



Monitoring Rangeland Health Indicators by Remote Sensing

Raymond E. Hunt and D. Terrance Booth; USDA-ARS; Contact Author Email: Raymond.Hunt@ars.usda.gov

Based on a land-cover classification from NASA's MODerate resolution Imaging Spectroradiometer (MODIS), rangelands cover 48% of the Earth's land surface, not including Antarctica. Nearly all analyses imply the most economical means of monitoring large areas of rangelands worldwide is with remote sensing; however, remote sensing is not integrated into the majority of land-management operational plans because there is a large difference between the information remote sensing can provide and the information rangeland managers have conventionally collected. Current management is often based on comparing the plant-community composition of an ecological site with the historic climax plant community using state and transition models. Classification of land cover using data from remote sensing platforms does not provide information on the species composition of a plant community. However, at a variety of spatial scales, indicators of rangeland health such as plant cover (sometimes by lifeform), bare ground, erosion rills and gullies, and some invasive weeds, can be remotely sensed and quantified. Plant productivity can be estimated at 56-70 m pixel resolution using the ResourceSat-1 Advanced Wide Field Sensor (AWiFS). Advanced Very-High Resolution Radiometer (AVHRR) Normalized Difference Vegetation Index (NDVI) is being tested as a basis for pasture, range and forage insurance by the USDA-Risk Management Agency, because there is a long time series of AVHRR NDVI to account for inter-annual variability in precipitation. We conclude that there is a need for indicators, which can be accurately and consistently measured from remote sensing data, that can be incorporated into state and transition models.

2009. 62nd Society for Range Management Annual Meeting. Paper No. 120-1.