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# Facilitating coastal and ocean science research in the laboratory

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For coastal engineers and ocean scientists, physical modelling is an essential part of the process of research and this is especially true for marine energy technology development. The recently built Coastal, Ocean and Sediment Transport (COAST) laboratory at Plymouth University provides a versatile facility in which next-generation scientists and engineers are being trained and new research projects are being carried out.

The flexibility of the laboratory stems from its multiple facilities: the 35 m long Ocean Basin with moveable floor can produce both regular and irregular waves at a range of water depths, and has 24 force absorbing wave paddles, mitigating reflections and allowing a quick experiment turnaround. In addition, currents can be run in two directions at the same time as the waves. The smaller Coastal Basin is fitted with a 20-element piston wave maker and recirculating current. The beach can be set at two angles and can be used with sediments (for moveable-bed models). The Sediment Wave flume is used for studying two-dimensional wave propagation with the option of using sediments and recirculating currents either in the direction of the wave or opposing it.

We present examples of the research projects already making use of the COAST laboratory facilities: such as the behaviour of moored devices in focussed wave groups, sediment transport in the presence of breakwater structures and two-dimensional wave-current interaction studies.