USCID

U.S. Committee on Irrigation and Drainage

The U.S. Society for Irrigation and Drainage Professionals

President's Message

Dear USCID Members and Friends,

As we move through another productive year in irrigation and drainage, I'm thrilled to invite you to our 2025 USCID Conference, taking place October 21–24 at the Eldorado Resort Casino in Reno, Nevada.

This year's conference will feature a keynote address by Adam Nickels, Bureau of Reclamation Regional Direction for the California Great Basin. The conference will engage participants through our shared commitment to advancing sustainable practices and technologies in water resource management. A robust lineup featuring technical sessions, panel discussions, workshops, and networking opportunities is designed to inspire collaboration and innovation across our diverse community of professionals.

Whether you're an irrigation district manager, researcher, practitioner, policymaker, or student, this event offers something for everyone. Make sure to check out the conference schedule and information on the USCID Conference Events Page at www.uscid.org Highlights include:

- A Tuesday half-day workshop on emerging canal lining and seepage reduction technologies
- A Friday field tour showcasing regional water projects in the Walker River Basin

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2025 USCID Conference

October 21-24 in Reno, Nevada

Join us this fall! As details become available, we will post them on the USCID website - www.uscid.org/events. We hope you can join us in Reno for conference activities that offer time for networking and reconnecting with colleagues!

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- Opportunities to engage with exhibitors and sponsors showcasing the latest tools and services
- Social events and receptions to reconnect with colleagues and build new partnerships

Registration is now open! Early bird pricing is available through September 6, with discounted rates for USCID members, authors, and students. Visit our official conference page (www.uscid.org/events) to register, view the full program, and explore sponsorship and exhibitor opportunities.

I encourage you to secure your spot early and join us in Reno for what promises to be an engaging and impactful gathering. Let's continue working together to shape the future of irrigation and drainage.

Looking forward to seeing you there,
Therese Stix, President
U.S. Committee on Irrigation and Drainage (USCID)

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In This Issue...

USCID Newsletter Advertisers
Summer 2025

We would like to thank our advertisers for making this edition of the USCID newsletter possible!

2025 USCID Annual Conference
October 21-24, 2025
Reno, NV

The 2025 USCID Annual Conference, organized by the United States Committee on Irrigation and Drainage (USCID), will be held in Reno, Nevada, from October 21–24, 2025. The event offers a vital forum for collaboration and innovation in the irrigation and drainage community. The conference aims to address the pressing challenges related to water supply and demand in the United States, particularly in light of climate change, urban growth, regulatory constraints, and increasing competition among agricultural, urban, and environmental water users. Emphasizing sustainable basin water management, the event will explore infrastructure improvements, policy changes, and innovative technologies required to support effective and equitable water resource management.

Water professionals such as irrigation and water district managers, consultants, academics, and agency staff are invited to participate and share their experiences and solutions. The conference will feature a study workshop on canal lining and seepage, plenary sessions, technical and policy presentations, networking opportunities, and a field tour.

Why Attend the USCID Conference?

Attending the 2025 USCID Annual Conference is important for anyone involved in water resources, irrigation, or environmental management because it offers a unique opportunity to engage with the most current challenges and solutions in sustainable water use. With growing pressure from climate change, drought, population growth, and competing demands for water, professionals need innovative tools, strategies, and policies to adapt. This conference brings together leading experts, practitioners, and policymakers to share real-world experiences, case studies, and cutting-edge research across a wide range of water-related topics. It's a chance to learn from diverse perspectives, build valuable professional networks, and gain insights into governance, infrastructure, technology, and economic considerations that impact water planning at the basin level. For those presenting, it's also an opportunity to contribute to the broader conversation, gain recognition, and influence how water resources are managed in the future.

Workshops are BACK!

October 21, 2025 at the USCID conference

8:30am-11:30am **WORKSHOP: LINING AND SEEPAGE REDUCTION (separate registration required)**

Presented by Charles Burt and Dan Howes, Cal Poly ITRC

This workshop will include presentations on:

- Justifications for lining, including bank stability, less hydraulic resistance, less maintenance, and seepage reduction
- Options and details of vibratory compaction without liners, simple geomembrane liners with no geotextile or concrete, geomembranes with concrete cover, concrete only, shotcrete, concrete canvas, and treated soil
- Differences between geotextiles and geomembranes; woven and non-woven geotextiles
- ASTM specs for geomembranes and various geotextiles
- Results of studies regarding longevity of various linings under various situations
- How to deal with situations involving seepage reductions with different variables
- Installation hints and tricks

OpenET Releases the Farm and Ranch Management Support (FARMS) Data Interface to Increase Access to Remotely Sensed Evapotranspiration Data

Forrest Melton[1], Rick Allen,[2,3], AJ Purdy[1,4], Sara Larsen[5], Will Carrara[1,4], Jordan Harding[6], John Volk[7]

Introduction

In 1948, Charles Thornthwaite wrote in *Geographical Review* that "We know very little about either actual evapotranspiration or potential evapotranspiration. We shall be able to measure actual evapotranspiration as soon as existing methods are perfected" (Thorthwaite, 1948). This statement has served as a challenge to multiple generations of scientists in biometeorology, hydrology, agricultural engineering and other fields who have built upon work by Thornthwaite, Penman and others in efforts to accurately quantify both actual and potential evapotranspiration (ET). While considerable work remains to be done before methods for quantifying actual (ET) could be considered perfected, the OpenET project has sought to increase knowledge of spatial and temporal patterns in ET by reducing barriers to broad access to field-scale data for both actual and potential ET. The OpenET Farm and Ranch Management Support (FARMS) interface represents an important advance in this effort, providing support for the generation of automated, recurring ET reports for any region in the western United States (US). FARMS provides a graphical user interface

