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Cover Photograph. The surface rupture of the previously unmapped Greendale Fault extended west–east for 28 km across gravel-dominated alluvial plains west of Christchurch, New Zealand, during the shallow-focus (*c.* 10 km depth), M_w 7.1 Darfield Earthquake which struck at 4.35 am on 4 September 2010 (New Zealand Standard Time). Along the central 14 km of surface rupture, 2 to 5 m of right-lateral displacement is distributed across a 30 to 150 m wide deformation zone, via Riedel shears, conjugate Riedel shears, horizontal flexure and decimetre-amplitude anticlinal bulging. In this aerial view looking NW, the deformation zone is up to 40 m wide, and the right-lateral displacement is 3 to 4 m. The photograph was taken 12 hours after the earthquake by Richard Jongens (GNS Science, member of the University of Canterbury & GNS Science Fault Rupture Response Team).