

NEVADA DIVISION OF WATER RESOURCES

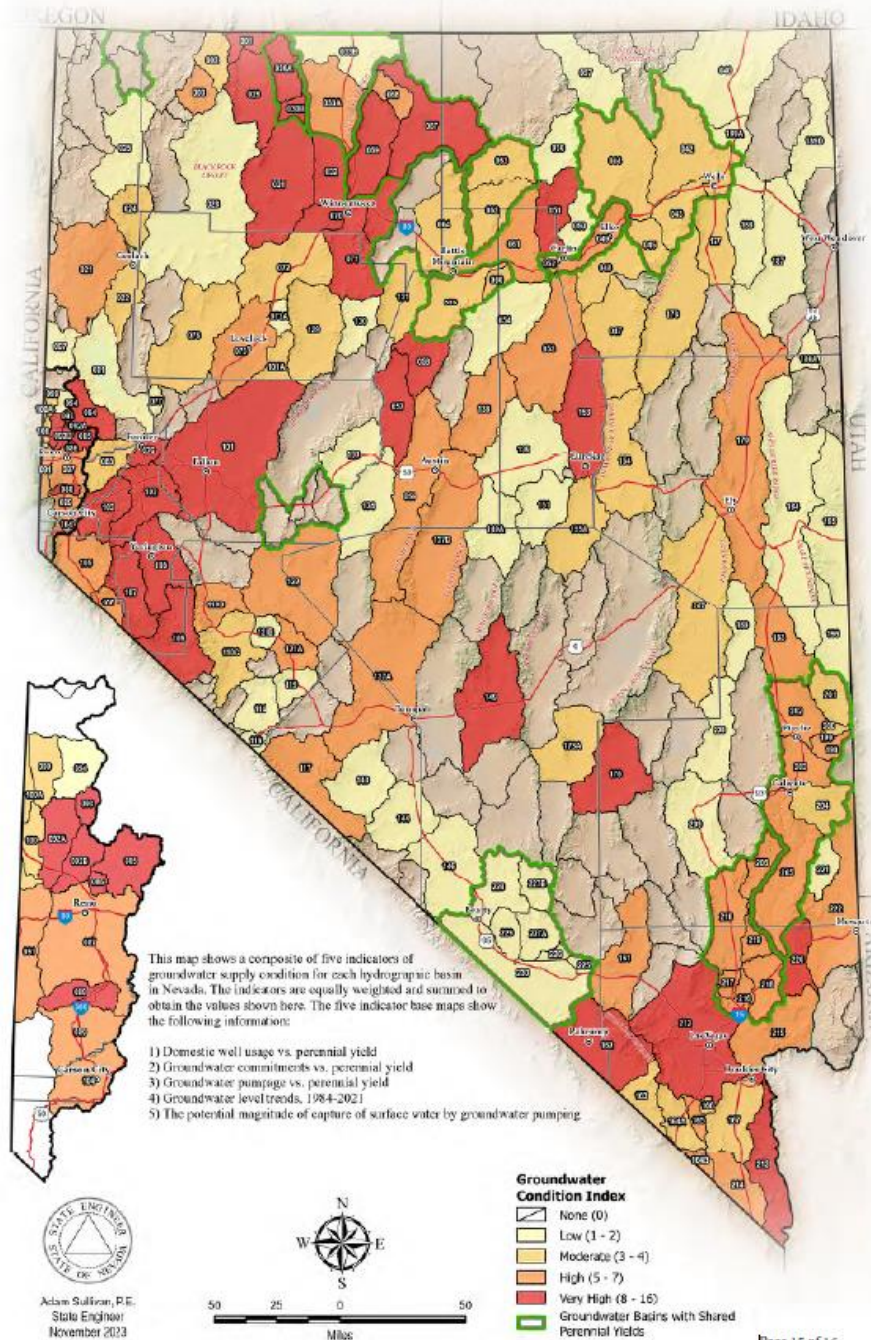


The Nevada Water Initiative: Where is the Water Coming From?

