USDA-CSREES 2006 National Water Quality Conference

Managed Recharge of an Alluvial Aquifer for Stream Augmentation

Managed groundwater recharge is a form of conjunctive water management that is increasingly used in the arid West as a method of streamflow augmentation to meet water rights demands. The primary intent of managed recharge is to re-regulate flows that are in excess of legal rights to, and physical demands for, water by senior water rights holders, enabling junior groundwater appropriators to withdraw water from tributary alluvial aquifers without harming existing senior water rights. In these systems, water is diverted from the river during high-flow, low-demand periods and pumped through pipelines to recharge ponds where it infiltrates and returns to the river during critical low-flow, high-demand periods, thus retiming flows and increasing the value of the water. The location of the recharge ponds and the hydrogeology determine the timing of the return flows at the river and the effectiveness of the systems. Managed recharge systems also modify the hydrology of the entire alluvium and, particularly, the groundwater/surface interfaces at the river, ponds and backwater sloughs. Our project has partnered with state and local water and wildlife agencies to monitor and model a managed groundwater system in Eastern Colorado. The project site is a complex hydrogeologic and ecological system that must meet Colorado Department of Wildlife (CDOW) goals because the study site is a CDOW Wildlife area, as well as provide flow as part of Colorado's contribution to the Platte Basin Endangered Species Recovery Program, as outlined in a cooperative agreement with the U.S. Department of the Interior, Nebraska, Wyoming and Colorado. Results have implications to many of the private well augmentation systems along the South Platte and other areas where pumping and recharge of alluvial aquifers tributary to shallow streams are of interest.

Author: Deanna Durnford
Coauthor(s): Calvin Miller, Mary Halsted, Jon Altenhofen