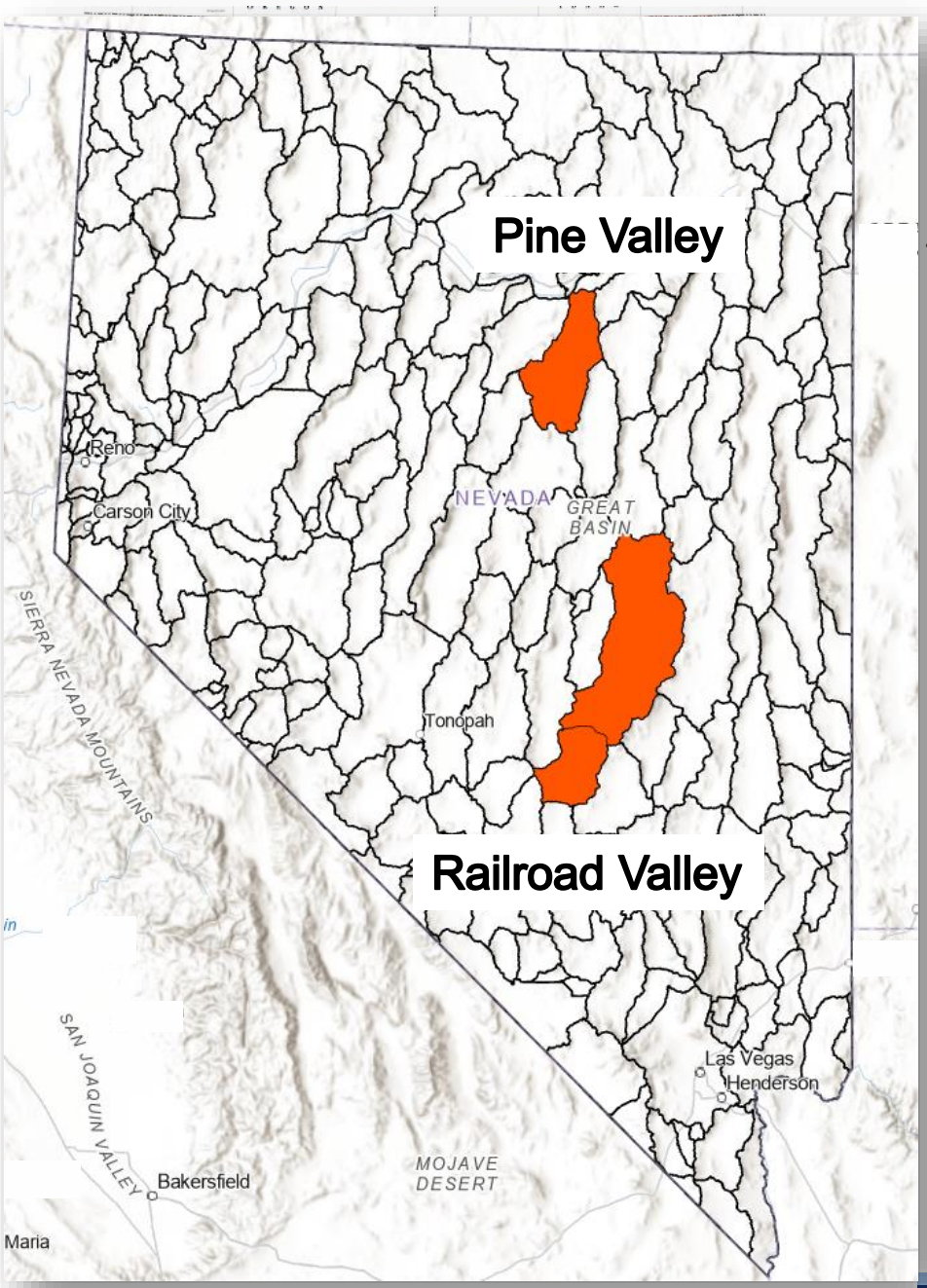


NEVADA DIVISION OF WATER RESOURCES

Nevada Department of CONSERVATION & NATURAL RESOURCES

The Nevada Water Resource Initiative: Updating estimates of Nevada's water availability

