

The Carson River Watershed

30-Year Drought and Water Sustainability Plan

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Carson Water Subconservancy District

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Presentation Overview

- Regional Systems & Water Sustainability Summary
- Historic Carson River Flows
- Groundwater Pumping
- Runoff Changes
- USGS Models
- Wet & Dry Years – Alpine Decree
- Conjunctive Management
- Potential Mitigation Strategies
- Key Takeaway Points





Nevada Department of
**CONSERVATION &
NATURAL RESOURCES**

This project started in 2023 with funding provided by the Nevada Department of Emergency Management. Funding was used to hire Lumos and Associates to do an analysis of 9 purveyors upstream of the Lahontan Reservoir and use that information in partnership with the USGS in the update of the Upper and Middle Groundwater Models. The results of these major efforts fed the 30-year report.



Partners and
Background

Regional Systems and water sustainability

All 9 purveyors have adequate water rights and water quality to support regional growth in the upper and middle Carson Watershed.



Minden and GRGID are projected to exceed their current pumping capacities and will require additional wells by 2051 to meet their future needs.



This study did not evaluate system constraints so many of the other water purveyors may need additional wells in the future.

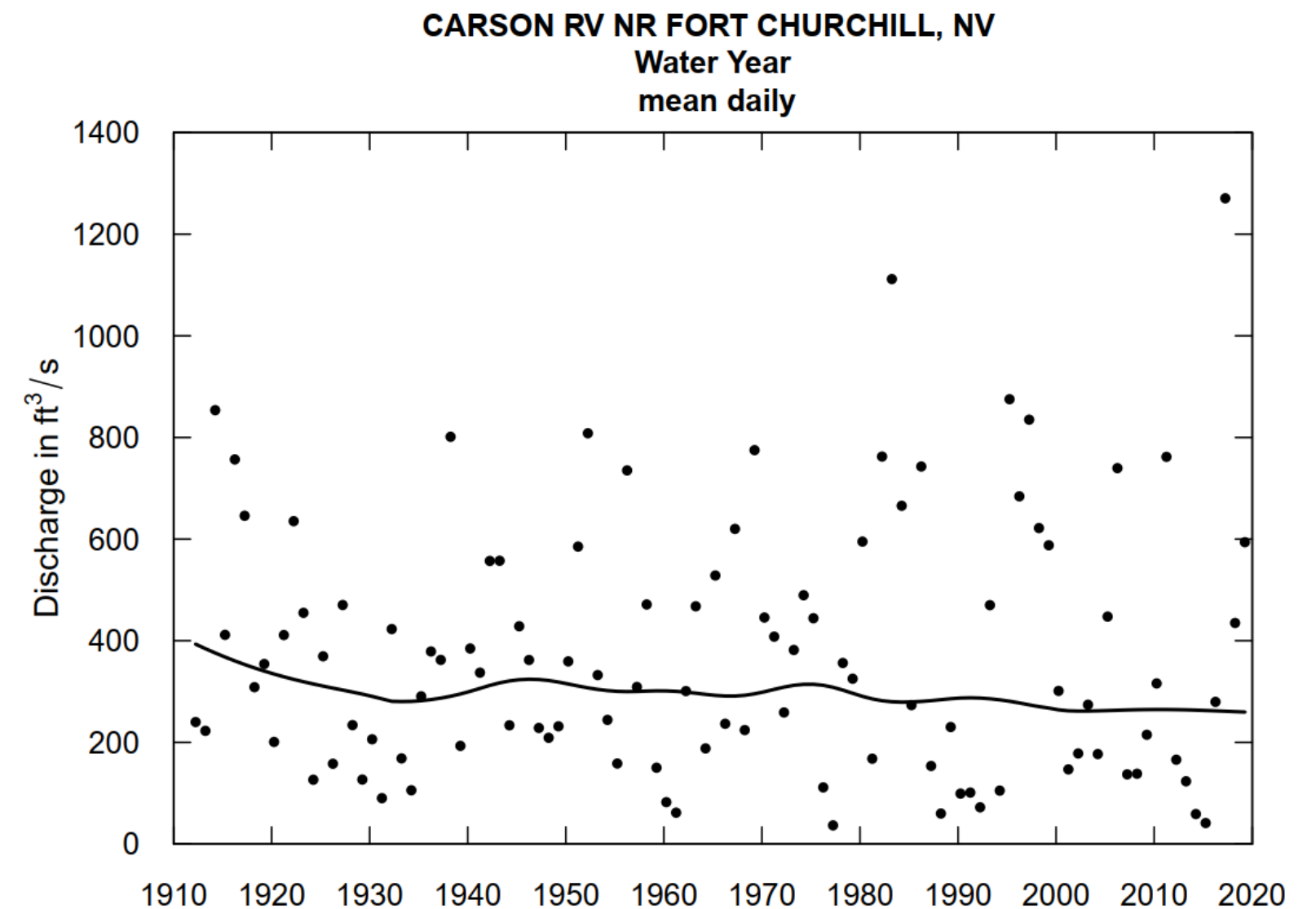
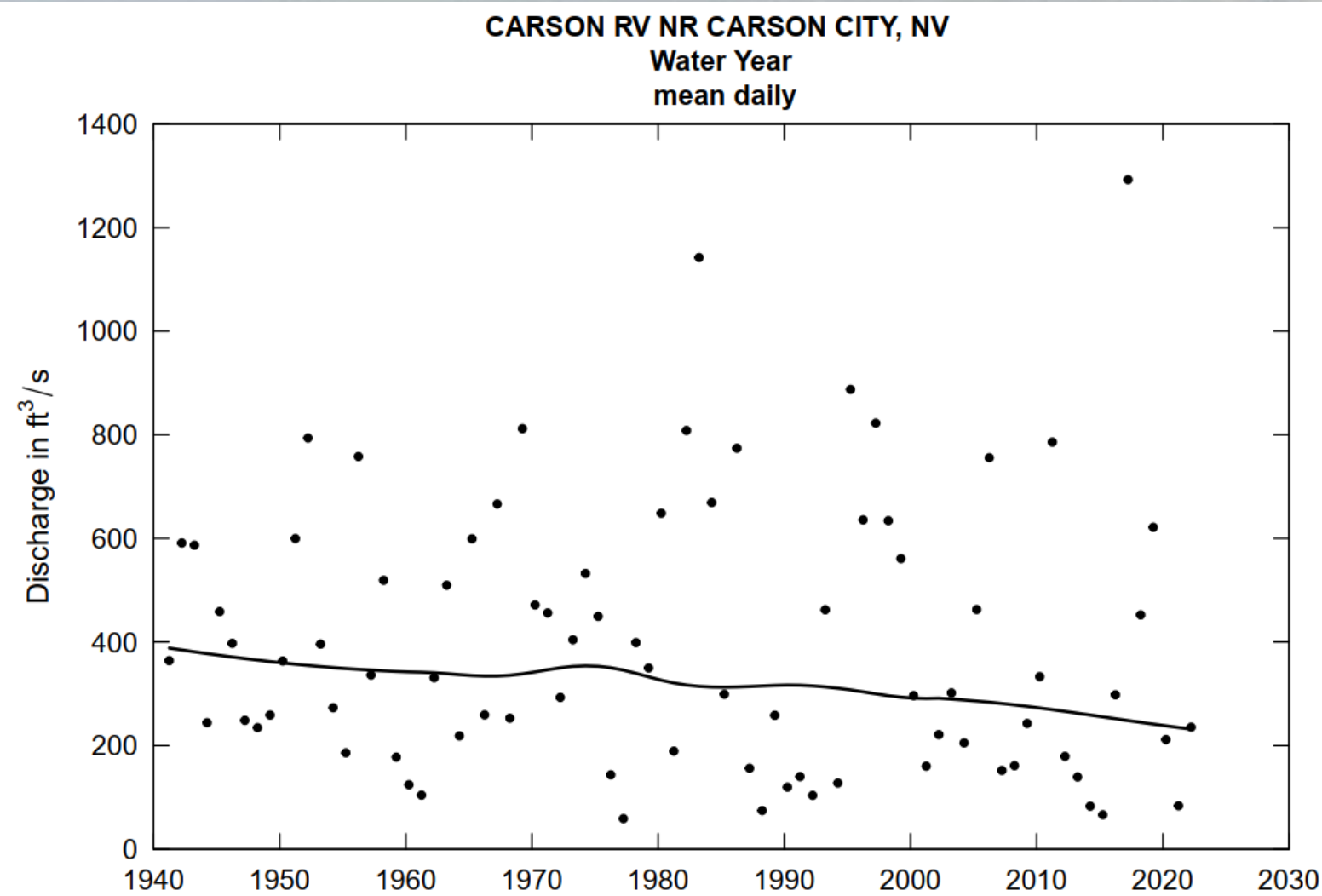


SSMWC and Stagecoach GID are projected to have adequate well capacity and water rights to support their limited growth through 2051. However, their growth potential is limited by the perennial yield of their respective basins



Historic Carson River Flows

In 2023, the USGS published their Middle Carson River Basin Report. Included in the study was Streamflow data from 1940–2018 which showed a slight overall decline, driven by climate variability and human influences.

