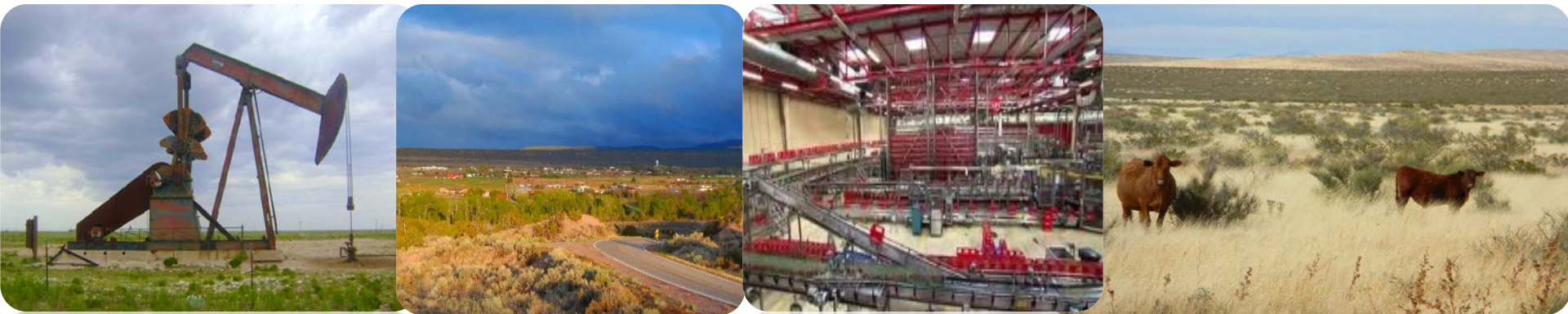


NM WRRI – Interim Water and Natural Resources Committee

5 September 2017

Sam Fernald
NM WRRI, NMSU



Purposes of New Mexico Water Resources Research Institute as defined by New Mexico Statute 21-8-40 of 2005

The purposes of the Institute are to:

- Provide research and training in water conservation and management
- Transfer water information through publications, newsletters, and conferences
- Provide expertise and technical information to address water problems
- Cooperate with local, state, and federal water agencies.

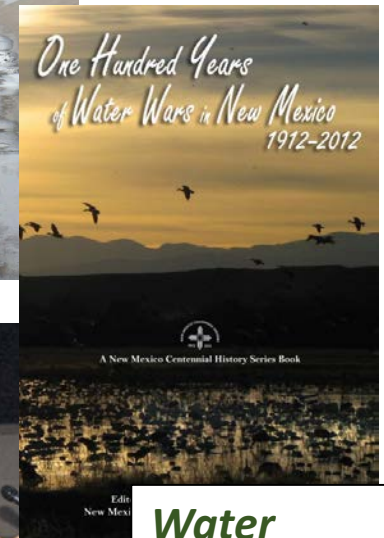
Research



Training



Statewide Cooperation



Water Information

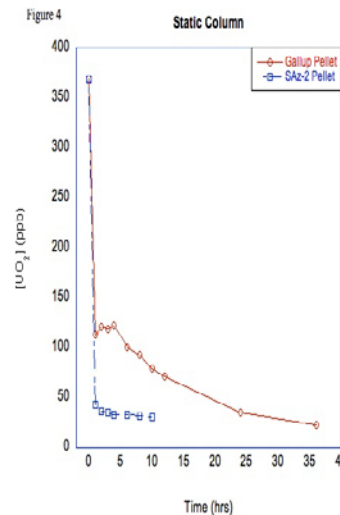
Use NM Clay to Convert Water to Clean Potable Water – Dr. Lara, NMSU

