



## **New paleoseismological evidence from the Wairarapa Fault (North Island, New Zealand)**

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The Wairarapa Fault is one of several major dextral-reverse faults at the southern end of the North Island, New Zealand. The North Island overlies a northeast trending subduction zone characterized by oblique collision between the Australian and the Pacific Plates. The Wairarapa Fault ruptured in 23 January 1855 with an estimated moment magnitude of 7.9 to 8.2, making it the largest seismic event in New Zealand history. Dextral slip in 1855 reached onland 18.7 m (average 16 m), which is the world's largest coseismic strike-slip offset reported. The 1855 fault rupture area is believed to have also included part of the subduction zone. The penultimate event on the fault is of similar size (single event displacement) to the 1855 as suggested from data in the southern sector. Current slip rate estimates for the fault in that area is  $\sim 11$  mm/yr.

Most of the fault data related to 1855 displacements and prior events are from the southern sector of the 1855 rupture. Here we present preliminary paleoseismic results from the northern sector of the Wairarapa Fault. These data include detailed mapping of Holocene offset geomorphic features together with trenching and radiocarbon ( $^{14}\text{C}$ ) dating. Fault parameters from the northern sector of the fault will help to assess if rupture during the penultimate event was indeed similar to 1855, and will also constrain the timing of previous events. We aim to assess whether the Wairarapa Fault always ruptures in conjunction with part of the subduction zone, or alternatively, whether the fault can also produce moderate earthquakes that rupture only the upper seismogenic crust.