Hydrogen Salt Storage Assessment (HYSS) Grant Agreement – 21/RDD/673

Kick Off Meeting

7th April 2022

07/04/2022

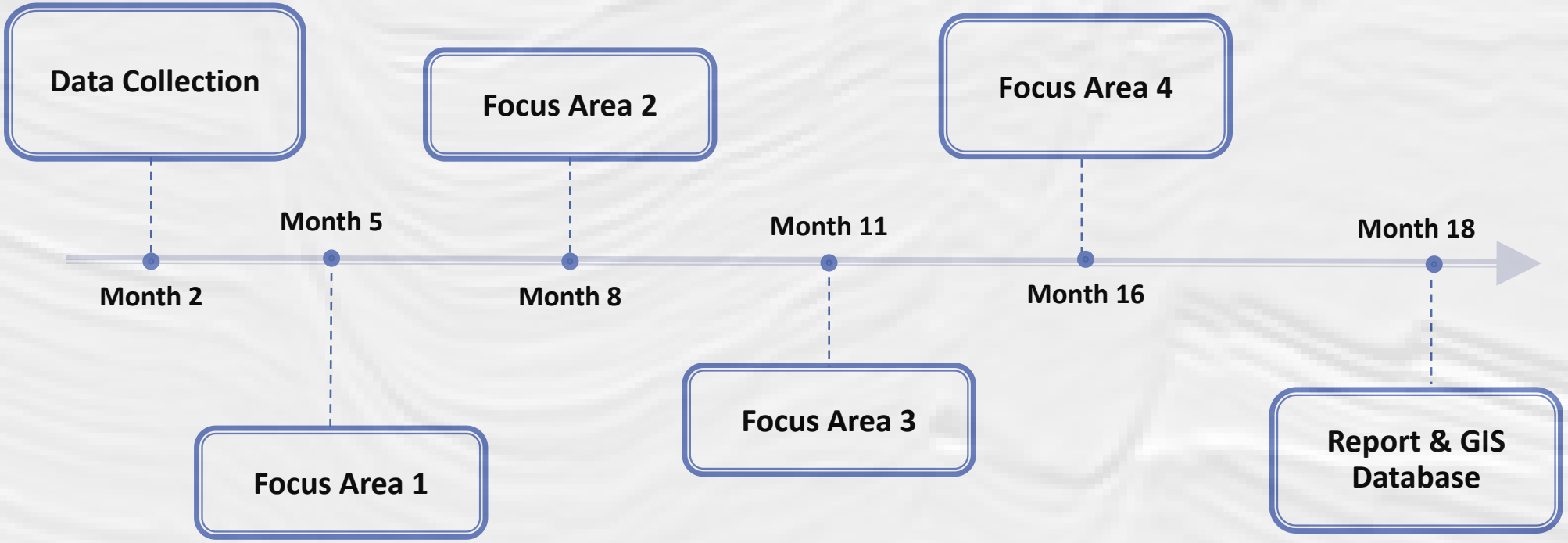
OBJECTIVES

- Fill identified data gaps in reports on potential of hydrogen storage offshore Ireland.
- Repurpose existing hydrocarbon industry datasets to evaluate the extent of geological salt formations.
- Assess hydrogen storage potential within manmade salt caverns.
- Identify potential surface, subsurface and environmental risks.
- Focused on areas suitable for offshore renewable energy development-
    - Focus Area 1: Kish Bank Basin
    - Focus Area 2: Irish Sea Basins
    - Focus Area 3: Celtic Sea Basins
    - Focus Area 4: Atlantic Margin Basins

