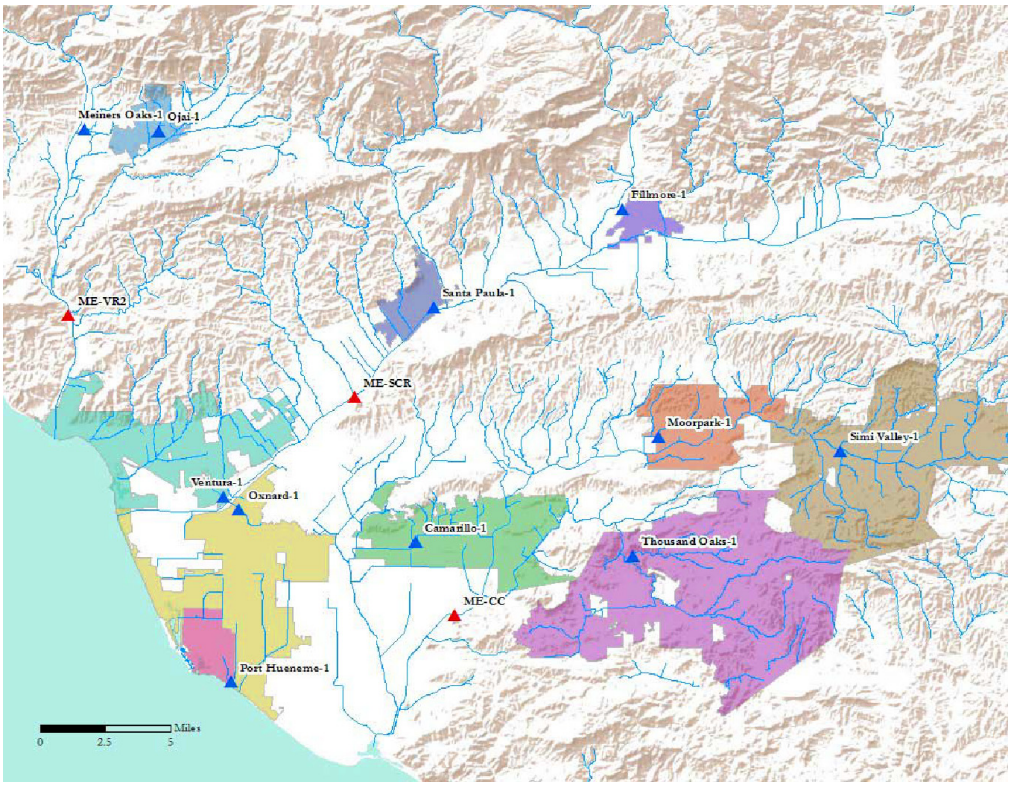
Ventura County Stormwater Monitoring

Isco Sampling & Communication Solutions

TELEDYNE ISCO
Everywhereyoulook™

Expertise in Stormwater

The Ventura County Watershed Protection District (VCWPD) needed to expand its stormwater monitoring system from three existing stations to a total of fourteen, in accordance with new NPDES MS4 permit requirements. The district began evaluating what functions would be required in order for the system to maintain accurate data, minimize trips for maintenance and data collection, and keep up with changes in the weather with limited staffing.



Ventura County watershed map Showing monitoring station locations

Identifying Areas for Improvement

The expansion of the monitoring program necessitated a close examination of the cost impact of several manual tasks, where automation previously could not have been justified. These included site trips for icing samplers, program adjustments, data collection, and battery checks.

Other areas of concern included the expense of a 120 VAC infrastructure (for sample refrigeration), unknown site status, false starts due to rapidly changing weather conditions, and vandalism.

Finding the Right Equipment

Even with the expansion of the program, VCWPD decided to keep operations in-house in order to keep staff fully trained and familiar with system design and equipment maintenance. With this in mind, it was decided that the water monitoring and data management equipment would be purchased from Teledyne Isco, by virtue of its relatively straightforward design and operation, as well as reliable customer service and technical support.

