CENTRAL IRON COUNTY WATER CONSERVANCY DISTRICT

# WATER RESOURCE

## ECONOMIC AND FISCAL ANALYSIS

JUNE 2019 | WORKING DRAFT | SUBJECT TO MATERIAL REVISION

APPLIED ANALYSIS

- Summary of Findings
- Identifying the Issue
- Iron County's Economic Climate
- Iron County's Water Demand Outlook
- Iron County's Water Supply Outlook
- Supply-Demand Dynamics and Potential Solutions
- Economic Impacts of Investments in Infrastructure
- Fiscal Considerations

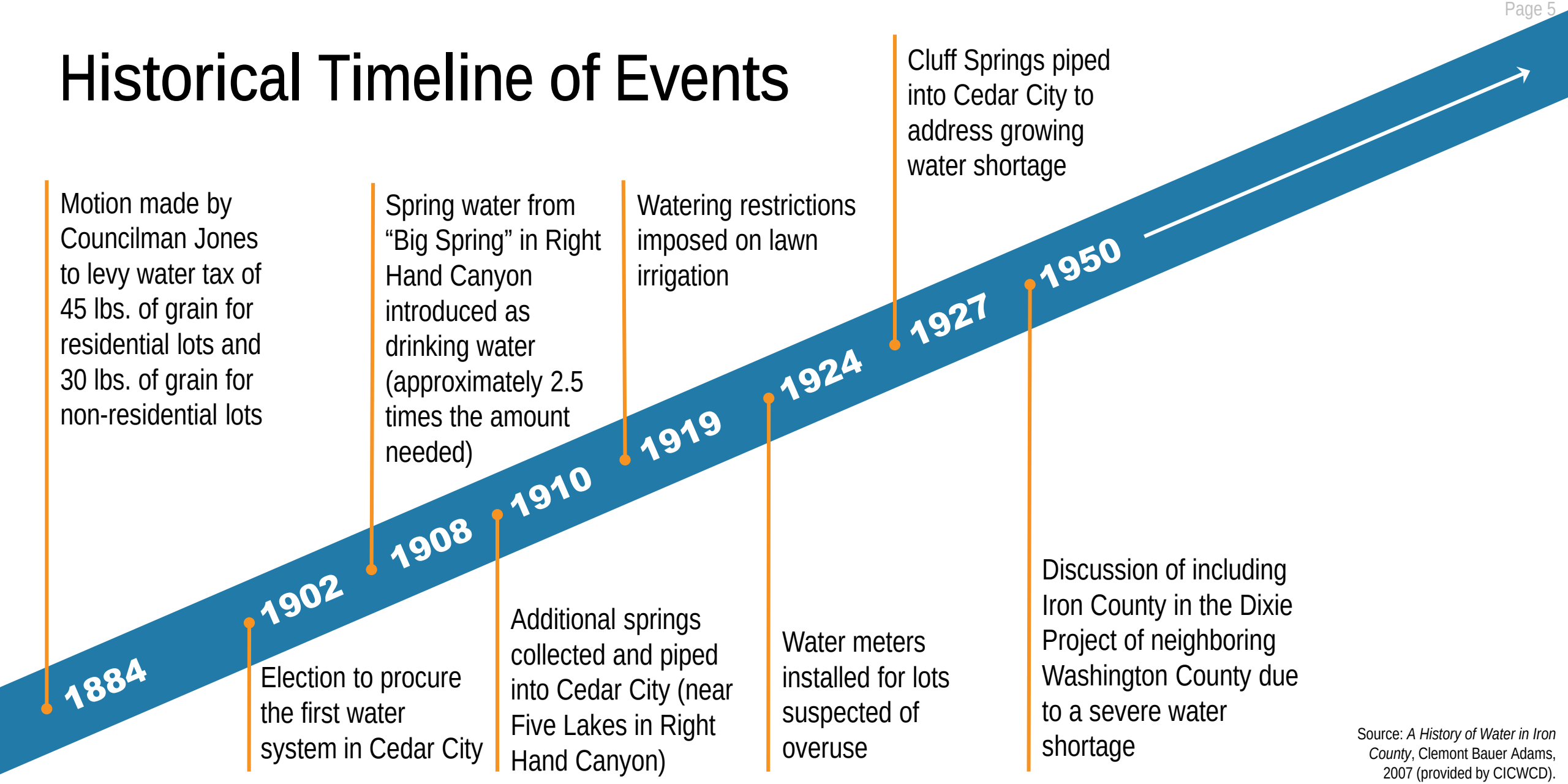
# Summary of Findings

- Identifying the Issue
- Iron County's Economic Climate
- Iron County's Water Demand Outlook
- Iron County's Water Supply Outlook
- Supply-Demand Dynamics and Potential Solutions
- Economic Impacts of Investments in Infrastructure
- Fiscal Considerations

# Summary of Findings

- Historical growth and other factors gave rise to the establishment of the CICWCD and a need to study and address water resource management challenges in Iron County
- Research suggests groundwater levels have been eroding for the better part of the past half century
- Iron County's economic climate supports continued growth, which will place additional pressures on the region's water supply-demand balance
- The long-term outlook for water demand in the region is expected to exceed capacity, a condition that can have significant economic and ecological implications
- Potential economic returns sourced to expanded water infrastructure investments are estimated to far exceed the public's cost of developing an expanded system
- A sound funding model has the potential to mitigate the risks of future water shortfalls
- The cost of doing nothing exceeds the cost of investing in additional water infrastructure

# Historical Timeline of Events




Source: *A History of Water in Iron County*, Clemont Bauer Adams, 2007 (provided by CICWCD).

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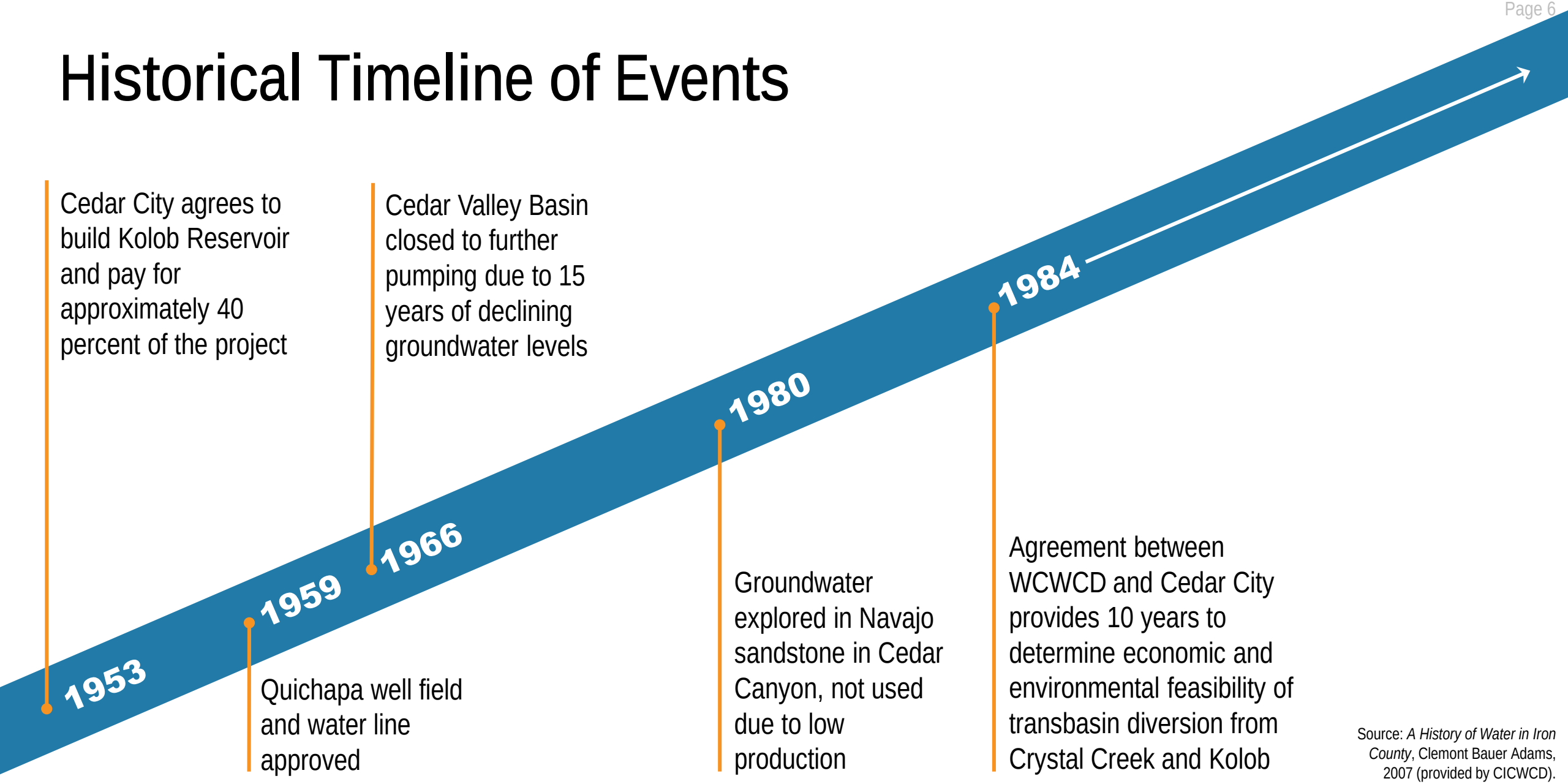


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# Historical Timeline of Events

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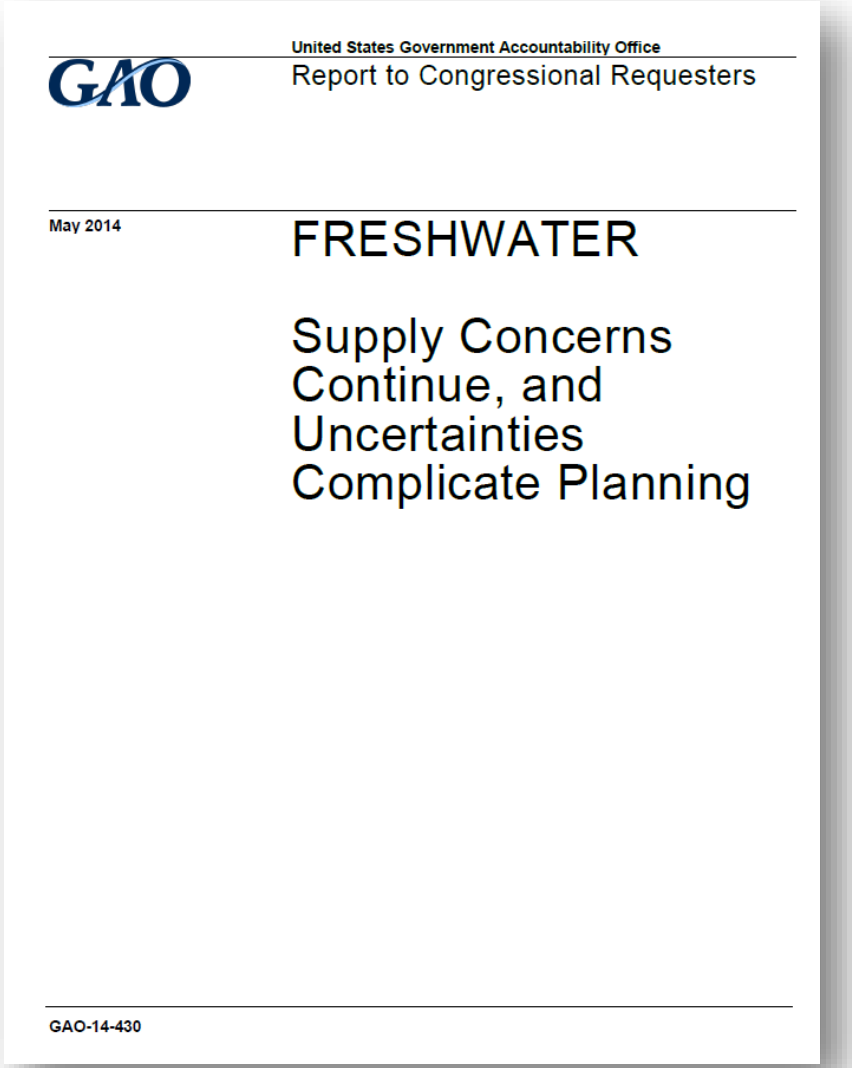
**1970s & Prior**

# Identifying the Issue

## Nationally, Regionally and Locally

Water resource stability is a vital concern for Iron County, the state of Utah and the United States as a whole. A relatively recent report by the Government Accountability Office (GAO) of the United States concluded:

> *According to state water managers, experts and literature GAO reviewed, freshwater shortages are expected to continue into the future. In particular, 40 of 50 state water managers expected shortages in some portion of their states under average conditions in the next 10 years. However, uncertainty stemming from factors, such as patterns of economic growth and land use change, is likely to complicate future state water managers' planning efforts.*


United States Government Accountability Office

GAO

Report to Congressional Requesters

May 2014

FRESHWATER

Supply Concerns Continue, and Uncertainties Complicate Planning

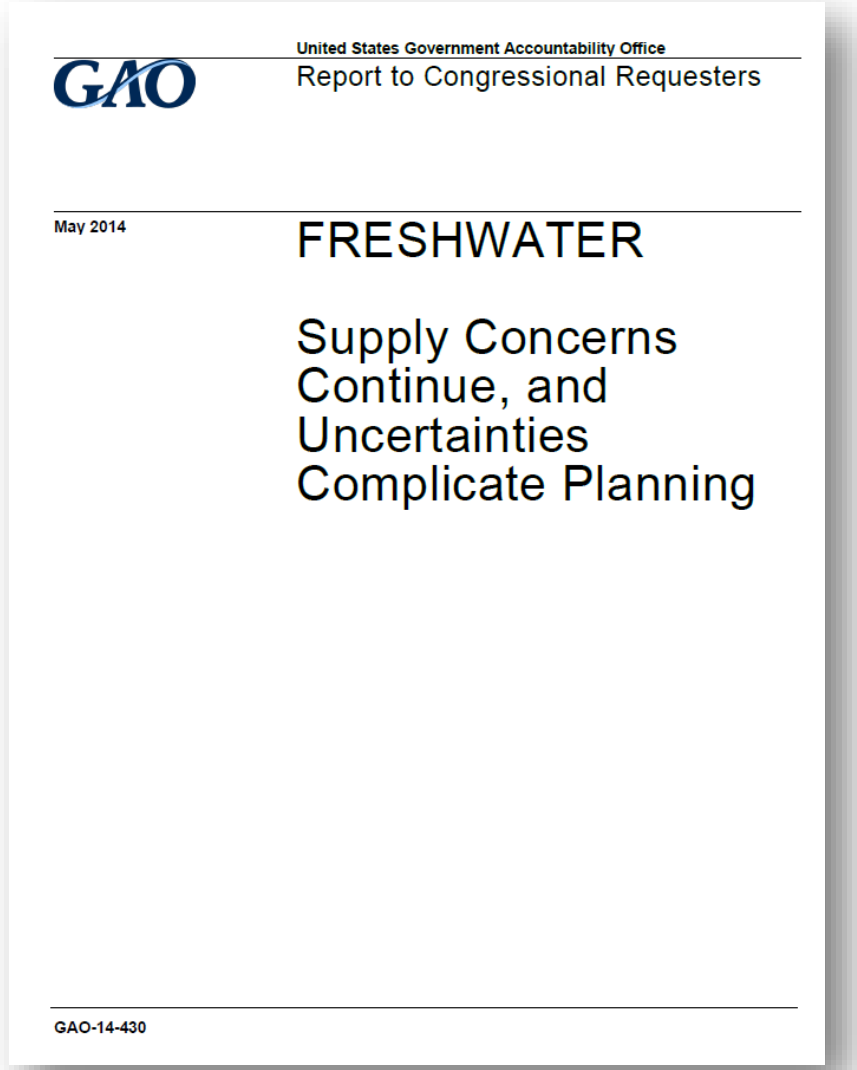
GAO-14-430

Source: Freshwater: Supply Concerns Continue, and Uncertainties Complicate Planning GAO-14-430: Published: May 20, 2014. Publicly Released: May 22, 2014.

# Identifying the Issue

## Nationally, Regionally and Locally

The GAO report makes it clear that there are a number of factors complicating the nation's water resource challenges, including economic, geographic, climate, conservation and commodity-pricing considerations. Also included are infrastructure-related concerns specific to the system by which water is captured, processed and delivered to the end consumer. The GAO citied the American Society of Civil Engineers rating the nation's water resource infrastructure at a "D" or below, the U.S. Environmental Protection Agency's estimating a cost of $384 billion to upgrade domestic drinking water infrastructure during the next 20 years, and a similar report by the American Water Works Association forecasting that it will cost more than $1 trillion over the next 25 years to replace and expand the nation's buried water infrastructure.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## United States Drought Monitor

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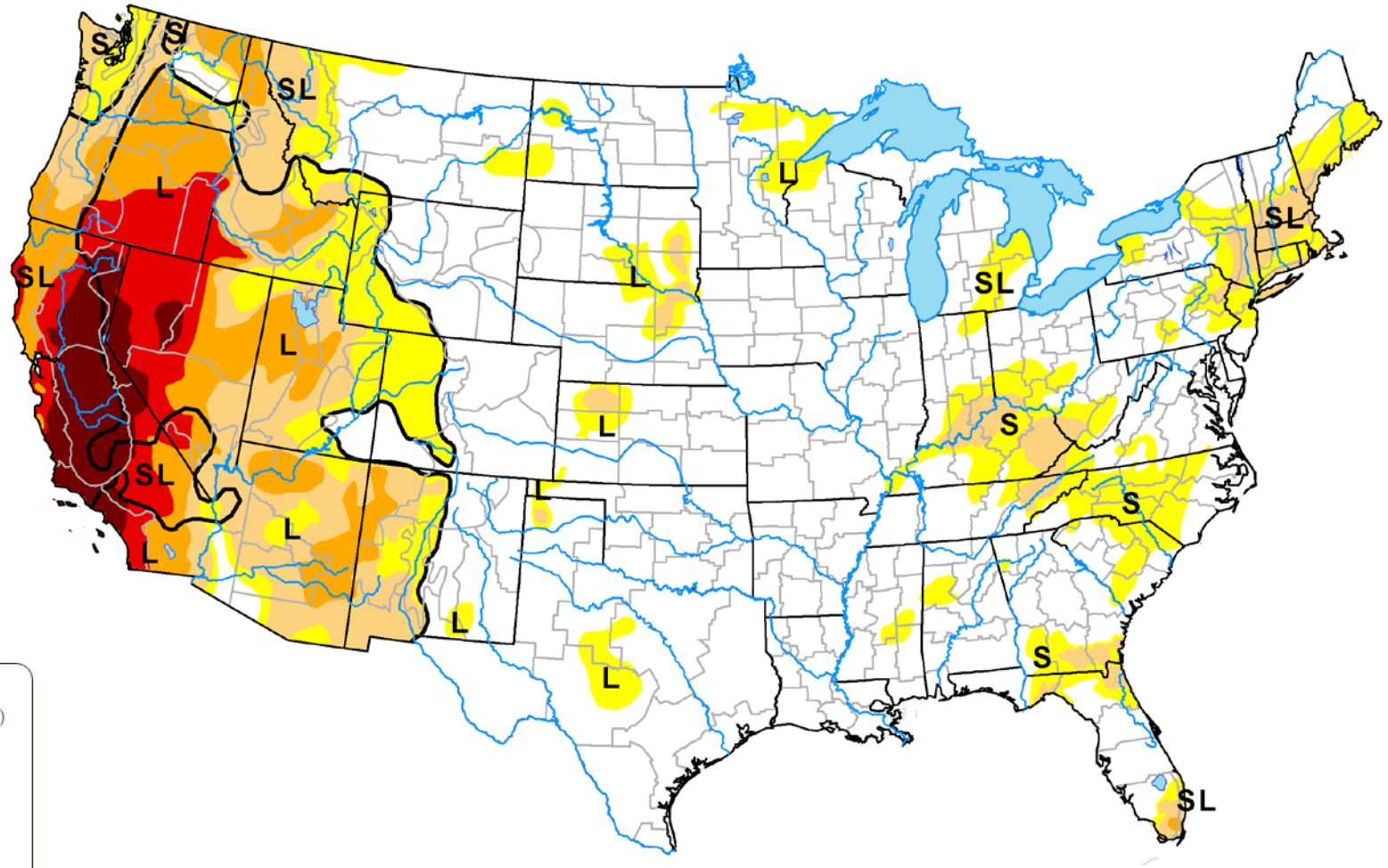


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*The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying **text summary** for forecast statements.*

**Author(s):**
Richard Tinker, NOAA/NWS/NCEP/CPC

Source: http://droughtmonitor.unl.edu/

Note: Seasonality, weather patterns and snow pack in any given year can impact reported drought conditions, but drought conditions remain a concern.

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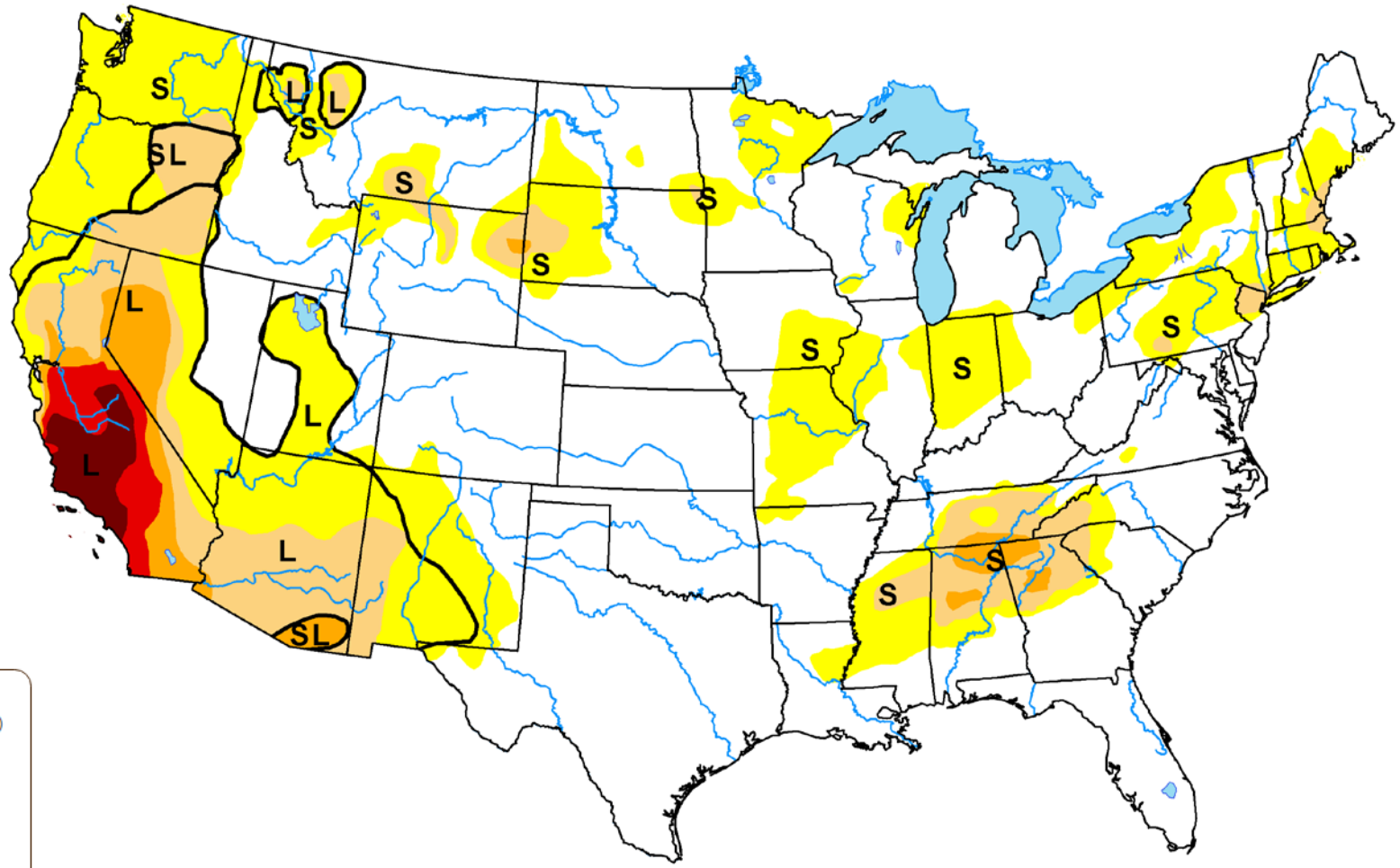


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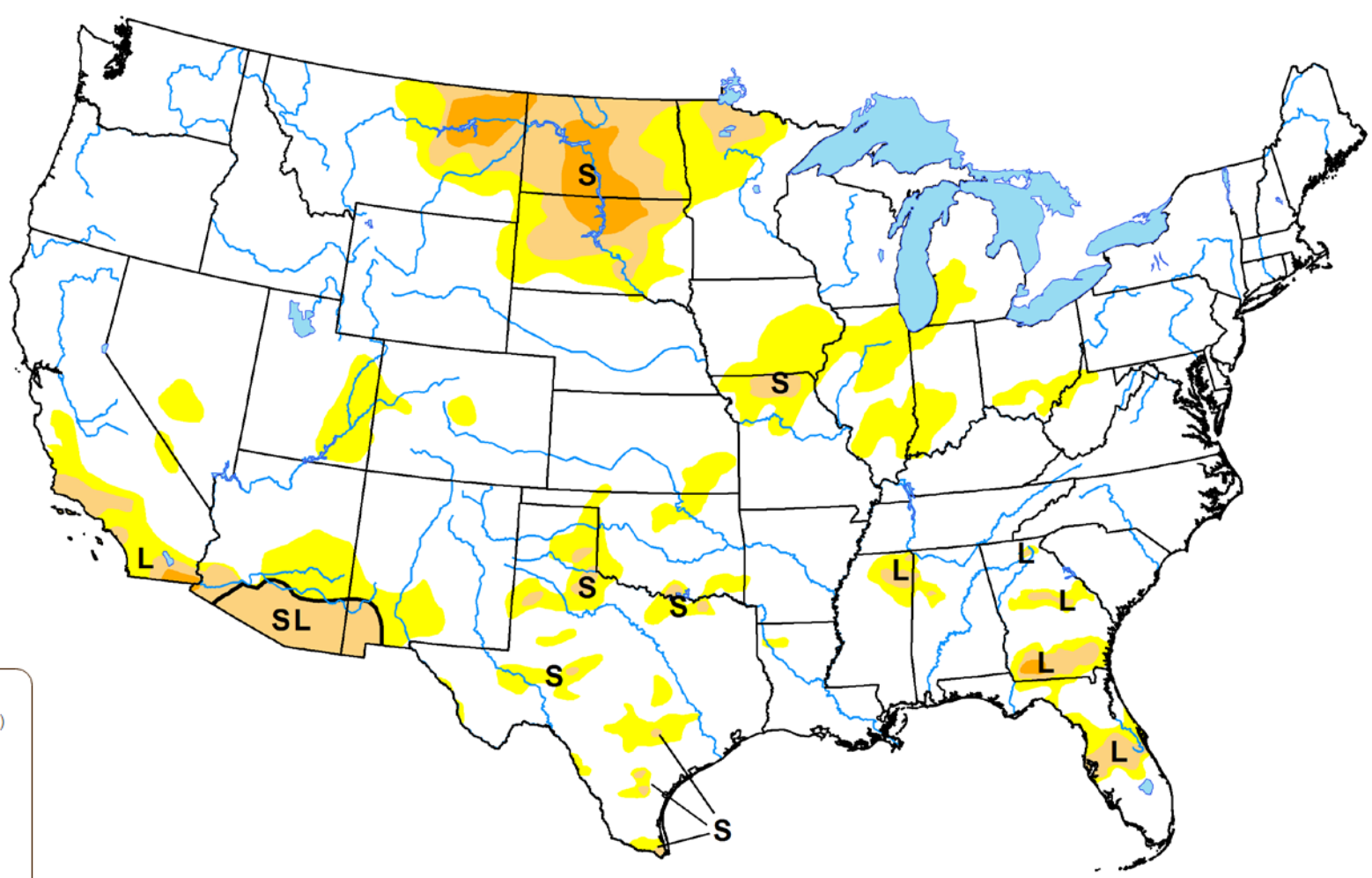


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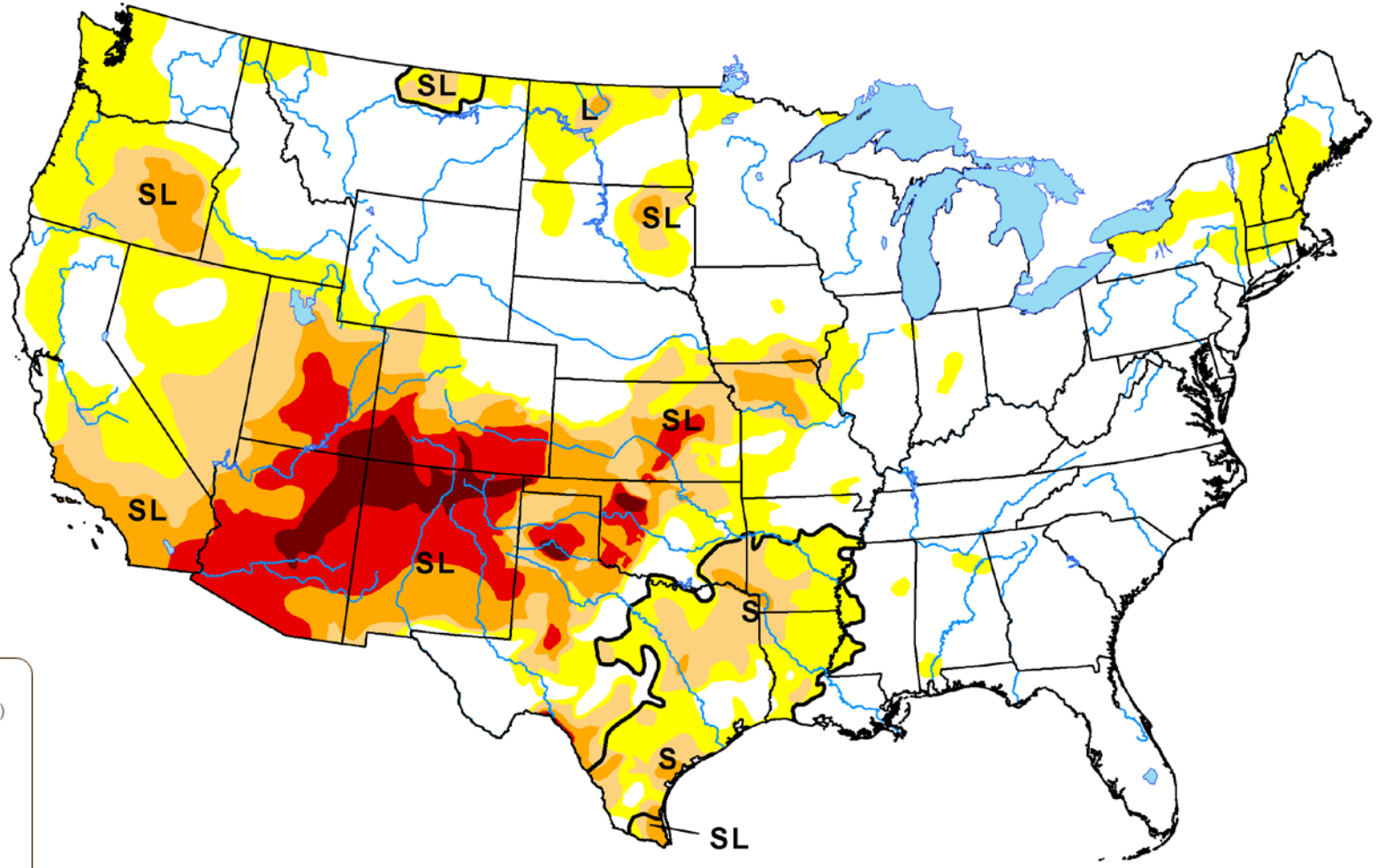


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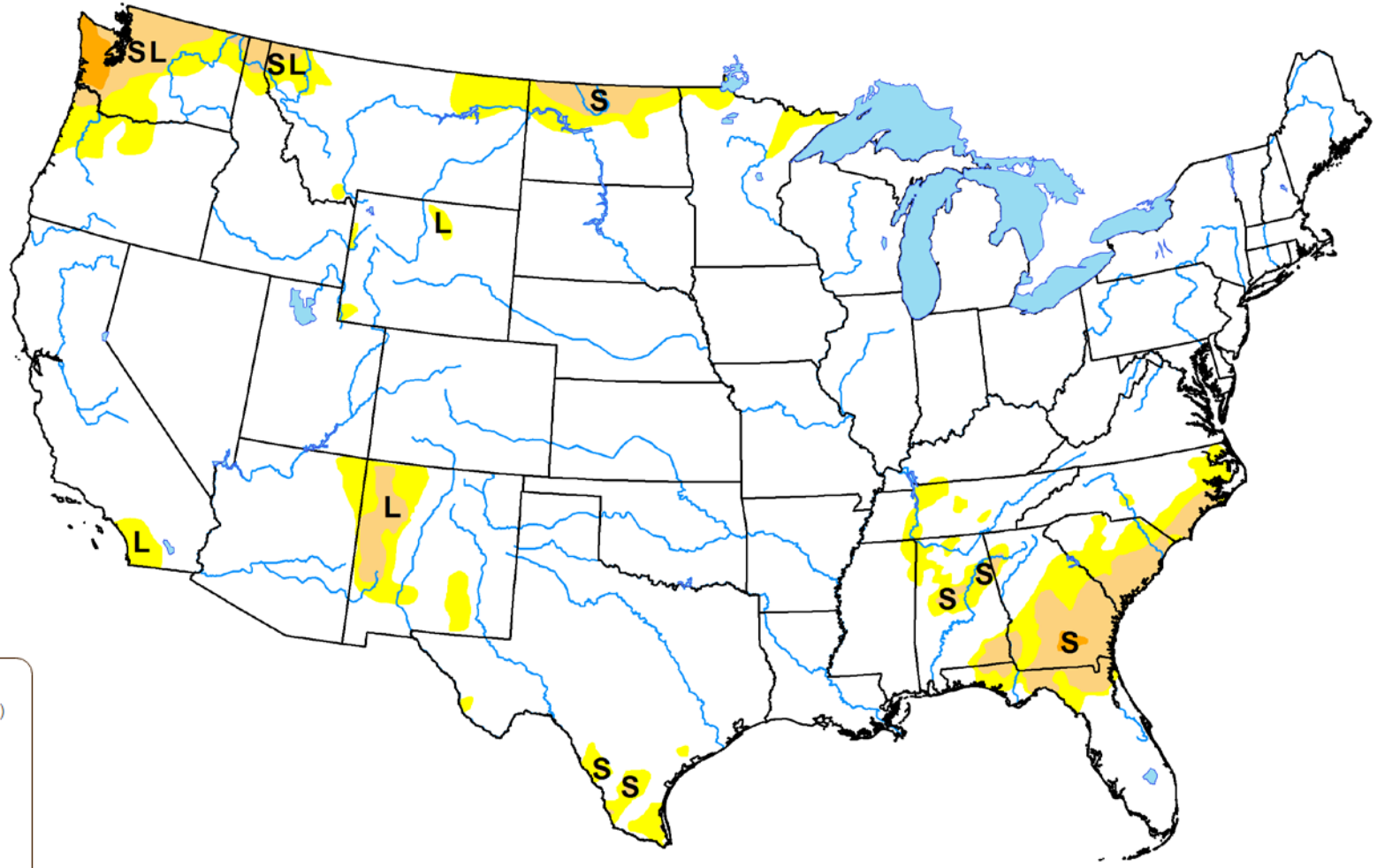


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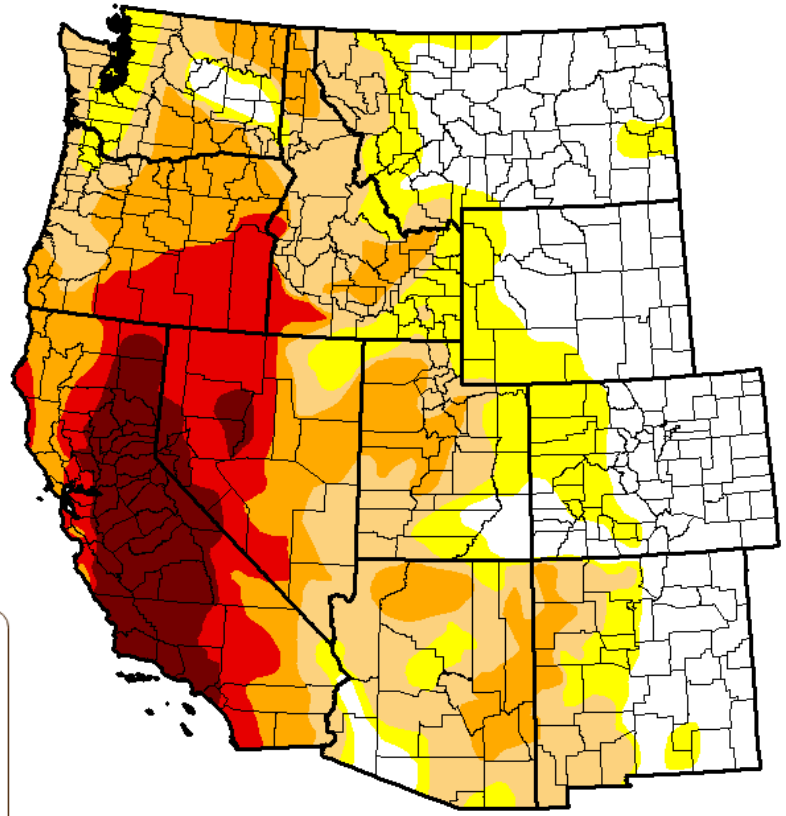

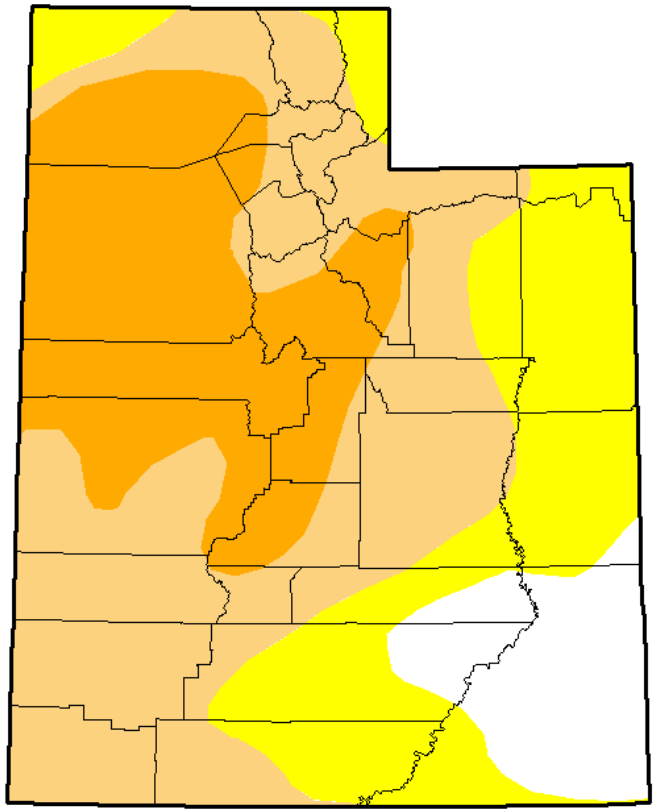

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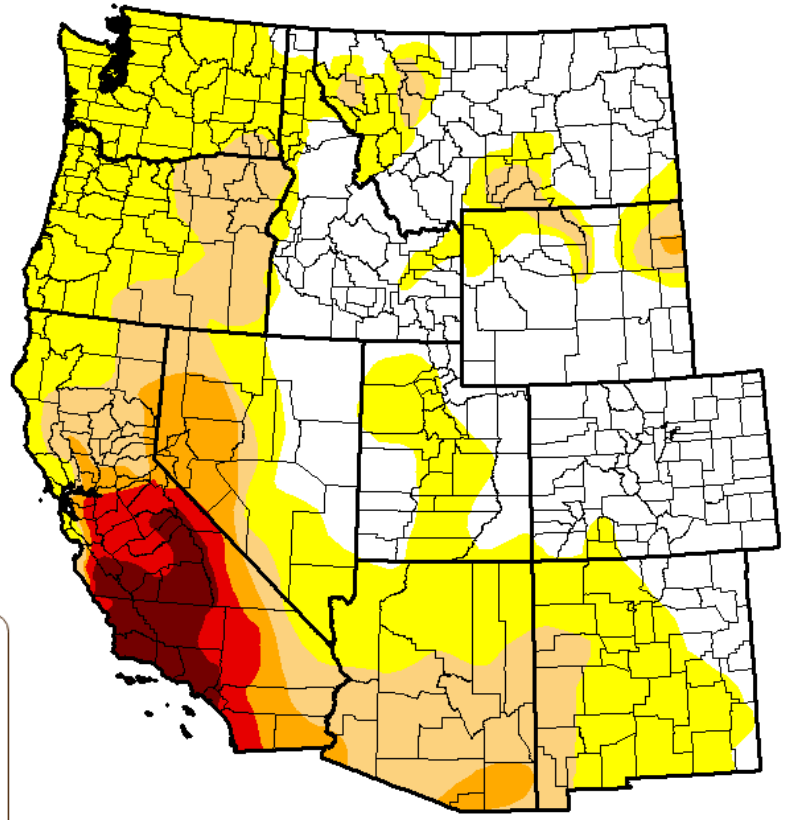

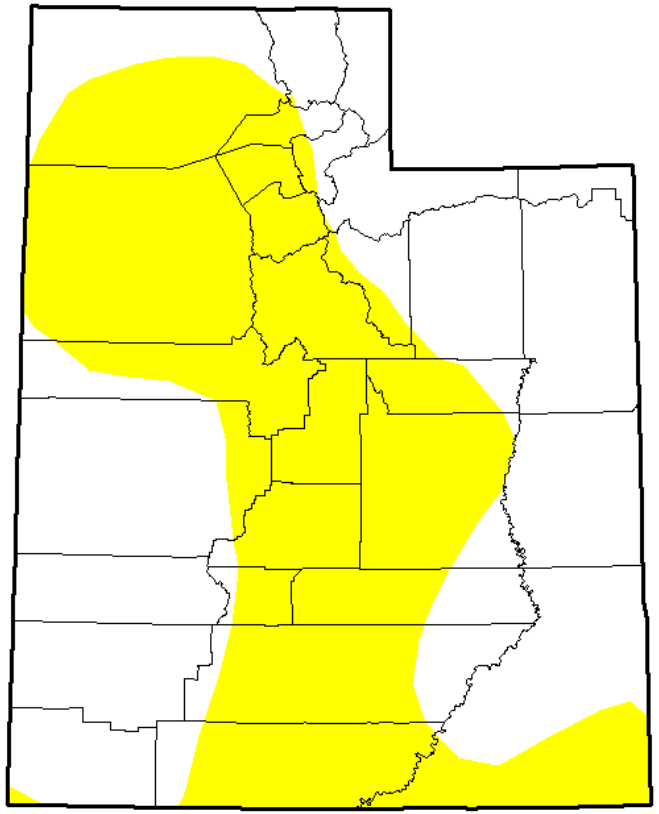

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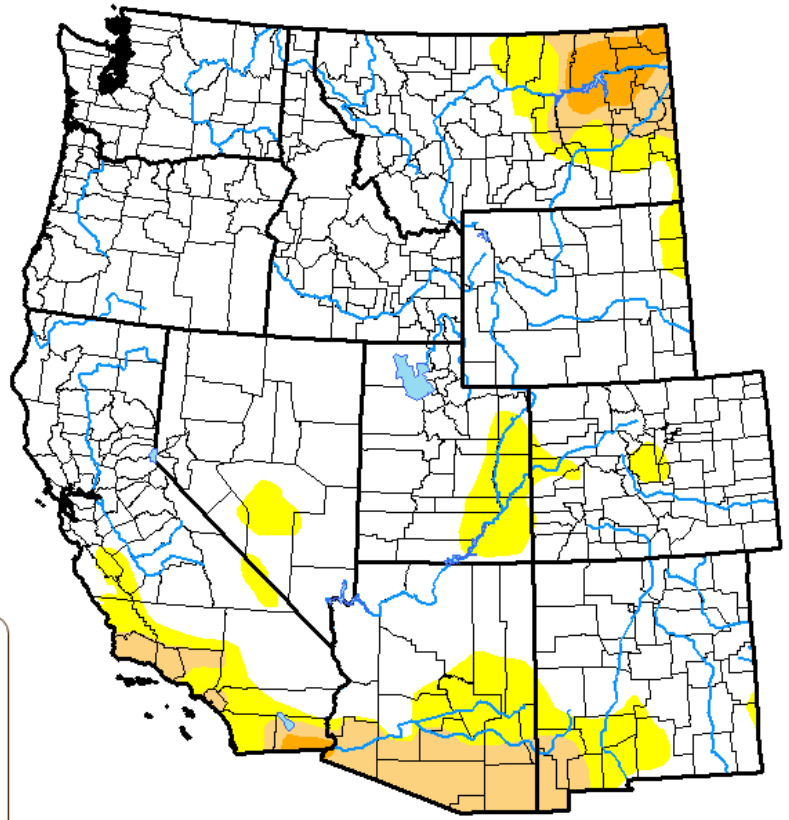

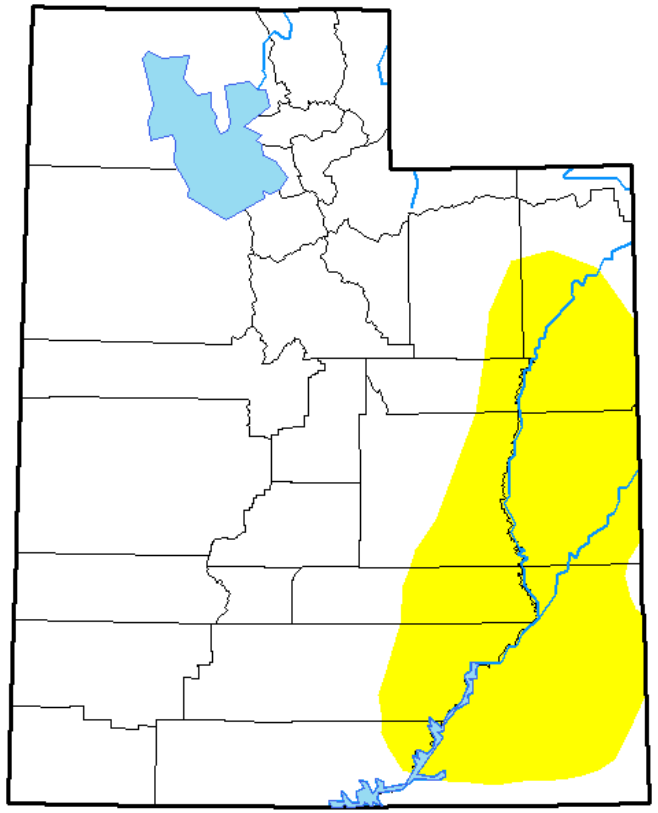

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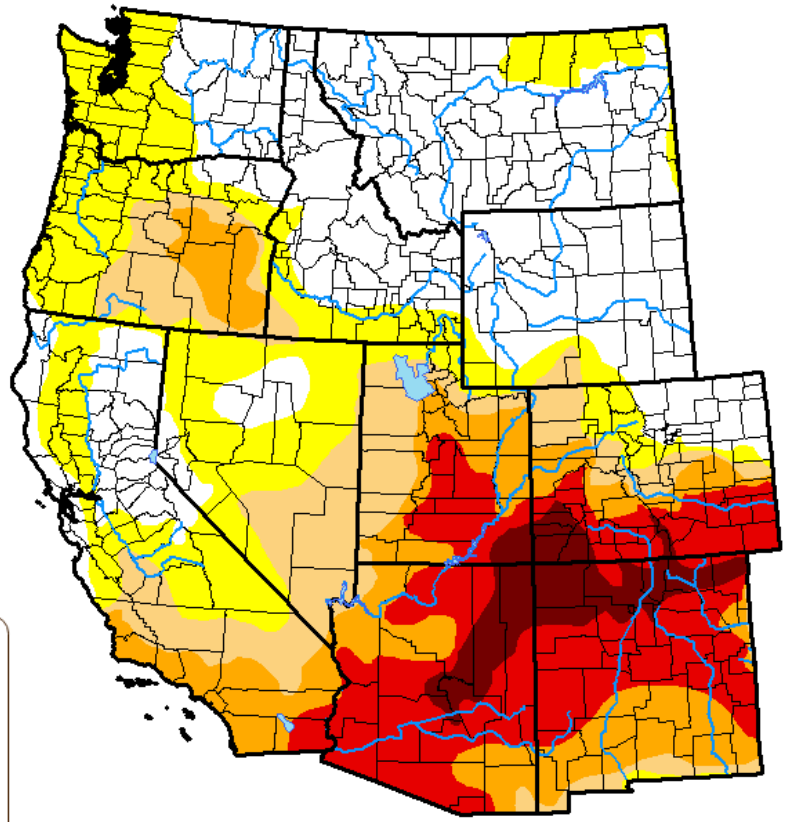

