

## **Compressional reactivation of E-W inherited normal faults in the area of the 2010-2011 Canterbury earthquake sequence**

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Earthquake ruptures of the 2010-2011 Canterbury sequence exploit a varying mixture of optimally oriented newly-formed faults and inherited discontinuities that are favourably oriented for reactivation within the prevailing tectonic stress field. Reinterpretation of subsurface data shows that the Torlesse basement is imprinted with an E-W fault fabric inherited from Late Cretaceous-Eocene rifting. The prevailing E-W band of rupturing illuminated by seismicity lies at the southern boundary of a Late Cretaceous basin, terminating against the Banks Peninsula structural high. Analysis of a set of seismic lines in the Ashley River region (c. 30 km north of the Greendale fault) demonstrates compressional inversion of inherited, high-angle E-W normal faults, folding and detachment of the Neogene cover sequence, and propagation of new faults through the Pliocene and Quaternary cover sequences. These structures provide an analogue to deformation in the epicentral region of the Greendale fault.

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