

Scientists develop model to map continental margins

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Scientists at the University of Liverpool have developed a new exploration method to assist the oil and gas industry in identifying more precisely where the oceans and continents meet.

Geophysicists at Liverpool have produced a mathematical technique to process satellite data that can map the thickness of the Earth's crust under the oceans in order to locate where the continents meet oceanic crust. The technique has been used to measure the crustal thickness of areas such as the South Atlantic, the Gulf of Mexico and the Arctic to identify new areas for oil and gas reserves.

The continental crust is the layer of granitic, sedimentary and metamorphic rock that forms the continents. This crust is very thick compared to oceanic crust which forms part of the outermost shell of the planet. The transition between the continental and oceanic crusts, however, is very difficult for scientists to identify because it lies far out to sea under thick sediments.

The area that separates the continental and oceanic crust is called a rifted continental margin; this forms when continents start to break apart and new oceans are formed in between. Scientists have been investigating where and how these margins are formed to better understand the map of the world and in particular where new oil and gas reserves may be found.

The new satellite remote sensing method relies on very small fluctuations

in the strength of the Earth's gravitational field that occur as a result of the difference in thickness between the continental crust and the oceanic crust. Scientists can use the variations in the strength of this field to predict the thickness of crust and map the edge of the continental and the start of oceanic crust under the sea.

Professor Nick Kusznir, at the University's Department of Earth and Ocean Sciences, explains: "Understanding where rifted continental margins are located and how they form is important both for finding oil and gas reserves at continent-ocean margins and for territorial claims under the UN law of the sea process.

"As conventional oil and gas resources become progressively exhausted, our future supplies will need to come from sedimentary basins at rifted continental margins in very deep present day waters. While deep water oil and gas exploration at rifted continental margins is very expensive it can produce enormous rewards as illustrated by recent major oil and gas discoveries in offshore Brazil, Angola and the Gulf of Mexico."

Source: University of Liverpool

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