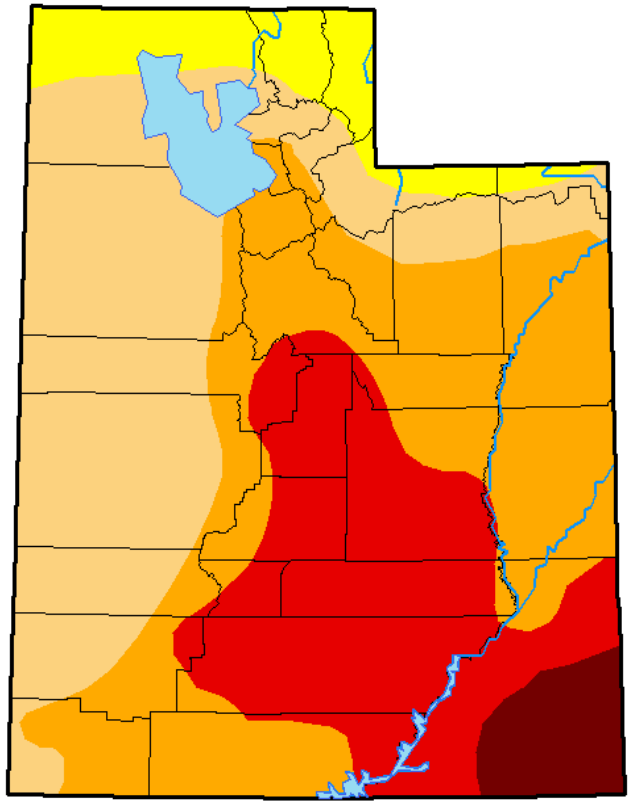

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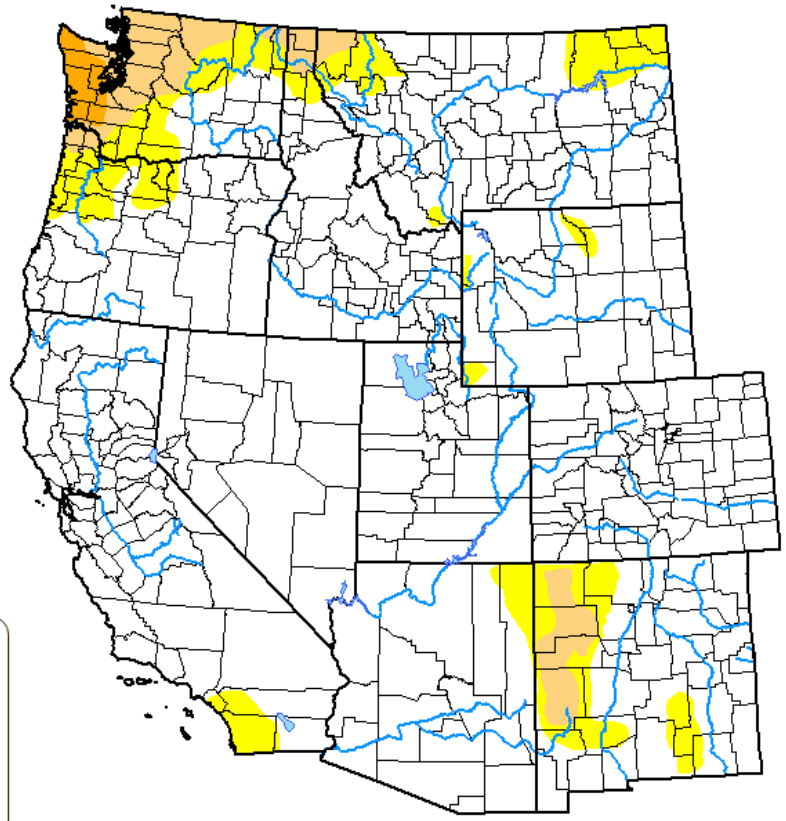

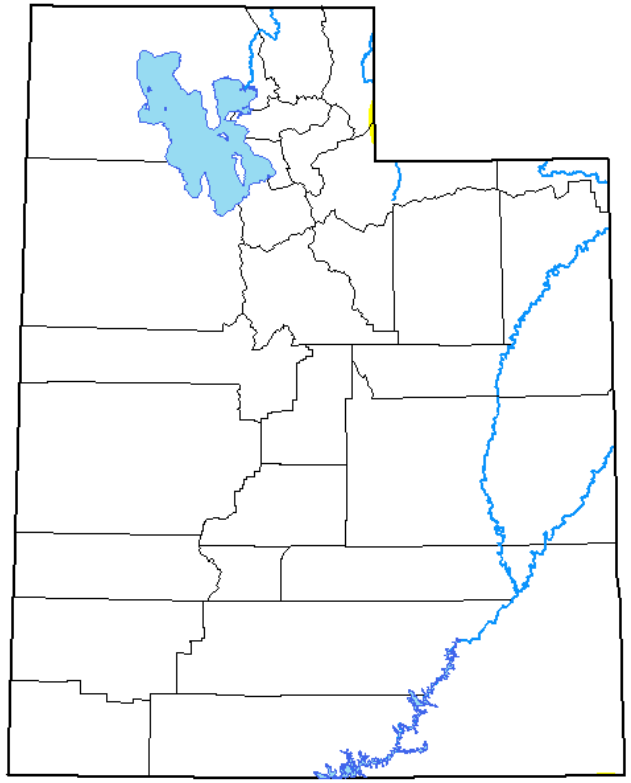

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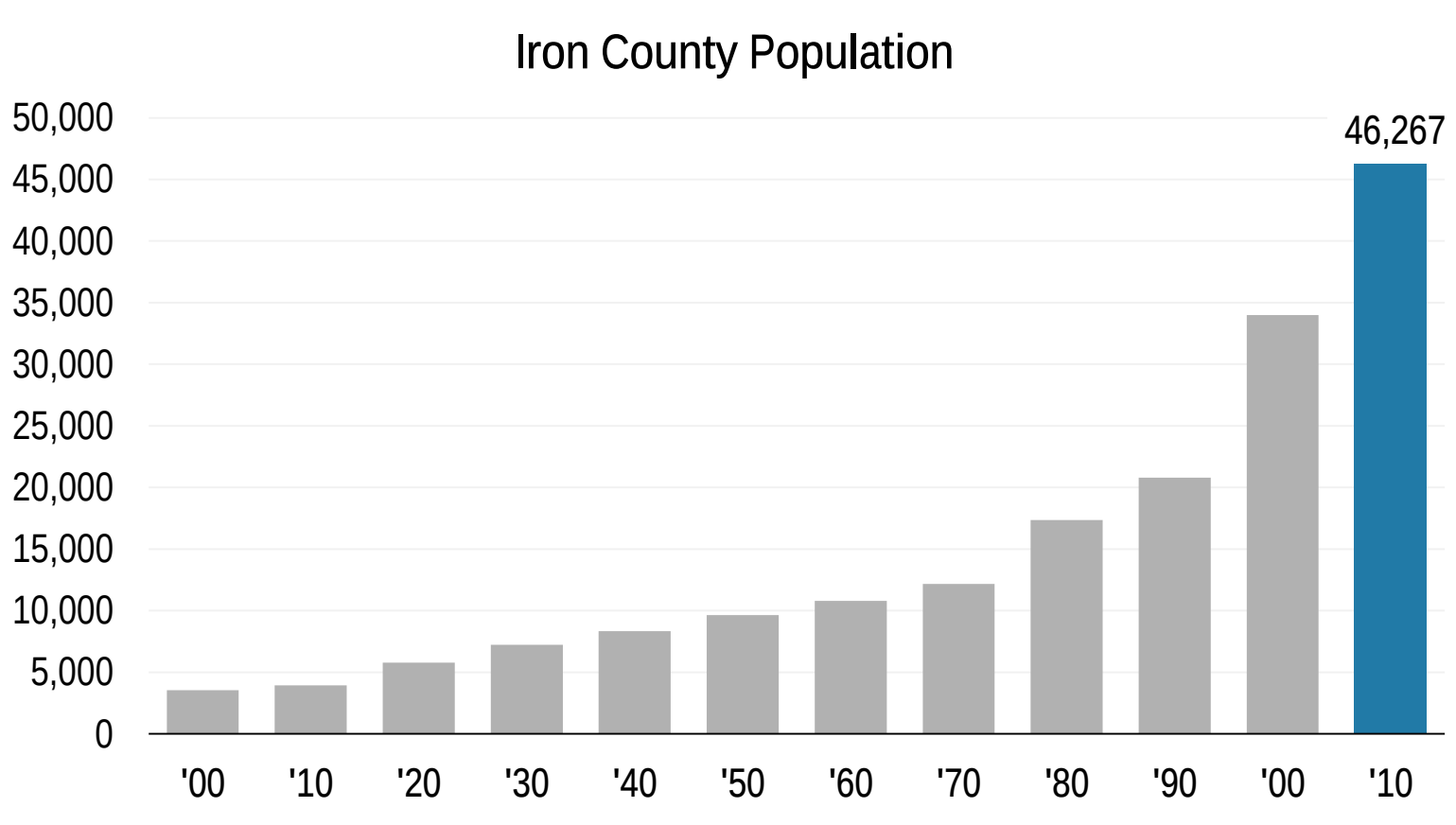
# Identifying the Issue

## Historical Population Growth

- Despite its location in a drought-plagued region, Iron County has grown at a compound annual growth rate of 2.4 percent each year during the past century.

- Projections of future growth have raised concerns about the sustainability of safe and reliable water resources going forward.




Source: US Census Bureau, Kem C. Gardner Policy Institute.

# Historical Timeline of Events

**1970s & Prior**

Historical growth patterns combined with dry conditions and other factors translated into more water being used in the Iron County area than was being put back into the system

**1997**

The Central Iron County Water Conservancy District was established in 1997 to manage the water demands and plan for the future water needs of the community

# Responding to the Issue

## The Creation of the CICWCD District


Serves the Cedar Valley area

- Established 1997 to benefit the people and municipalities within the CICWCD boundaries
- 1,380 square miles (approximately 81 percent vacant)
- Incorporated approximately 17 existing subdivisions with water systems into a basin-wide public water supply

Existing water systems in the District

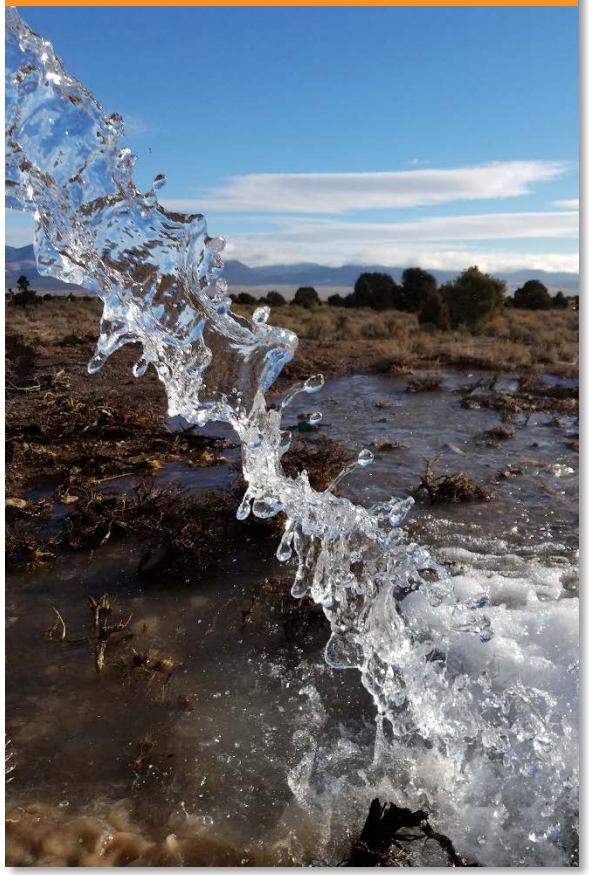
- Currently, there are about 45 residential subdivisions, cities, towns or entities with approximately 1,254 Equivalent Residential Connections (ERCs) (excluding Cedar City, Enoch City, and Kanarraville) in the Cedar Valley area
- These entities are under the jurisdiction of the District and are potential water customers of the District in the future.

Source: CICWCD Conservation Plan (2011); see http://www.cicwcd.org/Documents/2011%20CICWCD%20Final.Conservation.Plan.pdf

# Responding to the Issue

## District Objectives

### 1. IMPORT



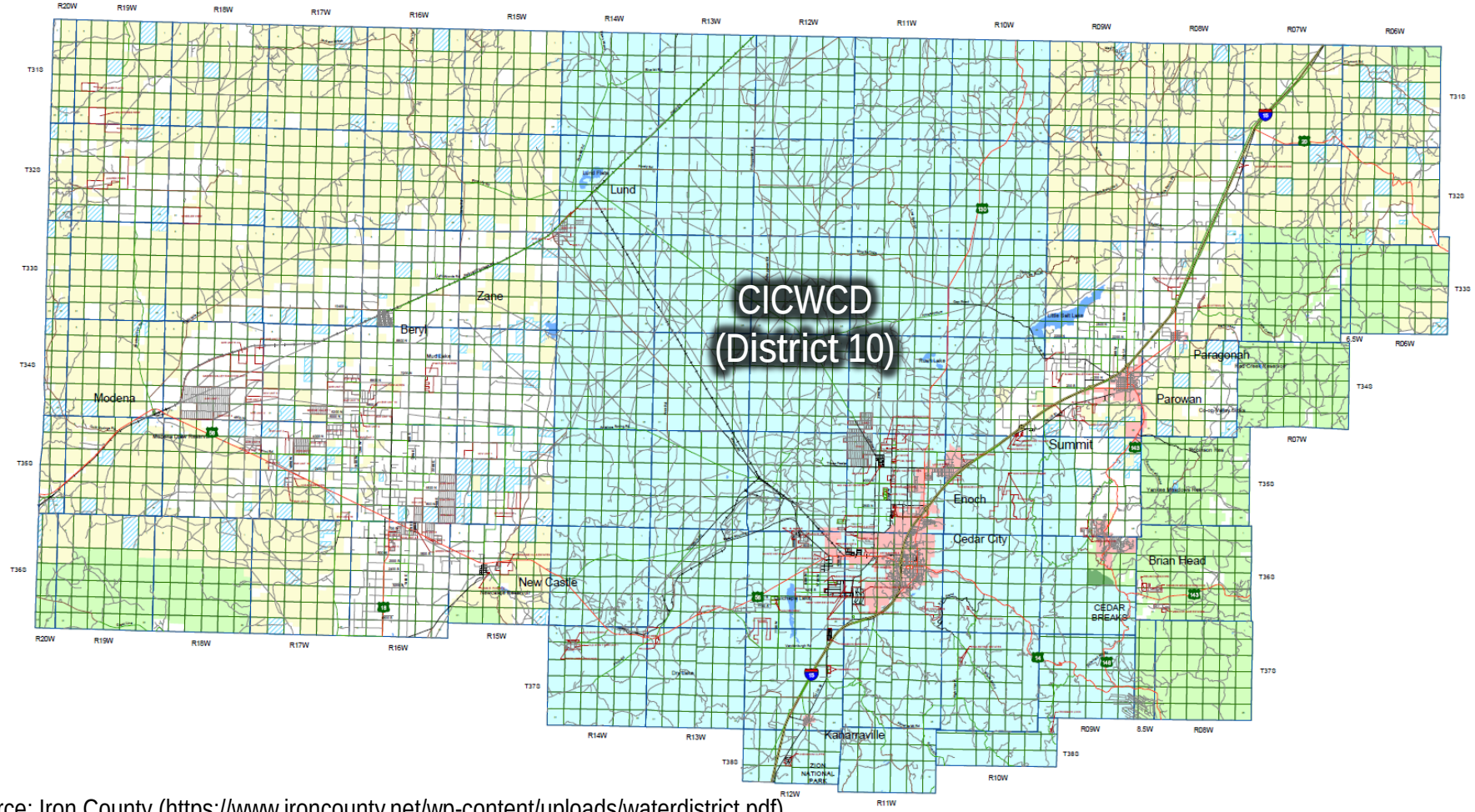
### 2. RECHARGE

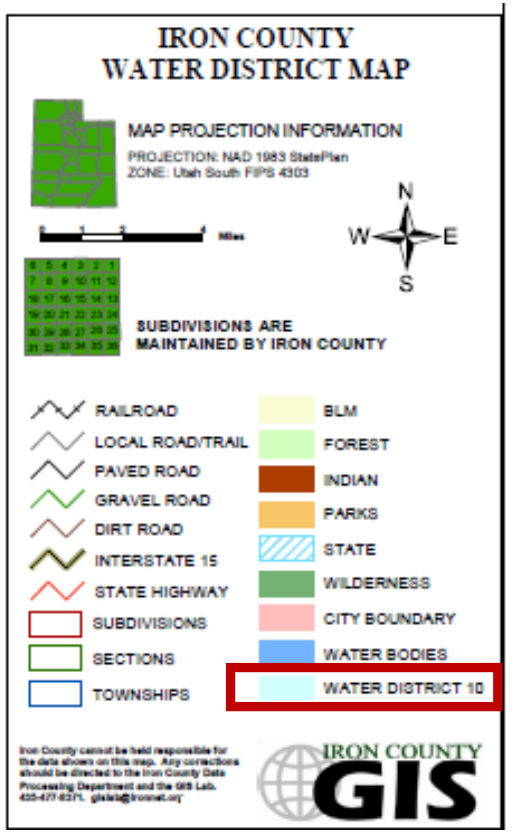
### 3. CONSERVE

Source: CICWCD.

# District Boundaries

## Water district ten as shaded in teal below




Source: Iron County (https://www.ironcounty.net/wp-content/uploads/waterdistrict.pdf)

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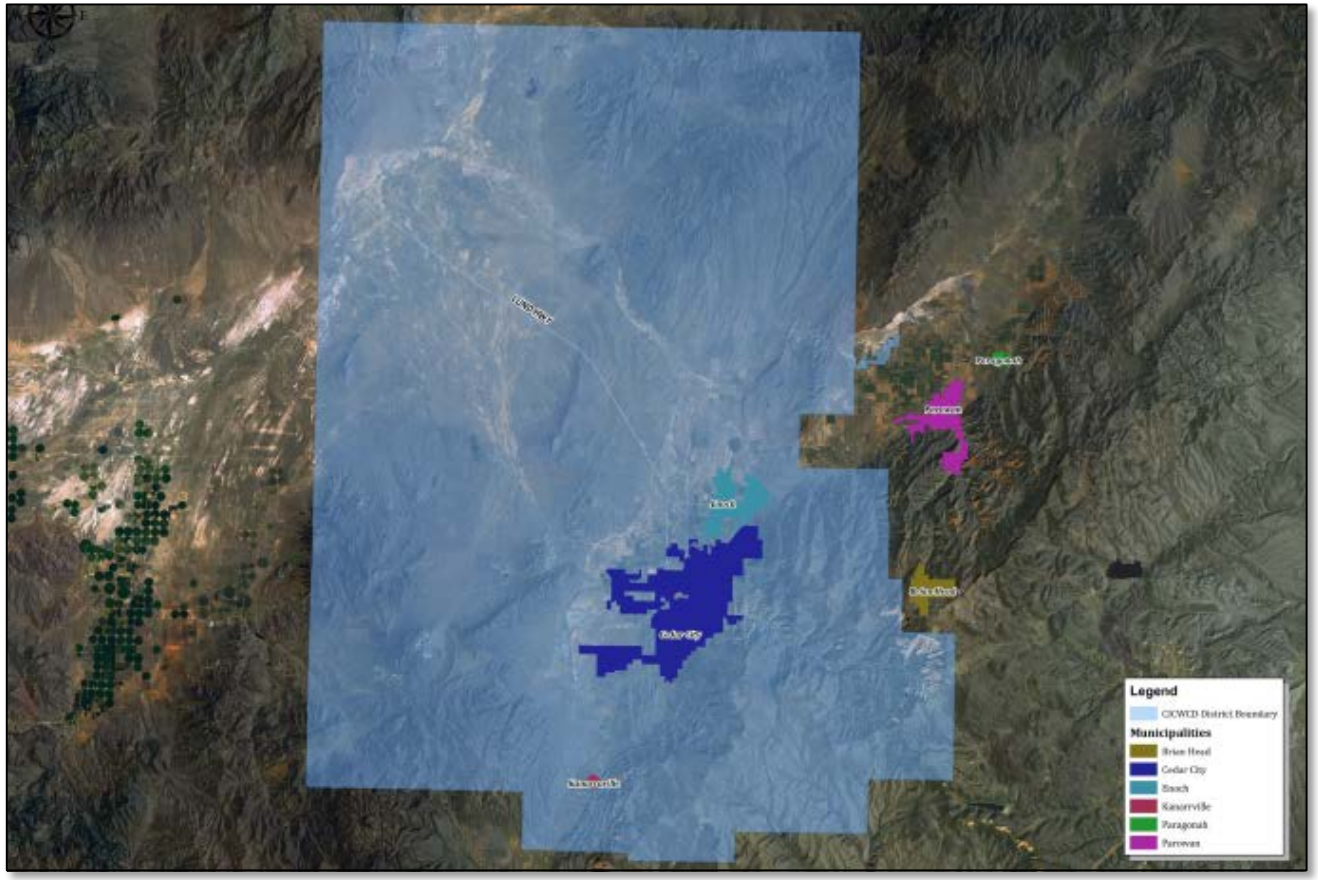


Source: Water Master Plan Report, 2014; Ensign Engineering & Land Surveying.

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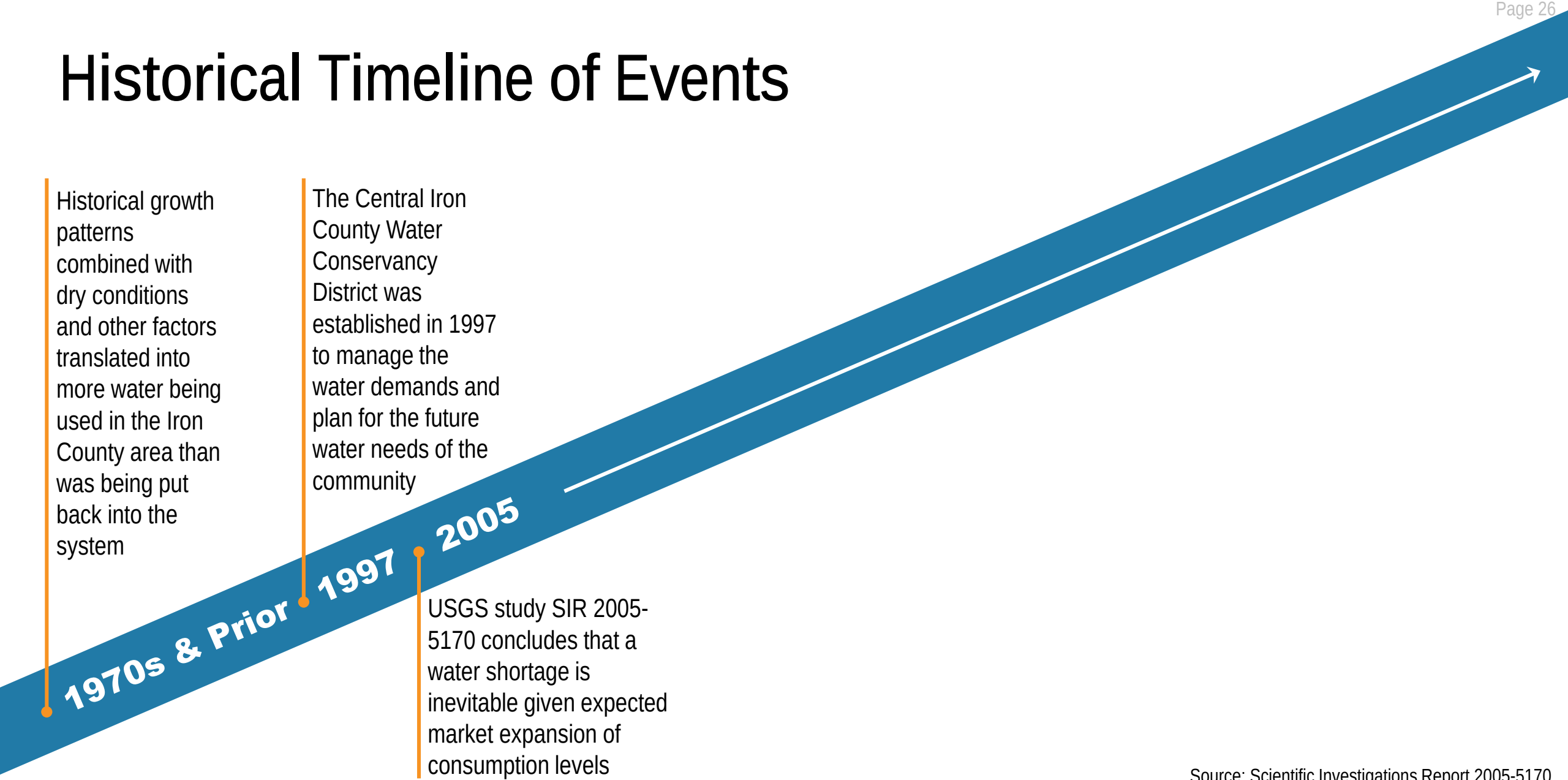


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The Central Iron County Water Conservancy District was established in 1997 to manage the water demands and plan for the future water needs of the community

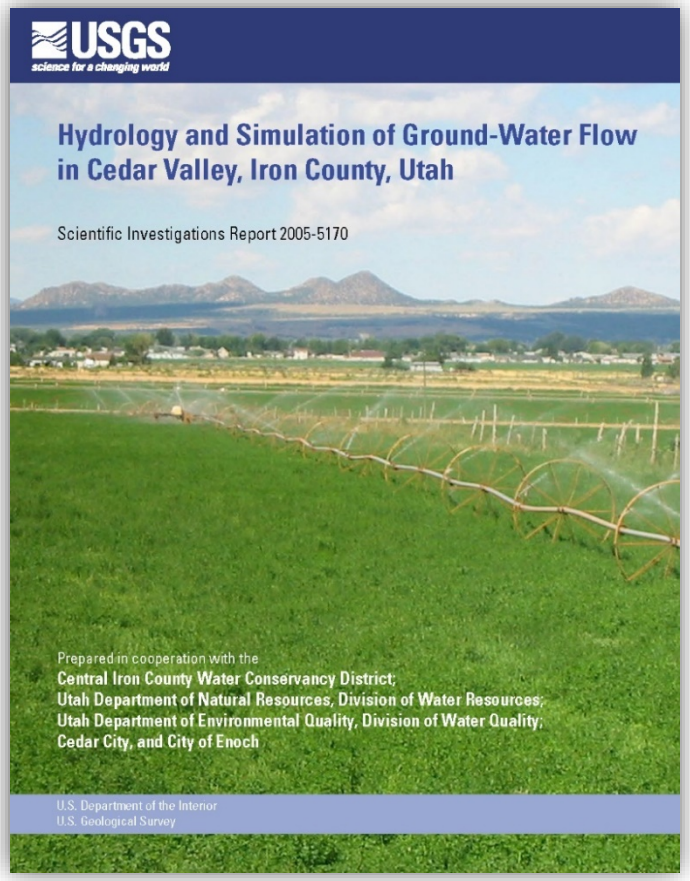
USGS study SIR 2005-5170 concludes that a water shortage is inevitable given expected market expansion of consumption levels

Source: Scientific Investigations Report 2005-5170.

# USGS

## Hydrology Report on Cedar Valley

*"Cedar Valley, located in the eastern part of Iron County in southwestern Utah, is experiencing rapid population growth that needs a larger share of the available water resources."*

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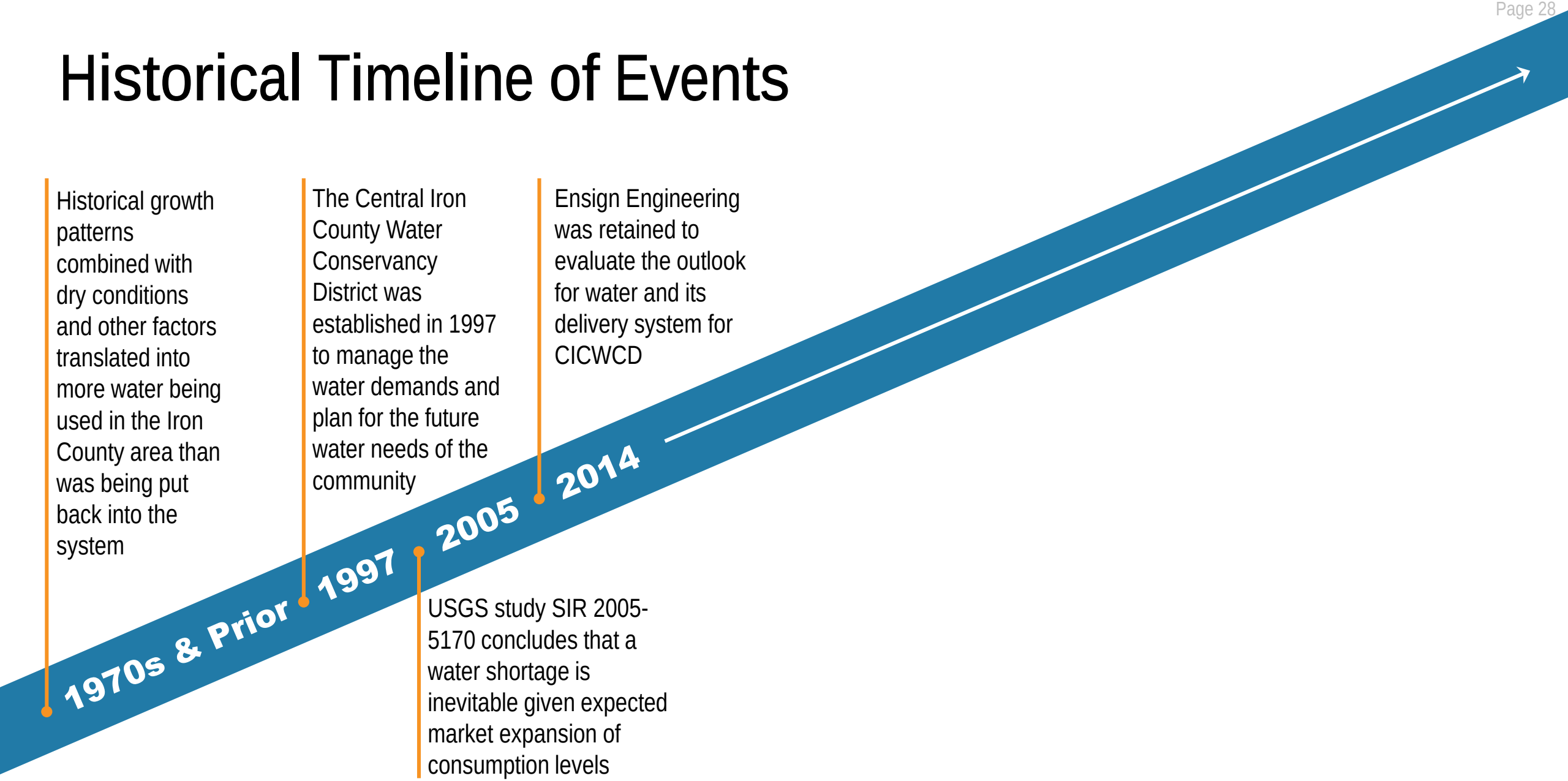


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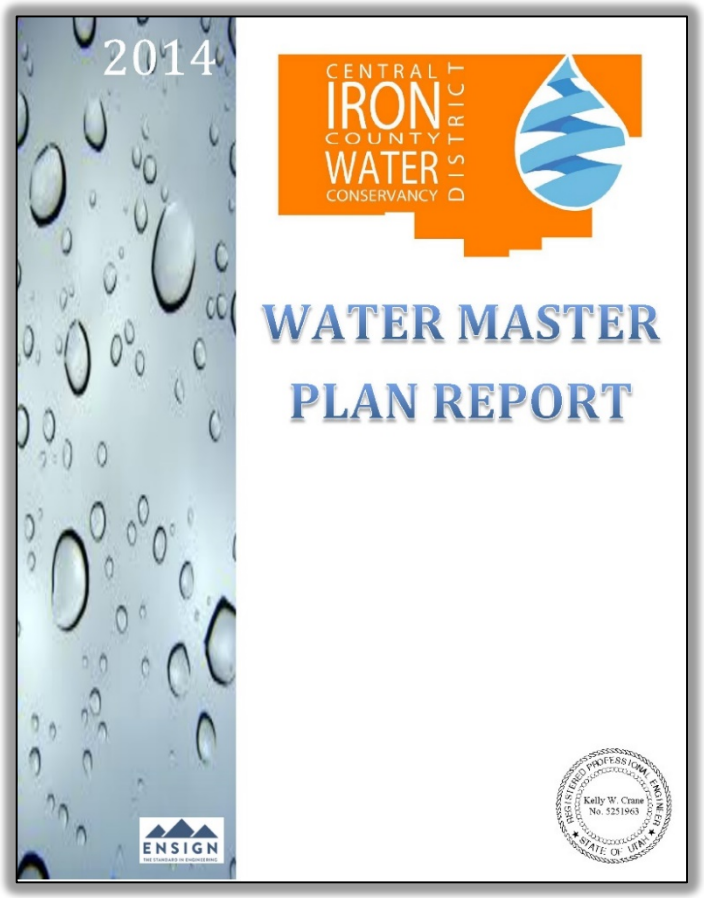
# 2014 Water Master Plan Report

## Ensign Engineering




In 2014, Ensign Engineering & Land Surveying prepared a master plan update to evaluate the current water delivery system and the long-term outlook for CICWCD

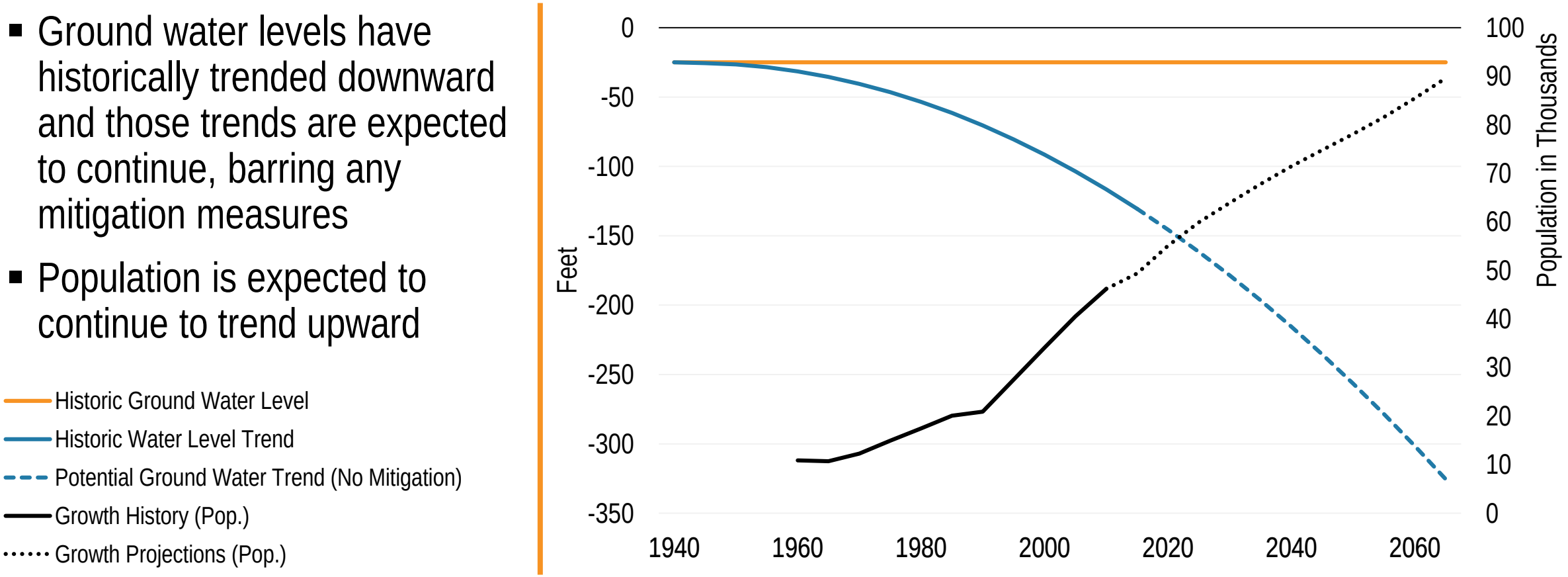
*"The groundwater level in the Cedar Valley is slowly dropping annually due to increased pumping for domestic and agricultural use."*

Source: Ensign Engineering.

# 2014 Water Master Plan Report

## Ground Water and Population Trends

- Ground water levels have historically trended downward and those trends are expected to continue, barring any mitigation measures
- Population is expected to continue to trend upward

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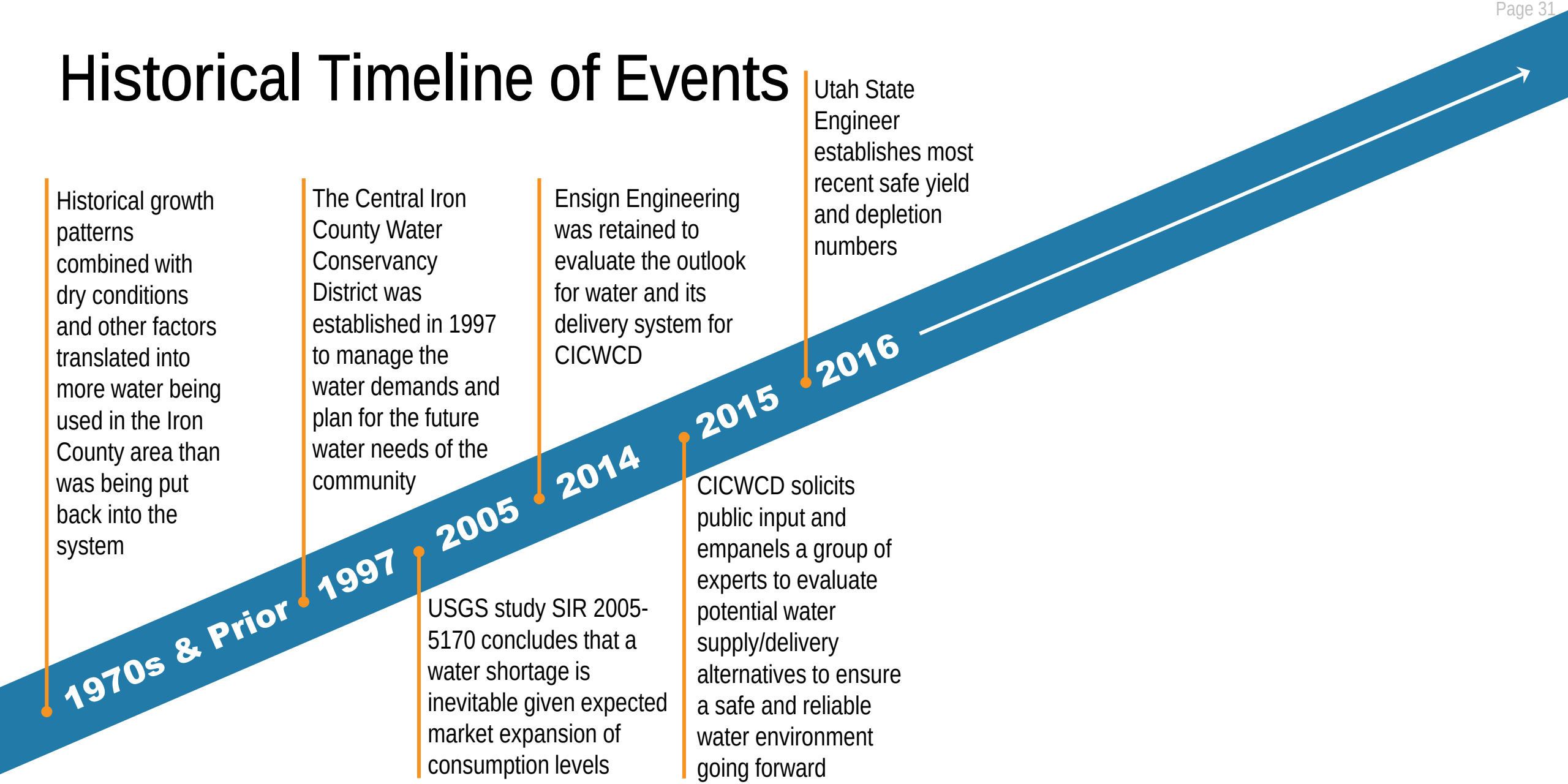


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CICWCD solicits public input and empanels a group of experts to evaluate potential water supply/delivery alternatives to ensure a safe and reliable water environment going forward

Utah State Engineer establishes most recent safe yield and depletion numbers

# Cedar Valley Public Meeting

December 8, 2016

During this meeting, the Utah State Engineer concludes:

- The established safe yield: 21,000 AF/year
- The current depletion: 28,000 AF/year
- The potential (available) depletion: 50,000 AF/year

Source: Utah Division of Water Rights.

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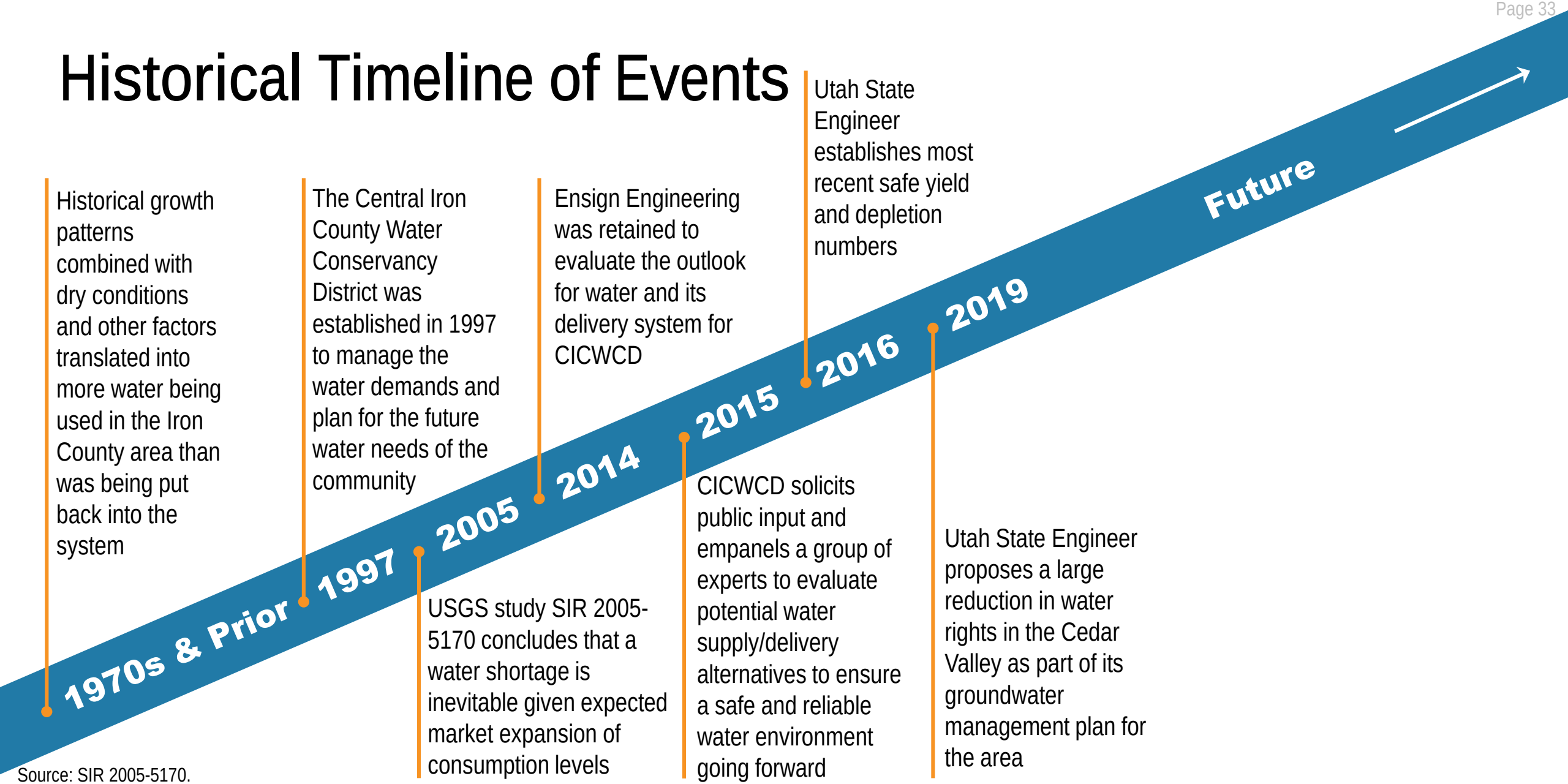


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Utah State Engineer establishes most recent safe yield and depletion numbers

Utah State Engineer proposes a large reduction in water rights in the Cedar Valley as part of its groundwater management plan for the area

Source: SIR 2005-5170.

# State Engineer's Proposed Groundwater Management Plan

## Cedar Valley Basin, February 2019


The Utah State Engineer, in the process of implementing a Groundwater Management Plan, proposes an aggressive reduction in water rights in the Cedar Valley Basin:

- Reduce water rights starting with the most junior in 2030
- Reduce water rights every 10 years, reducing depletion by an average of approximately 6,000 acre feet each decade
- Final reduction in 2070 to bring non-regulated rights to 20,143 acre feet in the Cedar Valley Basin

Source: Utah Division of Water Rights, CICWCD.

# State Engineer's Proposed Groundwater Management Plan

## CICWCD Groundwater Management Plan Committee Response

The CICWCD Groundwater Management Plan Committee, in response to the State Engineer's proposed plan, put forth a more measured time table

- Reduce water rights starting with the most junior in 2035
- Reduce water rights every 15 years, reducing depletion by an average of approximately 6,000 acre with each reduction
- Final reduction in 2090 to bring non-regulated rights to 20,143 acre feet in the Cedar Valley Basin

Source: Utah Division of Water Rights, CICWCD.

# Historical Timeline of Events

**1970s & Prior**

Historical growth patterns combined with dry conditions and other factors translated into more water being used in the Iron County area than was being put back into the system

**1997**

The Central Iron County Water Conservancy District was established in 1997 to manage the water demands and plan for the future water needs of the community

**2005**

USGS study SIR 2005-5170 concludes that a water shortage is inevitable given expected market expansion of consumption levels

**2014**

Ensign Engineering was retained to evaluate the outlook for water and its delivery system for CICWCD

**2015**

CICWCD solicits public input and empanels a group of experts to evaluate potential water supply/delivery alternatives to ensure a safe and reliable water environment going forward

**2016**

Utah State Engineer establishes most recent safe yield and depletion numbers

**2019**

Utah State Engineer proposes a large reduction in water rights in the Cedar Valley as part of its groundwater management plan for the area

**Future**

- What is the expected economic outlook?
- How does future demand evolve going forward?
- What constraints in water supply exist?
- How does the balance between supply and demand unfold?
- What are the potential implications of failing to address future water challenges?

Source: SIR 2005-5170.