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[3]*ETPlus, Inc., Boise, ID*
[4]*California State University Monterey Bay, Seaside, CA*
[5]*OpenET, Inc., Salt Lake City, UT*
[6]*Habitat Seven, Inc., Ottawa, Ontario, Canada*
[7]*Desert Research Institute, Reno, NV*

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for the OpenET Application Programming Interface (API) and facilitates direct access to data at daily, monthly and annual timescales computed from the 30 x 30 m (0.22 acres per pixel) satellite-derived ET data. Combined with the recent accuracy assessments that have evaluated OpenET data for different crop types and regions, there is now a clearer path towards meeting the challenge Thorthwaite laid down more than 75 years ago.

OpenET uses satellite observations from Landsat and other satellites in combination with gridded meteorological data to calculate ET at daily, monthly, seasonal and annual timescales using six satellite-driven ET models (Melton et al., 2022).

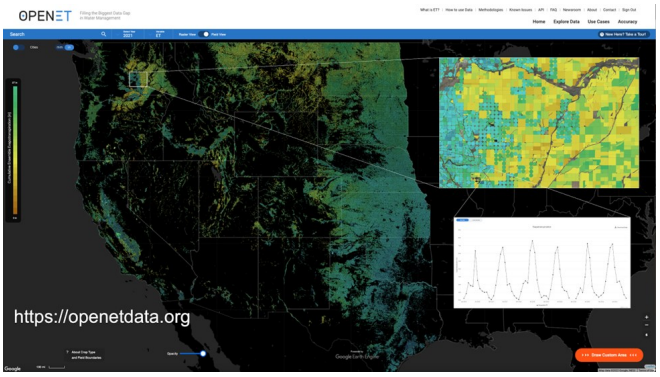

Fig. 1: The OpenET Data Explorer was developed to reduce barriers to access to satellite-derived ET information and allows users to retrieve data for any location in the western US.

Data are publicly available from October 1999 to present, and the current geographic coverage includes the 23 westernmost states in the US with work ongoing to provide data for the full contiguous US and Hawaii.

Increasing Access to Evapotranspiration Data

The OpenET system was developed to address the lack of easily accessible, consistent and reproducible information on ET. OpenET is an open science effort and makes data freely available via multiple open data services, provides model code as open source software to increase transparency, and hosts data in the public data catalog on Google's Earth Engine platform. In March 2025, OpenET released the OpenET FARMS user interface (https://farms.etdata.org) to increase access to OpenET data for the agricultural and water resources management communities. The FARMS interface was designed in close partnership with more than fifty agricultural producers and ag-tech companies to increase use of ET data in agricultural operations. FARMS allows users to easily upload, draw or select regions of interest, select time periods and variables for which the user wants information, and view or download the data in multiple formats to increase usability in the field (Fig. 2). FARMS also allows users to create automated recurring reports for areas of up to 150,000 acres in size (Fig. 3). FARMS was developed to complement the OpenET Data Explorer (https://explore.etdata.org), which allows any user with an internet connection to easily browse and explore ET data for the past six years (Fig. 1). In addition, the OpenET API (https://openet-api.org) supports automated data retrievals and integration with other water data and farm management decision support systems. Important strengths of the OpenET approach are that it implements six well-established satellite-driven ET models as a coordinated ensemble of models driven with consistent inputs, does not require local calibration or continuous collection of on-farm measurements, and data are freely available to users. It also provides an ensemble ET value computed from all six models to simplify selection of a single ET value in cases where no ground-based ET data are available for comparison.

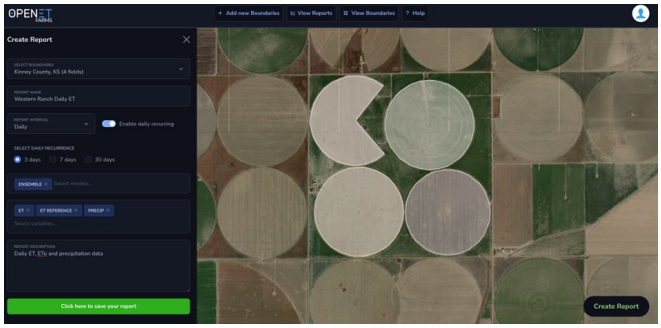

Fig. 2: The OpenET FARMS interface allows users to easily define regions of interest, select time periods and variables of interest and create automated, recurring reports.

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OpenET Releases the Farm and Ranch Management Support (FARMS) Data Interface to Increase Access to Remotely Sensed Evapotranspiration Data

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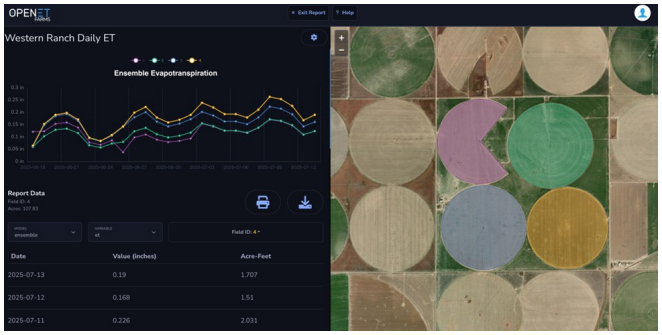

Fig. 3: The OpenET FARMS reports also facilitate comparison of ET patterns across regions of interest, such as fields within a farm or ranch, or wetland areas and burnscars, and supports retrieval of data in multiple formats to assist with use of the data in the field.

