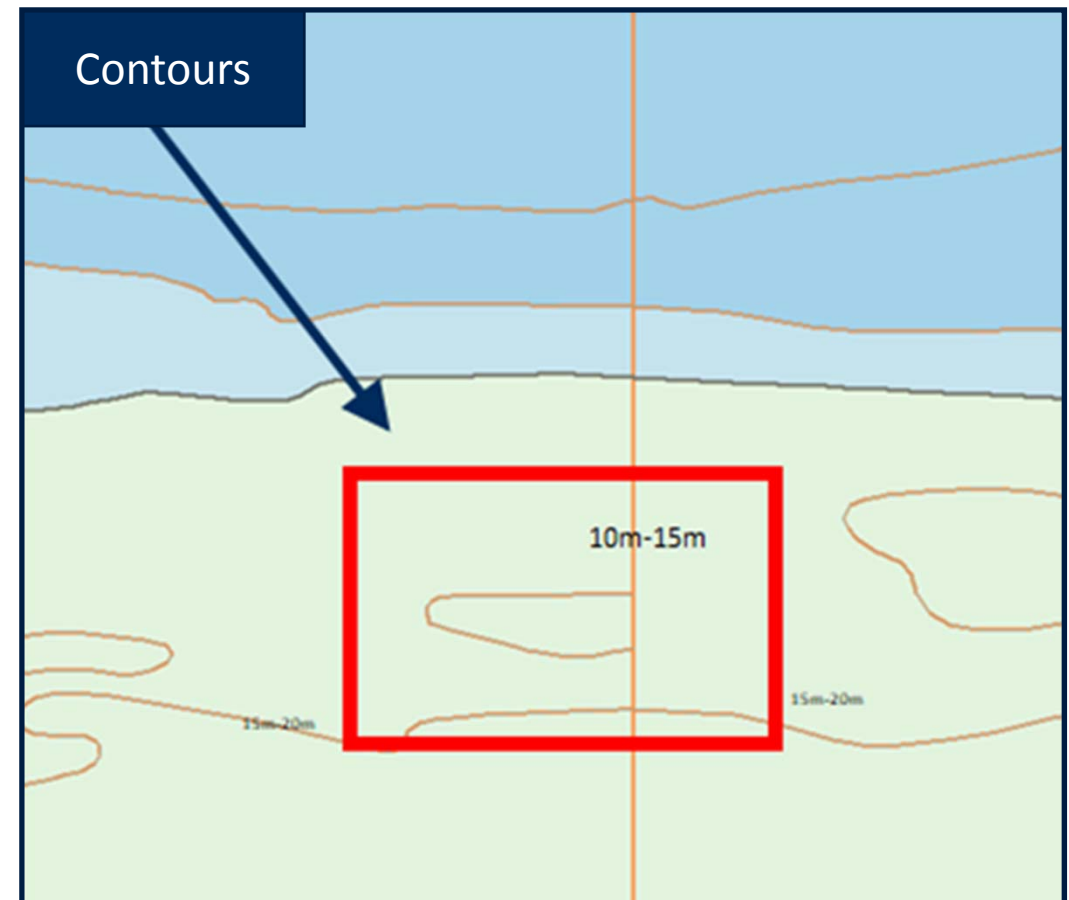
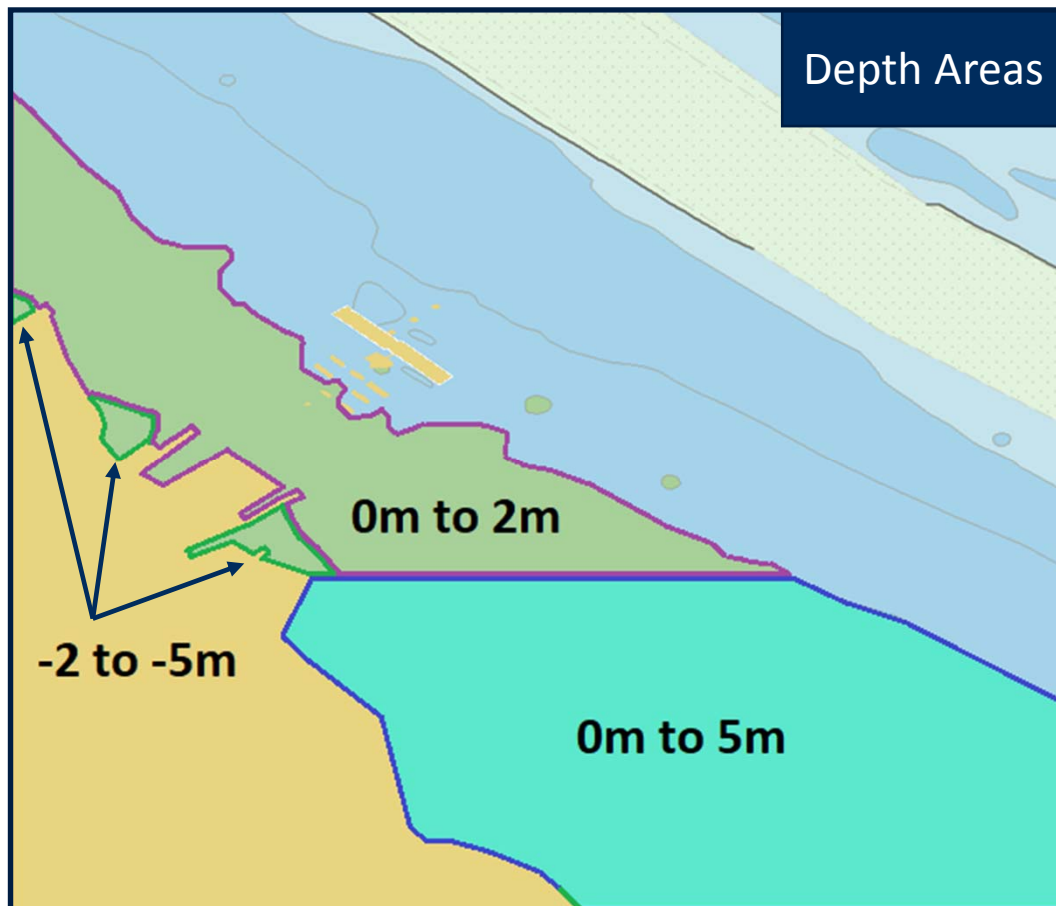
# Locating where to improve scale consistency

These images show where there are inconsistencies in the scale of the data once the rescheme has been applied

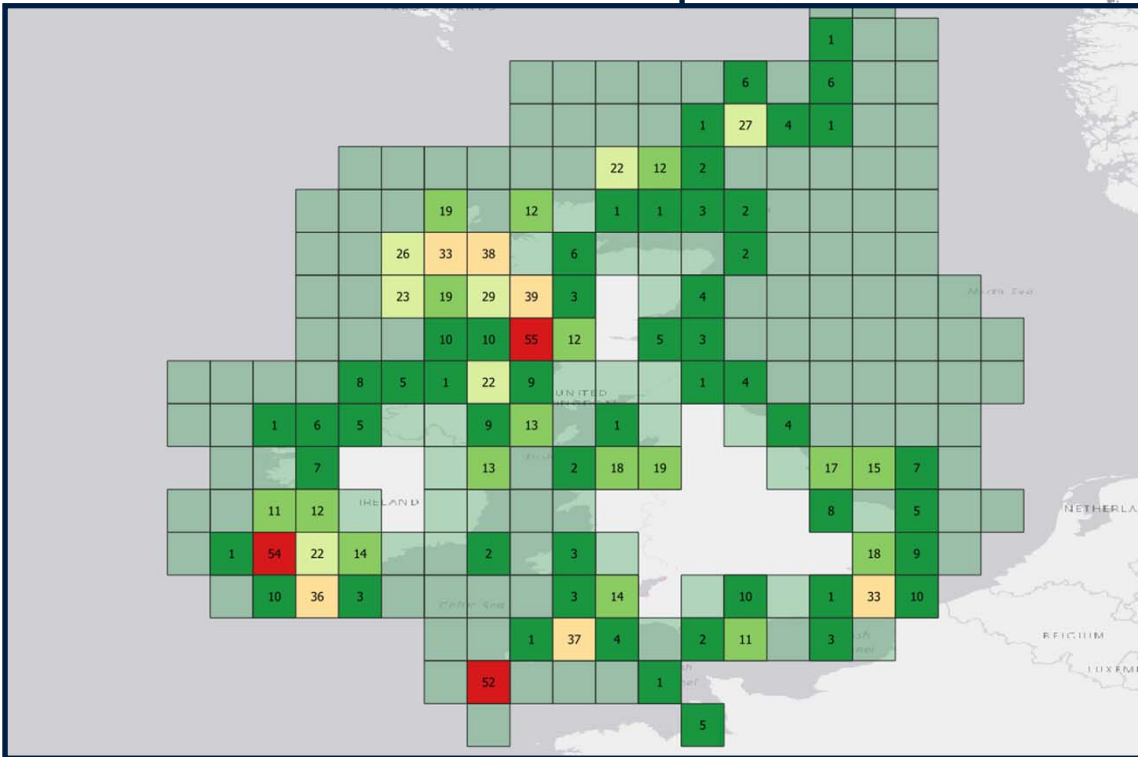
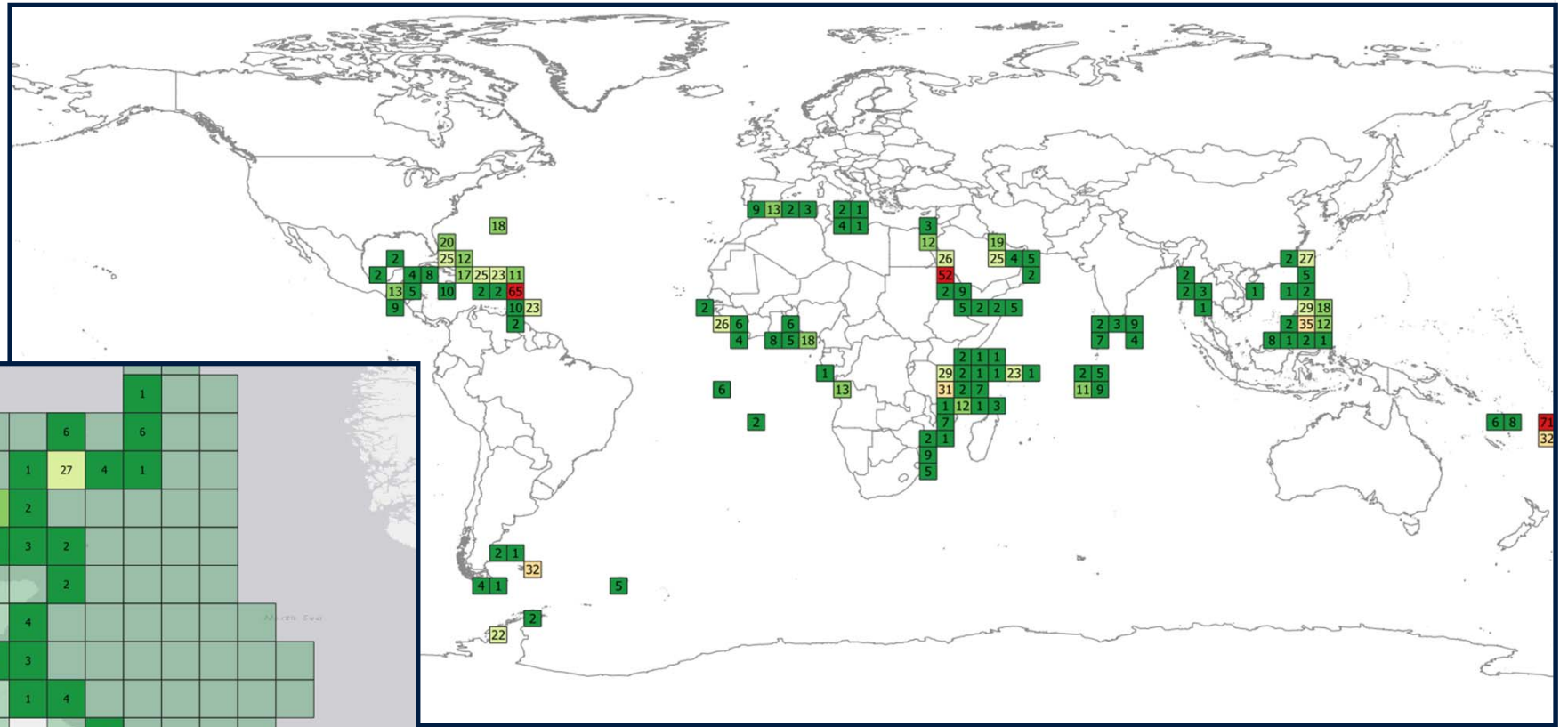




Inconsistencies in linear and area features across ENC limits can undermine user confidence in ENCs by showing discrepancies of lines and colours. UKHO will work to resolve these issues as applying a grid will change existing limits and make such discrepancies more exaggerated.

