

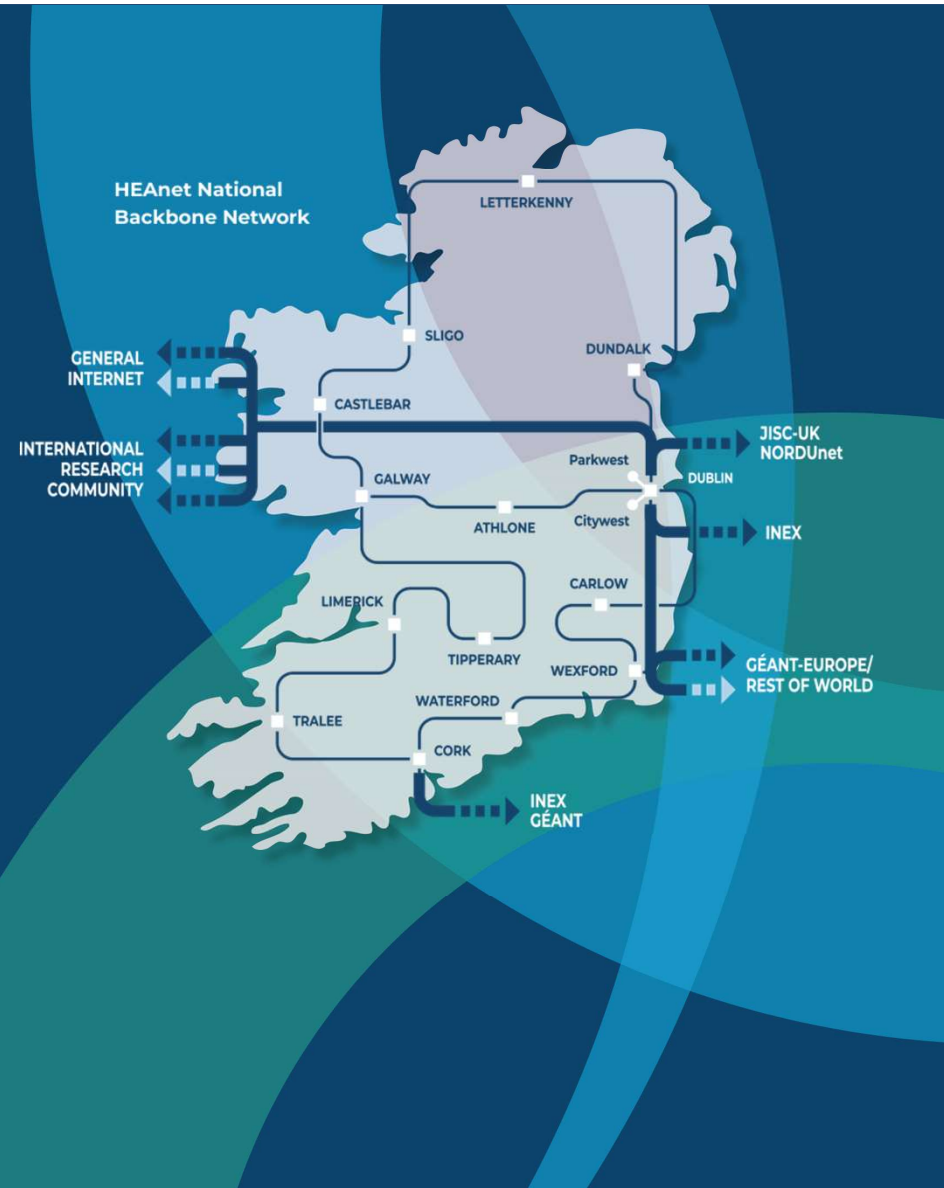
HEAnet Fibre Sensing Update

15th SIG-NGN Meeting

Bergen

9/9/2024

Eoin Kenny





Overview

- HEAnet's Journey
- Current plans
- Medium term
- Longer term