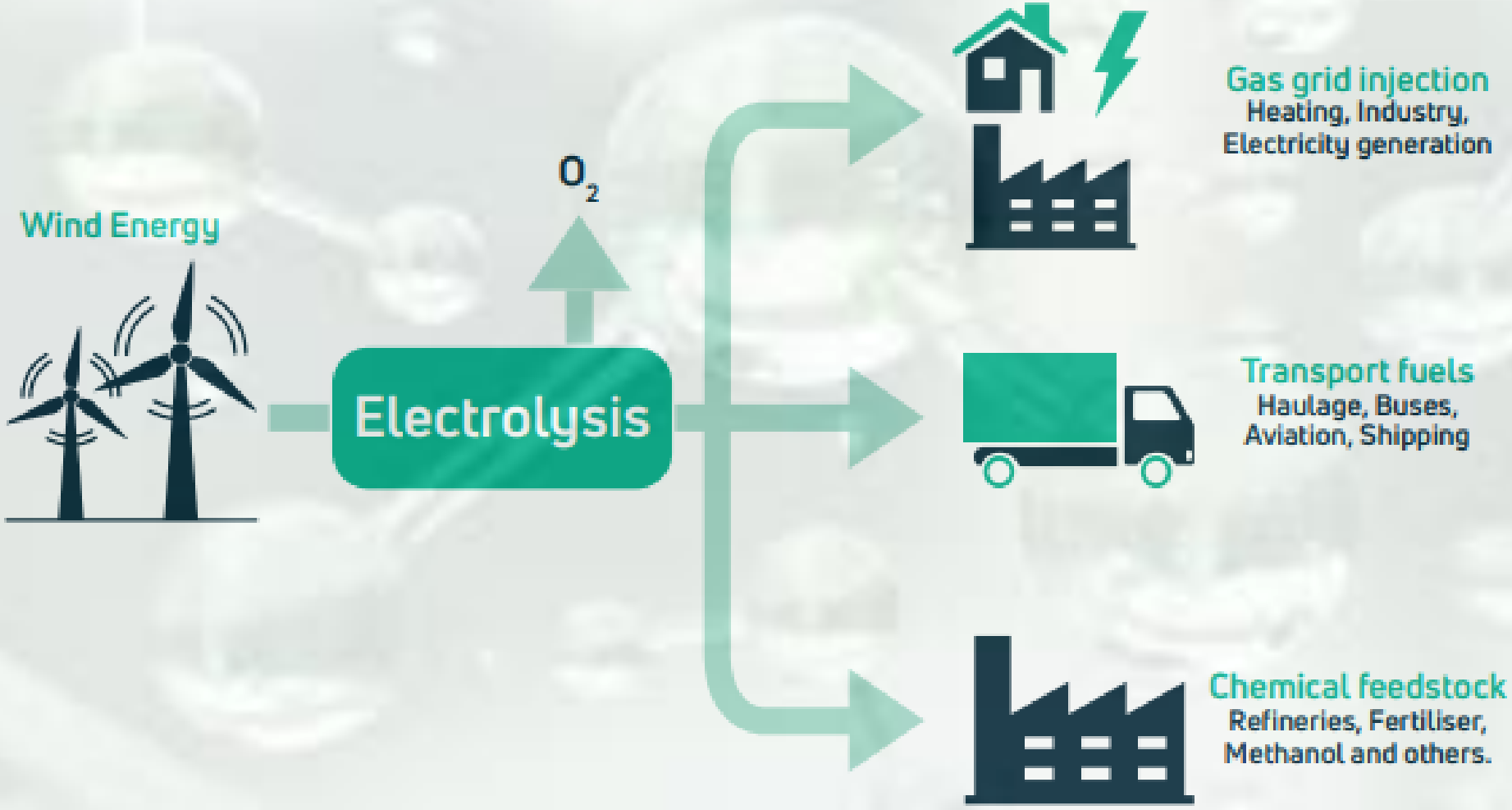
DELIVERABLES

- Public domain report and digital deliverables defining extent of geological salt formations.
- GIS project with all relevant spatial datasets/outputs.
- Common risk segment maps of surface and subsurface risks.
- Highlight potential synergies between energy generation storage offshore Ireland.
- Presentations at suitable industry forums/technical conferences and peer reviewed journals.
- All datasets made available to SEAI for future interrogation/further study.

