

An Economic Analysis of Groundwater Curtailment in the Republican River Basin of Colorado

Presentation to the Joint Agricultural Committees
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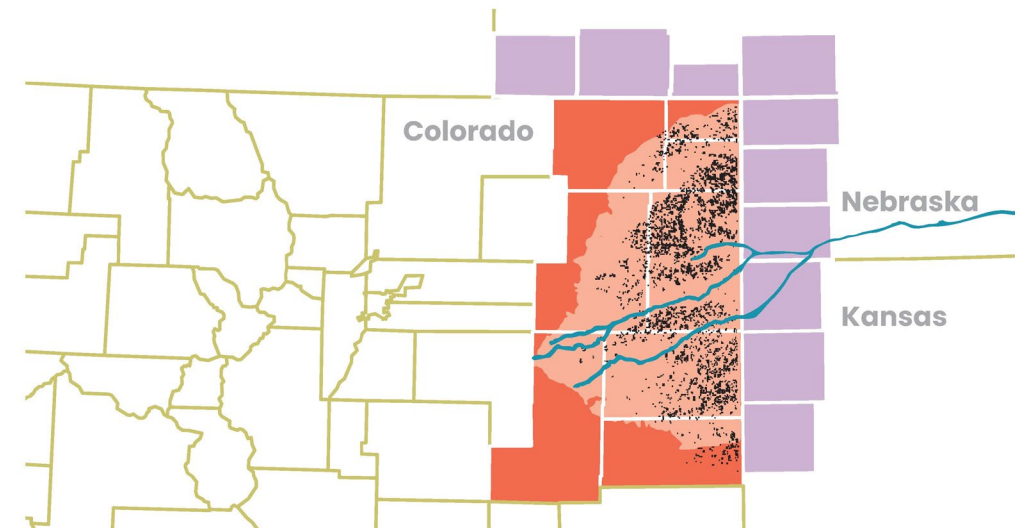
Study Motivation

- 2016 Republican River Compact resolution calls for Colorado to cease irrigation on 25,000 acres of groundwater-irrigated land near the South Fork of the Republican River (“South Fork Focus Zone”).
- Curtailment of all groundwater irrigation in the Republican River Basin of CO has been threatened by the State Engineer’s office if the 25,000-acre requirement is not achieved by 2030.
 - Approximately 526,000 of land would lose irrigation under curtailment.
- HB23-1220 called on CSU to conduct a study to quantify the economic impact of groundwater curtailment on the regional economy.
 - Thank you to the sponsors of this important legislation.



Approach and study area

- Evaluate the short-run economic impact of curtailing irrigation on 526,000 acres.
 - Economic impacts include – changes in private sector revenue, employment, household income, and government revenue
 - Use an input-output model that captures linkages between economic sectors
- Primary study area is the 8-county Republican River region in CO.
 - Also evaluate spillover impacts on:
 - Remaining CO counties
 - Bordering counties in KS and NE



Process

- Our research team has worked to develop the analysis that underlies the report over the last two years.
- We have consistently provided updates to the Republican River Water Conservation District (RRWCD) board and incorporated feedback related to assumptions and scenarios.
 - We provided an update of our progress to this committee in January 2025.
- We have worked with Karen Schlatter, Colorado Water Center Director, on the production and distribution of the final report and executive summary.



Background

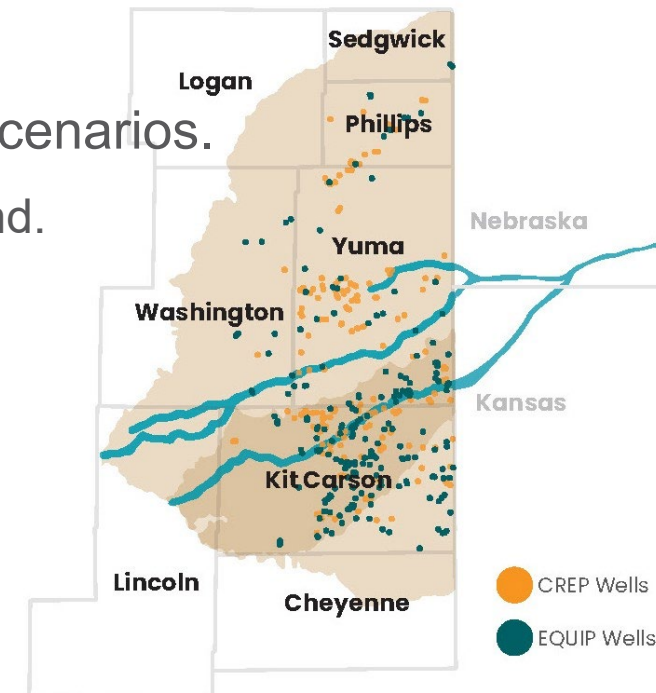
- 17,991 irrigated acres have been retired in the SFFZ since 2016, leaving an additional 7,000 acres to meet the requirement.
 - Primarily retired through the Environmental Quality Incentives Program (EQIP) and the Conservation Reserve Enhancement Program (CREP).
- Crop production and grazing accounts for over \$1 billion in annual revenue in the 8-county study area (approx. half from irrigated land).

