Overview of Socioeconomic Impact Analysis

2026 Regional Water Plans

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TEXAS WATER DEVELOPMENT BOARD

Analysis Goals

Primary

Provide a reasonable approximation of the potential economic impacts to the region should drought of record conditions prevail for a single year. (assumes no water management strategies are employed)

Secondary

- Theoretically sound
- Obtained with a reasonable amount of research/effort
- Obtained using data at the best possible level of geographic specificity
- Comparable in approach across planning regions

Water Use Categories

Non-municipal:

- Irrigated Agriculture
- Livestock
- Manufacturing
- Mining
- Steam-Electric Power Generation

Municipal:

- Residential
- Commercial: Water Intensive

Impact Measures:
Economic Impacts

- **Income**: Value of production less all costs (value added), adjusted for impacts on the input supply sectors and resulting impacts throughout the regional economy using IMPLAN multipliers. Analogous to GDP. (values in 2023 $)
- **Electrical power purchase costs**: cost of additional power purchased on the electrical grid due to water shortages
- **At risk jobs**

Additional Measures

Financial Transfers

- Taxes
- Water hauling costs
- Utility revenue & tax losses

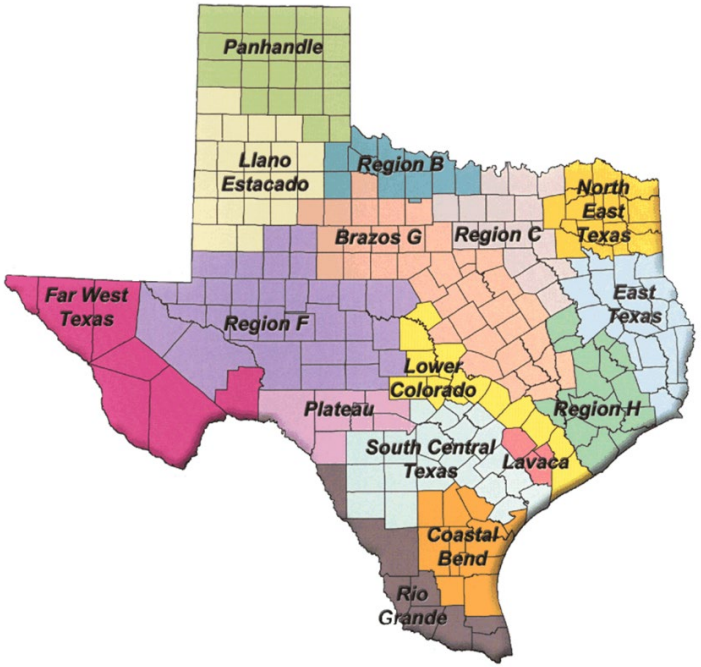
Social Impacts

- Consumer surplus losses
- At risk population losses
- At risk school enrollment losses

