



**EASTERN SAN JOAQUIN
GROUNDWATER AUTHORITY**

**GWA Board Meeting
March 25, 2020**

Annual Report Elements



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For the preceding water year, report on:

- (1) Groundwater elevation data
- (2) Groundwater extraction information
- (3) Surface water supply used or available for use
- (4) Total water use
- (5) Change in groundwater storage

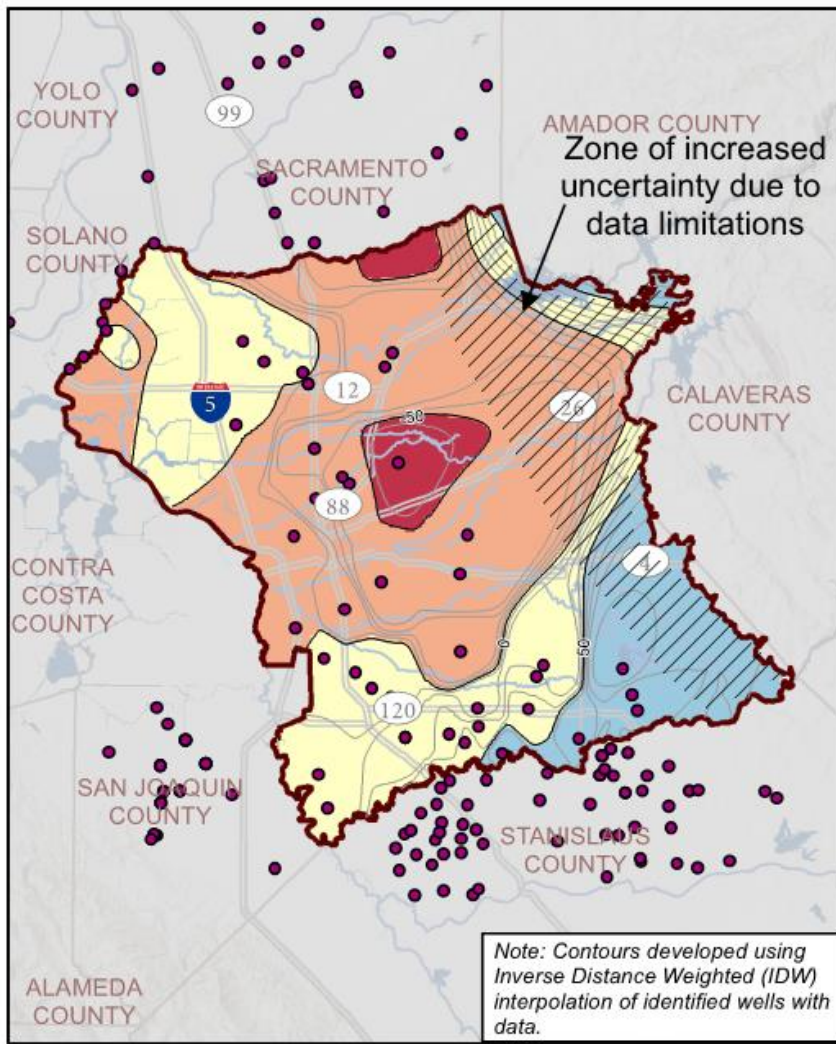
Groundwater Elevations



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- (1) *Groundwater elevation data from monitoring wells identified in the monitoring network shall be analyzed and displayed as follows:*
 - (A) *Groundwater elevation contour maps for each principal aquifer in the basin illustrating, at a minimum, the seasonal high and seasonal low groundwater conditions.*
 - (B) *Hydrographs of groundwater elevations and water year type using historical data to the greatest extent available, including from January 1, 2015, to current reporting year.*

***CA Code of Regs: Article 7 Section 356.2**



**Spring 2019
Groundwater Elevation Map
Eastern San Joaquin Subbasin GSP
Annual Report**

Legend

- Well with 2019 GW Elevation Data
- GW Elevation Contour Lines (50 ft. Interval)
- GW Elevation Contour Lines (10 ft. Interval)
- ▭ Eastern San Joaquin Subbasin Boundary
- Major Highways
- Rivers and Streams
- ▭ Lakes and Waterways
- ▭ County Boundaries

Groundwater Elevation (ft. relative to sea level)

