

Location and Intensity of Changes to Ecosystem Services of Irrigated Agriculture: A case study in Weld County, Colorado

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Abstract. This study synthesizes two previous studies on ecosystem services of irrigated agriculture and explores the risks to changing water supply and demand with spatially explicit models. Water diverted from streams and rivers in Colorado is primarily used for agriculture. A large network of tunnels, pipes and open canals are used to move water across the landscape to agricultural producers. Vegetation that develops along irrigation canals often resembles natural riparian ecosystems, however, the water source is completely controlled by humans and therefore at risk for future management modifications. Irrigated agriculture has several inefficiencies which can lead to the creation and expansion of wetlands. These wetlands have been shown to provide ecosystem services including late season return flows to rivers, habitat for wildlife and improved water quality. I examined the distribution and position of riparian ecosystems on irrigation canals and tailwater wetlands adjacent to irrigated agricultural fields in Weld County, Colorado to highlight the distribution and quality of wetland and riparian ecosystems dependent on irrigated agriculture. As changes in climate make Colorado's water supply less predictable, and urban development continues, these landscape features could be at risk. I modeled a 15 % reduction in irrigated agriculture. Results highlight network positions that are at risk for reductions in canal flow and wetland loss.