Project Timeline

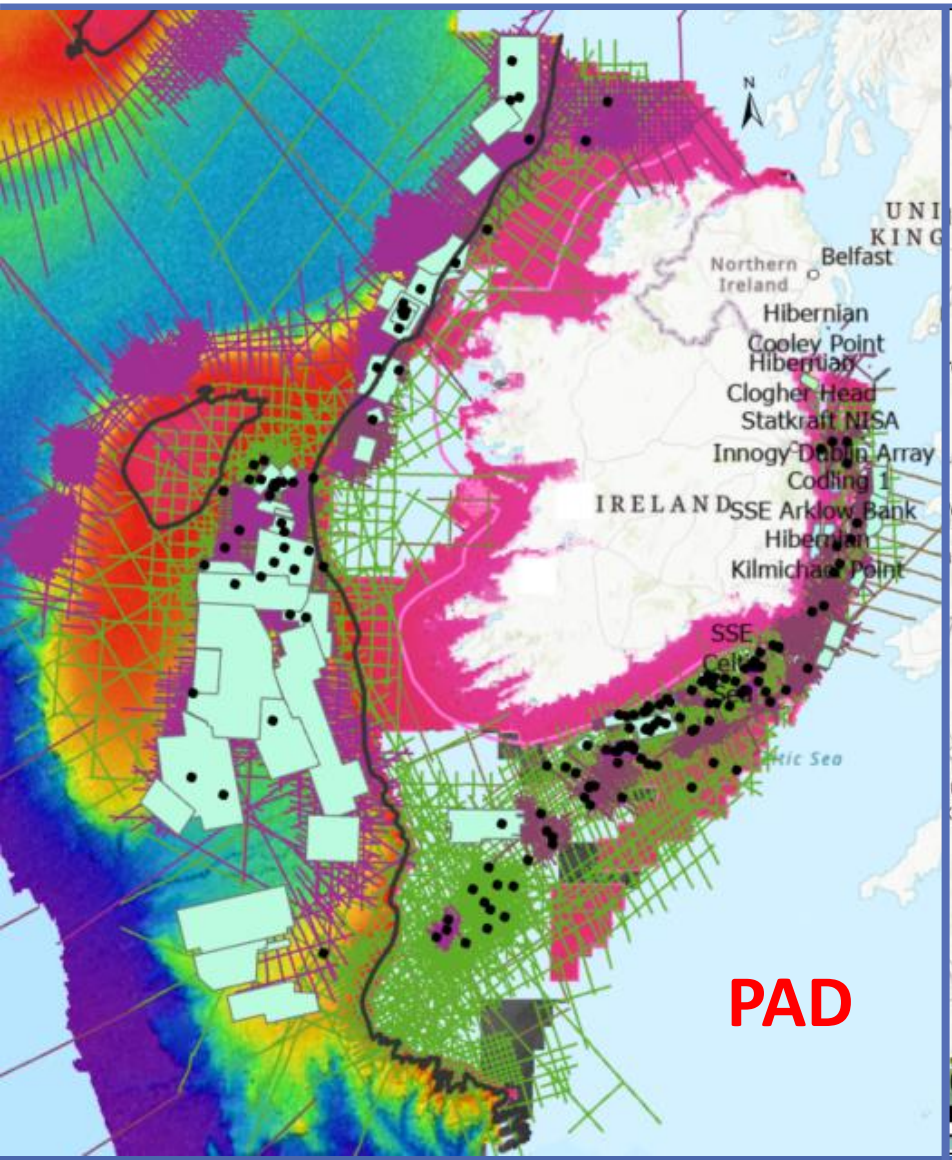


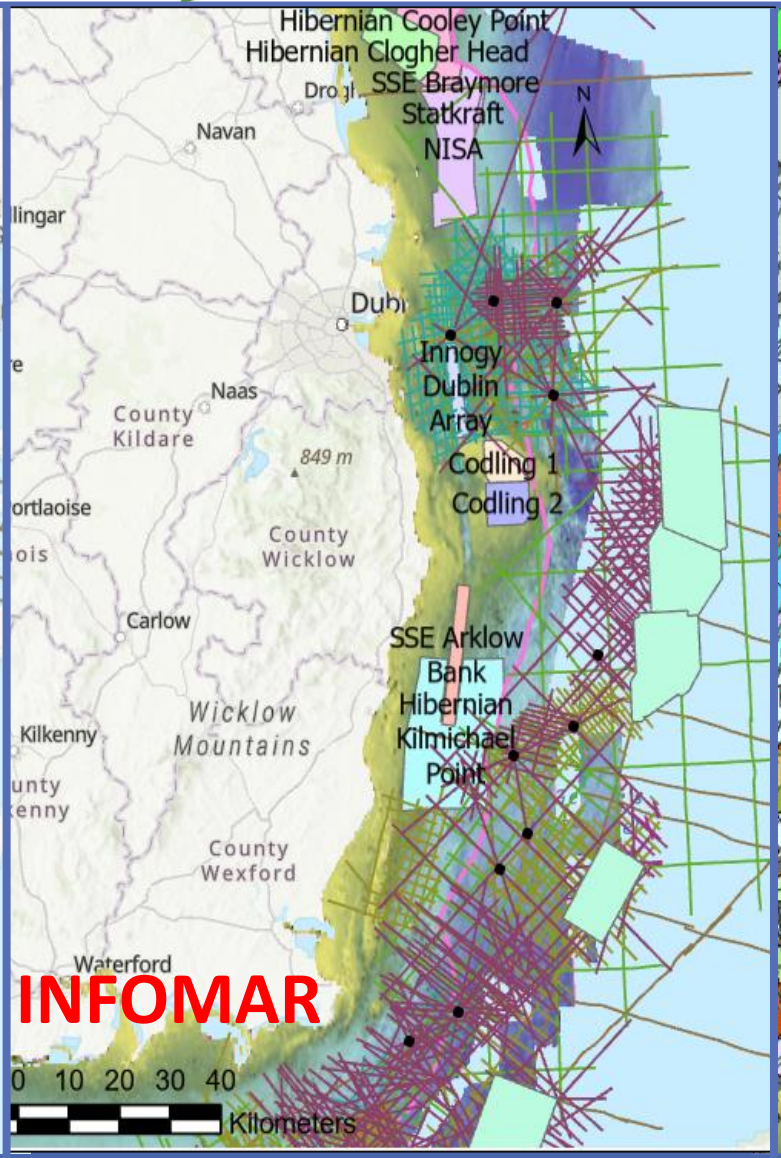
Green Hydrogen Model

