

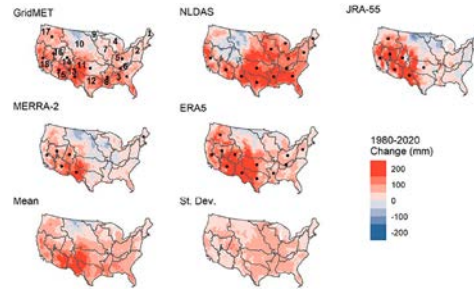
NM WRRRI presentation to WNRC 10/4/2023

1. New Mexico Water Resources Research Institute

- Mission: Research to support New Mexico’s water management needs
- Vision: Assure water availability for vibrant communities, thriving economies, and healthy ecosystems
- Making an impact: Improve water availability through reduced use, increased supply, improved quality

2. Background Situation – Increasing scarcity due to increased evapotranspiration, reduced runoff, changing land and water use.

“To put the changes in the Rio Grande in perspective from the standpoint of crop water requirements, a 135–235 mm ET_o change represents an 8%–15% increase from 1980 meaning that 8%–15% more water is needed to maintain a well-watered crop on the same amount of land area in 2020 relative to 1980” (Albano et al. 2022)



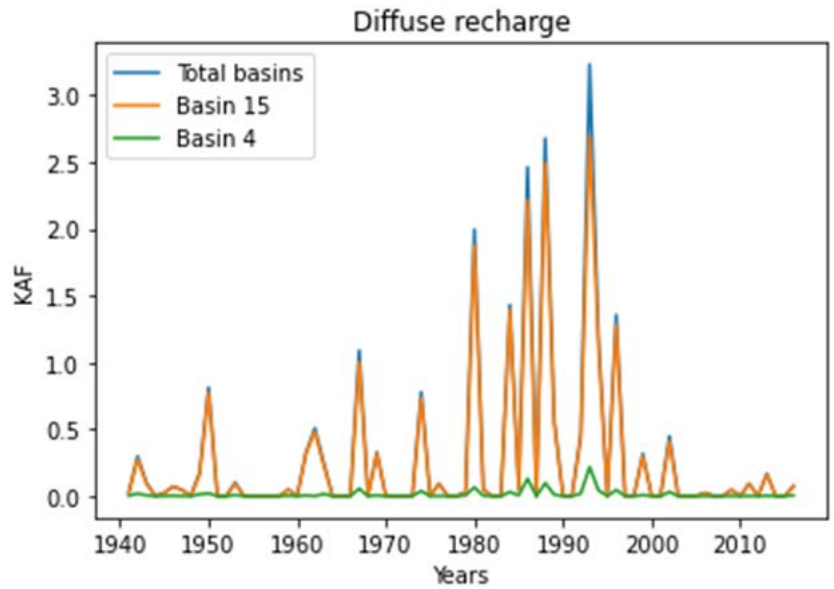
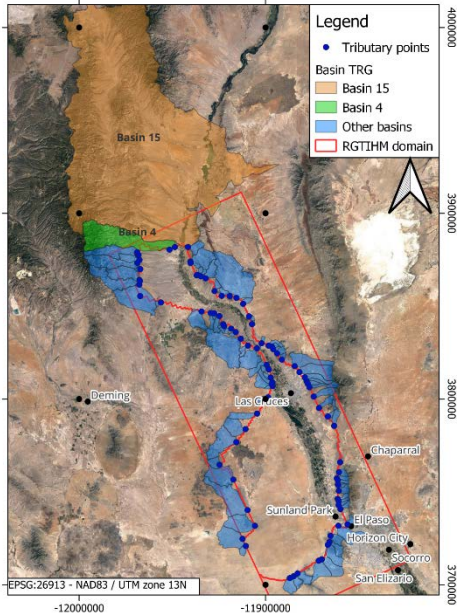
3. Approach – conservation, recharge, watershed management

In agricultural river valleys, the most recharge to the aquifer occurs from water that seeps from the river bed, from farmer’s fields across the valley floodplain, and from contributing watersheds.



