

WHY DOES OUR PROJECT MATTER?

Farmers, the local economy, wildlife species, and habitat all stand to benefit from the implementation of an incidental groundwater recharge program in Teton Valley. This innovative solution allows us to work with the natural system to make water available when it is needed most without having to increase water supply through other, more expensive, means. This model demonstrates great promise in meeting economic and environmental needs simultaneously and could be replicated elsewhere in the arid West to increase late-summer streamflow.



ACKNOWLEDGEMENTS

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¹ Idaho Department of Fish & Game. (2008). *IDFG 2003 Economic Survey Report*. Boise, Idaho: IDFG.

² ECONorthwest. (2006). *The Economic Value of Water in Wyoming's Green River Basin*. Eugene, Oregon: ECONorthwest.



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RECHARGE FOR THE RIVER

Incentivizing Groundwater Recharge in Teton Valley, Idaho

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INTRODUCTION

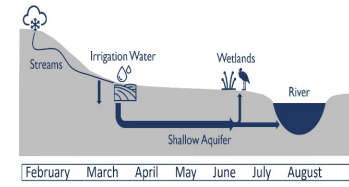
Teton Valley

Teton Valley is an agricultural community characterized by iconic open spaces and mountain views. The Teton River basin is a dynamic system fed by snowmelt from the Teton and Big Hole Mountains that surround the Valley. Teton Valley is part of the Greater Yellowstone Ecosystem and is home to a number of ecologically-significant fish as well as wetland habitat. The Teton River runs through the heart of the Valley and drives the local economy by sustaining agriculture and supporting vibrant tourism and recreation industries.



Incidental Groundwater Recharge

Increasing incidental groundwater recharge can be utilized to change the timing of when water is available in Teton Valley. Farmers can divert water into their unlined canals beginning in April. From there, it seeps into the ground, flows through the shallow aquifer and emerges in the wetlands and the Teton River later in the summer when flows are needed most.



Environmental Problem

Recent increases in snowpack variability and changes in irrigation practices have resulted in decreased late-summer streamflow in the Teton River and its tributaries. This decrease adversely impacts farmers who rely on surface water for irrigation, aquatic species that need cold water and adequate flows, and the dozens of important wildlife species that rely on wetland and fen ecosystems.

OBJECTIVES

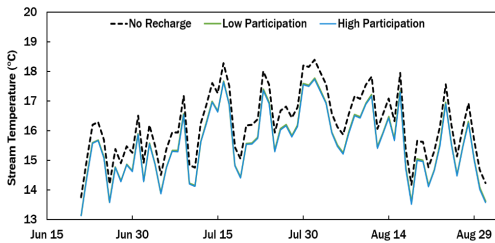
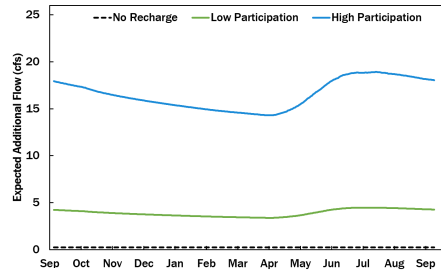
Our goal was to implement an incidental groundwater recharge program to augment late-season flows in the Teton River and buffer against annual hydrologic variability. To do so we needed to:

1. Model hydrologic conditions and the potential impact of recharge on streamflow in the Teton River
2. Quantify economic and environmental benefits of augmented flows

HYDROLOGY

Using an analytical water budget, we found that incidental groundwater recharge does in fact augment late-summer flows in the Teton River. Using a linear regression, we confirmed that these augmented flows reduce stream temperature.

Modeling shows that augmented flows from incidental groundwater recharge occur in the late summer when they are needed most. The magnitude of additional streamflow is determined by the level of farmer participation.



Modeling shows that augmented flows reduce stream temperature. More recharge results in a greater decrease in temperature in the late summer when fish need it most.

BENEFITS

Farmers

The cost to farmers of conducting incidental recharge is significantly less than the cost of having to rent storage water from a nearby reservoir.

Cost of Rented Water	
Average Price	\$6.00/acre-foot
Cost of Recharge Water	
To Cover Farmers' Costs	\$1.61/acre-foot
To Cover Farmers' Costs & Program Administration	\$3.07/acre-foot

For farmers to avoid renting storage water, recharge quantities must be much greater than what can be accomplished using canals exclusively. Recharge would need to be expanded to include flooding of marginal land. Once this threshold of augmented flows is met, farmers can reduce their irrigation costs by avoiding the rental of storage water.

Minimal additional streamflow needed for farmers to avoid renting water

= 58.8 cubic feet per second

BENEFITS CONTINUED

Environment

7.9% of the time from 1996-2000, water temperatures exceeded the salmonid spawning threshold. Augmented flows from incidental recharge could reduce these exceedances by one half.



Increased flows can improve the fishery by supporting more and larger fish.

Value of an improved fishery from a 5% increase in angler days¹

= \$34,400



Wetland ecosystem services can be beneficial for the local hydrology, water quality, and local community.

Value of wetland ecosystem services²

= \$1,800 per acre

OUR SOLUTION

Stage 1

- Two-year pilot project with two irrigation companies
- Participating farmers reimbursed for the direct costs of conducting incidental groundwater recharge in their canals

Stage 1 will demonstrate how much water can be diverted for recharge, as well as the ease and cost of recharging.

Stage 2

- Partnerships with environmental non-governmental organizations (NGOs) whose missions align with the goal of increasing Teton River streamflow
- NGO funding will be used to continue covering farmers' costs of recharge and to expand recharge areas to include flooding of marginal land and fields

Stage 2 will determine how much financial benefit farmers will gain from increased flows in the Teton River.

Stage 3