- ▭ < -50
- ▭ -50-0
- ▭ 0-50
- ▭ 50-100
- ▭ >100

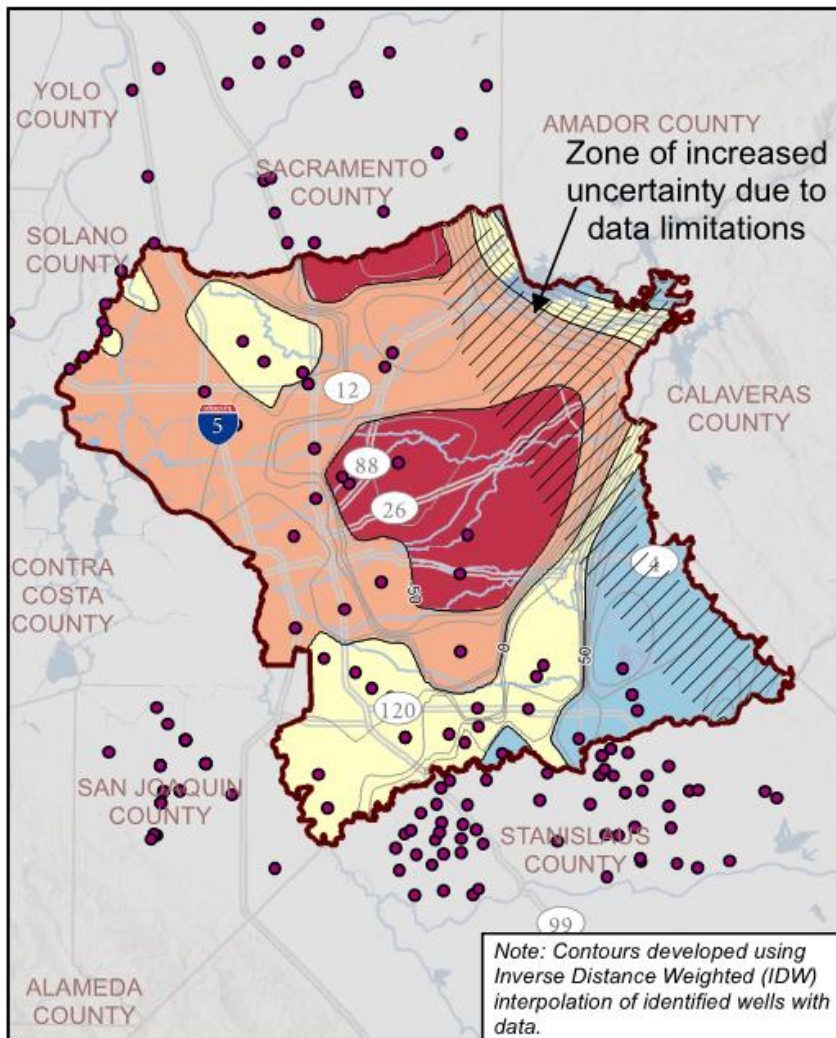
*NAVD 88



Note: Contours developed using Inverse Distance Weighted (IDW) interpolation of identified wells with data.

Seasonal High

- Mapped Groundwater Elevations for Spring 2019 recorded in CASGEM



Fall 2019
Groundwater Elevation Map
 Eastern San Joaquin Subbasin GSP
 Annual Report

Legend

- Well with 2019 GW Elevation Data
- GW Elevation Contour Lines (50 ft. Interval)
- GW Elevation Contour Lines (10 ft. Interval)
- ▭ Eastern San Joaquin Subbasin Boundary
- Major Highways
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Groundwater Elevation (ft. relative to sea level*)