Watershed runoff and diffuse recharge

- Total recharge from basins between (1940-2015) is 21.73 KAF and a yearly average of 0.29 KAF



4. Strategic community water management program

The objectives include improved water management, reduced conflict, increased supply, improved quality, nurtured culture, and supported local economies

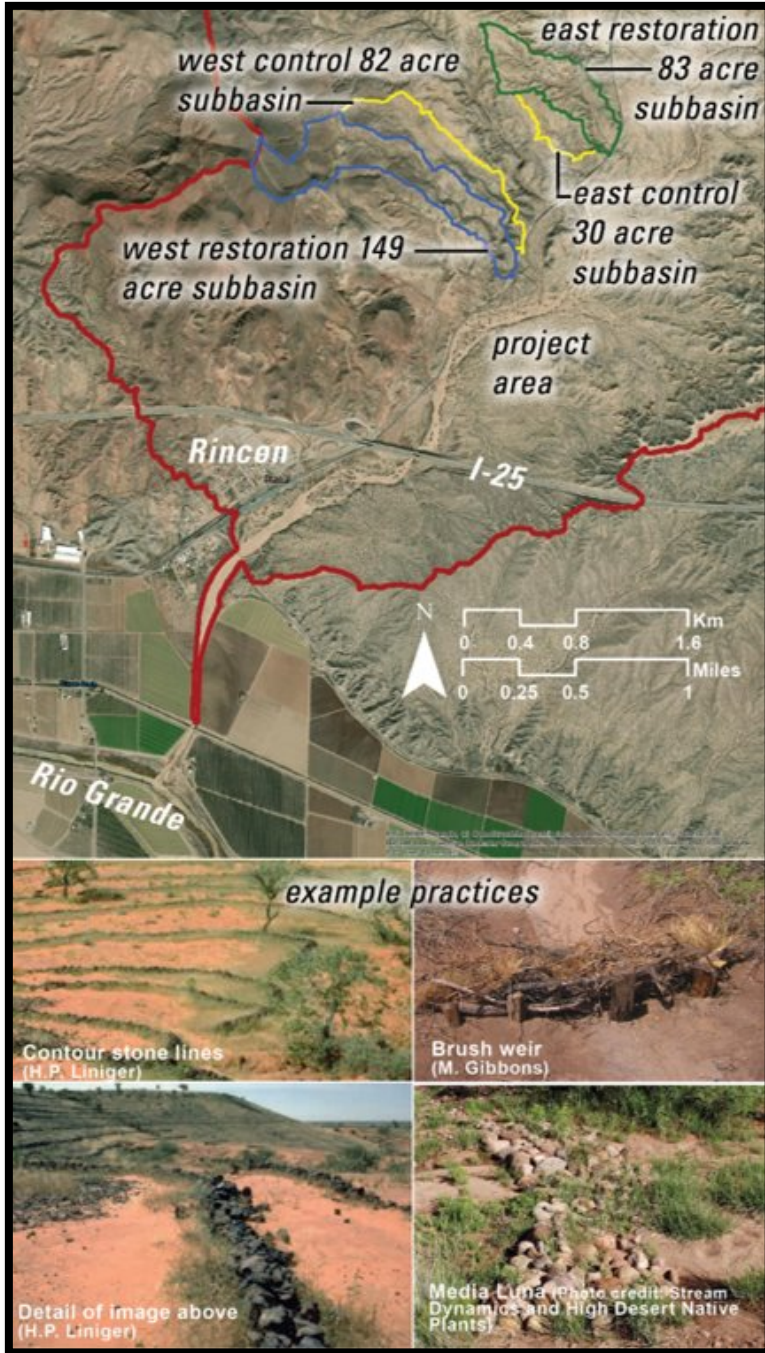
This program meets community defined needs for water information and real time information sharing.