HEAnet's Fibre Sensing Journey

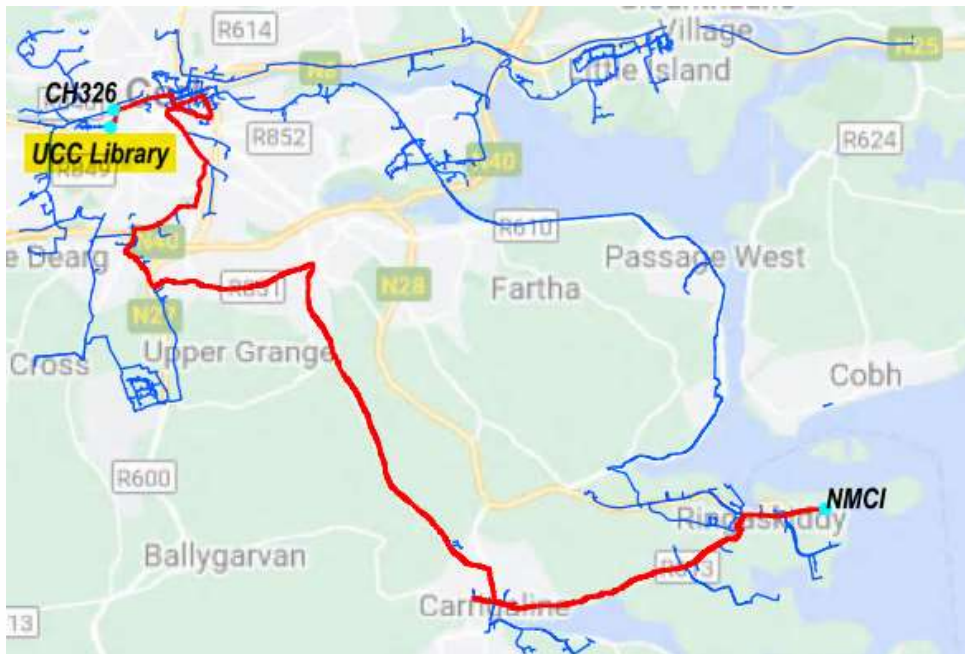


Current plans

- Terrestrial metro fibre CWDM DAS pilot
- Terrestrial L-Band DAS national pilot
- Submarine spectrum - SOP spectrum testing

