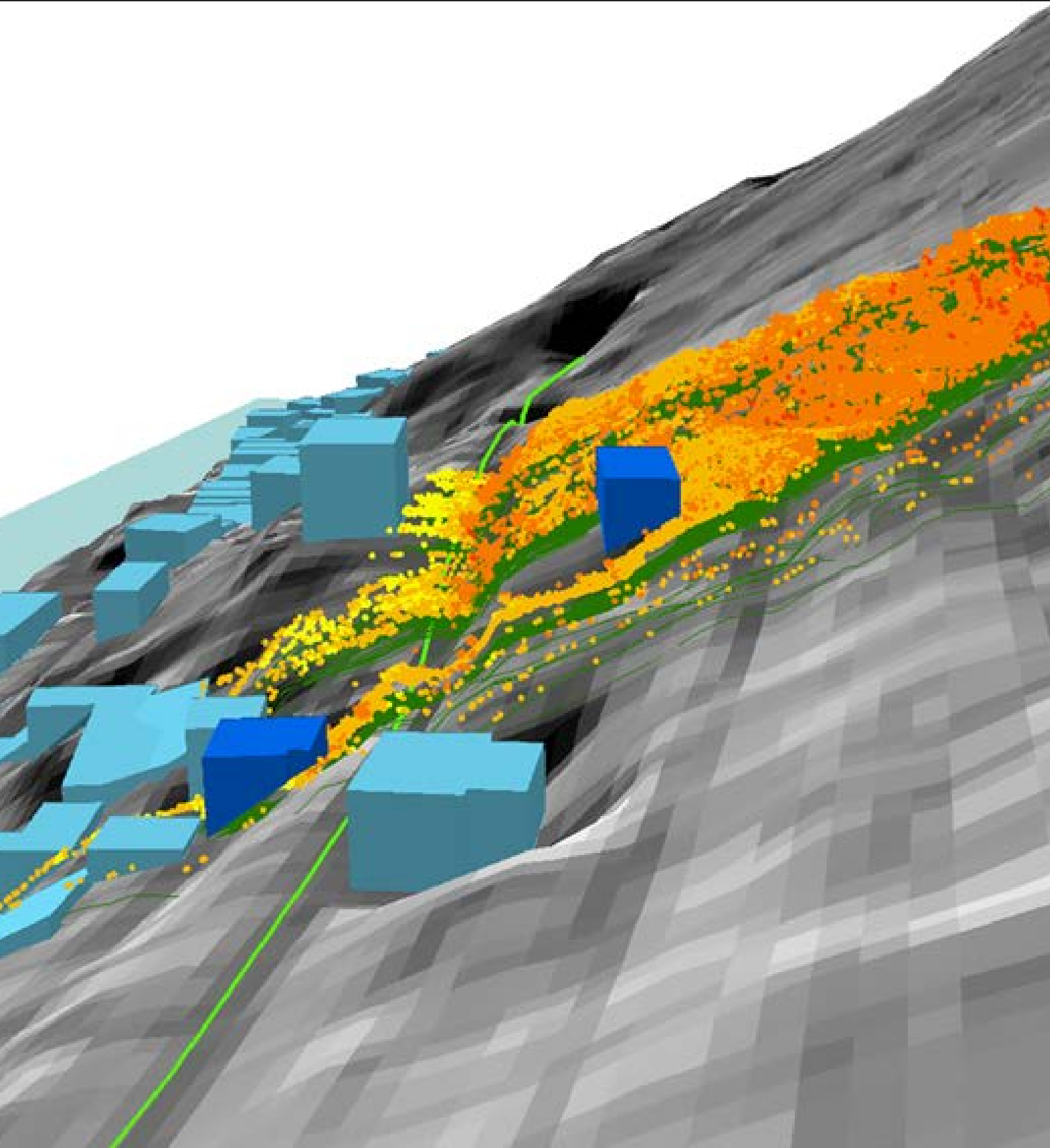
