

A scenic view of a river at sunset. The sky is filled with vibrant orange, red, and purple clouds. In the background, a modern building with a distinctive architectural design is visible. The river in the foreground reflects the colorful sky. The overall atmosphere is peaceful and natural.

Merced Irrigation-Urban Groundwater Sustainability Agency

Stakeholder Guidance Committee Meeting #1

Today's Agenda

1:00-3:00 pm

- Welcome / Introductions
- Project Background
- Water Supply Evaluation
- Break
- Groundwater Management Examples
- Wrap Up

3:00-5:00 pm

- Optional discussion time with the project team

Sustainable Groundwater Management Act

1

Form
Agencies:
MIUGSA
formed in 2017

2

Develop Plans: MIUGSA developed a joint groundwater sustainability plan (GSP) with the Merced Subbasin GSA and the Turner Island GSA (submitted to DWR in 2020 for review, pending approval by January 2022)

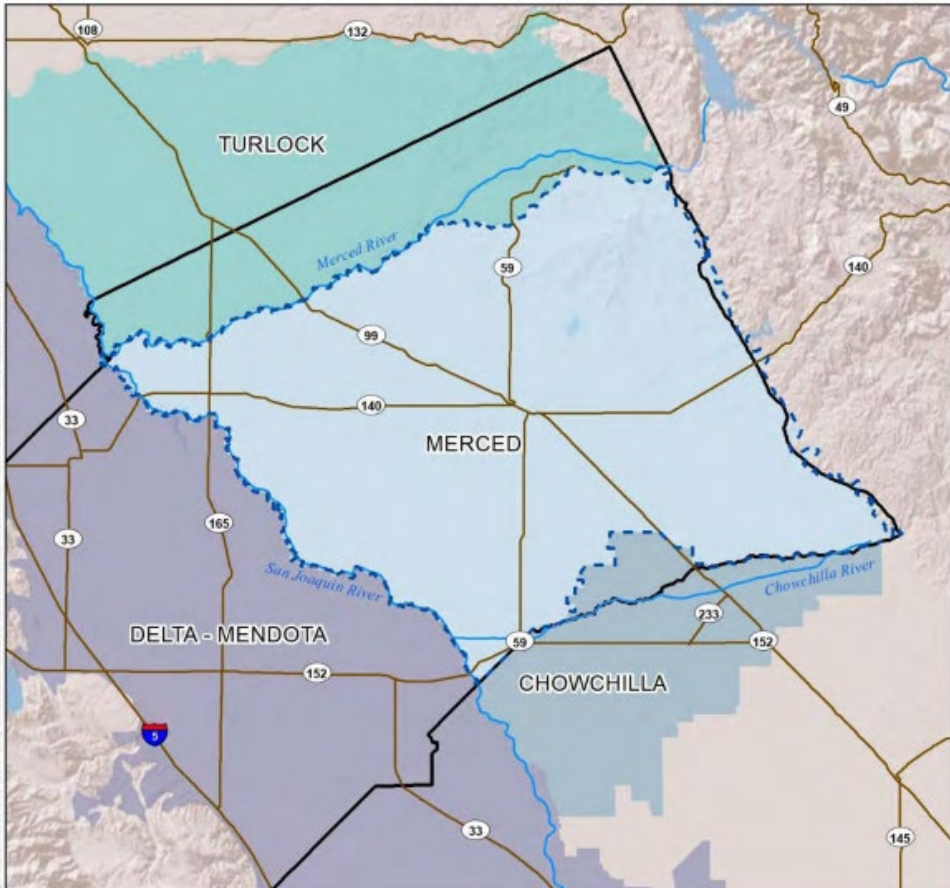
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Implement
Plans:
Purpose of this
meeting

4

Achieve
Sustainability:
By 2040

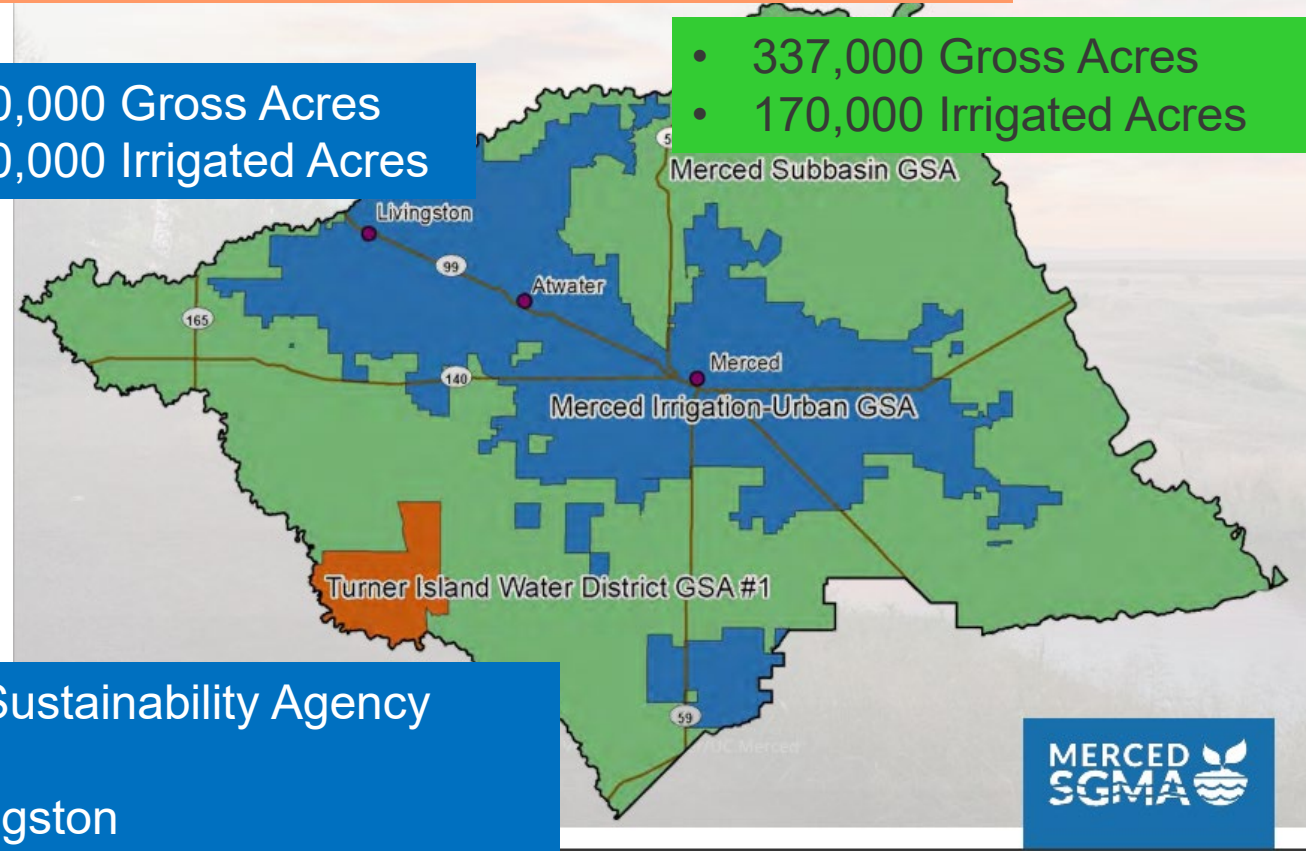
Merced Groundwater Basin – Local Management



- One Groundwater Sustainability Plan submitted for Merced Groundwater Basin
- To be implemented by three Groundwater Sustainability Agencies

- 160,000 Gross Acres
- 130,000 Irrigated Acres

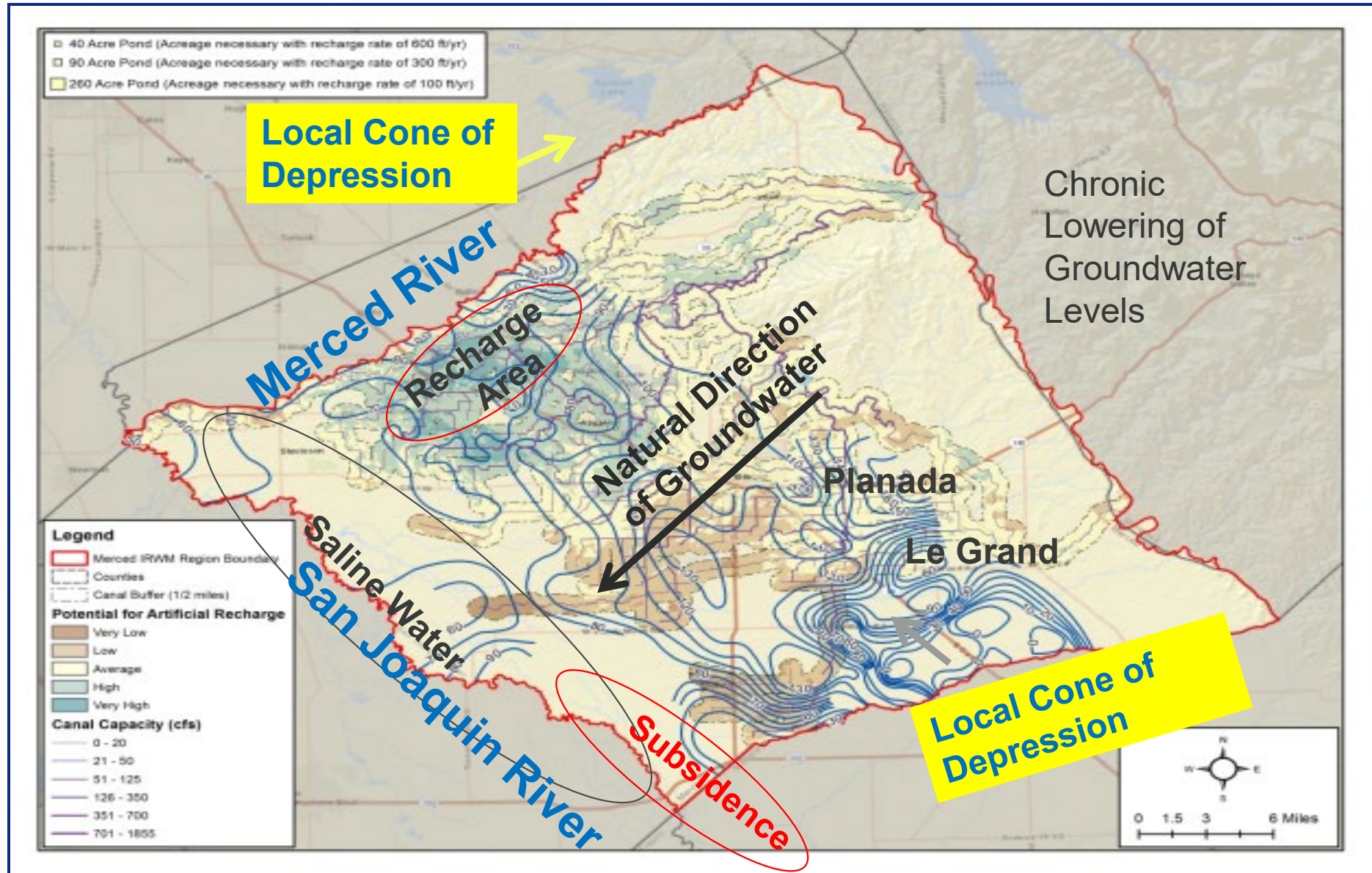
- 337,000 Gross Acres
- 170,000 Irrigated Acres



