Irrigation Management

Efficient irrigation management practices are needed to meet the nation's crop demands

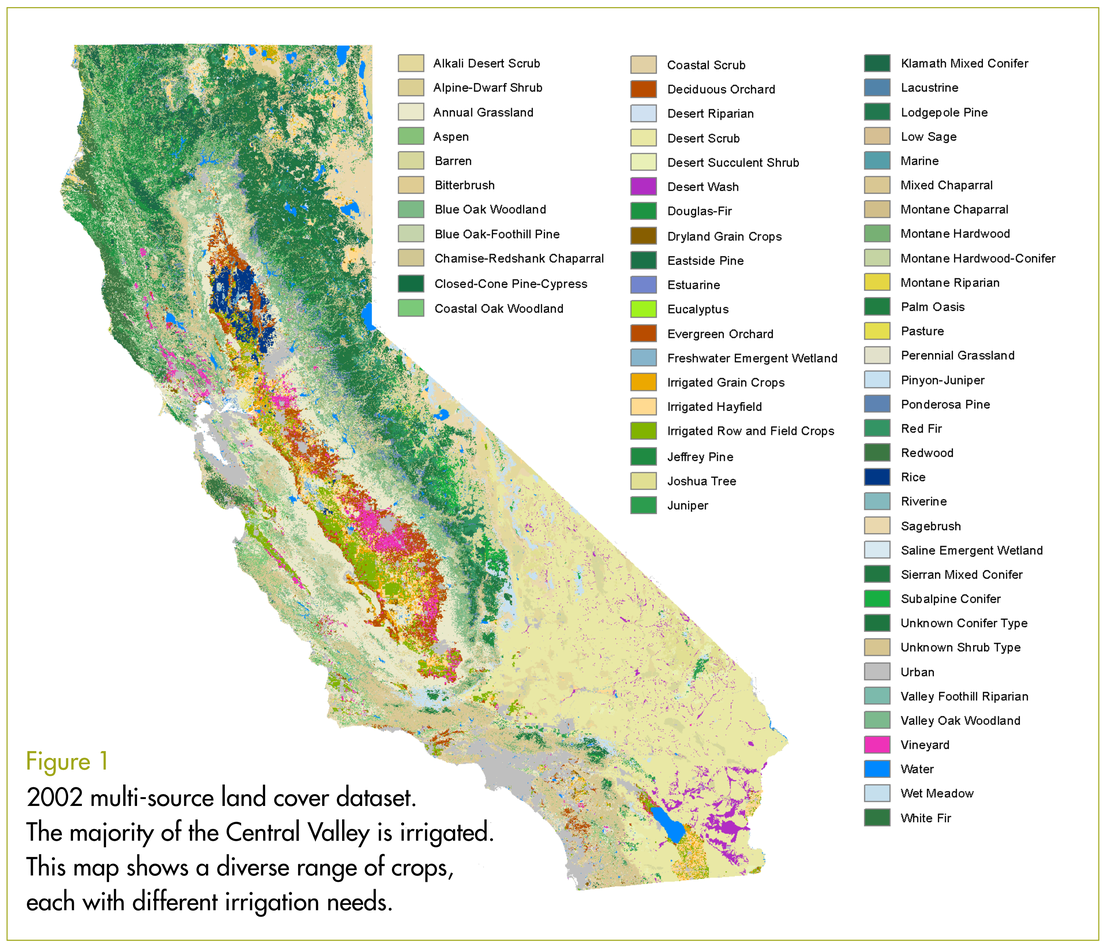
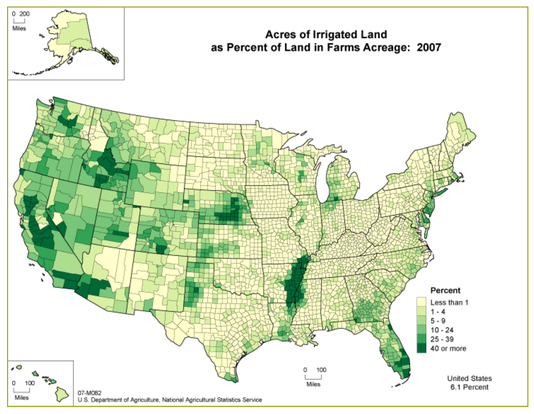
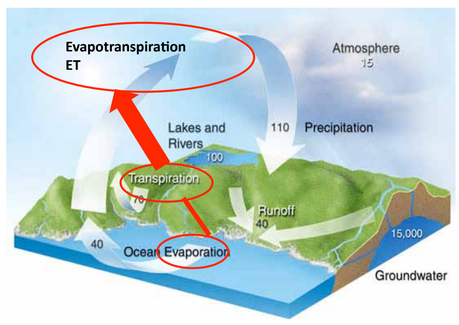


