

Comparison of Estimates of Evapotranspiration and Consumptive Use in Palo Verde Valley, California

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Abstract

Estimates of evapotranspiration and consumptive use by vegetation in Palo Verde Valley, California, were compared for calendar years 1981 to 1984. Vegetation types were classified, and the areas covered by each type were computed from Landsat satellite digital-image analysis. Evapotranspiration was calculated by multiplying the area of each vegetation type by a corresponding water-use rate adjusted for year-to-year variations in climate. The vegetation classifications slightly underestimated the total vegetated area when compared to crop reports because not all multiple cropping could be identified. The accuracy of evapotranspiration calculated from vegetation classifications depended primarily on the correct classification of alfalfa and cotton because alfalfa and cotton have larger acreages and use more water per acre than the other crops in the valley. Consumptive use was calculated using a water budget for each of the 4 years.

Estimates of evapotranspiration and consumptive use by vegetation, respectively, were: (1) 439,400 and 483,500 acre-feet in 1981, (2) 430,700 and 452,700 acre-feet in 1982, (3) 402,000 and 364,400 acre-feet in 1983, and (4) 406,700 and 373,800 acre-feet in 1984. Evapotranspiration estimates were lower than consumptive-use estimates in 1981 and 1982 and higher in 1983 and 1984. Both estimates were lower in 1983 and 1984 than in 1981 and 1982. These differences correspond most closely to significant changes in stage of the lower Colorado River caused by flood-control releases in 1983 and 1984 and to changes in cropping practices.

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