



Board of Directors Meeting
February 20, 2020
City Council Chambers, Fillmore City Hall
250 Central Avenue, Fillmore, CA 93015

MINUTES

Directors Present

Director Kelly Long, Chair
Director Ed McFadden, Vice Chair/Secretary/Treasurer
Director Tim Holmgren
Director Gordon Kimball
Director Candice Meneghin (arrived 5:34pm)
Director Glen Pace

Staff Present

Anthony Emmert, executive director
Wayne Lemieux, legal counsel
Kris Sofley, clerk of the board

Public Present

Lisa Ballin, Sacramento State CCP
Bryan Bondy, Bondy Groundwater
Emilio Cervantes, Jr., Five Points
Dan Detmer, UWCD
Zachary Hanson, UWCD
Tim Moore, DBS&A
Tony Morgan, DBS&A
Robert Morris, FBPA/Morris Ranch
George Reid
Steve Zimmer

1. Call to Order – First Open Session

Chair Long called the meeting to order at 5pm.

1A Pledge of Allegiance

Chair Long led everyone in reciting the Pledge of Allegiance

1B Directors Roll Call

Chair Long, Vice Chair McFadden and Directors Holmgren, Kimball and Pace were present for the Directors Roll Call. Director Meneghin was not present, but arrived at the meeting at approximately 5:35p.m.

1C Public Comments

Chair Long asked if there were any public comments. None were offered.

1D Approval of Agenda

Motion

As Executive Director Emmert advised that he would be late to the meeting, the Board decided to move the Executive Director Update to the end of the agenda. Motion to approve the agenda with this one amendment, Vice Chair McFadden; Second, Director Kimball. Voice vote: five ayes (Holmgren, Kimball, Long, McFadden, Pace); none opposed; one absent (Meneghin). Motion carries unanimously.

2. Updates

2A Director Announcements/Board Communications:

Fillmore Pumpers Association Stakeholder Director Update

Director Kimball reported that the FPA Board was dark in February and that he wouldn't be available for the scheduled May 21 FPBGSA Board meeting.

Piru Pumpers Association Stakeholder Director Update

Director Pace reported that the PPA Board was dark in February and that he would be unavailable for the FPBGSA Board meeting in April.

Environmental Stakeholder Director Update

Director Meneghin was not present.

City of Fillmore Member Director Update

Director Holmgren stated that he had nothing to report.

United Water Conservation District Director Update

Vice Chair McFadden reported that United Water Conservation District would be hosting the Water Sustainability Summit on February 28 and encouraged everyone to participate.

County of Ventura Director Update

Chair Long reported her participation at the Piru Neighborhood Council Meeting and commented that the presentation on Lake Piru included documentation that the 15,000 acre foot water release from the lake had direct benefit to Piru and Fillmore basins due to percolation rates and that when water is released, even though it is intended to benefit basins in Oxnard, everyone benefits from these releases. She said the release was a reminder to all stakeholders of the benefits resulting from these efforts. She also reminded Board members that on March 10, from 7 to 9pm, there would be a "Water Talks" event at Piru Elementary.

2B Executive Director Update

Information Item

The Executive Director advised that he would be late to the meeting, so this item was moved to the end of the agenda.

2C Legal Counsel Update

Information Item

Legal Counsel reported that with the passing of Resolution 2020-01, adopting a Social Media policy, he had updated the FPBGSA bylaws. He also suggested that each of the Board Members take an Oath of Office at the next meeting for inclusion in the Agency's Administrative Record.

2D GSP Consultant Update

Information Item

Tony Morgan of Daniel B Stephens & Associates discussed the schedule for upcoming meetings, including Projects and Management Actions which would be discussed in March, along with an Introduction of Sustainable Management Criteria. He stated that in April, the discussion would continue regarding Sustainable Management Criteria and would also include Groundwater Dependent Ecosystems (GDEs). Mr. Morgan also stated that there would be a review of the Communications and Engagement Plan and an agenda proposed for the upcoming April 2 Stakeholder Workshop.

3. CONSENT CALENDAR

All matters listed under the Consent Calendar are considered routine by the Board and will be enacted by one motion. There will be no separate discussion of these items unless a Board member pulls an item from the Calendar. Pulled items will be discussed and acted on separately by the Board. Members of the public who want to comment on a Consent Calendar item should do so under Public Comments. (ROLL CALL VOTE REQUIRED)

Clerk of the Board reported that Director Meneghin had emailed her with numerous changes to the Minutes from the January 16 Board meeting, but it was unclear if all were errors that needed to be corrected, omissions, or additional information the Director wanted included in the Minutes. The Board decided unanimously to extract item 3A from the Consent Calendar and hold the motion for that one item until Director Meneghin arrived at the meeting to provide clarification.

3A Approval of Minutes

The Board will consider approving the Minutes from the Board Meeting of January 16, 2020.

