

CARSON RIVER WATERSHED 30- YEAR REGIONAL WATER PLAN



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CWSD

4/17/2024

Background

Plan Overview:

To meet the needs of the watershed in the next 30 years, CWSD has partnered with Lumos & Associates and USGS to do a deep dive in to water demand, water rights, and water production - pertaining to the 13 water purveyors in the watershed.

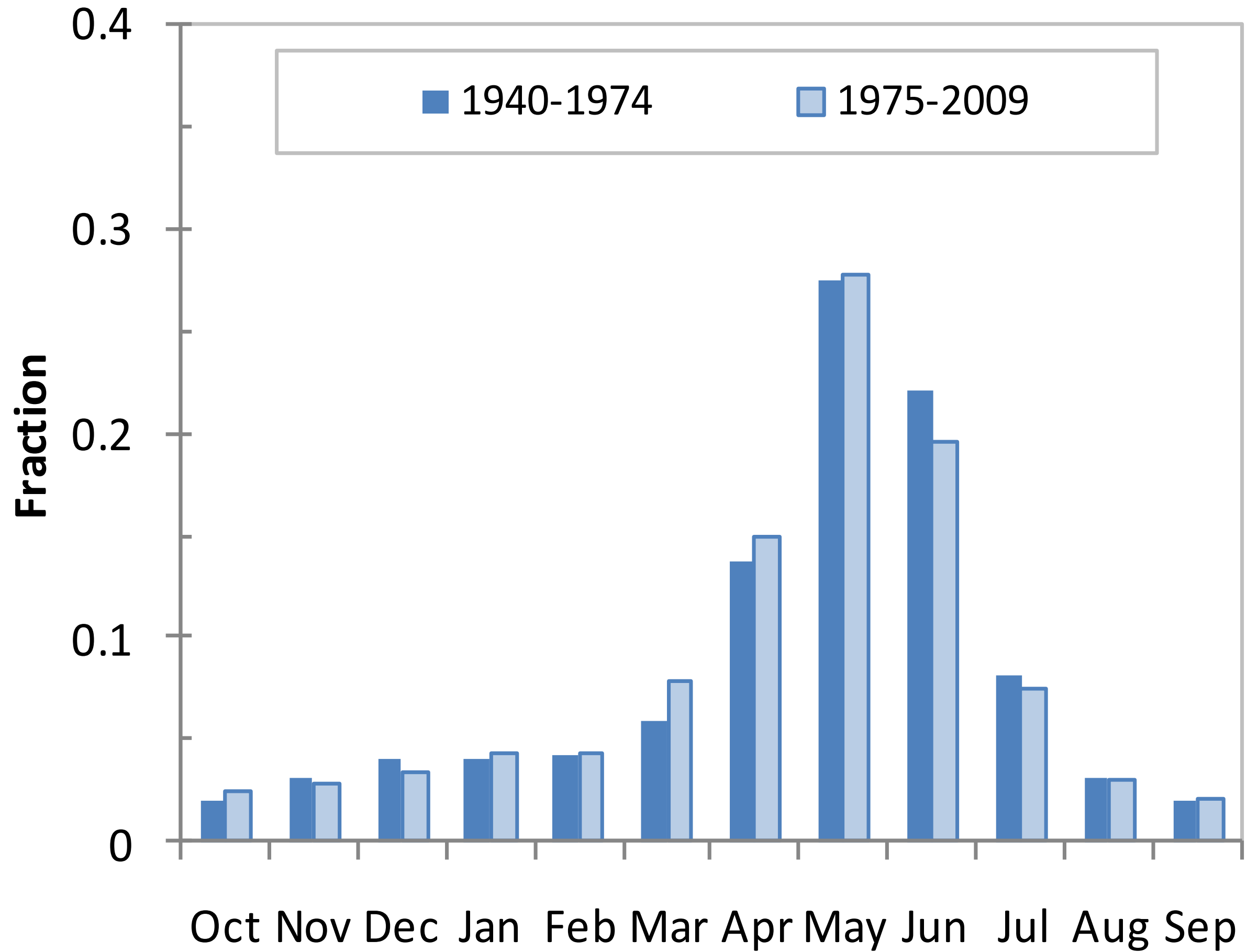
**Goals of the 30-Year Plan:
Evaluate Effects Growth and Climate Change
will have on Streamflow and Groundwater
Trends in the Carson River Watershed**

- Evaluate Future Water Demands and Water Supplies by Area
- Utilize the Upper and Middle Carson River Models Developed by the USGS
- Identify Water Supply Sources
- Identify Potential Water Limitations
- Evaluate Groundwater/Surface Water Interaction
- Evaluate Potential Mitigation Strategies

What the 30-Year Regional Water Plan Will Not Do

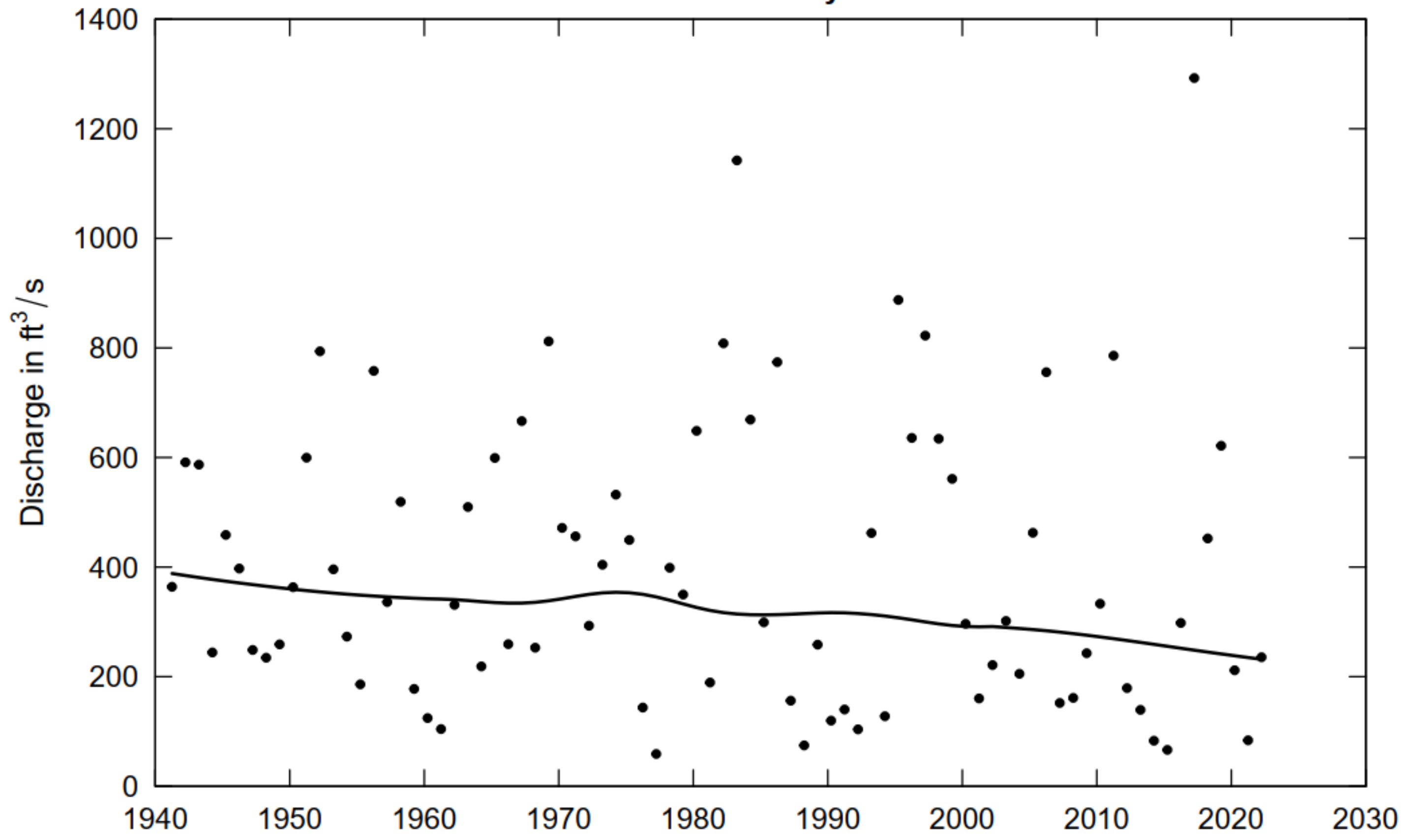
- It **Will Not** take away anyone's water rights
- It **Will Not** propose any changes to the Alpine Decree or Nevada Water Law
- It **Will Not** evaluate any water purveyor's water master plan