- ▭ < -50
- ▭ -50-0
- ▭ 0-50
- ▭ 50-100
- ▭ >100

*NAVD 88



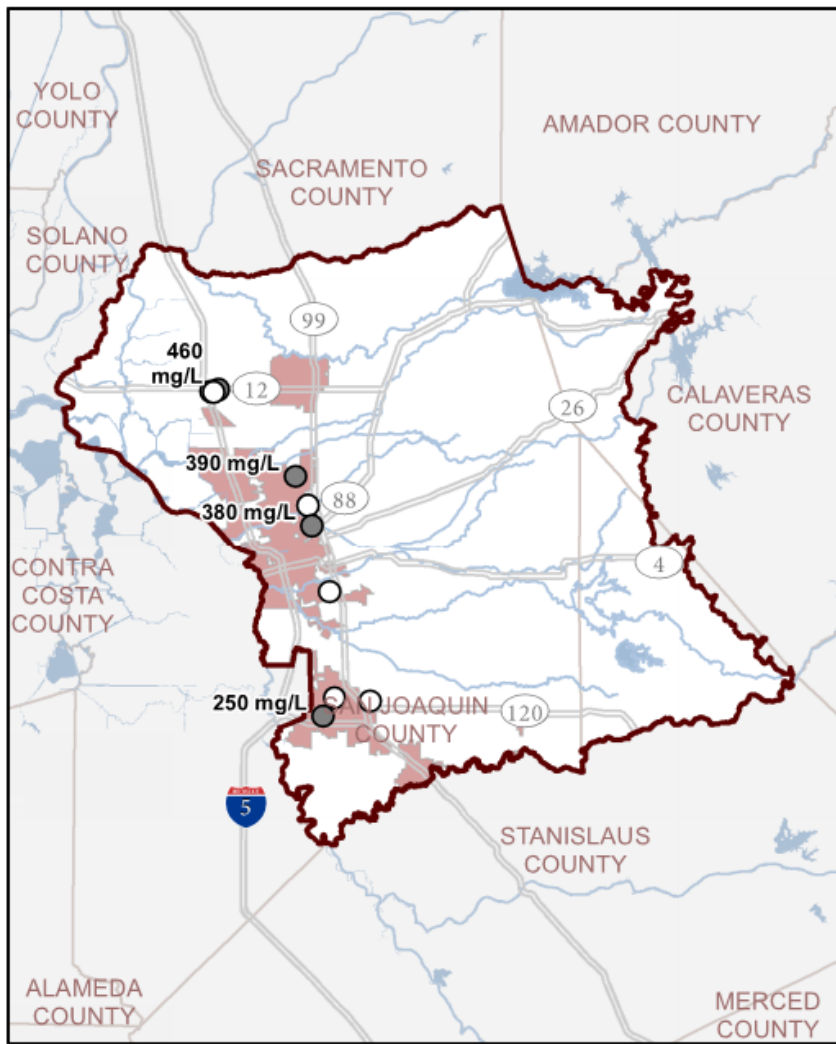
Note: Contours developed using Inverse Distance Weighted (IDW) interpolation of identified wells with data.

Seasonal Low

- Mapped Groundwater Elevations for Fall 2019 recorded in CASGEM

TDS Reported

Total Dissolved Solids Reported Water Year 2019 Eastern San Joaquin Subbasin GSP



Legend

- Eastern San Joaquin Subbasin Boundary
- Major Highways
- Rivers and Streams
- Lakes and Waterways
- County Boundaries
- Cities
- WY 2019 Data Reported
- No WY 2019 Data Reported

0 3.75 7.5 15 Miles



- Mapped TDS measurements, where available, taken at representative water quality wells

ESJWRM Update



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Model-Related Requirements in WY 2019 Annual Report:

(2) Groundwater Extraction

(3) Surface Water Supply

(4) Total Water Use

(5) Change in Groundwater in Storage

ESJWRM Update



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- Historical ESJWRM covers WY 1995-2015
- Requested and received updated water supply data for WY 2016-2019
- Reviewed updated water budgets and groundwater hydrographs

Groundwater Extraction



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(2) Groundwater extraction for the preceding water year. Data shall be collected using the best available measurement methods and shall be presented in a table that summarizes groundwater extractions by water use sector, and identifies the method of measurement (direct or estimate) and accuracy of measurements, and a map that illustrates the general location and volume of groundwater extractions.

Groundwater Use (AF)



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Agencies that provided municipal data:

- Cal Water
- Escalon
- Lodi
- Manteca
- Ripon
- Stockton
- LCWD
- LCSD
- SEWD

Month	Agricultural		Urban and Industrial		Total
	Agency Reported Values	Estimated Agricultural*	Agency Reported Values	Private Domestic*	
Oct-18	0	93,300	2,029	2,200	97,529
Nov-18	0	3,300	1,249	1,700	6,249
Dec-18	0	2,600	899	1,300	4,799
Jan-19	0	1,600	952	1,300	3,852
Feb-19	0	22,800	1,623	1,200	25,623
Mar-19	0	10,300	1,477	1,400	13,177
Apr-19	0	95,000	2,059	1,900	98,959
May-19	0	57,100	3,016	2,700	62,816
Jun-19	0	156,400	3,926	3,200	163,526
Jul-19	0	71,900	4,552	3,700	80,152
Aug-19	0	111,900	4,270	3,600	119,770
Sep-19	0	55,200	3,496	3,000	61,696
Total	0	681,400	29,547	27,200	738,147
Measurement Accuracy	High	Medium	High	Medium	n/a


* Additional groundwater pumping is estimated by the ESJWRM based on crop type, hydrologic data (precipitation and evapotranspiration), irrigation efficiency, and population information.