Motion to approve Consent Calendar items 3B and 3C, Director McFadden; Second, Director Kimball.
Roll call vote: five ayes (Holmgren, Kimball, Long, McFadden, Pace); none opposed, one absent (Meneghin). Motion carries unanimously 5/0/1.

3B Approval of Warrants

The Board will consider approving the following invoices for payment:

Olivarez Madrugá Lemeiux O'Neill LLP	\$ 710.50
Daniel B. Stephens & Associates	\$20,865.94
U.S. Postal Service	\$ 254.00
City of Fillmore (rental of Veterans Memorial Bldg)	\$ 125.00

3C Monthly Financial Report

The Board will receive a monthly profit and loss statement and balance sheet for the FPBGSA from UWCD's accounting staff.

4. ACTION ITEMS

4A Draft Stakeholder Communications and Engagement Plan

Motion

Consultant Lisa Ballin Board led the Board through a review of the Draft Stakeholder Communications and Engagement Plan that had been crafted by the ad hoc committee in collaboration with the Agency's consultants. Chair Long asked if there were any questions or comments from the Board.

Director Kimball called the Board's attention to page 6 of the draft document, to the last paragraph on the page, the portion of the sentence following the bolded Table 2. He said it appeared that the word "to" was missing from in front of "the FPBGSA."

Ms. Ballin went on to explain that Table 1 (page 8) was taken verbatim from DWR guidelines.

Director Kimball suggested that on page 9, in the second paragraph under FPBGSA Board meetings, the text should read "Information presented at Board Meetings, Public Forums and Workshops will also be presented and expanded upon at Stakeholder Workshops as described below."

Director Holmgren suggested that the first sentence in that same paragraph should state: "...will make presentations and hold public discussions and workshops on various aspects of GSP development." Ms. Ballin said that Board meetings are public forums.

Director Kimball suggested that Table 2 (page 9) should be added to the FPBGSA website's homepage as it provided options for the public to provide input to the Agency's GSPs. Vice Chair McFadden said there is a lot of good information on the Agency's

website. Ms. Ballin asked if the Agency used Twitter or Instagram and the Clerk of the Board replied that the Agency was only using Facebook.

On page 13, under the heading Consideration and Use of Public Input, on number 4, it was suggested that the text be changed to read: “The Agency will highlight public input received at each public meeting (questions and comments) in meeting minutes, which will be available on its website *when the minutes are approved*.”

At approximately 5:35p.m., Director Meneghin joined the meeting.

On Appendix A – Director Kimball asked that Santa Clara Elementary School District be added and a Chumash representative (Julie Tumamait-Stenslie, Tribal Chair of the Barbareño/Ventureño Band of Mission Indians (Chumash) was suggested by the Clerk of the Board). Director Kimball also pointed out that the Ventura County Fire Department was listed twice.

On Appendix E, #9, make the request for providing name, phone number and email optional and more prominent, and put it on both the front and back of the evaluation form.

Motion to approve the Draft Stakeholder Communications and Engagement Plan with the changes provided by the Board, Director McFadden; Second, Director Pace. Voice vote: six ayes (Holmgren, Kimball, Long, McFadden, Meneghin, Pace); none opposed. Motion carries unanimously 6/0.

4B Agenda Outline for Stakeholder Workshop on April 2, 2020

Motion

Board reviewed the Agenda Outline for the Stakeholder Workshop scheduled for April 2, 2020 at the Veterans’ Memorial Building in Fillmore with Ms. Ballin.

Director Pace said presentations should be five to 10 minutes and there should be an introduction explaining what the Agency has been doing. He said he would attend the Piru Neighborhood Council meeting on March 18 at 7pm and invite them to attend the workshop as well as a follow-up presentation on April 15 at the Piru Neighborhood Council. Clerk of the Board said she would reach out to Irene (Manny) to confirm participation.

Ms. Ballin said the agenda was for general framing, focusing on what the Agency is and why the Agency is doing the GSP and outreach and what ratepayers and stakeholders are getting for the money they’re paying.

Director Kimball asked that, under the bullet point “keep it simple” the language needs to change to say the Agency needs to manage and oversee groundwater, not regulate.

Under model presentation, first bullet, explain what the model is and *how* not why the GSA *will be using it*. Remove the third bullet re: Public input on planned and potential projects.

Mr. Morgan said the model would be used to run various scenarios to determine effect of projects. Chair Long said that wasn't in the budget, but maybe in the future.

Ms. Ballin went back to the agenda and said there would be brief presentations with long questions and answer sessions.

Director Kimball said he thought it was risky to take questions. Vice Chair McFadden said it should be a judgement call based on reading the audience. Ms. Ballin suggested using comment cards for questions. Vice Chair McFadden suggested quickly announce the facts then take questions.

