

Regional estimates of crop evapotranspiration for almonds using the WRF-ACASA model

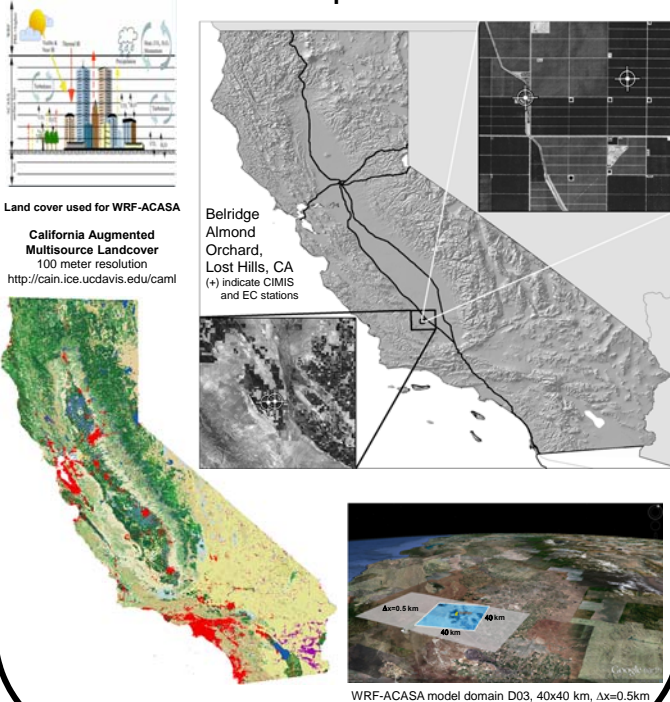


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Our research climate model incorporates detailed canopy structure and leaf area (LAI) in the land surface scheme (ACASA) integration with 3D research weather model (WRF). The goals within this Specialty Crop Research Initiative (SCRI) project are to provide spatial mapping tools for regional climate modeling:

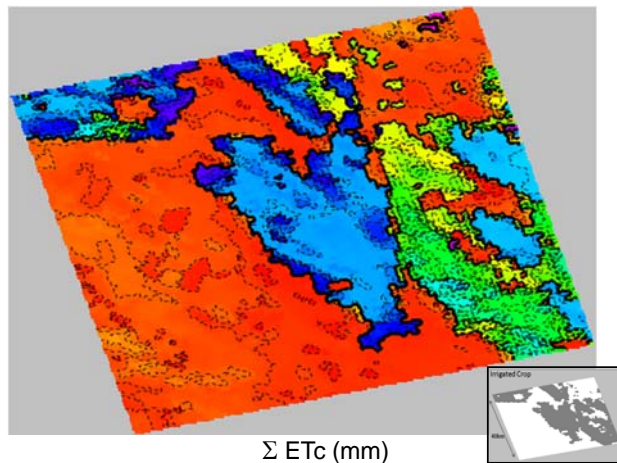
- for assessing current conditions and simulations of climate change scenarios and mitigation, such as adopting crop types and agricultural practices across a region.
- improved accuracy in crop evapotranspiration (ETc) estimates in irrigated orchards for growers and policy makers.

SCRI WRF-ACASA - Experimental domain



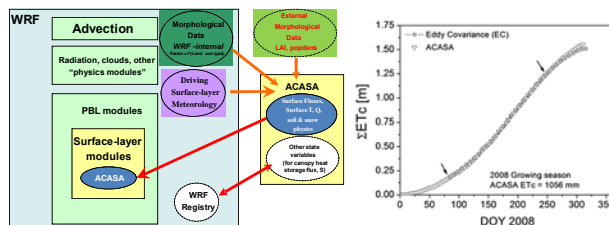
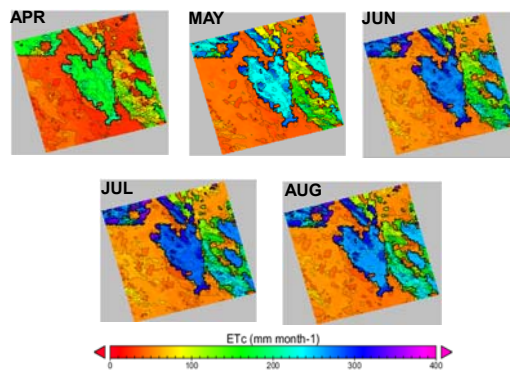
Cumulative Seasonal Crop Evapotranspiration (ETc) for Almonds in the San Joaquin Valley

April through August, 2008

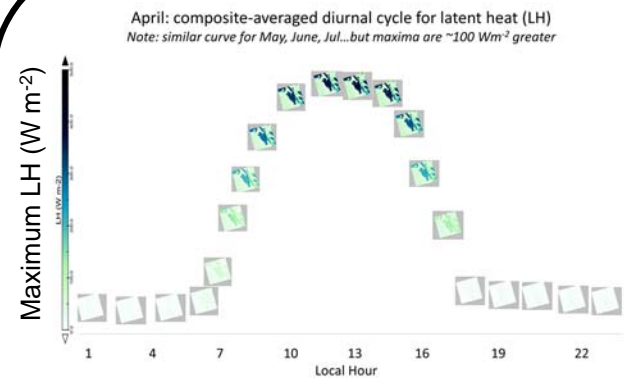


Monthly Evapotranspiration (ETc) for Almonds in the San Joaquin Valley

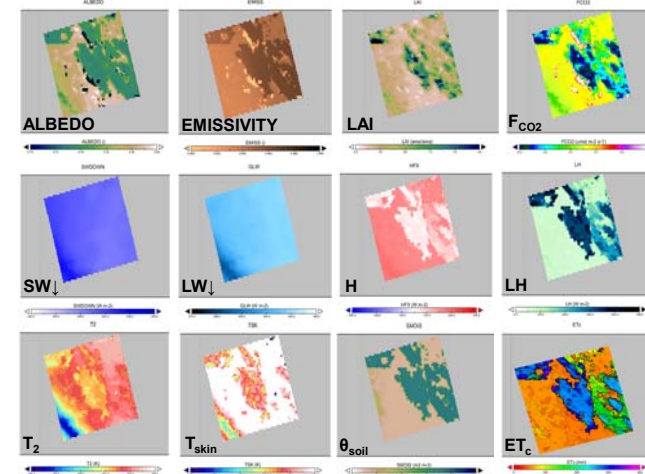
April through August 2008



Overview of the WRF-ACASA model
ACASA is implemented a WRF LSM scheme
Cumulative ET for both the ACASA insitu model and Belridge EC tower site. Growing season indicated by arrows.



June composite-averaged plots; 17:00 LT (00:00 UTC)



Conclusion:

WRF-ACASA has shown a large degree of sensitivity in the estimation of ETc to land use using detailed maps of LAI as derived from satellite products (MODIS, LANDSAT) across the region and throughout the season. Up to date land use maps provide current distribution of irrigated orchards for the model simulations and produce realistic distributions of ETc across the model domain. When ACASA is used as a standalone point model for the Belridge site, it strongly agrees with orchard eddy flux tower measured ETc (1100 mm). WRF-ACASA estimates are consistent with our earlier findings while extending the simulation to regional scale

ACKNOWLEDGEMENTS: Authors wish to extend our appreciation for research funding from the USDA-National Institute of Food and Agriculture, Specialty Crop Research Initiative (grant number: 2008-51180-19563).