

ECONOMIC ANALYSIS
of
Groundwater Curtailment
in
Colorado's Republican River Basin

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Context

An agreement between the states of Colorado, Nebraska, and Kansas, related to the Republican River Compact, requires that 25,000 irrigated agricultural acres in Colorado's South Fork Focus Zone be removed from irrigated production by 2030.

Failure to comply with this requirement could result in the curtailment of all groundwater pumping for irrigation across all of the Republican River Basin in Colorado.

Study Scope

This study examines four different scenarios to describe future economic impacts in the Basin and beyond, should groundwater pumping for irrigation be curtailed.



View the complete report at <https://watercenter.colostate.edu/reports>

Economic Background

Agriculture, including irrigated crop production (primarily corn and alfalfa), is critical to the economy in the Basin, representing more than 25% of total revenue and almost 20% of employment.

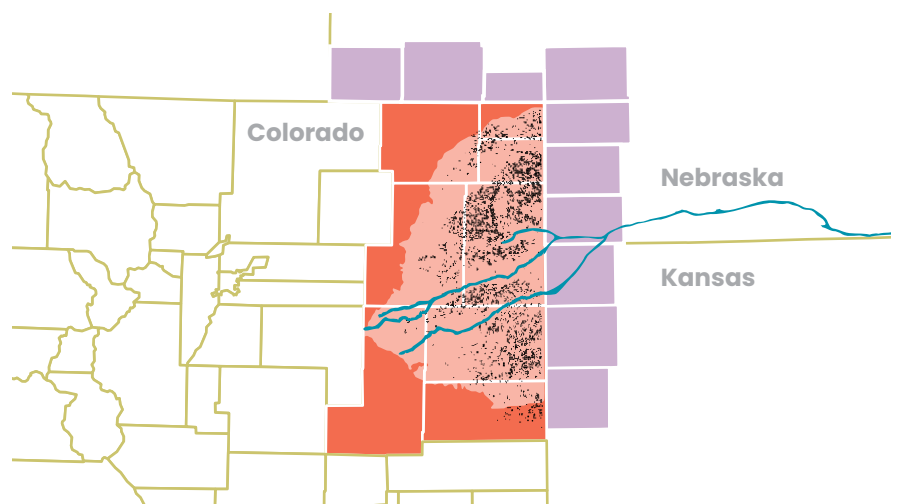
Without irrigation water from groundwater sources, agricultural production in the Basin would transition primarily to lower-value dryland crops and grazing, reducing revenue for agricultural producers and generating cascading effects on input suppliers, local businesses, and regional economies.

Study Methods and Data

Using data from the IMPLAN modeling tool, Colorado's Decision Support Systems, crop-enterprise budgets, and the USDA's Crop Data Layer, this study evaluates the primary and secondary economic impacts of groundwater curtailment on the eight counties in the Basin, as well as the spillover economic impacts on the remaining Colorado counties and neighboring counties in Kansas and Nebraska.

The analysis estimates changes in revenue from economic output, employment, and state and local government revenue. The scenarios highlight significant economic adjustments across the agricultural sector, and the findings provide stakeholders with insights into potential economic outcomes if groundwater curtailment were to occur.

Achieving compliance with the land retirement requirement would avoid the negative economic consequences of basin-wide groundwater curtailment.



Light orange area indicates the Republican River Water Conservation District boundary. The orange counties represent the study area. The purple counties are neighboring counties in Nebraska and Kansas. The black dots indicate irrigation wells located in the Colorado portion of the District. The blue lines represent the south and north forks of the Republican River, and the Arikaree River.

Curtailment Scenarios

Each of the four scenarios provides a description for how the 526,431 acres that are currently irrigated by groundwater could be impacted by curtailment.

ONE

All groundwater-irrigated land in the Study Area converted to grazing.

TWO

Conversion of irrigated acres to dryland crop production and grazing based on the current land use share of non-irrigated acres in the Study Area.

THREE

A predictive model of land conversion based on outcomes and characteristics of land enrolled in EQIP* in the Basin.