Watershed management

Reduced rapid runoff and erosion

Increased recharge



Watershed Restoration: Goal - Lower Flood Energy and Drop Sediment Out of Flood Flows, Increase Retention and Recharge

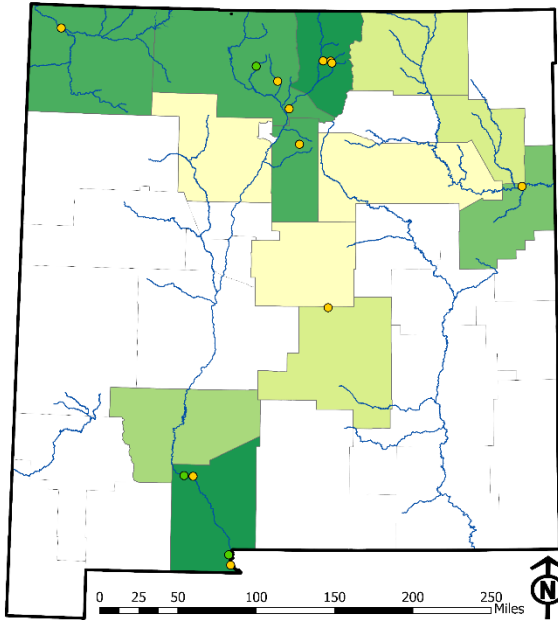
- **Challenge:** Scouring floods are washing large amounts of sediment into dams and the irrigation system. prevents wide-spread aquifer recharge projects and lowers conveyance capacity.

- **Research need:** We will expect to quantify the most effective practices and extent of restoration needed to achieve stakeholder goals within approximately 2 years (3 awarded NMED projects).

- **Paired watershed studies:** Subbasins with restoration are paired with control subbasins and critical indicators measured

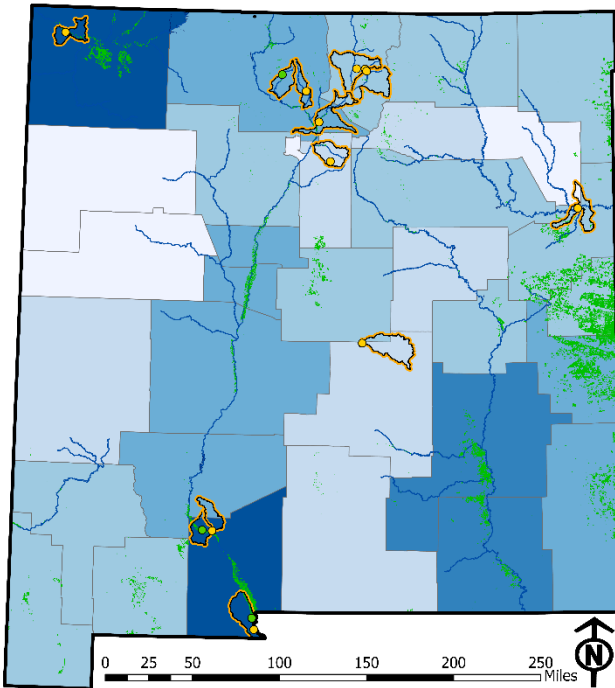
- **Real time information** Provide community requested information on locally accessible website with technical assistance

