



FROZEN ASSETS: INNOVATIVE GROUNDWATER MANAGEMENT AND RECHARGE STRATEGIES IN THE RIO GRANDE

Winter sheet ice, San Luis Valley, CO | Cary Aloia

PROJECT OVERVIEW

Frozen Assets explores how winter sheet ice, an innovative water management strategy that mimics natural processes, can support aquifer recovery, assist with native revegetation on retired lands, enhance wildlife habitat, and allow flexibility for agricultural producers in Colorado's San Luis Valley.

Winter sheet ice has been used historically in the SLV to spread water shallowly across the surface during the winter and 'store' it as ice for early spring use. Sheet ice starts developing when temperatures freeze in the fall, and producers slowly 'push' shallow water across the surface so that it freezes. Consistent application of water over time creates a large sheet of ice across the landscape. In the early spring, the ice slowly melts providing water and foraging resources for over wintering birds and wildlife and early spring migrants like waterfowl and cranes. This slow, over-winter process results in less water lost to evaporation and transmission, allows water to infiltrate soils and recharge aquifers, facilitating the growth of early season plant species by providing early season resources.

The Project brings together multiple partners, including American Rivers, Ducks Unlimited, Colorado Parks and Wildlife, Wetland Dynamics, Rio Grande Water Conservation District, Bureau of Reclamation, and private landowners to both understand and scale a nature-based approach to water management in the Rio Grande Basin.

COMMUNITY BENEFITS

Project Partners believe Frozen Assets will have many benefits for the local community in the San Luis Valley as well as other water users and agricultural producers across Colorado. This Project is designed to both equip water users with information about winter sheet ice and demonstrate it as a viable alternative for seasonal water use that enhances soil moisture retention and the resilience of local water tables, demonstrates improved habitat quality, and promotes the growth of native plant communities.



Melting winter sheet ice, Russell Lakes State Wildlife Area, CO | Cary Aloia

PROJECT GOALS

Project partners believe Frozen Assets will improve the local water table, illustrate the benefits of using winter water as a tool for water managers, and provide data to support a beneficial use of winter water for wildlife. To illustrate these benefits, Project partners will complete the following activities:

- Complete a groundwater study on the Russell Lakes State Wildlife Area and downstream private properties to document the positive benefit to the local water table when sheet ice forms over the winter and slowly melts during the early growing season.
- Document wildlife use by conducting spring migration bird surveys at Russell Lakes State Wildlife Area and private properties to demonstrate winter sheet ice benefits to wildlife, primarily by providing spring habitat for migrating cranes, geese, ducks and others.
- Develop a case study that documents the use of winter sheet ice to restore native vegetation, creates beneficial migratory bird habitat, and that advances this water management strategy.
- Connect with different stakeholders to highlight the findings and benefits of the Project and identify potential locations for future project sites.

Additionally, this Project will coincide with a Colorado Parks and Wildlife study on Russell Lakes State Wildlife Area to accurately measure the consumptive use of three wells during the winter. This study is key to understanding the difference between consumptive use of water during the winter, when evapo-transportation rates are presumably lower with cold temperatures and plant dormancy, versus during the growing/irrigation season. Accurate information is integral to how managers and the Colorado Division of Water Resources understand how a winter water application could be used as a viable strategy to achieve the goals of the Project and support an innovative water management tool for the San Luis Valley and greater Colorado.



Many species of wildlife, including migrating cranes, geese, ducks, and other waterfowl utilize winter sheet ice as important spring habitat. Frozen Assets looks to demonstrate the benefits of winter sheet ice, including its importance to wildlife, aquifer recharge and recovery, and as an innovative water management strategy for agricultural producers.

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