Ms. Ballin suggested a two-hour meeting then asked the Board to review the proposal submitted by Sky Productions for videotaping the workshop. Ms. Ballin also went through costs for translation/interpretation which was \$400 for the entire meeting and a minimum charge of \$235 if no one at the meeting required language assistance. Vice Chair McFadden suggested determining in advance of the meeting if anyone requested or required language assistance. Ms. Ballin suggested including language assistance on the flyer. Director Kimball suggested making the service available and then nobody has to be excluded or request it. Ms. Ballin suggested having the language service at the first meeting to see if ratepayers/stakeholders need this service.

Director Meneghin said the videographer's estimate for taping the workshop was \$550 (\$400 without editing) for viewing after the meeting. Ms. Ballin said that she suggested Facebook live stream/webinar but there is no Wi-Fi at Veterans Memorial and a hot spot would be questionable.

Chair Long departs at 6pm

Vice Chair McFadden suggested webcast only, no interaction. Ms. Ballin said that if the public were simply viewing the workshop, not interacting, it would simplify the recording.

Director Pace said the public could ask questions later which would avoid the live technical issues. The Board members discussed various scenarios for taping, live streaming the workshops. Director Pace preferred to record and post the video for viewing after the workshop. Director Kimball suggested paying for editing to include the PowerPoint presentations.

Motion to approve the plan for the Stakeholder Workshop, including the agenda and expenses, scheduled for April 2, 2020 at the Veterans' Memorial Building in Fillmore, Director Meneghin; Second, Director Holmgren. Voice vote: five ayes (Holmgren, Kimball, McFadden, Meneghin, Pace); none opposed; one absent (Long). Motion carries unanimously 5/0/1.

4C Resolution 2020-01 Amending Agency Bylaws

Motion

Legal counsel reported that the County's legal counsel was not required to approve or provide input regarding the Agency's bylaws, so the Board was free to consider approving Resolution 2020-01 amending the Agency's bylaws with Article 15 (Social Media policy).

Motion to adopt Resolution 2020-01 approving the amendment of the Agency's bylaws to include Article 15, Social Media Policy, Director Kimball; Second, Director Holmgren. Voice vote: five ayes (Holmgren, Kimball, McFadden, Meneghin, Pace); none opposed; one absent (Long). Motion carries unanimously 5/0/1.

5. INFORMATION ITEMS

5A Summary of Historical Water Budgets

Information Item

UWCD's Dr. Zachary Hanson presented an historical overview of the area's water budgets (see attached presentation).

Director Meneghin asked if, in addition to the UWCD monitoring wells, did the Historical Water Budget include USGS gauges, to which Dr. Hanson replied yes. He went on to say that the last study done in the basins was in the 30s and 50s and that those studies provided a good idea as to what the basins are capable of. He then presented data from 1927 through to 2017. He also said that current numerical modeling, which is what United Water is doing now, will develop more rigorous water budgets for future use. He added that Water Budget components will be detailed in the documentation for the GSPs.

Vice Chair McFadden asked if there was room in the system, the available storage, for more water and what the difference in storage was between the two basins. Dr. Hanson explained there was useable storage and available storage and is relative to where you define the lowest limit of the basin. Dr. Hanson explained that a review of all previous basin conditions, wet conditions, droughts, state water purchases, basin boundary changes, the new boundaries were expanded which will impact budgets and will impact total acre feet capacity.

Director Meneghin asked how the Water Budget incorporates flow into Piru from Pyramid, the State Water facility, and if climate change is being adequately considered. Dr. Hanson said that he's thinking of those situations. Mr. Detmer from UWCD said that the water rights for State Water were owned by UWCD. Director Kimball said the GSP will be reviewed and potentially revised every five years and every ruling will impact the GSPs. Director Meneghin said DWR and LADWP have to release water for current conditions which could be a benefit to the Fillmore and Piru basins. Mr. Detmer said the District is looking at realistic scenarios but the discussion today is on historical data, wastewater discharges, planning advance treatment has taken Santa Clarita Valley 25 years, but he expects more

of that water will be recycled and once the water is cleaned up, it is likely to have a negative impact on the Fillmore and Piru basins.

Dr. Hanson explained that State Water was introduced to Santa Clarita Valley in 1980 and, along with urban growth, has impacted the downstream basins. Director Holmgren asked about current conditions and was interested in hearing about drilling up north of Fillmore and if that had an impact on Fillmore's water.

Tim Moore of DBS&A said that was addressed at earlier Board meetings and that he would get that information to Director Holmgren. Director Pace asked who prepares the water budget. Mr. Morgan said that Dr. Hanson was researching the historical data and that United Water would take the first cut at the technical budget. Director Pace asked about the first cut of the Water Budget and Mr. Morgan said there is historical, current, projected, which comes later in the process or later in the year, and the model which will be available at the end of May. Mr. Detmer added the historical calibration generates more data. Director Pace said the Agency needs the budget to make decisions. Mr. Morgan said that he didn't see a water budget anywhere in SGMA/GSP. He explained that it is a calibration approach as opposed to modeling, which is used to forecast and predict. He added that the budget is a realistic and reasonable tool to use to determine sustainability criteria.

