

**Comparability of the Flat-slab Sectors of the Andes and Sevier-Laramide USA:
Consequences of Tectonic Erosion and Coupling at the Subducting Plate
Downbend.**

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Many earthquake ruptures apparently go right through the subducting plate in the downbend region, so a seismogenically compatible new model of subducting plate downbend has been set up (Osmaston IGC'92, UKGA'93, IASPEI94). This involves through-plate step-faulting, a bit like at the top of an escalator. Each increment in step-fault throw beneath the hanging wall offsets the subduction interface, locking subduction temporarily.

The resulting alternation of drop-down and shear-off involving the hanging wall material, seismologically recognised as "close-coupled" subduction zones, has three main consequences: (1) the downbend position is rapidly advanced further beneath the margin, deepening at a shallow angle; (2) the push of the subducting plate is mechanically coupled to the hanging wall at the downbend, so can induce foreland-directed thrusting that migrates as the downbend does; (3) arc magmatism migrates too but commonly fails to produce a supracrustal arc (just underplating?) while downbend advance is very rapid.

These consequences seem restricted to where the subducting plate is less than about 70Ma old. Their incidence will be discussed for transects in N-Central Peru, Central Chile-Pampean Ranges and Sevier-Laramide events in SW USA. The N-Central Peru interface has an inflection just offshore at which an erosional "second cut" of the hanging wall is occurring, reducing crustal thickness and producing the rapid Lima basin subsidence there. Where the interface and downbend lie below the Moho, as they do further east, subduction tectonic erosion does not induce subsidence.

A source for much-enhanced plate push from MORs will be outlined. It is evident that the shape of the hanging wall, as modified by subduction tectonic erosion, is what mainly controls such interface profiles, and not the properties of the slab, so superficial features like the Nazca Ridge have little effect.