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Desert pavements and soils on basaltic pyroclastic deposits at Lathrop Wells and Red Cone volcanoes, southern Nevada Abstract

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Abstract

Formation of desert pavement and accretionary soils are intimately linked in arid environments such as the Mojave Desert. Well-sorted fallout scoria lapilli at Lathrop Wells (75-80 ky) and Red Cone (~1 Ma) volcanoes (southern Nevada) formed an excellent starting material for pavement, allowing infiltration of eolian silt and fine sand that first clogs the pore space of underlying tephra and then aggrades and develops vesicular A (Av) horizons. Variations in original pyroclast sizes provide insight into minimum and maximum clast sizes that promote pavement and soil formation: pavement becomes ineffective when clasts can saltate under the strongest winds, while clasts larger than coarse lapilli are unable to form an interlocking pavement that promotes silt accumulation (necessary for Av development). Contrary to predictions that all pavements above altitudes of ~400 m would have been "reset" in their development after late Pleistocene vegetation advances (about 15 ka), the soils and pavements show clear differences in maturity between the two volcanoes. This indicates that either the pavements/soils develop slowly over many 10,000's of years and then are very stable, or that, if they are disrupted by vegetation advances, subsequent pavements are reestablished with successively more mature characteristics.