

# ET and Irrigation Management





# **Irrigation Management with SIMS and CropManage:**

*Advancing sustainable practices for management of  
agricultural water supplies*

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**NASA ARC-CREST**

### ***Key Partner***

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### ***Contributors***

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***Support from the NASA Western Water Applications Office, the CSU Agricultural Research Institute, and the California Department of Food and Agriculture***

**ES2A**



### **Virtuous Cycle**

- User needs inform next iteration of programs, missions and initiatives

### **Public Understanding & Exchange**

- Put more scientific understanding into public sphere
- Deliver applied science to users
- Participate in multi-way info exchange
- Use input to inform subsequent work

### **Solutions & Societal Value**

- Offer models, scientific findings and info through Open-Source Science principles
- Support climate services
- Provide science applications and tools to inform decisions

### **Earth System Science & Applied Research**

- Grow scientific understanding of Earth's systems
- Develop predictive modeling for science applications and tools to mitigate, adapt and respond to climate change

### **Foundational Knowledge, Technology, Missions & Data**

- Technology innovation
- Earth observations missions
- Data collected from space, air and ground

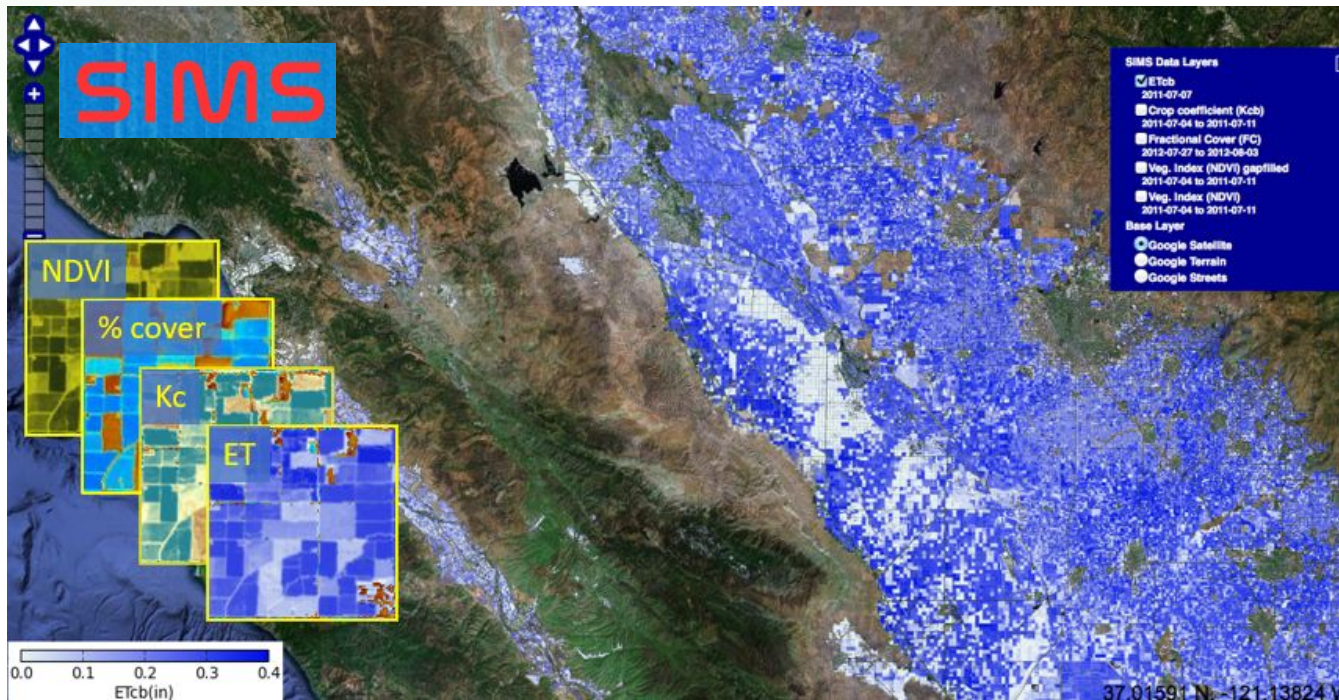


# WWAO Factsheet:



## Supporting Advances in On-farm Water Use Efficiency with Satellite Data:

Integration of the NASA Satellite Irrigation Management Support (SIMS) System and the UCANR CropManage Irrigation and Nutrient Management DSS



Sign Up

## Smarter Decisions. Better Yields.

Based on years of in-depth research and field studies conducted by the University of California, CropManage provides real-time recommendations for the most efficient, effective, and sustainable irrigation and fertilization applications possible.

