



Kern River Groundwater Sustainability Agency (KRGSA)

2ND GSP ANNUAL REPORT KERN COUNTY SUBBASIN

KRGSA BOARD MEETING

APRIL 1, 2021

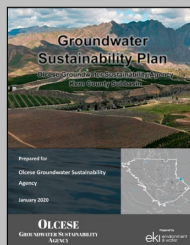
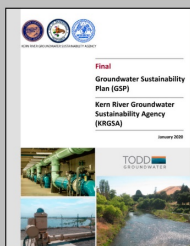
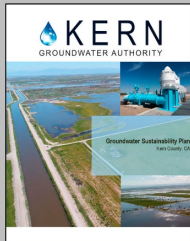
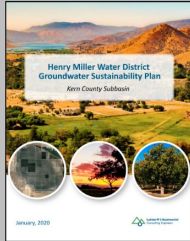
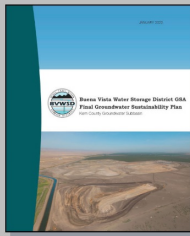


Kern County Subbasin Groundwater Sustainability Plans



Second Annual Report Water Year 2020

April 1, 2021



2nd GSP ANNUAL REPORT

- Being submitted to DWR **TODAY!**
- Covers Water Year 2020
 - Oct 1, 2019 – Sep 30, 2020
- First year of GSP Implementation

Kern County Subbasin Groundwater Sustainability Plans



Second Annual Report Water Year 2020

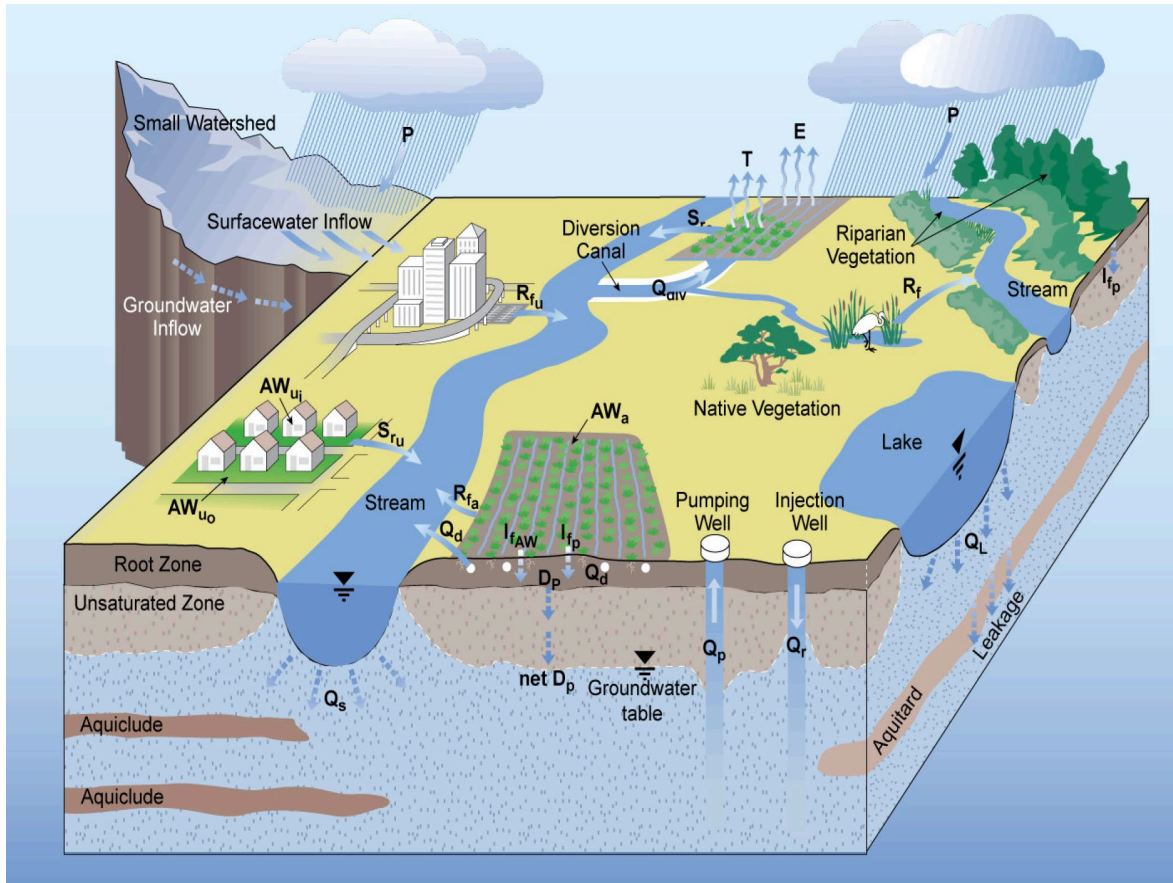
April 1, 2021



REQUIRED ELEMENTS

- Groundwater elevations historical through WY 2020 (26-year period)
- Groundwater extractions WY 2020 (agency data and model METRIC update)
- Surface water supply and total water use WY 2020 (agency data and model update)
- Change in groundwater in storage historical through WY 2020 (model)
- Progress reports for GSP implementation by each agency (19)

WY 2020 UPDATE of C2VSimFG-KERN MODEL



■ Input Data from 39 Agencies

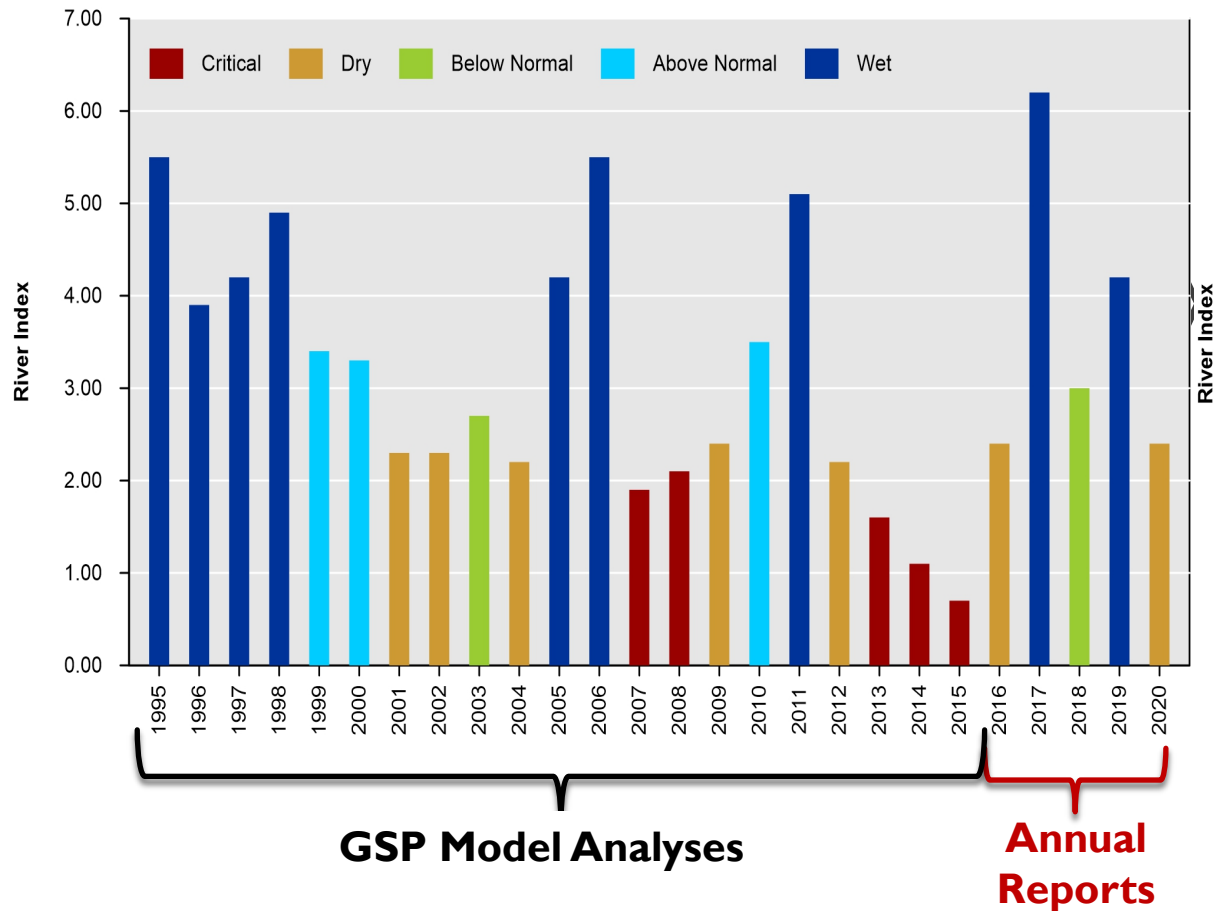
- Surface water deliveries
- Managed recharge and banking
- Bank recovery pumping
- Urban water supplies and use
- Local water sources and use