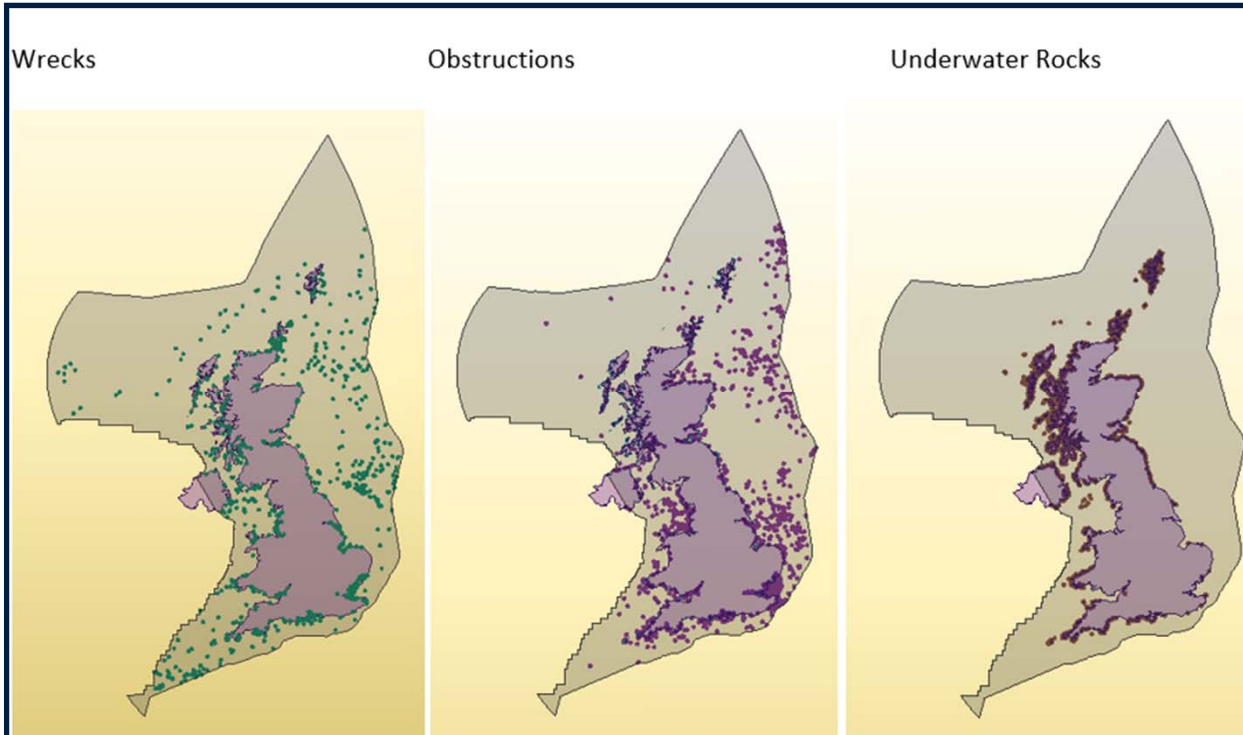


This slide shows how many inconsistencies there are between grid squares in GB ENC



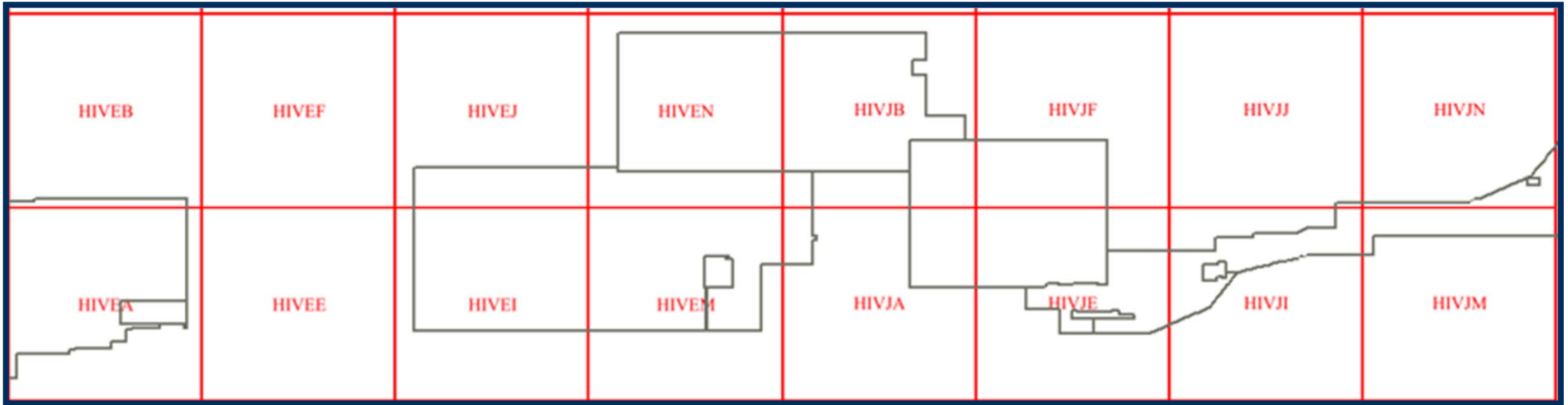
Isolated Dangers with an empty (unknown) VALSOU attribute will display as a danger symbol. The Danger Symbol is not always appropriate, only that the exact depth is unknown, we will investigate how depth data can be added to resolve the unknown attributes.

# Improving the depiction of Isolated Dangers

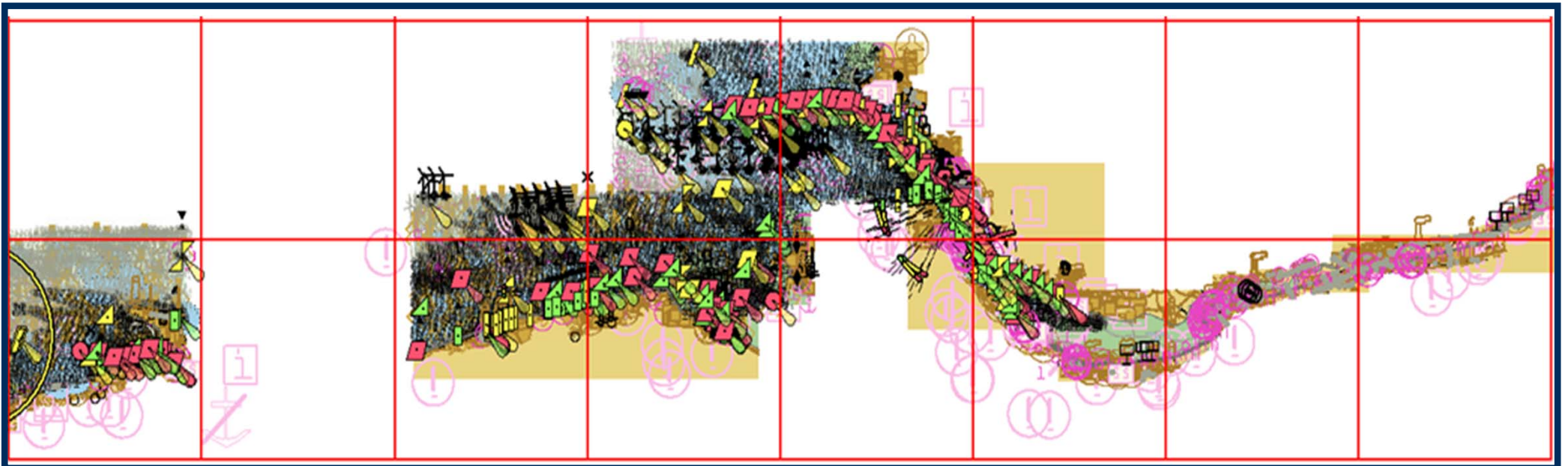




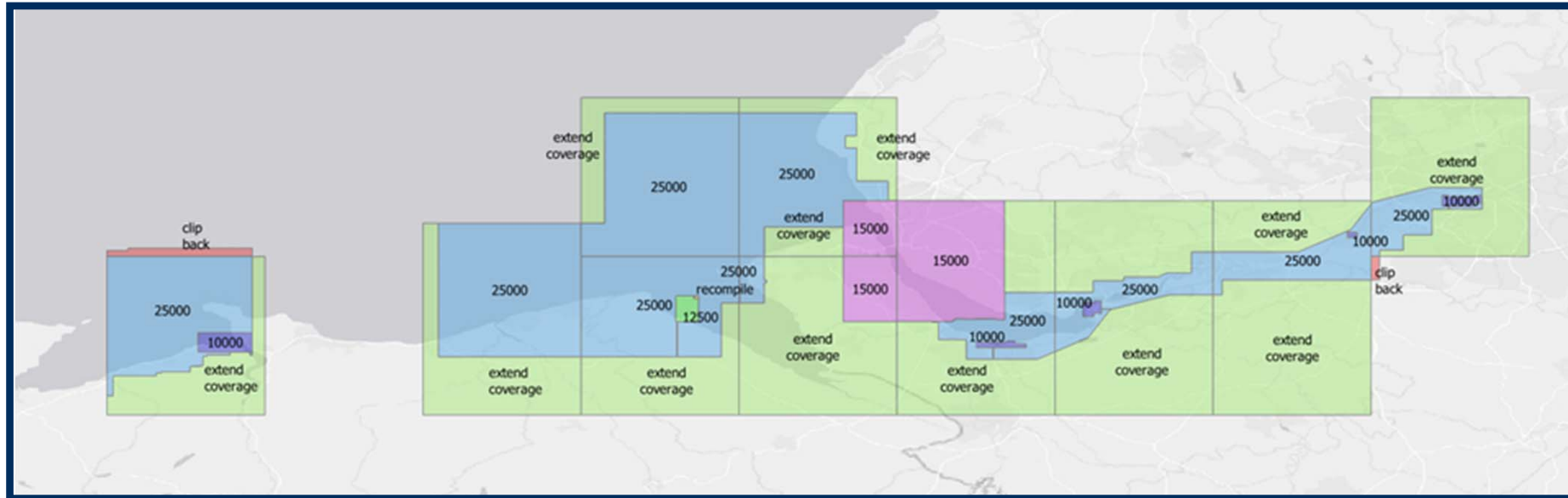
# Liverpool Trial 1: the current scheming