Groundwater Pumping Map

Annual Groundwater Pumping


Eastern San Joaquin Subbasin GSP
Annual Report


Legend

 Groundwater Sustainability Agencies


 Eastern San Joaquin Subbasin Boundary


Water Year 2019 Average Annual Groundwater Pumping (feet)

 0.0 to 0.5

 0.5 to 1.0

 1.0 to 2.0


 2.0 to 5.0


 5.0 to 10.0

 > 10.0

 Major Highways

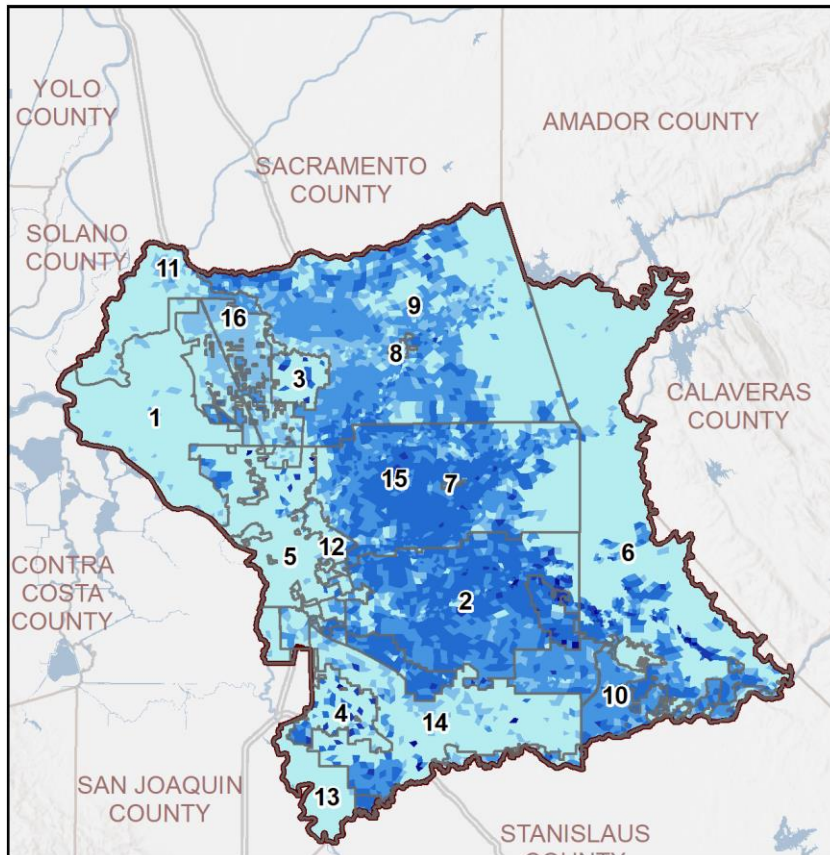
 Rivers and Streams

 Lakes and Waterways

 County Boundaries

Note: Figure shows model outputs, which are subject to uncertainty and future refinements.

0 3.75 7.5 15 Miles



- 1. Central Delta Water Agency
- 2. Central San Joaquin Water Conservation District
- 3. City of Lodi
- 4. City of Manteca
- 5. City of Stockton
- 6. Eastside San Joaquin GSA

- 7. Linden County Water District
- 8. Lockeford Community Service District
- 9. North San Joaquin Water Conservation District
- 10. Oakdale Irrigation District
- 11. San Joaquin County

- 12. San Joaquin County No.2
- 13. South Delta Water Agency
- 14. South San Joaquin Irrigation District
- 15. Stockton East Water District
- 16. Woodbridge Irrigation District

- Mapped total groundwater pumping by ESJWRM element for WY 2019
- Showing units of feet due to differences in element sizes

Surface Water Supply



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(3) Surface water supply used or available for use, for groundwater recharge or in-lieu use shall be reported based on quantitative data that describes the annual volume and sources for the preceding water year.

