

Storm wave study may help protect UK's coastal areas

● Scots scientists create first model showing impact on buildings and walls

By SHÂN ROSS

Britain's coastal defences could be helped to withstand powerful storms triggered by climate change, a study of wave dynamics by a Scottish university has shown.

In the first study of its kind, researchers at the University of Edinburgh developed a model showing how the millions of tonnes of water inside large waves collide with cliffs, sea walls and buildings.

Improving sea walls could help limit loss of life and damage to property as coastal waters become stormier over coming years, according to the findings, which were published in the Royal Society journal *Proceedings A*.

Their findings could help engineers design coastal defences better able to stop sea water spilling over on to land-known as overtopping.

When a breaking wave collides with an upright structure, a powerful jet of water is thrown straight up into the air. Researchers found these huge sheets of water then split into

several "fingers" before breaking apart into a spray of droplets, which can hit people and property with force.

Saltwater can also cause damage to buildings, vehicles and transport infrastructure.

Scientists at the universities of Edinburgh and Hokkaido in Japan recreated stormy sea conditions in a 24m wave flume in Japan, gauging the impact of waves on vertical walls. A scaled-down version of a sea wall was bombarded with waves, tracked using a high-resolution video camera.

They found water is dispersed in a distinct pattern that varies depending on the size of waves. The pattern differs from those produced by other types of spray, such as those produced by industrial sprayers used in car and agriculture industries.

Based on their findings, researchers developed a statistical model to calculate the pattern of spray produced by wave impacts.

This could help inform future sea defence strategies,

which have until now not taken into account the pattern of spray produced by waves, the team said.

Professor David Ingram, of the University of Edinburgh's school of engineering, said: "The UK and Japan are island nations on the edge of large oceans where storms can create

very big waves. With climate change increasing the intensity and frequency of storms, a better understanding of the interaction of waves and our natural and engineered coast is critical."

The UK has been hit by a number of major storms in recent years including storms Desmond, Eva and Frank last winter.

sross@scotsman.com





PICTURE: JEFF MITCHELL/GETTY IMAGES

↳ The Edinburgh-Japan study revealed the pattern of impact of large sea waves on walls

Ref: 118183948