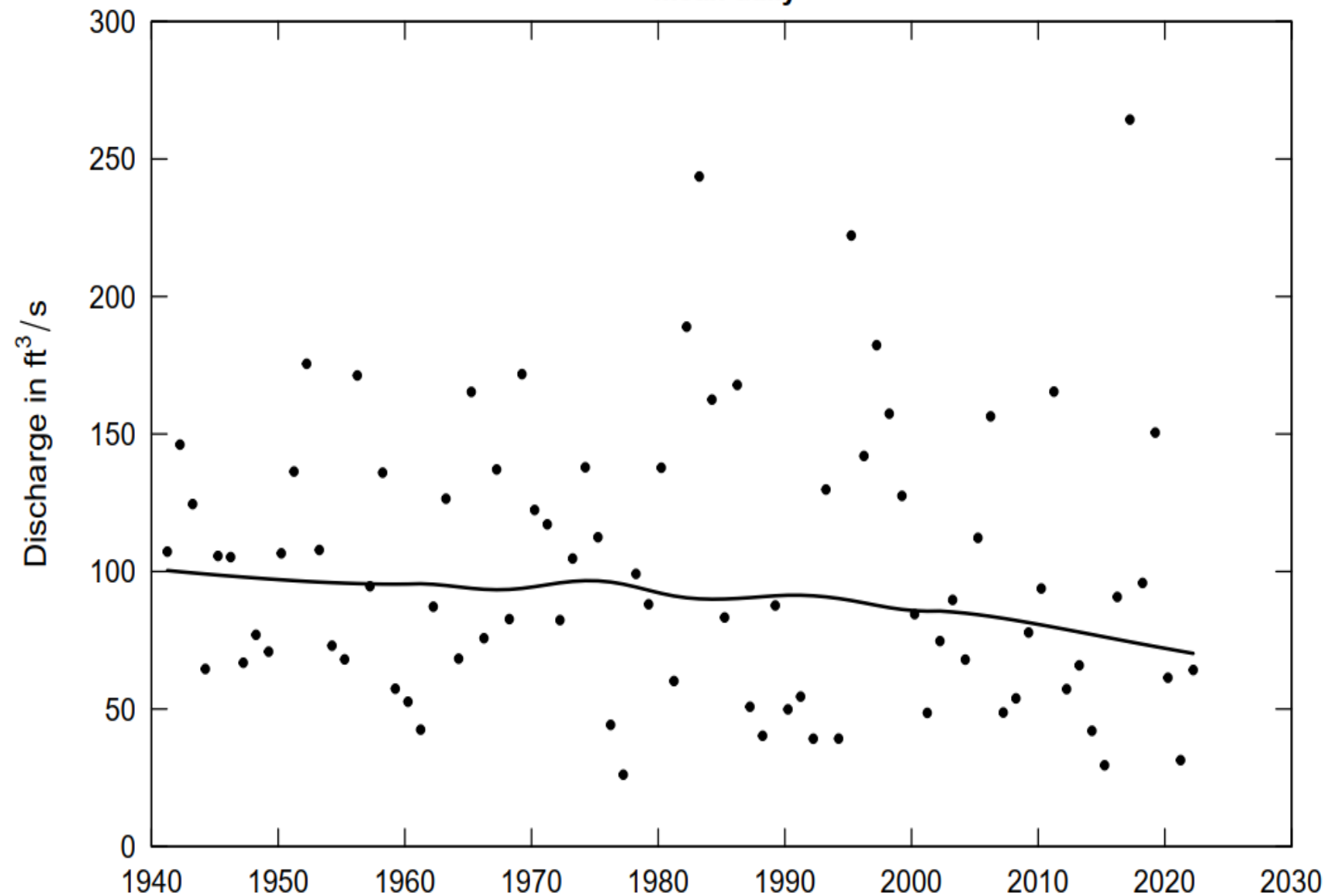


Historic Carson River Flows

CWSD staff conducted the same analysis for the East and West Forks

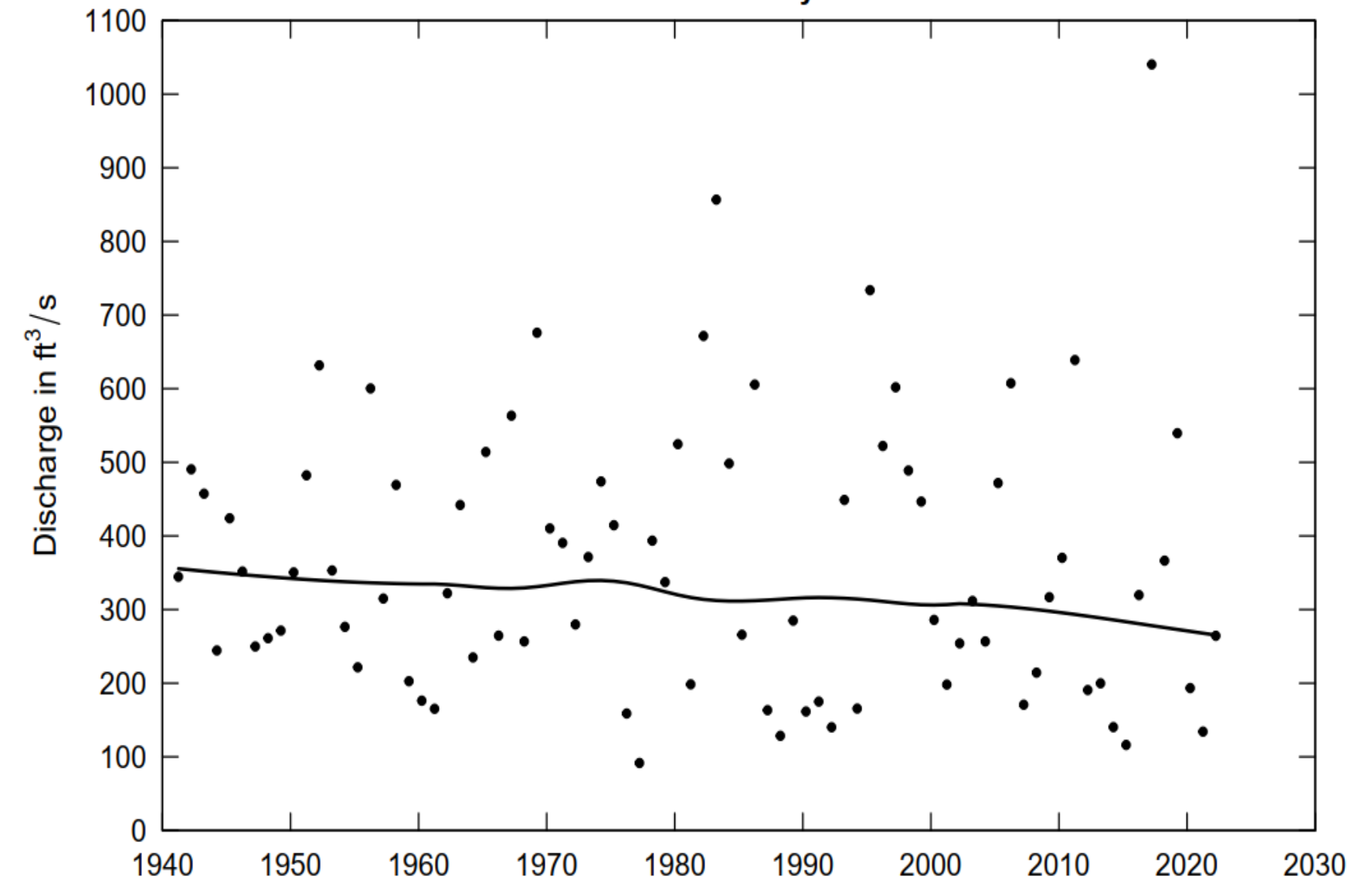
W FK CARSON RV AT WOODFORDS, CA

Water Year
mean daily

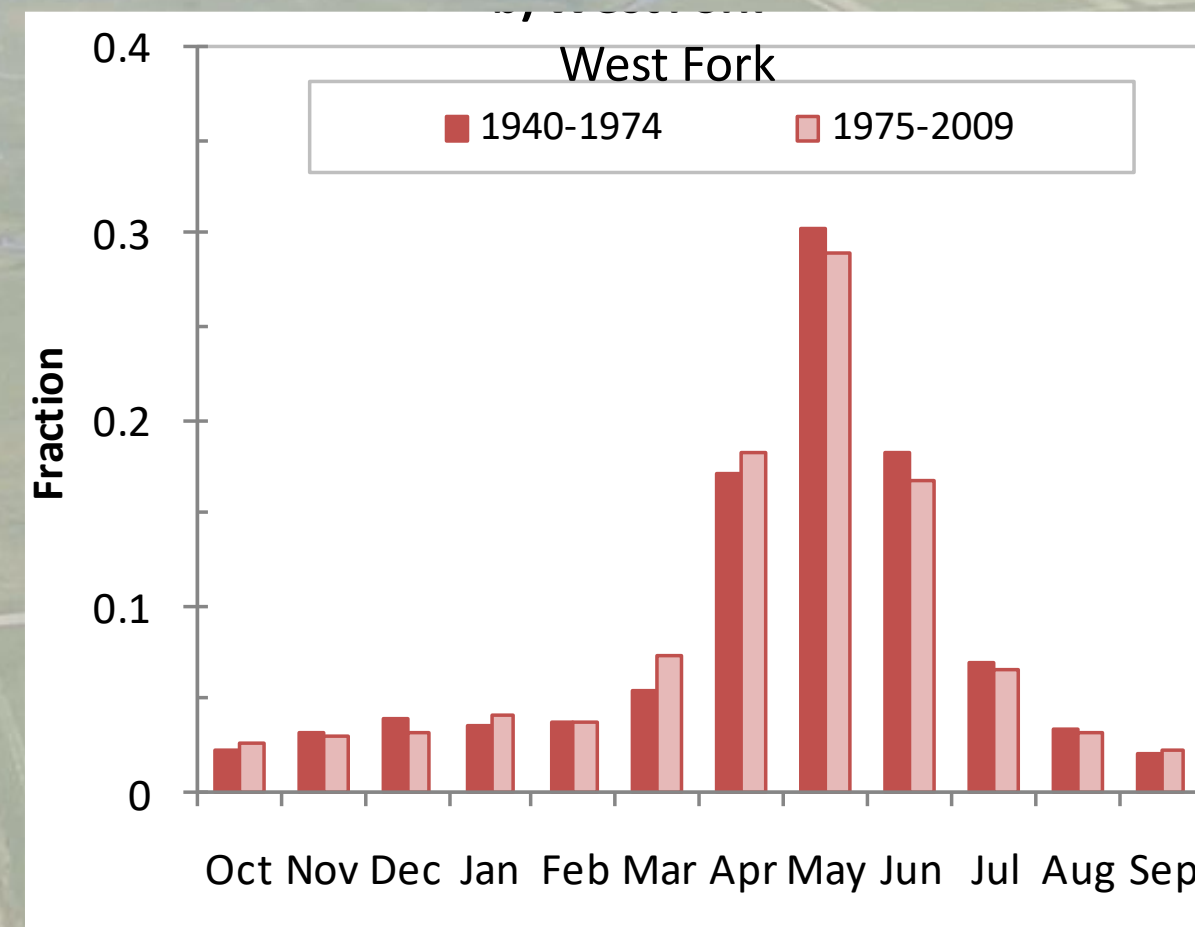
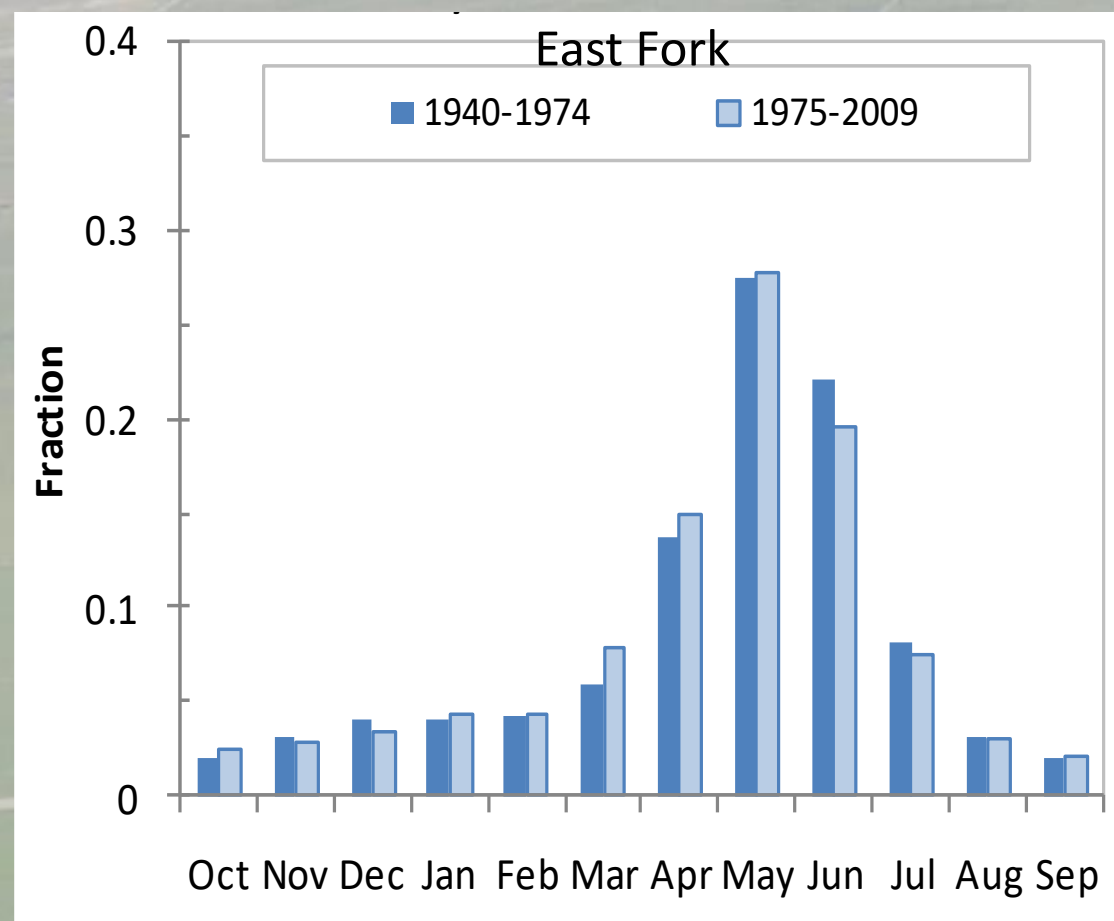
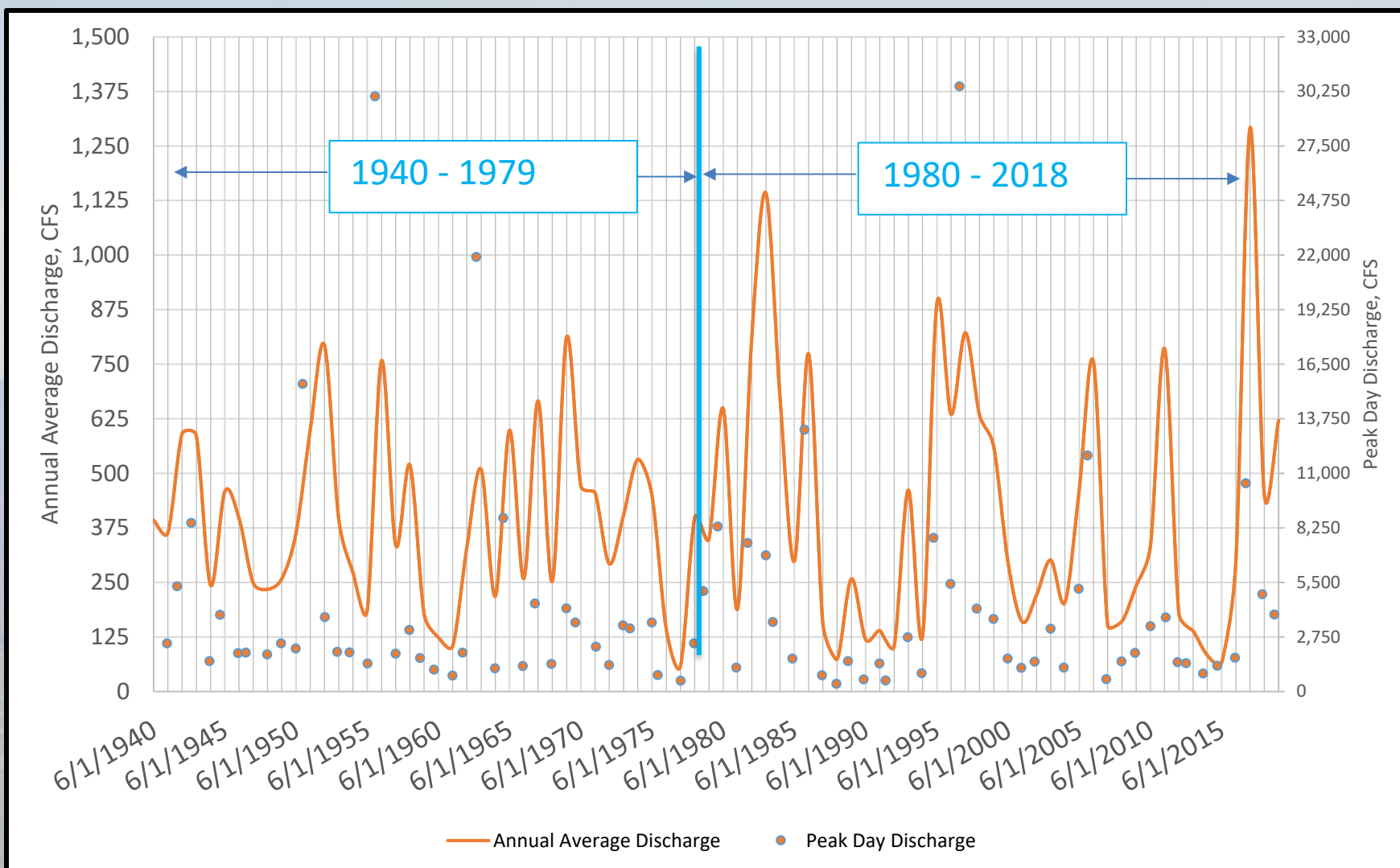


