Operational Wave and Water Level model
Impact Case Study #7

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What does your job entail?

I work in the Vale of Glamorgan Council with my manager Clive Moon (Engineering Manager Environment) and we have responsibility for coastal management, flood risk management and associated land drainage duties. Part of our job is to provide advice to the Waste Management team within the council who are responsible for managing the majority of the council's coastal structures.

Over the years we have undertaken a number of pro-active measures, such as the installation of a tide station at Penarth Pier and monitoring cameras at several locations. We are particularly interested in the impact of wave overtopping which has been one of the studies we have commissioned at sites of particular interest to us along the coast.

The main coastal areas in our region to suffer from coastal flooding are Penarth Promenade and Swanbridge. We regularly monitor and inspect structures at the coastal resort of Barry Island and other leisure beaches within the Vale of Glamorgan. Since Dec 2020, we have been heavily involved in investigating surface water flooding to communities within the Vale of Glamorgan.

How are you using the SWEEP-OWWL forecast and why is it of value to you?

We have been signed up to the OWWL model since 2019 and receive forecasts for the key regions that we're responsible for – Penarth, Whitmore Bay and Aberthaw.

The OWWL model is a really useful addition to the other sources of data we use to predict and respond to coastal flooding. With its 3-day in advance hazard warning for potential coastal overtopping, it helps increase our confidence in passing on the right advice to those (the waste management team and emergency planning team) who are making decisions on the appropriate response and resource allocation in relation to coastal flood risk.

A key feature of the OWWL model that is important to us is the wave height data. Penarth is affected by north-easterly winds which tend to bring the large waves that cause us the most problems in terms of overtopping and coastal flooding. It's difficult to predict overtopping from tide height and wind speed alone and other data available for wave height is patchy and often reliant on visual observation. So having the OWWL data is really helpful.

How have you benefitted from the OWWL model, for example during Storm Eunice, and how do you anticipate benefitting from it further in the future?

On the 17th of February, the OWWL model flagged overtopping warnings for Penarth Pier, Whitmore Bay and Aberthaw. In reality there wasn't a huge amount of overtopping due to the fact that peak wind and maximum wave reach didn't coincide with high tide, but it was still helpful to have advanced warning of the potential for this via the OWWL forecasts so we could be primed and ready to respond rapidly, if needed.

I'd say the key values of the OWWL model to us going forward are as follows - all of which will help improve how we target our limited resources and achieve cost-savings.

- Reduce disruption and damage to local businesses, especially near Penarth Prom. Providing accurate and timely advise to our response teams so they are able to deploy if required measures (such as sand bags) to prevent structural damage.
- Reduce damage of flooding to properties located close to the sea
- Increase the safety of local people, who often head to the coast to observe the stormy weather and overtopping waves.
- Minimise disruption to local highways, especially at Penarth and Swanbridge
- Protect the Welsh Water sewerage pumping station on Penarth Prom which, if overwhelmed with water (both rainfall and overtopping), will lead to significant sewage flooding both in the immediate area and more wide spread due to its connection with other pumping stations. This has in the past led to significant disruption and costs both from a sewerage clean up perspective and if repairs are required to the pump (which costs c.£50,000) and the pumping station (which would cost £100ks to repair or replace)
- Provide an early warning system to help with strategic decision making for example, in connection with the power station site near Aberthaw, where £8m has already been spent by a consortium of local councils and a further £36m investment is planned.