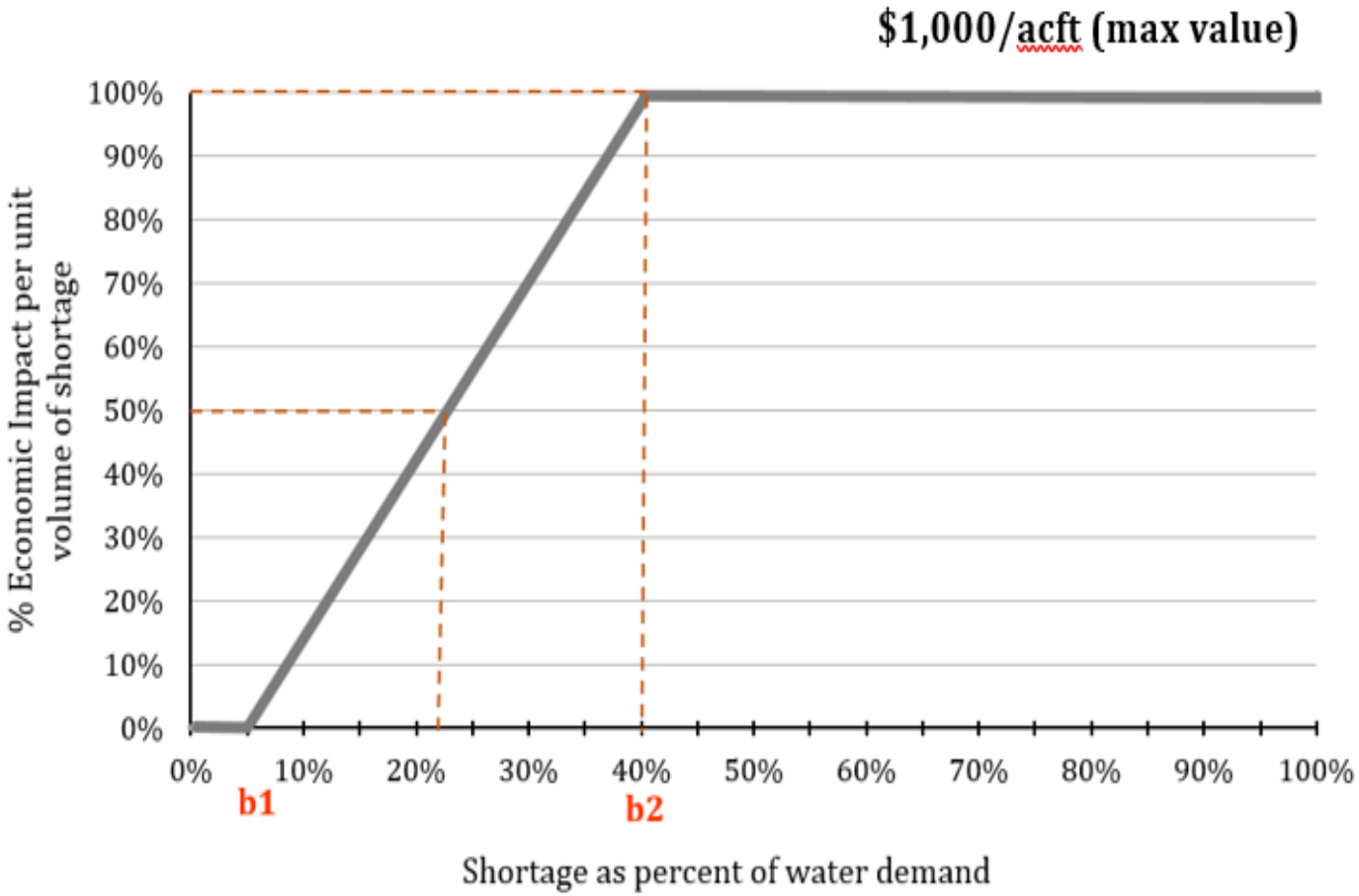
Impact Planning Model (2021)