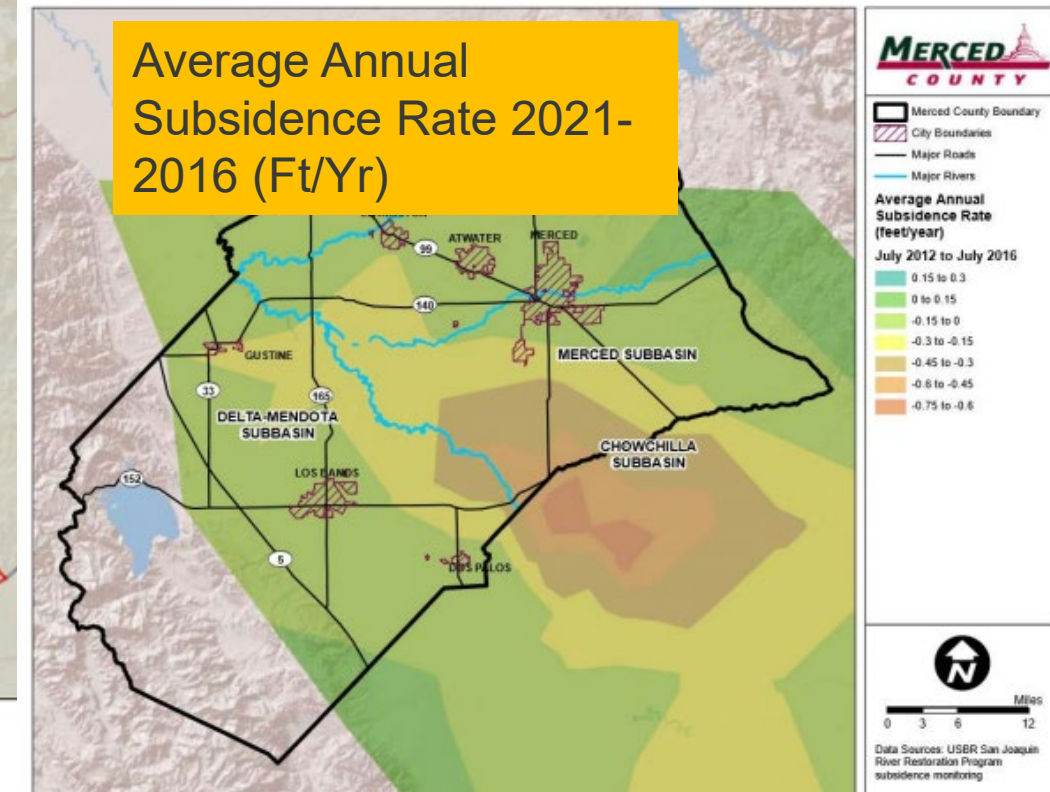
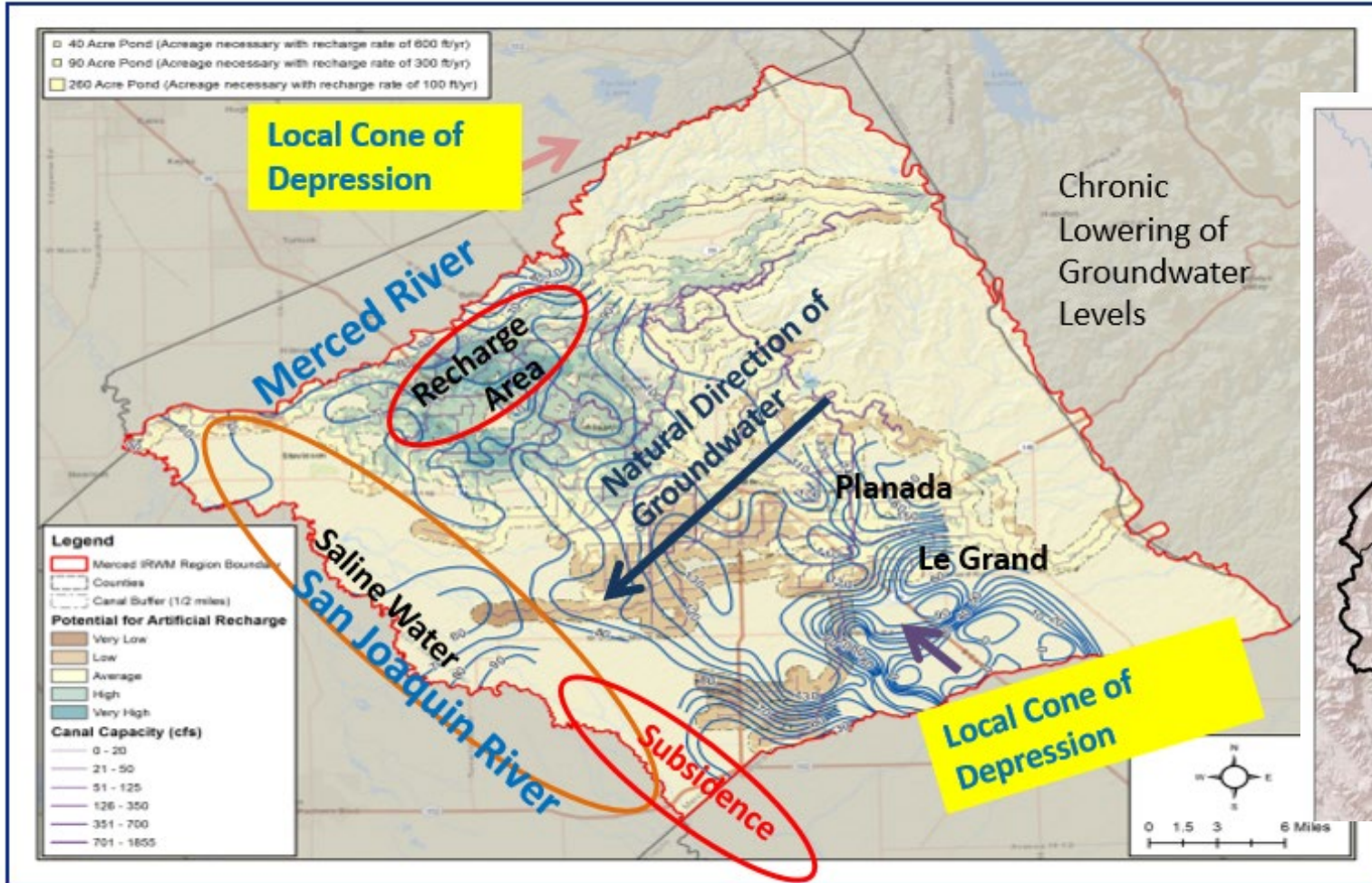
Merced Irrigation-Urban Groundwater Sustainability Agency (MIUGSA)
Cities of Merced, Atwater and Livingston
Community Services Districts of Planada and LE Grand,
Winton Water and Sanitary District
Merced Irrigation District



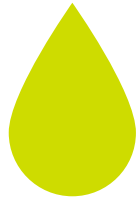
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Major Challenges Facing Implementation and Compliance



Development of Principle Guidelines to Implement GSP within Merced Irrigation-Urban GSA



Water Supply Evaluation

Ongoing, much to share today.



Public Engagement

Four SGC meetings starting today



Recommendations Report

Planned for March/April 2022

Olsson Project Team



Jim Schneider, PhD



Stacey Roach



Brian Dunnigan, PE



Mallory Morton, PE



Haley Engstrom

An aerial photograph showing a large concrete dam in the foreground, with a reservoir of greenish water below it. A river flows through a dry, hilly landscape with sparse vegetation and dirt roads. The text "Water Supply Evaluation" is overlaid in large white letters across the center of the image.

Water Supply Evaluation

Urban Water Use vs. Agricultural Water Use

- GSP includes goals for urban water use reductions
- Will be exploring those in future meetings, but concentrating on agricultural water use today
 - Agricultural water use is much larger than urban water use

Merced Sub-basin Water Supplies



Precipitation: Limited and variable



Surface Water: MID

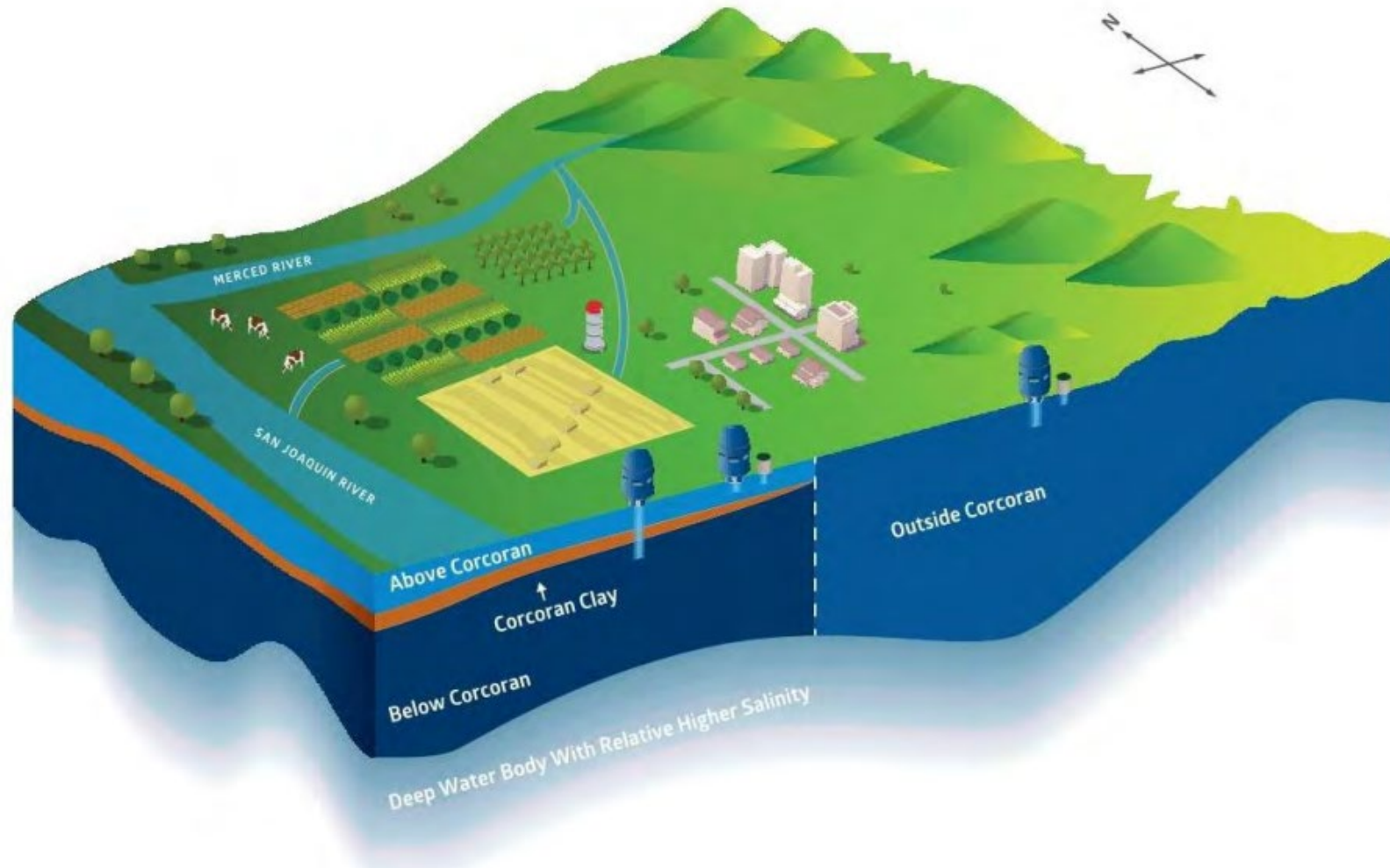


Native Groundwater: Naturally occurring

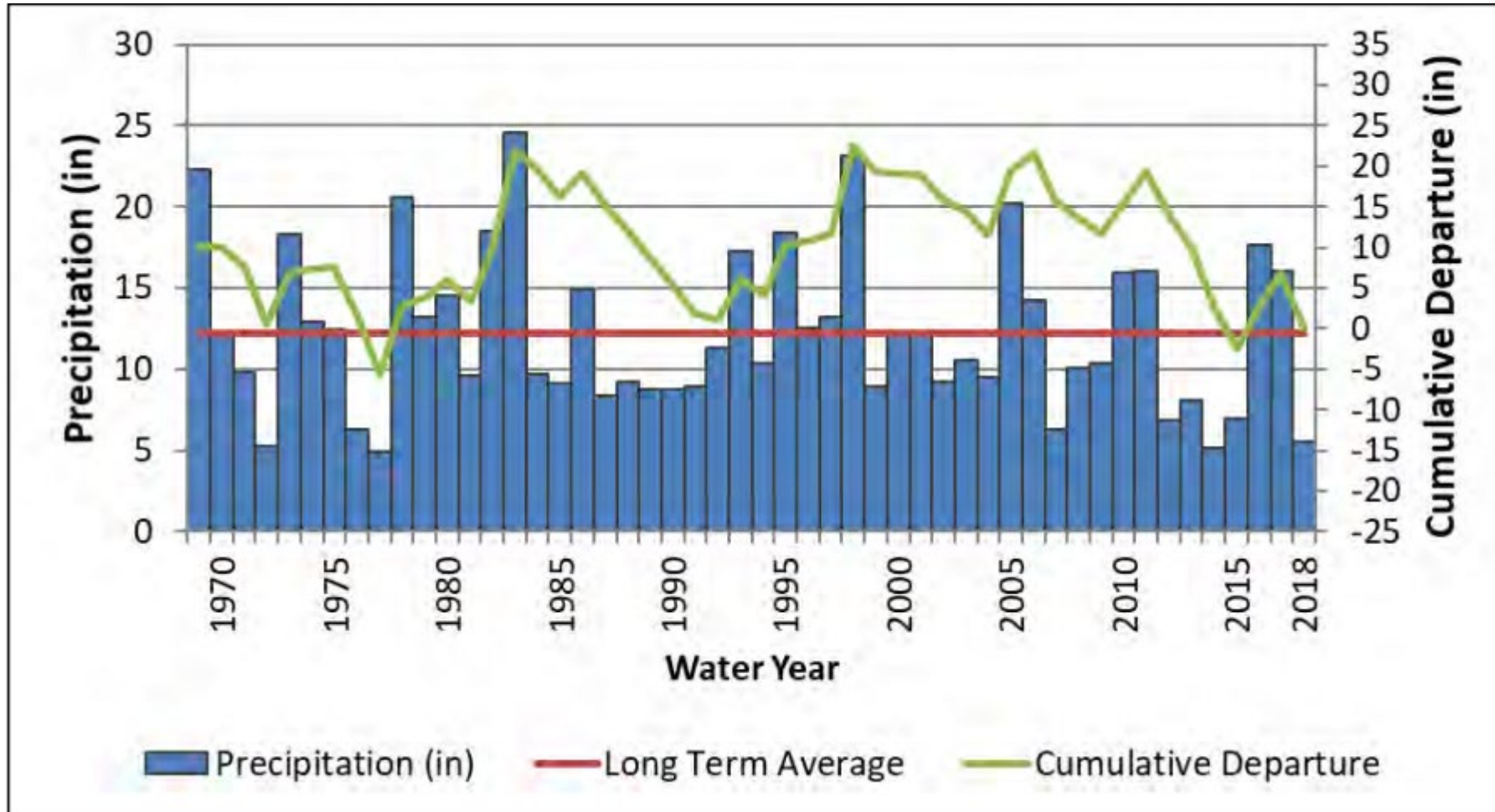


Developed Supply: Seepage from imported surface water (canals and deep percolation)