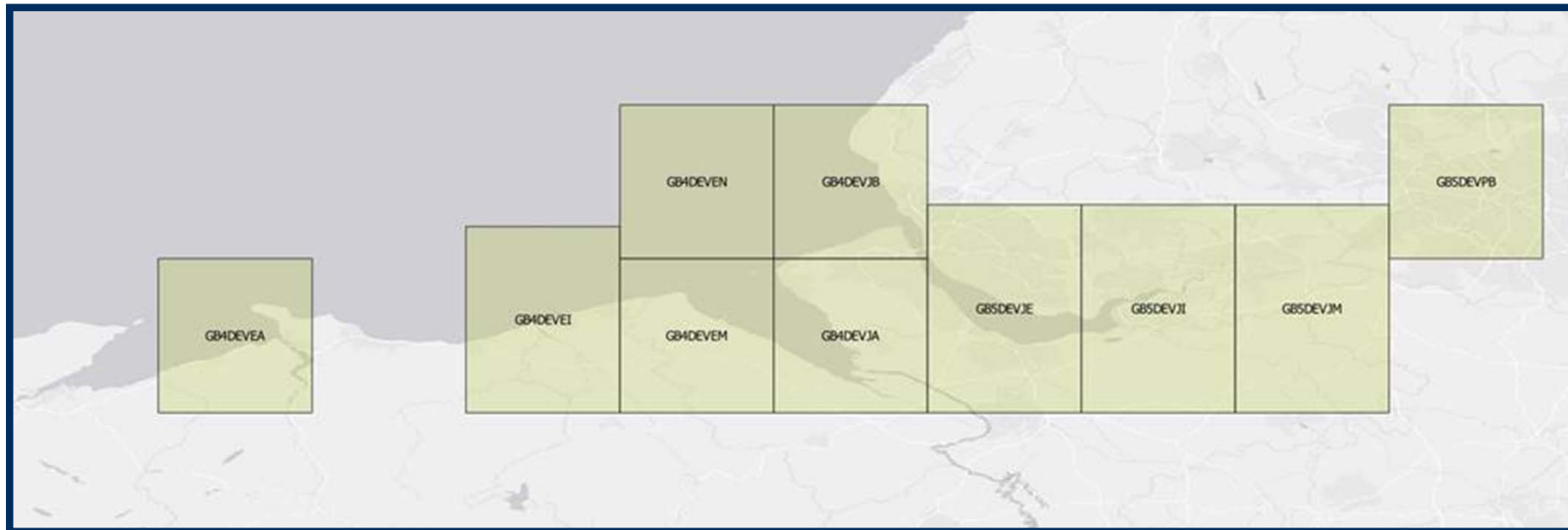
Current Coverage at Liverpool







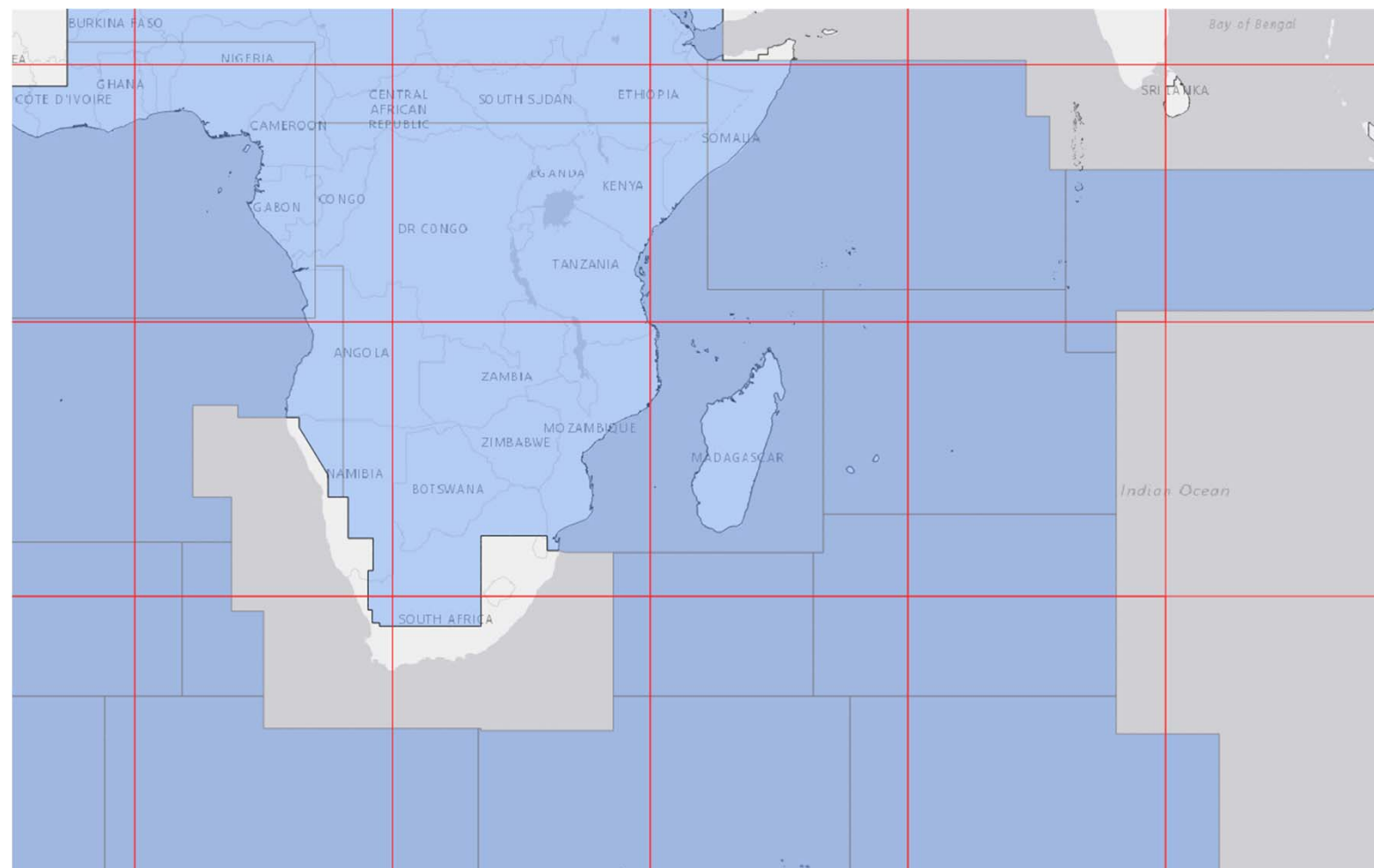
The trial only increased the number of ENCs of Liverpool from 12 to 14





