



INFOMAR

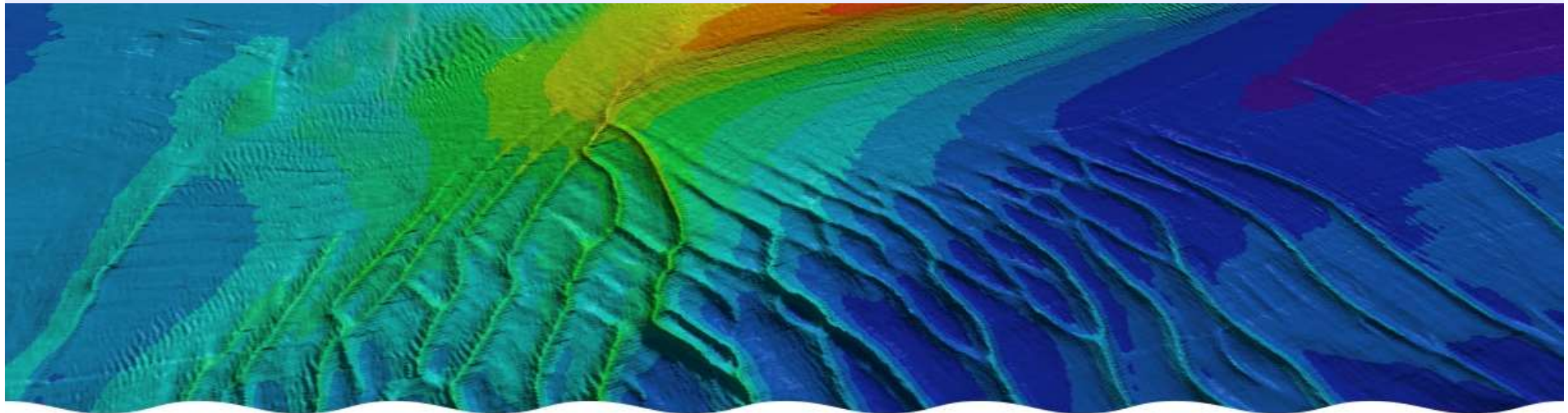
Integrated Mapping for the
Sustainable Development
of Ireland's Marine Resource

Atlantic Ireland

Ronan O'Toole (GSI)

30th October, 2019

Ireland's Seabed Mapping Programme



Roinn Cumarsáide, Gníomhaithe
ar son na hAeráide & Comhshaoil
Department of Communications,
Climate Action & Environment



Foras na Mara
Marine Institute



Geological Survey
Suirbhéireacht Gheolaíochta
Ireland | Éireann



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of Ireland's Marine Resource

ABOUT INFOMAR

SEABED MAPPING 2019

WHAT WE MAKE

EDUCATIONAL IMPACT

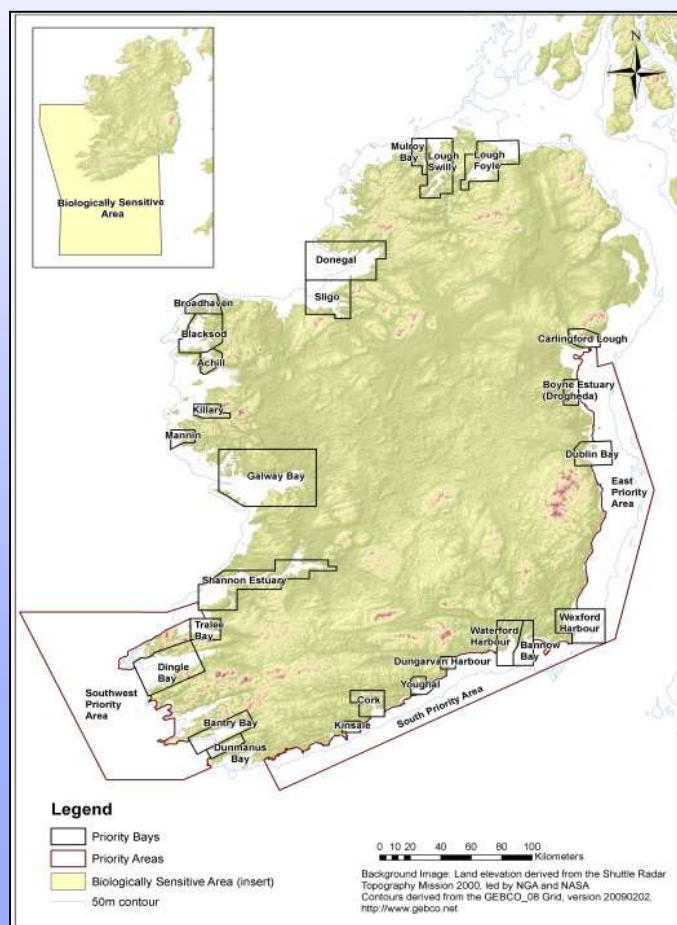


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INtegrated Mapping Survey FOr the Sustainable Development of Ireland's MARine Resource



Partnership between MI & GSI.
€80m (DCCA)E)
Cost Benefit 4-6 times return



PHASE 1: 2006-2016

PHASE 2: 2016 – 2026

(Remaining Areas – 125,000 KM2)



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PROGRAMME AREAS

1. Data Acquisition, Management & Interpretation

Data Acquisition Programme (UKHO / SOLAS)

Baseline Surveys for Habitats / Maritime Development

2. Data Exchange & Integration

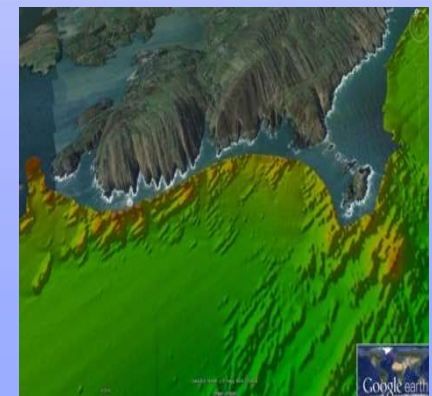
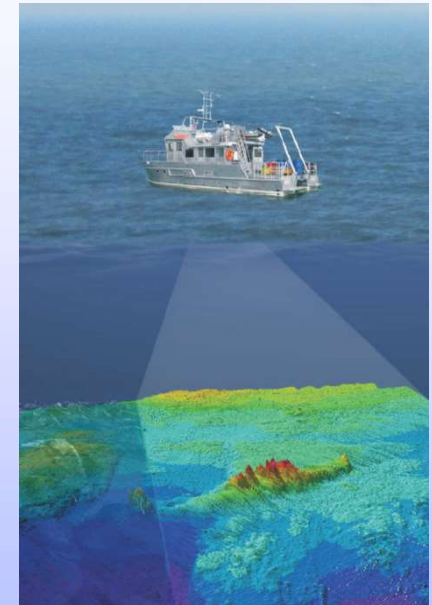
MSP /MSFD / WFD Reporting

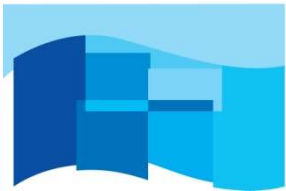
Cross Agency Support /Aquaculture / Fisheries

3. Value Added Exploitation

Product Development

National / International Partnerships /Research and Education





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OFFSHORE SURVEY



RV Celtic Explorer



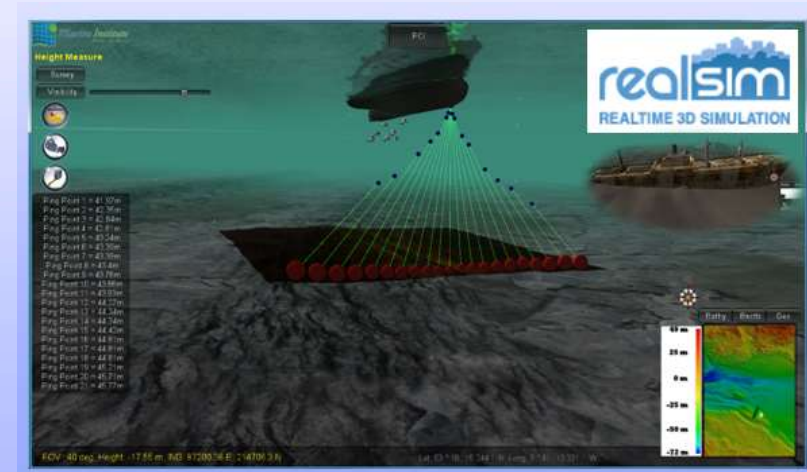
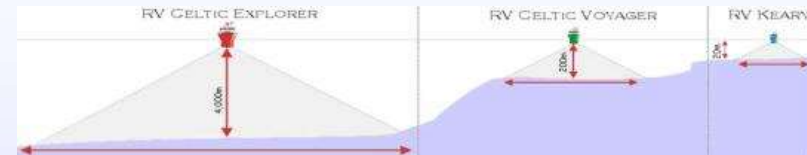
RV Celtic Voyager



RV Mallet



RV Keary





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NEARSHORE SURVEY



RV Lir



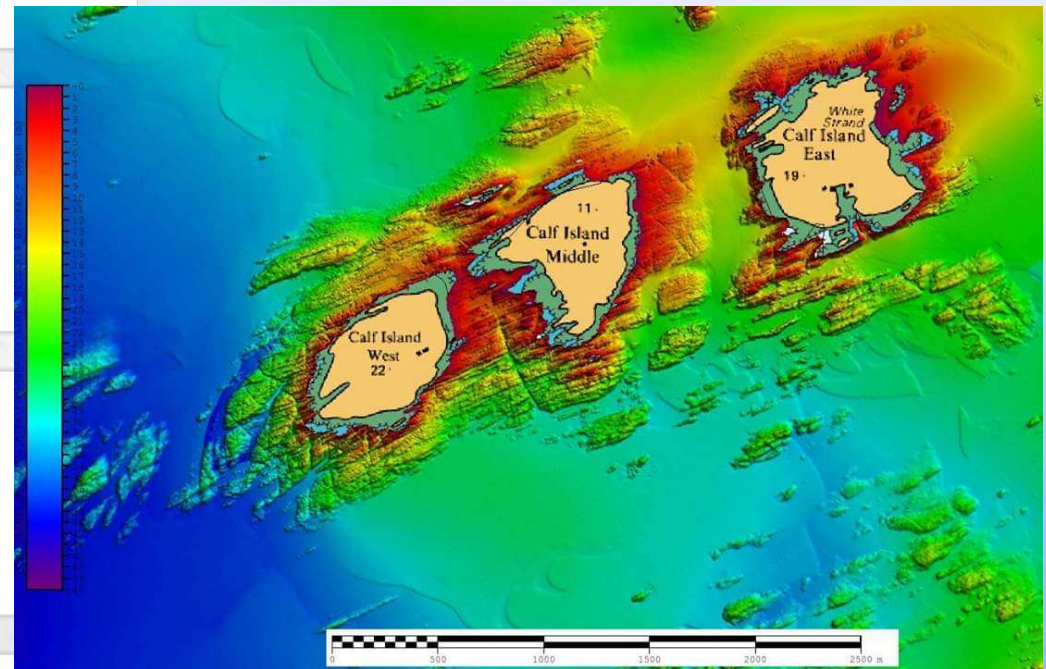
RV Geo



RV Tonn



M.V. Cosantóir Bradán





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Quality Standards



INFOMAR's Data Acquisition **underpinned** by Hydrographic Standards

International Hydrographic Organisation (IHO) Order 1a:

Vertical Accuracy (Depth Z)	+/- 0.5m (+ 5% depth)
Horizontal Accuracy (Position X & Y)	+/- 5m (+5% Depth)
Full Seafloor Search	Required
Data Density	9 Soundings/2mSQ

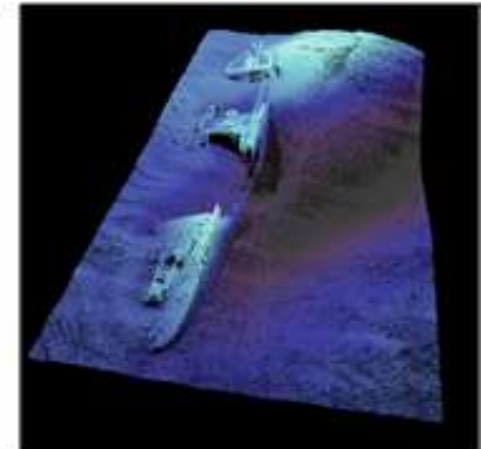
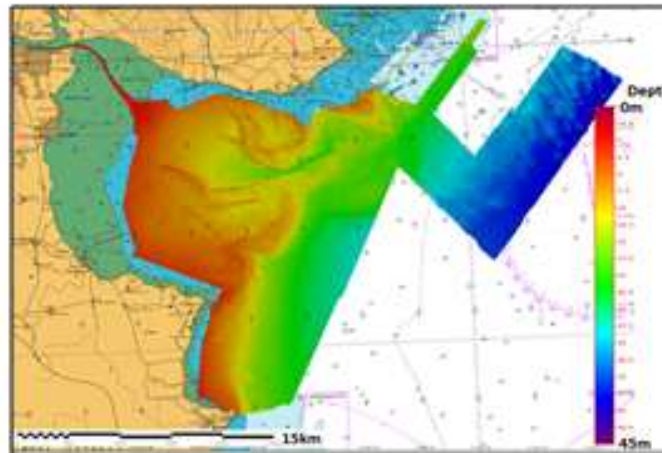
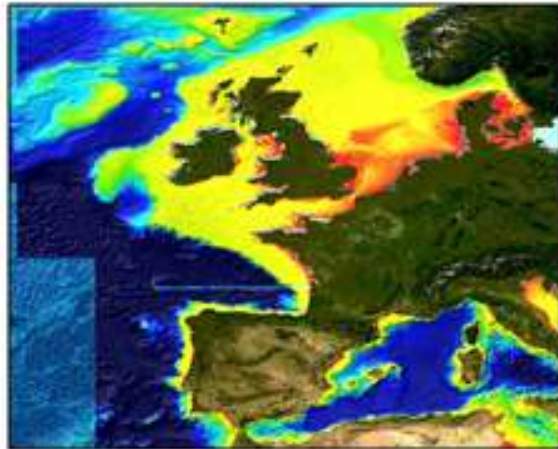
Multibeam Echosounders (MBES) become the tool of choice



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Multiple Applications



Regional Scale



Local Scale

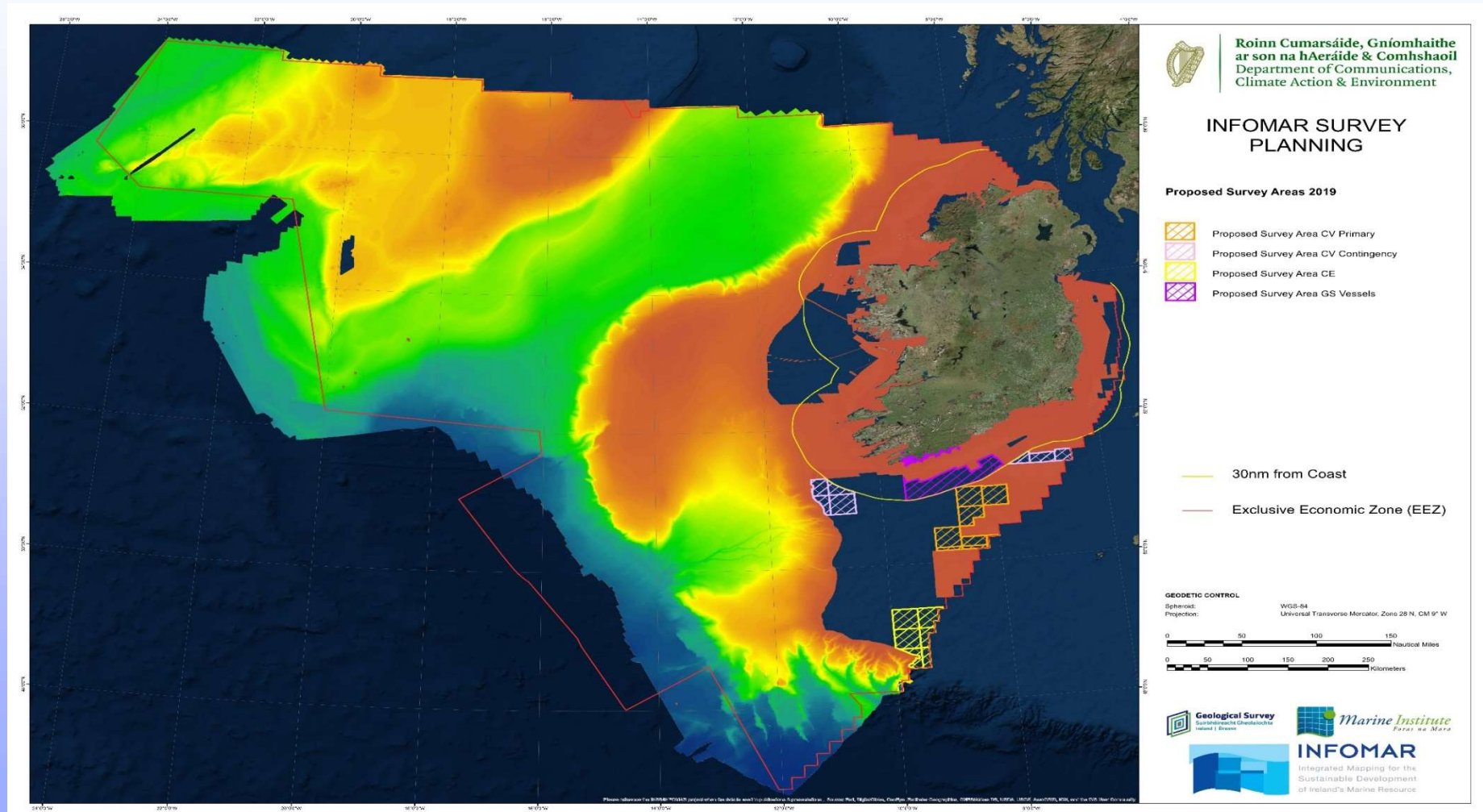
Full Seafloor Search Yields High Resolution DEMs



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AREA OF OPERATIONS





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HARNESSING OUR OCEAN WEALTH

National Marine Plan (HOOW - Action 23)

OUR VISION

Our ocean wealth will be a key element of our economic recovery and sustainable growth, generating benefits for all our citizens, supported by coherent policy, planning and regulation, and managed in an integrated manner.

GOAL 1

THRIVING MARITIME ECONOMY

- Sustainable economic growth of our marine/ maritime sectors
- Increase the contribution to our national GDP
- Deliver a business-friendly yet robust governance, policy and planning framework

GOAL 2

HEALTHY ECOSYSTEMS

- Protect and conserve our rich marine biodiversity and ecosystems
- Manage our living and non-living resources in harmony with the ecosystem
- Implement and comply with environmental legislation

GOAL 3

ENGAGING WITH THE SEA

- Building on our maritime heritage, strengthen our maritime identity
- Increase our awareness of the value, opportunities and societal benefits
- Engagement and participation by all

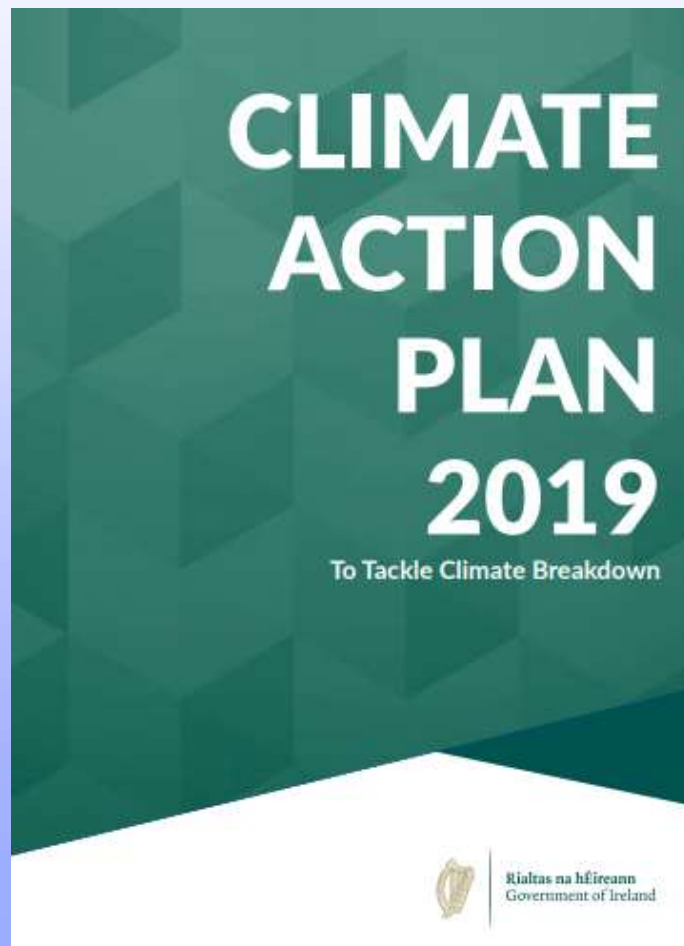


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HARNESSING OUR OCEAN WEALTH

Action 26: Complete the INFOMAR Seabed Mapping Programme





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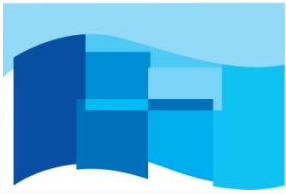
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SEABED MAPPING BENEFITS