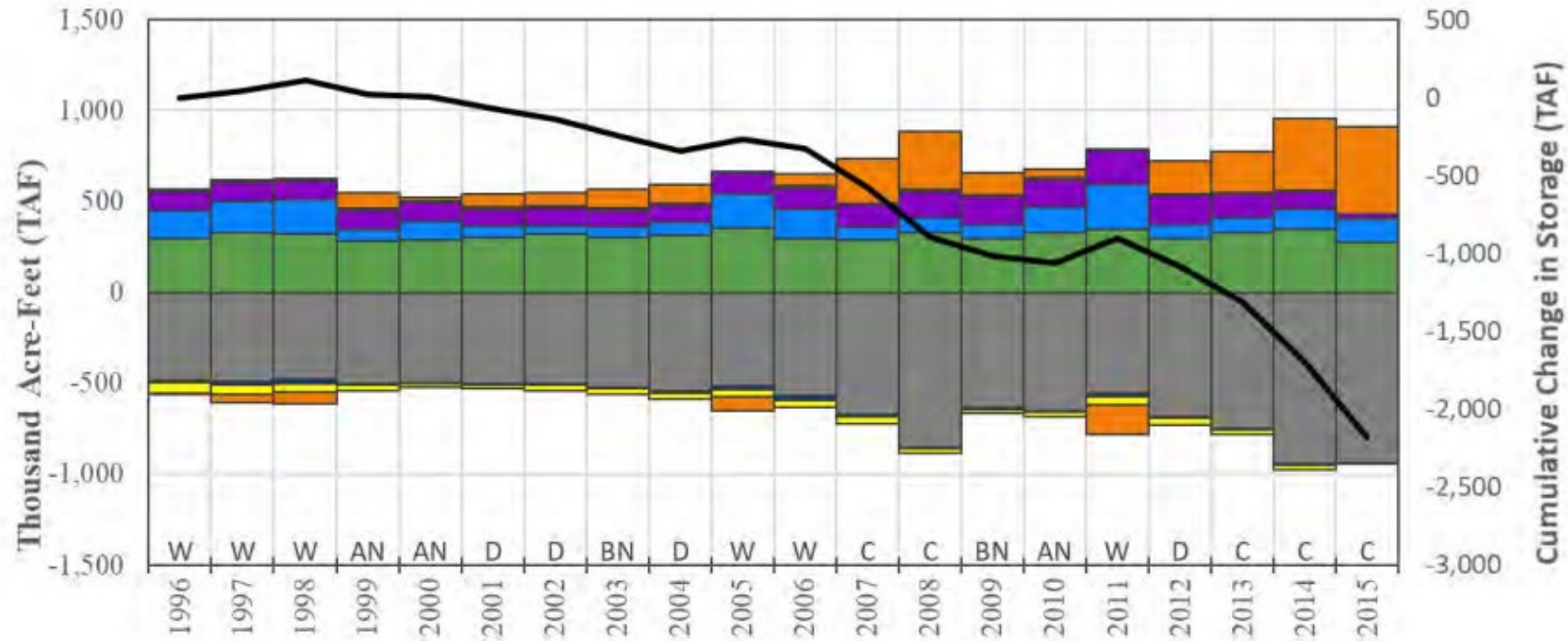
Conceptual model of hydrologic setting



Precipitation Trends



Groundwater Budget



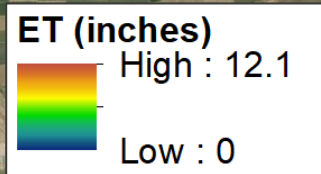
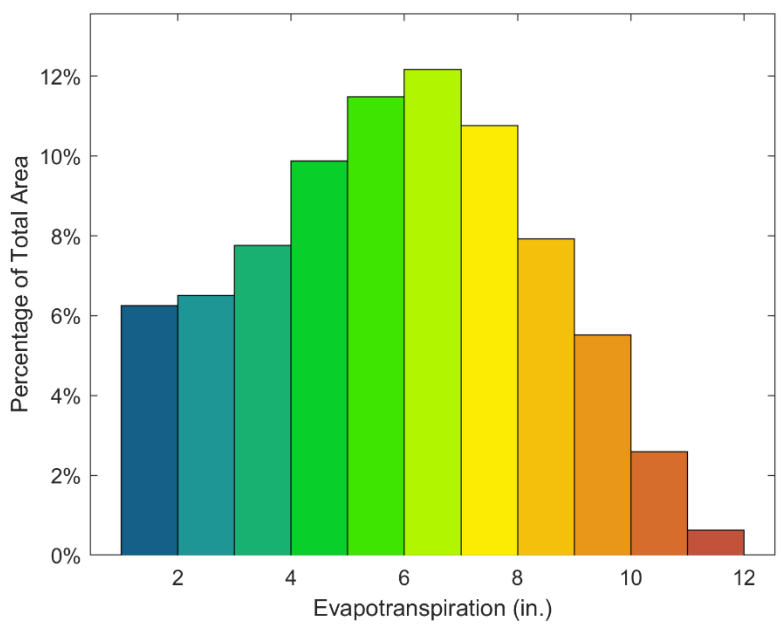
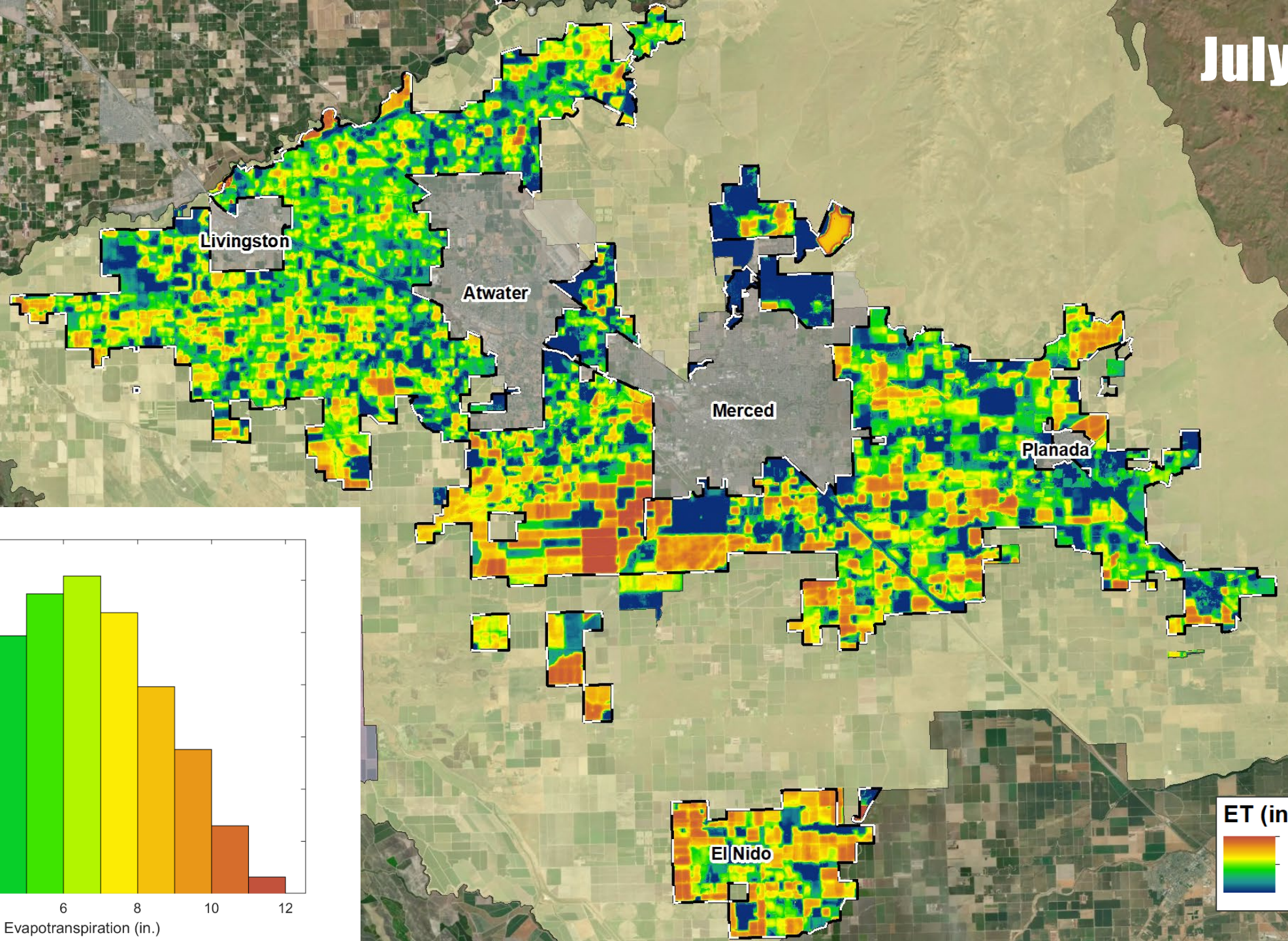
- Groundwater Pumping (-)
- Stream Seepage (+)
- Outflow to Root Zone (-)
- Outflow to Adjacent Area (-)

Water Year

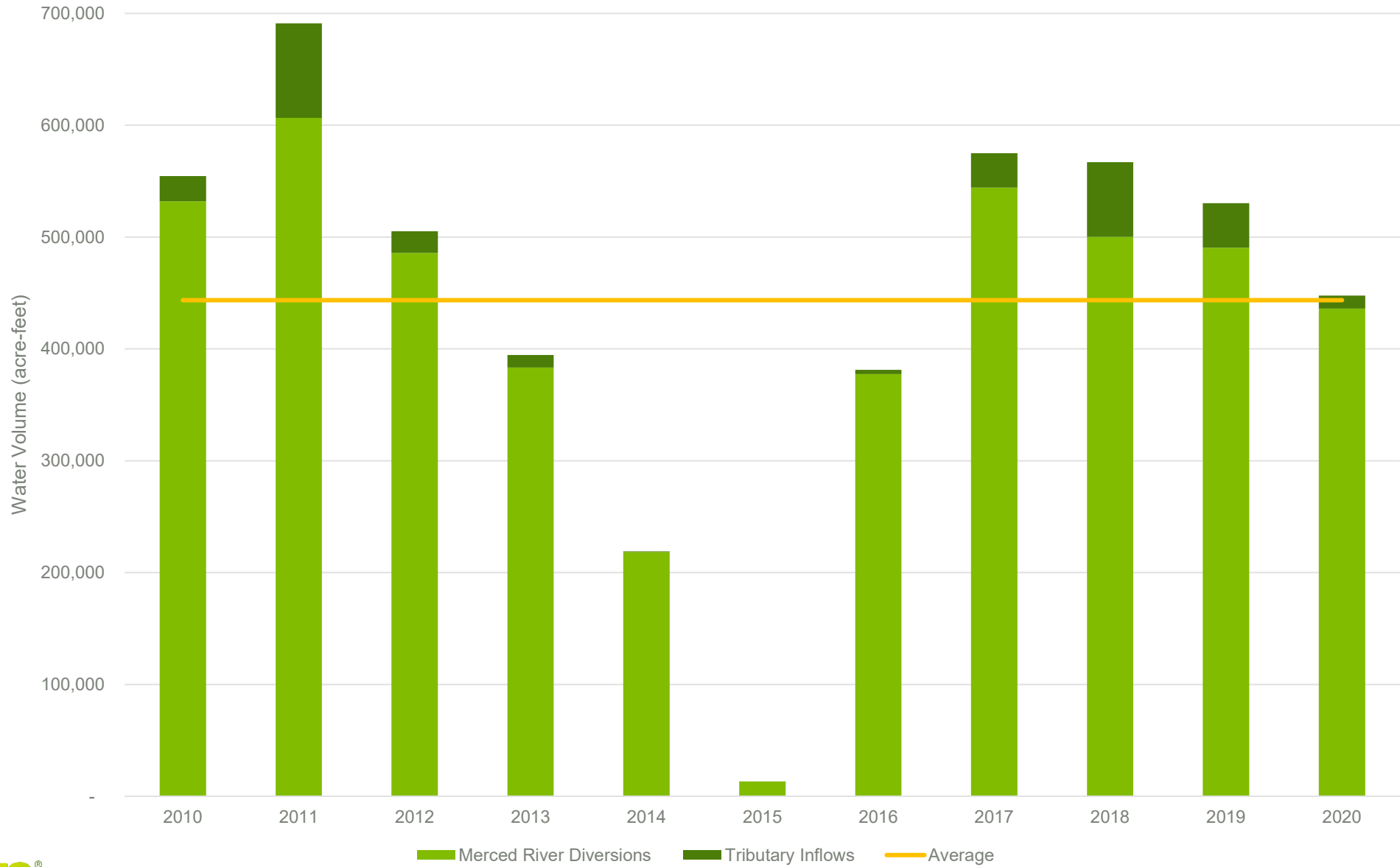
- Deep Percolation (+)
- Canal Recharge (+)
- Inflow from Foothills (+)
- Change in Storage