A. Input-output software designed to allow estimation of regional impacts of changes in production in 546 sectors

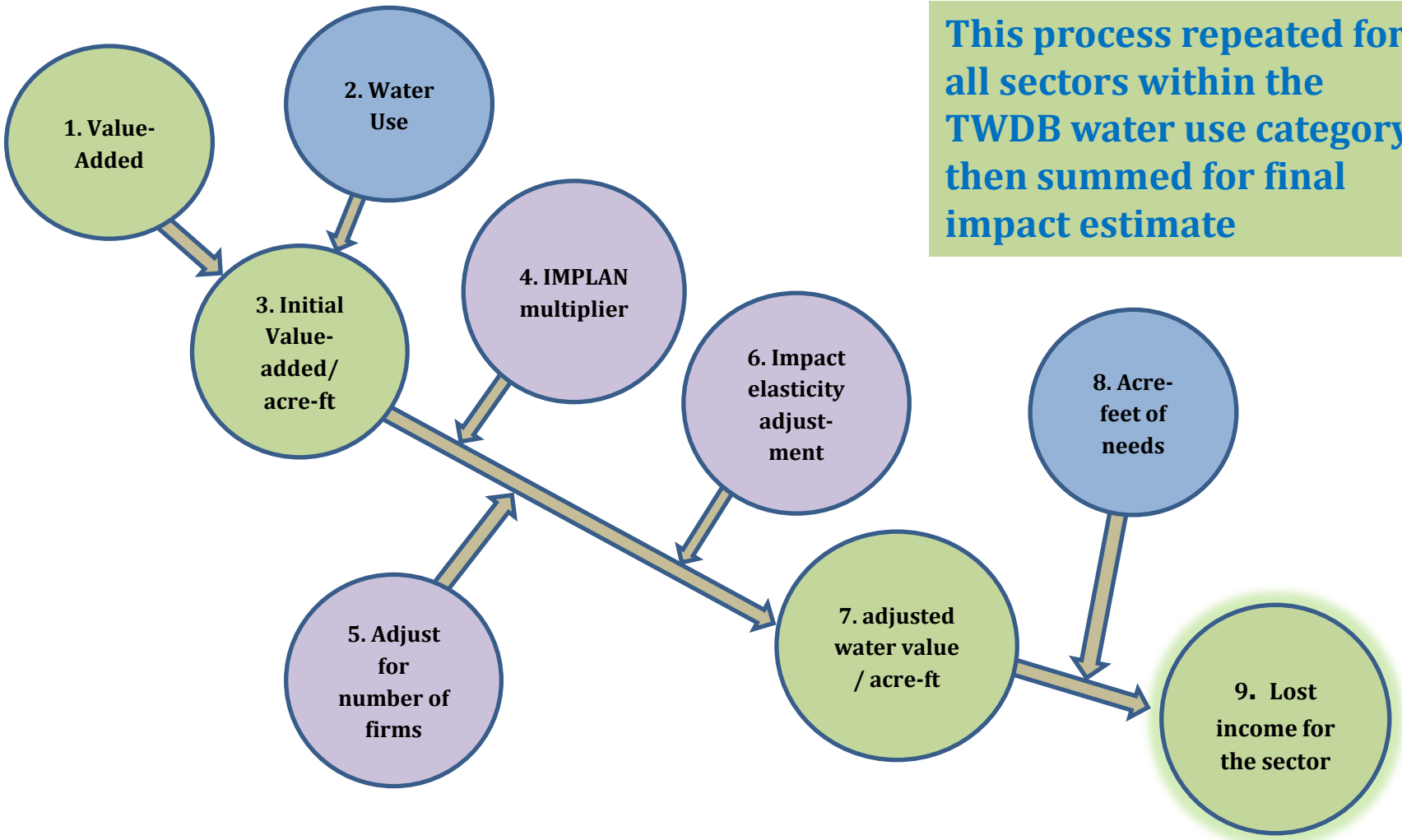
B. Used to estimate potential lost **income, taxes, and at-risk jobs** for the region due to water shortages



Impact Elasticity Adjustments



Determining Lost Income



This process repeated for all sectors within the TWDB water use category, then summed for final impact estimate

(adjusted water value /acft) x (acft of needs)