■ Other Data Sets

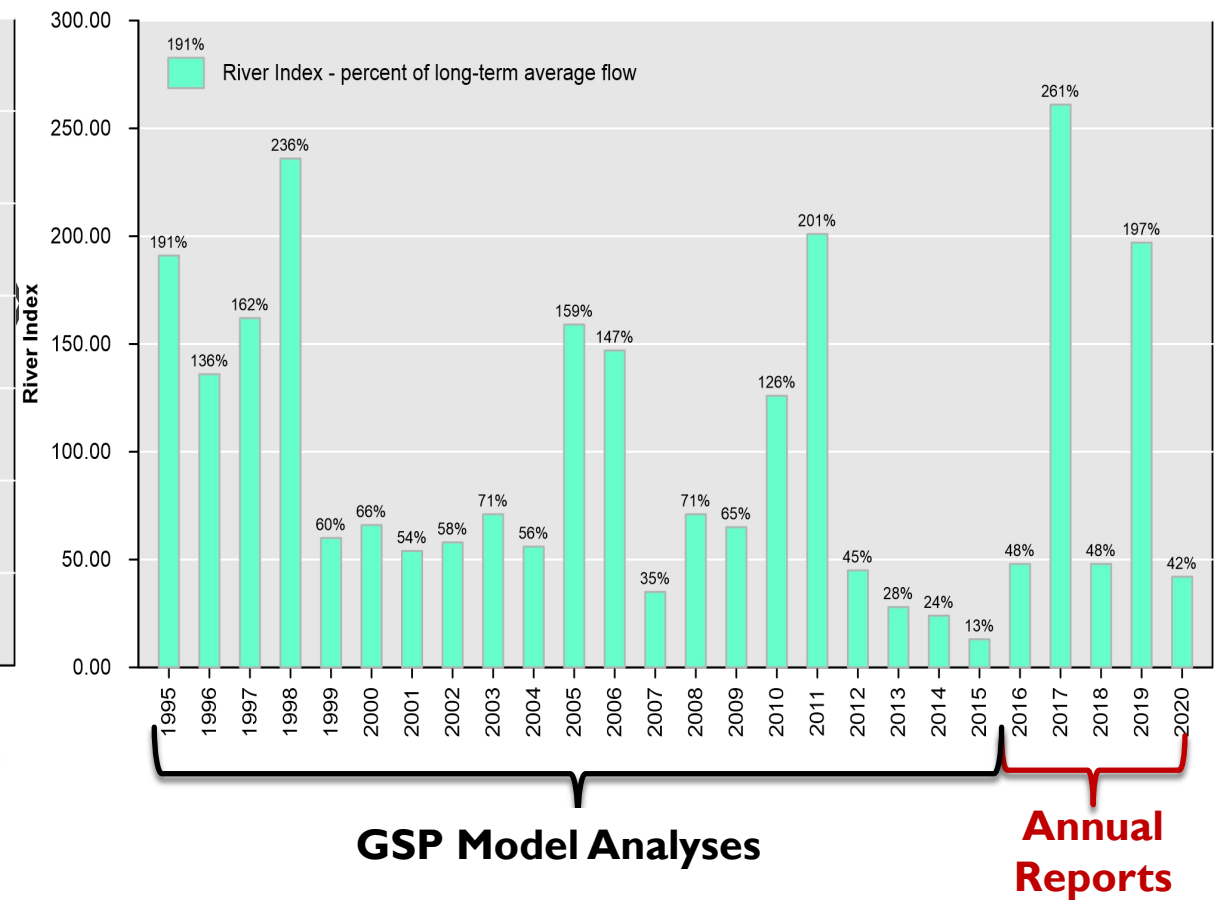
- ITRC METRIC ET data
- PRISM precipitation data
- Kern River Hydrographic Reports (and data)