- » Mapping our Resources
- » Guiding Shipping & Transport
- » Supporting Fisheries & Aquaculture
- » Discovering our Marine Heritage
- » Promoting Conservation & Protecting Biodiversity
- » Helping to Realise Ireland's Economic Potential





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WHAT DO MAKE

EDUCATIONAL IMPACT



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INFOMAR Inshore Fleet

RV Geo



RV Keary



RV Mallet



RV Lir

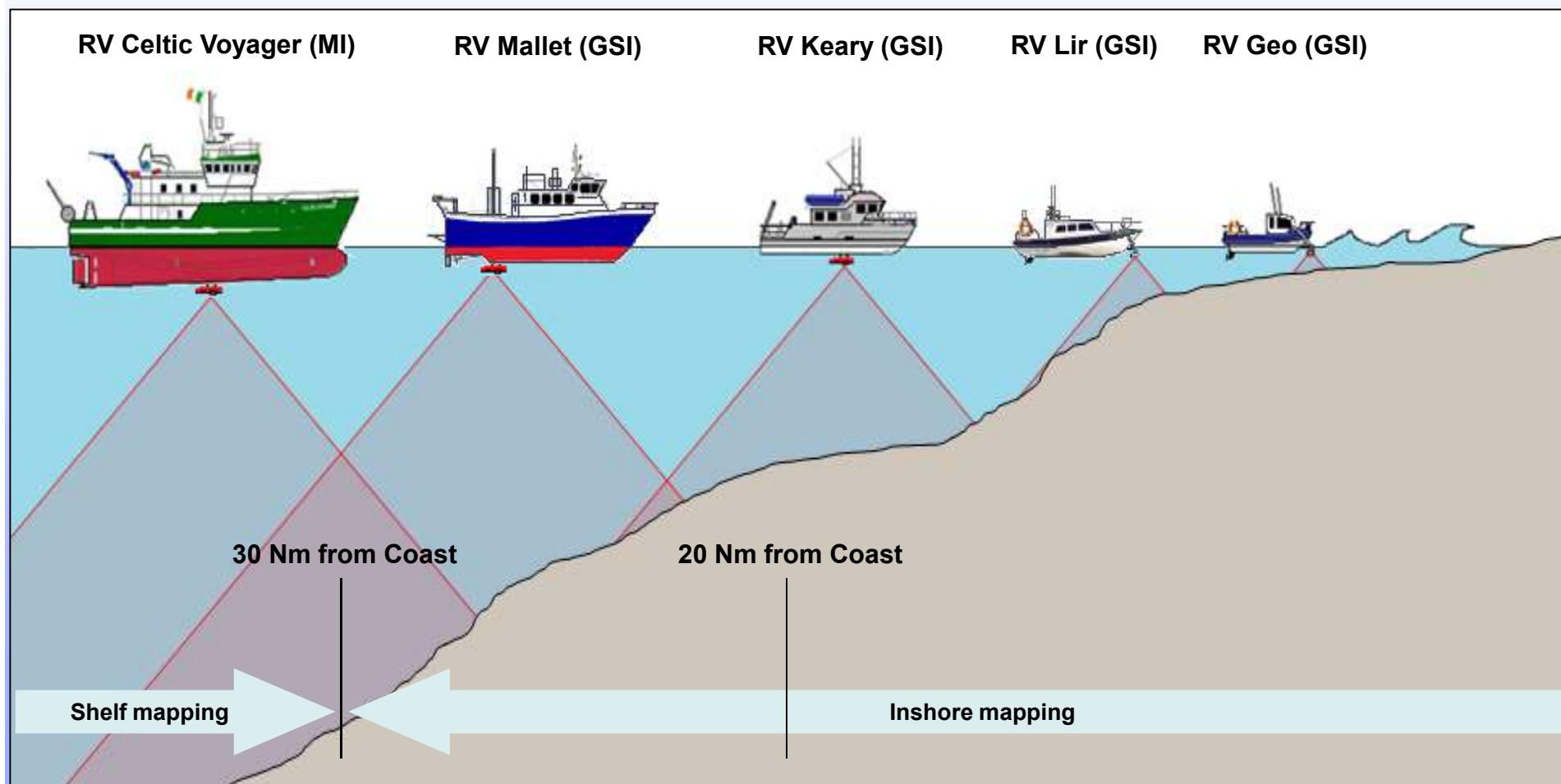




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Distribution of Vessels –GSI & MI





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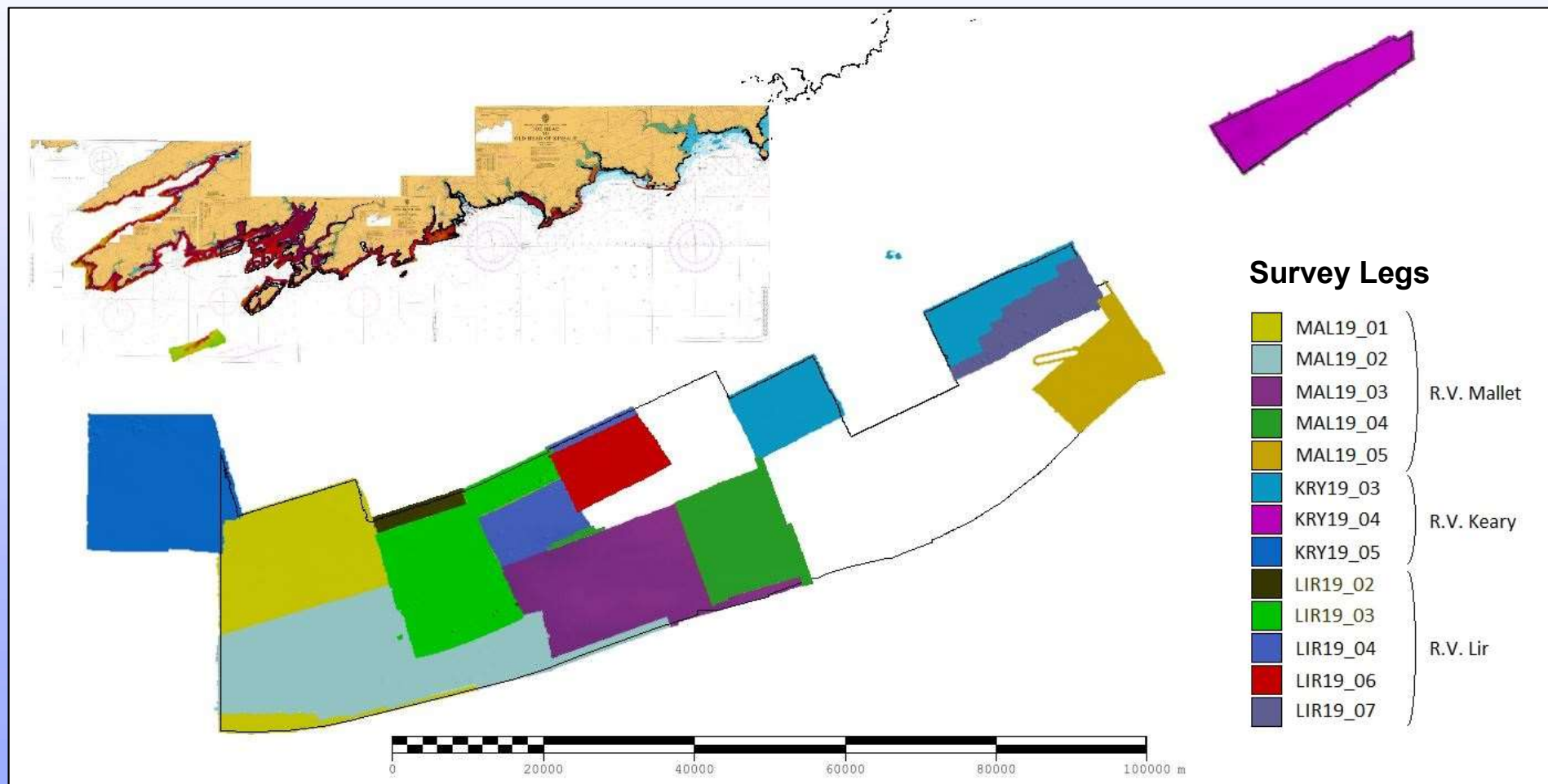
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2019 Survey Coverage