### Edit Watering Event

Event Date \* 6/4/2023

Irrigation Method \* Drip

Recommendation ⓘ inches hours

7.5 hours

Recommendation Summary ▾

Manager Amount hours

Enter the amount recommended by a manager

Water Applied 6.7 hours

Enter the amount that was actually applied

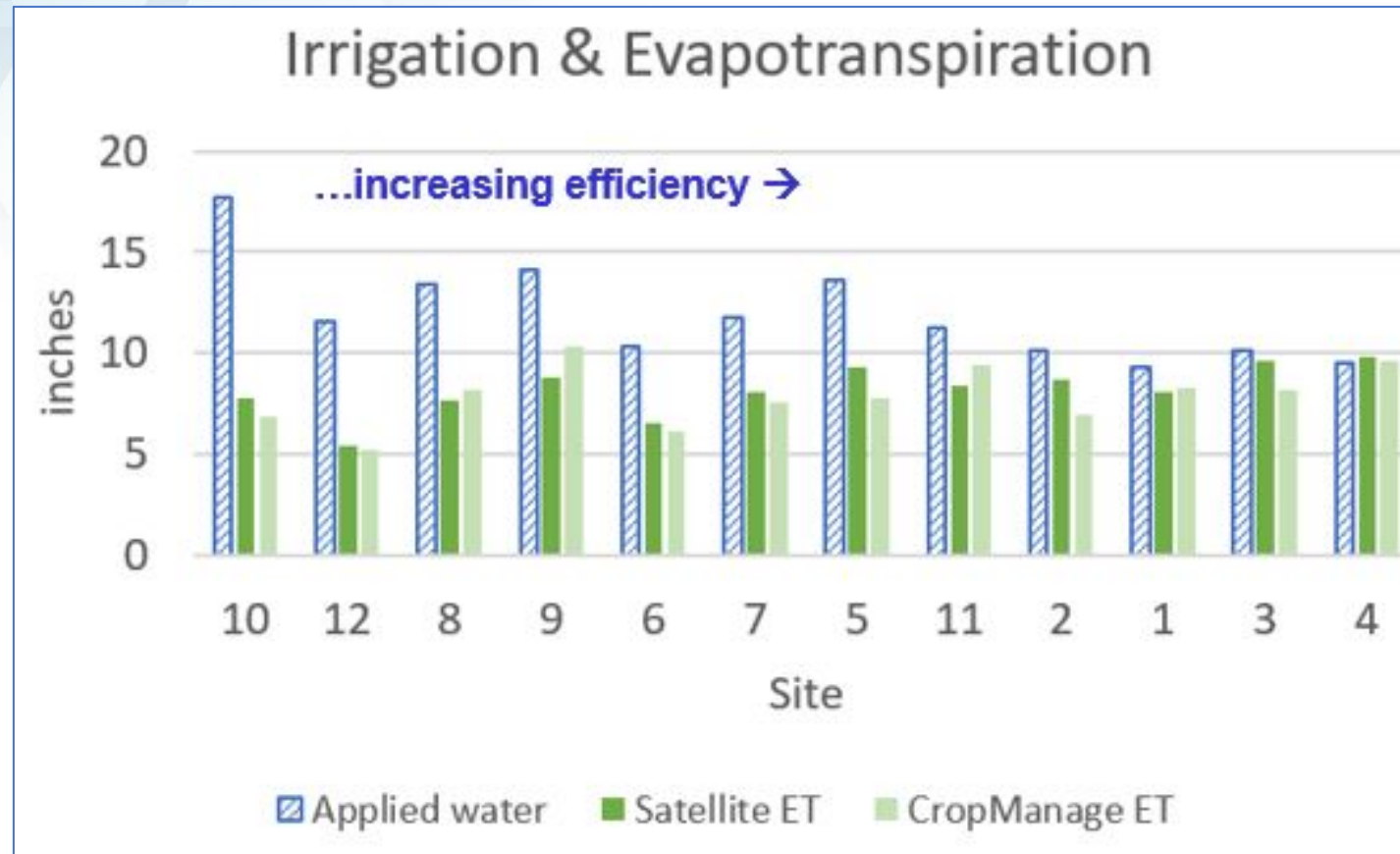
Flow Meter Information:  
0.74 in. = 213540 gals over 10.67 acres

