

THE COLORADO PLATEAU CORING PROJECT (CPCP): CHRONOSTRATIGRAPHIC CONTEXT FOR TRIASSIC- JURASSIC EARTH SYSTEM EVENTS AND PROCESSES

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The CPCP seeks to provide a rigorous geochronologic framework for the rich biotic assemblages of early Mesozoic strata of the American West by providing complete stratigraphic sections sampled largely by coring. With unambiguous superposition, time can be assessed at problem-appropriate resolution, and events, fossil occurrences, and environmental records can be temporally linked across geography and facies with a globally-exportable time scale based on paleomagnetic polarity stratigraphy and high-resolution U-Pb zircon dates. Coring for Phase 1 of the project was completed during December, 2013 in Petrified Forest National Park, AZ, USA and was funded by US-NSF and ICDP. A total of 840 m of core from two sites, separated by 31 km, was recovered spanning the lower Owl Rock Member of the Chinle Fm. to the base of the formation (Late Triassic), and all of the Moenkopi Fm. (nominally Early and early Middle Triassic), terminating in the Permian Coconino Fm. The 2.5 in dia. cores were drilled inclined from the vertical to maximize expression of the paleomagnetic reversal pattern. The main paleobiological questions addressed include: 1) was the largest identified medial Late Triassic biotic turnover synchronous with the giant Manicouagan impact? 2) were continental biotas of tropical Pangea radically different than those from higher latitudes despite the geographic contiguity? 3) how does the new exportable timescale inform our understanding of existing biostratigraphic correlations? 4) what was the tempo and mode of continental biotic recovery from the Permian-Triassic extinctions in west-central Pangea?; and 5) what was the biotic context for the interval before the end Triassic extinction (ETE). Phase II of the CPCP is planned to recover longer cored sections that span the Early Jurassic and Late Triassic, overlapping with cores from Phase I and sampling the end Triassic extinction and the subsequent biotic recovery at several sites. The main paleobiological issues addressed by these cores will include: 1) the nature and chronology of the ETE subsequent recovery in west-central Pangea; 2) the interplay between global environmental change and apparent climate change driven by tectonic plate translation across zonal climate zones and effects on the biota; and 3) the chronostratigraphic context for the rise to ecological dominance of the dinosaurs. Phase III of the CPCP, still in the early planning stages, is aimed at providing the chronostratigraphic and paleoclimatic context for the famous Late Jurassic biotic assemblages from western North America. [Partly supported by UNESCO-IUGS IGCP Project 632].