Target: 3390 km²

Achieved: 3562 km²

**21 Survey legs in total –
coastal & offshore**

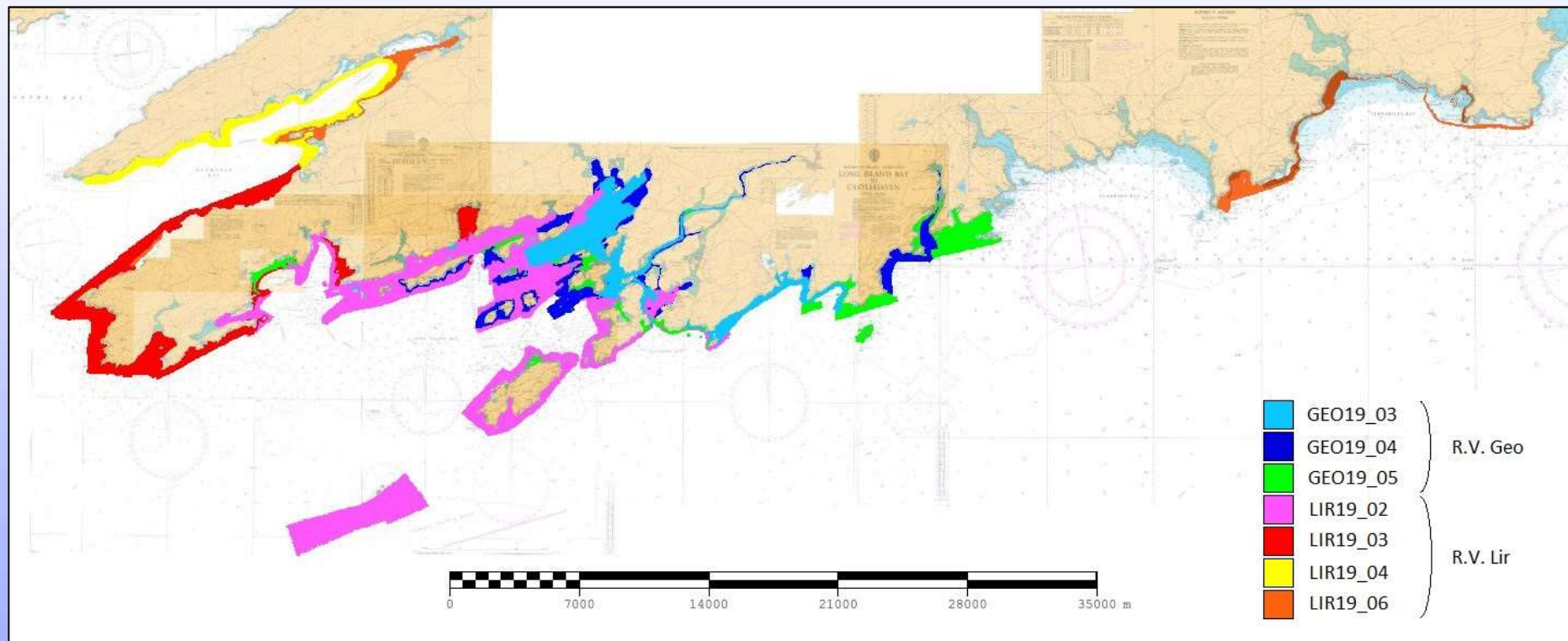


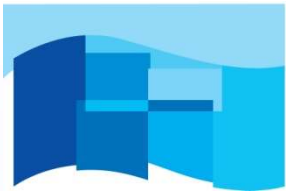


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Survey Legs Inshore

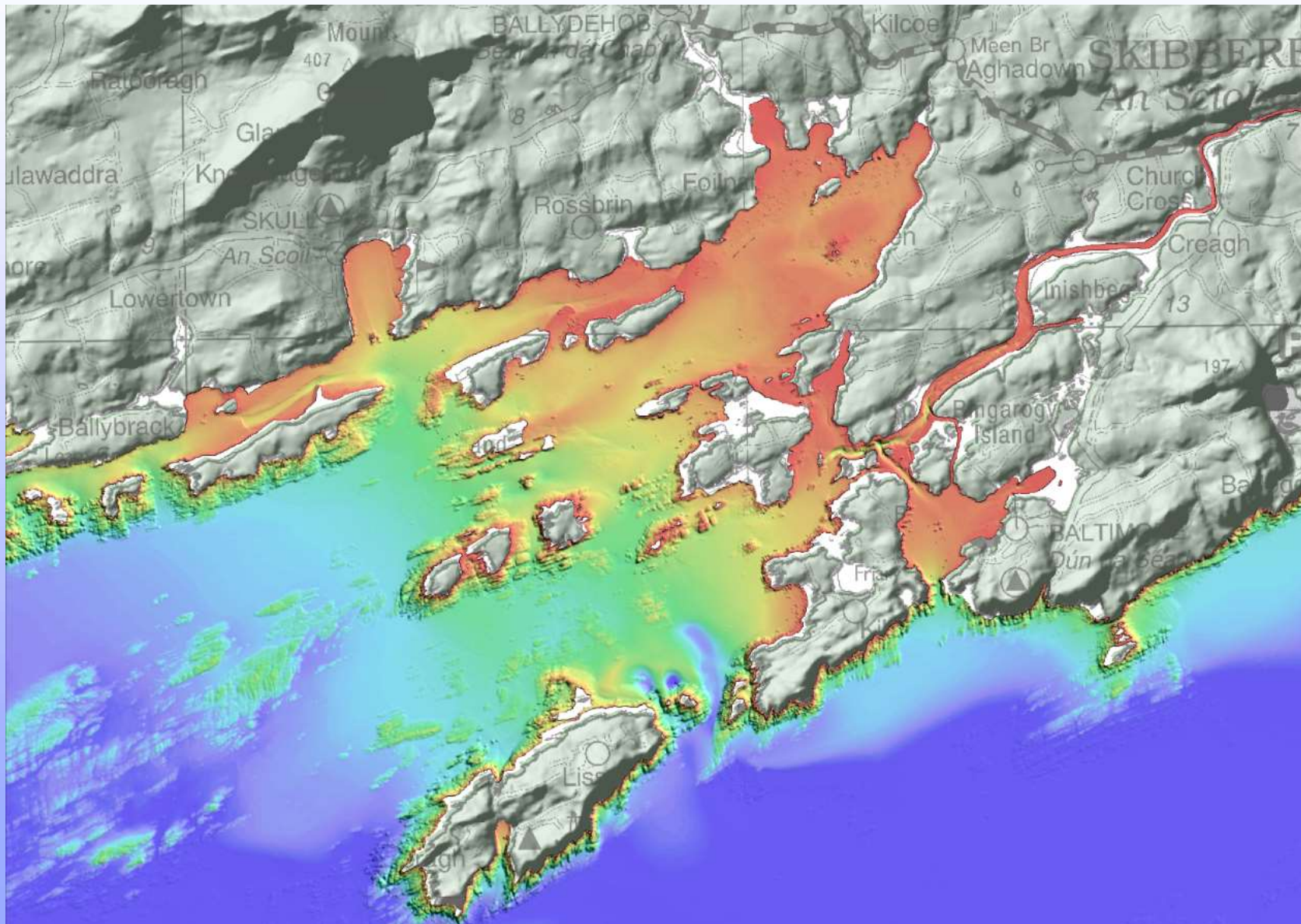


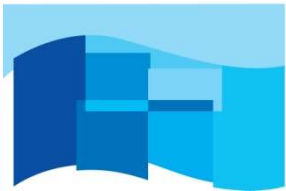


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Real Map of Baltimore

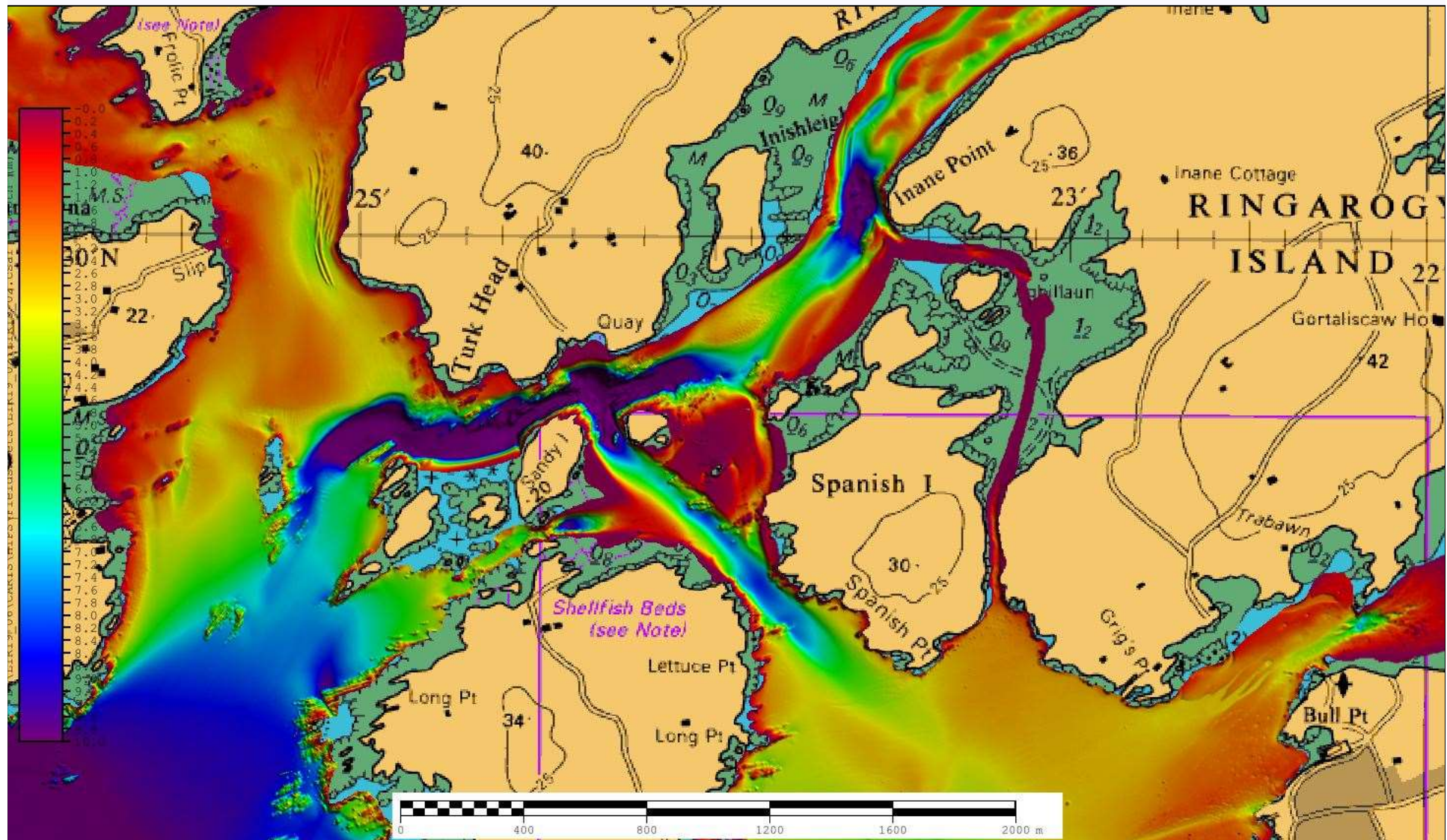


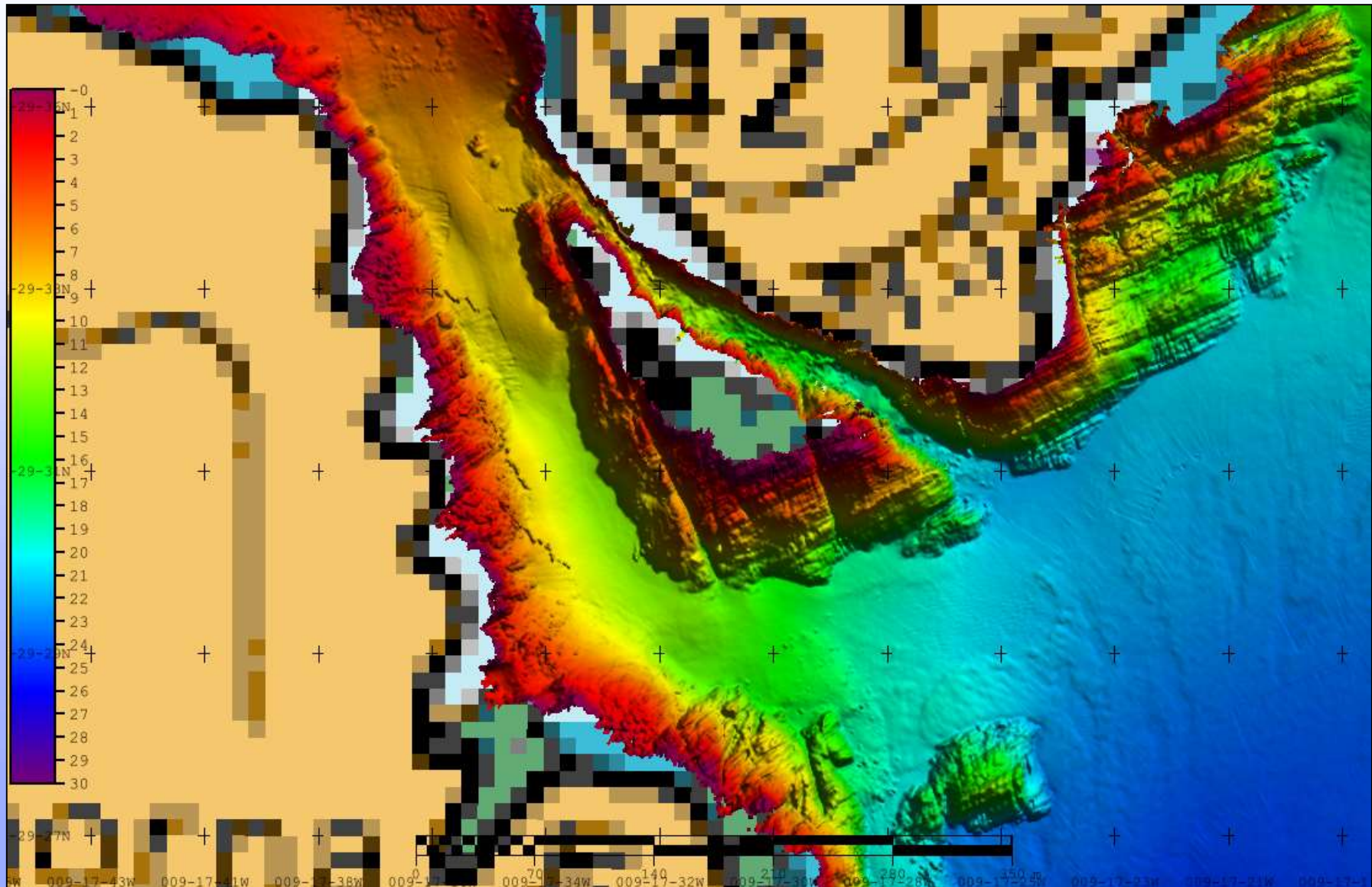


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Challenging inshore work



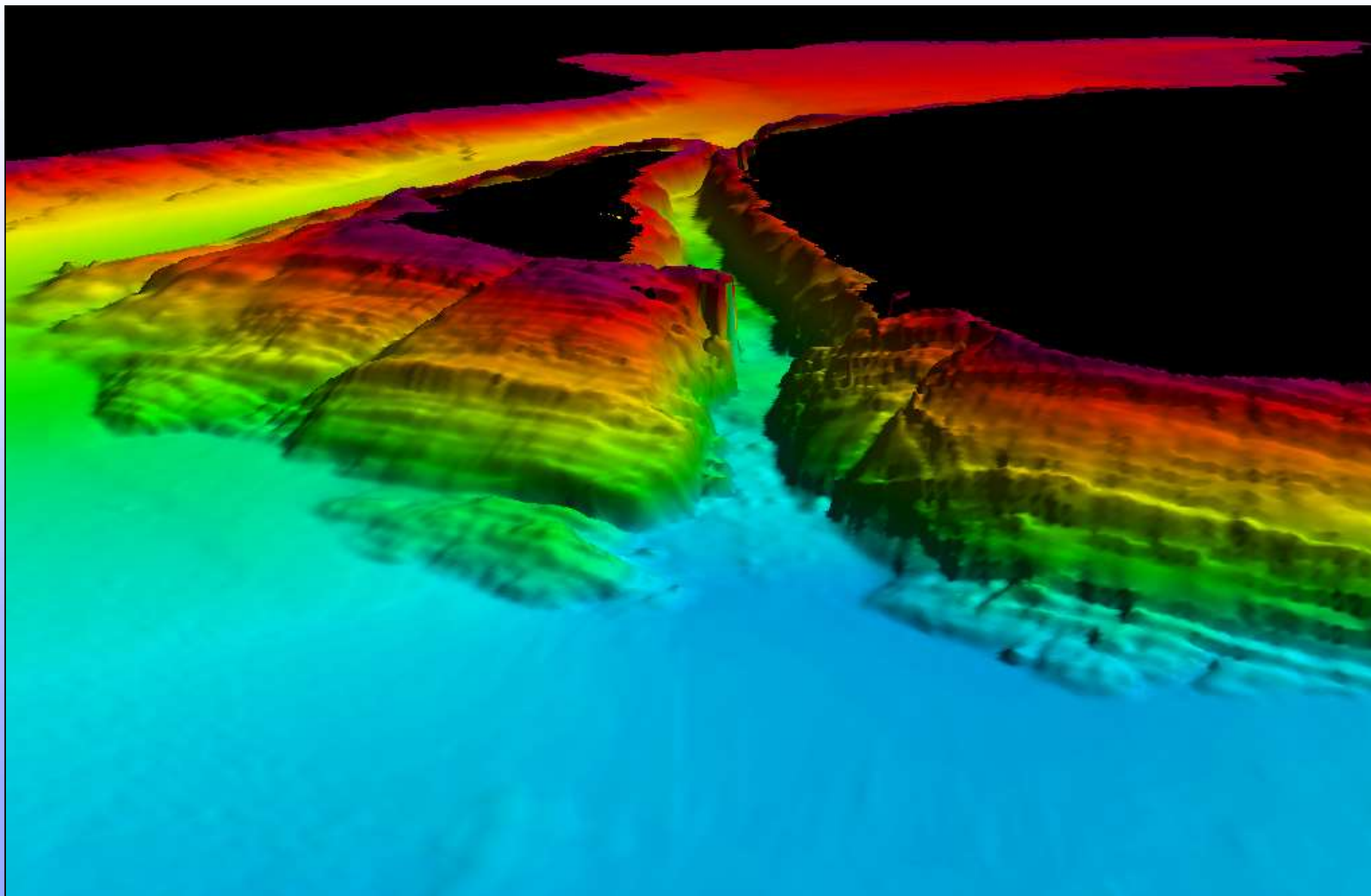




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Approach to Lough Hyne

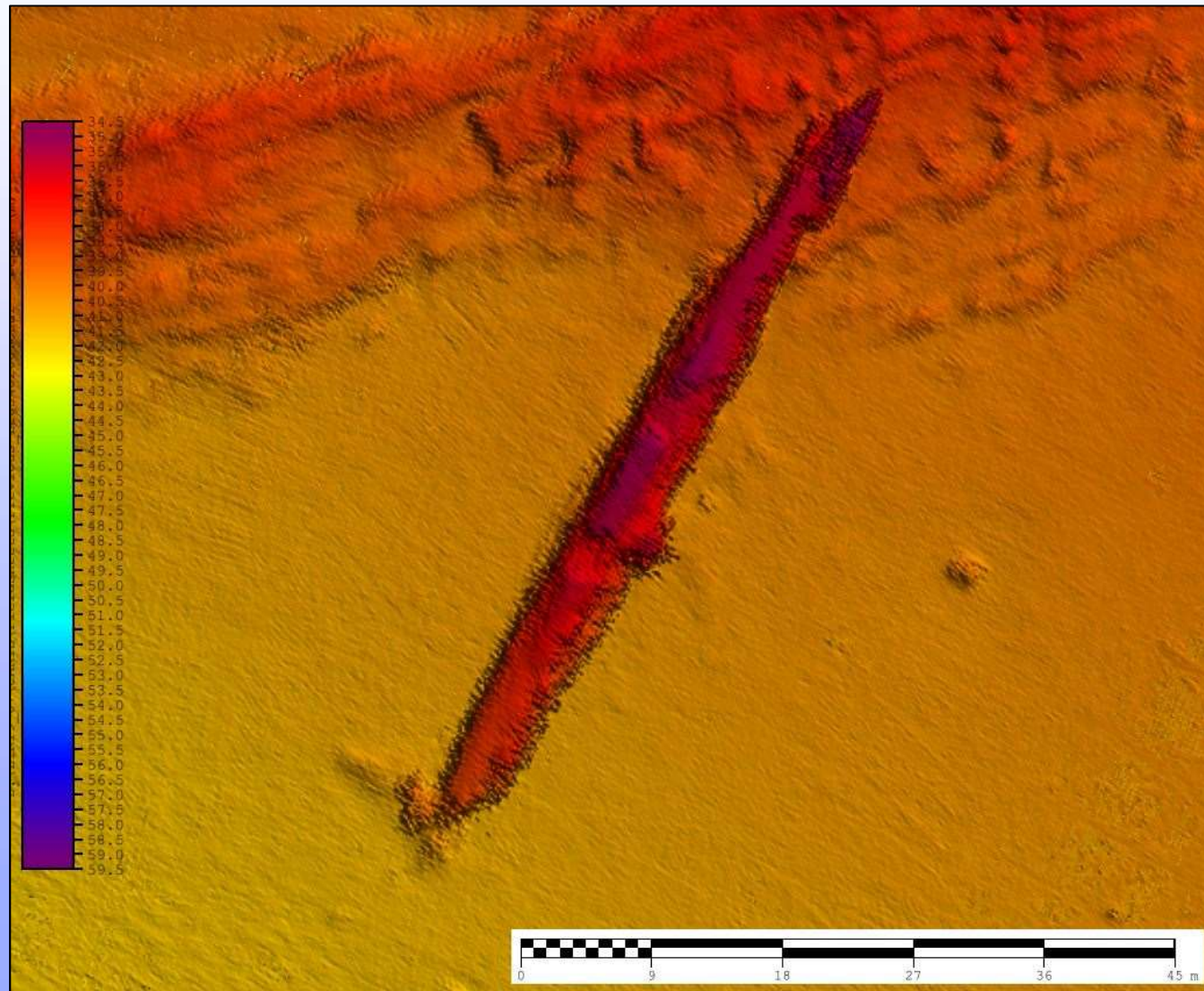




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Wrecks – U260

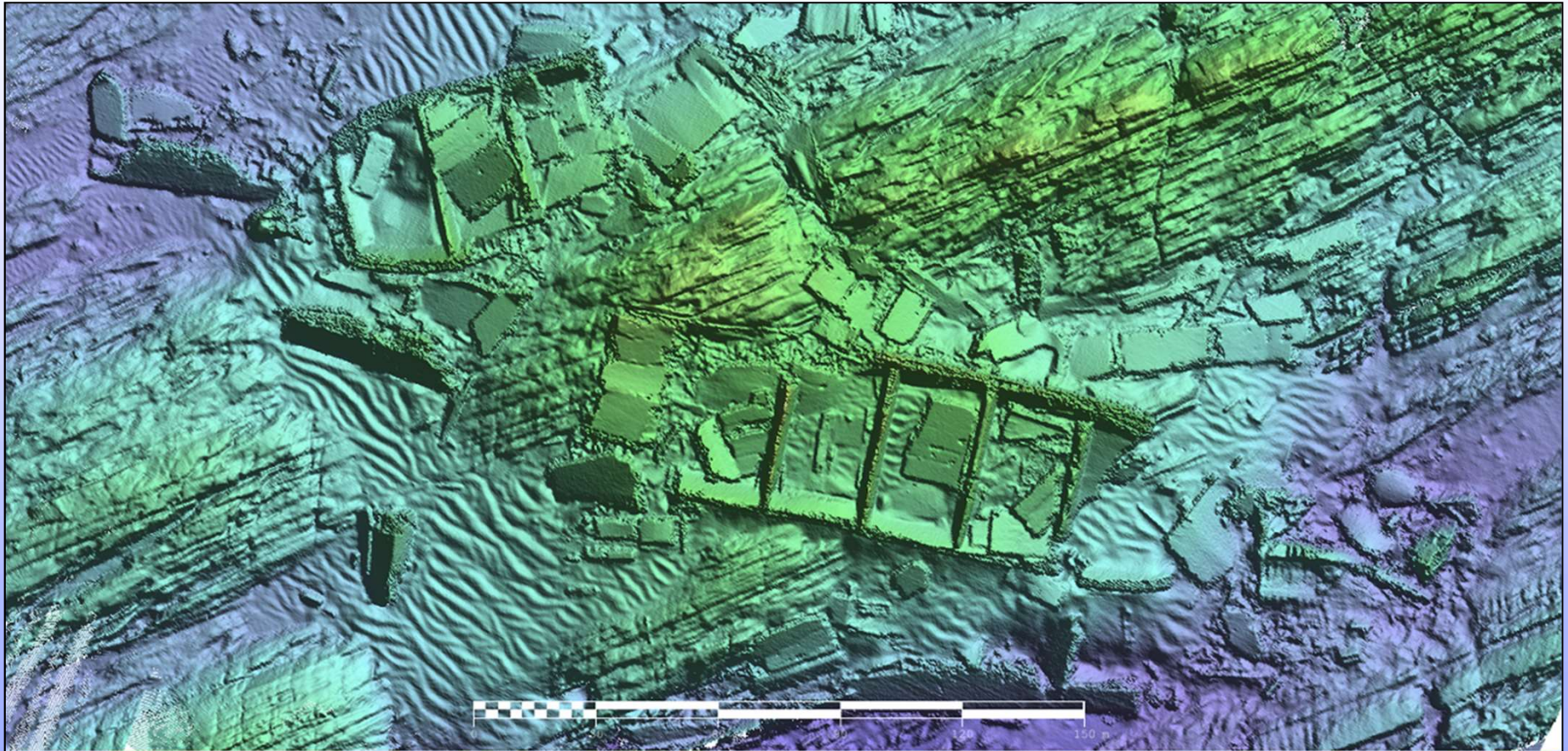




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Wrecks – MV *Kowloon Bridge* (RV Geo)





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Wrecks – *SS Manchester Merchant* (RV Keary)