X-Axis Abbreviation	Description
W	Wet year type
AN	Above normal year type
BN	Below normal year type
D	Dry year type
C	Critical year type

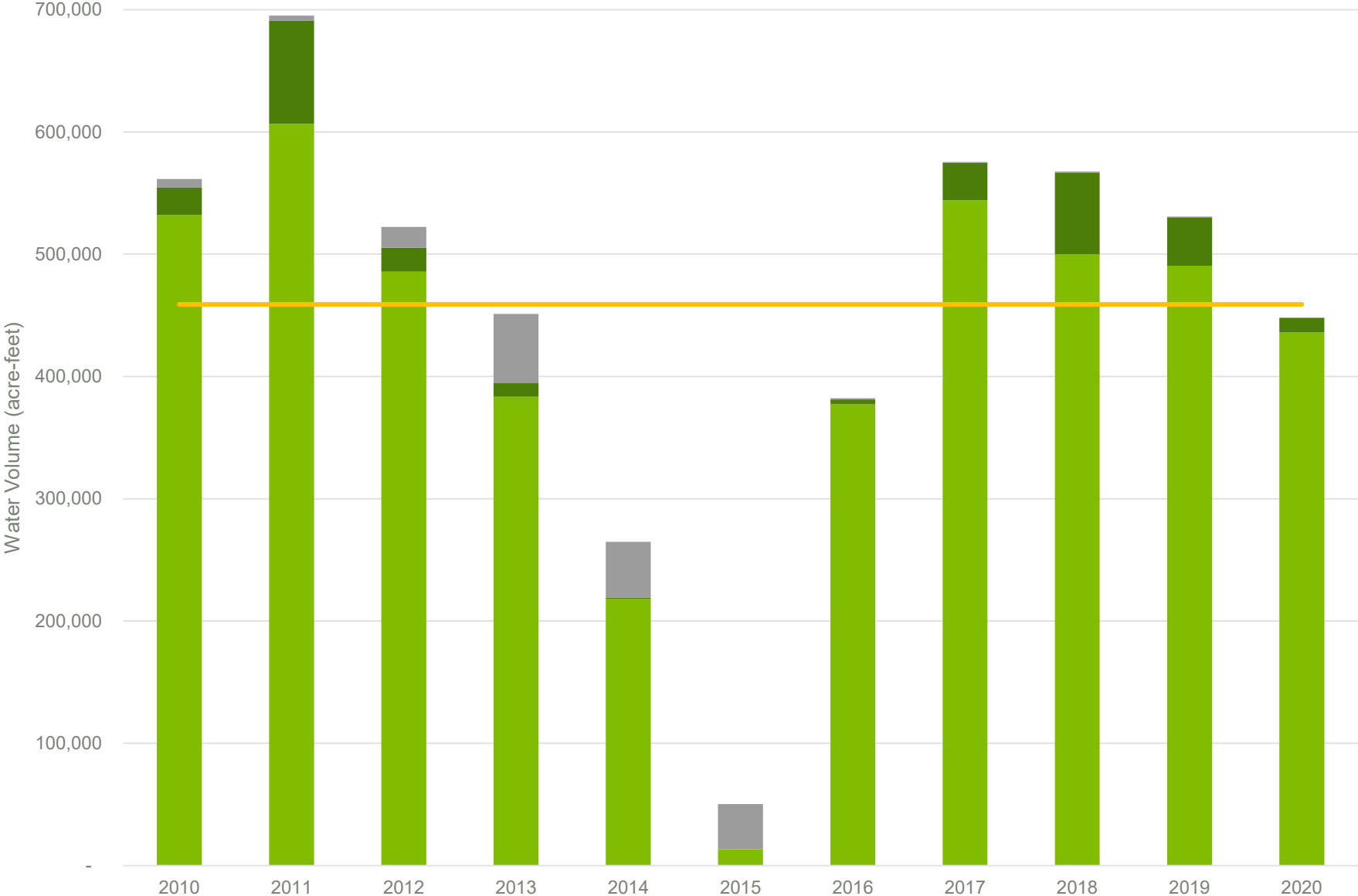
July 2013



MID Surface Water Supplies

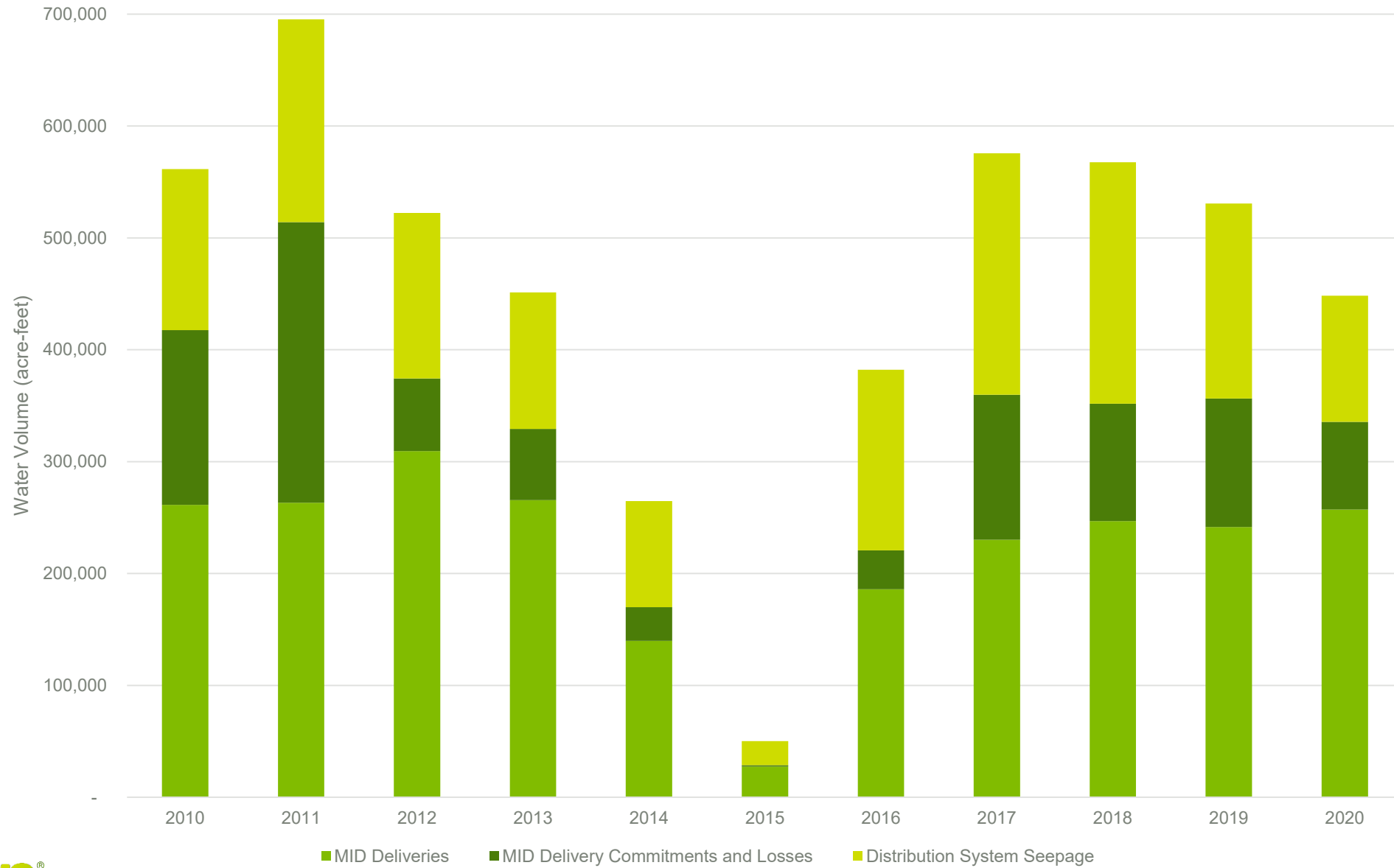


Total MID Supplies

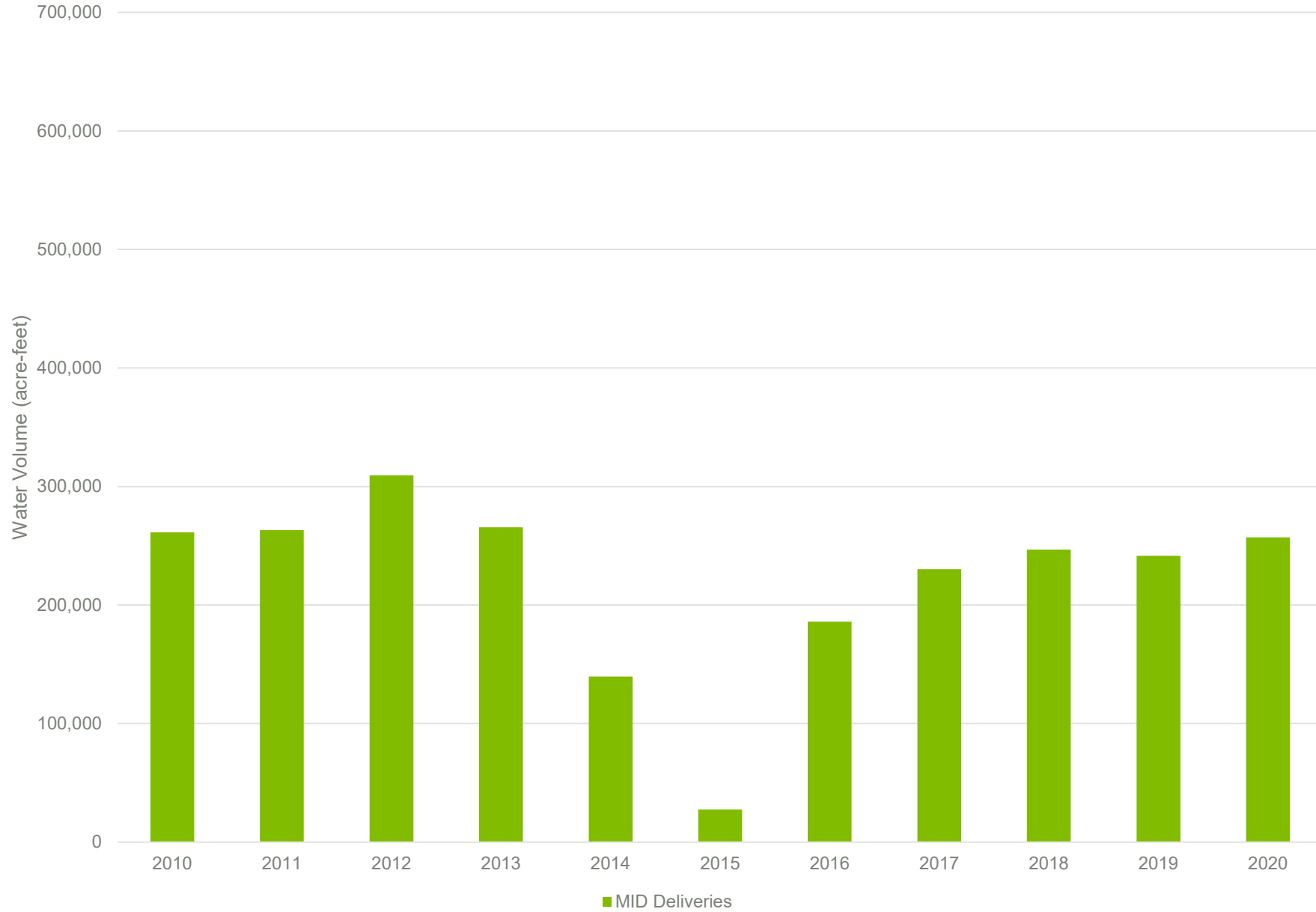


Merced River Diversions Tributary Inflows MID Groundwater Pumping Average with MID Pumping

