

INFOMAR – A National Seabed Mapping Success Story

ERVO, 03rd June 2025

Thomas Furey - thomas.furey@marine.ie

www.infomar.ie



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



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

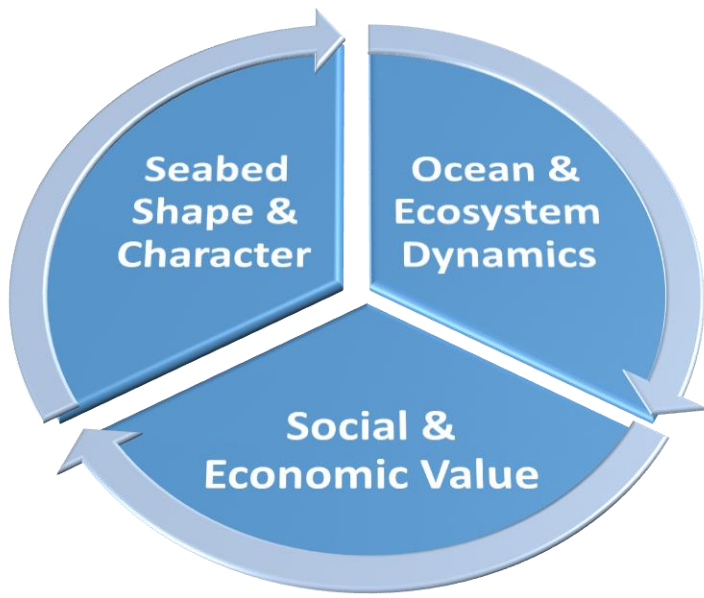


Geological Survey
Suirbhéireacht Gheolaíochta
Ireland | Éireann



Foras na Mara
Marine Institute

Drivers for a systematic Seabed Mapping program?



Benefits

- **Engineering**
 - Energy
 - Telecommunications
 - SMEs
- **Data Applications**
 - Decision Support Tools
 - Navigation/EIA/SEA/
- **Heritage & Biodiversity**
 - Diving/Angling Tourism
 - Habitat Conservation
 - Sustainable Fisheries



National seabed mapping programme

- DECC Funded €80m
- 2006-2026
- GSI & MI Partnership
- HOOW - Action 23
- Programme for Gov.
- Climate Action Plan

Focus:

1. Acquisition
2. Data Exchange & Integration
3. Value Added Exploitation

Supporting:

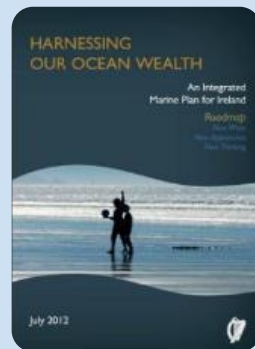
1. Cross Sectoral Sustainable Development
2. Spatial, Resource & Risk Management

The Plan

Grow:

Data availability
Scientific advice
Economic impact

Sustainably



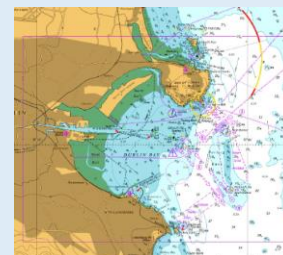
To Deliver:

Data
Enabled
Decisions

Approach

Develop:

Relevant outputs
Capacity build
Partnerships



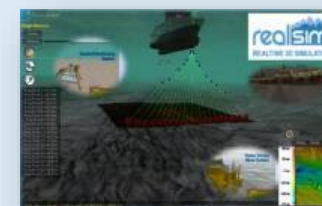
To Increase:

Infrastructure,
Knowledge &
Collaboration

Technology

Utilise:

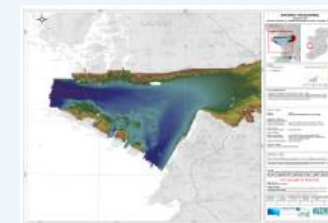
Innovative equipment
Multiple platforms
R&I project leverage



Strengthening:

Data integration &
Inter-disciplinary
engagement

Products



Free Open Data:

Exploration
Development
Blue Growth

UNCLOS

Petroleum Affairs Division
Survey Outsourced

1997 -
1999

UNCLOS Offshore

Irish National Seabed Survey
Outsourced to Self Survey

1999 -
2005

Funding & Political Support

PwC Cost Benefit Analysis
"INFOMAR Marine Mapping Study -
Options Appraisal Report"

2008

Research & SMEs

Thematic Research Funding Calls
ML / Hyperspec / Wreck E <https://www.searover.ie/dives.php>

2008 &
2012 -
Present

Multi-Sectoral Inshore

INFOMAR Phase 1 (to 2016)
Hydrography
Bays & Coastal Areas / New fleet

Capacity Build

*Seabed Mapping MSc Module
Onboard Training*

2019 -
2024

Inshore & Offshore

Atlantic Mapping ('15-'17)
INFOMAR Phase 2 ('16 - '26)

2015 -
2017

Data Services

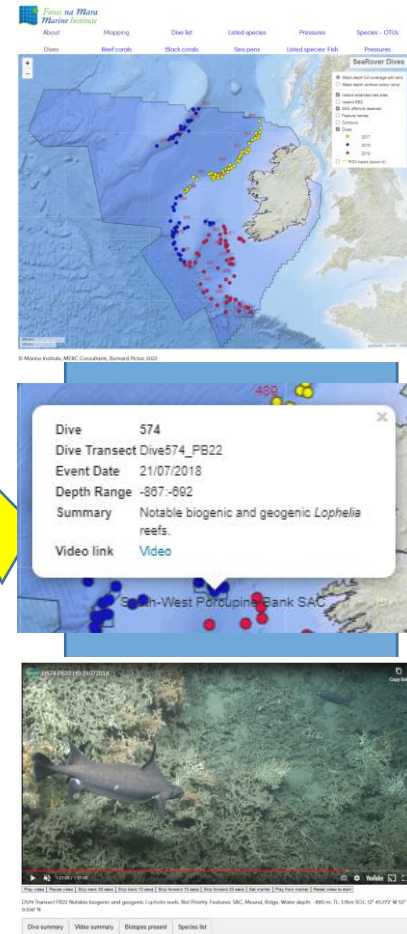
QMF Systems / Streamlined
Workflows / Cloud hosting

2020 -
2024

EU Habitats Dir.