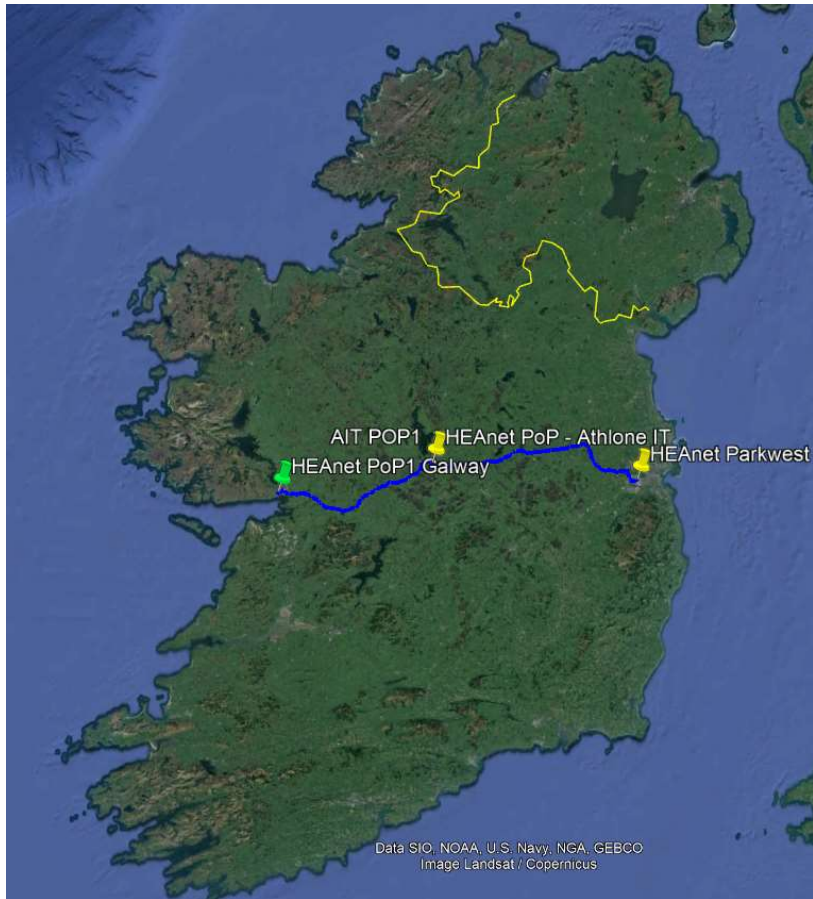


Cork Metro Pilot - DAS on a metro CWDM fibre



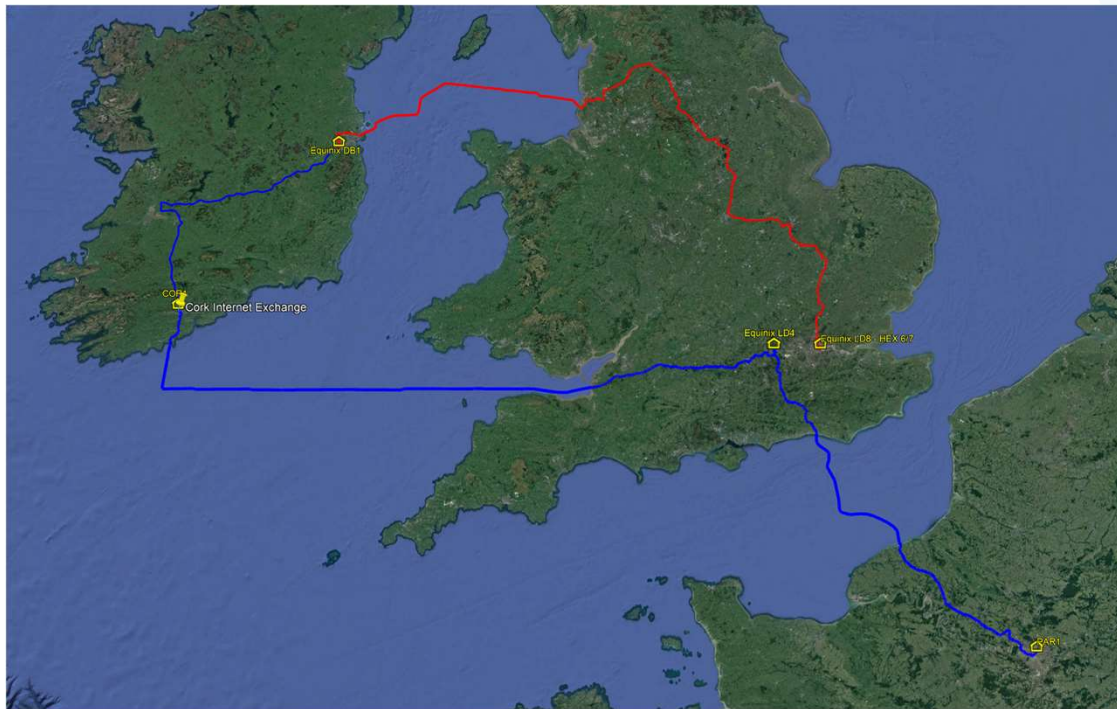
- CWDM MUX and OADMs
- 1550 window for DAS
- 28Km of fibre
- Photonic group
- Commercial DAS system
- September 2024

National Pilot L-Band DAS



- Dublin – Athlone 141.7Km and 29dB
- Athlone – Galway 112Km and 29dB
- ROADM network with L-Band splitters
- Two L-Band DAS systems – one on each span
- Seismology
- January 2025

GÉANT Ireland Connectivity



- GÉANT Ireland Links
- Spectrum only
- Amplifiers
- EXA Infrastructure
- What is feasible?
- SOP?
- Very long – noisy
- SOP x 2 wavelengths

Medium term

- Submarine fibre - Dark vessel detection
- Aerial fibre – temperature sensing
- Submarine fibre - seismology/climatology