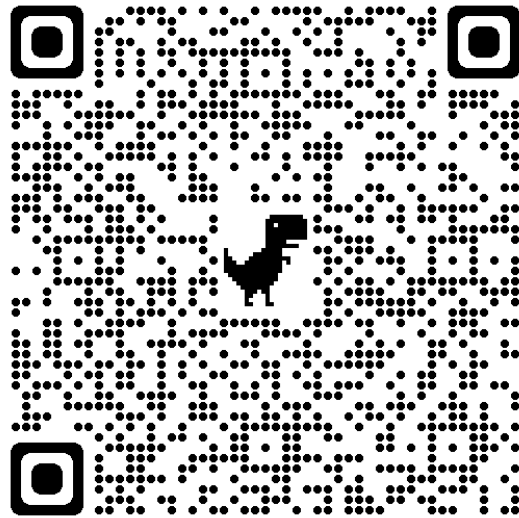
2024 NWRA Annual Conference

Las Vegas, Nevada
January 31, 2024

Presented By:
Kip Allander, *Hydrogeologist*



**LAST YEAR WE STARTED
“MOVING BEYOND THE PERENNIAL YIELD”**

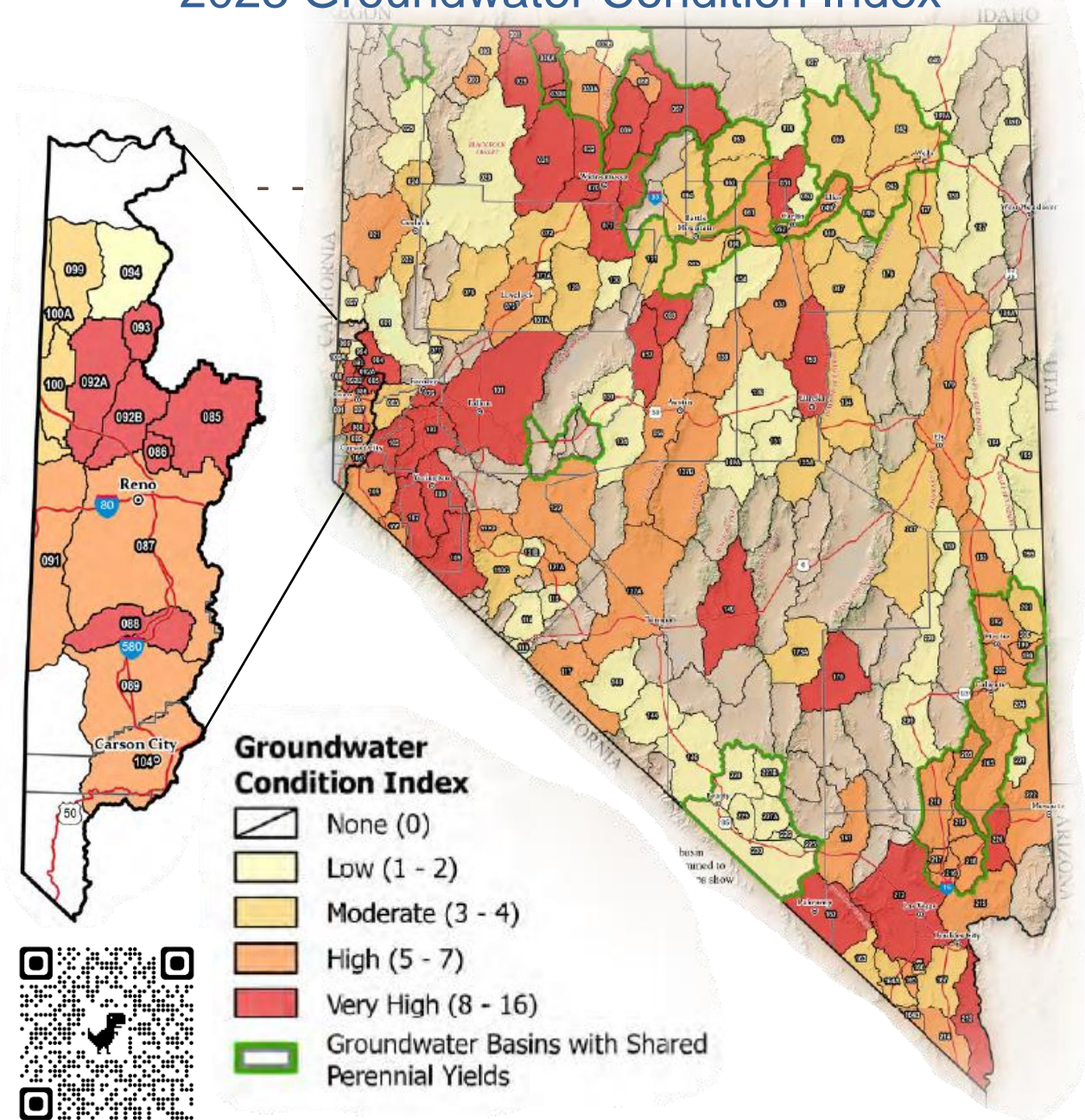


2023 BASIN STATUS ASSESSMENT: A NEW APPROACH FOR EVALUATING BASIN GW CONDITIONS

5 basin indicators to better represent hydrographic basin groundwater supply conditions.

- 1) Domestic well vulnerability
- 2) GW commitments
- 3) GW pumpage
- 4) GW level trends
- 5) Potential stream capture by pumping
- 6) Composite indicator map (shown)

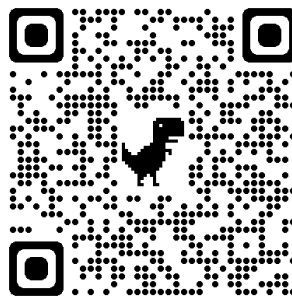
2023 Groundwater Condition Index



WHERE IS THE WATER COMING FROM?



CHARLES V. THEIS
1900-1987



1. All water discharged by wells is balanced by a loss of water somewhere.
2. This loss is always to some extent and in many cases largely from storage in the aquifer. Some ground water is always mined. The reservoir from which the water is taken is in effect bounded by time and by the structure of the aquifer as well as by material boundaries. The amount of water removed from any area is proportional to the drawdown, which in turn is proportional to the rate of pumping. Therefore, too great concentration of pumping in any area is to be discouraged and a uniform areal distribution of development over the area where the water is shallow should be encouraged, so far as is consistent with soil and marketing or other economic conditions.
3. After sufficient time has elapsed for the cone to reach the area of recharge, further discharge by wells will be made up at least in part by an increase in the recharge if previously there has been rejected recharge. If the recharge was previously rejected through transpiration from non-beneficial vegetation, no economic loss is suffered. If the recharge was rejected through springs or refusal of the aquifer to absorb surface waters, rights to these surface waters may be injured.
4. Again, after sufficient time has elapsed for the cone to reach the areas of natural discharge, further discharge by wells will be made up in part by a diminution in the natural discharge. If this natural discharge fed surface streams, prior rights to the surface water may be injured.