HYDROLOGIC INDICES

San Joaquin Valley

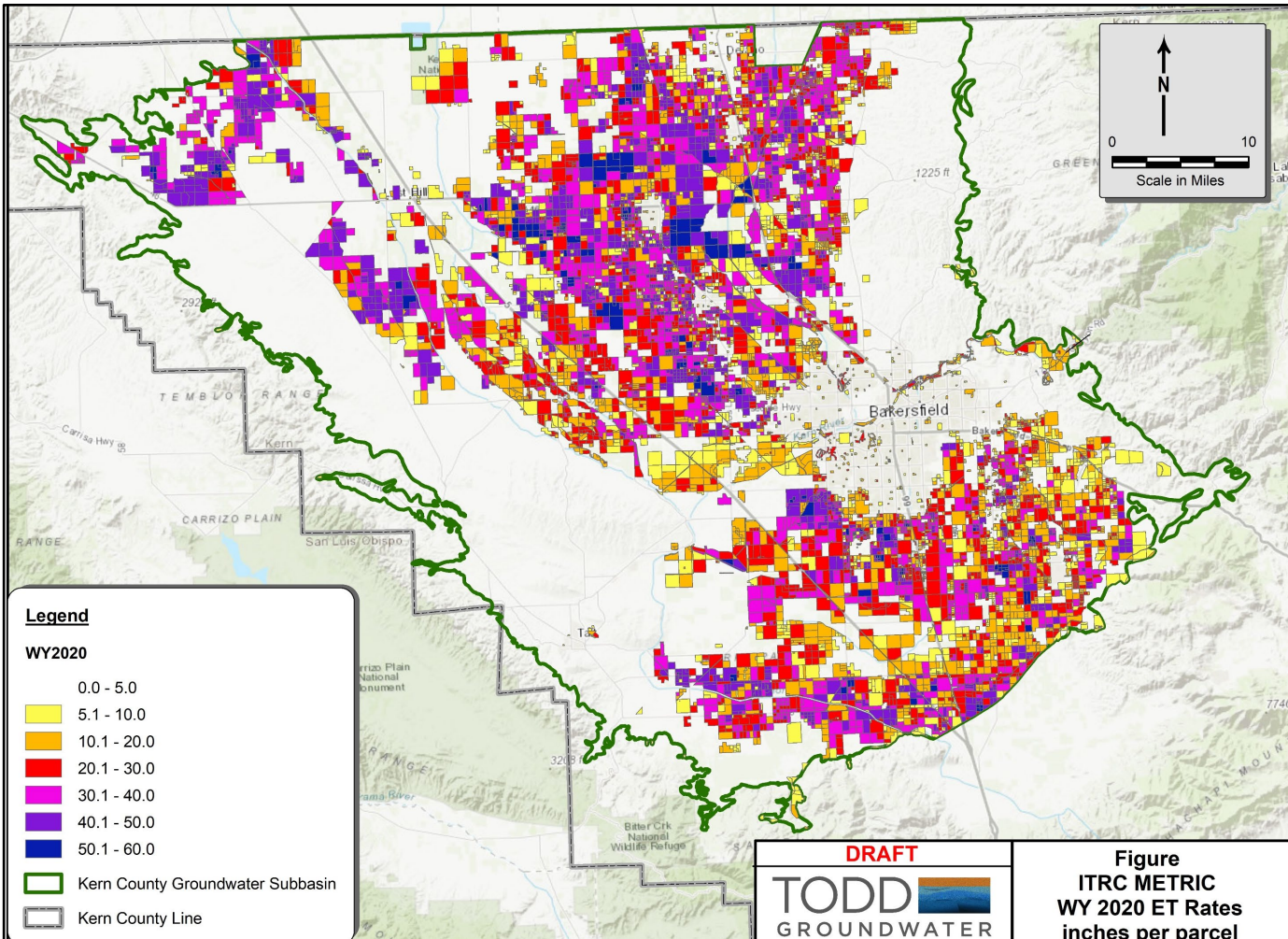


Kern River



EVAPOTRANSPIRATION (ET) DATA FROM LANDSAT IMAGERY

ITRC METRIC DATA FOR WY 2020



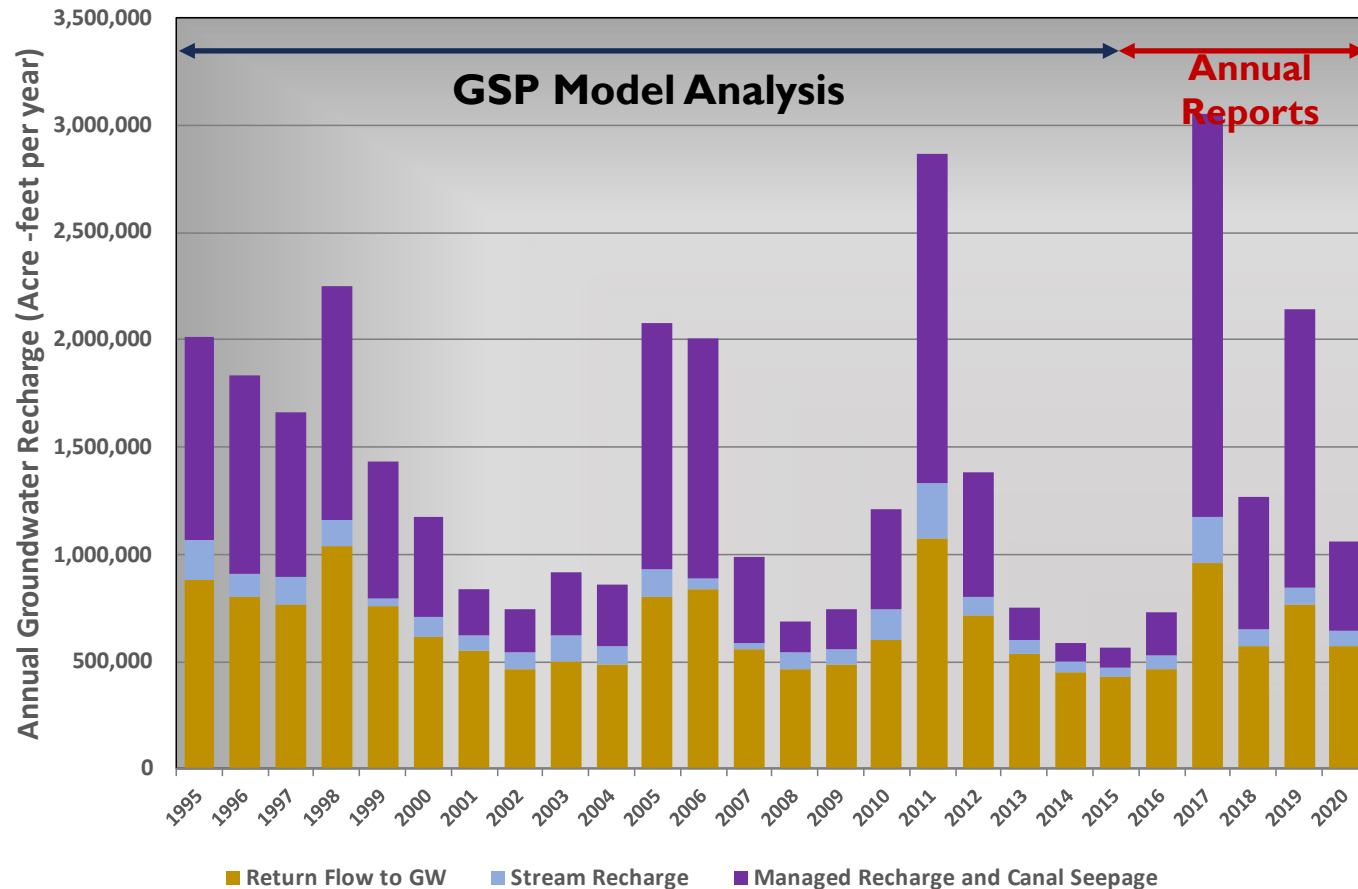
■ Methodology

- Mapped ET to DWR land use categories
- Correlate ET to land use at pixel level
- Monthly Average ET per crop type or land use
- Calculated ET rates
 - Irrigated Agriculture
 - Urban Areas
 - Native and Refuge Areas

WY 2020 MODEL RESULTS

GROUNDWATER RECHARGE and SURFACE WATER SUPPLIES

Kern County Subbasin Groundwater Recharge for WYs 1995-2020
2020 Annual Report Update

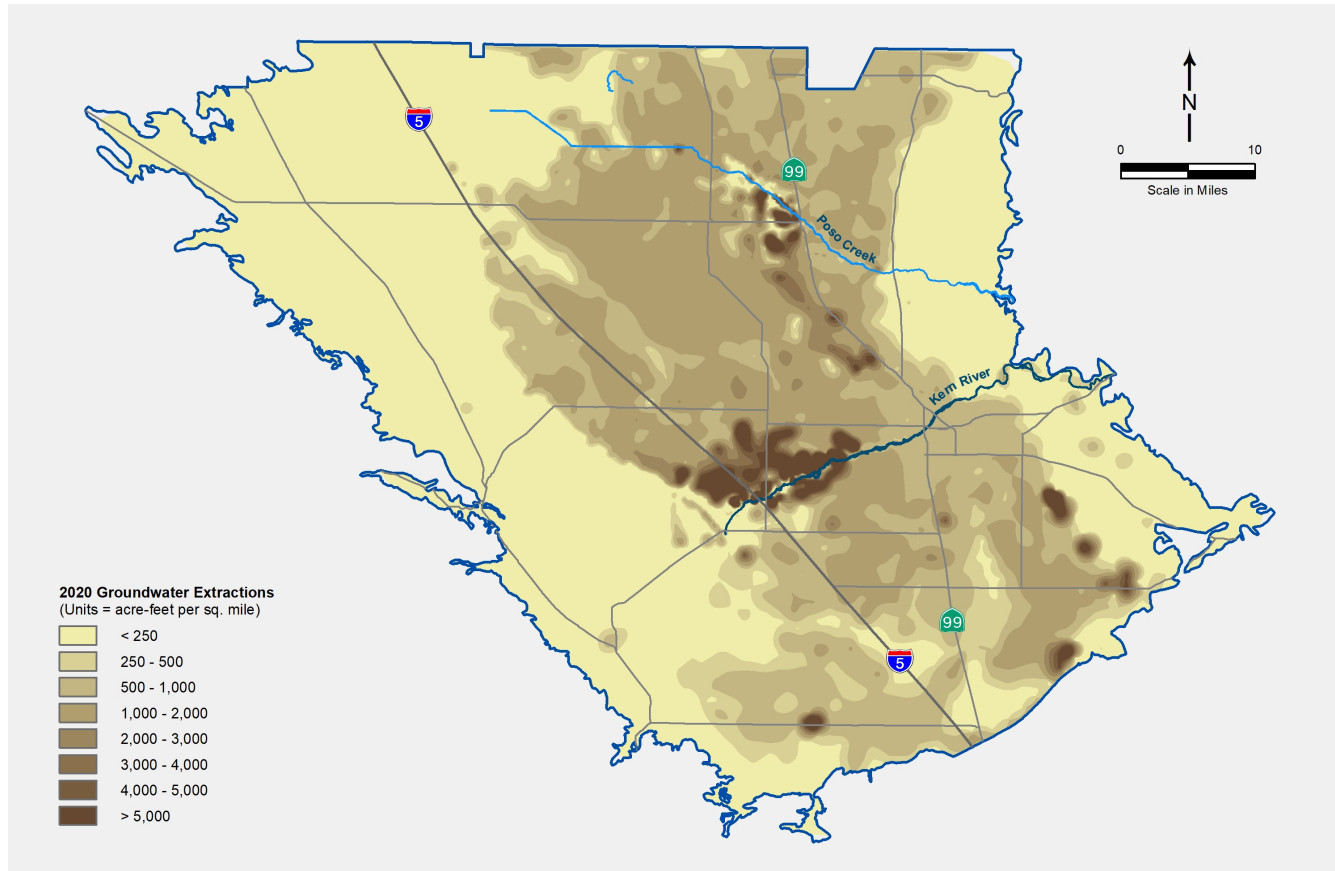


- 1,405,576 AFY Total Surface Water Supply
- 861,453 AFY – Imported (61%)
- 428,452 – Local Surface Water (31%)
- 115,582 – Other Local Sources (8%)

Surface Water Supply Source	Volume, AF
Central Valley Project	256,447
State Water Project	605,005
Colorado River Project	0
Local Supplies	428,542
Local Imported Supplies	56,805
Recycled Water	58,710
Desalination	0
Other Water Source	67
Total Surface Water Supply	1,405,576

WY 2020 MODEL RESULTS

MAP of GROUNDWATER EXTRACTIONS



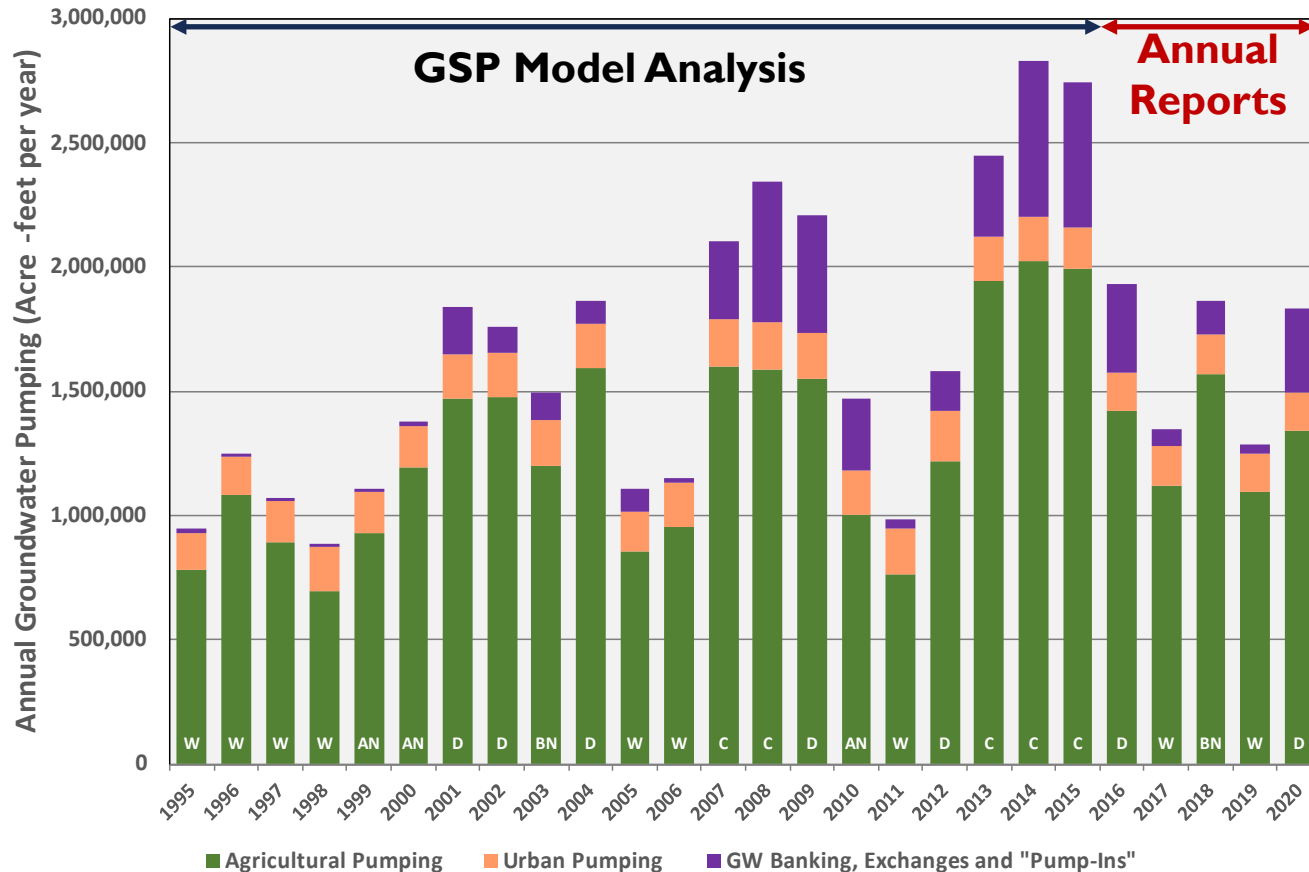
- 1,835,054 AFY Total Subbasin Pumping
 - 152,291 AFY – urban (8%)
 - 1,342,590 – agricultural (73%)
 - 340,174 – bank recovery, other (19%)

