

VC predicts the motion of the ocean

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Credit: Photo by sub_lime79 via Flickr.

Australian National University Vice-Chancellor, Professor Ian Young AO, has just published research that will help you every morning with the surf report.

Research led by the Vice-Chancellor will allow oceanographers and meteorologists to better predict the rate at which ocean swells decay, or deteriorate, as they travel across the globe.

"Ocean cargo shipping, offshore oil and gas production, and even

recreational activities such as surfing, are all dependent on wave action," says Professor Young.

"It is therefore critical that we are able to predict swell."

It is estimated that 75 per cent of [waves](#) across the world are not actually generated by local winds. Instead, they are driven by distant storms which propagate as swell.

"Imagine you drop a rock in a pond. Waves radiate out from the rock. You don't need anything to push the waves. Once generated, they propagate by themselves.

"So, for most of the Indian, Pacific and South Atlantic oceans, it is actually the weather in the Southern Ocean thousands of kilometres away that dominates the wave conditions," explains Professor Young.

"The Southern Ocean is dominated by big low pressure systems that move across it year round. These systems generate waves that then grow and can travel tens of thousands of kilometres from where they were actually formed, to crash on a beach in Australia."

Professor Young, who is affiliated with the Research School of Earth Sciences, used orbiting satellites to track swell generated in the Southern Ocean and measure the rate of decay as it travelled north towards Australia.

The results showed that the decay of the swell depends on how steep the wave actually is.

"Steep waves decay very quickly. However, typical swell is not very steep and can travel across oceanic basins with only a relatively small loss of energy."

Over 200 individual cases were tracked, making this study the first to provide such comprehensive data of this decay.

"What we were able to do is track the swell from the satellite as it moved from the south to the north, some 1400 kilometres. We only chose cases where there was no wind so that we could be confident that all we were measuring was the swell decay.

"We can take these results and put them into a mathematical formula that can be put straight into computer models used by national weather bureaus.

"This will increase our ability to better predict wave action. As 70 per cent of the world's oceans are dominated by swell, it's extremely important to be able to predict them accurately."

More information: (Phys.org) —Professor Young's research is published today in *The Journal of Physical Oceanography*:
journals.ametsoc.org/doi/abs/10.1175/JPO-D-13-083.1

Provided by Australian National University

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