Director Pace said the Board would need that information sooner and that he was anxious to see the data. Dr. Hanson said it would probably be late March or early April and could even be the end of May before the model was up and running and was able to post processing results as its calibration is still being checked. Vice Chair McFadden thanked Dr. Hanson stating that he provided a very good presentation.

Executive Director Emmert arrives at approximately 6:53p.m.

5B Monitoring Plan and Data Gaps presentation

Information

Daniel B. Stephens & Associates' Tim Moore presented an overview of the Agency's Monitoring Plan and Data Gaps (see attached presentation) and explained that he was in the process of writing a technical memorandum. He stated that Best Management Practices #2 included historical data sets and established monitoring sets in the technical memorandum components. He said the consultants would also be looking at chloride, sulfate and nitrate levels, County annual reports and try to find data to fill in the time and space gaps. He explained that the focus would be on groundwater levels and quality and the location of stream flow gaging. He said subsidence and ecological memos would be covered in another technical memorandum. He then explained the various slides in his presentation in relation to SGMA requirements.

Director Meneghin asked if they had identified which wells are probably abandoned. Mr. Moore replied that abandoned or old wells haven't been or were not permitted so it's hard to tell, and then pointed out that the wells that were destroyed were indicated on the chart.

Vice Chair McFadden asked if the County was actively pursuing proper destruction of wells. Mr. Moore completed his presentation and stated that next steps included drafting the technical memo, reviewing that internally and then passing it on to UWCD staff for their review and that it would be an appendix to the GSP. Director Meneghin asked if the Board would see a final version of the memo for its review and Mr. Morgan said information would be provided in various sessions and that the best available data was being used. He added that the Board decides if more aquifer specific information had a bearing on basing management.

Bryan Bondy, a consultant hired by the Pumpers Associations asked to make a comment. He stated that the principal aquifer in the GSP, the Board has discretion. He said the risk with DWR is that they're reasonable perspective, not basin, but aquifer with distinct zones. How much connection between the zones do they need to be managed separately? He said start with more generic details and tell the story to DWR. If monitoring is required, the GSP update can evaluate before the memo is finalized. It's a foundational item, take small steps back and reassess, including future costs. Data gaps and technical perspective, GSPs identify gaps in the sustainability criteria. He also asked where in the process is the opportunity for the stakeholder s to provide input.

Director Kimball asked if dividing basins is too much and clarified by stating this is a policy question. Mr. Bondy said its an interface of technology and policy. Director Meneghin asked if there were pros and cons of the gap approaches. Director Pace said that the position from DBS&A was that there were three distinct basins or zones, then he restated saying, zones, layers, primary aquifer that technically it is all the same. Vice Chair McFadden said there are upper and lower aquifers and not a lot of water movement between them, different strata in one big bowl. Mr. Moore said with unconfined storage calculations and more additional data does it make sense to carve out distinct areas for this presentation and added that whether it's the final scheme is the Board's decision. Vice Chair McFadden said the difference is in connectivity. Mr. Moore said it is conditioned on 13 layers of the model and constructed in different ways to describe. Director Kimball said he worries about clearly defining certain layers that can be confined, adding that the Board doesn't call layers aquifers and then what impact does that have on monitoring. Vice Chair McFadden said it's the same bowl of water. Director Kimball said there needs to be a decision regarding the definition of what is an aquifer and what is not an aquifer. Director Pace agreed, stating that decision makes a big difference in work, especially regarding data gaps.

The Board addressed item 3A from the Consent Calendar, with a motion to approve the Minutes from the January FPBGSA Board meeting as amended, from Director Pace; Second, Director Meneghin. Voice vote: five ayes (Holmgren, Kimball, McFadden, Meneghin, Pace); none opposed; one absent (Long).

FUTURE TOPICS FOR BOARD DISCUSSION

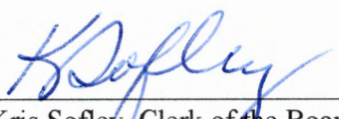
Suggestions from the Board regarding future Board discussion topics include: a presentation on “Safe Harbor” agreements; presentation of potential projects that make sense to the Board at some time in the future when the needs of the GSA are known and the Board can explore all the options out there; a schedule of deliverables from the consultants; explore if Santa Clara River Conservancy would be interested in collaborating on restoration projects.

ADJOURNMENT 7:54p.m.

Vice Chair McFadden adjourned the meeting at 7:54p.m. to the next **Regular Board Meeting** on Thursday, **March 19, 2020** or call of the Chair.

ATTEST: 
Kelly Long, Chair, FPB GSA Board of Directors

I certify that the above is a true and correct copy of the minutes of the Fillmore and Piru Basins Groundwater Sustainability Agency’s Board of Directors meeting of February 20, 2020.

