

A powerful new tool for lifting the resilience of our communities and infrastructure

RiskScape™ is a powerful risk assessment tool used to analyse and evaluate the potential impacts of natural hazards on communities and assets. Built on the expertise of GNS Science and NIWA, through long-term support provided by SSIF (Hazards & Risk Management and Resilience to Hazards), it is a programme that combines geospatial hazard and exposure data, and vulnerability information linking the two. The RiskScape™ Engine (or calculator) generates risk profiles for specific areas or regions using novel spatial analysis methods. The tool is open-source and flexible, allowing users to input information about elements at risk, such as buildings, infrastructure, population, and natural resources, and to visualise potential impacts through maps, charts and other visualisations. The utility of the engine is exemplified by its use as the risk quantification tool by Toka Tu Ake EQC who are providing direct funds for continued development of the engine. The RiskScape™ Platform is a newly developed tool for sharing multi-hazard risk information and provides users with bespoke interfaces and risk modelling options through a web interface utilising cloud computing resources.

Cyclone Gabrielle caused loss of life and significant damage to buildings, critical infrastructure and primary production in the regions of Hawke's Bay and Tairāwhiti. Sustainable long-term recovery of impacted communities and sectors needs to be informed by a sound understanding of present and future risk from multiple natural hazards. A new project (Extreme Weather SSIF for Cyclone Gabrielle Recovery) will accelerate the development and implementation of the RiskScape™ Platform for use by Cyclone Gabrielle recovery agencies and researchers for multi-hazard risk modelling and information sharing. Our multi-agency implementation team consists of science and technology leaders in multi-hazard risk assessment from NIWA, GNS Science, Catalyst IT, University of Auckland, University of Canterbury and Market Economics. We expect to deliver the completed RiskScape™ project to the Cyclone Gabrielle recovery agencies within the next few months. Within the cloud-based platform, users will be able to interact with multi-hazard risk models and a risk visualisation dashboard, customised for agencies tasked with making short- and long-term recovery decisions for individuals, communities and sectors in Hawke's Bay and Tairāwhiti.

Multi-hazard risk model operations enable decision makers to investigate present and future community or sector risk to different natural hazard impacts under future redevelopment and growth scenarios, climate change scenarios, engineering and construction options, and land use planning intervention options, such as avoid, mitigate and adapt. Modelled analyses of costs and benefits of interventions will further provide a transparent evidence base for decision making on community and sector recovery futures.

The advent of the web-based RiskScape™ Platform allows for key agencies to assess the impacts of both short- and long-term planning decisions. Following Cyclone Gabrielle, recovery agencies will be able to investigate the impacts and cost-benefits of different development and recovery futures, and land use planning interventions for Cyclone Gabrielle impacted communities and sectors. More broadly, the RiskScape™ Platform will be a vital aid when considering the impacts of climate change, i.e., effective and considered planning for staged versus wholesale managed retreat, allowing council planners to prepare and build resilience in their communities.

The ability to build and deploy the RiskScape™ Platform for recovery from Cyclone Gabrielle would not have been possible without the previous investment in RiskScape software development and risk science research funded through SSIF over the past decade.