Strategic community water management program impacts

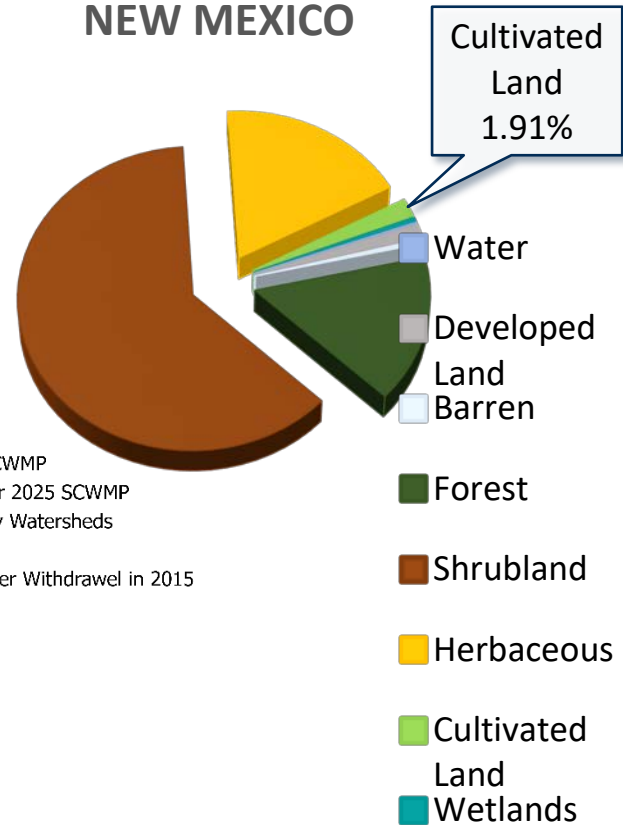


- Fiscal Year 2024 SCWMP
 - Potential Fiscal Year 2025 SCWMP
- Acres Of Impacted Community Watershed By County
- 134 ac
 - 135 ac - 35,383 ac
 - 35,384 ac - 97,161 ac
 - 97,162 ac - 124,854 ac
 - 124,855 ac - 275,674 ac