Project funding within NM WRRRI Base Budget



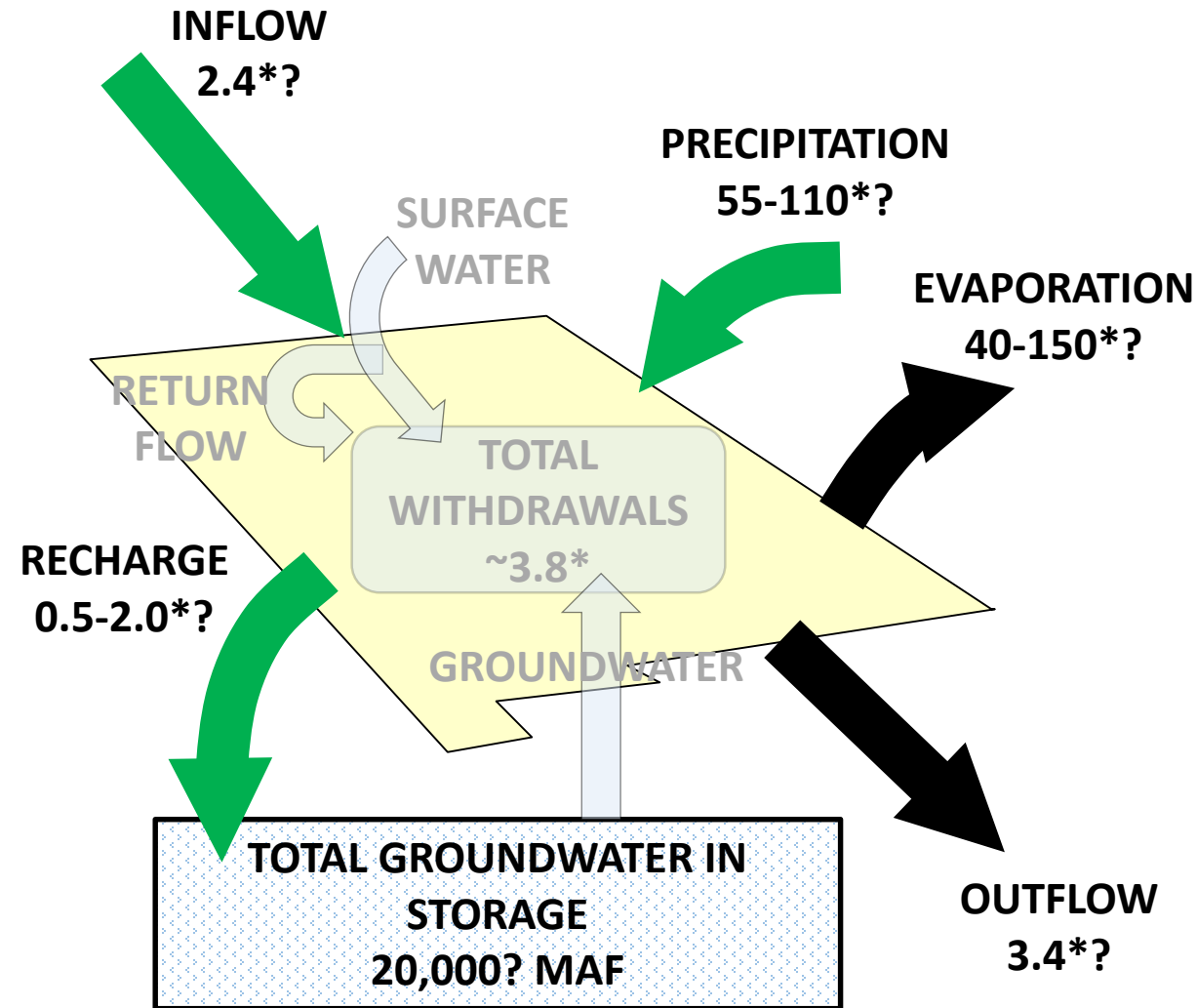
- Uranium contaminated water sources are creating dire illnesses and some deaths
- The Four Corners area is most affected with uranium and heavy metal contamination

Dirt Ceramic Pellets (DCPs): An appropriate solution (inexpensive, simple, and materials are readily available)



- DCPs are very effective at removing uranium

Why we need a Statewide Water Budget

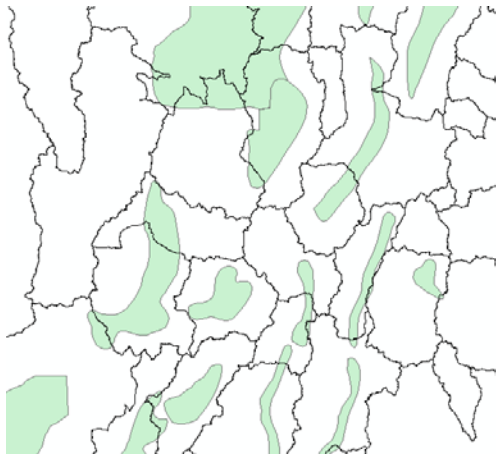


- Physical supply is not well known
- Need for a comprehensive assessment of NM's water resources
- Aim is to complement OSE and other agencies' water programs while providing new information through research

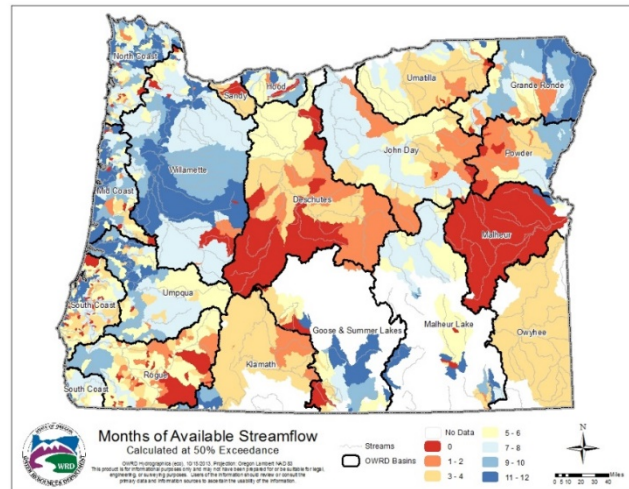
*Fluxes in millions of acre-feet per year

Other western states' water assessments to enhance water administration and planning; NM should invest likewise

