

# Proposed RWR Project Impacts to the Water Resources of the San Luis Valley

Heather Dutton, San Luis Valley Water Conservancy District

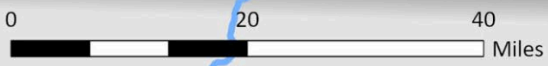
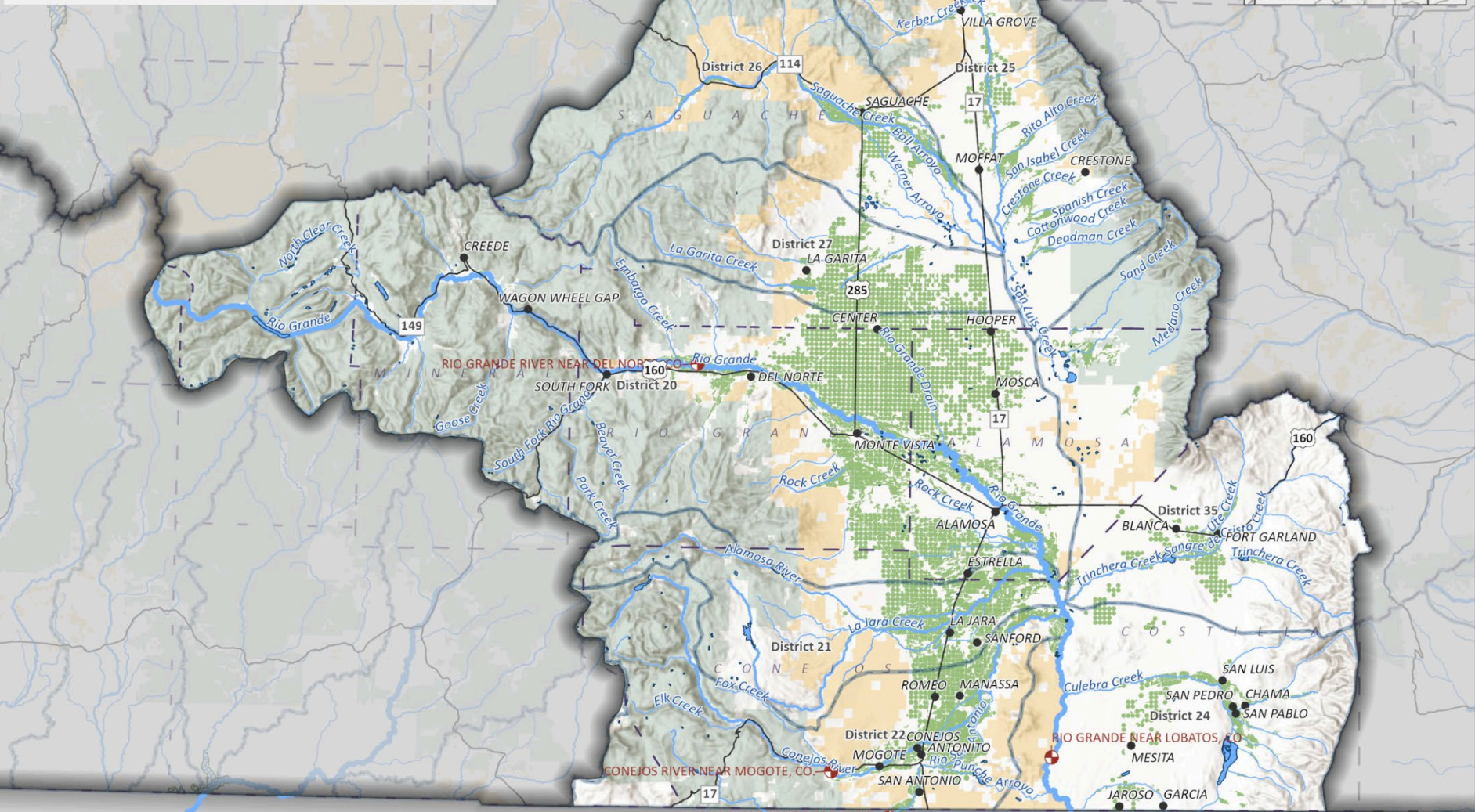
Clinton Phillips, Davis Engineering