= IMPACT

Methodology
Determining Lost Income

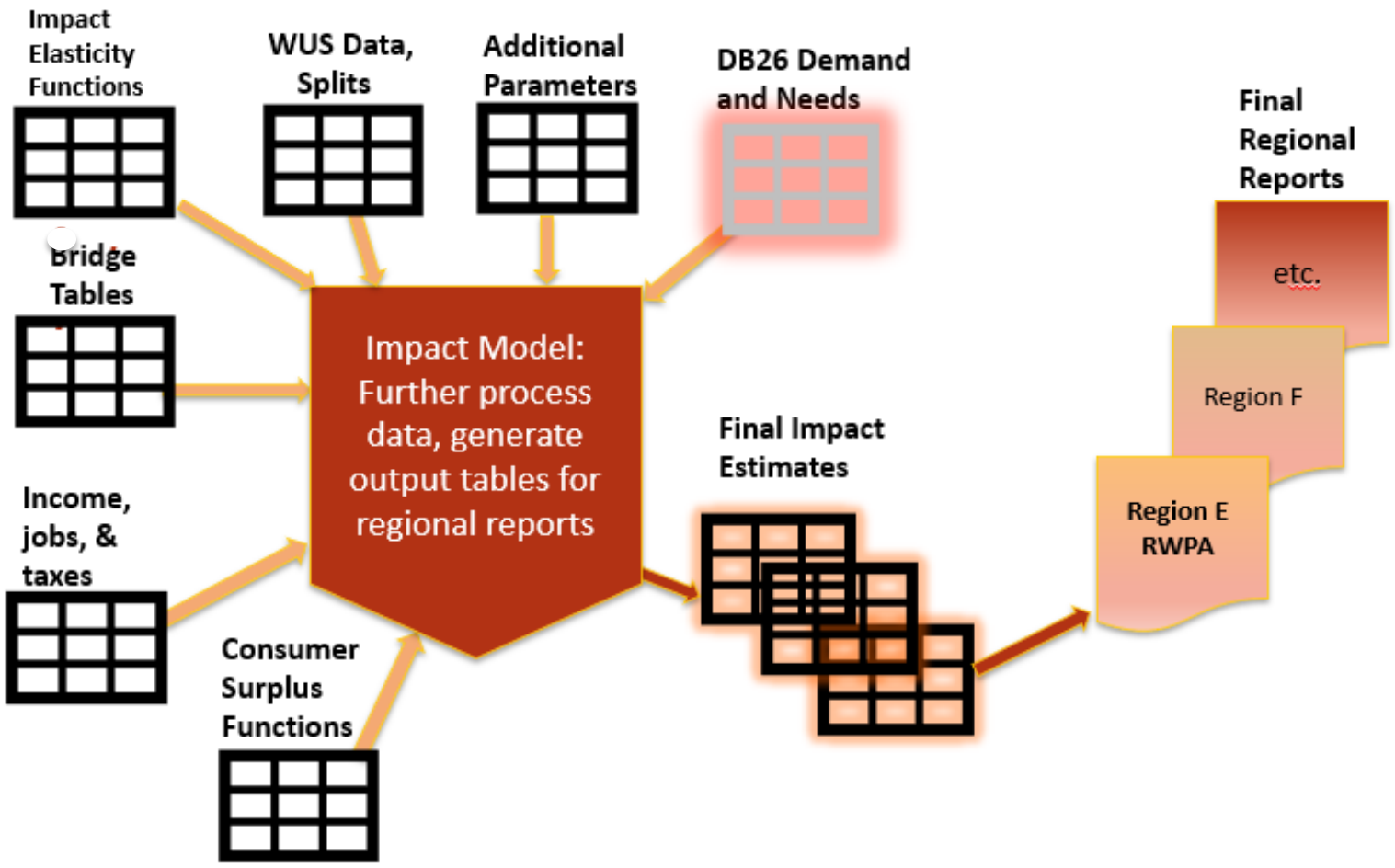
Results in impact estimates which:

- Vary by degree of shortage
- Vary by the composition of water use/economic activity by county
- Employ region specific multipliers to reflect impact on that region