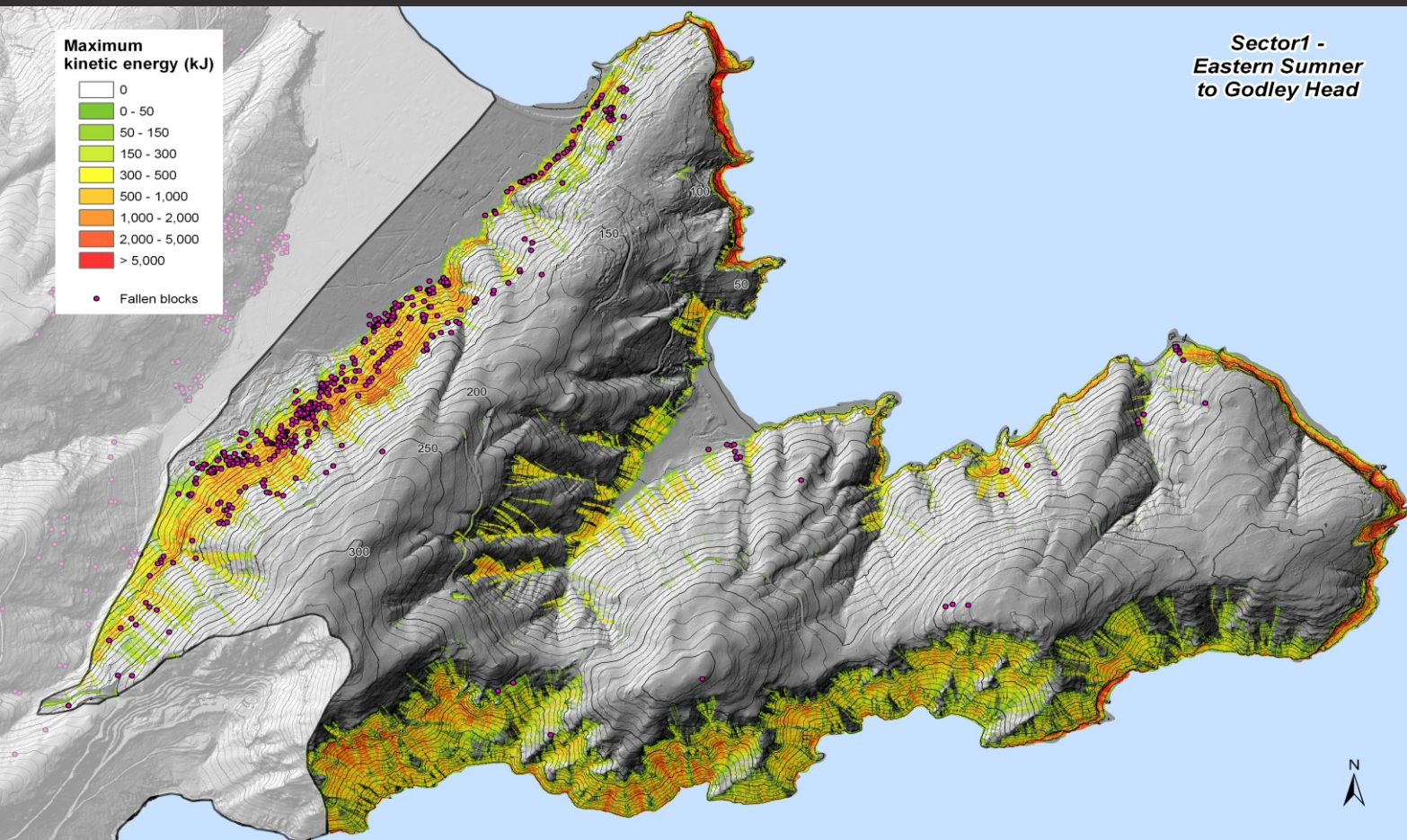