Uses of OpenET in the Western United States

Since the launch of the OpenET Data Explorer in October of 2021, OpenET has seen rapid uptake and use across the West. In 2022, the eeMETRIC model (Allen et al., 2007) within the OpenET Framework was unanimously adopted by the four Upper Colorado River Basin states and the Upper Colorado River Commission to provide a consistent measure of water consumption across the Basin for the first time (UCRC, 2022). In California, data from OpenET were integrated into California's Water Rights Report Management System to support water use reporting in California's San Francisco Bay-Delta region. The integrated system increased the accuracy of water use reporting in the California Delta while also reducing regulatory compliance costs for farmers. The State of California estimates that this system has saved farmers more than $29 million, with more than 70% of water users in the Delta currently participating in alternative compliance plans that utilize OpenET data (Office of the Delta Watermaster, 2024). OpenET has also seen rapid uptake and use in irrigation management applications. Over the past 12 months, 40% of data retrievals from the OpenET API in the western U.S. have been for the purpose of irrigation management, based on user-reported applications of the data. Commercial and agricultural extension agency partners have incorporated OpenET data into multiple irrigation and nutrient management tools and numerous field trials have shown that an ET-driven irrigation management approach can reduce applied water by 15-25% (Cahn et al., 2023), which has important co-benefits for fertilizer management and reducing nitrate leaching. The OpenET data and API are now used by more than 10,900 users, ten state agencies and the U.S. Bureau of Reclamation to increase the accuracy of consumptive water use estimates, integrate ET data into sustainable water management plans, and to accelerate innovative local- to regional-scale water accounting and conservation programs.

Assessing the Accuracy of the OpenET Data

A key aspect of advancing operational use of satellite-derived ET data is documenting the accuracy of the data through open, reproducible, peer-reviewed accuracy assessments. The OpenET science team published the largest, peer-reviewed accuracy assessment and intercomparison study for field-scale ET data to date in *Nature Water* in 2024 (Volk et al., 2024). This study used ground-based ET data from 60 agricultural sites, including data from four weighing lysimeters and 56 flux towers equipped with full eddy covariance instrumentation, to evaluate the accuracy of data from the OpenET Collection 2.0 dataset. The flux tower sites included in this study were all equipped with the full suite of micrometeorological instruments necessary to measure all components of the surface energy balance and compute ET using the eddy covariance method (Volk et al., 2023). In theory, the sum of all energy fluxes (sensible heat, latent heat, and ground heat fluxes) should equal the available energy (the net radiation at the flux tower site), and it should be possible to fully "close'" the surface energy balance using all of the available inputs. In practice, however, problems with tower siting, instrumentation maintenance or failure, advection and other factors can impact the observations collected at the flux tower site. These types of problems usually result in an imbalance between the total available energy (net radiation minus the ground heat flux) and the turbulent fluxes (the latent energy and sensible heat fluxes). Evaluating the energy balance closure provides a critical indication of the data quality at the flux tower for any given time period. While smaller imbalances can be addressed through energy

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OpenET Releases the Farm and Ranch Management Support (FARMS) Data Interface to Increase Access to Remotely Sensed Evapotranspiration Data
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balance closure corrections, correcting larger imbalances is expected to introduce substantial uncertainty into the ground-based ET data, limiting its utility as a reference for evaluating ET data computed from satellite-driven models or other sources (Foken, 2008). In addition, flux towers that are not instrumented to measure all surface energy balance components inherently assign all measurement error to the computed ET without a way to assess data quality and accuracy. This can limit the utility of these data as a reference measurement for evaluating ET computed from other data sources.

The Volk et al. (2024) study evaluated both the six satellite-driven ET models included within the OpenET system, along with the OpenET "ensemble ET" value. The ensemble ET value is computed as the mean of the ensemble after identification and removal of outliers for each timestep and pixel using the median absolute deviation approach (Leys et al., 2013). Key findings from this study were that across all 60 sites, the ensemble ET value was more accurate than the individual models, though some models did outperform the ensemble ET value at individual agricultural sites. For water accounting purposes, the accuracy of ET data at growing season and annual timescales are often the most important time periods to consider. For the growing season, Volk et al. found that the mean bias error (MBE) for the ensemble ET value was only -2.0%, indicating strong expected accuracies for applications of OpenET data over larger areas and across multiple crops. MBE is used to characterize the average bias

[1] See Volk at al. (2024) or https://openetdata.org/accuracy/ for additional details.

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in a model relative to a reference dataset. The mean absolute (MAE) error is another widely used accuracy metric and is calculated by averaging the absolute differences between two paired datasets, such as a modeled and a reference dataset. The MAE for the ensemble ET value over the growing season for agricultural sites was ±12.9%. The R-squared value, which is the square of the Pearson's correlation coefficient (r), represents the proportion of variance in the dependent variable explained by the independent variable and the degree to which a model is able to reproduce the observed variability in a reference dataset. For the ensemble ET value, the R-squared value was 0.87, also showing good agreement with ground-based ET datasets. At annual timescales, the MAE improved slightly to 11.2%, and the R-squared value was also high at a value of 0.84, though the MBE also increased to -5.1%. The MBE for the ensemble ET value at monthly timescales was similar at -5.8% and the R -squared value increased to 0.9, though the MAE increased to 17.3% at this timestep. Individual models also performed well at seasonal and annual timescales, and accuracy metrics for most of the individual models were close to the ensemble at annual timescales.

