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Modern segmentation of the Manila subduction system from wedge taper analysis

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Based on bathymetric data and multichannel seismic data, the Manila subduction system is divided into three segments, the north Luzon segment, the seamount chain segment and the west Luzon segment starts in Southwest Taiwan and runs as far as Mindoro. The volume variations of the accretionary prism, the forearc slope angle, taper angle variations support the segmentation of the Manila subduction system. The accretionary prism is composed of the outer wedge and the inner wedge separated by the slope break. The backstop structure and a 0.5-1 km thick subduction channel are interpreted in the seismic Line 973 located in the northeastern South China Sea. The clear décollement horizon reveals the oceanic sediment has been subducted beneath the accretionary prism. A number of splay faults occur in the active outer wedge. Taper angles vary from $8.0\pm1^\circ$ in the north Luzon segment, $9.9\pm1^\circ$ in the seamount segment to $11\pm1^\circ$ in the west Luzon segment. Based on variations between the taper angle and orthogonal convergence rates in the world continental margins and comparison between our results and the global compilation, different segments of the Manila subduction system fit well the global pattern. It suggests that subduction accretion dominates the north Luzon and seamount chain segment, but the steep slope indicates in the West Luzon segment and implies that tectonic erosion could dominate the west Luzon segment.