Reef Habitat Mapping -
SeaRover (EMFF)

2017 -
2022



Dive summary | Video summary | Biotopes present | Species list

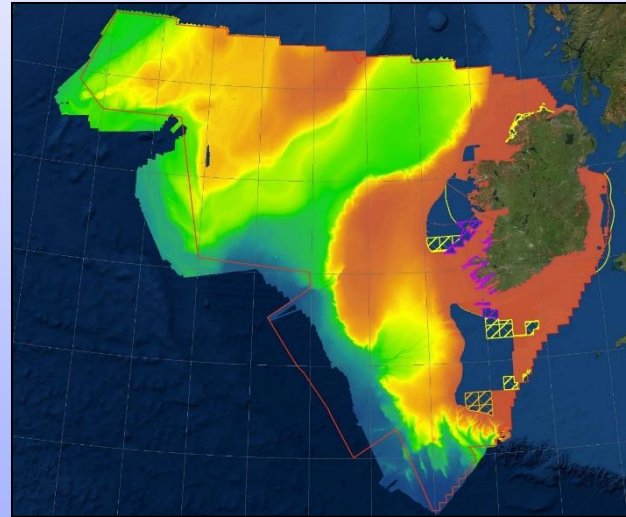
START VIDEO [00:00:00]/03:32. ROV stops for sampling two pushcores. [00:15:00] Mud cloud. OTU1049. [00:18:00] Mud/gravel/coral gravel/scattered cobbles. [00:25:00] Marine snow. Scc



Systematic vs Random Mapping

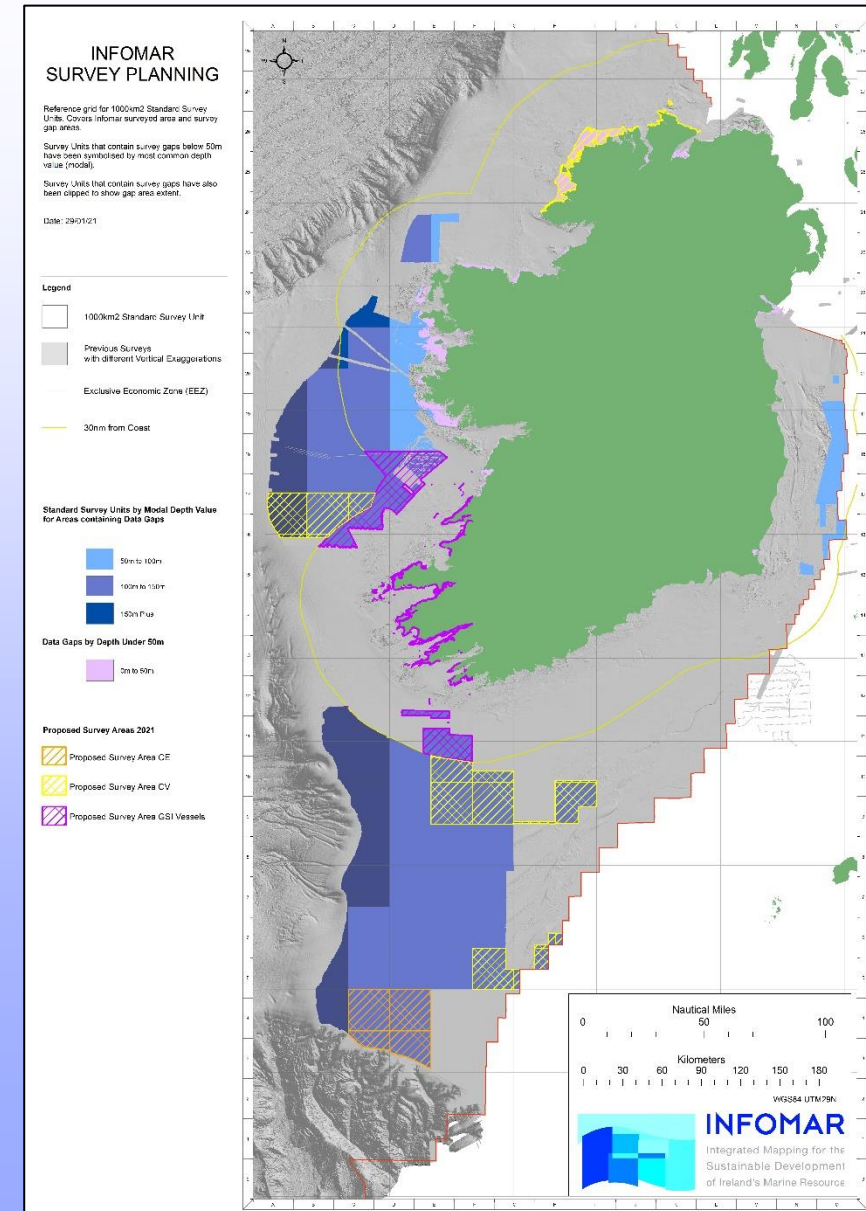
Pros

- Cohesive dataset & derived products
- Aspiration to complete
- Predictive operations

