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Jornada Experimental Range and Sevilleta LTER: Unique arid rangelands for experiments to validate satellite systems

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The Jornada Experimental Range (Jornada) in southern New Mexico USA and the Sevilleta Long Term Ecological Research (LTER) in Central New Mexico provide unique opportunities to use remote sensing techniques to study arid rangeland and the responses of vegetation to changing hydrologic fluxes and atmospheric driving forces. Research at the Jornada has been conducted continuous since 1912 by the United States Department of Agriculture (USDA) Forest Service and USDA Agricultural Research Service and has been a National Science Foundation LTER site since 1981. Research at the Sevilleta LTER has been continuous since 1988. These long-term investigations provide unique ground data on vegetation characteristics, ecosystem dynamics, and vegetation response to changing physical and biological conditions. To complement the programs of ground measurements, a campaign called JORNEX (JORNada EXperiment) began in 1995 to collect remotely sensed data from aircraft and satellite platforms to provide spatial and temporal data on the physical and biological states of these arid rangelands. A wide range of ground, aircraft, and satellite data have been collected on the physical, vegetative, thermal, and radiometric properties of the ecosystems (grass, grass/shrub transition, and shrub) typical of arid rangeland of southwestern U.S. deserts. Spatial surface energy balance estimates were made from a combination of parameters and state variables estimated from satellite, aircraft and ground data. Landscape surface roughness was evaluated with the laser altimetry data and used to estimate aerodynamic roughness. Data from different platforms allowed the evaluation of the landscape at different scales. These measurements are being used to quantify hydrologic budgets and plant responses to change in components in the

water and energy balance at the Jornada and Sevilleta. Surface energy fluxes have been observed since 2000 for several different surface conditions.