- Summary of Findings
- Identifying the Issue
- **Iron County's Economic Climate**
- Iron County's Water Demand Outlook
- Iron County's Water Supply Outlook
- Supply-Demand Dynamics and Potential Solutions
- Economic Impacts of Investments in Infrastructure
- Fiscal Considerations

# Economic Overview

## Iron County

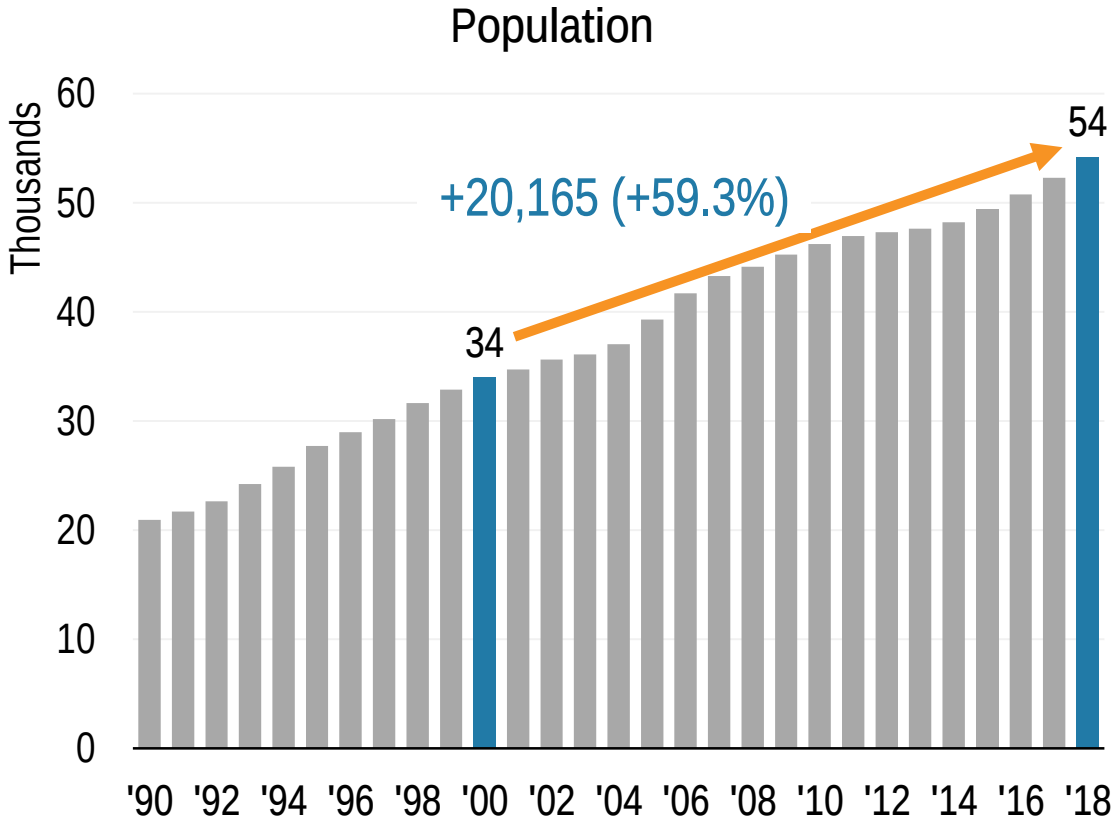
| | Peak | | Present | | % Δ |
|---|---|---|---|---|---|
| Population | 2018 | 54,151 | 2018 | 54,151 | At Peak |
| Labor Force Employment | Apr-19 | 22,924 | Apr-19 | 22,924 | At Peak |
| Unemployment Rate | Nov-06 | 2.1% | Apr-19 | 3.0% | 0.9% ▲ |
| Personal Income (Billions) | 2017 | $1.53 | 2017 | $1.53 | At Peak |
| Per Capita Personal Income | 2017 | $30,088 | 2017 | $30,088 | At Peak |
| Average Weekly Wage | Q4 17 | $621 | Q3 18 | $610 | -1.8% ▼ |
| Establishment Count | Q3 18 | 1,557 | Q3 18 | 1,557 | At Peak |

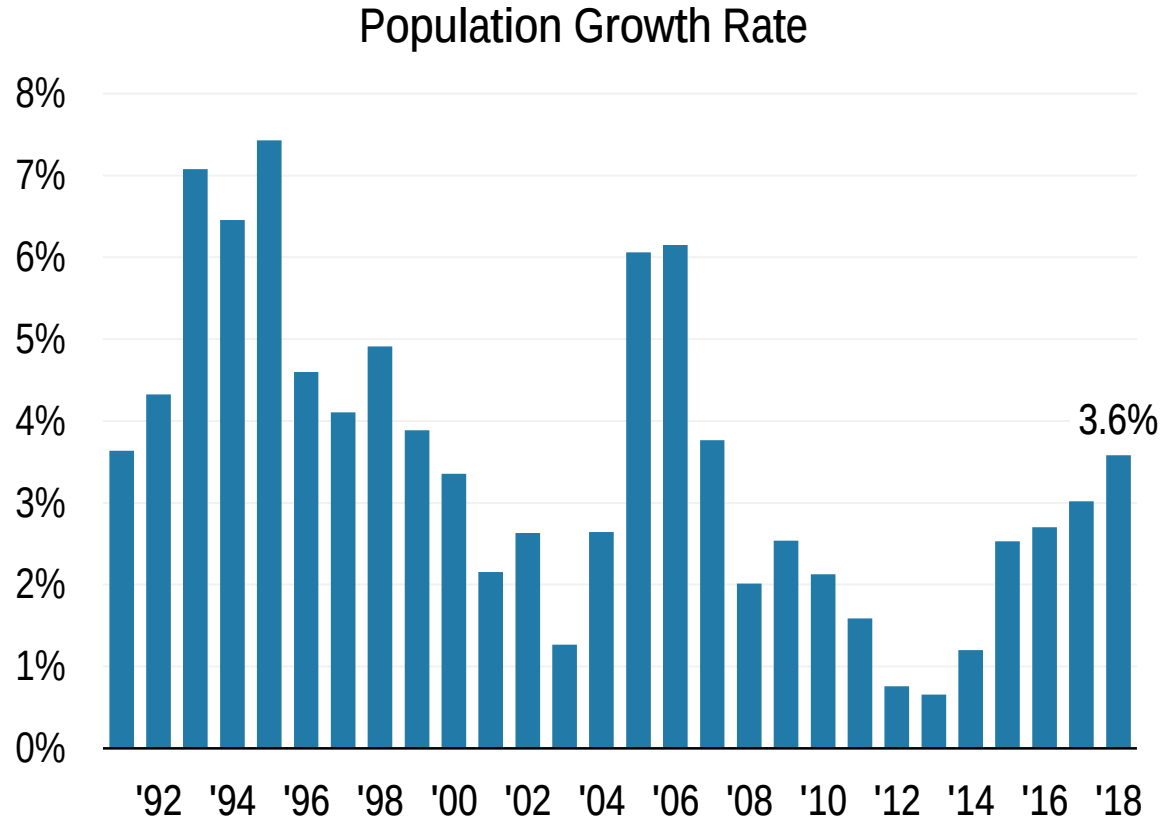
| | Prior Year | | Present | | % Δ |
|---|---|---|---|---|---|
| Population | 2017 | 52,278 | 2018 | 54,151 | 3.6% ▲ |
| Labor Force Employment | Mar-19 | 22,752 | Apr-19 | 22,924 | 0.8% ▲ |
| Unemployment Rate | Mar-19 | 3.4% | Apr-19 | 3.0% | -0.4% ▼ |
| Personal Income (Billions) | 2016 | $1.46 | 2017 | $1.53 | 5.0% ▲ |
| Per Capita Personal Income | 2016 | $29,269 | 2017 | $30,088 | 2.8% ▲ |
| Average Weekly Wage | Q3 17 | $596 | Q3 18 | $610 | 2.5% ▲ |
| Establishment Count | Q3 17 | 1,453 | Q3 18 | 1,557 | 7.2% ▲ |

Source: Kem C. Gardner Policy Institute, Bureau of Labor Statistics, Bureau of Economic Analysis.
Note: Population estimates in recent years have exceeded those previously forecasted by the Gardner Policy Institute.
For conservatism, the Institute estimates have been utilized in the modeling efforts contained elsewhere in this presentation.

# Population

## Iron County

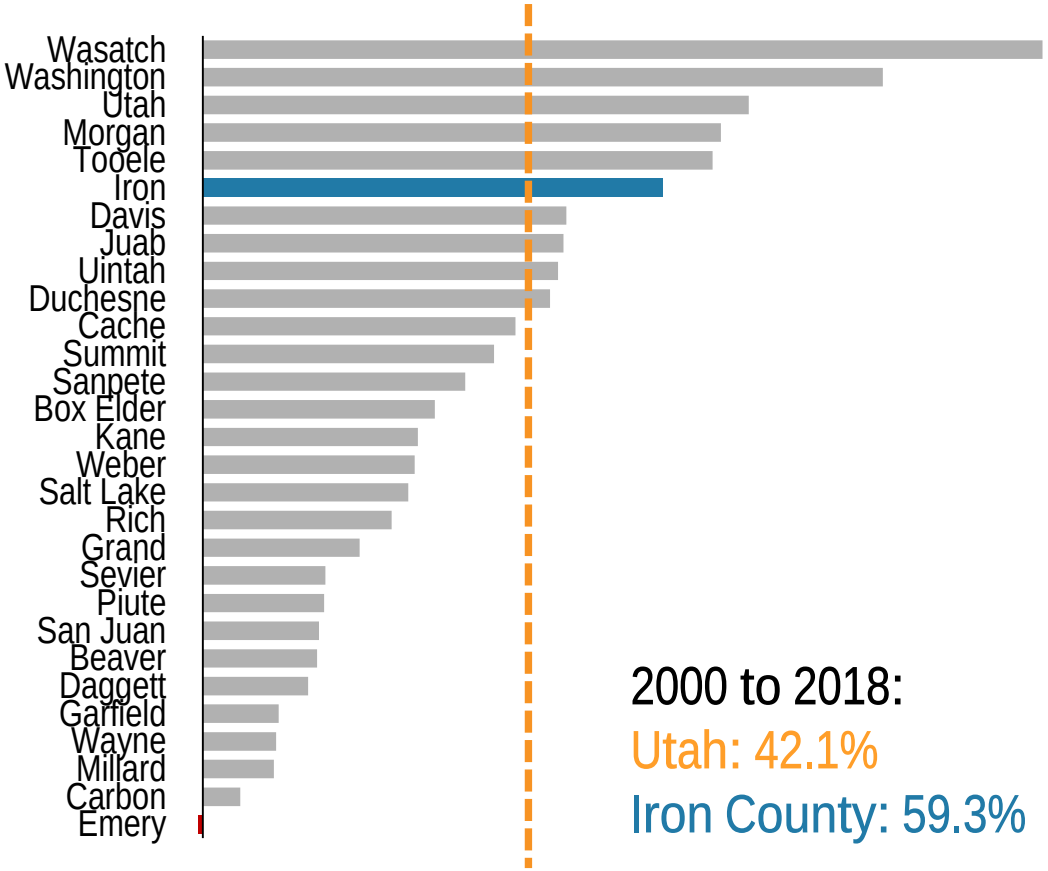



Source: US Census Bureau, Kem C. Gardner Policy Institute.

# Population Growth Rankings

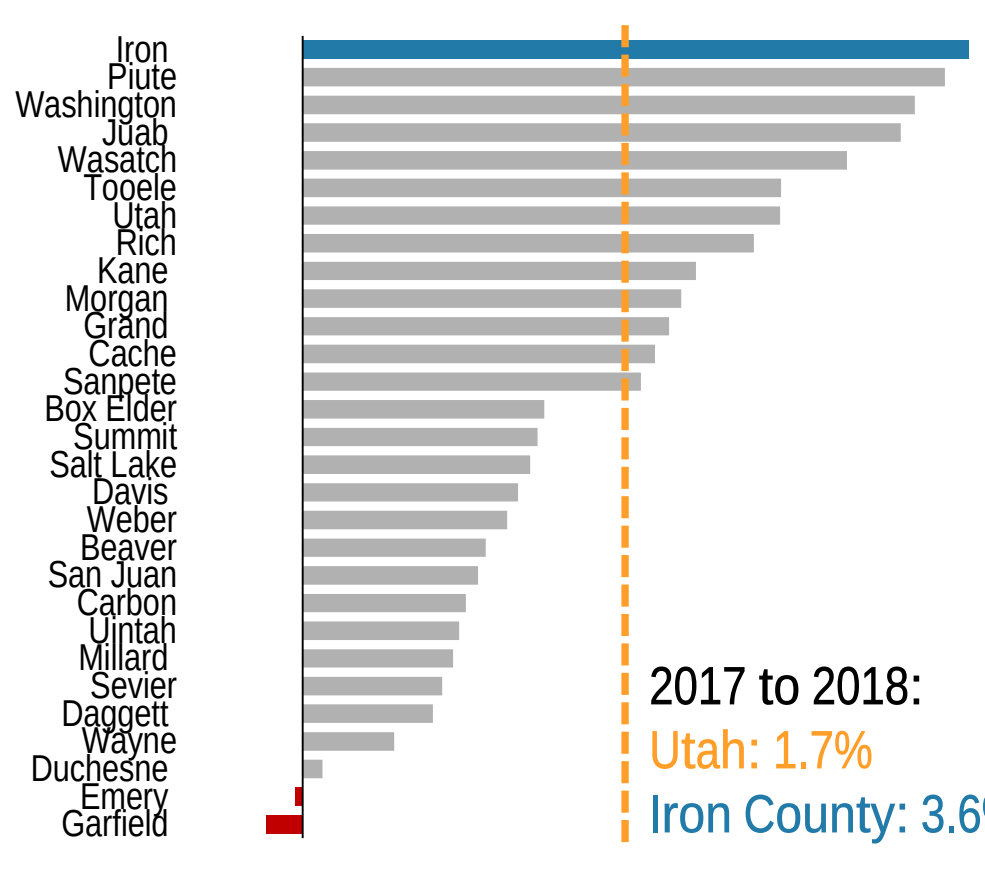
## Utah




2000 to 2018:

Utah: 42.1%

Iron County: 59.3%




2017 to 2018:

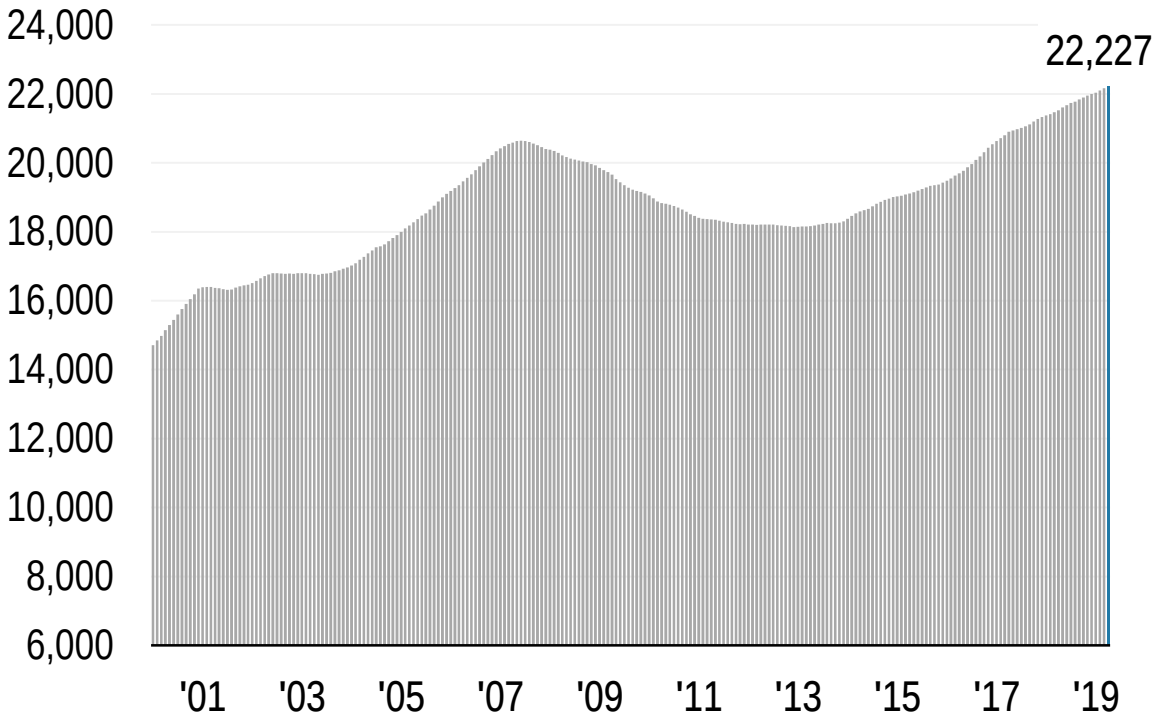
Utah: 1.7%

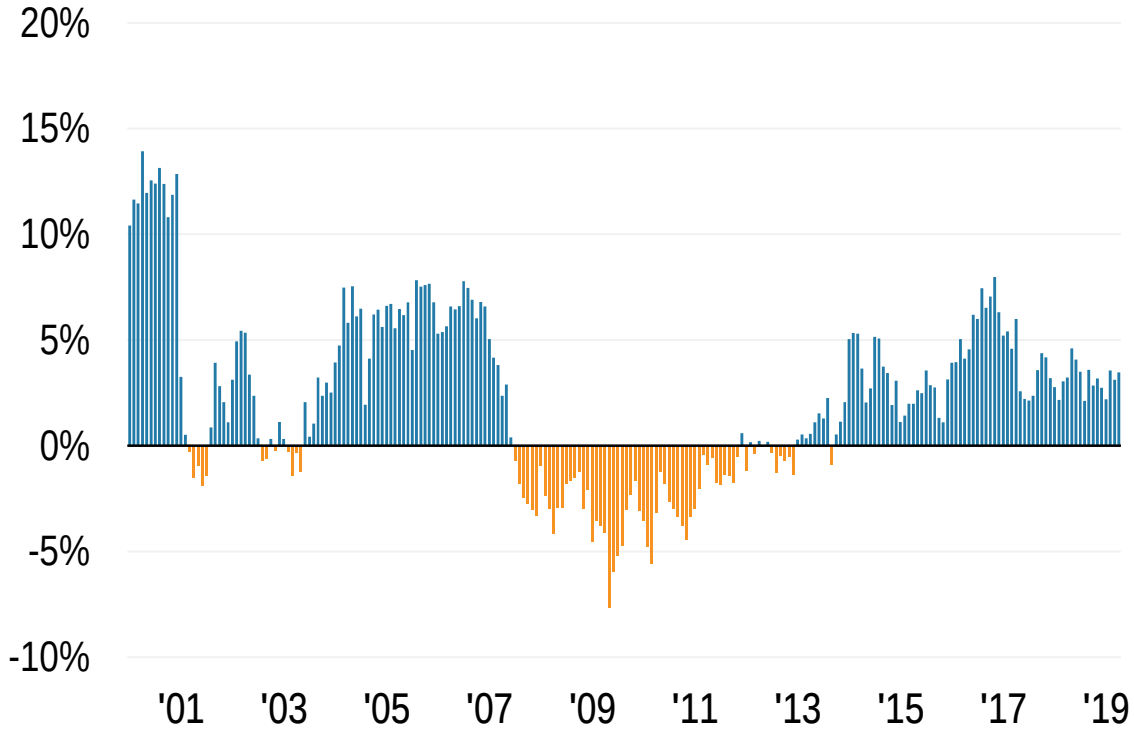
Iron County: 3.6%

Source: US Census Bureau, Kem C. Gardner Policy Institute.

# Labor Force Employment

## Iron County

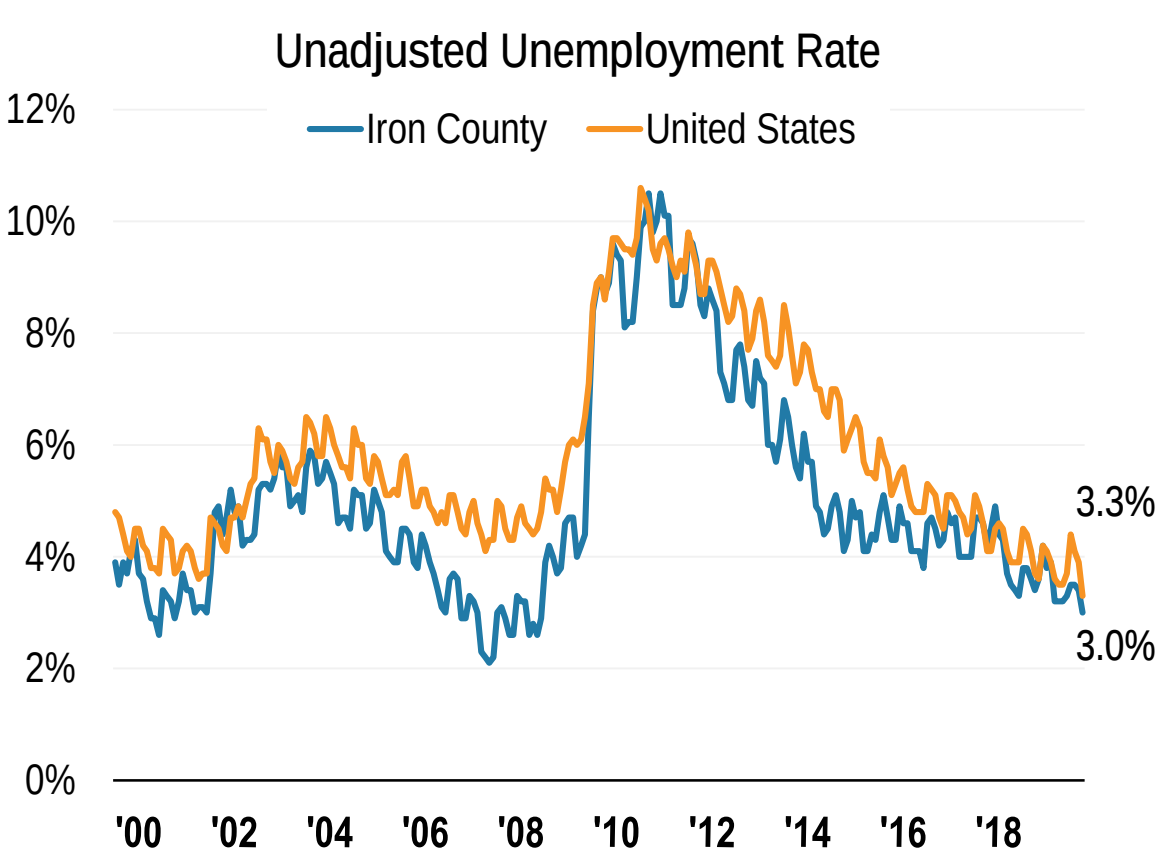


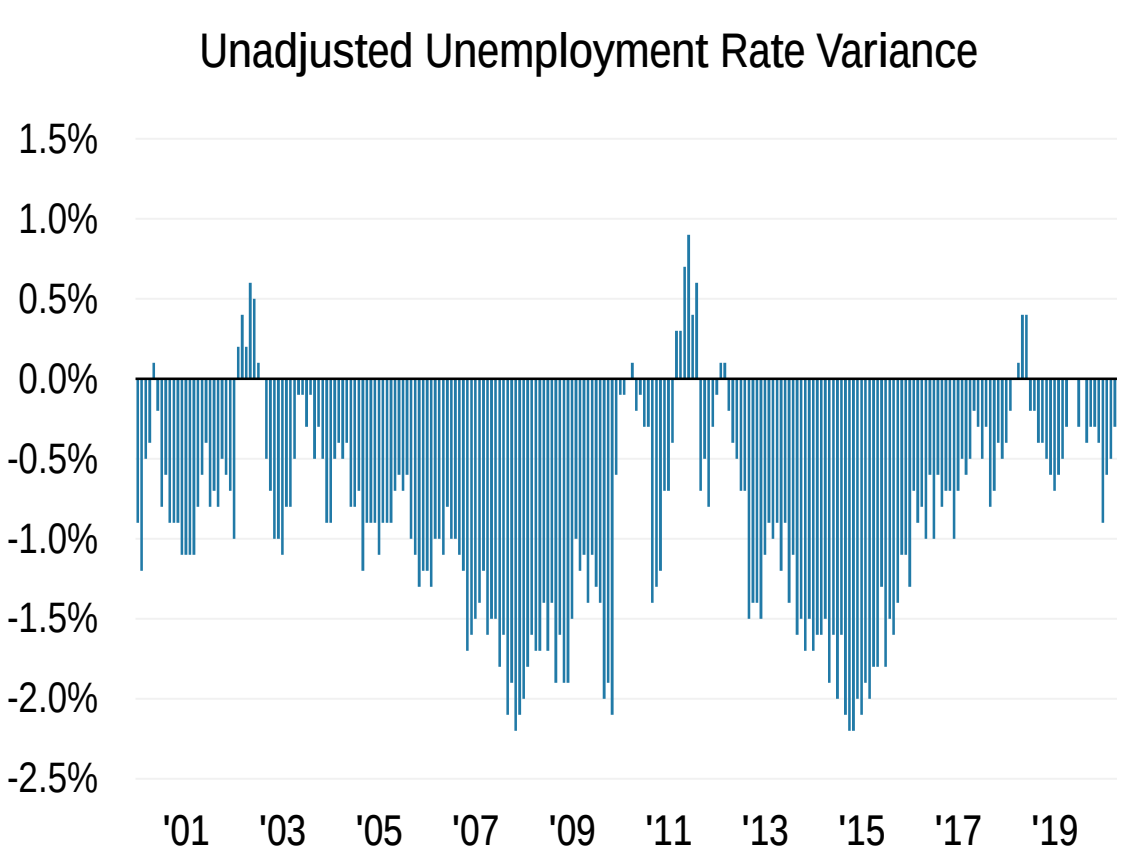




Source: Bureau of Labor Statistics, Current Population Survey.

# Unemployment Rate Comparison

## Iron County vs. United States

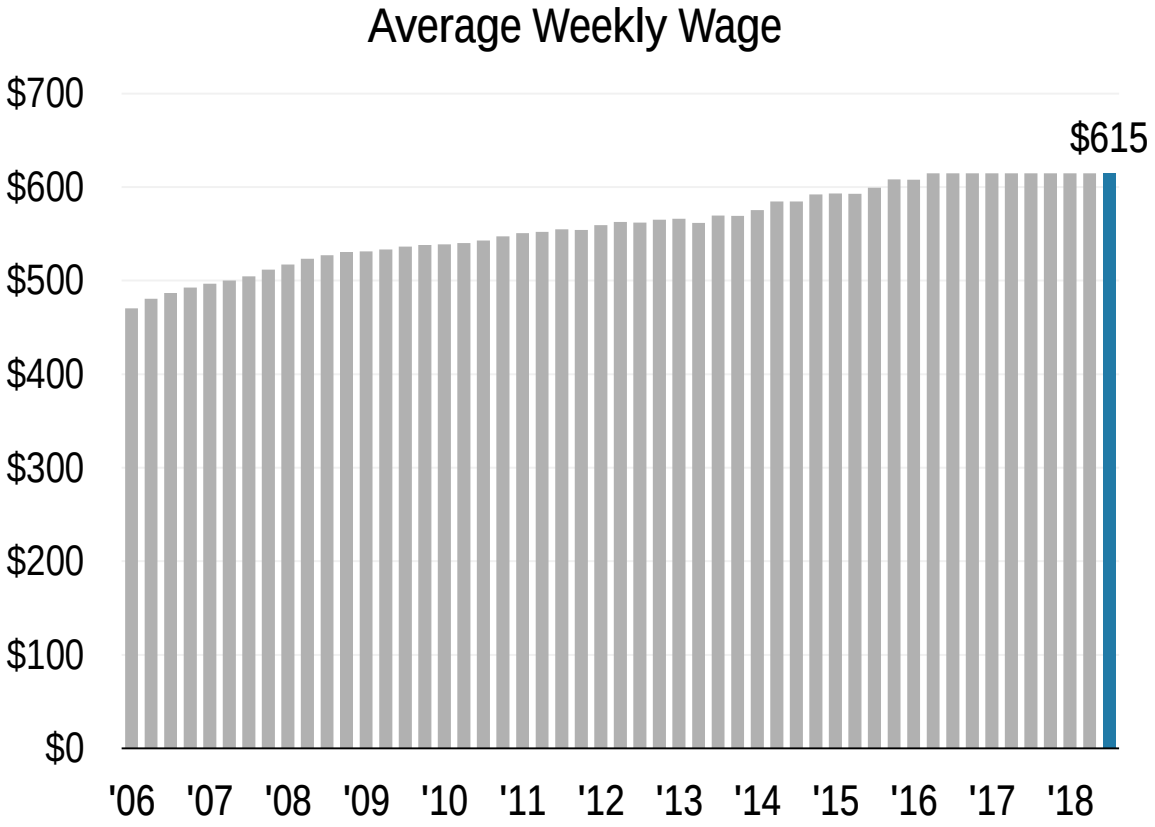


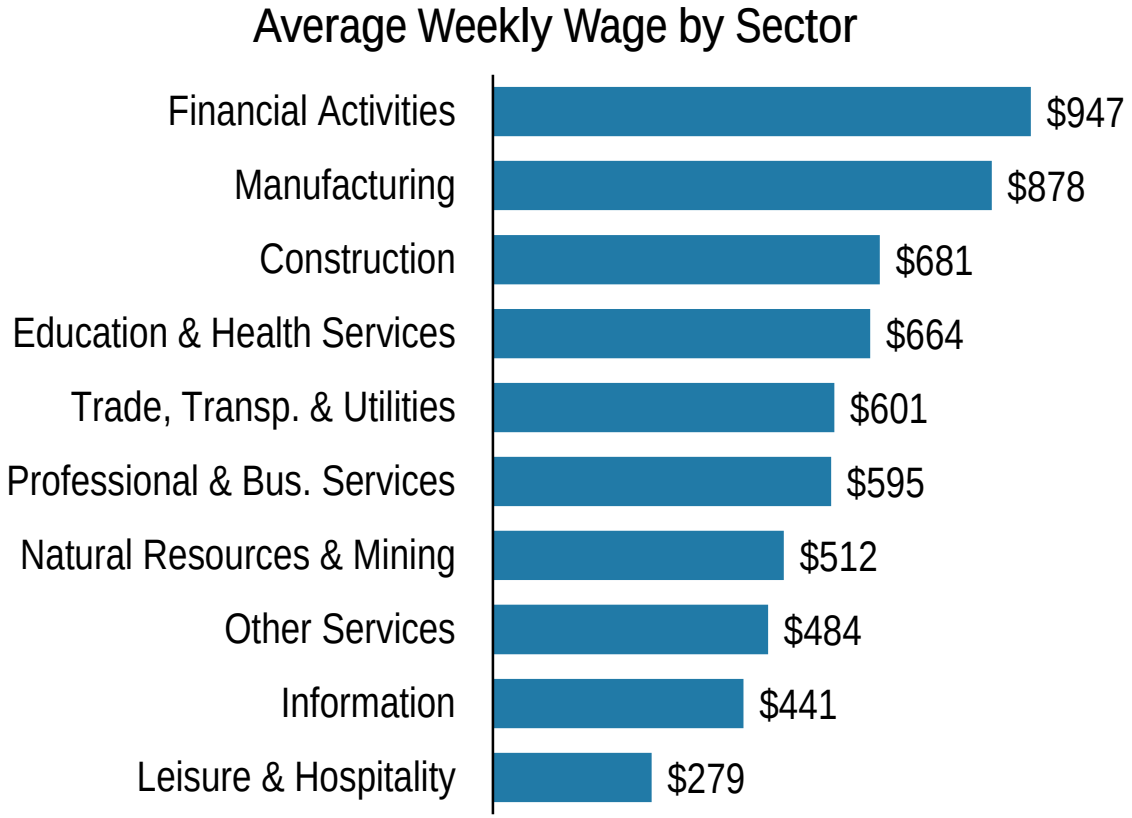




Source: Bureau of Labor Statistics.

# Average Weekly Wages

## Iron County

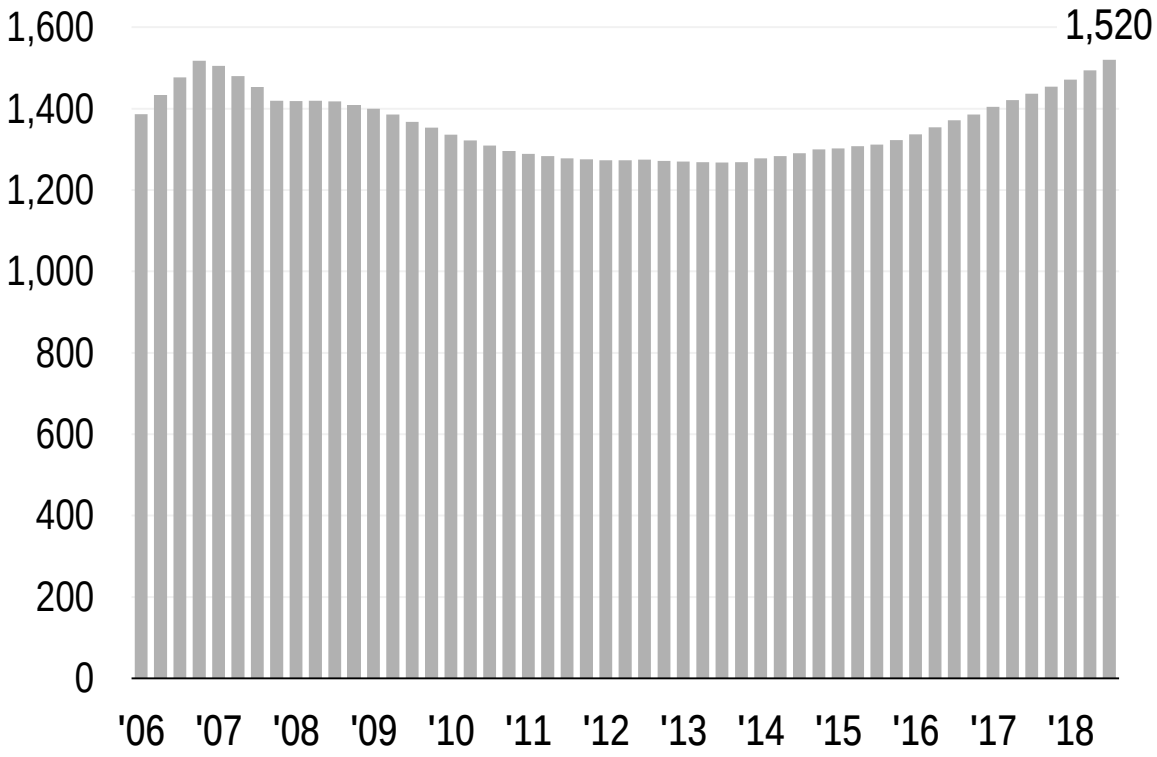


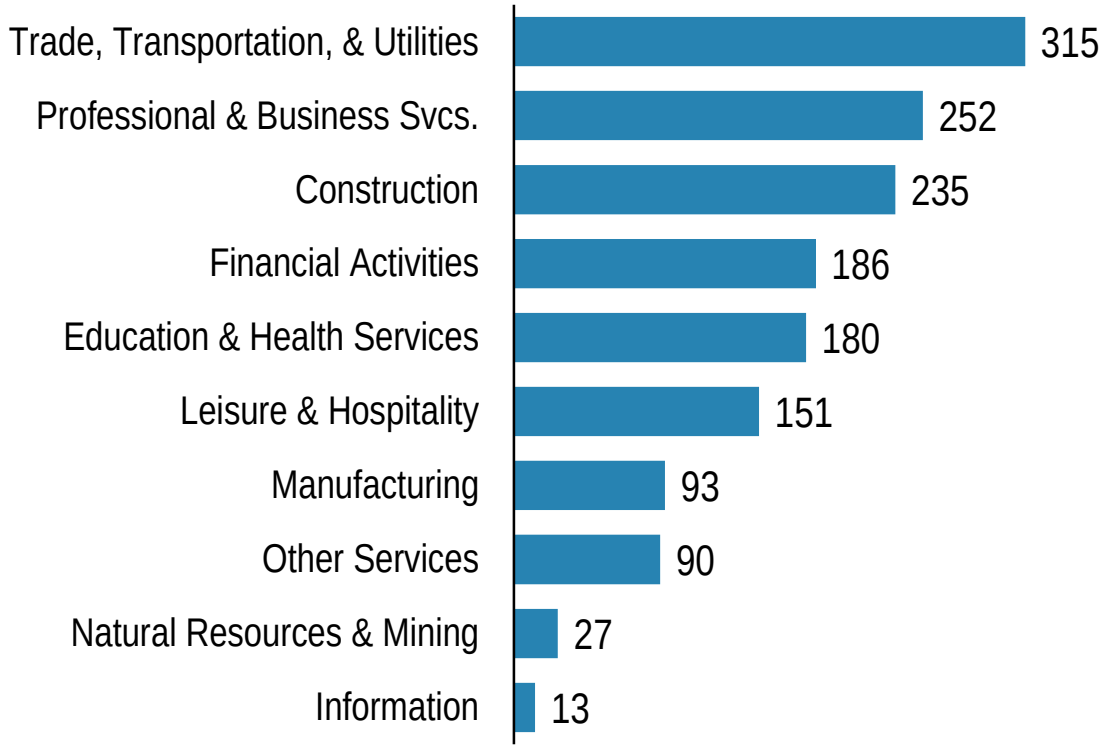




Source: Bureau of Labor Statistics. Note, “Average Weekly Wage by Sector” is for Q3 2018 (latest available data).

# Employment Establishments

## Iron County

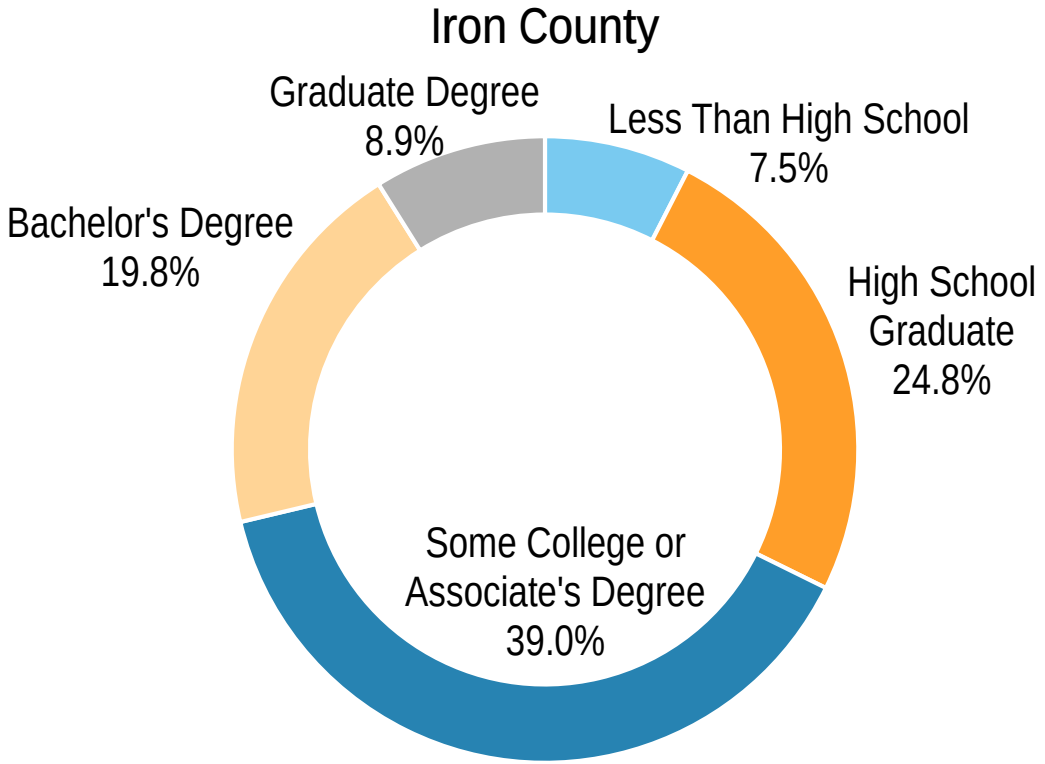


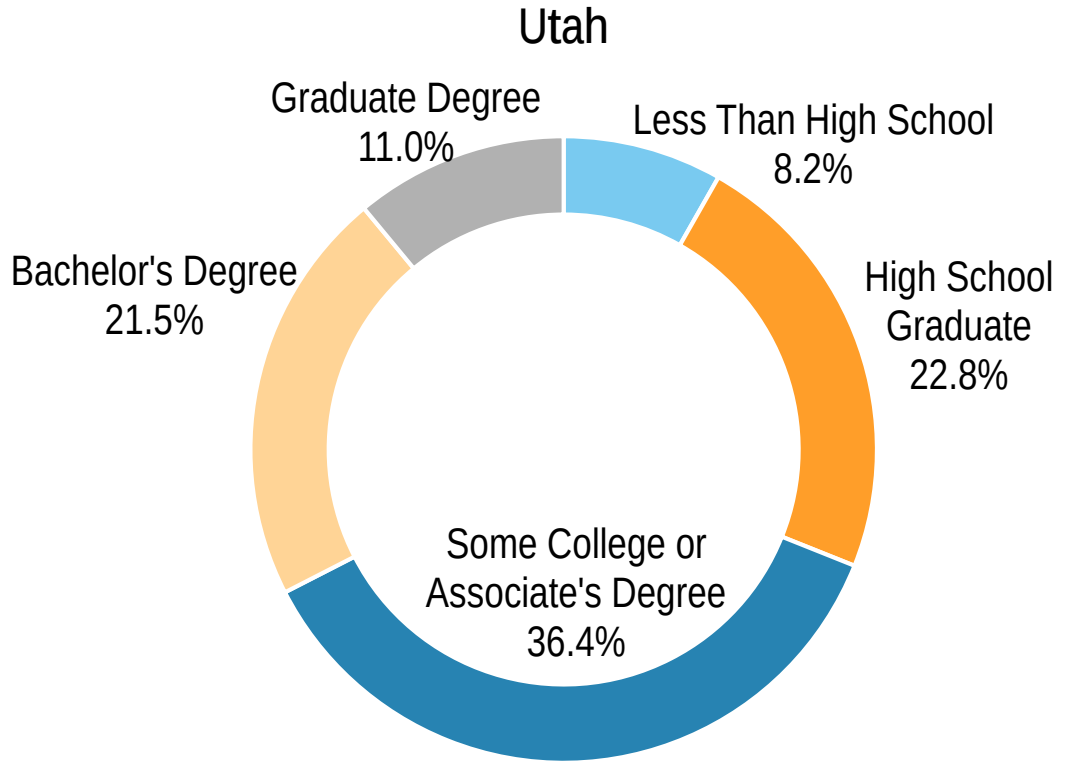




Source: Bureau of Labor Statistics. Note, “Establishments by Sector” is for Q3 2018 (latest available data).

# Educational Attainment

## Iron County, Population aged 25 years or older

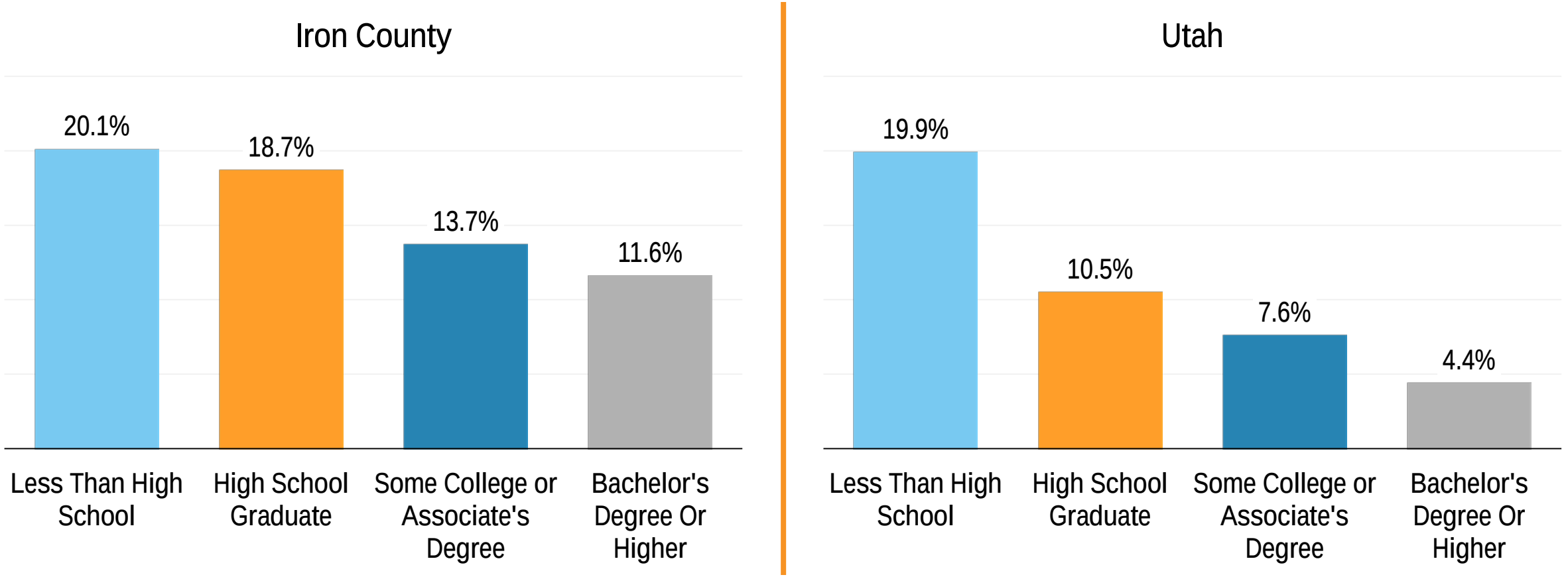



Source: US Census Bureau, American Community Survey. Figures for 2017.

# Poverty Rate

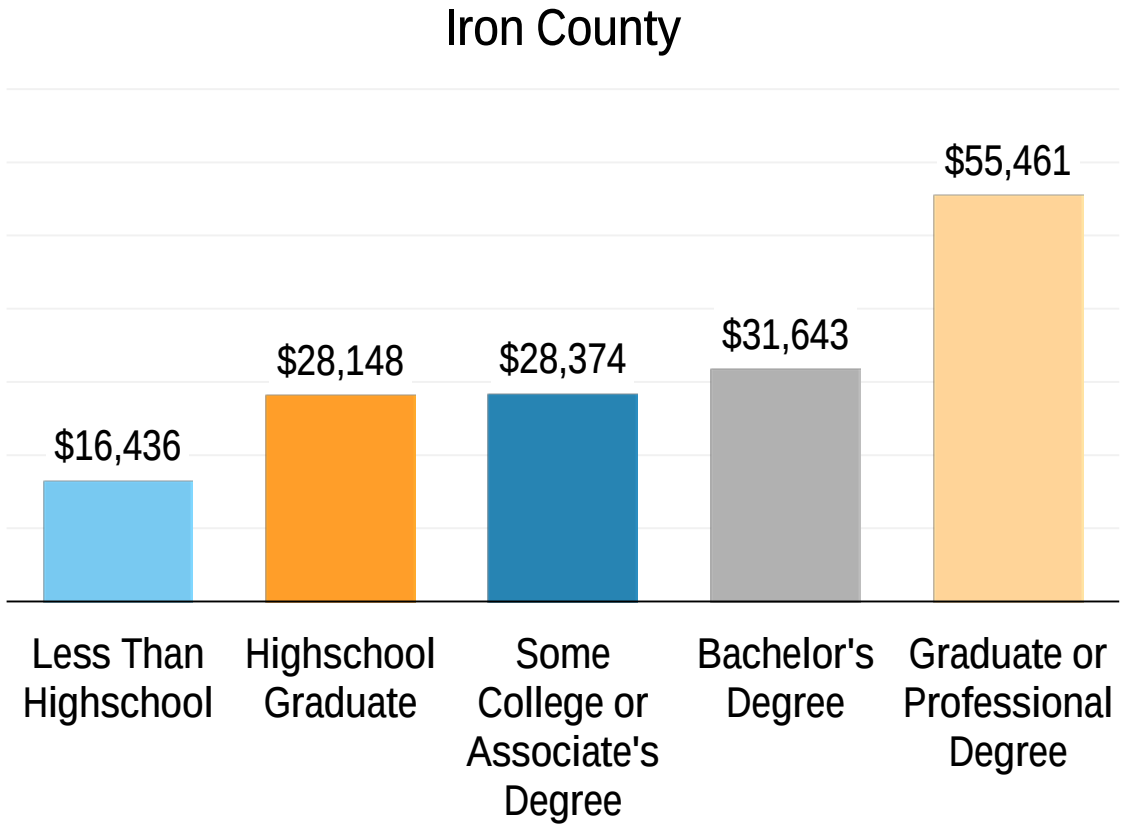
## By Educational Attainment

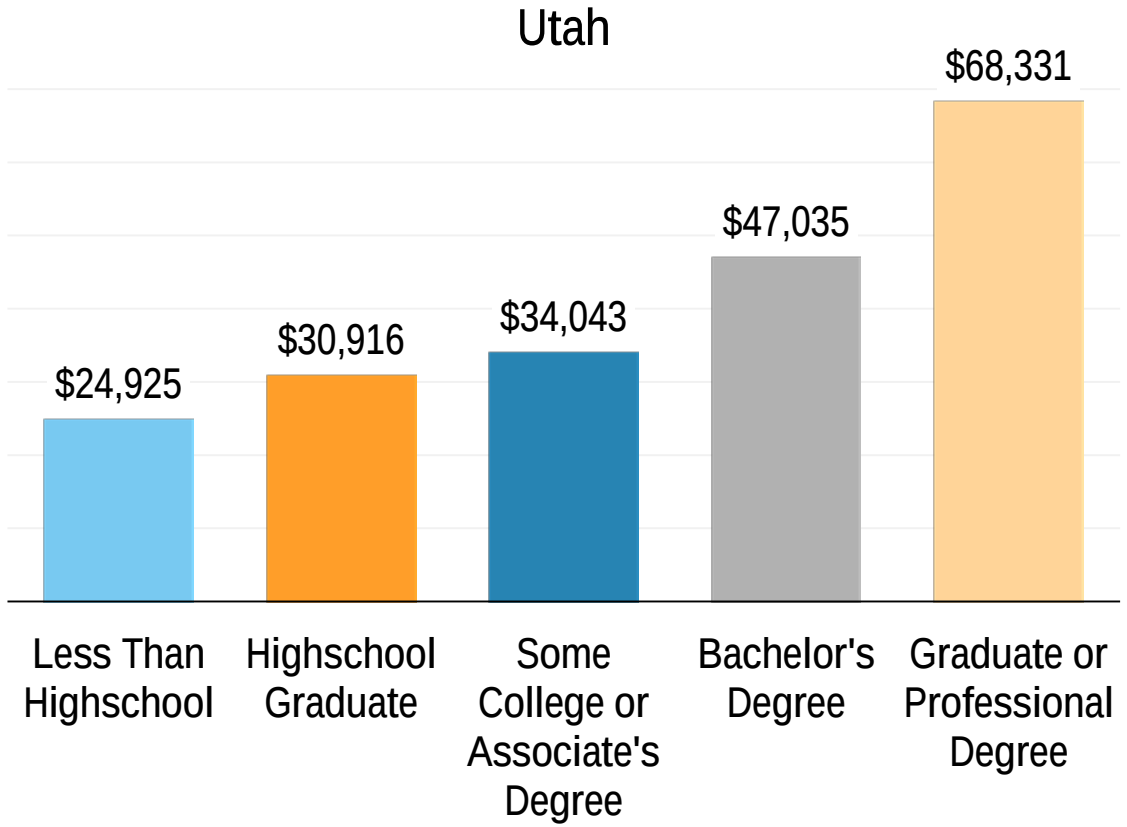



Source: US Census Bureau, American Community Survey. Figures for 2017.