ATTEST: 
Kris Sofley, Clerk of the Board



BOARD MEETING & PUBLIC HEARING

February 20, 2020 @ 5:00pm

City Council Chambers, Fillmore City Hall

250 Central Avenue, Fillmore, CA 93015

Name: Zach Hanson

Organization: United Water

Phone: _____

E-mail: _____

Name: Tony Monagan

Organization: DBS & A

Phone: _____

E-mail: _____

Name: Steve Zimmer

Organization: _____

Phone: _____

E-mail: _____

Name: Emilio Cervantes Jr.

Organization: Five Point Newhall

Phone: _____

E-mail: _____

Name: LISA BALLIN

Organization: Sac State CCY

Phone: _____

E-mail: _____

Name: Bryan Bondy

Organization: B6C

Phone: 805

E-mail: bryan@bondygroundwater.com

Name: Don Detmer

Organization: UWCD

Phone: _____

E-mail: _____

Name: Tim Moore

Organization: DBS & A

Phone: _____

E-mail: _____

Name: A Reid

Organization: _____

Phone: _____

E-mail: _____

Name: ROBERT MORRIS

Organization: FBPA / MORRIS IRIGA

Phone: 805 231 4085

E-mail: FARMOR1303@I2ARTUCINE.NET

GSP Update

- Board Discussion Topics / Schedule
- Communication & Engagement Plan (CEP) - Agenda Items 4A
- Agenda Outline for Stakeholder Engagement Workshop (02Apr20) - Agenda Item 4B
- Summary of Historical Water Budgets - Agenda Item 5A
- Monitoring Plan and Data Gaps - Agenda Item 5B



DBS&A
Daniel B. Stephens & Associates, Inc.

Board Discussion Topics / Schedule

	Topic 1	Topic 2	Topic 3
Feb-2020	Water budget (historical data) (UWCD)	Monitoring Networks & Plan	Data Gaps
Mar-2020	Projects & Management Actions, cont'd	Intro to Sustainable Management Criteria	
Apr-2020	Sustainable Management Criteria, cont'd	GDEs	

- Proposed technical topics for discussion at Board meetings
- Introduction to important elements in the GSP
- References to suggested reading materials (e.g., DWR Best Management Practices or Guidance Documents) - resources on flash drive

Reference / Background Materials

Mar
2020

- *BMP Sustainable Management Criteria*
- *CCR § 354.22 Introduction to Sustainable Management Criteria*



DBS&A
Daniel B. Stephens & Associates, Inc.

Reference / Background Materials - Feb 2020

- **BMP Sustainable Management Criteria**

https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/BMP-6-Sustainable-Management-Criteria-DRAFT_ay_19.pdf

- **CCR § 354.22 Introduction to Sustainable Management Criteria**

[https://govt.westlaw.com/calregs/Document/I86E380AB2D89470B951D8393BE80E831?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=\(sc.Default\)](https://govt.westlaw.com/calregs/Document/I86E380AB2D89470B951D8393BE80E831?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=(sc.Default))

Questions ?



DBS&A
Daniel B. Stephens & Associates, Inc.

Fillmore and Piru Basins: Summary of Historical Water Budgets

Zach Hanson, PhD, Assistant Hydrogeologist, United Water Conservation District

Fillmore and Piru Basins GSA Board of Directors Meeting
Thursday, February 20, 2020



Water Budget and SGMA/GSP Context

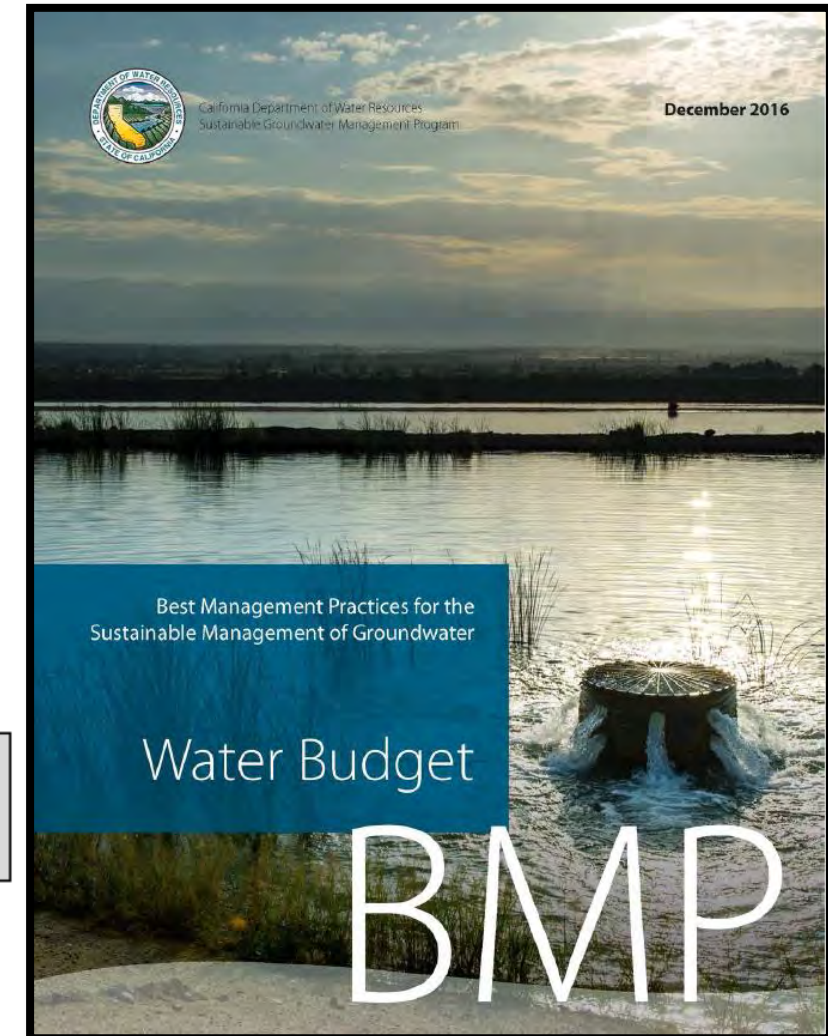
- CA Department of Water Resources (DWR)
BMP #4 – Water Budget

