

# **THE 1968 INANGAHUA, NEW ZEALAND, AND 1994 NORTHRIDGE, CALIFORNIA, EARTHQUAKES: A SEISMOTECTONIC COMPARISON**

ROBERT S. YEATS

The Inangahua earthquake in northwest Nelson ruptured a west-dipping blind reverse fault close to an east-dipping surface fault that was locally reactivated in the opposite sense from its long-term displacement. The southern boundary of secondary rupture was a lateral ramp, as was the western boundary of major moment release at Northridge. Aftershocks beyond these lateral ramps probably accounted for limited moment release. In both Inangahua and Northridge, the source fault was beneath another active fault dipping in the opposite direction that did not undergo primary rupture. In both cases, the footwalls of the faults that did not reactivate were uplifted, a clue in searching for similar concealed faults elsewhere. Like the California Transverse Ranges, northwest Nelson is a range-and-basin province with ranges bounded by high-angle reverse faults. A long term shortening rate of  $6 \pm 3$  mm/yr across Northwest Nelson based on a balanced cross section is consistent with GPS results and suggests that the eastern part of the area, closer to the Alpine fault, has more shortening than the western part, even though the western part has more historical seismicity.