# Median Earnings

## By Educational Attainment

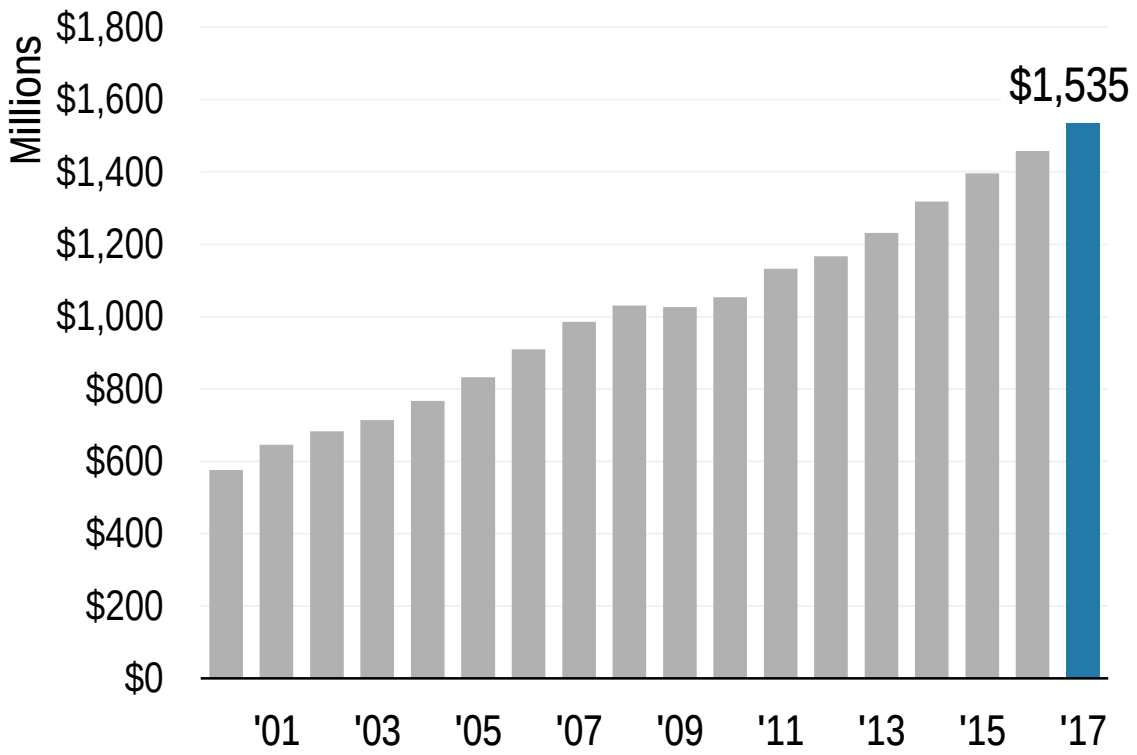


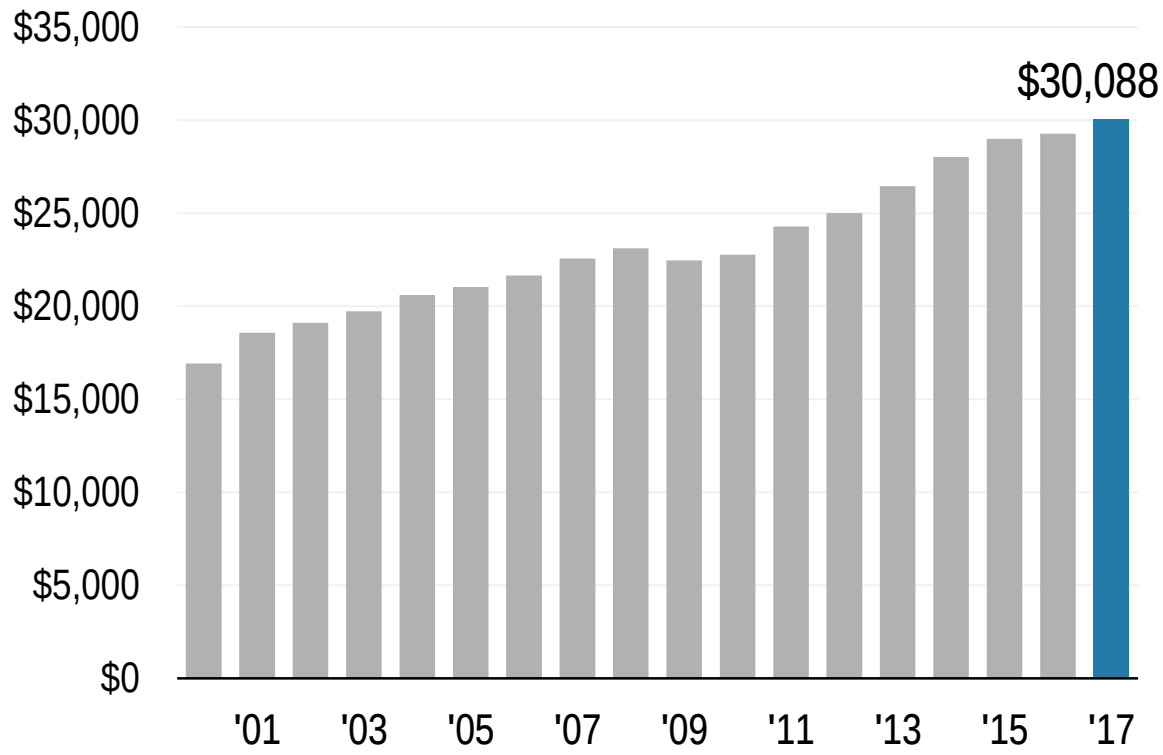




Source: US Census Bureau, American Community Survey. Figures for 2017.

# Personal Income

## Cedar City Micropolitan Statistical Area

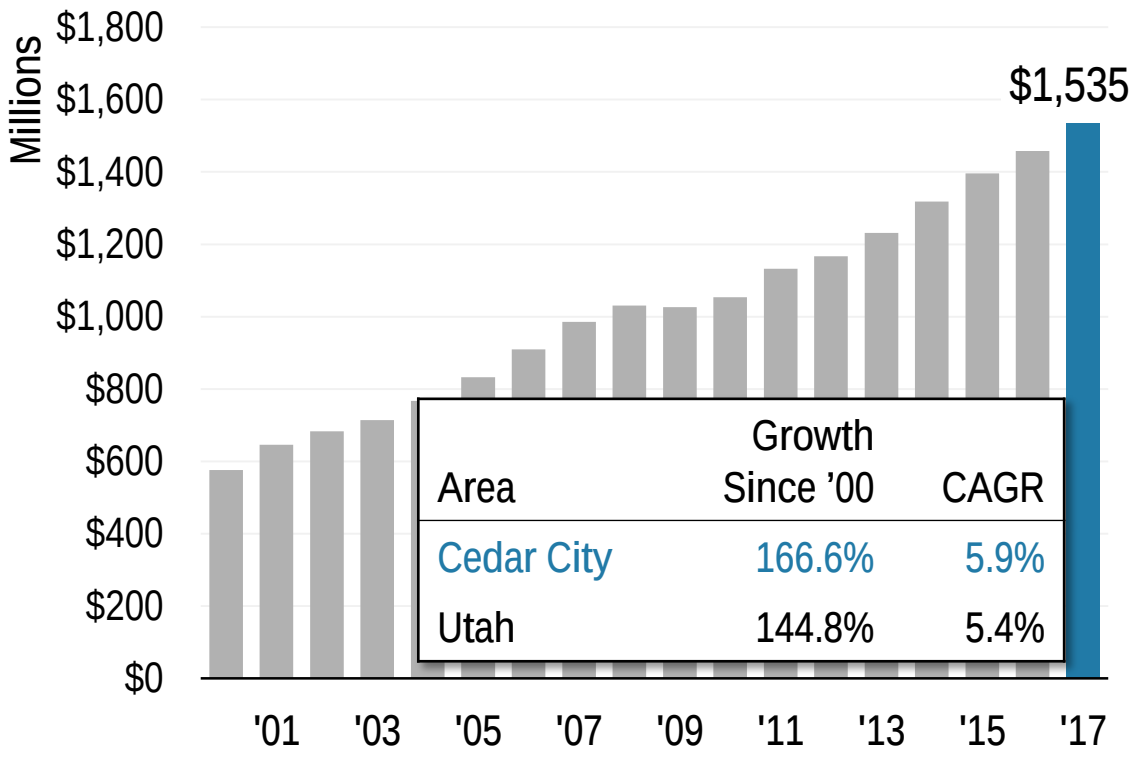


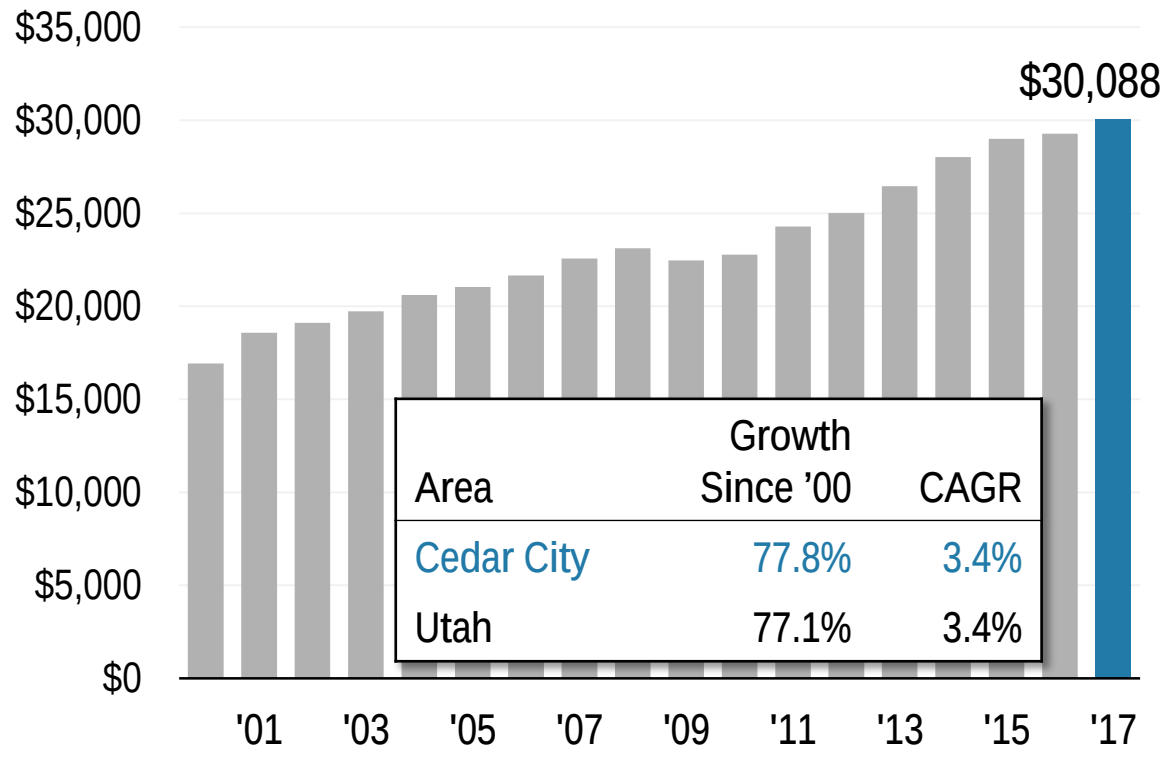




Source: US Bureau of Economic Analysis.

# Personal Income

## Cedar City Micropolitan Statistical Area

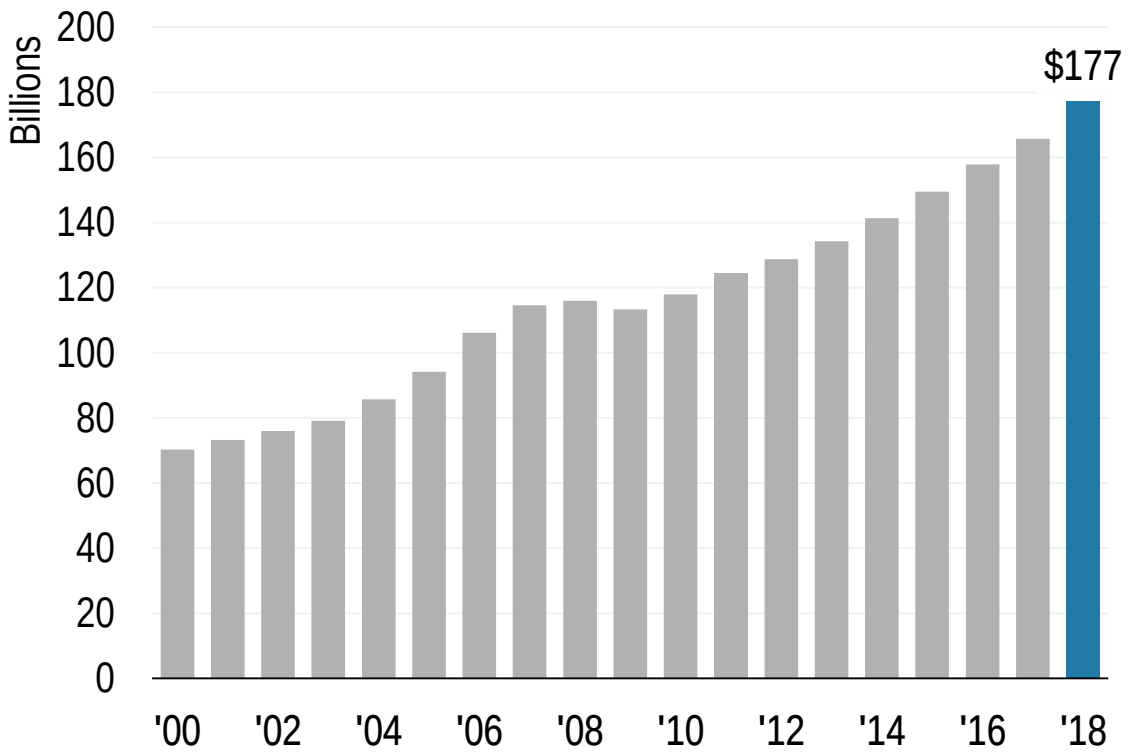


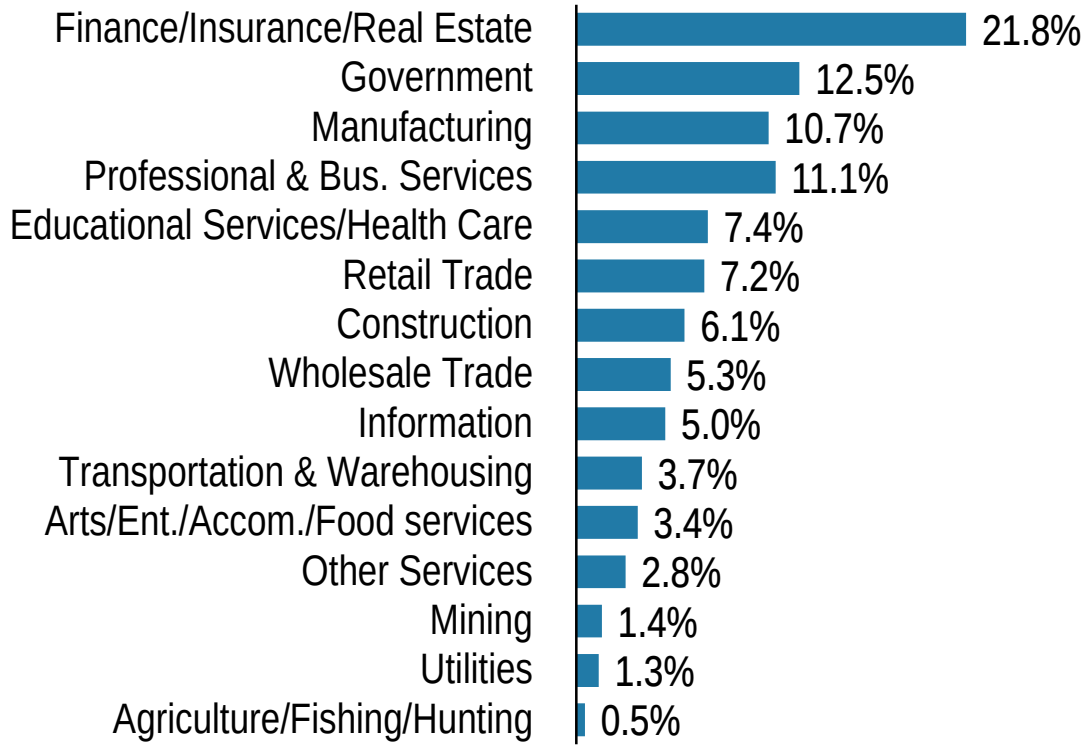




Source: US Bureau of Economic Analysis.

# Gross Domestic Product

## Utah

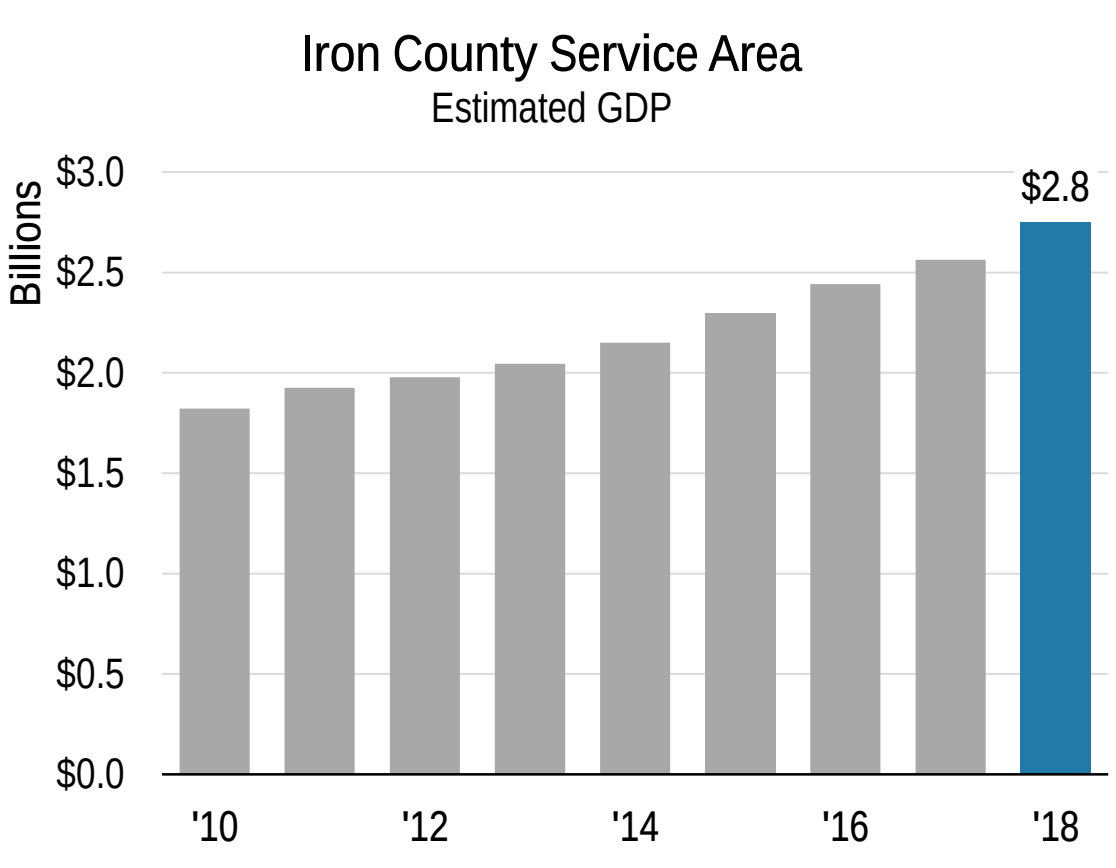


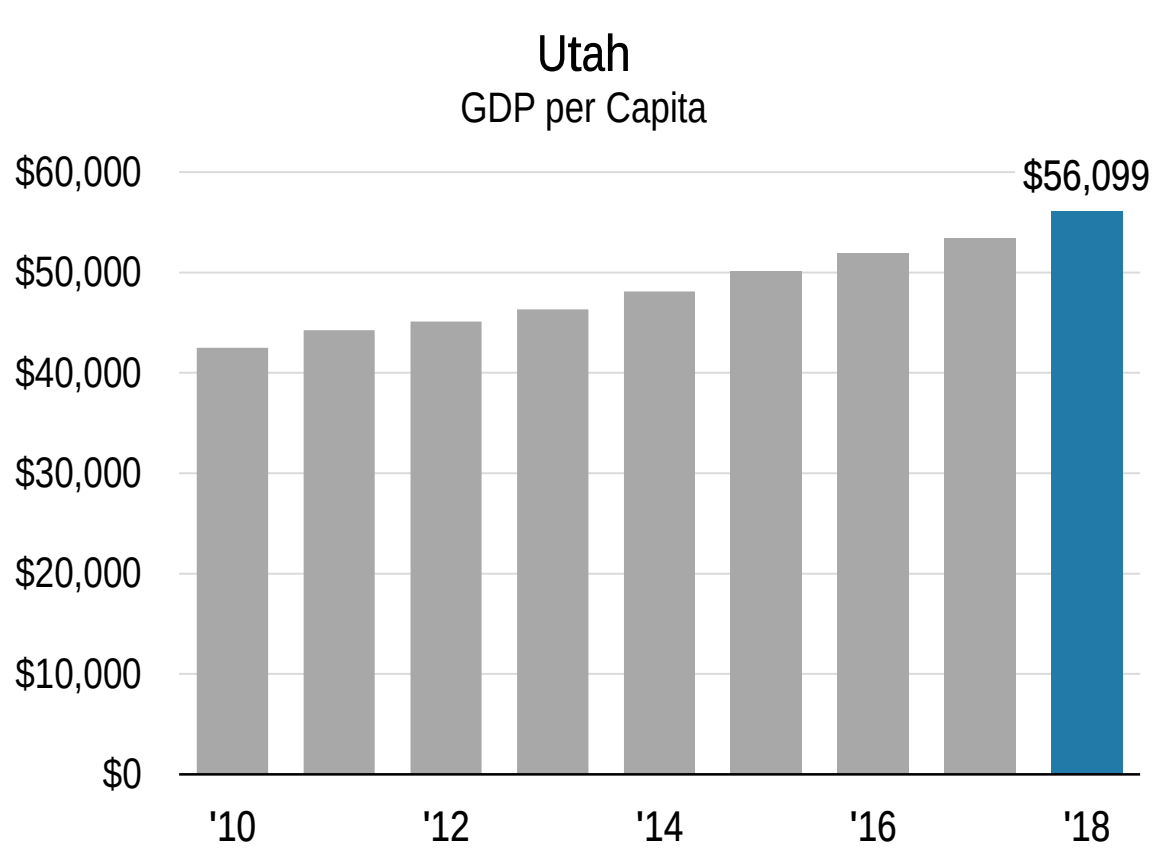




Source: US Bureau of Economic Analysis.

# Gross Domestic Product

## Estimate




Source: US Bureau of Economic Analysis (Iron County service area estimates assume consistent per-capita GDP and 92.7 percent population of Iron County).

# Groundwater Supply-Demand Balance

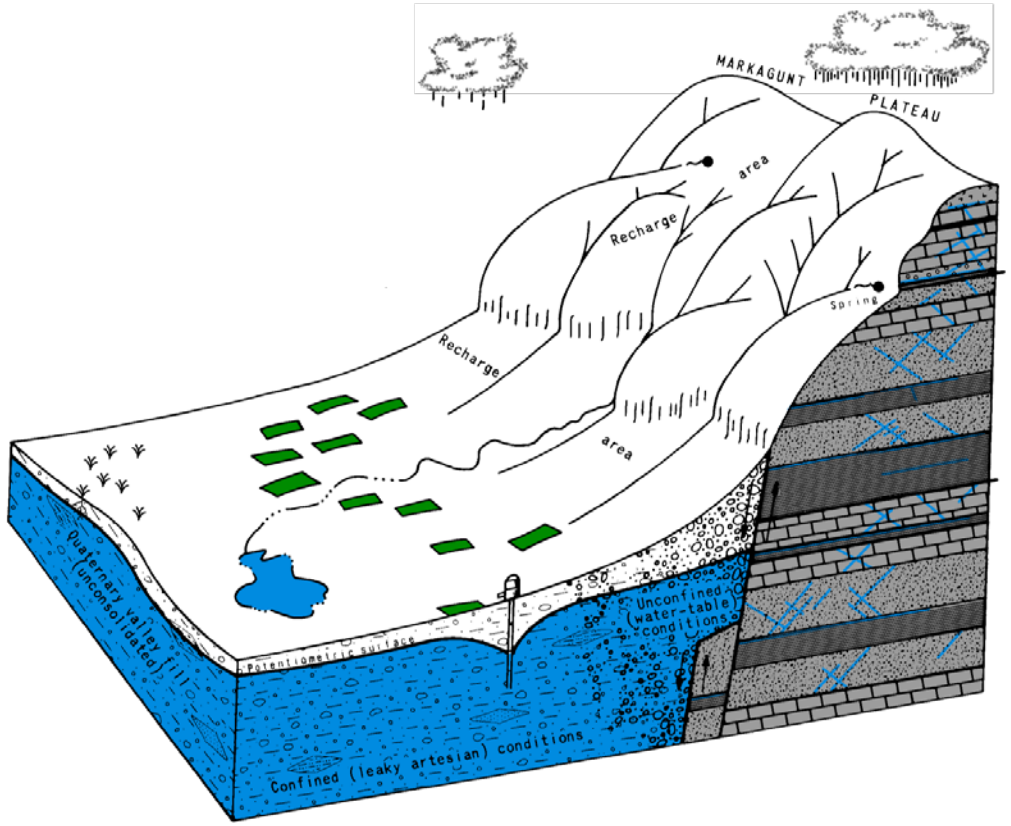
## Cedar Valley Basin

### Discharge (or Depletion or Use)

- Well pumping
- Subsurface outflow
- Evapotranspiration (evaporation and plant transpiration)
- Valley springs

### Recharge

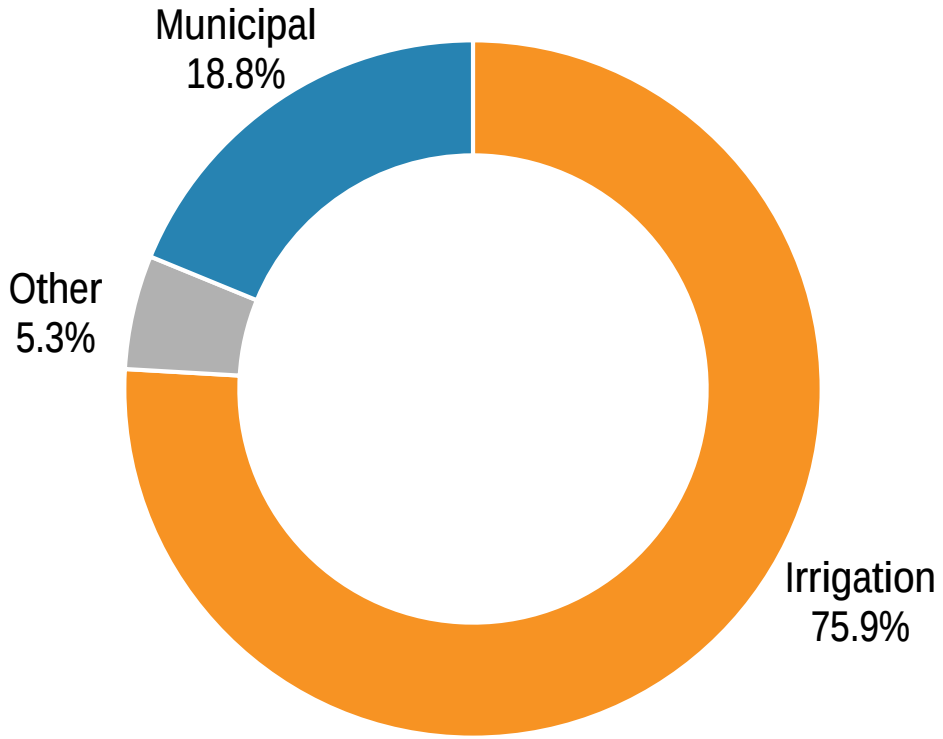
- Precipitation
- Seepage from irrigation
- Seepage from streams and canals
- Subsurface inflow




Source: Cedar Valley Water Users public meeting concerning the process for development a groundwater management plan for Cedar Valley in Iron County (January 7, 2016).

# Discharge/Depletion Sources

## Cedar Valley Basin

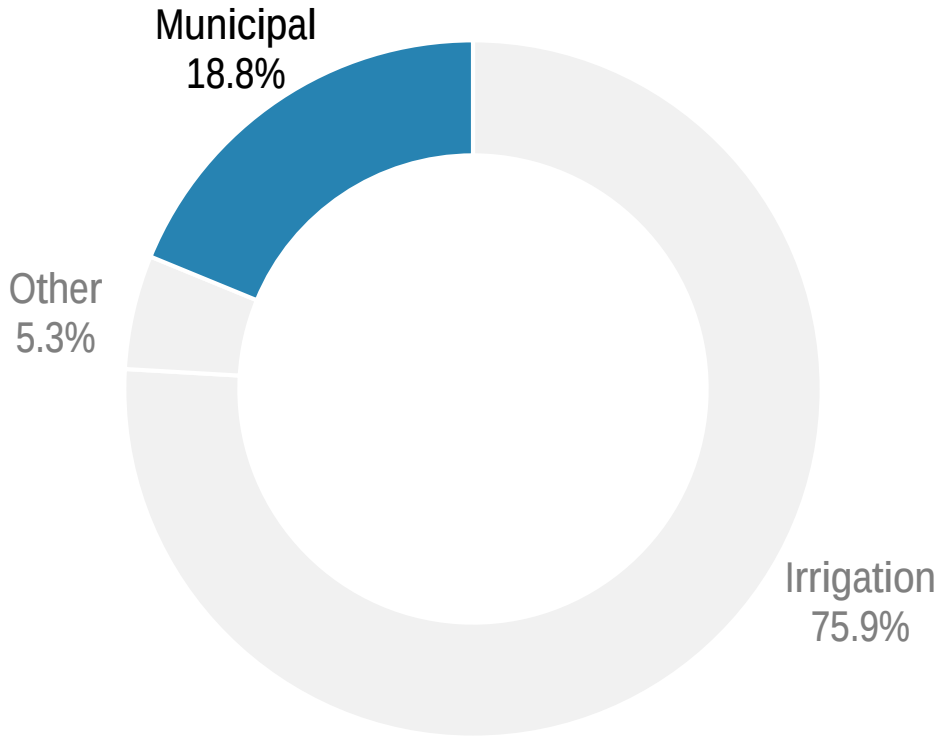



*"The majority (±95 percent) of water depletion is sourced to irrigation (agriculture) and municipal (non-agricultural) uses"*

Source: Cedar Valley Water Users public meeting concerning the process for development a groundwater management plan for Cedar Valley in Iron County (January 7, 2016).

# Discharge/Depletion Sources

## Cedar Valley Basin

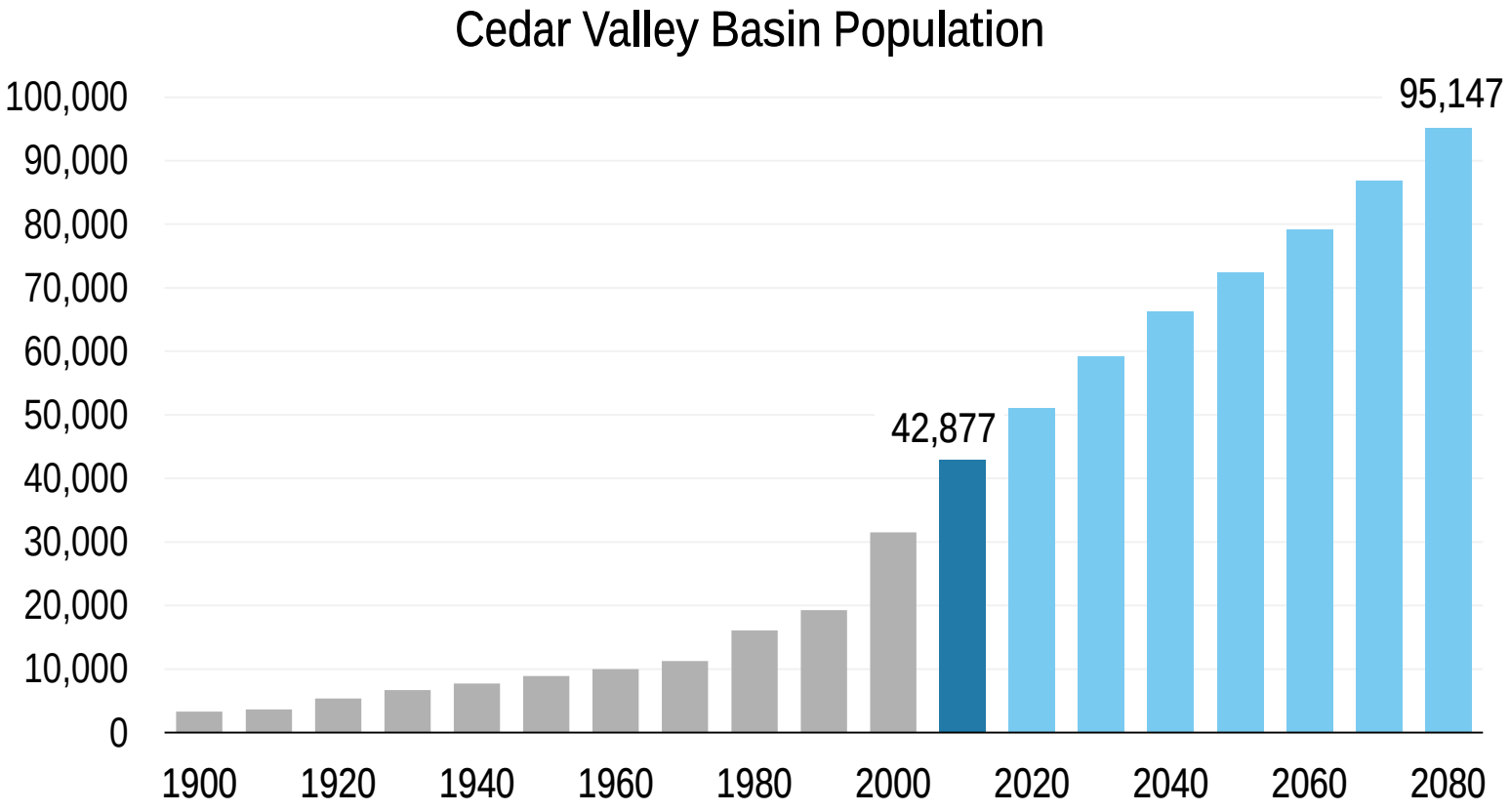



The following provides a demand projection for municipal water

Source: Cedar Valley Water Users public meeting concerning the process for development a groundwater management plan for Cedar Valley in Iron County (January 7, 2016).

# Non-Agriculture Use

## CICWCD Population Expectations



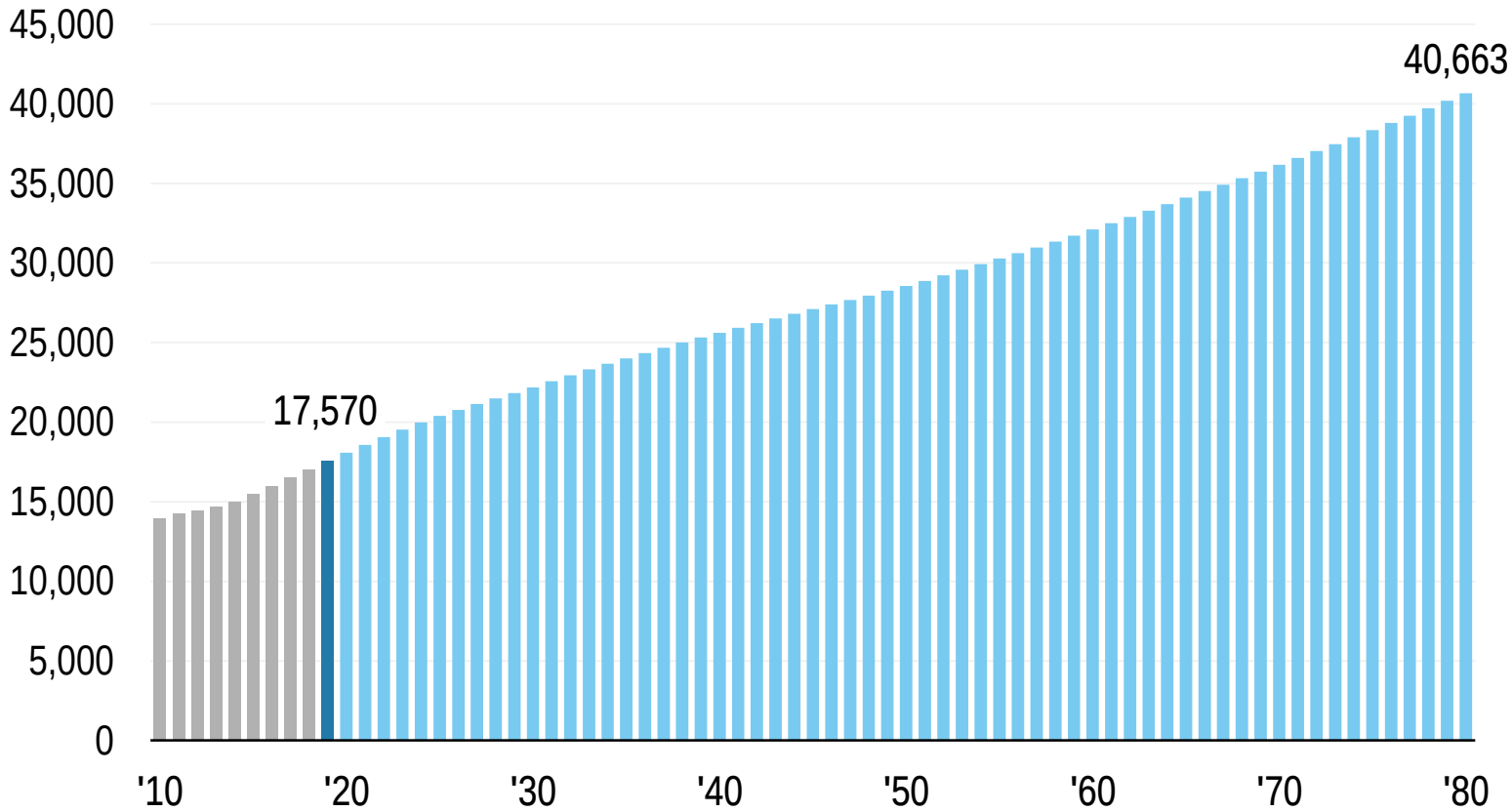

*"Projected population growth remains a key driver of potential water demand going forward"*

Source: US Census Bureau, Kem C. Gardner Policy Institute, Applied Analysis (CICWCD population based on approximately 92.7 percent of Iron County population).

# Non-Agriculture Use

## Household Expectations

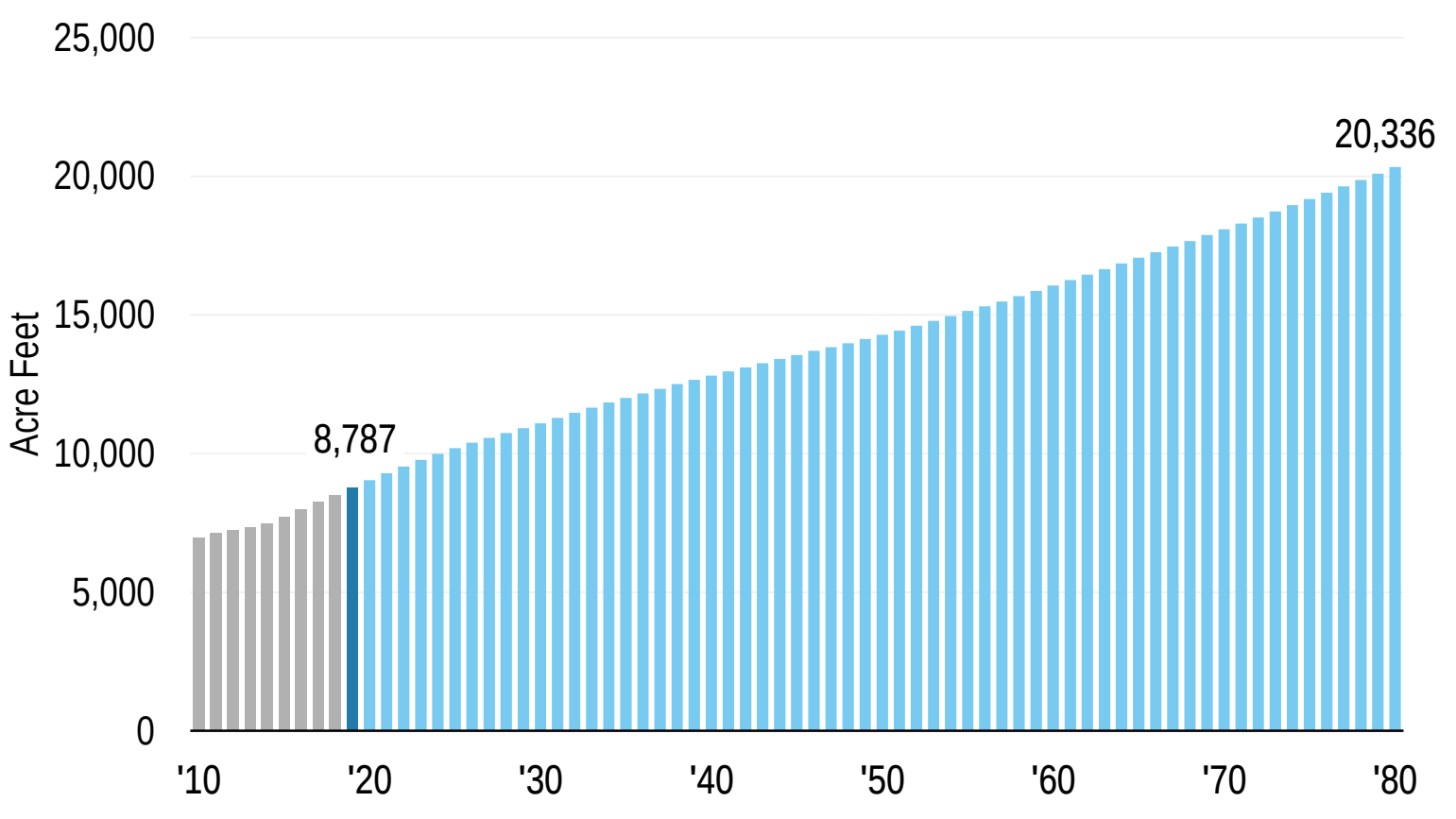
*"The number of households are expected to generally track with population growth and reach over 40,600 in 2080, more than double the current amount"*




Source: US Census Bureau, Kem C. Gardner Policy Institute, Applied Analysis (CICWCD population based on approximately 92.7 percent of Iron County population).

# Non-Agriculture Use

## Water Demand Estimates: No Conservation

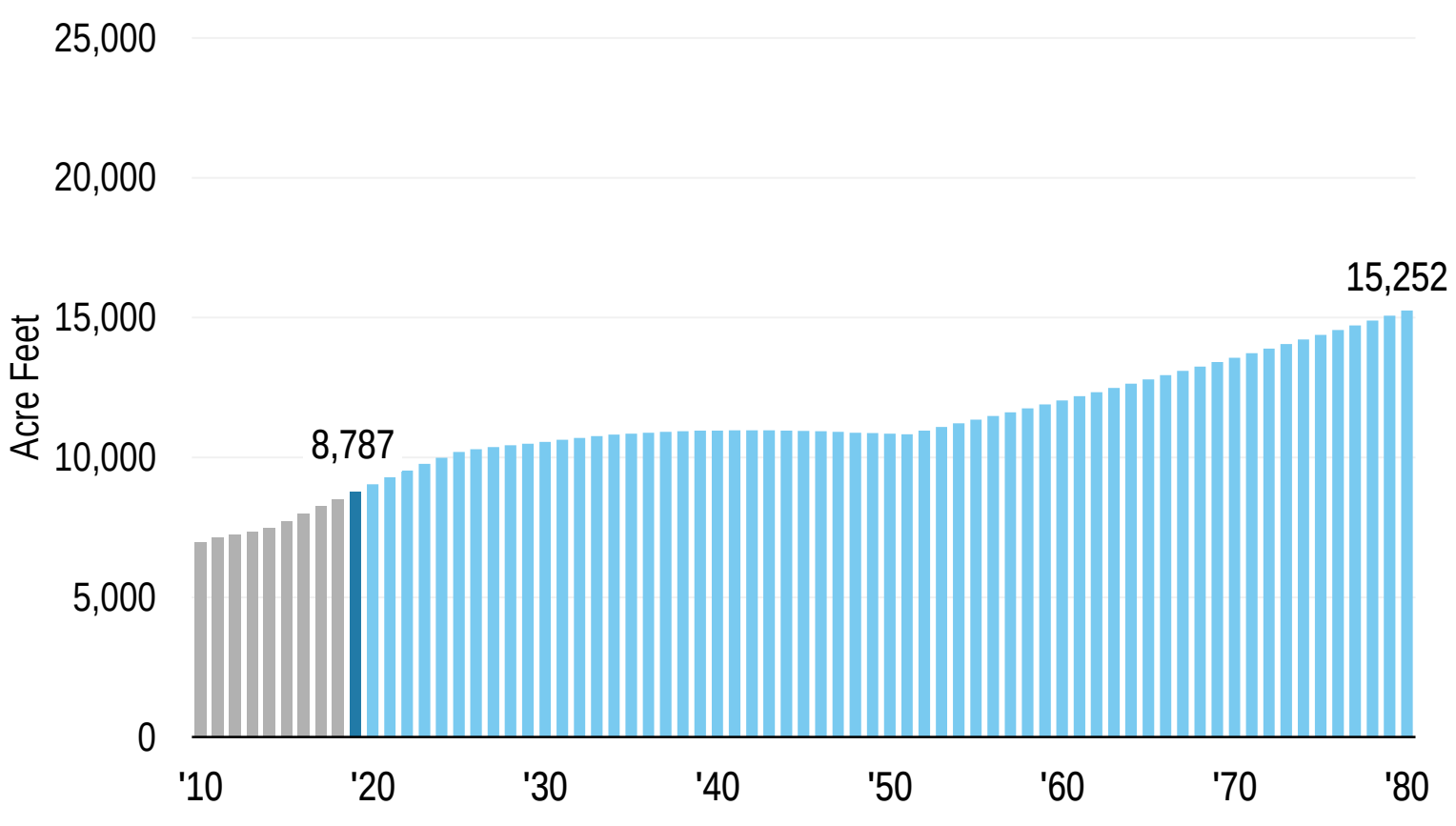



*"Assuming no additional conservation measures, non-agriculture use is expected to reach over 20,000 acre feet in 2080"*

Source: US Census, Kem C. Gardner Policy Institute, Applied Analysis, Ensign Engineering (assumes two households per acre foot).