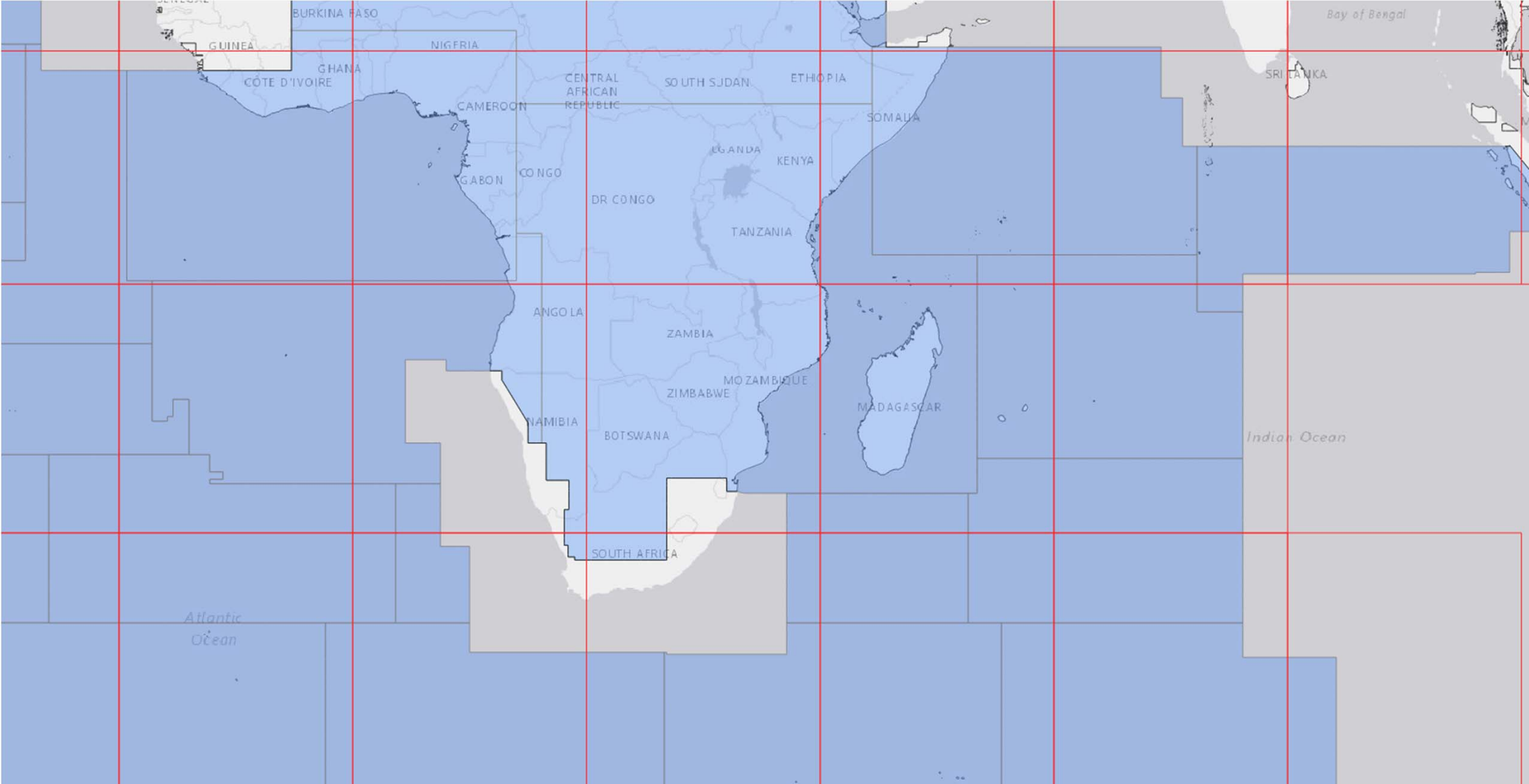
## SAIHC18 - Examples applying the grid

Band 1 Coverage



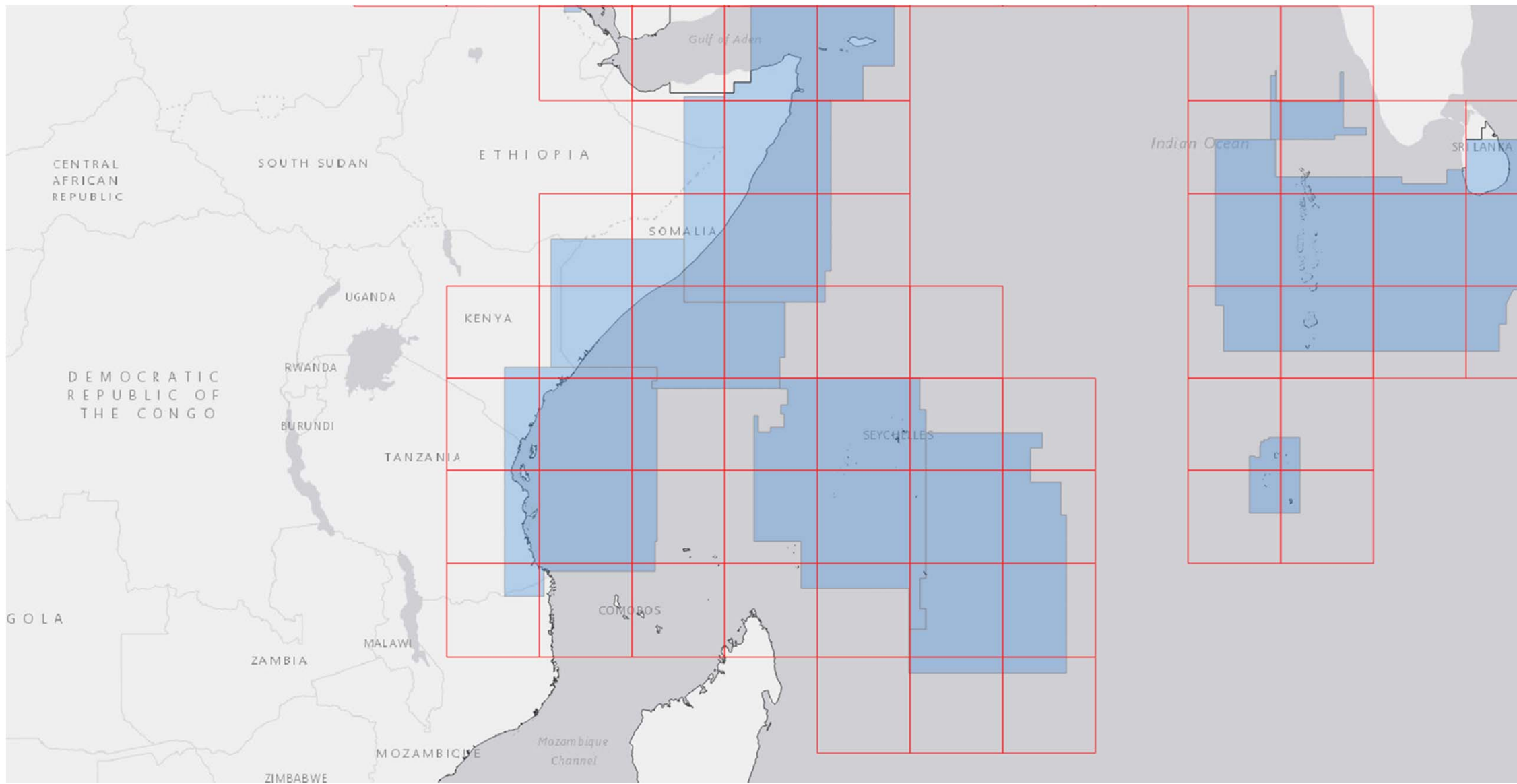
Kenya - Mombasa

# Band 1 Coverage

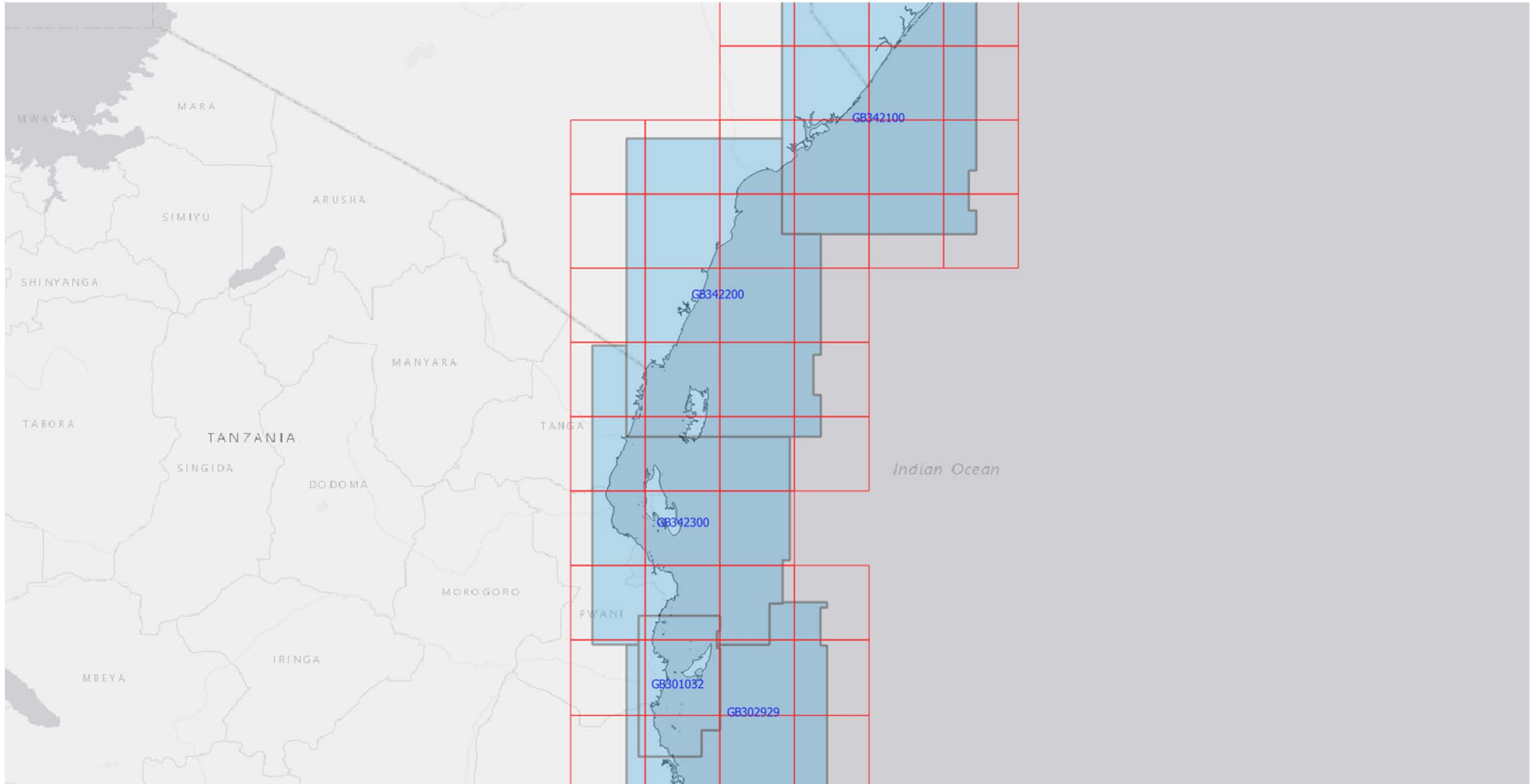




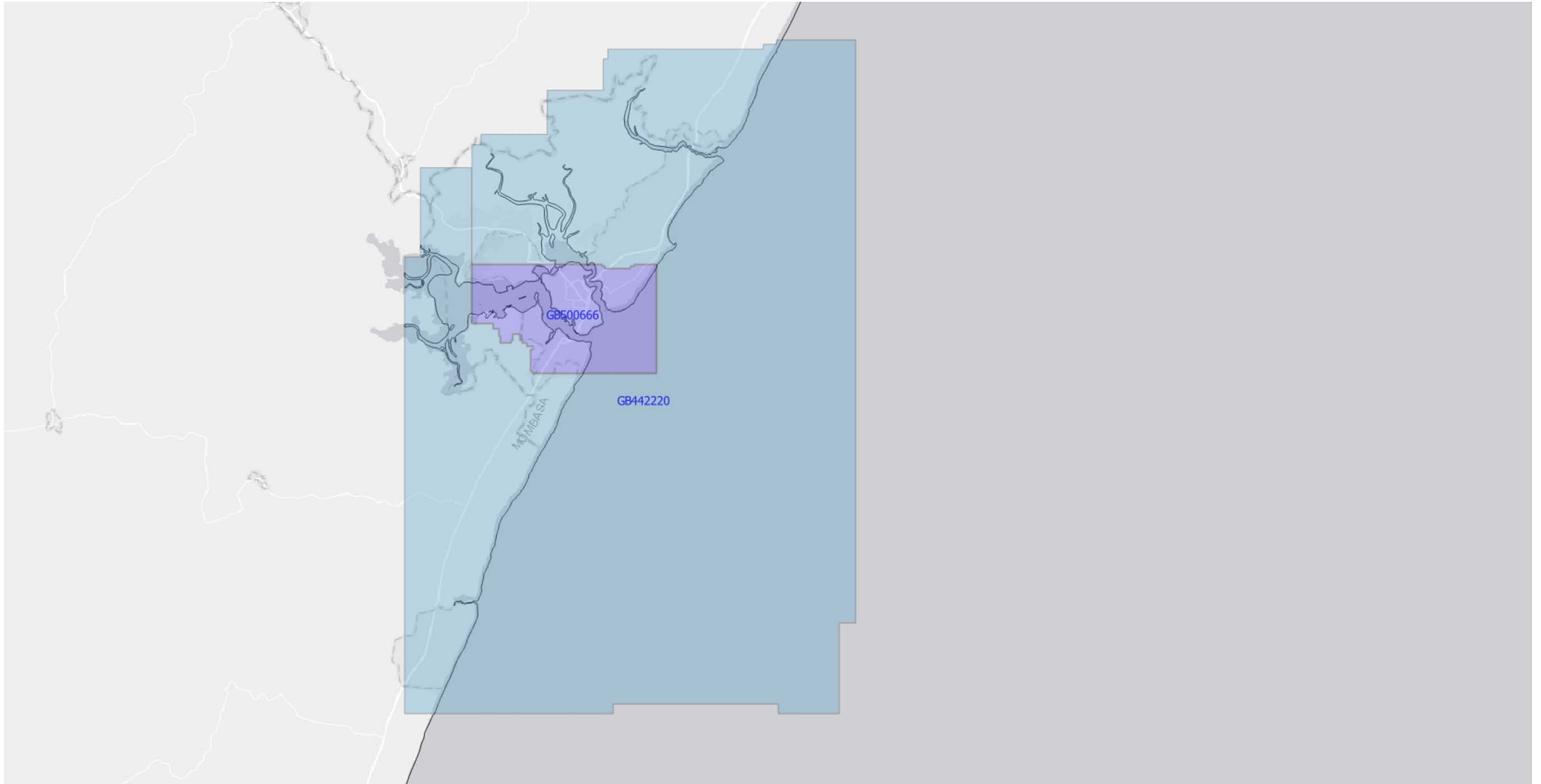
# Band 2 Coverage



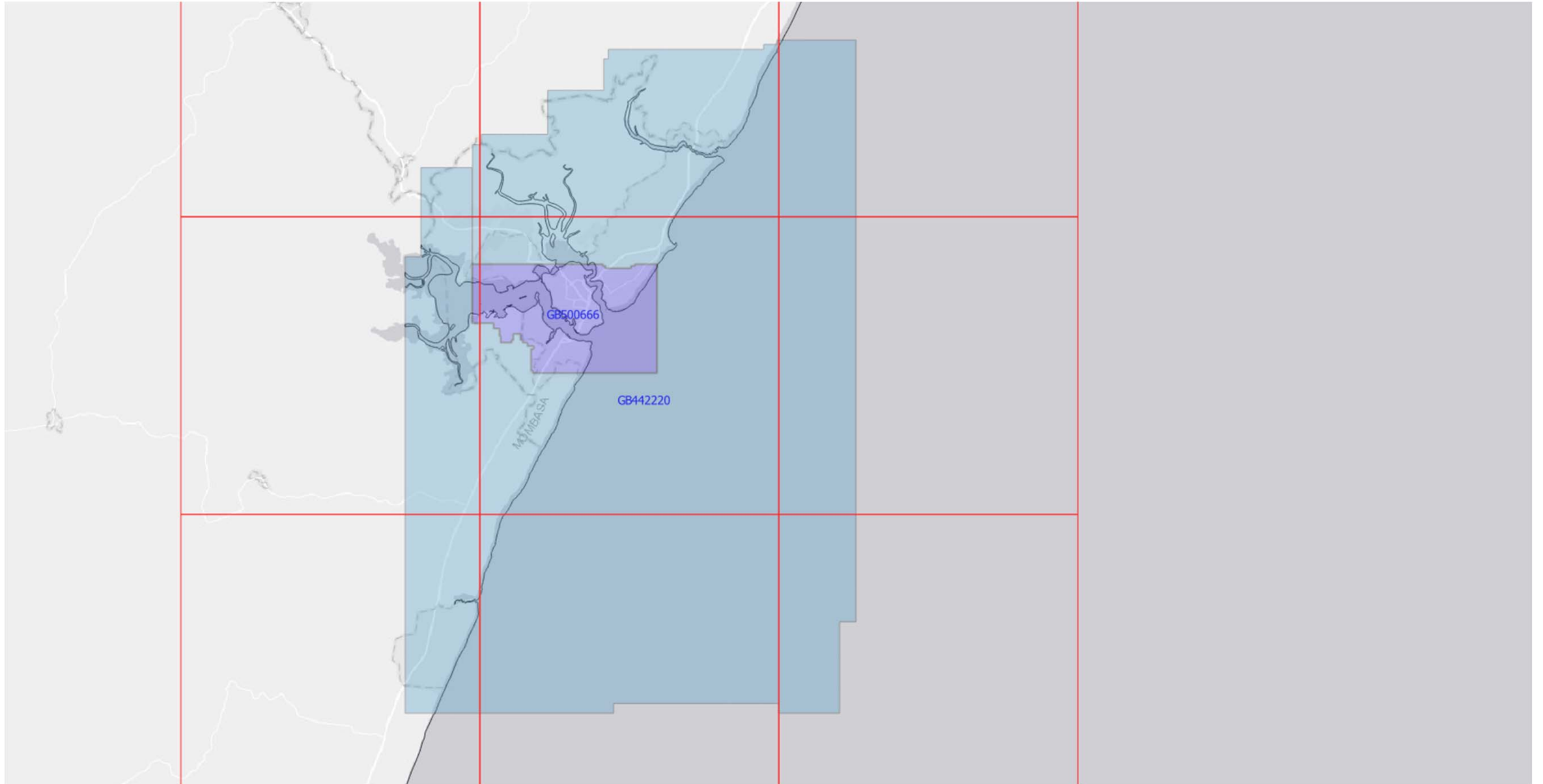
# Band 3 Coverage



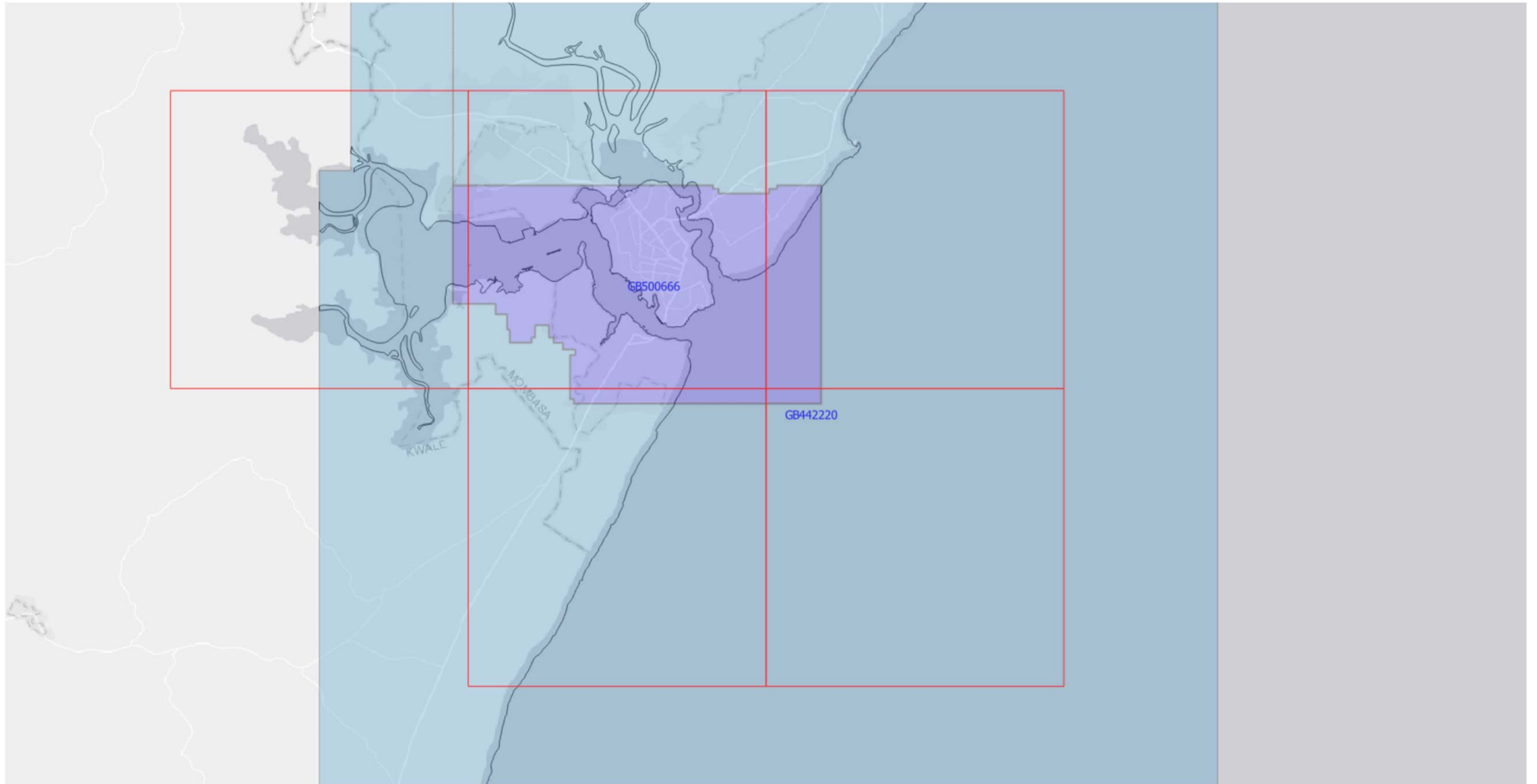
# Band 4 and 5 Coverage



# Band 4 and 5 Coverage (with band 4 grid)



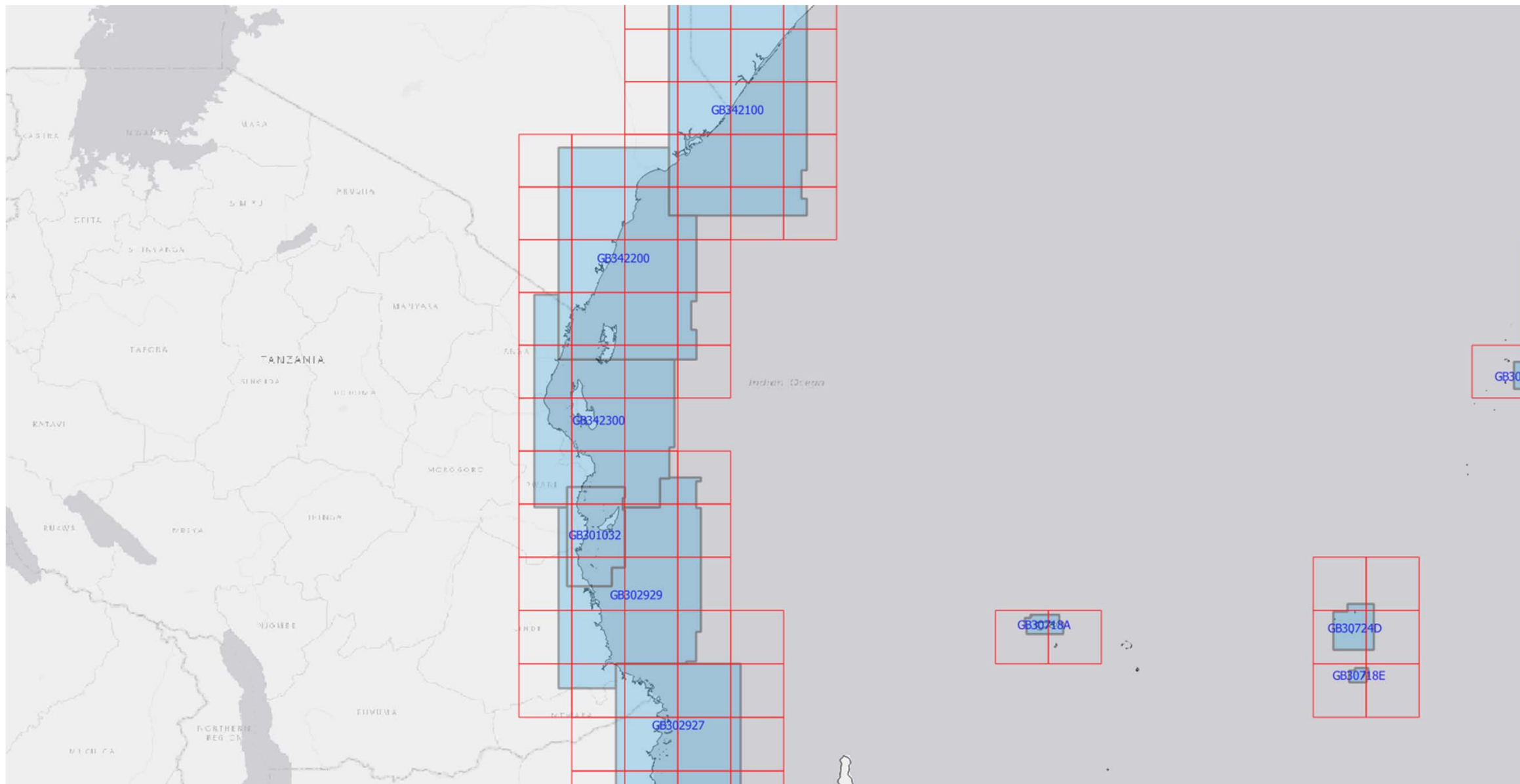
# Band 4 and 5 Coverage (with band 5 grid)