Central Nevada Regional Water Authority

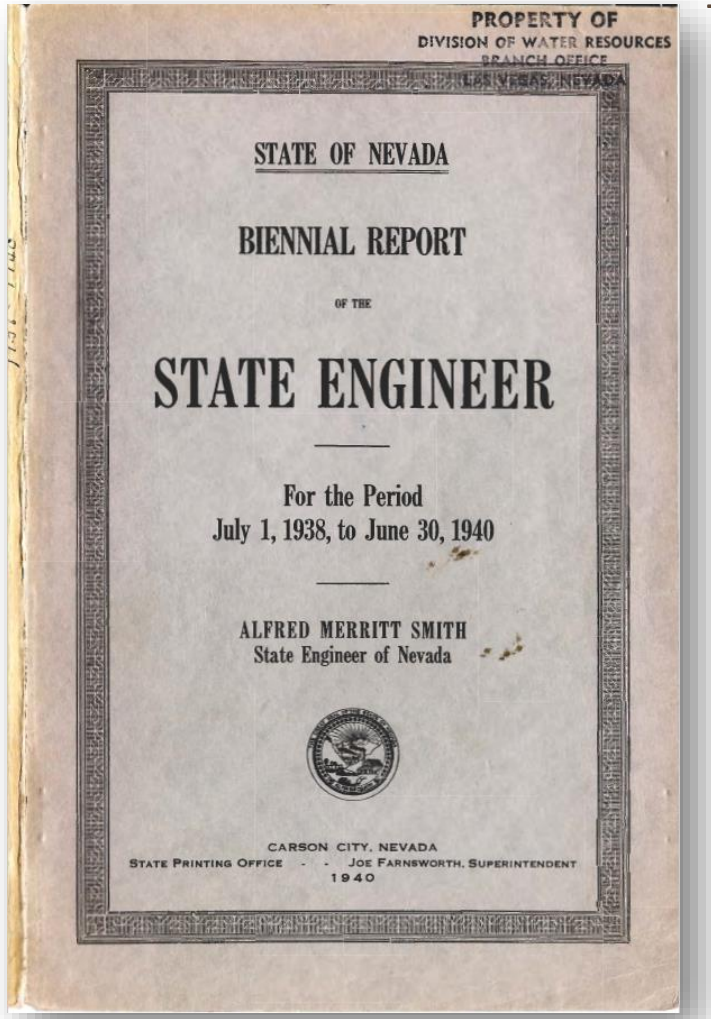
Fallon, Nevada
July 7, 2023

Presented By:
Kip Allander, *Hydrogeologist*

ORIGIN OF GROUNDWATER MANAGEMENT IN NEVADA

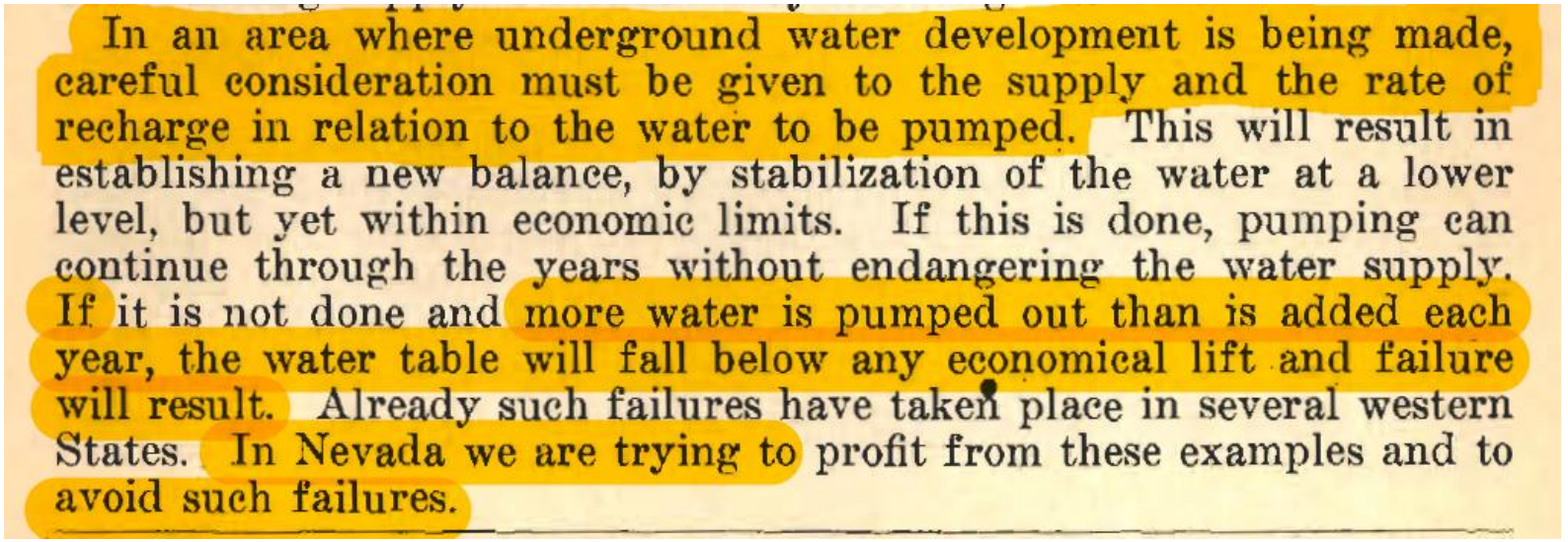
Underground Water Law of 1939 – NRS 534

- Clarified that all groundwater (GW), among other waters of the State, belongs to the Public.
- Gave State Engineer (SE) authority to manage groundwater.
- Established concept of basins, but did not define or delineate the basins.
- Did not establish Perennial Yield (PY) as basis for GW management.

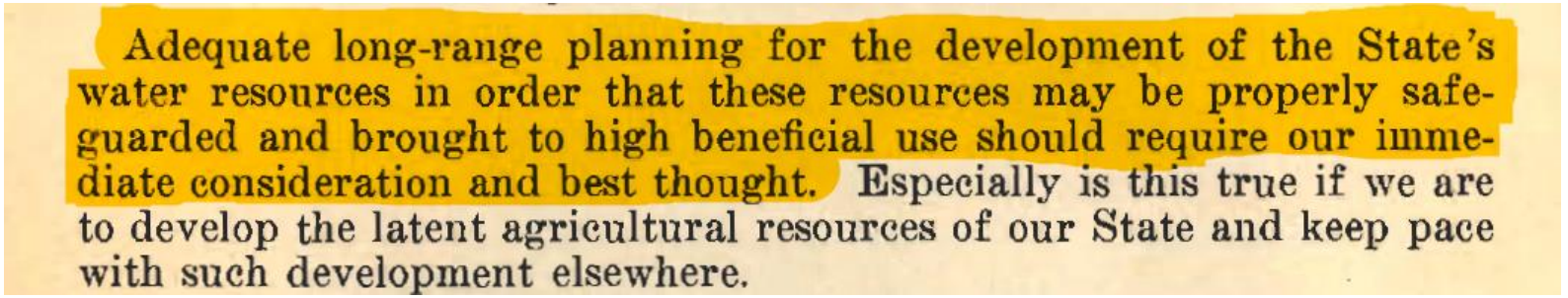


(SE Biennial Report 1938-40, 1940, pg 89)

THE STATE ENGINEER UNDERSTOOD THE NEED TO QUANTIFY WATER AVAILABILITY FOR SAFE DEVELOPMENT OF NV GROUNDWATER RESOURCES



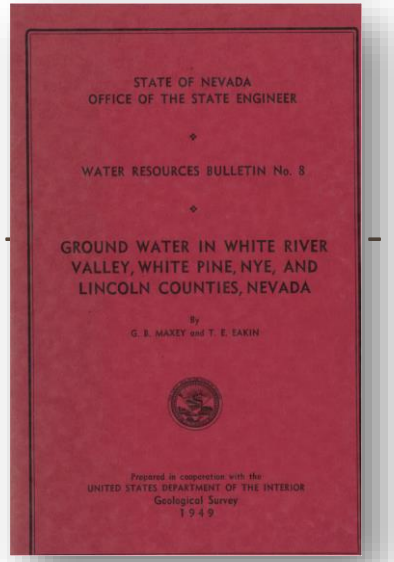
In an area where underground water development is being made, careful consideration must be given to the supply and the rate of recharge in relation to the water to be pumped. This will result in establishing a new balance, by stabilization of the water at a lower level, but yet within economic limits. If this is done, pumping can continue through the years without endangering the water supply. If it is not done and more water is pumped out than is added each year, the water table will fall below any economical lift and failure will result. Already such failures have taken place in several western States. In Nevada we are trying to profit from these examples and to avoid such failures.



Adequate long-range planning for the development of the State's water resources in order that these resources may be properly safeguarded and brought to high beneficial use should require our immediate consideration and best thought. Especially is this true if we are to develop the latent agricultural resources of our State and keep pace with such development elsewhere.

