



**INFOMAR**

Integrated Mapping for the  
Sustainable Development  
of Ireland's Marine Resource

# Optimising a Small Craft for Mapping in >100m WD on the open Atlantic Coastline of Ireland.

**FEMME Conference 2023**

David Hardy

28<sup>th</sup> September 2023



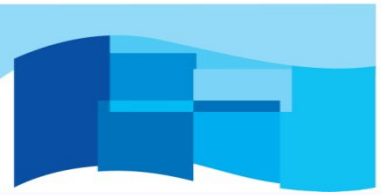
An Roinn Comhshaoil,  
Aeráide agus Cumarsáide  
Department of the Environment,  
Climate and Communications



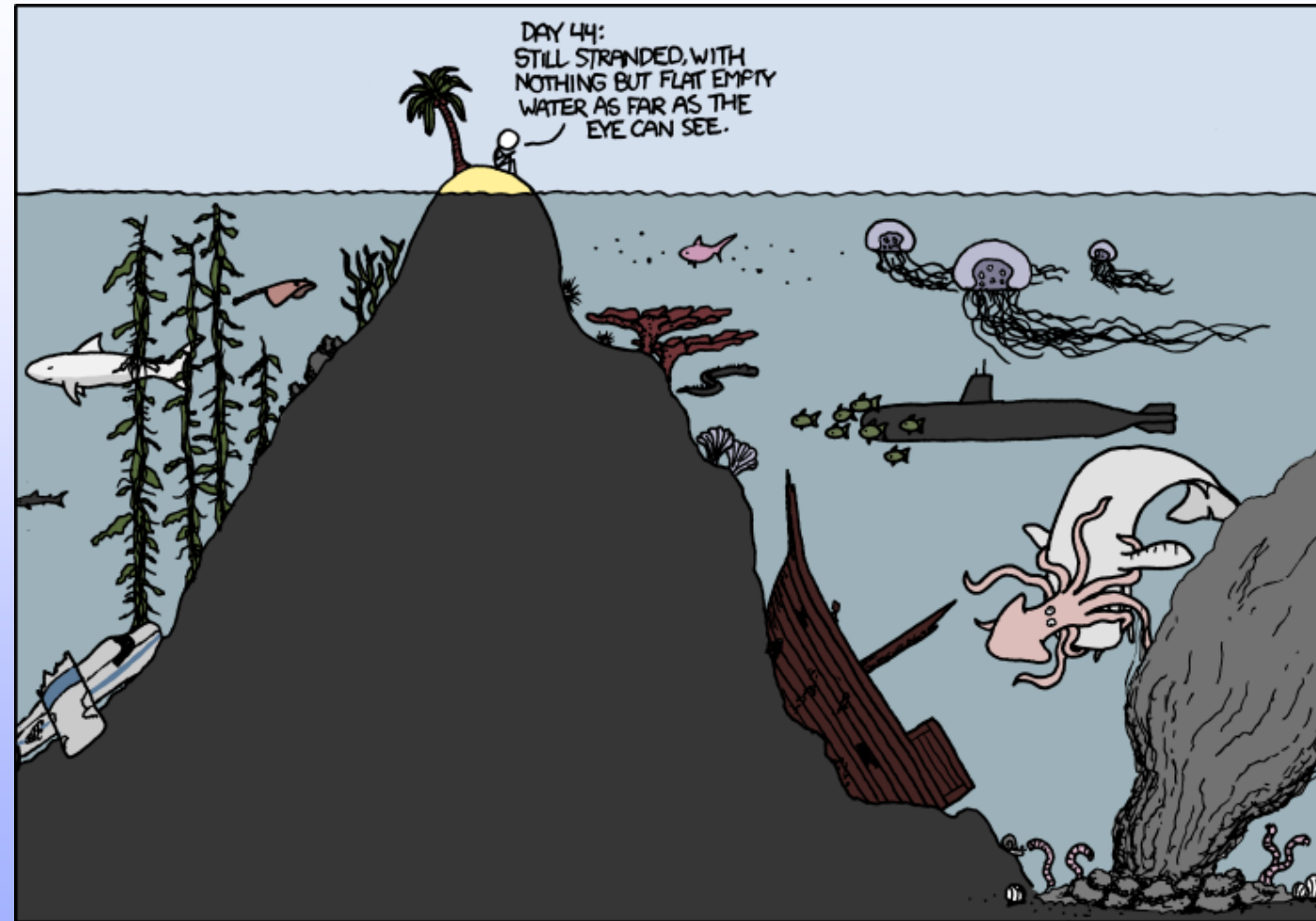
*Foras na Mara*  
*Marine Institute*



**Geological Survey**  
Suirbhéireacht Gheolaíochta  
Ireland | Éireann



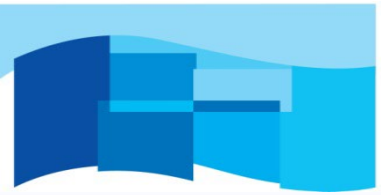
1. What is INFOMAR
2. Meet the Fleet
3. Timing & Budget Challenges
4. The Plan
5. Outcome
6. Initial Data Assessment
7. Pathway to Improvement
8. EM2040P Data Results
9. Takeaways & Future Actions



Telescopes and bathyscapes and sonar probes.....the most exciting new frontier is charting what's already here.

[www.xkcd.org](http://www.xkcd.org)



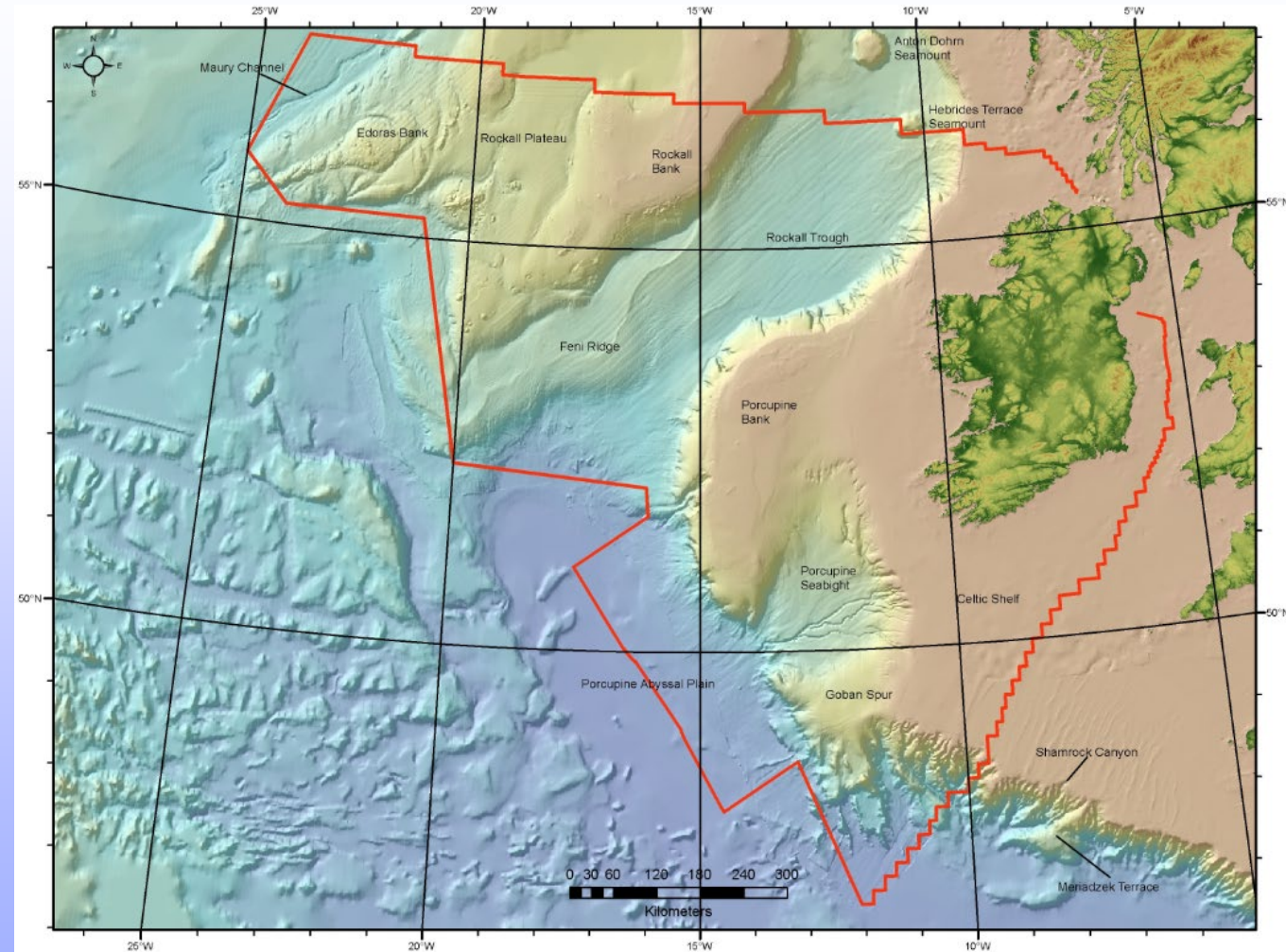


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## What is INFOMAR?

- Irish, state funded, marine mapping programme –
  - **Integrated Mapping for the Sustainable Development of Ireland's Marine Resource**
- Builds on the success of the preceding **Irish National Seabed Survey (1999-2005)**.
- Jointly operated by Geological Survey of Ireland and the (Irish) Marine Institute.
- Funded by the Department of the Environment, Climate and Communications.
- Full details at [www.infomar.ie](http://www.infomar.ie) and social media (@followtheboats).
- Projected 6-8x return.
- Ambitious 20 year plan – with a finite and variable budget (3-4 million).

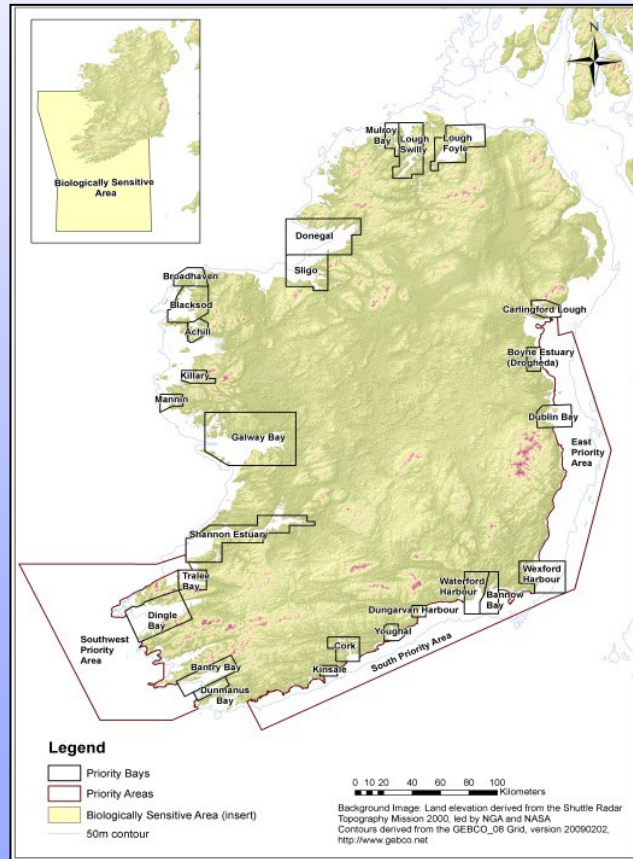


*Real Map of Ireland, with boundary in red.*



## PHASE 1: 2006-2016

- 26 Priority Bays
- 3 priority areas

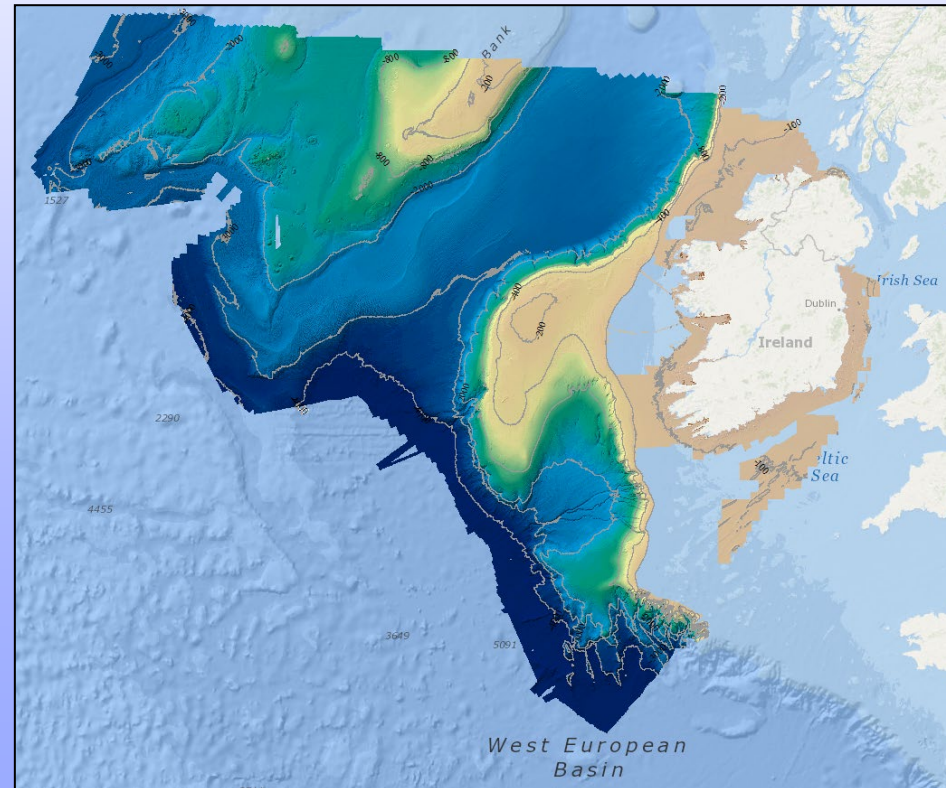


RV Mallet

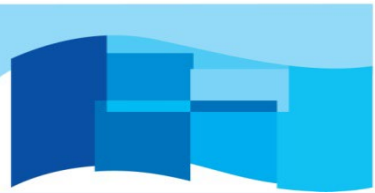
## PHASE 2: 2016 – 2026

Map remaining areas

- Coastal areas between bays
- Celtic Sea
- Atlantic Shelf







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# What is INFOMAR?

