



Biofouling community on a wave energy device.

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Rationale



The Welsh coast provides an ideal test environment for wave energy devices. These devices are novel structures in coastal waters and provide unique habitat for biofouling organisms.

Bombora's mWave device uses a flexible rubber membrane which is likely to be 'fouled' by marine organisms. The device is potentially a stepping-stone for non-native species, and the function of the membrane may be altered by encrusting organisms. Therefore, we aim to understand the rate and nature of biofouling and its effect on the device's functionality.

Methods



The project will develop biofouling plates constructed from the rubber membrane used for the Bombora mWave device. Plates will be left in a wave-exposed coastal environment for 6 months under conditions resembling those of the mWave deployment sites.

On retrieval, the material will be analysed for all colonizing flora and fauna. Organisms will be taxonomically identified and quantified and alien species will be determined. In addition, samples will be taken for DNA metabarcoding of the fouling community. Next generation sequencing (NGS) will allow species identification of mixed organism samples including those it would be impossible to identify morphologically.

Outputs

The project will provide Bombora with information about the interaction of their wave power device with the natural environment. Results will inform their decision where and when to deploy the test devices and highlight potential risk to its performance. Assessing biofouling communities with different methods will allow us to compare their strength and weaknesses and work towards more efficient monitoring methods.



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