Ground Motion Simulation + Validation

Using physics-based simulation methods to predict earthquake ground motion for engineering design and assessment.

Using specific features of the regional geology, geotechnical conditions, and potential earthquake sources to more accurately predict ground shaking.

**TECHNIQUES**

- **Then**
  - Observation History
- **Now**
  - Physics-based Modelling

**GEOLOGICAL CONDITIONS**
- igneous
- metamorphic
- sedimentary rocks and derived soils

**TYPES OF BUILDINGS**

**3 MAIN FACTORS DETERMINE GROUND MOTION INTENSITY**

- Ground Motion Simulation + Validation
- Using physics-based simulation methods to predict earthquake ground motion for engineering design and assessment.
- Using specific features of the regional geology, geotechnical conditions, and potential earthquake sources to more accurately predict ground shaking.

**GROUND MOTION SIMULATION ATLAS**
Illustrating earthquake characteristics and intensity potential for 500 of the highest risk fault lines to Aotearoa New Zealand.

**TECHNIQUES**

- **Then**
  - Observation History
- **Now**
  - Physics-based Modelling

**GEOLOGICAL CONDITIONS**
- igneous, metamorphic, sedimentary rocks and derived soils

**TYPES OF BUILDINGS**

**3 MAIN FACTORS DETERMINE GROUND MOTION INTENSITY**

- Distance from Fault
- Soil Conditions
- Magnitude

**WE HAVE PERFORMED**

**17,000 SIMULATIONS**

**OF POTENTIAL FUTURE EARTHQUAKES ON NZ’S LARGEST SUPERCOMPUTER.**

**COLLABORATION FOR IMPACT**

AF8 (Alpine Fault magnitude 8), is an award-winning programme of scientific modelling, response planning and community engagement.

It exists to understand the impacts a rupture would have on people living in communities across the South Island and our infrastructure.

**3 HYPOCENTRE SCENARIOS FOR THE ALPINE FAULT**

**SIMULATED INTENSITY MEASURES FOR FUTURE HOPE FAULT SCENARIOS**

Created computer models of 50 different ways that the Hope Fault could rupture.

This produced a hazard map to share with Civil Defence groups, local and regional Councils, marae, and others for their preparedness planning.