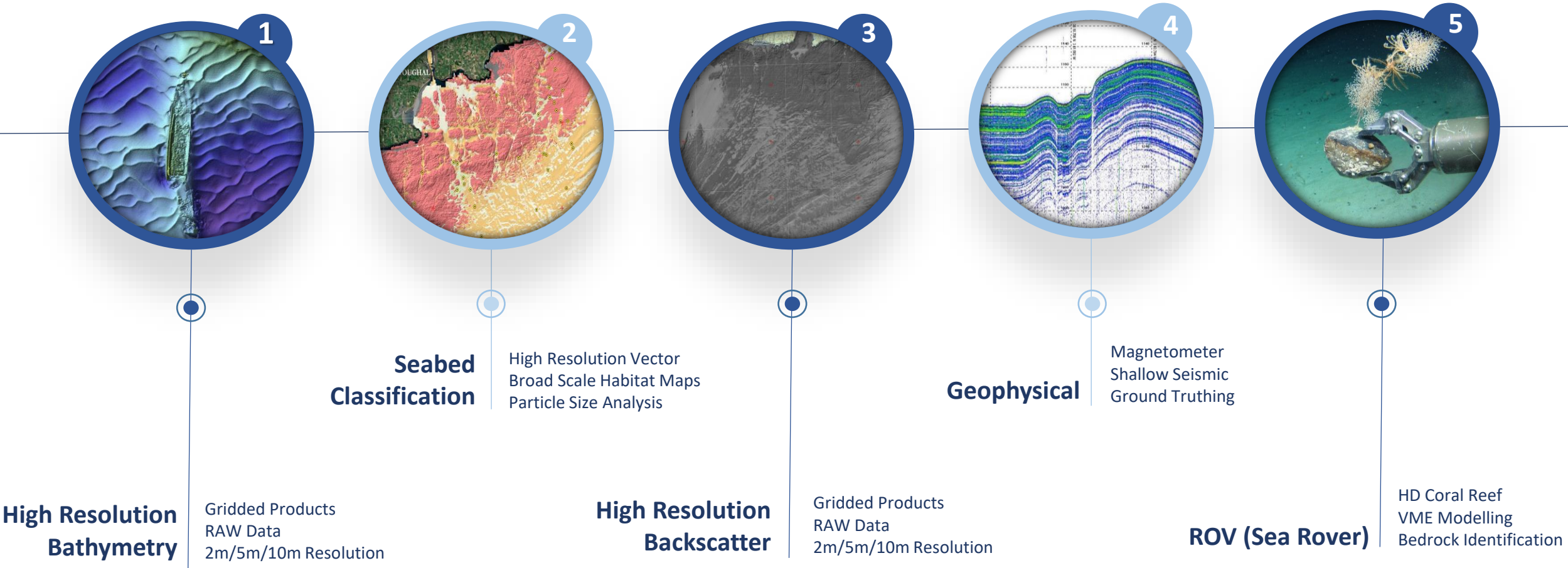


Cons

- Prioritisation is Challenging
- Hardest Last



Top 5 Data Types for INFOMAR data requests 2004 - 2024

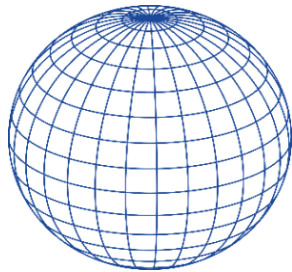


Top 5 sectors for INFOMAR data requests 2004 - 2024



**Research &
Education**

39%



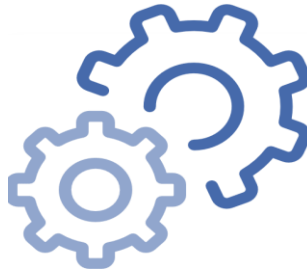
**Marine Spatial
Planning**

21%



**Offshore
Renewable
Energy**

17%



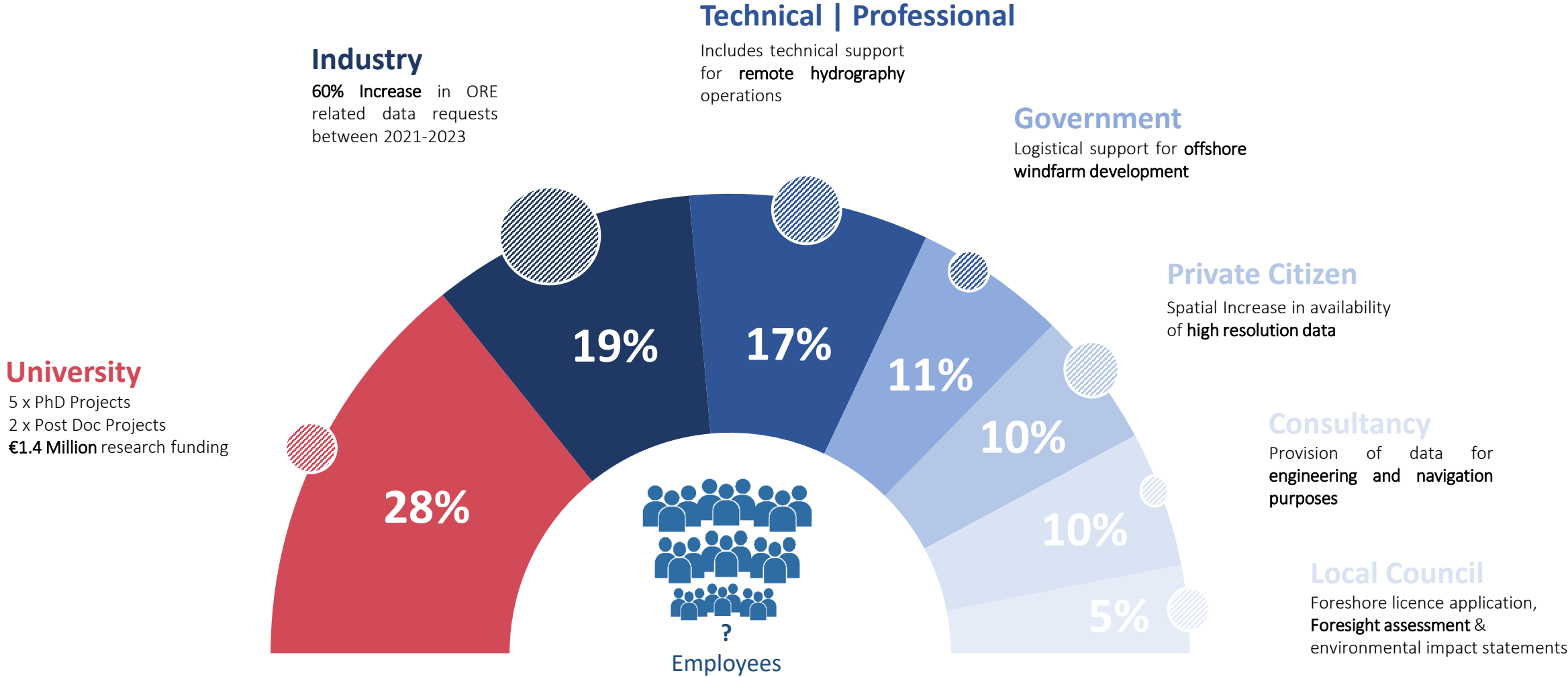
**Geoscience &
Engineering**

11%

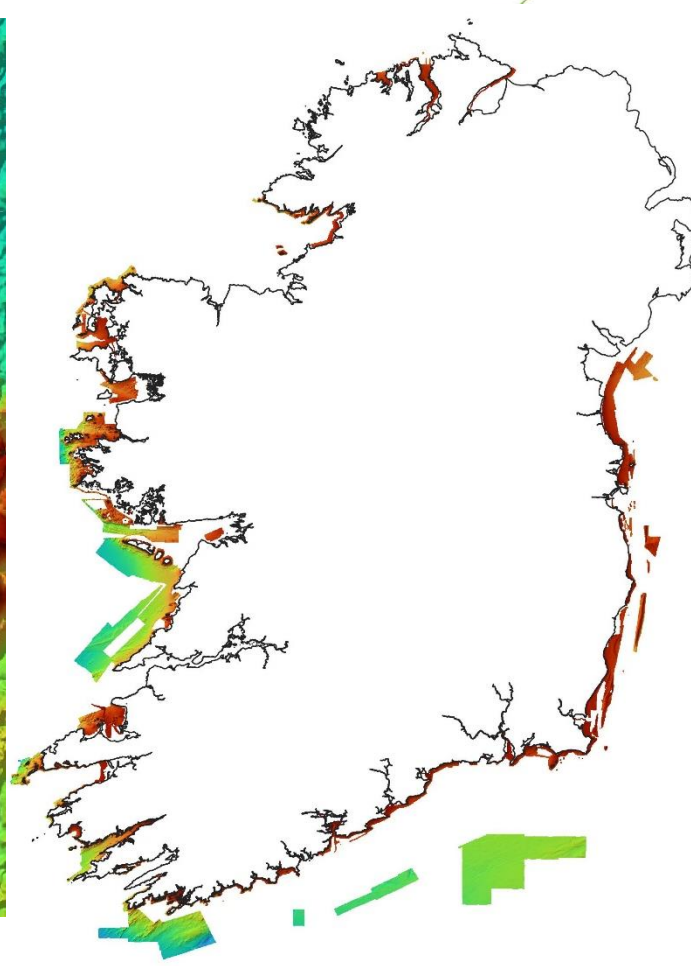
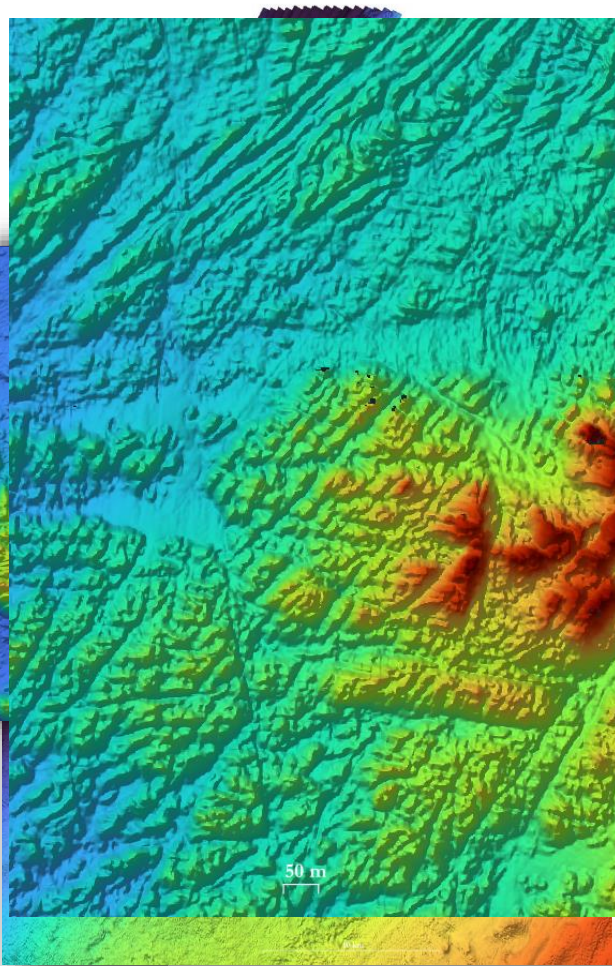