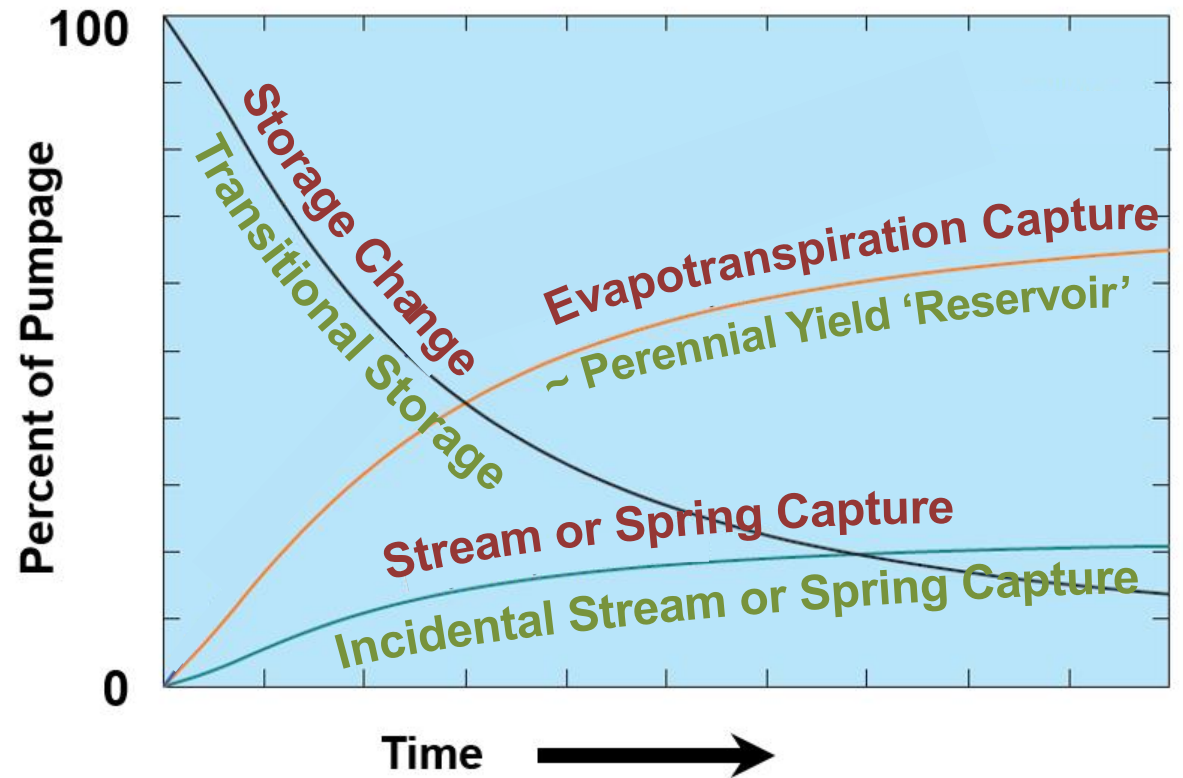
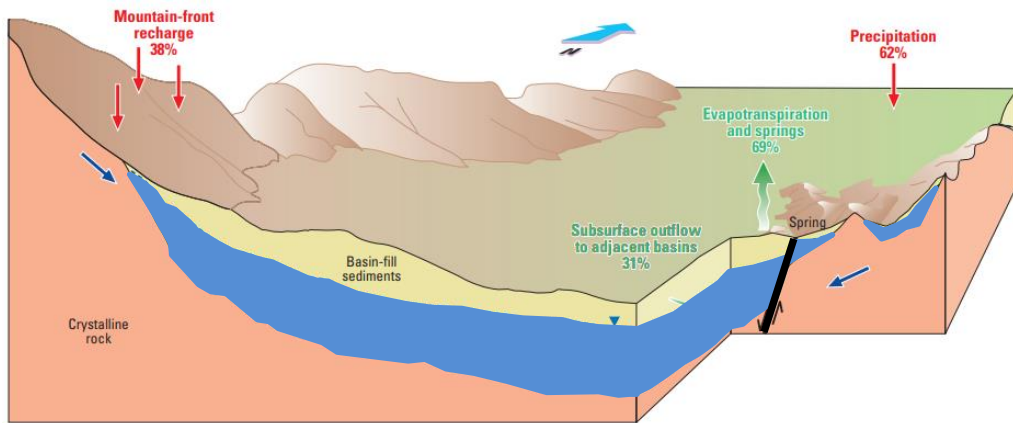
[Theis, C.V., 1940, Source of water derived from wells](#)

WATER MANAGEMENT IN NEVADA IS EVOLVING TOWARD “WHERE IS THE WATER COMING FROM?”