Data Access → [infomar.ie](http://infomar.ie) *All data freely available!*

**Dynamic Web Mapping**  
Analyse bathymetry data. 'How to use viewer' video guide.

**Seabed and Sediment**  
Bathymetry, backscatter and sediment distribution data.

**Data Viewer**  
Download and interrogate data.

**Follow The Fleet**  
Follow the INFOMAR survey vessels.

**Charts**  
Bathymetry, backscatter and shaded relief charts.

**Maps**  
All our maps, Google Earth files and the Real Map of Ireland.

**Shipwrecks**  
Over 350 shipwrecks mapped, 3D models, maritime history and much more

**Surveys, Reports and Metadata**

Improving the accessibility of INFOMAR data to the fishing industry & related users.

## DINGLE PENINSULA



[@followtheboats](https://twitter.com/followtheboats)





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## Meet the Fleet

RV Mallet

### Offshore Fleet (30NM +)

### Inshore Fleet (Coastline to 30NM)



*Celtic Voyager*



*Celtic Explorer*



*Tom Crean*



*Keary*



*Mallet*



*Geo*



*Lir*



*Galtee*



RV Tonn



M.V. Cosantóir Bradán (2012 - 2014)



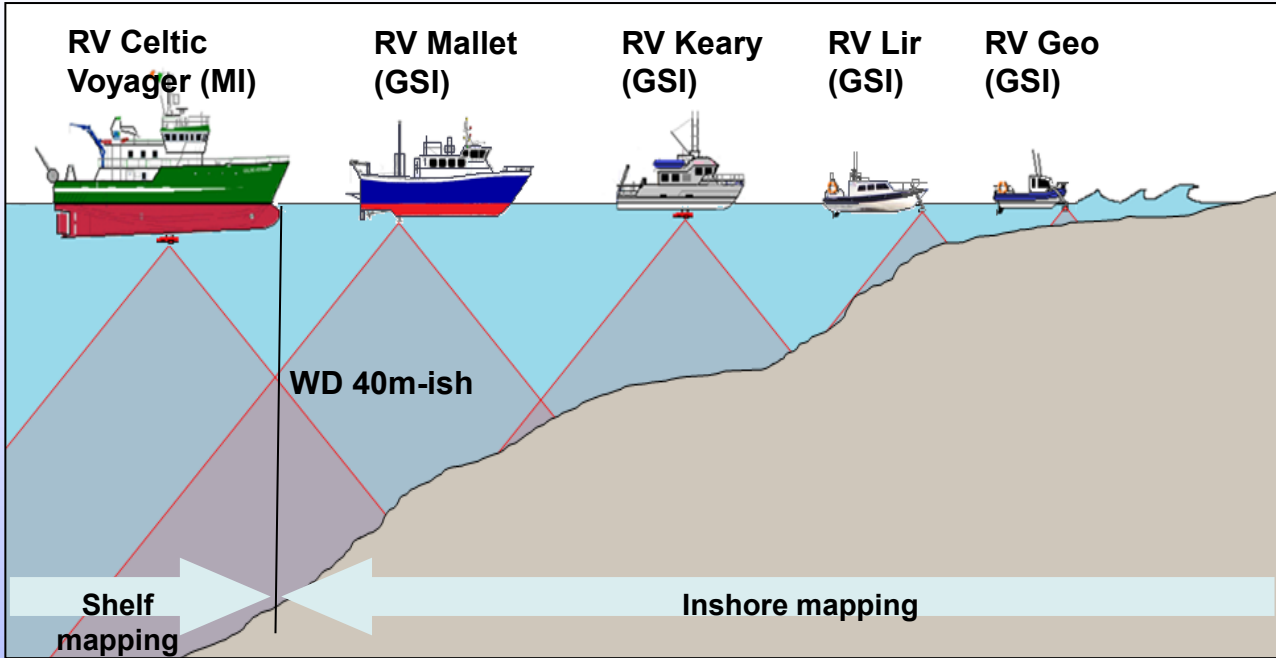


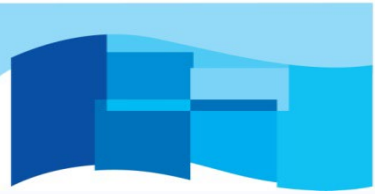
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## Timing & Budget Challenges

RV Mallet

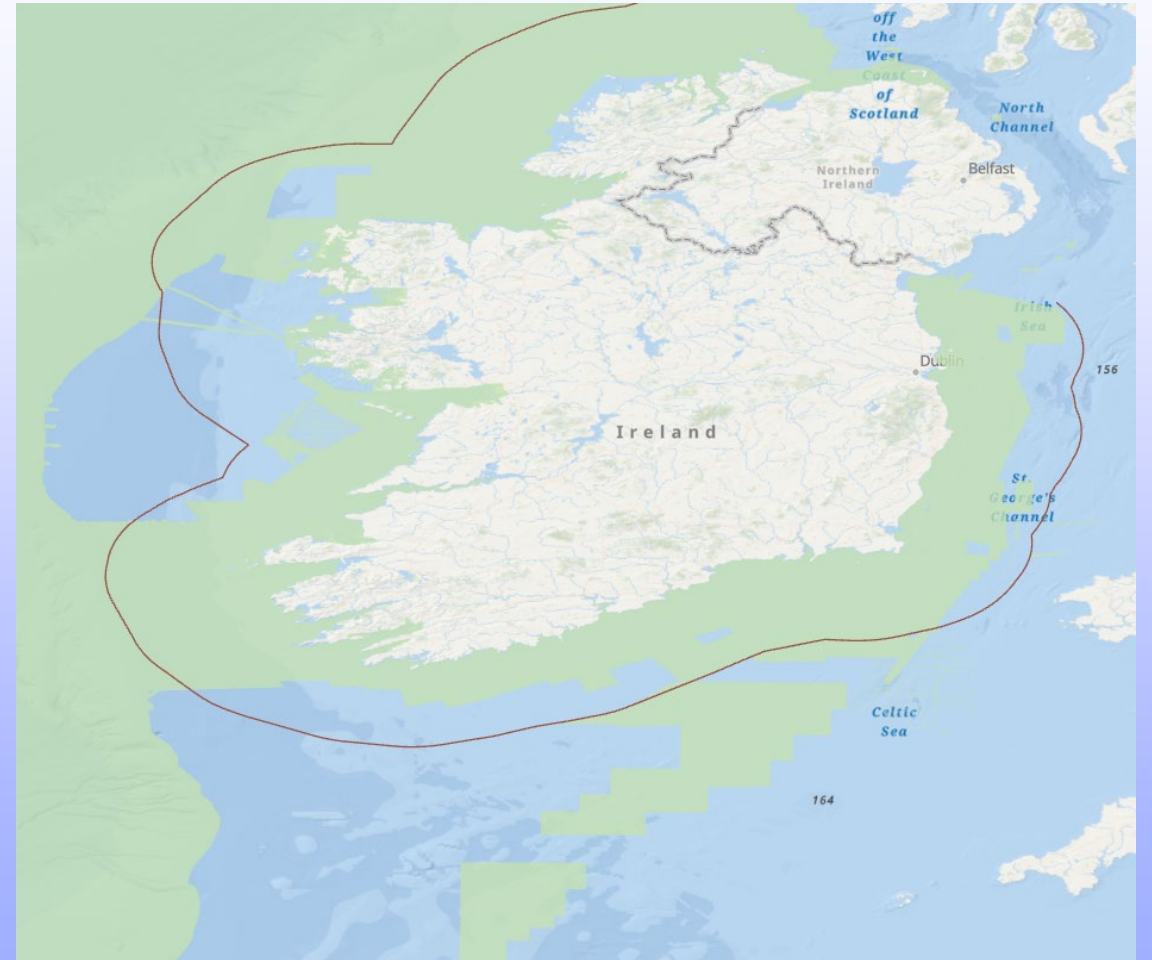
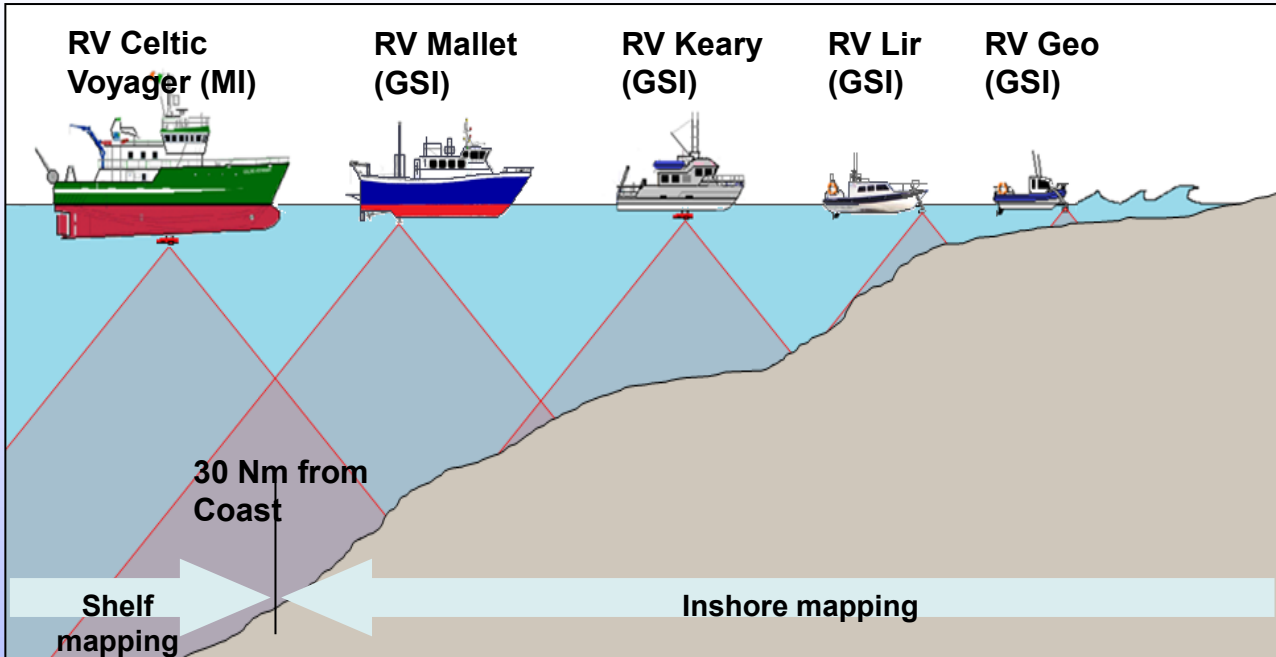




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## Timing & Budget Challenges







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## The Plan





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## The Plan



- 11m RIB.
- Dual diesel engine.
- 20kts transit.
- Nice, sensible inshore mapping platform.

