Late Paleozoic and Early Mesozoic Carbonate Rocks and Depositional History of the Chulitna Terrane

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Paleozoic and Mesozoic rocks of the Upper Chulitna District, south-central Alaska, comprise one of the many terranes considered to be originally allochthonous and subsequently accreted to the western margin of North America. Paleozoic and lower Mesozoic rocks exposed in the Chulitna terrane are composed of a series of volcanic, volcaniclastic and sedimentary rocks that generally record two transgressive-regressive successions. The character and distribution of Permian and Triassic carbonate rocks provide some general constraints on the paleogeographic, depositional, and tectonic history of this poorly understood terrane.Basal volcanic rocks, chert and tuff of the Chulitna terrane includes units as old as late Devonian and as young as Mississippian. Pennsylvanian(?) and Permian rocks record deepening upward deposition beginning with volcaniclastic conglomerates, sandstones and siltstones with a mid-shelf trace fossil assemblage overlain by cherts and thin bedded sandstones and siltstones with graded beds, basal scours, and abundant neritic trace fossils including *Chondrites* and *Scalarituba*. The subjacent volcaniclastics, sandstones and siltstones record terrestrial to shallow marine deposition and a proximal volcanic source while the cherts and overlying sandstones and siltstones imply relatively deep water pelagic and tubiditic deposition and a distal volcanic source.

Overlying the Permian turbidites are Permian limestones containing a series of coarsening upward cycles with quartz sand-rich wackestone grading into crinoidal packstone or grainstone. The fauna, including horridonid and spirifirid brachiopods, bryozoans, and solitary rugose corals, and overall lithology of these limestones indicate cool-water and deposition during a period of quiescence in both volcanism and siliciclastic input. The Permian limestone is overlain by a heterogeneous Permian(?) to Triassic unit including mafic volcanic flows, sills, tuffs, and redbed volcaniclastic rocks. This packages marks the top of the first transgressive-regressive succession.

Brown calcareous Triassic sandstone, argillite, and limestone overlies theredbed unit and represents the beginning of a second transgressive succession. A 15-20 m thick Upper Triassic limestone unit, composed of shelf margin and upper slope bioclastic rudstones and grainstones that grade upward into biostromal beds composed of laminar spongiomorphs and patches of branching scleractinian corals. This unit appears to be a lateral equivalent of thin limestones interbedded with the brown calcareous siliciclastic rocks. A tropical to subtropical fauna of corals, spongiomorphs, *Spondylospira* and other brachiopods, alatoform bivalves, sponges, and echinoids and lithologic characteristics of this limestone imply warm-water, regressive deposit.

The uppermost Triassic unit is represented by Norian limestones interbedded with basalt, tuff, and/or volcanically derived sandstone. Interbedded limestone and sandstone in the northeastern part of the Chulitna terrane appears to be a lateral equivalent of interbedded limestone and basalt that crops out to the south and west. The limestones contain a fauna similar to that described below and they represent the maximum shoaling during the Triassic.

The upper Paleozoic and lower Mesozoic rocks of the Chulitna terrane record variations in depositional environments through two transgressive-regressive cycles. Cool-water carbonate deposition during the Permian implies an open ocean setting in the eastern portion of the ancestral Pacific but does not provide strict paleolatitudinal controls. Warmer-water Upper Triassic carbonates imply a change in paleoceanography and represent either a low paleolatitude setting or the existence of a tectonic barrier outboard of the terrane that sheltered these carbonates from cool open eastern ocean basin. Further research on the carbonate and volcanic rocks of the Chulitna terrane will be necessary to accurately gauge its relationship to other coeval terranes in southern Alaska.

The Alaska Geological Society 1999 Science and Technology Conference