Surface Water Deliveries (AF)



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Agencies that provided data:

- Cal Water
- CCWD
- CSJWCD
- Lodi
- Manteca
- NSJWCD
- OID
- Stockton
- SEWD
- SSJID
- WID

Month	Agricultural		Urban and Industrial		Total
	Agency Reported Values	Estimated Riparian*	Agency Reported Values	Estimated in ESJWRM*	
Oct-18	16,964	8,100	6,063	0	31,127
Nov-18	2,354	700	5,301	0	8,355
Dec-18	604	300	3,768	0	4,672
Jan-19	651	300	3,532	0	4,482
Feb-19	1,494	1,800	2,423	0	5,717
Mar-19	6,873	3,200	3,220	0	13,292
Apr-19	21,761	10,400	4,734	0	36,895
May-19	32,413	41,400	5,818	0	79,631
Jun-19	42,912	30,800	6,858	0	80,570
Jul-19	48,207	47,700	7,560	0	103,467
Aug-19	46,400	29,000	7,713	0	83,114
Sep-19	28,647	30,100	6,374	0	65,121
Total	249,279	203,800	63,364	0	516,444
Measurement Accuracy	High	Medium	High	Medium	n/a

* Estimated agricultural surface water deliveries include deliveries to Central Delta Water Authority, South Delta Water Authority, and riparian users along major streams.

Groundwater Recharge or In-Lieu Use



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- Agencies conducting in-lieu recharge include Cal Water, CCWD, City of Escalon, City of Lodi, City of Manteca, City of Ripon, City of Stockton, CSJWCD, LCWD, LCSD, NSJWCD, OID, SSJID, SEWD, and WID. Riparian users of surface water are also benefitting from in-lieu recharge.
- Direct recharge projects exist in NSJWCD and SEWD and recharged over 5,500 AF in WY 2019

Total Water Use



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(4) Total water use shall be collected using the best available measurement methods and shall be reported in a table that summarizes total water use by water use sector, water source type, and identifies the method of measurement (direct or estimate) and accuracy of measurements. Existing water use data from the most recent Urban Water Management Plans or Agricultural Water Management Plans within the basin may be used, as long as the data are reported by water year.

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Total Water Use (AF)



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Month	Agricultural		Urban and Industrial		Total
	<i>Direct Measurement</i>	<i>Estimated in ESJWRM*</i>	<i>Direct Measurement</i>	<i>Estimated in ESJWRM*</i>	
Oct-18	16,964	101,400	8,092	2,200	128,656
Nov-18	2,354	4,000	6,551	1,700	14,605
Dec-18	604	2,900	4,667	1,300	9,471
Jan-19	651	1,900	4,483	1,300	8,334
Feb-19	1,494	24,600	4,046	1,200	31,340
Mar-19	6,873	13,500	4,697	1,400	26,469
Apr-19	21,761	105,400	6,793	1,900	135,854
May-19	32,413	98,500	8,834	2,700	142,447
Jun-19	42,912	187,200	10,784	3,200	244,096
Jul-19	48,207	119,600	12,112	3,700	183,619
Aug-19	46,400	140,900	11,983	3,600	202,883
Sep-19	28,647	85,300	9,870	3,000	126,817
Total	249,279	885,200	92,911	27,200	1,254,591
Measurement Accuracy	High	Medium	High	Medium	n/a

* Includes estimated agricultural groundwater use, estimated private domestic groundwater use, and estimated riparian surface water use. See previous tables for further details.

Groundwater Storage



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(5) Change in groundwater in storage shall include the following:

(A) Change in groundwater in storage maps for each principal aquifer in the basin.

(B) A graph depicting water year type, groundwater use, the annual change in groundwater in storage, and the cumulative change in groundwater in storage for the basin based on historical data to the greatest extent available, including from January 1, 2015, to the current reporting year.


***CA Code of Regs: Article 7 Section 356.2**

Groundwater Storage Map

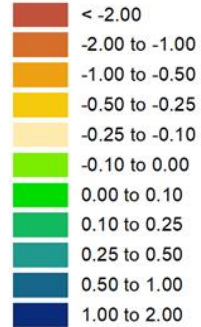
Average Annual Change In Groundwater Storage


Eastern San Joaquin Subbasin GSP
Annual Report

Legend


 Eastern San Joaquin Subbasin Boundary

Water Year 2019 Average Annual Change in Groundwater Storage (feet)



 Major Highways

 Rivers and Streams

 Lakes and Waterways

 County Boundaries

Note: Figure shows model outputs, which are subject to uncertainty and future refinements.



