

Media Release

Chiefs of Staff, News Directors

Wednesday 2 July 2014

New research: Earth vibrations can shed light on deep ocean storm activity

New research led by the University of Tasmania has shown that vibrations in the Earth can be used to study patterns of deep ocean (outside the continental shelf) storms in the Southern Ocean.

The study, an international collaboration with the University, CSIRO and the University of Utah, was published recently in *Geophysical Research Letters* and reports the first decade-long analysis of seismic signals generated by ocean storms with a focus on the Southern Ocean.

Dr Anya Reading, (lecturer in Physical Sciences/Earth Sciences at the University), said deep ocean storms (with strong winds and big waves) play an important role in the uptake of carbon dioxide.

“They are the ‘eggbeater’ that mixes carbon dioxide into the oceans- and it is very important that carbon dioxide is stored in the oceans rather than building up in the atmosphere.”

Dr Reading said there is a general sense that storm activity is increasing and extreme events are getting worse. Learning about these storms in the past has been difficult.

“There is a lot of activity going on and it is important for understanding global systems.

“However, it is difficult to track and measure deep ocean storms from normal measurements alone, such as wind speed or direct observation.”

What *can* shed some light is seismic records.

“The constant background energy recorded by seismic instruments, originally intended for the study of earthquakes, provides a long-baseline record of deep ocean storm occurrence,” Dr Reading said.

“This has great potential to monitor changes in storm patterns, including frequency and severity, particularly in remote locations with no direct meteorological observations.”

Dr Reading said the research team found that seismic records provided continuous information on storms that complemented satellite records, which observe from above, and direct weather observations, such as coastal monitoring.

Combining the three techniques provided a much fuller picture of deep ocean storm activity.

“There are decades of archive seismic records from around the globe that hold a wealth of information on the oceans that can now be accessed with improved analysis techniques developed at the University.”

Dr Reading and her team will continue to develop this research area, using seismic records to detect shifting patterns of storm activity in the Southern Ocean back in time, and to discover or find out more about changes in the storms making landfall on the coast of Australia.

This research was supported by an Australian Research Council Discovery Grant.

Full paper available here: *Dominant seismic sources in the Southern Ocean and West Pacific, 2000-2012, recorded at the Warramunga Seismic Array, Australia:*
<http://onlinelibrary.wiley.com/doi/10.1002/2014GL060073/full>

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