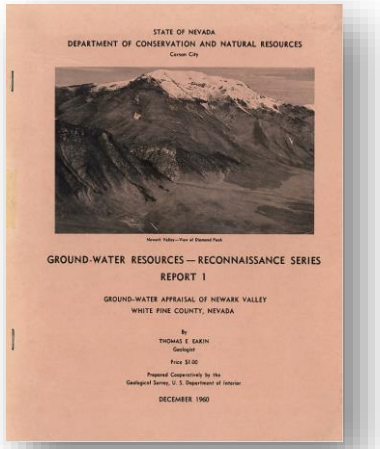
(SE Biennial Report 1944-46, 1946)

The Nevada Groundwater Program



http://water.nv.gov/bulletins.aspx

- 1945: Systematic investigation of Nevada GW began.
- 1946 - ~1976: Water Resources Bulletin Series.
- 1960 - ~1974: Groundwater Resources – Reconnaissance Series.
- Original estimates of Perennial Yield derived from these early reports.



http://water.nv.gov/reconreports.as
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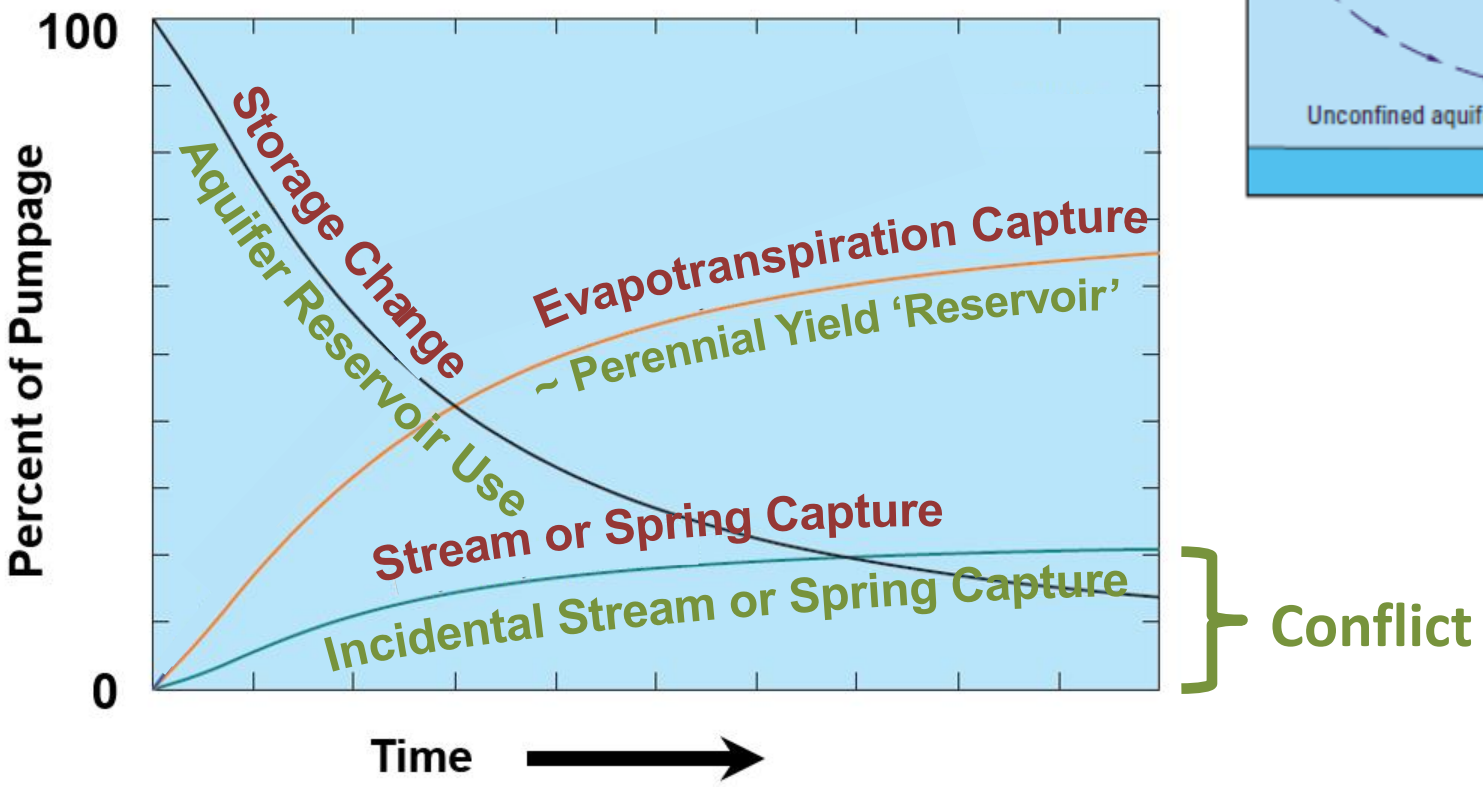
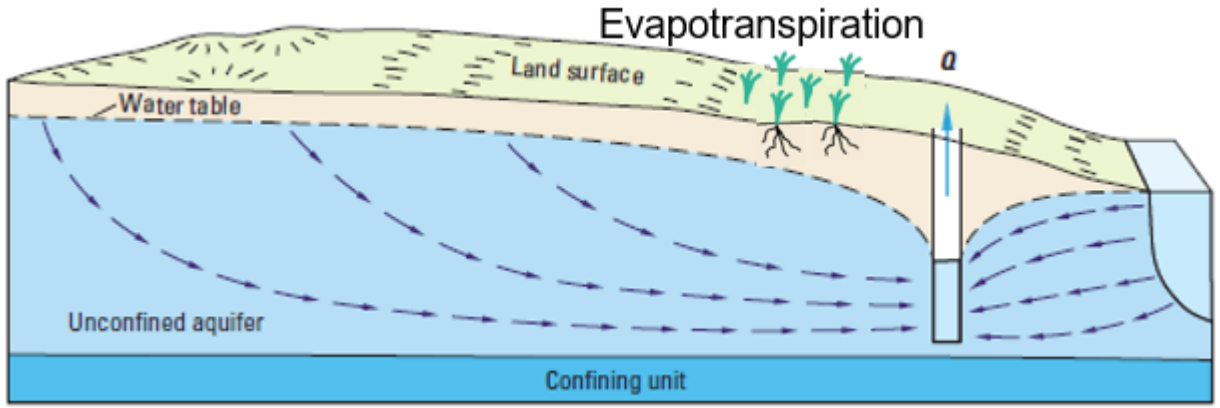
ADDITIONAL CONSIDERATIONS BEYOND PERENNIAL YIELD FOR GROUNDWATER MANAGEMENT