Perennial Yield Reservoir

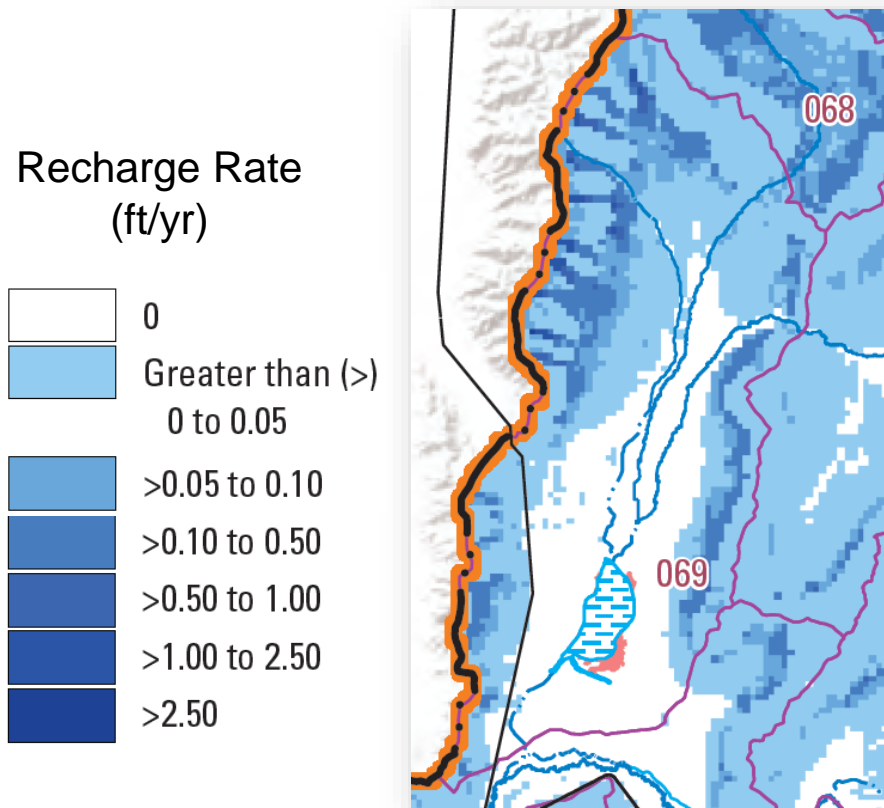


Where is the water coming from?

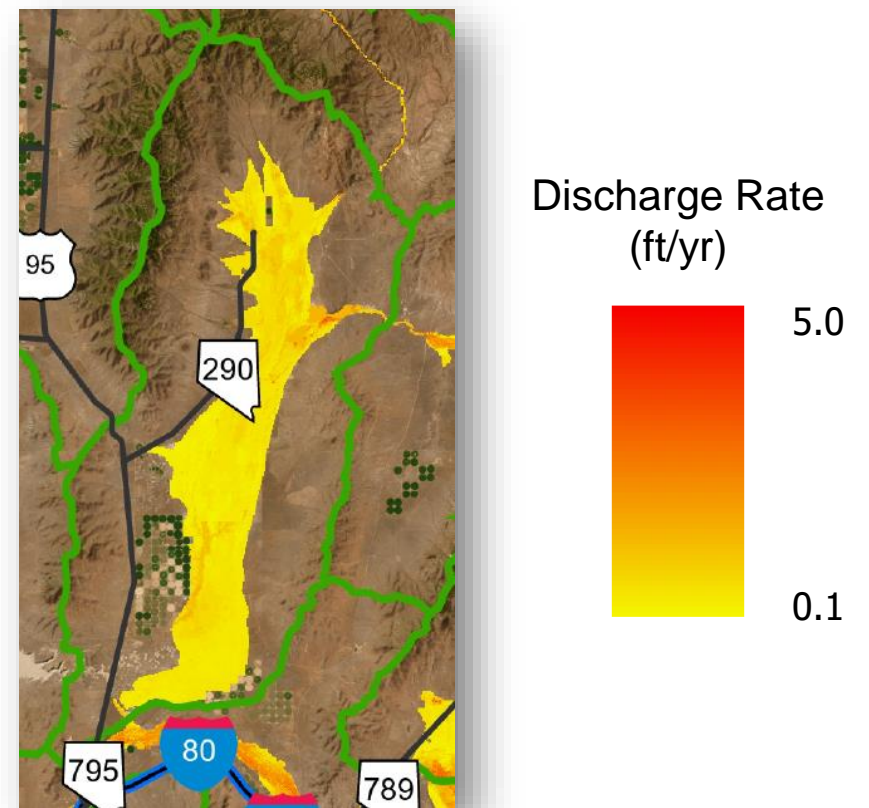


WE NEED TO UNDERSTAND WHERE WATER IS RECHARGING, DISCHARGING, AND HOW THAT INFLUENCES AQUIFER PROPERTIES AND EFFECTS OF PUMPING ON EXISTING RESOURCES AND WATER RIGHTS

Where is recharge occurring?