Recent studies have also been conducted to evaluate the accuracy of OpenET for specific crop types, including an evaluation of OpenET data for alfalfa fields in New Mexico (Sabiston et al., 2024). For the flux tower measurement footprint within the field in which the flux tower was installed, this study reported a seasonal difference in total ET of 48 mm (1.89 in or -3.6%) between the measured ET and the ensemble ET data over the tower footprint, with differences for individual models all within ±11.4%. This study also reported results from comparisons made for additional fields, but these results involved comparisons using very small fields (<2.2 ha or 5.43 acres) in which no measurements were actually collected. Importantly, the OpenET team recommends caution when using OpenET data for fields that are less than 100 m (330 ft) in diameter and smaller than 2 ha (5 acres) in size. In a separate study in New Mexico, Tawelbeh et al. (2024) evaluated the OpenET data using five years of eddy covariance data collected over a pecan orchard in the Mesilla Valley. This study also found that the ensemble ET value performed best, and reported an R-squared value of 0.95 with a 2% mean relative difference and standard error estimate of 15 mm/month (0.59 in/month) relative to the flux tower ET over the five-year study period. Individual models also performed well in this study, with mean absolute differences between the flux tower ET and the individual models ranging from -8.3% to 11.2%.

In California, Knipper et al. (2024) evaluated the accuracy of OpenET data using flux towers equipped with eddy covariance instrumentation in six almond orchards in the California Central Valley. Consistent with Volk et al. (2024) and the studies listed above, this study again found that the ensemble ET value agreed most closely with the flux tower ET over the two-year study, and reported an R-squared value of 0.73 and a MAE of 0.95 mm/day (0.04 in/day or 15.7%) for the ensemble ET value. Knipper et al. (2024) did note that both the individual OpenET models and the ensemble ET value had difficulty in capturing some types of short-term variability in ET at these sites, such as the rapid decline in ET preceding almond harvest when irrigation is shut off completely. This is likely due to

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the 8-day revisit period of Landsat, which limits the ability of the satellite-driven models to consistently capture rapid changes in daily ET driven by abrupt shifts in agronomic or irrigation practices.

In another evaluation of OpenET data over tree crops in California, Dhungel et al. (2024) compared OpenET data against flux towers equipped with micrometeorological instrumentation installed in two citrus orchards (naval and mandarin) in the San Joaquin Valley, CA. This study was the only study to date that reported differences between OpenET data and flux tower ET that were larger than those documented by Volk et al. (2024) for cropland sites. Dhungel et al. (2024) found that while the ensemble ET value again agreed best with the flux tower ET, the ensemble ET value was 30% larger on average than both the flux tower ET and the total amount of water applied for irrigation, with an r-squared value of 0.71 and a root mean square error (RMSE) of 1.16 mm/day (0.046 in/day). The study noted that most of the difference occurred during the spring (approximately day of year 60 to 120). Dhungel at al. hypothesized that in deficit irrigated citrus crops the stomatal resistance may vary over the course of the day, with lower stomatal resistance in the morning, when the Landsat overpass occurs, and increasing resistance in the afternoon leading to lower ET rates. While this study only provided data for two sites, the OpenET team is currently working to evaluate potential biases for citrus crops. A key advantage of OpenET is that advances in the models to better represent biophysical processes will provide direct benefits to all users of OpenET data without the need for recalibration at individual sites. In addition, while the Dhungel et a. (2024) results are valuable in highlighting an important crop for additional investigation, the results from this study should also be considered in the broader context of the results from Knipper et al. (2024) for almonds, Tawelbeh et al. (2024) for pecans, and the overall seasonal MBE of -2.0% reported by Volk et al. (2024) across a wide range of crops.

One key challenge of working with eddy covariance instrumentation is that the measurement area sampled by the key instruments on the tower (often referred to as the tower “footprint”) is limited to the area that is upwind of the tower location at a given time and varies with wind direction. Frequently, the tower footprints only include a portion of a single agricultural field. In addition, due to the technical difficulties and expense of collecting eddy covariance data, it can take years to collect measurements at multiple sites for a single crop. As a result of these challenges, recent studies have also compared OpenET data to data from flow meters and precipitation gauges or gridded precipitation data products. Knipper et al. (2024) compared OpenET total annual ET to data on precipitation and applied water for irrigation collected at 148 almond orchards over two water years. Results from this comparison found that the OpenET ensemble ET value was within 13% of measured water inputs (applied water and precipitation), but noted differences of up to 54% for individual ranches included in the study. In resolving these types of large discrepancies, however, it is important to consider potential errors both in the remotely-sensed ET data as well as errors in linking metered information at wells to the actual place of use boundary. The challenge is magnified in cases when one field is served by multiple wells or where multiple interconnections exist across a ranch. Zipper et al. (2024) also compared OpenET data to metered data on applied water across 43 fields in Kansas for which the relationship between the location of the well and the place of use was well known and carefully defined. For these fields, Zipper et al. reported a MAE for the ensemble ET value of only 48 mm/yr (1.9 in/yr), with a MBE of 1.6% and an R-squared value of 0.74.