Nathan Coombs, Conejos Water Conservancy District

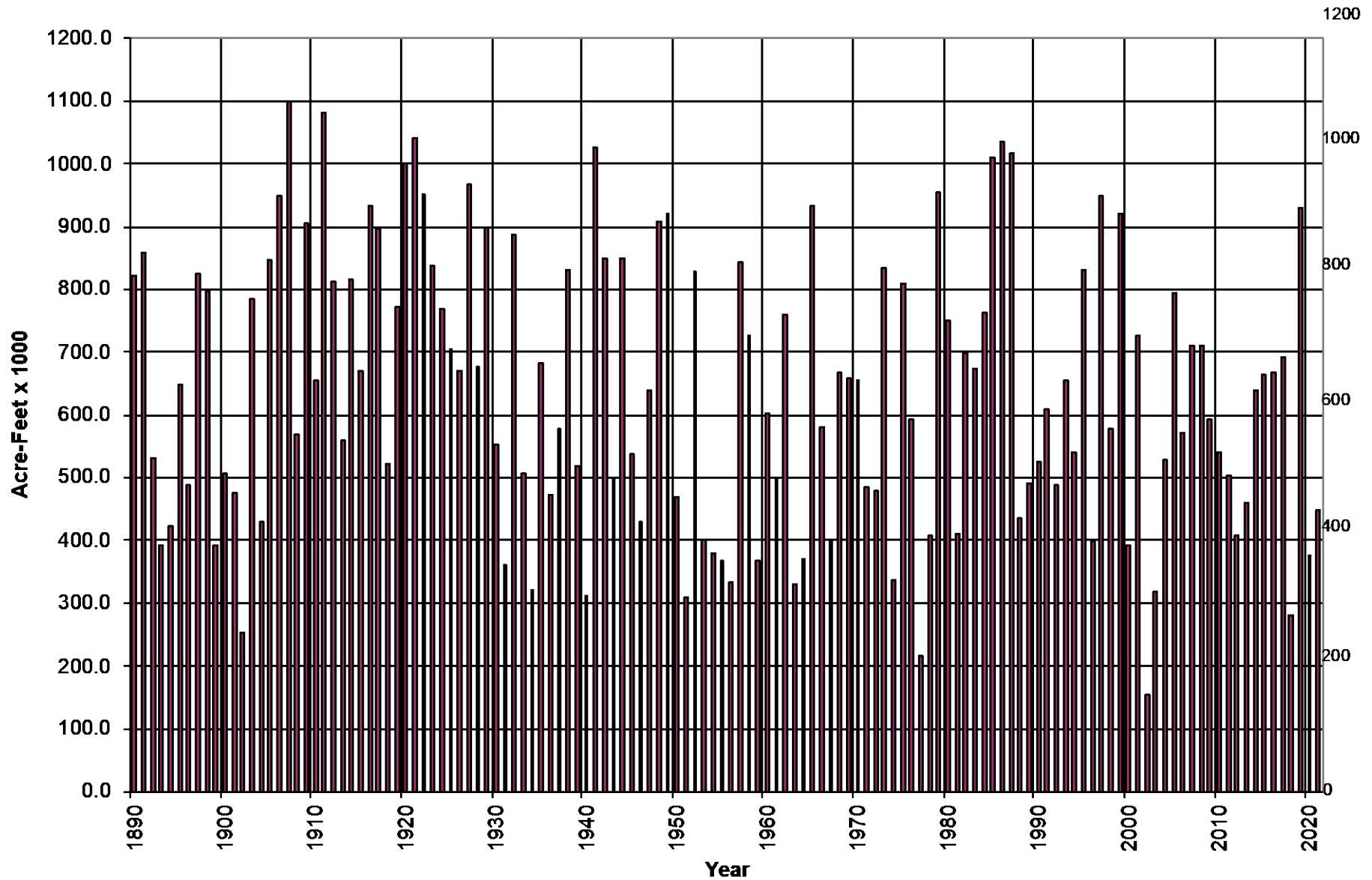
Emma Reesor, Rio Grande Headwaters Restoration Project

Cleave Simpson, Rio Grande Water Conservation District

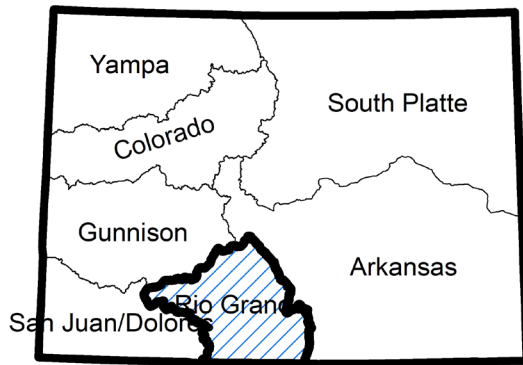
- Stream Gages
- Streams
- Lakes and Reservoirs
- Water Districts
- Communities
- Counties
- Highways
- Irrigated Area
- Bureau of Land Mgmt
- US Forest Service and Parks



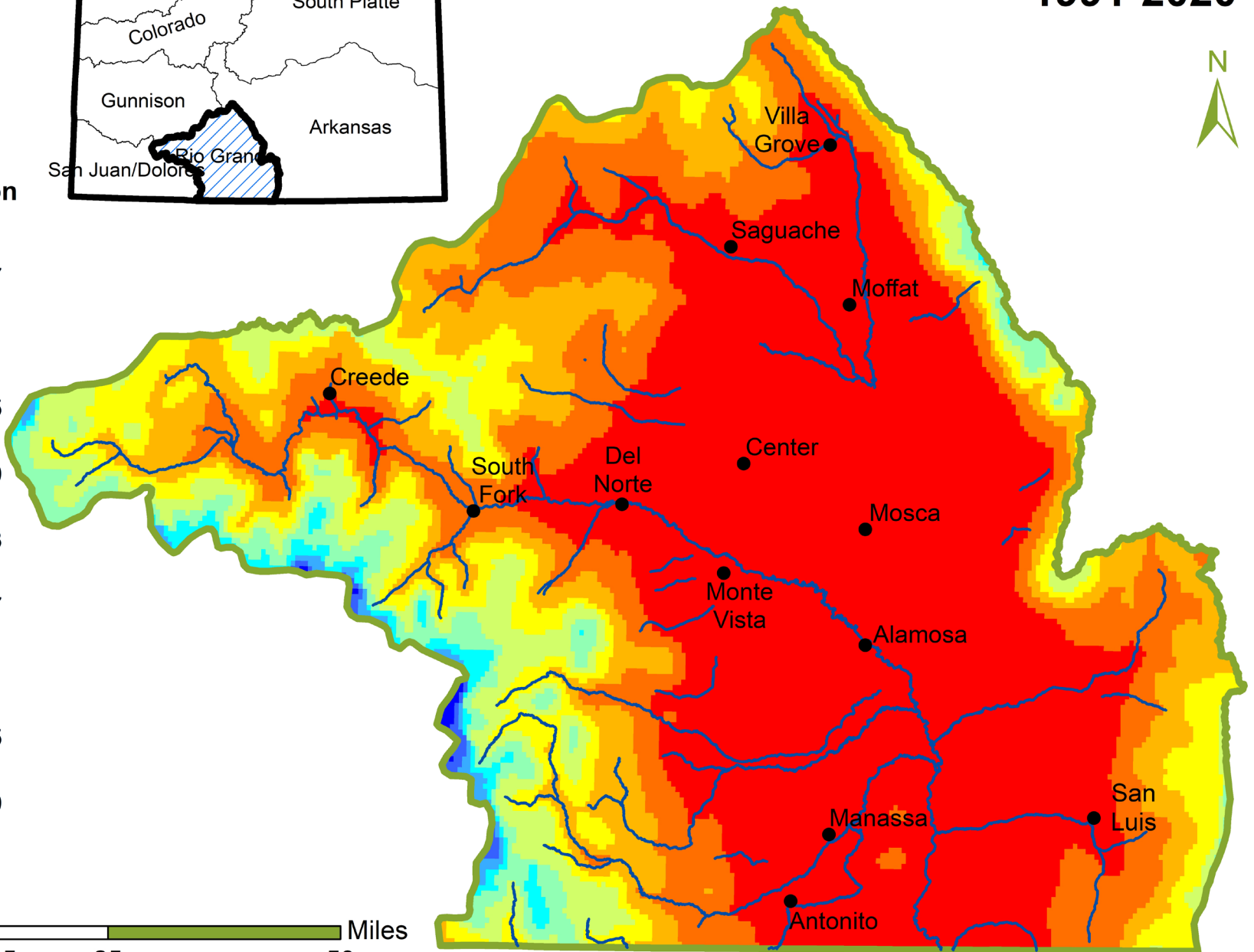
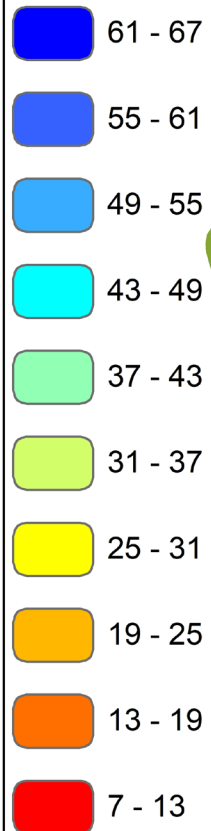
**Rio Grande River near Del Norte, CO  
Annual Calendar Year Flows (1890-2021)**



