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What is a Ramp Valley?

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Compressional reactivation of a graben or strike-slip basin in changing tectonic regimes leads to either "basin block down" and continued deposition or "basin block up" and erosion of sediments. "Ramp valley" is a useful descriptive term introduced by Willis (1928) for basins of the first type and lacks confusing tectono-genetic connotations. Ramp valleys are fairly common in tectonically active areas today, probably have been in the past, and are more likely to be preserved in the rock record than ramp uplifts. We present map and LANDSAT data from two active ramp valleys (Enriquillo, Dominican Republic; Turfan, China) and review published data on the most thoroughly studied ramp valley, the Ventura Basin, Calif. Several general characteristics of ramp valleys are suggested and contrasted with those of other basin types. These may provide useful criteria for identifying ancient ramp valleys: 1) In cross-section, ramp basins are symmetrical between bounding reverse faults and are synclinal both from depositional basinward dips and syn- to post-depositional deformation; 2) Great relief between depressed basin floor and uplifted margins results in very rapid sedimentation rates; 3) Subsidence rates generally increase with time; 4) Some ramp valleys are close to or below sea level with thick evaporite deposits; 5) Permanent or slightly shifting depocenters result in immense stratigraphic thicknesses deposited over one point.