Groundwater Extraction	Total Groundwater Extractions	Meters Volume	Land Use Volume
Water Use Type	Acre-ft	Acre-ft	Acre-ft
Urban	152,291	139,080	13,210
Industrial	0	0	0
Agricultural	1,342,590	195,352	1,147,238
Managed Wetlands	0	0	0
Managed Recharge	259,658	259,658	0
Native Vegetation	0	0	0
Other	80,515	8,233	72,282
Total	1,835,054	602,324	1,232,731

WY 2020 MODEL RESULTS

GROUNDWATER EXTRACTIONS

Kern County Subbasin Groundwater Extractions for WYs 1995-2020
2020 Annual Report Update



- Pumping conditions similar to WY 2016
- Urban pumping relatively consistent over time
- Additional recovery pumping from banking projects during dry years
- Agricultural pumping increased about 20% from WY 2019 in response to dry conditions

WY 2020 MODEL RESULTS

TOTAL WATER SUPPLY AND USE

■ **Total Water Supply: 3,240,630 AF**

- Groundwater: 56%
- Surface Water (local + imported): 42%
- Recycled/other water: 2%

Water Supply Source	Total Volume, Acre-ft
Groundwater	1,835,054
Surface Water	1,346,799
Recycled Water	58,710
Reused Water	67
Total Water Supply	3,240,630

■ **Total Water Use: 3,075,992 AF**

- Urban: 6%
- Agriculture: 73%
- Managed Recharge: 10%
- Other/Banking Recovery: 12%

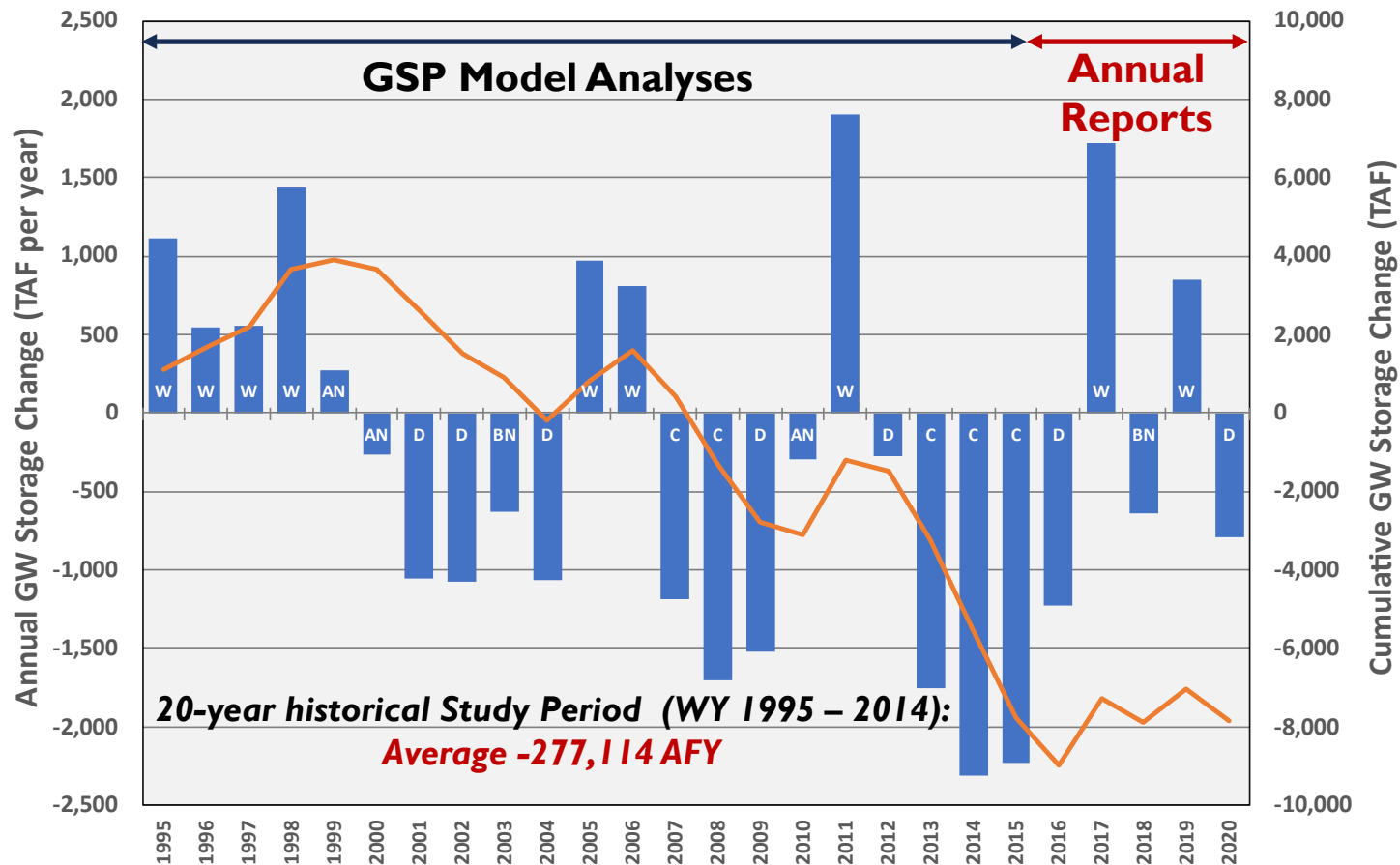
Total Water Use Sector	Total Volume, Acre-ft
Urban	176,016
Agricultural	2,232,497
Managed Wetland	22,582
Managed Recharge	304,723
Other Water Source Type	340,174
Total Water Use	3,075,992

Difference of 188,720 AFY (about 5%) is assumed to be associated with conveyance losses/recharge

WY 2020 MODEL RESULTS

CHANGE in GROUNDWATER in STORAGE

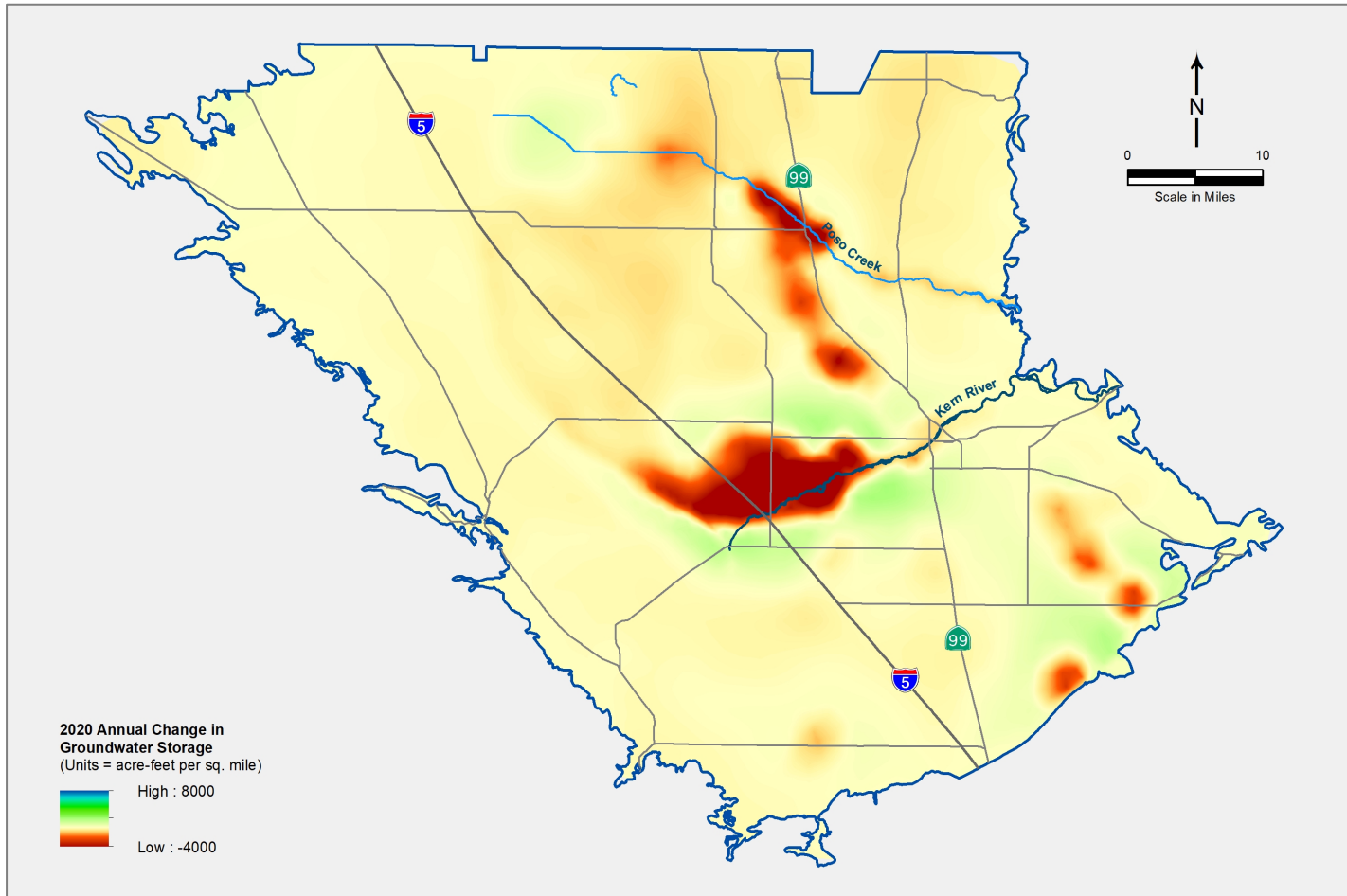
2020 Annual Report Update



- WY2020 GW in Storage Change
 - -788,078 Annual Change
- Post-GSP GW in Storage Change
 - WY 2016 – WY 2020:
 - -78,650 AFY
 - WY 2016 – WY 2020:
 - -15,730 AFY