Dark Vessel Detection Competition

Maritime Situational Awareness

- *An increasingly global issue in MSA, that requires immediate attention, is the identification and tracking of so-called dark vessels; vessels (or other maritime "dark" objects) that employ measures to hide their identities, locations and activities.*
- Develop and demonstrate the feasibility of a solution that significantly enhances the Irish Naval Service's capabilities in Maritime Situational Awareness. The solution should enable **detection and localisation of dark vessels** to enhance maritime situational awareness, and enable timely and effective response to potentially unsafe or illegal activities. The system may leverage a **range of sensing modalities, data sources and approaches** to achieve its functionality and performance. Especially compelling solutions will consider **integration of data and information** from different modes or across various services (e.g., Irish Naval Service, An Garda Síochána, Revenue Commissioners, Irish Coast Guard etc.). Ideal solutions will position the Irish Naval Service as a **world-leader in the detection of dark vessels** and/or other dark objects on, or below, the sea surface.



An Roinn Cosanta
Department of Defence



Rockabill



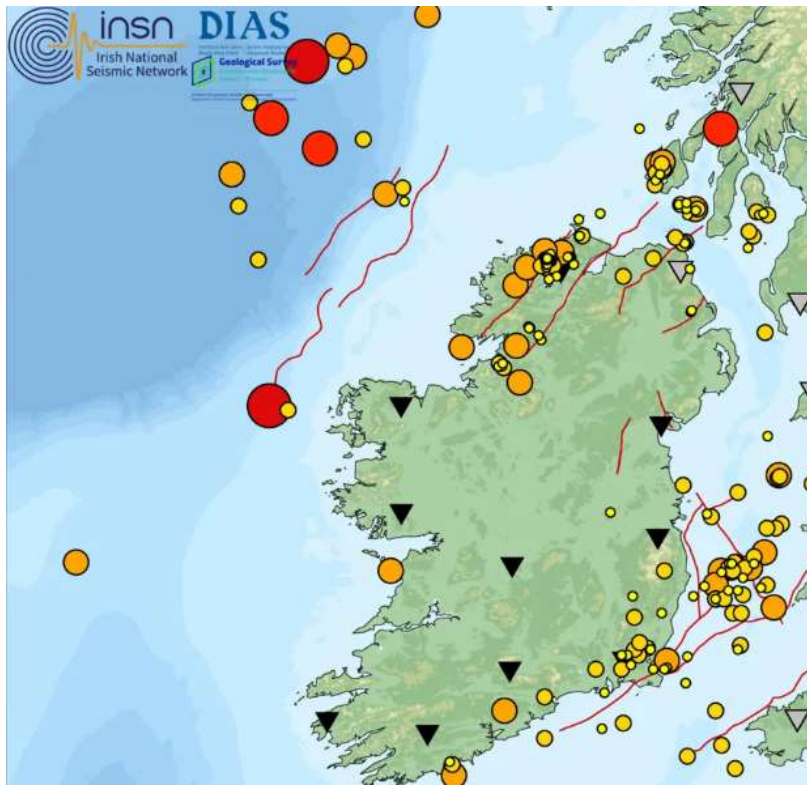
- 221 Km
- 96 fibres
- No amplifiers
- DAS
- SOP
- Dark Vessel Detection
- Seismology
- Climatology

