THE WALNUT GULCH LTAR

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The Walnut Gulch LTAR builds on and advances 60 years of research on the USDA-ARS Walnut Gulch Experimental Watershed surrounding the town of Tombstone in southeast Arizona. Instrumentation on the watershed was initiated in 1953 and currently approximately 149 square kilometers of semiarid rangeland are monitored and serve as an outdoor laboratory. The watershed is a tributary to the upper San Pedro Basin that drains northward spanning the Mexico-U.S. border. Satellite watersheds associated with the WG-LTAR include 8 small watersheds located in the Santa Rita Experimental Range (SRER) operated by the Univ. of Arizona that are located roughly 75 km WNW of Tombstone and 40 km south of Tucson. These watersheds are representative of approximately 60 million hectares of brush and grass covered rangeland found throughout the semi-arid Southwest in the transition zone between the Chihuahuan and Sonoran Deserts. Elevation of the watersheds ranges from ~900 m to 1585 m MSL. In this region, cattle grazing is the primary land use with mining, limited urbanization, and recreation making up the remaining uses. All the instrumented watersheds are drained by ephemeral channels that are dry about 99 percentof the time. The "Business as Usual" agricultural practice consists of continuous and rotational pasture grazing. Brush management is a relatively common practice to increase forage production, improve vegetative cover, and reduce surface soil erosion. It has increased in recent years in Texas through New Mexico and into southeastern Arizona due the availability of Natural Resource Conservation Service Environmental Quality Incentive Program (EQIP) funding. The 8 WG-LTAR Santa Rita watersheds have a 40-year set of baseline observations of rainfall, runoff and sediment delivery comparing the two different grazing practices with and without mesquite *(Prosopis velutina)*. Our proposed alternatively managed production system (AM) will involve removing mesquite on two of the Santa Rita watersheds to evaluate the impacts on a number of ecosystem services compared with the prior record and the other six untreated watersheds. An overview of key historical research results as well as the existing and planned infrastructure and experimental design will be presented in this poster.

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