Where is discharge occurring?

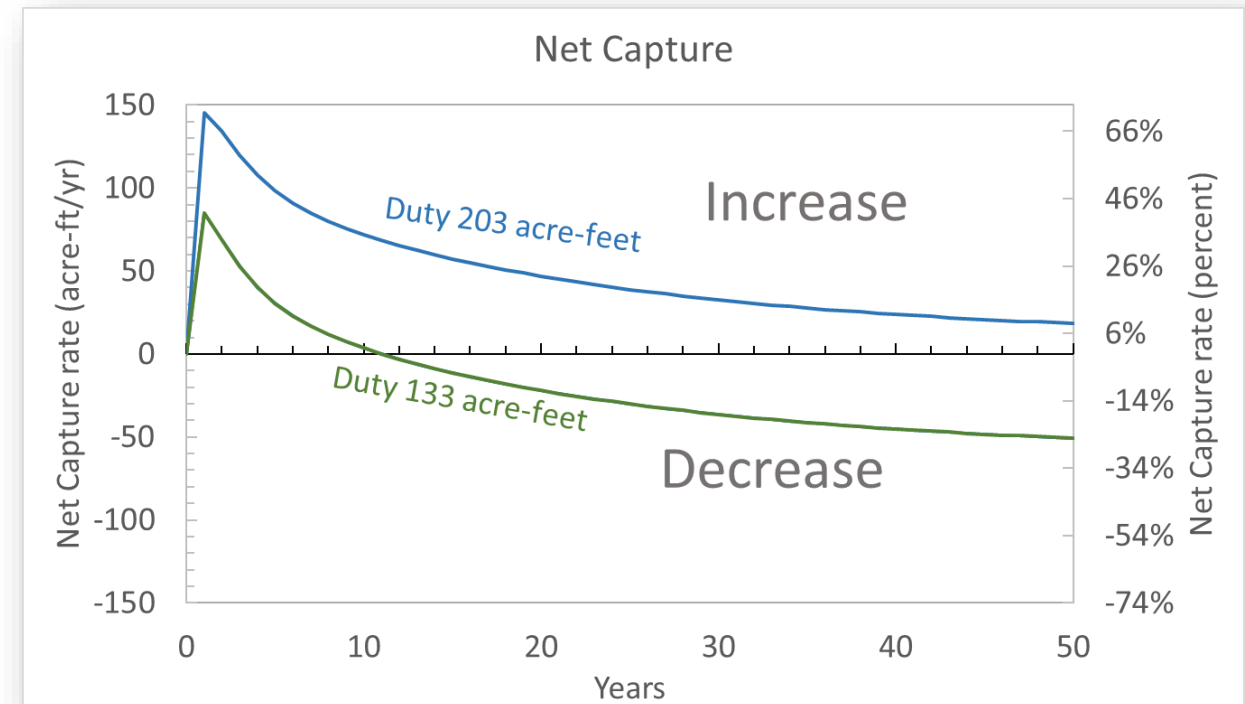


Example distributions of recharge and evapotranspiration discharge from Paradise Valley (HA 069)

