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Convergent Plate Margin East of North Island, New Zealand

The Indian-Pacific plate boundary passes along the eastern margin of North Island, New Zealand, with the Pacific plate being thrust under the Indian plate to the west. The continental slope forming the Indian plate margin is broad with a well-formed series of trench slope basins and intervening ridges along the continental slope and shelf, subparallel to the margin, and continuing onto land. Multichannel seismic reflection data recorded across this margin show a thick (2.5-km) sedimentary section overlying oceanic basement in the deep-water part of the profile, and part of this sedimentary section is apparently being subducted under the accretionary prism. At the toe of the continental slope, nascent thrusts, often showing little apparent offset but a change in reflection amplitude, occur over a broad region. Well-defined trench slope basins show several episodes of basin formation and thrusting and are similar to structural interpretations for adjacent onshore basins. A bottom simulating reflector, which may delineate a gas-hydrate layer, can be traced over the midslope part of the profile. A major reflector, interpreted as the base of the accretionary prism, can be traced discontinuously to the coast where it coincides with the top of a zone of high seismicity, considered to mark the top of the subducted Pacific plate.