

CVP Districts are eligible for ITRC Technical Assistance, including:

Anderson-Cottonwood Irrigation Dist
Arvin-Edison Water Storage District
Banta-Carbona Irrigation District
Bella Vista Water District
Byron Bethany Irrigation District
Carpinteria Valley Water District
Central California Irrigation District
Central San Joaquin Water Cons District
Chowchilla Water District
Clear Creek Community Service District
Columbia Canal Company
Colusa County Water District
Corning Water District
Del Puerto Water District
Delano-Earlimart Irrigation District
Dunnigan Water District
El Dorado Irrigation District
Exeter Irrigation District
Feather Water District
Firebaugh Canal Water District
Fresno Irrigation District
Friant Water Authority
Glenn-Colusa Irrigation District
Glide Water District
Gravelly Ford Water District
Hills Valley Irrigation District
Ivanhoe Irrigation District
James Irrigation District
Kanawha Water District
Kaweah Delta Water Conservation Dist
Kern-Tulare Water District
Lindmore Irrigation District
Lindsay-Strathmore Irrigation District
Lower Tule River & Pixley Irrig Districts
Madera Irrigation District
Maxwell Irrigation District
Meridian Farms Water Company
Natomas Central Mutual Water Co

Orange Cove Irrigation District
Orland-Artois Water District
Pacheco Water District
Panoche Water District
Patterson Irrigation District
Placer County Water Agency
Porterville Irrigation District
Princeton-Codora-Glenn Irrigation Dist
Proberta Water District
Provident Irrigation District
Reclamation Dist. No. 1004
Reclamation Dist. No. 108
Roberts Ditch Company
Sacramento County Water District
Sacramento Valley Regional Water Mgmt.
Contractors
San Benito County Water District
San Joaquin River Exchange Contractors
San Luis Canal Co/Henry Miller Recl Dist
San Luis Water District
Santa Clara Valley Water District
Saucelito Irrigation District
Shafter-Wasco Irrigation District
Southern San Joaquin Mun Water Dist
Stockton East Water District
Stone Corral Irrigation District
Sutter Mutual Water Company
Sycamore Mutual Water Company
Tea Pot Dome Water District
Tehama Colusa Canal Authority
Terra Bella Irrigation District
The West Side Irrigation District
Tranquility Irrigation District
Tulare Irrigation District
West Stanislaus Irrigation District
Westlands Water District
Westside Water District

TECHNICAL ASSISTANCE CONTRACT



— BUREAU OF —
RECLAMATION

ITRC 
moving water in new directions

1996-2021

25-YEAR UPDATE

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CALIFORNIA-GREAT BASIN REGION**
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USBR Region 10 (California-Great Basin)

TECHNICAL ASSISTANCE PROGRAM

25-YEAR UPDATE

ITRC has provided technical assistance to California-Great Basin Region irrigation districts since 1996. From the ITRC offices at Cal Poly State University San Luis Obispo, ITRC's engineers have traveled to and worked with water districts, agencies, manufacturers, and other water professionals throughout the California-Great Basin Region.

Today's farmers and irrigation districts face increasing demands on their water supplies due to water shortages, increases in electrical power rates, and environmental protection needs. In order to meet these demands and still maintain or improve on-farm production and profits, districts must find new and innovative ways to modernize their operations, structures, and facilities.

However, many districts don't know where to turn to learn about new techniques or how to use them correctly.

Recognizing this need, the Water Conservation Office of the USBR, California-Great Basin Region (CGB) (then called the Mid-Pacific Region) contacted the Irrigation Training and Research Center (ITRC) of California Polytechnic State University (Cal Poly), San Luis Obispo, in late 1995 to provide a technical assistance program to irrigation districts.

Since that time, ITRC and the USBR have researched and introduced state-of-the-art technology, techniques, and education to irrigation districts throughout the California-Great Basin Region. Feedback from districts participating in the program has been overwhelmingly positive. Over 70 districts in the Sacramento and San Joaquin Valleys are eligible for this technical assistance.

Energy Efficiency

With rapidly rising energy rates and increasing demands on the world's energy supplies, the development of innovative, energy-saving techniques and technologies is a high priority in California and throughout the nation. ITRC regularly promotes energy conservation in irrigation districts, and offers annual training on pumps.

