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Media Release

Chiefs of Staff, News Directors

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Tracking the deep ocean tides of the Tasman Sea

An international ocean study to track the massive internal tides of the Tasman Sea begins from Hobart this week.

The 10-week project, termed T-TIDE, involves two U.S. research vessels, *Roger Revelle,* from Scripps Institution of Oceanography and *Falkor*, operated by the Schmidt Ocean Institute, along with U.S., Canadian, and Australian scientists. It will ultimately lead to major improvements in global climate models, and an understanding of biological production concentrating nutrients for fisheries.

According to Australian biological oceanographer, Dr Pete Strutton, from the University of Tasmania's Institute for Marine and Antarctic Studies (IMAS), the Tasman Sea is considered a global internal tide hotspot and a natural laboratory for the study.

Internal tides form when the more familiar regular tides push water across seafloor features such as seamounts or ridges. The forces created by this movement spawn underwater waves that can travel great distances in the interior of the sea. These waves reflect off the sea surface and seafloor, and can be found at any depth. Far below the surface, waves can be hundreds of metres high, with wavelengths of up to 200 km.

Tasmania is a special place, in that it stands in the path of a powerful, focused beam of internal tidal waves generated on the Macquarie Ridge, south of New Zealand. Computer models predict, and satellite observations confirm, that these waves slam into the East Coast of Tasmania after a four-day, 1400 km transit through the Tasman Sea. What happens next is not so clear, since the wave-breaking and turbulence that results from this impact will happen far below the stormy sea surface.

Dr Strutton said one challenge will be to carefully tease out the effects of the internal tide wave from the region's renowned eddies, which are almost permanent features of the ocean in south-east Australia. Eddies are circular currents that spin off of larger currents and can reduce the width of the tide wave, or change its path.

"The goal of this research expedition is to discover and measure the procession of those internal tidal waves and to document the various phenomena that occur when they impact the deep continental slopes.

“The internal tides and turbulent mixing that occurs in the deep sea off Tasmania is thought to affect the overall circulation of the global ocean. Understanding these processes is a critical step in predicting our climate” says Dr. Strutton.

Background

Scientists will study these internal waves by deploying autonomous deep-diving gliders and install 15 deep sea moorings from the *Roger Revelle* to study the internal tide’s movements and effects after it breaks 1-3 km down on the Tasmanian continental slope. A series of continental shelf moorings will be installed to determine the near-shore consequences of the internal tide, supporting research led by Prof. Nicole Jones of The University of Western Australia.

The *Falkor* will be using high resolution mapping and sensors that will measure vital long term data of the internal tides such as temperature, depth and salinity. *Falkor*’s new high performance supercomputer will be used for the first time to communicate real-time data. Historical data sourced from Australia’s Integrated Marine Observing System will be sourced during the experiment.

The moorings are anchored cables equipped with dozens of temperature sensors and multiple current and CTD profilers that will provide vital, longer-term data on the internal tides. Additional collaborations will include the *Falkor* team coming in to the shelf for several days of coordinated research with the *Roger Revelle* collecting supplementary data to ensure the highest resolution maps of the wave’s dissipation there.

The project is being funded by the US National Science Foundation, the Schmidt Ocean Institute, The University of Tasmania and The University of Western Australia.

More information: http://schmidtocean.org/story/show/2963

Information released by:
Communications and Media Office, University of Tasmania
Phone: 61 3 6226 2124
Email: Media.Office@utas.edu.au