a) East Fork



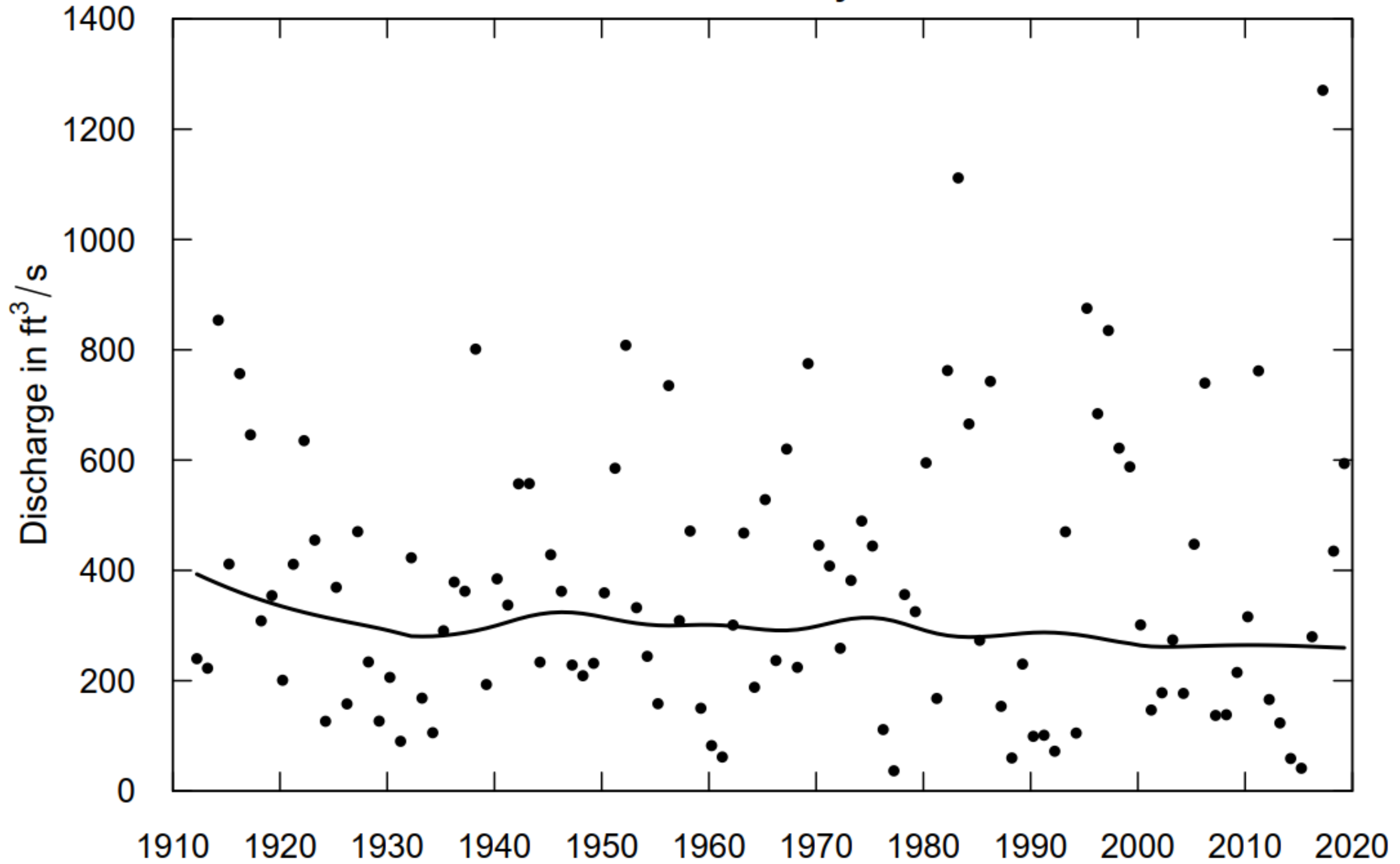
CARSON RV NR CARSON CITY, NV

Water Year
mean daily



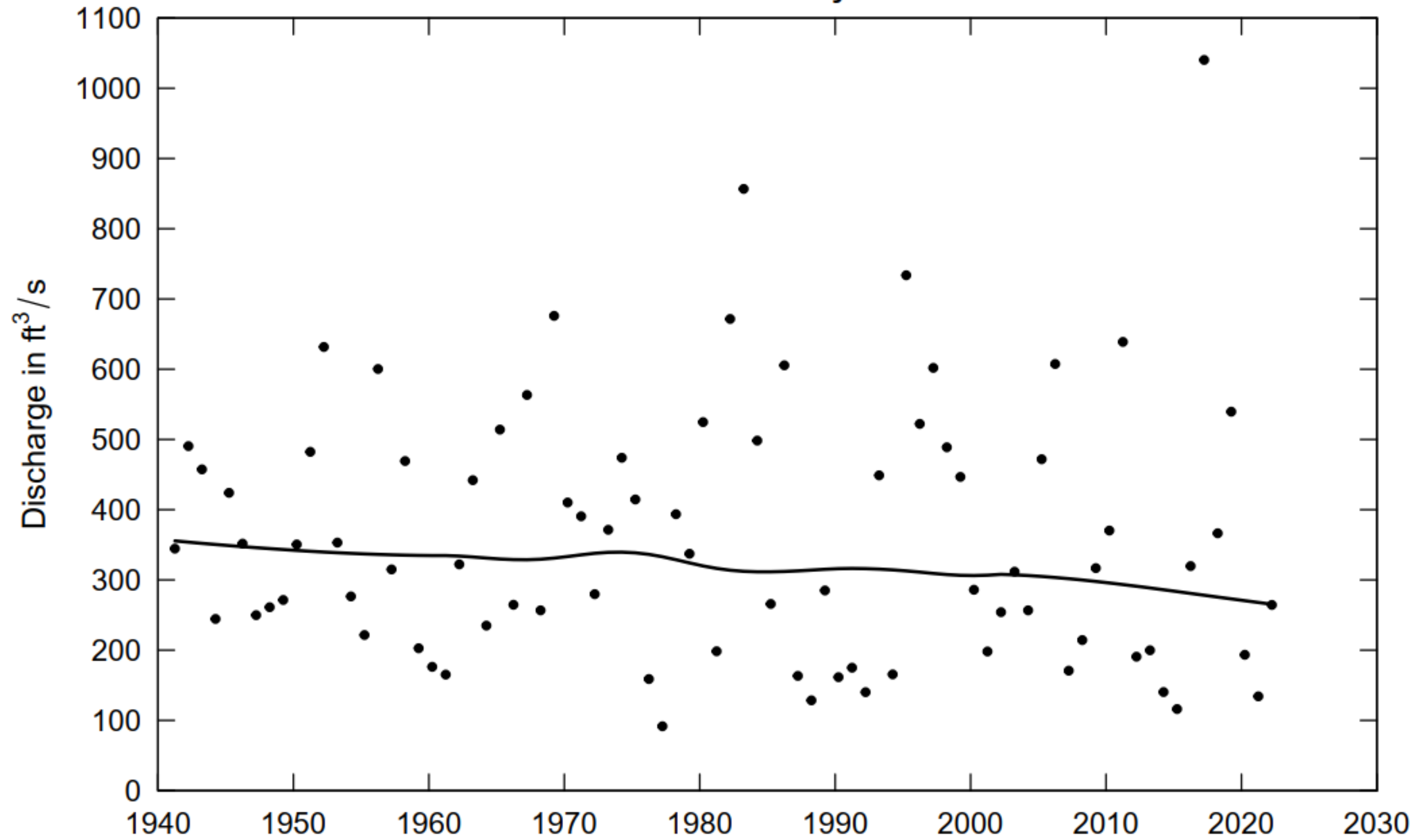
CARSON RV NR FORT CHURCHILL, NV

Water Year
mean daily



E FK CARSON RV NR GARDNERVILLE, NV

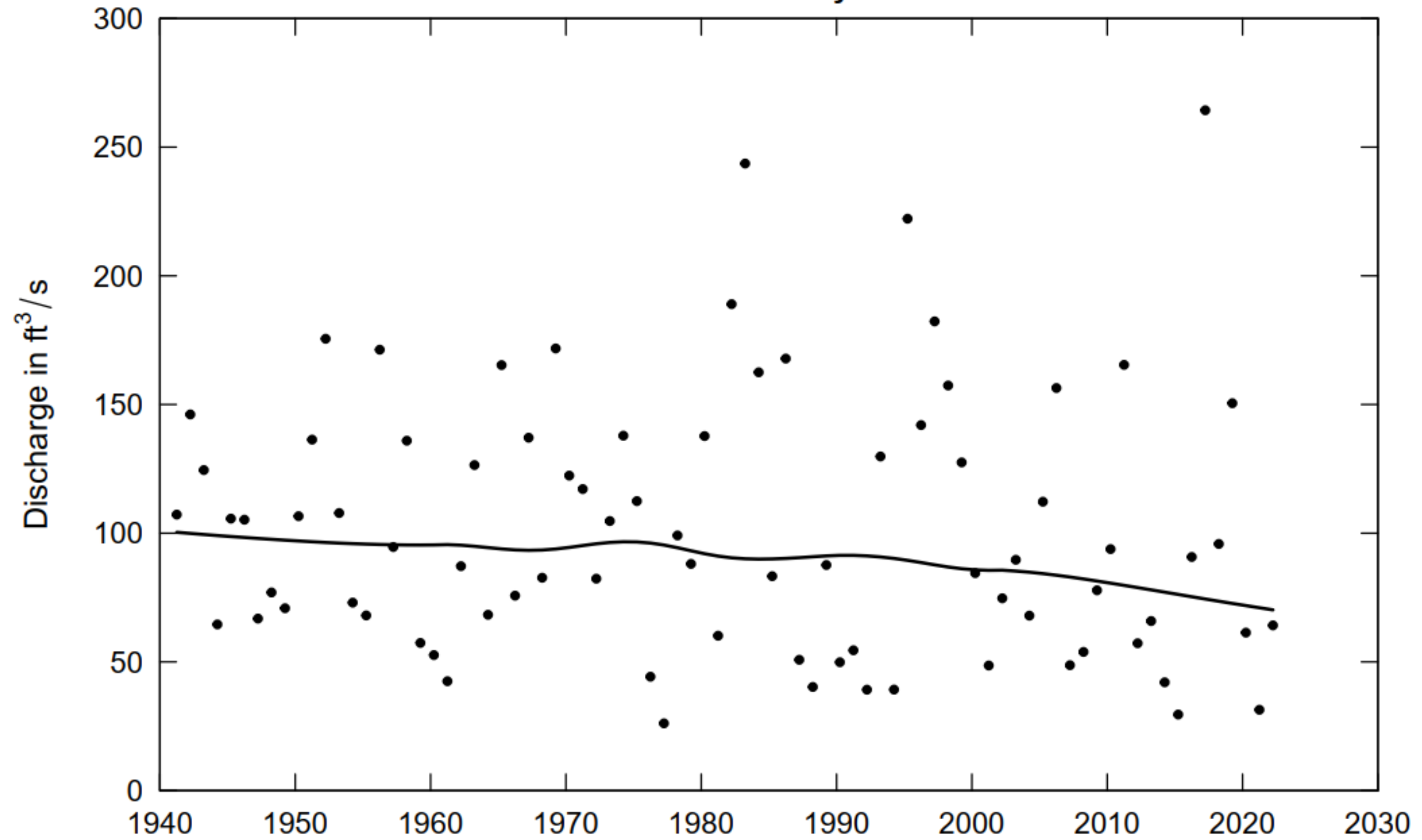