E FK CARSON RV NR GARDNERVILLE, NV

Water Year
mean daily



Historic Carson River Flows



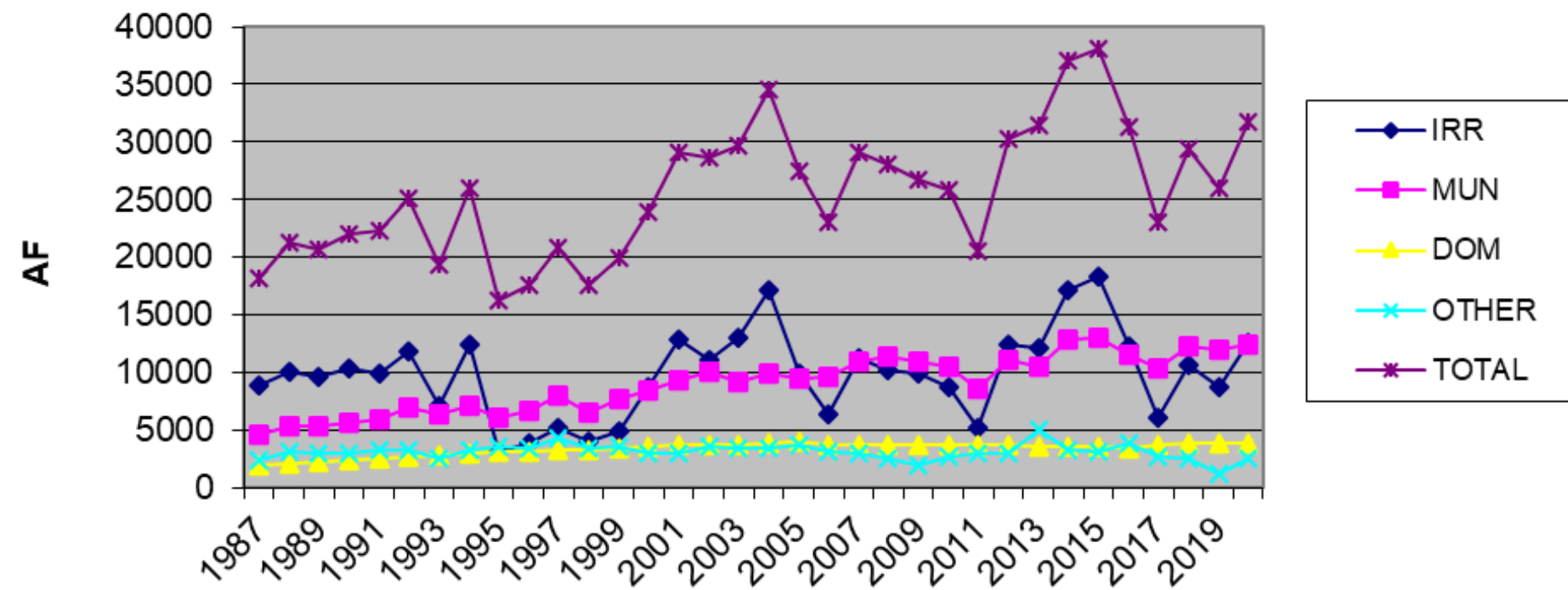
Groundwater Pumping

Summary on the Nine Major Water Purveyors

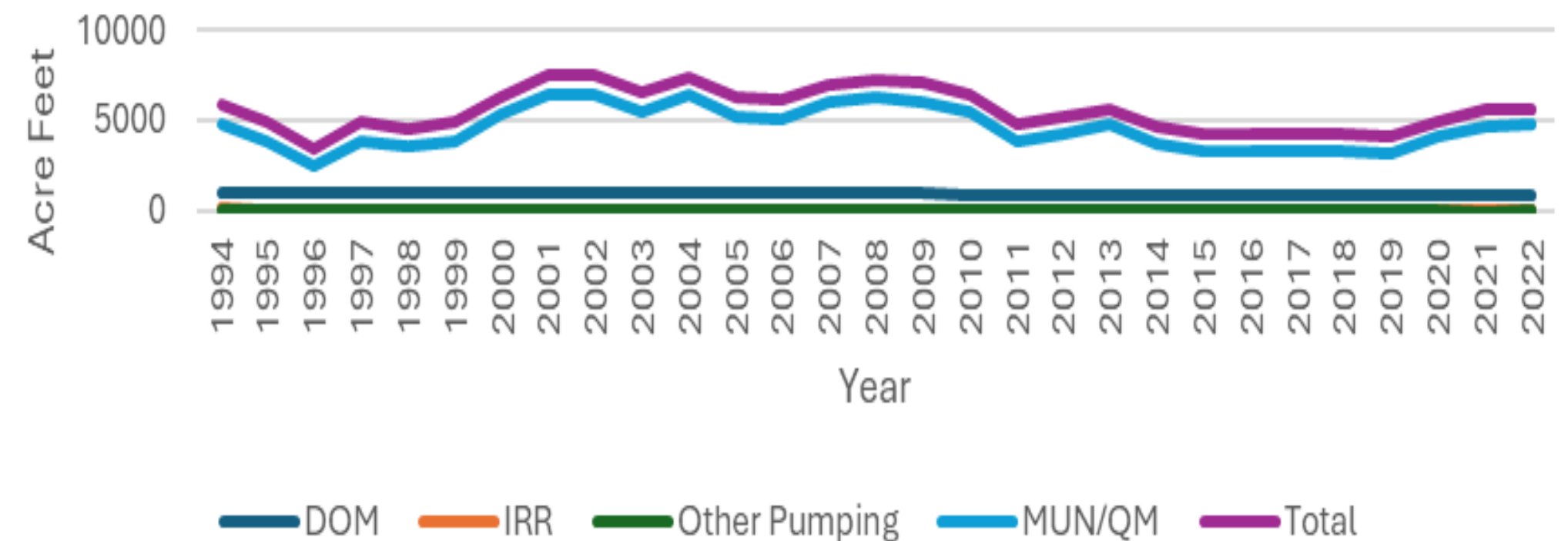
- Gardnerville Ranchos General Improvement District (GRGID) 0.54% growth
- Gardnerville Water Company (GWC) 0.54% growth
- Town of Minden 0.54% growth
- Douglas County 0.54% growth
- Indian Hills General Improvement District (IHGID) 0.8% to 0.0% growth
- Carson City Water Utility 0.7% to 0.1% growth
- Lyon County Utility 0.8% growth
- Stagecoach General Improvement District (Stagecoach GID) 0.43% growth
- Silver Springs Mutual Water Company (SSMWC) 0.43% growth

