tonic style of sedimentation occurred in the middle Berriasian from arc-derived to basement-derived sediment. These changes are ascribed to a decrease in the angle of subduction, which caused a cessation of volcanism and widespread uplift of basement rocks. Sedimentation and subsidence continued only along the frontal-arc and rear-arc due to thermally induced subsidence. Away from the arc, sedimentation was initiated diachronously after regional unconformity, and subsidence was mainly controlled by the rate of sedimentation.

Two subparallel metamorphic belts were the main source terranes for the Morro Solar Group, which was deposited in a tectonically quiescent basin. The Brazilian shield furnished sediment only to the foreland basin. A complex distribution of source terranes gave rise to nonsystematic distribution of environments along and across the Andes. Fluviodeltaic and shallow-marine peritidal sedimentation characterizes most of the lowermost Cretaceous strata in the Peruvian Andes.

In the Lima basin, the Morro Solar Group consists of quartz-rich sandstone, shale, and minor micritic limestone beds. Sandstones are highly mature and exhibit cross-bedding that suggests paleosediment transport to the southeast. Shale units are thinly laminated and contain minor interbedded siltstone. Vertical facies variation suggests progradation of a braided system toward a broad intertidal zone prior to encroachment of the late Valanginian sea.

Lower Neocomian siliciclastic sedimentation in the Peruvian Andes is consistent with earlier facies developed in the initial stages of fore-arc evolution prior to the emplacement and localization of the volcanic arc. Continuous Mesozoic continental erosion not only accounts for the lack of an accretionary wedge, but also for the landward migration of the trench and uplifting of metamorphic cores. These processes resulted in a shortening of the fore-arc basin.

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Modern Mahakam Delta, Indonesia: Sand Distribution and Geometry in Mixed Tide and Fluvial Delta

A core study was made of a mixed, tide and fluvial, low-wave delta formed in the humid tropics. Little subsurface data were previously available for this type of delta, in which morphology and sediment distribution reflect both fluvial and tidal characteristics.

The delta plain is a tidal marsh, with bioturbated organic clays, incised by separate networks of distributary and tidal channels. In contrast to the mud-filled meandering tidal channels, distributaries are linear and filled with sand accumulating as lateral accretion bars. Distributaries form narrow ribbons of channel-fill sands of variable thickness (5 to 11 m), eroded or superimposed onto underlying delta front clays and sands. Facies and vertical sequences are fluvial, erosive based and fining-up in the upper delta plain, and tidal and coarsening-up in the lower delta plain. The lack of fluvial levees and splays reflects the tidal influence in the distributaries.

On the delta front, sand occurs as numerous bars, forming a spectrum of distinct types which reflect the local river-tide ratio. Major distributaries form thick (7 m) localized arcuate mouth bars, while off smaller distributaries, triangular middle ground bars occur, forming more sheet-like, thinner sand bodies. In areas of low river input, tidal ridges predominate. The bars are separated by organic clay, but lateral coalescence and stacking can locally increase sand continuity. Sequences are coarsening-up, and facies show tidal and marine characteristics. A general seaward bar thickening exists owing to the more distal position of the thicker arcuate bars; this results in a vertical bar thinning-up progradational sequence.

Seaward of the delta front bars, prodelta sediments composed of massive clays form the base of a 50-m thick regressive sequence composed of multiple bar deposits, followed and incised by sandy distributary fills. Sedimentation rates range between 0.2 and 1.3 cm per year $^{-1}$.

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Structural Control of Rocky Mountain Front: COCORP Profiles Across Laramie Mountains

The Rocky Mountain Front forms the eastern edge of the North American Cordillera and represents significant Laramide deformation of the continental basement 1,500 km from the nearest coeval plate margin. COCORP deep seismic profiles were recorded across the northern part of the front to investigate its structure and the influence of the Archean-Proterozoic crustal boundary, expressed in the nearby Medicine Bow Mountains as the Nash Fork-Mullen Creek (NFMC) shear zone.

Four COCORP profiles totaling 180 km transect the Denver basin, Laramie Mountains, and Laramie basin. West-dipping (20°) reflections beneath the mountains truncate basement events and project to key frontal faults, suggesting that the northern front has a structure of shallow, en echelon basement thrusts. A steep northwest dip for the NFMC shear zone is indicated by equivocal truncations and diffractions in basement beneath the east edge of the Laramie basin. Alternatively, a band of events with apparent southward dip under the mountains may be sideswiped from the shear zone, which, together with a predominant southeast-dipping seismic basement fabric, suggests a moderately steep southeast-dipping shear zone. The second interpretation is favored. Continuous reflections at 15.5 to 17.0 sec east of the mountains may indicate a Moho depth of 48 km, while the deepest events on other lines are shallower (11 to 13 sec).

Thus, COCORP profiling and nearby refraction surveys suggest crustal thinning to the northwest across the Archean-Proterozoic boundary which also controlled the segmentation of the northern Rocky Mountain front. On a regional scale, crustal thinning may be partly responsible for the greater diversity of the Laramide in Wyoming.

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Diagenesis and Secondary Porosity Evolution of Sarir Sandstone, Southeastern Sirte Basin, Libya

Virtually all porosity is of secondary origin in the productive Lower Cretaceous Sarir Sandstones of the Calanscio area in the southeastern Sirte basin, Libya, where production is obtained from depths of about 8,000 to 13,000 ft (2,438 to 3,962 m). Principal reservoirs are fluvial sandstones now composed predominantly of quartz, but originally composed of up to 25% mud intraclasts, rock fragments, feldspars, and mica. Even though most of the original porosity was destroyed by compaction and cementation, deep-burial leaching of the non-quartz constituents created considerable porosity. Average porosity is 13%; the maximum is 31%. Most secondary pores are oversized molds of dissolved non-quartz grains. Skeletal feldspars and ragged metamorphic rock fragments are preserved in some layers. Commonly, feldspar and rock fragments are