# Average Annual Precipitation 1991-2020

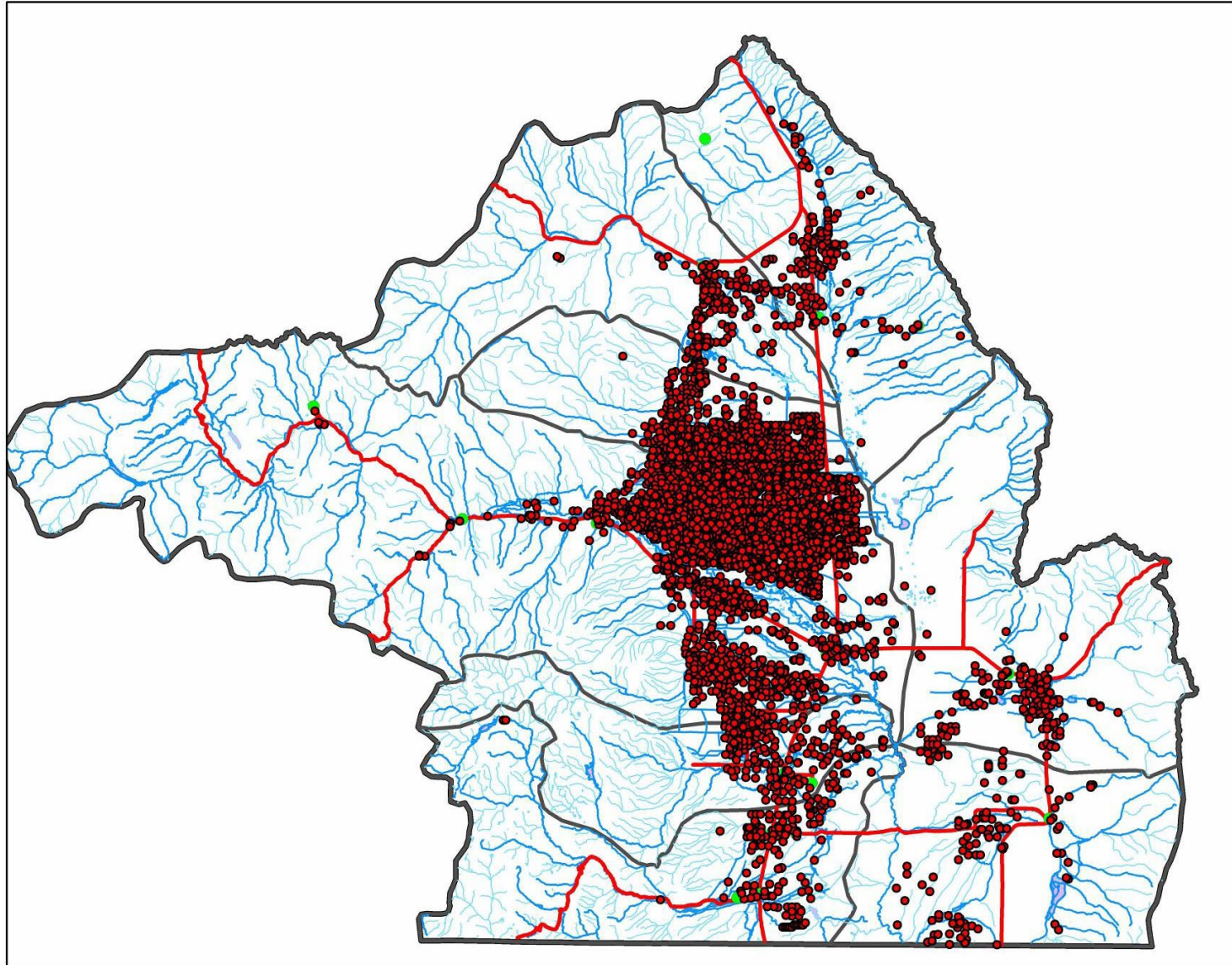


## Precipitation (inches)





# Wells in the San Luis Valley - Present Day



# Key Dates

- 1972: Moratorium on new wells in the confined aquifer and unconfined aquifer outside of the Closed Basin.
- 1981: Moratorium on new wells in the unconfined aquifer in the Closed Basin.
  - Ending ability to drill new wells in Division 3.
- 1998: HB 98-1011 directed State Engineer and CWCB to study relationship between surface streams and confined aquifer.
  - RGDSS
- 2004: Confined Aquifer Rules
- 2015: Rules Governing the Use of Groundwater in Division 3