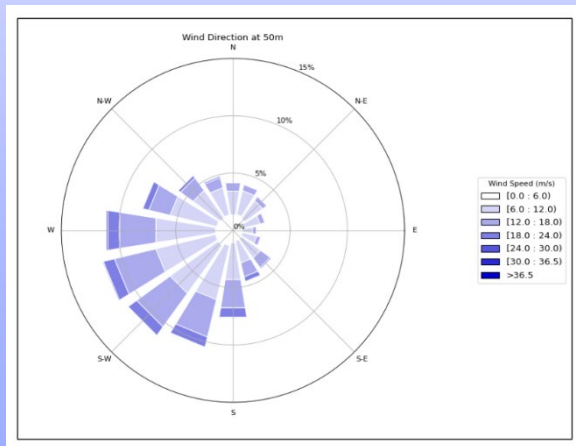
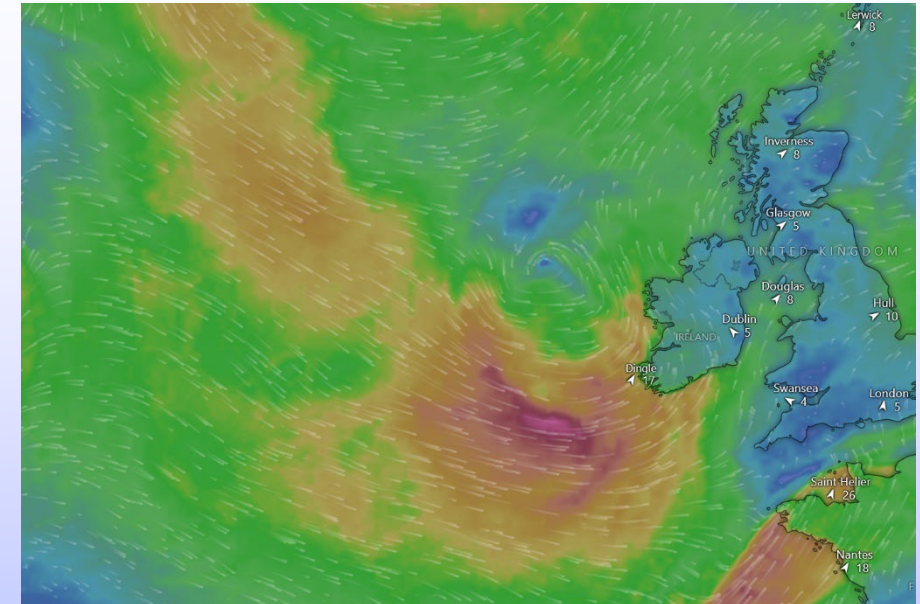
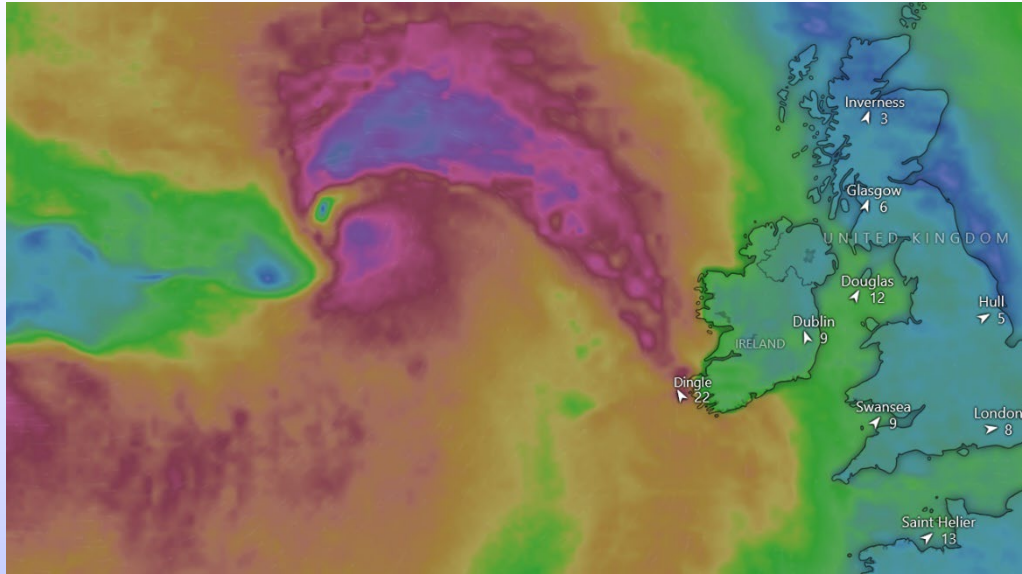




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## The Plan



AMETS A, Loughlin & O'Malley (MI)  
2023

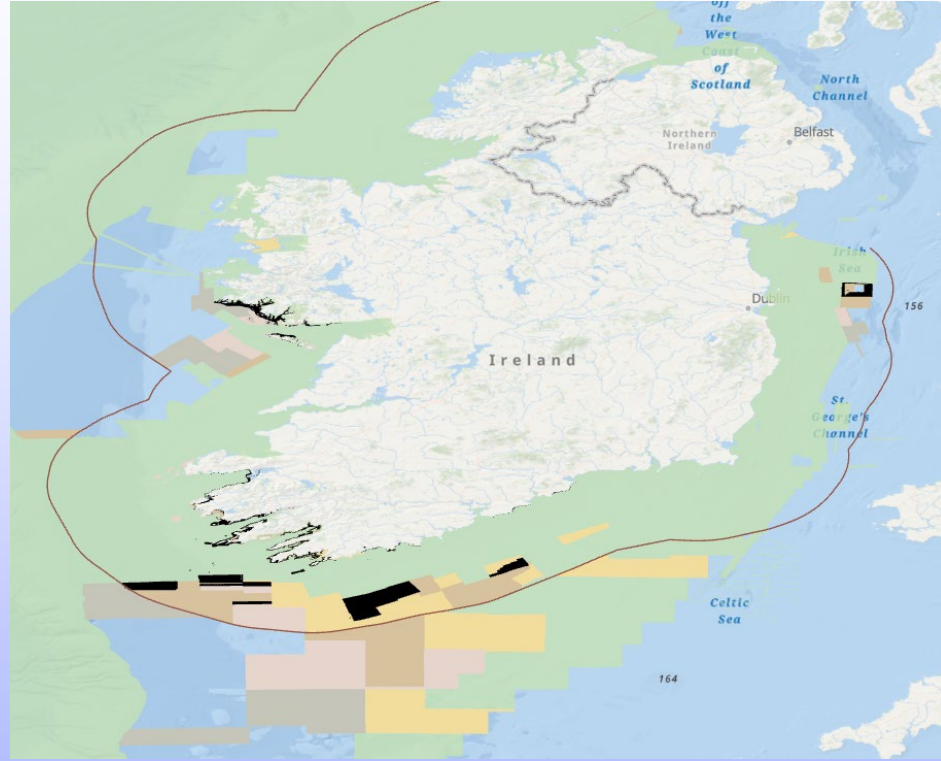
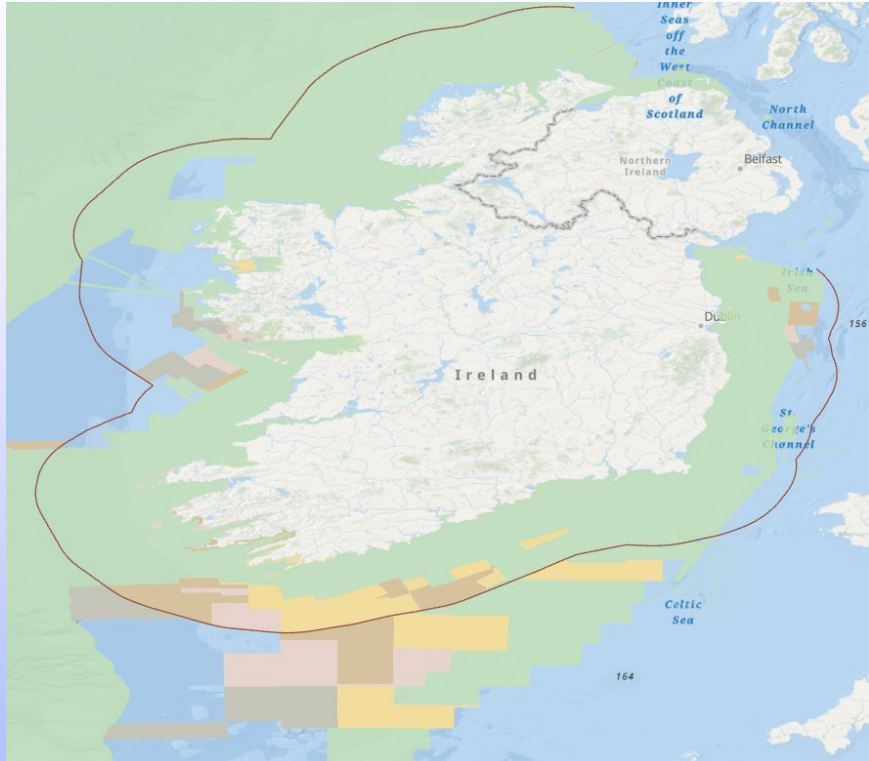




# INFOMAR

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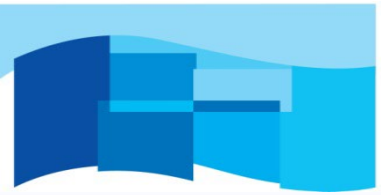
# Outcome



Year	Line KM	RIB Days	RIB Cost (@E1500)	24hr Pinging Time (@8kts)	Large Vessel coverage @ 15% (weather,transit,mob/demob,casts)	Large Vessel Cost (@ E25000 per day)	Ratio
2019	2262	27	40500	6.3	7.245	181125	1:4.5
2020	1582	23	34500	4.4	5.06	126500	1:3.6
2021	124	1	1500	0.4	0.46	11500	1:7.6
2022	0	0	0	0	0	0	0

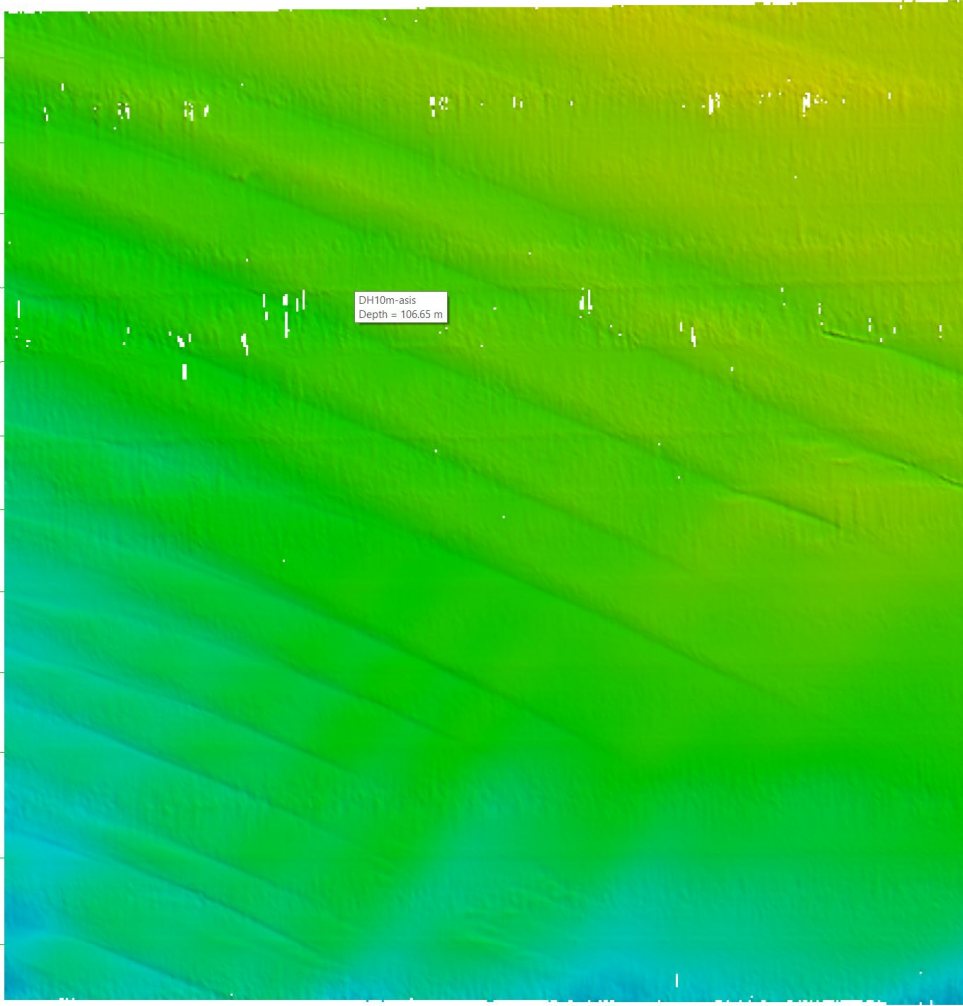
But, not an apples top apples comparison... Logistical nightmare, miss out on SBP/opportunistic sampling/value-added, project & data management, data quality assessment...

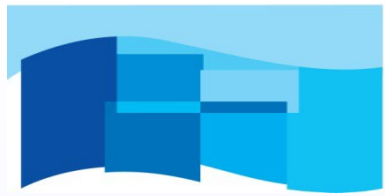




# Initial Data Quality

- 10m grid – appropriate for density assessment.
- Area selected to show 'ideal' days (south) and 'marginal' (north).