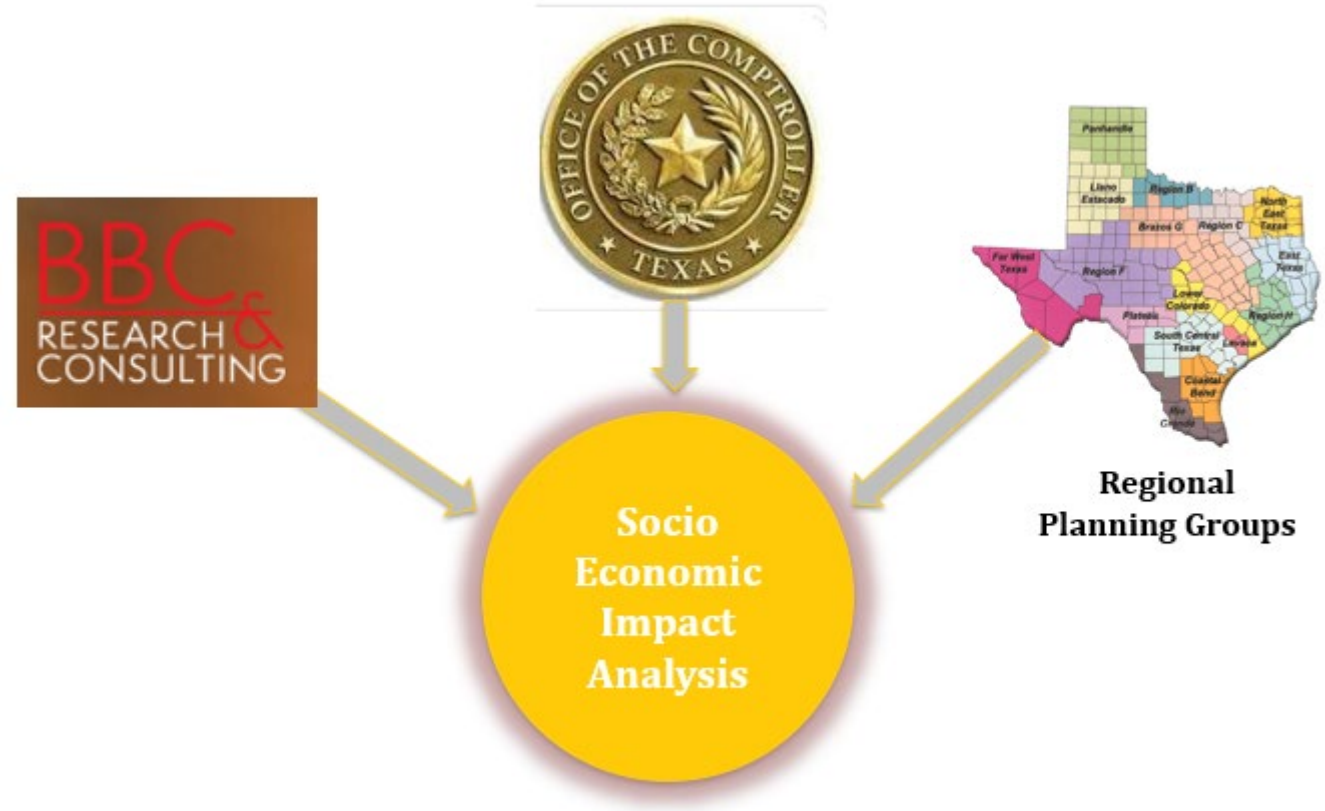
Input data updates, changes in assumptions

- **Baseline structure of the economy**
  (IMPLAN model, 2021)
- **Projected water needs**
  updates in supplies, GAMS, DFCs, and WAM runs, infrastructure
- Key parameters
  prices (residential water, water trucking costs, electricity rates, etc.)
- Population and municipal water demand projections
  based on 2020 U.S. Census, declining population at the county level
- Impact methodology
  minor revisions of manufacturing, mining, and irrigation impact procedures
- Inflation
  use of CPI to value impacts in year 2023 dollars

Linkage: processed data, aggregation model, and reports



Peer Reviews of Methodology and Reports



Regional Report Contents

- **Executive Summary**
  a) Year 2021 Primary Production Sectors
  b) Year 2021 Water Use summary by sector (six SEIA sectors)
  c) Decadal Needs Projections
- **Description of Impact Measures**
- **Methodology Description**
- **Impact Measurement Results (regional by water use sector)**
- **Appendix A- County level results by WUG (municipal and non-municipal)**

