

## EXECUTIVE SUMMARY

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Land use data is an essential ingredient for floodplain modeling and drainage studies. Hydrologic modeling software, such as the Sacramento Hydrologic Calculator (Sac-Calc) developed for Sacramento County and the GIS integrated software FLO-2D™, require land use parameters to operate. LANDSAT imagery can be easily downloaded and used in a Geographic Information System (GIS) to generate required land use classifications, and be input or imported into various hydrologic models. Supervised classification on 6 bands of the LANDSAT 7 imagery for a particular area at the north-eastern part of Sacramento County was performed using ArcGIS™ (GIS software developed by Environmental Systems Research Institute, Inc. [ESRI©]). Basic land use categories to represent the area and corresponding percent impervious and *n* values were generated in the example study, using the City/County of Sacramento's Hydrology Standards Drainage Manual. The study area is comprised of urban, open space, trees and vegetation, the course of the American River, and negligible agricultural areas within the watershed downstream of Folsom Dam. Therefore, the land use categories were reduced to Water, Open Space, Urban, Vegetation, and Landscape. The ArcToolbox™ Raster Processing and Multispectral tools and the Spatial Analyst™ extension were used to compile the collection of LANDSAT bands into a single image composite, build and evaluate the spectral signatures derived from the training sets using ArcGIS™ Online Service World Imagery and DWR's Year 2000 Land Use Survey, and perform the supervised classification functions. The training sets were applied to a larger extent of the region and the results were compared and evaluated for accuracy by utilizing the Create Error Matrix© tool in ArcGIS™, developed by Nathan Jennings. The results of this mini study indicates that remote sensing technology using GIS is a feasible solution for extracting land use information for hydrologic purposes, but highly agricultural areas could be problematic using this technique as outlined and would require additional review.