OPENET

FILLING THE BIGGEST DATA GAP IN WATER MANAGEMENT

VISION

Our goal is simple, but transformative: to fill a critical data gap in water management across the western U.S. through a transparent, credible, and easily accessible web-based platform — OpenET.

OVERVIEW

A growing scarcity of water, compounded by the impacts of changing climate and a growing population, has made sustainable water management one of the most challenging issues of our time. Adequate freshwater supplies are critical for the health of communities and wildlife, and nothing is more important to agriculture's ability to grow food. But in arid regions such as the western U. S., freshwater resources are dwindling.

> **Evapotranspiration (ET)** is the process by which water is transferred from the land to the atmosphere. It includes both evaporation from soil and transpiration from plants. ET is a core driver of the Earth's water cycle, returning water to the atmosphere to fall again as precipitation. For irrigated agricultural fields, ET is necessary for plant growth and food production.

To maximize the benefits of our water supplies, we must know how much water is available and how much is being used. Evapotranspiration (ET) is a measure of the water used by crops and other plants as they grow. Scientists are currently using satellite and weather data to calculate ET at the individual field level. However, access to this data has previously been limited and expensive, keeping it out of the hands of most water users and decision-makers.
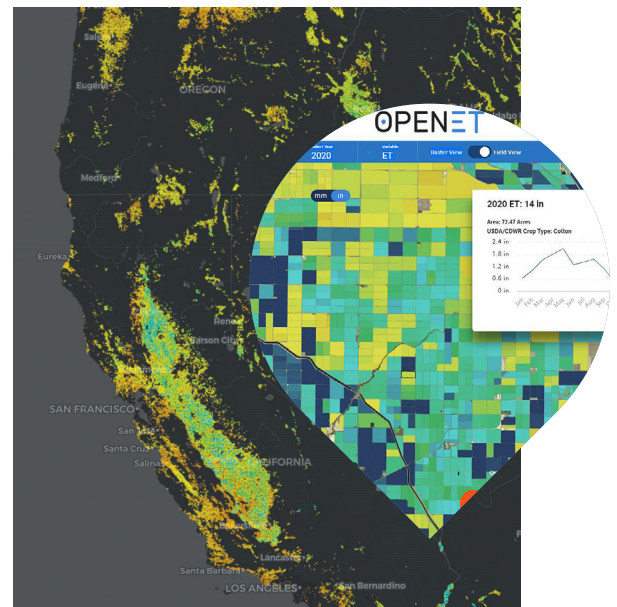
A TOOL FOR EFFECTIVE WATER MANAGEMENT

It is now possible to generate field scale ET data across vast areas, thanks to a growing array of satellites and powerful cloud computing resources like Google Earth Engine and the NASA Earth Exchange. The OpenET platform leverages these resources and applies an ensemble of trusted methods to generate ET data from satellite observations for user-defined geographies and time frames across the western U.S. OpenET has brought together a community of scientists and nationally recognized experts to develop a consistent, trusted source of ET data.

Low-cost, reliable, and widely accessible ET data at the field scale can help:

- ✓ **Rural communities** to design locally driven water conservation and trading programs.

- ✓ **Water managers** to develop more accurate water budgets, incentive programs and other innovative strategies.

- ✓ **Farmers** to improve irrigation practices to maximize "crop per drop" and reduce costs for fertilizer, water, and energy.