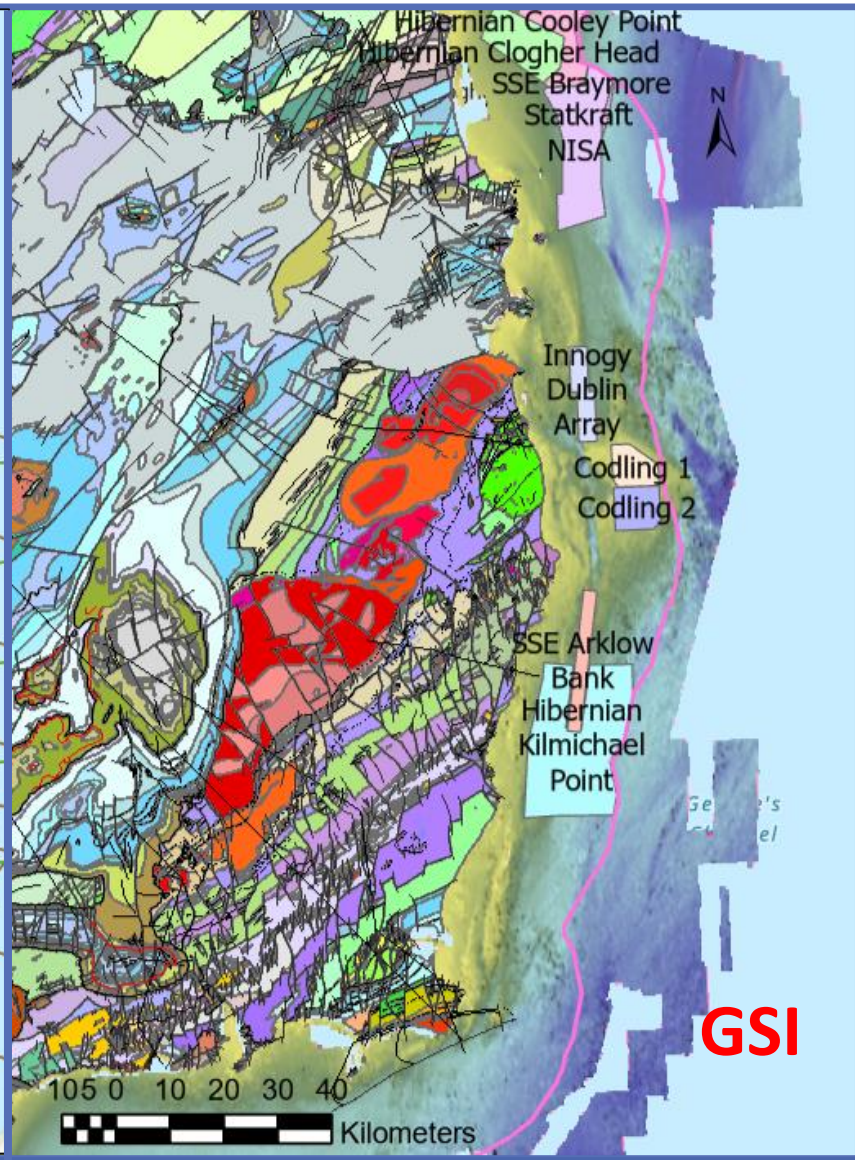


Courtesy: Wind Energy Ireland. Hydrogen & Wind Energy, Jan 2022.