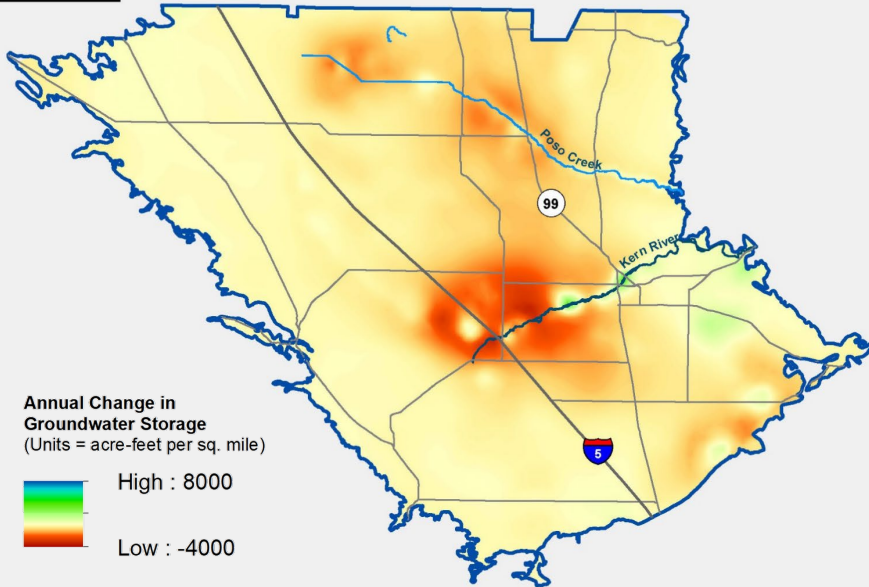
WY 2020 MODEL RESULTS

CHANGE in GROUNDWATER in STORAGE

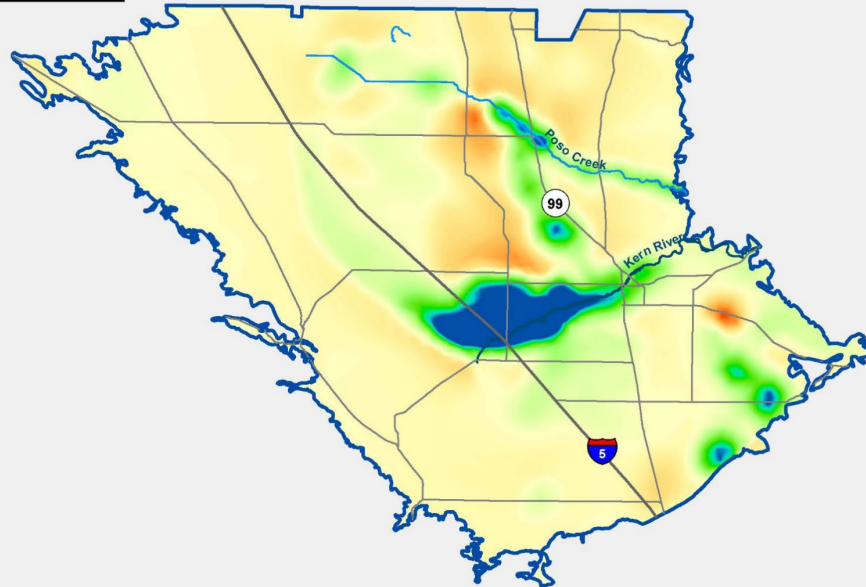


- Widespread low-level declines basinwide
- Higher declines at large banking recovery operations
- Minor increases are residual mound from previous recharge operations