Groundwater Pumping

CARSON VALLEY GROUNDWATER PUMPAGE

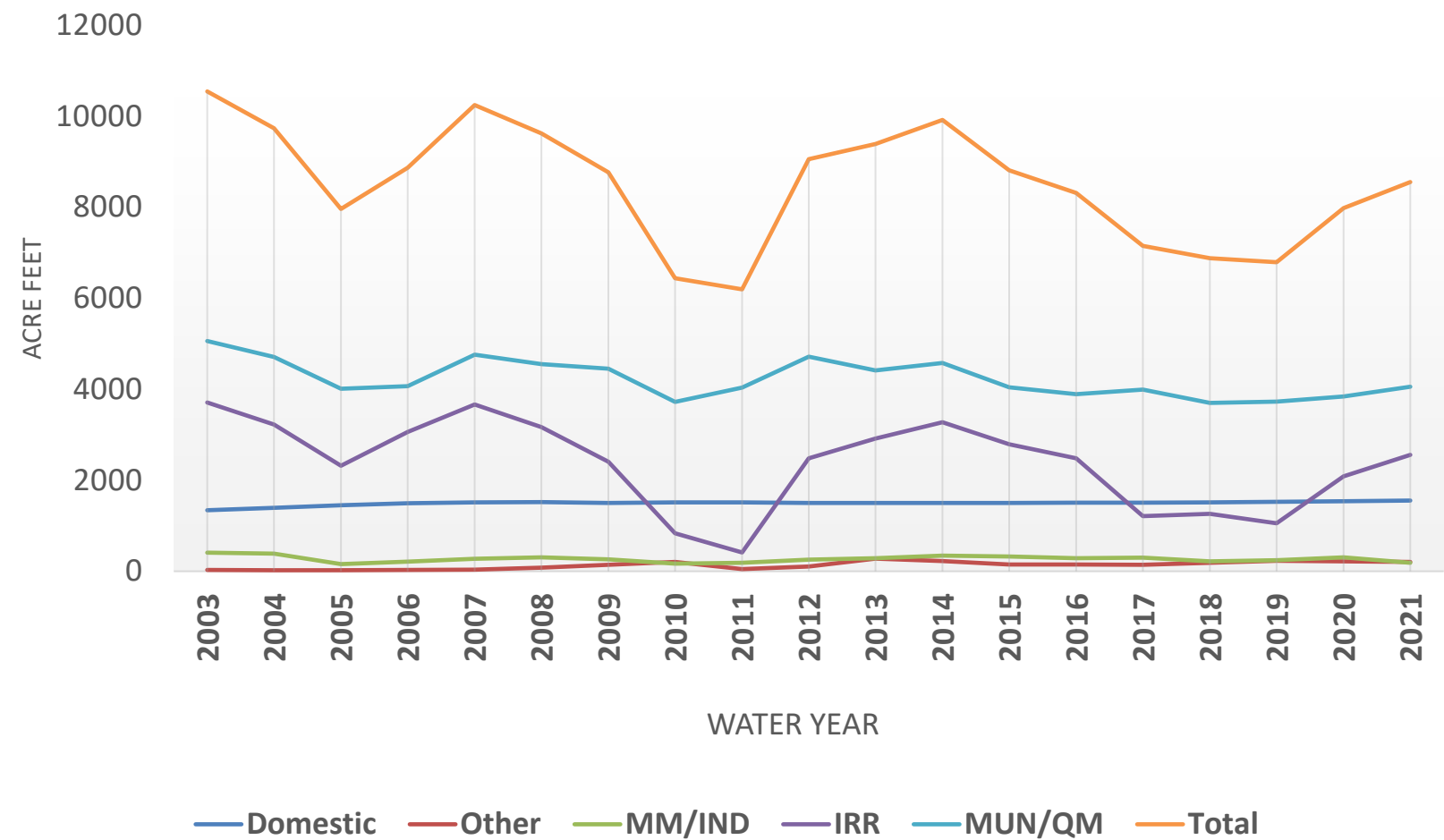


EAGLE VALLEY GROUNDWATER PUMPAGE

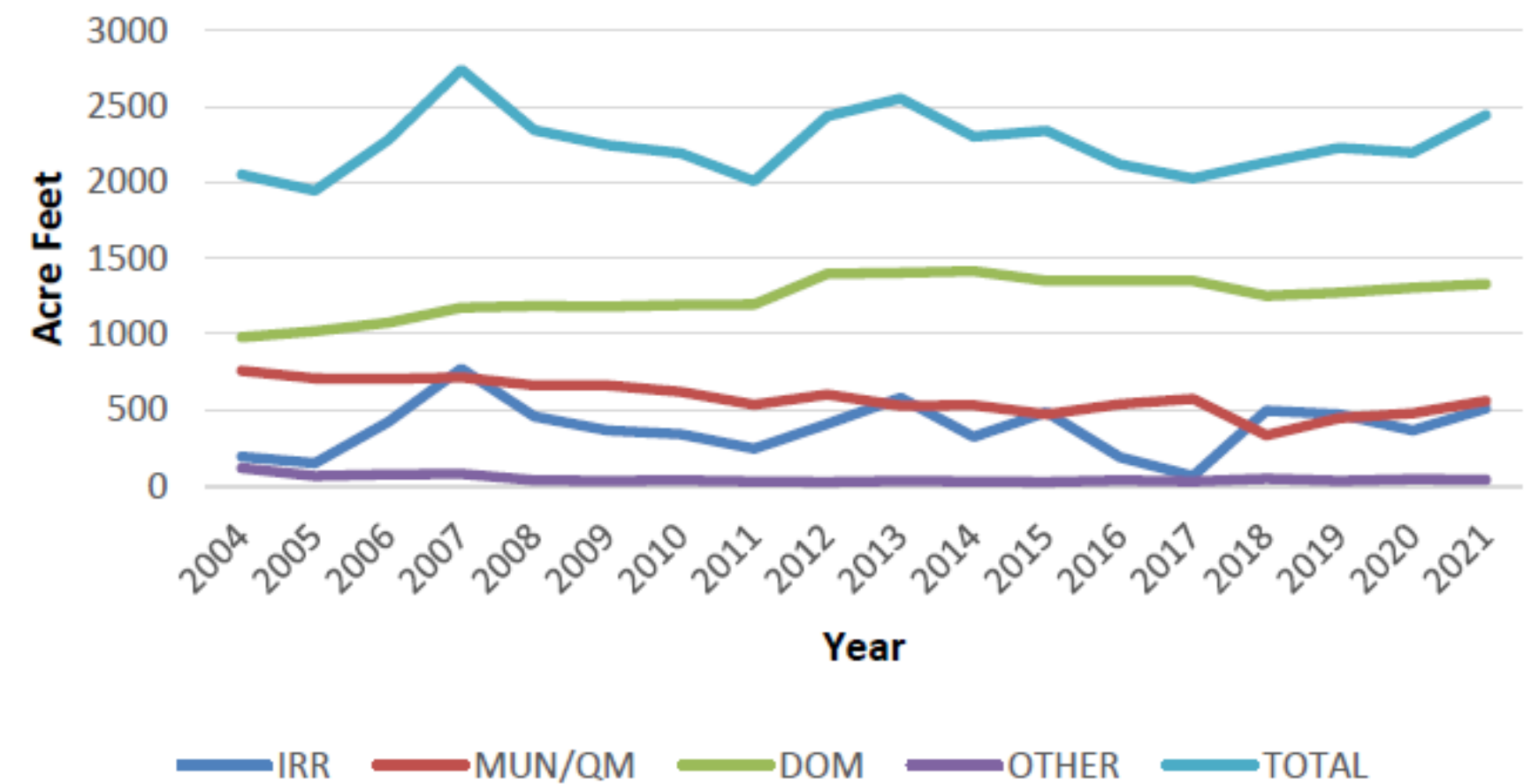


Groundwater Pumping

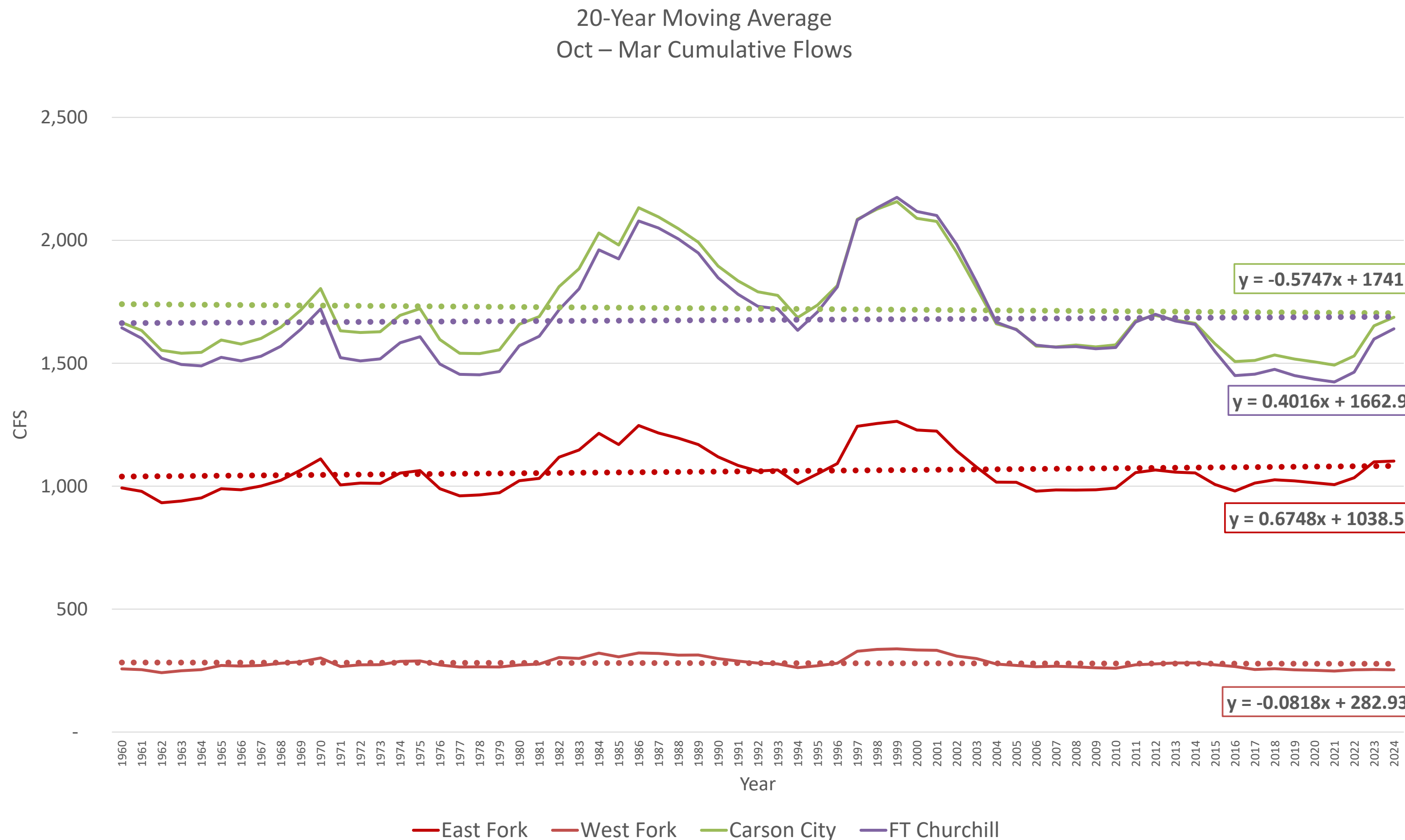
