

Suarez, C.A., Sharman, G.R., Oefinger, J., Boudreaux, A., Mmasa, D., Crowley, J.L., Mohr, M.T., Marsh, A.D., Milner, A.R.C., and Park Boush, L.E. 2025, A revised chronostratigraphy of the Triassic-Jurassic Moenave Formation, western USA: GSA Bulletin, <https://doi.org/10.1130/B37784.1>.

Supplemental Material

Table S1. Detrital zircon samples taken from study sites. Stratigraphic location, Grain size, depositional environment, number of grains analyzed, and location are indicated.

Table S2. Carbon-isotopic composition of bulk organic carbon from study sites. Stratigraphic location, %C, and C-isotope data relative to two age-model-generated ages are presented.

Table S3. Results of detrital Zircon LA-ICPMS isotopic U-Pb analyzed at the University of Arkansas

Table S4. Metadata for LA-ICPMS analysis for Boise State University

Table S5. Results of Detrital Zircon LA-ICPMS isotopic U-Pb analyzed at Boise State University.

Table S6. Zircon Standard LA-ICPMS isotopic U-Pb and trace element concentration data used at Boise State University

Table S7. U-Pb CA-TIMS isotopic data results

Table S8. Results of Bayesian age-models. Two models were generated. The MDA model assumes maximum depositional age distributions and DA model assumes grains represent the depositional age of the strata.

Table S9. Known taxa from the Moenave Formation by member.

Figure S1. Relative %C versus $\delta^{13}\text{C}_{\text{org}}$.

Figure S2. Detrital zircon age distributions for each study site.

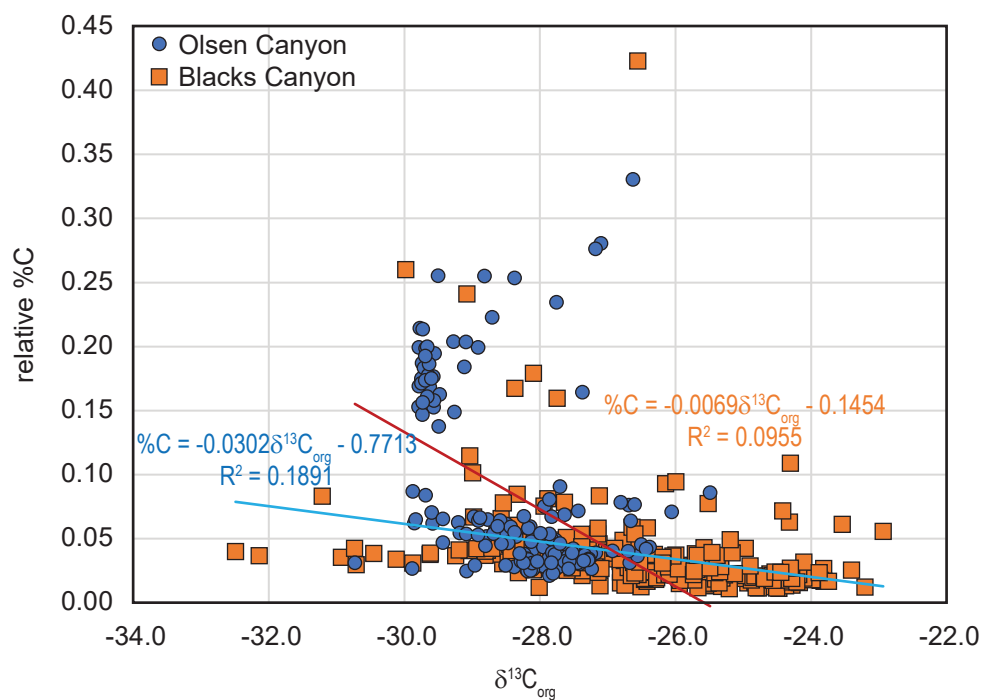


Figure S1. C-isotopic composition of samples relative to the %C preserved in each sample for Blacks Canyon (blue circles) and Olsen Canyon (orange squares). There is a poor correlation between organic C preservation and isotopic composition suggesting %C does not control the C-isotopic composition the sample.