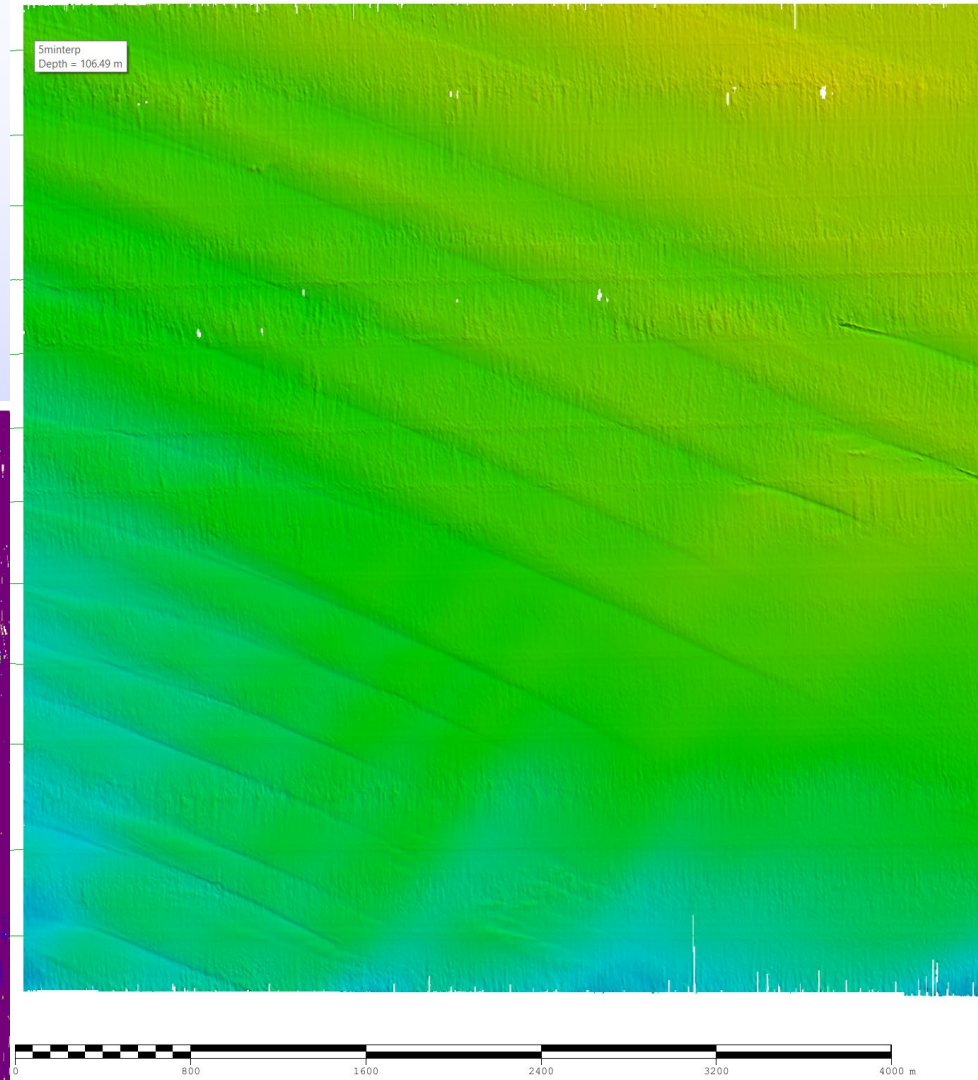
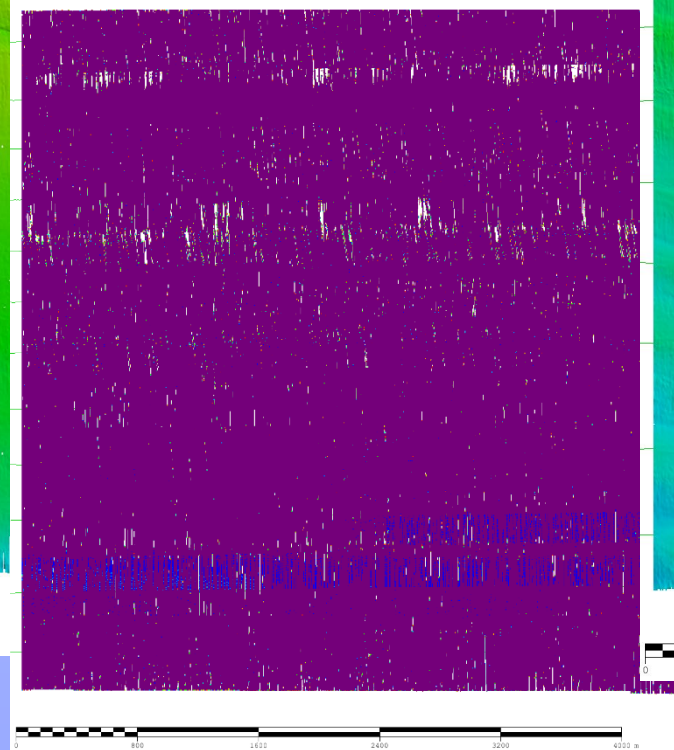
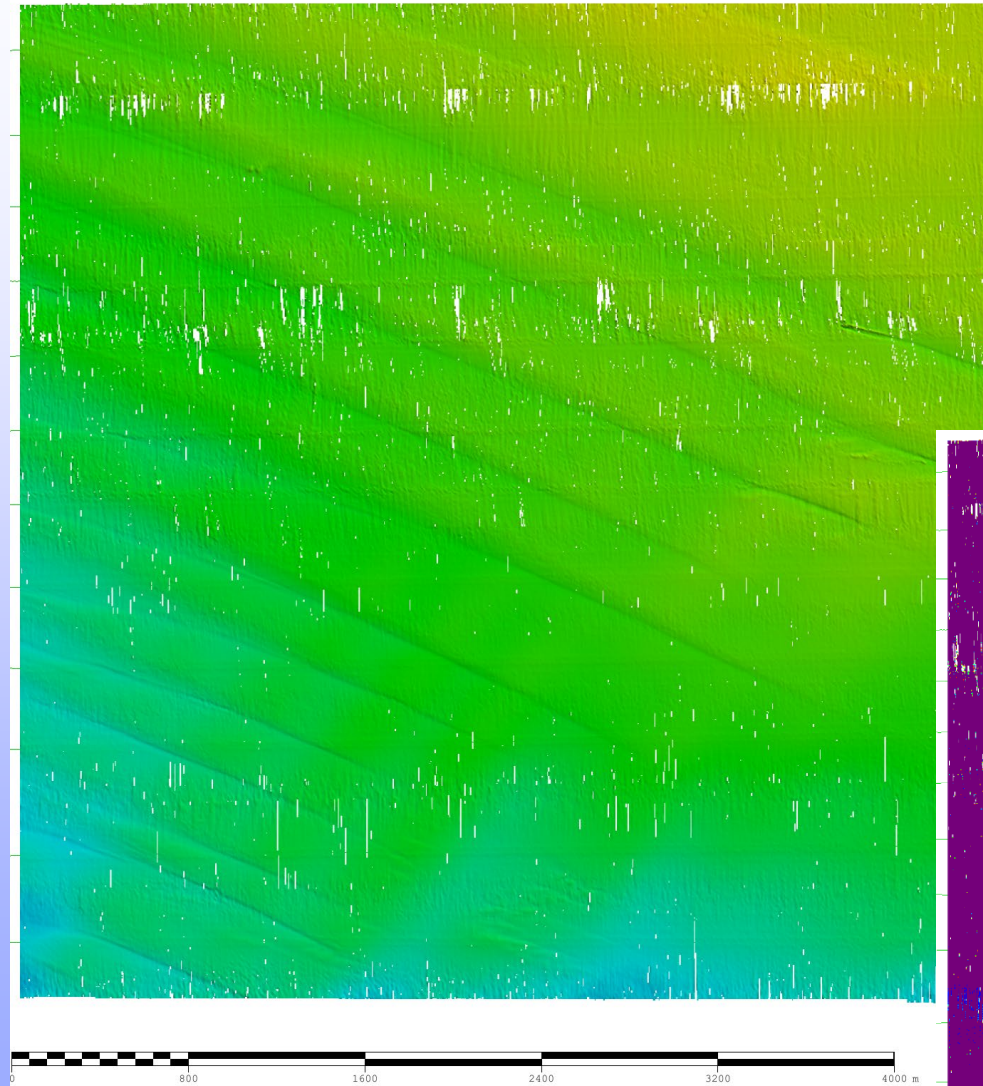


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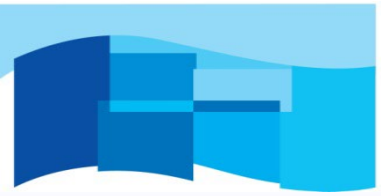
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## Initial Data Quality

- 5m grid
- Interpolated





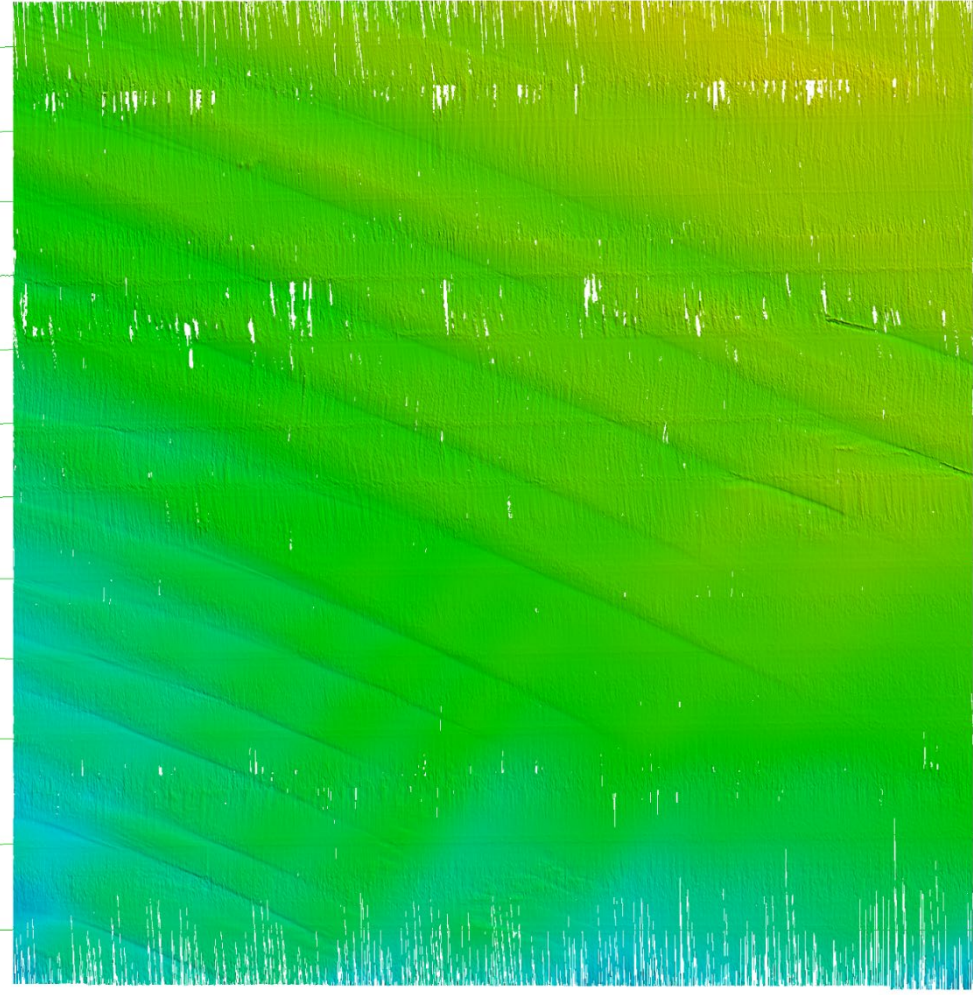
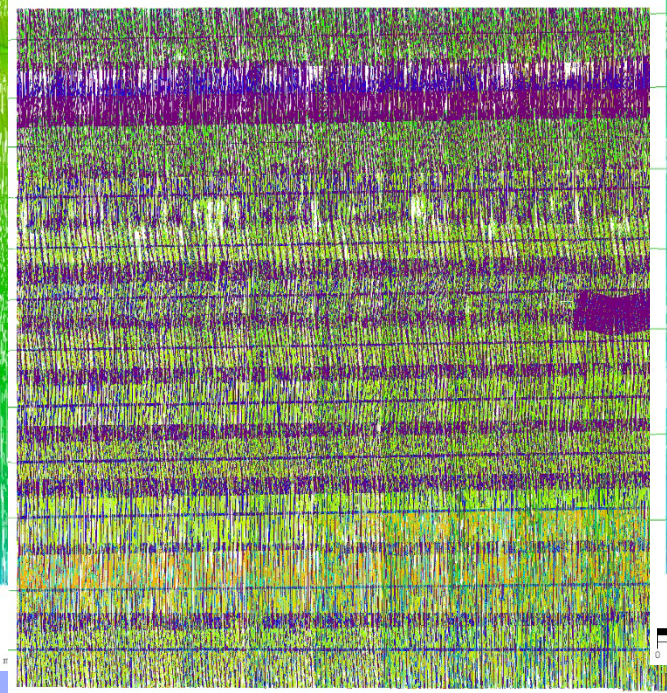
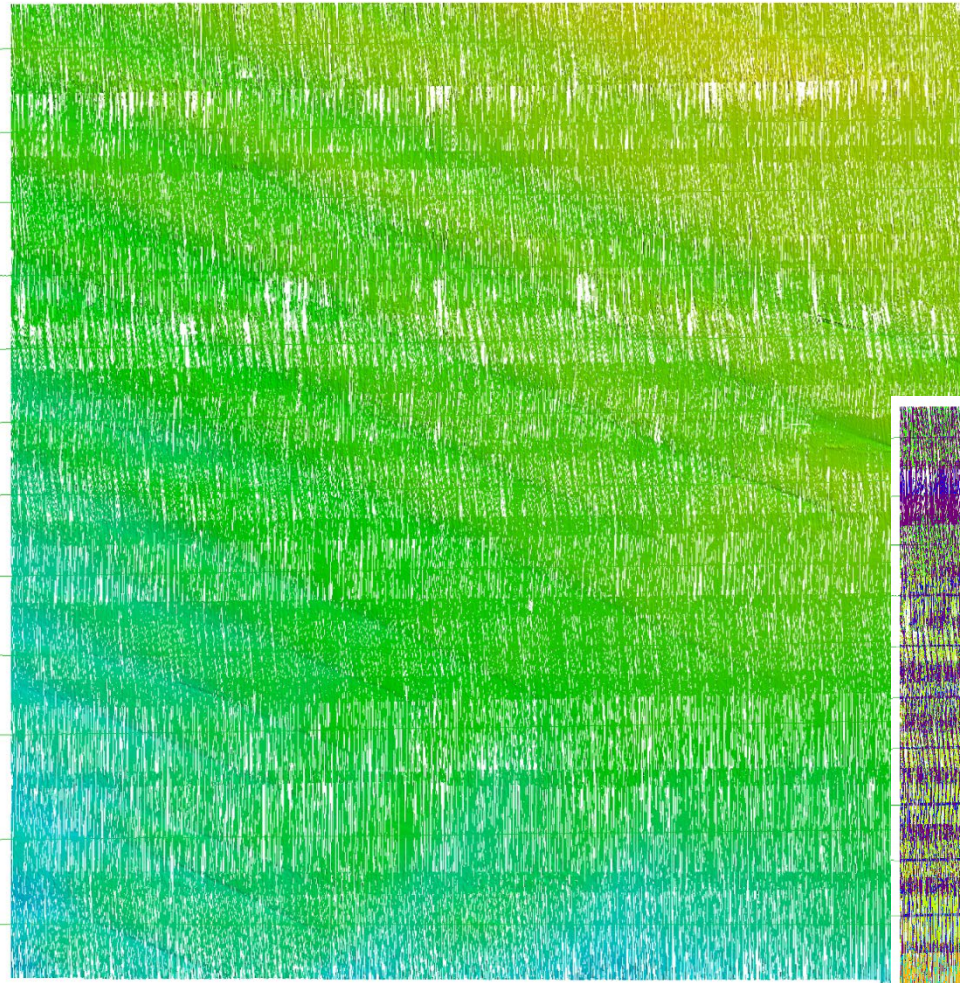