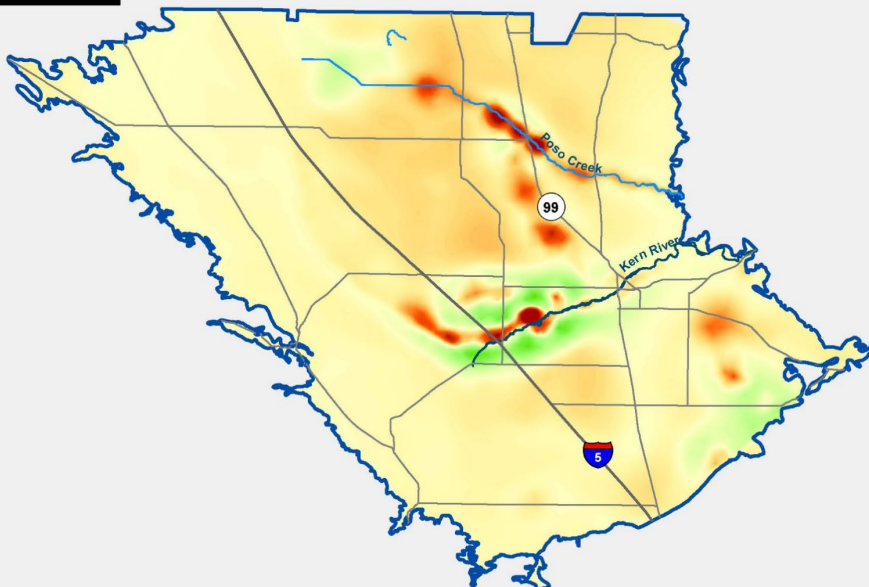
Year: 2016



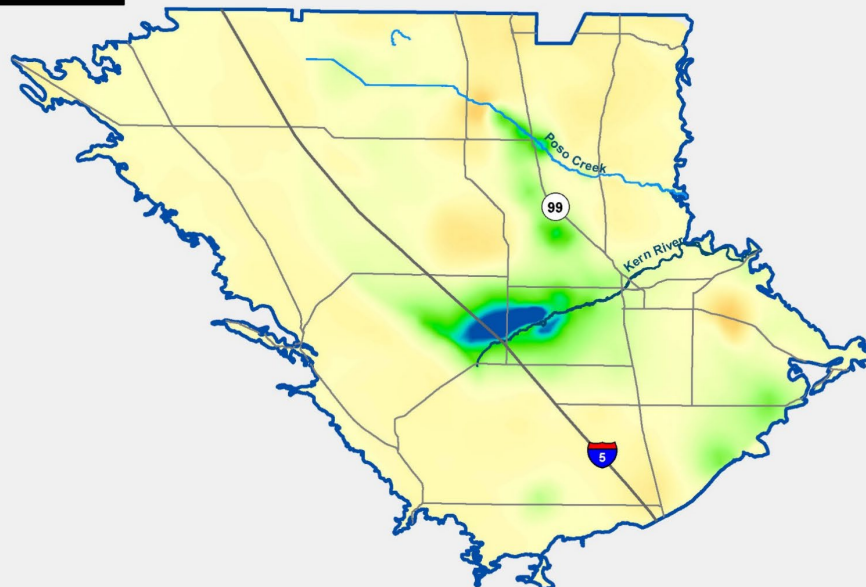
Year: 2017



Year: 2018



Year: 2019

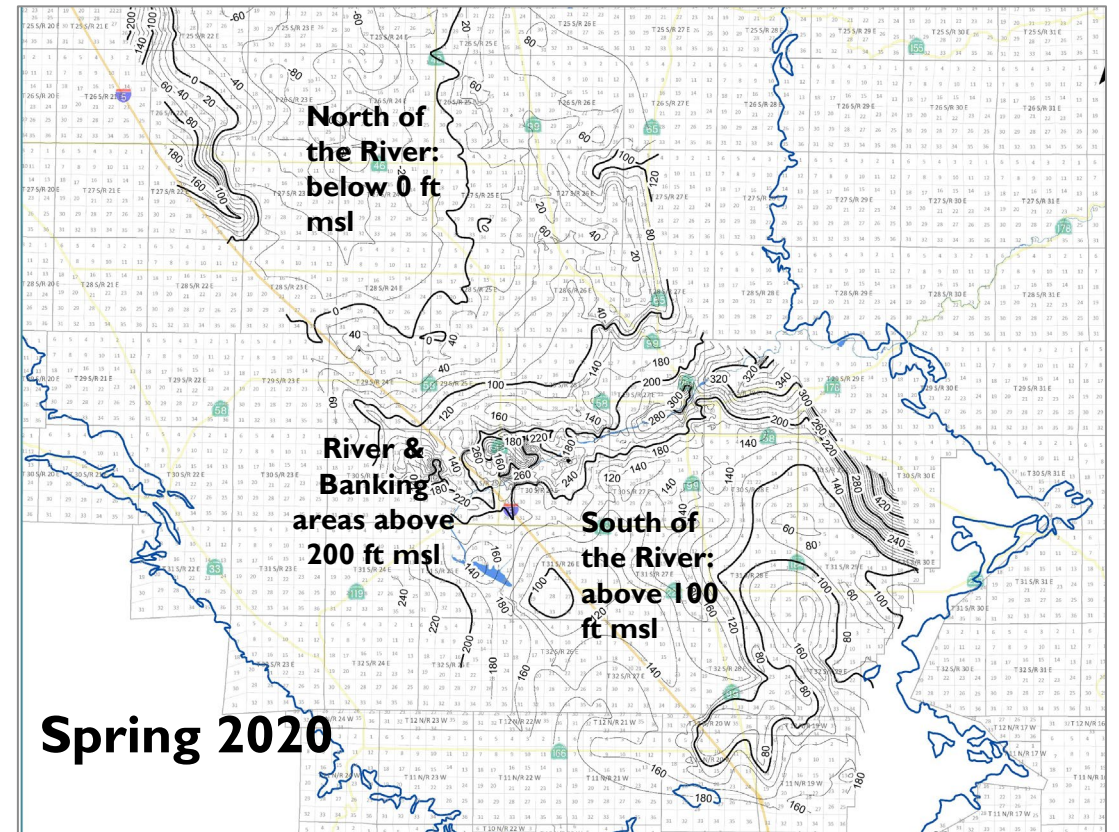
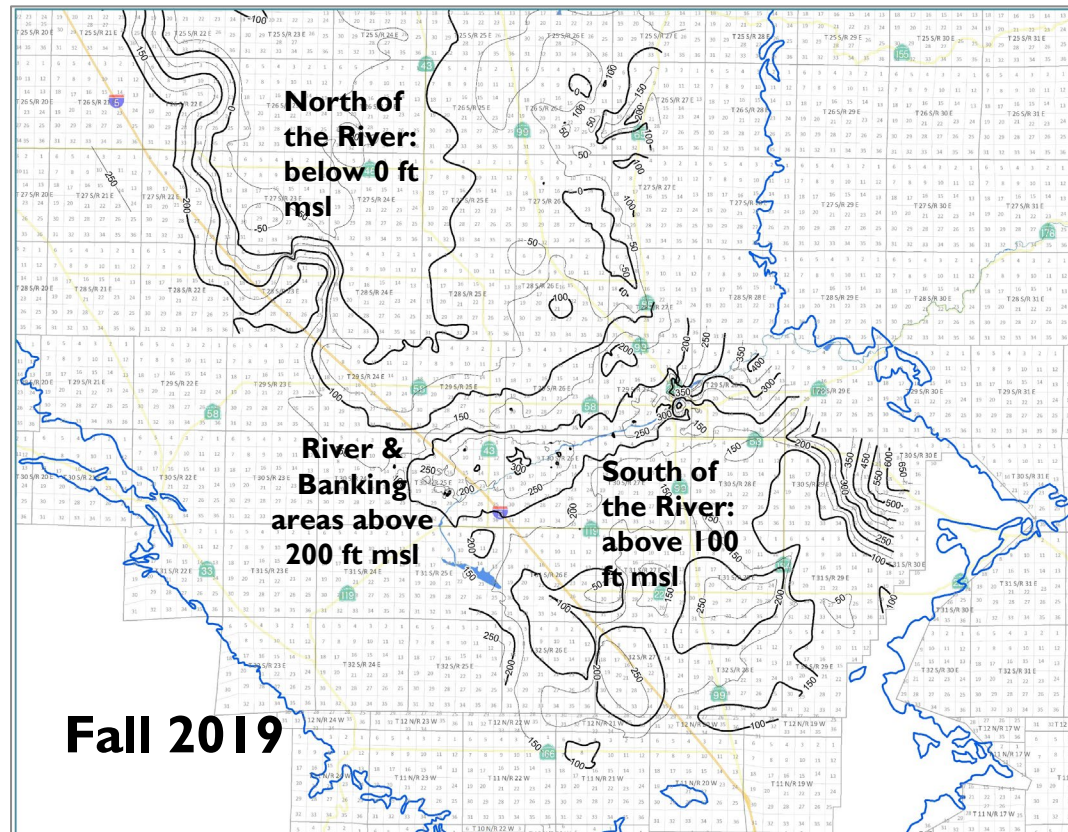


PREVIOUS MAPS CHANGE in GW in STORAGE

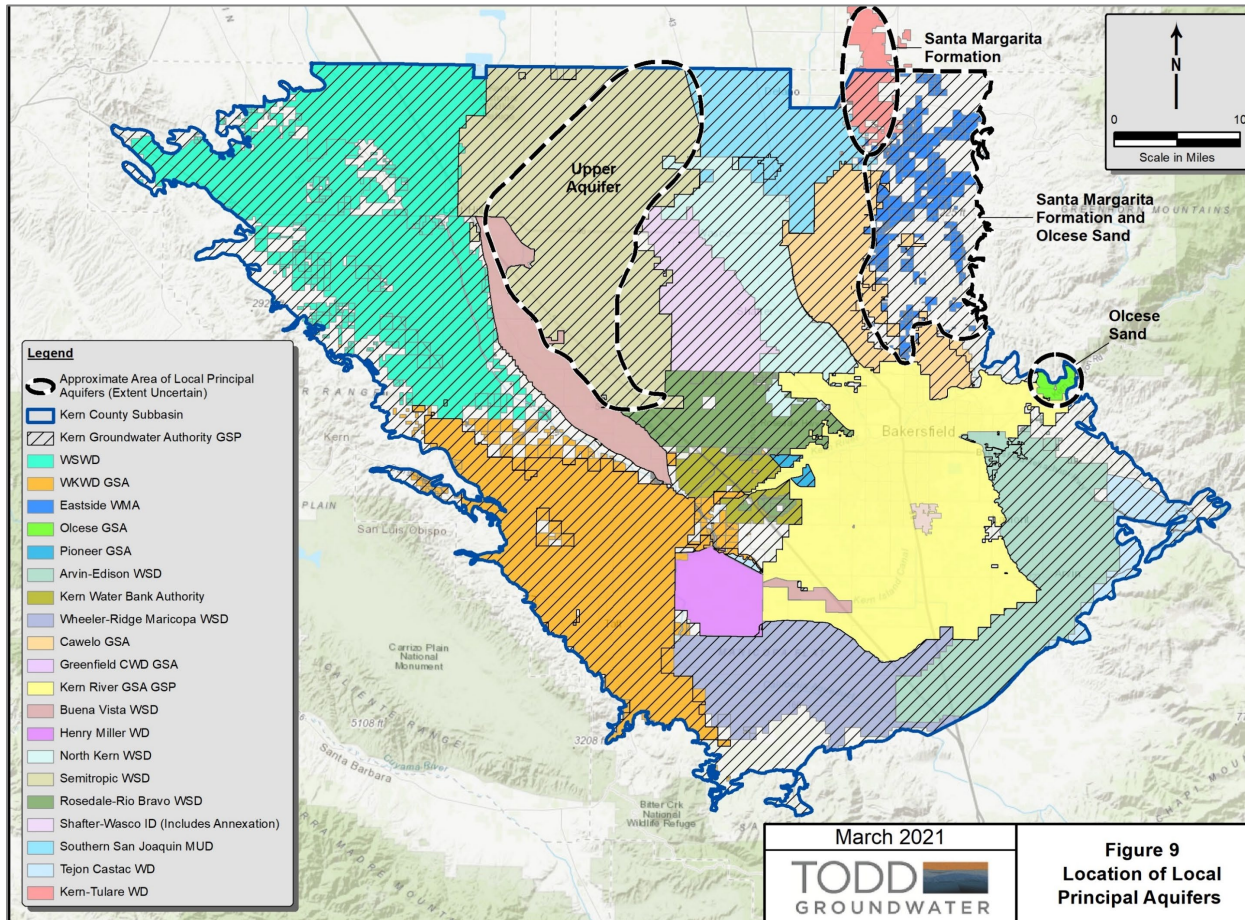
- Subbasin-wide analysis
- Demonstrates the large influence of banking projects on Subbasin water budgets
- Includes some water identified for export