Water Year
mean daily



W FK CARSON RV AT WOODFORDS, CA

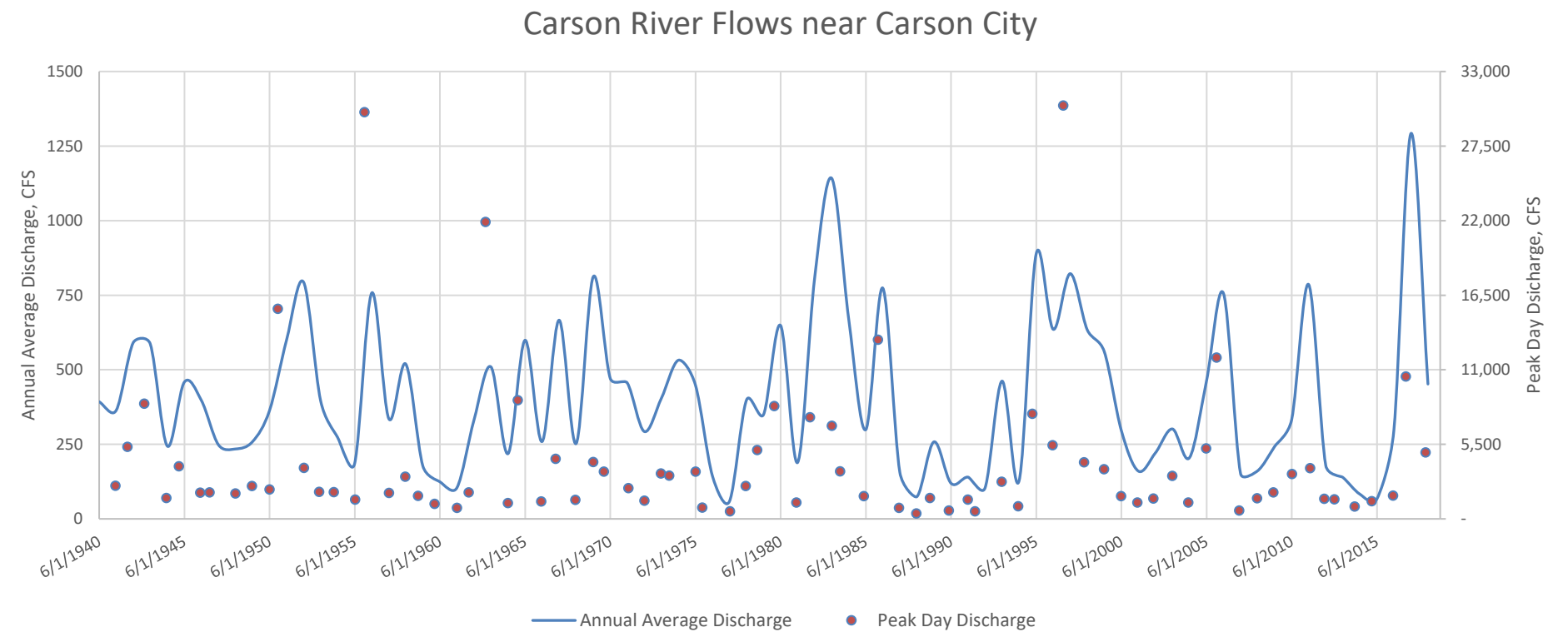
Water Year

mean daily



Instream Flows - 1940 to 2018

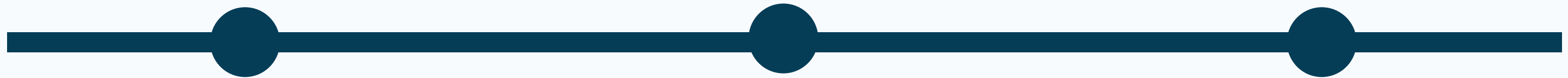
- Flows are highly variable
- On average, flows are slowly decreasing in each river stretch



