

Statewide Water Analysis Network Workshop
California Water Plan Water Portfolios
Methods Describing Current Water Conditions in California

Land Use – Tom Hawkins

Key Deliverables:

Agricultural cropped acreage by DAU/County by year (20 crops/categories)

DWR's website for accessing annual agricultural cropped acreage information (1998 – 2003 available):
<http://www.landwateruse.water.ca.gov/annualdata/landuse/years.cfm>

Data and information used to develop cropped acreage:

DWR's land use survey data, county agricultural commissioner reports, local water district information (if available), any other data sources that might be available

Methods used to develop agricultural cropped acreage by DAU/County:

Conduct annual land use surveys by county, usually about 4 – 6 counties per year. From this data, determine the cropped acreage for each DAU (or portion of each DAU) within that county.

DWR's website for accessing Land Use Survey data (73 surveys available):
<http://www.landwateruse.water.ca.gov/basicdata/landuse/landusesurvey.cfm>

For the remainder of the State (counties without a DWR land use survey for that year), create crop factors by comparing the previous DWR land use survey data to county agricultural commissioner data (for the same crop and year). Apply these crop factors to that counties annual agricultural commissioner's crop report data to estimate county crop acreage for that year. Also, from the previous DWR land use survey, determine the percentage of each crop that is grown within each DAU (or portion of each DAU within that county). Apply that percentage to the estimated county crop acreage to develop cropped acreage by DAU/County.

If local information (specifically irrigation and water district information) is available, use it to improve estimates of crop acreage.

DWR's website of IDEG0 Flow Diagrams for developing annual agricultural land use:
<http://www.waterplan.water.ca.gov/technical/processmaps/flowpm/dgm23.htm>

What improvements we are considering:

Our goal is to improve the accuracy of our cropped acreage information for the Water Plan. In the last 15 years, the annual statewide acreage that is surveyed averaged about 13% (highest year about 17%, lowest about 7%). The remaining 87% (average) of the statewide acreage is developed from the procedure modifying data from the county agricultural reports. Improving land use data for those areas where there are no land use surveys that year is a primary goal.

Using additional available data from other sources:

Within our existing procedures, we may be able to use the Department of Pesticide Regulation's Pesticide Reporting database to aid in developing DAU/County crop acreage.

Remote Sensing for crop identification:

Implementing the increased use of remote sensing techniques with satellite imagery within the survey program. Preliminary work has been performed by DWR in Sutter County, where initial accuracy in identifying crops was initially about 75% (without implementing any refinements that are required to improve accuracy). Using unit applied water values by crop to compute annual county-wide applied water, the accuracy of total applied water was 98% of our actual estimates.

Remote sensing could be used on a much larger scale (half the Central Valley per year or more), and would decrease the accuracy of crop identification by field (when compared to a normal land use survey), but increase the accuracy of crop acreage on a DAU/County level.

Remote sensing for estimating crop ET:

Various techniques have already been developed using multi-spectral and thermal satellite imagery and ground level weather data with energy balance equations to estimate crop evapotranspiration. This approach would bypass the use of crop acres, ETo, crop coefficients, etc. to arrive at regional estimates of crop (or other plant material) ET. We are working with the USBR on evaluating these techniques.

Remote sensing for estimating irrigated landscape acreage:

Currently outside urban water use (irrigation of landscapes) is determined by the minimum month method. DWR (with USBR assistance) is currently using 1 meter infrared digital imagery to accurately identify lawns/ground covers, shrubs/trees, and swimming pools. Quantifying irrigated landscape area could allow for another means to estimate urban landscape water use, and more importantly, estimate potentials for conservation.