Limitations of Perennial Yield as Basis of GW management

Source of Water to a Well

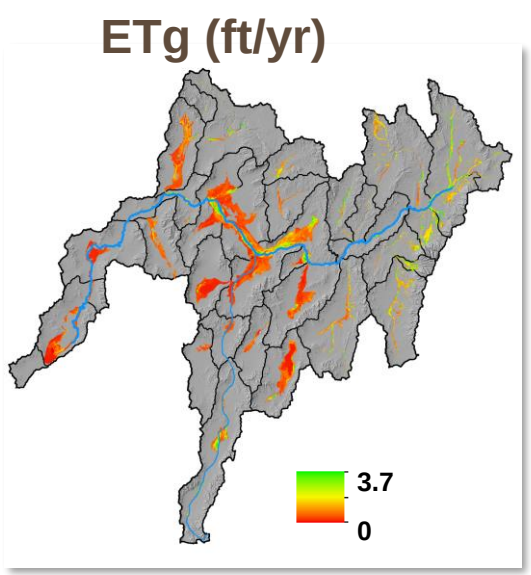
Groundwater Management Perspective

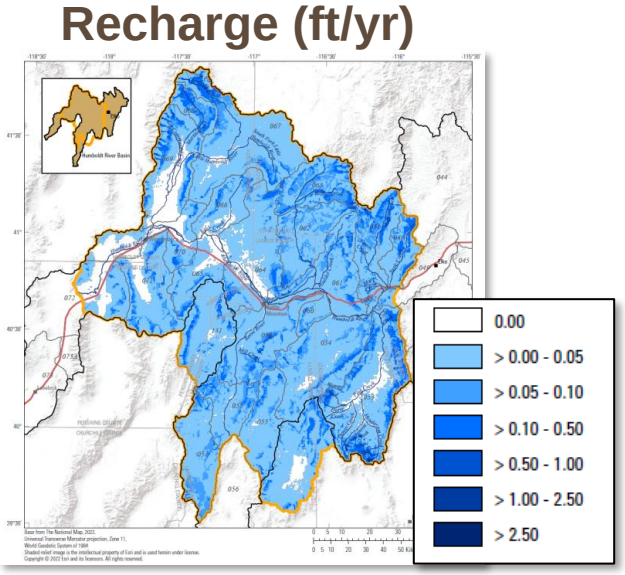


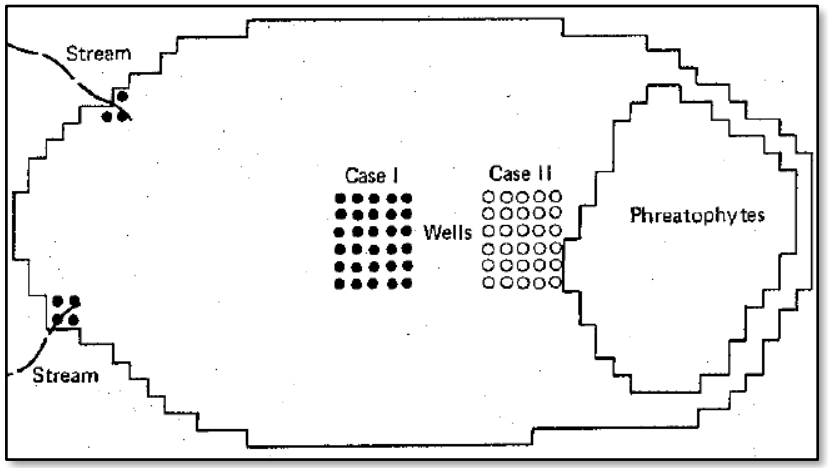


Limitations of Perennial Yield as Basis of GW management

- Perennial Yield establishes upper limit for GW development.
- To be sustainable, must know:
  - Where recharge and discharge occur.
  - Aquifer properties.
- Pumping needs to be strategically located:
  - To capture available discharge.
  - To avoid conflict with existing rights.
- Original estimates >50 years old.