Fate of MID Supplies



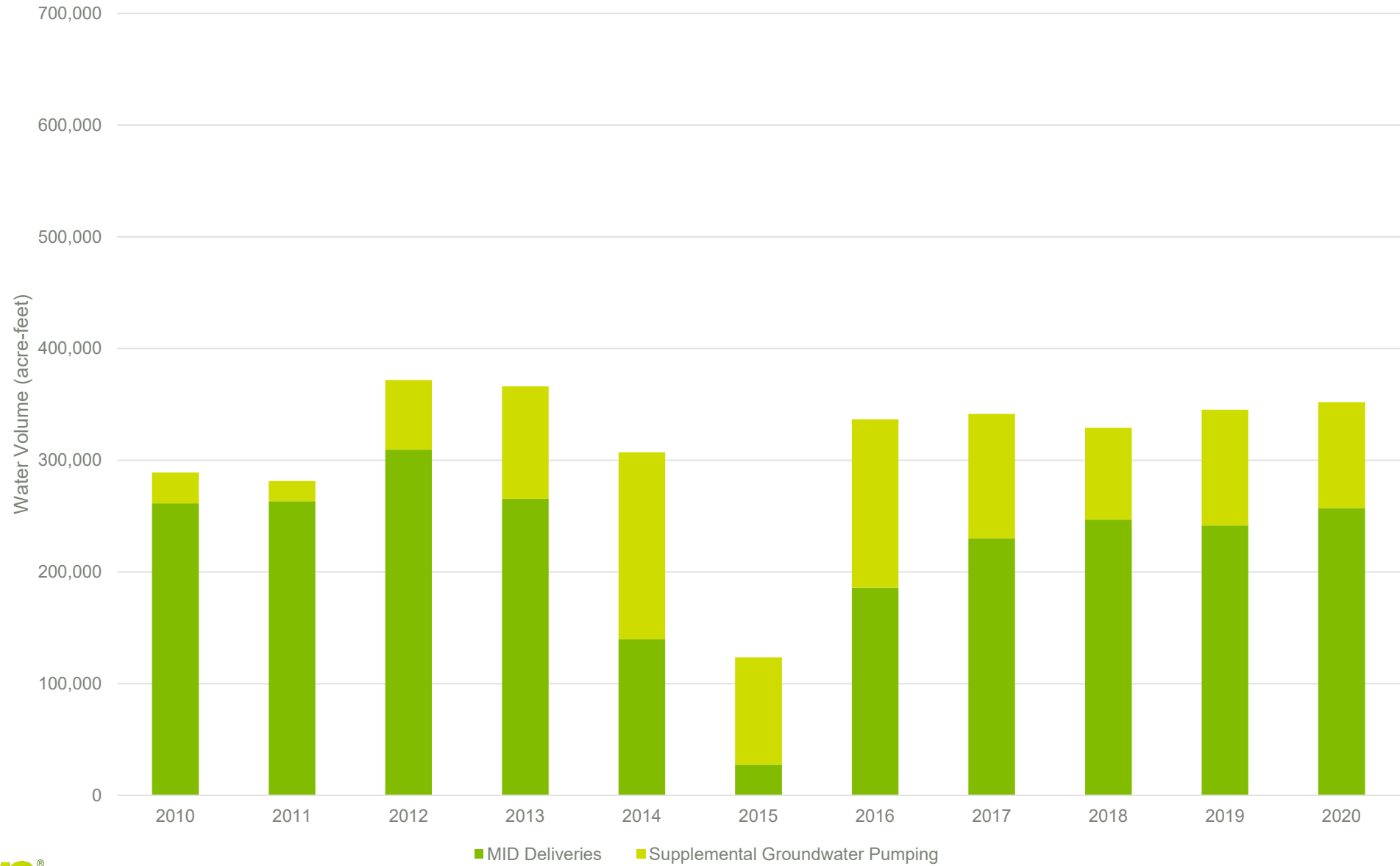
MIUGSA Irrigation Supplies



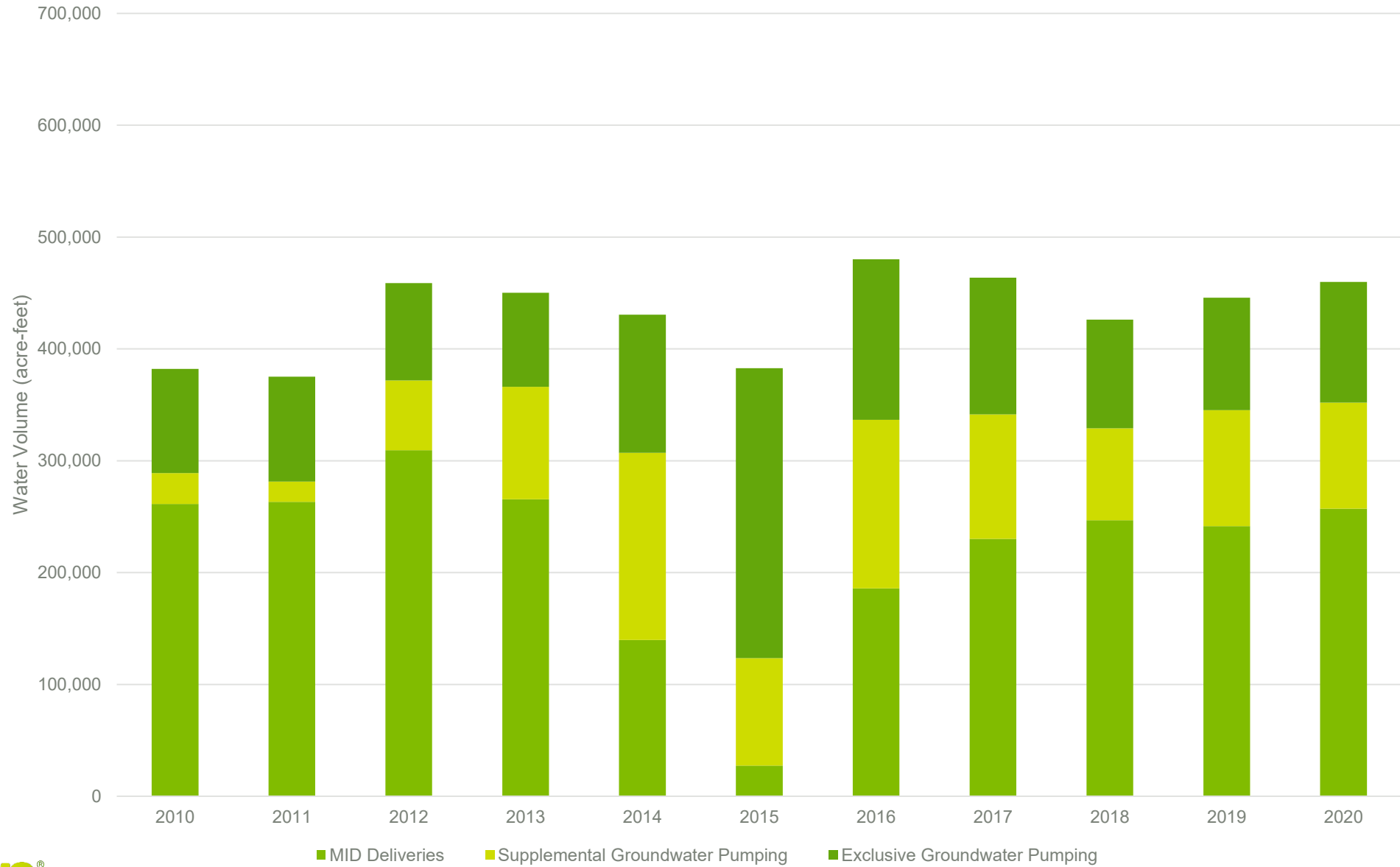
Private Groundwater Pumping Terms

- **Supplemental** Private Groundwater Pumping: Groundwater irrigation that supplements MID deliveries.
- **Exclusive** Private Groundwater Pumping: Groundwater irrigation that is not supplementing MID delivers.