# Non-Agriculture Use

## Water Demand Estimates: 25% Conservation

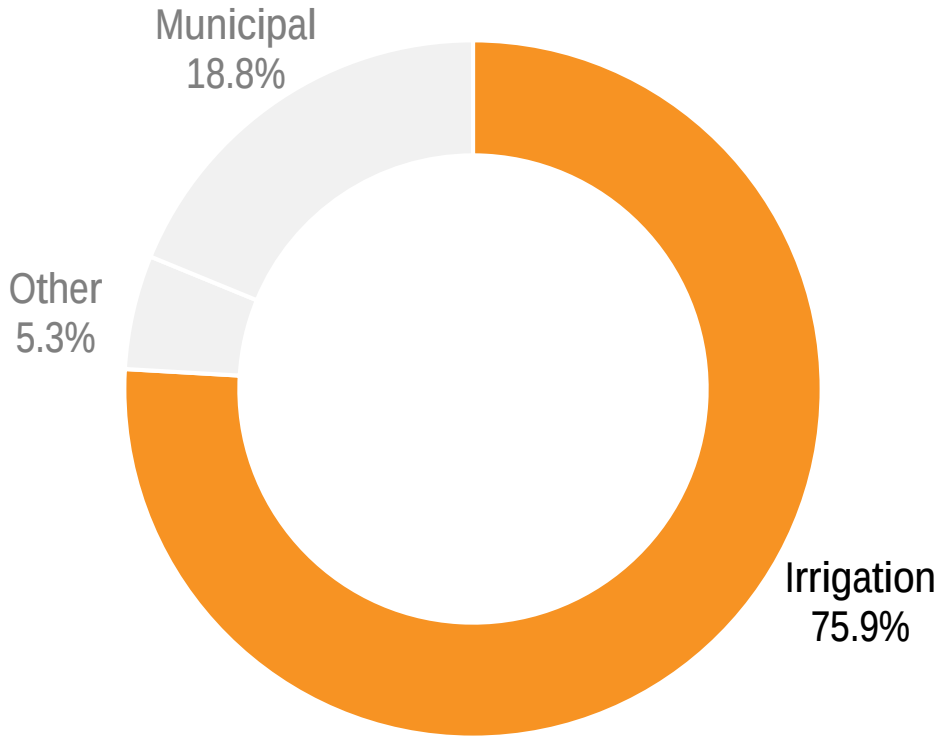



*"With additional conservation measures, water demand is expected to eclipse 15,000 acre feet in 2080"*

Source: US Census, Kem C. Gardner Policy Institute, Applied Analysis, Ensign Engineering (assumes two households per acre foot and 25-percent conservation from 2025 to 2050).

# Discharge/Depletion Sources

## Cedar Valley Basin



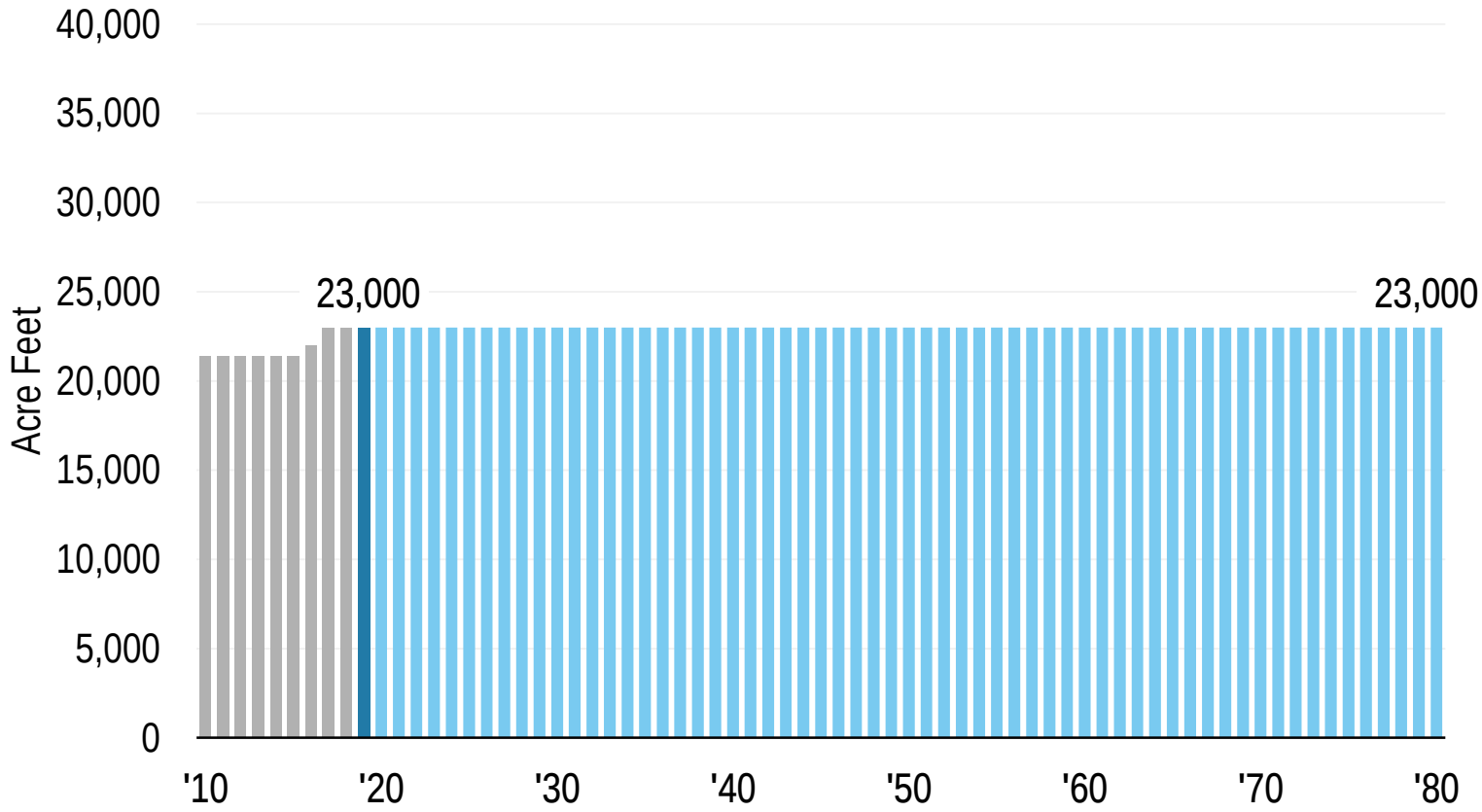

The following provides a range of demand projection scenarios for agricultural purposes, which currently account for approximately three quarters of all uses

Source: Cedar Valley Water Users public meeting concerning the process for development a groundwater management plan for Cedar Valley in Iron County (January 7, 2016).

# Agriculture Use

## Water Demand Estimates: Status Quo

*"Assuming no conversion and overall use holds stable, approximately 23,000 acre feet of water will be demanded for agricultural use"*

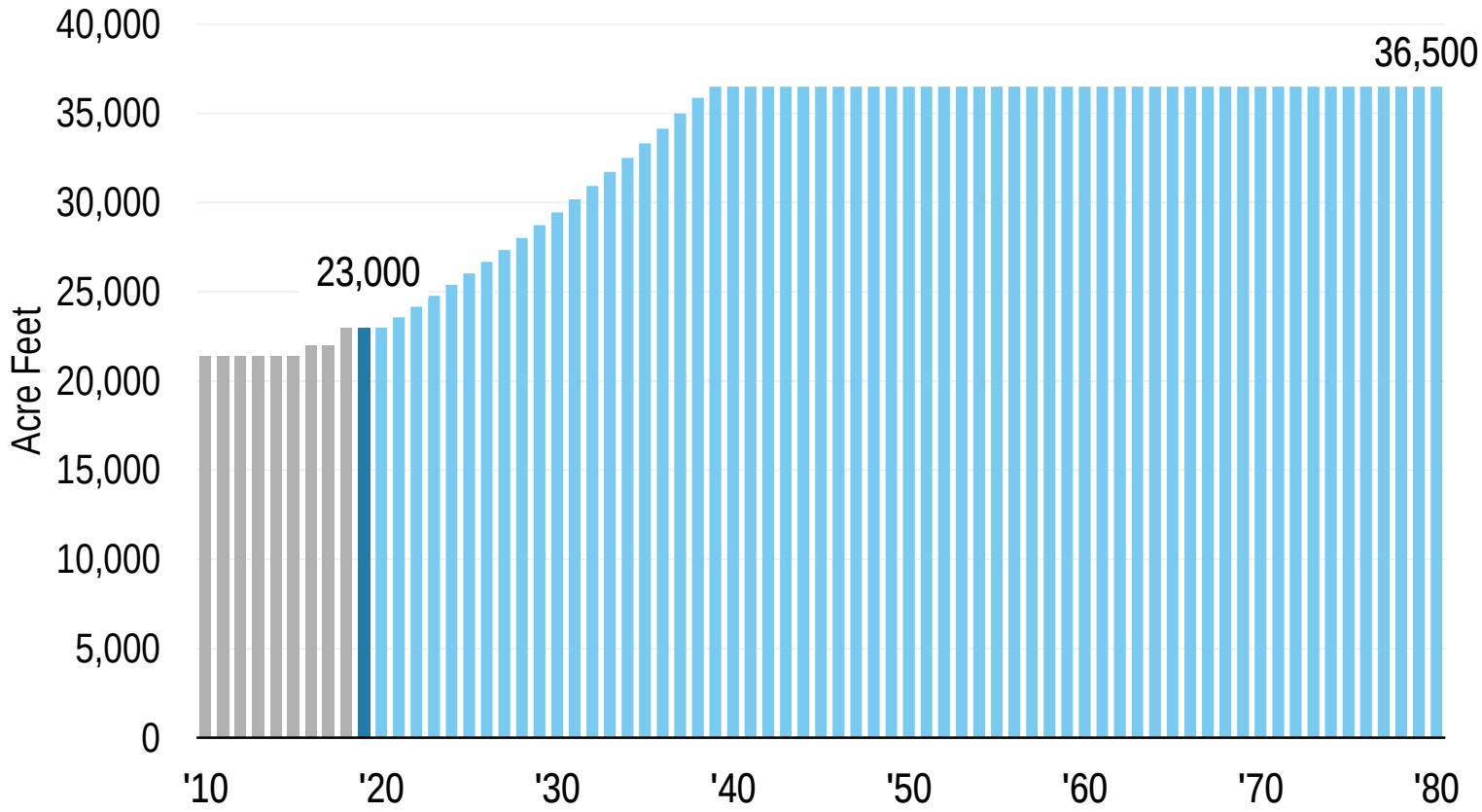



Source: Applied Analysis, Ensign Engineering.

# Agriculture Use

## Water Demand Estimates: Full Water Right Utilization, No Conversion to Non-Agricultural Uses

*"Assuming water rights owners' water use continues to increase to full water right utilization, demand reaches 36,500 by approximately 2038"*

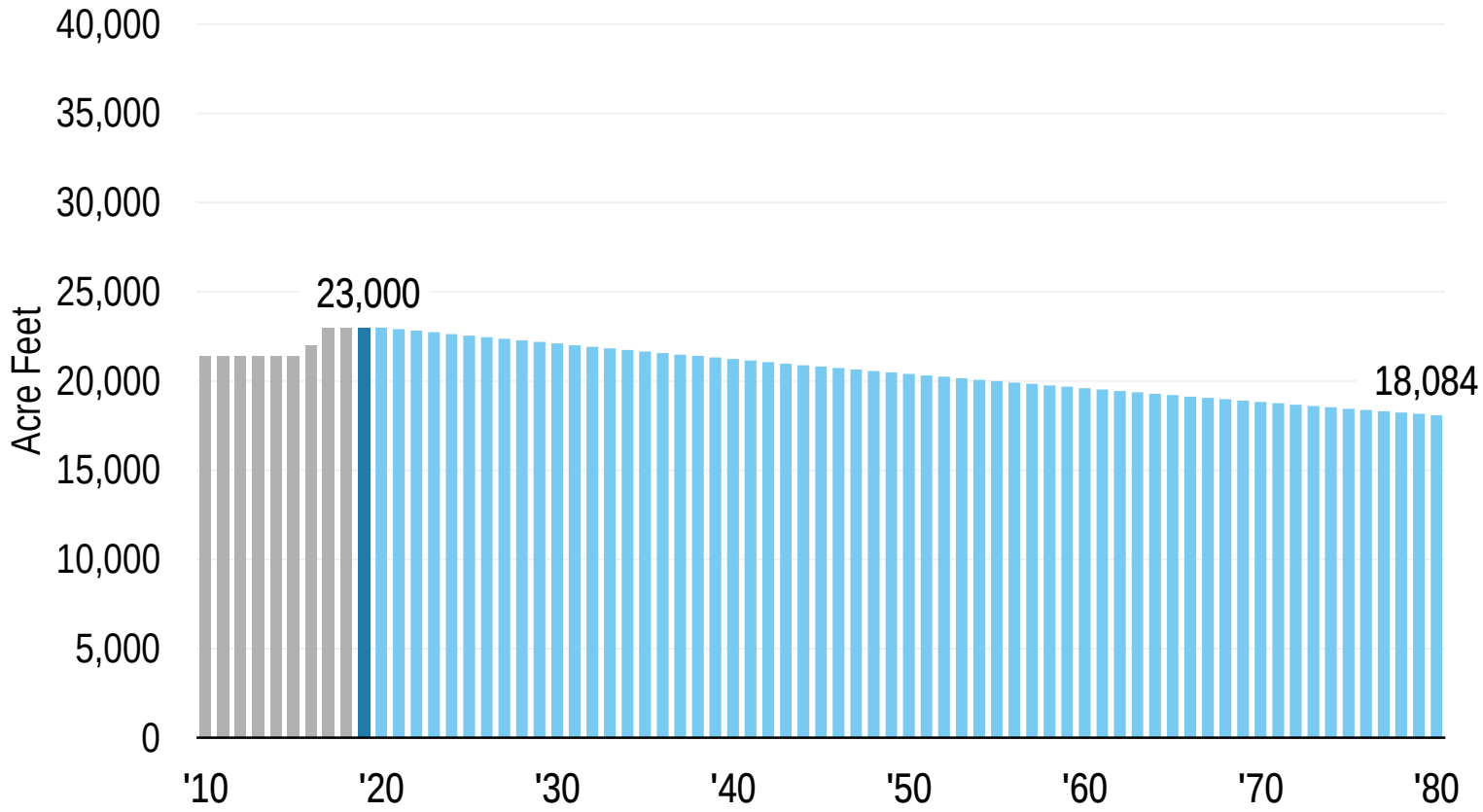



Source: Applied Analysis, Ensign Engineering.

# Agriculture Use

## Water Demand Estimates: With Conversion to Non-Agricultural Uses

*"Assuming conversion of agricultural uses at a rate of 0.4 percent annually, demand is expected to decline at a modest rate to roughly 18,000 acre feet in 2080"*

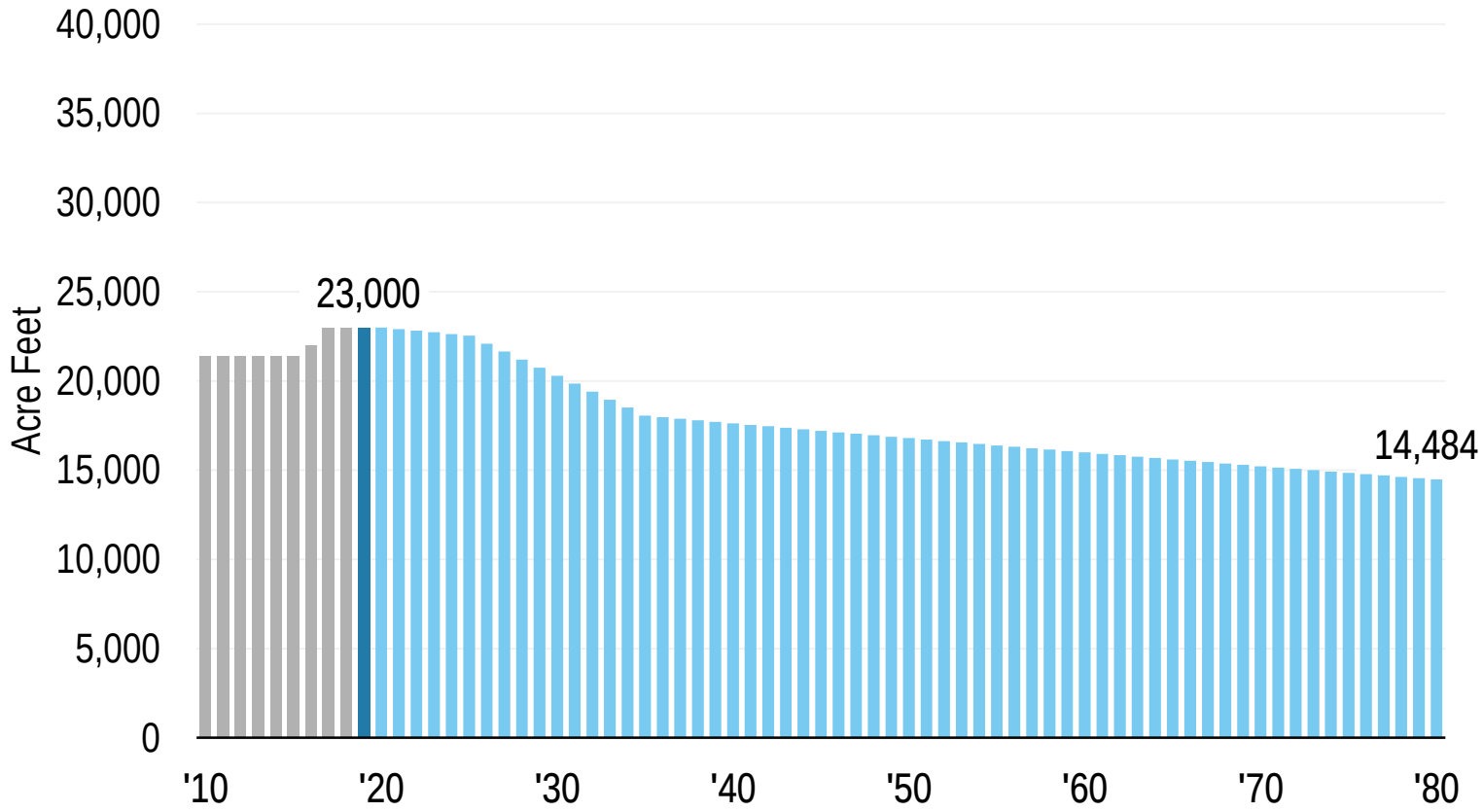



Source: Applied Analysis, Ensign Engineering

# Agriculture Use

## Water Demand Estimates: With Conversion to Non-Agricultural Uses, LESA Irrigation Conversion

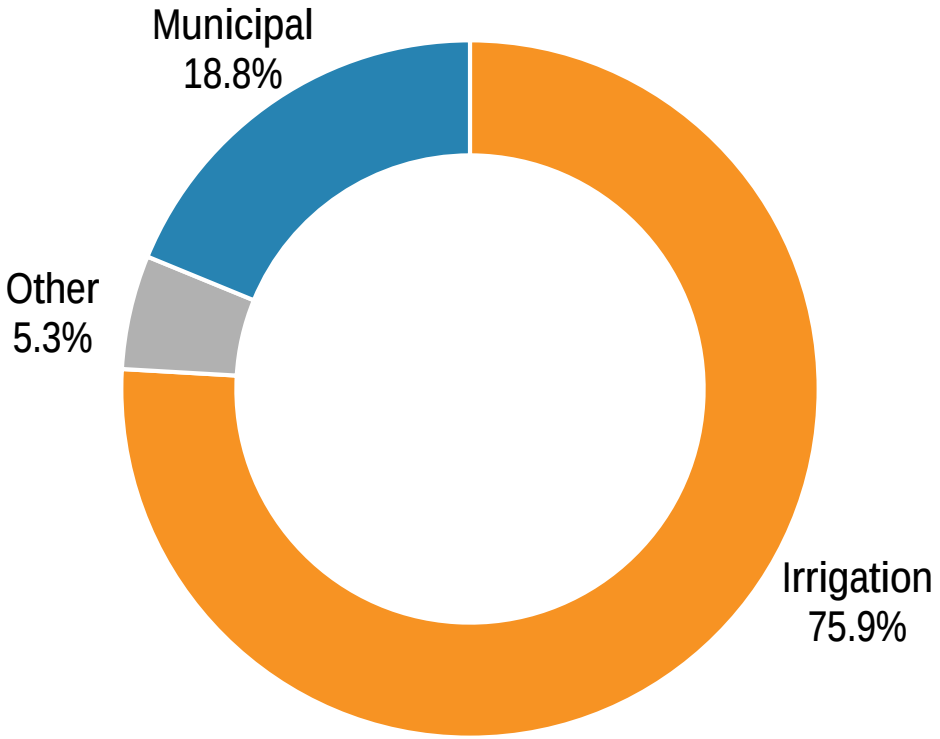
*"After implementing LESA pivot irrigation over 8,000 acres of farm land, demand is expected to decline to below 15,000 acre feet in 2080"*




Source: Applied Analysis, Ensign Engineering.

# Discharge/Depletion Sources

## Cedar Valley Basin

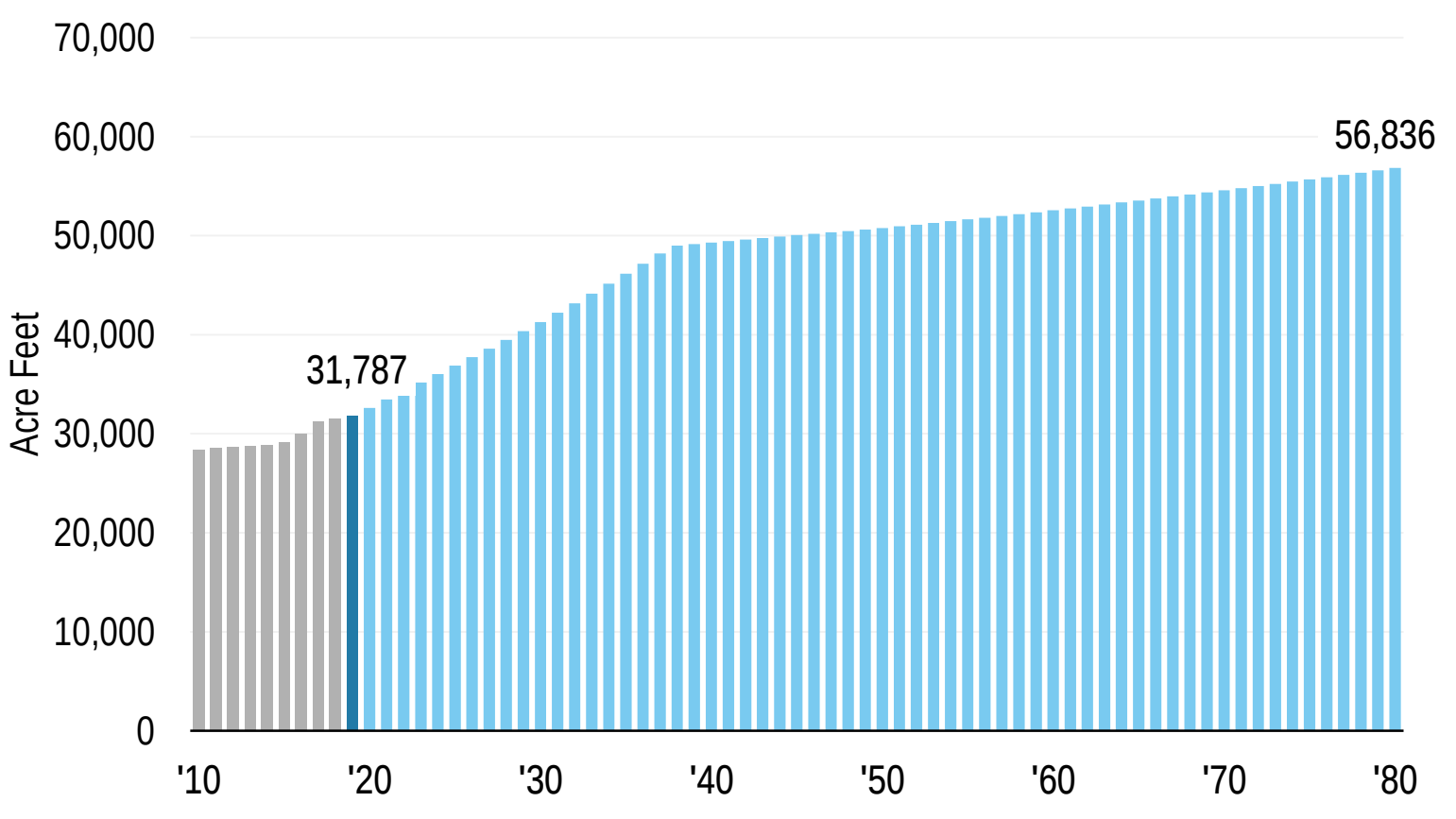



*"The majority (±95 percent) of water depletion is sourced to irrigation (agriculture) and municipal (non-agricultural) uses"*

Source: Cedar Valley Water Users public meeting concerning the process for development a groundwater management plan for Cedar Valley in Iron County (January 7, 2016).

# All Water Use

## Water Demand Estimates: No Additional Municipal Conservation, Full Ag Water Right Utilization

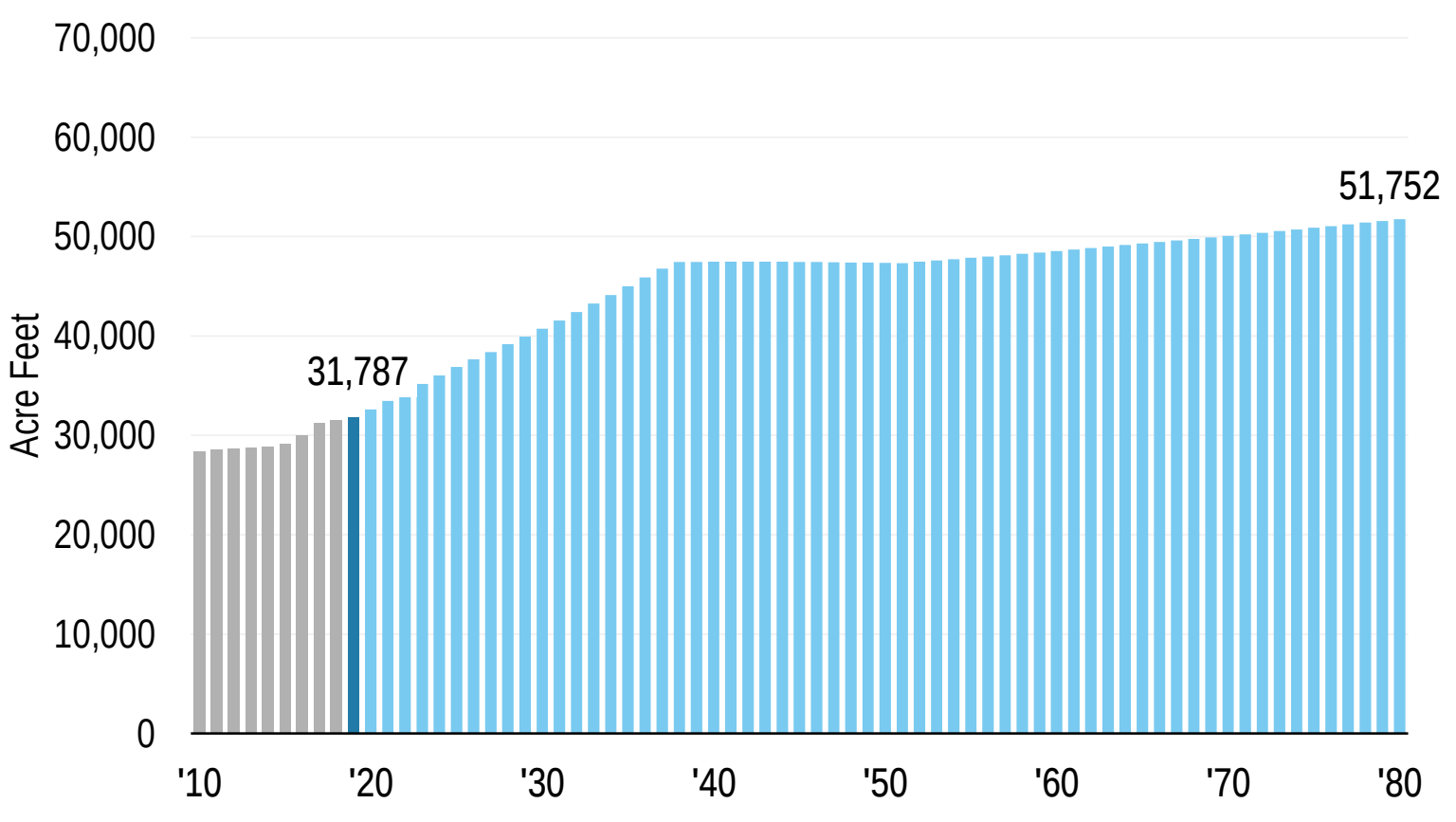



*"With no additional conservation efforts and full water right utilization, total water demand will equate to nearly 57,000 acre feet in 2080"*

Source: US Census Bureau, Kem C. Gardner Policy Institute, Applied Analysis, Ensign Engineering (assumes two households per acre foot).

# All Water Use

## Water Demand Estimates: 25% Municipal Conservation, Full Agricultural Water Right Utilization

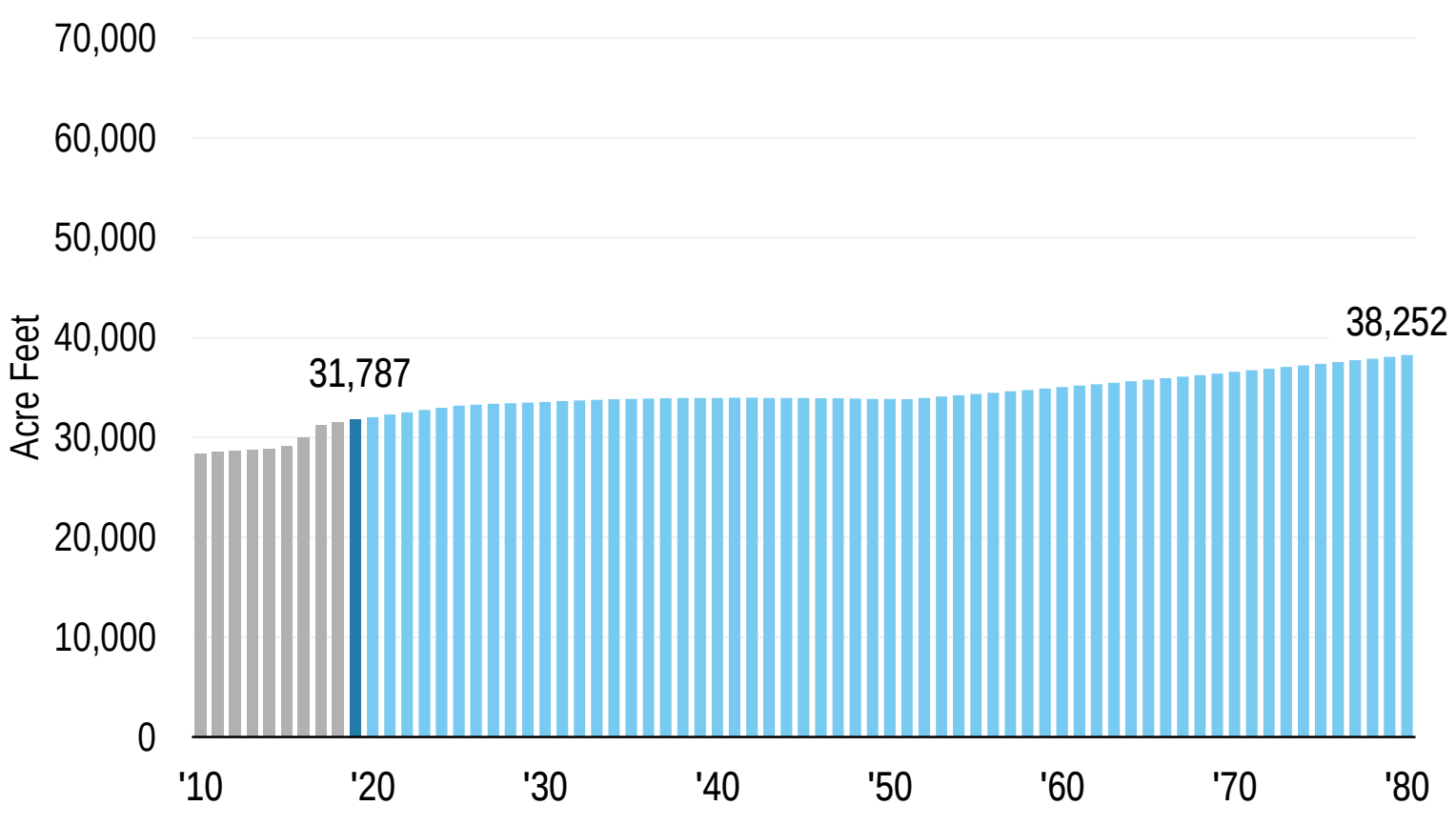



*"With a 25 percent conservation effort from 2025 to 2050 and full water right utilization, total water demand equates to nearly 52,000 acre feet in 2080"*

Source: US Census, Kem C. Gardner Policy Institute, Applied Analysis, Ensign Engineering (assumes two households per acre foot and 25-percent conservation from 2025 to 2050).

# All Water Use

## Water Demand Estimates: 25% Municipal Conservation, Status Quo Agricultural Use

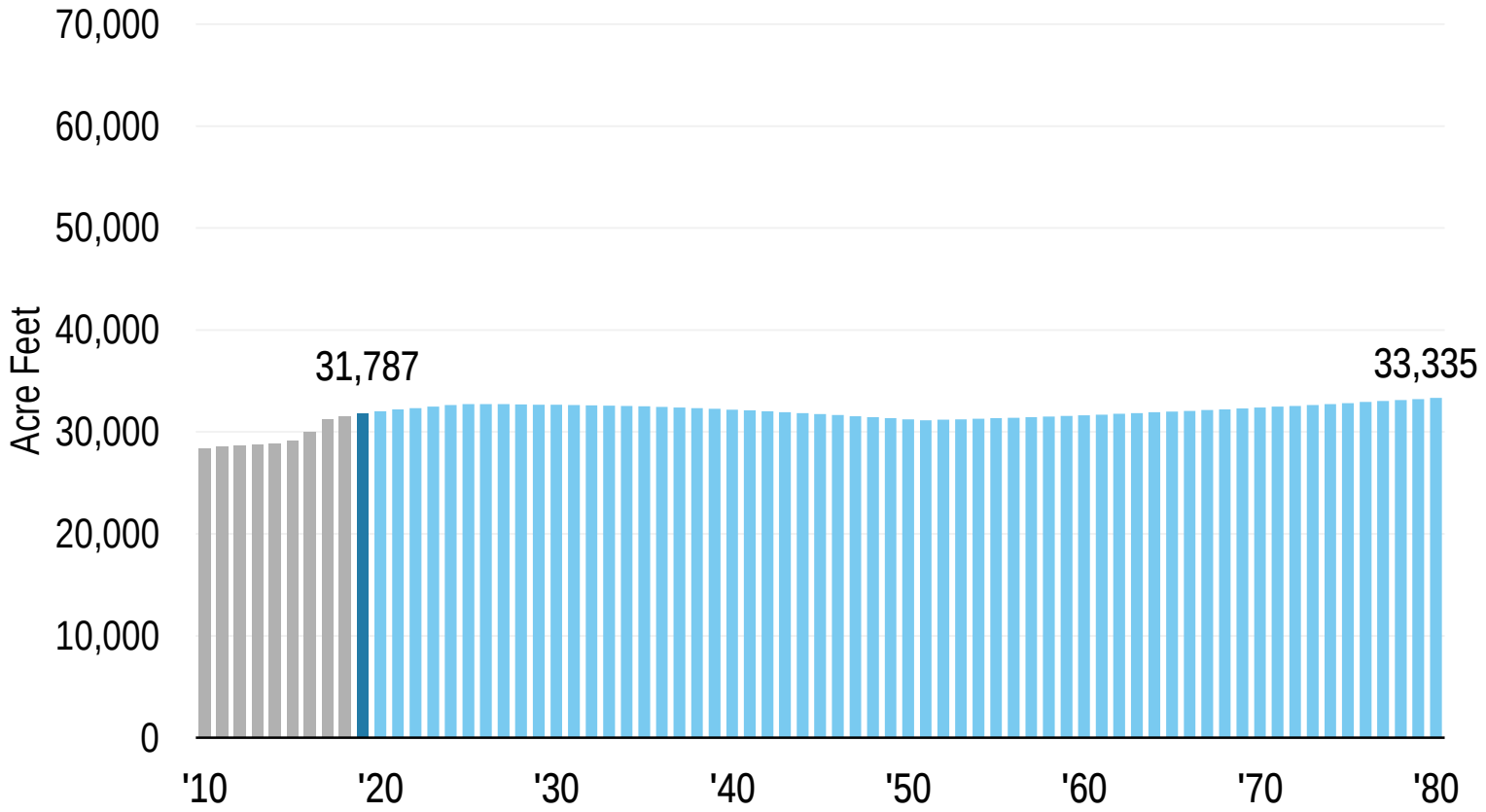



*"With a 25 percent conservation effort from 2025 to 2050 and stable (status quo) agriculture use, total water demand equates to over 38,000 acre feet in 2080"*

Source: US Census, Kem C. Gardner Policy Institute, Applied Analysis, Ensign Engineering (assumes two households per acre foot and 25-percent conservation from 2025 to 2050).

# All Water Use

## Water Demand Estimates: 25% Municipal Conservation, Conversion to Non-Agricultural Uses

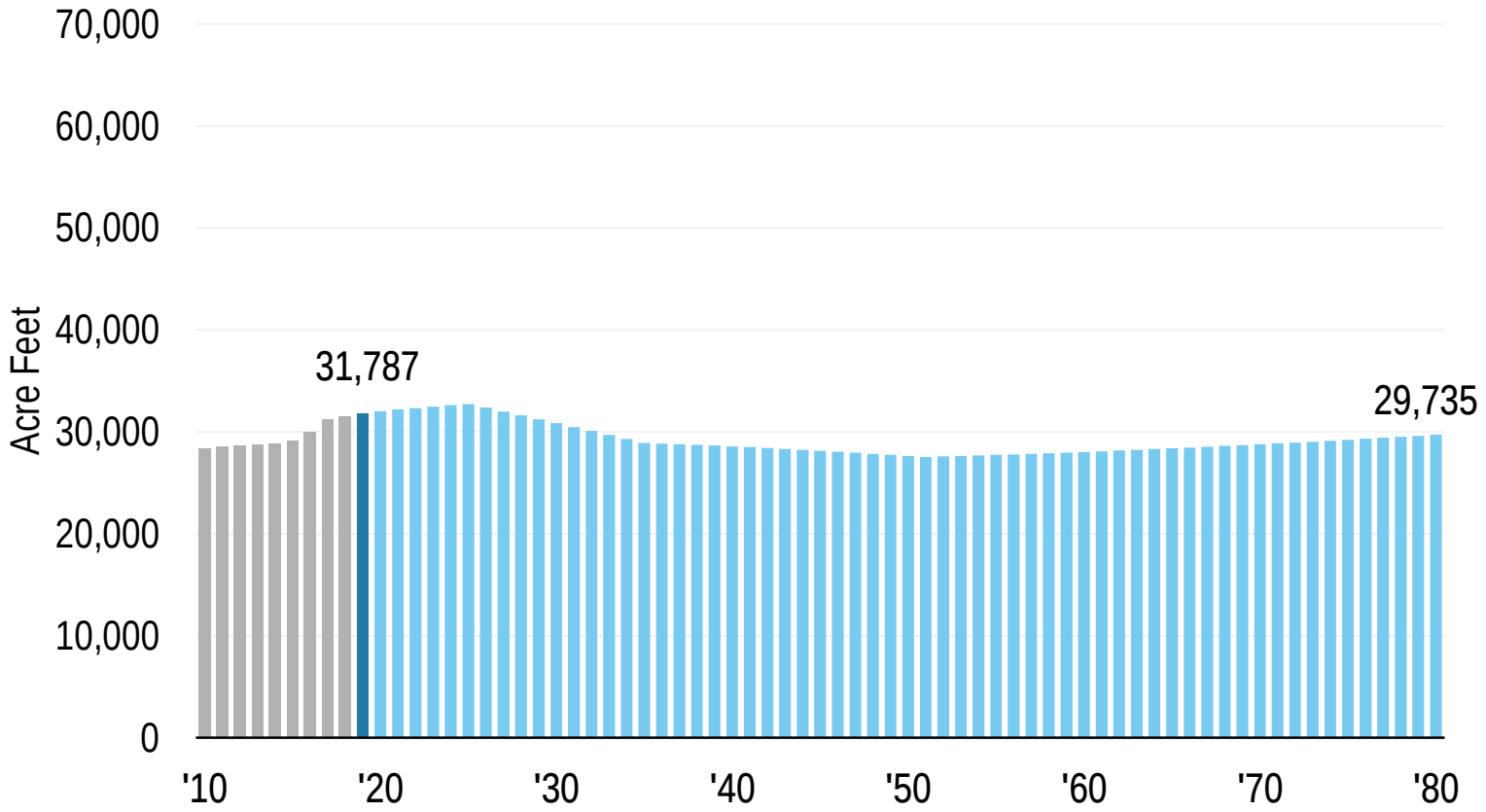



*"With a 25 percent conservation effort from 2025 to 2050 and the conversion of agriculture use, total water demand equates to over 33,000 acre feet in 2080"*

Source: US Census, Kem C. Gardner Policy Institute, Applied Analysis, Ensign Engineering (assumes two households per acre foot and 25-percent conservation from 2025 to 2050).

# All Water Use

## Water Demand Estimates: 25% Municipal Conservation, Conversion to Non-Ag Uses and LESA Irrigation Conversion




*"With a 25 percent conservation effort from 2025 to 2050, and the conversion of agriculture use combined with LESA irrigation conversion, total water demand will fall modestly to under 30,000 acre feet in 2080"*

Source: US Census, Kem C. Gardner Policy Institute, Applied Analysis, Ensign Engineering (assumes two households per acre foot and 25-percent conservation from 2025 to 2050).

# Groundwater Supply-Demand Balance

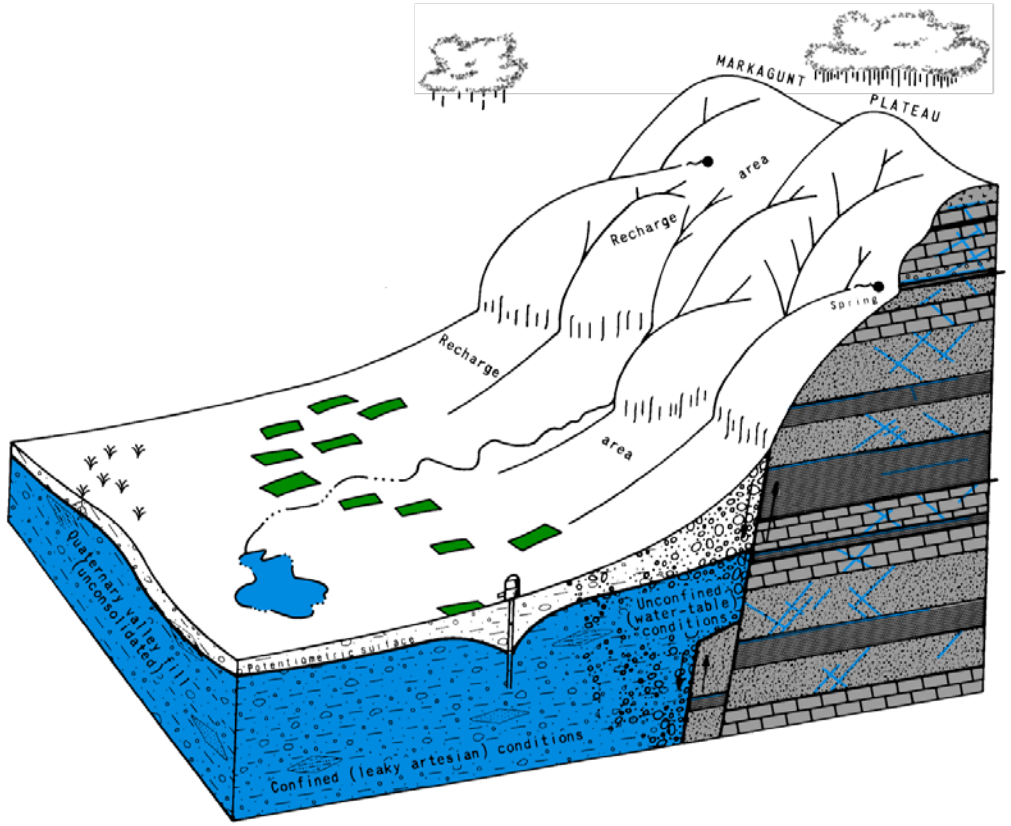
## Cedar Valley Basin

### Discharge (or Depletion or Use)

- Well pumping
- Subsurface outflow
- Evapotranspiration (evaporation and plant transpiration)
- Valley springs

### Recharge

- Precipitation
- Seepage from irrigation
- Seepage from streams and canals
- Subsurface inflow




Source: Cedar Valley Water Users public meeting concerning the process for development a groundwater management plan for Cedar Valley in Iron County (January 7, 2016).

# Supply/Recharge Sources

## Cedar Valley Basin

Quantifying the amount of recharge in the region is a difficult exercise. Based on a number of scientific analyses and studies, the Utah Division of Water Rights ("UDWR") noted four estimates:

- Flow Budget 32,000 Acre Feet
- Groundwater Model 24,000 Acre Feet
- Chloride Mass Model 21,000 Acre Feet
- Storage Change (15-year Analysis) 20,000 Acre Feet

UDWR concluded the amount of recharge is estimated between 20,000 and 24,000 acre feet annually.

The Utah State Engineer estimates the sustainable safe yield is approximately 21,000 acre feet.

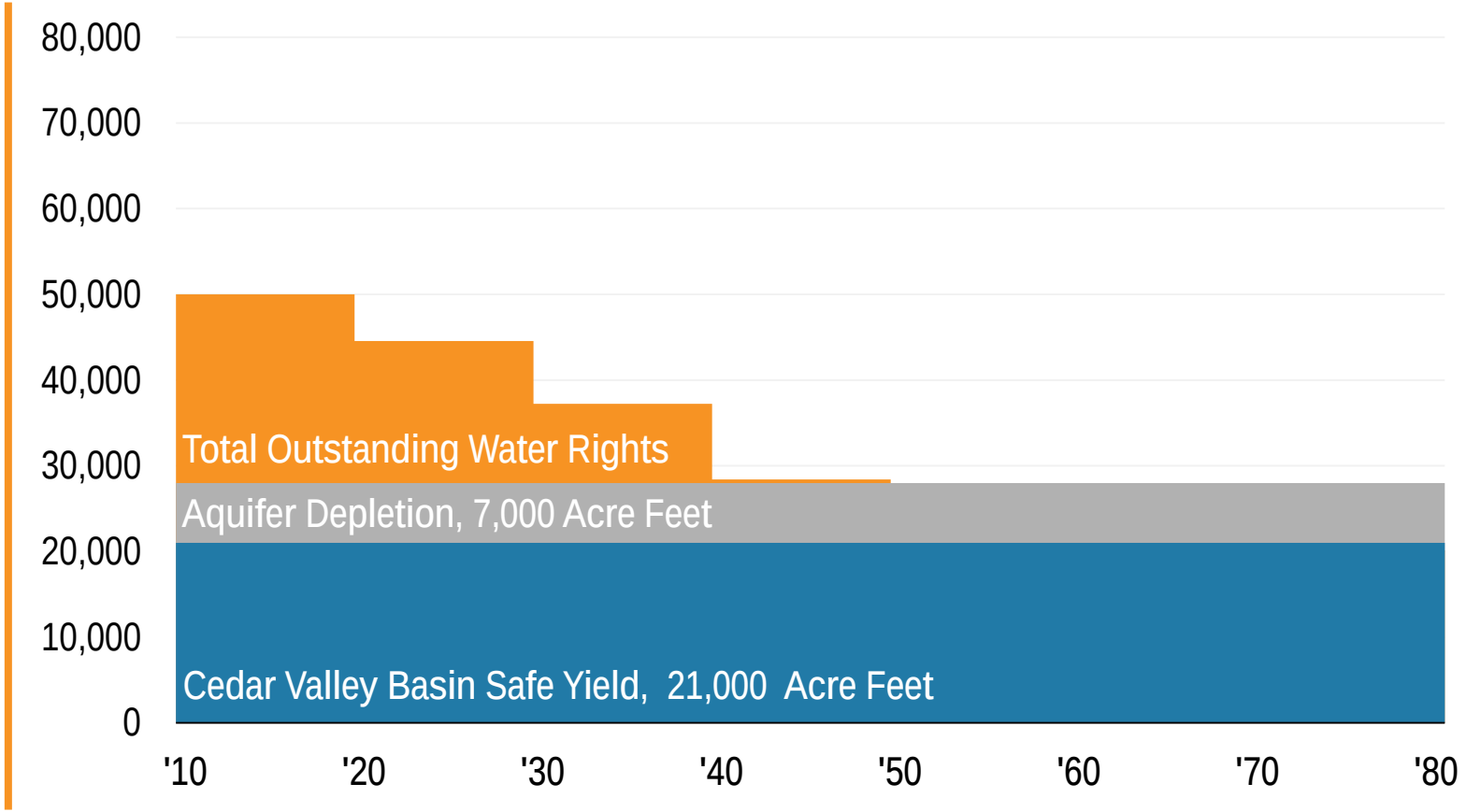
Currently, approximately 50,000 acre feet of water rights in the Cedar Valley Basin

Source: Cedar Valley Water Users public meeting concerning the process for development a groundwater management plan for Cedar Valley in Iron County (December 8, 2016); Ensign Engineering.