*"The confined and unconfined aquifers are also overappropriated, and the current rates of withdrawal from these aquifers exceed their long-term rates of recharge, the result of which is a groundwater overdraft or groundwater mining of the entire aquifer system."*

Findings of Fact,  
Conclusions of Law,  
Judgement, and Decree  
2004CW24

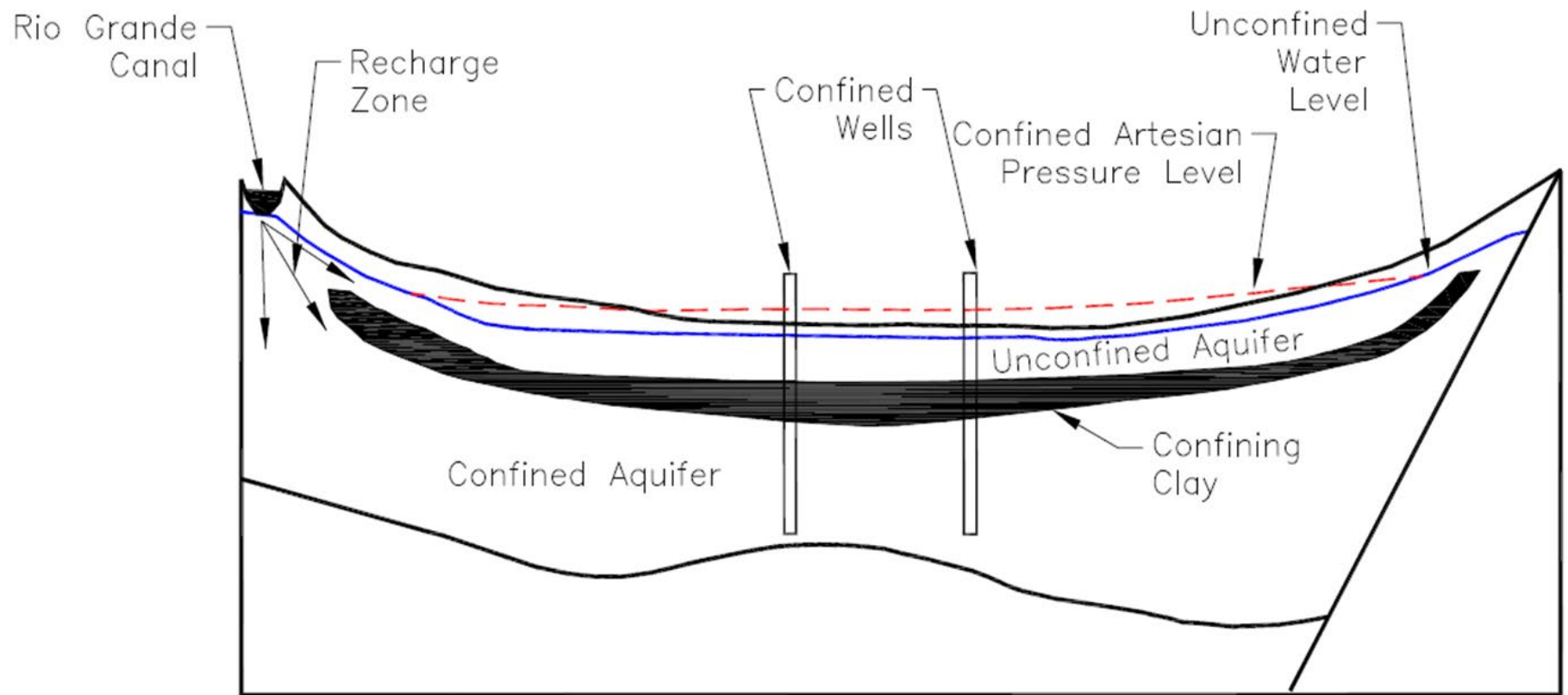


# A Changing Supply

- Warmer temperatures, less snowfall, fewer monsoons.
- Historic Average flow of Rio Grande at Del Norte (1890-2021): 639,000 AF
- Average flow of Rio Grande at Del Norte 2000-2021: 550,000 AF
  - Reduction of 89,000 AF per year; -15%



# San Luis Valley Aquifers



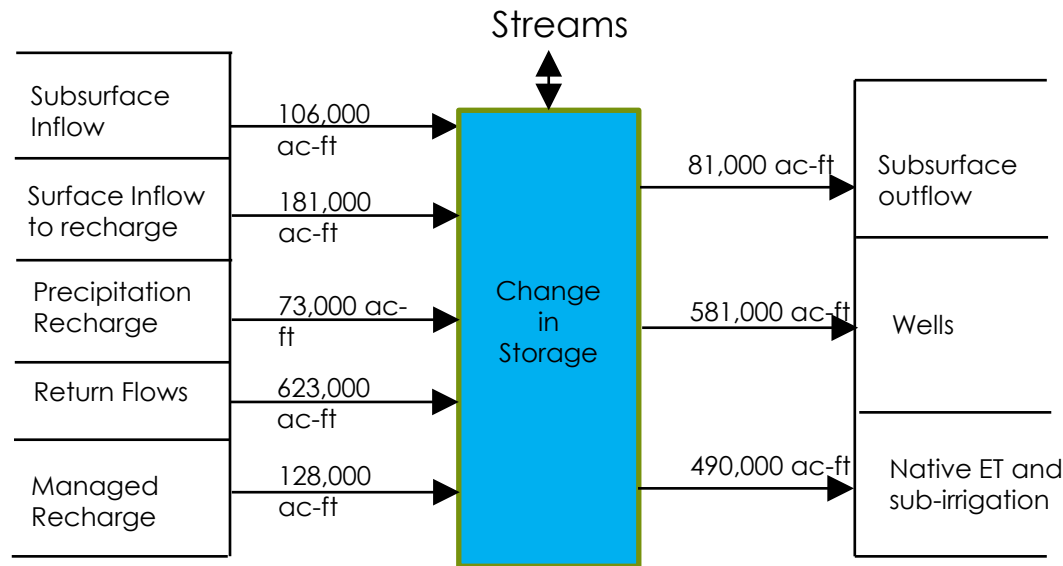


# Current Water Balance

Groundwater Modeled Results for 2011-2020

INFLOWS = 1,111,000 ac-ft

OUTFLOWS = 1,152,000 ac-ft



Decrease in storage of 41,000 ac-ft

- Subsurface Inflow – San Juan, Culebra, and alluvial subsurface flows

- Surface Inflow to recharge – Net loss of surface streams to the groundwater system.