In addition to these published studies, the OpenET user community has now grown to over 10,900 users who are currently applying the data for a wide range of uses, including use in ongoing accuracy assessments for additional crops and natural land cover types. Ongoing water resources management applications range from irrigation scheduling and decision support across thousands of agricultural fields to water accounting across both the Upper and Lower Colorado River Basins.

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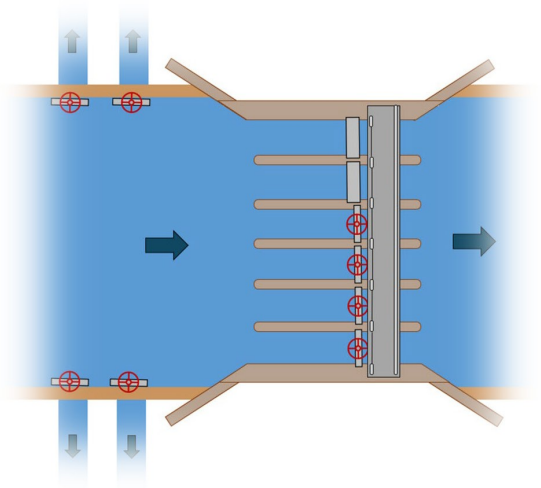

NEW Comprehensive Irrigation Structure Control Package

FLUID

Advanced automation for gate control and flow management

Developed and implemented by:
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What is FLUID?

FLUID is a new comprehensive control package for canal gate structures. It was built for the Schneider Electric SCADAPack RemoteConnect platform and can control:

- Up to 6 main check structure gates
  - Undershot Gates (radial gates, sluice gates)
  - Overshot Gates (tilt, Langemann)
- Up to 4 lateral gates

FLUID includes various control modes, which can be changed on-the-fly via the site OIT or HMI:

- Remote Manual
  - Gate position control
- Automated
  - Upstream water level control
  - Downstream water level control
  - Flow control without level overrides
  - Flow control with level overrides
  - Lateral flow control

Why use FLUID?

- Developed from decades of ITRC research and field experience with canal control.
- Multiple control modes that can be changed on-the-fly via the site OIT or HMI
- Integrate with a new or existing SCADA systems
- Provide accurate flow totalization
- Comprehensive alarm suite (power monitoring, site intrusion, failure and sensor parameter alarming)
- Role-based access for operators and supervisors

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Implementation Process

- Modernization Plan/Rapid Appraisal
- Survey & analysis
- ITRC optimization routines for control constants
- Streamline code
- Coordinate with implementation team
- Site commissioning
- Maintenance support (long-term)

What's Next?

- A separate, future control package will include pump control. Look for that package in late 2025 or early 2026.

01/29/2025

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Additional applications for groundwater management in the California Central Valley and across the Ogallala Aquifer, and use in administration of incentive-based water conservation programs in Utah and the San Francisco Bay Delta are also providing rigorous scrutiny of the OpenET data. One key takeaway from these applications is that it is critical to carefully consider the actual place of use boundary and time of consumptive water use when comparing data from OpenET against other data sources and measurements. It is also important to consider the measurement footprint of the ground-based ET measurement technique when retrieving data from the OpenET system for comparison. Due to the potential impact of these errors on analysis results, it is prudent to treat preliminary results from any study with caution until they have been submitted for peer-review and publication, which often offers considerable value in flagging and resolving these types of errors and oversights.

Conclusions

Taken together, the independent, peer-reviewed accuracy assessments of OpenET data published to date are consistent with the study published by Volk et al. (2024). These studies have found that the ensemble ET value has shown the best agreement with ET data computed from flux towers installed within agricultural sites. With the exception of the study by Dhungrel et al. (2024) in citrus, all studies have reported accuracies for agricultural sites that are consistent with, or better than, the OpenET accuracy metrics reported by Volk et al. (2024). Key takeaways from these studies are that the accuracy for the OpenET ensemble ET value shows minimum bias at monthly to annual timescales, and that expected MAE values for agricultural crops are in the range of ±11% at annual timescales, ±13% for the growing season, and ±17% for monthly ET values. The important notable exceptions where larger errors may be expected in the OpenET Collection 2.0 data are citrus orchards and small fields that are less than 100 m (330 ft) in diameter or smaller than 2 ha (5 acres) in total area. As reported by Volk et al. (2024), the OpenET team is also investigating ways to improve calculation of ET between satellite overpass dates, integrate additional satellite observations to increase the observation frequency of satellite inputs, and identify and correct biases in meteorological inputs to the models. All of these advances are expected to further increase the accuracy of OpenET data in the near future, enhancing the value of satellite-based ET for agricultural and water management applications.

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United States Committee on Irrigation & Drainage

2025 Annual Conference

USCID

October 21-24, 2025
Eldorado Resort Casino
Reno, Nevada

2025 USCID CONFERENCE SCHEDULE OF EVENTS

TUESDAY, OCTOBER 21

7:00am — **CONTINENTAL BREAKFAST (workshop participants only)**

8:00am-11:30am — **WORKSHOP: LINING AND SEEPAGE REDUCTION (separate registration required)**
Charles Burt, Cal Poly ITRC Founder and Dan Howes, Cal Poly ITRC Chairman

- Justifications for lining, including bank stability, less hydraulic resistance, less maintenance, and seepage reduction
- Options and details of vibratory compaction without liners, simple geomembrane liners with no geotextile or concrete, geomembranes with concrete cover, concrete only, shotcrete, concrete canvas, and treated soil
- Differences between geotextiles and geomembranes; woven and non-woven geotextiles
- ASTM specs for geomembranes and various geotextiles
- Results of studies regarding longevity of various linings under various situations
- How to deal with situations involving seepage reductions with different variables
- Installation hints and tricks

12noon-1:15pm — **OPENING LUNCH WITH KEYNOTE SPEAKER**
Adam Nickels, Regional Director, Bureau of Reclamation, California Great Basin Region (invited)

1:30pm-3:00pm — **GENERAL SESSION: POLICY**
Berrenda Mesa Water District Afterbay Reservoir Lining Project
Jeff Ecklund, P.E., Provost & Pritchard Consulting Group

Conjunctive Management in Prior Appropriation States: An Examination of Policy Governing Surface and Groundwater Management in the Western U.S.
Caitlin Skulan, Schroeder Law Offices, P.C.