# Supply/Recharge Sources

## Cedar Valley Basin: State Engineer Water Rights Reduction Plan

*"In February 2019, the State Engineer proposed a plan to reduce water rights in the Cedar Valley Basin to match the safe yield of 21,000 acre feet. The CICWCD groundwater management plan committee submitted an alternative timeline"*

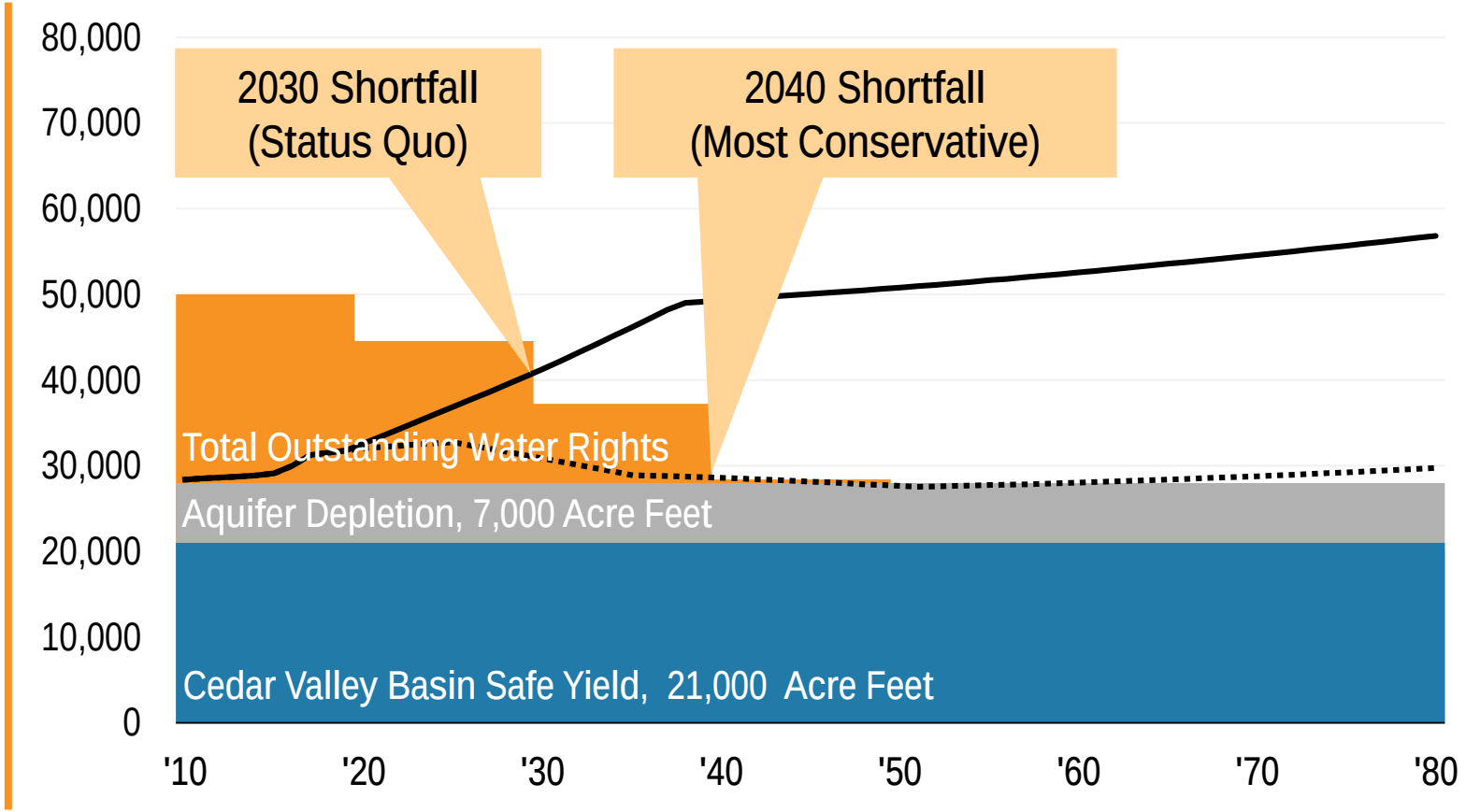



Source: Applied Analysis, Ensign Engineering (assumes two households per acre foot and 25-percent conservation from 2025 to 2050).

# Supply/Recharge Sources

## Cedar Valley Basin: State Engineer Water Rights Reduction Plan

*"Considering timing of the State Engineer's proposed water rights reduction plan for the Cedar Valley Basin, projected demand indicates a shortfall relative to supply by 2030 or 2040 under two scenarios"*

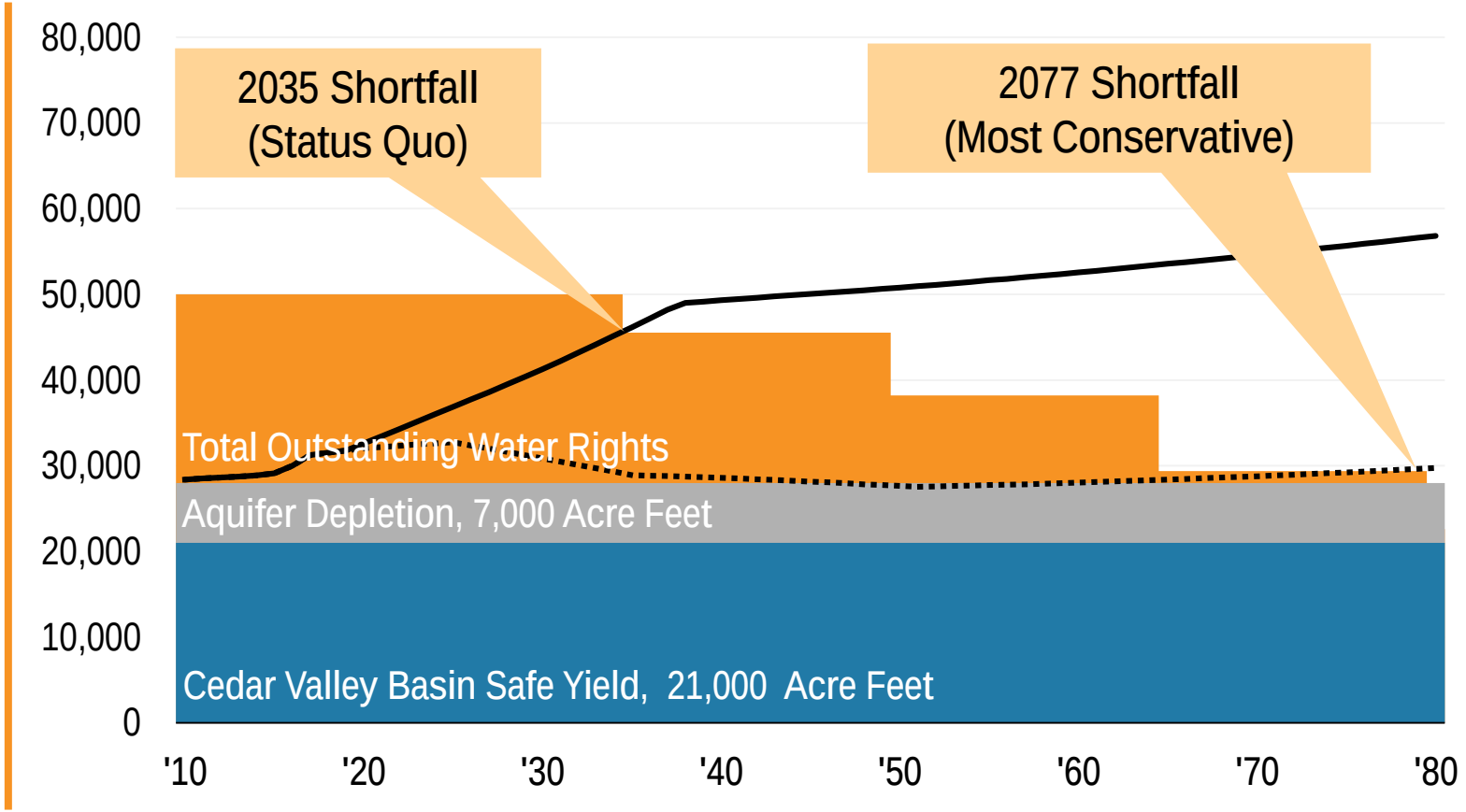



Source: Applied Analysis, Ensign Engineering (assumes two households per acre foot, 25-percent conservation from 2025 to 2050, 0.4% ag conversion to municipal use, and LESA irrigation conversion).

# Supply/Recharge Sources

## Cedar Valley Basin: CICWCD Committee's Response to State Engineer

*"Considering timing of the CICWCD Committee's proposed water rights reduction plan for the Cedar Valley Basin, projected demand indicates a shortfall relative to supply by 2035 or 2077 under two scenarios"*




Source: Applied Analysis, Ensign Engineering (assumes two households per acre foot, 25-percent conservation from 2025 to 2050, 0.4% ag conversion to municipal use, and LESA irrigation conversion).

# Supply/Demand Balance

## Cedar Valley Basin

### Discharge (or Depletion or Use)

- Well pumping
- Subsurface outflow
- Evapotranspiration (evaporation and plant transpiration)
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### Recharge

- Precipitation
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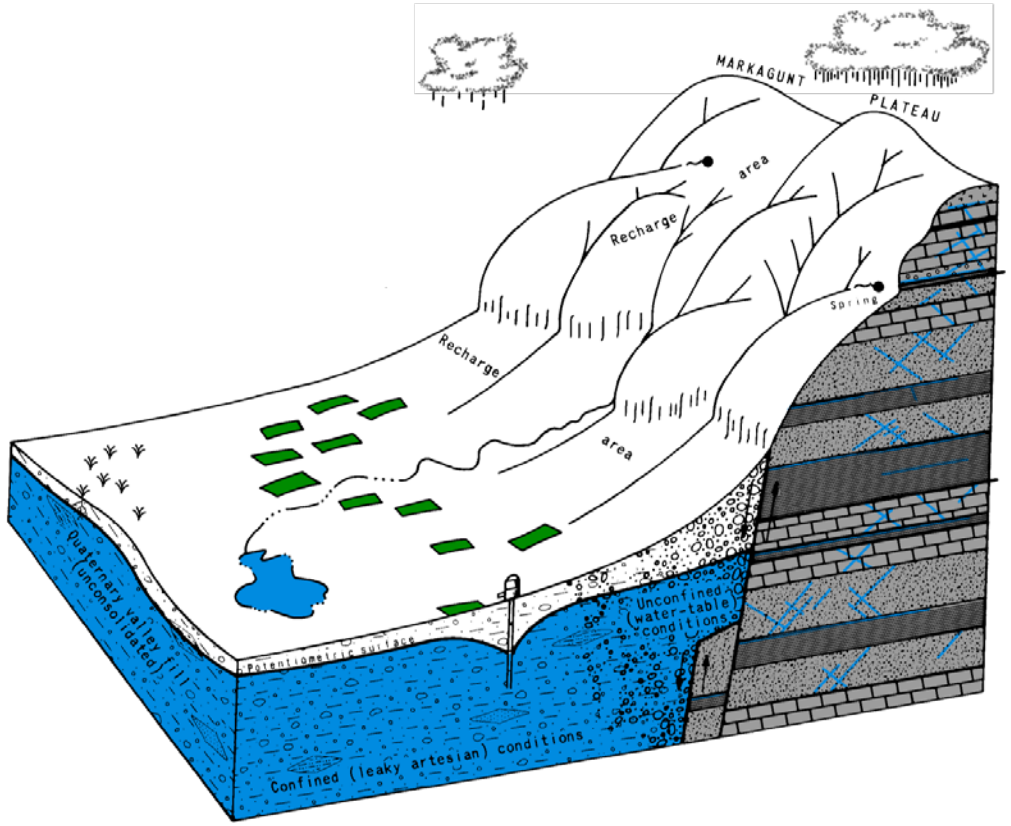



Source: Cedar Valley Water Users public meeting concerning the process for development a groundwater management plan for Cedar Valley in Iron County (January 7, 2016).

# Supply/Demand Balance

## Putting it in Perspective

Recharge: +21,000 Acre Feet

- Precipitation
- Seepage from irrigation
- Seepage from streams and canals
- Subsurface inflow

Discharge/Depletion: -28,000 Acre Feet

- Well pumping
- Subsurface outflow
- Evapotranspiration (evaporation and plant transpiration)
- Valley springs

Net Loss: -7,000 Acre Feet per Year

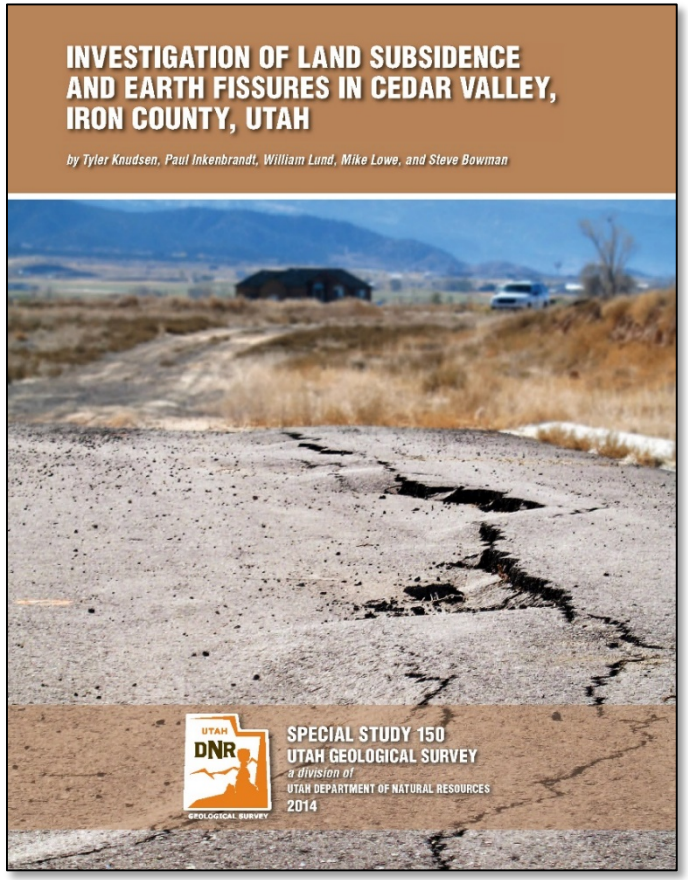
# Supply/Demand Balance

## Putting it in Perspective

*"The reality of the situation is that more water is being used than is being captured, and that cannot continue into perpetuity. While water may continue to pour from residents' faucets, other potential issues are concerning, including subsidence and fissures."*

# Supply/Demand Balance

## Utah Geological Survey Conclusions




In 2009, a 2.5-mile fault line was identified in Enoch, sourced to subsidence.

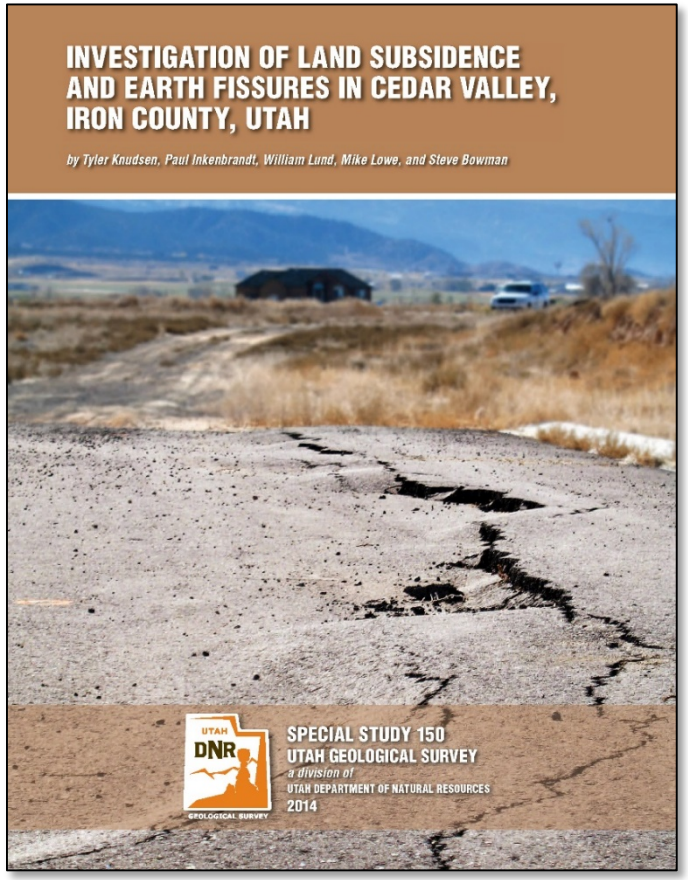
A total of 8.3 miles of earth fissures have formed the southwest and northeaster portions of Cedar Valley.

The Utah Geological Survey ("UGS") concluded the following:

Source: Utah Department of Natural Resources, Special Study 150, Utah Geological Survey.

# Supply/Demand Balance

## Utah Geological Survey Conclusions

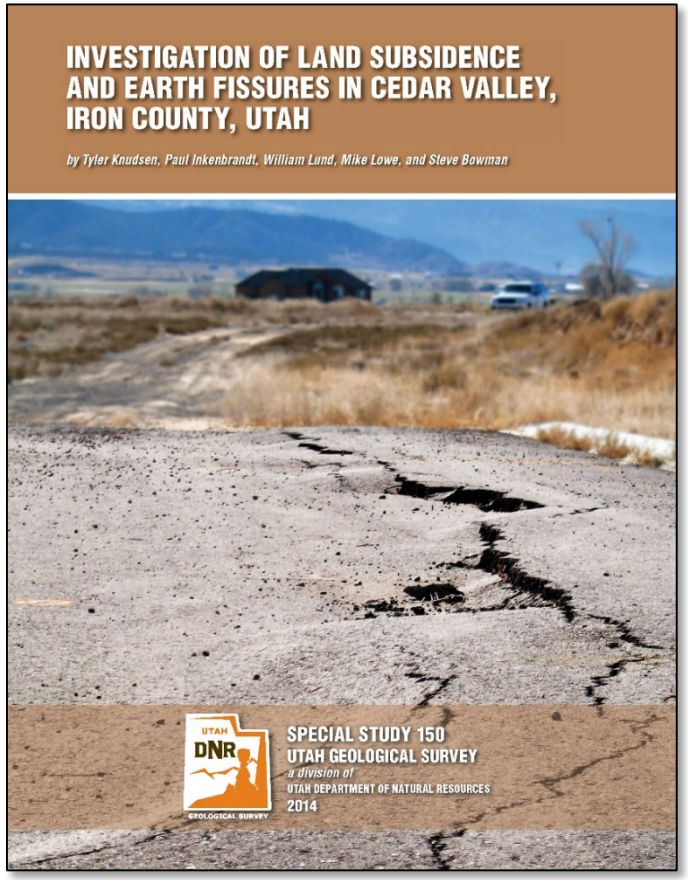



1. Long-term groundwater pumping in excess of recharge (groundwater mining) is the cause of the land subsidence and earth fissures in Cedar Valley.
2. The maximum amount of land subsidence and earth fissure formation in Cedar Valley coincide with areas of significant groundwater-level decline and the presence of compressible fine-grained sediment in the subsurface.
3. If groundwater levels in Cedar Valley continue to decline at a rate of approximately 2 feet per year, average basin-wide subsidence will likely continue at a rate of 0.02 to 1.2 inches per year.
4. Continued subsidence will likely cause new fissures to form in the future.
5. The inventory of earth fissures in Cedar Valley is likely incomplete because fissures lacking offset or not enlarged by erosion typically exist as hairline cracks that are rarely visible on aerial photographs and are difficult to identify in the field.

Source: Utah Department of Natural Resources, Special Study 150, Utah Geological Survey.

# Supply/Demand Balance

## Utah Geological Survey Conclusions



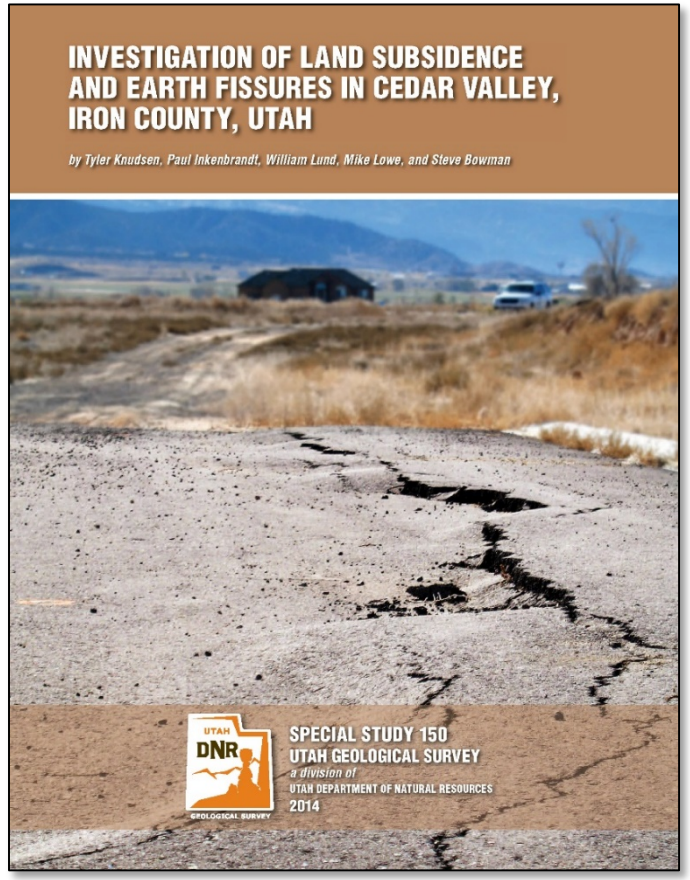

6. Currently unrecognized or new earth fissures may damage existing and future infrastructure in Cedar Valley.
7. Continued southward growth of either the Enochgraben-west or -east fissures may eventually impact fully developed neighborhoods in Enoch City.
8. Earth fissures could provide a direct path for contaminated surface water to reach the Cedar Valley aquifer, a principal source of potable water in Cedar Valley.
9. Managing basin-fill aquifers as a renewable resource and managing the hazards presented by land subsidence and earth-fissure formation require that subsiding areas and rates of subsidence within those areas (likely variable) be defined (technologies such as InSAR, LiDAR, and high-precision GPS/GNSS surveying are well suited to this task).
10. Site-specific hazard investigations are required for new development, and in some instances for existing development, in areas known or suspected to be subsiding.

Source: Utah Department of Natural Resources, Special Study 150, Utah Geological Survey.

# Supply/Demand Balance

## Utah Geological Survey Recommendations

1. Increase overall water resources by importing water from other basins
2. Increase groundwater recharge to aquifers through conjunctive management of groundwater and surface-water resources
3. Disperse high-discharge wells to reduce localized land subsidence
4. Reduce overall groundwater withdrawals from the basin




Source: Utah Department of Natural Resources, Special Study 150, Utah Geological Survey.

# Supply/Demand Balance

## Putting it in Perspective

*What are the potential supply implications of moving forward with the Pine Valley and Wah Wah Valley water projects recommended by the review panel*

# Supply/Recharge Sources

## Cedar Valley Basin and the West Desert Water Supply Project

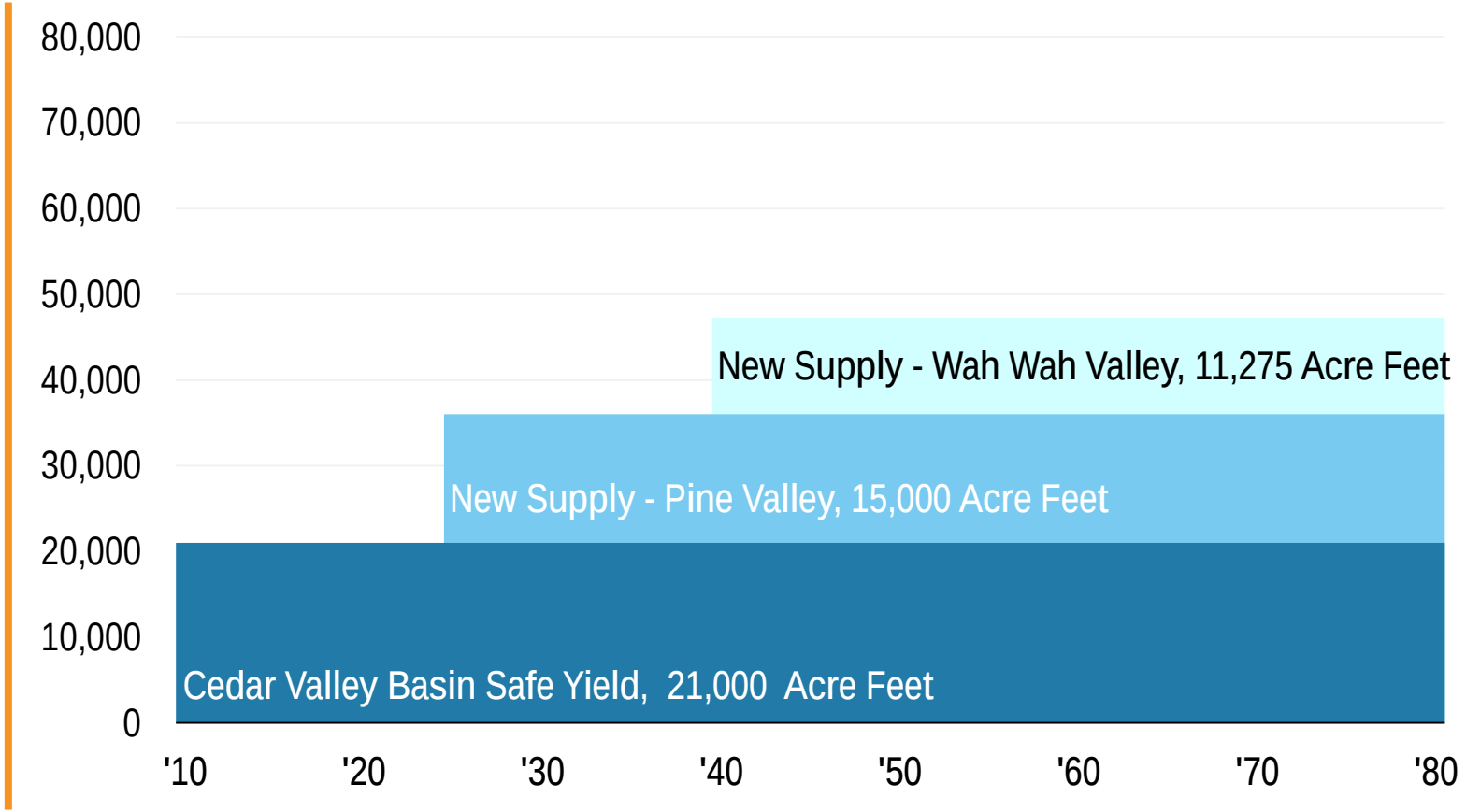
*"Currently, the Cedar Valley Basin has a sustainable safe yield of 21,000 acre feet"*


Source: US Census, Kem C. Gardner Policy Institute, Applied Analysis, Ensign Engineering.

# Supply/Recharge Sources

## Cedar Valley Basin and the West Desert Water Supply Project

*"Pine and Wah Wah Valleys could theoretically come online in 2025 and 2040, respectively, increasing District water supply to 47,275 acre feet when considering safe yield of 21,000 acre feet in the Cedar Valley"*

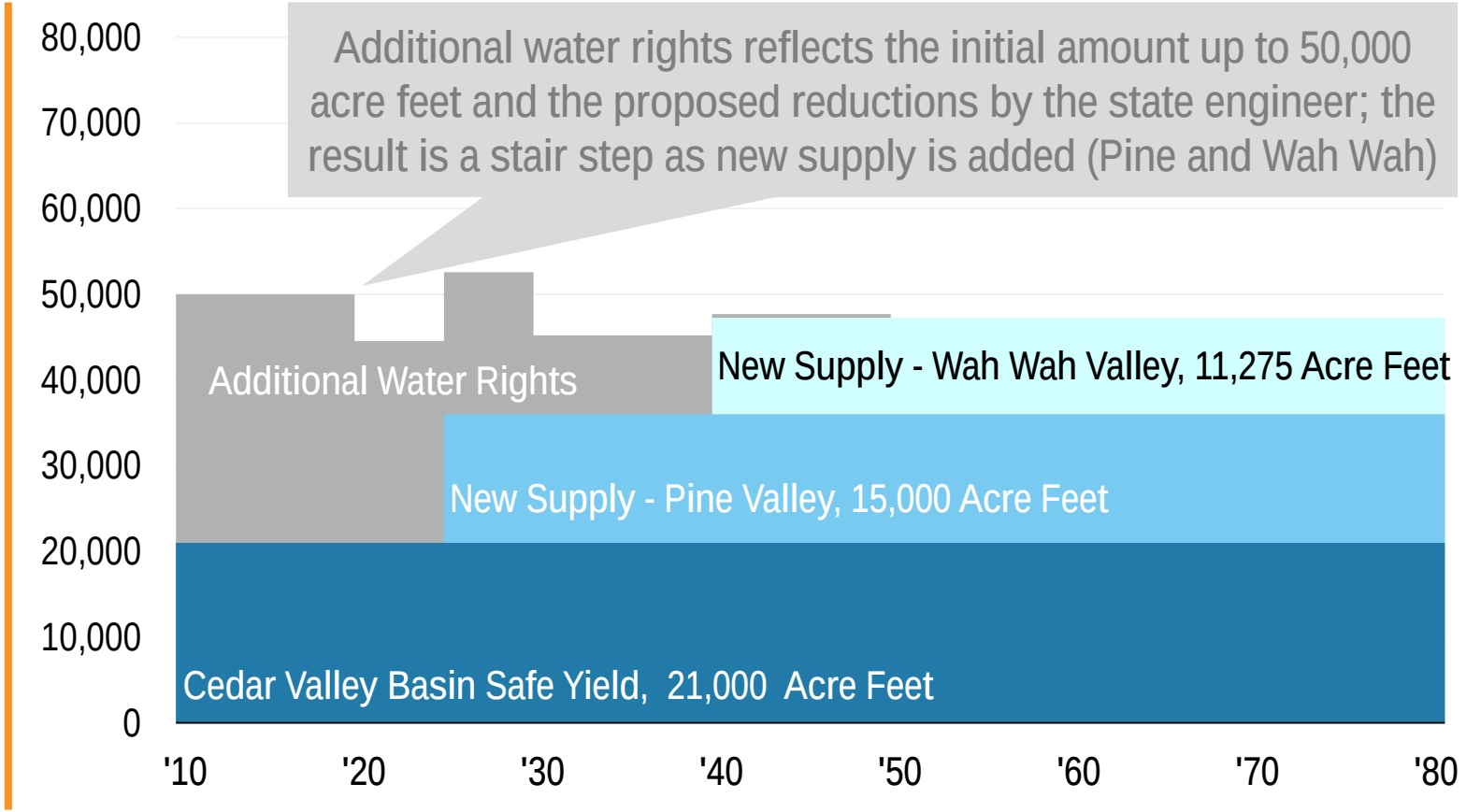



Source: US Census, Kem C. Gardner Policy Institute, Applied Analysis, Ensign Engineering.

# Supply/Recharge Sources

## Cedar Valley Basin and the West Desert Water Supply Project
## State Engineer Water Rights Reduction Plan

*"When considering the maximum potential of water rights and the additional sources, total capacity reaches a maximum of slightly more than 50,000 acre feet"*

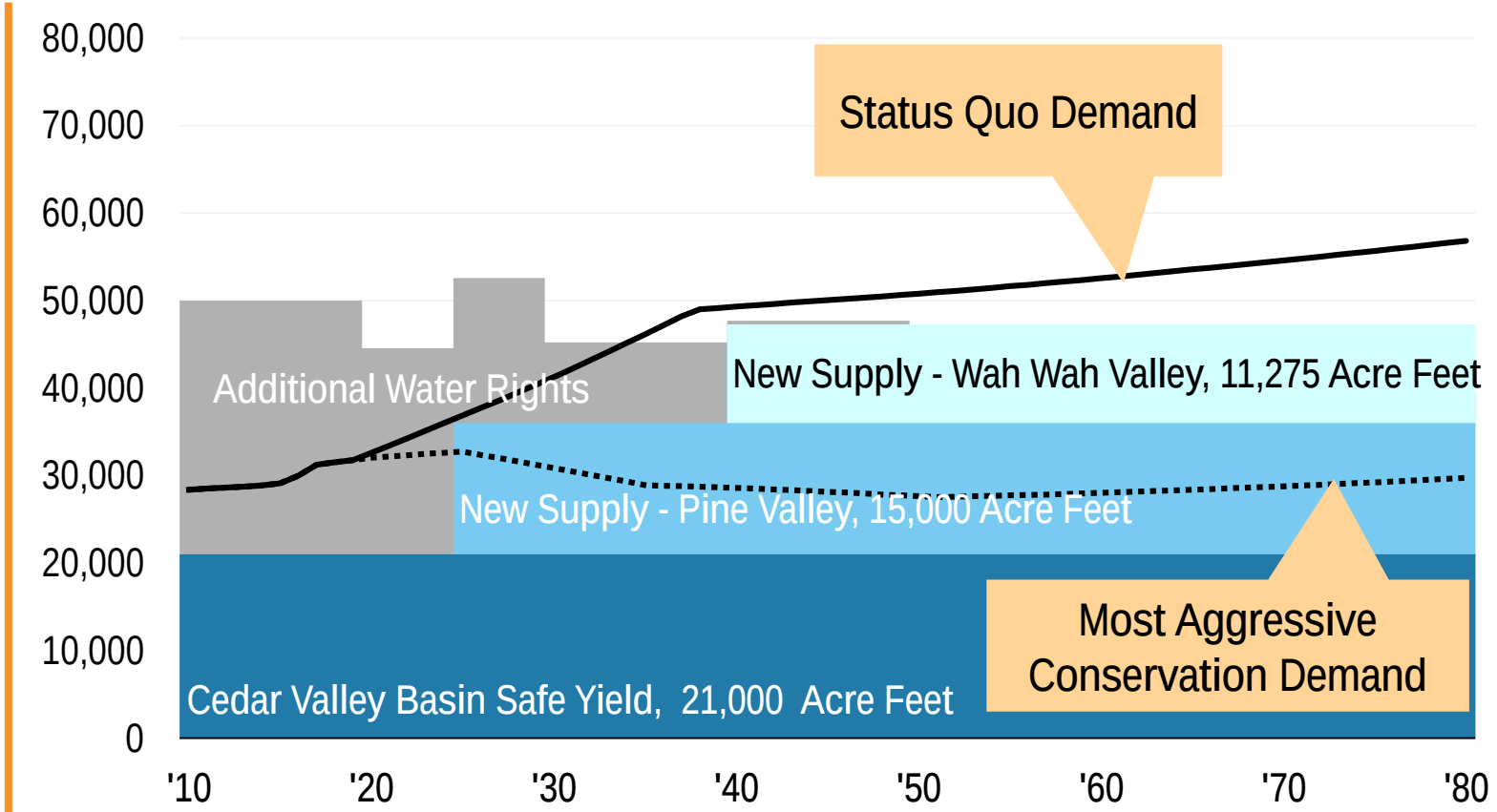



Source: US Census, Kem C. Gardner Policy Institute, Applied Analysis, Ensign Engineering

# Supply/Recharge Sources

## Cedar Valley Basin and the West Desert Water Supply Project
## State Engineer Water Rights Reduction Plan

*"While new supply from the West Desert Project adds capacity in 2025 and 2040, increased supply is insufficient to meet demand unless municipal conservation, agriculture conversion and the LESA irrigation program are implemented"*

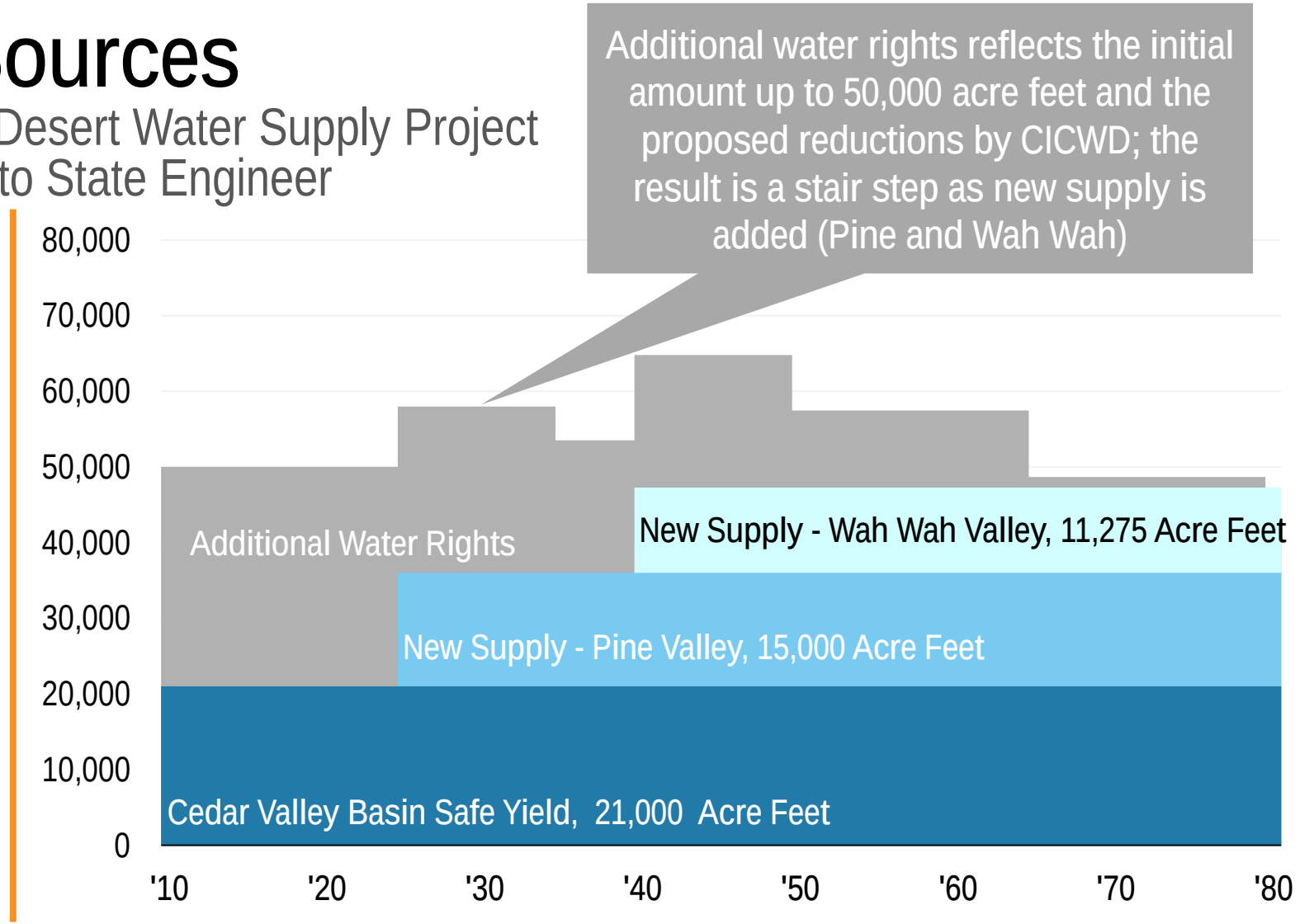



Source: US Census, Kem C. Gardner Policy Institute, Applied Analysis, Ensign Engineering.

# Supply/Recharge Sources

## Cedar Valley Basin and the West Desert Water Supply Project
## CICWCD Committee's Response to State Engineer

*"When considering the maximum potential of water rights and the additional sources, total capacity reaches in excess of 60,000 acre feet at its highest point"*

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## Cedar Valley Basin and the West Desert Water Supply Project
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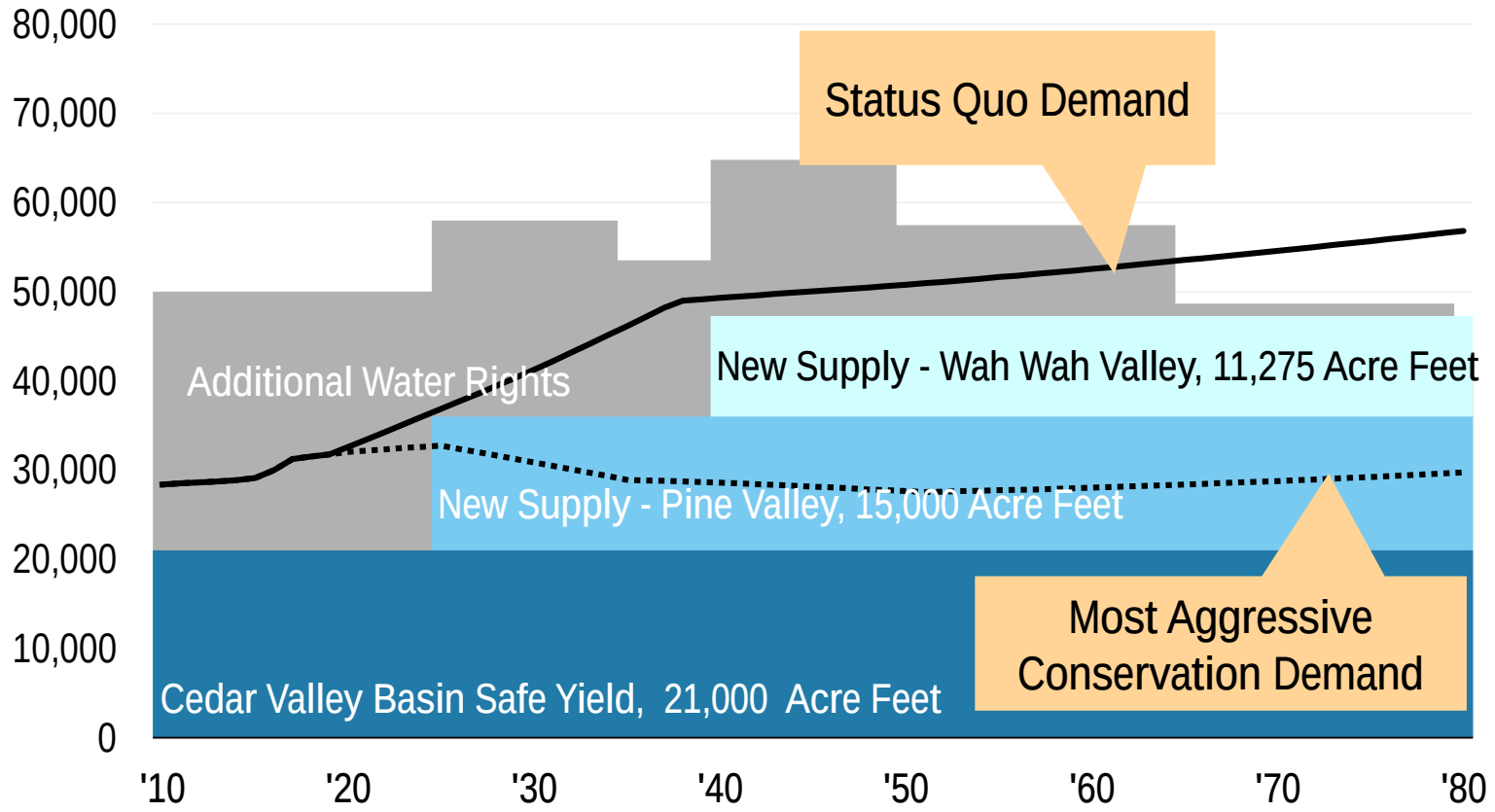



Source: US Census, Kem C. Gardner Policy Institute, Applied Analysis, Ensign Engineering.

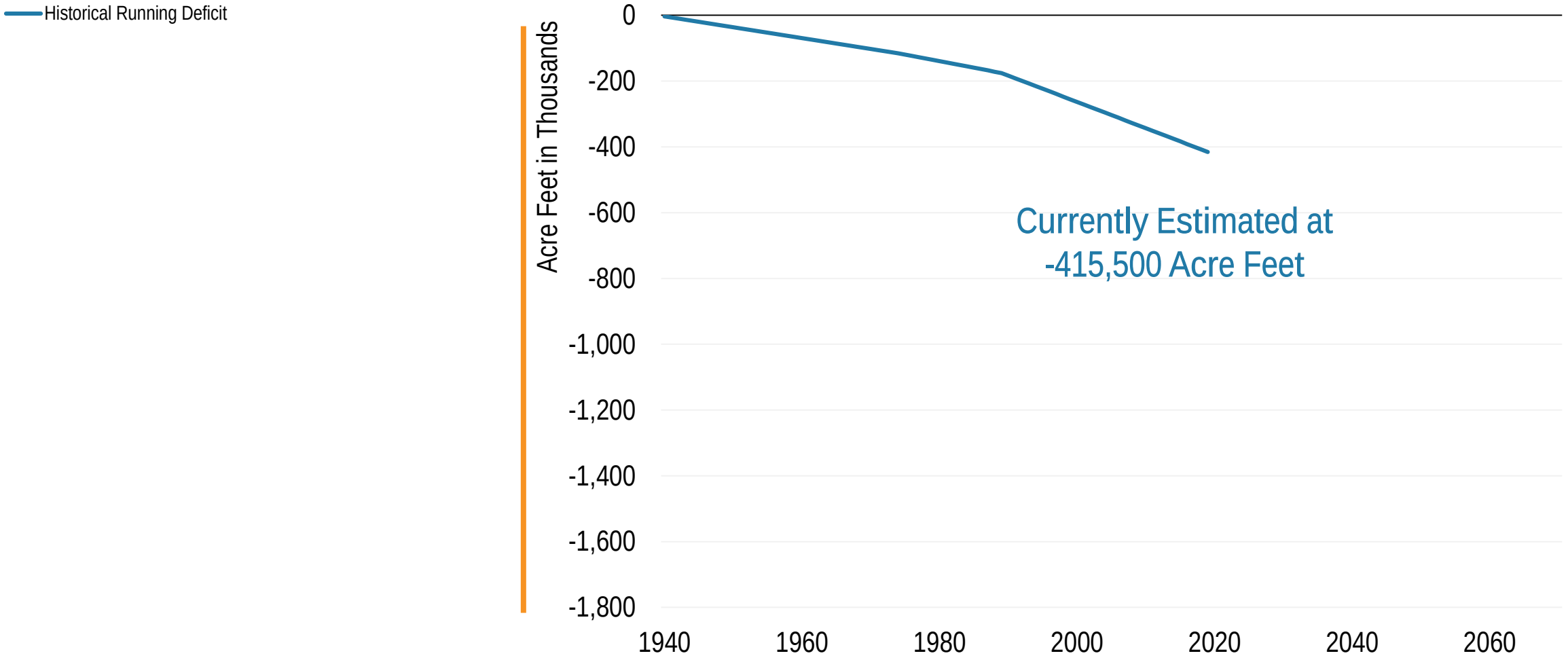
# Supply/Demand Balance

## Putting it in Perspective

*What are the historical and projected impacts on the aquifer's running deficit when measured in acre feet?*

# Supply/Demand Balance

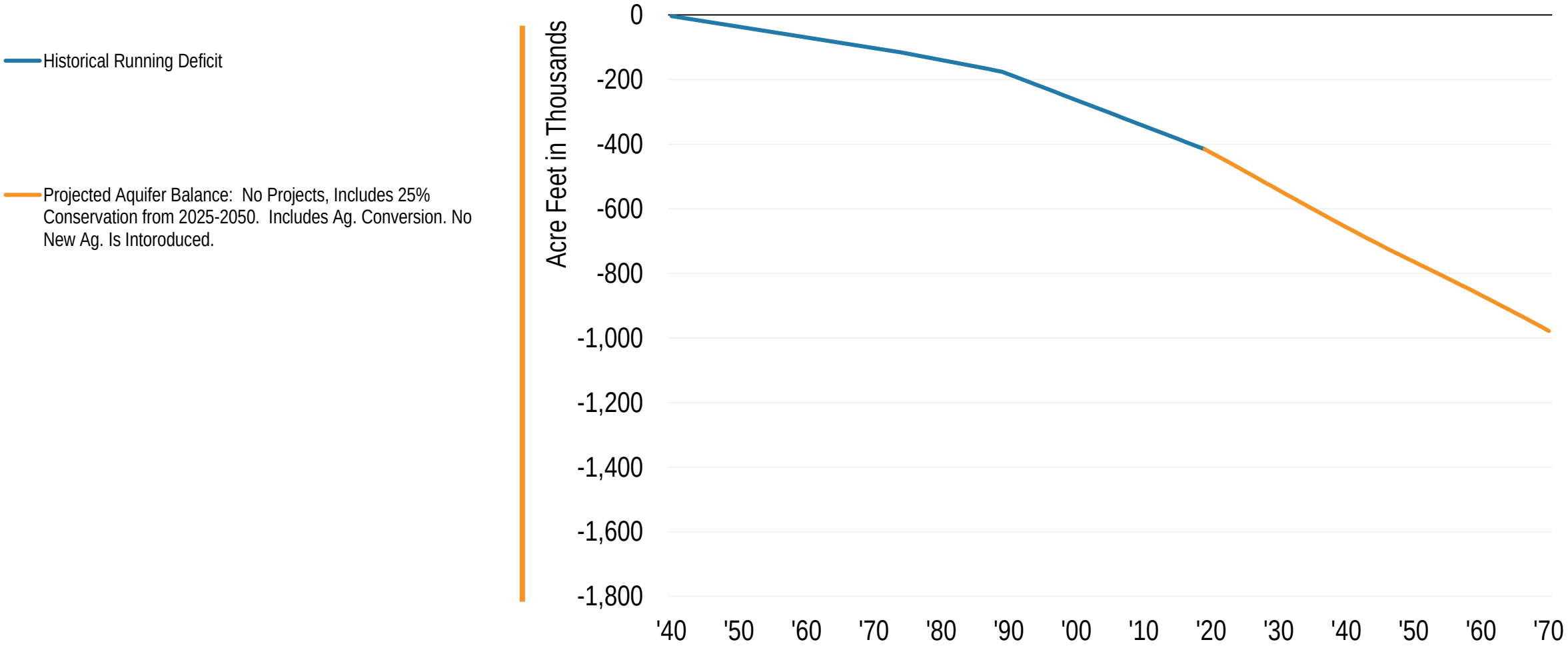
## Running Aquifer Deficit, Cedar Valley Basin




Source: US Census, Kem C. Gardner, Applied Analysis, Ensign Engineering.