Delete Cancel Save

# Motivation...



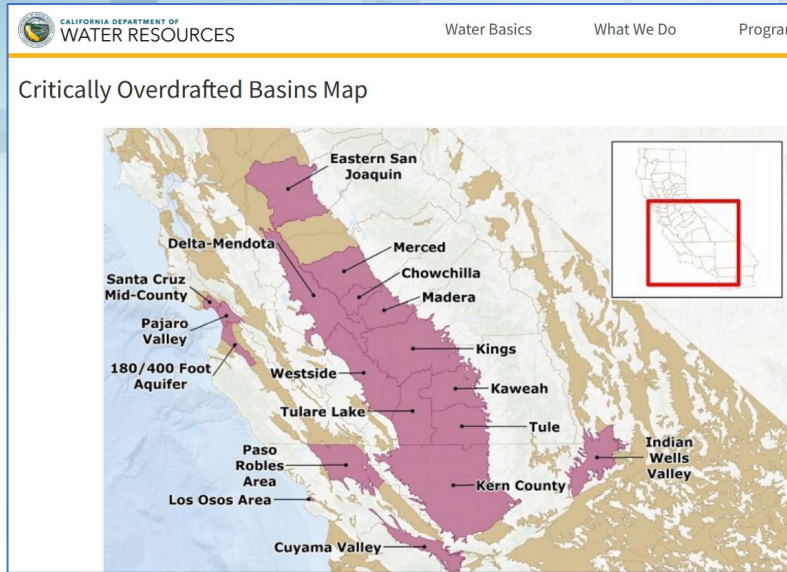
flowmeter



- 12 successful commercial lettuce plantings in Salinas Valley, 2022-23



# Regulations



## Ag Order 4.0 Adopted

Written by Sarah Lopez on April 16, 2021. Posted in News.

April 16, 2021 – The Central Coast Water Board adopted Ag Order activities by all Central Coast growers, related to surface water, ground water, and groundwater pumping. For more information, visit [Waivers | Central Coast Regional Water Quality Control Board \(ca.gov\)](#) or attend informational meetings, later this summer.

## The Fresno Bee

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LOCAL

### A first for state water board: Probation for Tulare Lake subbasin, will require pump flow meters

BY LISA MCEWEN AND JESSE VAD  
APRIL 19, 2024 10:09 AM

June 1, 2018

## Governor Signs Historic Water Use Efficiency Bills - AB 1668 And SB 606 Impose New Or Expanded Requirements On California Water Agencies And Suppliers

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PUBLISHED IN:

Gov. Jerry Brown signed Assembly Bill 1668 and Senate Bill 606 yesterday, which are jointly designed to overhaul California's approach to conserving water. The measures impose a number of new or expanded requirements on state water agencies and local water suppliers, and provide for significantly greater state oversight of local water suppliers' water use, even in non-drought years. They were adopted in response to Brown's May 2016



# Common foundation

Observed via NDVI:

