



Usefulness of Terrestrial Laser Scanning for Survey of Frontal Zone of Hansbreen - Svalbard Tidewater Glacier

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Location and Topography of Spitsbergen



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The reasons of scanning the tidewater glaciers:

- climate changes - global warming
- sea level rise
- precise studies of glacier flow
- ice-cliff position changes (glaciers retreat)
- calculation of calving flux (volume of iceberg production)
- glacier geometry - cliff shape, DEM of the surface

Glaciers are very sensitive on climate changes - good indicator!



Technical aspects of investigation:

- Riegl LPM-321 scanner
- 5 scanner positions
- 3 measurement epochs
- 25 registered scans
- mean linear resolution 30 cm
- mean distance to the object 800 m
- scanning rates: 100 and 1000 Hz
- RiPROFILE software for processing





Results:



Conclusions:

Long range scanners seems to be very adequate tool for such researches!

Disadvantages:

- very dependent on weather conditions: temperature, fog, rain, snowfall
- accuracy decreases with the increasing distance to the target - big areas
- problems with DEM creating in frontal zone
- very heavy equipment
- power supply

Advantages:

- many possible applications
- high accuracy
- complex data acquisition
- immediate 3D data