# Supply/Demand Balance

## Running Aquifer Deficit, Cedar Valley Basin

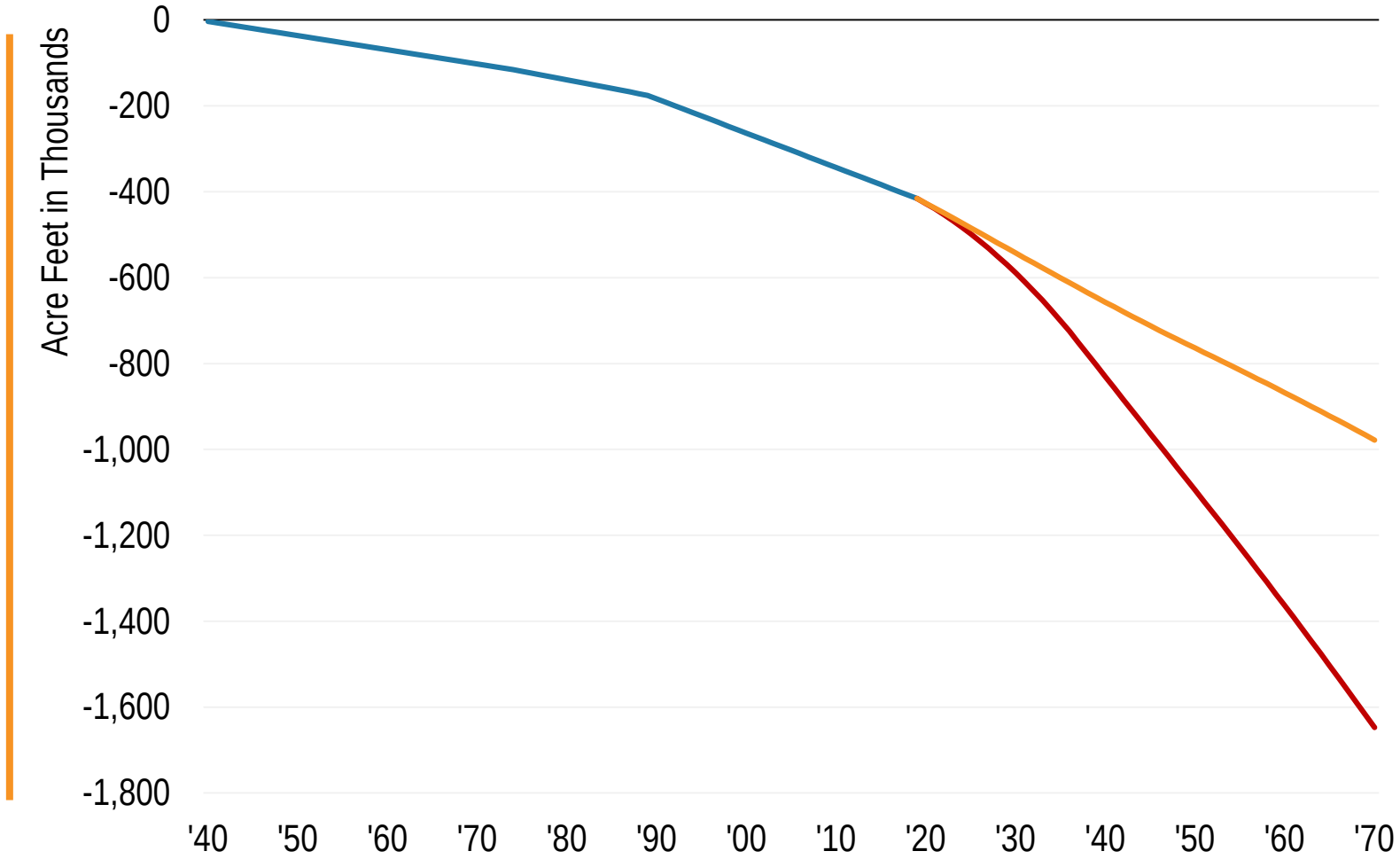



Source: US Census, Kem C. Gardner, Applied Analysis, Ensign Engineering.

# Supply/Demand Balance

## Running Aquifer Deficit, Cedar Valley Basin

- Historical Running Deficit
- Projected Aquifer Balance: No Water Projects. No Additional Conservation or Ag. Conversion. Agriculture increases to Proved Water Rights.
- Projected Aquifer Balance: No Projects, Includes 25% Conservation from 2025-2050. Includes Ag. Conversion. No New Ag. Is Intoroduced.

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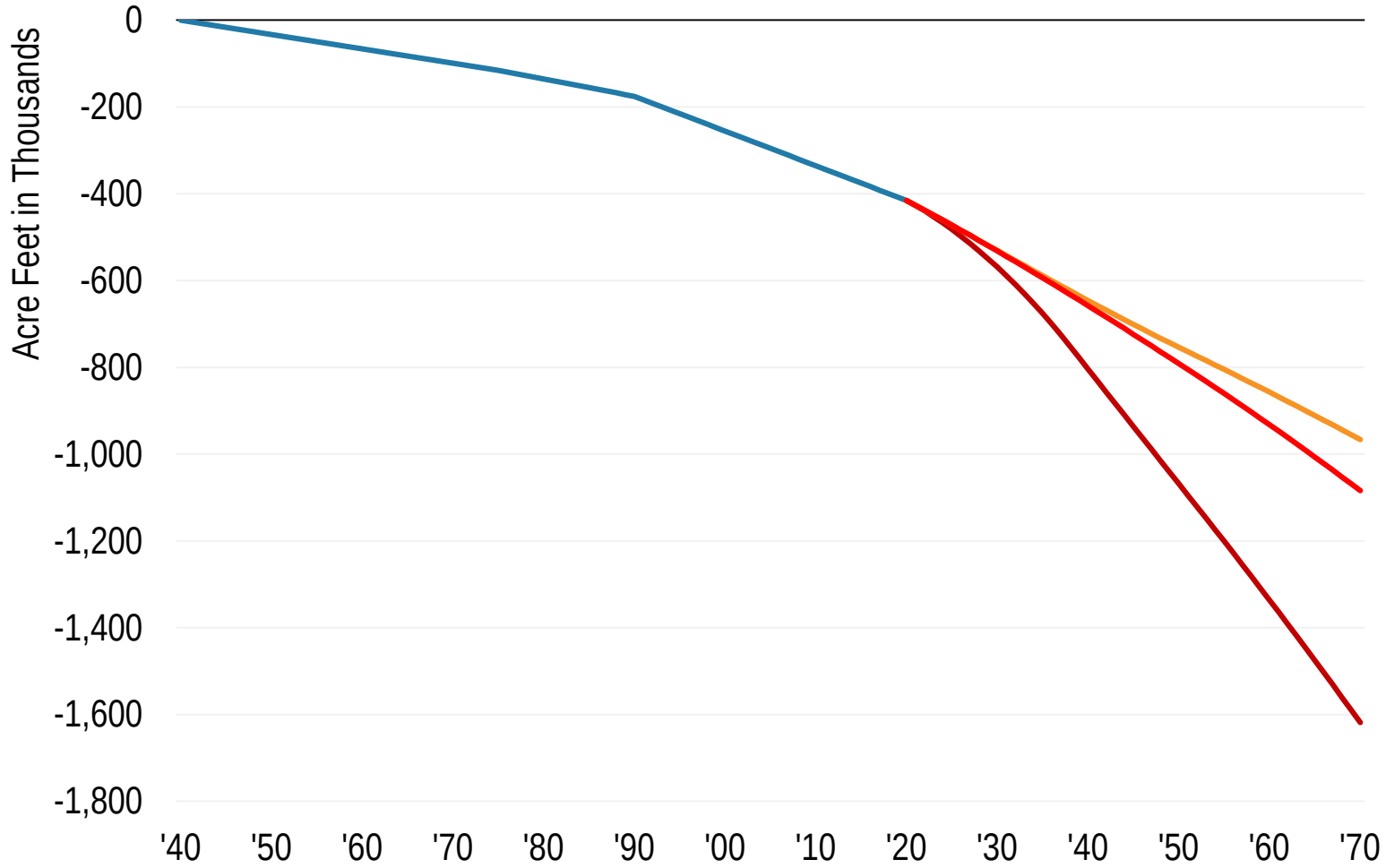


Source: US Census, Kem C. Gardner, Applied Analysis, Ensign Engineering.

# Supply/Demand Balance

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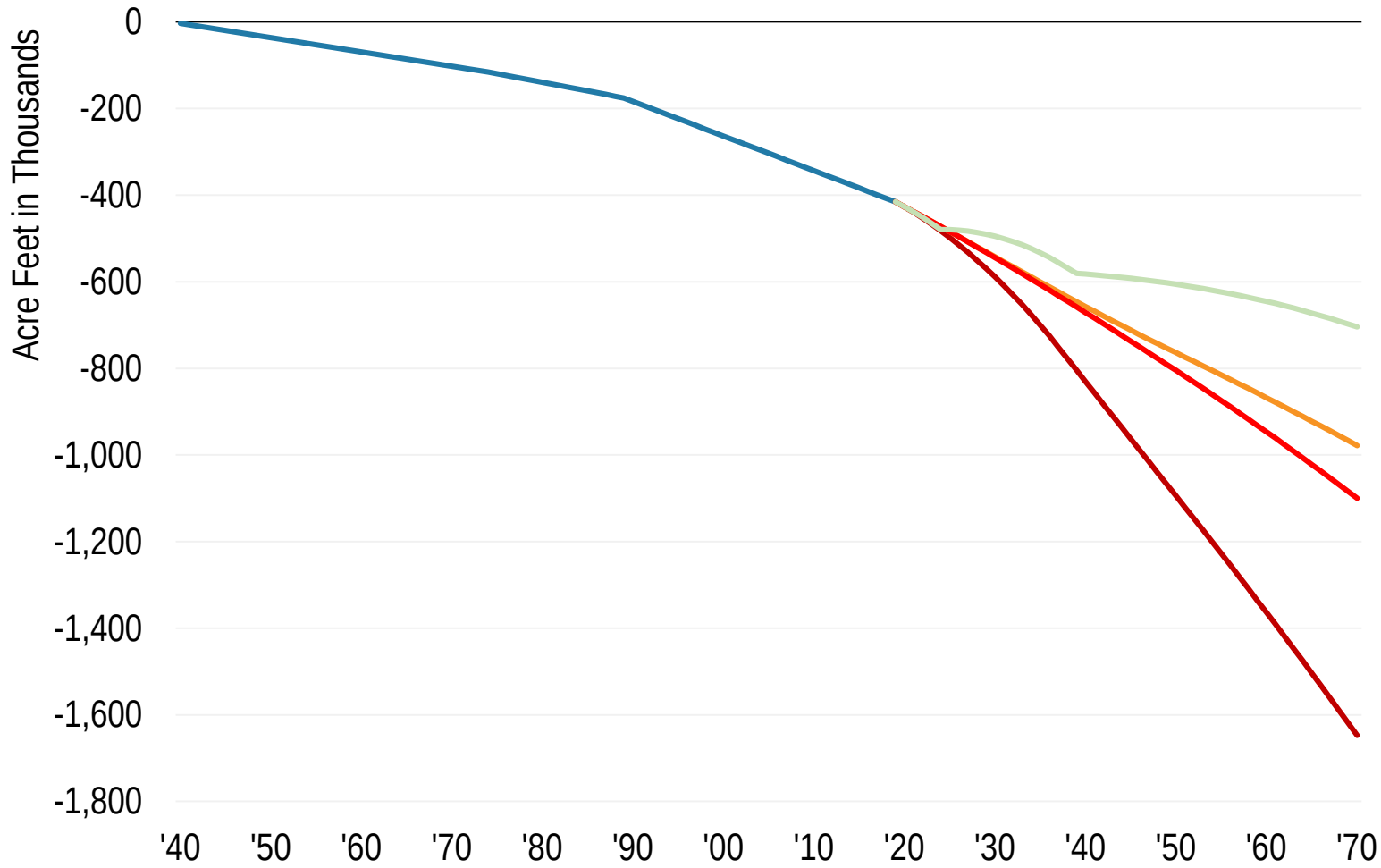


Source: US Census, Kem C. Gardner, Applied Analysis, Ensign Engineering

# Supply/Demand Balance

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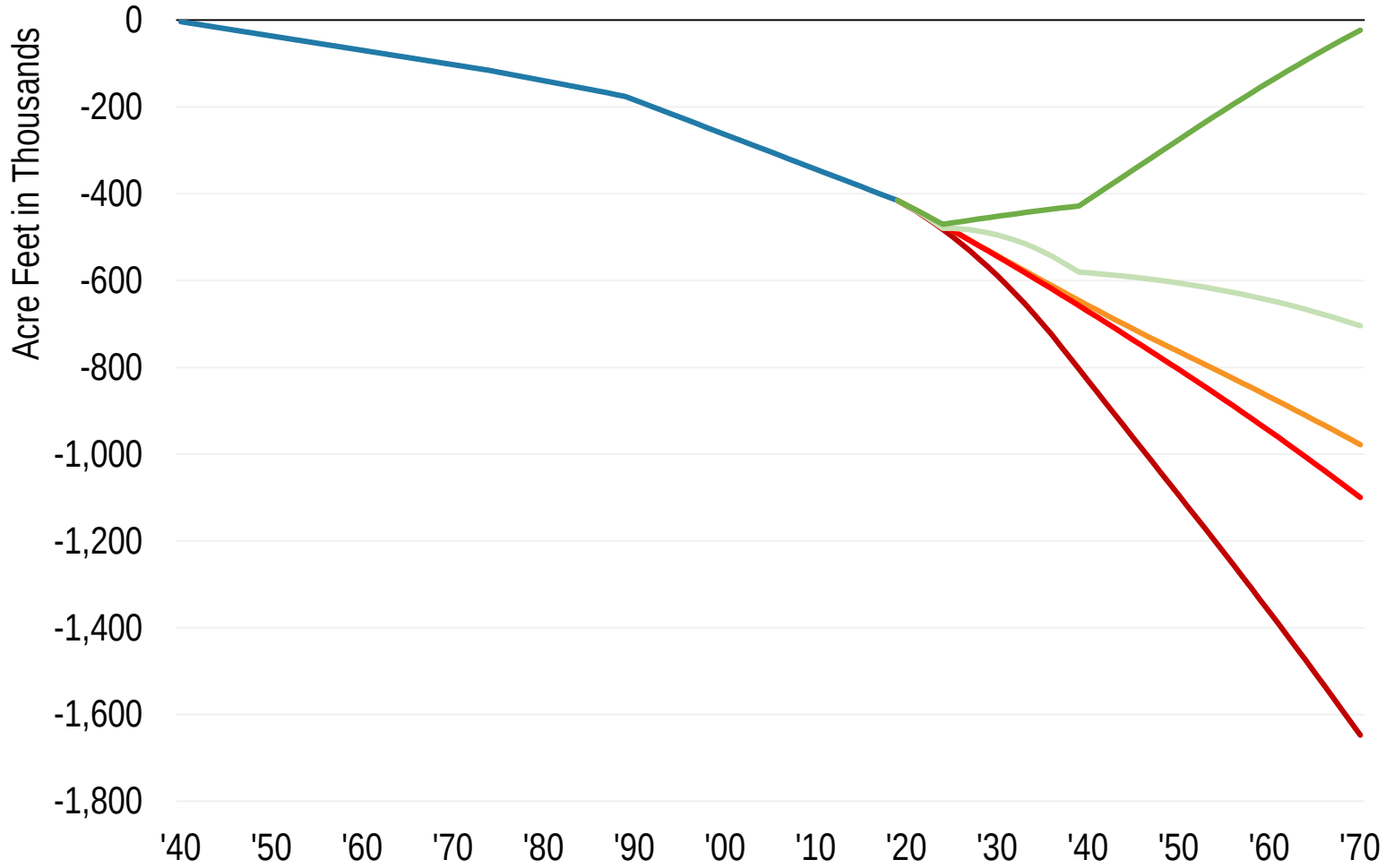


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# Supply/Demand Balance

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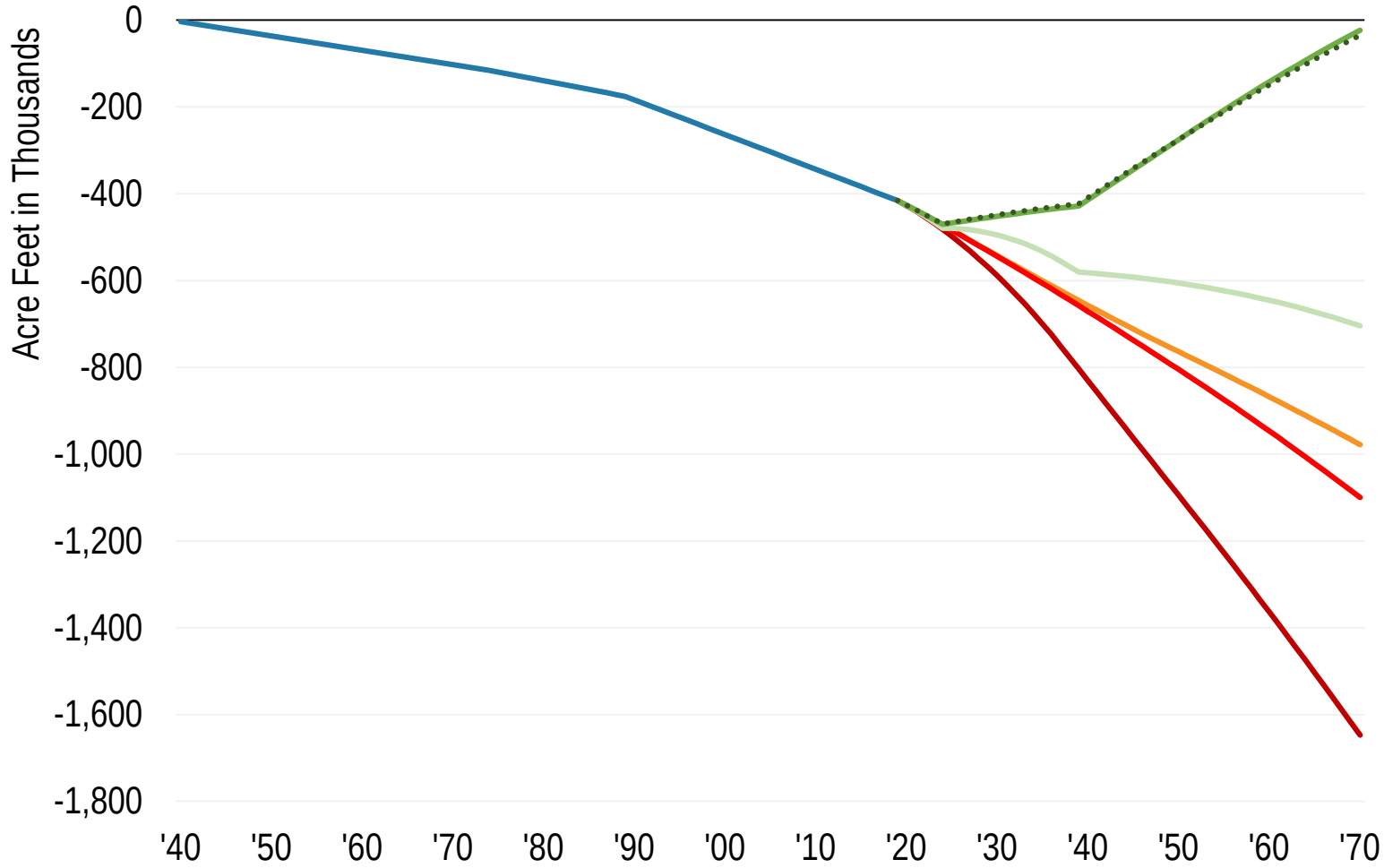


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# Supply/Demand Balance

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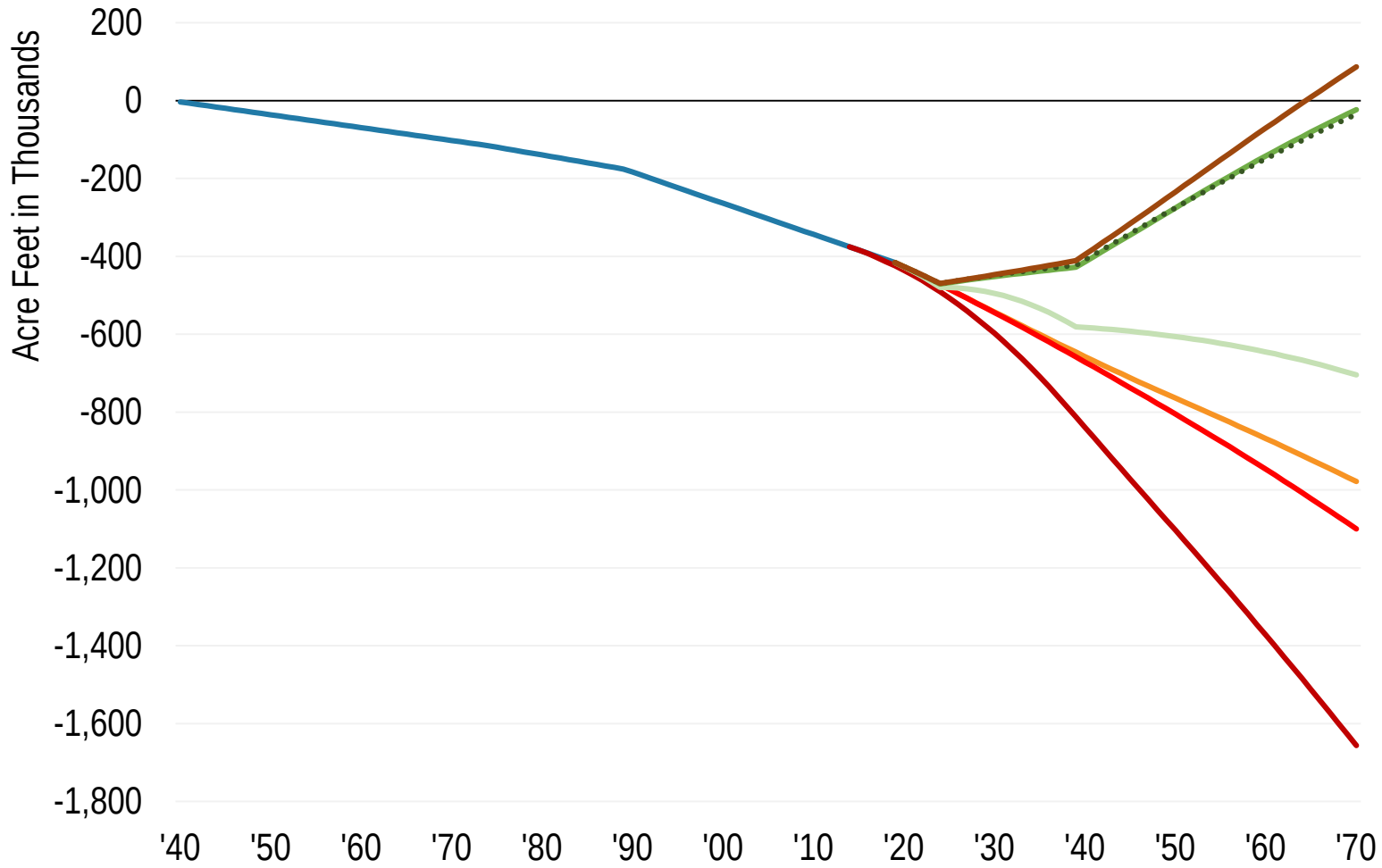


Source: US Census, Kem C. Gardner, Applied Analysis, Ensign Engineering.

# Supply/Demand Balance

## Putting it in Perspective

In addition to measuring the impact on the running deficit, what are the implications on ground water levels

# Supply/Demand Balance

## Running Aquifer Deficit and Population Growth

- Historical Running Deficit
- Projected Aquifer Balance: No Water Projects. No Additional Conservation or Ag. Conversion. Agriculture increases to Proved Water Rights.
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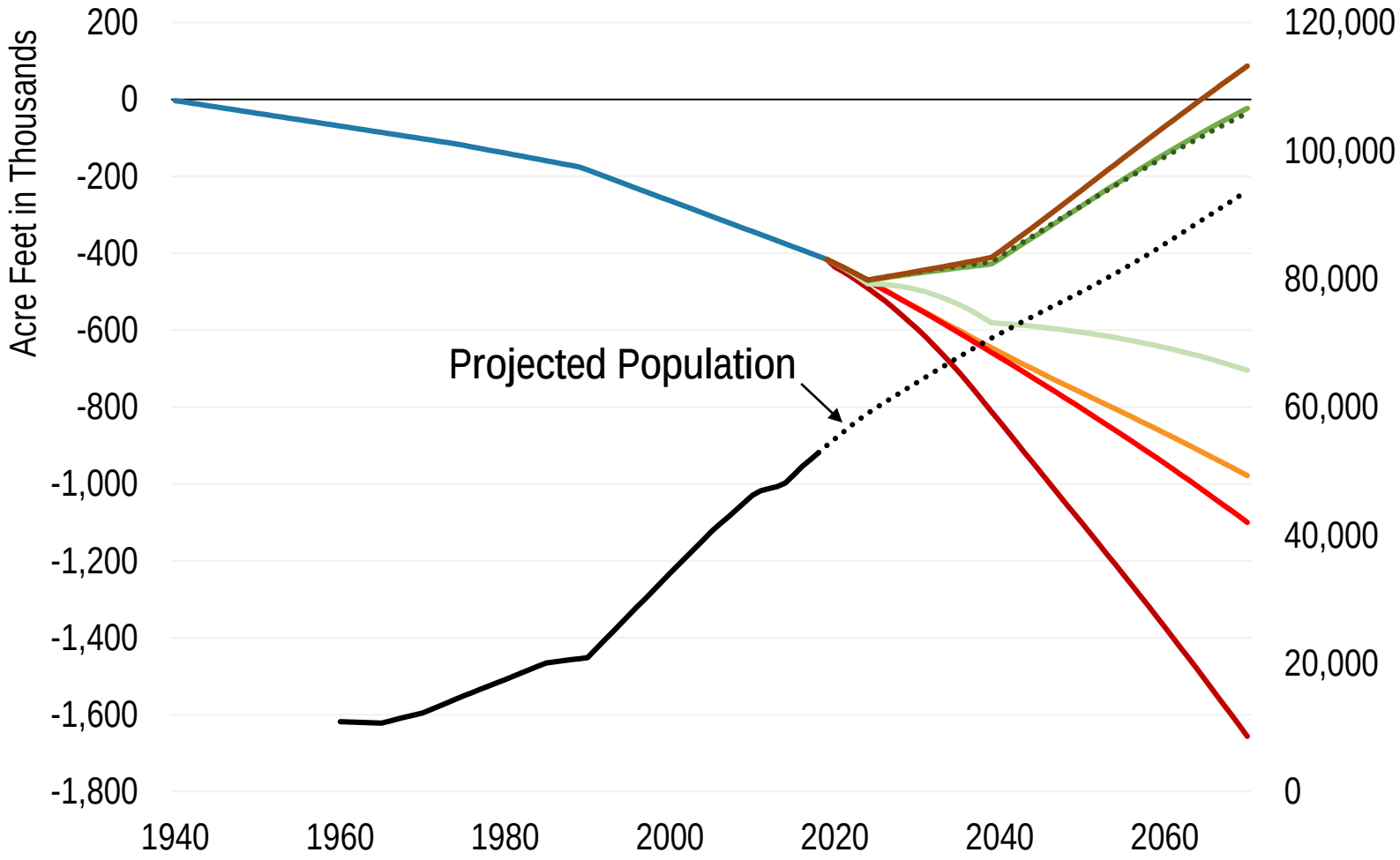


# Iron County Water Strategy

- Develop a renewable, reliable source of potable water

- Least Aggressive Strategy:
  - No new water projects
  - No additional conservation efforts
  - No agriculture conversion
  - Agriculture use increases to approved water right allowance
  - This will increase the deficit to 1.7 million acre feet by 2070

## Summary

**415,000 AF**
Current Deficit

**24,000 AF Every Year**
Average Additional Deficit

**507,000 AF**
2025 Deficit

# Iron County Water Strategy

- Develop a renewable, reliable source of potable water

- Most Aggressive Strategy:
  - Bring in water from Pine and Wah Wah Valley
  - Perform a Coal Creek recharge project
  - Conserve an additional 25% of non-agricultural water from 2025 through 2050
  - Convert agriculture use water to non-agriculture use water at a fairly aggressive rate
  - Allow no new agriculture growth past 2018
  - Convert all pivot irrigation to LESA
  - This will relieve the water deficit by 2065

## Summary

**415,000 AF**
Current Deficit

**10,000 AF Every Year**
Average Additional Deficit

**466,000 AF**
2025 Deficit

# Quantifying the Economic Impacts of the Alternatives

## Two Key Considerations

### Types of Economic Impacts Considered

**1**

**POSITIVE IMPACTS**

One-time construction impacts on the local economy that are sourced to new infrastructure investments (e.g., Pine Valley and Wah Wah Valley projects)

**2**

**NEGATIVE IMPACTS**

The recurring economic losses sourced to an insufficient water system in the event no infrastructure investments are made, limiting future growth potential

# Quantifying the Economic Impacts of the Alternatives

## Two Key Considerations

### Types of Economic Impacts Considered

**1**

**POSITIVE IMPACTS**

One-time construction impacts on the local economy that are sourced to new infrastructure investments (e.g., Pine Valley and Wah Wah Valley projects)

**2**

**NEGATIVE IMPACTS**

The recurring economic losses sourced to an insufficient water system in the event no infrastructure investments are made, limiting future growth potential

# One-Time Economic Impact of Infrastructure Investments

## Quantifying the Impacts

*In addition to the broader implications of a reliable water supply system, there are one-time economic impacts associated with the development of new infrastructure*

### Economic Output

Impact of Total Spending within the Local Economy

### Wages and Salaries

Impact on Personal Incomes for Local Residents

### Employment

Impact on the Number of Jobs within the Local Economy

# One-Time Economic Impact of Infrastructure Investments

## Approach, Methodology, and Assumptions

### IMPLAN Model:

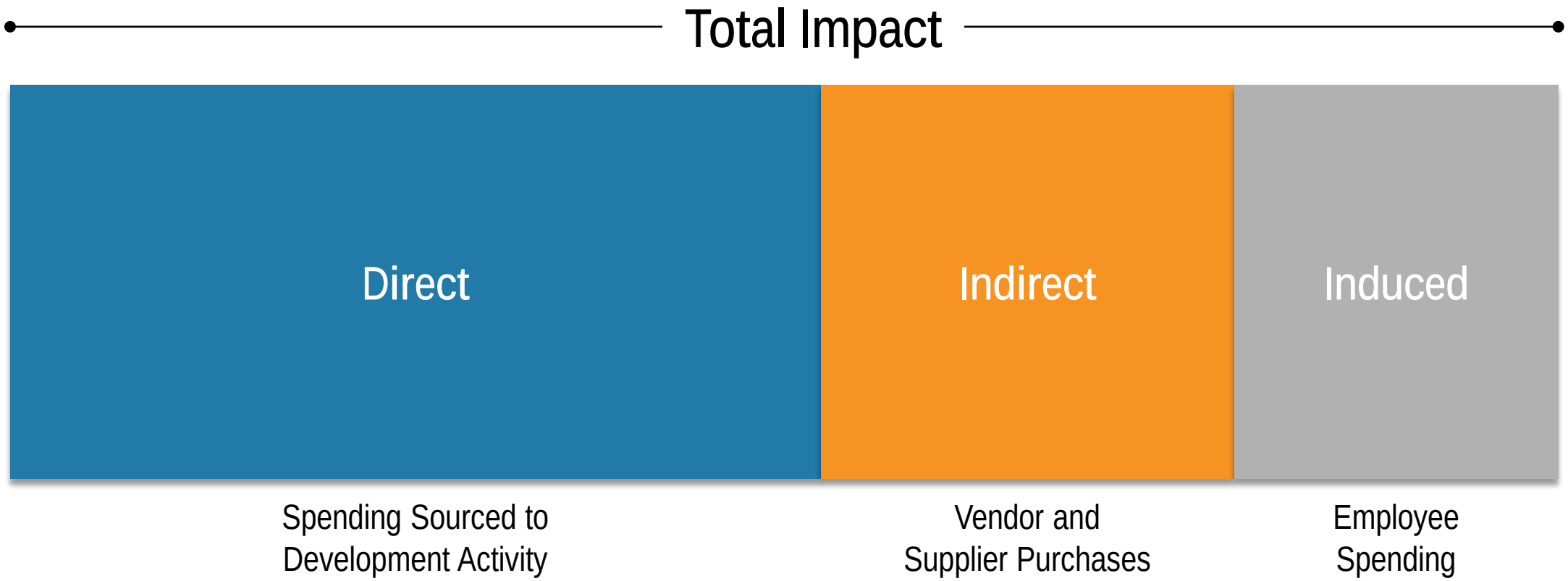
- 1 of 3 nationally recognized impact analysis software tools
- Developed by Minnesota IMPLAN Group, Inc. and used by more than 1,000 public and private institutions
- IMPLAN is an input-output model that utilizes complex economic equations to explain how the "outputs" of one industry become the "inputs" of others, and vice versa
- This relationship is sometimes referred to as the "multiplier effect", illustrating how changes in one sector of the economy can affect other sectors

### Types of Impacts:

- Direct Impacts: Generated by direct spending on the development of homes and other uses
- Indirect Impacts: Secondary impacts generated by businesses supporting the economic activities of the development activity (e.g., vendors)
- Induced Impacts: Sourced to businesses that are supported by the spending of employees supported by direct impacts (e.g., at grocery stores, in movie theaters or at doctor's offices)
- Total Impacts: The sum of direct, indirect and induced impacts

# One-Time Economic Impact of Infrastructure Investments

## Multiplier Effect




Note: Indirect and induced impacts sourced to IMPLAN.

# One-Time Economic Impact of Infrastructure Investments

## West Desert Supply Project

**PINE VALLEY**
**15,000 ACRE FEET**

Original Cost Estimate: **$150.0 Million**

Revised Cost Estimate: **$253.6 Million**

**WAH WAH VALLEY**
**11,275 ACRE FEET**

Original Cost Estimate: **$50.0 Million**

Revised Cost Estimate: **$165.7 Million**

**TOTAL INVESTMENT: $419.3 MILLION**

Source:CICWCD.

# One-Time Economic Impact of Infrastructure Investments

## Economic Impact Summary

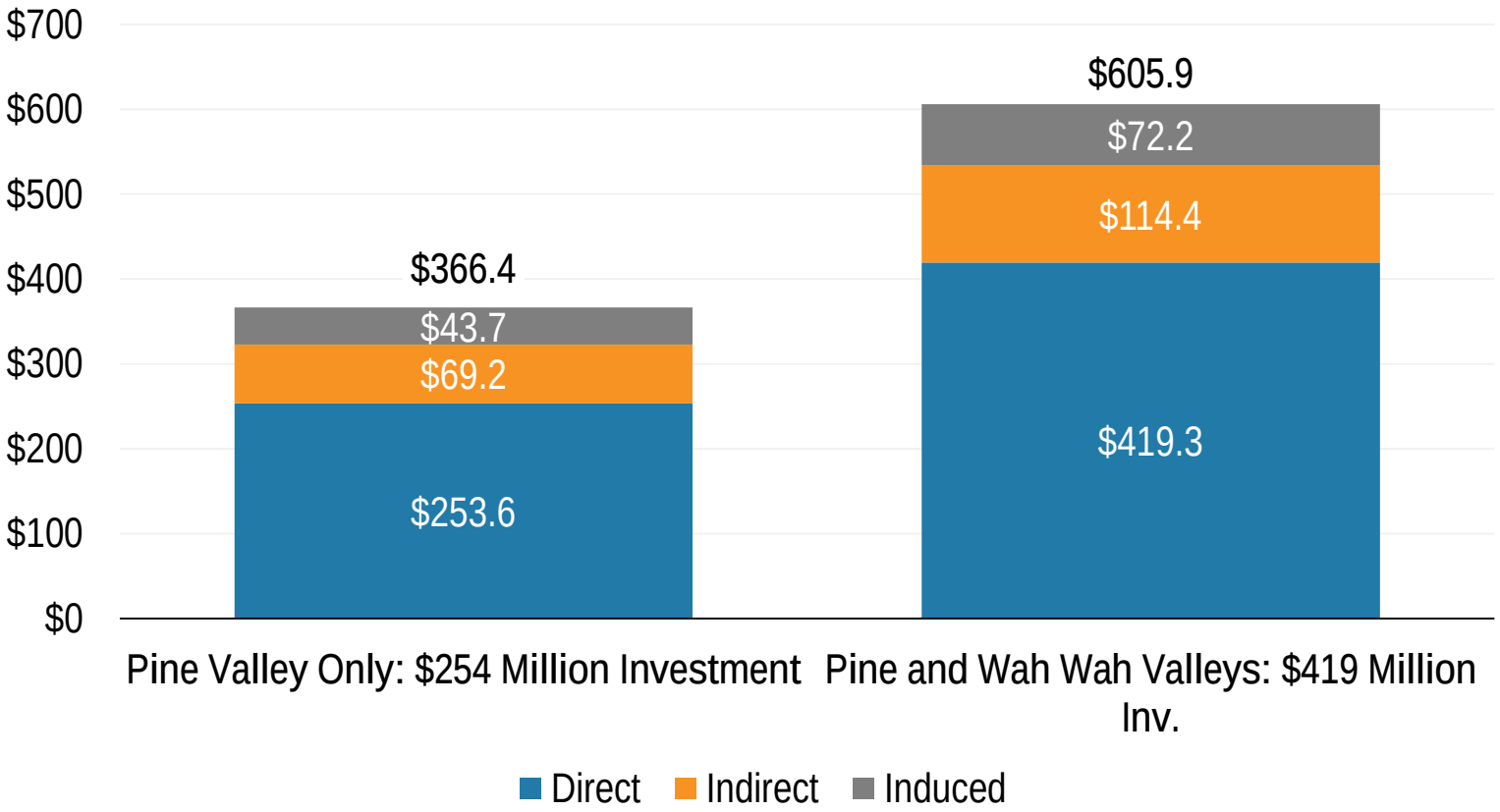
| ($ in Millions) | Direct | Indirect | Induced | Total |
|---|---|---|---|---|
| Pine Valley Only: $254 Million Investment | | | | |
| Economic Output | $253.6 | $69.2 | $43.7 | $366.4 |
| Wages & Salaries | $58.2 | $16.0 | $10.6 | $84.9 |
| Employment | 1,982 | 702 | 428 | 3,113 |
| | | | | |
| Pine and Wah Wah Valleys: $419 Million Investment | | | | |
| Economic Output | $419.3 | $114.4 | $72.2 | $605.9 |
| Wages & Salaries | $96.3 | $26.5 | $17.5 | $140.3 |
| Employment | 3,278 | 1,161 | 708 | 5,147 |

*The potential economic impacts sourced to large-scale investment in infrastructure are significant with $606 million in output, supporting approximately $140 million in wages and an estimated 5,100 person-years of employment.*

Note: Indirect and induced impacts sourced to IMPLAN; employment stated in person-years of employment (i.e., one person employed for an entire year).

# One-Time Economic Impact of Infrastructure Investments

## Economic Impact Summary: Economic Output

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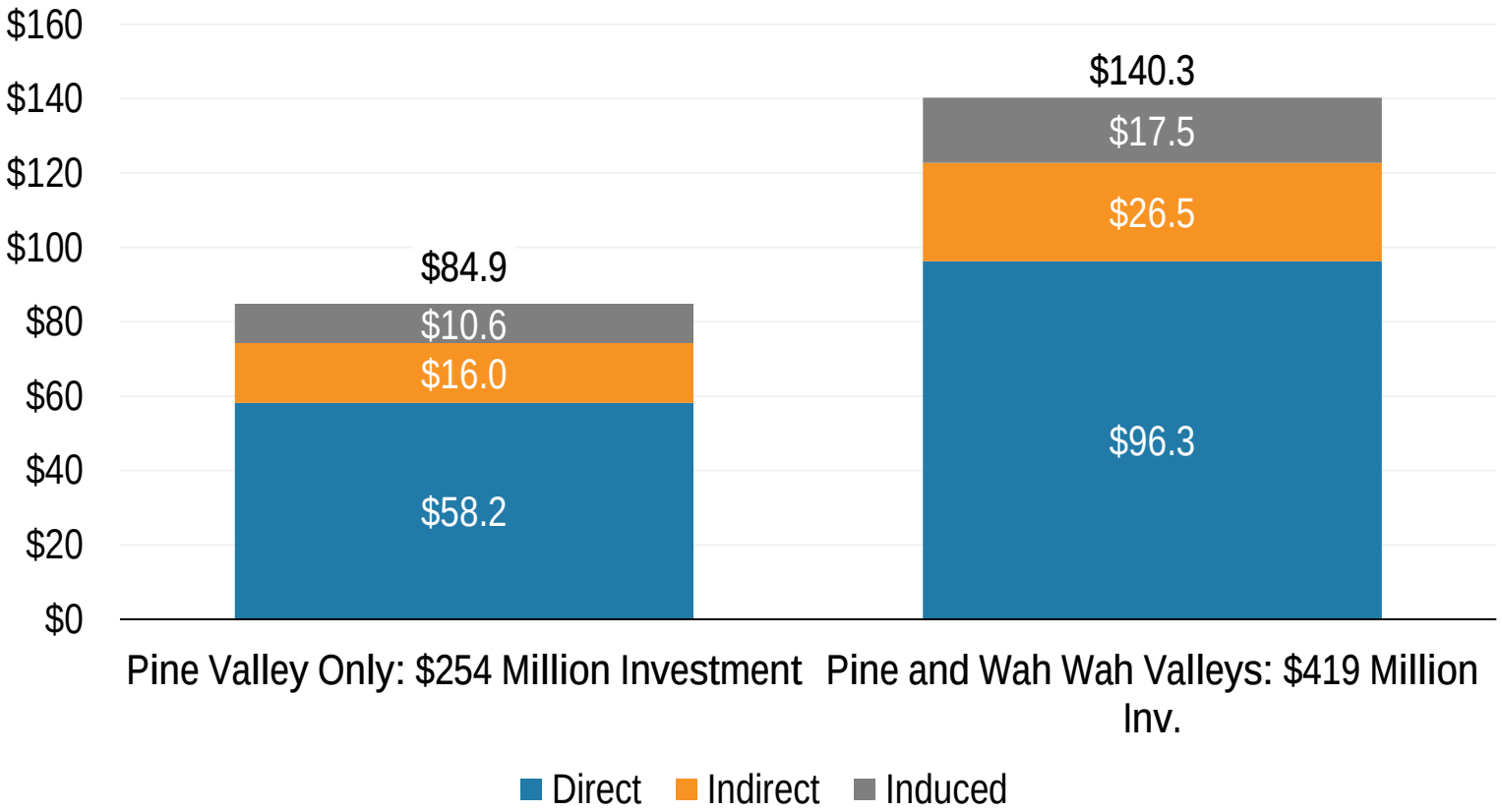
Note: Indirect and induced impacts sourced to IMPLAN; employment stated in person-years of employment (i.e., one person employed for an entire year).

# One-Time Economic Impact of Infrastructure Investments

## Economic Impact Summary: Wages and Salaries

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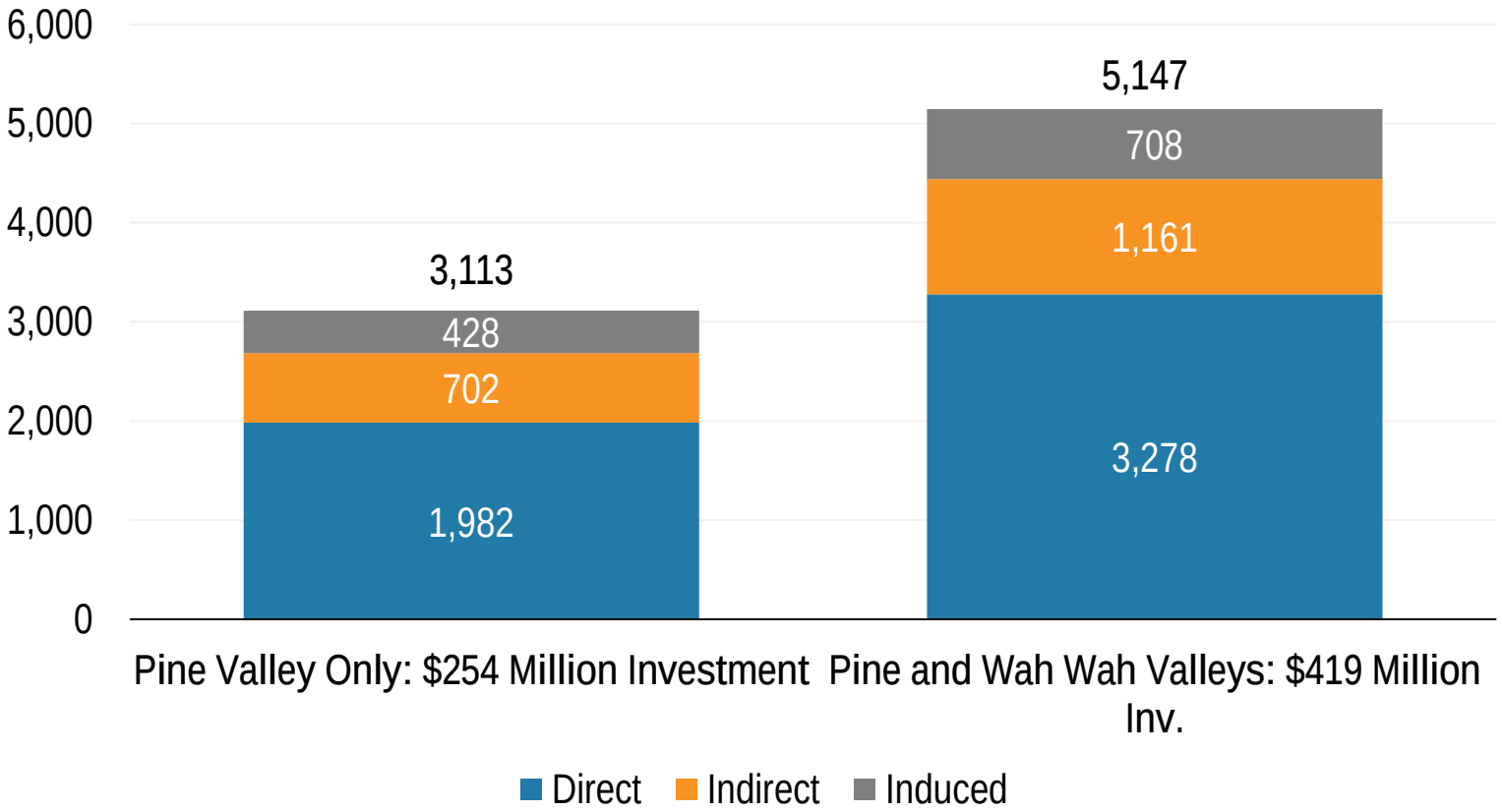
# One-Time Economic Impact of Infrastructure Investments

## Economic Impact Summary: Employment




*The potential economic impacts sourced to large-scale investment in infrastructure are significant with $606 million in output, supporting approximately $140 million in wages and an estimated 5,100 person-years of employment.*

Note: Indirect and induced impacts sourced to IMPLAN; employment stated in person-years of employment (i.e., one person employed for an entire year).

