

Economic Impacts Due To Well
Curtailment on Northeastern Colorado
South Platte River Basin

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2

Example of Economic Impact of South Platte Water Leaving Colorado at Julesburg, Colorado Running into Nebraska

Approximate amount of water which left Colorado in 2009-2015 (per Northern Colorado Water Company District) without beneficial use to Colorado. 3,000,000 Ac Ft.

Presumed amount of irrigation water which might have been put to beneficial use: $\frac{50\%}{1,500,000 \text{ Ac Ft.}}$

Economic Benefits Lost to Colorado Citizens

Amount of water needed to produce one acre of corn is 2.2 Ac Ft./year

Calculations: $\frac{1,500,000 \text{ Ac Ft.}}{2.2 \text{ Ac Ft./Ac}} = 681,818 \text{ Acres}$

Which could have potentially been irrigated during the period

(This computes to $\frac{681,818 \text{ Acres}}{7 \text{ Years}} = 97,403 \text{ Ac/Year}$)

Presumed irrigated corn yield = 160 bu/Ac/year

Calculations: $\frac{681,818 \text{ Ac} \times 160 \text{ bu/Ac}}{7 \text{ years (2009-2015)}} = 15,584,411 \text{ Bushels of corn}$
which was not produced per year.

Estimated price of corn is \$3.²⁵/bushel

Calculations: $15,584,411 \text{ bushels/year} \times \$3.²⁵ /bushels = \$50,649,336.⁰⁰$
In Directly lost corn sales.

Economic activity turn over factor 7 times/year = \$354,545,350.00/year in lost economic benefit to Colorado.

Calculations: $\$50,649,336.⁰⁰⁰⁰/year in lost economic benefit to Colorado$

Economic Impact of Buy and Dry on Northern Colorado
If N.I.S.P. is Not Built

Dry-up of 69,500 Irrigated Acres in Weld and Larimer Counties to meet water needs for population growth

69,500 Acres x 160 Bushel/Acre Corn Production
=11,120,000 Bushels of corn lost

11,120,000 bushels of corn @ \$3.²⁵/ bushel =
\$36,140,000.⁰⁰/year in lost revenue to the two counties

\$36,140,000.⁰⁰ x 7 (Economic Turn Over Factor)=
\$252,980,000.⁰⁰ in lost economic activity in Northern Colorado

I. Changes in Land Value Resulting FROM IRRIGATION Well Shut Down in 2003. (4)

Change in Platteville Farm Irrigated Acreage

| | Pre Empire Era | Post Empire Era |
|---|---|--|
| Flood Irrigated Acreage | 168 Acres | 40 Acres ^{257,160⁰⁰} × 1642.9/acre |
| Dryland Acreage | 0 Acres | 128 Acres \$ 110,340 ⁰⁰ = \$ 866 ⁰⁰ /acre |
| Estimated Value at \$6,000.00/Irrigated Acre and \$1000.00/Dryland Acre | \$1,008,000.00 \$ 6429 ⁰⁰ /acre | \$368,000.00 |

Difference in Value = (\$640,000.00) or (63.4% Loss in Value)

In 2003 when 3 of 4th row irrigation wells were shut off the 45th well pumping was curtailed. This farm became an operation where only 40 acres (23.8%) could be adequately irrigated with the ditch water and the balance of the 128 acres (76.2%) became dryland farmland. The value of the farm basically declined by approximately 63.4%. Further, the revenue stream from this operation declined by approximately the same amount; h

IF Loss of Irrigated Acreage

TABLE 2

Change in South Platte River Area Irrigated Acres

Irrigated Land Comparison – 2002 to 2007 Census of Agriculture

(Source: U.S.D.A. National Agricultural Statistics Services)

Irrigated Land Acreage ¹ in Northern and Northeastern Colorado counties where the South Platte River and its major tributaries run:

| Year/Change | County/Irrigated Acreage | | | | | |
|-----------------|--------------------------|----------|----------|----------|---------|-----------------------|
| | Larimer | Logan | Morgan | Sedgwick | Weld | Total |
| 2002 | 58,837 | 110,569 | 133,513 | 41,075 | 326,494 | 670,488 |
| 2007 | 63,405 | 100,278 | 94,611 | 40,040 | 327,836 | 626,170 |
| Change | + 4,568 | - 10,291 | - 38,902 | - 1,035 | + 1,342 | - 44,318 ² |
| % Change | + 7.7% | - 9.3% | - 29.1% | - 2.5% | + .4% | - 6.6% |

The data contained in Table 2 reflect the amount of irrigated acreage in the five (5) Colorado counties directly impacted by the South Platte River and its tributaries, being Larimer, Logan, Morgan, Sedgwick and Weld, which decreased by a total of 44,318 acres between 2002 and 2007, which is the same period when the wells were shut down. While the data does not detail the actual cause of the reduced irrigated acres nor what use these acres were converted to, it is clear a large portion of these acres were no longer irrigated because the wells were shut down and very likely these acres end up as dryland farmland, just like they did on the Platteville farm I just described. It's clear that 44,318 less acres were irrigated in 2007 than in 2002, which equates to 341 standard sized - 130 acre pivot sprinklers.

The data in Table 2 also indicate the largest acreage loss occurred in Morgan County between 2002 and 2007, consisting of 38,902 less acres being irrigated in 2007.

¹ Data not adjusted for acreage taken out of production due to commercial and residential uses.

² Note: 44,318 acres of irrigated cropland reduction equates to 341 - 130 Acre Standard Irrigation Pivot Sprinklers.