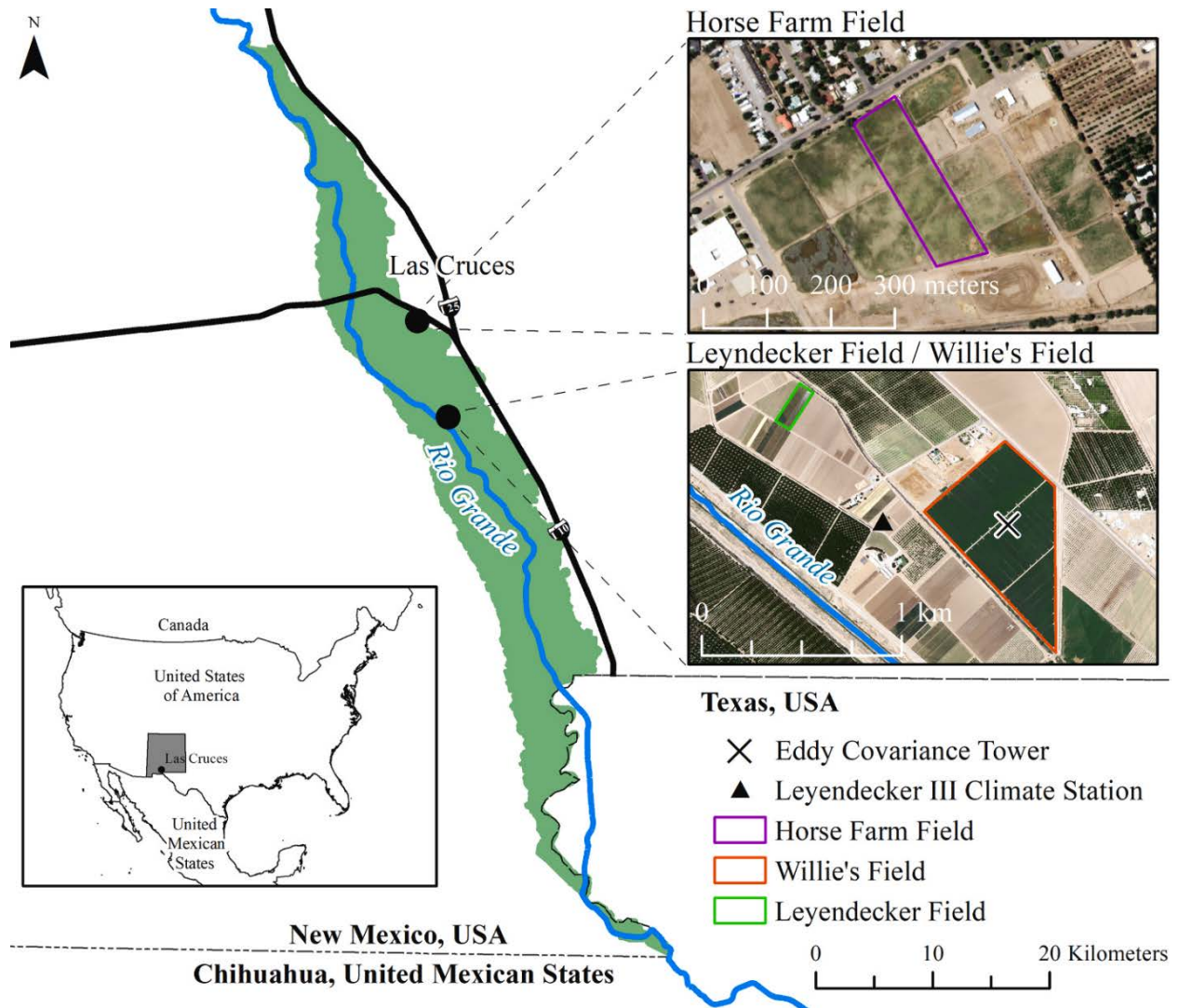
LAND COVER CLASSIFICATION OF NEW MEXICO



- Fiscal Year 2024 SCWMP
 - Potential Fiscal Year 2025 SCWMP
 - ▭ SCWMP Community Watersheds
 - Cultivated Land
- Total Acre Feet of Water Withdrawel in 2015
- 3429 - 10243
 - 10244 - 36654
 - 36655 - 90789
 - 90790 - 153145
 - 153146 - 238557
 - 238558 - 382501



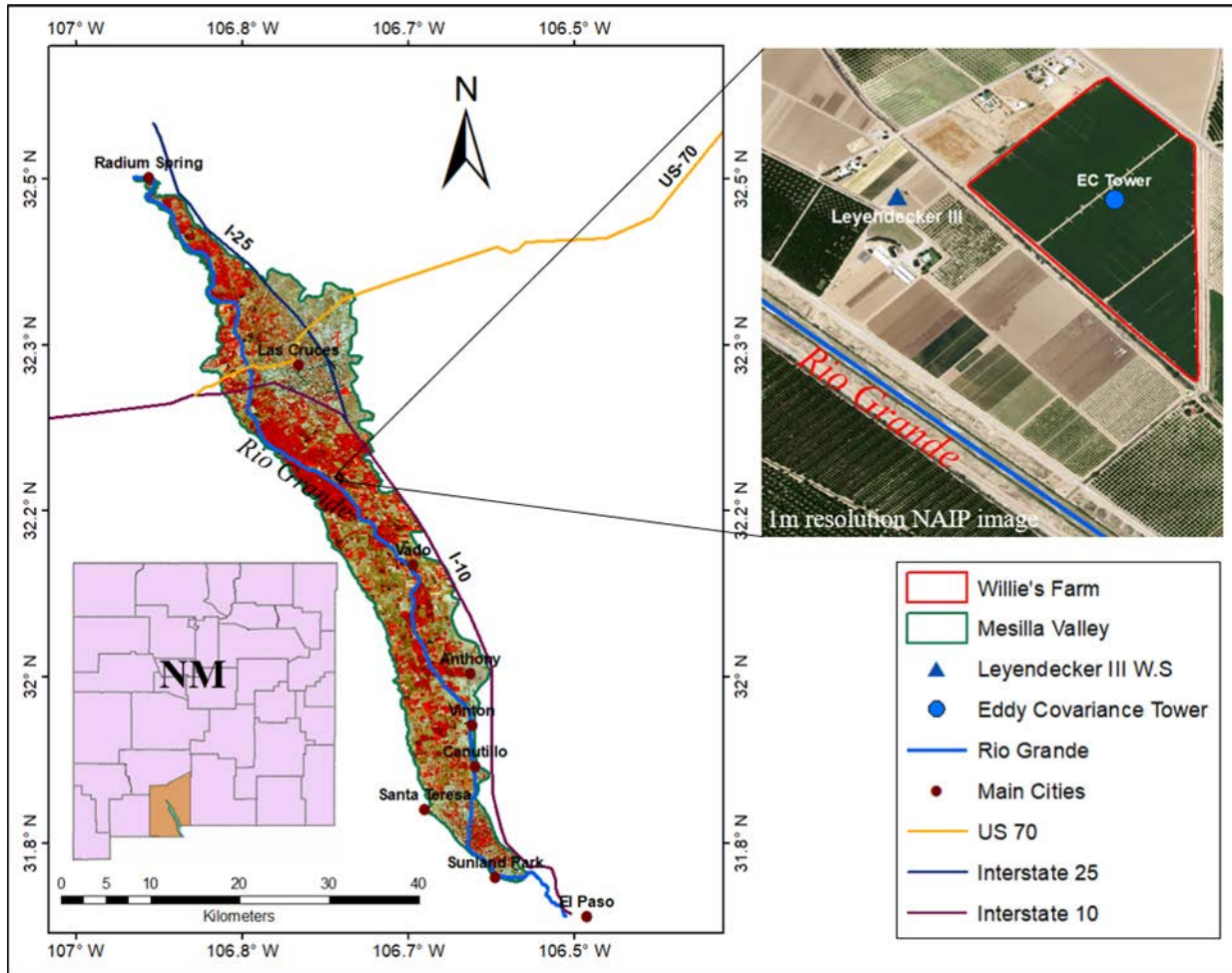
5. Increasing water availability
Focused recharge