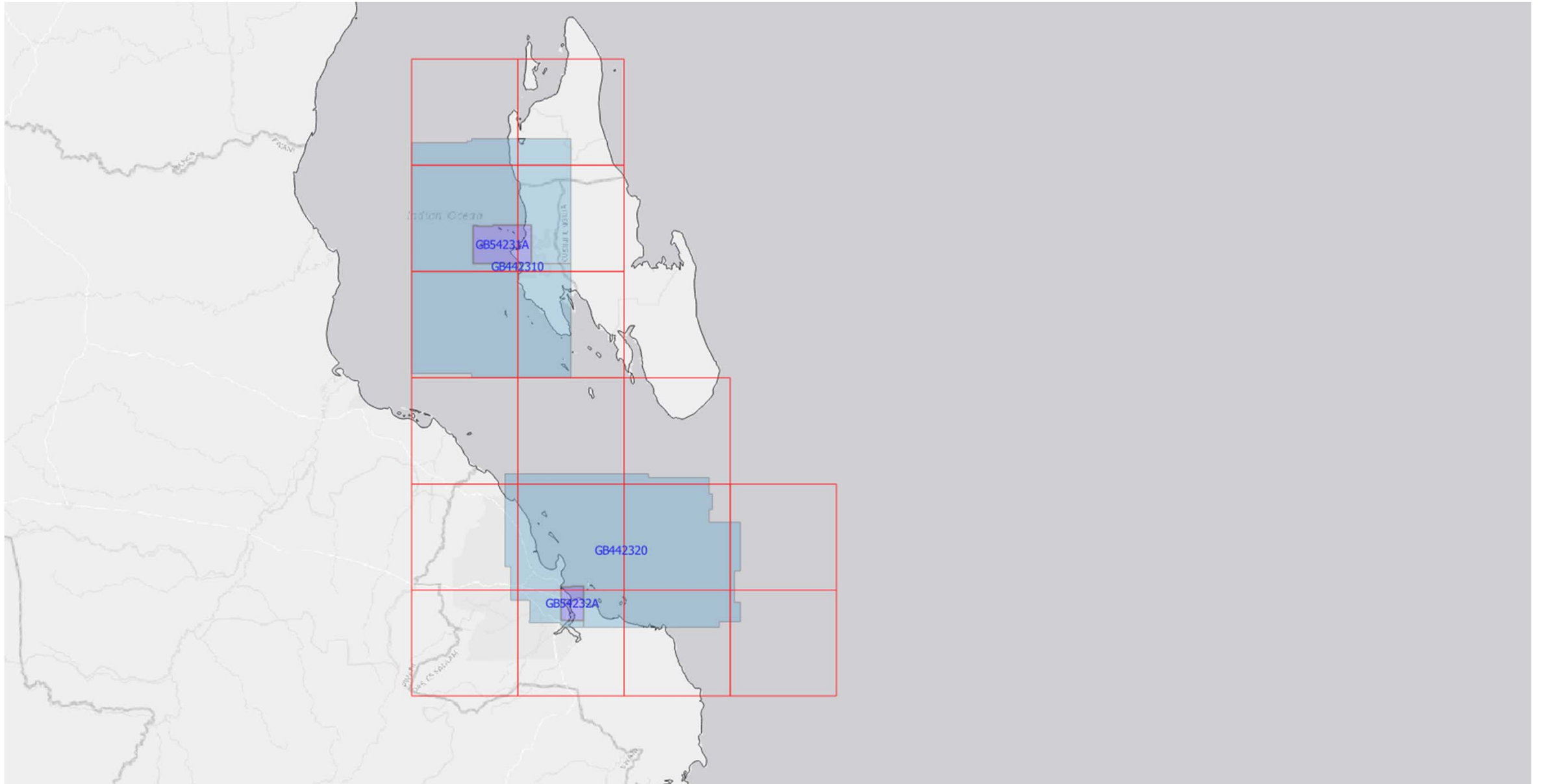
Tanzania - Dar es Salaam



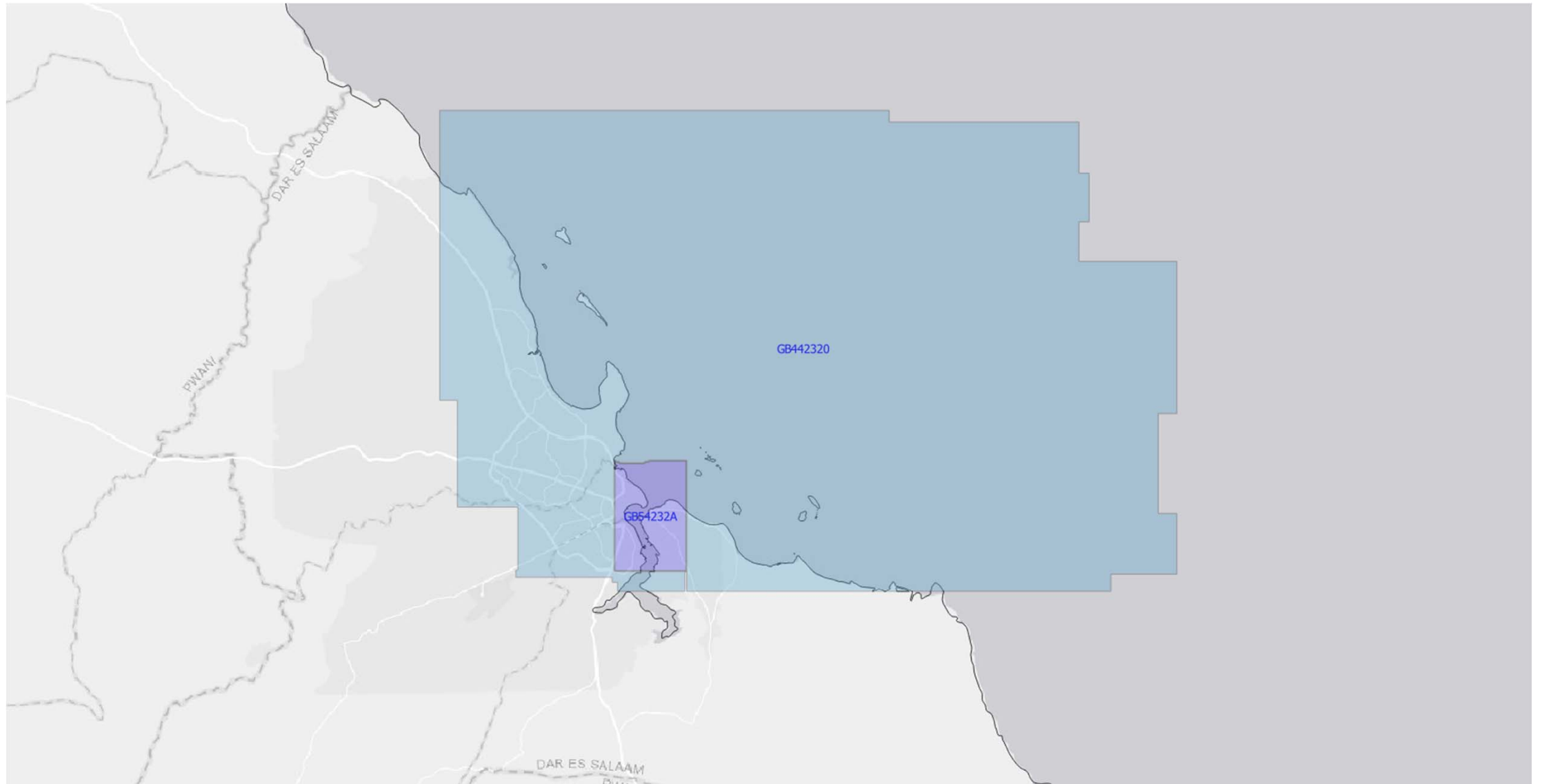
# Band 3 Coverage



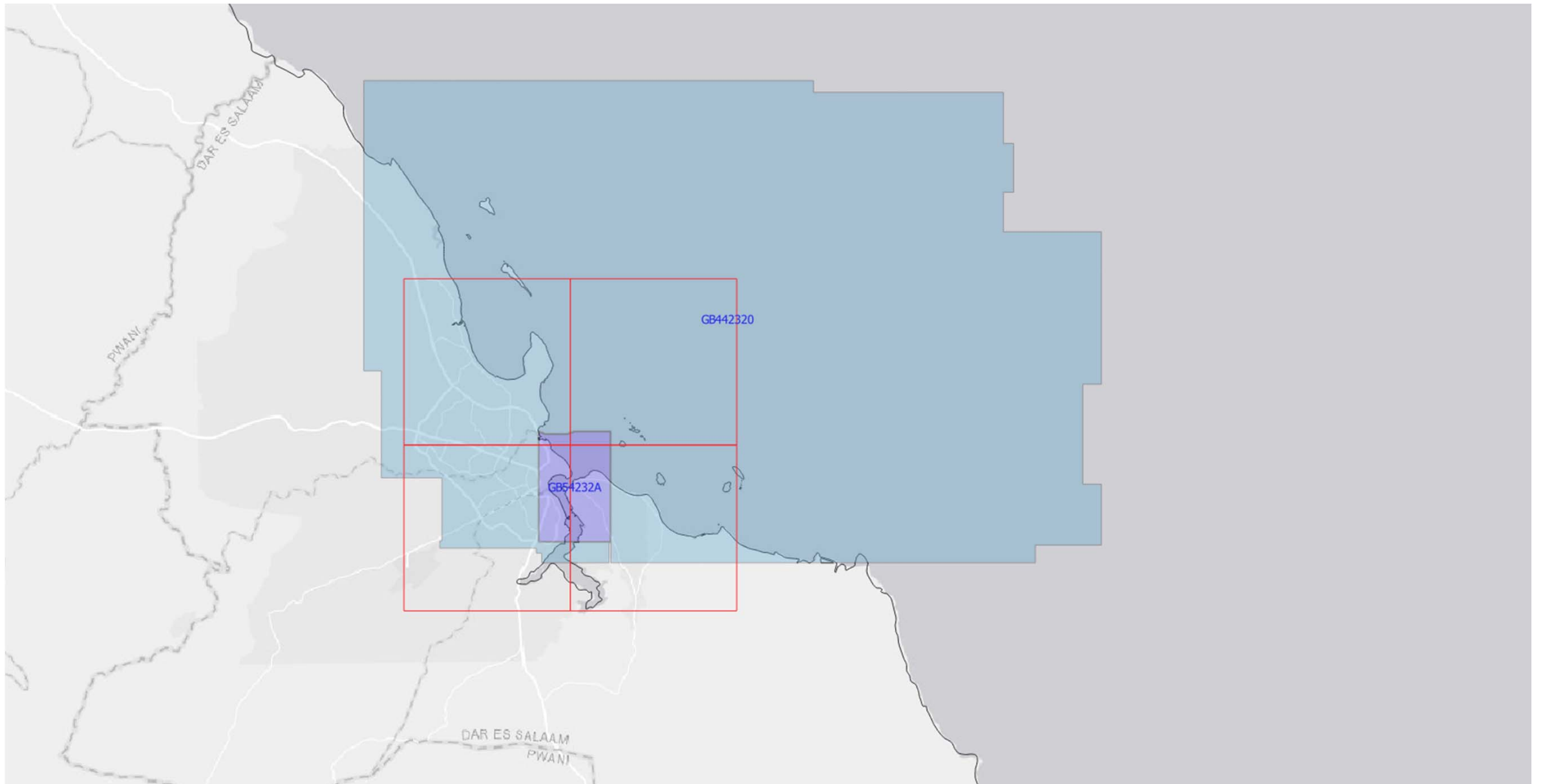
# Band 4 and 5 Coverage (with band 4 grid)



