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Unmanned Aerial Vehicles (UAV's) a large part of the Kaikoura solution

New technology is allowing spatial data professionals to make instant assessments of damage to the roads and valleys caused by the South Island earthquakes.

UAVs mounted with specialised data capture cameras are the new surveying and mapping tools that have become readily available since the Christchurch quakes. The UAV mounted cameras, used in aerial photography fields such as Lidar and photogrammetry, are the perfect tool to provide quick and accurate measurement of ground profiles. UAVs allow for the safe, unmanned capture of vast area profiles very quickly. From land profiles, the amount of material to be removed, the location of earthquake tears and any problems with blocked streams and dams caused by landslips can then be determined. The results of the such mapping can be seen in the images below.

Immediately after the Christchurch earthquakes, land surveyors - who specialise in precise measurement - were critical to the urgent monitoring of building stability movement, determining by centimetres, the effect and changes in ground levels and resultant flooding. Spatial data managed by surveyors, spatial professionals and the construction sector has been a critical in the Canterbury rebuild, helping to re-establish services.

Many of the challenges to respond, and to provide services for measurement of earthquake damage is around logistics and communication. Spatial professionals in Christchurch have proven how important this is and are taking lessons learned to provide a coordinated and effective response in Kaikoura.

The earthquakes have provided a different challenge for Civil Defence and support services with the massive land slips and roadway blockages along extensive stretches of the enchanting tourist highway running alongside the Pacific Ocean. The damage runs from Seddon to Goose Bay and well south of Kaikoura.

The *Inland Kaikoura Route* is a perfect example of the challenges being faced and how spatial data specialists have been able to quickly assist. This is a road that winds through farming country west of Kaikoura and includes Culverden, Rotherham, the Waiau plains and Mt Lyford. It has been an absolute priority from the outset to get the road open so a basic traffic link to the outside world for the stoic people of Kaikoura and its surrounds can be provided.

Surveyors used a 1.8m span octo-copter to take a series of photos which were then further processed to provide 3d models of the major Rotherham land slip. There are of course, many slip and damaged areas to be flown, mapped and assessed with modelling experts to the forefront of this work. The outcome is something we can all be proud of that these communities are slowly reopening and recovering.

The images below are the work of Christchurch based survey consultancy, Fox and Associates who are helping to map and survey the damaged areas.



Perspective image created of part of the Kaikoura SH1



Fractures at the top of an escarpment

About the NZIS

NZIS is the professional body for surveyors and spatial professionals in New Zealand. It is a national organisation with its office in Wellington. Surveyors and GIS/Spatial professionals are involved in all aspects of land subdivision and development and spatial data capture, management and applications of spatial information.

The Institute promotes ethical and professional conduct amongst members, aims to raise public awareness of the knowledge, skills and importance of the profession, whilst representing the interests of members and the community. www.surveyors.org.nz.

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