

Case Study of Emery County Real-time Monitoring and Control System Implementation

March 2020

Authors: Amy Green, Roger Hansen, Rangesan Narayanan, and Colby Green

Focus Question: How can quantification of available water supply and agricultural use be improved to increase water productivity and improve water management?

Key Finding: Quantification of diverted and applied water significantly benefits the producer, the community, and the environment and is desired by both water users and managers. The Emery County case study is proof positive that this system works in Utah.

The goal for this project was to engage stakeholders in Emery County (including water managers and producers) and to understand, document, and evaluate the drivers, methods, costs, benefits, and lessons learned from the implementation of a network of flow measurement structures with a transparent Real-time Monitoring and Control System (RTMCS).
Is quantification of water supplies and diversions beneficial?

Background

The Emery Water Conservancy District (District) began installation of a real-time monitoring system in 1992 and continues to expand it for its agricultural service area. The District is also moving toward fully automating many of its diversion structures. Citizens in Emery County recognize the value of the system and voted to enact an ad valorem tax to augment funding from federal grants and continue expanding the system.

Key Findings

Costs. The cost for a simple monitoring station is between \$3,000 and \$5,000. For a control site, costs range above \$7,000, depending on the complexity of the installation.

Cost Benefits. Under even the most conservative assumptions, the agricultural benefits of RTMCS are evident. Using an ex-ante analysis, the net present value is \$4.75 million with a 32.38 % internal rate of return. In this analysis, the benefit-cost ratio measure is 1.93.

Other Benefits. Stakeholders perceive the benefits of improved crop production (because of the lengthened irrigation season of up to 1 month) and increased transparency. Benefits to the environment include reduced salt loading to the Colorado River and reductions in fertilizer, herbicide, and pesticide loads to the water system.



Figure 1. Fully automated Swasey Diversion Structure with flow and water level monitoring

Conclusions

1. Real-time and transparent data describing actual water use resulted in reduced water diversions and consumption.
2. An RTMCS is a cost-effective and environmentally sound method to improve agricultural irrigation delivery systems and conserve water throughout the state. The RTMCS has helped justify transitioning from open canal to pipeline systems.
3. An RTMCS provides transparency and improves trust between all water users.

Recommendations

Areas considering an RTMCS should consider the following: financial means and personnel to install and maintain the system; buy-in from water users; a basin-wide system; federal and state grants where available; and standardized equipment and software for ease of installation and maintenance.

Statewide Action. The State of Utah Divisions of Water Resources and Water Rights should consider the following actions: increase technical support staff; provide grants to encourage RTMCS; develop operational and water rights models to interface with real-time information; and install a statewide, real-time website.