- ✓ **Policymakers** to more accurately track water supplies, simplify regulatory compliance, and co-develop solutions with local communities.
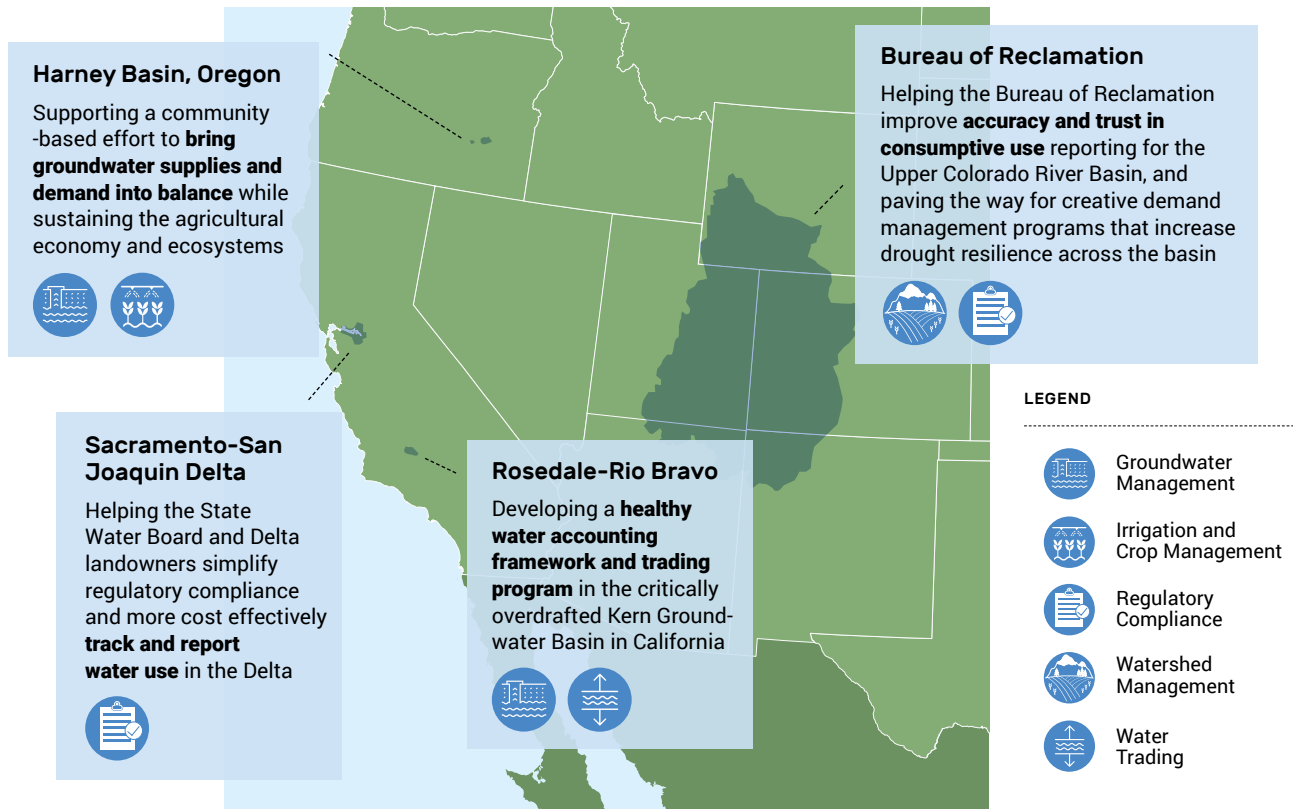

ET data at the field scale is accessible across the western U.S. from the OpenET web interface.

USE CASES AND APPLICATIONS

Project partners have developed use cases and applications to demonstrate OpenET's value in supporting sustainable land and water management practices at the local, regional, and even international scales.

Examples of current applications include the following:

Harney Basin, Oregon

Supporting a community -based effort to **bring groundwater supplies and demand into balance** while sustaining the agricultural economy and ecosystems

Bureau of Reclamation

Helping the Bureau of Reclamation improve **accuracy and trust in consumptive use** reporting for the Upper Colorado River Basin, and paving the way for creative demand management programs that increase drought resilience across the basin

Sacramento–San Joaquin Delta

Helping the State Water Board and Delta landowners simplify regulatory compliance and more cost effectively **track and report water use** in the Delta

Rosedale–Rio Bravo

Developing a **healthy water accounting framework and trading program** in the critically overdrafted Kern Groundwater Basin in California

LEGEND

Groundwater Management

Irrigation and Crop Management

Regulatory Compliance

Watershed Management

Water Trading

TRANSPARENT SCIENCE, GROUND-TRUTHED DATA

To provide the most scientifically rigorous data, the OpenET team conducted the largest intercomparison and accuracy assessment of field-scale satellite-driven ET models to date. This includes comparing OpenET data to in-situ ET estimates collected by 142 ground-based stations throughout the United States and data records from four weighing lysimeters. Importantly, results from these accuracy assessments are available on the OpenET website. Our transparent data and methodologies allow for open dialogue with growers across the western U.S. so that we can continually advance the science for the benefit of all OpenET users and support sustainable land and water management.

PROJECT PARTNERS

The team includes leading national and international experts in remote sensing of ET, cloud computing, web design, and water resources and policy. OpenET has received funding from the NASA Applied Sciences Program Western Water Applications Office, S. D. Bechtel, Jr. Foundation, Gordon and Betty Moore Foundation, Walton Family Foundation, The Keith Campbell Foundation for the Environment, Lyda Hill Philanthropies, The Laney and Pasha Thornton Foundation, Water Funder Initiative, Desert Research Institute Maki Endowment, Delta Water Agencies, and the Windward Fund. In-kind support has been provided by partners in the agricultural and water management communities, Google Earth Engine, and the Water Funder Initiative.

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Learn more at **openetdata.org.**