# INFOMAR

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## Initial Data Quality

- 2m grid – expected 'modern' resolution.
- Interpolated



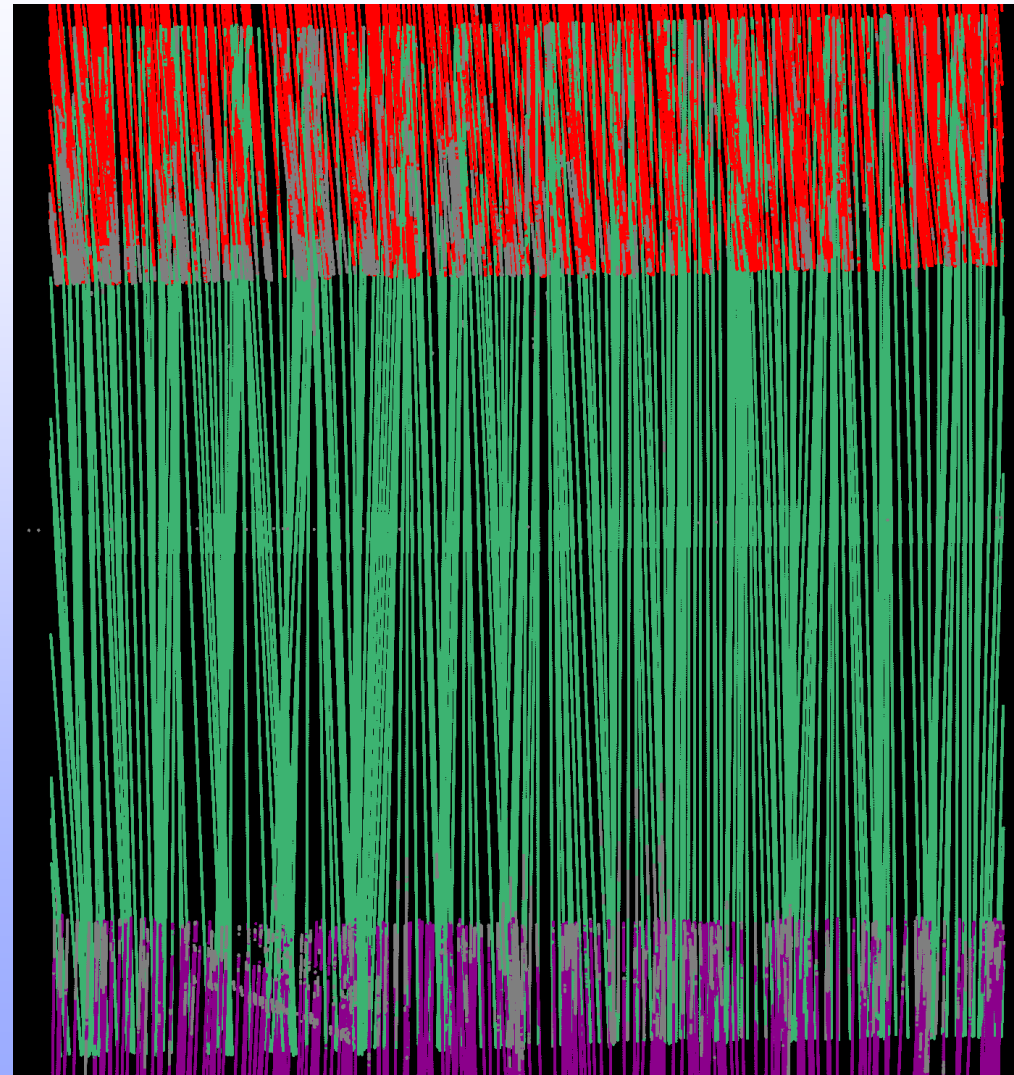




**INFOMAR**

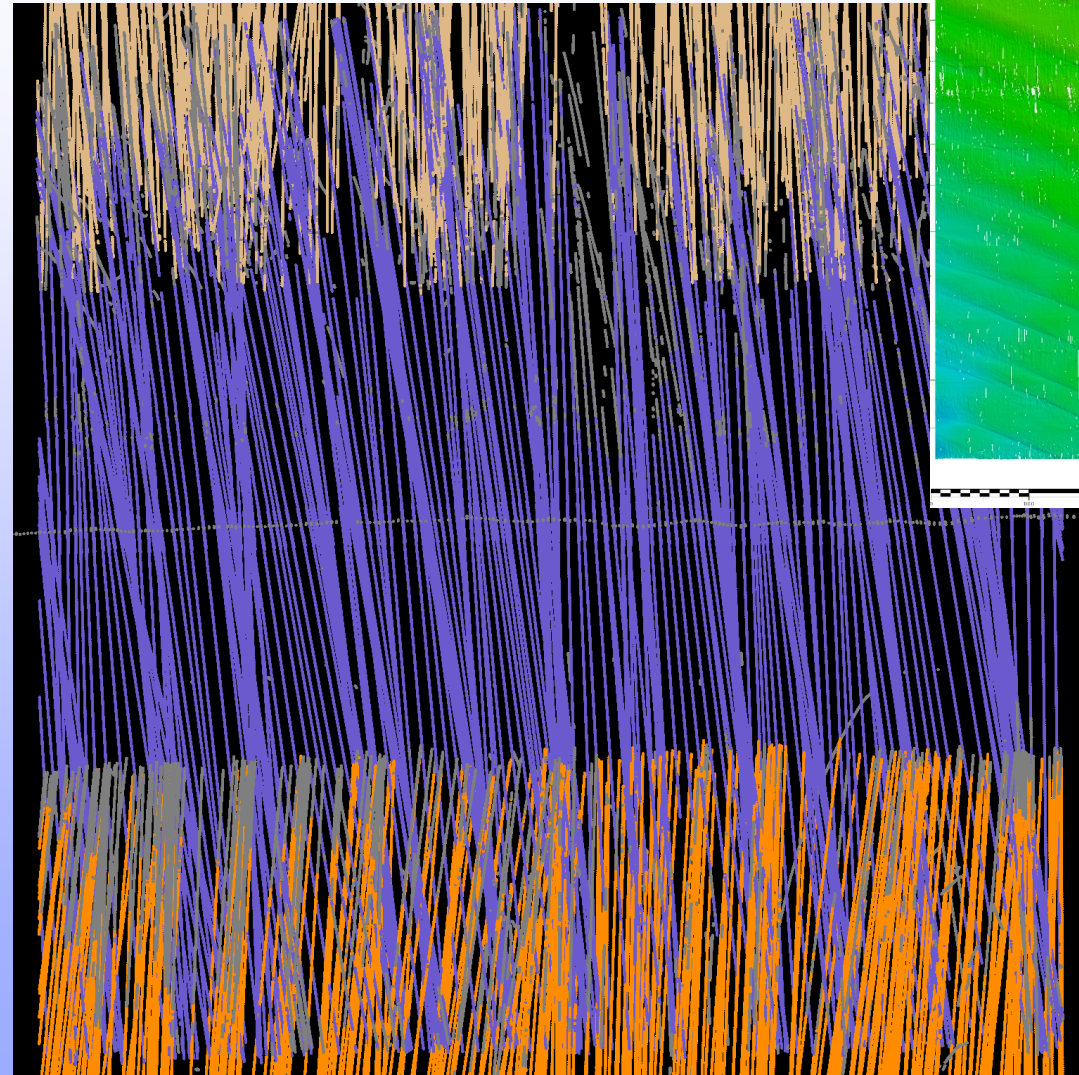
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# Sounding Distribution

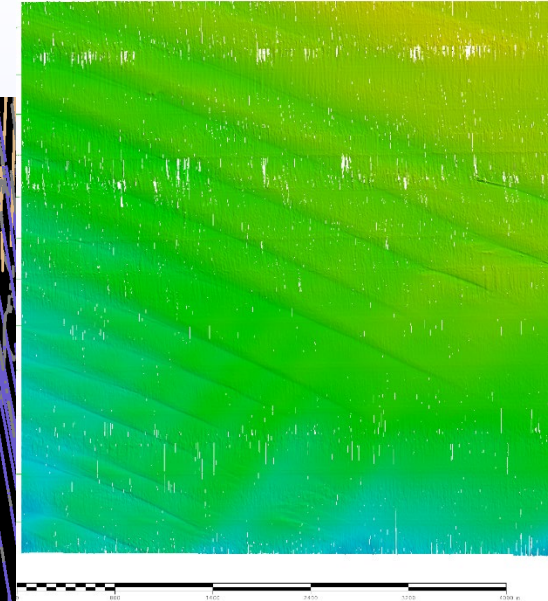


450m

500m



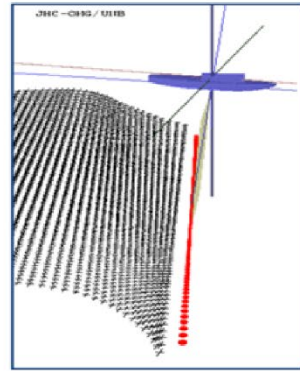
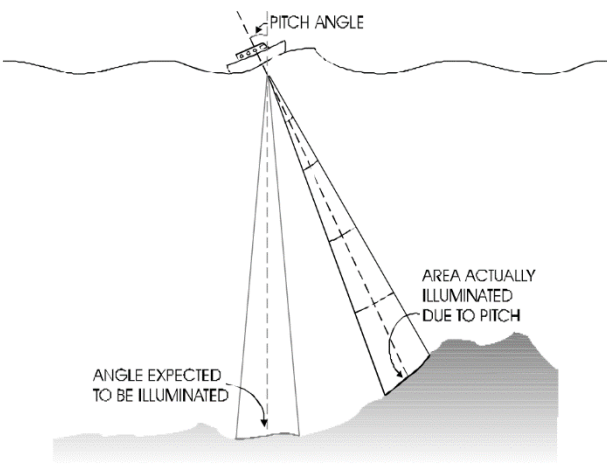
450m



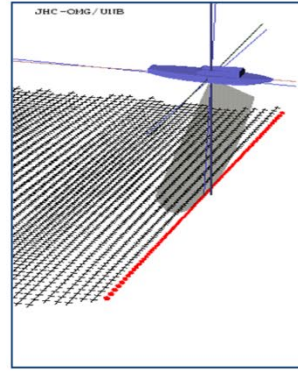




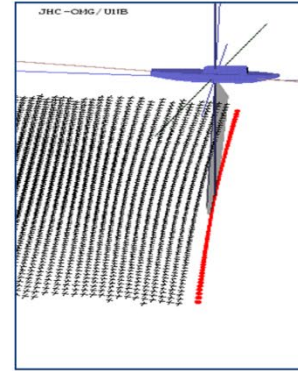
# Sounding Distribution



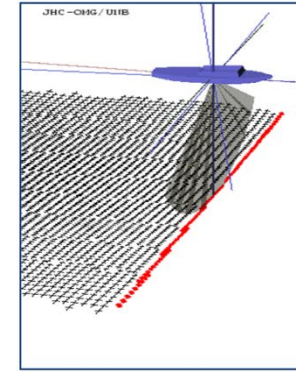
No Stabilization



Roll Stabilization

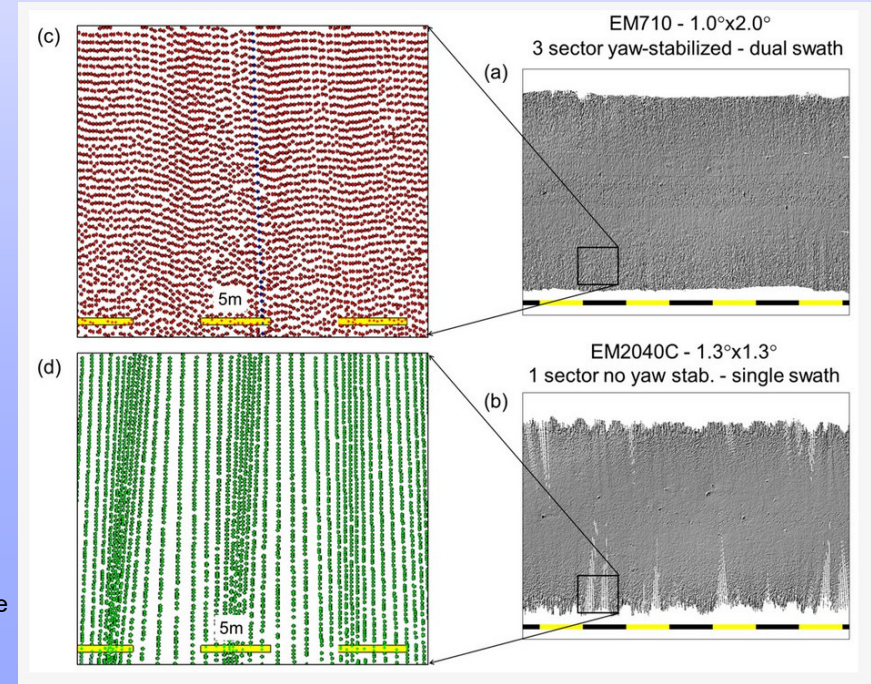
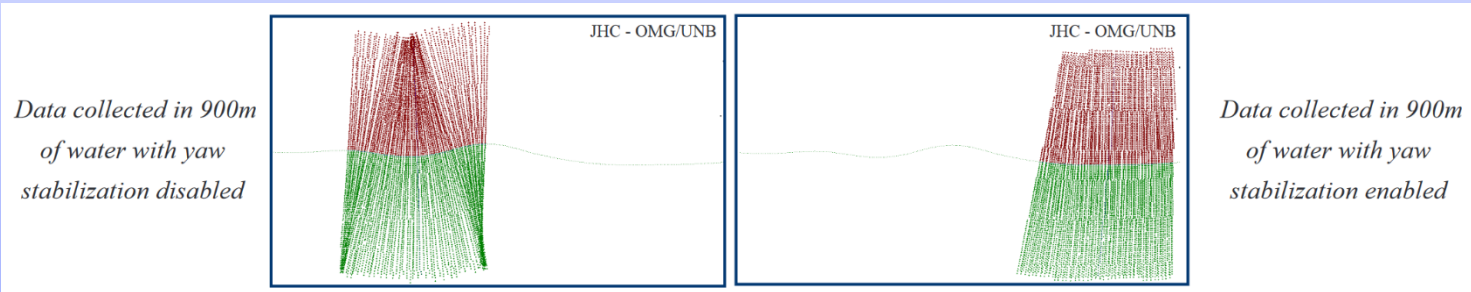