Location	WF at Woodfords	EF near Gardnerville	EF + WF	CR near Carson City	CR near Fort Churchill*
USGS Station #	10310000	10309000		10311000	10312000
Annual Average Flow, CFS	103.0	365.4	468.3	401.1	377.4
Annual Flow Standard Deviation, CFS	50.2	181.3		256.4	258.4
Average Peak Day Flow, CFS	1,150.7	3,599.5		4,178.8	3,278.8
Peak Day Flow Standard Deviation, CFS	1,253.8	3,579.0		5,544.0	3,700.5
% Average Annual Change in Flow	-0.10%	-0.05%	-0.06%	-0.12%	-0.05%
% Average Change in Flow between 1940 and 2018	-7.91%	-4.03%	-4.88%	-8.99%	-3.74%

*Data trends from Ft Churchill gauge are not statistically significant and should be interpreted as such

Process



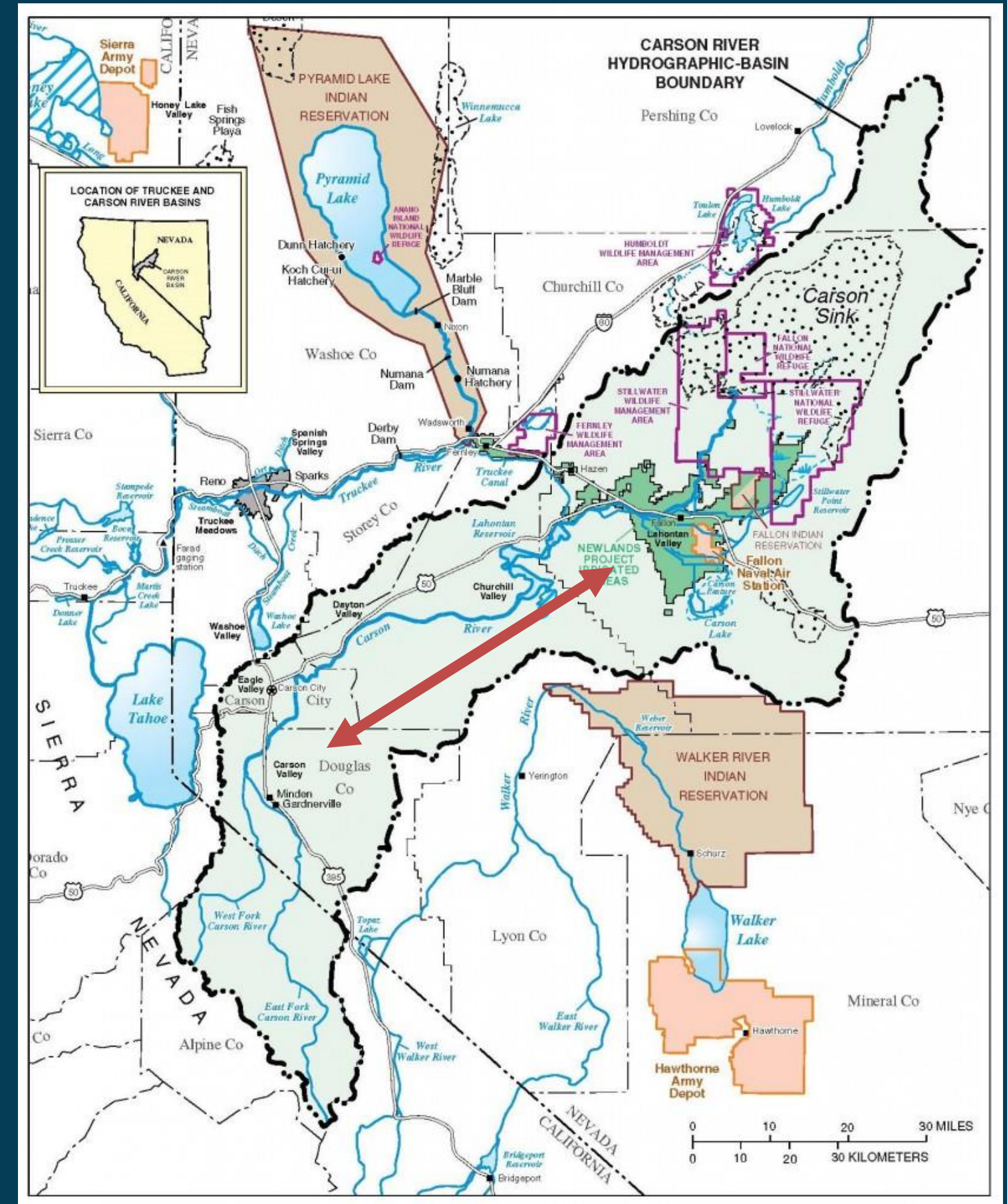
Lumos & Assoc. gathers information and data to estimate M&I demand for each purveyor in the watershed.

Accumulated data will be given to USGS to be inserted into their model. USGS will cultivate model and run a multitude of scenarios.

Results will be assed to provide mitigation plans that can potentially circumvent issues based on the findings of USGS model.

Data Collection

Upper Watershed & Lower Watershed



Purveyors

- Minden Gardnerville Sanitation District
- Town of Minden
- Lyon Counties Utility - Dayton/Moundhouse
- Indian Hills General Improvement District
- Gardnerville Water Company
- Gardnerville Rancheros General Improvement District
- City of Fallon
- Douglas County Public Works
- Churchill County Public Works
- Carson City Public Works
- Silver Springs Mutual Water Company
- Stagecoach General Improvement District
- Storey County Public Works