2105 Interface Module

- Optional GSM or CDMA cellular communication
- Sampler enabling & pacing
- Variable rate data storage
- Alarm generation
- Inputs include:
  - Isco flow meters
  - Rain gauge
  - SDI-12
  - Modbus

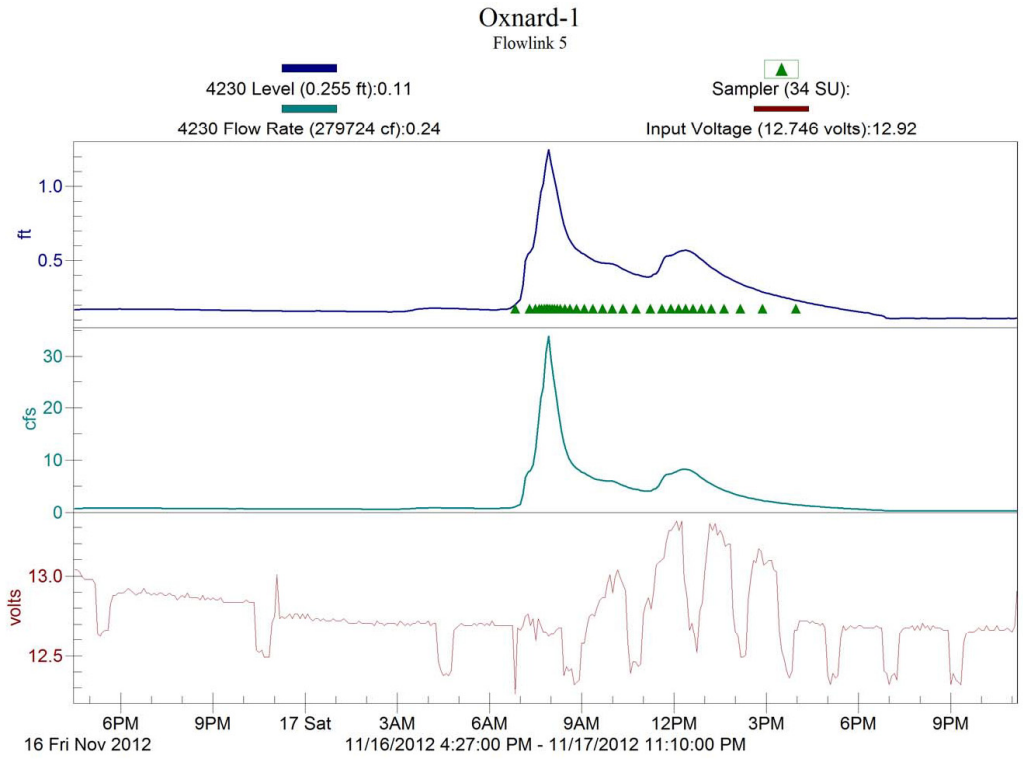
"By researching and investing in quality field equipment, we have been able to improve the quality of the data while improving efficiency, saving staff time, and reducing the risks involved with multiple field visits in inclement weather."
— William Carey,
Water Resources Specialist,
VCWPD

Automated Sampling + Remote Access

At each monitoring site, the appropriate type of Isco flow technology is installed. This may be a 4230 Bubbler, 4210 Ultrasonic, or 4250 Area Velocity flow meter, depending on the site, and in some cases a 674 rain gauge. Isco automatic water samplers collect representative flow weighted composite samples based on flow and/or rainfall data transmitted from the meters to Isco 2105 interface modules. AC-powered sites utilize 6712FR refrigerated samplers, while solar-powered sites combine the portable 6712 sampler with DC-powered refrigerators.

Equipped with CDMA cellular communication, the 2105 interface module serves as a central hub for sampler control and data transfer, pushing rainfall, water level and flow, battery voltage, and sample count data to a database stored on the county's SQL server running Isco's Flowlink® data management software. Through the dedicated Website, VCWPD staff can now remotely track site conditions and equipment status, view any site data from anywhere in near real-time, and make changes to the sampling program as conditions evolve before and throughout the storm. Additionally, the 2105 will issue text alarms if battery voltage becomes insufficient, or if a large flow occurs during dry weather.

An unexpected benefit with the use of CDMA communication was clean data free of noise and gaps, regardless of the number of sites simultaneously pushing to the server.



Storm event graphically depicted with Flowlink® (With sample events and input voltage)

Efficiency of Operation, Reduction of Costs

In addition to the staff of VCWPD and Teledyne Isco, contributors to the success of this project include the Cities & County of Ventura, VCWPD Operations & Maintenance, GSA Facilities & Materials, and the Ventura Regional Sanitation District. As a result of their combined efforts, the expanded monitoring program has better efficiency and reliability, as well as less travel time, maintenance, and staff time.

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