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#### Plate Boundaries in Solomon Sea Region and Subduction at Trenches

The Solomon Sea region is part of an interactive buffer zone of small plates between the Australia and Pacific plates. The Solomon Sea plate is subducting both in the New Britain Trench on the north and in the Trobriand Trough on the south. Subduction in the Trobriand Trough is at a rate of less than 2 cm/year. A low rate of oblique convergence would explain the present lack of recorded seismicity under the Trobriand platform. The Trobriand Trough is filled with thick sediments. The depth to oceanic basement is approximately the same as in the New Britain Trench. The difference in the surficial depth to the trenches results from the greater thickness of the trench fill in the Trobriand Trough.

Accretion is observed throughout the New Britain Trench, gradually increasing toward the west, and is finally extended to the Huon Ridge forming the Finsch Deep behind the ridge. These distinct subduction-related processes document the structural development of: (1) sediment subduction accompanied by minor accretion in the east; (2) subduction-accretion farther west; and (3) collision in the west.

The age of the Solomon Sea plate is refined using new magnetic, heat-flow, and water-depth data; in particular, Oligocene magnetic anomalies are identified within the age range of 28-39 Ma.