**Fisheries &
Aquaculture**

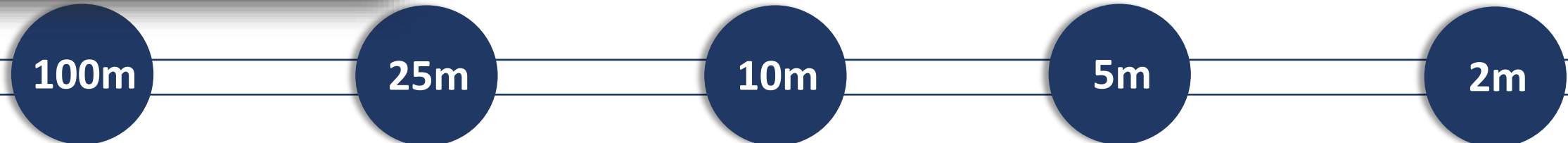
11%

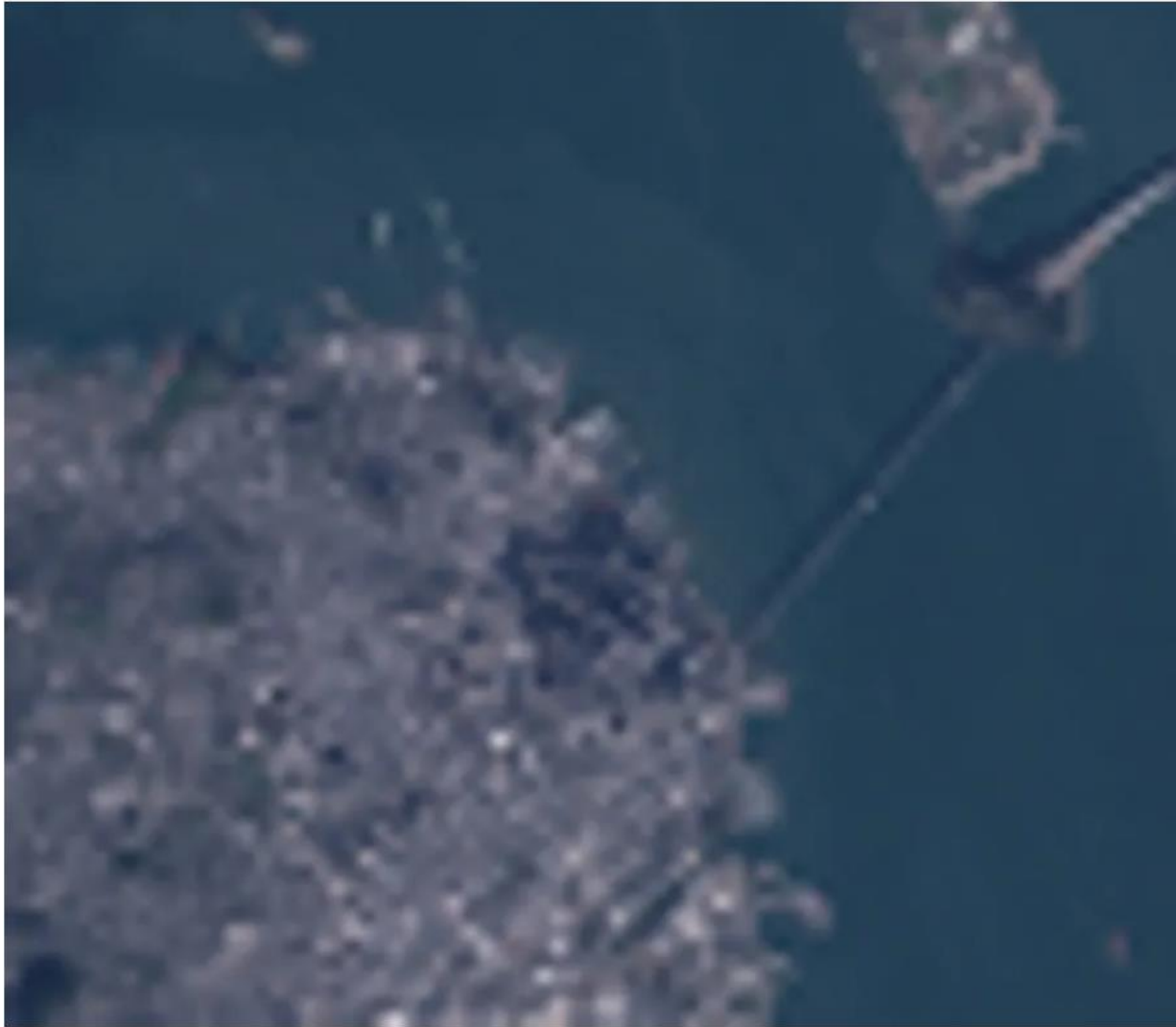


Advances in **Data** production: **Gridded Bathymetric Surfaces**

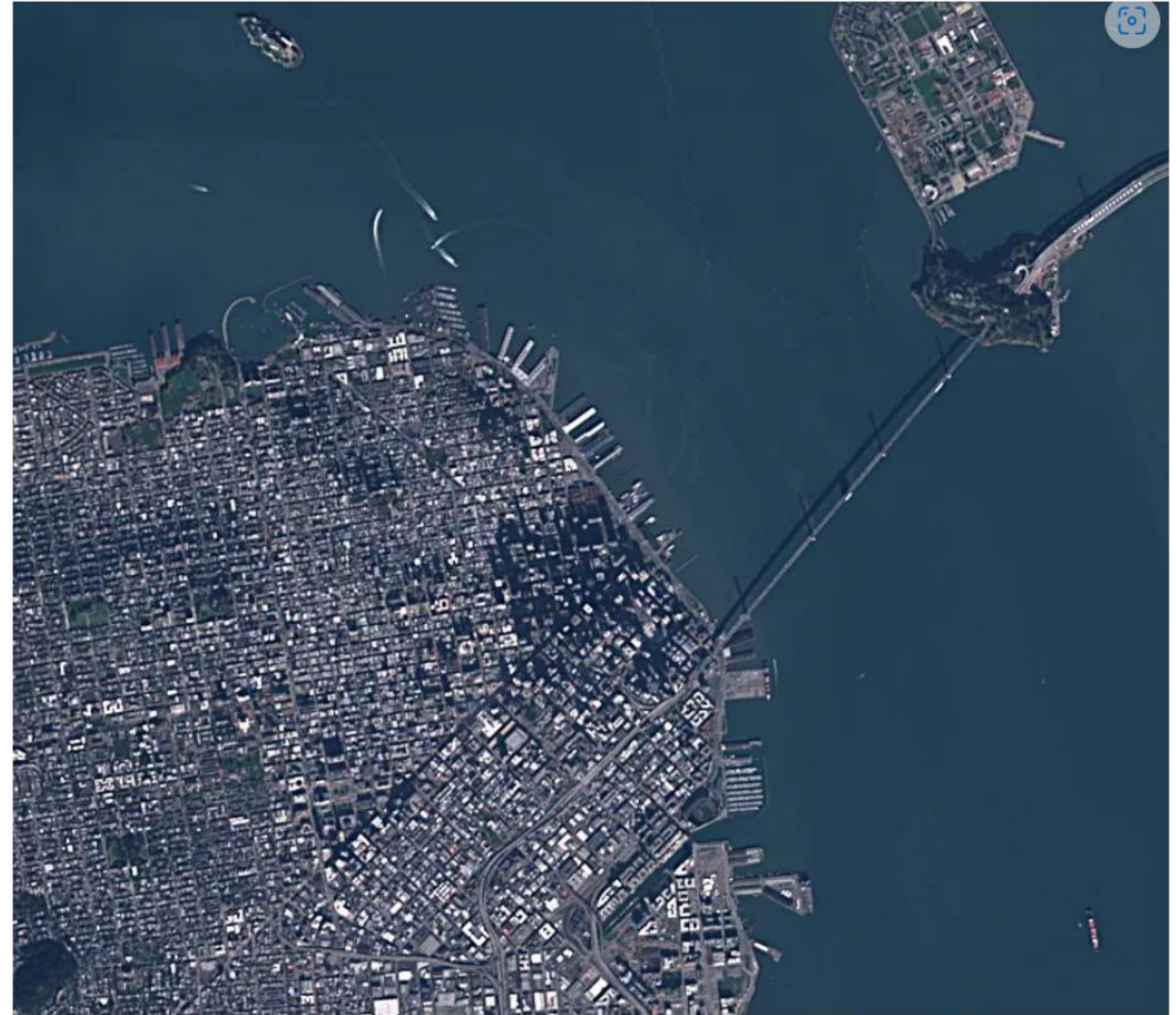


- 625,000 km² | Single Surface
- 510,000 km² | Single Surface
- 94,000 km² | Single Surface | Individual Survey