		Avg. Acres (2020-2023)	2022 Acres	2022 Annual Revenue
Irrigated	Corn	458,174	462,846	\$379,047,390
	Hay	78,259	78,192	\$46,098,067
	Other grain	60,811	60,063	\$21,785,755
	Other non-grain	66,627	62,772	\$6,452,896
Non-irrigated	Corn	640,275	665,185	\$206,774,854
	Fallow	1,004,775	1,125,246	\$0
	Hay	47,756	45,666	\$17,491,189
	Other grain	1,373,763	1,269,414	\$180,029,448
	Other non-grain	374,676	354,857	\$43,452,851
	Grazing	4,632,787	4,613,419	\$162,752,593
Total		8,737,901	8,737,660	\$1,063,885,043



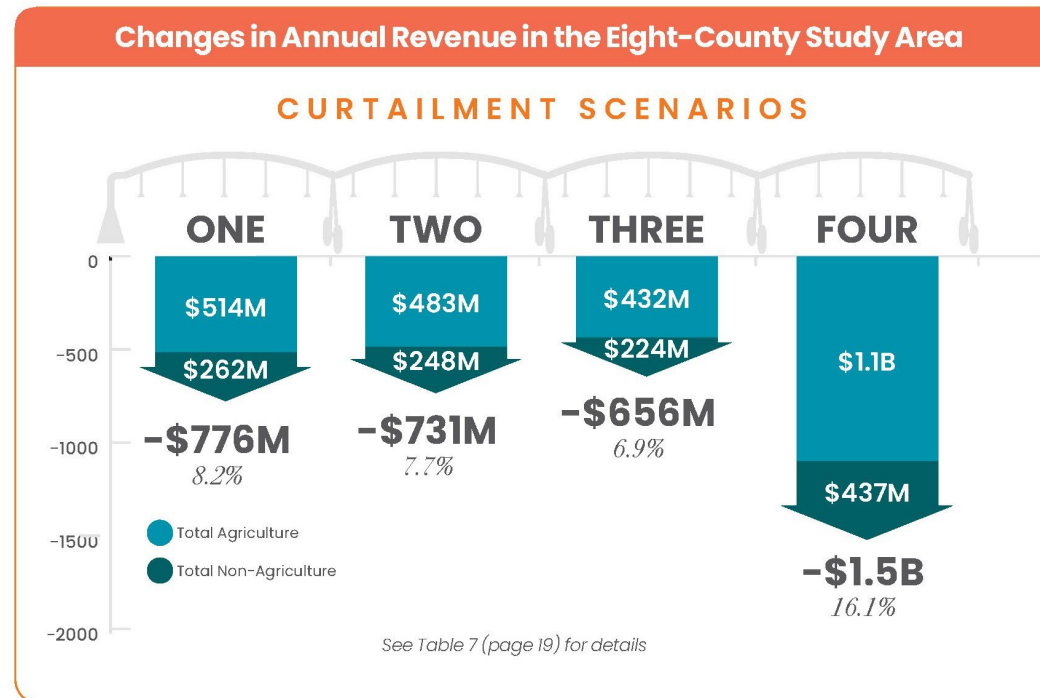
Irrigated land conversion

- If irrigation is curtailed, agricultural producers will face a choice of what (or if) to produce on formerly irrigated land.
- We cannot predict with certainty, so we implement four scenarios.
 - **Scenario 1:** All irrigated land converts to pasture/grazing land.
 - **Scenario 2:** Irrigated land converts to pasture, fallow, and dryland crop production in the proportions observed on non-irrigated land in the basin.
 - **Scenario 3:** Irrigated land converts to pasture, fallow, and dryland crop production based on model results using choices on EQIP parcels.
 - **Scenario 4:** Land use proportions are the same as Scenario 3, but the scenario also includes a 50% reduction in revenue from confined feeding operations.



Changes in annual revenue

- Reductions in annual revenue range from \$656 million in Scenario 3 to \$1.5 billion in Scenario 4.
- The relative magnitude of impacts across scenarios remains the same for other economic outcomes.