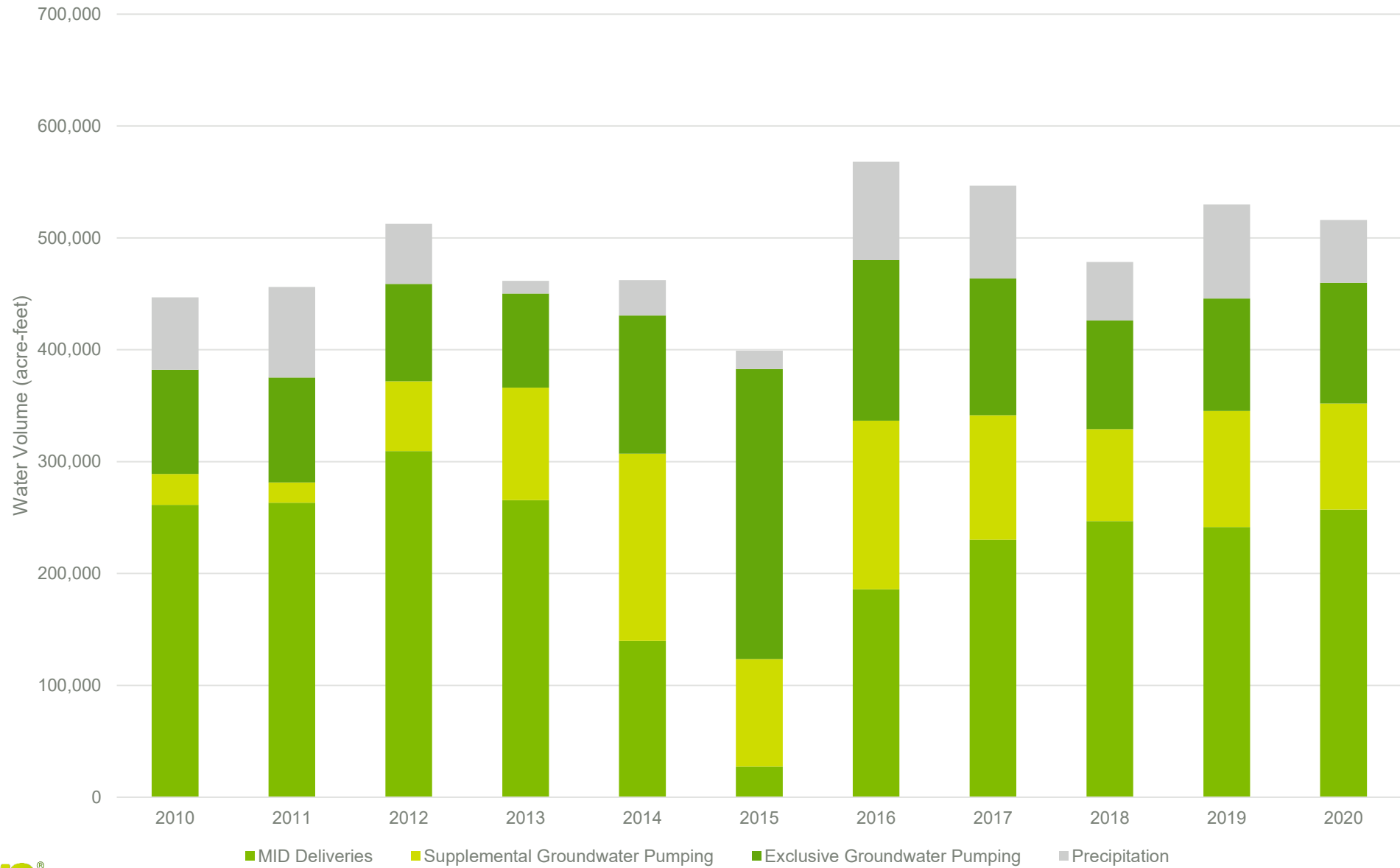
MIUGSA Irrigation Supplies



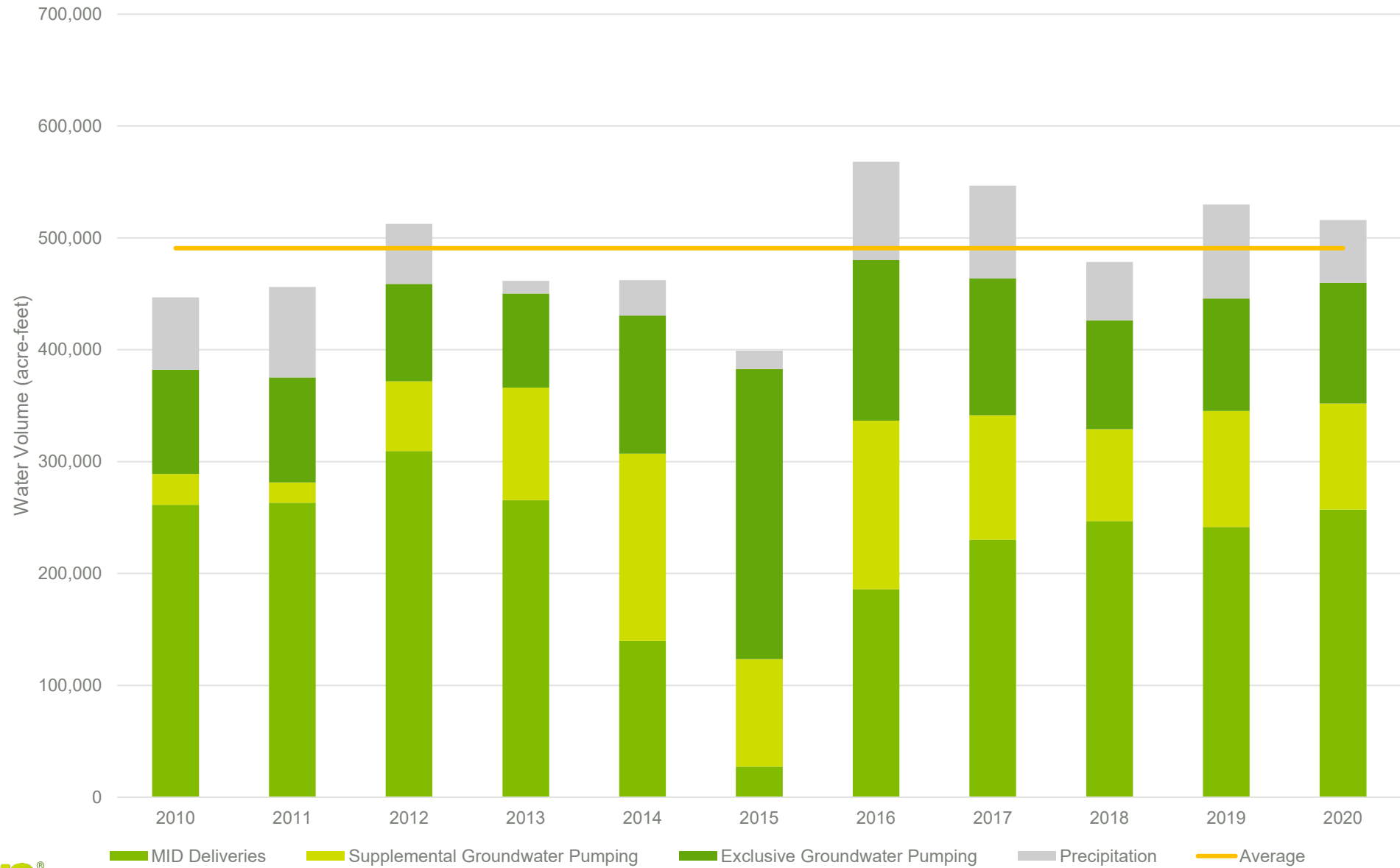
MIUGSA Irrigation Supplies



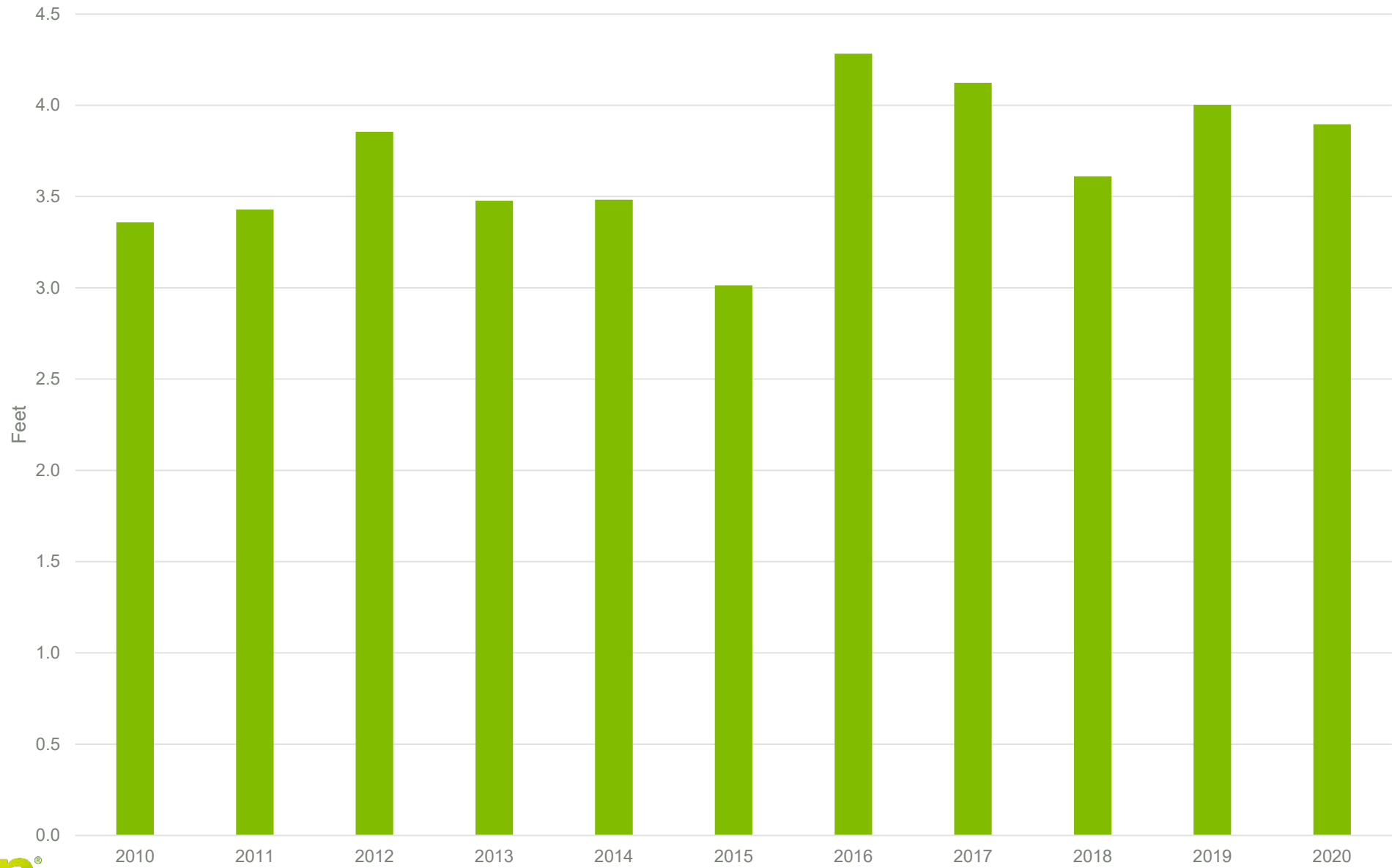
MIUGSA Irrigation Supplies



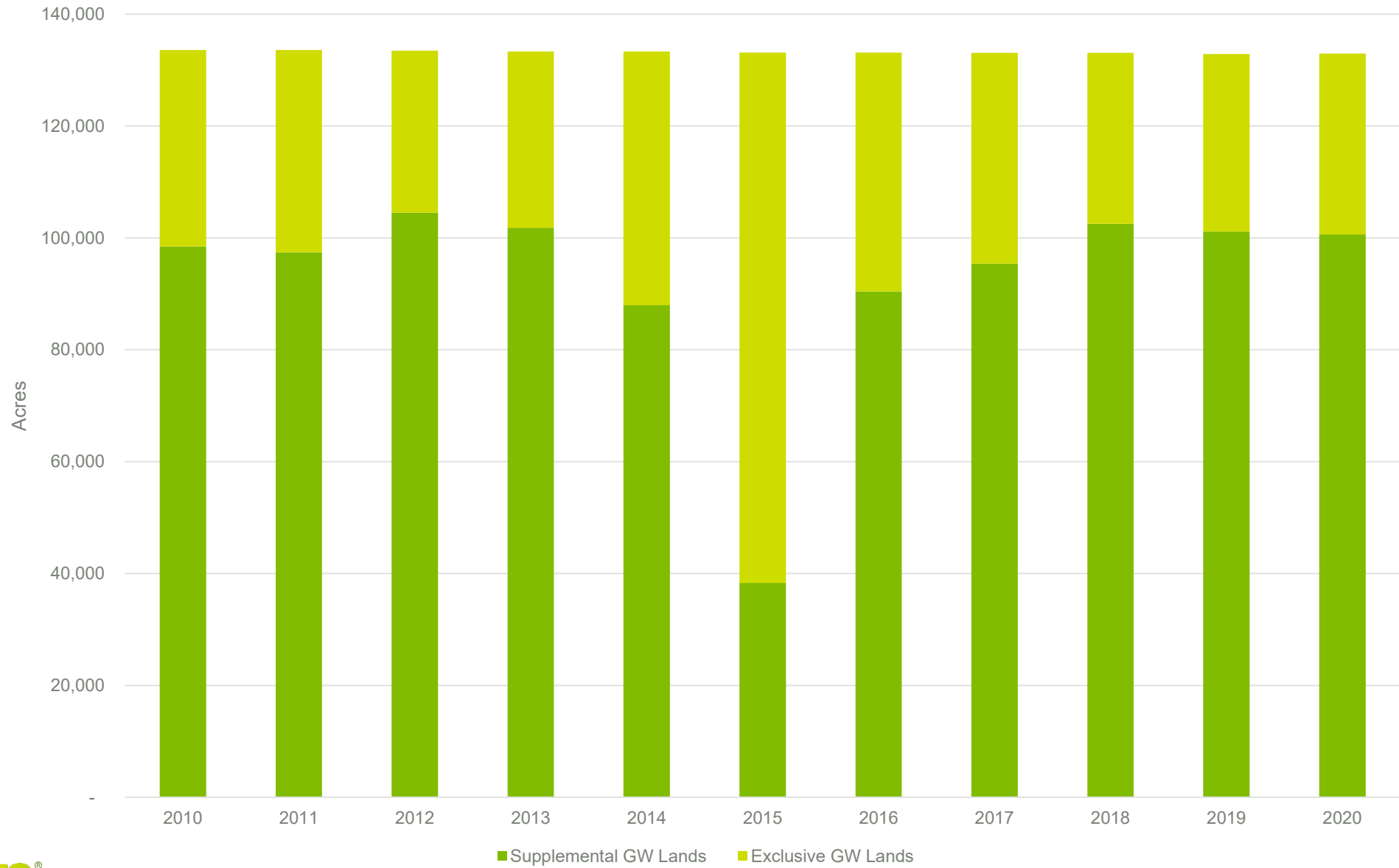
MIUGSA Irrigation Supplies



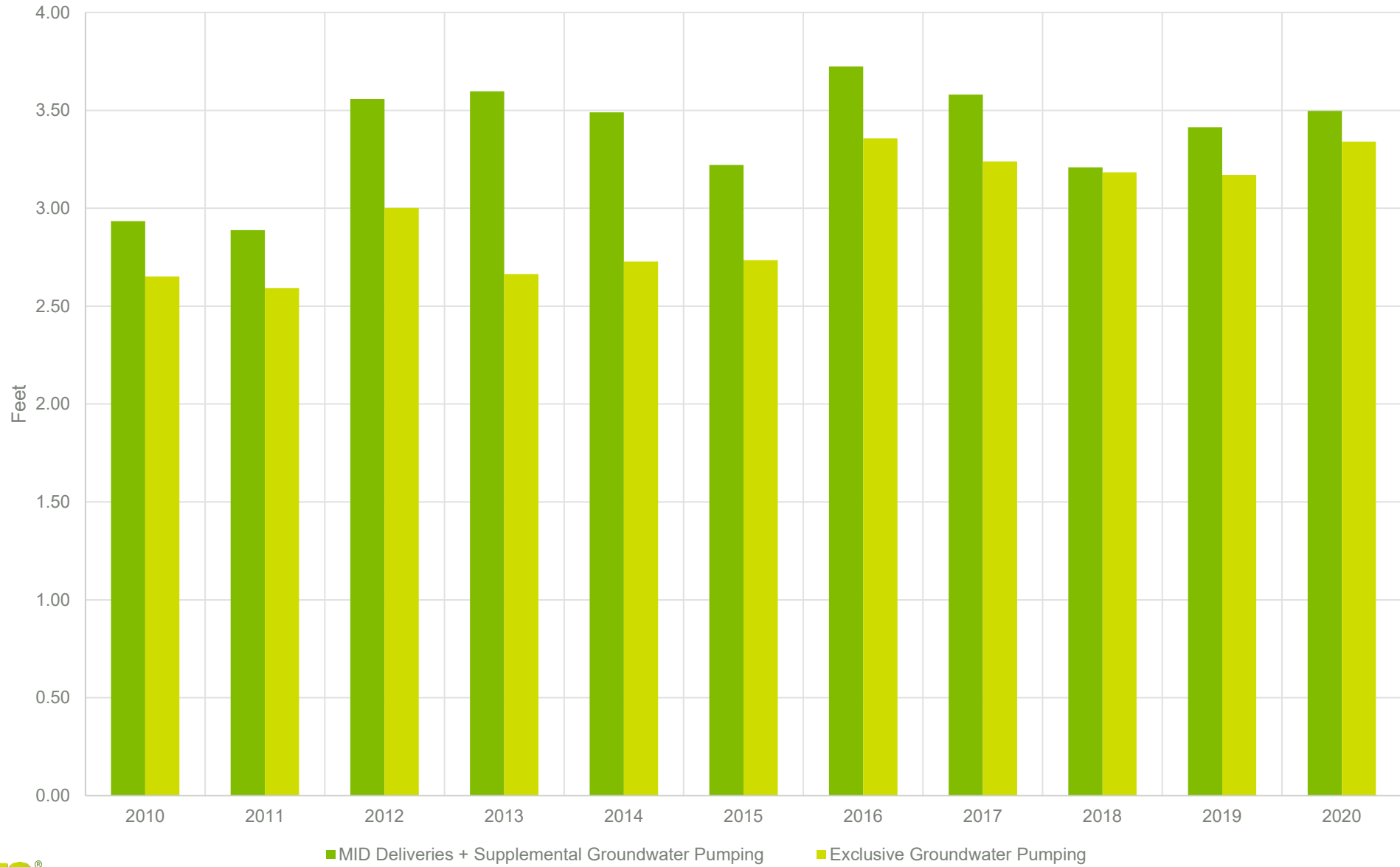
Total Irrigation Depth



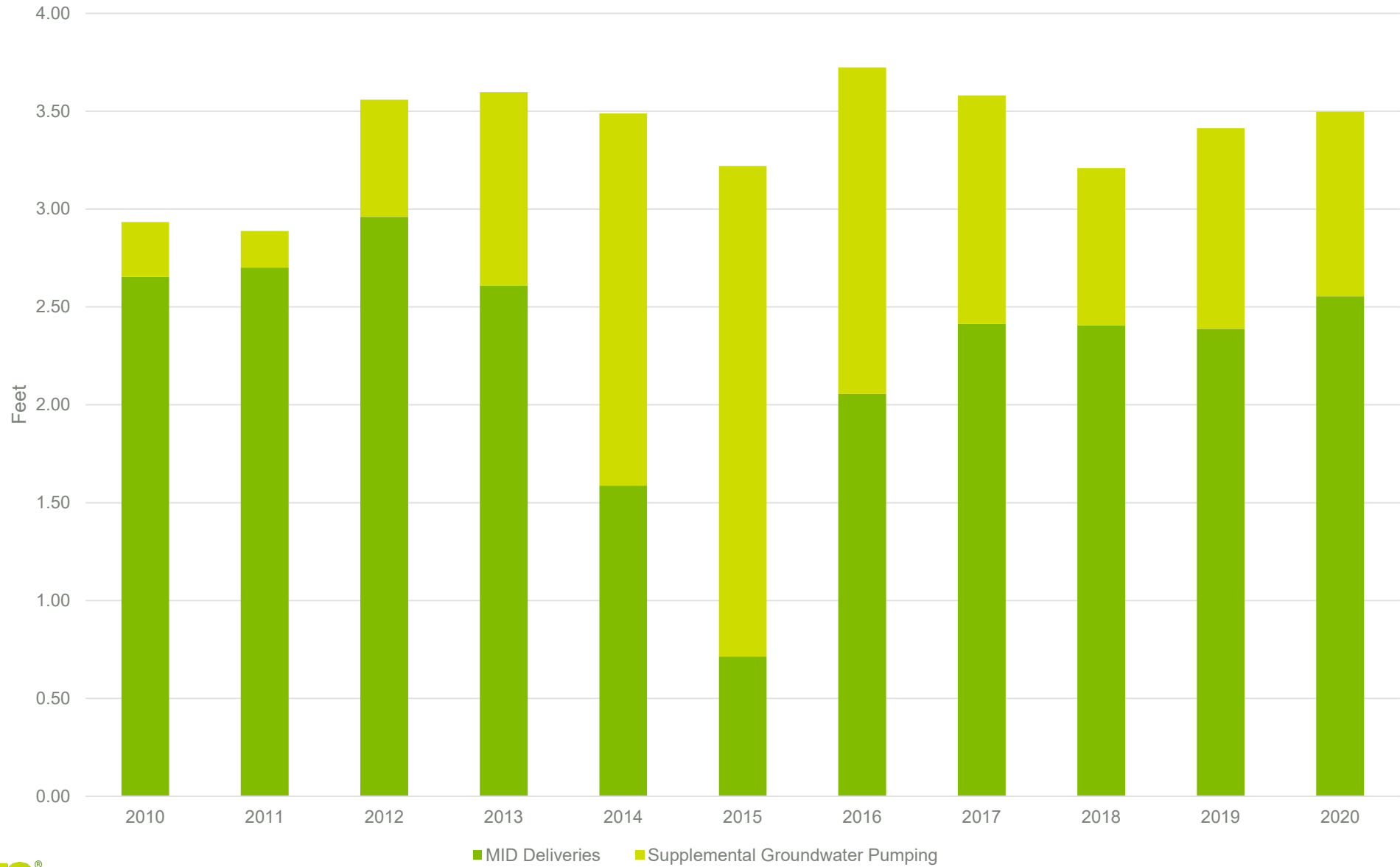
Irrigated Acres



Irrigation Depth



Water Use in MID



Groundwater Use Comparison (2010-2020)

- Pumping Depth – Supplemental GW Users (feet)

- Minimum = 0.19
- Maximum = 2.51
- **Average = 1.1**

- Total Acres – Supplemental GW Users

- Minimum = 38,321
- Maximum = 104,480
- Average = 92,596

- Pumping Depth – Exclusive GW Users (feet)

- Minimum = 2.59
- Maximum = 3.36
- **Average = 2.97**

- Total Acres – Exclusive GW Users

- Minimum = 28,966
- Maximum = 94,813
- Average = 40,629



Questions?

A photograph of a fountain in a pond. The fountain has several jets of water spraying upwards and outwards. The pond is surrounded by lush green trees and reeds. The sky is blue with some light clouds. The word "Break" is written in large, bold, white letters across the center of the image.

Break

Groundwater Management Examples

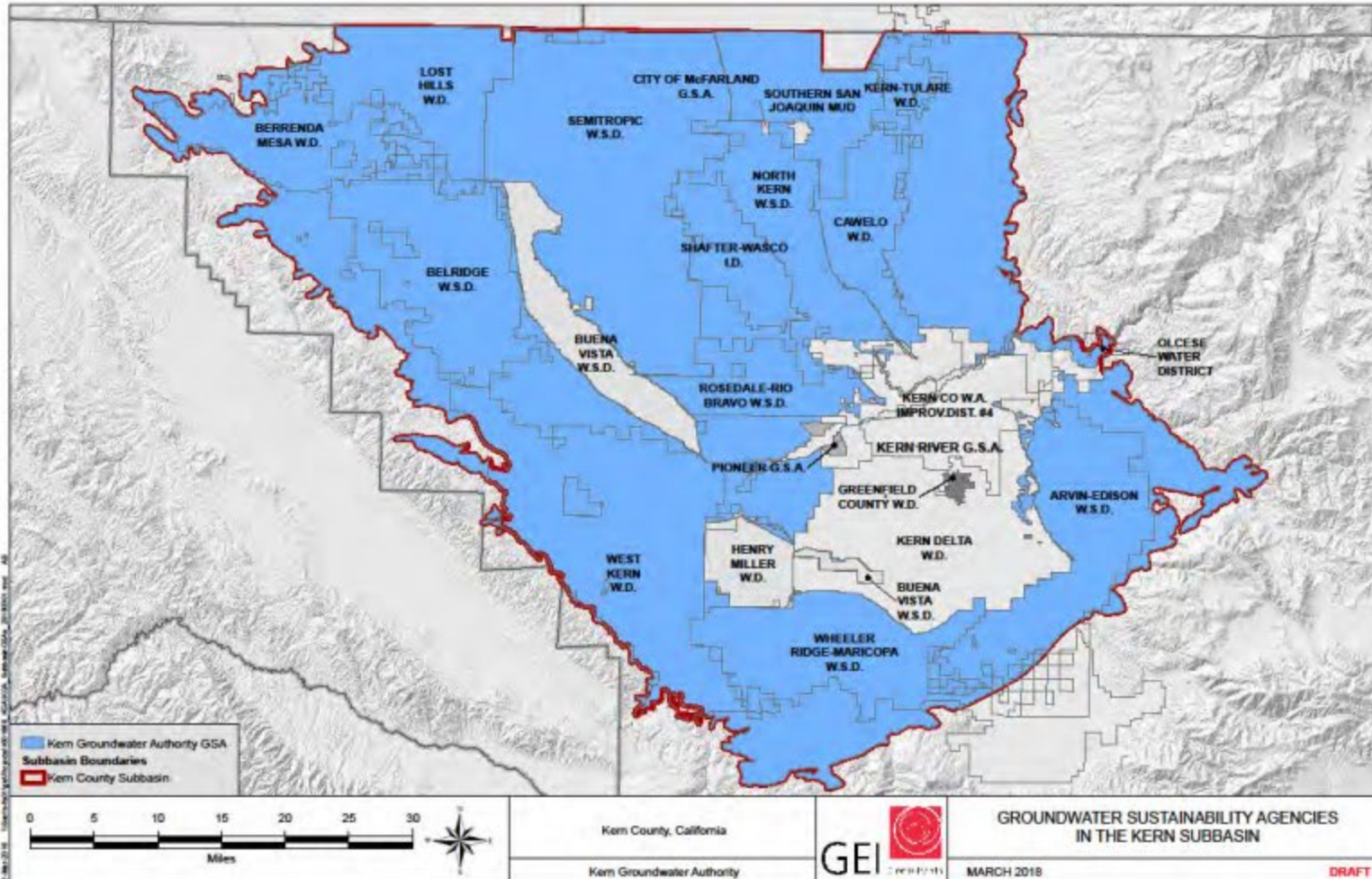
Rosedale Rio-Bravo Water Storage District

- Kern County, CA

Upper Republican Natural Resources District

- Southwest Nebraska

KERN GROUNDWATER AUTHORITY GROUNDWATER SUSTAINABILITY AGENCY



Members of the Kern Groundwater Authority (KGA)

- Arvin Community Services District
- Arvin-Edison Water Storage District
- City of Shafter
- County of Kern
- Kern County Water Agency
- Kern-Tulare Water District
- North Kern Water Storage District
- Rosedale Rio-Bravo Water District
- Semitropic Water Storage District
- Shafter-Wasco Irrigation District
- South San Joaquin Municipal Utilities District