- 75,000 km² | Single Surface | Individual Survey
- 8,500 km² | Single Surface | Individual Survey



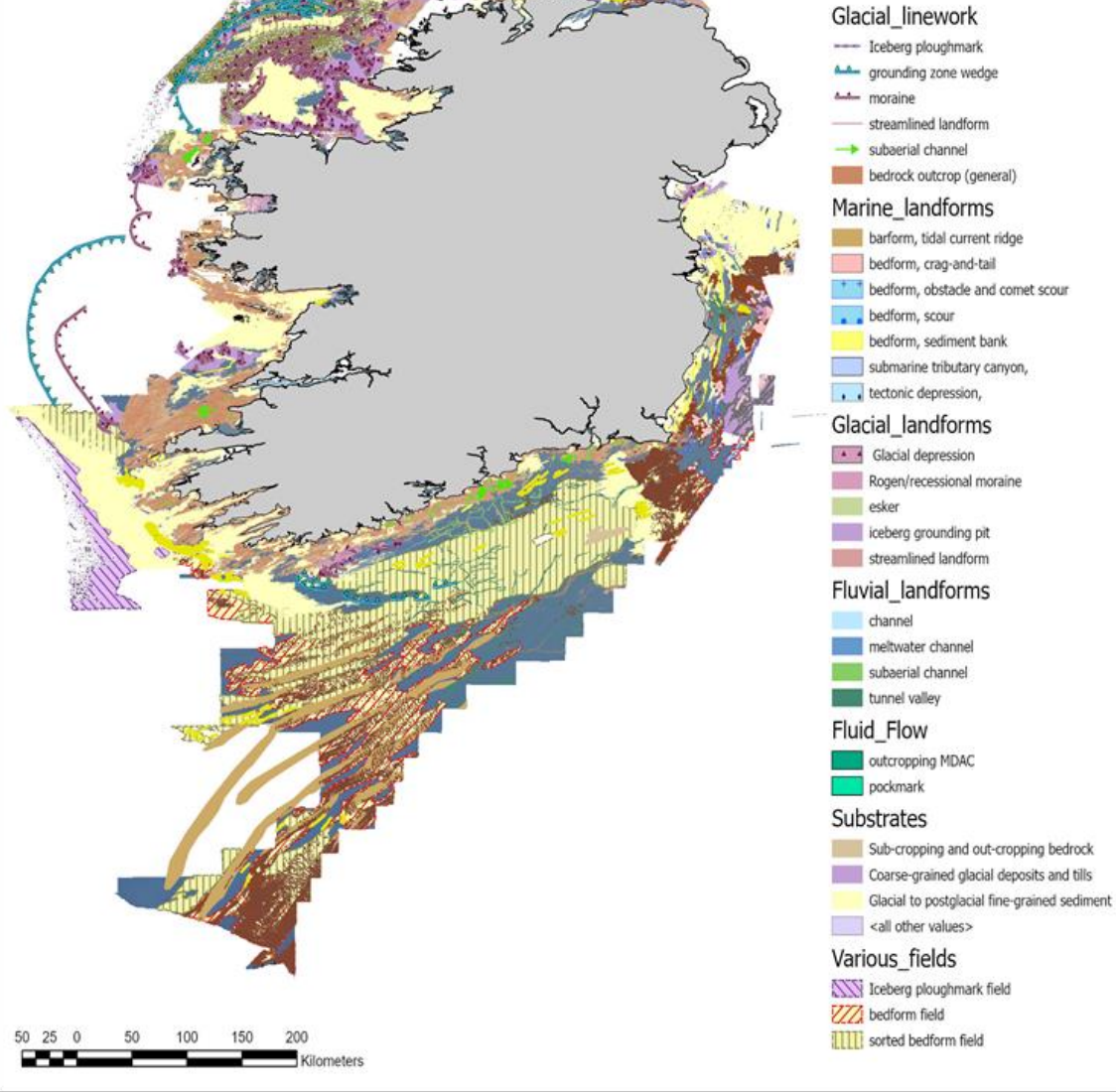


San Francisco 100 m resolution



San Francisco 10 m resolution

Source: Antti Lipponen - [Comparison of Spatial Resolutions in Satellite Images](#) | by Antti Lipponen | Medium



