

**Prehistoric techniques for enhancing soil fertility in aridisols at the Creekside Village Archaeological Site, New Mexico, and its implications for dryland soil and water management policy**

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Studying a prehistoric culture's soil management can provide relevant information to modern societies and their relationships with the biophysical environment. The archaeological record illuminates human's long-term connection with soil, especially the soil taxonomic class of aridisols (dry soils). The escalation of desertification on all continents, paired with declining water availability, instigates aridisol fertility research that aids this global crisis. Prehistoric indigenous people have practiced dry agriculture in the Southwest United States region for hundreds of years, and by researching past management of soils, it may be possible to understand how to better conserve and protect today's fragile soil resources. This research examines the prehistoric techniques at the Jornada Mogollon Creekside Village Archaeological Site (CSV) near Tularosa, New Mexico, used to manage soil moisture and fertility in aridisols by integrating water reservoirs. This thesis uses micromorphological and geoarchaeological proxies to analyze how past humans altered CSV's reservoir starting in the Mid-Mesilla Phase (650–700 A.D.) and its implications for soil health during the occupation and after abandonment. Results trend toward enhanced soil fertility and indicate that the water reservoir was part of the site's runoff agricultural system. This is the first micromorphological analysis of the site's reservoir, and more research is needed to complete the story. Many indigenous communities, such as the Jornada Mogollon, who once practiced niche soil management, have moved away from their ancestral sites, resulting in modern communities that lack understanding of their landscapes.

Studying the connection between humans and ecosystems as a symbiotic system is essential to implementing ecocentric resource management, especially in dryland agriculture. The innate challenges of farming in aridisols paired with current poor land-use practices motivate land-use policy research of prehistoric indigenous soil and water management practices, such as those at CSV. Geoarchaeology analyses highlight the unique identities of Southwestern United States prehistoric sites and the importance of niche soil management specific to each soil ecosystem. This ongoing research contributes new micromorphological analyses, stable isotopic analysis, and literature for Jornada Mogollon sites in proximity to CSV.

**Advisor signatures:**

Timothy Beach

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**Affirmation of academic integrity:**

G.O. I affirm that this Research Proposal represents my original work and that it does not violate any of the University's standards of academic integrity. I affirm that I will conduct my research and write my thesis adhering to these academic standards.

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