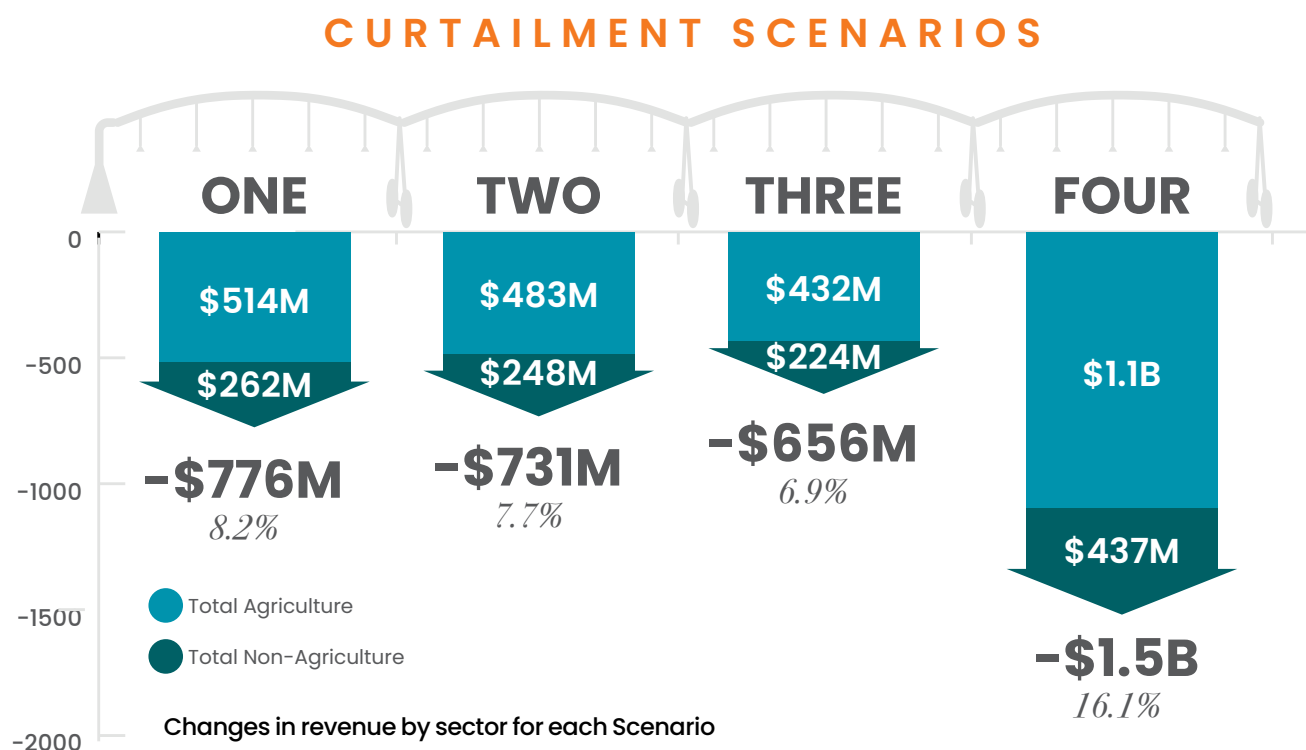
FOUR

The land use changes from Scenario 3 with the addition of a 50% reduction in demand for non-grazing livestock sectors as a result of livestock operations leaving the area.

*EQIP: The Environmental Quality Incentives Program is one of the two groundwater rights retirement programs available to producers in the Study Area.

The analysis finds that groundwater curtailment could reduce revenue in the study area by as much as \$1.5 billion annually.

Changes in Annual Revenue in the Eight-County Study Area



Study Outcomes

The analysis finds that groundwater curtailment could reduce annual revenue in the Study Area by as much as \$1.5 billion, depending on land use changes and impacts to feedlots—a decrease of 16.1% in the value of economic output. The reduction in economic output is associated with a decrease in employment of between 2,591 and 5,263 jobs, representing a 6.9% to 13.9% decrease.

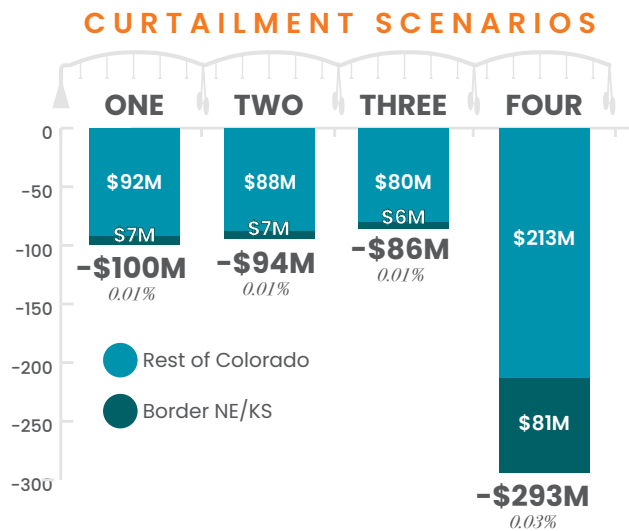
The decreases in revenue and employment are concentrated in Yuma and Kit Carson counties, which lie fully within the Republican River Basin. The economic declines are associated with significant reductions in household income and state/local government revenue and also lead to diminished economic outcomes in Colorado counties that lie outside of the Republican Basin and in bordering counties in Kansas and Nebraska.

Discussion and Conclusions

Achieving compliance with the Compact's 2030 land retirement requirement will avoid the negative economic consequences of basin-wide groundwater curtailment. This report underscores the cost of basin-wide curtailment on the State of Colorado and neighboring areas in Kansas and Nebraska. The findings are intended to illuminate the economic implications of alternative land use scenarios.

This research explores the primary impact that shifting irrigated agricultural production to dryland farming and grazing would have on agricultural producers, as well as the secondary impacts on businesses that supply inputs to agricultural production or benefit from the spending of agricultural producers and workers.

Annual Revenue Impacts in other Colorado Counties and Adjacent States



Changes in Employment in the Eight-County Study Area