Water Levels are Low, but Vibes are High
Lauren Bartels, Nevada Division of Water Resources

Policy on the Edge of Science—Water Accounting Isn't for the Faint of Heart!
Jeffrey C. Davids, Davids Engineering, Inc.

3:15pm-4:45pm — **GENERAL SESSION: ET REMOTE SENSING**
Flowmeters and Remote Sensing: How do the Methods Compare?
Daniel J. Smith, Davids Engineering, Inc.

Tracking Evapotranspiration of Applied Water and Effective Precipitation by Color-Coding Standardized Soil Water Budgets
Meetpal Kukal, PhD, University of Idaho

Developing Long-Term Groundwater Withdrawal and Consumptive Use Inventories for Irrigated Agriculture in the Western U.S. Using Satellite Remote Sensing
Sayantan (Monty) Majumdar, PhD, Division of Hydrologic Sciences, Desert Research Institute

4:45pm-5:00pm — **USCID UPDATE/USCID ANNUAL MEETING**
Therese Stix, USCID President, Schroeder Law Offices PC

5:00pm-5:30pm — **MEET THE EXHIBITORS**

5:30pm-7:30pm — **WELCOME RECEPTION WITH EXHIBITORS**

WEDNESDAY, OCTOBER 22

8:00am-8:30am — **CONTINENTAL BREAKFAST WITH EXHIBITORS**

2025 USCID CONFERENCE SCHEDULE OF EVENTS (CONTINUED)

WEDNESDAY, OCTOBER 22 (continued)

8:30am-10:15am **GENERAL SESSION: GROUNDWATER RECHARGE**

Recharge Evaluation Framework Basin Siting
Bryan Thoreson, P.E., PhD, GEI Consultants, Inc.

Recharge Basin Design—Southern San Joaquin Municipal Utility District Case Study
Sam Schaefer, P.E., GEI Consultants, Inc.

Walker Recharge Project Infrastructure Planning and Implementation—Case Study
Wayne E. Eckas, P.E., Independent Consulting Agricultural Engineer

10:30am-12noon **GENERAL SESSION: BASIN WATER PLANNING AND MANAGEMENT**

Restoring Watershed Function and Recharging the Local Aquifer
Ricardo Aguirre, WEST Consultants, Inc.

Water Right Buy Backs: Quantifying How Much Wet Water is Actually Conserved
Justin Huntington, Division of Hydrologic Sciences, Desert Research Institute

Protecting Irrigation Ditch and Pipeline Easements
Therese A. Ure Stix, Schroeder Law Offices, P.C.

California's Stream Gage Improvement Program (CalSIP) - Questions that Demand Better Streamflow Data
Jeffrey C. Davids, Davids Engineering, Inc.

12noon-1:15pm **LUNCH WITH SPEAKER**

Commissioner Brian Steed, Great Salt Lake Commission (invited)

1:30pm-3:15pm **GENERAL SESSION: COMPETING AGRICULTURAL, URBAN AND ENVIRONMENTAL USES**

Agricultural Lands Owned by MWD: The Sustainability of Farming and Partnerships with Building Healthy Soils in the Palo Verde Valley and Reducing Land Subsidence Near the Freshwater Pathways in the Sacramento-San Joaquin Delta
David Bradshaw, The Metropolitan Water District

Navigating SGMA Oversight in the Chowchilla Subbasin
Jacob Winslow, Davids Engineering, Inc.

Land Repurposing Program Development in the Turlock Subbasin: A Grower-Centered Solution to Groundwater Demand Reduction
Christopher Heppner, PhD, PG, EKI Environment & Water, Inc.

Integrating Ag Use of Recycled Water on a Regional Scale, the SacSewer Harvest Water Program Interface with Grower Facilities and Needs
Neal T. Colwell, P.E., Kjeldsen, Sinnock & Neudeck, Inc.

3:30pm-5:00pm **GENERAL SESSION: GROUNDWATER AND SURFACE WATER MANAGEMENT**

Characterizing Stream-Aquifer Exchanges with Stream Reach Water Budgets
Christopher Sorter, Davids Engineering, Inc.

Affordable Feasibility Assessment to Understand Hydrologic and Economic Benefits, if any, from Cloud Seeding
Luciana Cunha and Benjamin Choat, WEST Consultants, Inc.