# Quantifying the Economic Impacts of the Alternatives

## Two Key Considerations

### Types of Economic Impacts Considered

1

POSITIVE IMPACTS

One-time construction impacts on the local economy that are sourced to new infrastructure investments (e.g., Pine Valley and Wah Wah Valley projects)

2

NEGATIVE IMPACTS

The recurring economic losses sourced to an insufficient water system in the event no infrastructure investments are made, limiting future growth potential

# Quantifying the Potential Impacts of Water Infrastructure

## Cedar Valley Basin: Value per Acre Foot of Water

Based on current non-agricultural (M&I) demand levels, the value of each acre foot of water equates to:

- 5.70 residents
- 2.00 households
- 2.53 employees
- 0.16 businesses
- $174,641 in personal income
- $319,636 in gross product

| | | Current Demand | | |
|---|---|---|---|---|
| | | Muni. & Ind. | Agriculture | Combined |
| | *Count* | *8,787 AF* | *23,000 AF* | *31,787 AF* |
| Population | 50,063 | 5.70 | 2.18 | 1.57 |
| Households | 17,573 | 2.00 | 0.76 | 0.55 |
| Employees | 22,227 | 2.53 | 0.97 | 0.70 |
| No. of Business Establishments | 1,435 | 0.16 | 0.06 | 0.05 |
| Personal Income | $1,534,500,000 | $174,641 | $66,717 | $48,275 |
| Gross Product (est.) | $2,808,512,402 | $319,636 | $122,109 | $88,355 |

Source: US Census Bureau, Bureau of Labor Statistics, Bureau of Economic Analysis, Applied Analysis.

# Quantifying the Potential Impacts of Water Infrastructure

## Cedar Valley Basin: Value per Acre Foot of Water

When agricultural demand is included, the value of each acre foot of water equates to:

- 1.57 residents
- 0.55 households
- 0.70 employees
- 0.05 businesses
- $48,275 in personal income
- $88,355 in gross product

| | | Current Demand | | |
|---|---|---|---|---|
| | | Muni. & Ind. | Agriculture | Combined |
| | *Count* | *8,787 AF* | *23,000 AF* | *31,787 AF* |
| Population | 50,063 | 5.70 | 2.18 | 1.57 |
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Source: US Census Bureau, Bureau of Labor Statistics, Bureau of Economic Analysis, Applied Analysis.

# Quantifying the Potential Impacts of Water Infrastructure

## Pine Valley and Wah Wah Valley: Value per Acre Foot of Water

When applying the value per acre foot to the additional capacity of new developments, local economy is expected support:

- Over 41,000 residents
- Over 14,000 households
- Over $1.26 million in additional personal income each year
- Over $2.32 million in economic activity each year

| | Future Supply | | |
|---|---|---|---|
| | Pine Valley | Wah Wah Valley | Combined |
| | *15,000 AF* | *11,275 AF* | *26,275 AF* |
| Population | 23,625 | 17,758 | 41,383 |
| Households | 8,293 | 6,233 | 14,526 |
| Employees | 10,489 | 7,884 | 18,373 |
| No. of Business Establishments | 677 | 509 | 1,186 |
| Personal Income | $724,126,031 | $544,301,400 | $1,268,427,431 |
| Gross Product (est.) | $1,325,328,731 | $996,205,430 | $2,321,534,161 |

Source: US Census Bureau, Bureau of Labor Statistics, Bureau of Economic Analysis, Applied Analysis.

# Quantifying the Potential Impacts of Water Infrastructure

## Pine Valley and Wah Wah Valley: Value per Acre Foot of Water

When applying the value per acre foot of municipal and industrial water to the additional capacity of new developments, local economy is expected support:

- Nearly 150,000 residents
- Over 52,000 households
- Almost $4.6 million in additional personal income each year
- Approximately $8.4 million in economic activity each year

| | Future Supply | | |
|---|---|---|---|
| | Pine Valley | Wah Wah Valley | Combined |
| | *15,000 AF* | *11,275 AF* | *26,275 AF* |
| Population | 85,465 | 64,241 | 149,706 |
| Households | 30,000 | 22,550 | 52,550 |
| Employees | 37,945 | 28,522 | 66,467 |
| No. of Business Establishments | 2,450 | 1,841 | 4,291 |
| Personal Income | $2,619,615,807 | $1,969,077,881 | $4,588,693,688 |
| Gross Product (est.) | $4,794,541,206 | $3,603,896,806 | $8,398,438,012 |

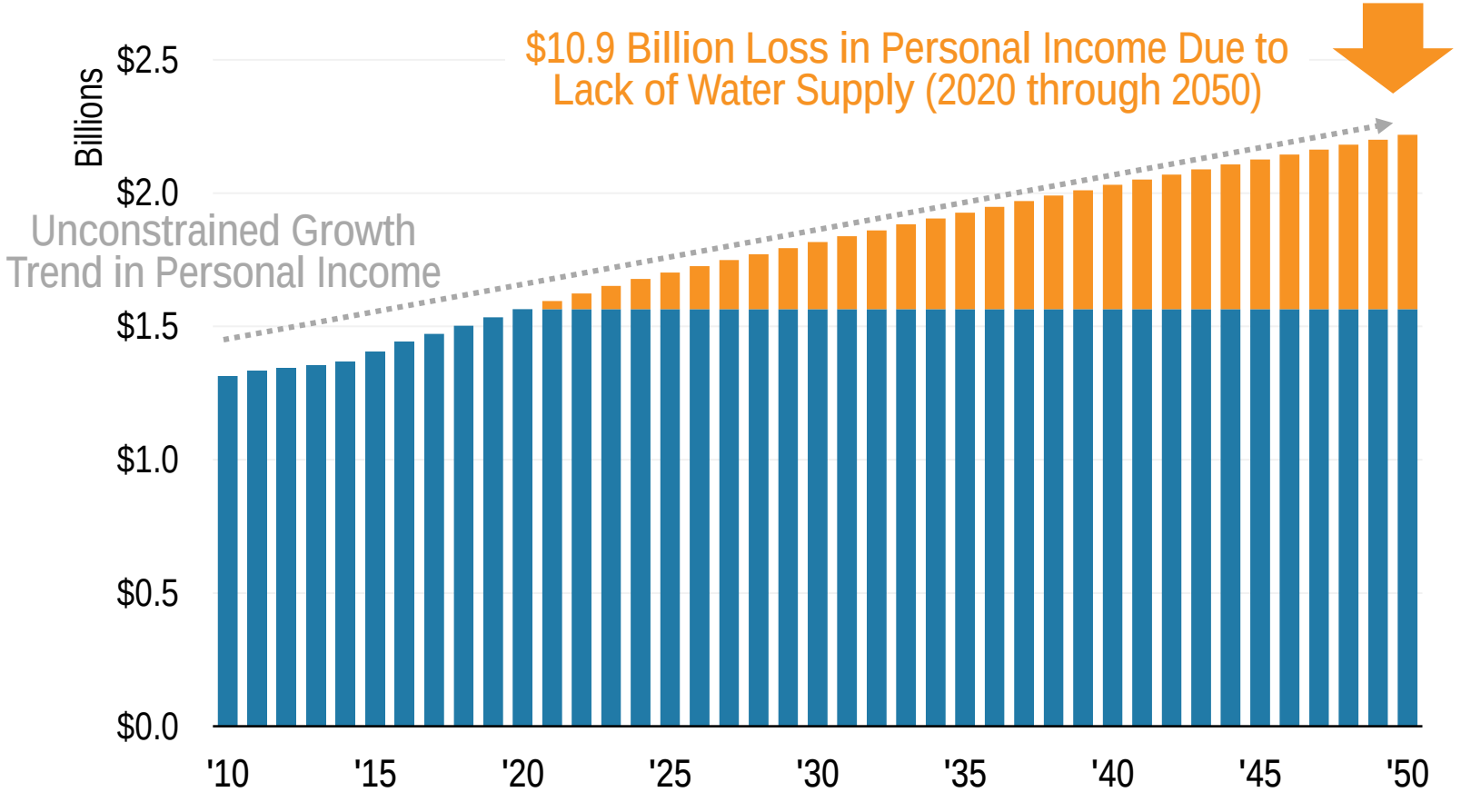
Source: US Census Bureau, Bureau of Labor Statistics, Bureau of Economic Analysis, Applied Analysis.

# Quantifying the Potential Impacts of Water Infrastructure

What are the impacts on personal income to the community under potential water constraint scenarios

# Quantifying the Potential Impacts of Water Infrastructure

## Personal Income Impacts Over the Next 30 Years: Constrained 2020

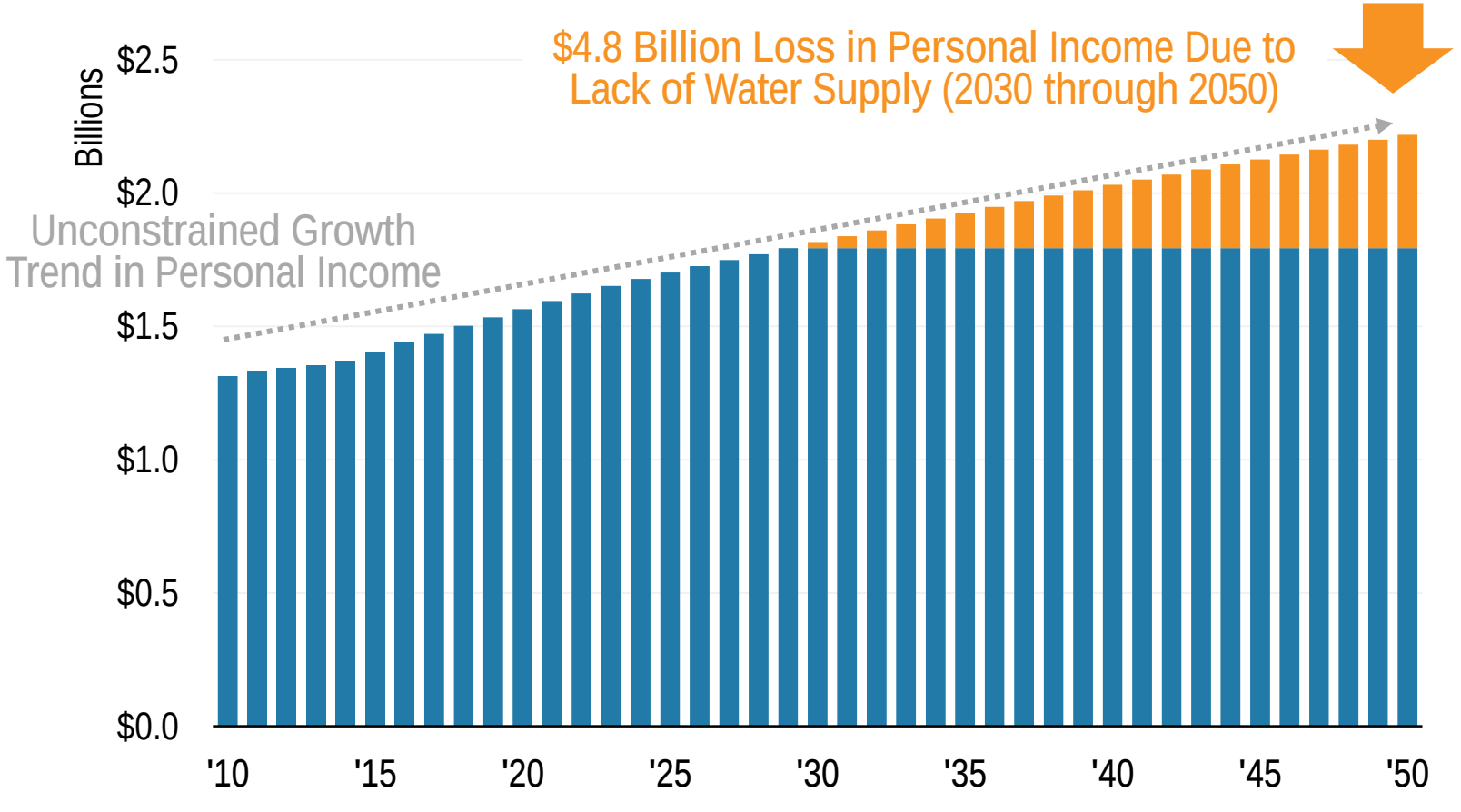



- When applying the per-capita personal income estimate of $30,652 (2019 dollars) to projected District population in the Iron County area, personal income is estimated to reach $2.2 billion annually by 2050 (in 30 years)
- Assuming growth is constrained next year (2020), the remaining 30-year impact (loss) to the community is $10.9 billion

Source: Bureau of Economic Analysis, Kem C. Gardner Policy Institute, Applied Analysis.

# Quantifying the Potential Impacts of Water Infrastructure

## Personal Income Impacts Over the Next 30 Years: Constrained in 2030

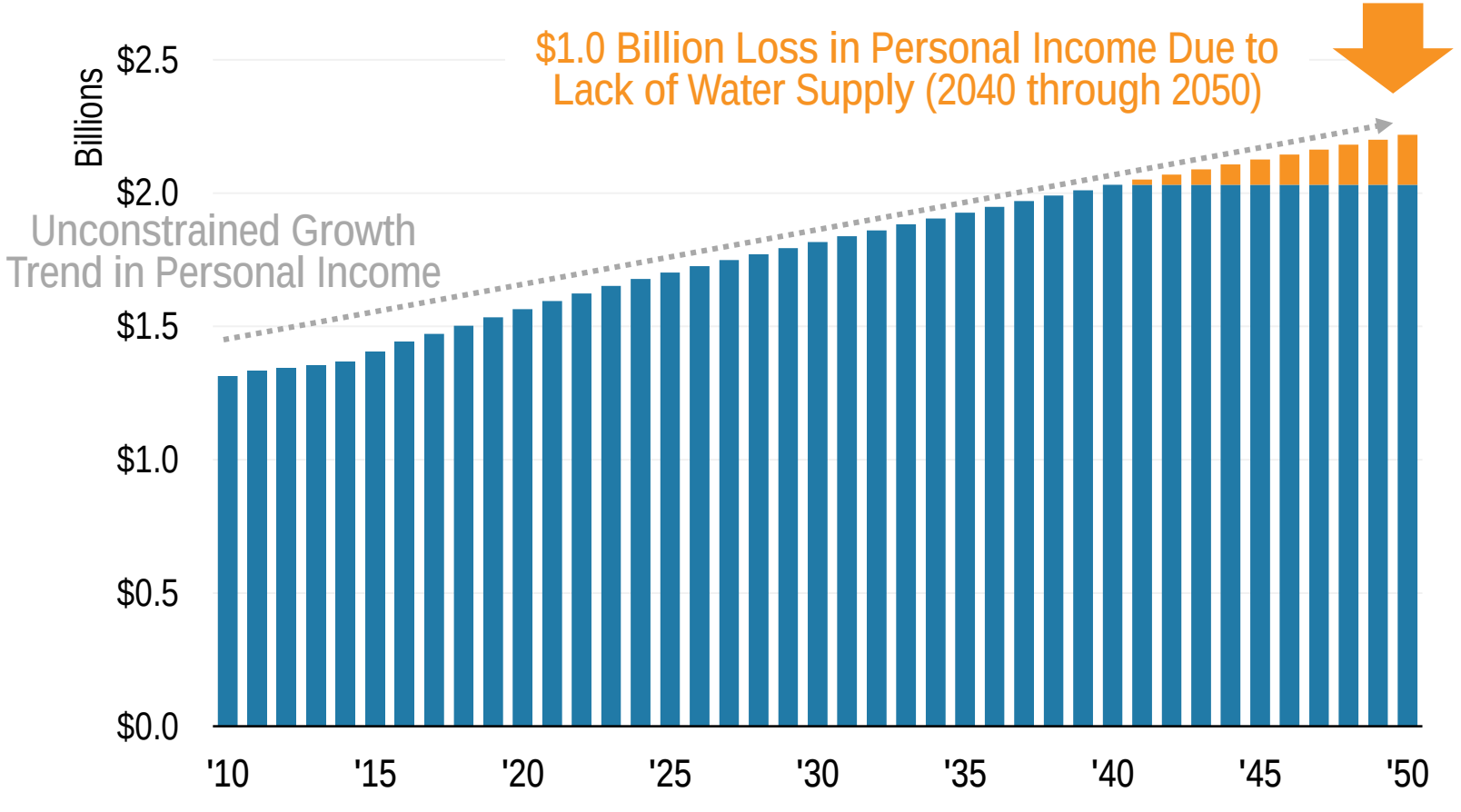



- When applying the per-capita personal income estimate of $30,652 (2019 dollars) to projected District population in the Iron County, personal income is estimated to reach $2.2 billion annually by 2050 (in 30 years)
- Assuming growth is constrained in 2030, the remaining 20-year impact (loss) to the community is $4.8 billion

Source: Bureau of Economic Analysis, Kem C. Gardner Policy Institute, Applied Analysis.

# Quantifying the Potential Impacts of Water Infrastructure

## Personal Income Impacts Over the Next 30 Years: Constrained in 2040




- When applying the per-capita personal income estimate of $30,652 (2019 dollars) to projected District population in the Iron County, personal income is estimated to reach $2.2 billion annually by 2050 (in 30 years)
- Assuming growth is constrained in 2040, the remaining 10-year impact (loss) to the community is $1.0 billion

Source: Bureau of Economic Analysis, Kem C. Gardner Policy Institute, Applied Analysis.

# Quantifying the Potential Impacts of Water Infrastructure

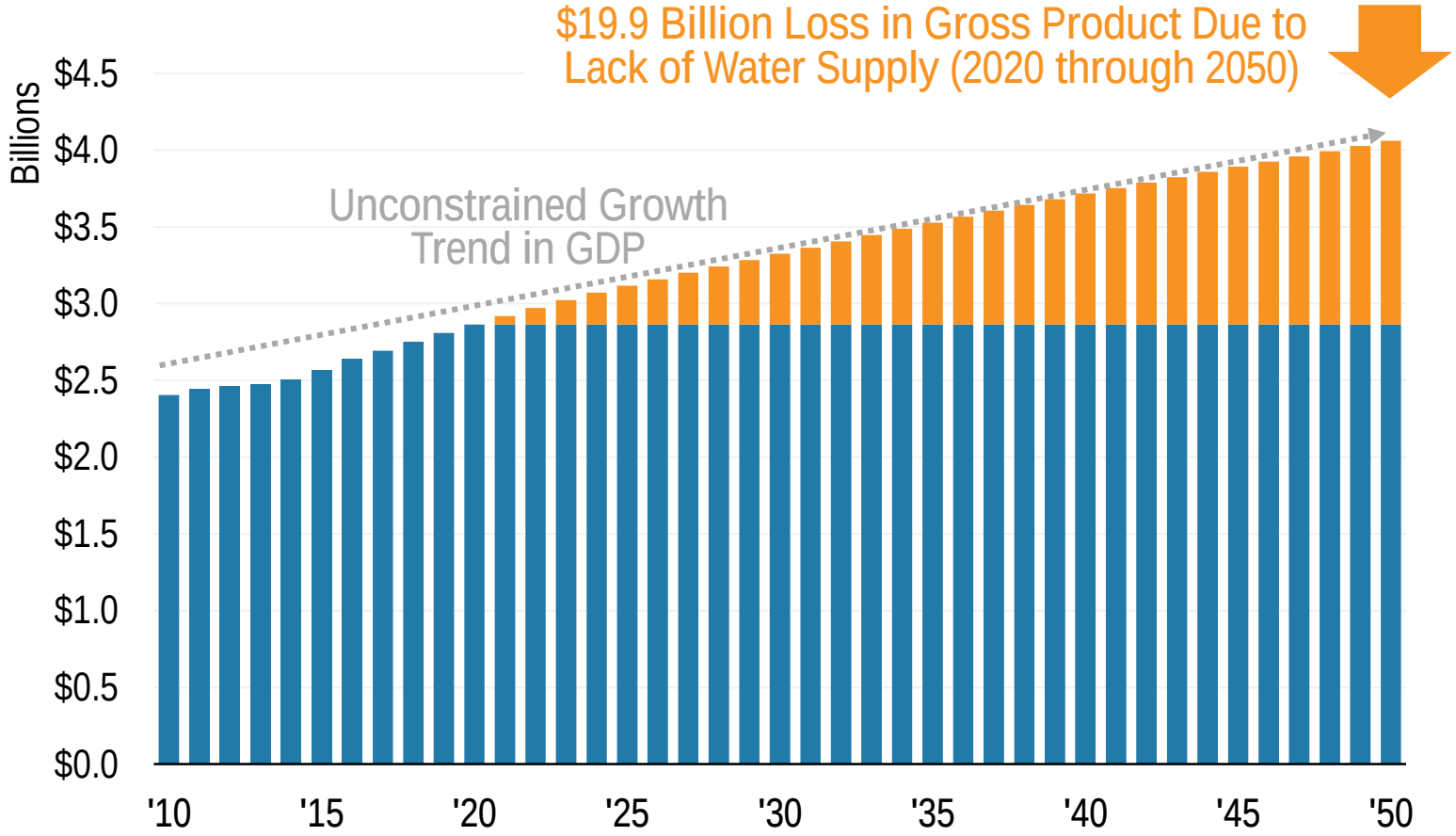
## Gross Product Impacts

What are the impacts on gross product (economic activity) to the community under potential water constraint scenarios

# Quantifying the Potential Impacts of Water Infrastructure

## Gross Product Impacts Next 30 Years: Constrained 2020

- When applying the per-capita gross product estimate of $56,099 (2019 dollars) to projected District population in the Iron County, gross product is estimated to reach $4.0 billion annually by 2050 (in 30 years)
- Assuming growth is constrained next year (2020), the remaining 30-year impact (loss) to the community is $19.9 billion

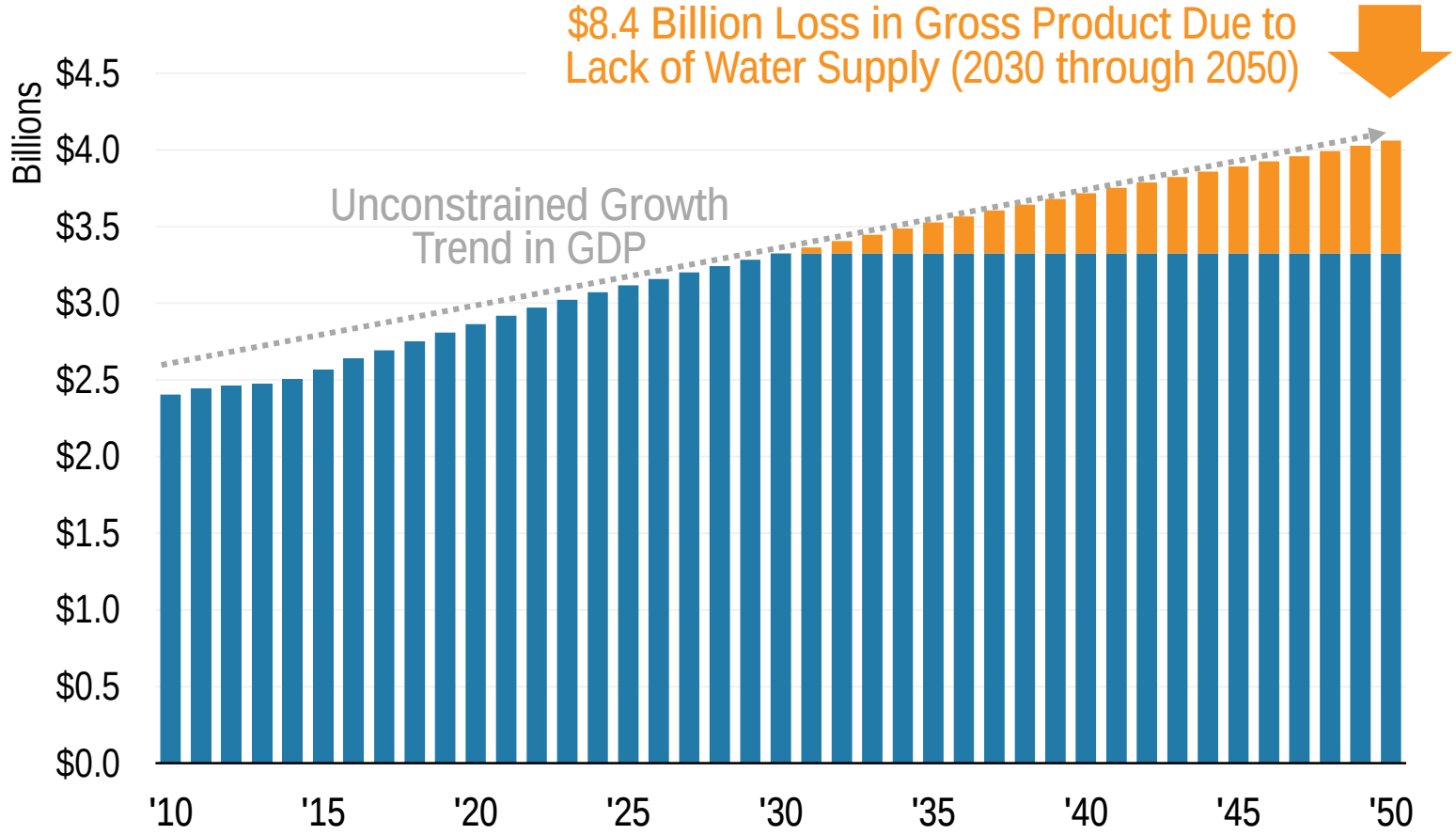



Source: Bureau of Economic Analysis, Kem C. Gardner Policy Institute, Applied Analysis.

# Quantifying the Potential Impacts of Water Infrastructure

## Gross Product Impacts Next 30 Years: Constrained 2030

- When applying the per-capita gross product estimate of $56,099 (2019 dollars) to projected District population in the Iron County, gross product is estimated to reach $4.0 billion annually by 2050 (in 30 years)
- Assuming growth is constrained in 2030, the remaining 20-year impact (loss) to the community is $8.4 billion

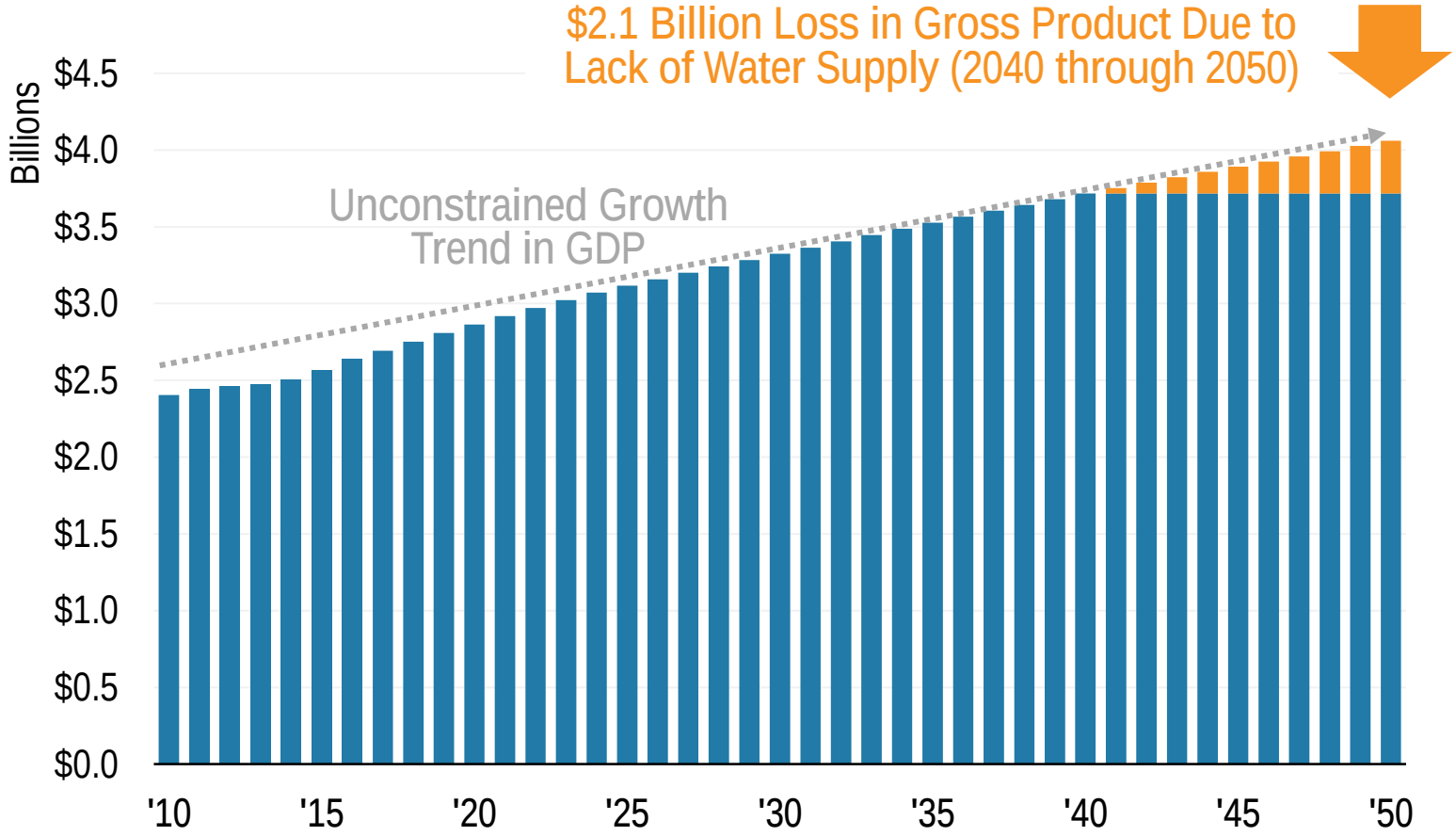



Source: Bureau of Economic Analysis, Kem C. Gardner Policy Institute, Applied Analysis.

# Quantifying the Potential Impacts of Water Infrastructure

## Gross Product Impacts Next 30 Years: Constrained 2040

- When applying the per-capita gross product estimate of $56,099 (2019 dollars) to projected District population in the Iron County, gross product is estimated to reach $4.0 billion annually by 2050 (in 30 years)
- Assuming growth is constrained in 2040, the remaining 10-year impact (loss) to the community is $1.9 billion




Source: Bureau of Economic Analysis, Kem C. Gardner Policy Institute, Applied Analysis.

# Quantifying the Potential Impacts of Water Infrastructure

## A Range of Returns on Investment

When comparing the potential economic implications of a constrained growth environment with the investment, or cost, associated with the Pine Valley and Wah Wah Valley pipeline projects, the ratios are significant:

- Personal Income: Assuming water infrastructure investments of $419.3 million were able to secure an additional 10 years of community growth (2041 to 2050), the impact of an additional $1.0 billion of personal income translates into a return of $2.50 for every $1.00 invested; more near-term constraint scenarios increase that ratio significantly

- Gross Product: Similarly, gross product returns during the 10-year period from 2041 to 2050 are estimated to be $1.9 billion – equating to a return of 4.5-to-1.0 with larger impacts under more conservative scenarios

| | Potential Impact | Rate of Return |
|---|---|---|
| **Personal Income Impacts for the Next 30 Years:** | | |
| Constrained in 2020 | $10,877,150,359 | 25.9 : 1.0 |
| Constrained in 2030 | $4,863,765,891 | 11.6 : 1.0 |
| Constrained in 2040 | $1,041,624,985 | 2.5 : 1.0 |
| **Gross Product Impacts for the Next 30 Years:** | | |
| Constrained in 2020 | $19,907,860,331 | 47.5 : 1.0 |
| Constrained in 2030 | $8,041,032,598 | 19.2 : 1.0 |
| Constrained in 2040 | $1,906,429,904 | 4.5 : 1.0 |

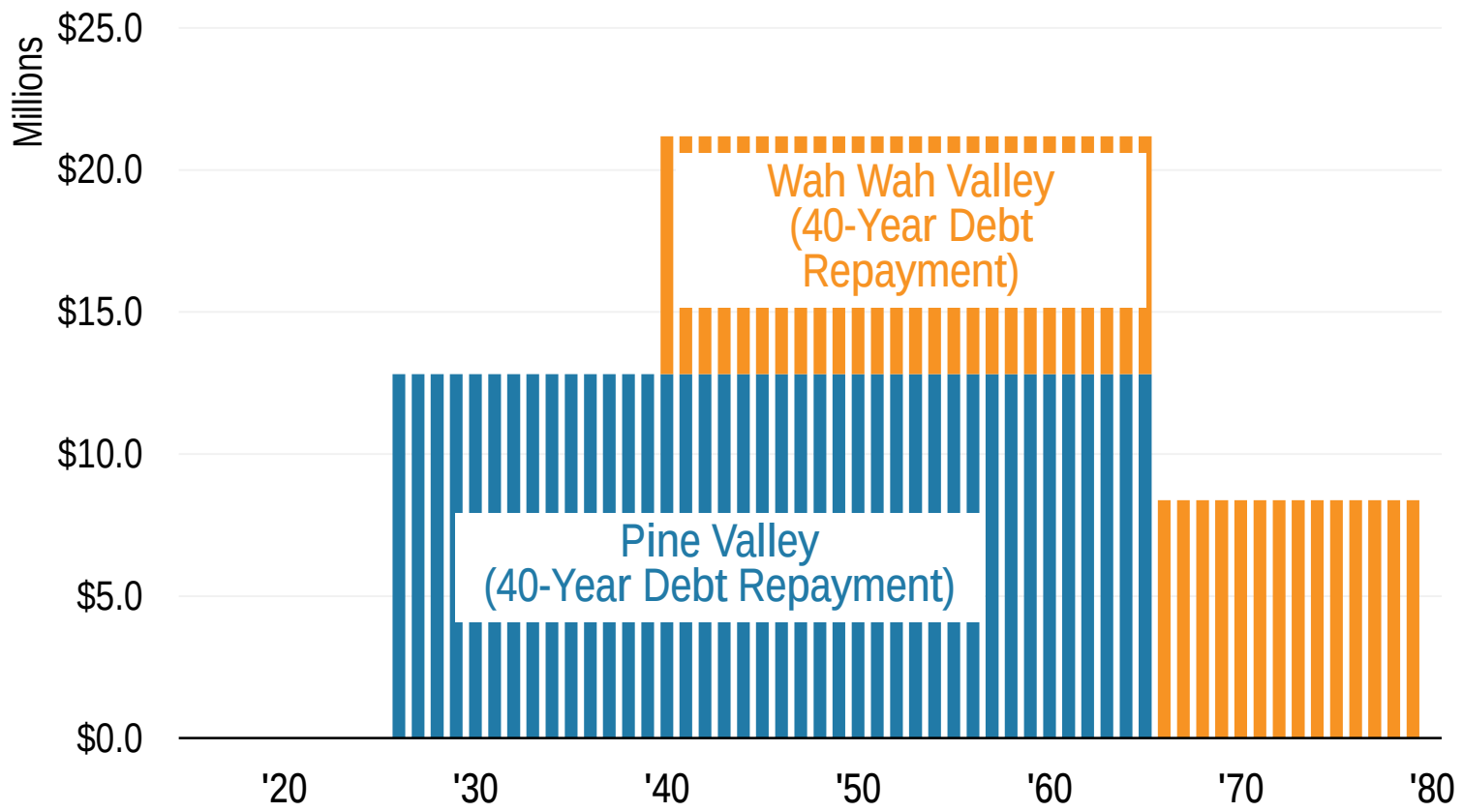
Source: Bureau of Economic Analysis, Kem C. Gardner Policy Institute, Applied Analysis


- Summary of Findings
- Identifying the Issue
- Iron County's Economic Climate
- Iron County's Water Demand Outlook
- Iron County's Water Supply Outlook
- Supply-Demand Dynamics and Potential Solutions
- Economic Impacts of Investments in Infrastructure
- **Fiscal Considerations**

# Potential Debt Financing Scenario of New Infrastructure

- While there are a number of financing alternatives, this analysis assumes:
  - Term: 40-Year Repayment
  - Interest Rate: 4.0%
  - Fixed Payments

- Amortization and Debt Service:
  - Pine Valley:
    - Starts: 2026
    - Annual Debt Service: $12.8 M
  - Wah Wah Valley:
    - Starts: 2040
    - Annual Debt Service: $8.4 M




Source: CICWCD

# Total Debt Service, Plus O&M of New Infrastructure

- While there are a number of financing alternatives, this analysis assumes:
  - Term: 40-Year Repayment
  - Interest Rate: 4.0%
  - Fixed Payments

- Amortization and Debt Service:
  - Pine Valley:
    - Starts: 2026
    - Annual Debt Service: $12.8 M
  - Wah Wah Valley:
    - Starts: 2040
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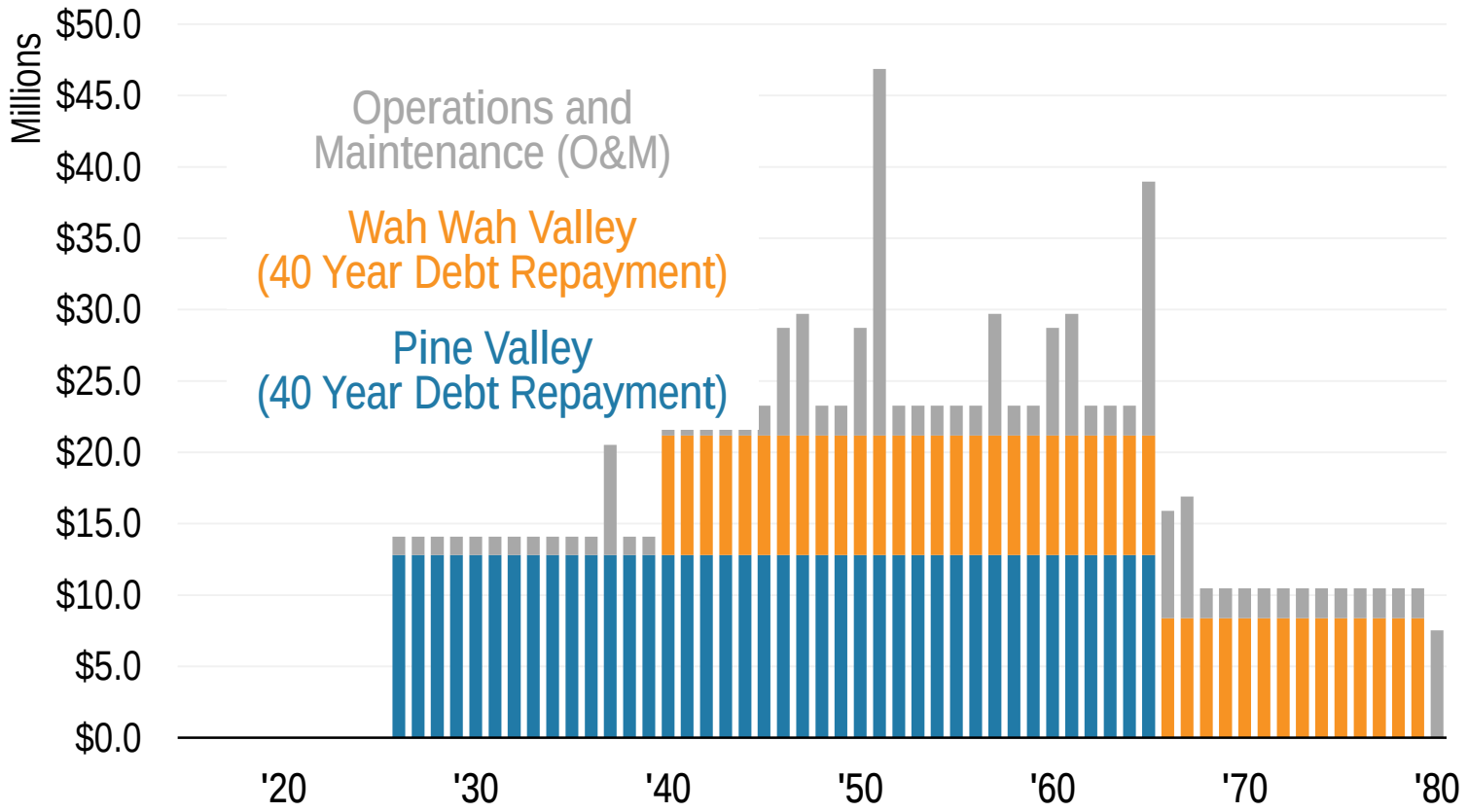



Source: CICWCD

# Potential Funding Sources for New Infrastructure

## User Fees (Incremental Water Usage Fees)

| Period | Annual per HH |
|---|---|
| 2017-2026 | $0.50 |
| 2026-2030 | $2.30 |
| 2030-2040 | $2.50 |
| 2040-2050 | $2.60 |
| 2050-2060 | $2.50 |
| 2060-2080 | $2.00 |

## Impact Fees (Development/Investment Community)

| Period | Per New HH |
|---|---|
| 2017-2026 | $3,500 |
| 2026 | $5,000 |
| 2026-2030 | +3.0% |
| 2030-2040 | +3.0% |
| 2040-2050 | +3.0% |
| 2050-2060 | +1.0% |
| 2060-2080 | 0.0% |

## Property Taxes (Residents, Businesses, and Landowners)

| Period | % To Project |
|---|---|
| 2017-2026 | 0.0% |
| 2026-2030 | 1.0% |
| 2030-2040 | 1.0% |
| 2040-2050 | 1.0% |
| 2050-2060 | 1.0% |
| 2060-2080 | 1.0% |

Source: CICWCD.

# Residential Water Bills and Rates

## Current Rates

*Average Monthly Water Bill*
*$2.24 per 1,000 Gallons*

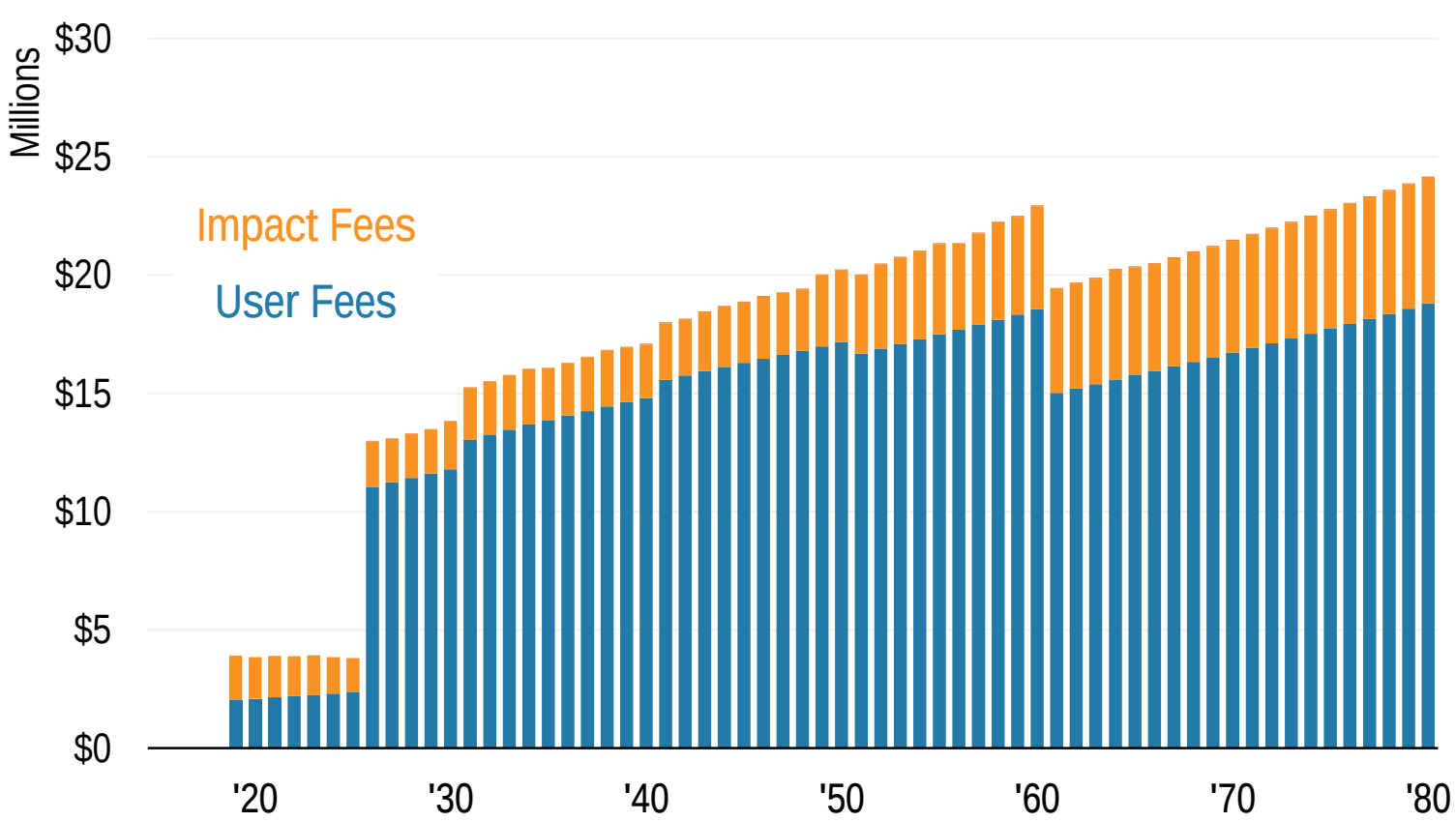
*Average Monthly Water Bill*
*15,926 Gallons / $35.71 per month*

*Average Monthly Water Bill*
*191,112 Gallons / $428.52 per year*

| Level | Description | Cost | Includes |
|---|---|---|---|
| #0 | Minimum Monthly Fee | $31.00 | No Water, Minimum Monthly Fee |
| #1 | Plus $0.78 per 1,000 Gallons | $0.78 | 0 to 12,000 Gallons/Month |
| #2 | Plus $0.94 per 1,000 Gallons | $0.94 | 12,001 to 20,000 Gallons/Month |
| #3 | Plus $1.65 per 1,000 Gallons | $1.65 | 20,001 to 30,000 Gallons/Month |
| #4 | Plus $2.78 per 1,000 Gallons | $2.78 | 30,001 to 60,000 Gallons/Month |
| #5 | Plus $3.09 per 1,000 Gallons | $3.09 | 60,001 to 100,000 Gallons/Month |
| #6 | Plus $4.12 per 1,000 Gallons | $4.12 | Over 100,000 Gallons/Month |

Source: Water Master Plan Report, 2014; Ensign Engineering & Land Surveying, CICWCD.

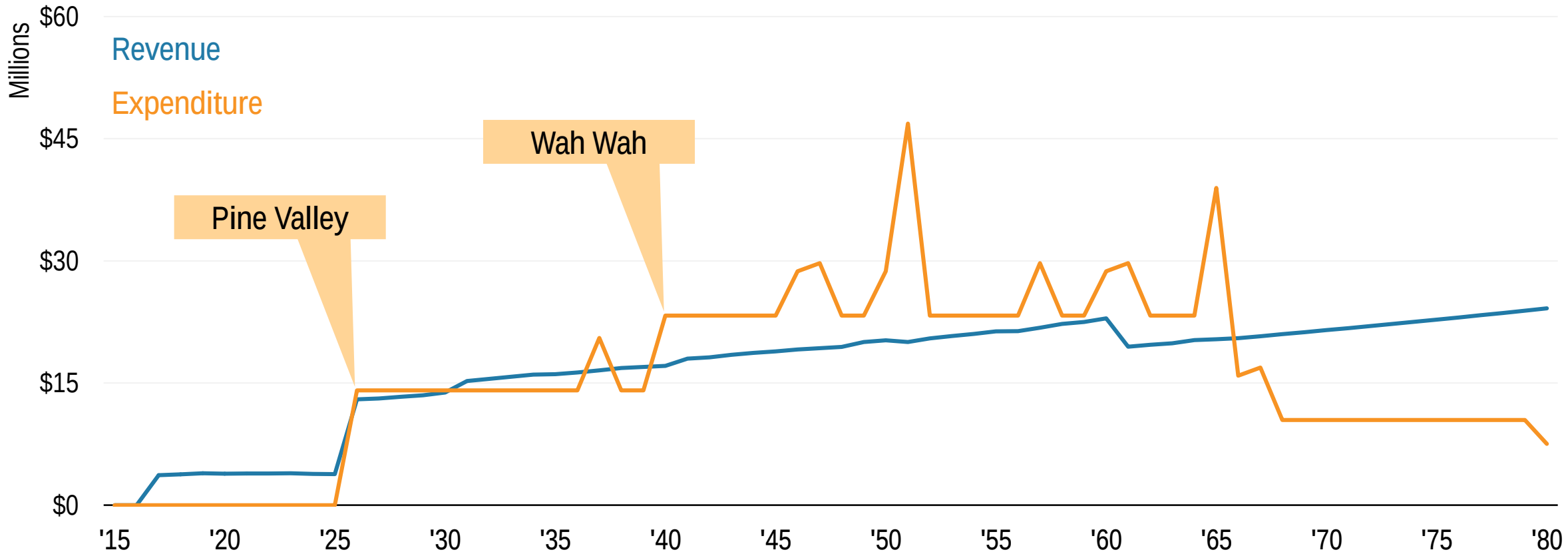
# Potential Revenue Scenario




- There are a number of potential financing scenarios for the project; this scenario reflects one alternative

Source: CICWCD

# Potential Revenue and Expenditure Scenario




Source: CICWCD

CENTRAL IRON COUNTY WATER CONSERVANCY DISTRICT

# WATER RESOURCE

## ECONOMIC AND FISCAL ANALYSIS

JUNE 2019 | WORKING DRAFT | SUBJECT TO MATERIAL REVISION

APPLIED ANALYSIS