**Coastal and waterway engineering**

Research into coastal and waterway structures, management and flood defences, estuarine engineering, reservoir and dam engineering and hydrodynamics.

Engineering research into coastal and waterway structures, management and flood defences – both ‘hard’ (artificial structures) and ‘soft’ (natural resources). This research area also includes estuarine engineering, reservoir and dam engineering and hydrodynamics.

This established UK research area plays a role in addressing engineering challenges associated with flooding. We aim to have:

* the community continuing to undertake multidisciplinary research in flooding and coastal erosion
* a focus on research underpinning the development of infrastructure systems that exhibit resilience and can adapt to future challenges, including climate change
* the community seeking to develop a holistic approach to water research incorporating flood risk management with water management and bringing in new perspectives from the digital economy
* continued support and encouragement for work across research disciplines and for collaborative research with other research councils, particularly NERC
* continued to specifically recognise the importance of whole-catchment management, blue-green cities and the interface of ‘natural’ and ‘engineered’ flood management
* worked with the community to gain a comprehensive picture of the ‘people pipeline’ and to understand any developing issues which may require intervention from the relevant stakeholders.

Flooding and coastal erosion remain important and government agencies with responsibility for flood risk management are faced with the difficult challenge of optimising system performance against a background of environmental change and real-term decreases in capital and maintenance budgets. The Committee on Climate Change report [Projections of future flood risk in the UK](https://www.theccc.org.uk/wp-content/uploads/2015/10/CCRA-Future-Flooding-Main-Report-Final-06Oct2015.pdf.pdf) estimates that current costs of flooding are £1.1 billion a year and that this could rise to £2.8 billion a year by 2080.

Offshore wind and marine energy installations are projected to meet up to 30% of UK electricity needs by 2030. Both require an understanding of wave-structure interactions, as evidenced by the EU’s [Streamlining of Ocean Wave Farm Impacts Assessment project](https://www.plymouth.ac.uk/research/coast-engineering-research-group/sowfia-project).

Coastal, Ocean and Sediment Transport , based at Plymouth University, is an EPSRC-recognised physical modelling facility providing model experimentation with combined waves, currents and wind effects. The [UK Collaboratorium for Research in Infrastructure and Cities](https://www.ukcric.com/) will also support some facilities that are relevant to flooding.

There is some concern that there are insufficient early career researchers in this area and, while the number of students registered with EPSRC has doubled since 2013, there is no centre for doctoral training (CDT) dedicated to this area, although there will be some doctoral projects in waterway engineering and flooding at one of the CDTs concerned with water engineering.

Research into both flood risk and coastal defence is highly multidisciplinary, with researchers drawn from communities supported across the research councils – particularly [Natural Environment Research Council (NERC)](https://www.ukri.org/councils/nerc/) and the [Economic and Social Research Council](https://www.ukri.org/councils/esrc/), as well as EPSRC. NERC has a number of relevant investments, including the flooding from intense rainfall and UK droughts and water scarcity programmes, a highlight topic on physical and biological dynamic coastal processes and their role in coastal recovery, and long term research programmes at the [Centre for Ecology and Hydrology](https://www.ceh.ac.uk/), [National Oceanography Centre](https://noc.ac.uk/) and [British Geological Survey](https://www.bgs.ac.uk/) – several researchers in these programmes have previous or current support from EPSRC.