- Precipitation Recharge – Fraction of Precipitation that becomes recharge (10% on irrigated lands, 3% on non-irrigated lands, and 28% at the Sand Dunes).

- Return Flows – Canal leakage & Deep percolation from groundwater withdrawals & flowing wells.

- Managed Recharge – Recharge under recharge decrees.

- Subsurface Outflow – Along the Stateline.

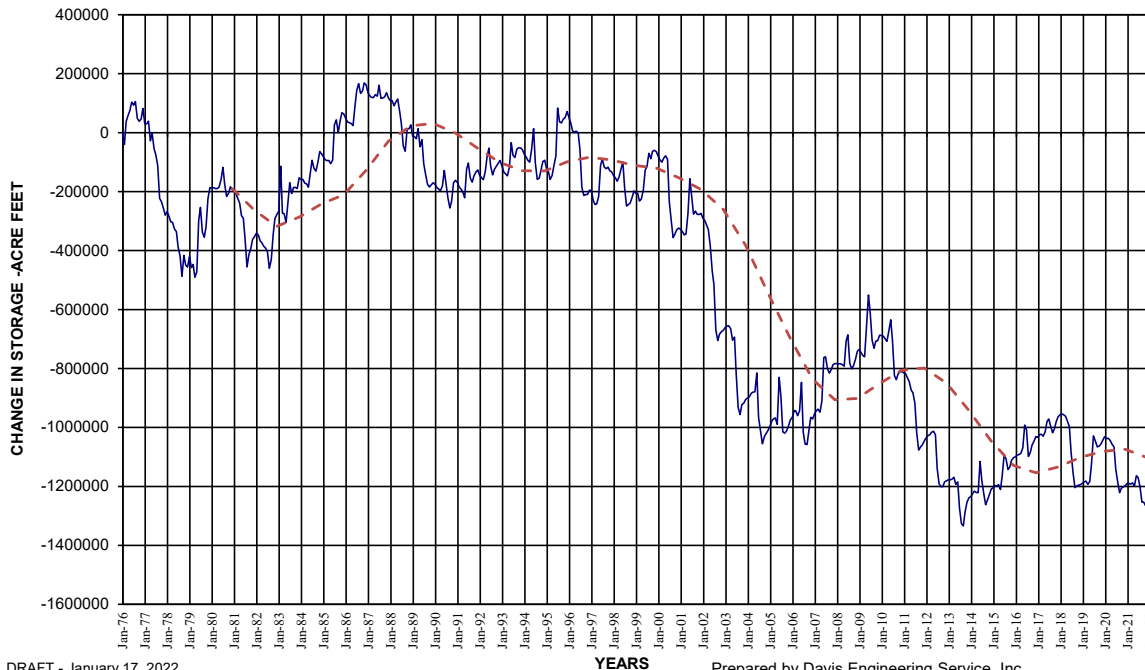
- Wells – Flowing, Municipal & Industrial (M&I) Wells, and Agricultural Wells.

- Native Evapotranspiration (ET) on non-irrigated lands. ET on irrigated lands is called sub-irrigation.

# Change in Aquifer Study: Unconfined

CHANGE IN UNCONFINED AQUIFER STORAGE  
WEST CENTRAL SAN LUIS VALLEY

— Monthly Change    - - 5 yr. running avg.



## Unconfined (Shallow) Aquifer Storage Study

- Study Period: 1976-Current
- 24 Unconfined Study Wells
  - Measured Monthly by RGWCD
- Since December 2000, the unconfined aquifer level has **declined 927,392 acre-feet.**

DRAFT - January 17, 2022  
Data through January 17, 2022

Prepared by Davis Engineering Service, Inc.  
For Rio Grande Water Conservation Dist.