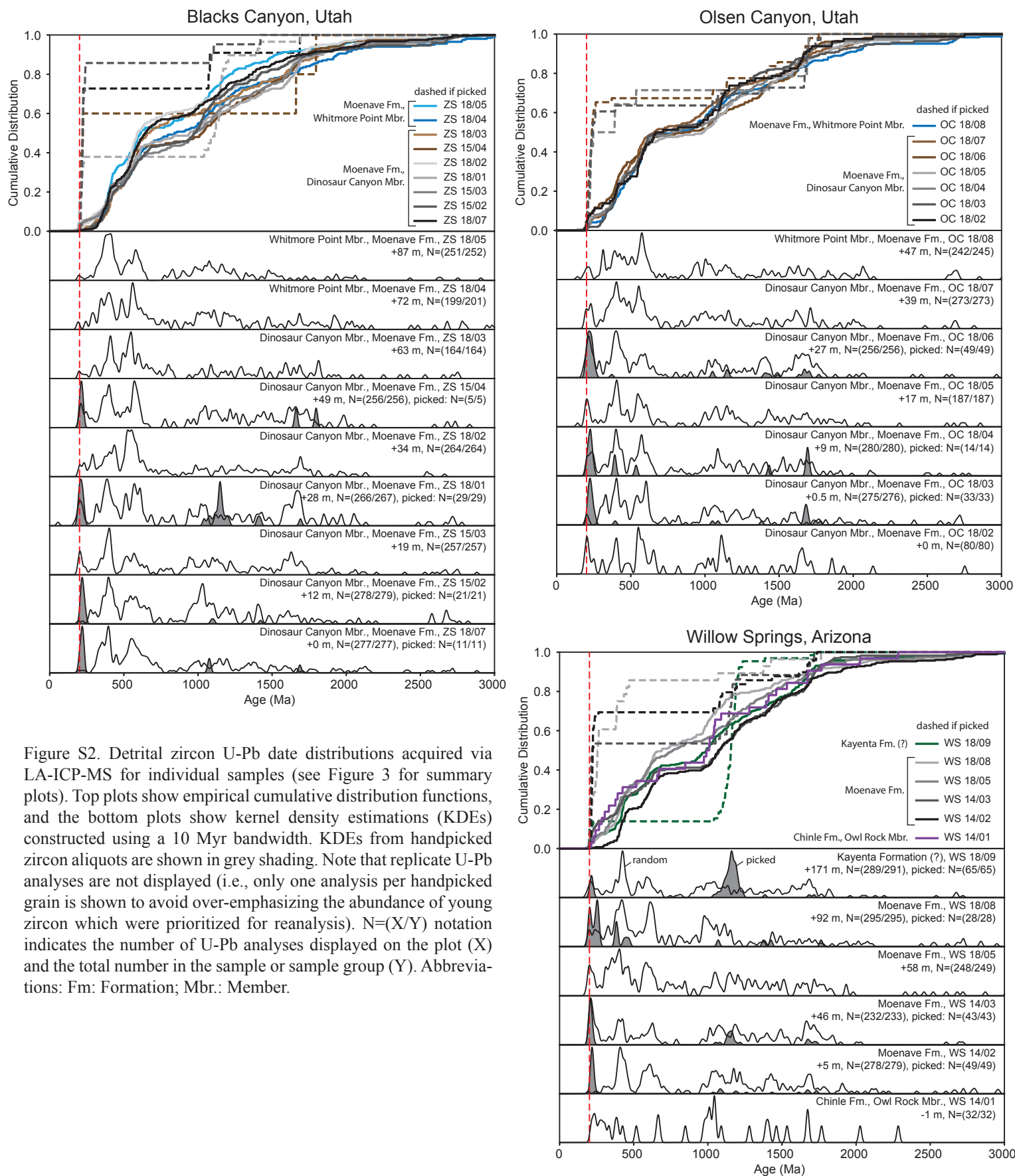


Figure S2. Detrital zircon U-Pb date distributions acquired via LA-ICP-MS for individual samples (see Figure 3 for summary plots). Top plots show empirical cumulative distribution functions, and the bottom plots show kernel density estimations (KDEs) constructed using a 10 Myr bandwidth. KDEs from handpicked zircon aliquots are shown in grey shading. Note that replicate U-Pb analyses are not displayed (i.e., only one analysis per handpicked grain is shown to avoid over-emphasizing the abundance of young zircon which were prioritized for reanalysis). N=(X/Y) notation indicates the number of U-Pb analyses displayed on the plot (X) and the total number in the sample or sample group (Y). Abbreviations: Fm: Formation; Mbr.: Member.

Supplementary Data Table 9: Know Taxa from the Moenave Formation

Dinosaur Canyon Member	Whitmore Point Member
Flora	Flora
<i>Equisetum sp.</i>	<i>Equisetum sp.</i>
<i>Saintgeorgia jensenii</i>	<i>Sanmiguelia lewisii</i>
<i>Araucarities stockeyi</i>	<i>Pagiophyllus sp</i>
<i>Minerites planus</i>	Confierales undet
<i>Podozamites sp.</i>	
<i>Clathropteris cf. walkeri</i>	
Vertebrate Traces	Vertebrate Traces
<i>Batrachopus</i>	<i>Batrachopus</i>
<i>Grallator</i>	<i>Grallator</i>
<i>Eubrontes</i>	<i>Eubrontes</i>
<i>Brachychirotherium</i>	<i>Kayentapus</i>
	<i>Gigandipus</i>
	<i>Anomoepus</i>
	<i>Characichnos</i>
	Eucynodont synapsid tracks
	<i>Unichnia</i> (two morphotypes)
	<i>Piscichnus</i>
Vertebrates	Vertebrates
<i>Protosuchus richardsoni</i>	<i>Ceratodus stewarti</i>
Coelophysid	<i>Lissodus johnsonorum</i>
	Palaeoniscoidea n. gen. et. sp.
	Mawsoniidae coelacanth, n. gen. et sp.
	<i>Lophionotus kanabensis</i>
	<i>Lophionotus</i> morphotype A
	<i>Lophionotus</i> morphotype B
	<i>Lophionotus</i> morphotype C
	<i>Dilophosaurus</i> -like theropod
	Ceolophysoid theropod teeth
	cf. <i>Ornithischia</i> (partial tooth)
	cf. Synapsida (partial tooth)
Invertebrate Traces	Invertebrate Traces
Arthropod trackway	<i>Palaeophycus tubularis</i>
	<i>Skolithos</i> isp.
	<i>Helminoidichnites tenuis</i>
	<i>Scoyenia</i> isp.
	<i>Lunullipes</i> isp.
	<i>Siskemia eurypyge</i>
	<i>Kouphichnium</i> isp.
	<i>Diplichnites triassicus</i>
	cf. <i>Treptichnus</i>
	cf. <i>Margaritichnus</i>
	cf. <i>Rhizocorallium</i>

Ostracoda

- Lockeia*
- Ostracoda**
- Suchonellina globosa*
- Suchonellina stricta*
- Whipplella cuneiformis*
- Whipplella* sp. 2?

Conchostraca

- Conchostraca**
- Euestheria brodieana*
- Bulbilimnadia killianorum*

Mollusca

Mollusca

Total taxa

Unionid
14

44