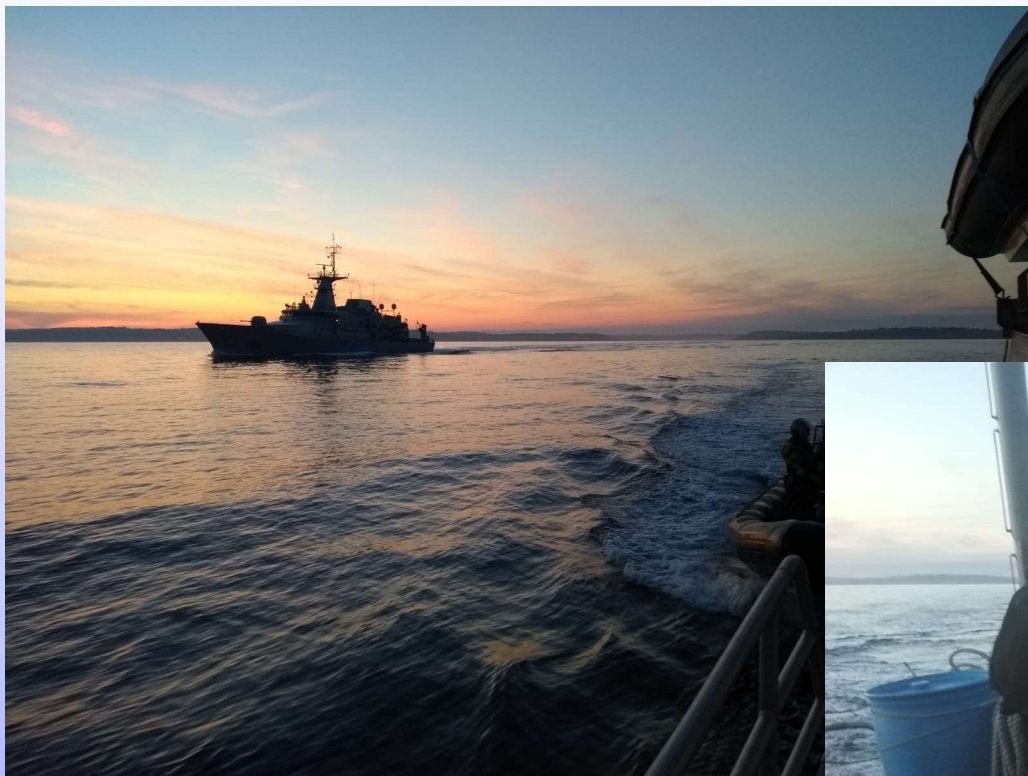




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Exercises



**Boarding action from LE
Bernard Shaw to RV Keary**





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Exercises



**Coastguard helicopter
& RV Keary**



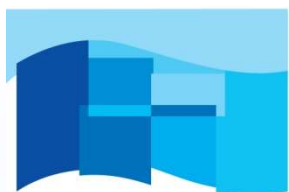
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Exercises

Baltimore Inshore Lifeboat & RV Mallet





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Planning

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
27															
26															
25							2025						5.0		
24													6.7		
23													25.7	20.7	5.0
22													17.2	25.1	25.9
21													38.6		
20													48.7		
19													8.2	6.9	
18													1.9	3.9	
17													2.4	25.4	
16													7.0	4.4	6.8
15													0.3	1.2	3.9
14													13.4	5.9	
13													28.3	16.9	
12															
11															
10															
9															
8															

Cell Guide

