

Recharging Ahead

By Max Ludington

Recharge Program Basics:



LEFT Max Ludington and Greg Bagley discuss recharge efforts on the Bagley family's farm in Victor, Idaho.

RIGHT Excess water is spread out in the spring to recharge the aquifer.

Water Agriculture in Teton Valley and areas further downstream depend on snowpack to serve as a natural water storage system.

Water A changing climate is causing snow to melt earlier, making it harder and more expensive for farmers to obtain water for their crops in late summer. The earlier run-off is also having negative impacts on river health during the hottest times when plants, fish, and wildlife need it most.

Water Agricultural interests hold and manage the vast majority of water rights in Teton Valley. Farmers have the means and legal right to manage water in ways that can lead to more late season water availability.

Water By incentivizing Teton Valley's farmers to flood irrigate their fields when water is abundant (April-June), the aquifer can be turned into a natural and cost-effective water storage mechanism (July-September).

Water Recharged water is then slowly released from the aquifer into the Teton River, benefitting the ecosystem and the fishery, as well as farmers.

Water More abundant late season water provides economic benefits to the entire valley, from family farms to fishermen.

"We're all in this together. If we are to devise durable solutions to water availability for the future, we must think about both agricultural and residential users, farmers and outdoor enthusiasts, natural ecosystems and the economics of water." – Max Ludington



The Teton Water Users Association (TWUA) is a first-of-its-kind partnership combining science, economics, and the ingenuity of local farmers to address decreasing water availability. Partners include farmers, local irrigators, and a variety of local governments, state agencies, and local and regional nonprofits—including the Idaho Farm Bureau, Teton Soil Conservation District, FTR, and many more.

TWUA was created in response to Teton Valley's declining aquifer levels—on average twenty-five feet and up to fifty-five feet in some localized areas. The reasons for the change in water availability are varied, but three key factors seem to be driving it: First is the change in snowpack (less of it and earlier melting); second is the increased demand for water (there are more of us); and the third cause, (which is also a potential solution) is a change in agricultural water use.

To add efficiency to farming, most of Teton Valley's farmers have switched from flood irrigation to sprinkler systems. These systems offer a variety of benefits, including reduced water use, improved crop production, and decreased labor costs. The major unforeseen consequence of the shift is that the extra water used in flood irrigation no longer seeps into the ground. As a result, Teton Valley's aquifers have lost a recharging mechanism, which in turn reduces the amount of water emerging from those aquifers that eventually works its way into local waterways throughout the summer. Additionally, groundwater moves more slowly than surface water. As we've shifted to a surface dominated system, water is leaving the valley earlier in the year.

To address this question, TWUA has proposed a solution based on a simple economic concept: scarce summer water is worth more than abundant spring water. Building on

this idea, TWUA's goal is to convert spring water into summer water through farming practices that lead to additional aquifer recharge, creating value. In practice, local farmers combine early seasonal flood irrigation with mid-season sprinkler systems.

At its core, TWUA is trying to change the timing of water flowing out of Teton Valley. This is no small task, and success will require a coordinated effort from TWUA's members. To date, TWUA has succeeded in the critical first steps of developing not only the knowledge needed to pursue the project, but the mutual trust between the many parties necessary to carry it out. Should it succeed, this approach has real potential to be applied in agriculture-heavy headwater basins throughout the Greater Yellowstone Ecosystem, as well as broadly across the West.



Max is a project director for LegacyWorks Group. He devises collaborative approaches with economic drivers for community scale conservation problems around the region, including Teton Valley.

How do we know it's working?

Water **Monitoring wells:** Monitoring wells allow us to measure the direct aquifer response to recharge. Program manager Bryce Contor has worked with the Idaho Department of Environmental Quality to collect historic well data and to re-start monitoring of additional wells.

Water **Modeling Teton River flows:** Dr. Rob Van Kirk (Henry's Fork Foundation) has developed a sophisticated water model for the Teton Basin, based on nearly one hundred years of measured snowpack, temperature, and stream-flow data. This serves as our control for the program and lets us know what stream flows would be under normal irrigation practices.

Water **Measuring Teton River flows:** FTR and HFF are measuring the direct flows in the Teton River over the course of the year. We are able to compare observed flows with modeled flows in order to see how the recharge program is impacting timing and volume of water in the river.

Piloting the Program:

In 2018, we launched a pilot program with four canals. That first year proved the feasibility of employing this approach, but was too small in scale to generate significant results. Building on that successful launch, we are expanding the program. In 2019, there are fifteen canals participating from six different canal systems. We are hopeful that this level of participation will produce measurable improvements in the timing of water delivery across the valley.

Spread the word (and the water).

Want to know more about recharge? Email Bryce Contor brycec@henrysfork.org

Thank you to Patagonia and 1% for the Teton for their support of this innovative program.

