

TR-306

Use of Satellite Remote Sensing in Monitoring Saltcedar control along the Lower Pecos River, USA

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Vegetation along the riparian corridor of the lower Pecos River in the United States has been dominated by saltcedar for the past century. In 1999 through 2004, herbicides were sprayed from helicopters along some sections of the river to reduce saltcedar infestation. Here we describe a simple methodology based on satellite remote sensing for monitoring the impact of the saltcedar control measures. Data from the Landsat 7 Enhanced Thematic Mapper Plus (ETM+) and the Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) obtained in 1999 through 2004 over a section of the Pecos near Mentone, Texas were used for the present study. Herbicides were applied in September of each year. A normalized difference vegetation index (NDVI) image was derived from the satellite data for one growing season, and then it was compared to an NDVI image from the previous year. Using the write memory insertion change detection technique, we superimposed the NDVI image pair. The superimposed image highlighted areas where vegetation was lost during the interval between the times when the two satellite data sets were acquired. The areas of vegetation loss indicated by the change detection image coincided well with the areas where herbicides were applied in the same time interval. Since the riparian vegetation previously was dominated by saltcedar, identifying the areas of vegetation loss in this case is useful in assessing the long-term impact of the herbicide treatments. The same type of change detection technique was also used to locate areas of native vegetation recovery after the herbicide application.