# Change in Aquifer Study: Confined

Well Name	Time Span	2000 Measurement (Feet)	2021 Measurement (Feet)	Difference in Measurement (Feet)	Well Depth (Feet)	Page No.
<b>Model Layer 5</b>						
ALA 13	11/28/00-12/22/21	-10.00	-8.68	-1.32	2150.00	5
<b>Model Layer 4</b>						
CON 1	11/21/00-12/14/21	48.03	63.05	-15.02	608.00	1
RIO 1	11/27/00-12/6/21	23.80	43.17	-19.37	632.00	2
CON 2	11/21/00-12/14/21	-13.70	-11.80	-1.90	700.00	1
ALA 6	12/28/00-12/14/21	-12.40	-3.30	-9.10	750.00	8
SAG 1	11/30/00-12/20/21	18.50	28.21	-9.71	825.00	7
SAG 9	11/29/00-12/21/21	-11.00	-5.88	-5.12	900.00	9
ALA 12	11/27/00-12/14/21	-8.50	-1.86	-6.64	908.00	3
RIO 4	11/27/00-12/15/21	-8.00	1.05	-9.05	986.00	9
ALA 8	11/27/00-12/14/21	-19.60	-7.00	-12.60	1250.00	10
SAG 11	11/29/00-12/17/21	-33.00	-31.14	-1.86	1350.00	6
RIO 2	11/22/00-12/14/21	-4.40	2.71	-7.11	1500.00	3
SAG 2	11/30/00-12/22/21	-40.30	-39.91	-0.39	1987.00	10
ALA 4	11/20/00-12/27/21	-33.10	-31.41	-1.69	2062.00	2
ALA 10	11/22/00-12/16/21	-23.00	-14.11	-8.89	2084.00	4
SAG 10	11/29/00-12/21/21	-34.50	-29.97	-4.53	2087.00	11
SAG 4	11/30/00-12/22/21	-45.40	-42.62	-2.78	2301.00	11
Average				-7.24		
<b>Model Layer 3</b>						
SAG 17	11/28/00-12/17/21	-24.50	-24.02	-0.48	700.00	12
SAG 13	11/29/00-12/21/21	-14.80	-11.80	-3.00	830.00	12
ALA 11	12/29/00-12/23/21	-11.10	-8.34	-2.76	340.00	13
SAG 18	11/30/00-12/20/21	-4.10	No Measurement	-	382.00	13
ALA 2	11/28/00-12/16/21	-17.10	-7.46	-9.64	415.00	6
ALA 7	11/27/00-12/14/21	-12.40	-2.78	-9.62	490.00	14
ALA 14	11/20/00-12/27/21	-16.00	-14.50	-1.50	560.00	4
SAG 12	11/28/00-12/21/21	-5.90	-7.96	2.06	560.00	7
SAG 3	11/29/00-12/20/21	4.54	3.34	1.20	580.00	8
ALA 16	11/20/00-12/23/21	-29.00	-22.58	-6.42	593.00	14
ALA 15	12/29/00-12/27/21	-24.80	-21.79	-3.01	595.00	15
Average				-3.32		
<b>Model Layer 2</b>						
ALA 5	12/1/00-12/15/21	-0.86	-0.38	-0.48	118.00	5
SAG 6	11/30/00-12/20/21	7.73	15.32	-7.59	120.00	15
RIO 3	12/18/00-12/30/21	-0.88	No Measurement	-	199.00	16
Average				-4.04		
<b>Layer Not Specified</b>						
ALA 17	11/21/00-12/14/21	-2.60	2.66	-5.26	-	16
(-) Measurement values at feet above ground.						
(+) Measurement values at feet below ground.						

## Confined (Deep) Aquifer Monitoring Wells

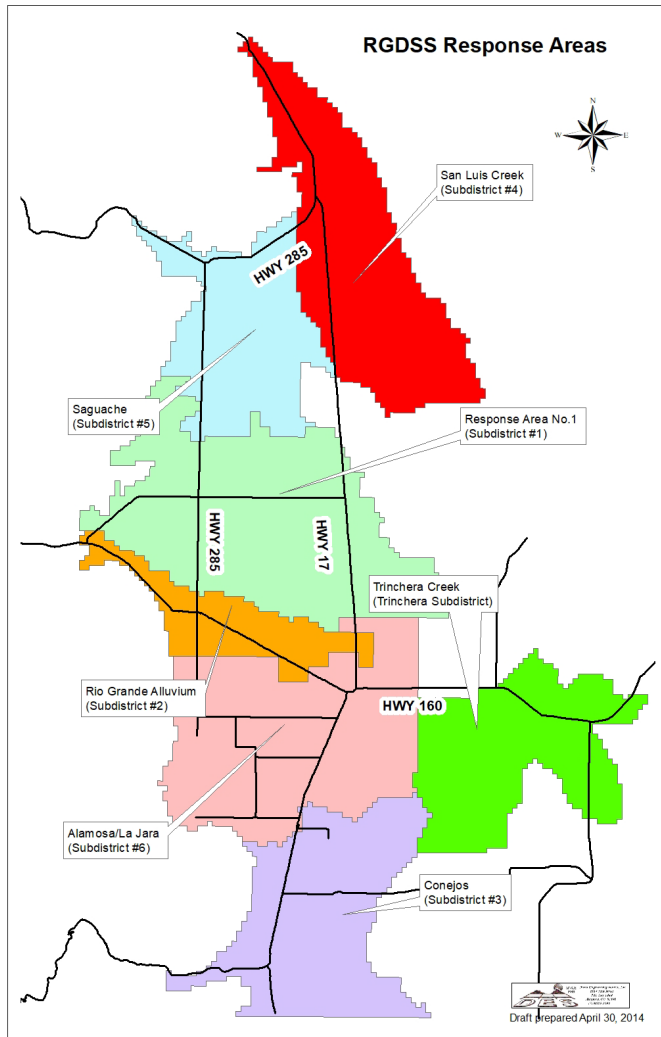
- 32 Confined Monitoring Wells throughout the San Luis Valley.
  - Measured monthly by RGWCD
- Water Level Difference Between 2000 & 2022
- Model Layer 5 – Avg. Decline 1.32 feet
- Model Layer 4 – Avg. Decline 7.24 feet
- Model Layer 3– Avg. Decline 3.34 feet
- Model Layer 2 – Avg. Decline 4.04 feet



# Rules Governing the Withdrawal of Groundwater in Water Division 3 (The Rio Grande Basin)

- Promulgated by the State Engineer in 2015
  - Challenged in Division 3 Water Court and upheld in 2019
  - Compliance Deadline: March 15, 2021
- The 2015 Rules regarding Division 3 and data confirm there is **no available water in the Rio Grande Basin.**
- The rules require well owners to **replace their depletions to streams** and take action to **recover aquifers to sustainable levels.**
- Options for well owners:
  - Participate in an existing augmentation plan
  - Create an augmentation plan
  - Join a groundwater management subdistrict
    - Subdistricts are the most widely used mechanism.