Roll and Pitch Stabilization



Roll, Pitch and Yaw Stabilization

From: L-3 Communication SeaBeam Instruments

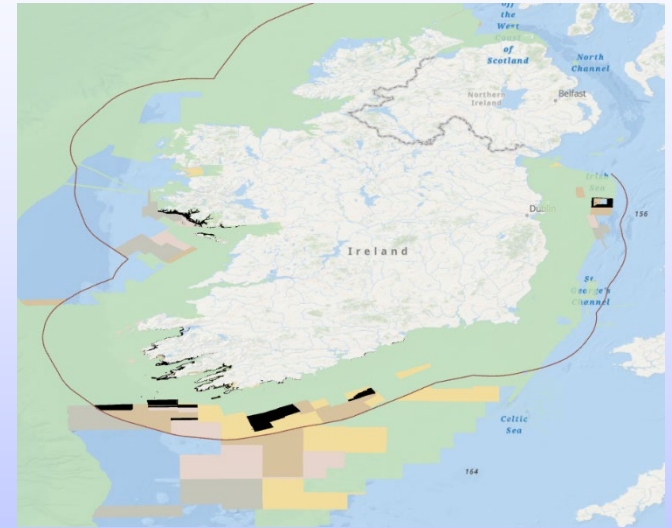
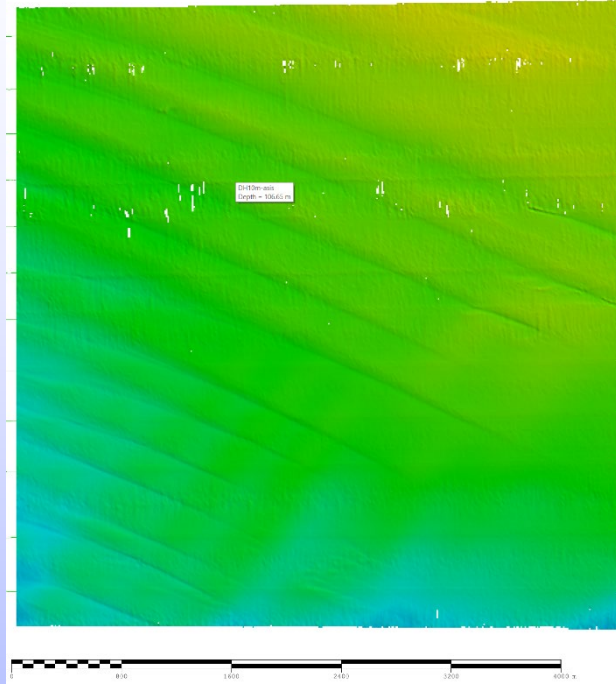




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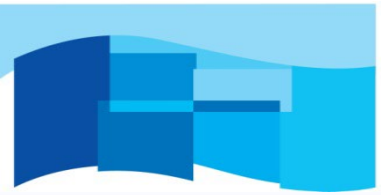
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## Pathway to Improvement



Year	Line KM	RIB Days	RIB Cost (@E1500)	24hr Ping Time (@8kts) s	Large Vessel overage @ 15% (weather,transit,mob/demob,cast Large Vessel Cost (@ E25000 per day)	Ratio	
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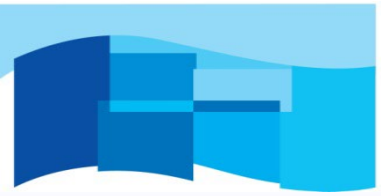
## Pathway to Improvement

System changes elsewhere in the fleet made an EM2040P available for mobilisation on a RIB.

- Providing pitch stabilisation.
  - Providing yaw stabilisation.
  - Providing dual ping functionality.
- In a package mountable on existing bow-mounts.

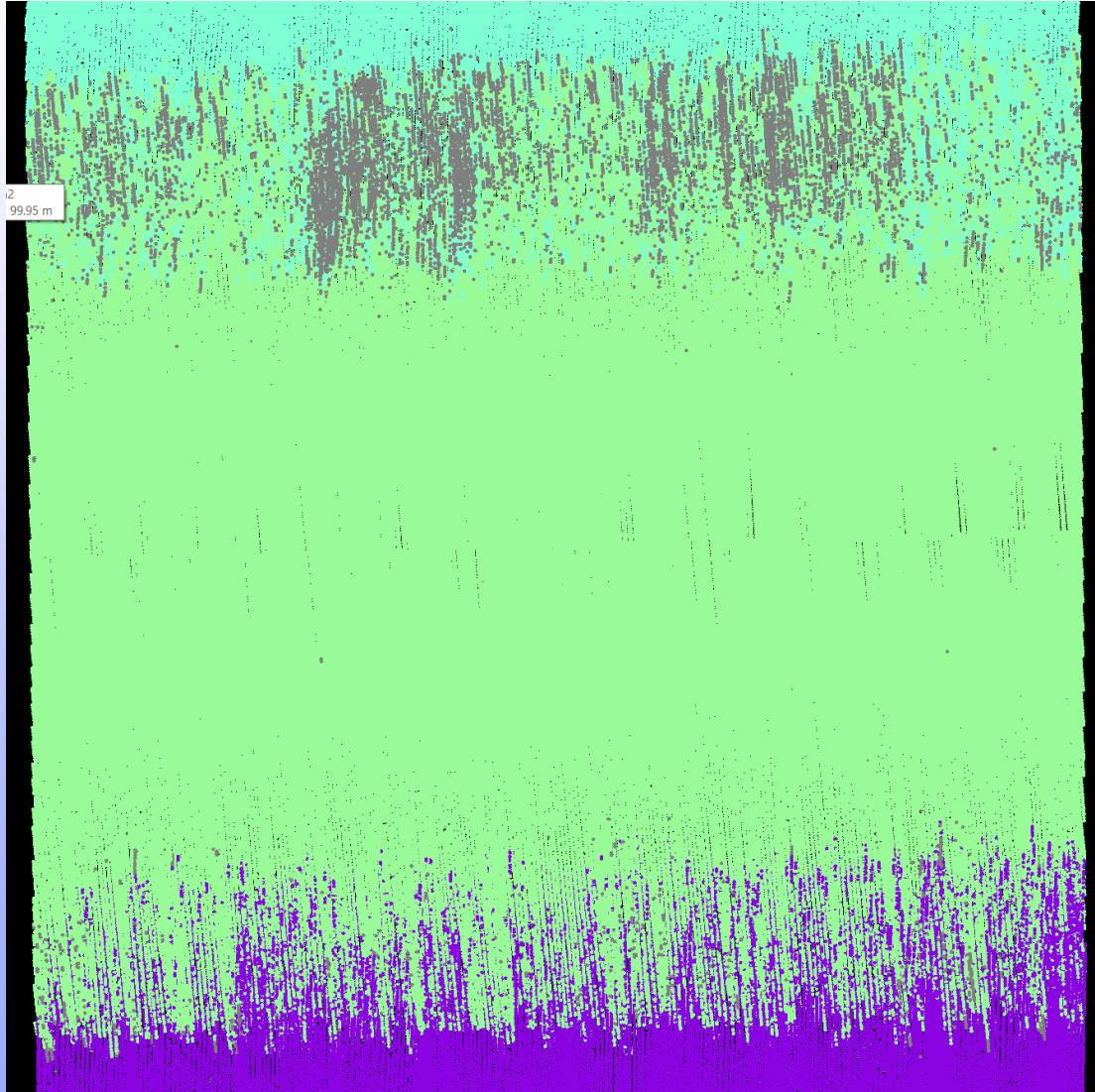






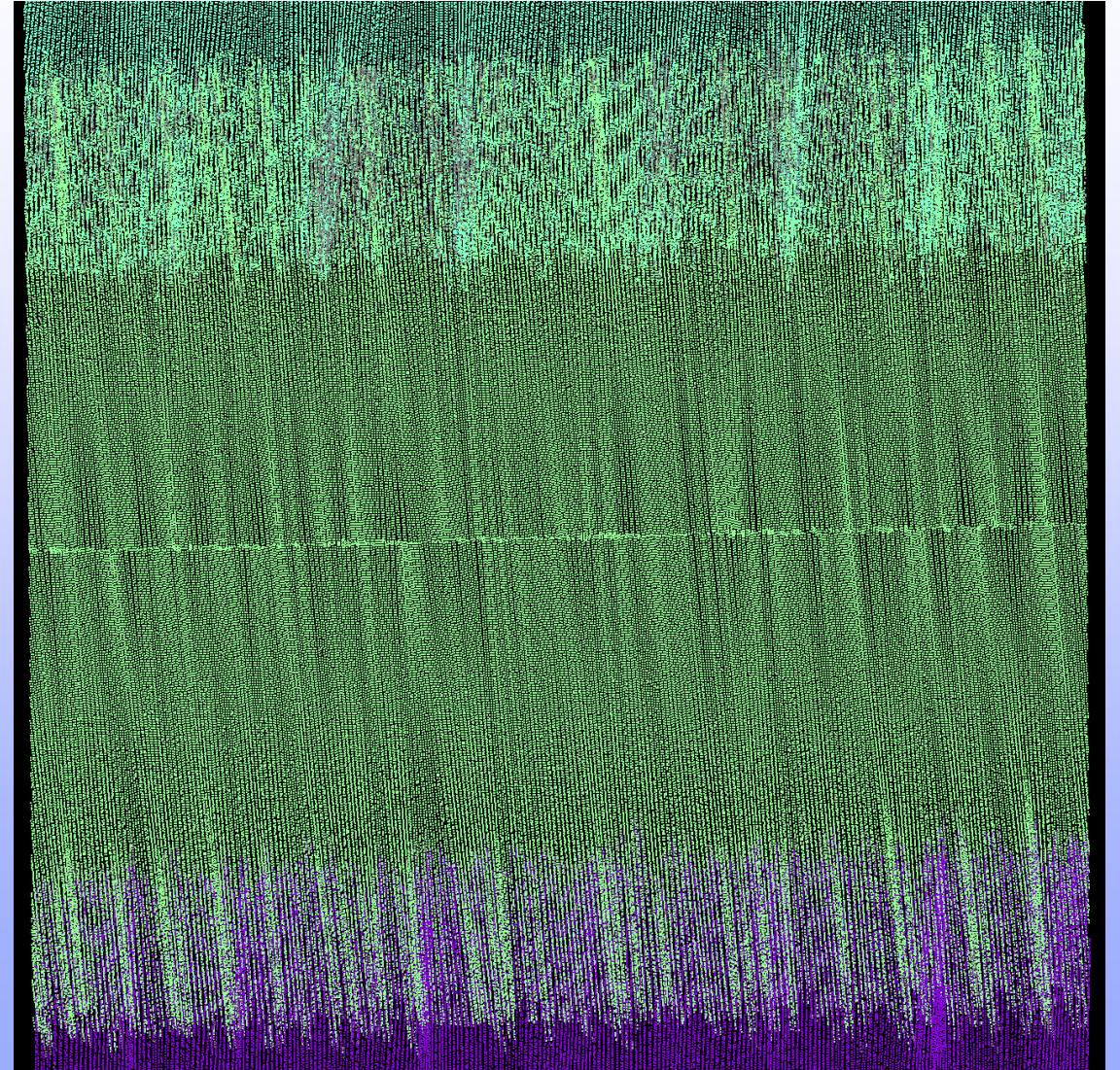
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# EM2040P Sounding Distribution