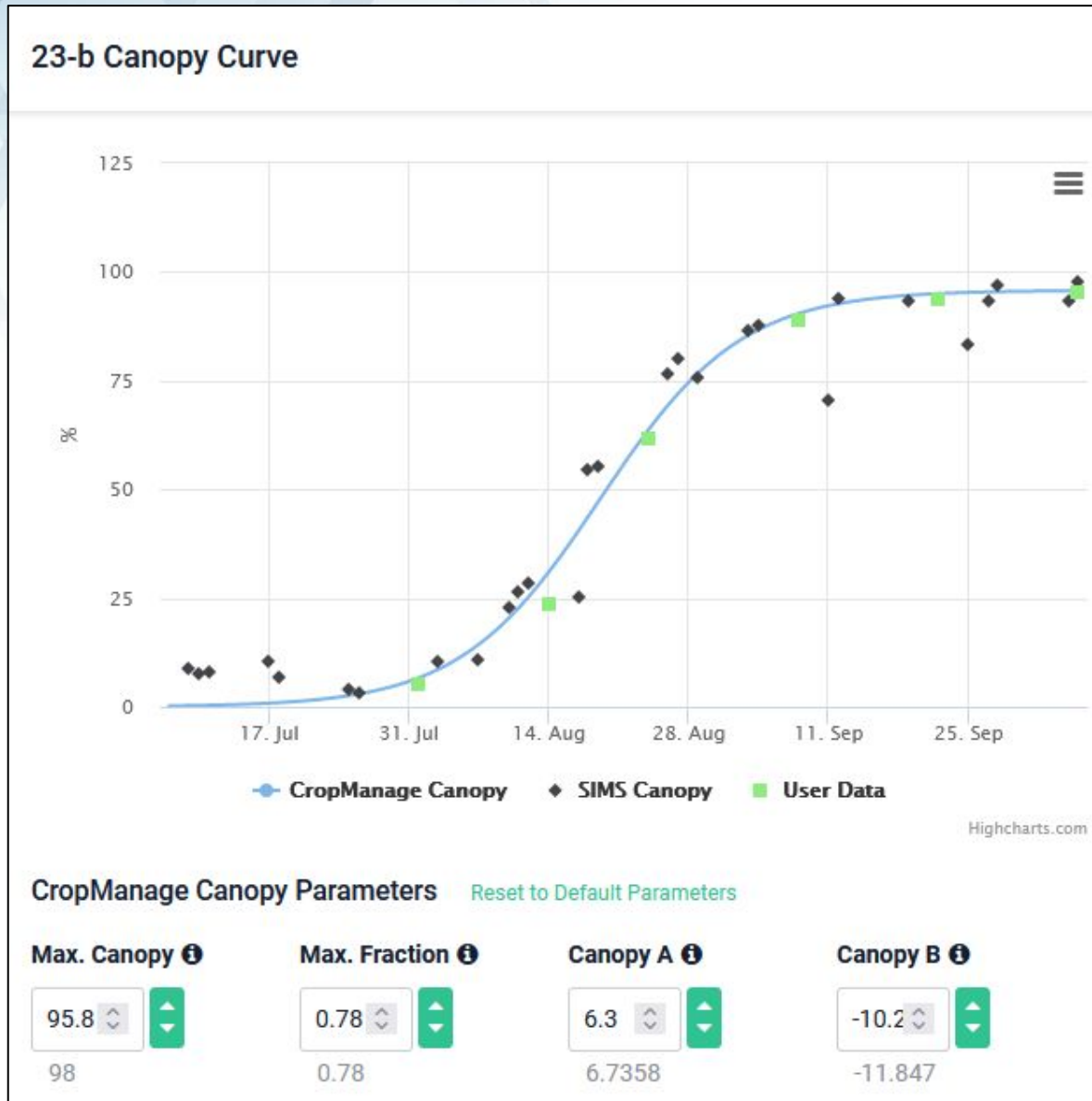


Simulated via DAP:



**Green fractional canopy cover**

# SIMS-CM linkage



Canopy measurements can be used to adjust simulated phenology for anomalous conditions





# Impacts...

# CropManage use

- >12,000 annual irrigation recommendations (~2x increase since project start 2018)
- >500 farms
- Extended number of crop types including strawberry, grape, and orchards
- Expanded use in Central Valley (mainly orchards)

# Broad support for industry

(~20,000 acre farm)