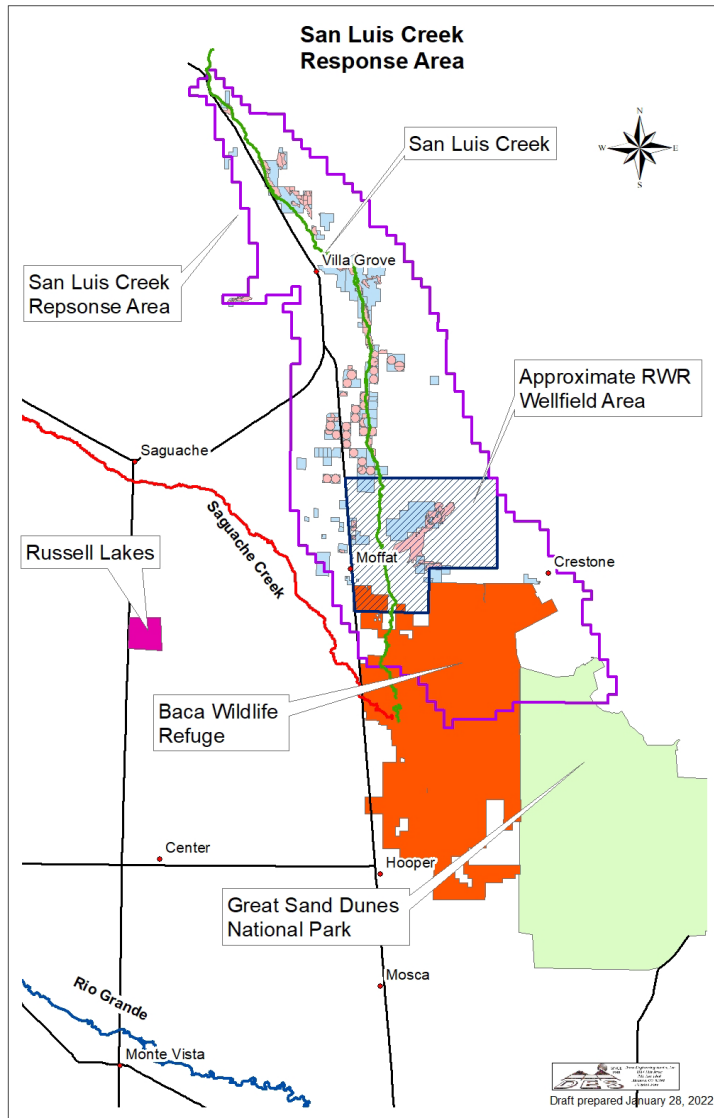
# Groundwater Management Subdistricts



- Stream impacts calculated using RGDSS model.
- Divided into response areas based on distinct hydrology.
- Groundwater users across the San Luis Valley have formed 7 subdistricts.
  - Unconfined Aquifer Subdistricts
    - Subdistrict #1: Closed Basin
    - Subdistrict #2: Rio Grande Alluvial
    - Trincher Subdistrict
  - Confined Aquifer Subdistricts
    - Subdistrict #3: Conejos
    - Subdistrict #4: San Luis Creek
    - Subdistrict #5: Saguache
    - Subdistrict #6: Alamosa/La Jara
- The model analyzes groups of wells, not individual wells to determine degree in which well pumping impacts streams.

Response Area	2020 Groundwater Withdrawals (ac-ft)
San Luis Creek	10,413
Saguache	41,823
Subdistrict #1	244,520
Rio Grande Alluvial	±12,800
Alamosa La Jara	106,051
Conejos	35,245

# RWR's Potential Impact



- Confined Aquifer New Use Rules: require 1 to 1 dry up.
- RWR's proposed project is located in the San Luis Creek Response Area.
  - The San Luis Creek Response Area has approximately 20,000 irrigated acres (both groundwater & surface water irrigation).
  - The 5-year average groundwater withdrawal of this response area between 2016 and 2020 was 11,487 acre-feet.
  - Currently the San Luis Creek Response Area is considered **Unsustainable** according to 2015 groundwater rules.
- RWR claims "no impact"
  - It is unclear how many total acres RWR plans to dry up.
  - How will RWR repay stream impacts caused by new wellfield?
  - How will they deal with sustainability?
  - What effect will moving 22,000 ac-ft of pumping to the RWR wellfield area have on surrounding area?
  - RWR has not provided enough information to determine that this project will have "no impact" on the surrounding areas.



# On the Ground Perspective



- Background: 5<sup>th</sup> Generation farmer, Manager CWCD, School Board member, President Manassa Land and Irrigation, Vice Chair Subdistrict #3, Chair of Rio Grande Basin Roundtable.
- Water Supply: 1 drain ditch, 2 rivers, 3 confined aquifer wells, and daily prayer for snowpack!
- Water Short System: we KNOW there is not any extra water.
  - If there was water we would have gone after it a LONG TIME AGO!
- SB04-222: Driven by San Luis Valley Community
  - To become sustainable.
  - *\*Didn't want our deep wells injuring our neighbor's domestic wells that are also in the CONFINED AQUIFER, nor our river supplies and systems.*

# We Are Facing Hard Choices



- RGDSS (Model)
  - Started in 1998; updated constantly for 24 years
- *Do you really believe we missed some “hidden” source of water that is so magical that it is not connected to any other water in the valley?*
- Water Users are working together to reduce use and be sustainable:
  - Reduced pumping
  - Fallowing
  - Improved Efficiency
  - Trying New Crops
- *We understand our future so well that are all “taking food off our own tables” to ensure our neighbors can have a future in the Valley.*
- If RWR can acquire water from someone who already owns it in the SLV, their change case will require “shared scarcity.”
- Sustainability REQUIRES us to cut back in order to recover levels, RWR wells will NOT be exempt. Therefore, the supply they propose to acquire can be neither absolute nor guaranteed.



