

COWI Maps Greenland Glacier with UAV



COWI has used its UAV to map a glacier 150km northeast of Nuuk, Greenland, in order to test whether UAVs can be used as an alternative to satellites and aircraft when mapping glaciers. The test mapping was carried out for DTU SPACE to enable daily mapping of the glacier edge geometry, with the purpose of studying the applicability of the UAV technology in monitoring glaciers.

The area of interest is located at the bottom of Godthåbsfjorden, from where icebergs commence their journey towards Nuuk. For a large part of the year, these ice bergs constitute a potential danger for the marine traffic.

Melting of icebergs

One of the most important responsibilities of DTU SPACE is to register, map/survey and report the melting of ice bergs in the arctic area. For this purpose they normally use satellites and airplanes equipped with special sensors, which are, among other things, developed to determine the thickness of the ice.

The UAV constitute a new mapping method, and the researchers believe that they can be used to collect data in arctic areas. As COWI has great experience in collecting data by using ordinary airplanes as well as UAV, DTU SPACE and COWI decided to fly over a selected area with the purpose to study the applicability of the UAV when operating in arctic conditions. This also included a study determining whether or not the results of UAV mapping can be used as alternatives or supplements to results from data collections carried out using airplanes or satellites.

UAV and arctic areas

For the practical UAV mapping, two field staff were transported by helicopter from Nuuk to the KNS glacier, on which they were placed 600 meters above the surface of the sea, with a view over the glacier. Over the following four days, the UAV systematically overflew the edge of the glacier, at different altitudes.

Subsequently, the data was processed and the results were presented in a detailed colour-coded point cloud. The results of the UAV mapping was later compared with data from periodic large scale projects, where the entire marginal zone along the Greenlandic ice cap has been mapped, for example using air-born Lidar.

The UAV recordings make it possible to obtain reference data from areas that are much larger than those covered when conducting traditional fieldwork, as traditional fieldwork requires the researchers to be transported to all areas of the glacier in order to put up measuring equipment.