**D'ARRIGO**  
CALIFORNIA

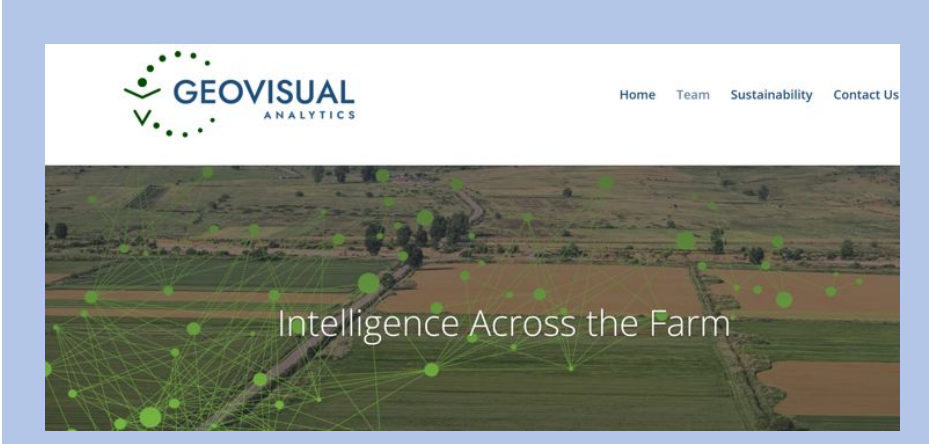




# Commercial partnership example



Irrigation  
recommendations



# Regulatory support

- CropManage is an officially accepted method for consumptive use (ET) reporting by growers
- OpenET is on GSA “radar screen” for consumptive use reporting at field/farm & basin levels

# Industry outreach





# Incorporation of SIMS into OpenET model ensemble



Filling the Biggest Data Gap  
in Water Management

[What is ET?](#) | [How to Use Data](#) | [Methodologies](#) | [Known Issues](#) | [FAQ](#) | [Newsroom](#) | [About](#) | [Contact](#) | [Login](#)

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## OPENET

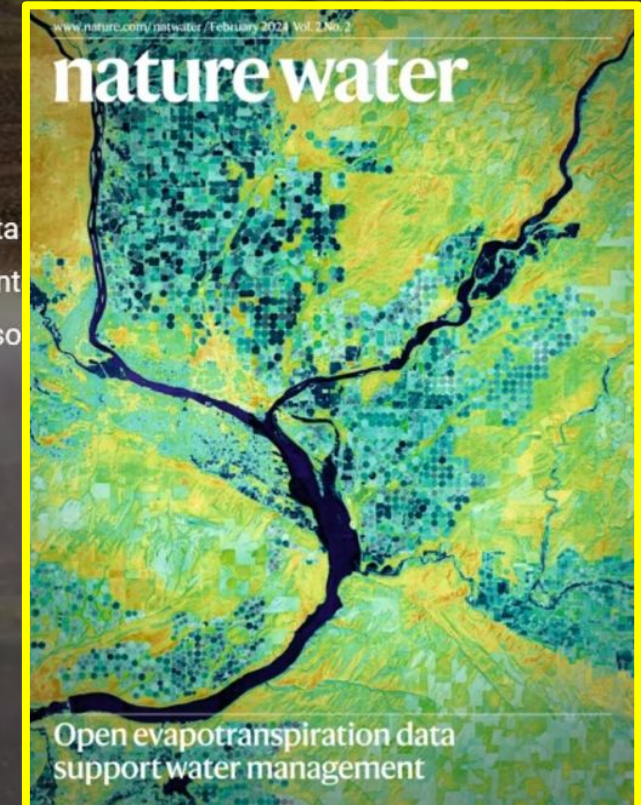
OpenET uses best available science to provide easily accessible satellite-based evapotranspiration (ET) data for water management across the western United States. Using the Data Explorer or Application Programming Interface, users can access ET data at the field scale for millions of individual fields or at the original quarter-acre resolution of the satellite data.



Explore Data



Explore API



# OpenET linkage

OPENET

NDVI-fractional cover



 CropManage

# OpenET linkage

OPENET

NDVI-fractional cover



Gridmet ETo



ETa



- Enable CM operations throughout Western States
- Added check on CM simulation
- Support by NASA/ROSES



Continued NASA/CSUMB/UCCE cooperation in monitoring of major Salinas Valley vegetable crops.



Partial support from USDA/CDFR Specialty Crop Block Grant Pgm & CSU-ARI



Thanks!  
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