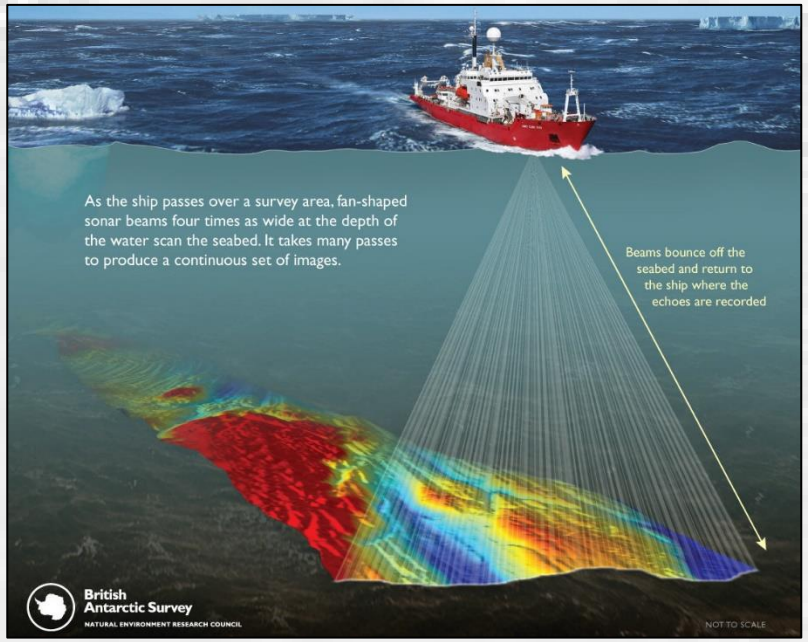
Phase 1: Integrating Geo Datasets

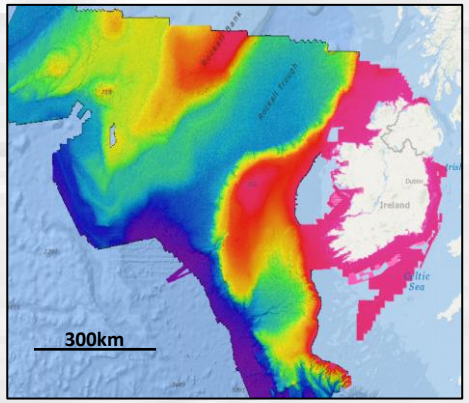




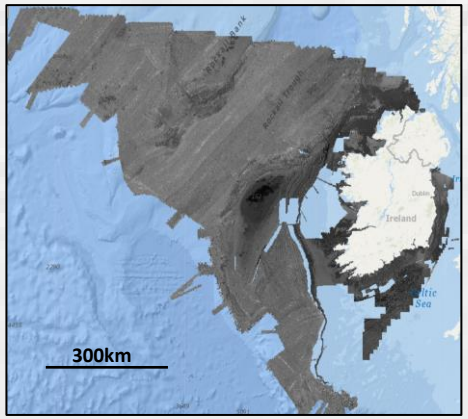


INFOMAR: Bathymetry & Backscatter Products

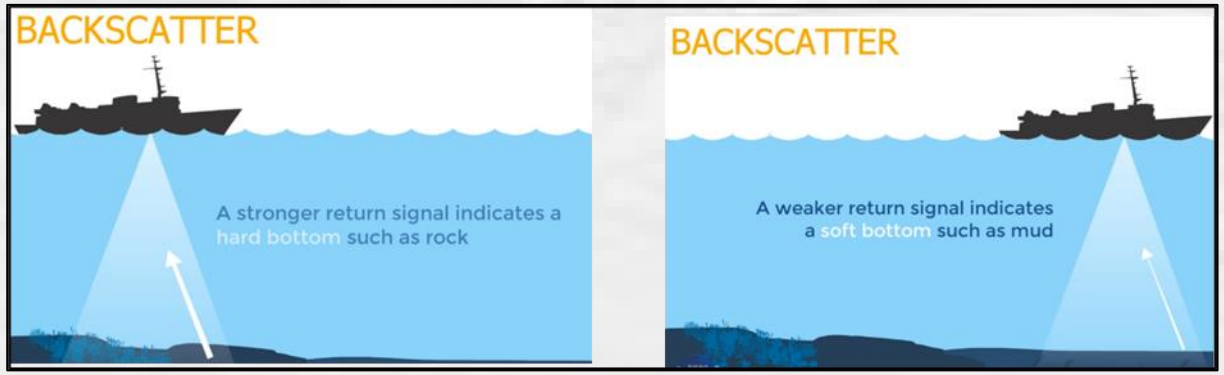




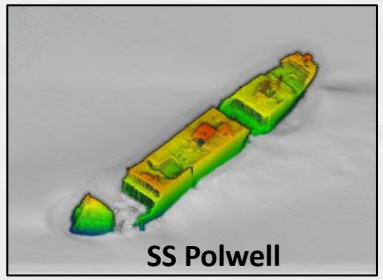
Bathymetry Survey Coverage



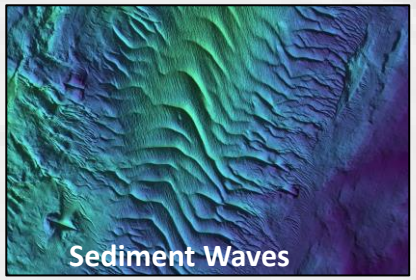
Backscatter Survey Coverage



- The primary acoustic devices used by the INFOMAR programme are Multibeam Echosounder (MBES), Singlebeam Echosounder (SBES), Shallow Seismic / Sub Bottom Profiler (SBP), and Side Scan Sonar (SSS).
- The bathymetric data is a dataset that has being acquired and processed to international hydrographic standards. It produces high quality digital maps that are easily accessible through the INFOMAR data portal.
- Backscatter is when different seafloor types return the acoustic signal with different levels of energy. These differing values in intensity or 'scatter' are used to examine the nature of the seafloor in a backscatter chart.
- Data acquisition gaps should be considered, as there are areas where data still needs to be acquired as part of programme strategy to end 2026.