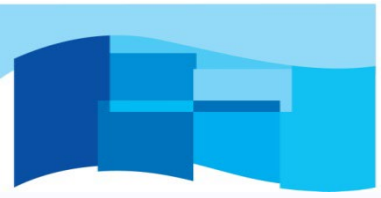
500m

450m



500m

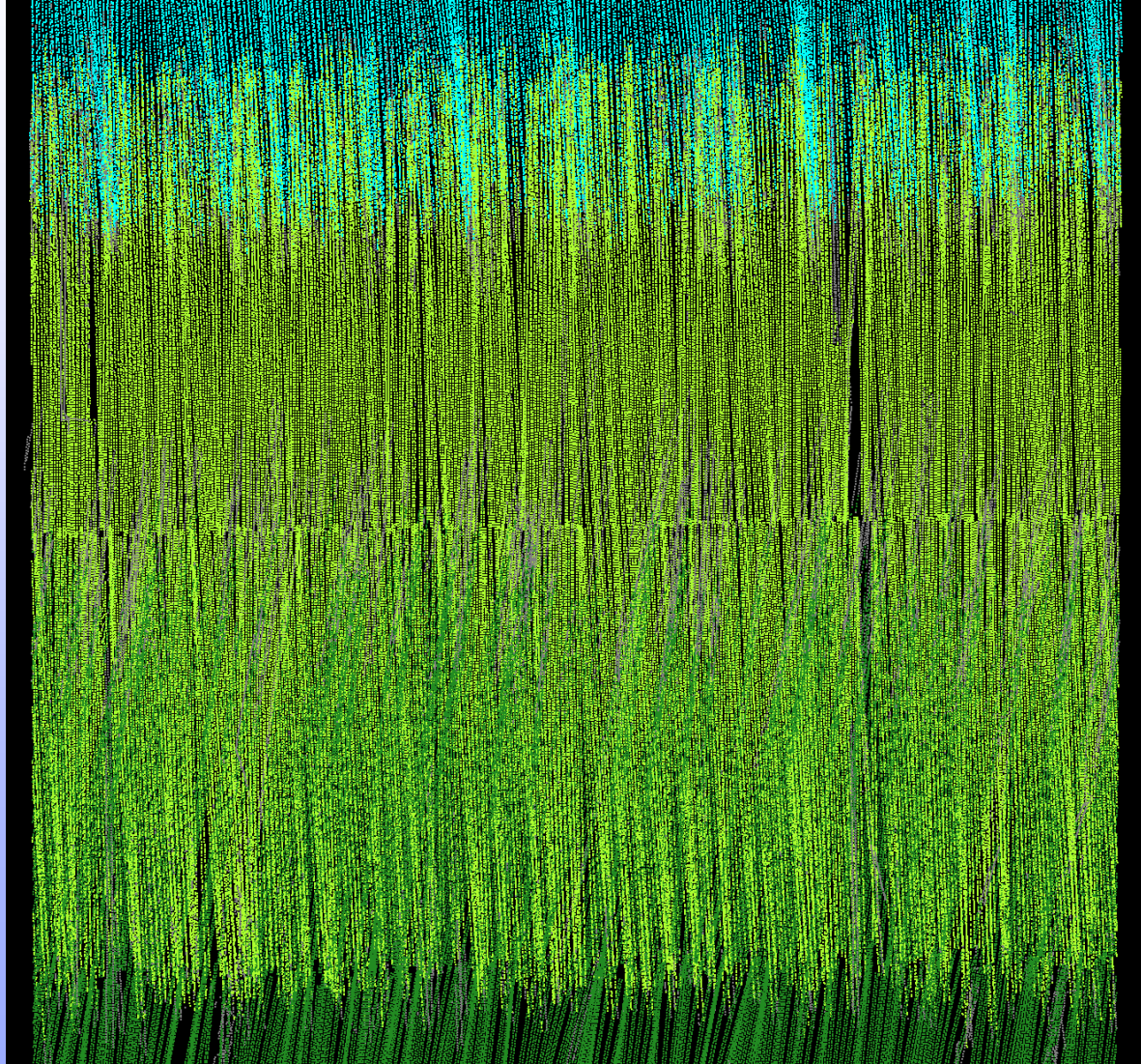




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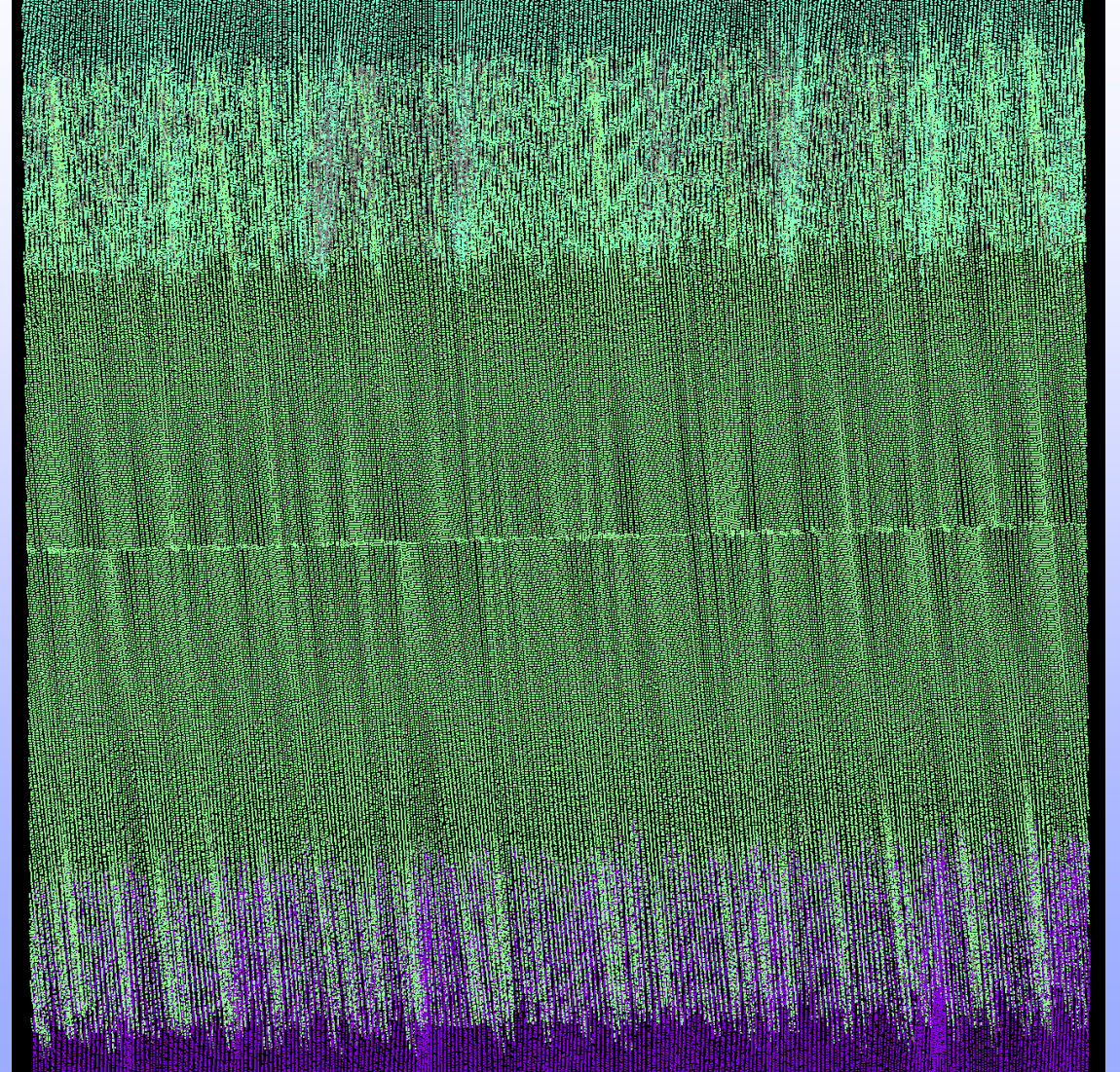
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# EM2040P Sounding Distribution



500m

450m



500m



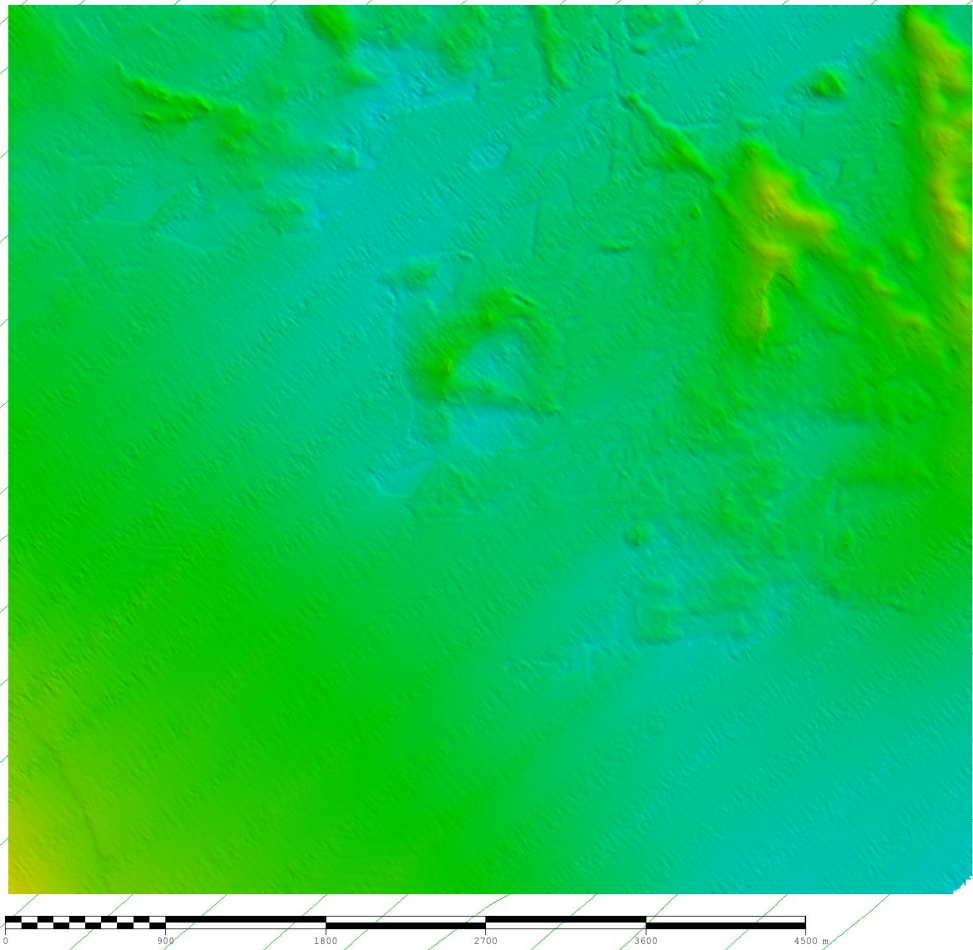


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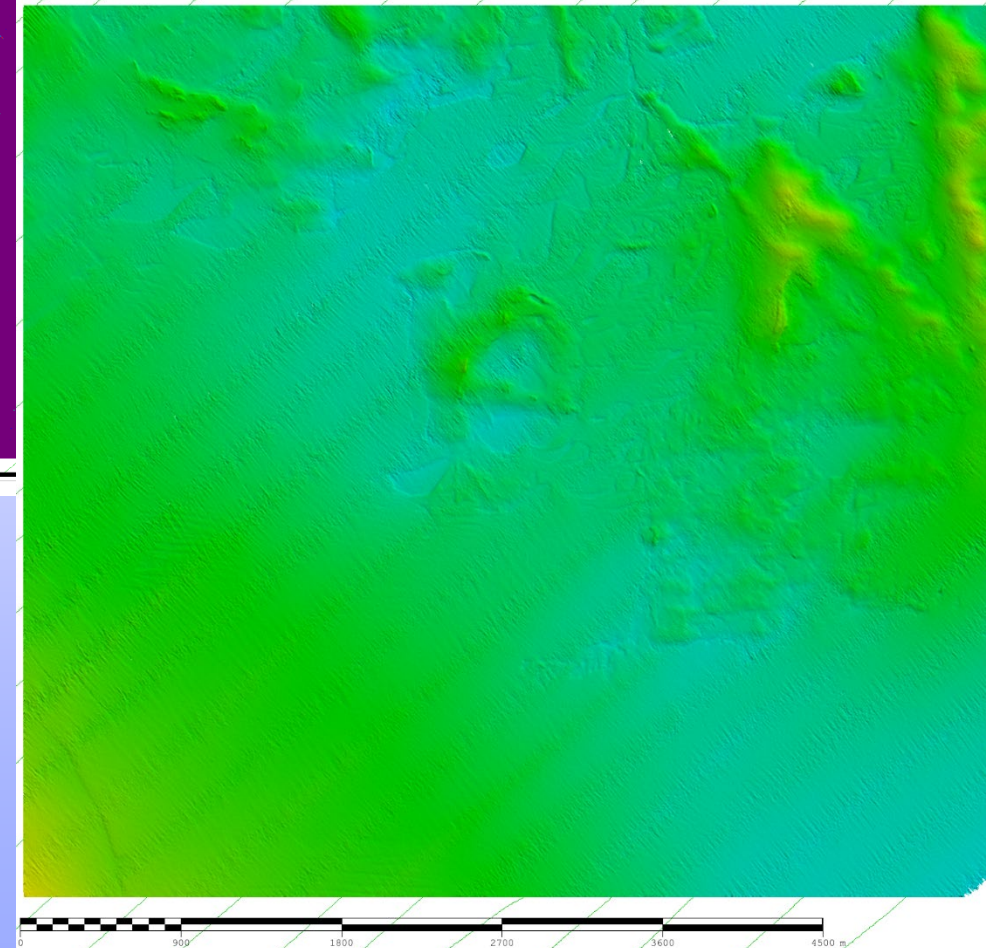
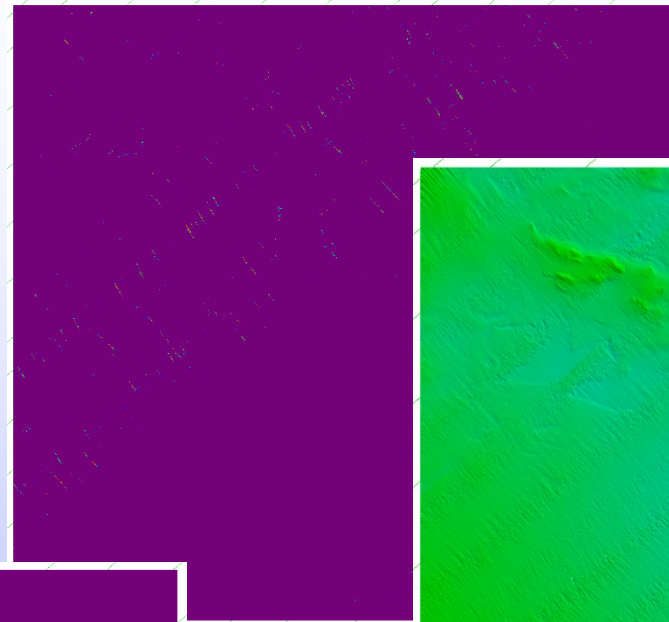
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## EM2040P Gridded Data

- 5m, no holidays.