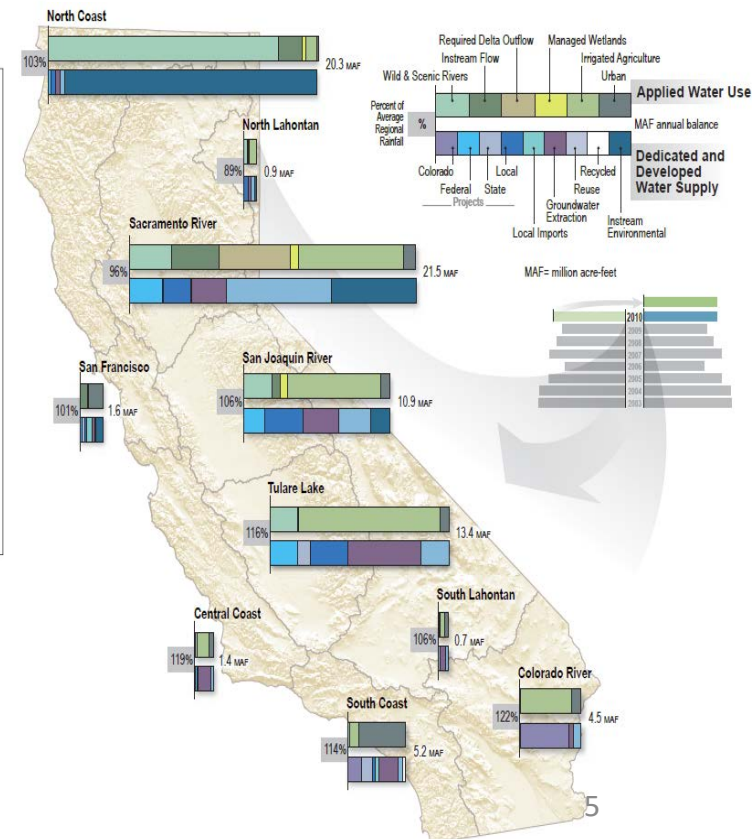
Utah: Combined state water use and USGS water resource areas