Dayton Valley Groundwater Pumping



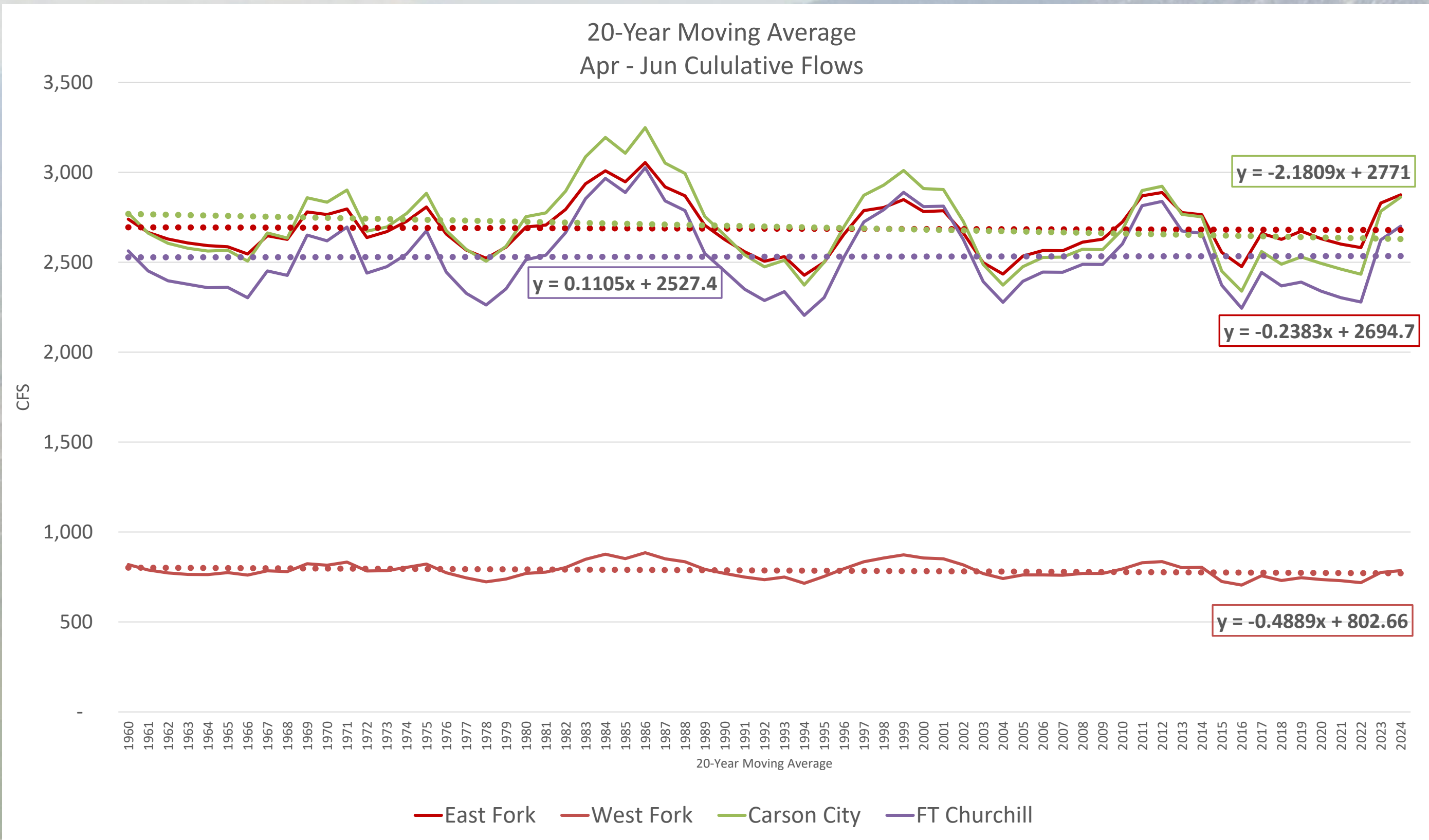
CHURCHILL VALLEY GROUNDWATER PUMPAGE



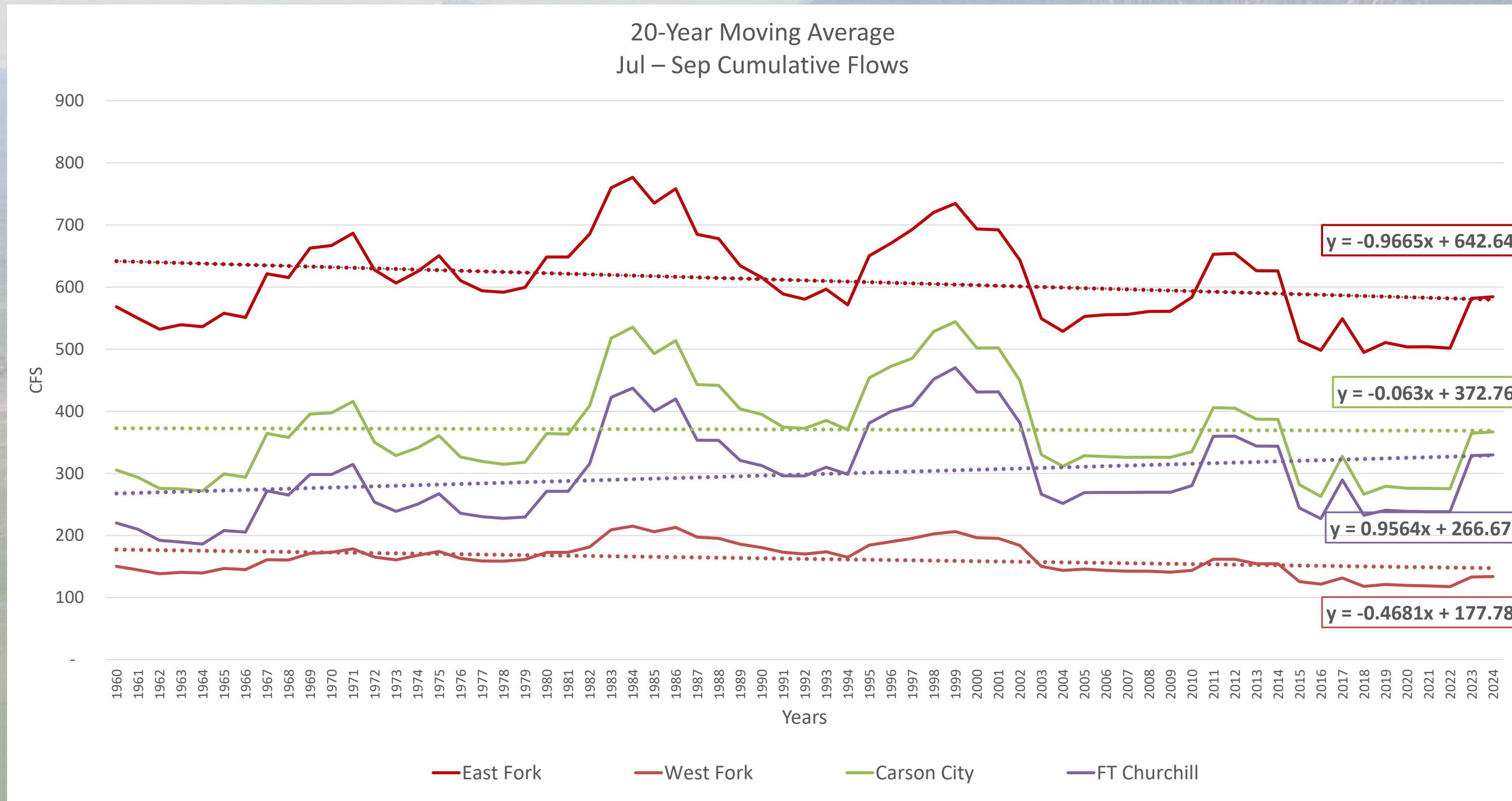
Runoff Changes



Runoff Changes