Research & Innovation

Blue Scale Maps | Public Engagement

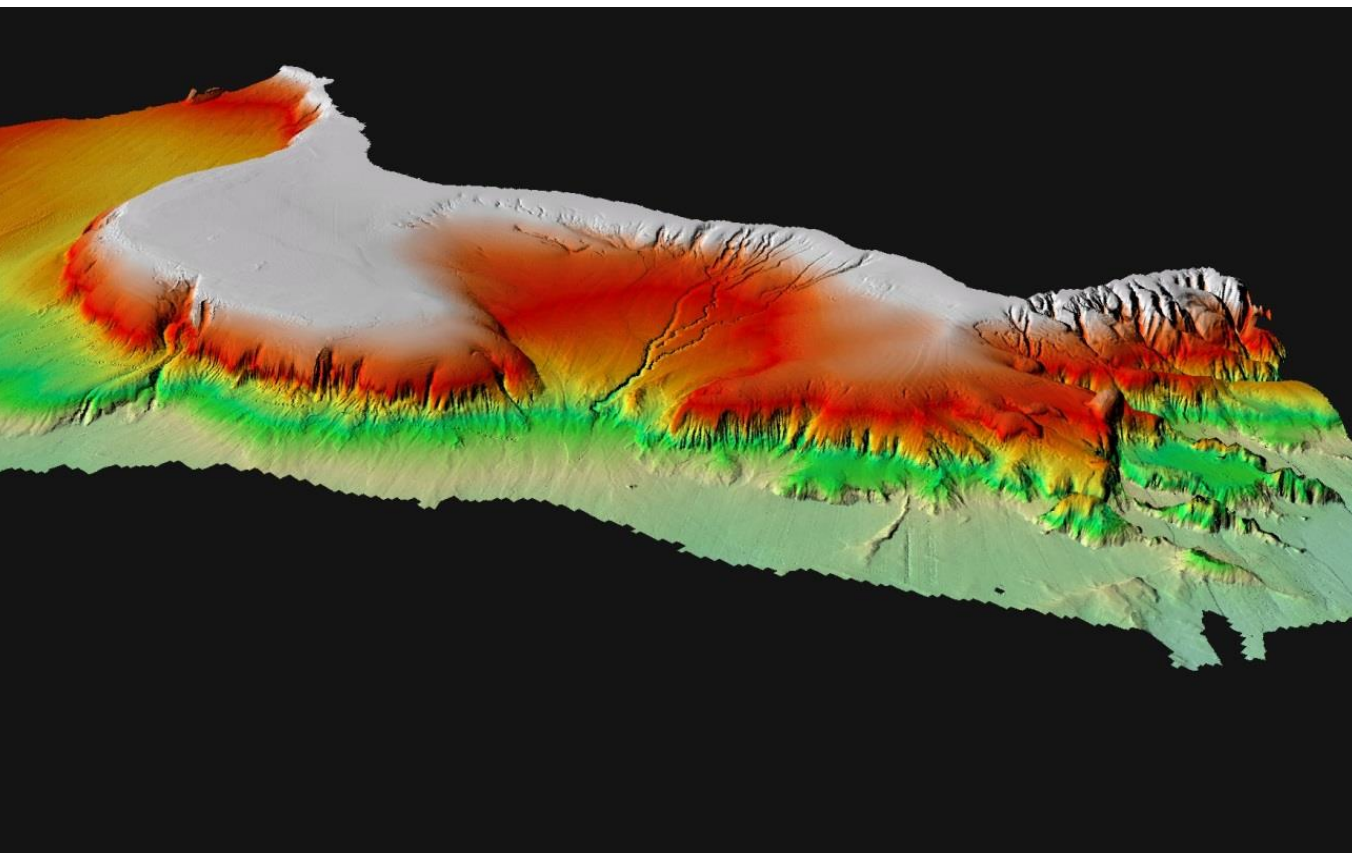
ORE Surveys | Plan Led Regime | Designated Maritime Area Plan

ML / AI | AUV Ops | Geomorphology | VME | Bedrock

Visual

ORESS 2.1

ML / AI



Seabed Classification | MSFD Habitat Map

Baseline habitat maps | Licensing / A. Assessments

Habitat Spatial Database | NPWS collaboration for OSPAR database contribution

Sensitive Ecosystem Analysis

Classify

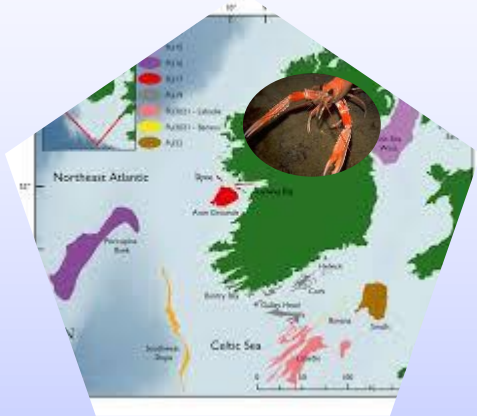
Map

Database

Analysis

Resource Assessment, Risk Management, Development & Growth

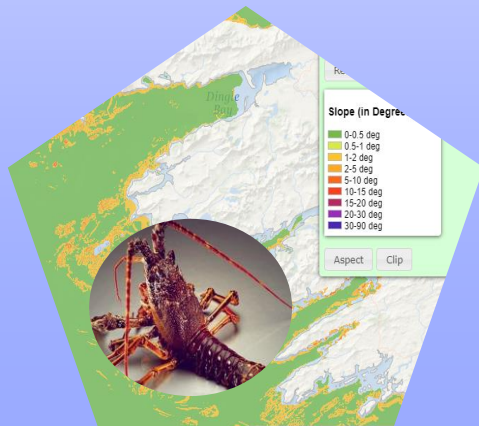
Mapping Fishing Grounds (Nephrops / Herring Spawning)



Mapping for Modelling (Oceanographic, Ecosystem, Flood Risk)



Habitat Suitability Modelling Spiny Lobster



Hyperspectral Seaweed Resource Assessment



Supporting SMEs

www.xocean.com



- Sustainably Fish
- Restore Biodiversity
- Manage Risk
- Measure Resources
- Reduce Human Effort
- Share Knowledge
- Reduce Carbon Footprint
- Develop Infrastructure

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Home

Synth

01. INTRO

04. ASSE THE NOR

07. PREV ACHIEVE

10. REGI PRESSUR AT THE L REGIONS

Foras na Mara
Marine Institute

Noise modelling and environmental risk assessment of a geophysical survey and its impact on herring and minke whales in Irish coastal waters

Final report 2.0

24 October 2023

Prepared for Marine Institute / Foras na Mara

DHI

EMODnet

EA

Start da

A European

The European Marine Observing System (EMOS) is a key component of the European Union's Maritime and Fisheries Policy. It is a multi-disciplinary, multi-scale, and multi-sectoral system that provides a comprehensive view of the marine environment. The EMOS is a key component of the European Union's Maritime and Fisheries Policy. It is a multi-disciplinary, multi-scale, and multi-sectoral system that provides a comprehensive view of the marine environment.

