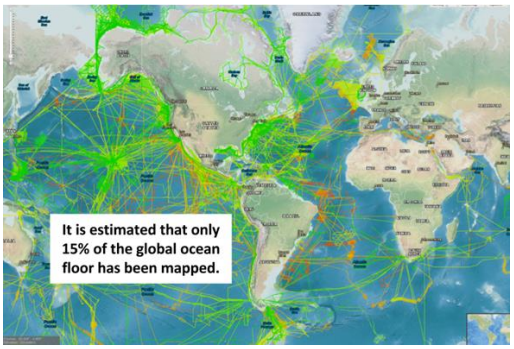
ATLATNIC OCEAN MAPPING

INTRODUCTION

The collecting and sharing of multibeam sonar data exemplifies INFOMAR'S dedication and resolve to map the ocean. There is general consensus that less than 20% of the ocean floor has been mapped. By making this data open and available, this bathymetry will add to the foundational knowledge for understanding global ocean systems. Bathymetry steers ocean circulation, provides the foundation for underwater habitats, and impacts vessel traffic and safety.



PROJECT BACKGROUND

Atlantic Ocean Research Alliance (AORA) formed following the signing of the Galway Statement on Atlantic Ocean Cooperation between Canada, the EU and the US in May 2013. Its goals are to join resources of its three signatories to better understand the North Atlantic Ocean and to promote the sustainable management of its resources. Priority areas include, seabed mapping, aquaculture, ocean literacy, ocean health and ocean observation/prediction.

A key component of the Atlantic Ocean Research Alliance is the **Atlantic Seabed Mapping Working Group** which INFOMAR staff are active members. The specific aims are to undertake a collaborative EU, US, & Canadian multibeam echo sounder (MBES) survey.

AORA: https://www.atlanticresource.org/aora/

INFOMAR INVOLVEMENT TO DATE

1st Trans-Atlantic mapping survey (Fig 1) took place from June1-8, 2015 on board the Irish research vessel, RV Celtic Explorer. A multibeam survey team joined the vessel in St. John's, Newfoundland, representing each of the signatories. The Irish lead survey was supported by INFOMAR staff.

The team gathered information on the physical characteristics of the seafloor, such as depth, hardness, and sediment cover, while also acquiring valuable oceanographic data including temperature, salinity, and fluorescence. They uncovered 235km2 of iceberg scarred seabed **(Fig 2)**, ancient glacial moraine features, and buried sediment channels on the Newfoundland and Labrador shelf. They charted a 15km long down-slope channel feature on the western Atlantic continental slope. They crossed the Charlie-Gibbs Fracture Zone on the Mid-Atlantic Ridge creating a 3D visualisation of a 3.7km high underwater mountain **(Fig 3)**. Continuing eastward a straight asymmetric ridge feature **(Fig 4)** was surveyed over 140km long, peaking at 1108m high. It also targeted the drop location for the first trans-Atlantic telecommunications cable laid in 1857 between Ireland and Newfoundland, and set out to groundtruth seafloor features identified through satellite altimetry research in the last two years.

INFOMAR'S involvement in subsequent surveys expanded coverage on features and areas covered in the first Trans-Atlantic survey. The INFOMAR team have also trialled remote accessing of the Multibeam Echosounder to assess the future feasibility of tri-lateral 24-hour supervision of the multibeam echosounder by remote

experienced hydrographers and data analysts. Should this be successful it will be another milestone on the path to a developing a cost-effective mapping campaign of the North Atlantic.

Media coverage of 1st Trans-Atlantic: https://vimeo.com/133034327
Interactive Story map 1st Trans-Atlantic: http://www.infomar.ie/StoryMaps/Atlantic/index.html