# Water is Connected

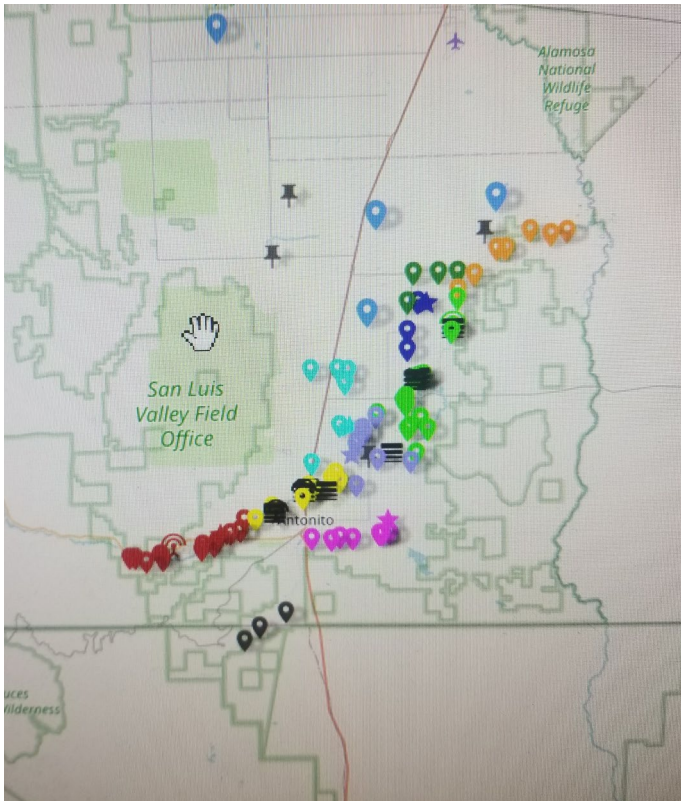
- It isn't just that we have differing views; we have different interests.
  - The San Luis Valley is trying to survive - RWR wants to make money.
  - The RWR proposal isn't new, it isn't different, and it isn't truthful.
- *My most southern farm ground is only 54 miles away from RWR's proposed well field and draws its water from the **SAME** aquifer.*
- *My wells impact every reach of the Rio Grande, Alamosa River, and Conejos River system.*
- Any additional water pumped from confined aquifer will exacerbate our problems.
- Groundwater Users Include: ALL Towns, rural schools, wildlife refuges, and the countless domestic wells that supply rural houses.





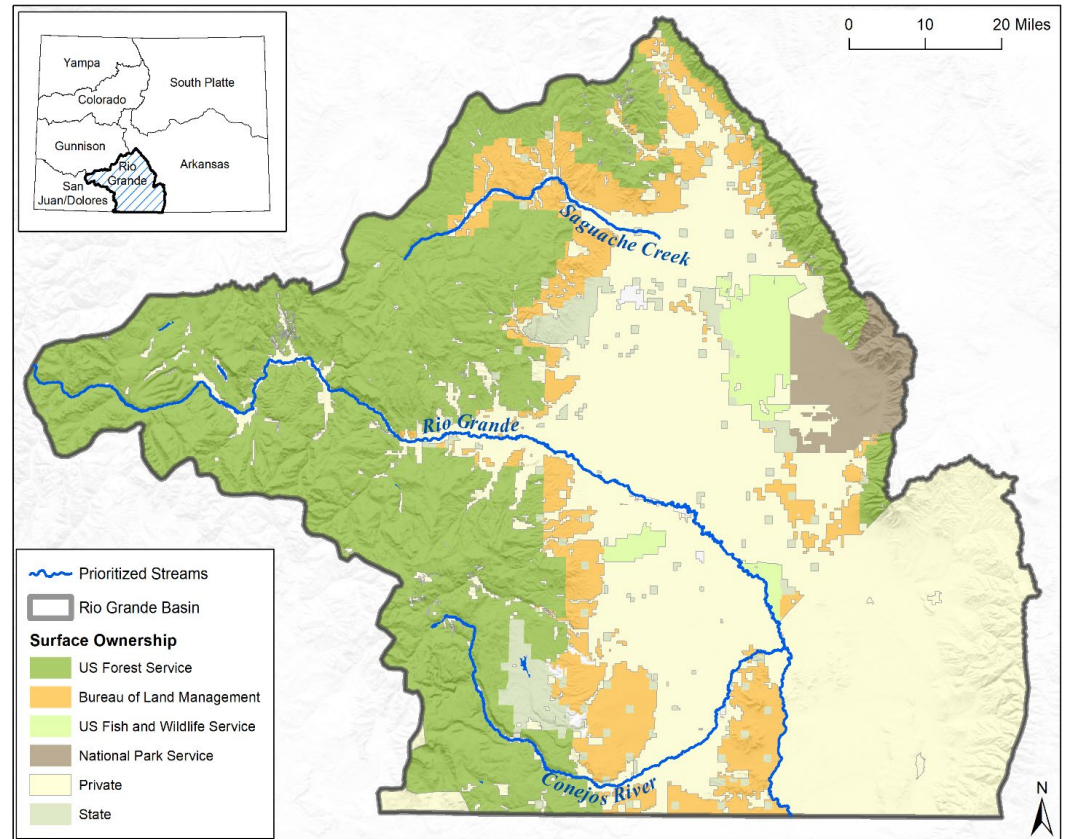
# Proactive and Data Driven

- Aquifer Monitoring
  - Conejos Water Users and CWCD installed 13 NEW confined aquifer monitoring sites.
- Stream Measurement
  - CWCD installed 72 new river diversion monitoring sites and 12 new automatic diversion structures
- Streamflow Forecasting
  - 5 new snowpack monitoring stations
  - Cooperated with SLVWCD, RGWCD, CDOT, Valley Counties, and irrigation companies to permanently install new Weather RADAR in Alamosa.
- Why Invest in Data ?
  - *Because we are NOT stupid!!*
  - We are adding to our understanding of our water supplies, confined and unconfined aquifers, and recharge.
- We continue to seek solutions and form partnerships.



# Rio Grande Headwaters Restoration Project

- Formed by farmers and ranchers to improve the health of the Rio Grande
- River health and aquifer health is deeply connected
- Working on rivers and streams across the San Luis Valley



# RGHRP Projects

- Work with diverse stakeholders to improve the river for all users:
  - Agriculture
  - Towns
  - Fish & Wildlife
  - Recreation
- Projects improve:
  - Diversion efficiencies and water conveyance
  - Access to water on farms, aquifer recharge
  - Water quality
  - Fish and wildlife habitat
  - Community connection





# Community Based Solutions



- The SLV has a long history of working together towards local solutions.
- We face many challenges, but are committed balancing our water demands.
- Protecting our rivers and aquifers is critical to our future as a community.





# No Win-Win

- We have provided a comprehensive set of facts.
- There is no water available.
- The RWR proposal isn't a project; it is a poorly defined idea.
- More questions than answers.
- There is no version of RWR's proposal that is a "win-win" for the San Luis Valley.





# Questions?