Oregon: Point flow data converted for water unit flow management

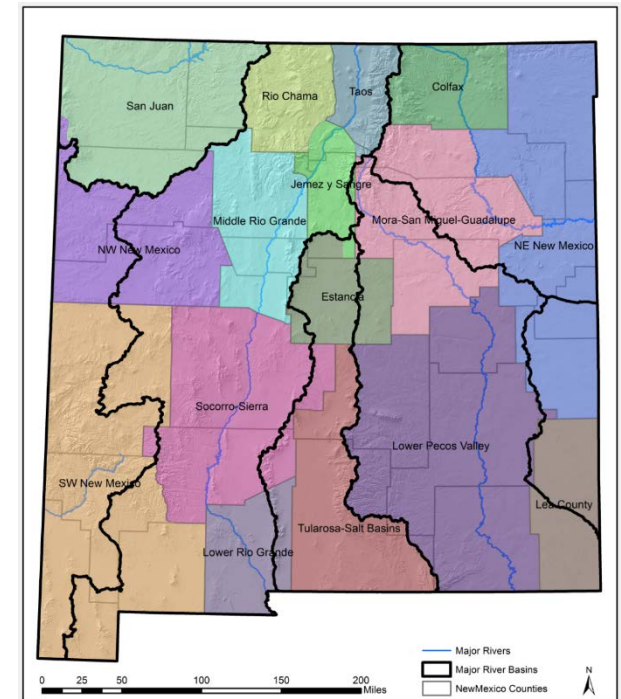


California: Common platform for water uses and supplies by region

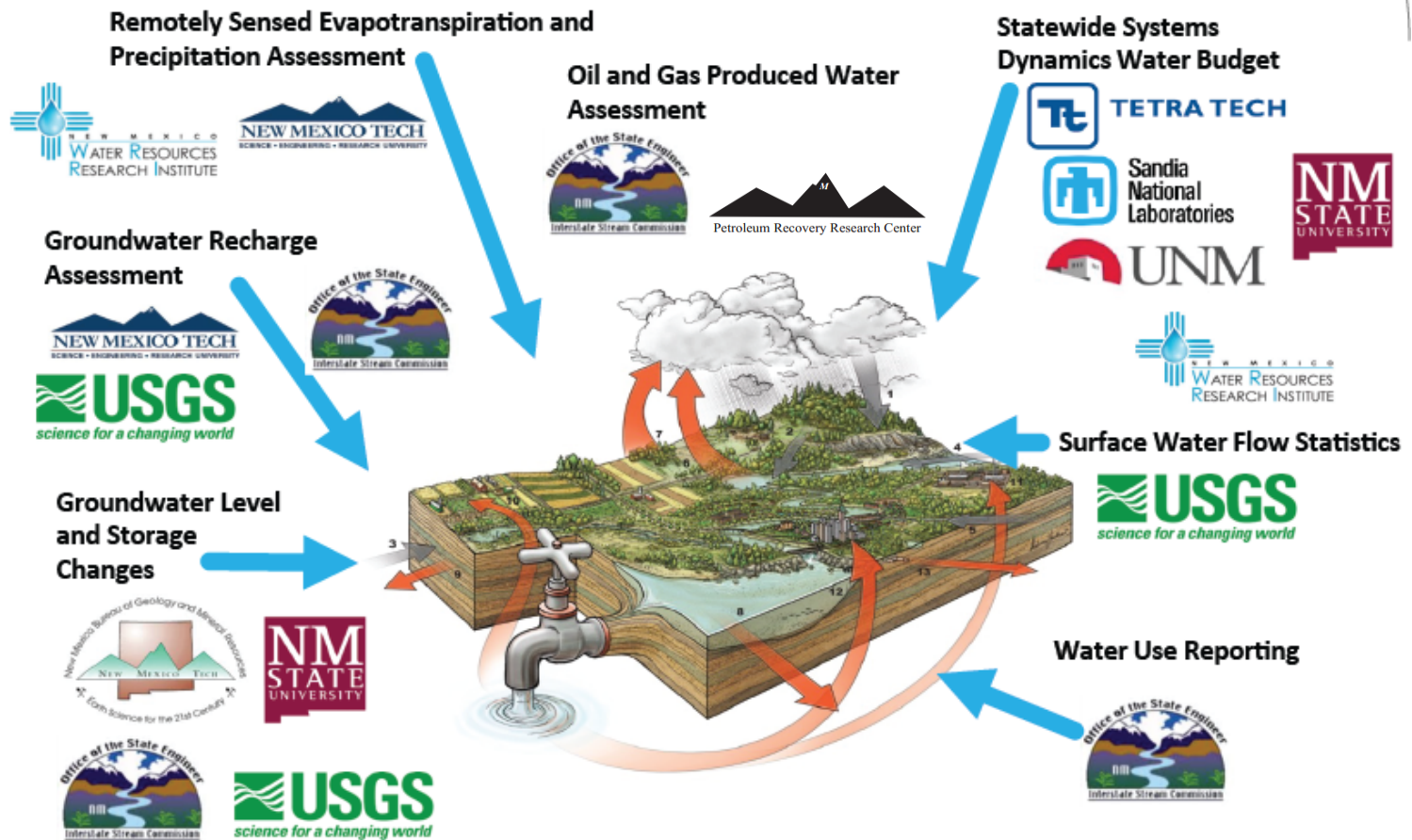


The Statewide Water Assessment: Why It is Critical

- A tool for proper planning of water resources to avoid water shortage crises
- A unique, multi-scale dynamic model that fills in gaps of historic water management in New Mexico
- Work closely with Interstate Stream Commission to complement State Water Plan
- Future scenario estimations to help alleviate uncertainty for state water planners
- Multi-university collaboration on a variety of water topics
- Leading academic researcher in areas of evapotranspiration, hydrology, modeling
- Graduate students and young professionals engaging in applied water research and management (future water managers!)