- Strategic Reports** | European Marine Board Future Science Brief #11 “Marine Habitat Mapping” (2024)
- Technical Reports** | EUSeaMap 2023 Technical Report (EMODnet Seabed Habitats)
- Status Reports** | OSPAR Quality Status Report 2023 MSFD – Status, Monitoring, Measures
- Research Reports** | Noise modelling and environmental risk assessment of a geophysical survey and its impact on herring and minke whales in Irish coastal waters (2023)



- IHO – International Hydrographic Organisation
- IOC – Intergovernmental Oceanographic Commission
- GEBCO – General Bathymetric Chart of the Oceans
- EMODnet – European Marine Observation Data Network

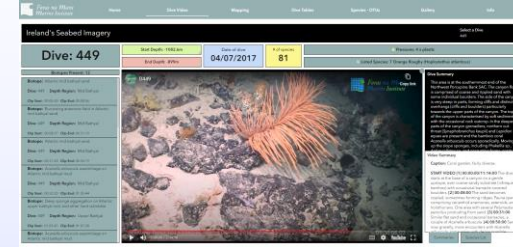


**EMODnet
Seabed
Habitats**

**IHO/IOC
Seabed
2030 /
GEBCO**

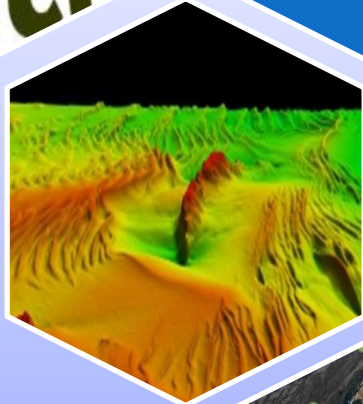
**Mission
Atlantic**
*H2020
Integrated
Ecosystem
Assessment
WP Lead*

*Shipwreck
Pollution Risk
Assessment
(Post Doc)*



SeaRover

2016
-2018



**All-Atlantic
Ocean
Research
&
Innovation
Alliance**

ASMI WG
Mapping
Network /
Roadmap

Universities
Eurofleets+
**MSc
Training
Module**

**SeaShelf
EMFAF
Shelf Habitat
Mapping**



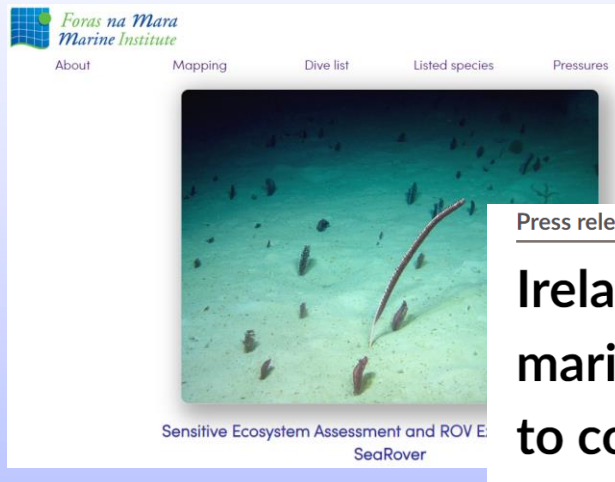
MIM WG
**MAREANO
INFOMAR
MAREMAP
Working
Group**

*Research
WGs
Projects
Informal
MOUs*



Impact of SeaRover ROV Ops (2017-2019)

SeaRover - [MERC/Bernard Picton](#)
SeaRover – [MI IS&D version](#)



Press release

Ireland announces major boost in marine environmental protection to coincide with COP15

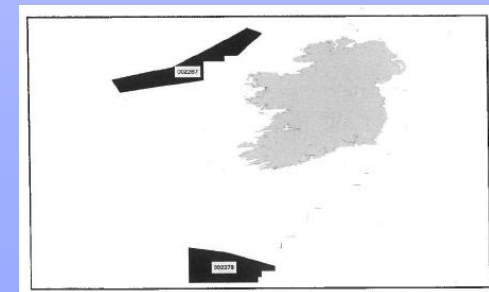
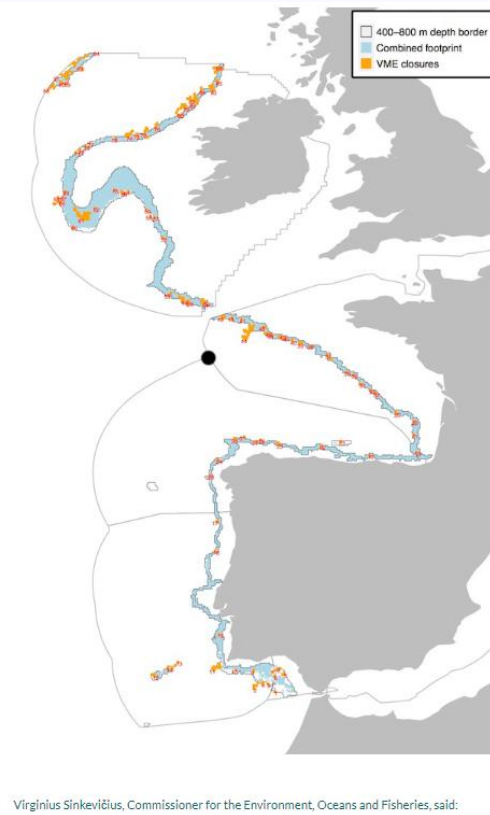
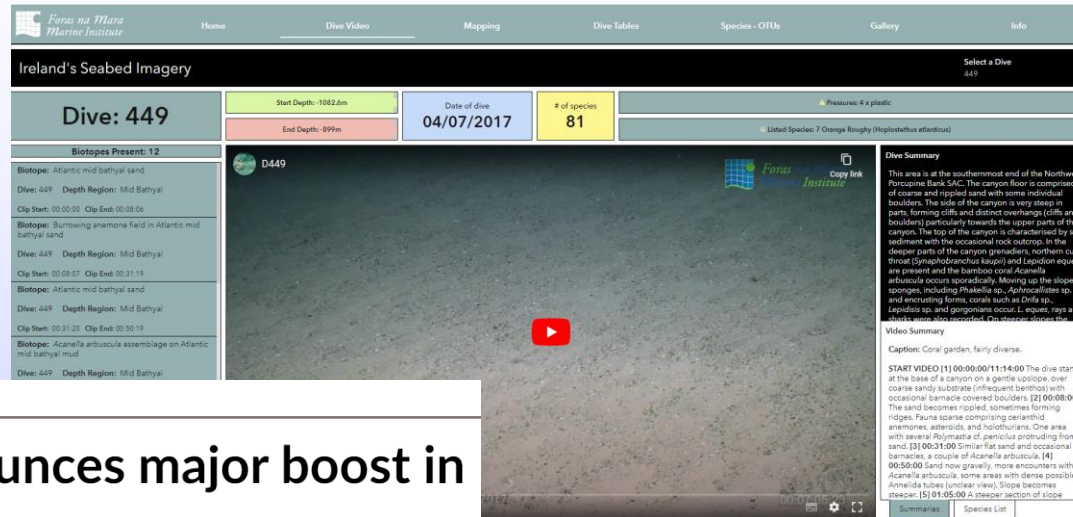
ICES Special Request Advice
EU ecoregions
Published 5 January 2021

From [Department of Housing, Local Government and Heritage](#)
Published on 13 December 2022
Last updated on 13 December 2022

EU Request to advise on the list of areas where VMEs are known to occur or are likely to occur and on the existing deep-sea fishing areas (ref. (EU)2016/2336)

