

Maptek I-Site technology used to measure glacial movement

Maptek technology is called upon to measure the advancing face of New Zealand's Fox Glacier.



HIGHLIGHTS

- Data analysed in the field with any changes identified immediately
- Ease of use and portability of I-Site technology vital in such a challenging environment
- I-Site Studio enabled data to be worked up on site with analysis taking place in real time

Global climate change is a worldwide concern, so when the Institute of Geography and Earth Sciences at Aberystwyth University in Wales asked for assistance with a study measuring the movement of the Fox Glacier, the I-Site team was more than happy to help.

The Fox Glacier on New Zealand's South Island has been reported to be advancing since 1985, raising concerns about the effect this would have on the surrounding environment.

The researchers from Aberystwyth University set out to monitor the movement of the Fox Glacier over a nine day period and asked Maptek to assist with providing technology for their research.

The Maptek team provided the university with the I-Site 4400LR laser scanner along with the I-Site Studio software. Given the challenging environment, ease of use and portability were key factors recommending the I-Site system.

The I-Site Studio software enabled data to be worked up on site, and analysis to take place in real time. The face of the glacier was scanned on a daily basis from two different locations, and an additional two locations every three days. Given the danger surrounding ice masses like the Fox Glacier, the ability of the I-Site scanner to scan from a distance of 700 metres ensured that all team members remained safe.

In addition to the I-Site scanner, the team from Aberystwyth University used GPS measurements to determine the speed of the glacier and how fast the top of the glacier was moving forwards.

Recording the change in melt, however, was a more manual process. This involved inserting masts into the ice and recording the difference in the height of the glacier compared to the mast.

In order to correctly analyse the data, two factors had to be taken into consideration: the advance of the glacier, and the melt generated from sunlight and weather conditions.

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The powerful performance delivered by the I-Site 4400LR has identified laser scanning as a viable and successful option for glacial monitoring.



Image data collected from the scanner overlaid with point cloud data from the scanner. Data coloured blue represents parts of the glacier advancing down the valley; orange represents where the glacier is moving away, or in this scenario, melting.

Using I-Site Studio, the data can be analysed in the field with changes identified immediately. Problem areas were rescanned on the spot which not only increased efficiency but produced quality results.

At the end of the nine day study, researchers from the university discovered that the Fox Glacier advanced a total of 4.8 metres. Further analysis revealed that this is an average change of 0.43 metres per day with melting significantly higher in areas exposed to direct sunlight.

The team from the Institute of Geography and Earth Sciences at Aberystwyth University has taken the data back to Wales in a variety of formats for further analysis.

Preliminary results suggest significant changes are taking place on the face of the Fox Glacier. This confirms reports that the glacier is advancing and raises concerns about the impact this would have on the surrounding environment.

As interest in the global environment continues to grow, the ability to accurately monitor changes in glaciers will become increasingly important.

The powerful performance delivered by the I-Site 4400LR has identified laser scanning as a viable and successful option for glacial monitoring now and into the future.