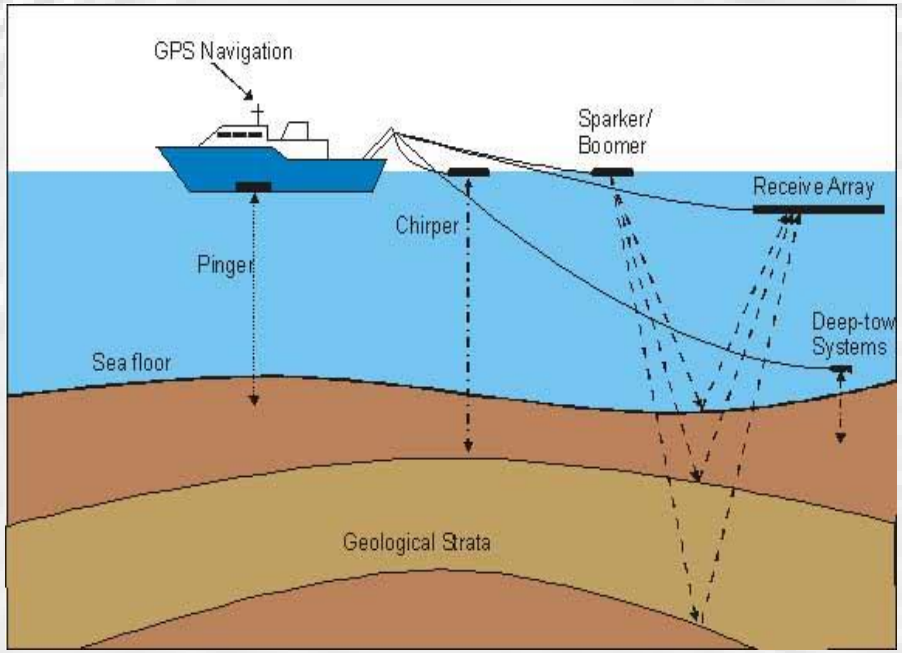


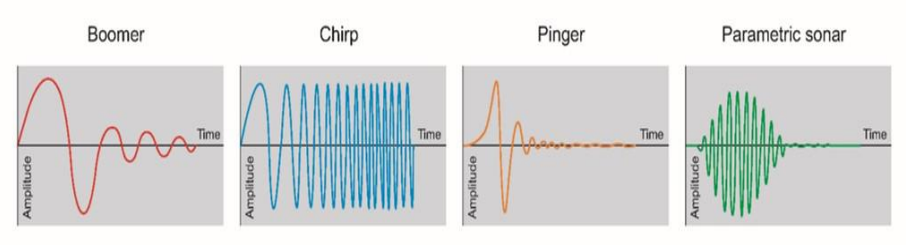
SS Polwell

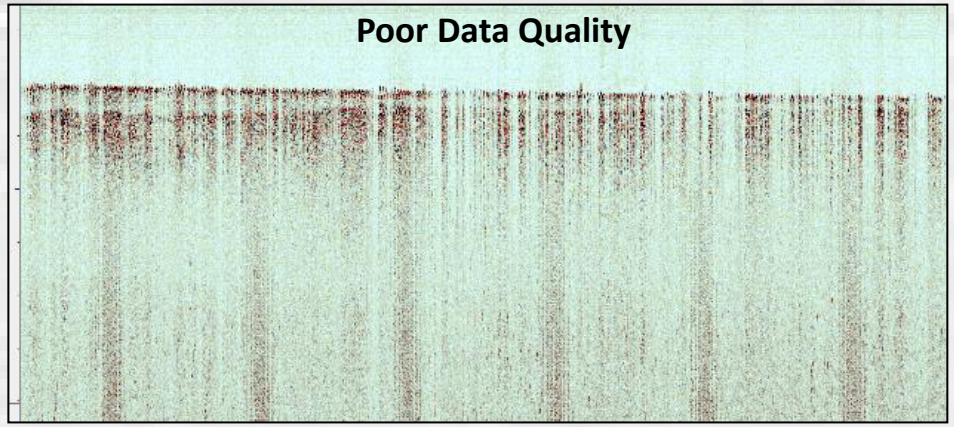


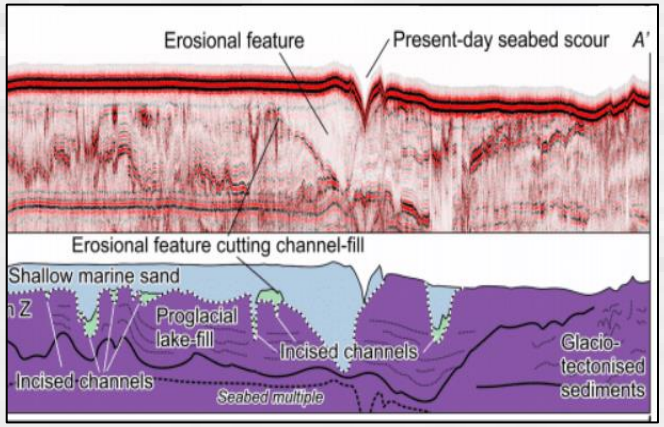
Sediment Waves

INFOMAR: Shallow Seismic and Sub Bottom Profile (SBP) Data



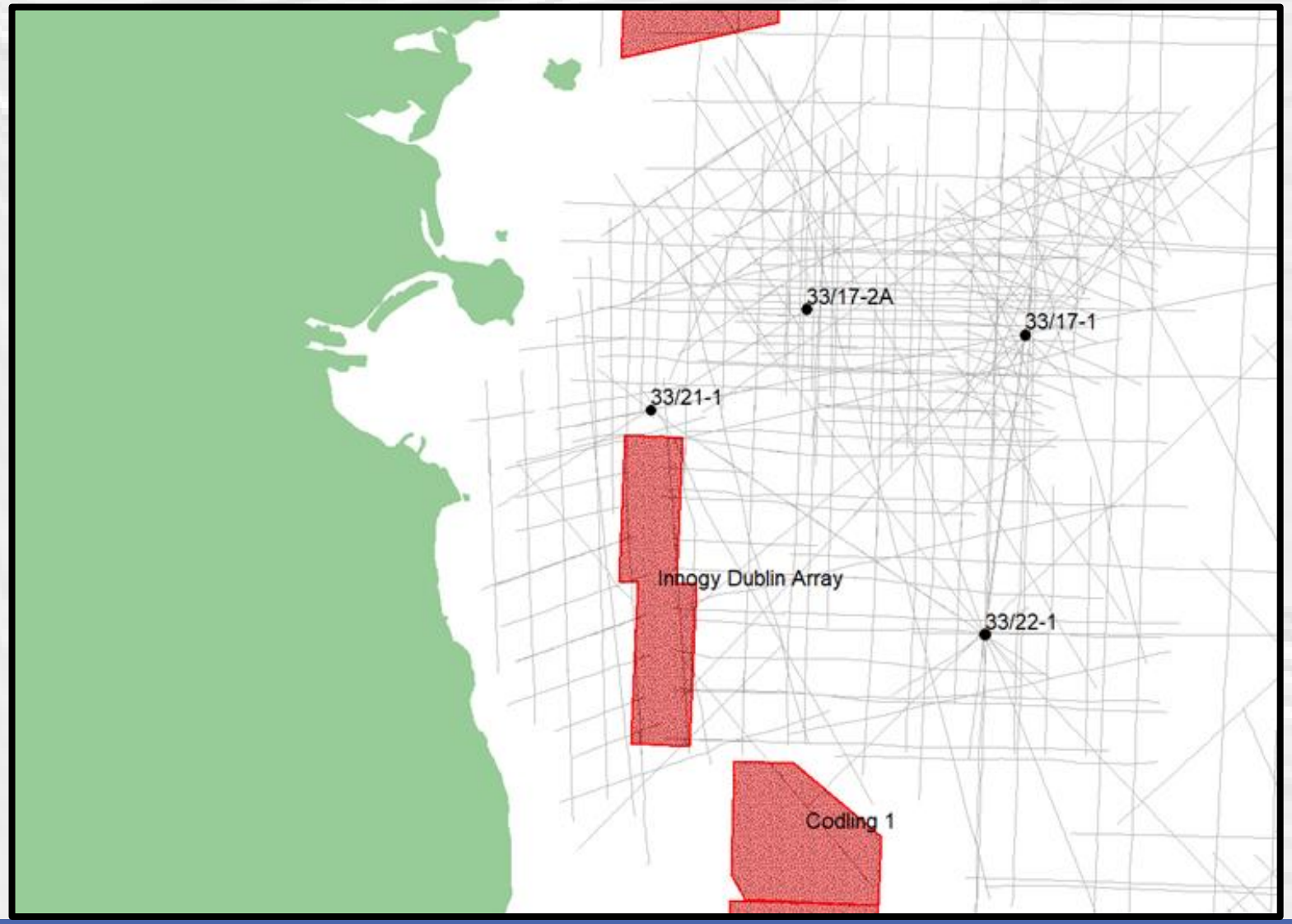






- The SBP data is the most valuable geophysical dataset when constructing an accurate ground model particularly for offshore fixed bottom installations and cabling onshore.
- The SBP data is considered a value-added product and so data quality is variable.
- Seismic processing and reprocessing are key to unlocking the value of this dataset.
- Higher end software packages offer advanced processing capabilities which leads to data quality enhancement and uplift.