Range of population growth

0.1-1.7%

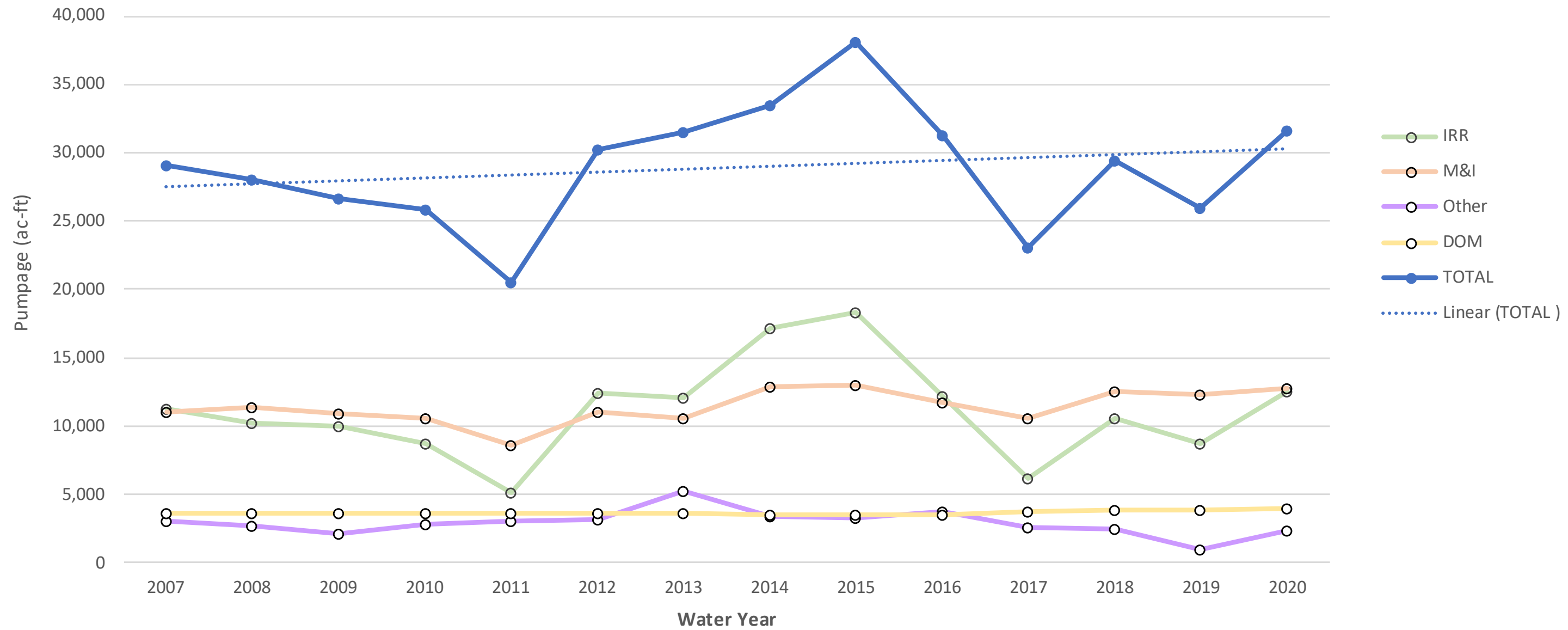
Historical Trends In River Discharge and Preliminary Projections

An aerial photograph of a rugged coastline. The left side shows dark blue, turbulent waves crashing against a rocky shore. The right side shows a lighter, brownish-grey rocky terrain. A white rectangular box is centered horizontally across the middle of the image, containing the text 'CARSON VALLEY' in a bold, dark blue, sans-serif font. There are two small white horizontal bars, one in the top left and one in the bottom right corner of the image.

CARSON VALLEY

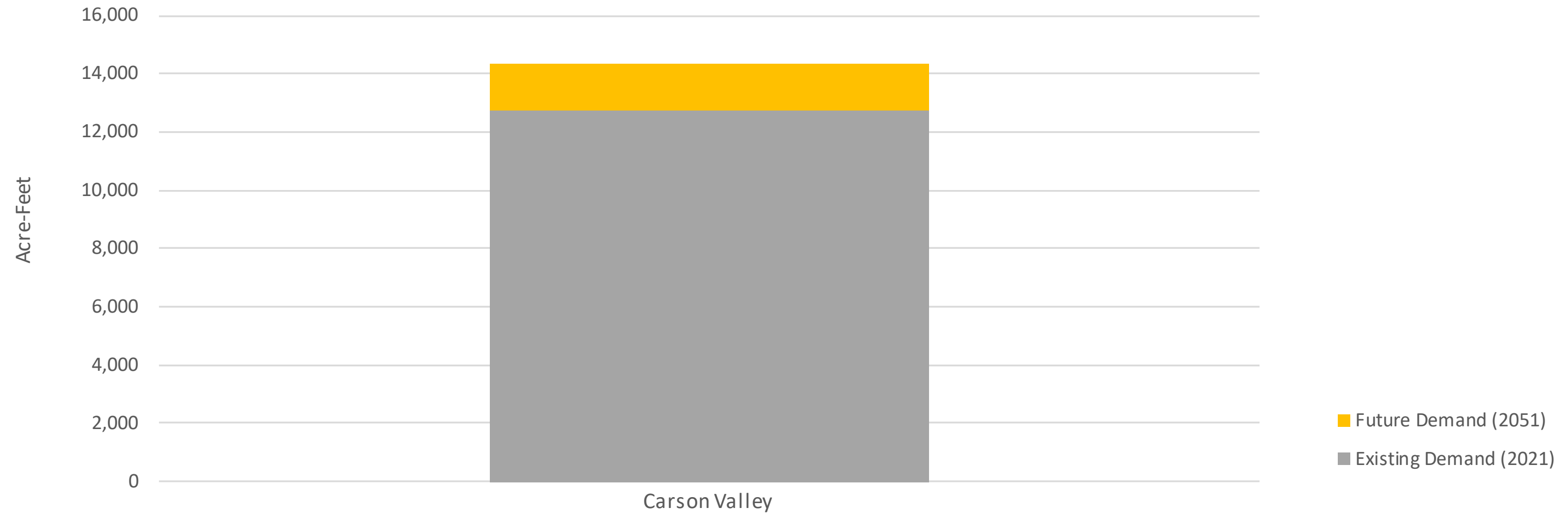
Historical Pumping

Historical Pumpage (ac-ft) per Water Year - Carson Valley



Preliminary Projection

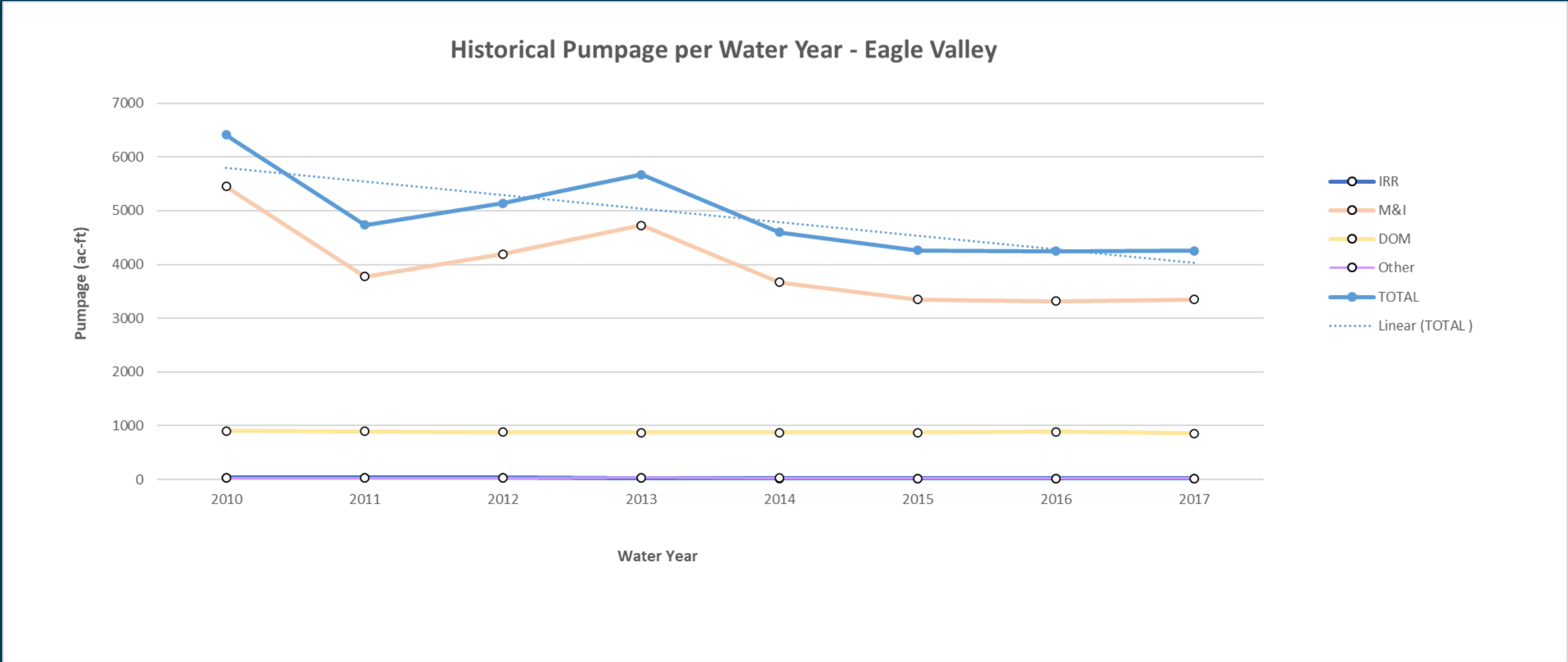
Existing Vs. Future Demand (Preliminary)



An aerial photograph of a rugged coastline. The top half shows dark blue, turbulent waves crashing against a rocky shore. The bottom half shows a lighter, sandy beach area with some rocks. A white horizontal bar is visible in the top left corner, and another white horizontal bar is visible in the bottom right corner.