- West Kern Water District
- Westside Water District Authority
- Wheeler Ridge-Maricopa Water Storage District

Rosedale Rio-Bravo Water Storage District

44,000 acres / 27,500 irrigated

Water provider, no direct deliveries of water

Water supplies are recharged into aquifer

Rosedale Rio-Bravo Water Storage District

- Several supplies of water:
 - Precipitation
 - Native Yield (very small, ~0.2 AF/acre)
 - Project Water
 - Stored Water



Rosedale Rio-Bravo Water Storage District



Withdrawals are limited by available supply and regulated through an allocation of Consumptive Use



Water use estimated using remote sensing / OpenET



Unused water is redistributed to other users annually



Any remaining overuse results in fee

Rosedale Rio-Bravo Water Storage District

All parcels under a common producer are automatically pooled

Allocation occurs on an annual basis

No carry-over / “use it or lose it”

Water Budget Overview

ac-ft ac-ft/ac

+ Acres Managed 153.0 ac

Total acres of all your managed parcels

- Allocation 507.6 ac-ft

Project Water 458.9 ac-ft

Reconciliation 0.0 ac-ft

Native Yield 22.9 ac-ft

Stored Water 0.0 ac-ft

Precipitation 25.7 ac-ft

Your annual allocated water budget

+ Purchased -

Water supply you have purchased this year

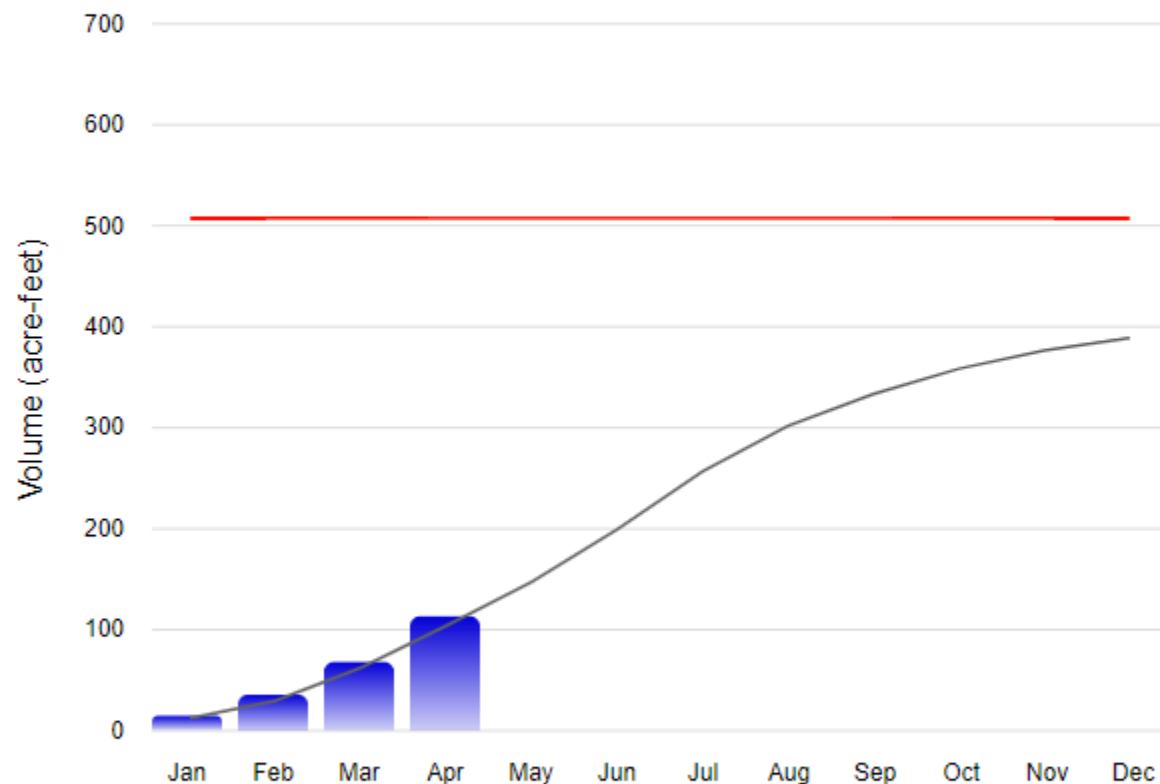
+ Sold -

Water supply you have sold this year

Total Supply 507.6 ac-ft

Allocation + Purchased - Sold

2021 Allocation and Usage



■ Cumulative Monthly Usage
 ■ Average Usage (All Years)
 ■ Annual Supply (Allocation +/- Trades)

Rosedale Rio-Bravo Water Storage District

- Water Trading
- Not active yet
- Have developed platform as an option for growers should there be a demonstrated scarcity

Buy and Sell Water New Posting

There are currently 2 active postings, with a total of 0 ac-ft on offer to sell and 150 ac-ft seeking to buy.