KISH BANK DATA & PROPOSED ORE



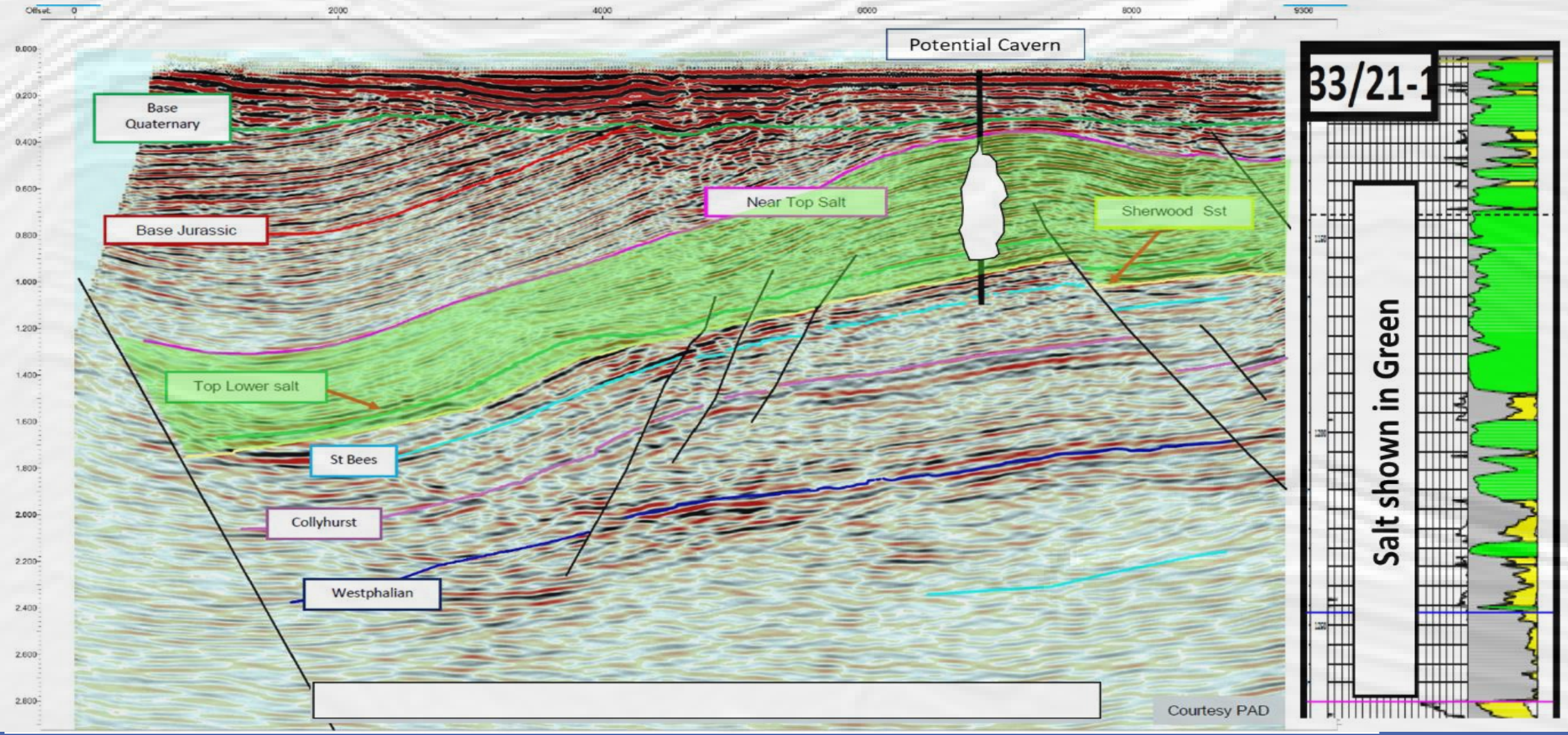
Kish Bank Seismic Data

Geological Survey Suirbhéireacht Gheolaíochta Ireland | Éireann

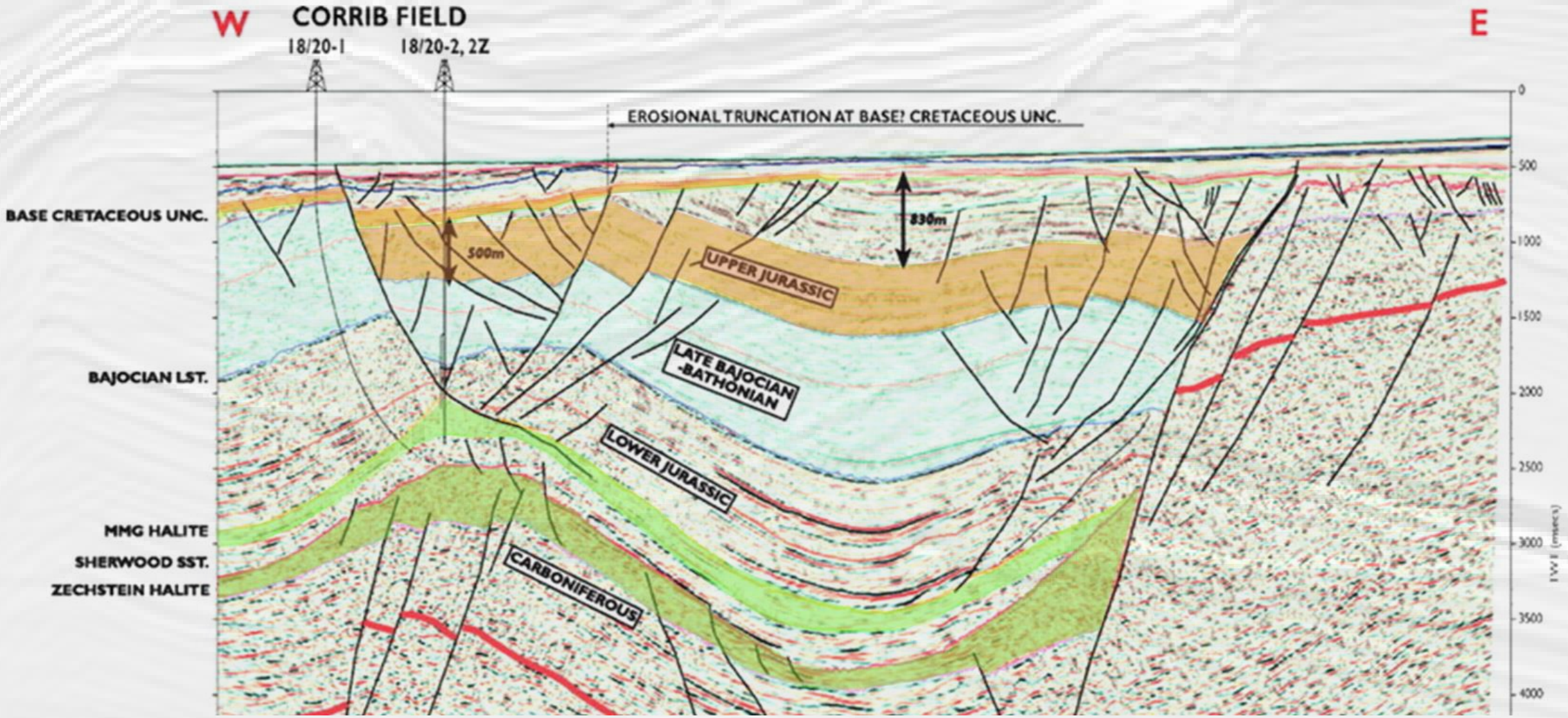
seai SUSTAINABLE ENERGY AUTHORITY OF IRELAND