# Band 4 and 5 Coverage



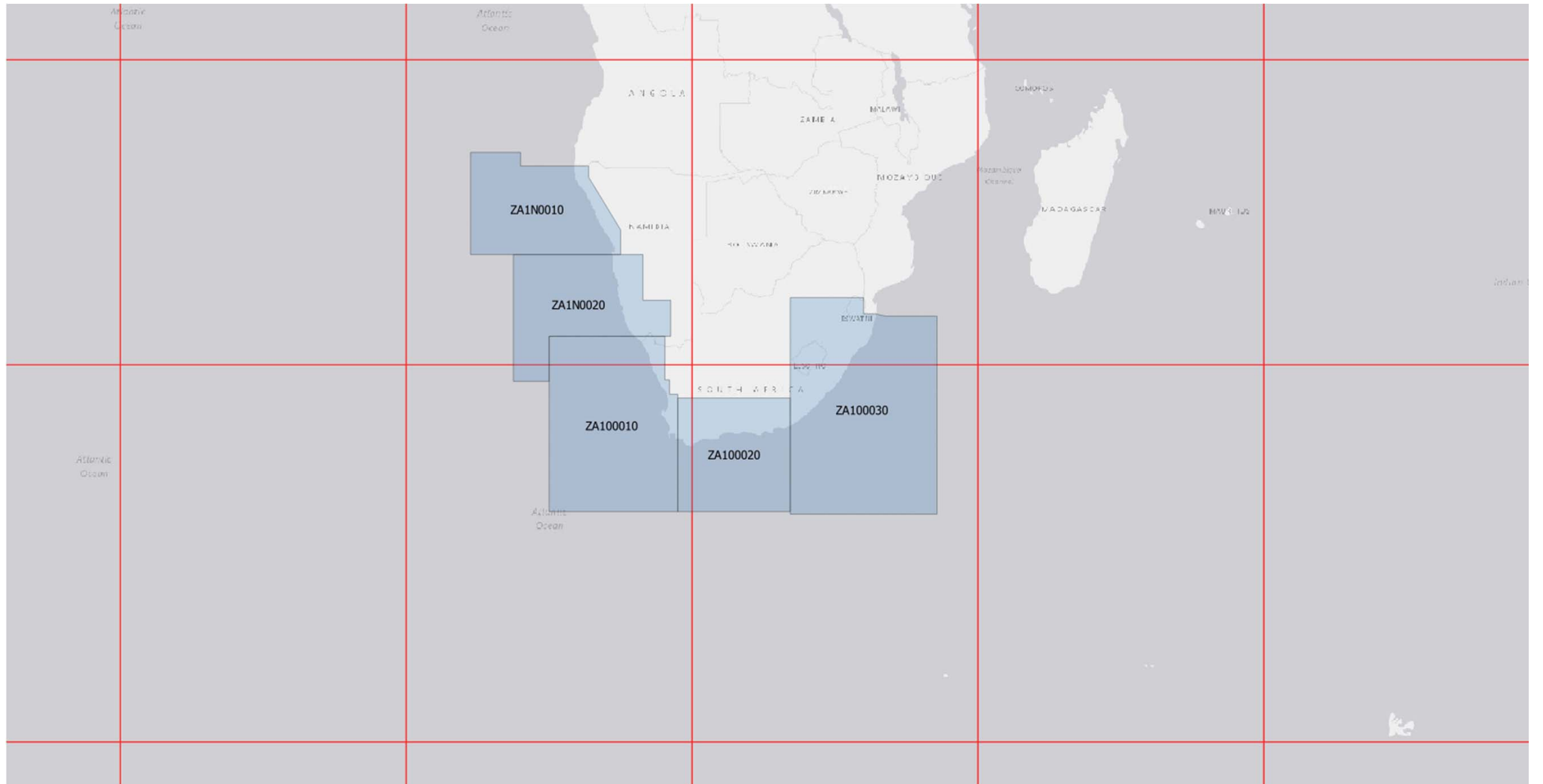
# Band 4 and 5 Coverage (with band 5 grid)



# Republic of South Africa

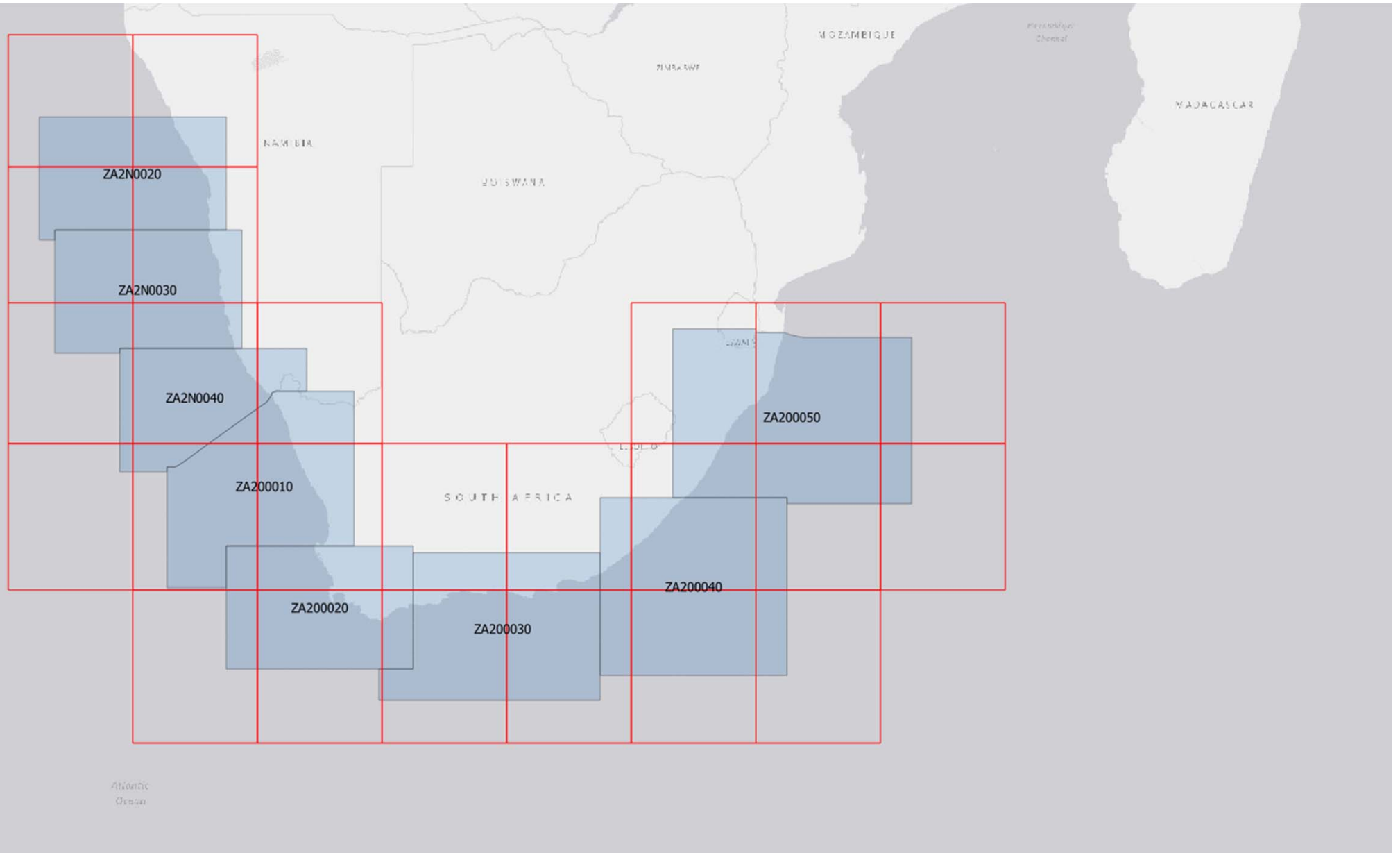
(WGS 84/World Mercator EPSG:3395)