MANAGEMENT PROCEDURES ALLOW FOR INCREMENTAL REDUCTION IN APPROPRIATED WATER RIGHTS OVER THE LONG TERM

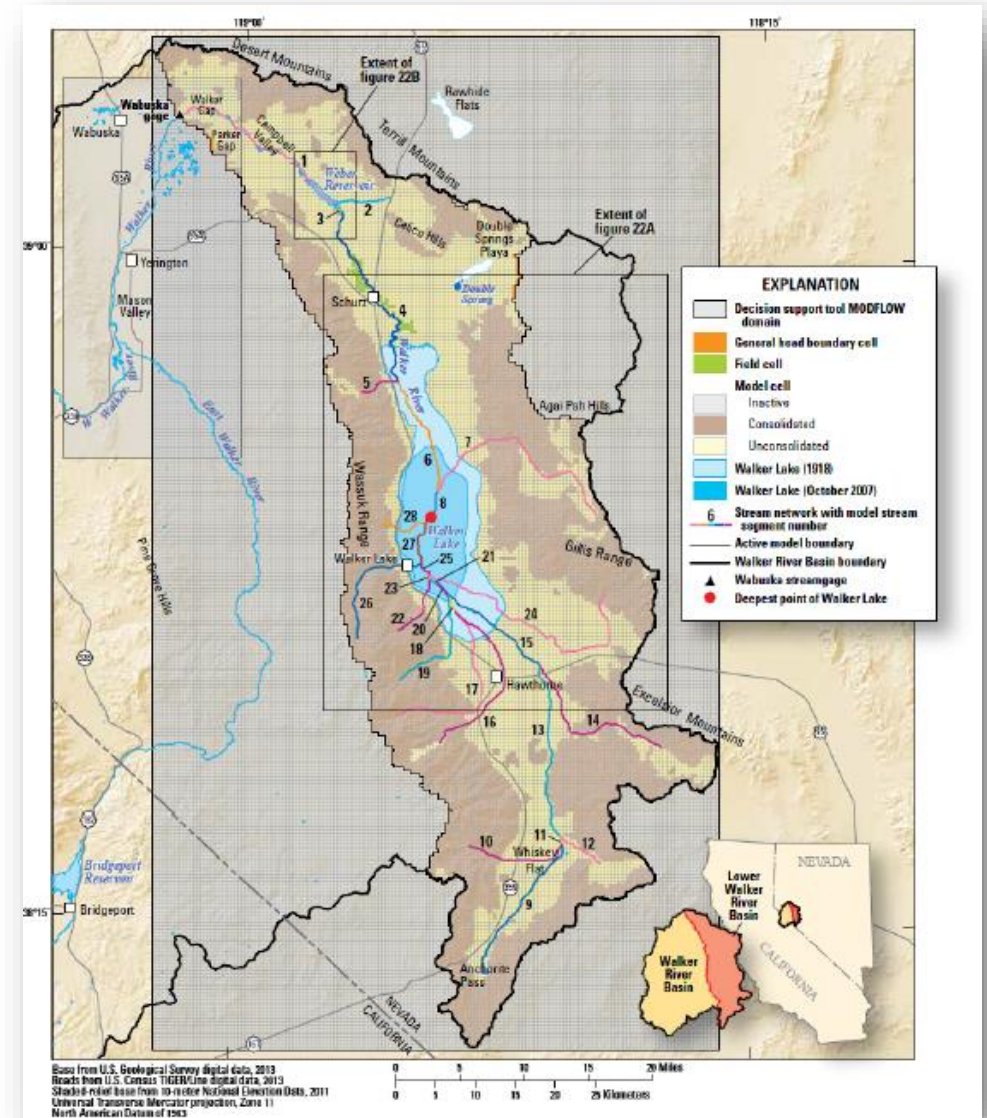
- Evaluate conflict over 50 years.
- Water rights can be moved if they don't increase conflict.
- For fully appropriated basins.
 - Can reduce appropriations over time.
- Decisions based on analysis.
- Based on our understanding of where the water is coming from.

Example of change application resulting in long-term decrease in conflict – and reduction in appropriation.



NEVADA WATER INITIATIVE – WHAT WILL IT PROVIDE

- Datasets needed for groundwater models.
- Update of water availability estimates.
- Improved understanding of flow systems.
- Information needed for conjunctive management.
- Data and tools available to all.



DUSTING OFF THE WATER RESOURCES BULLETIN SERIES FOR THE NWI



WRB series resurrected after being dormant for 32 years.