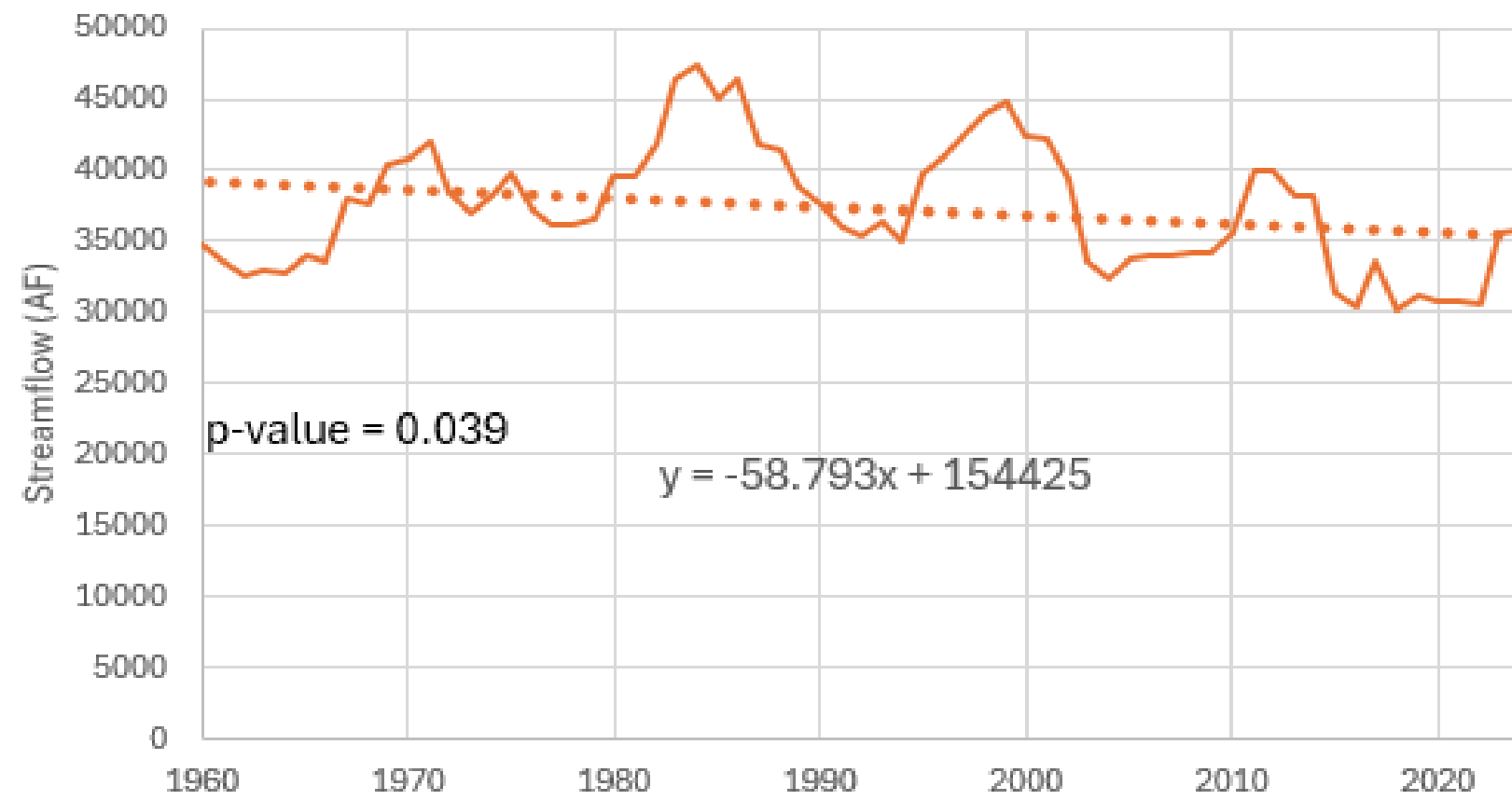


Runoff Changes

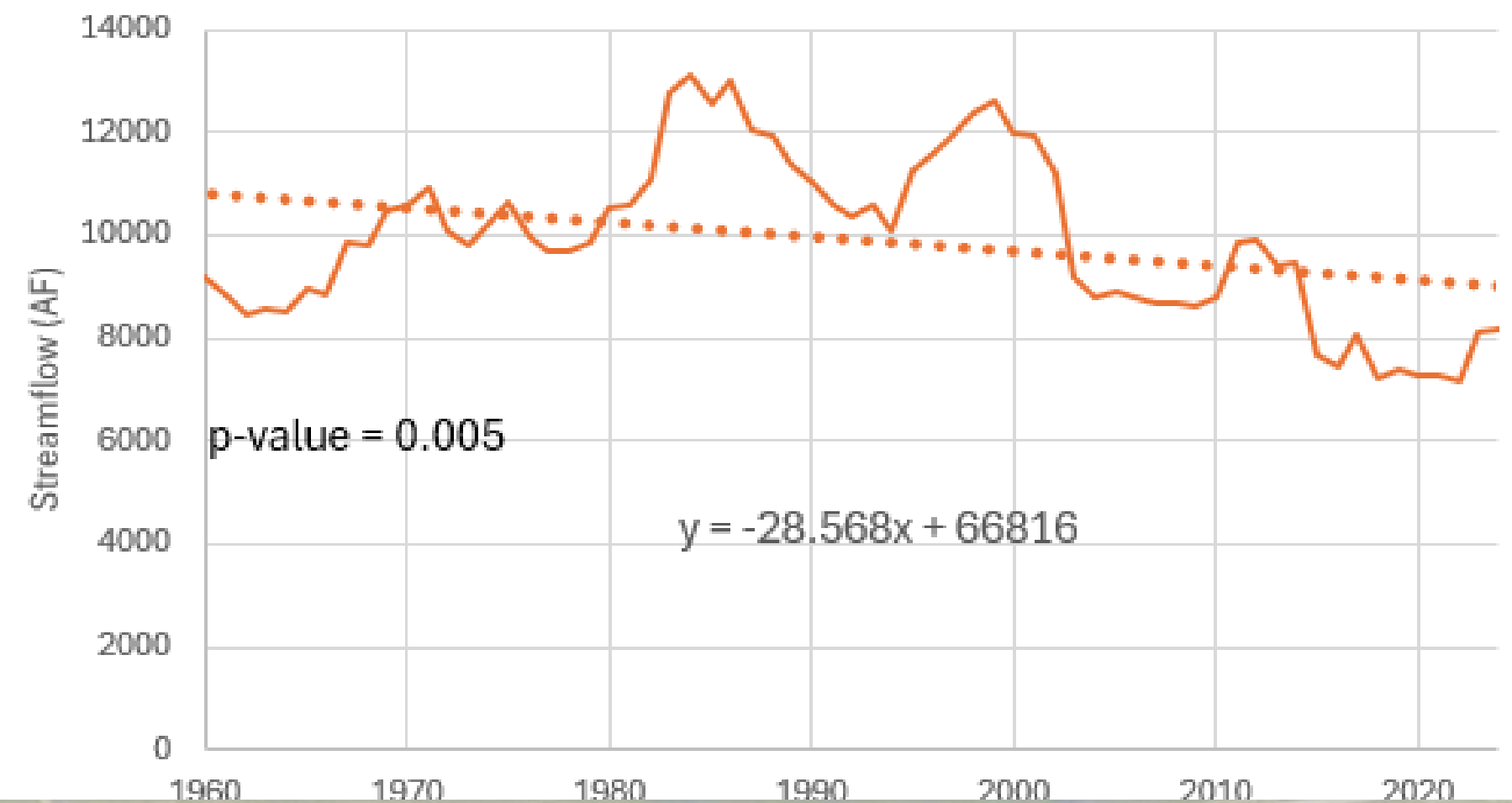


Runoff Changes

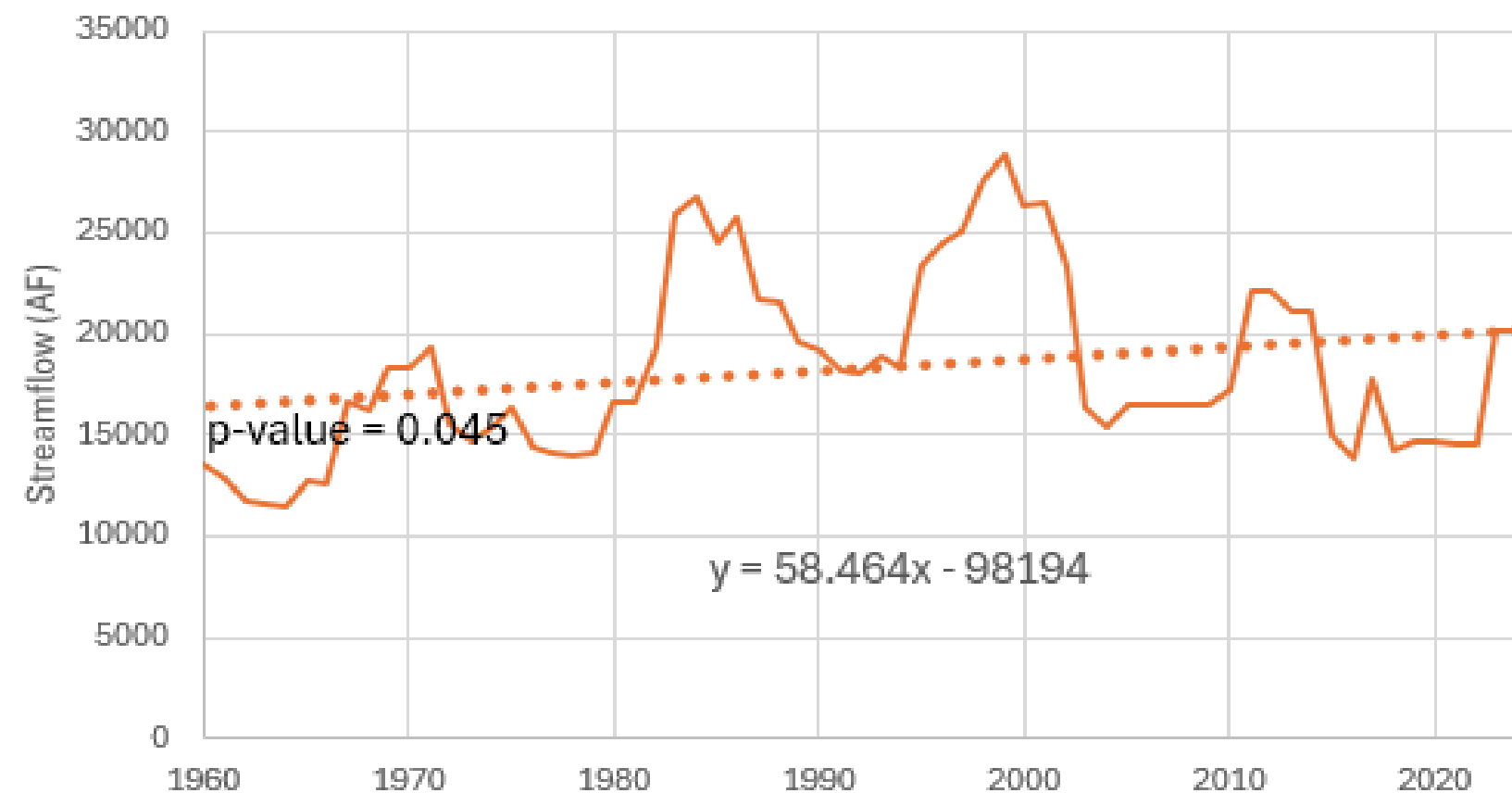
Mean Daily Flow for Season Jul - Sep for East Fork
Carson River near Gardnerville



