Satellites show the way to new oil finds

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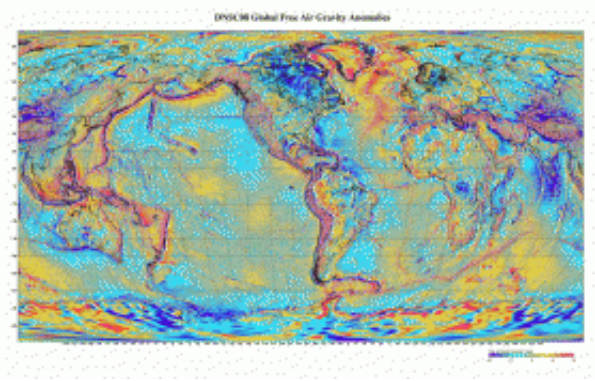

The map shows variations in gravitational force across the surface of the Earth and knowledge about these small variations is a valuable tool in oil exploration.

A new map of the Earth's gravitational force based on satellite measurements makes it much less resource intensive to find new oil deposits. The map will be particularly useful as the ice melts in the oil-rich Arctic regions. Ole Baltazar, senior scientist at the National Space Institute, Technical University of Denmark (DTU Space), headed the development of the map.

The US company Fugro, one of the world's leading oil exploration companies, is one of the companies that have already made use of the gravitational map. The company has now initiated a research partnership with DTU Space.

"Ole Baltazar's gravitational map is the most precise and has the widest

coverage to date," says Li Xiong, Vice President and Head Geophysicist with Fugro. "On account of its high resolution and accuracy, the map is particularly useful in coastal areas, where the majority of the oil is located"

Ole Baltazar's map shows variations in gravitational force across the surface of the Earth and knowledge about these small variations is a valuable tool in oil exploration. Subterranean oil deposits are encapsulated in relatively light materials such as limestone and clay and because these materials are light, they have less gravitational force than the surrounding materials.

Ole Baltazar's map is based on satellite measurements and has a hitherto unseen level of detail and accuracy. With this map in your hands, it is, therefore, easier to find new deposits of oil underground.

The gravitational map from DTU Space is unique on account of its resolution of only 2 km and the fact that it covers both land and sea regions. Oil companies use the map in the first phases of oil exploration. Previously, interesting areas were typically selected using protracted, expensive measurements from planes or ships. The interesting areas appear clearly on the map and the companies can, therefore, plan their exploration much more efficiently.

"The map will also be worth its weight in gold when the ice in the Arctic seriously begins to melt, revealing large sea regions where it is suspected that there are large deposits of oil underground. With our map, the companies can more quickly start to drill for oil in the right places without first having to go through a resource-intensive exploration process," explains Ole Baltazar.

The success of the gravitational map is due in large part to the fact that it is not based on direct gravitation measurements but on observations of

the height of the sea, which reflects the gravitation.

“Height measurements have the advantage that it is possible to determine the gravitational field very locally and thus make a gravitational map with a resolution of a few km. For comparison, the resolution of satellite measurements of gravitational force is typically around 200 km. Satellite gravitation measurements are used, for example, to explore conditions in the deeper strata of the Earth, but are not well suited to our purposes,” Ole Baltazar explains.

Provided by Technical University of Denmark