

Protecting dams during record snowmelt: A real-time monitoring success

Country

United States

Project type

Hydrodam monitoring

Sector

Infrastructure

Main product

Monitoring solution

Context

In the winter of 2022 to 2023, record snowfall was observed in the Eastern Sierra Mountain ranges of California. While this water was welcomed due to the recent drought conditions, it also posed a risk to the water infrastructure in Owens Valley. The amount of snowmelt expected was more than the water collection system could reasonably handle.

Due to this anticipated snowmelt, [the Los Angeles Department of Water and Power \(LADWP\)](#) needed to increase real-time monitoring for three of their dams and reservoirs:

- South Haiwee
- Tinemaha
- Long Valley

The objective was to better understand the dams' conditions and responses.



Solution

The project was overseen by a set of complementary stakeholders:

- [LADWP](#), as the dams' Owner / Operator
- [Stantec](#), as the Project Engineer
- [Specto Technology](#), as the Instrumentation Solution Provider
- [Worldsensing](#), as the Datalogging and Communications provider
- [Bentley Systems](#), as the Data Visualization Provider
- [Geokon](#) and [In-Situ](#), as the sensors manufacturers

This project team sprang into action to deliver an installed and configured system before the peak of the expected snowmelt. Since the snow had already begun melting in the surrounding watershed, it was crucial to proceed with deployment to capture data and ensure optimal risk management.

The team worked around the clock to design, install, configure, and display the metrics from this project in real time, including:

- 18 [ThreadX3](#) connected to field cameras, to register visual observations in real time
- 3 Worldsensing [Gateways](#), allowing long-range communications
- 20 [Event detection Tiltmeters](#) to detect any deformation or slope movement, working through Sensemetrics and [Bentley iTwin IoT](#).
- 30 [Vibrating Wire logger 1-channel](#) connected to a variety of turbidity sensors and piezometers

The overall system monitored several parameters at the dam, including the reservoir, weir, and piezometer levels at multiple locations for abnormal changes.

Benefits, value for company

This project provided LADWP with real-time data to understand how their dams responded to the unprecedented snowmelt loads. It gave the organisation peace of mind, having hourly and synchronized instrumentation monitoring data and images across the remote dam sites, which would have been impossible to do manually.



Advantages

- Increased real-time monitoring capabilities, thanks to the installation and configuration of advanced monitoring systems, including field cameras, gateways, tiltmeters, and various sensors.
- Improved risk management with the set-up of an early warning system, measuring deformation or abnormal changes in water levels.
- Mitigation of environmental impacts and improvement of worker and community safety through proactive risk management.



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