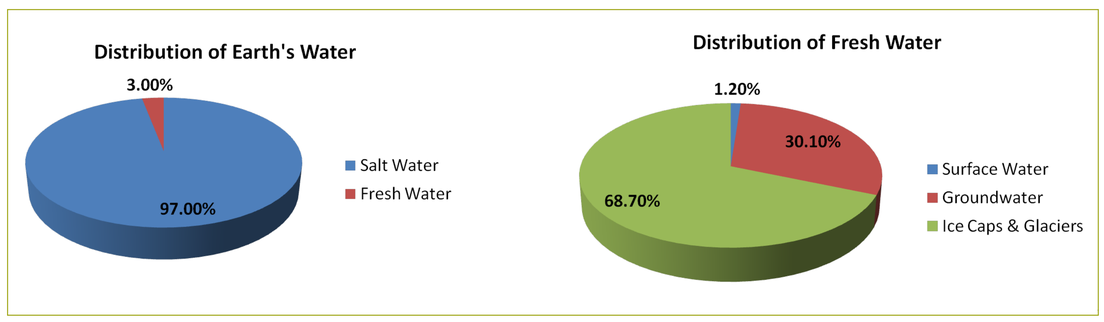
Figure 1
2002 multi-source land cover dataset.
The majority of the Central Valley is irrigated.
This map shows a diverse range of crops,
each with different irrigation needs.



▲ Figure 2—Acres of irrigated land in 2007.



▲ Figure 3—Water cycle in units of thousands of km³/yr.



▲ Figure 4—Water distribution.

FIGURE REFERENCES: 1—2002 Multi-Source Land Cover dataset produced by the CDF; 2—USDA Census of Agriculture 2007; 3—Jackson et al. 2001; 4—http://ga.water.usgs.gov/edu/waterdistribution.htm

CALIFORNIA, AS THE WORLD'S fifth largest supplier of food and agricultural commodities, is one of the leading irrigation water users in the US. An estimation of spatially distributed evapotranspiration is important to determine the water balance at different spatial and temporal scales to promote efficient management of water resources.

The California Irrigation Management Information System currently manages over 130 weather stations throughout the state providing estimates of reference evapotranspiration (ETo) for various climatic regions. These stations measure wind speed, humidity, temperature, and solar radiation to estimate ETo (water use by a non-stressed cool season grass).

Because of California's complex topography, vegetation and climate, many locations within the state lack representative weather stations. As a result, there are significant spatial ETo data gaps. Remote sensing using satellite imagery and regional scale weather models provide a means to fill in those missing gaps.

Efficient on-farm water management is required to effectively irrigate farm land to reduce the pressure on fresh water resources. Proper management requires knowing the crop water requirements (evapotranspiration or ET) and by applying the correct amount of water efficiently across the field at the time water is most needed.

Remote sensing, weather stations and weather models are valuable tools to characterize water losses from the landscape. By integrating data from computer models, surface observations, and satellites, scientists from UC Davis are taking time and spatially-varying factors like wind speed into account to provide more accurate ET estimates. This research can lead to more efficient water management particularly if ET estimation is coupled with developing technologies like remote irrigation control systems.

CREDITS:

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