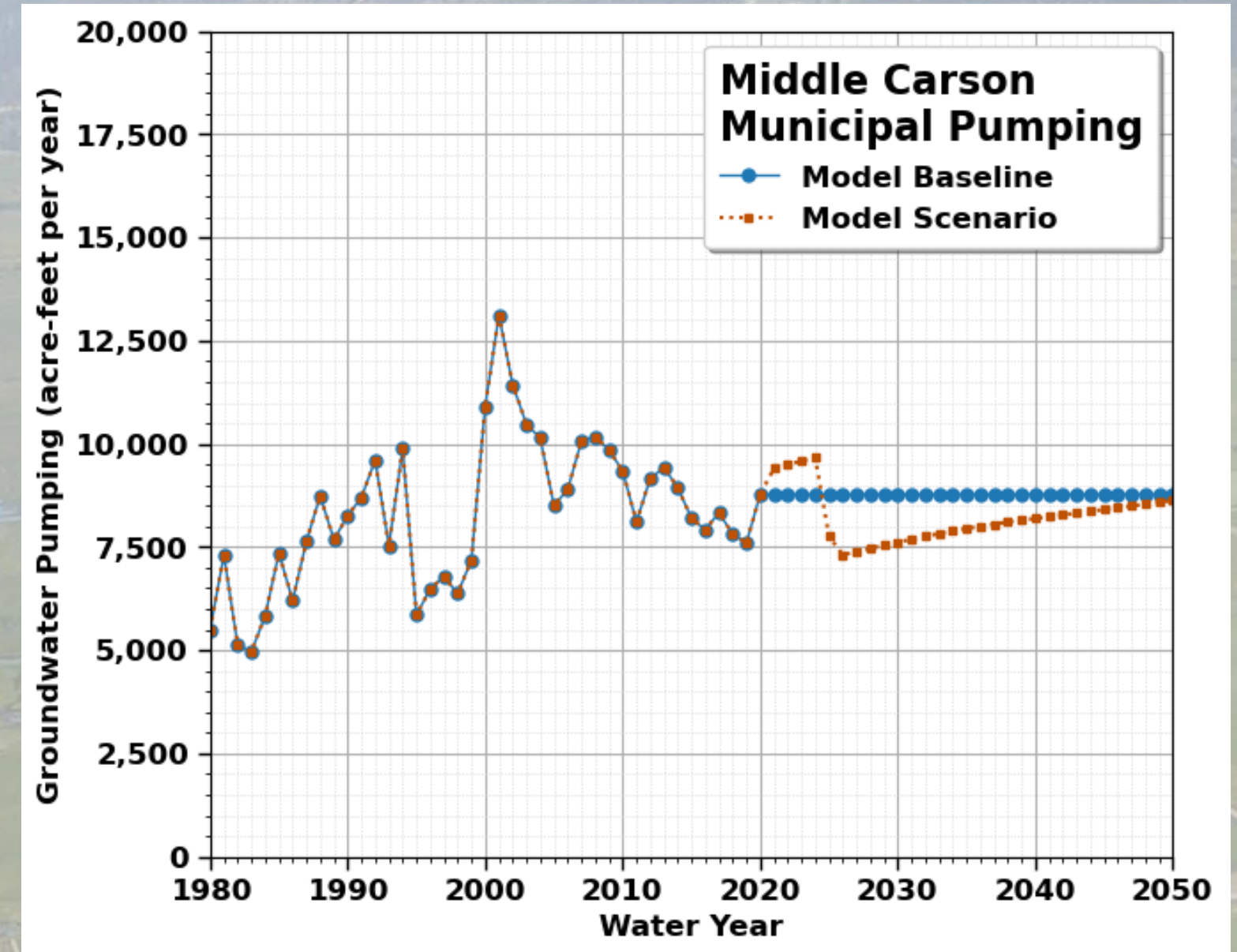
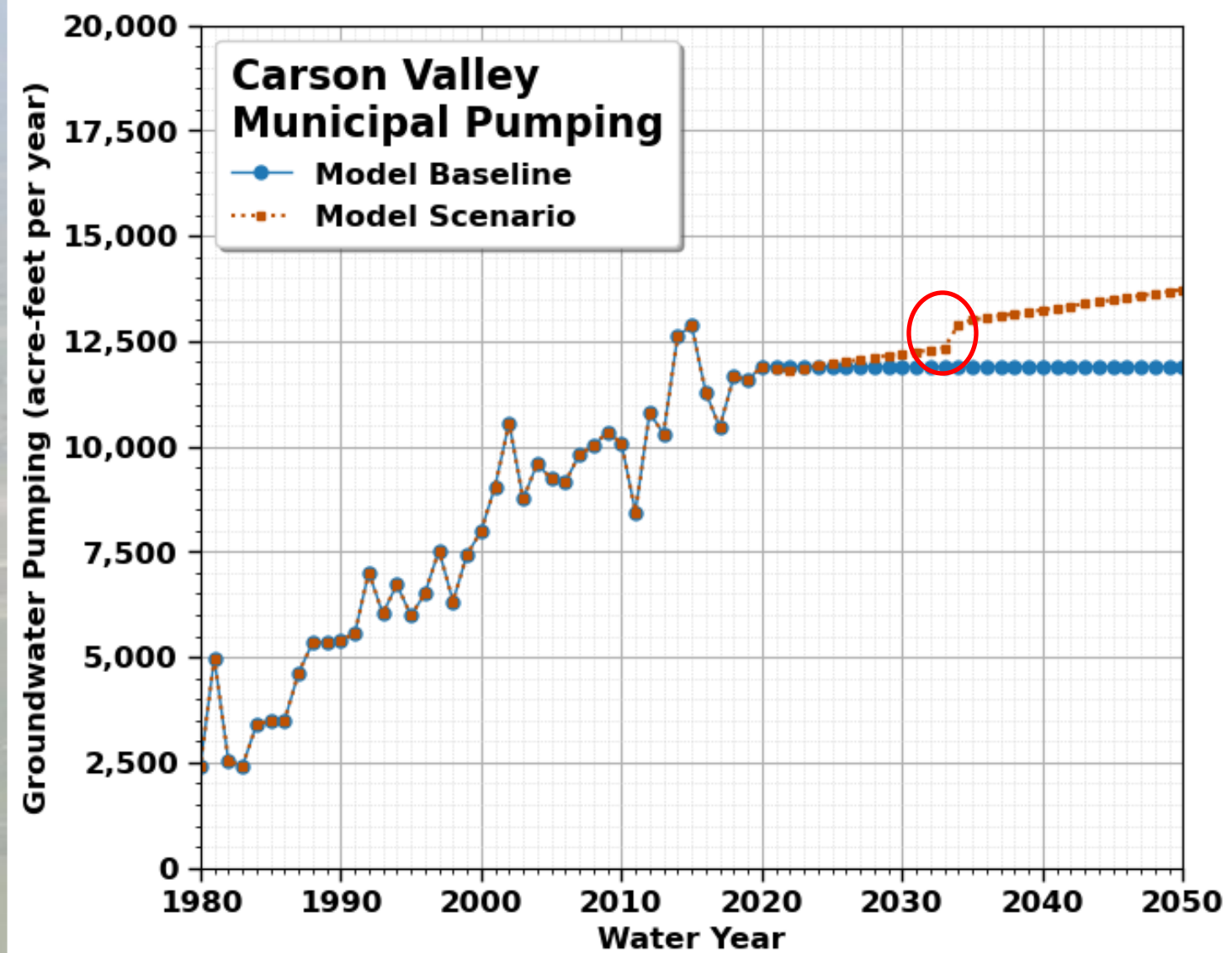
Mean Daily Flow for Season Jul - Sep for West Fork
Carson River at Woodfords



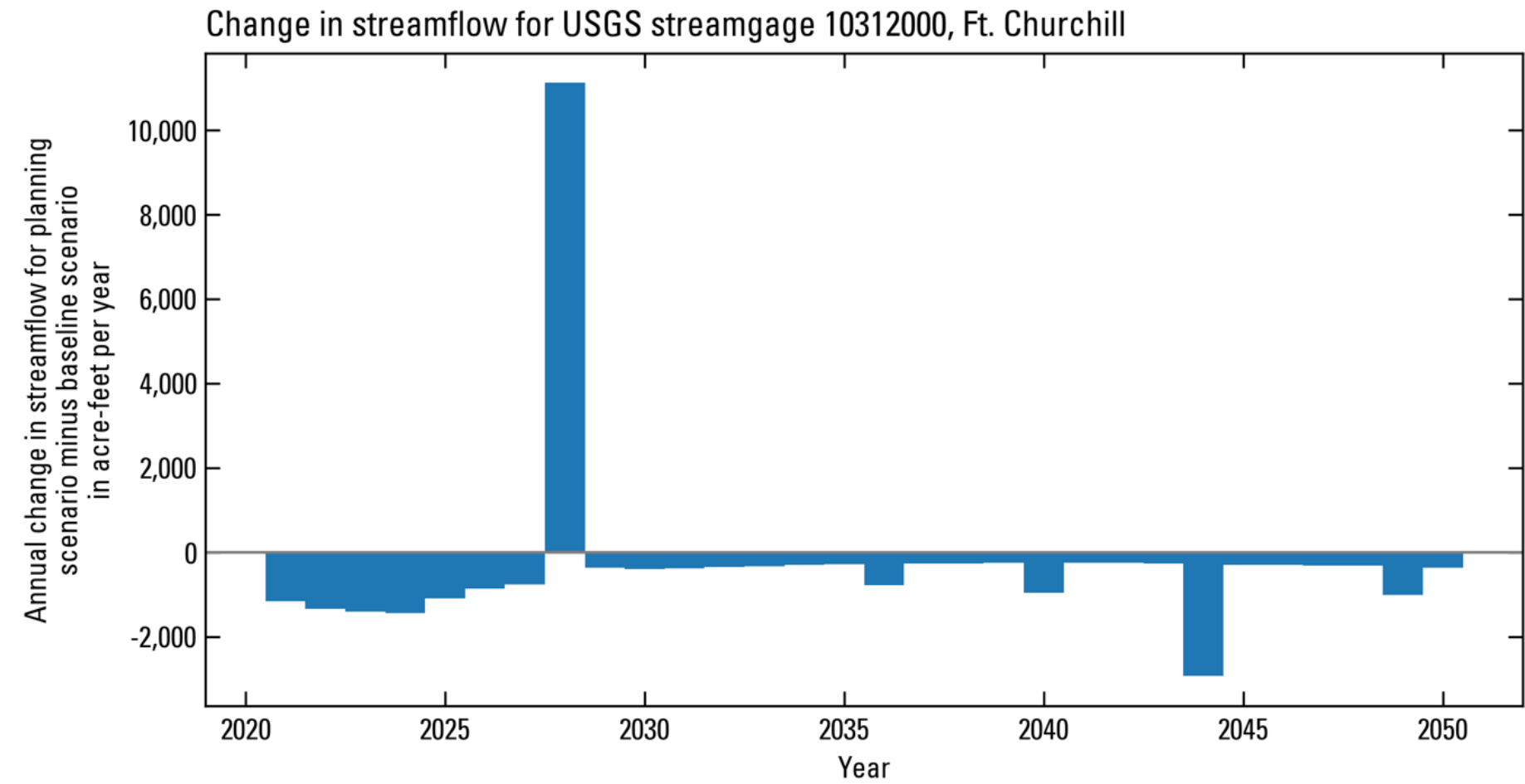
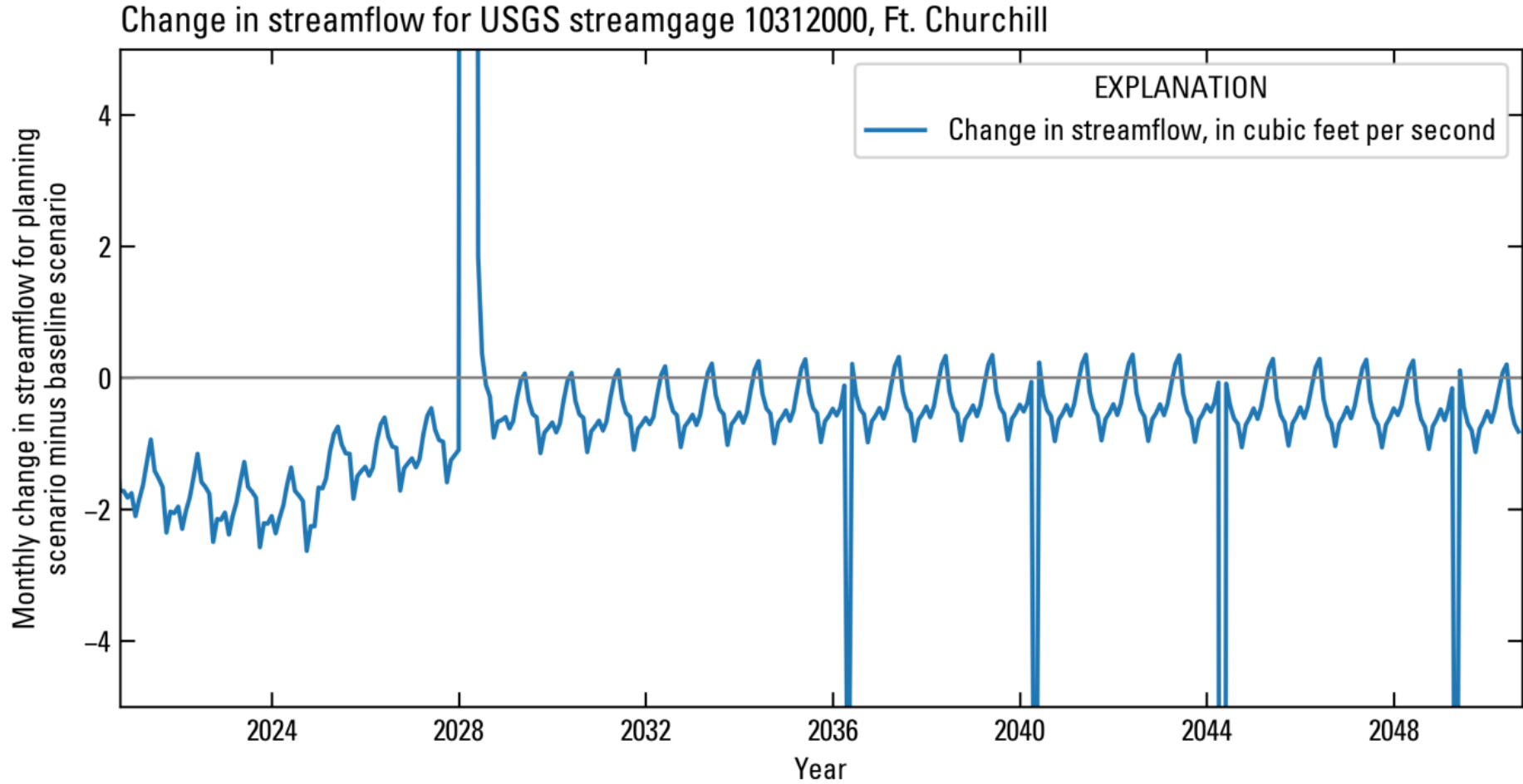
Mean Daily Flow for Season Jul - Sep for Carson River
near Fort Churchill



