Tackling the climate crisis by scientifically-underpinning seagrass restoration in the Isles of Scilly

sweep

Impact Summary

A wide variety of stakeholders across the South West and beyond, have approached the SWEEP team, keen to benefit from their cutting-edge science and collaborative approach to tackling coastal hazards. Applying their Operational Water and Wave Level (OWWL) science and approach more broadly, these impact summaries highlight the key benefits delivered from this work during SWEEP.

Why it mattered?

Seagrass beds are hugely important from a natural capital perspective. Not only do they harbour a wide variety of wildlife, they provide vital ecosystem services such as carbon storage. Capturing carbon at a rate 35 times faster than tropical rainforests, they are one of the most important natural solutions to the climate crisis. However, seagrass has declined drastically during the last century.

Much of this is due to increased human disturbance such as pollution, dredging, mobile fishing gear and coastal development. The Isles of Scilly (IOS), in the South West of the UK, are home to the main surviving UK seagrass habitats but even these are under threat, declining in both extent and quality.

What we did

Working with the University of Swansea, Natural England and the Environment Agency, the SWEEP team developed a bespoke Operational Wave and Water Overtopping (OWWL) model encapsulating the Isles of Scilly.

Ways of Working

The model was applied to, and helped to strengthen, a separate Natural England funded project called *Physical Characterisation of the Marine Environment in the Isles of Scilly: Wave and Hydrodynamic Modelling Report*. The SWEEP team input wave characterisation data into a Swansea University-led Habitat Suitability Model (HSM) – data that is often poorly represented in such models.

This provided insights into the wave climate outside, and within the interior of, the archipelago, as well as a characterisation of hydrodynamics and bed shear stresses. The outputs from the modelling work were fed into Z. Marina Habitat Suitability Modelling performed by Swansea University.

Impacts & benefits delivered

Knowledge/Capacity

As part of this work, SWEEP has:

- Enabled a better understanding of the current environment and habitat thresholds in which seagrass is present, and how these might change in the future - key information for informing strategic decision making for the restoration or future planting of seagrass.
- Highlighted to Natural England the importance of using high-resolution wave models that effectively capture physical wave processes (such as the SWEEP-OWWL model), when assessing potential sites for seagrass habitat restoration, thus ensuring they will be key to informing and strengthening seagrass research and restoration projects in the area and beyond.
- Strengthened the modelling methodology used in this project, as well as the requirements for modelling use in general - contributing to the wider body of knowledge, and confidence, needed to effectively apply these kind of models to enhance evidence-based research to underpin new policy and practice.
- Considerably strengthened the collaboration between marine biologists at Swansea University, and the physical coastal processes team at the University of Plymouth, which is expected to lead to further collaboration and a research paper.

Organisations we've worked with

Swansea University Prifysgol Abertawe

NATURAL ENGLAND

Environment Agency

For more information contact
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About SWEEP

The South West Partnership for Environmental & Economical Prosperity (SWEEP) is a partnership between the University of Exeter, the University of Plymouth, and Plymouth Marine Laboratory. Funded by the Natural Environment Research Council and stakeholders together to solve key challenges faced by those working with our natural resources. **www.sweep.ac.uk**

UKRI Natural Environment Research Council