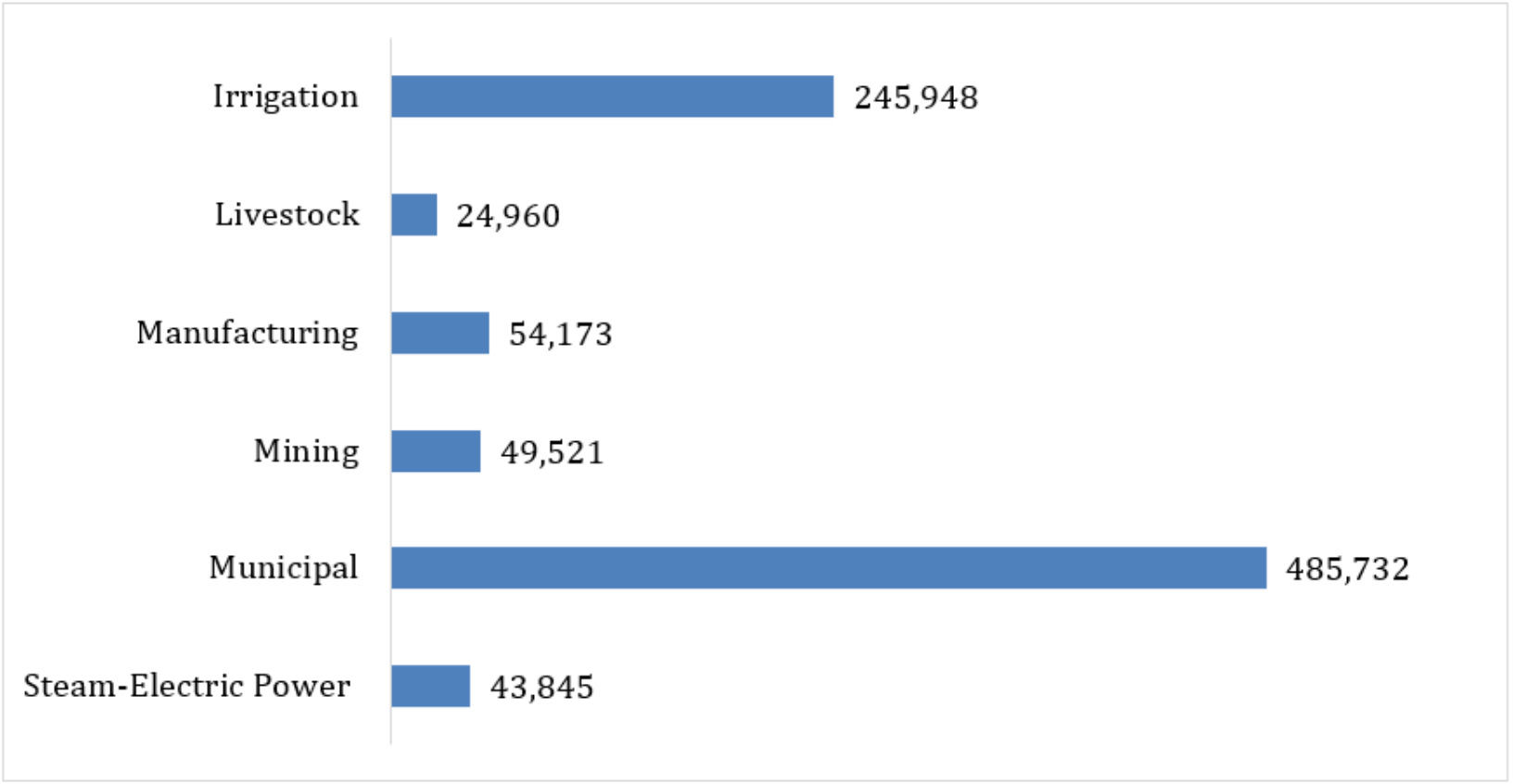
Sample Year 2021 Production Sectors

Table 1-1 Region L regional economy by economic sector*

Economic sector	Value-added ($ millions)	Tax ($ millions)	Jobs
Finance and Insurance	$19,160.31	$1,049.45	120,803
Manufacturing	$17,542.18	$259.32	72,967
Health Care and Social Assistance	$13,794.86	($418.96)	178,812
Professional, Scientific, and Technical Services	$12,463.15	$90.73	121,694
Retail Trade	$10,777.03	$2,312.27	152,183
Wholesale Trade	$10,662.76	$1,566.26	45,565
Real Estate and Rental and Leasing	$10,423.06	$1,347.49	77,040
Mining, Quarrying, and Oil and Gas Extraction	$10,022.89	$1,801.51	22,851
Accommodation and Food Services	$7,642.09	$38.86	146,446
Administrative and Support and Waste Management and Remediation Services	$7,242.88	$143.11	118,681

Sample 2021 Water Use Estimates

Figure 1-1 Region L 2021 water use estimates by water use category (in acre-feet)



Source: TWDB Annual Water Use Estimates (all values in acre-feet)

Sample Needs and Impacts (Irrigation, Region L)

Table 1-2 Regional water needs summary by water use category*

Water Use Category		2030	2040	2050	2060	2070	2080
Irrigation	water needs (acre-feet per year)	71,258	71,187	71,793	71,862	71,927	71,979
	% of the category's total water demand	23%	23%	23%	23%	23%	23%

Table 4-1 Impacts of water shortages on irrigation

Impact measure	2030	2040	2050	2060	2070	2080
Income losses ($ millions)*	$35	$35	$36	$36	$36	$36
At risk job losses	1,001	1,001	1,016	1,017	1,017	1,018

* Year 2023 dollars, rounded. Entries denoted by a dash (-) indicate no estimated economic impact. Entries denoted by a zero ($0) indicate estimated income losses less than $500,000.

Sample Needs and Impacts, Manufacturing (Region L)

Water Use Category		2030	2040	2050	2060	2070	2080