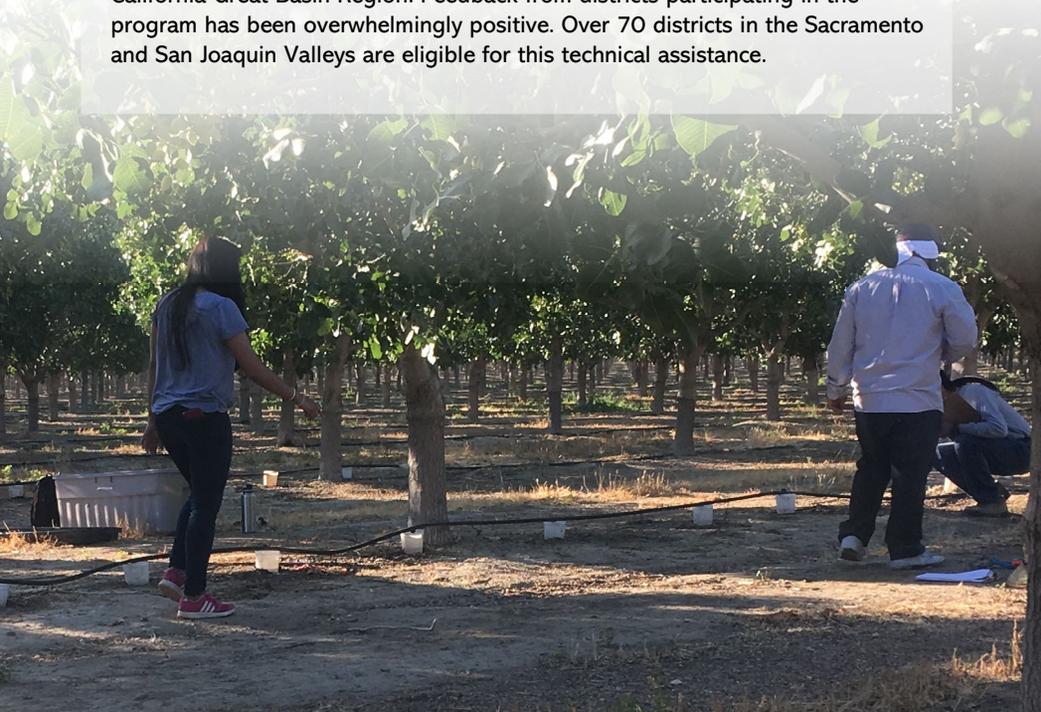
Variable Frequency Drive (VFD) Systems

In an effort to help pump owners improve pump station efficiency and service flexibility, ITRC developed a comprehensive set of VFD system specifications that cover minimum design, installation, and documentation requirements for a basic VFD system (up to 600 HP), while enabling site-specific customization and future advancements in VFD technology. A discussion of optional add-ons and supplementary educational material is also provided.

Ongoing dissemination and outreach is making the information public through various technical presentations, short courses, and workshops conducted by ITRC staff. The specifications can be found online at www.itrc.org/VFD.

Bathymetry

Bathymetry is the process of mapping the invert of submerged areas. For irrigation districts, bathymetric surveying provides a measure of current sedimentation and capacity (storage volume).



RESEARCH

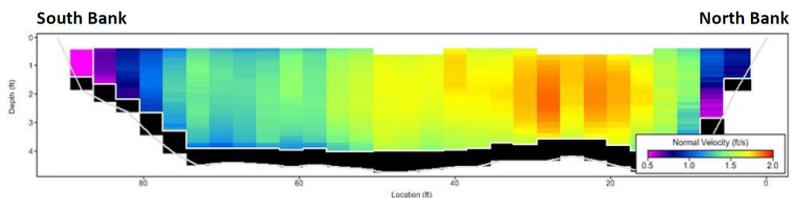
EDUCATION

Flow Control and Measurement

Reliable and accurate flow measurement techniques are essential for irrigation districts, farmers, and other agricultural and environmental water users at key points in their water distribution and delivery systems. To this end, ITRC has:

