

## LANDSAT-BASED CALCULATION OF AGRICULTURAL WATER USE FRACTIONS IN CALIFORNIA

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### ABSTRACT:

Improved quantification of agricultural water use efficiency is a focus of California's Water Conservation Act of 2009. Metrics for quantifying irrigated agricultural water use can help evaluate irrigation system performance and assess strategies for improved water management. Pursuant to this legislation, the California Department of Water Resources (CDWR) has recommended several metrics to help identify opportunities for improved agricultural water use efficiency. Two such indicators are the Crop Consumptive Use Fraction (CCUF), which evaluates consumptive use relative to applied water, and the broader Agronomic Water Use Fraction (AWUF), which additionally considers water dedicated to land preparation, soil salinity management, and frost protection. Both metrics can apply at field, water district, and broader scales, though field-level is the focus of this study. A prototype software calculator has been developed to provide users with a consistent and practical means to derive these water fractions. The tool develops and relates Landsat-based estimates of crop evapotranspiration (ET) with irrigation totals to evaluate CCUF for non-stressed crops on drip or microjet delivery systems. Additional calculations can be applied to adjust CCUF for crops subjected to deficit irrigation or serviced by sprinkler, flood or furrow water delivery systems during all or part of the season. The user may supply reference ET from the CDWR California Irrigation Management Information System or use default historical averages. For AWUF derivation, the user may then input additional values for agronomic water use or use on-board tools to assist in the estimation of these parameters under best professional practices. The calculator runs under common spreadsheet software and operates on several major annual/perennial crops including almond, table grape, winegrape, oranges, peach, garlic, broccoli, lettuce, tomato, melon, and wheat.

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