IrrigationTriggers-Global: A Web Application for Determining Site-Specific Soil Moisture-Based Triggers for Irrigation Scheduling Globally
Meetpal Kukal, PhD, University of Idaho

A Method for Calculating Drainage Flow in Intermittently Improved Subsurface Pipes
Jin Mingrui, China Institute of Water Resources and Hydropower Research

2025 USCID CONFERENCE SCHEDULE OF EVENTS (CONTINUED)

WEDNESDAY, OCTOBER 22 (continued)

5:00pm-6:30pm **RECEPTION WITH EXHIBITORS**

THURSDAY, OCTOBER 23

8:00am-8:30am **CONTINENTAL BREAKFAST WITH EXHIBITORS**

8:30am-10:15am **GENERAL SESSION: WATER DISTRICT INFRASTRUCTURE**

Designing Suitable Ratio Feedback Control Systems to Control EBID Main Canal Reaches
Blair Stringam, New Mexico State University

Honey Lake Valley Resource Conservation District Old Channel Lining Project
Ben Volk, J-U-B Engineers, Inc.

Irrigation District Pumping with VFDs
Charles M. Burt, P.E., PhD, BC., WRE

10:30am-12noon **GENERAL SESSION: HYDRAULICS OF WATER MANAGEMENT**

Large Irrigation District Canal Flumes: History, Challenges and Future Designs
Stuart Styles, Cal Poly ITRC

Case Study: Effects of Transients in Gravity Supply
Rodrigo Ribeiro Franco Vieira, Brazilian Federal Development Company

Canal Design and Regime Theory: A Fascinating History
Brian Wahlin and Brent Travis, WEST Consultants

How the Lack of Experience and Education Can Lead to Poor and Unsafe Canal Designs—Case Study Malawi CVTP
Dan Howes, Cal Poly ITRC

12noon-1:15pm **LUNCH WITH SPEAKER**
Ed James, Carson Water Subconservancy District (invited)

1:30pm-3:15pm **PANEL DISCUSSION: WATER DISTRICTS MANAGEMENT AND OPERATIONS**

3:30pm-4:30pm **GENERAL SESSION: INTERNATIONAL PRESENTATIONS**

Predicting Spacial Tendency of Groundwater Head Using a Machine Learning Algorithm in the Tanghan Plain, China
Nebiyou Kassahun, State Key Laboratory of Water Cycle Simulation and Regulation, China Institute of Water Resources and Hydropower Research

Decision Support System (DSS) for Flood Management in Lower Indus Basin
Syed Farrukh Hasan, Data Center, Sindh Resilience Project, Sindh Irrigation Department

FRIDAY, OCTOBER 24

7:30am-3:30pm **FIELD TOUR: WALKER RIVER IRRIGATION DISTRICT**
(separate registration required)

Walker River Irrigation District (WRID) was formed in April 1919 under the authority of the Nevada Irrigation District Act and operates independently under the guidelines of NRS 539. WRID encompasses approximately 235,000 acres of which over 80,000 are irrigated. WRID operates two storage reservoirs; east fork storage is located in Bridgeport, CA and west fork storage is located at Topaz Reservoir. WRID operates and maintains extensive drainage systems, ditches and canals in both Smith and Mason Valleys. Tour attendees will learn about WRID's operations from Topaz Reservoir down through Mason Valley into our ditch systems including our modernization project that has been taking place since 2011. ***AT THE END OF THE TOUR, THE BUS WILL DROP PASSENGERS AT THE RENO AIRPORT AND THE ELDORADO HOTEL.***

CONFERENCE WEBSITE

Please visit us at https://www.uscid.org/events for conference information, up-to-date schedules, hotel information, online registration, and to download registration, exhibitor, and sponsorship information forms. ONLINE REGISTRATION IS AVAILABLE ON OUR WEBSITE.

HOTEL INFORMATION & RESERVATIONS

The 2025 United States Committee on Irrigation & Drainage will be held at the Eldorado Hotel & Casino, located at 4th and Virginia Streets in downtown Reno, Nevada. Room rates start at $45 (plus reduced resort fee of $15/day and applicable taxes.

- *Book online at https://www.uscid.org/events. Click on the Hotel Information tab.*
- *Call the hotel reservations line at (800)687-8733. Please mention the USCID Conference, group code* ***SRCID5*** *to ensure the group rate.*
- *MAKE YOUR RESERVATIONS EARLY!!!!! THE DEADLINE FOR HOTEL RESERVATIONS AT THE SPECIAL RATE IS OCTOBER 6, 2025* **OR** *UNTIL OUR ROOM BLOCK IS FILLED.*

CONFERENCE DEADLINES

- *The Eldorado Hotel room reservation deadline is October 6, 2025 OR until our room block fills.*
- *Conference early registration deadline is September 6, 2025. After September 6, registration fees are higher.*

CANCELLATIONS

- *Eldorado Hotel room reservation cancellations must be made directly with the hotel at least 72 hours prior to your scheduled arrival to avoid a cancellation penalty.*
- *Conference registrations cancelled by October 6 will be refunded in full. There will be no refunds for registrations cancelled after October 6 or for "no shows".*

EXHIBITOR INFORMATION

Exhibitor Receptions will be held Tuesday and Wednesday evenings. In addition, continental breakfasts and breaks will be served in the exhibit area on all days. For details, please refer to the enclosed Exhibitor Information and Application. If you have questions, please call us at (916)206-7186 or email jane@agamsi.com. Information and online registration is also available on our website: https://www.uscid.org/events

SPONSORSHIP INFORMATION

A limited number of sponsorship opportunities are available. Please refer to the enclosed Sponsorship Opportunities menu. Information and online registration is also available on our website: https://www.uscid.org/events

MARK YOUR CALENDARS

United States Committee on Irrigation & Drainage 2026 Annual Conference
October 20-23, 2026
Eldorado Resort Casino, Reno, NV

QUESTIONS?