Changes in annual revenue

- Irrigated corn sector has nearly \$350 million annual revenue decline.
- Reductions in state and local government revenue are nearly \$50 million.
- \$175 million reductions in non-ag private sector revenue per year
 - Wholesale trade, utilities, and real estate sectors have biggest declines.



Scenario 3

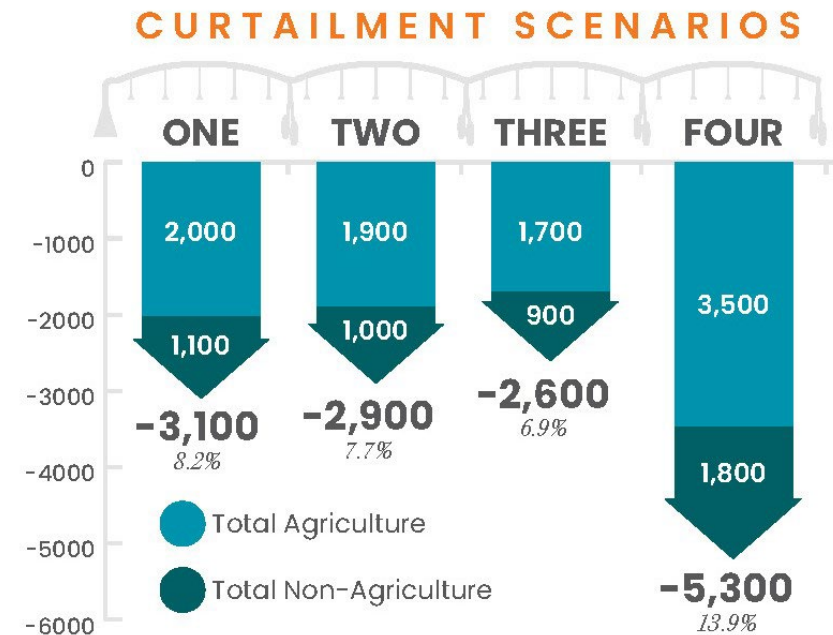
Sector	Annual revenue change (\$ Million)
Irrigated corn	-\$342.12
Irrigated other crops	-\$48.47
Dryland crops	\$81.35
Support activities for ag	-\$18.26
Grazing	-\$89.71
Animal production (non-grazing)	-\$15.20
State and local government	-\$48.74
Wholesale trade	-\$41.84
Utilities and waste	-\$33.14
Real estate and housing	-\$28.31
Retail	-\$17.09
Monetary authorities	-\$13.86
Other private sector	-\$40.77
Total	-\$656.16

Changes in employment and income

- Curtailment is predicted to reduce employment by between 2,600 jobs (6.9%) and 5,300 jobs (13.9%).
- Employment losses are highest in the ag. sector and in non-ag. sectors such as local government, wholesale trade, real estate, and retail.
- Curtailment would also reduce household incomes in the region by 4.25% to 7.16% depending on the scenario.



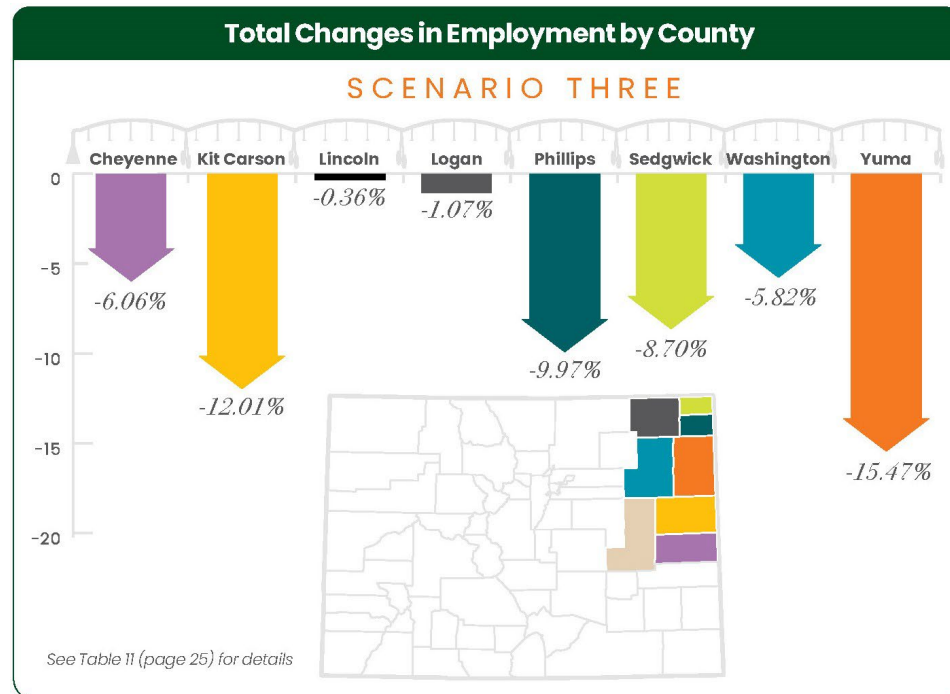
Changes in Employment in the Eight County Study Area