Aerial Fibre

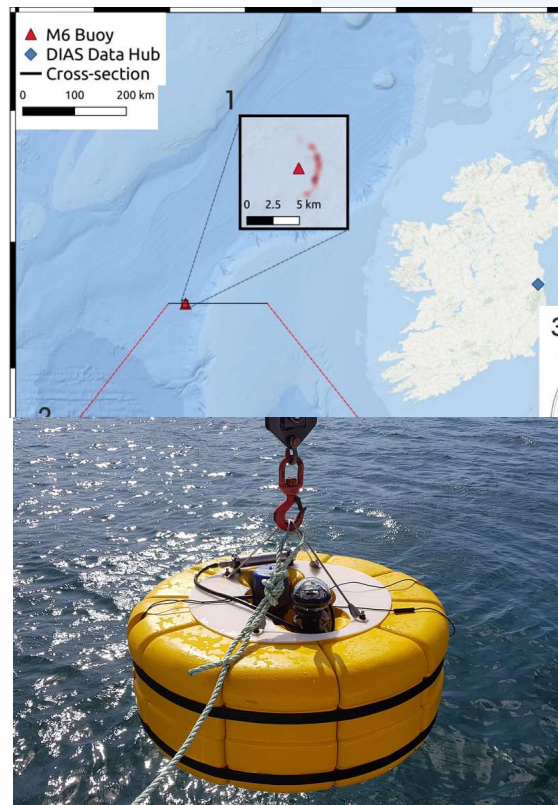


- HEAnet leases 1200Km of aerial fibre
- Temperature sensing very important
- Helicopters used to check bi-annually!
- DAS and SOP could help

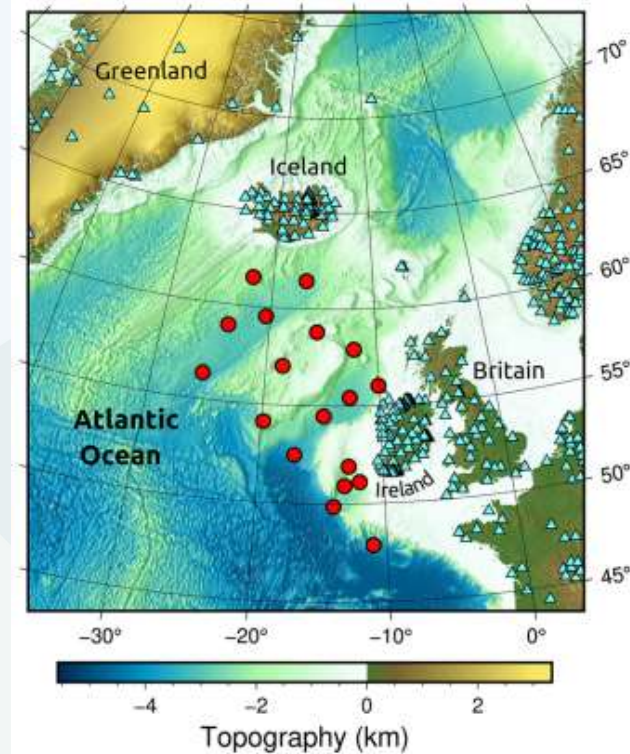
Seismic sensor projects



<https://www.insn.ie/>



2016 Bottom seismometer
with acoustic modem to buoy



SEA-SEIS 2018/19

FARICE IRIS

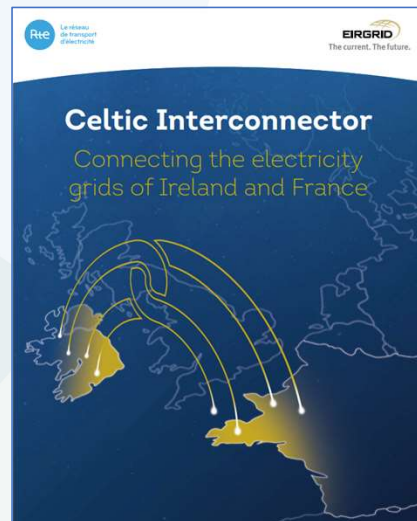


- 1770 Km
- Amplifiers
- First amplifier 50Km from Galway
- DAS for first 50Km
- SOP with amplifier loopbacks
- Seismology
- Climatology

Longer term - International Connectivity Projects of Interest...



Ireland to Portugal
(PISCES)



Ireland to France
2026



Ireland to Japan via Arctic Polar Connect
Ireland to Japan via Northwest Passage – Far North

Summary

- Terrestrial metro fibre – CWDM DAS pilot
- Terrestrial L-Band DAS national pilot
- Submarine spectrum - SOP spectrum testing
- Submarine fibre - Dark vessel detection
- Aerial fibre – temperature sensing
- Submarine fibre - seismology/climatology

November 2025 – All invited

Conference 2024

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Join us at the HEAnet Conference 2024

One of Ireland's leading
education and research
conferences



6 – 8 November 2024



Great Southern Hotel
Killarney

Any questions?



Or Advice?