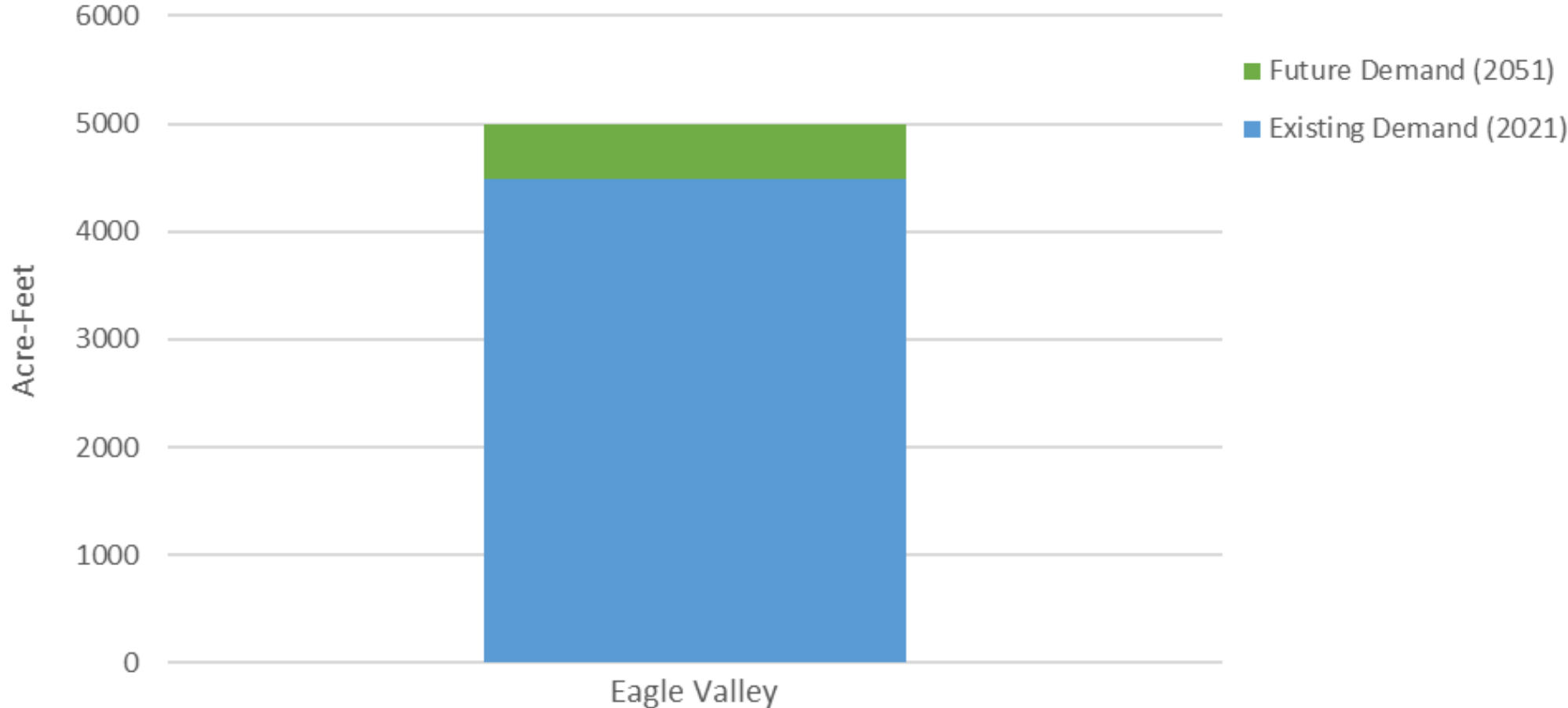
EAGLE VALLEY

Historical Pumping



Preliminary Projection

Existing Vs. Future Demand (Preliminary)