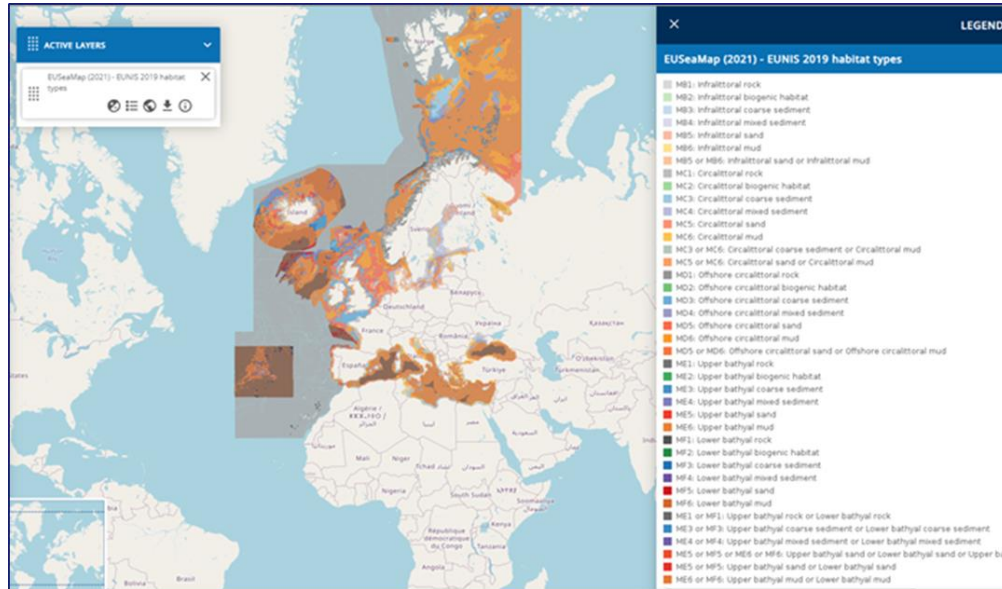
The EU Commission has acted to close 87 sensitive zones to all bottom gears in the EU waters of the North-East Atlantic.

Based on the Deep-sea Access Regulation and on the advice from the scientists of the International Council for the Exploration of the Sea (ICES), the new regulation protects 57 vulnerable deep-sea ecosystems.



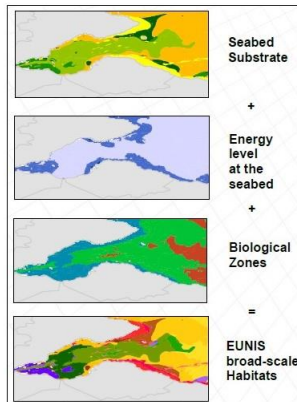
EMODnet Seabed Habitats

Overview



Combining substrate and environmental variables to make EUSeaMap

- Seabed substrate, qualitative energy classes and biological zones are known as **habitat descriptors**
- Layering all these habitat descriptor layers in a GIS will produce a **predictive habitat map**
- Approach used primarily in **broad-scale** habitat mapping projects



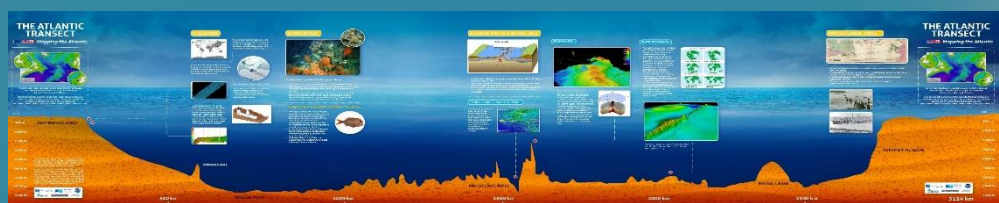
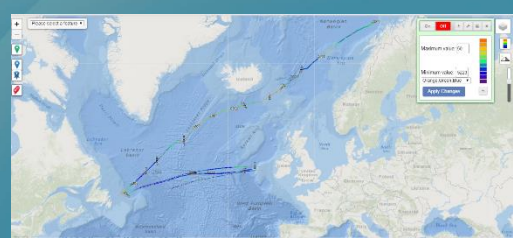
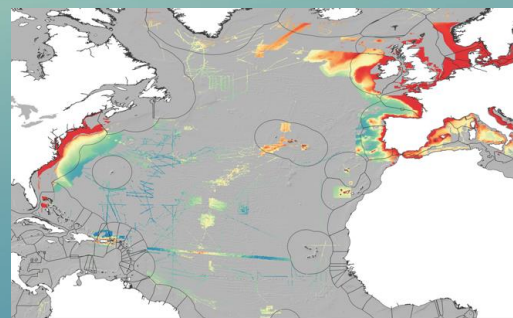
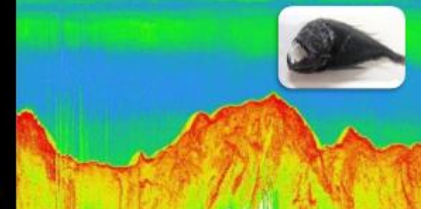
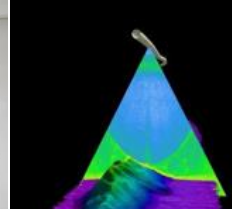
One of seven European Marine Observation and Data Network (EMODnet) themes, EMODnet Seabed Habitats represents a long-term initiative assembling marine data, metadata and products, and making them accessible to the wider community.

It represents the one-stop-shop for accessing seabed habitat data in Europe, with a library of over 900 habitat maps from survey, and hosting nearly 500,000 point observations of habitats.

Phase 4 (2021-2023) expanded geographical coverage of EUSeaMap to the Caspian and some EU jurisdictions in the Caribbean. Phase 5 (2023-2025) will see continued enhancement of EUSeaMap in Europe and the Caribbean region.

First Collaborative Atlantic seabed mapping survey

by
Atlantic Ocean Research Alliance



Seabed Mapping WG (2015-2020)

- Partners – Gov / Industry / Research
- Hydrographers, Data, Geoscience, Habitat, Oceanography, Survey, Educators
- Delivering;
- Maps - Grey / Black / Blue = Unmapped!
- Open Data & Science for Policy & Management
- Methodologies for Systematic Mapping (A. Armstrong)
- Standard Operating Procedures
- Infrastructure Access & Effective Deployment
- Capacity Build, Training & Connectivity (Seabed2030)
- Awareness & Public Engagement

Related Research Programmes:

- iAtlantic (mapping WP - Colin Devey, GEOMAR)
- Mission Atlantic (H2020) WP Lead on Seabed & Habitat Mapping, T. Furey)



People

Infrastructure

Requirement



All-Atlantic Ocean Research Forum

FROM POLE TO POLE

6 - 7 February 2020

#AtlanticAll

Bathymetry AND Benthic Atlantic Mapping Framework Considerations

Planning Phase

- Policy Drivers
- Legal Constraints
- Socioeconomics
- Priorities
- Methodologies
- Standards
- Infrastructure
- Partnerships
- Effort & Plans

Delivery Phase

- Funding
- R&I Support
- Outreach
- Progress Tracking
- Data Sharing
- Capacity Build
- Societal Engagement

D4.1 - Framework for future Atlantic cooperation on seafloor mapping efforts & prioritisation of seabed targets for

IEA (<https://missionatlantic.eu/results/>)