Contact Jane Townsend at (916)206-7186 or jane@agamsi.com or Megan Corcoran megan@agamsi.com

CAL POLY Irrigation Training & Research Center

Professional Education Opportunities at ITRC 2026

www.itrc.org

Winter 2026

ITRC

Flow Measurement – January 2026
February 2026
(8 am - 5 pm)

Sponsor: USBR California-Great Basin Region

ITRC is providing several training and educational opportunities for staff, engineers, and water operators of agricultural irrigation districts. These classes utilize the excellent indoor and outdoor facilities at ITRC.

Chico

Flow Measurement – *February 2026*
(9 am - 4 pm)

Sponsor: USBR California-Great Basin Region

Provided in cooperation with Chico Farm, this annual flow measurement and canal operation training covers topics including: flow measurement details such as how to properly use a meter gate, how to get more water through various structures, and an introduction to SCADA.

ITRC

Pumps (for Irrigation Districts) – February 2026
(8 am – 5 pm)

Sponsor: USBR California-Great Basin Region

Pumps topics covered include types; terms; curves; pumps in series and parallel; system curves; TDH computations; efficiency; WHP, BHP, input HP; pump selection; common pump questions and answers.

ITRC

SCADA (for Irrigation Districts) – 2026
(8 am - 5 pm)

Sponsor: USBR California-Great Basin Region

This course provides an overview of SCADA systems, starting with electric and electronic fundamentals and moving on to typical technician role and responsibilities.

Spring and Summer 2026

ITRC

Certified Irrigator Program
Training for ITRC Certified Irrigator
(8 am - 5 pm)

Sponsor: CDFA WETA

Certified Irrigator I
Focuses on the basics of irrigation.

Certified Irrigator I (English and Spanish)
TBD
Winter 2026

Certified Irrigator II
Covers basic pipeline hydraulics, irrigation efficiency, salinity management for drip/micro and drainage and freeze protection.

Certified Irrigator II (English and Spanish)
TBD
Winter 2026

Exam administered after class.

ITRC

Ag Irrigation System Evaluation Short Course 2026
Training for ITRC Certified Evaluator
Sponsor: DWR

ISE I: Theory and Laboratory Practice of Evaluations.
This 2½-day course will be held **June 2026.** The class combines classroom (50%) and outdoor laboratory (50%) activities.

ISE II: Field Evaluations of Drip/Micro Systems
This 2½-day class, held on **June 2026**, travels to the San Joaquin Valley and performs the entire evaluations on 2 fields.

Exam administered after class.

CHICO

Ag Irrigation System Evaluation
Training for ITRC Certified Evaluator
***2026** (9 am - 4 pm)*

Sponsor: DWR

This comprehensive 3-day class combines classroom (50%) and outdoor laboratory (50%) activities. The techniques and programs covered are the standard used for DWR-funded evaluation projects throughout California.

ITRC

Designer/Manager School of Irrigation
(8 am - 5 pm)

The Designer/Manger School is a comprehensive educational program offering a variety of classes designed for agricultural irrigation professionals. See http://www.itrc.org/classes/desmgr.htm for details.

Irrigation Scheduling **TBD 2026**
Training for IA Certified Ag Irrigation Specialist
Soil texture and structure, water holding capacity, retention, intake rates, evaporation, transpiration, soil classification, measurement of soil moisture and tension, ETo and crop coefficients. *Exam administered after class.*

Pipeline Hydraulics **TBD 2026**
Pipe material & sizes, energy equation, friction, elevation changes, and basic spreadsheet operations.

Pumps **TBD 2026**
Pumps topics covered include types; terms; curves; pumps in series and parallel; system curves; TDH computations; efficiency; WHP, BHP, input HP; pump selection; trimming impellers; common pump questions and answers.

Row Crop Drip Irrigation **TBD 2026**
Design layouts, flushing, fittings, how design relates to management, hose installation, retrieval.

Drip/Micro Irrigation Design **TBD 2026**
Training for IA Certified Irrigation Designer
Filtration, step-by-step design procedure of hardware selection and hydraulics, drip/micro system design, SDI for trees and vines, plugging prevention. *Exam administered after class.*

ONLINE

Fertigation
Training for ITRC Certified Fertigator
Online class available now!
Sponsor: CDFA FREP

The class will cover new techniques in the control and application of fertilizers through irrigation systems and strategies to conform with the intent of the new nitrogen regulations in California. Increasing yields per acre-foot of evapotranspiration (ET) through better fertility management, will also be discussed – a key topic for California growers. *Exam administered after class.*

USCID

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www.uscid.org

The United States Committee on Irrigation and Drainage is a National Committee of the International Commission on Irrigation and Drainage.

Executive Director
Jane Townsend, jane@agamsi.com

Associate Director
Megan Corcoran, megan@agamsi.com

Sustaining Member
Bureau of Reclamation

USCID Meeting

USCID Conference. October 21-24, 2025, Reno, NV.

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Uncompahgre Valley WUA
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Weber Basin Water District
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American Academy of Water Resource Engineers
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Mission Statement

The mission of USCID is to promote progressive and sustainable irrigation, drainage and flood control practices in support of food and fiber production and public safety, recognizing that sustainability embodies economic, social and environmental goals.

USCID Newsletter and Membership

The *USCID Newsletter* is published by ITRC for USCID members. News items and technical articles of interest to the irrigation community are invited. Membership information is available on the USCID website www.uscid.org