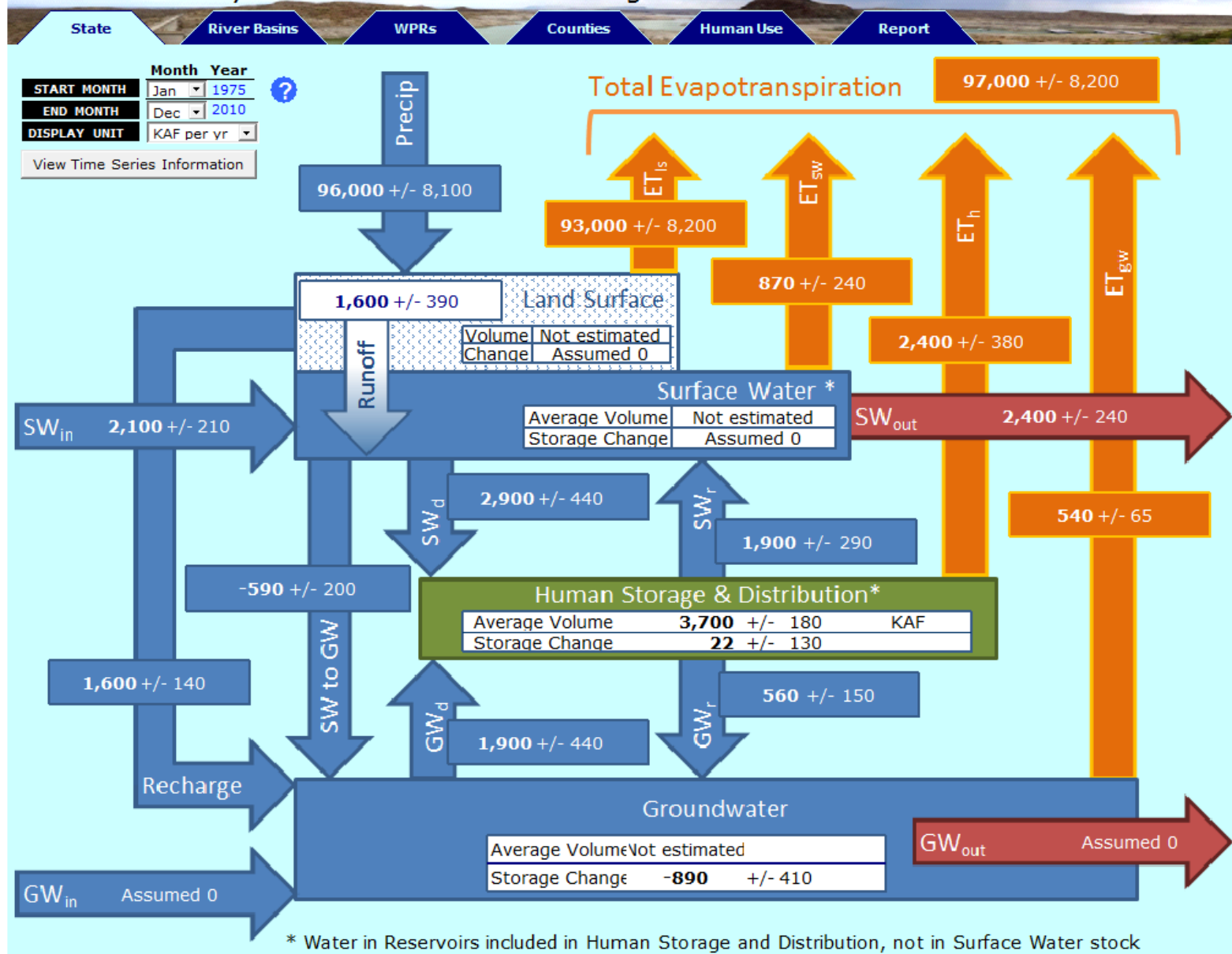


Statewide Water Assessment Collaboration



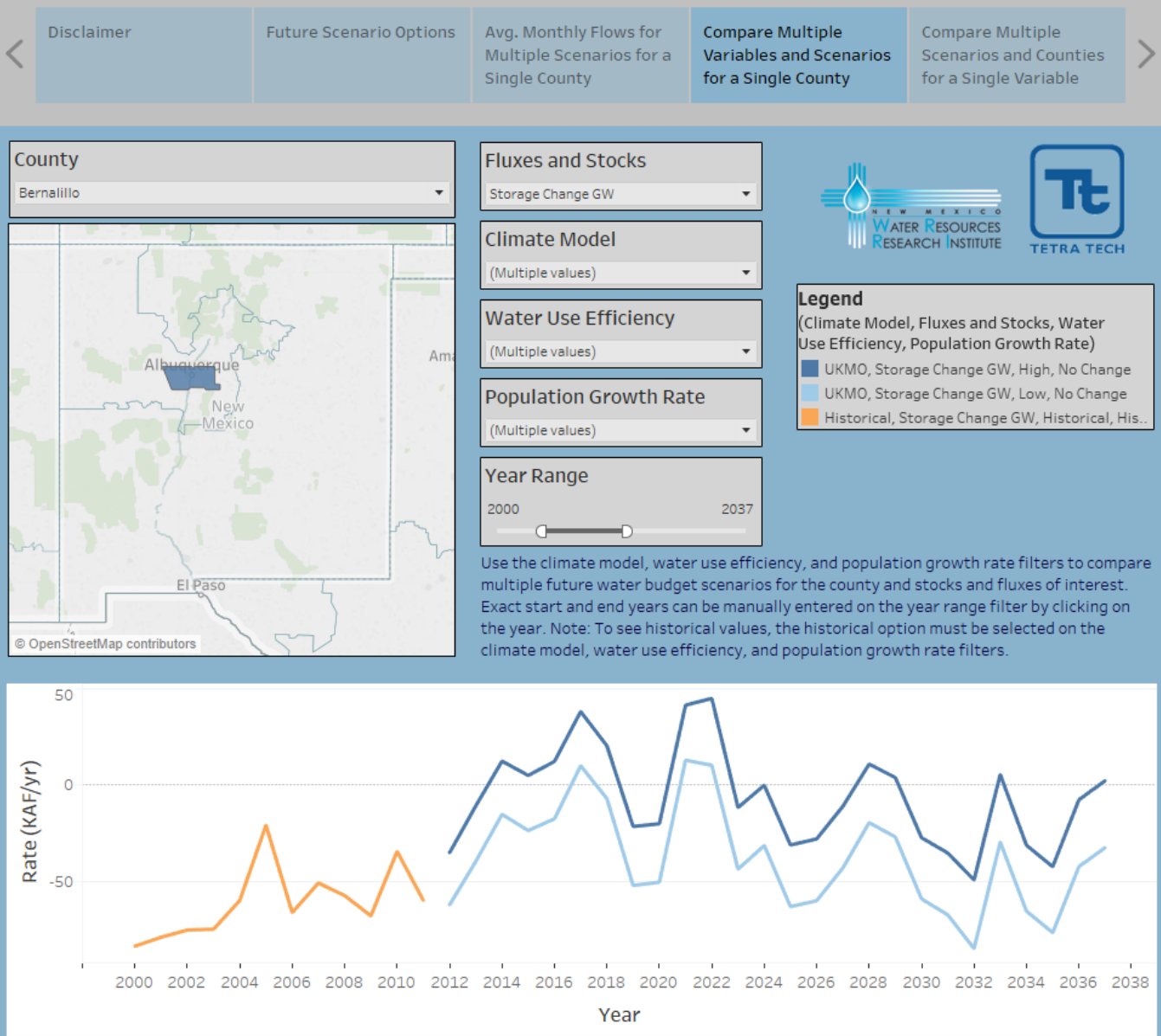
Historical Periods (1975-2011)