<https://water.ca.gov/Programs/Groundwater-Management/SGMA-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents>

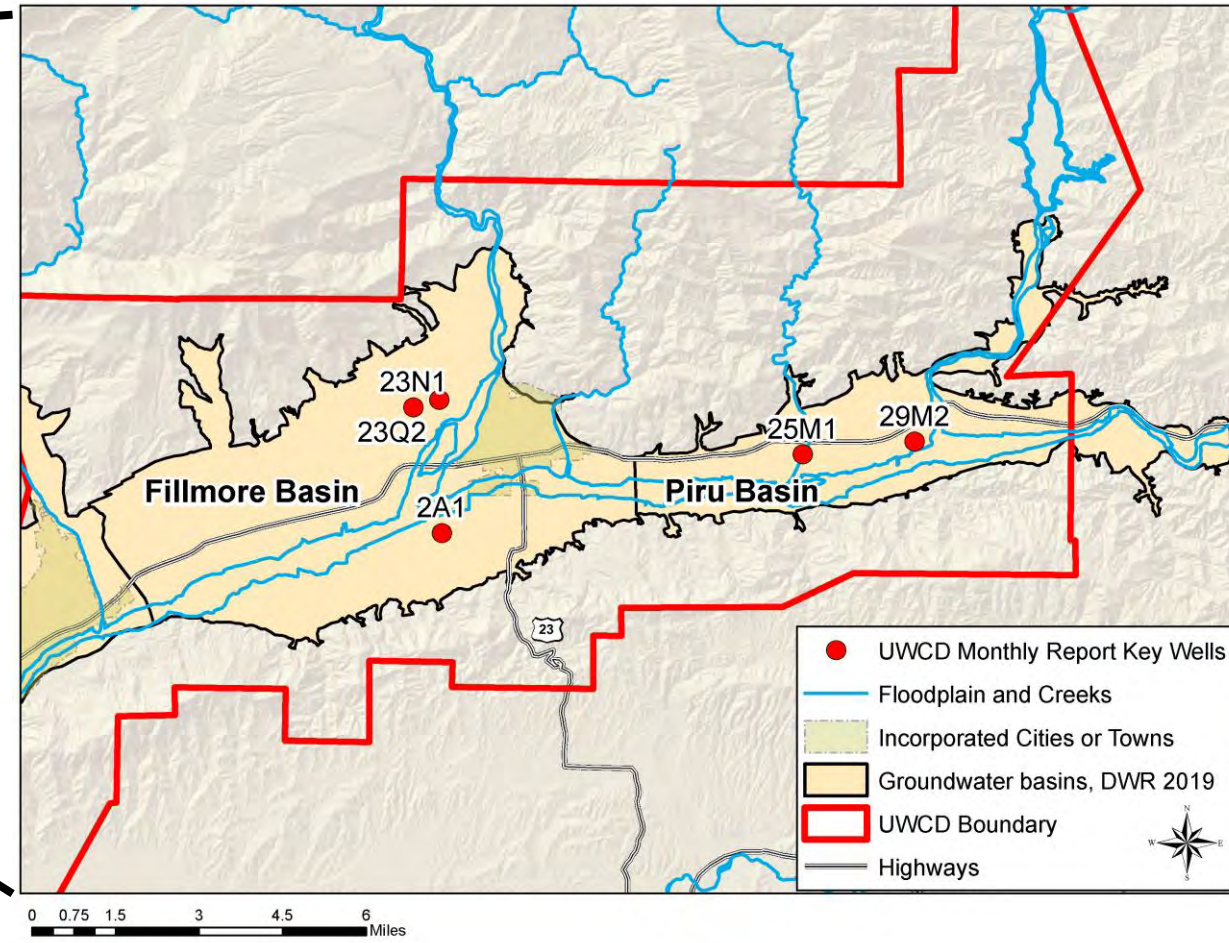
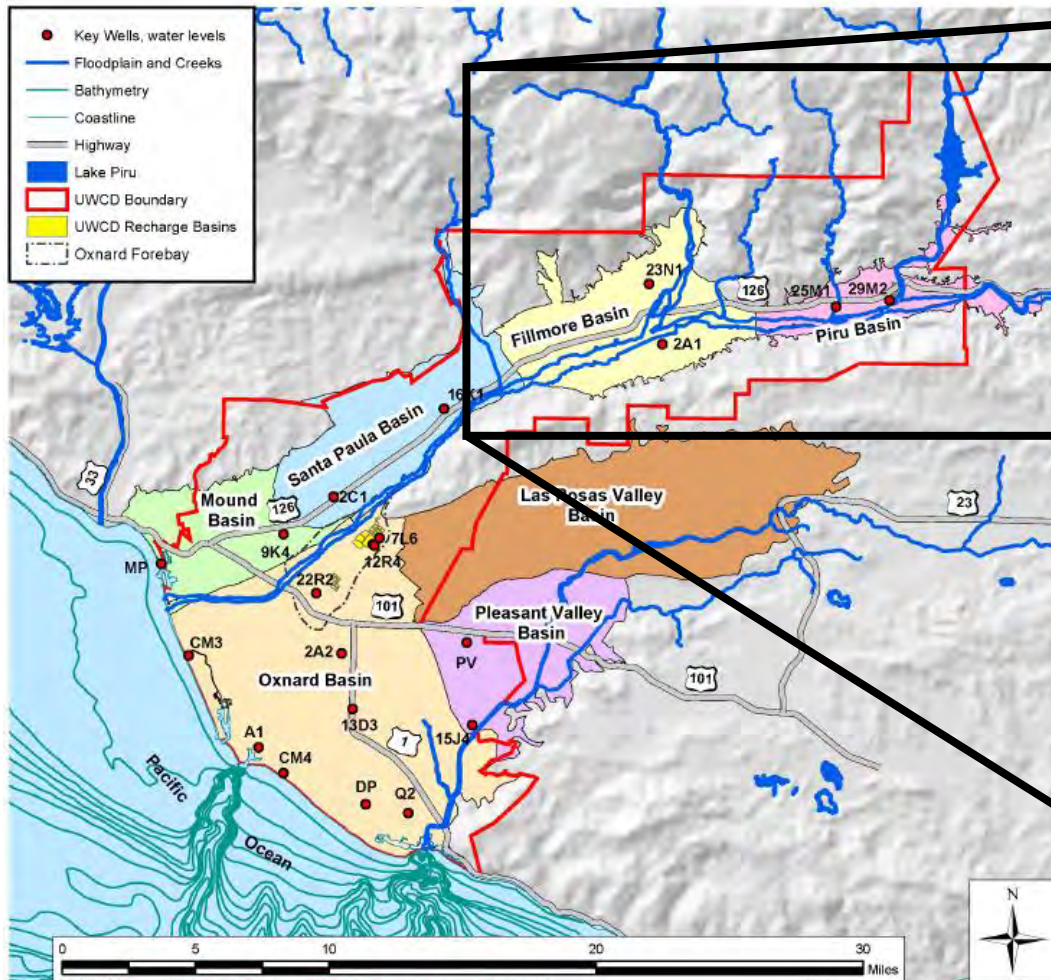
- California Code of Regulations (CCR)

[https://govt.westlaw.com/calregs/Document/I86E380AB2D89470B951D8393BE80E831?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=\(sc.Default\)](https://govt.westlaw.com/calregs/Document/I86E380AB2D89470B951D8393BE80E831?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=(sc.Default))