III Negative Impact on County Assessed Valuation
and Tax Base Reduction
TABLE 3

Change in Assessed Valuation

Comparison Between Irrigated Land vs. Dryland Assessed Valuation Per Acre
 (Source: County Annual Abstract of Assessments)

Assessed Valuations for Morgan and Sedgwick Counties:

| | Morgan County | % of County Total Assessed Valuation | Sedgwick | % of County Total Assessed Valuation |
|--------------------------------|----------------|--------------------------------------|----------------|--------------------------------------|
| 2002 Irrigated Cropland | \$96.41/Acre | 7.0% | \$75.48/Acre | 12.0% |
| Dryland Cropland | \$21.77/Acre | 1.7% | \$31.39/Acre | 17.0% |
| Difference | - \$74.64/Acre | | - \$44.09/Acre | |
| % Difference | | - 77.4% | | - 58.4% |
| 2007 Irrigated Cropland | \$87.02/Acre | 5.1% | \$68.07/Acre | 10.0% |
| Dryland Cropland | \$15.98/Acre | 1.1% | \$24.48/Acre | 12.2% |
| Difference | - \$71.04/Acre | | - \$43.59/Acre | |
| % Difference | | - 81.6% | | - 64.0% |

Table 3 indicates the irrigated acreage reduction, represented a decrease in assessed valuation of \$71.04/acre (81.6%), which was a loss of \$2,763,598.08 in total assessed valuation in Morgan County. Clearly there was a decline in the tax revenue generated by the acreage likely converted from irrigated to dryland in 3 of the 5 counties.

The Morgan County Assessor, Mr. Bob Wooldridge, provided data for 2011 that indicate the loss in assessed valuation was \$2,478,910.00 and the resultant lost tax revenue was \$193,355.00 per year, which began occurring sometime between 2000 and 2011. Further, Mr. Wooldridge estimated in 2008 the loss to Morgan County alone was \$39,976,000.00 in total lost revenue from corn sales in the local economy.

IV Reduced Economic Activity throughout Northern (7)
& Northeastern Colorado

TABLE 4

Gross Income/Year from Winter Wheat Production

Irrigated v. Dryland

| Irrigated Winter Wheat Income/Acre – S. Platte Valley & NE Colorado | Dryland Winter Wheat Income/Acre – Fallow Rotation |
|--|---|
| \$477.12/Acre | \$314.16/Acre |
| Difference | \$162.96/Acre or (34.2%) |
| Direct Cost/Acre \$341.69/Acre | \$171.36/Direct Cost/Acre |
| Difference | \$170.33/Acre or (49.8%) |

As summarized in Table 4, the data from these Enterprise Budgets indicate irrigated wheat production resulted in a gross income/acre of \$477.12/year while the Fallow Rotation Dryland practices (which is the most common practices in Northern and Northeastern Colorado) resulted in gross income of \$314.16/acre/year. This computes to a 34.2% reduction, in gross revenue from these acres (irrigated vs. dryland). However, this does not tell the whole story since irrigated production occurs every year, while fallow rotation only produces one crop every other year on each acre. Further, the yield for irrigated wheat is substantially higher than for dryland production. Irrigated wheat yield in the budget is 85.2 bushels per acre, while dryland wheat production under summer fallow practices commonly runs 25 to 35 bushels per acre (every other year), which is substantially lower.

TABLE 5

Total Revenue from 44,318 Acres Converted from Irrigated to Dryland Farming

OVER A 4 YEAR PERIOD

| | Irrigated Cropland | Dryland Conventional Tillage-Fallow Rotation | % of Irrigated Value |
|---------------|---------------------------|---|---------------------------------|
| Year 1 | \$21,145,004.00 | \$13,922,943.00 | 65.8% |
| Year 2 | \$21,145,004.00 | \$ -0- | -0- |
| Year 3 | \$21,145,004.00 | \$13,922,943.00 | 65.8% |
| Year 4 | \$21,145,004.00 | \$ -0- | -0- |
| TOTALS | \$84,580,016.00 | \$27,845,886.00 | 32.9% (-67.1%) |

\$84,580,016.00 less \$27,845,886.00 = \$56,734,150.00 Loss
= \$14,183,538.00/year X 7 = \$99,284,763.00/Year

The data in **Table 5** indicates the crop sales revenue from the irrigated acreage would generate over \$84,000,000.00 over 4 years, while dryland summer fallow practices would generate only about \$28,000,000.00 or 32.9% of the revenue generated on irrigated acres over a 4 year period. Clearly there is nearly a 70% reduction in revenue from the conversion from irrigated production of winter wheat to dryland production of winter wheat. Further, this analysis does not account for the gross income/acre reduction frequently seen for other crops raised under irrigated practices. In any event, if we assume the lost crop sales each year is conservatively \$14,183,538.00 and it would have turned over 7 times in the economy each year, the annual total loss of crop sales is nearly \$100,000,00.00 for the Colorado economy.

Dairy Cow Feed Consumption Calculation

1 Cow @ 50 lbs/day X 365 days = 18,250 lbs of Hay/Year

$$\frac{18,250 \text{ lbs}}{2000 \text{ lbs/ton}} = 9.125 \text{ tons/year}$$

$$\frac{9.125 \text{ tons/year}}{4.5 \text{ tons/acre}} = 2.027 \text{ acres of irrigated alfalfa hay/cow/year}$$

$$\frac{44,318 \text{ acres}}{2.027 \text{ acres/cow/year}} = 21,863.838 \text{ cows/year}$$

(Rounded to 21,864 cows/year)

Clearly, the acreage lost to irrigated cropland production between 2002 and 2007 would support approximately 22,000 dairy cows. How many jobs for Northern and Northeastern Colorado does this loss represent? Quite a few, I suspect.

Further jobs much would be lost.