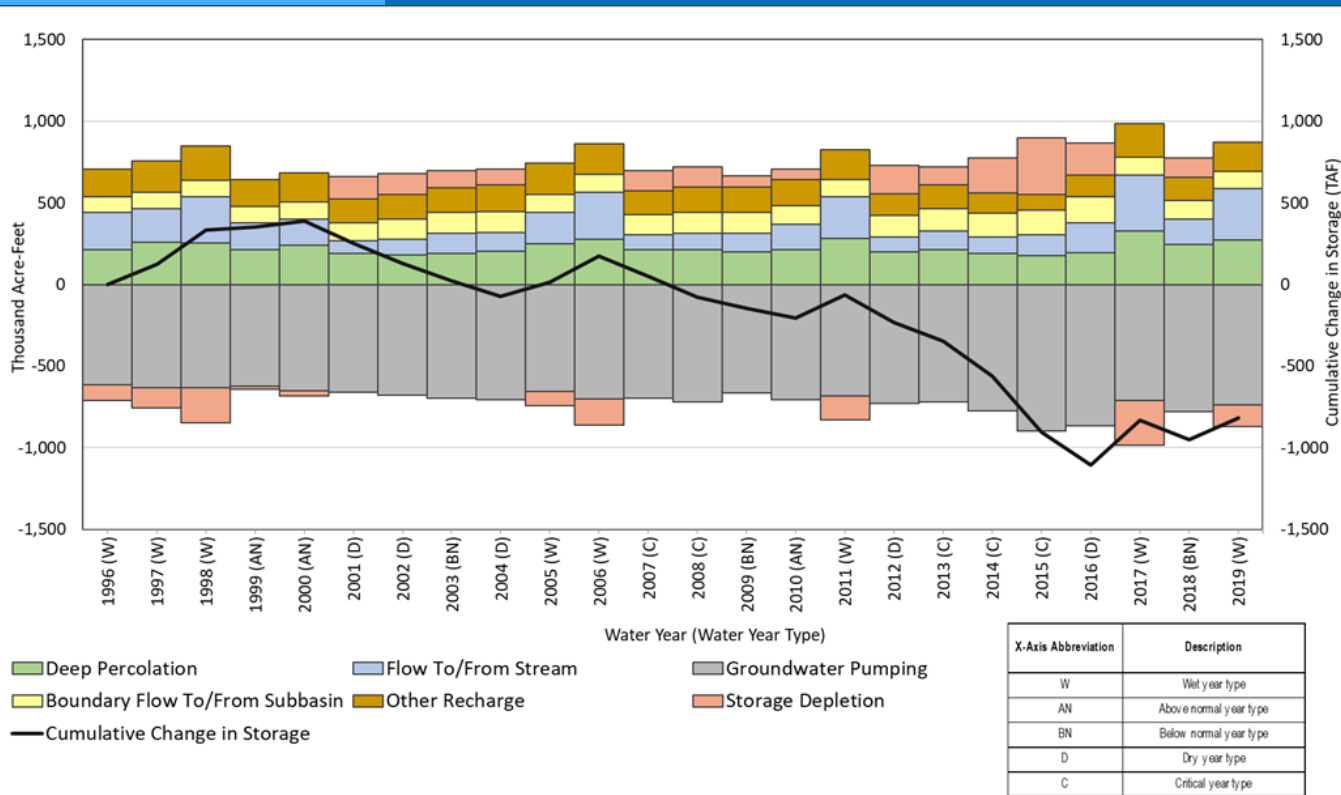
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- Mapped change in storage by model element from end of WY 2018 to end of WY 2019 (September 30, 2018 to September 30, 2019)
- Showing units of feet due to differences in element sizes

Groundwater Storage



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- Storage has increased overall since WY 2016
- Increase of 132,000 AF over WY 2018
- Total freshwater storage: 53 MAF

Annual Report Submittal to DWR



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- **Annual Report Document**
- **GSP Annual Report Elements Guide (“Crosswalk”):** Included in the Annual Report document itself
- **DWR Data Upload Templates**
 - Part A: Groundwater Extractions
 - Part B: Groundwater Extractions Methods
 - Part C: Surface Water Supply
 - Part D: Total Water Use

Schedule



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- 3/17 – Draft AR to TAC for review
- 3/18 – TAC Meeting to review report
- 3/23 – TAC provided comments on AR
- 3/25 – Review AR and proposed recommendation to “accept” the AR and send to DWR by the April 1, 2020 deadline
- 3/25 – GWA Board presentation on AR and action on AC recommendation
- 3/30 – Final AR to County for Screencheck review
- 4/1 - Submittal to DWR

Proposed Action



Proposed Action:

- It is proposed that the GWA Board accept the Annual Report and send to DWR by the April 1, 2020 deadline