See Table 8 (page 20) for details

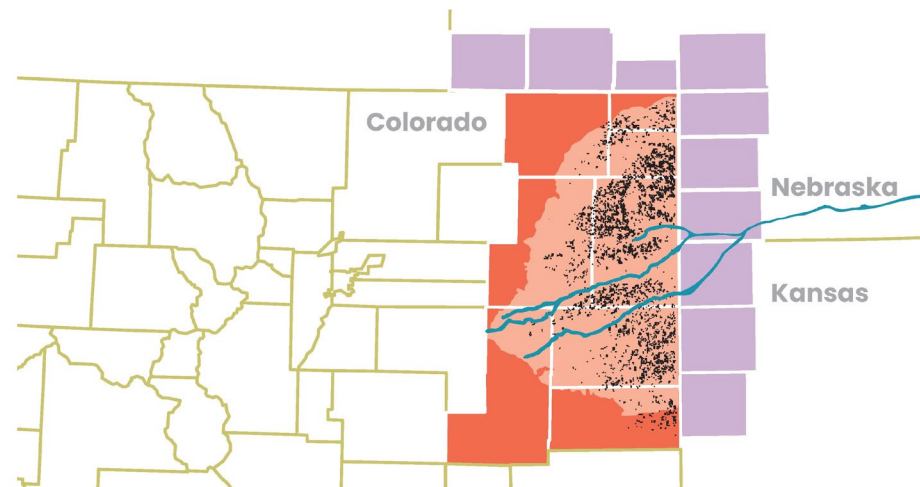
Changes in employment by county

- Employment (and revenue) losses are highest in Kit Carson and Yuma counties, which lie fully within the Republican Basin.
- In Scenario 3, we find that Kit Carson loses 12% of jobs and Yuma loses more than 15% of all jobs in the county.

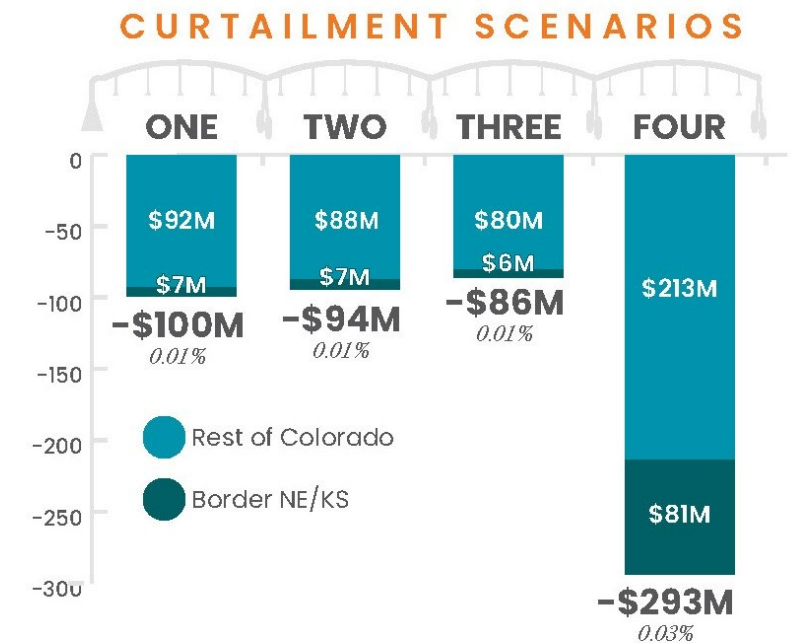


Impacts of curtailment in the rest of CO and neighboring states

- Curtailment reduces annual revenue by:
 - \$80 to \$213 million in CO counties outside the 8-county study area.
 - \$6 to \$81 million in border NE and KS counties.
 - This includes a reduction in Colorado tax revenue of \$11 to \$28 million annually.



Annual Revenue Impacts in other Colorado Counties and Adjacent States



See Table 12 (page 26) for details



Summary

- Curtailment would result in large reductions in revenue and employment in both agricultural and non-agricultural sectors.
- Losses are highest in Kit Carson and Yuma counties but also affect the rest of the State of Colorado and counties in Kansas and Nebraska.
- The report and executive summary posted on the Colorado Water Center website.
 - <https://watercenter.colostate.edu/reports/>
- We will coordinate with the Republican River Water Conservation District on additional presentations of the report.



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Thank you



Colorado State University