Click a posting to see details and make an offer, or create a new posting to advertise your intent to buy/sell water

Show these postings: All Postings Offers to Buy Offers to Sell

	Posting Date	Type	Available Quantity	Unit Price (ac-ft)	Total Price	Description
View Posting	2/26/21, 4:44 PM	Offer to Buy	50	\$350.00	\$17,500.00	Need to complete transaction ...
View Posting	2/5/21, 4:43 PM	Offer to Buy	100	\$250.00	\$50,000.00	Looking to purchase before Ma...

Upper Republican Natural Resources District

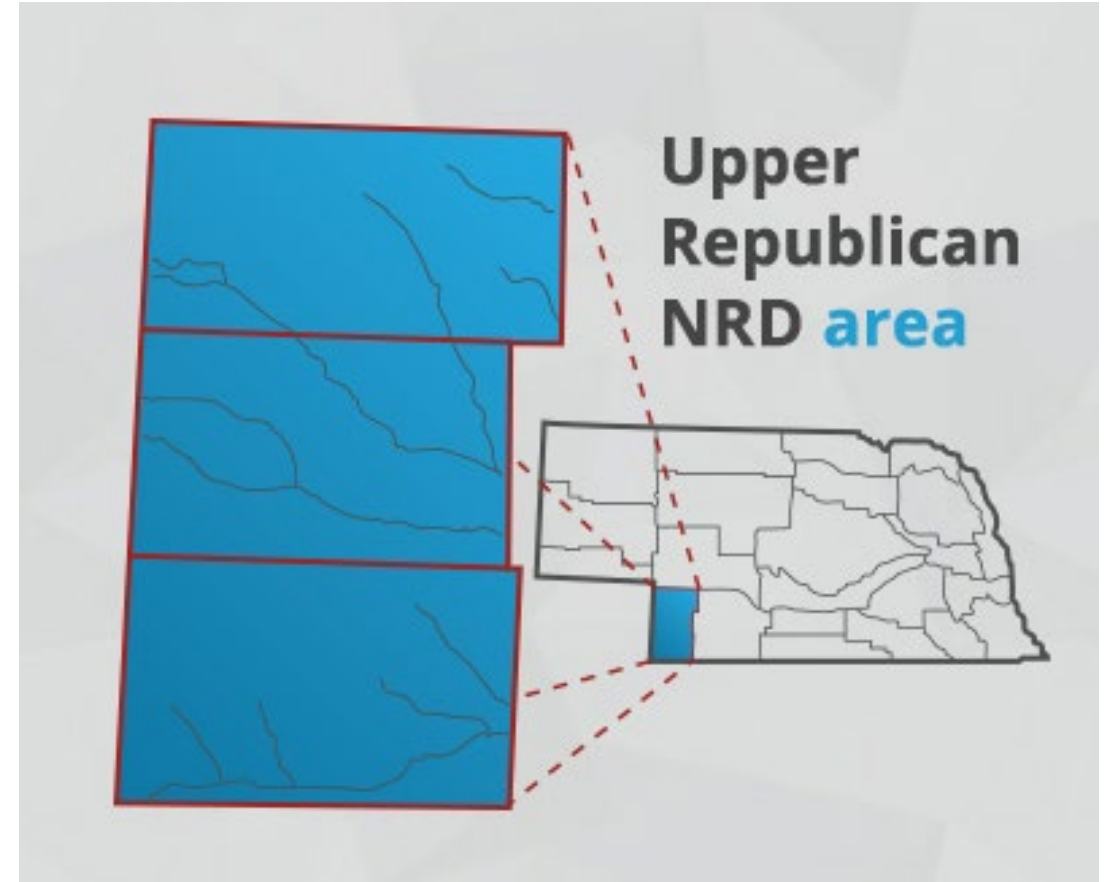
1.7 million acres / 450,000 irrigated

Does not supply water / only regulates use

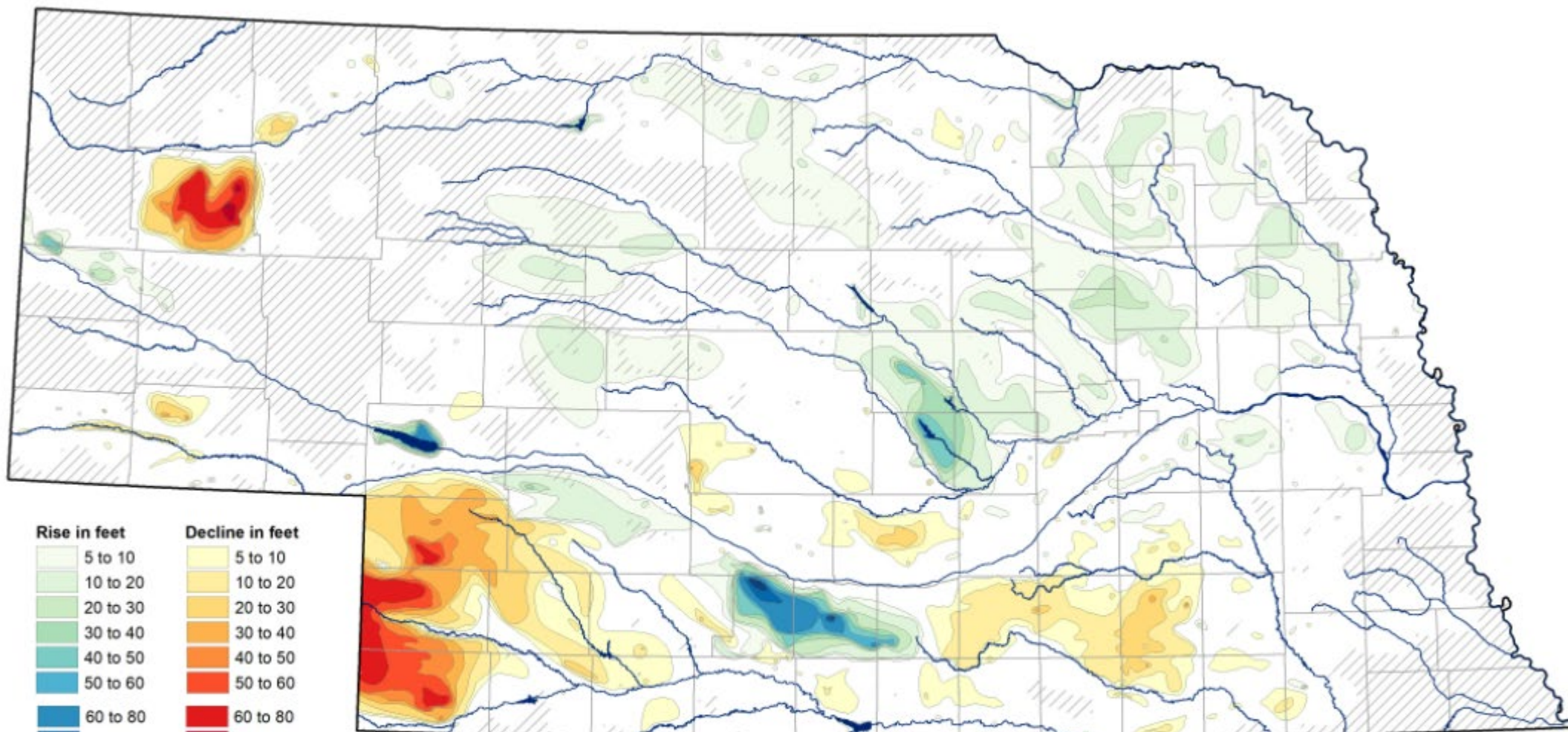
Abundant natural supply but groundwater levels have declined over time

Upper Republican Natural Resources District

- One of 23 Natural Resources Districts in Nebraska
- Formed in 1972 in order to consolidate several hundred special purpose districts
- Many authorities related to natural resources
- In early 1980's the State delegated groundwater regulation to the NRDs



Groundwater-Level Changes in Nebraska - Predevelopment to Spring 2020



Rise in feet	Decline in feet
5 to 10	5 to 10
10 to 20	10 to 20
20 to 30	20 to 30
30 to 40	30 to 40
40 to 50	40 to 50
50 to 60	50 to 60
60 to 80	60 to 80
80 to 100	80 to 100
100 to 125	100 to 125

< +/- 5 feet
 Sparse data
 Surface water
 (1 foot = .3048 meters)

For an explanation of information presented on this map, see the 2020 Nebraska Statewide Groundwater-Level Monitoring Report, available for download at go.unl.edu/groundwater

CONSERVATION AND SURVEY DIVISION (<http://snr.unl.edu/csd>)
 School of Natural Resources (<http://snr.unl.edu>)
 Institute of Agriculture and Natural Resources
 University of Nebraska-Lincoln

Aaron Young, Survey Geologist, CSD
 Mark Burbach, Water Levels Program Supervisor, CSD
 Les Howard, GIS Manager, CSD

Data provided by:
 Nebraska Natural Resources Districts
 Central Nebraska Public Power and Irrigation District
 U.S. Geological Survey
 Nebraska Water Science Center



URNRD Groundwater Management History

Allocation: First groundwater allocations set in 1981

Pooling: The pooling of certified acres is allowed under certain conditions (floating township)

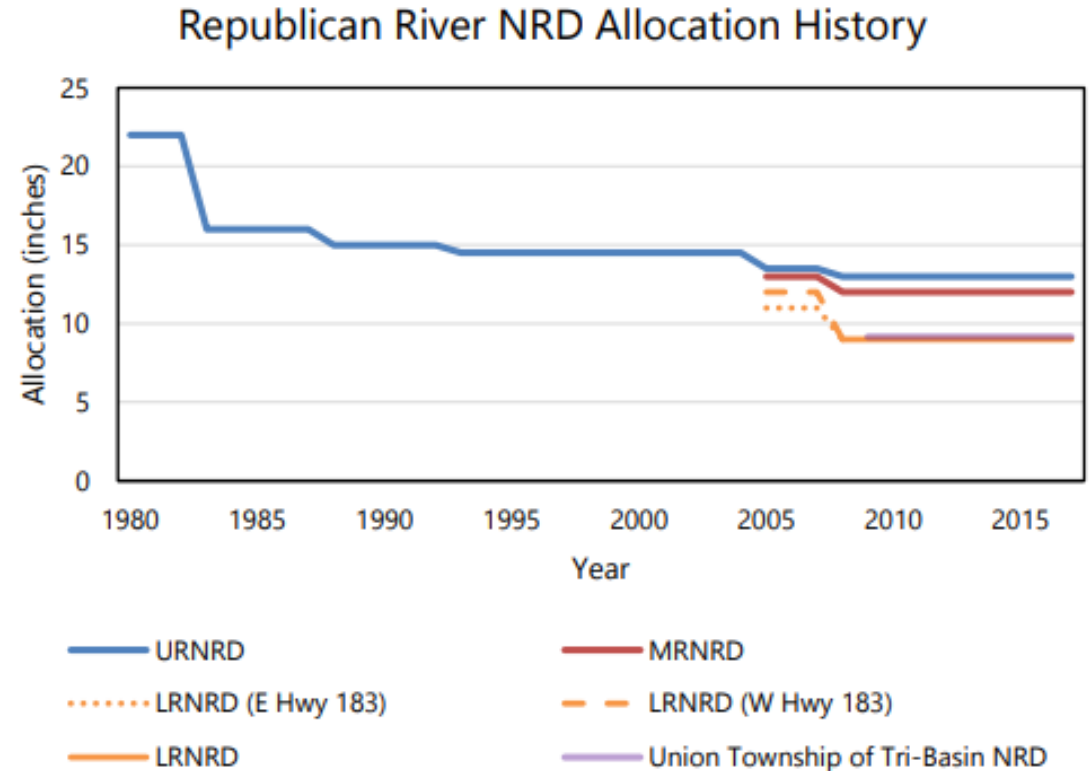
Well spacing: Over the 1980's and 1990's enhanced well spacing restrictions (more strict than statutory requirements) helped to slow proliferation of well development

Moratorium: In 1998 the URNRD placed a moratorium on new irrigated acres

Transfers: Irrigated acres (called "certified acres") can be transferred from one location to another under certain conditions

History of URNRD Allocations

- Multi-year allocation of Gross Pumping
- 1981-1983: 66 inches over three years
- 1984-1988: 80 inches over five years
- 1989-1993: 75 inches over five years
- 1994-2004: 72.5 inches per five-year period
- 2005-2007: 67.5 inches over three years
- Since 2008: 65 inches per five-year period



Current URNRD Allocations

65 inches from 2018-2022: can be used in any way over the five-year period

Carry-over: Up to 7.5 inches can be carried over from one allocation period to the next (this used to be unlimited)

Overuse: results in a penalty in the next allocation period – producers lose two inches for every inch of overuse

Cease and desist: If allocation is exceeded before year five, producer receives a cease-and-desist order (violation of order punishable under Nebraska law)

In Summary

- This meeting sets the stage for continued discussion to answer questions like these:
 - What should the allocation period be? (e.g. annual, 3-year, 5-year)
 - Allocating pumping vs. consumptive use?
 - Should there be carry-over? How much?
 - What should penalties for overuse be?
 - Pooling?
 - Trading?
- MIUGSA is not the only GSA in the Subbasin, but by completing this process MIUGSA can achieve sustainability and protect its water users



Questions?