

Pioneering research to reduce coastal flooding

November 10 2010

(PhysOrg.com) -- Coastal areas could be saved from the misery of flooding thanks to groundbreaking new research from the University of Plymouth.

Academics have made a significant breakthrough in understanding the behaviour of mixed sand and shingle beaches in response to [waves](#).

They have devised a new formula for measuring the response of a beach to changes in longshore drift, where waves cause material like sand and shingle to build up at parts of the shoreline, but leave other areas exposed and coastal defences vulnerable.

They installed a temporary groyne on three beaches and spent three years painstakingly measuring the height of waves, the angle of their approach, the steepness of the beach, the materials there, and the state of the tide using a beach videoing system – the first time all these variables have been linked together and significantly analysed.

The findings will help to improve the management of mixed sand and shingle beaches, ensuring appropriate sea defences are built, used effectively and are robust enough to deal with the natural elements.

And that could spare hundreds of people from having their properties destroyed or damaged each year – one in six homes are at risk from flooding and 2.4 million properties are vulnerable to coastal/river floods, according to the Environment Agency's Flooding in England Report –

safeguard transport links, and save millions of pounds in insurance claims.

Dominic Reeve, Professor of Coastal Dynamics at the University, said: “Protecting our coastline against the forces of nature is a hugely complex problem, but this research has the potential to help local councils manage beaches more effectively for the next 100 years.

“From our research, we now know that longshore drift depends on the wave height, wave period, beach slope, sediment characteristics and the state of the tide. The results have allowed us to modify existing formula, so that they more accurately represent the longshore transport on mixed beaches.”

One of the benefits of the research will be the production of a new blueprint next year for coastal authorities on how to monitor, model and approach coastal management.

Professor Reeve added: “Much of the UK [shoreline](#) is made up of sand and shingle beaches and our research could also be applied to other beaches.

“By mitigating the worst aspects of the impact of the natural environment we can help to improve everyone’s quality of life.”

The University’s research on mixed beaches is continuing as part of the European-funded THESEUS project, in collaboration with international research groups.

Around 60 academics from across Europe will be discussing new ways to defend coastlines from flooding and erosion at a major summit meeting hosted by the University this week (November 9-11), as part of the project.

The visit will include a field trip to view parts of the South Devon coastline, which is one of the pilot sites investigating the vulnerability of coastal communities to flooding.

Other research currently being carried out by the University as part of the project includes looking at the environmental impacts of sea defences and investigating the scope for modifying them to provide enhanced marine habitat, without compromising their main purpose.

Provided by University of Plymouth

Citation: Pioneering research to reduce coastal flooding (2010, November 10) retrieved 2 May 2024 from <https://phys.org/news/2010-11-coastal.html>

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