  - Used old technology & methodologies







UPDATING ESTIMATES OF WATER AVAILABILITY WITH THE NEVADA WATER RESOURCES INITIATIVE

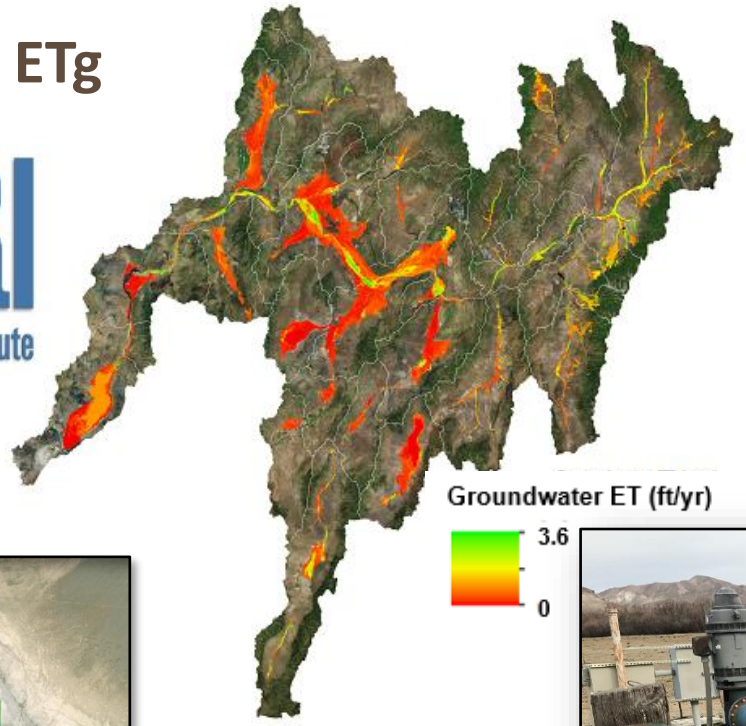
Nevada Water Resource Initiative – overview and vision

- 2020's version of the Nevada Groundwater Program.
- Use new technologies and data to update science and understanding of water resources.
- Re-estimate water budgets
- WHERE water enters and leaves our hydrographic basins.
- Develop the resources and tools for sustainable management.

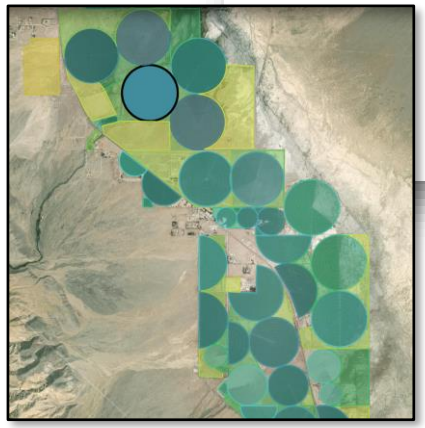
Nevada Water Resource Initiative – Components

Develop Statewide Discharge Datasets:

ETg



Desert Research Institute

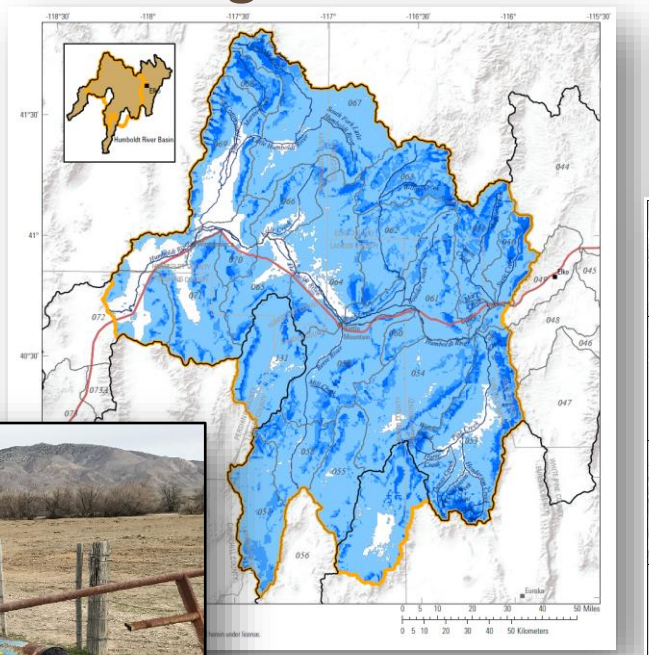


Pumping

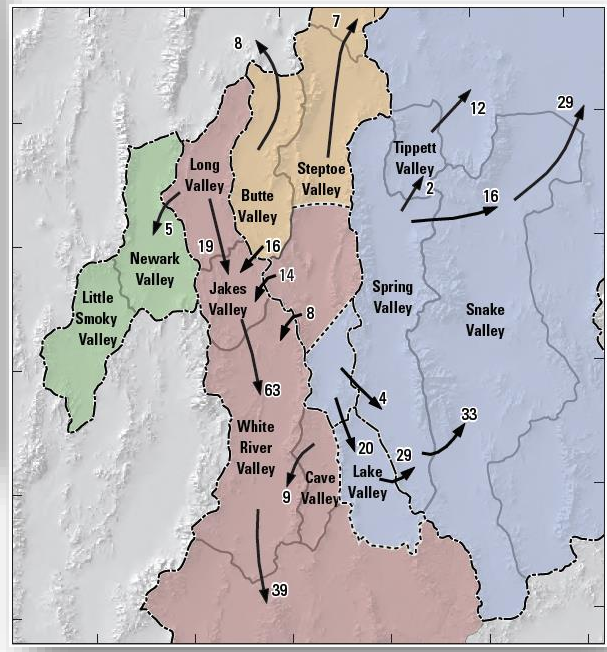
Develop Tools and Approaches for estimating:

USGS science for a changing world

Recharge



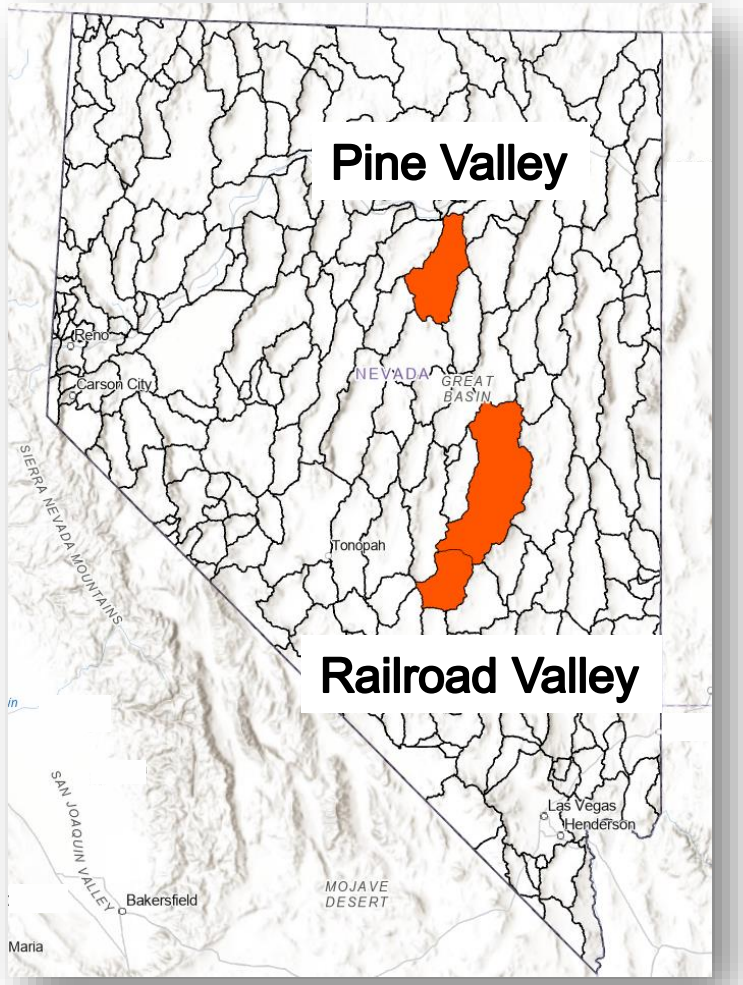
Interbasin Flow



Nevada Water Resource Initiative – Components (continued)

Increased Hydrologic Monitoring

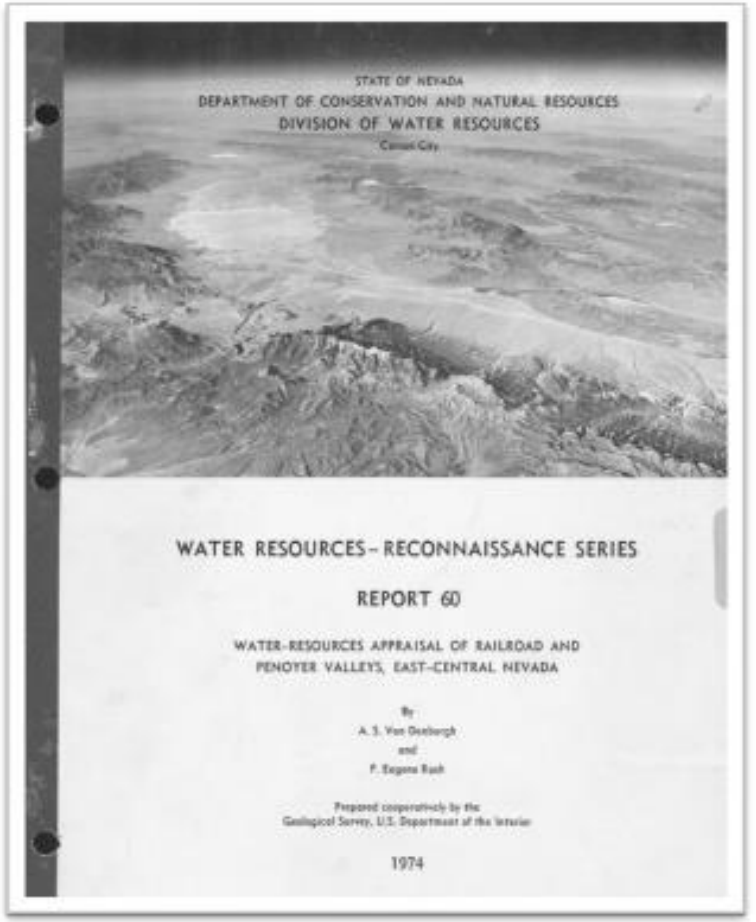
Application of Methods in Demonstration Basins



Demonstration basin – Railroad Valley

USGS Objectives:

1. Estimate water budgets in Railroad Valley for a 3-year period, from 2024 to 2026.
2. Develop conceptual model for GW system and generate water table map(s).
3. Characterize trends of ground and surface water resources, earliest period of record to 2026.
4. Publish data in summary report in 4th year of the study in 2027.



NDWR original perennial yield of 77,800 acre/yr
(Van Denburgh and Rush, 1974)

USGS

Nevada Water Resource Initiative – Summary

For Water Resource Community

- Updated science and understanding.
- New useful tools and approaches.
- Additional data and resources.
- Data needed for GW models.
- Who benefits:
  - Municipalities & Water Authorities, Mines & Industry, Consultants, Irrigators/Irrigation Districts, State & Federal Agencies, Universities & Schools, Non-Governmental Organizations
  - Public

For NDWR

- Perennial Yield will remain important constraint for GW appropriations.
  - Update of Perennial Yield when warranted.
  - Potential for increase in water availability in some basins.
- More effective management of water resources (water rights)
- Inform/Reduce existing conflict
- Conjunctive Management of GW & SW
- Sustainable Development of our Water Resources

Questions?

Contact

Kip Allander, Hydrogeologist
Division of Water Resources
Phone: 775-684-2853
Email: kallander@water.nv.gov