3D ROCKFALL MODELLING DESIGN BUILD SOLUTION DEVELOPMENT FOR LARGE SCALE REMEDIATION

Christchurch, New Zealand



THE LARGEST AND MOST COMPLEX 3D ROCKFALL MODELLING EXERCISE UNDERTAKEN GLOBALLY TO DATE.

PROJECT OVERVIEW:

Following the devastating earthquakes Christchurch experienced in September 2010 and throughout 2011, leading rockfall protection experts Geovert offered to develop a complete solution for the New Zealand Government Agency – Canterbury Earthquake Recovery Authority (CERA).

Geovert were engaged by CERA to complete large scale 3D modelling of the widespread rockfall that had been triggered by the massive earthquakes. They then produced a cost benefit analysis of rockfall protection solutions based on the modelling result. From this a detailed design build solution was recommended by Geovert which detailed rockfall protection systems, construction program and cost to construct. The protection solution options and costs were used to determine the direction of the Christchurch Port Hills rebuild process and were critical in the Red Zoning and Section 124 Notice decisions.

The 3D and 2D analysis were equally critical - the 3D presenting the lateral extent of the issue and helping define

what areas are exposed to risk, while the 2D analysis is where energies and impact velocities are calculated to help define what level of risk those areas ascertained in the 3D analysis are subject to. Typically between 15 and 20 cross sections per kilometre were analysed for the 2D analysis varying depending on the risk presented at individual locations.

Geovert brought in and worked in collaboration with specialist partners from Austria and Italy, Hannes Salzmann from Freefall AG and Professor Giovanni Crosta from University of Milan, to complete the large scale, complex rockfall modelling using the sophisticated Hystone program.

Our scope included:

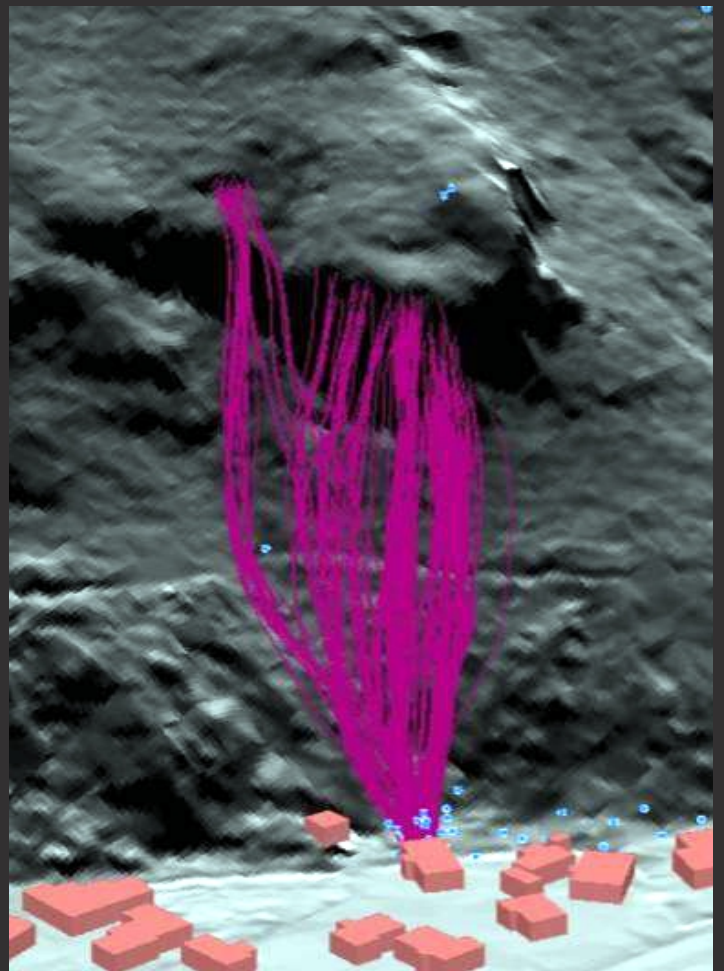
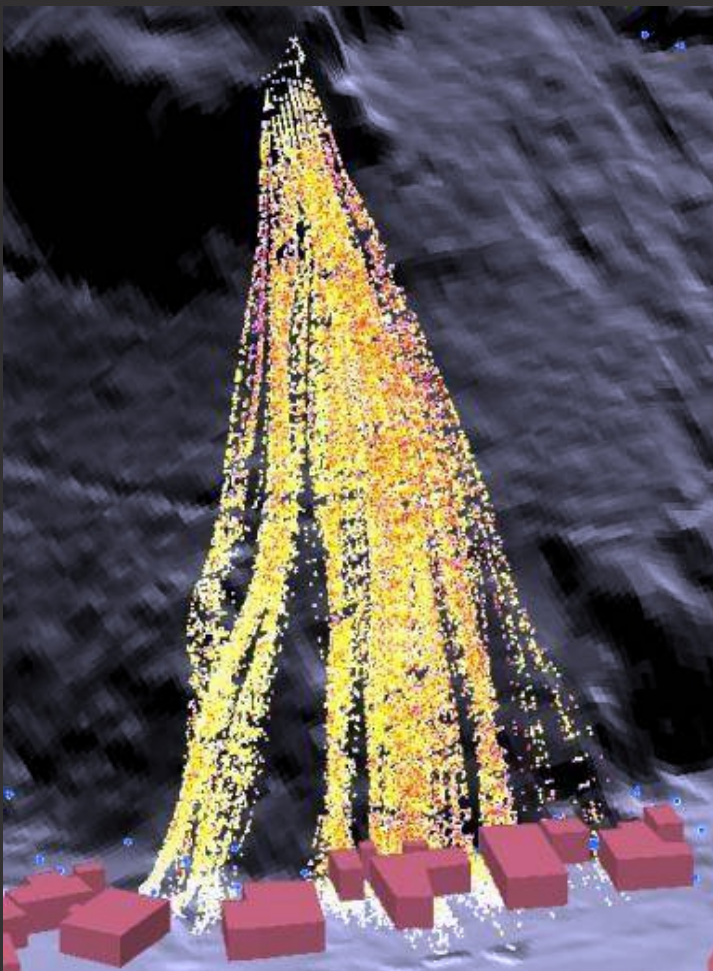
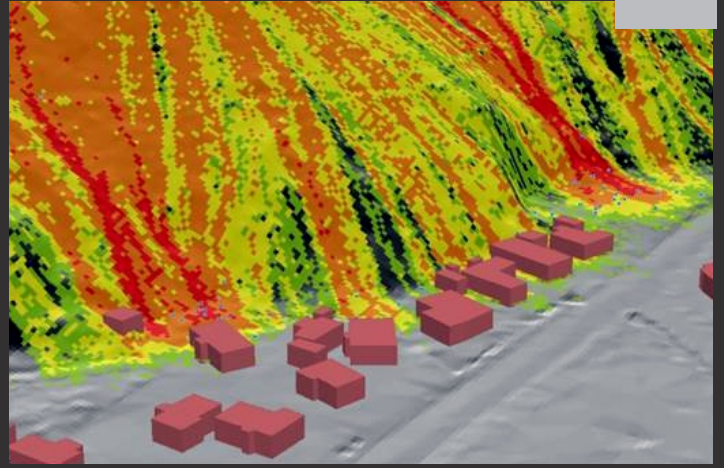
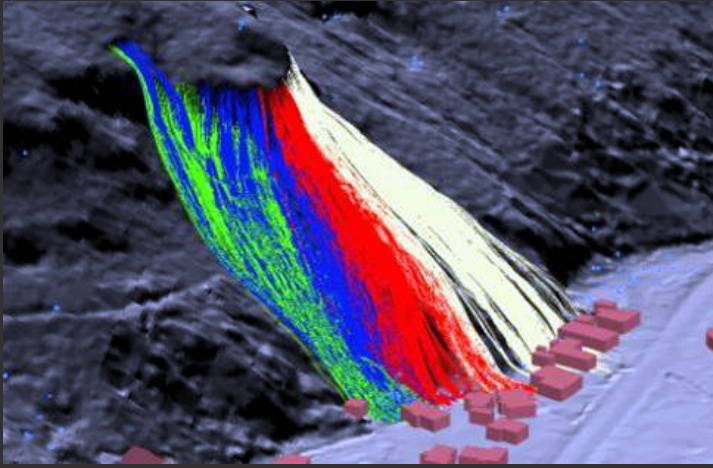
- Field work: visit the site, check available datasets collected by the PHGG, and CCC
- Analysis of rock fall inventories available for the earthquake from PHGG and historical from GNS
- Analysis of available data (topography, geology, land use, lithology, etc.) and implementation