Recharge in flood irrigated alfalfa fields in the Mesilla Valley, New Mexico, for 2017 was from 37% to 45%. (Boyko et al., 2018)

Deep percolation in flood irrigated pecan field in Mesilla Valley for 2020 was 12% of irrigation water applied and recharge in the drip irrigated field was 4% of total water applied.

Conservation



- Remote Sensing Coupled with Ground Level Measurements (Satellite-Based ET, Flux Measurements, Climate)
- Spatiotemporal Variability of Consumptive Use or ET – Field Scale and Regional Scale
- Fallow Farm Field – Hydrology (Infiltration, Evaporation Losses)
- Regional Water Budget – Accounting? Collaborative Effort

Leverage Dynamic Statewide Water Budget

Thriving economy – to provide water for all uses

– this model shows future scenarios for community water resources objectives

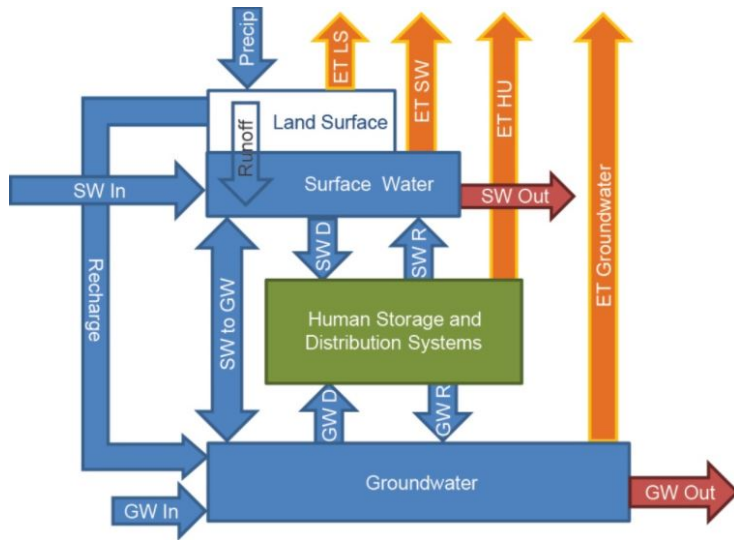


Diagram of the DSWB model

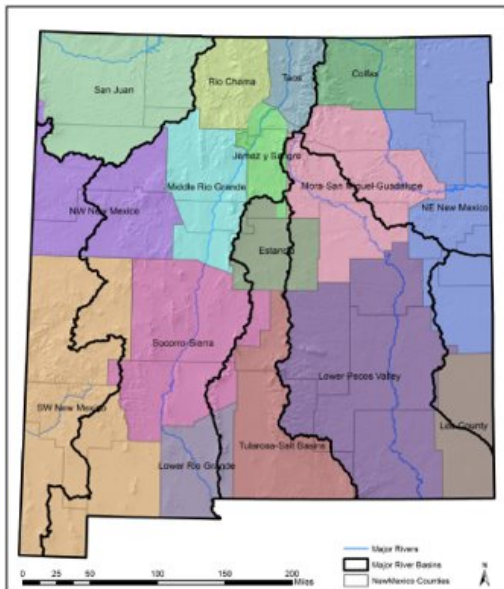
Includes flows into region and the effects on the water volumes (stocks)

Monthly timestep

Historical (1975–2020)

Future (2019–2099)

> 30 million data points



Spatial Scales

Counties (33)

Water Planning Regions (16)

Major river basins (7)

Statewide (1)

Future work: Coordinated flexible management approach to increase groundwater storage



THANK YOU!