WY 2020 WATER LEVEL CONTOUR MAPS

PRIMARY PRINCIPAL AQUIFER – KCWA

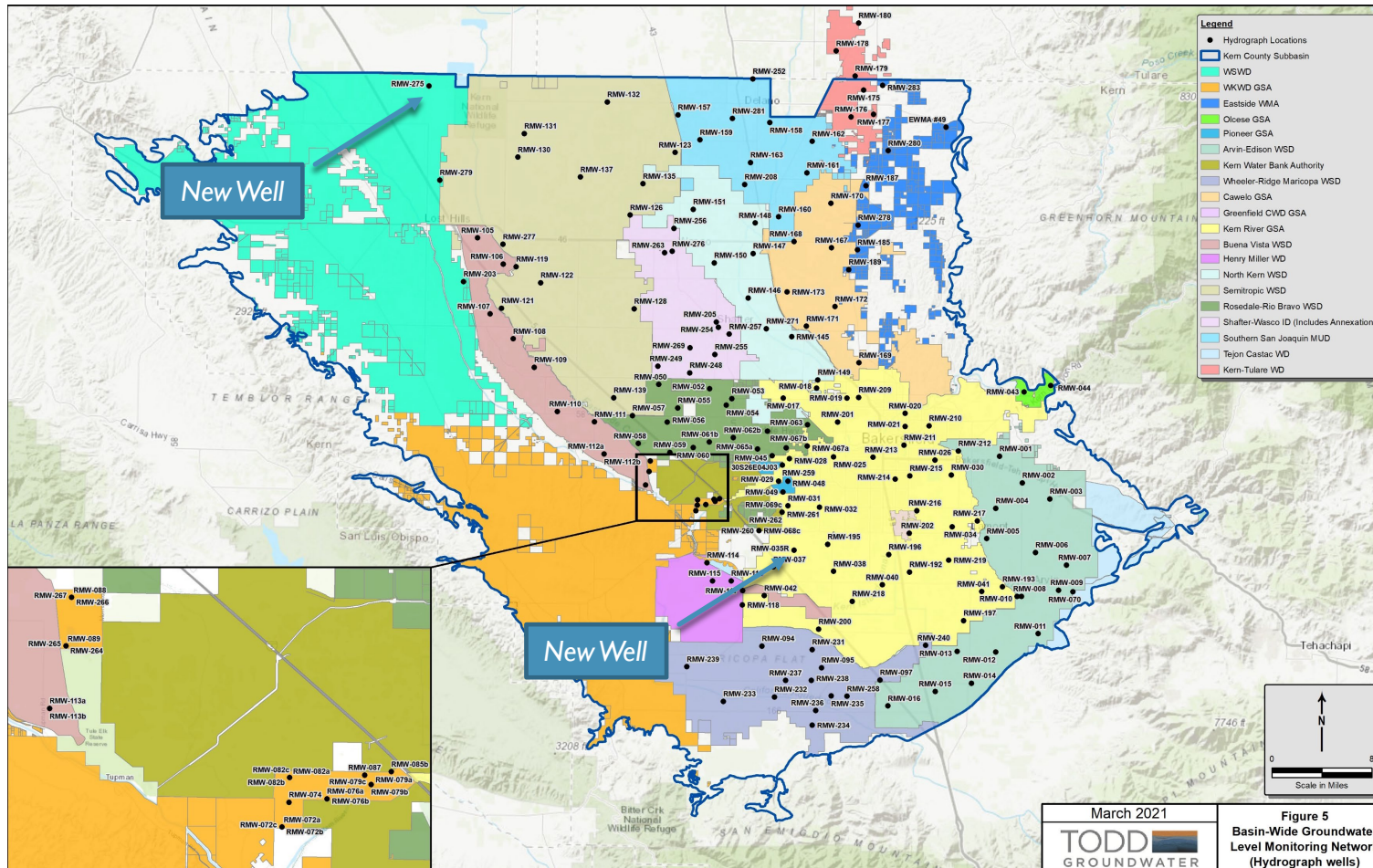


THREE ADDITIONAL LOCAL PRINCIPAL AQUIFERS



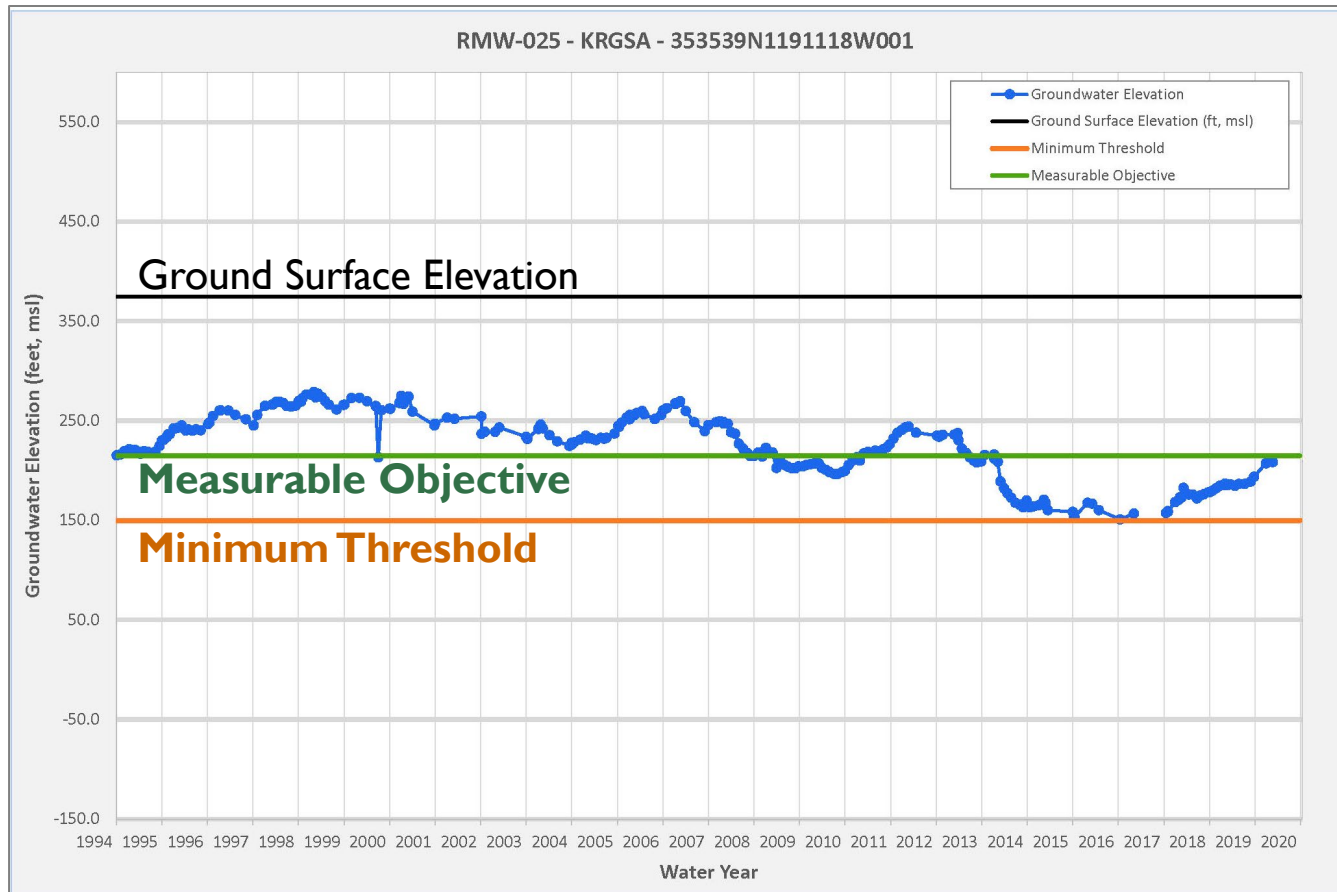
- Three Local Principal Aquifers
 - Upper Aquifer (SWSD)
 - Santa Margarita (KTWD)
 - Santa Margarita & Olcese Sand (EWMA)
 - Olcese Sand (Olcese GSA)
- Contour maps for Olcese Sand by Olcese GSA
- Insufficient data for additional Local Principal Aquifer contour maps
- Remains a requirement for future reports

SUBBASIN GSP MONITORING NETWORK



- More than 200 wells in the Subbasin GSP Monitoring Network
- 2 new wells added in this report (1 KRGSA); 4 wells removed (2 KRGSA)
- Hydrographs for network wells with Minimum Thresholds (MTs) and Measurable Objectives (MOs) in Appendix A

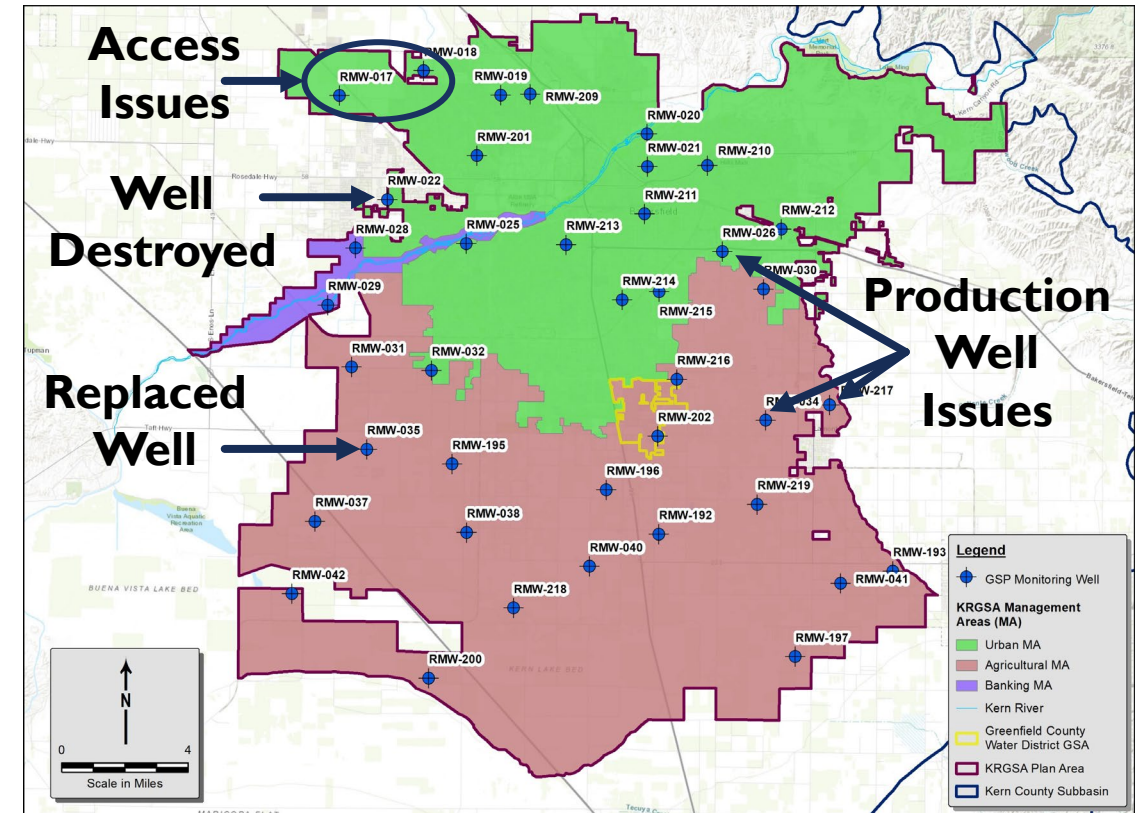
HYDROGRAPHS - APPENDIX A



- Generated 204 hydrographs for GSP Network Wells
- Historical data to the extent available
 - WY 1995 – WY 2020
 - Historical Study Period updated through current reporting period (WY 2020)
- Consistent scales and formatting, to the extent practicable
- Demonstrate compliance with MTs and MOs