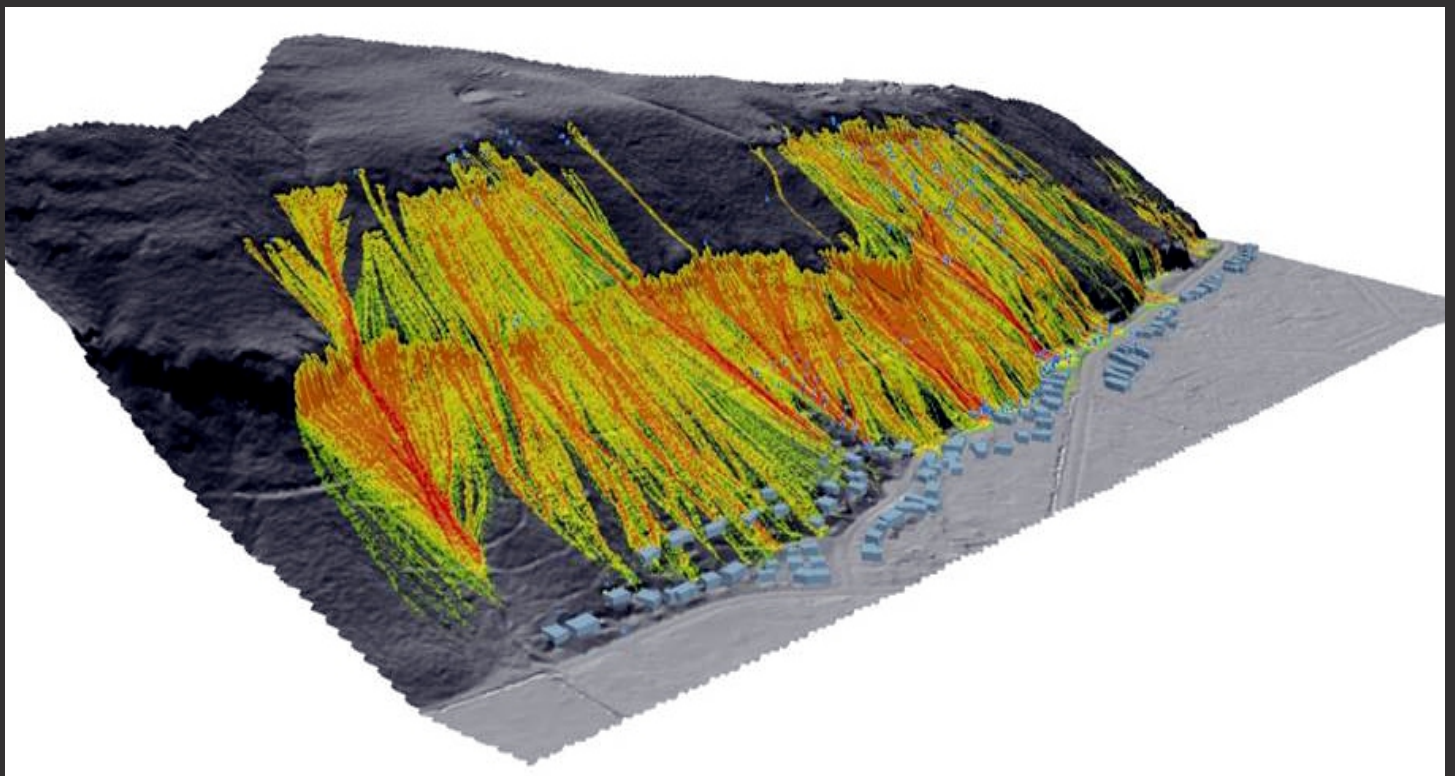
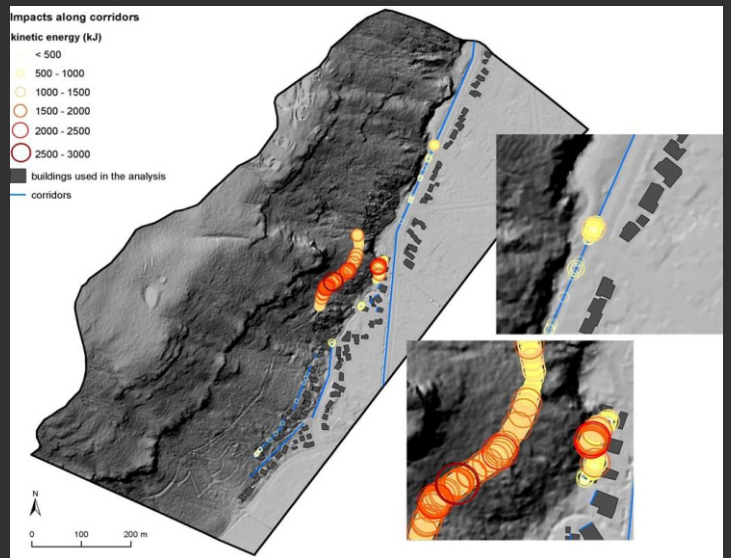
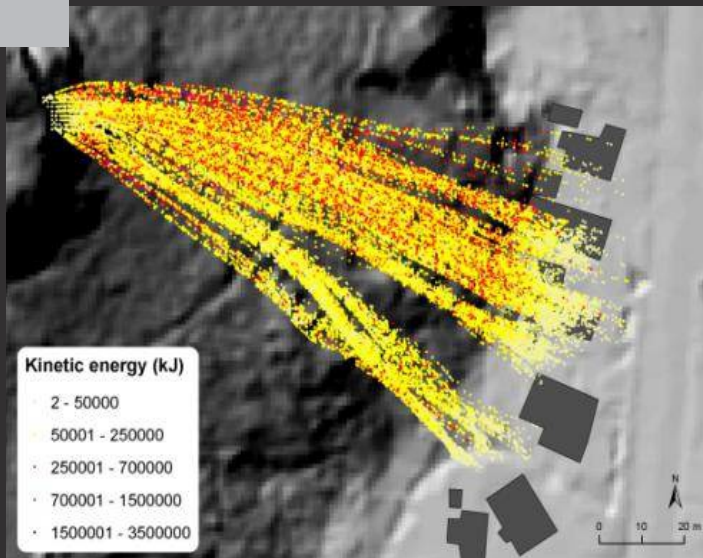
of datasets from CCC

- Preparation of database for buildings and population distribution from CCC
- Attribution of a rockfall onset susceptibility on the basis of available geotechnical/ geomechanical studies
- 3-D Rockfall Model calibration, at least one calibration per subarea required
- 3-D Rockfall Modelling (linear or polygonal source areas) for different rock fall scenarios (block sizes, shape etc)
- Detailed hazard analysis
- 2-D Rockfall Modelling including implementation of mitigation structures
- 3-D Rockfall Modelling including effects of mitigation measures on the final hazard and risk (if required)
- Completed report to CERA, inclusive of options for remediation used in the final risk assessment

Services related to this project

Geotechnical Investigation
Rockfall Modelling
Design Build





More information is available online at www.geovert.com