Strengthening business decision making - OWWL forecasting for Offshore Shellfish Ltd., Lyme Bay, Devon

sweep

Impact Summary

Rope grown mussels

Drawing on the success of the first SWEEP Operational Wave and Water Level (OWWL) model developed for the Environment Agency, SWEEP's team - **Professor Gerd Masellink, Dr Tim Poate and Dr Kit Stokes from the University of Plymouth's Coastal Processes Research Group** - have developed a suite of additional bespoke, localised OWWL models for a variety of wider partners. The following impact summaries highlight the benefits being delivered, both for the public and private sector.

A bespoke **localised**, forecast for Lyme Bay delivering **finer resolution data** for decision making

Vital learning strengthening wider OWWL work, including **2** new projects

Ways of Working

Innovative Knowledge Provision — **Tailored Decision Support**

Why it mattered?

Offshore Shellfish Ltd (OSF) in Lyme Bay, Devon, is the UK's largest offshore rope cultured mussel farm. The production of mussels offers an environmentally-friendly, sustainable source of high-quality seafood that also contributes important natural capital services such as carbon capture and wildlife protection.

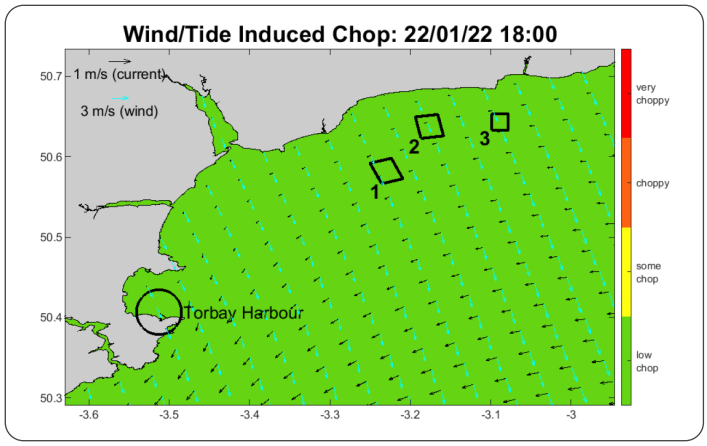
The mussel farms in Lyme Bay are frequently exposed to high wind and waves; conditions that limit the proximity of vessels alongside the suspended ropes of mussels that are easily dislodged. This can limit business operations, impacting on profit and loss, so accurately predicting these conditions is vital to making correct 'go/no-go' decisions for vessels heading out to the farm.

OSF approached SWEEP to develop a bespoke Operational Wave and Water Level (OWWL) model that provided more nuanced sea conditions, enabling better, more cost-efficient, operational decisions about whether to go to sea to harvest in rough sea conditions.

What we did

Working with John and George Holmyard, the Managing Director and Head of Operations at OSF, the SWEEP team developed:

- A bespoke version of the SWEEP OWWL model.
- Automated, bespoke, co-designed high-resolution (1 km) forecasts of sea conditions most problematic to OSF's operations.
- A monitoring system to evaluate the use and value of the forecasts.



Lyme Bay Mussel Farm, photo credit: Ross Brown

Impacts & benefits delivered

Various factors limited the immediate and direct impact of this project. A key factor was the unreliability of the Met Office data feeding the forecasts, which resulted in these arriving sporadically with OSF, reducing confidence in their use. A change in personnel at OSF, and external business issues, also impacted on levels of project engagement and impact.

Knowledge/Capacity

Delivery of a new, bespoke, co-created OWWL model: SWEEP forecasts arrived automatically with OSFs at 1km resolution (finer resolution than was available to OSF at the time), including forecast elements specifically important to them, e.g., wind and wave chop.

Application of lessons learnt, strengthening new projects: the key impact of this work has been the invaluable learning about the processes and resources required to effectively transfer this type of cutting-edge academic know-how into real-world solutions. This has strengthened the team's wider OWWL work in Plymouth Sound (with the Marine Institute) and East Pickard Bay, Pembrokeshire (with Bombora Wave Energy's Wave Energy Converter).

> *"When the OWWL model was available it was able to provide a finer detailed forecast and a map of the weather which was entirely down to SWEEP."*
>
> **George Holmyard, Head of Operations, OSF**

Lyme Bay Mussel Farm, photo credit: Ross Brown

Looking to the future

OSF are keen to continue collaborating with the SWEEP team to refine the OWWL forecasts and enable more consistent operational 'go'/'no-go' decisions on whether to go to sea for mussel harvest. It is anticipated this will result in more productive days at sea leading to increased sales, reduced costs from fewer wasted journeys, improved safety for workers and more accurate assessment of locations suitable for new offshore mussel farms.

Learning from this project has already strengthened other OWWL projects, demand for which, continues to increase. The OWWL model data feed has been switched to the more stable Copernicus Marine data (CMEMS) and improvements have been made to ensure more effective co-creation, delivery and embedding of localised OWWL forecasts within partner organisations.

> *"The forecasts provided by OWWL were a useful tool to check against existing forecasts. The forecast did prove to be more accurate than existing forecasts on several occasions but was not the deciding factor in going to sea. Had we had a long run of uninterrupted forecasts then we would have been more confident in using the forecast as the deciding tool."*
>
> **George Holmyard, Head of Operations, OSF**

Organisation we worked with

offshore shellfish ltd

Underpinning NERC Science

- NE/N015525/1 - Physical and biological dynamic coastal processes and their role in coastal recovery (BLUE-coast)
- NE/M004996/1 - Impact of sequence of extreme storms during 2013/14 winter on South West coast of England
- EP/H040056/1 - New understanding and prediction of storm impacts on gravel beaches (NUPSIG)

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**

For more information contact sweep@exeter.ac.uk

UKRI Natural Environment Research Council