USGS Models



USGS Models



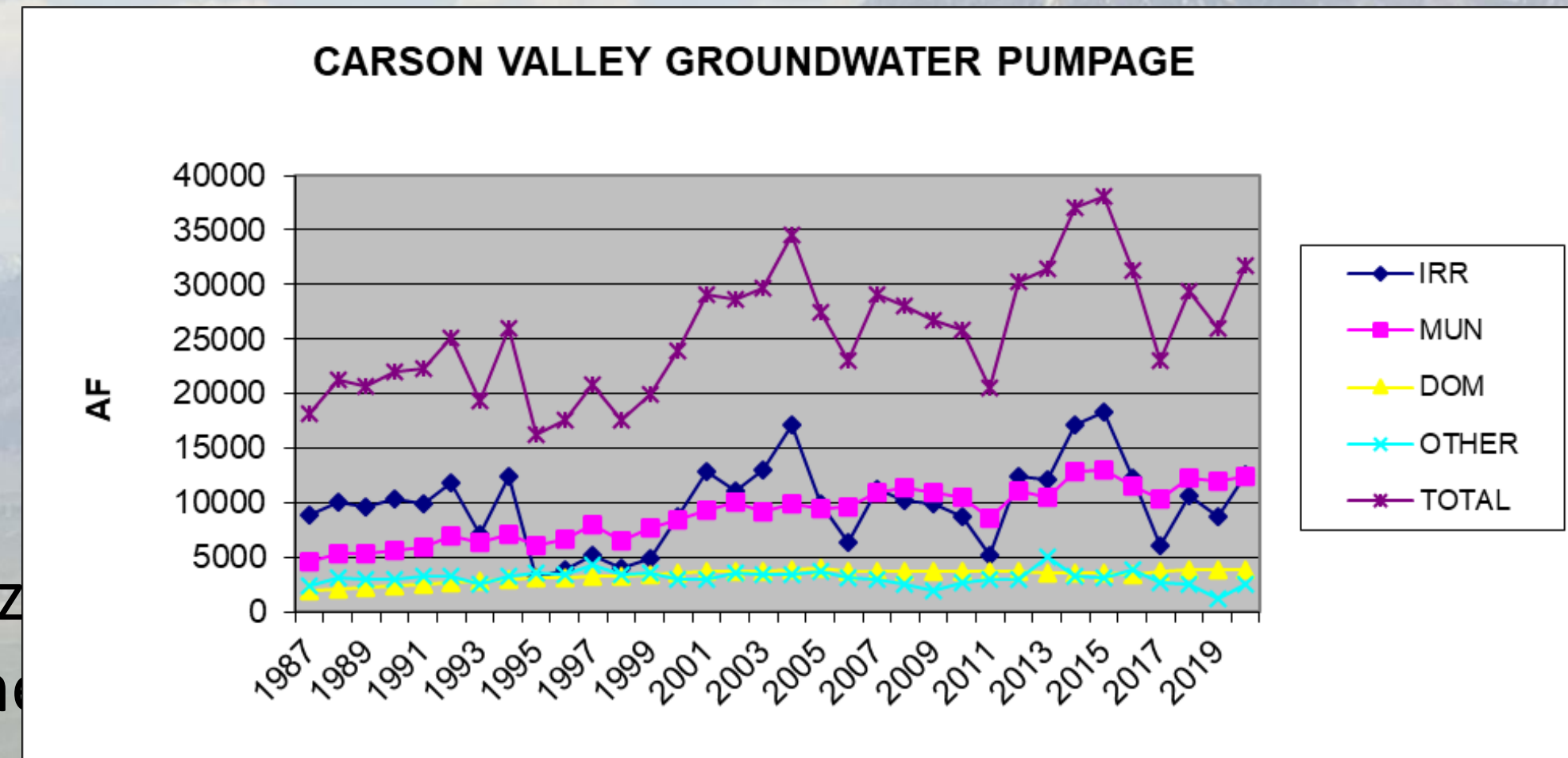
Wet and Dry Years - Alpine Decree

- Alpine Decree Distributes the Surface Water flows Wet, Average, and Dry Years
- Impact on irrigation users. In dry years more groundwater is pumped.
- All the Major Water Purveyors Currently can meet their water demands in dry years.
- There are areas facing potential water shortages i.e. Johnson Lane and Ruhenstroth areas
- Additional work – evaluate the impact of multiple dry years



Conjunctive Management

- In 2017, Nevada Legislation authorized the State Engineer to conjunctively manage surface and groundwater.
- NDWR is currently implementing conjunctive management strategy in the Carson River system for all new water right applications.



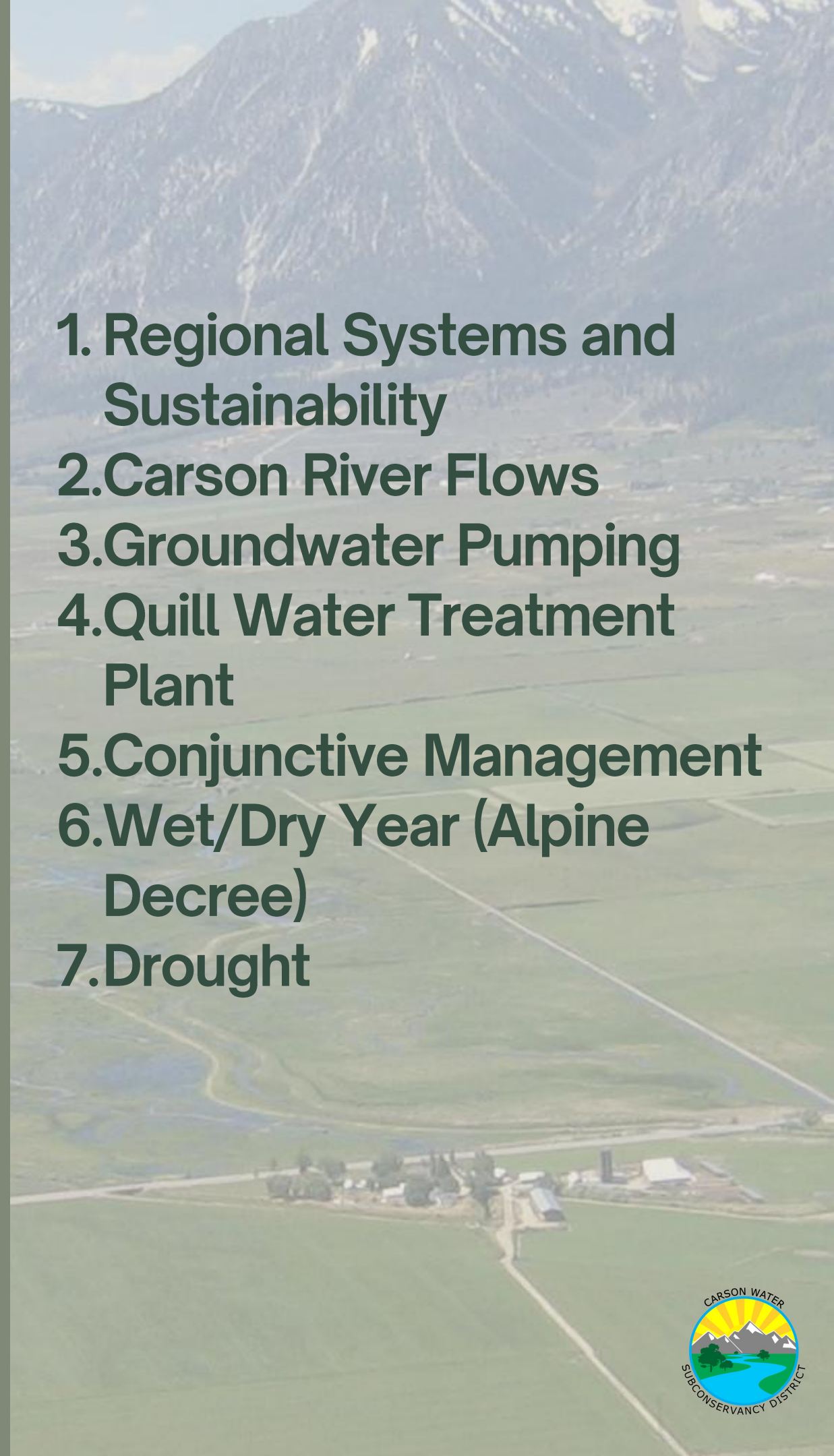
Potential Mitigation Strategies

- Non-Irrigation Season (October 1 to March 31):
 - Release dedicated surface water rights from upstream reservoirs
 - Recharge using reclaimed water
- Early Irrigation Season – Not Under Regulation (April 1 to June 30):
 - Release surface water from upstream reservoirs
 - Reclaimed water recharge
 - Use dedicated surface irrigation water rights
- Late Irrigation Season – Under Regulation (July 1 to September 30):
 - During this period, downstream users cannot place a call for water.
 - Mitigation may be necessary within the Carson River Segment where groundwater pumping occurs.
 - Use dedicated surface irrigation water rights
 - Coordination with the Federal Water Master and NDWR will be essential to determine appropriate mitigation actions.



Key Takeaways

1. Regional Systems and Sustainability
2. Carson River Flows
3. Groundwater Pumping
4. Quill Water Treatment Plant
5. Conjunctive Management
6. Wet/Dry Year (Alpine Decree)
7. Drought



Thank You!

Special thanks to all stakeholders and partners that helped shape this plan.



Contact Us

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