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UNDEB EWROPEAIDD EUROPEAN UNION
Llywodraeth Cymru Welsh Government
Cronfa Datblygu Rhanbarthol Ewrop European Regional Development Fund

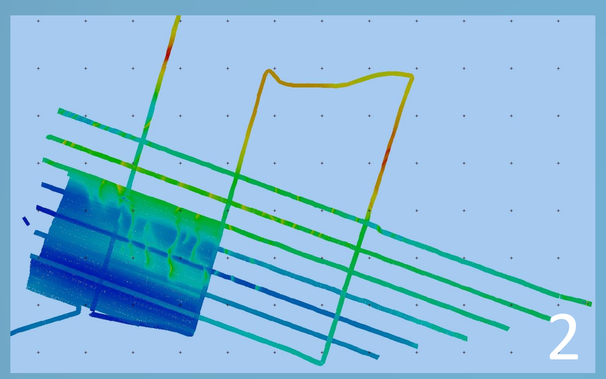
SEACAMS2: Geoscience research to support the development of a wave energy demonstration zone in Pembrokeshire, South Wales

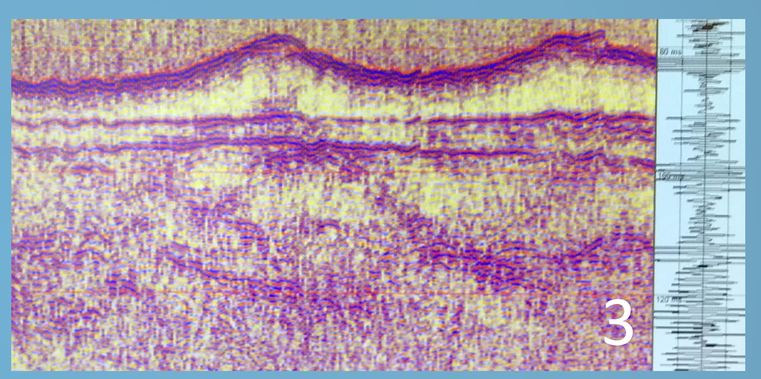
AIMS:

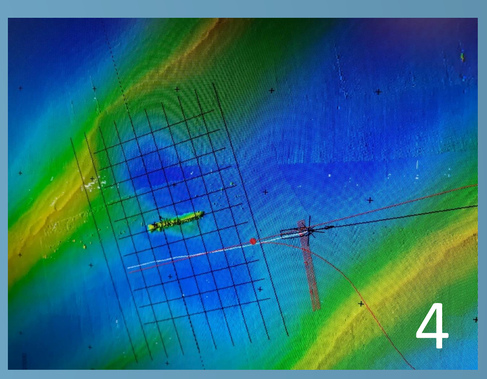
- To research and characterise the seabed environment off the coast of South Pembrokeshire using geo-scientific survey methods to identify appropriate areas for the development of a wave energy demonstration zone.
- To research the effectiveness of using submerged structures as analogues for predicting long-term (decadal) changes in seabed conditions and the influence of Marine Renewable Energy (MRE) infrastructure on physical marine processes in shallow water (>70m) marine environments characterised by medium-strong wave conditions.

RATIONALE:

The successful delivery of a wave energy demonstration zone in South Wales depends on addressing critical first-order issues, associated with financial viability (appropriate site selection, optimum engineering design for devices and arrays) and agreed environmental consent (acceptable impact mitigation). This project will provide new insights into medium energy, offshore environments (>70m) that will provide Wave Hub Limited and other commercial developers with a detailed first-order understanding of physical conditions at key sites of interest and provide information that will be integral to identifying specific sites for potential future deployment and for optimising the design of MRE related infrastructure.







1) Research Vessel Prince Madog 2) MBES and S-Boom survey data acquired in May 2018 3) S-Boom seismic profile over the Wave Hub site illustrating sand waves and underlying solid reflector/s 4) MBES grid model of HMAV Penshurst (torpedoed in 1918) approximately 12nm west of the potential Wave Hub site.

METHODS:

- High resolution multibeam sonar (MBES) from key areas within and adjacent to the proposed demonstration zone. Additional data sets obtained by external organisations will also be sourced.
- Simultaneous seismic sub-bottom surveys during MBES transects using an Applied Acoustics' 'S-Boom' boomer system.
- Additional high resolution multibeam surveys have been undertaken over numerous (40+) wreck sites in similar water depths, tidal regimes underlain by similar substrates in order to gain insights into the potential impacts similar MRE foundations may have over varying timescales and to assess the extent such structures have on the physical seabed environment.
- Sediment grab samples to examine geotechnical properties of seabed sediments and to facilitate sediment classification studies using associated backscatter data and Swathway software.

OUTCOMES:

- Acquisition of essential new geo-scientific data sets (MBES, seismic, sediment grabs) from areas off the south coast of Pembrokeshire to support MRE sector ambitions in South Wales.
- Provision of a geoscientific report focussed on areas of interest to MRE developers off the south coast of Pembrokeshire.
- Scientific publications focussed on seabed geology, sediment transport and potential interactions between MRE related infrastructure and the physical marine environment.

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