# Band 1 grid

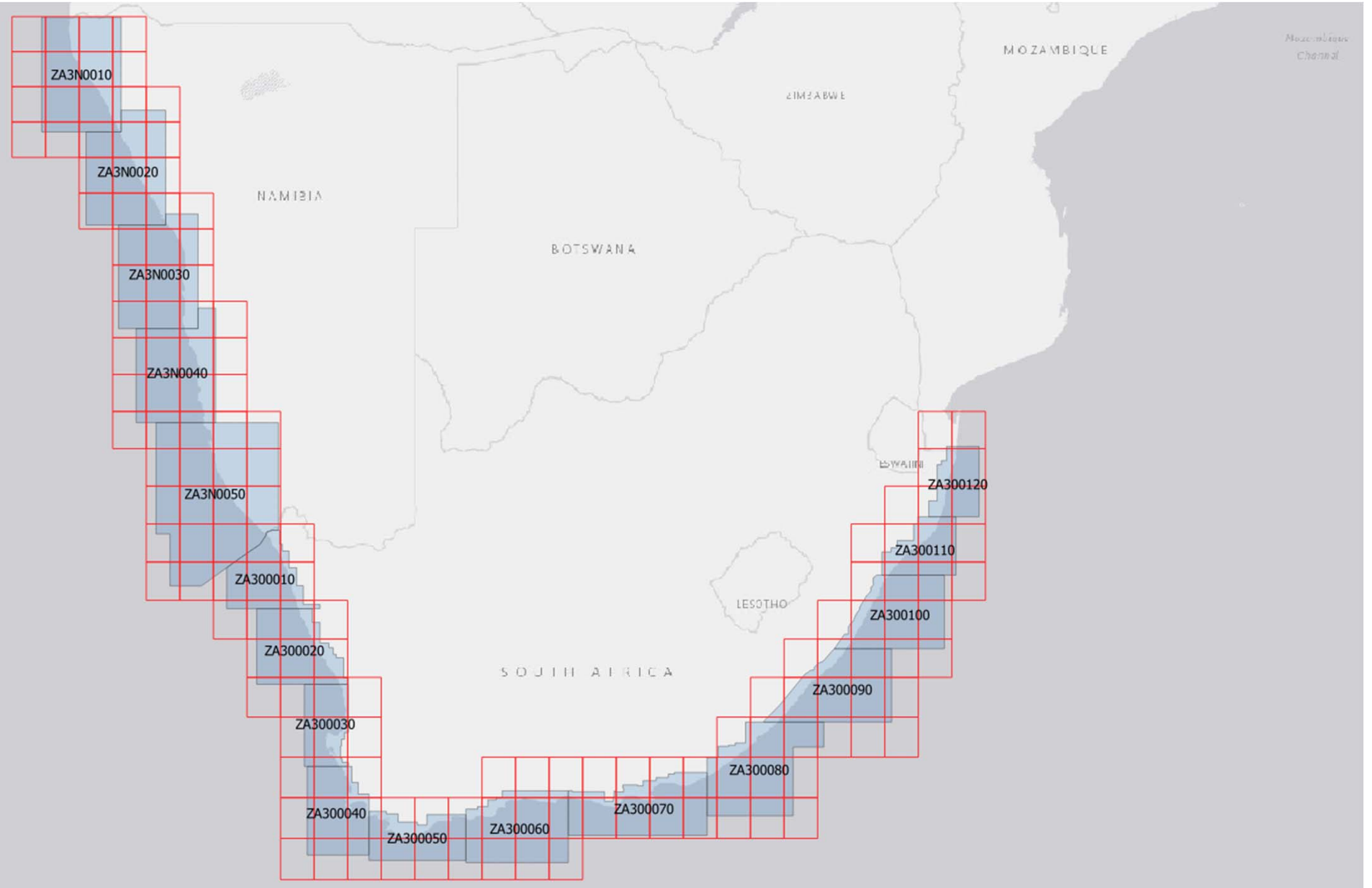




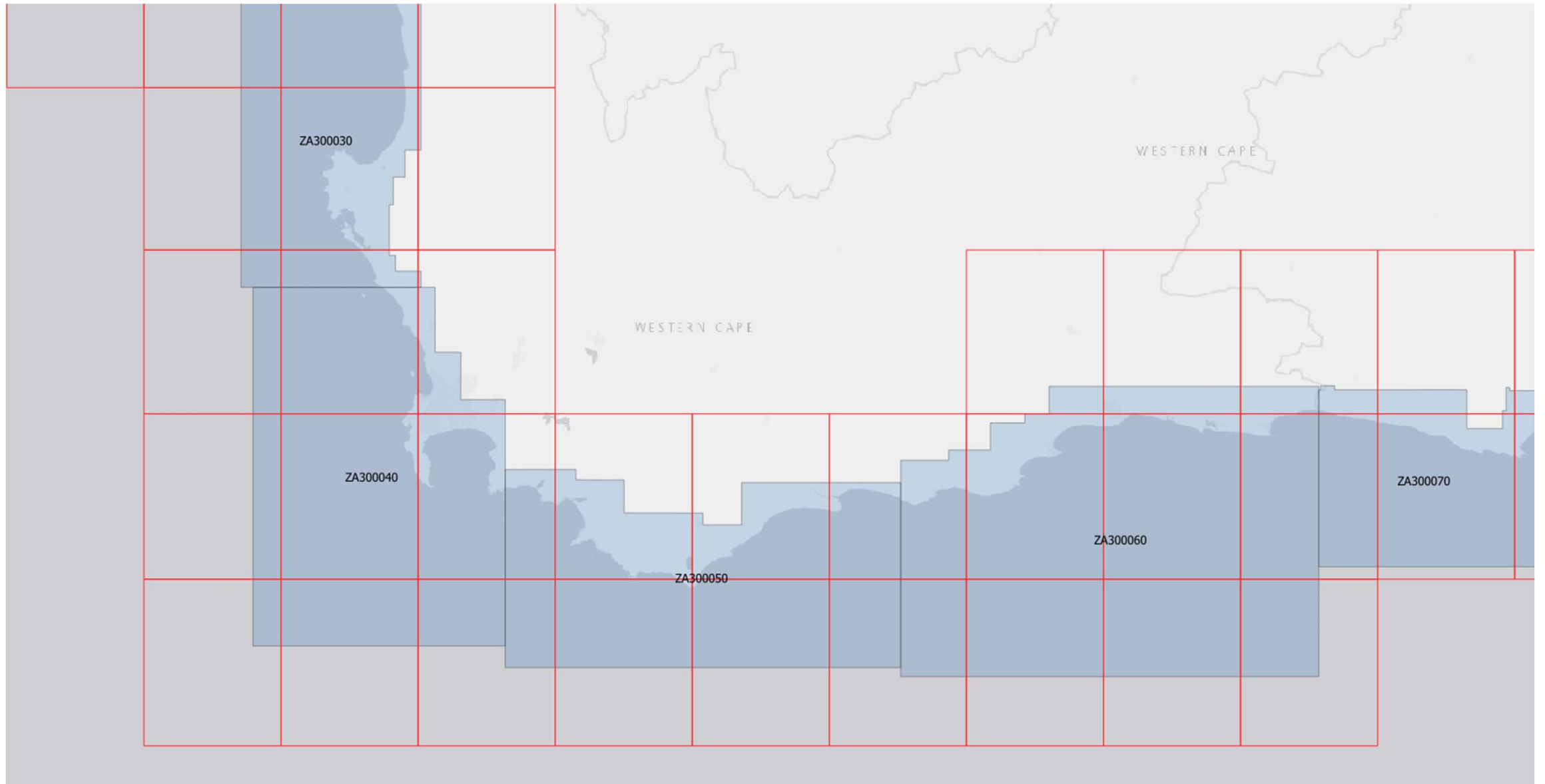
# Band 2 grid



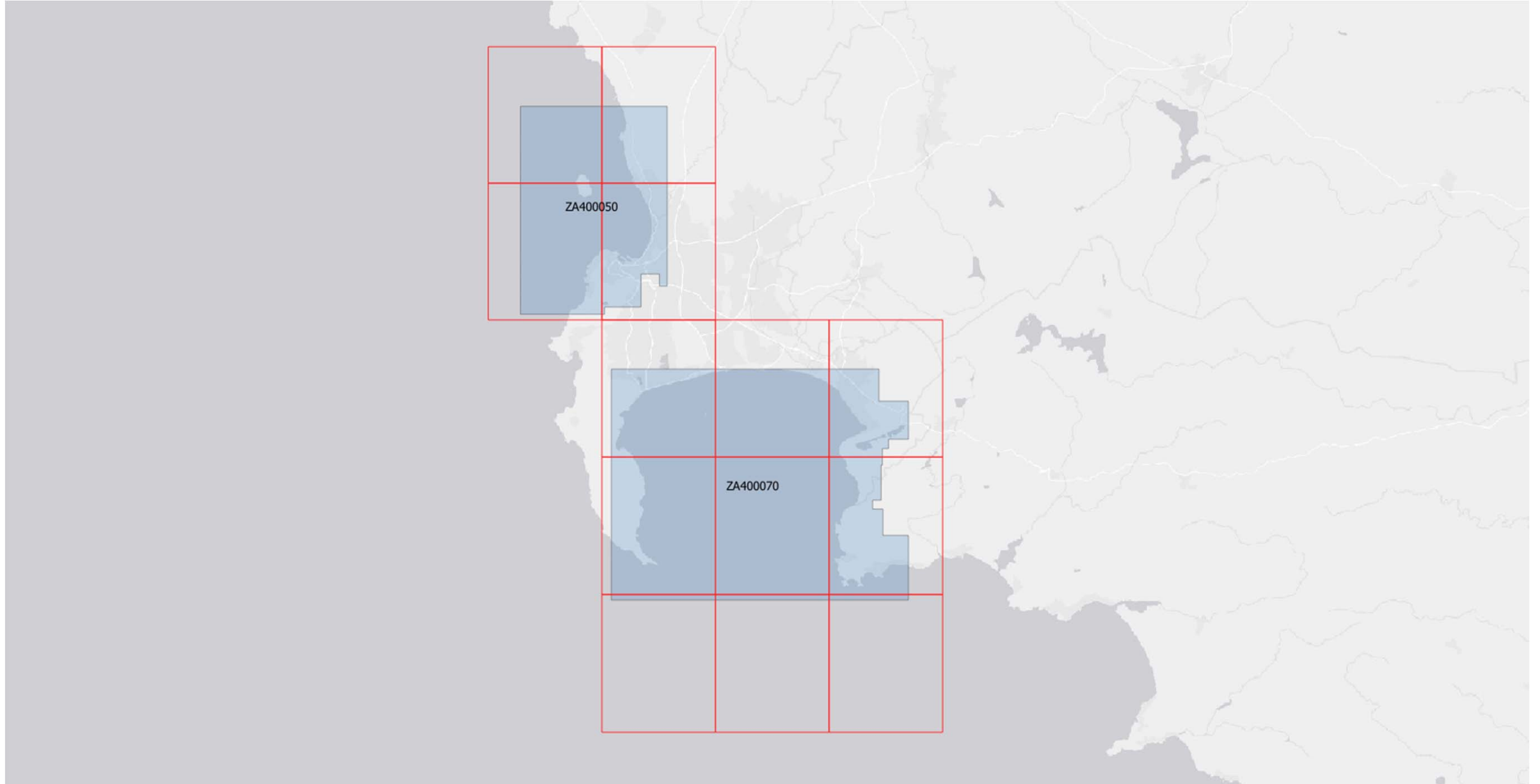
# Band 3 grid



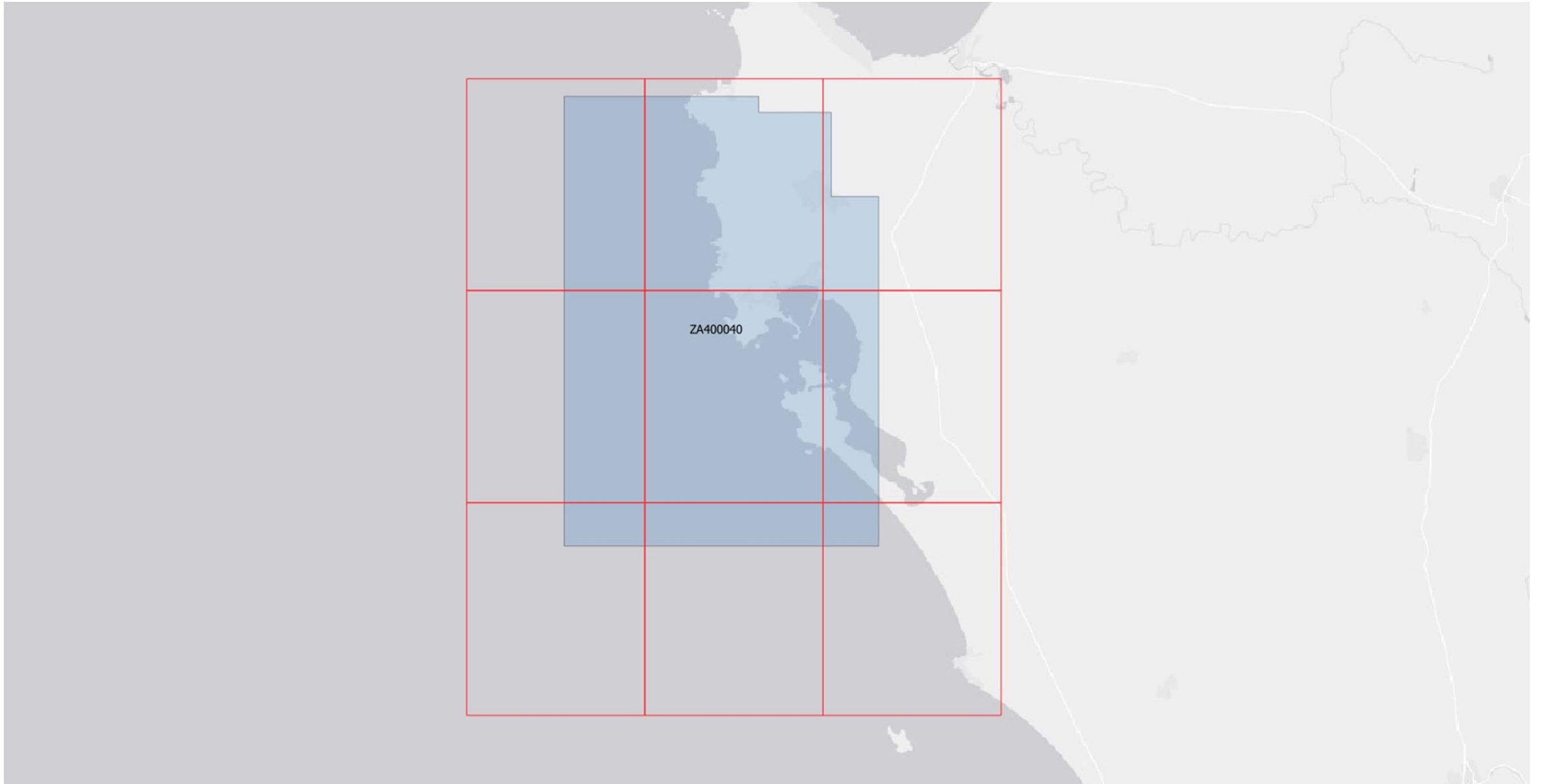
# Band 3 grid (focussing on the Western Cape)