New Mexico's Dynamic Statewide Water Budget



The Interactive Visualization Tool

NMDSWB - County Future Scenarios

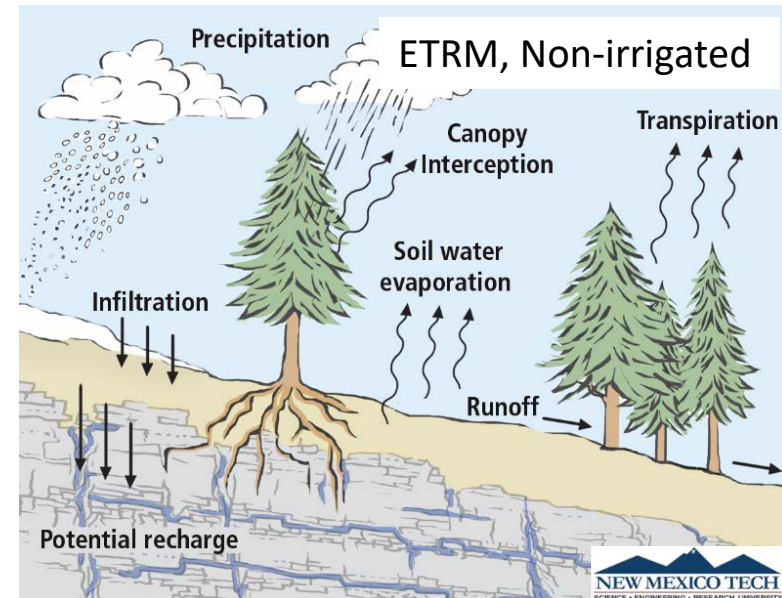
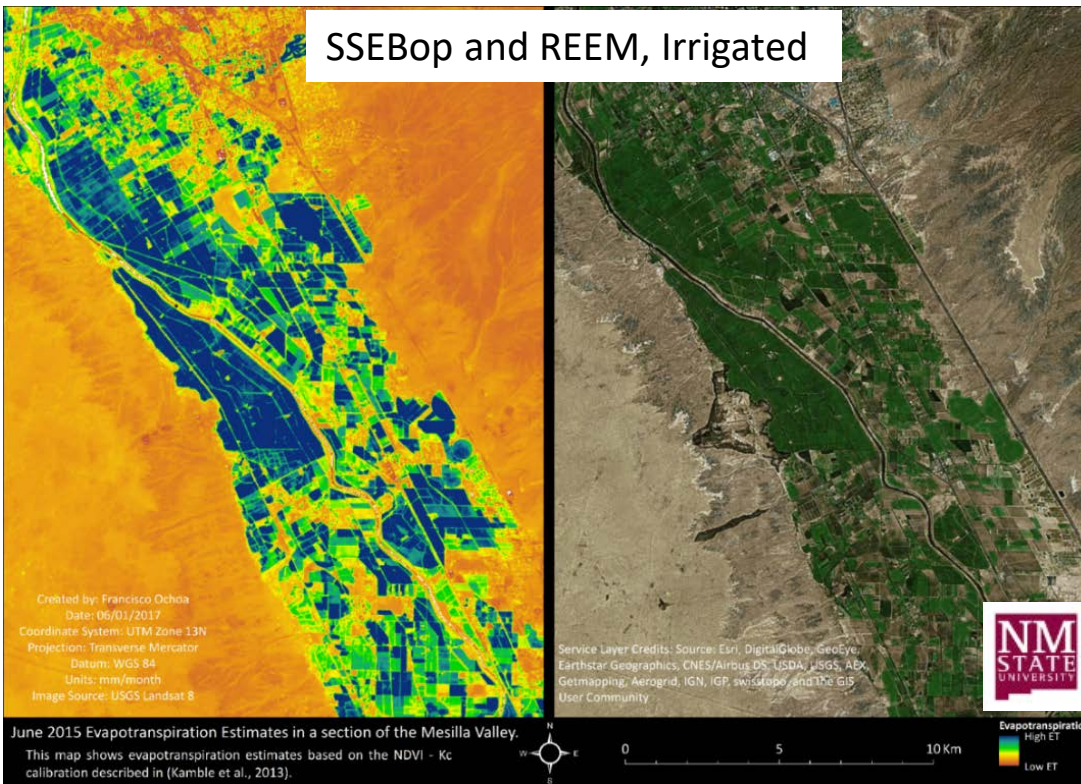


- Creating an easily accessible tool that is useful to water planners, researchers, and water users
- Allows users to compare multiple variables and scenarios
- Example shows two future groundwater storage change projections comparing high and low water-use efficiency

Ensemble Evapotranspiration Method

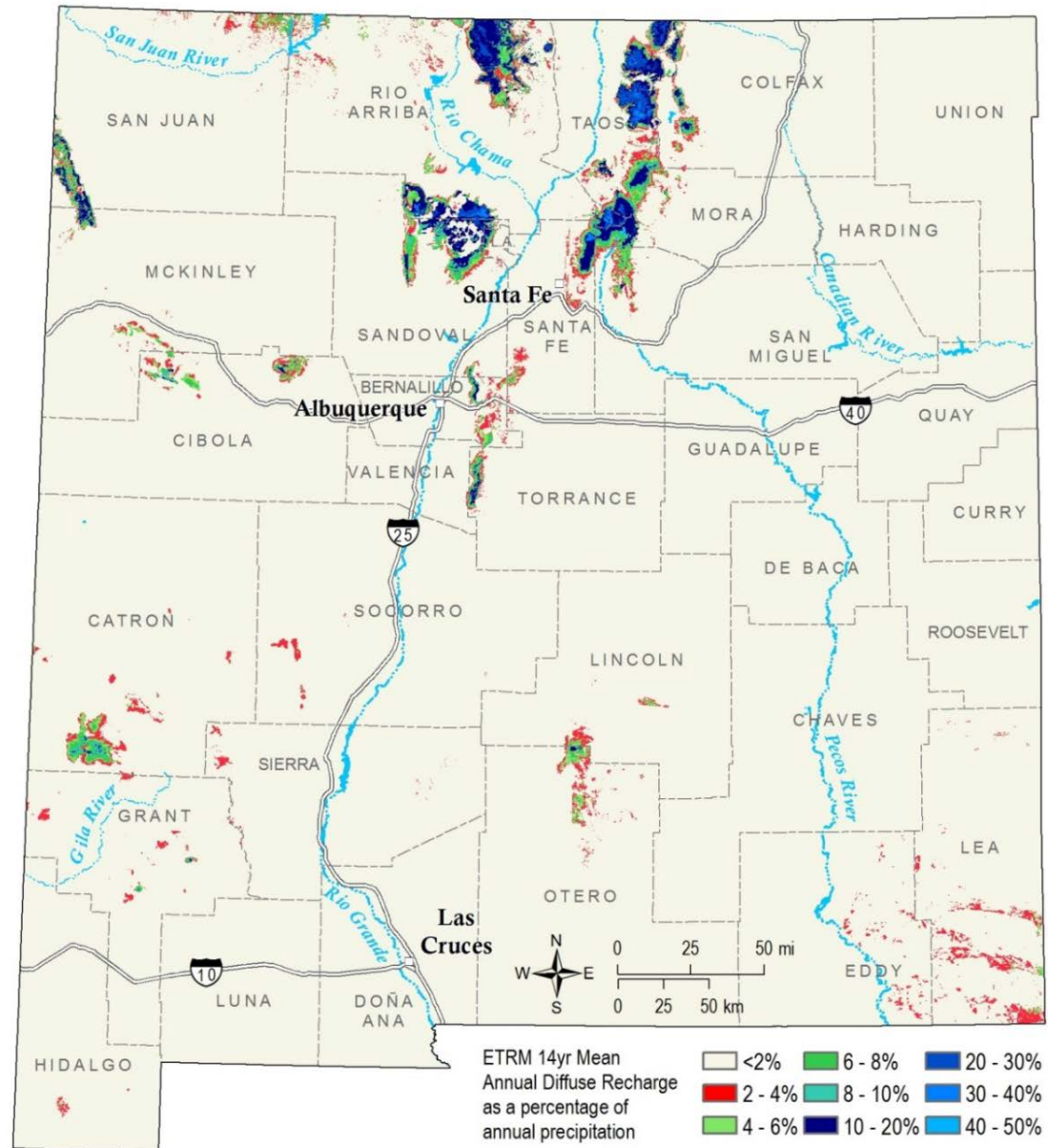
- Cutting edge science to inform the Statewide Water Budget
- Combined ET model research approach from NMSU, NM Tech, and USGS
- Mean ET estimates for irrigated and non-irrigated areas