- 10m, no holidays.
- Even Density



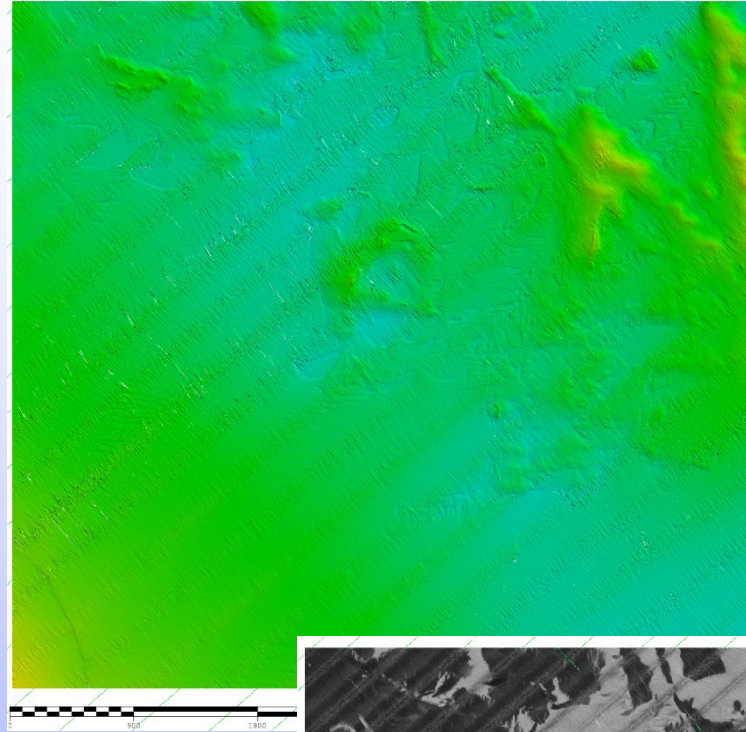
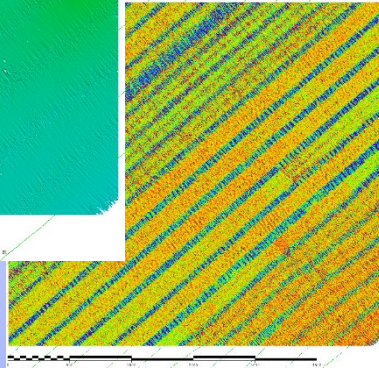
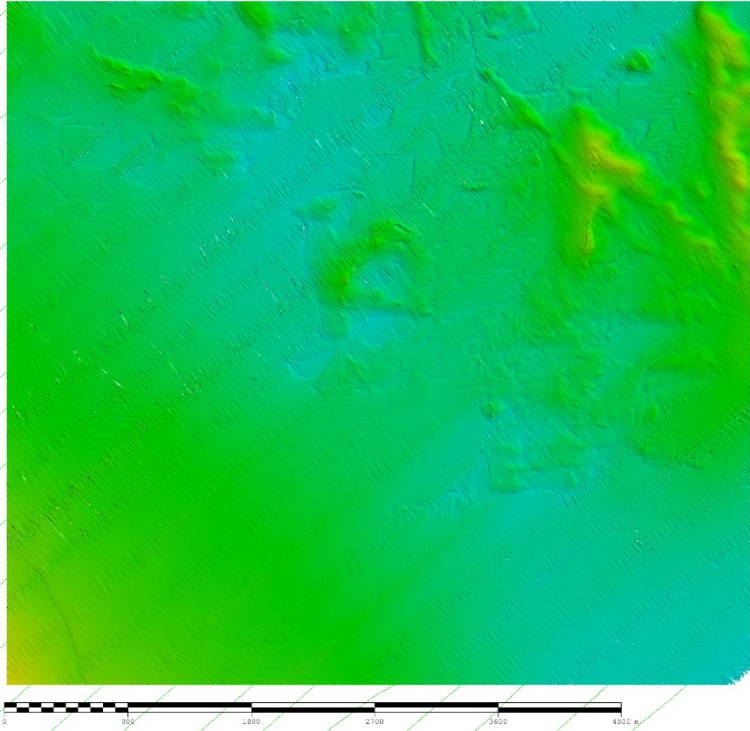




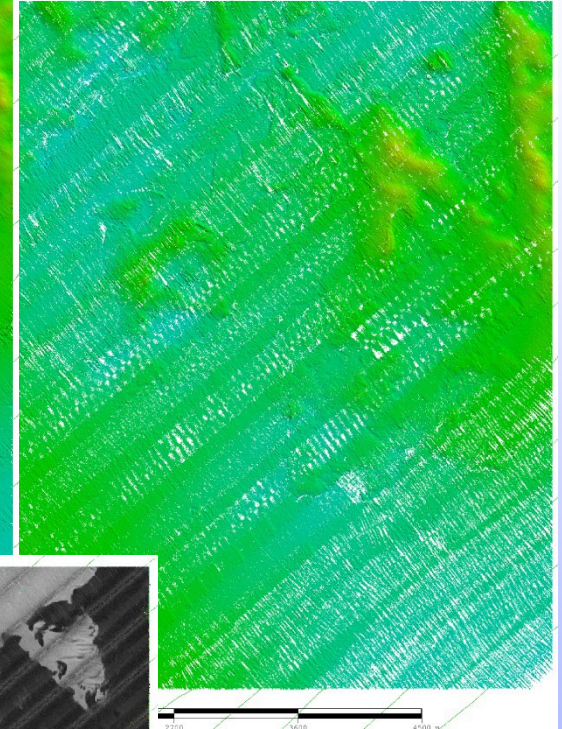
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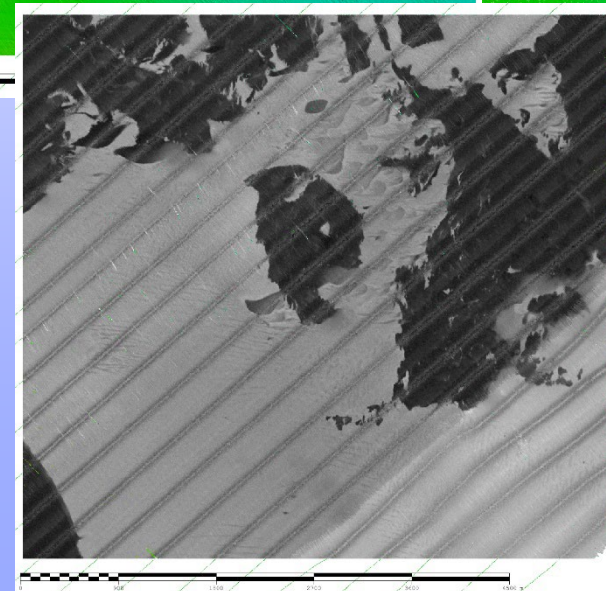
## EM2040P Gridded Data



1m



75cm



- 2m, sparse holidays.
- Low & uneven density.
- Comparable to what expected from larger craft.

5m Backscatter  
SIPS toolkit, without  
being sure what I was  
doing!



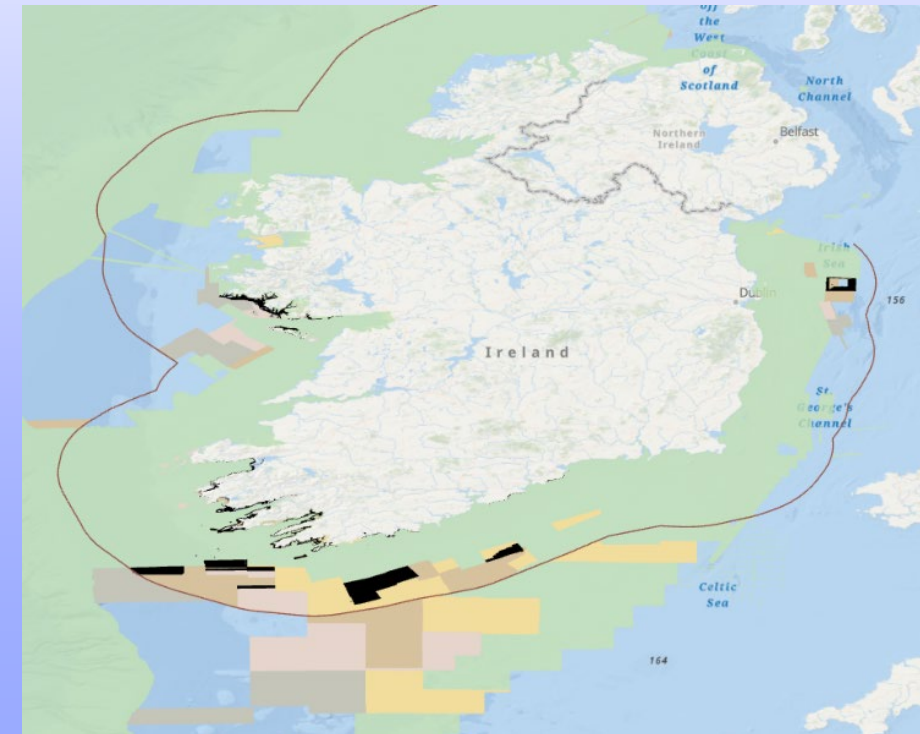


### Takeaways:

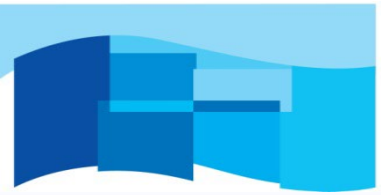
- Interactions of WD, vessel design and motion experienced – make additional axis of stabilisation a key benefit.
- Dual ping is a marked benefit over additional across-track beams under many conditions.
- As line items of spec-sheets – they can have an outweighed contribution to data quality and utility under the right scenarios.

### Future Actions:

- Add a SBP solution.
- Move to SIS5 & KMALL / re-examine offsets.
- Internally, highlight value of RIB acquired 'deepwater' data – motivate what are often 'non-fun' survey days.





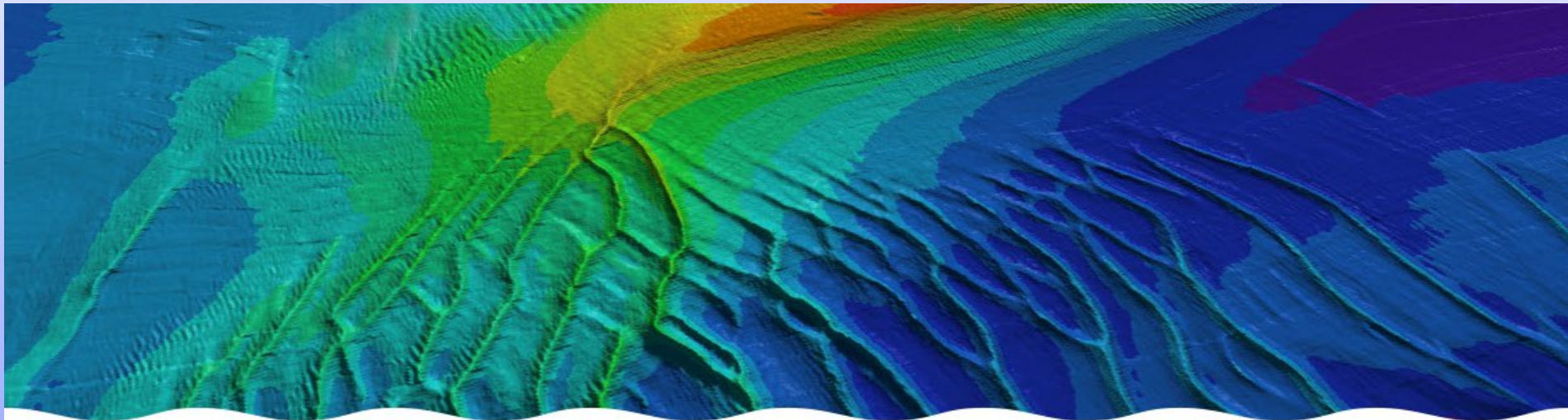


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## Thank you for listening!

- Data Access- see *infomar.ie* or email *data@infomar.ie*
- Email: *david.hardy@gsi.ie*



An Roinn Comhshaoil,  
Aeráide agus Cumarsáide  
Department of the Environment,  
Climate and Communications



*Foras na Mara*  
*Marine Institute*



**Geological Survey**  
Suirbhéireacht Gheolaíochta  
Ireland | Éireann