Manufacturing	water needs (acre-feet per year)	39,765	41,606	45,440	49,562	53,838	58,272
	% of the category's total water demand	36%	36%	38%	40%	42%	44%

Table 4-3 Impacts of water shortages on manufacturing

Impacts measure	2030	2040	2050	2060	2070	2080
Income losses ($ millions)*	$9,192	$9,568	$9,999	$10,553	$11,259	$12,102
At risk job losses	73,986	77,134	80,664	85,014	90,268	96,365
Tax losses on production and Imports ($ millions)*	$331	$344	$360	$381	$409	$444

Sample Needs
Municipal (Region L)

Water Use Category		2030	2040	2050	2060	2070	2080
Municipal	water needs (acre-feet per year)	38,660	69,433	111,065	184,152	264,266	361,827
	% of the category's total water demand	7%	11%	16%	24%	31%	38%

Sample Impacts, Municipal (Region L)

Table 4-5 Impacts of water shortages on municipal water users

Impacts measure	2030	2040	2050	2060	2070	2080
Income losses[1] ($ millions)*	$319	$472	$911	$1,429	$2,072	$2,798
At risk job losses[1]	4,121	6,094	11,759	18,437	26,726	36,060
Tax losses on production and imports[1] ($ millions)*	$14	$20	$39	$62	$90	$121
Trucking costs ($ millions)*	$6	$6	$6	$15	$26	$107
Utility revenue losses ($ millions)*	$154	$305	$516	$865	$1,245	$1,704
Utility tax revenue losses ($ millions)*	$2	$5	$9	$16	$23	$31

Limitations

1. Analysis focuses on sectors with adequate water use data,
2. Consideration of only 1 year of drought,
3. No consideration of impacts on the forwardly linked sectors,
4. No consideration of backward linked impacts on *other planning regions,*
5. Analysis does not consider building moratoriums due to long term water shortages,
6. Increased value of water over time is not considered.
7. Considers structure of the economy as static (year 2021)

SEIA Dashboard

Google TWDB socioeconomic

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