SSEBop and REEM, Irrigated



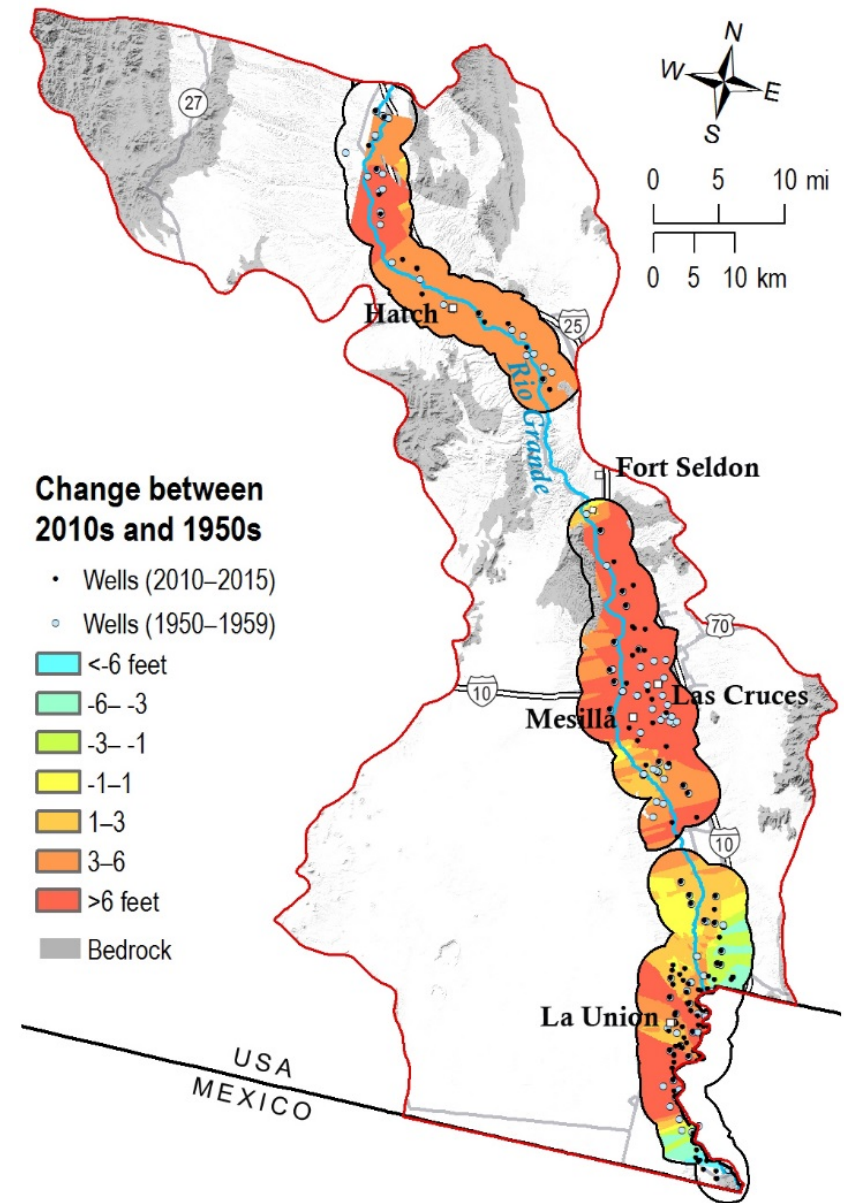
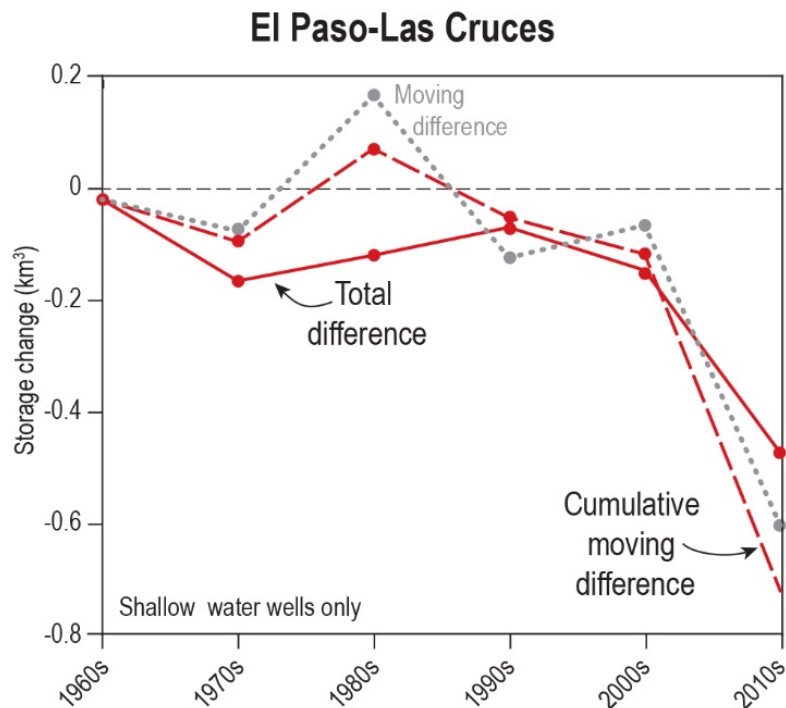
Evapotranspiration and Recharge Model (ETRM)