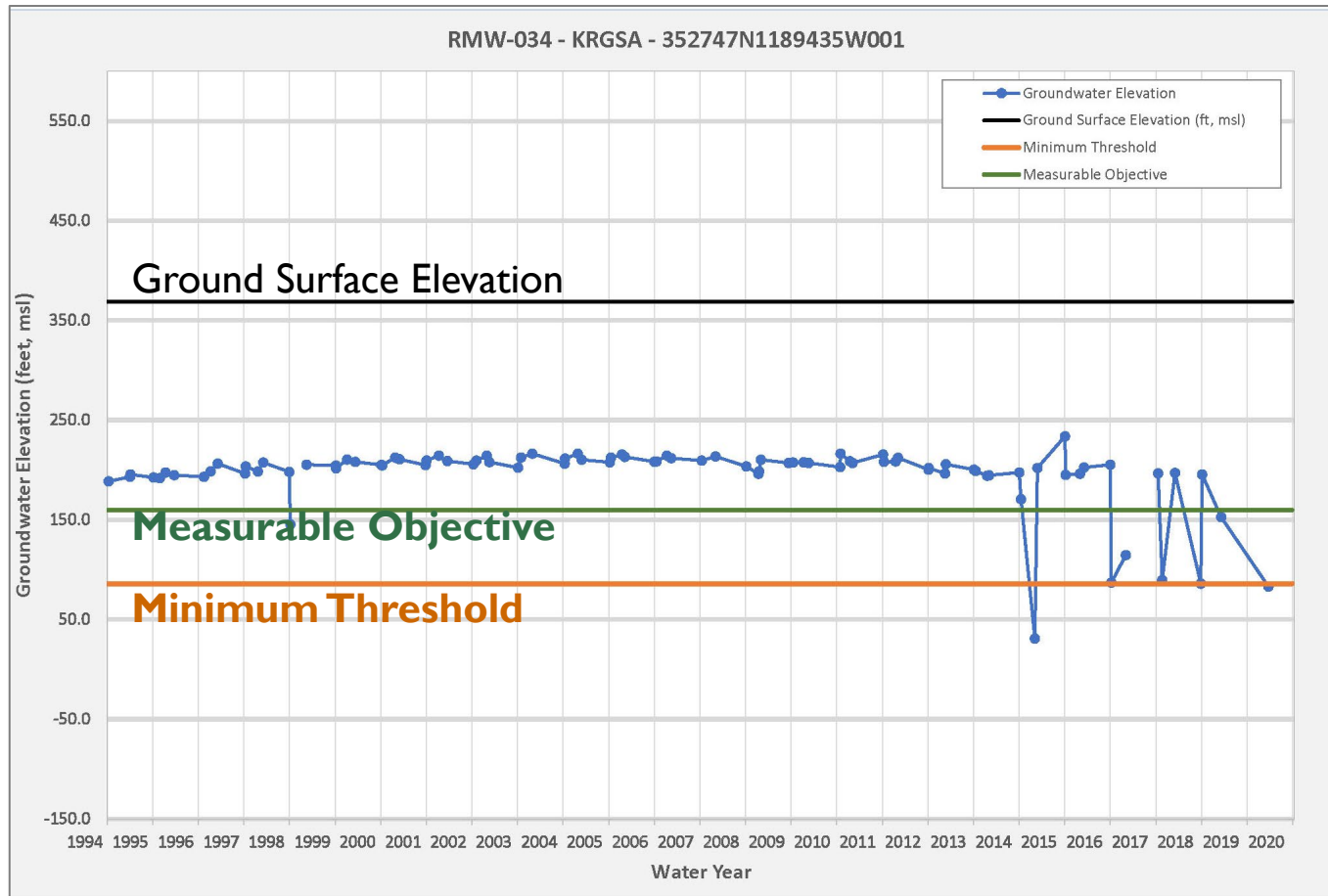
KRGSA WATER LEVEL MONITORING PROGRAM

- Original KRGSA GSP Monitoring Program
- Report semi-annual water level data to the DWR online SGMA portal (coordinated by the Subbasin Plan Manager)
- Lost access to 4 wells
 - City is contacting well owners and researching replacement wells in northwest
 - 1 well destroyed
 - KDWD added a replacement well
- Problems with several active production wells
 - Prevents measurement if pump is running
 - Results in water level declines below Minimum Thresholds, if measured



39 wells in 3 Management Areas

KRGSA HYDROGRAPHS



- Some MT Exceedances in western KRGSA
- Some issues with pumping wells
- Not currently “undesirable results”, but requires investigation

PROGRESS ON GSP IMPLEMENTATION SUBBASIN COORDINATED ACTIVITIES

- Summarize Subbasin-wide activities coordinated by the Basin Coordination Committee (BCC) and in the Subbasin Coordination Agreement
- Initiation of regional subsidence investigations
- Selection of GEI Consultants to develop the Subbasin-wide Data Management System (DMS) (DWR Prop 68 grant)
- Development of approach and scope for C2VSimFG-Kern model revisions and Subbasin-wide Native Yield Study
- Ongoing consideration of installation and monitoring of Subbasin-wide ET stations, funded by Prop I grant
- KRGSA supporting/participating in all Subbasin activities

Kern County Subbasin Coordination Agreement

~~JANUARY 20, 2020~~
THIS COORDINATION AGREEMENT (the "Agreement") is made effective as of January 20, 2020, by and among the Groundwater Sustainability Agencies ("GSA") within the Kern County Subbasin that are developing a Groundwater Sustainability Plan ("GSP") (each a "Party" and collectively the "Parties"), each of which is identified in Appendix 1 and is made with reference to the following facts:

WHEREAS, on September 16, 2014, Governor Jerry Brown signed into law Senate Bills 1168 and 1319 and Assembly Bill 1739, known collectively as the Sustainable Groundwater Management Act ("SGMA"); and

WHEREAS, SGMA requires all groundwater basins designated as high or medium priority by the Department of Water Resources ("DWR") to manage groundwater in a sustainable manner; and

WHEREAS, the Kern County Subbasin (Basin Number 5-22, 14, DWR Bulletin 118) ("Basin") within the San Joaquin Valley Groundwater Basin, has been designated as a high-priority basin by DWR; and

WHEREAS, the Basin includes eleven (11) GSAs that are managing the Basin through five (5) different GSPs; and

WHEREAS, SGMA allows local agencies to engage in the sustainable management of groundwater, but requires GSAs intending to develop and implement multiple GSPs within a basin to enter into a coordination agreement;

WHEREAS, the Agreement does not prevent any Party from providing comments on a GSP, or otherwise coordinating among parties with regard to specific items in a GSP outside this Agreement, on issues including but not limited to specific border conditions between GSP's and/or the timing and/or effect of projects and management actions contained within another GSP; and

WHEREAS, nothing in this Agreement represents or should be construed as the determination of any claim or assertion of a groundwater right; specifically, the coordinated water budget information or data does not amount to an allocation, or otherwise represent a determination, validation, or denial of any claimed or asserted groundwater right.

THEREFORE, in consideration of the facts recited above and of the covenants, terms and conditions set forth herein, the Parties agree as follows:

GSP IMPLEMENTATION PROGRESS REPORTS FROM 19 AGENCIES INCLUDING KRGSA

Progress in GSP Implementation for each GSA/MA

- 1) Compliance with Sustainable Management Criteria
 - a) GSP Monitoring Activities
 - b) Changes in GSP Monitoring Network
 - c) Progress in Achieving Interim Milestones
 - d) Compliance with Sustainable Management Criteria
 - a) Implementation of Projects and Management Actions
 - 1) Coordination with Stakeholders
 - 2) Summary of other GSP-related special studies or activities
- About 46 pages of text and tables



GSP IMPLEMENTATION PROGRESS

KRGSA

- Monitoring Program and progress toward sustainable management criteria
- Implementation of Phase One Projects and Management Actions from the GSP
 - Optimization of Conjunctive Use (City, ID4, KDWD)
 - Expansion of recharge facilities (City, ID4, KDWD)
 - Water quality improvement projects (ENCSD)
 - ID4 support of Delta Conveyance Project (MA 7.2.5)
 - City Technical Assistance to DACs (MA 7.2.7)
 - Policies and procedures being developed to support additional MAs on monitoring improvements, reporting, Action Plans, etc. (7.2.1, 7.2.8, 7.2.4)



QUESTIONS?



TODD 
GROUNDWATER

TODD 
GROUNDWATER