# Band 4 grid (Cape Town and False Bay)

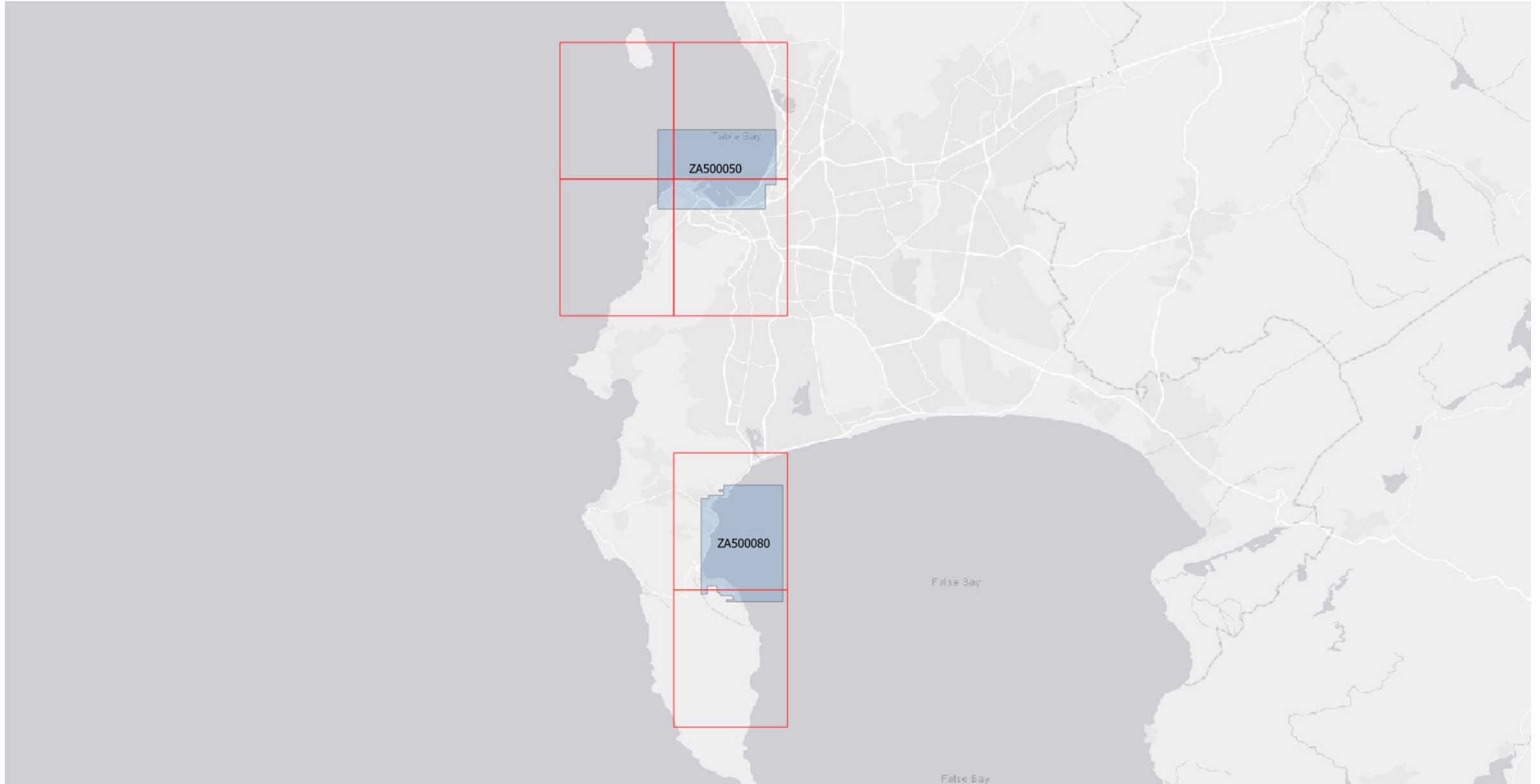


# Band 4 grid (Saldanha Bay)

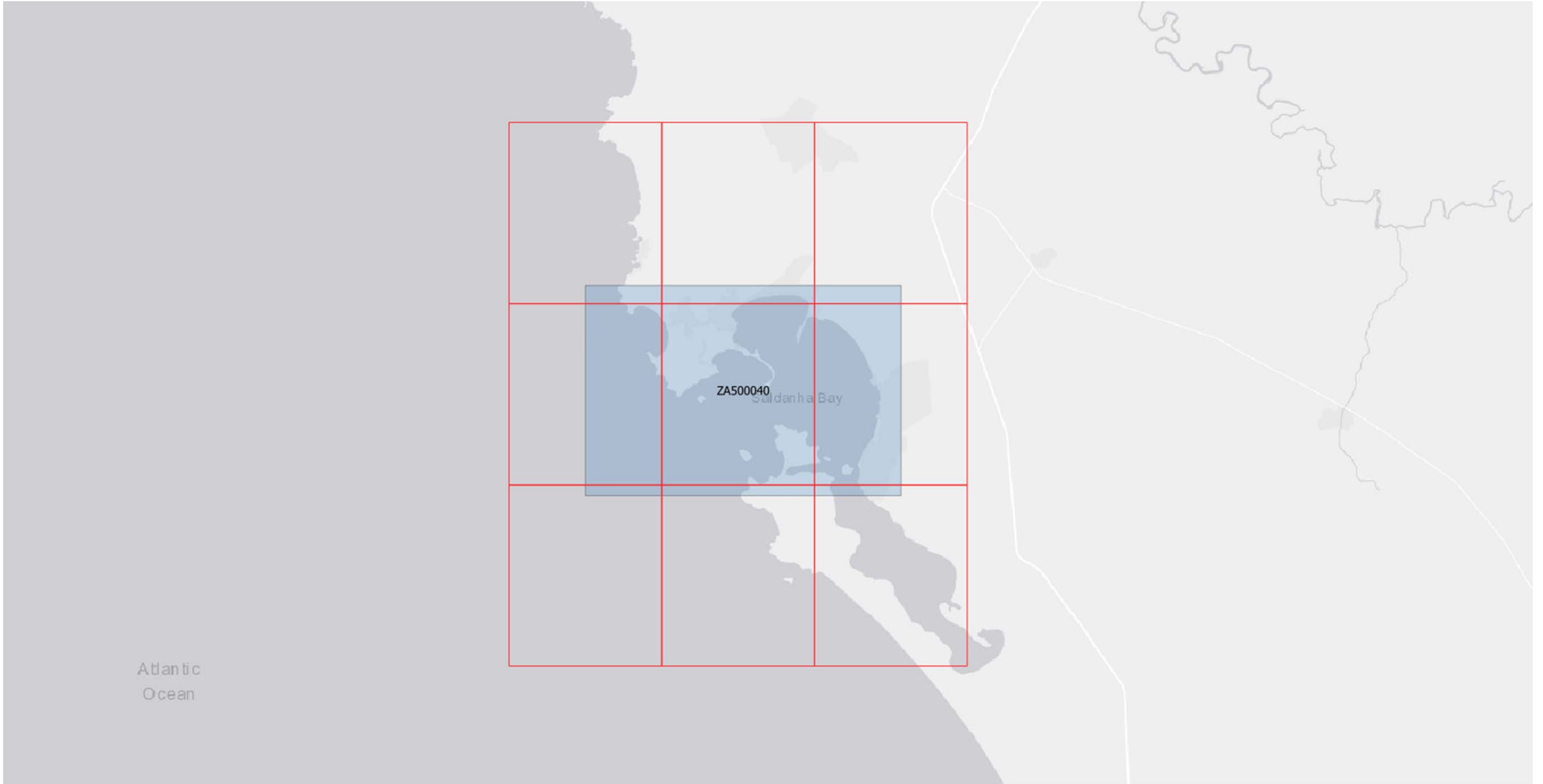




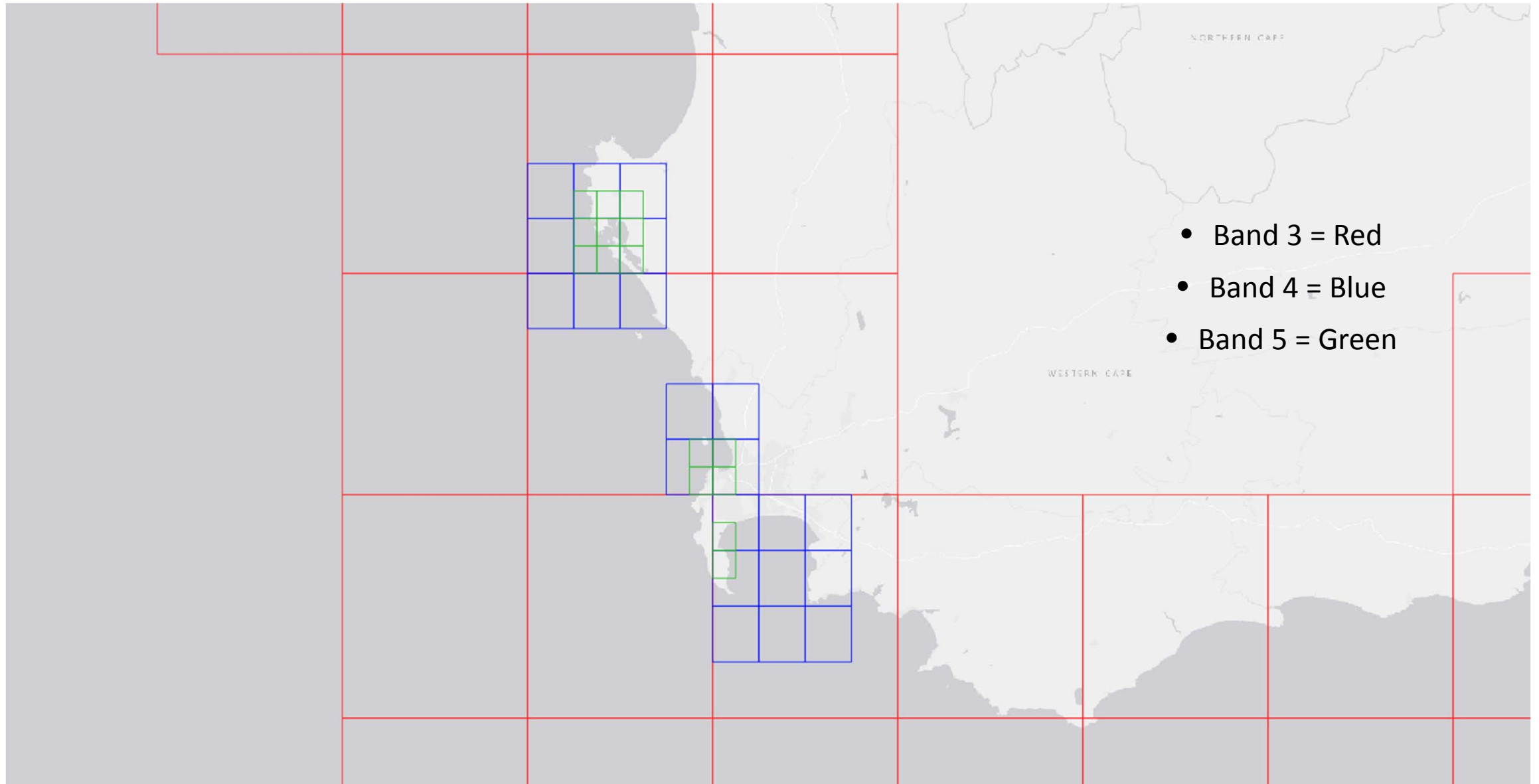
# Band 5 grid (Cape Town and False Bay)



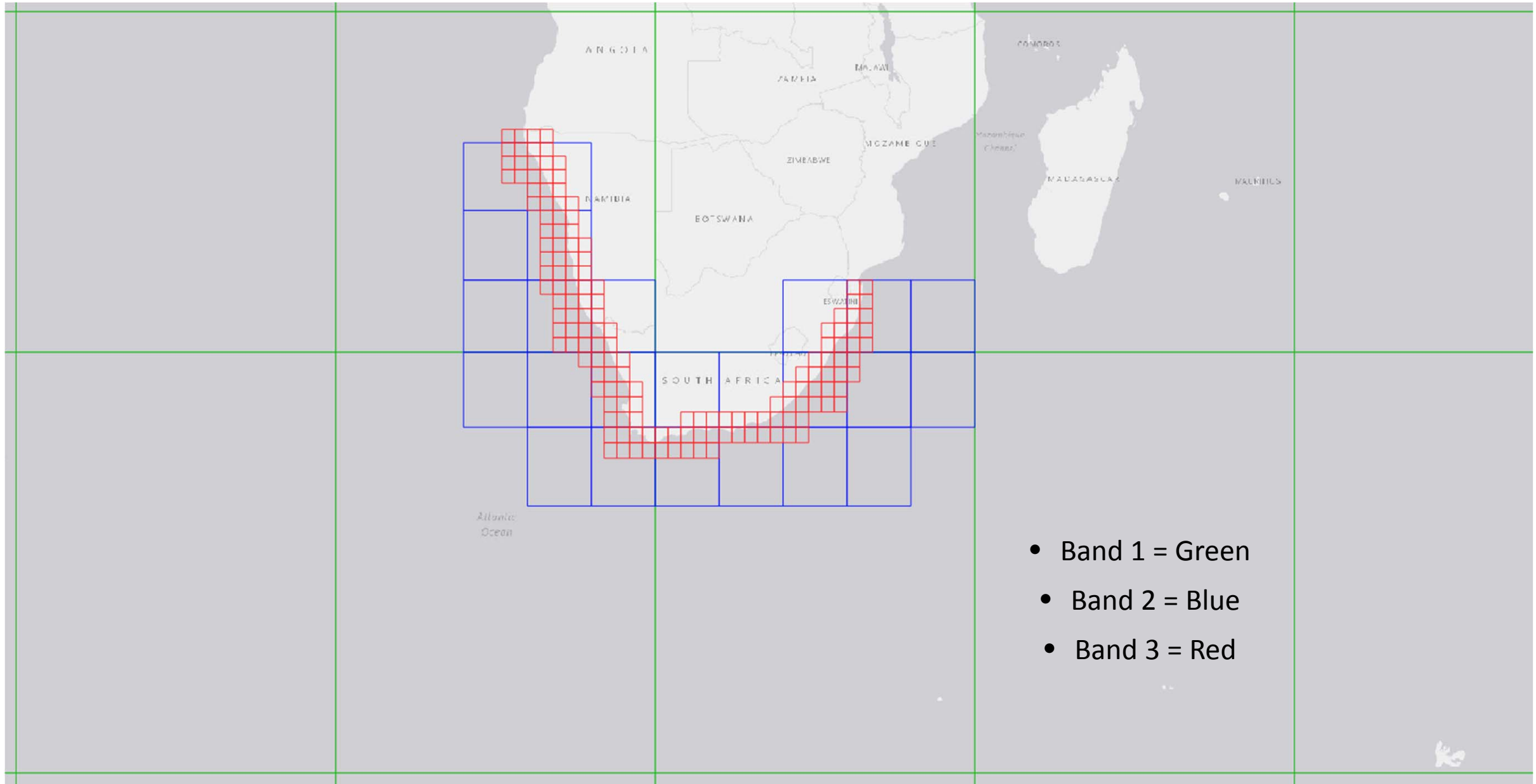
# Band 5 grid (Saldanha Bay)



# How the grids intersect (Bands 3, 4 and 5)



# How the grids intersect (Bands 1, 2 and 3)



## ENC Improvements & Benefits for the User: Summary

Incorporation of focussed user research

Improved scale consistency between  
ENCs

Improved consistency of linear and area  
features between ENCs

High Density ENCs to include more  
options for user to select a more  
appropriate Safety Contour

Positive evolution from the paper chart  
origins which can still be observed on  
ENCs

Forward looking step away from the  
historic paper chart look of ENCs

Reschemed coverage to improve  
interoperability with future S-100  
products



# S-100 Implementation Roadmap

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The Roadmap for the S-100 Implementation Decade (2020-2030) constitutes a transition plan aiming to the regular and harmonized production and dissemination of S-100 based products.

The WENDWG-12 meeting held in February this year raised the issue concerning RHCs' best practice in the preparation of the future and how the Roadmap on the S-100 Implementation Decade is to be considered by RHCs. The intention is to have a global understanding on the plans in the RHC for the implementation of the S-100 Roadmap.

# S-100 Implementation Roadmap

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**HOs to consider the following regarding implementation of S-100:**

- Intention to implement S-100
- Constraints and challenges
- Implementation strategy and estimated timeframe to produce operational S-101 ENC's in parallel with regular S-57 ENC's 'dual fuel' model
- Identify top priority S-1xx products
- Requirement for capacity building
- Requirement to outsource production of S-100 on behalf of HO
- Capacity building
- Engagement
- Establishment of partnerships

# S-100 Implementation Roadmap

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South Africa is currently in the process of developing an S-100 strategy based on a comprehensive implementation plan and intends to be S-101 operational by mid 2024.

## High level strategy:

Phase 1: Preparation for conversion from S-57 to S-101 (target date July 2023)

Phase 2: Importing S-57 HPD database to the S-101 database platform (target date July 2024)

Phase 3: S-101 database validation and S-101 product creation (target date December 2024)

## Priority S-1xx products identified:

Product	Description
S-101	Electronic Navigational Charts (ENC)
S-102	Bathymetry
S-122	Marine Protected Areas
S-124	Navigational Warnings
S-104	Water Level Information for Surface Navigation

# Marine Protected Areas

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- There is a growing awareness for vessels to be environmentally friendly and to protect the environment from potential catastrophic effects of major pollution incidents to tasks such as changing of fuels and emptying of grey water before entering sensitive areas and this subject is raising new questions.
- The future of the paper chart as a primary navigation tool remains a major consideration taking into account the increased workload and possible additional maintenance overheads regarding portrayal of MPAs.
- The general practise is to include the limits of MPAs on large scale paper charts only when there is a "routine" requirement to produce a new chart or new edition of the chart.
- Currently, most information regarding MPAs are shown on charts by means of a note referring to Sailing Directions or other publications.
- The subject is complicated by the existence of different restrictions and levels of legislation and how to warn the mariner regarding areas that have restrictions vs. areas which are unlegislated.

# Marine Protected Areas

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- Challenges achieving a balance between the level of charted detail and the risk of clutter with the addition of MPA limits on charts which previously did not show them.
- S-122 would allow for all MPAs to be captured and the limitations of paper charts mean that it will be a compromise to avoid cluttering the chart, specifically smaller scale paper charts which do not have larger scale coverage.
- The current practise on smaller scale charts is to only show the most significant areas such as PSSA or Special Areas designated by IMO under MARPOL.
- Questions may arise such as should mariners avoid legislated as well as un-legislated MPAs?
- Only show MPAs that have restrictions in place such as anchoring?



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# Matters arising

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# Thank you for your attention!