- Entirely new representation of recharge in New Mexico developed for the Statewide Water Assessment project
- Estimates recharge to groundwater for areas that receive only natural precipitation



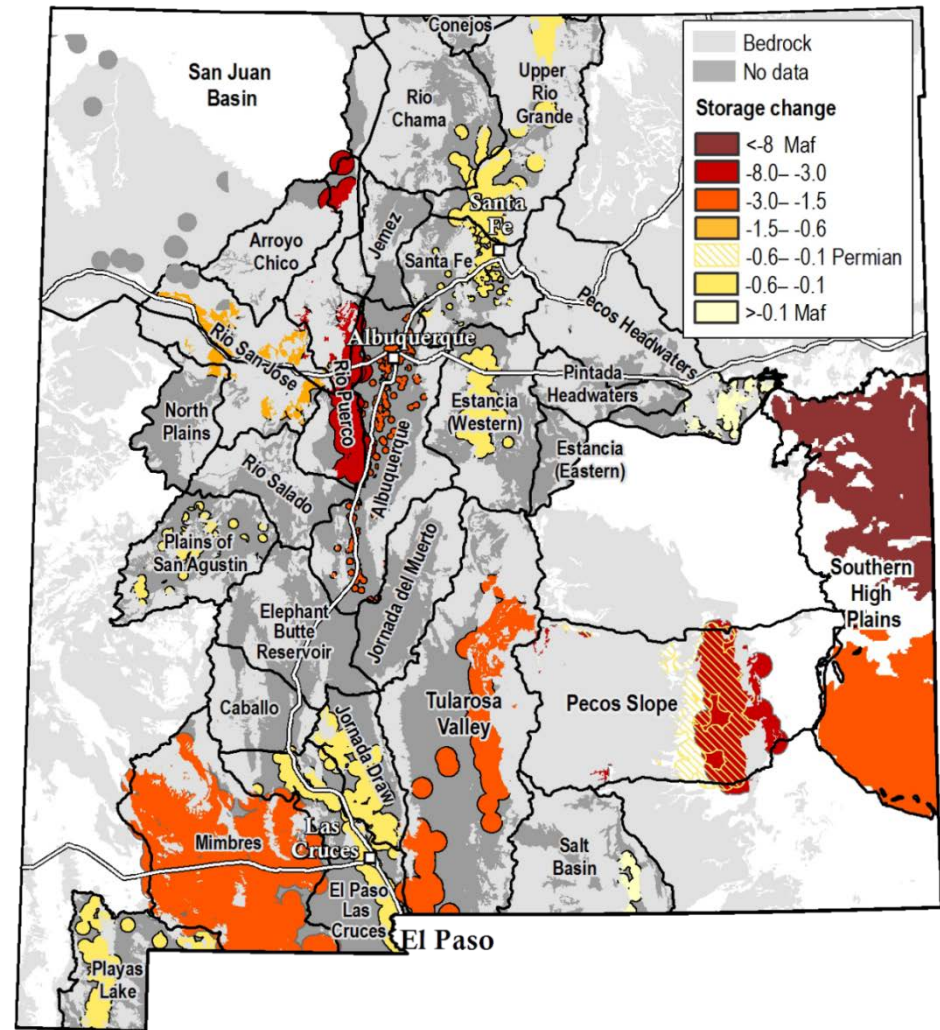
Mesilla Basin Groundwater Storage Change

- Detailed characterization of groundwater storage changes
- Informs water managers and improves the Statewide Water Budget
- Example for the lower Rio Grande shows basin-wide changes since the 1950s (1 km³=0.82 million acre-feet)



Groundwater Storage Change

- Analyzed data across the state
- Groundwater storage is decreasing
- Closed basins and areas far from rivers and streams have been most affected
- Funding is required to complete the remaining areas



The storage change project by itself has really changed conversations I have with people about water in New Mexico—we have information, not guesses.

Dr. Alex Rinehart



Thank
You