SLR

ILLMATIC ENERGY



Atlantic Seismic Data



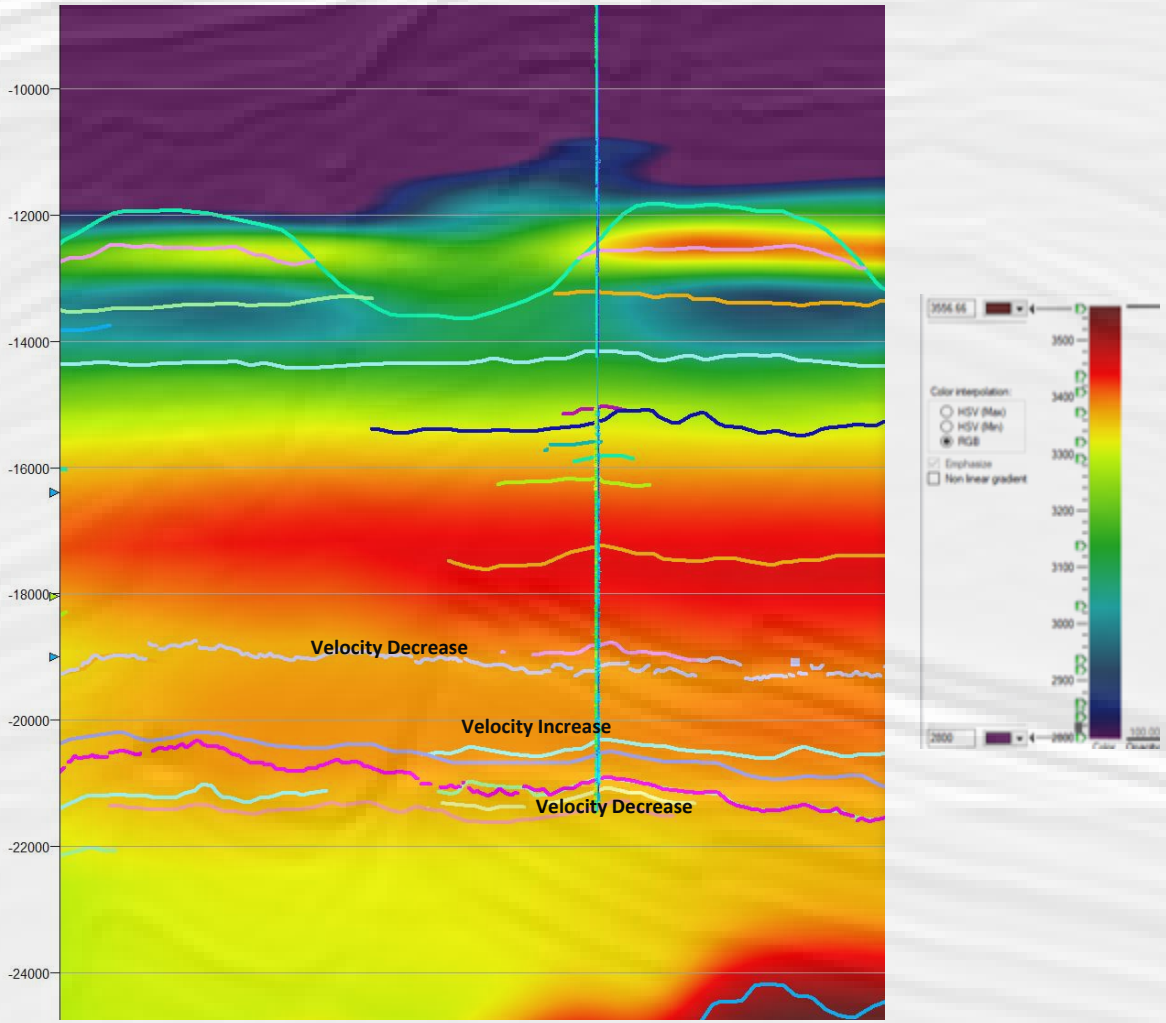
Overpressure & Seismic

Seismic is sensitive to pressure changes since there is a relation between porosity, compaction, acoustic parameters and pore pressure.

An increase in burial depth leads to an increase in compaction and a decrease in porosity. Hence, shear and bulk modulus increases with depth leading to a decrease in rock compressibility and an increase in velocity.

In an overpressure zone, the compaction rate is decreased, and sometimes it even ceases. The acoustic velocity decreases in the overpressure zone because of the decrease in compaction. Hence, the seismic can be a powerful tool to detect overpressure zones.

Well A



Support

Accessing seismic data from GRO.

Propose providing a large secure disk for transfer.

Access to marine traffic density.

Shipping.

Fisheries.

Leisure.

Precise locations of proposed ORE activity.

Suggested integrations with other SEAI/GSI funded projects?

End