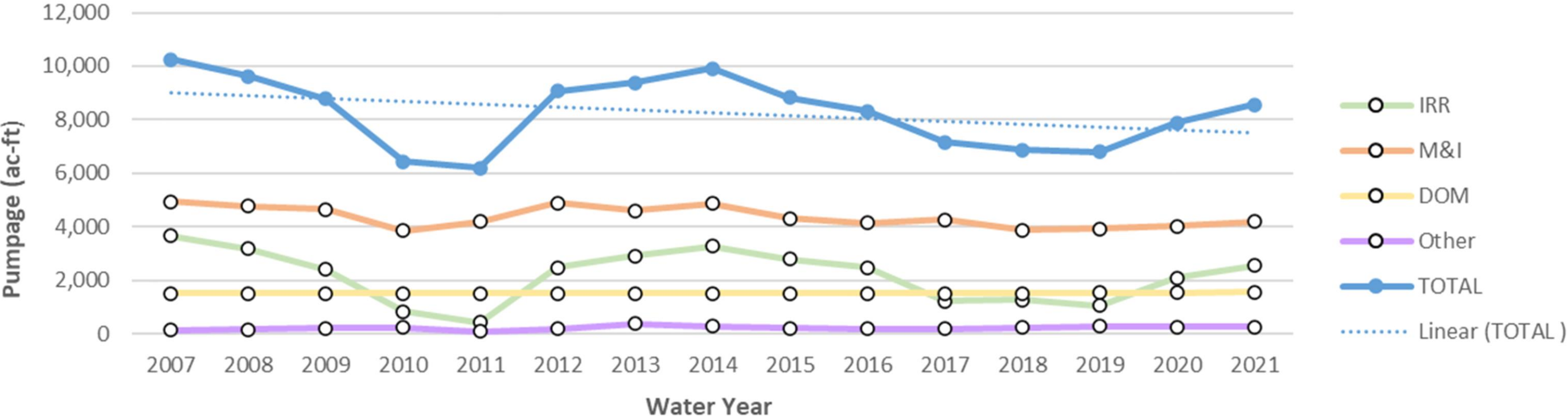




**DAYTON
VALLEY**

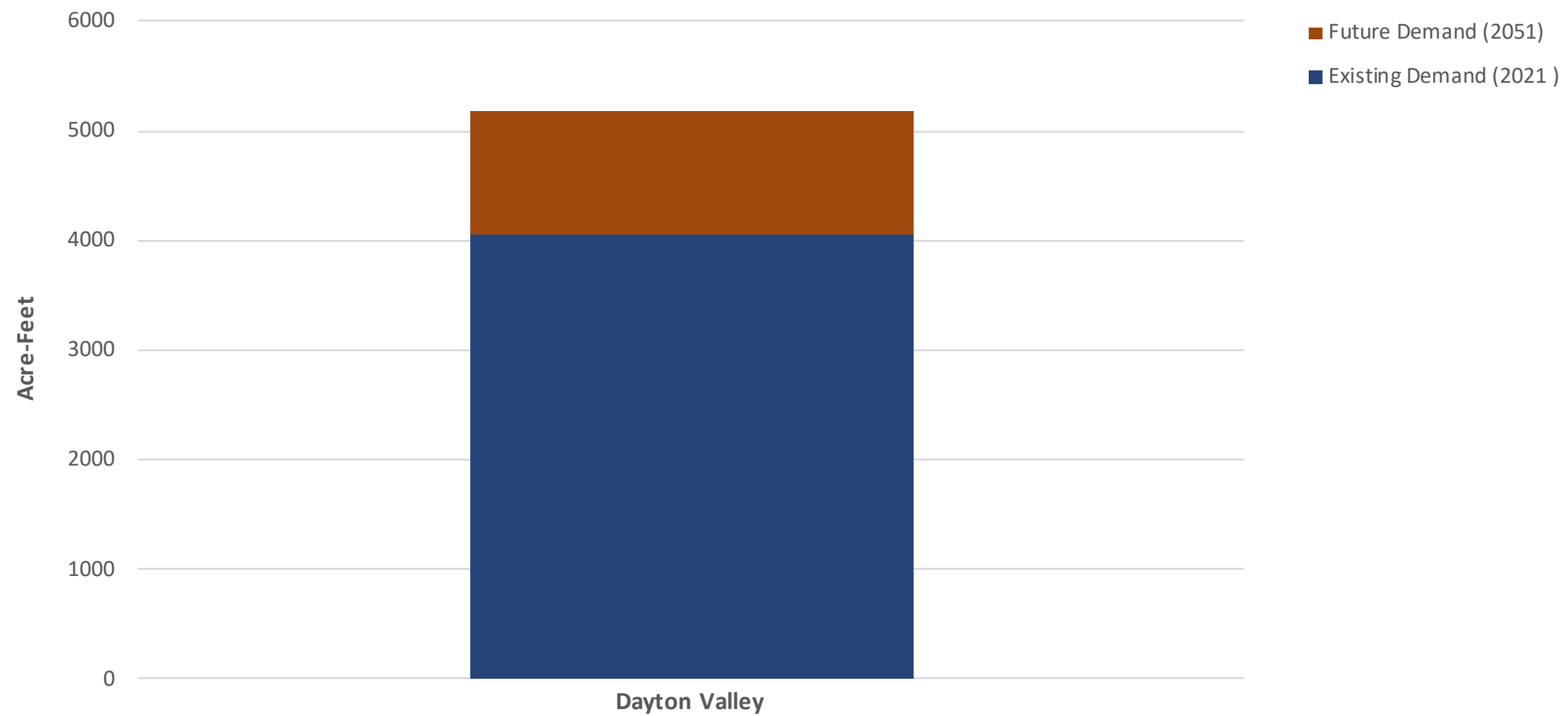
Historical Pumping

Historical Pumpage per Water Year - Dayton Valley



Preliminary Projection

Existing Vs. Future Demand (Preliminary)

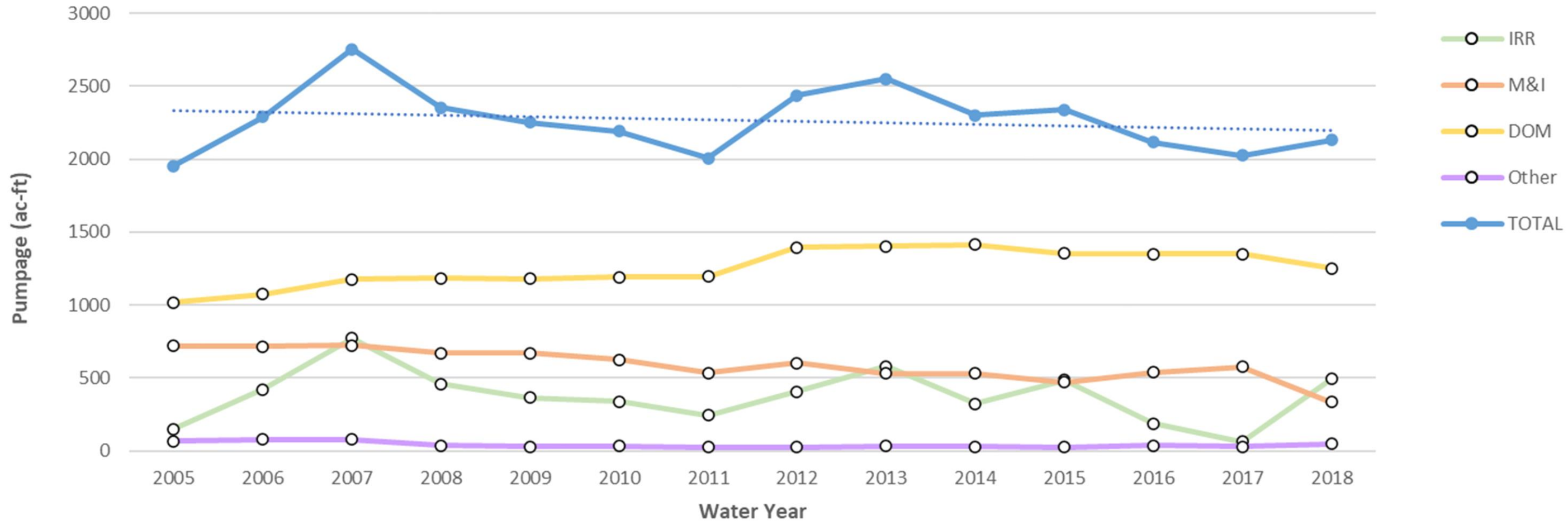


An aerial photograph of a rugged coastline. The left side shows dark blue ocean waves with white foam crashing against a rocky shore. The right side shows a steep, rocky cliffside with a textured, brownish-grey surface. A white rectangular box is centered over the image, containing the text 'Churchill Valley' in a bold, dark blue font. There are two small white horizontal bars, one in the top left and one in the bottom right corner of the image.

Churchill Valley

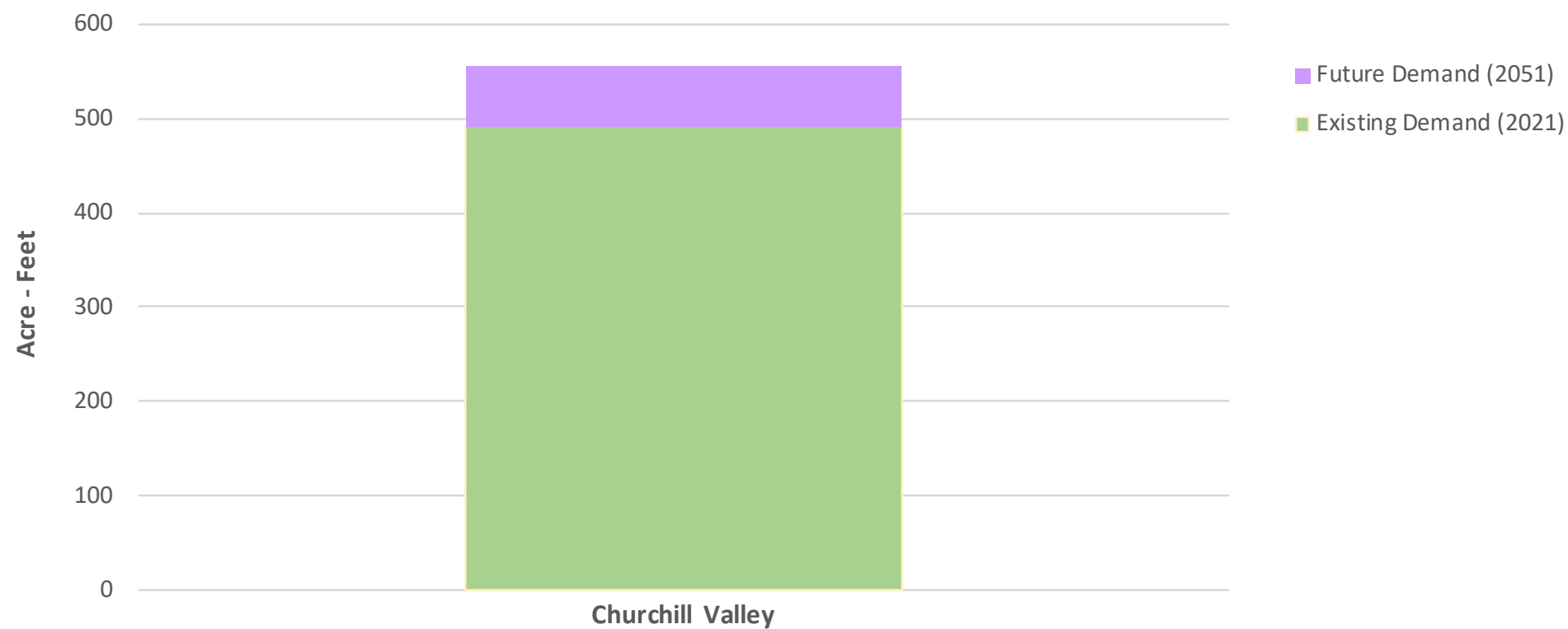
Historical Pumping

Historical Pumpage per Water Year - Churchill Valley



Preliminary Projection

Existing Vs. Future Demand (Preliminary)

