SOIL GEOMORPHIC PATTERNS AND GRASSLAND RESISTANCE AT THE JORNADA BASIN LTER SITE

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Geomorphic properties, such as elevation, slope gradient, and orientation, are fundamental elements of the landscape that play a large role in the persistence of desert grasslands. Microclimatic variations created by these landform elements can control physical and chemical weathering rates of parent material. Topographic location (e.g. Run-on vs. Run-off position) can control the redistribution of this weathered material, which can influence the movement of nutrients and sediments by wind and water throughout an ecosystem. Over time, the process of erosion and sedimentation differentiates the landscape into individual soil units that vary in age, physical, and chemical composition. Upon these soil-geomorphic entities, isolated patches of grasslands can be found in the Jornada Basin, New Mexico. These grass patches are resistant against the transition from semi-arid, perennial grasslands to a shrub dominated ecosystem that began within the Jornada Basin 150 years ago. The survival of these remnant grasslands are strongly influenced by vegetation-soil-landform relationships. Therefore, the soil-geomorphic properties of a specific landscape can provide a stronghold for grass species to resist and survive the detrimental effects of desertification, thus, producing the isolated grass patches that are observed today in the Jornada Basin.


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