Days for 1 big boat (e.g. 7-10 hour day)

Days for 1 small boat (e.g. 5 hour day)

Comments

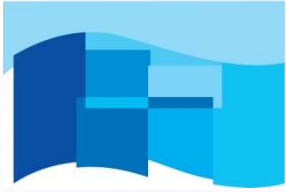
Small vessel restricted to mapping between 2 and 5m LAT

Numbers in red pertain to areas unlikely to be mapped
(These numbers are not included in the calculations)

2 boats:

2018	6.1	3.052
	26.7	13.34
2019	73.2	36.6
	15.9	7.955
2020	105.8	52.91
	39.7	19.86
2021	85.5	42.76
	71.5	35.77
2022	140.5	70.26
	100.6	50.29
2023	123.9	61.93
	41.1	20.56
2024	58.3	29.17
	78.4	39.19
2025	95.1	47.53
	123.7	61.83
2026	87.0	43.52
	66.0	32.99

We are here



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OUR PRODUCTS

EDUCATIONAL IMPACT



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PORTAL - WEBSITE



Maps ▾ Data Surveys ▾ R&D and Education ▾ Gallery News & Events ▾ About ▾



Mapping our sea beds

Exploring our underwater resources: from fish spawning habitats to foundations
for ocean energy

MORE ABOUT US

Explore our amazing seabed

Ever wondered what lies beneath the sea?