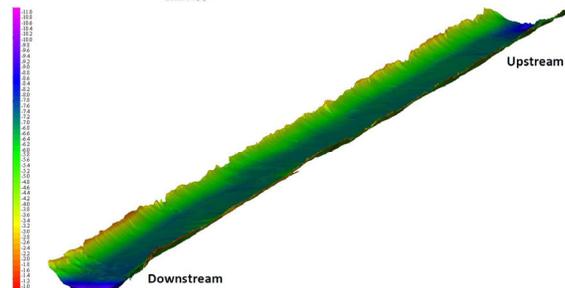
- ◆ Widened the application of Replogle flumes in irrigation projects
- ◆ Worked side-by-side with manufacturers to create new flow measurement devices
- ◆ Developed indexing procedures for calculating flow rates in canals and at non-standard flow measurement structures
- ◆ Created guidelines for canal flow rate measurement with hydroacoustic meters, which provide remote velocity sampling and integrated flow measurement based on the Doppler shift
- ◆ Designed and implemented a system to test and rate flow measurement equipment
- ◆ Built and maintained a gravimetric tank with a NIST-traceable uncertainty of $\pm 0.1\%$ for flow device/method calibration

ITRC performs a variety of flow measurement techniques, including turnout flow measurement calibration with ITRC's Irrigation Turnout Calibration Unit (ITCU), point-velocity measurements with hand-held meters, and large channel profiles with boat-mounted sensors.



Velocity profile for current profiling from boat-mounted sensors

Bathymetric survey of canal reach obtained from boat-mounted sensors



Over 4,500 water professionals have attended over 500 ITRC short courses since 1994.

Cal Poly students also benefit from ITRC facilities & resources in classes such as:

- Principles of Irrigation Hydraulics*
- Landscape Irrigation*
- Irrigation Water Mgmt*
- Chemigation*
- Irrigation Engineering*
- Drainage*
- Drip/Micro Irrigation*
- Ag Irrigation Systems*
- Water Wells & Pumps*
- Irrigation Project Design*
- Irrigation Theory*
- Water For A Sustainable Society*

As an offshoot of the California State University system, ITRC provides quality classes and short courses. ITRC's educational opportunities are technical, targeted, and pragmatic, providing highly specialized information that is not available elsewhere to water professionals. ITRC offers classes on topics ranging from SCADA and canal automation, to drip irrigation design.

The Designer/Manager School of Irrigation series, held every summer at ITRC, is a comprehensive educational program offering a variety of classes designed for both agricultural and landscape irrigation professionals. Participants learn about hydraulics, drip system design, fertigation, and other irrigation topics.

The annual winter/spring Irrigation District School of Irrigation series is designed for operators, district managers, and engineers to brush up their knowledge and learn new techniques in the fields of flow measurement, SCADA, and pumps.

Books

ITRC has updated the books *Drip and Micro Irrigation for Trees, Vines and Row Crops* and *Fertigation*, into English and Spanish versions. These books have become the primary texts in their subjects, often used at universities and in classes through The Irrigation Association. They are available to download free at www.itrc.org/books/.



Modern Canal Control

ITRC has made major theoretical and practical advances in computerized canal automation. ITRC is able to simulate actual flows, velocities, and water depths throughout a complete system and can provide specific information for any position within a pool in time increments as small as one second.

ITRC has created completely new control algorithms necessary to automate gates and pumps in vast canal systems, and also works with major integrator companies that physically install automation equipment in irrigation districts. The center specializes in complete automation plans that incorporate both sophisticated and simple structures and concepts. One such structure is the ITRC flap gate, which requires no electricity and works automatically. ITRC flap gates are installed at over 200 locations in California.



Supervisory Control & Data Acquisition (SCADA)

ITRC has provided assistance to dozens of districts in planning, installing, and implementing SCADA systems. These systems range from simple remote monitoring of structures to completely automated systems. ITRC aids districts in radio testing, installation, HMI and PLC programming, selecting integrators, and has also developed a set of detailed specifications to ensure that only quality SCADA systems are purchased and installed.

Rapid Appraisal Process (RAP)

The ITRC Rapid Appraisal Process for irrigation projects was created in 1989 as a tool to quickly provide valuable insight into many aspects of irrigation performance including project design, engineering, operations and management. The RAP is a one-week process of data collection and analysis both in the field and in the office designed to provide a fresh look at the whole system, with the goal of identifying specific actions that could be taken immediately, as well as options for major future investment.

ITRC has performed dozens of appraisals for water districts and agencies throughout the California-Great Basin Region.



General Support

ITRC serves as a valuable information source for irrigation districts, farmers, consultants, etc. throughout the California-Great Basin Region.

As part of the California-Great Basin Region technical assistance program, ITRC is able to field phone calls and provide quick assistance regarding irrigation practices, means to conserve water, etc. This support is a vital lifeline for many districts and other professionals that is not available elsewhere.