Satellite measures gravity's effect on climate change

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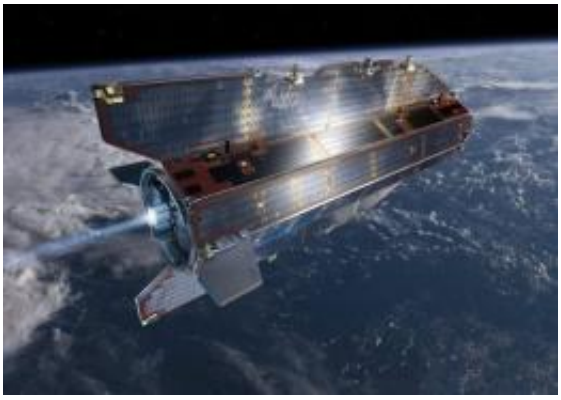

An artist's impression of the Ocean Circulation Explorer (GOCE) satellite. After nearly two years in space, the European satellite GOCE has collected the raw data needed to map variations in Earth's gravity field, the European Space Agency has said.

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The data will help scientists better understand the impact of climate change on sea levels, ice sheets, and ocean circulation systems.

ESA launched the five metres long (16 feet), 1,050 kilogrammes (2,310 pounds) satellite in 2009 as part of its "Earth Explorer" programme.

From its relatively low orbital position 260 kilometres (160 miles) above the planet, GOCE can, with unprecedented accuracy, detect minute changes in Earth's gravity field.

Gravity's pull is not felt equally across the planet. Rather, Earth's slightly flattened shape and the irregular distribution of heavy rock lead to inconsistent gravitational forces across different regions.

Scientists at ESA will use the new data to generate a planetary "geoid," a hypothetical model of how gravity would shape a global ocean in the absence of tides and currents.

The geoid will allow for a far more accurate measure of ocean circulation, massive ice sheet in Greenland and Antarctica and changes in sea level, all of which are influenced by global warming.

An improved knowledge of gravitational discrepancies will also contribute to a clearer view of Earth's interior, as well as the physics behind volcanoes and earthquakes.

GOCE (Gravity field and steady-state Ocean Circulation Explorer) is slated to continue its mission until the end of 2012.

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