Latest maps & publications

For all the latest publications, charts &
much more



Already in marine industry

Discover a vast array of data, products and
infrastructure





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DATA ACCESS

DYNAMIC WEB MAPPING

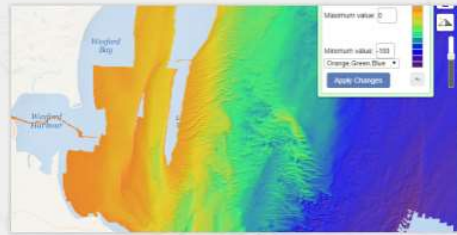
Seabed Bathymetry,
Backscatter and Sediment Data

DATA VIEWER


Download and Interrogate Data

SURVEY STATUS

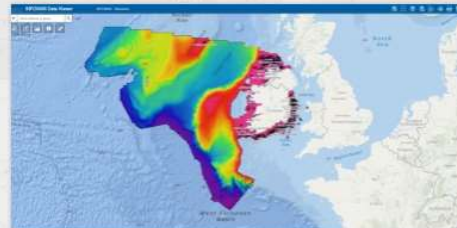
Vessel Locations and Area Of Survey



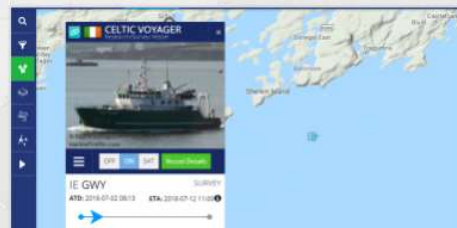
Dynamic Web Mapping
Analyse bathymetry data. 'How to use viewer' video guide.



Seabed and Sediment
Bathymetry, backscatter and sediment distribution data.



Data Viewer
Download and interrogate data.



Follow The Fleet
Follow the INFOMAR survey vessels.



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PRODUCT ACCESS

INFOMAR CHARTS

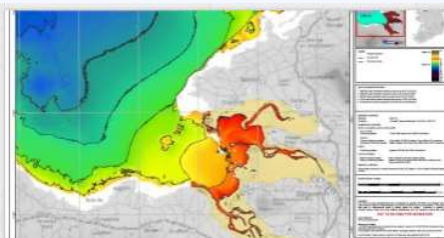
Bay/Area Specific finished charts .PDFs
are available

MAP VIEWER

Download Google Earth Files and RMOI

SHIPWRECKS

Download Wreck information sheets in
.PDF



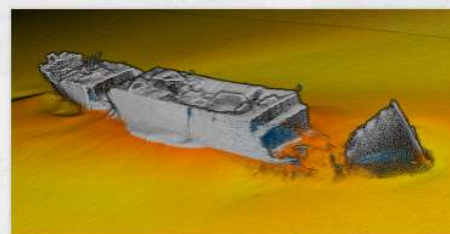
Charts

Bathymetry, backscatter and shaded
relief charts.



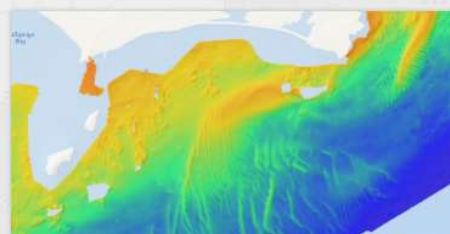
Maps

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



Shipwrecks

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



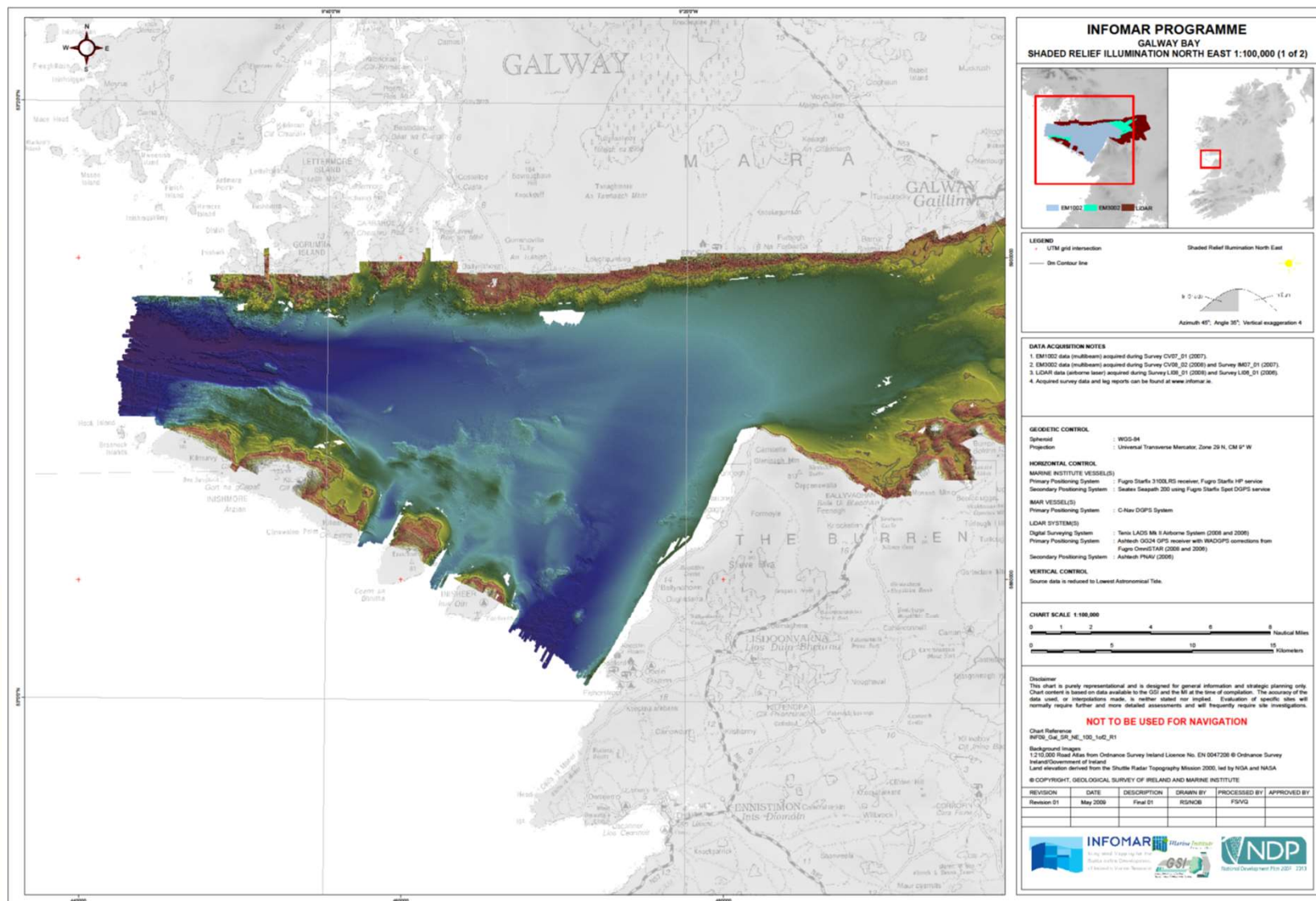
Surveys, Reports and
Metadata



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CHARTS





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STORYMAPS

Shipwrecks in Irish Waters

8 SS Manchester Merchant

On January 12th, 1903, it is thought that the cotton cargo spontaneously ignited, with the vessel subsequently catching fire as it neared the SW Irish coast. The vessel sought refuge in Dingle Bay. With efforts to fight the fire having failed, the ship was scuttled in shallow water.

Multibeam Imagery of the Seabed off the Irish Coast

5 Tralee Bay

LIDAR image of Tralee Bay highlighting channels carved into the soft substrate.

Kilkieran Bay Marine Life

5 Cerianthus lloydii

A large solitary tube anemone found in soft sediments. This very common species of burrowing anemone can reach up to 40cm in height. However, the anemone's tentacles are usually all that is visible.

