

Re-measuring Mount Everest by Geoid Determination



The world's highest mountain might just be a little higher than traditionally thought: new measurements to determine the Earth's geoid could add a few metres to Mount Everest's height. In December 2010, scientists on board a King Air turboprop ascended through the thin Himalayan air to find out how high Mount Everest really is.

By flying back and forth over Mount Everest, the team sought to measure the gravitational pull at the peak using a gravimeter.

The sea level varies depending on how the ocean is affected by the Earth. In the case of Mount Everest, its enormous mass influences the geoid, and this is where the gravity part comes in, explains COWI chief specialist Kristian Keller, who made COWI's aircraft

available for the mission. He explains that the method returns a more precise reference point than was available for calculation before, which means that it is likely that the company will come up with a different geoid than the current one. The height difference in Everest's case could be up to several metres.

Even though the result is not expected to be ready until this summer, everything is pointing to a gravity measurement that puts Everest's peak a few paces further up into the clouds.

Earlier efforts using lasers, GPS equipment and even satellites have all confirmed the mountain's height as 8,848 metres, but these scientists are employing a third method for determining heights: they are using gravity measurements to determine the Earth's geoid (its theoretical level).

An aeroplane flies back and forth over the mountain in a series of parallel lines to measure how much gravity pulls down on its peak. The measurements will be used together with GPS readings from satellites to calculate both the geoid and Everest's height.

The project was developed in cooperation between COWI, DTU Space and Survey Department, The Ministry of Land Reform, Nepal. DTU Space, with geodesist Rene Forsberg in charge, is working on the final calculations in the study and expects the results to be ready in summer 2012.