

Vegetative Growth Status	Value
No Vegetation	0
Spring Only	1
Summer Only	3
Fall Only	5
Spring and Summer Only	4
Summer and Fall Only	8
Spring and Fall Only	6
All Seasons	9

Value assigned based on vegetative growth status.

value is considered irrigated and changed to an output value of "1"; all values below the threshold are considered nonirrigated and changed to an output value of "0". Each threshold seasonal mosaic then is reassigned such that spring images with a value of "1" retain a value of "1," summer images of "1" are assigned a value of "3," and fall images of "1" get a value of "5." With these values reassigned, the seasonal mosaics are combined in a single image in which every possible combination of seasonal vegetative growth is assigned a unique value (see table above), and pixels are counted no more than once.

This method was applied to 2002 satellite imagery to estimate the irrigated land in the Lower Rio Grande (LRG) Basin in New Mexico. The LRG was extracted from a Rio Grande sub-area and refined further to show the western, eastern and North Las Cruces portions of the LRG from Caballo Dam to the border with Texas. The NDVI results of these three areas as well as the corridor along the Rio Grande then were clipped from the statewide NDVI image and the irrigated

area was computed. The table at right shows the resulting estimation compared to the New Mexico Office of the State Engineer's Hydrographic Survey Bureau (HSB) estimate; the estimates for the Nutt-Hockett Basin are also shown.

The results show that the NDVI methodology provides an adequate estimate for irrigated lands and consumptive use of water statewide. Although the approach calls for using Landsat ETM+ imagery, which will not be available in the future, past experience both within the OSE/ISC and by out-of-state agencies indicate that higher spatial resolution satellite systems, digital low-flying aircraft imagery, or aerial photography may be suitable substitutes.

OSE/ISC has identified and is using advanced technologies to produce a GIS data layer of the entire state that contains all relevant details of a given water

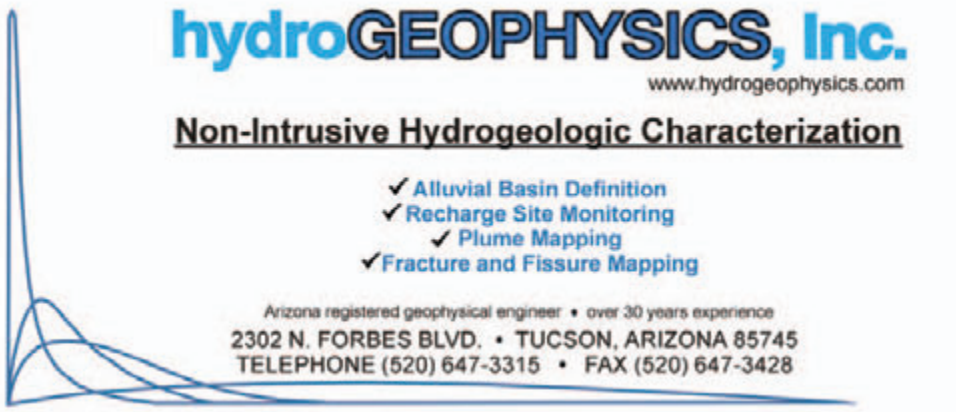
Area	HSB Acreage Estimate	NDM Acreage Estimate
Nutt-Hockett	11,554	10,971
LRG*	99,182	95,888
Totals	110,736	106,859

* Includes Rincon, Northern Mesilla, Southern Mesilla and outlying areas.

HSB cropland acreage and NDVI acreage estimates for 2002.

right. As part of this process, OSE/ISC has begun acquiring multispectral airborne digital imagery of high spatial resolution to replace its aerial photography. The objective behind obtaining digital airborne imagery is to replace past aerial photography with a product that has greater spectral resolution, similar spatial resolution, up-front computer compatibility, and the capability to simultaneously use multiple-image analyses.

The authors wish to acknowledge the contribution and technical work of Paul Neville of the Earth Data Analysis Center (EDAC) at the University of New Mexico. Contact Dario Rodriguez-Bejarano at drodriguez@ose.state.nm.us or Nabil Shafike at nshafike@ose.state.nm.us.



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