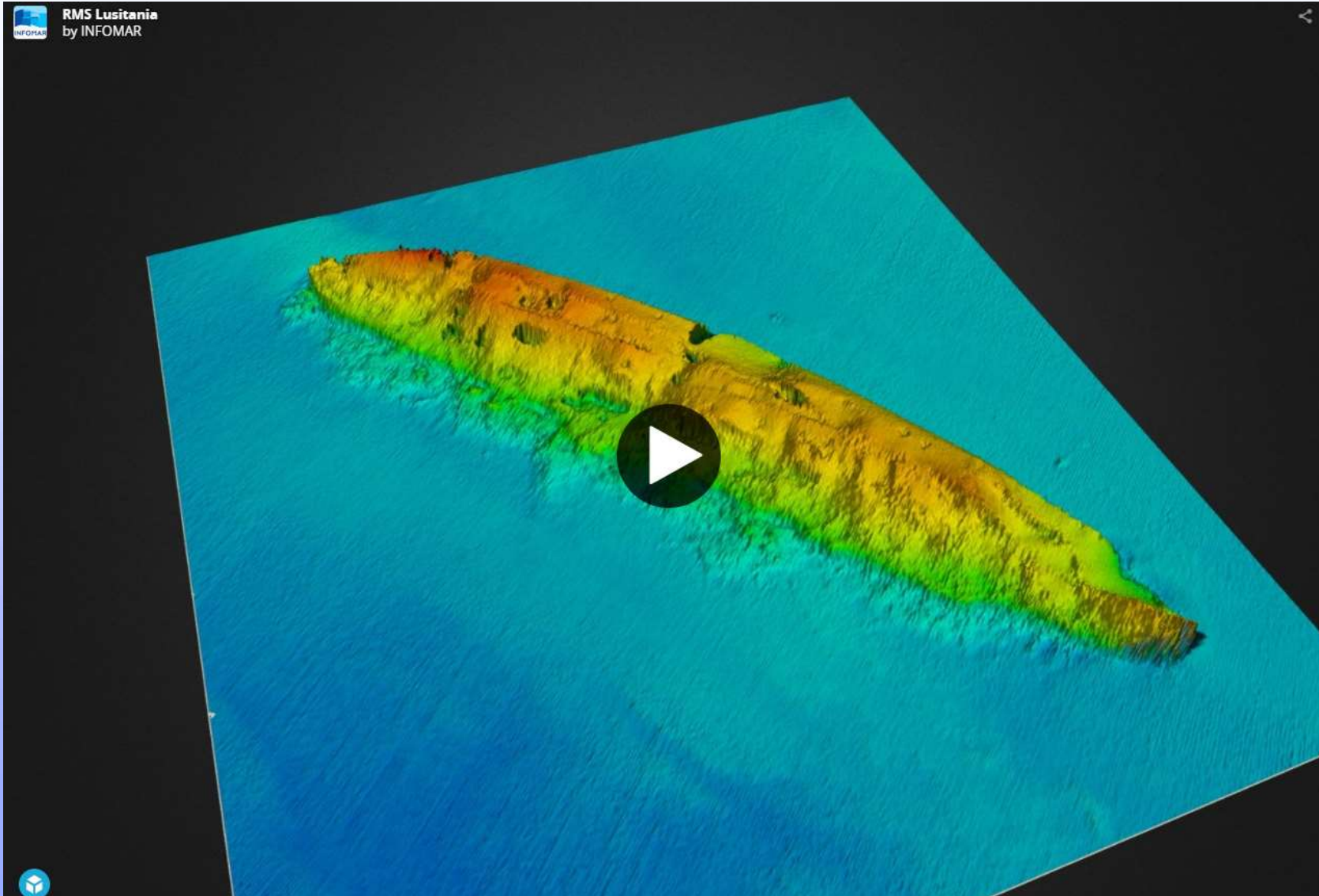
© Nicolas Chopin

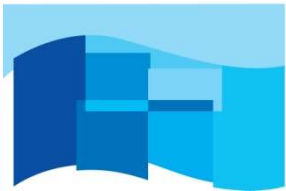


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SHIPWRECKS





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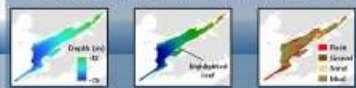
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OUTREACH EVENTS / PRODUCTS

Profile of a Reef Kenmare River, Ireland



Overview of Physical Habitat of Kenmare River



Key to Reef Species



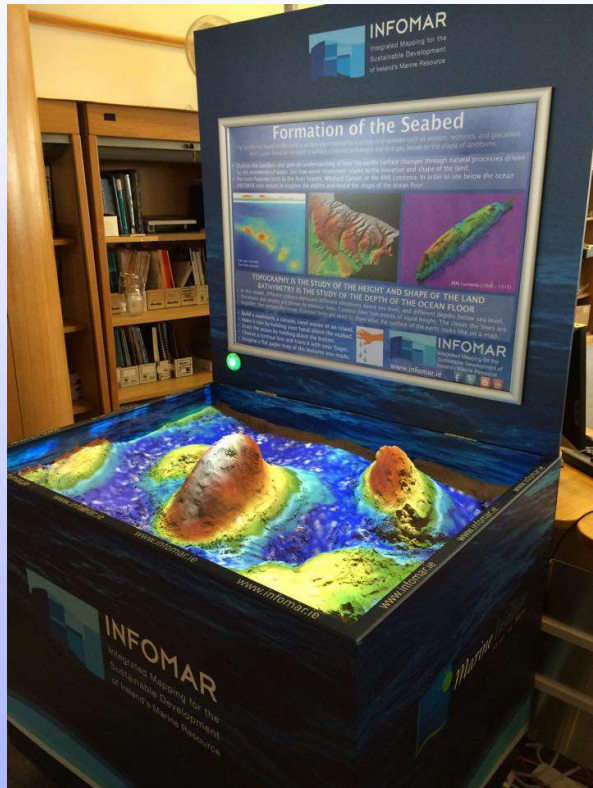
Warships, U-Boats & Liners

A GUIDE TO SHIPWRECKS MAPPED IN IRISH WATERS



Karl Brady | Charise McKeon | James Lyttleton | Ian Lawler





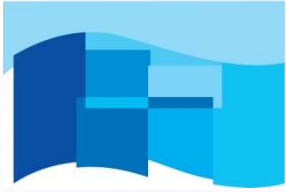
AR Sand Box Sessions

- Xbox + projector + PC + sand = 3D Interactive Map
- Learn how 3D shapes translate to 2D maps
- Look about contours and depth shading

General Interactive Sessions

- ROV in a tank.
- Live video feed to surveyor on a ship
- Shipwrecks presentation
- INFOMAR table quiz with prizes (feedback)





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scoilnet

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GO TO
POST-PRIMARY

Search Resources

Browse Resources

Add a Resource +

Choose a level

No options

No options

No options



In The Spotlight



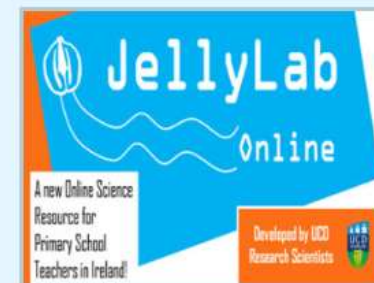
Student Maths Area

Find a wide range of Junior Cycle and Leaving Certificate Mathematics resources in this new student area by the PDST Maths Team.



RTÉ Archives

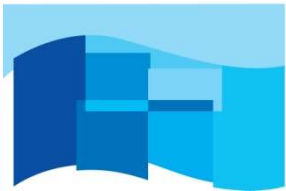
Scoilnet has collaborated with the RTÉ Archives to bring together a collection of resources that relate directly to the Irish Primary School History Curriculum.



JellyLab Online

JellyLab Online is a video based science education resource for primary school teachers in Ireland created by UCD research Scientists.



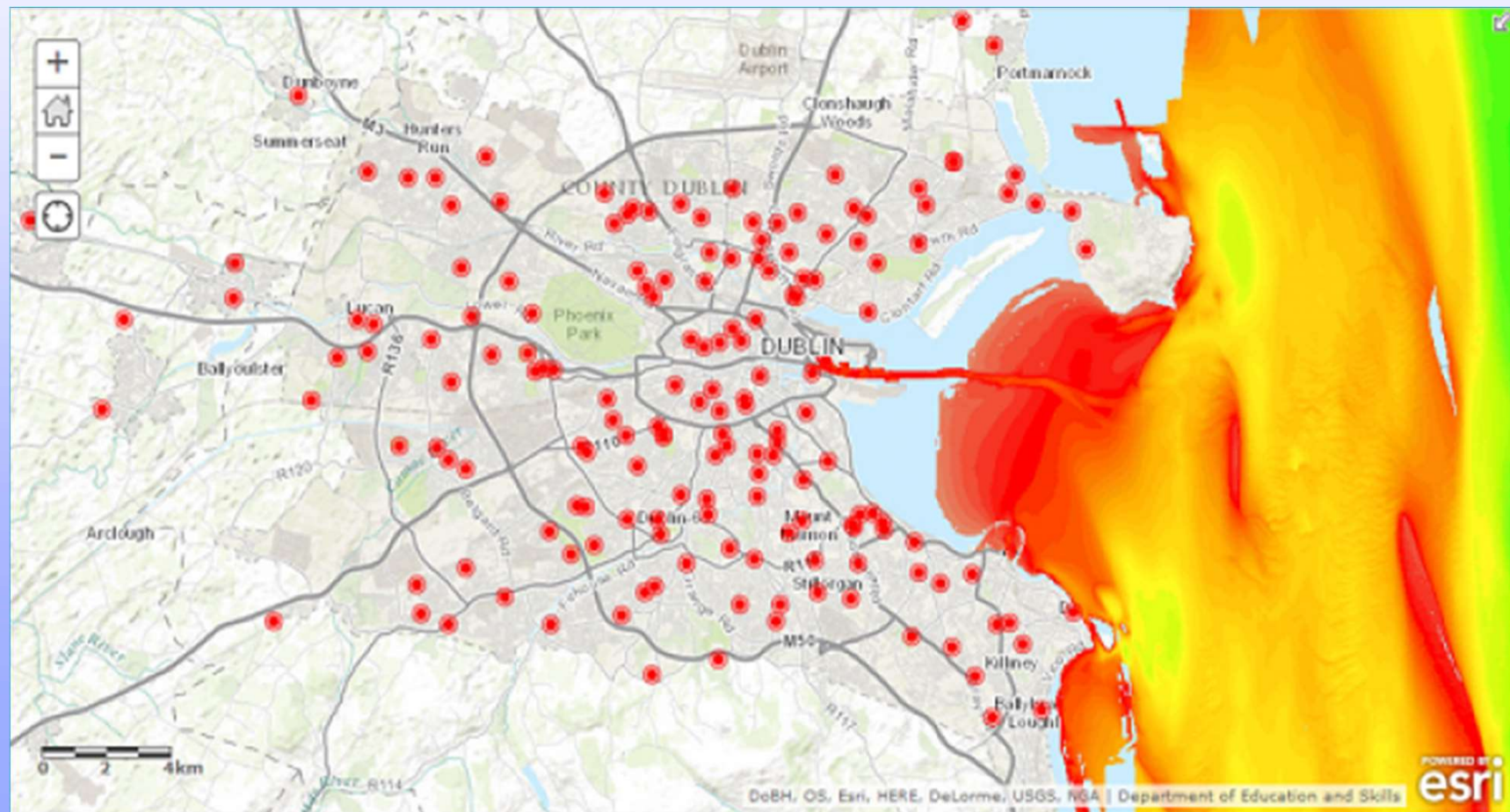


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TY STUDENTS

TY Student Education Outreach Development Programme





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TRAINING - NATIONAL

S.M.A.R.T. (GMIT) – CV 2020

EUROFLEETS+ Floating University – CV 2020



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MSC MODULE

MSC. GIS & MARINE REMOTE SENSING –

DEPARTMENT: GEOGRAPHY

INFOMAR MODULE

CREDITS: 10



**Maynooth
University**

National University
of Ireland Maynooth

1. Introduction to Ireland's seabed mapping programme
2. Fundamentals of oceanography
3. Marine survey planning
4. Seafloor mapping – how to image the seafloor
5. Marine geological mapping / Rock, mud and biology
6. Data analysis
7. Data products and data delivery
8. Impact of INFOMAR
9. The Future of ocean mapping



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FUTURE ACTIVITY

- **Knowledge transfer** – education/industry/modelling
- **Data applications development** – data for decision support
- **Baseline mapping** informing change monitoring/management
- **TAC Technical Advisory Committee** being re-established
- **MSP/MAFA Support**
- **Internationalisation** potential
- **Coastal/Climate** role –input to modelling, Earth Observation & Sea Level monitoring
- **Completing the map!**



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THANK YOU

DATA: www.infomar.ie

CONTACT: Ronan.O'Toole@gsi.ie