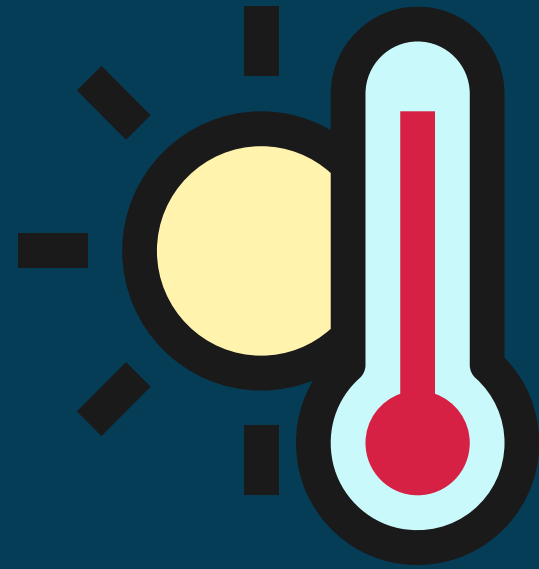


- There is little (63ac-ft) predicted growth that will come from the service area in Silver Springs.
- Domestic wells are predicted to increase following current trends (undetermined amount)
- A new water source will have to be considered in order to see growth in Churchill Valley

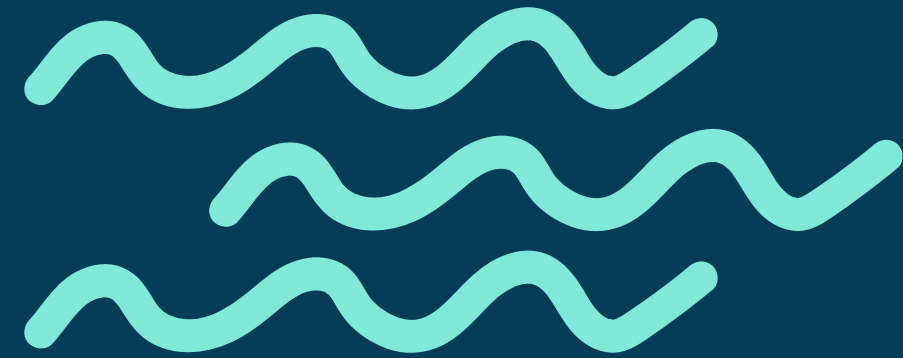
OTHER CONSIDERATIONS

AGRICULTURE

- Changes in agriculture and agriculture management.



Alpine Decree



WEATHER TRENDS

- Consecutive dry years
- Abundant changes in the seasonal mean

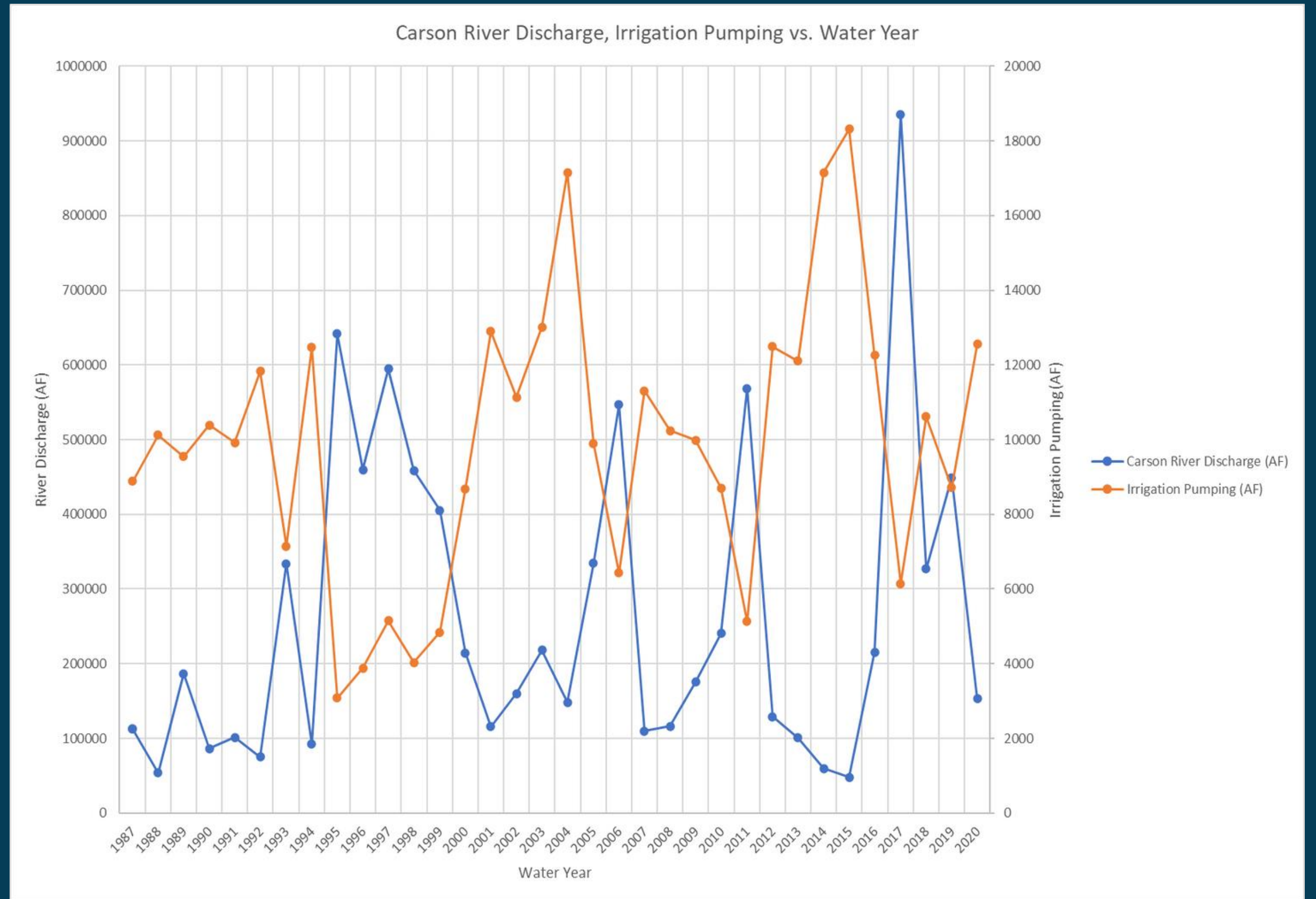


Model Accuracy

- This is an estimation – needs will have to be revisited frequently and updated

Irrigation Pumping in Carson Valley

1987-2020



Plan Goals

- Determine if there are sufficient water rights and infrastructure in place.
- Understand the effects of future demand and river discharge
- Recommend possible mitigation on related to future water demands



**Questions?
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www.cwsd.org