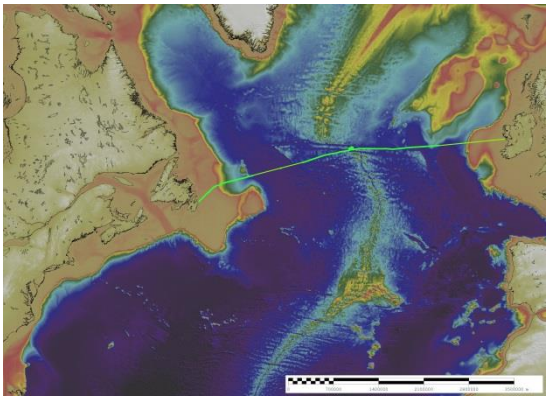


Figure 1: First Trans-Atlantic Survey Route

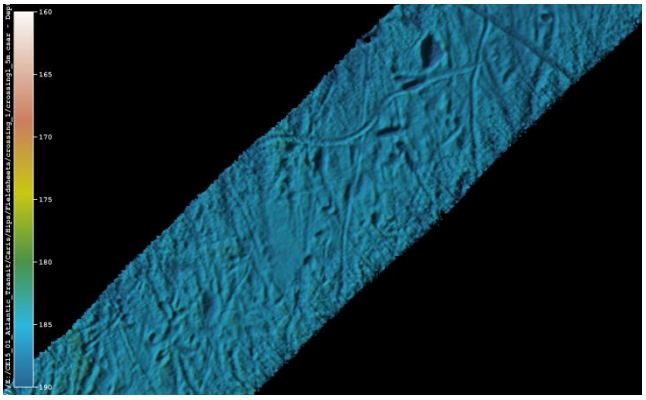


Figure 2: Iceberg scarred seabed

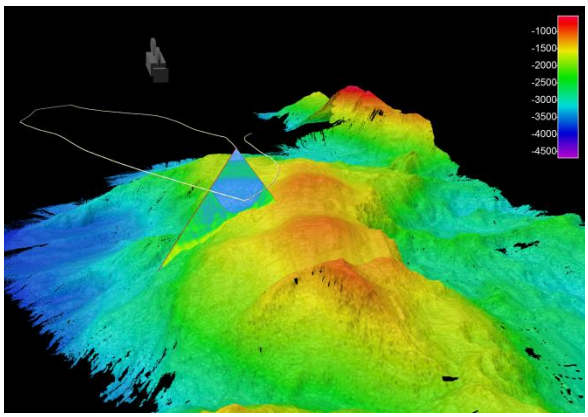


Figure 3: Underwater Mountain

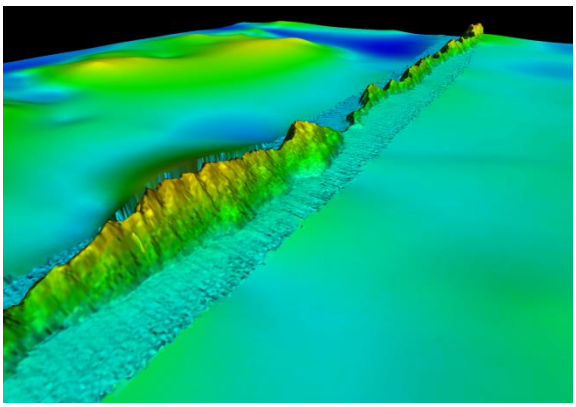


Figure 4: Straight asymmetric ridge feature

FUTURE PROJECT OUTCOMES

Information from the sea-floor is vital to the sustainable management of the Atlantic as well as to important industries such as fisheries, aquaculture and tourism. Ireland has developed a world-leading reputation for sea-bed mapping. AORA mapping group intends to produce seabed terrain data and visualization products, both for science, and the public. They want to encourage seabed mapping related EU, US, Canadian research, data and operational collaboration and create momentum and interest in mapping a largely unsurveyed Atlantic Ocean. The final outcome will hopefully involve an entire bathymetric grid of the largely unmapped Atlantic Ocean. This will help Irish business and researchers to compete in a global environment. All which have been largely underpinned by mapping done by INFOMAR.

Results from the Atlantic Transects were presented at the **Harnessing Our Ocean Wealth (HOOW)** conferences, and at the Seabed Mapping Working Group meets.

HOOW Report :
https://www.ouroceanwealth.ie/sites/default/files/sites/default/files/Publications/2012/HarnessingOurOceanWealthReport.pdf

The Atlantic Mapping Project is an **EU Horizon 2020 Framework Programme** and **FP7 funded** projects that support the International dimension of the EU Atlantic Strategy via the Galway Statement: **Horizon 2020 :** https://ec.europa.eu/programmes/horizon2020/