Bulletin 47 – NV NIWR (2010)

Bulletin 48 – Humboldt ET_g

Bulletin 49 – Upper Humboldt Model

Bulletin 50 – Lower Humboldt Model

Bulletin 1 located and released online

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

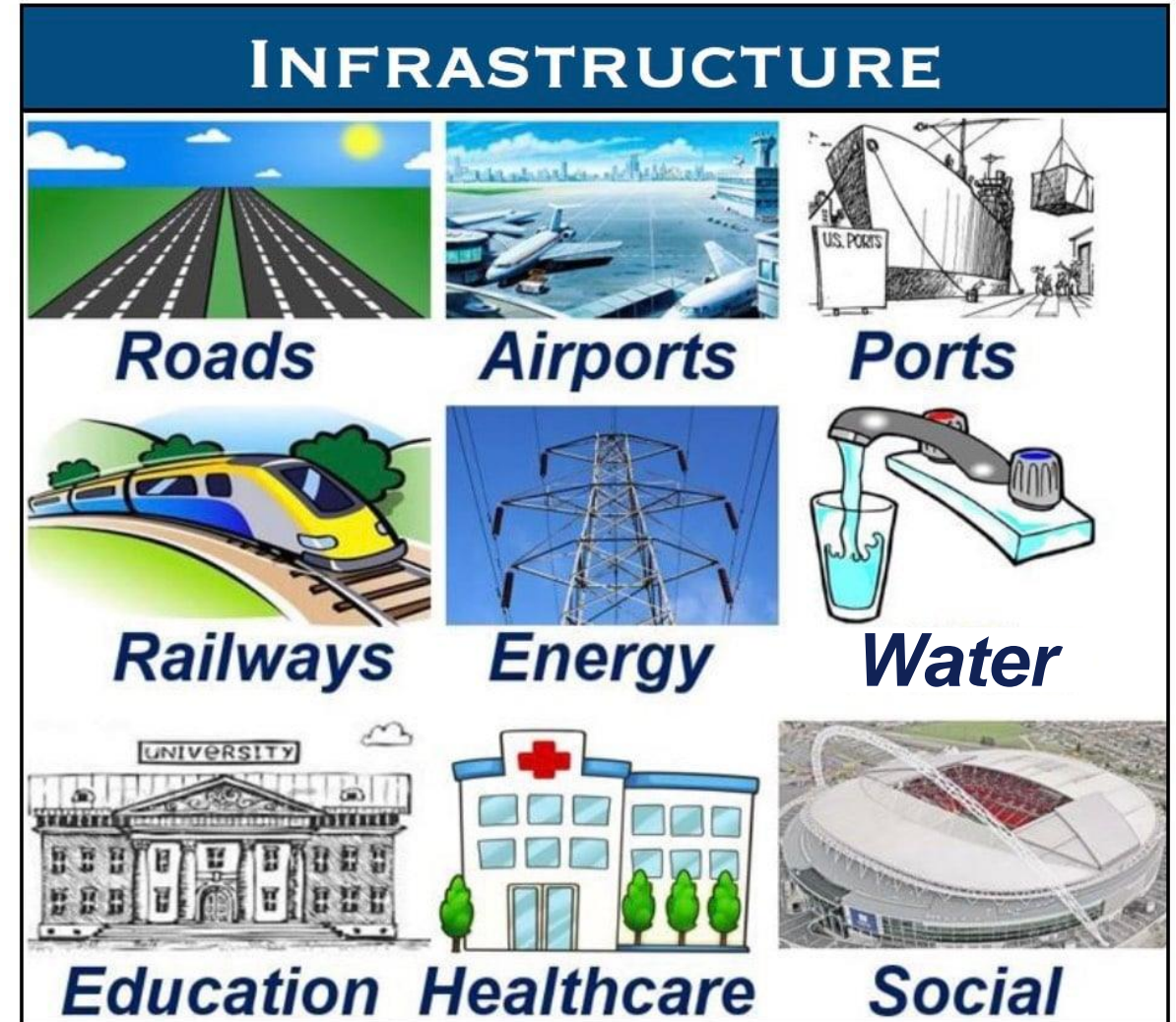
WHAT'S NEXT WITH NWI

- Continue current investigations.
- Roll out of web page with NDWR.
- Select next Hydrographic Basin(s) for investigation.
- Continue building support for long-term program.



WATER SCIENCE IS BASIC INFRASTRUCTURE FOR NV'S WATER RESOURCES

- Transportation has:
 - Roads, highways, bridges
- Energy has:
 - Power plants, transmission lines, etc.
- Water has:
 - Reservoirs, canals, ditches
 - Wells, pumps & pipes
 - **Water science**



NWI is Nevada's bridge to a sustainable water future



Contact

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