23 CCR §354.18(c): Each Plan shall quantify the current, historical, and projected water budget for the basin.

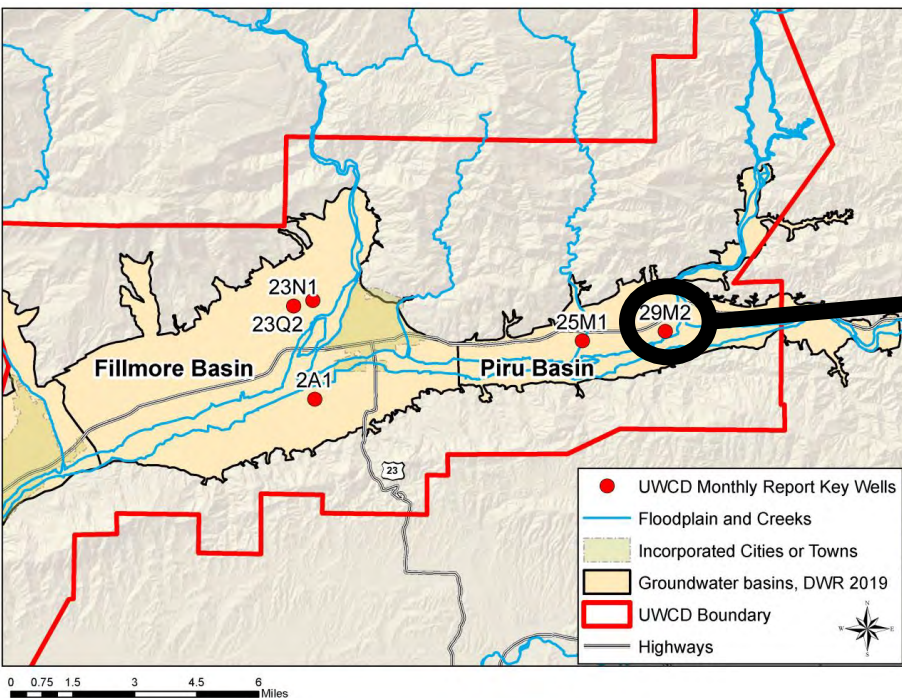


Basin Setting

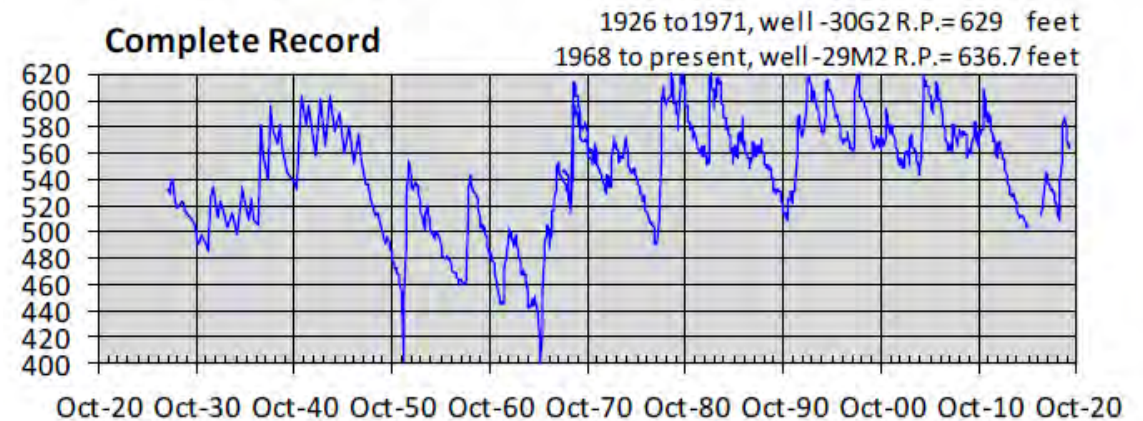
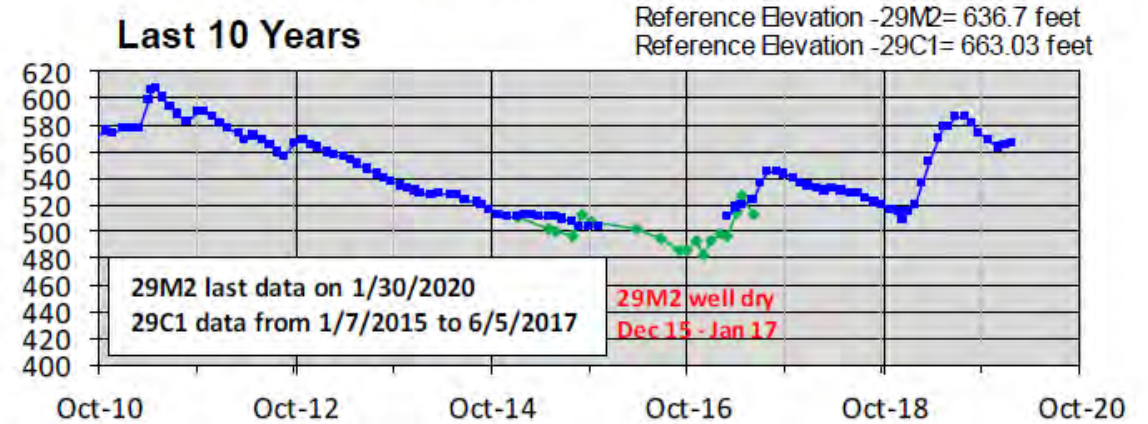


(UWCD's Monthly Hydrologic Conditions Reports:
<https://www.unitedwater.org/reports-5/groundwater-conditions>)

Groundwater Well Hydrographs - Piru



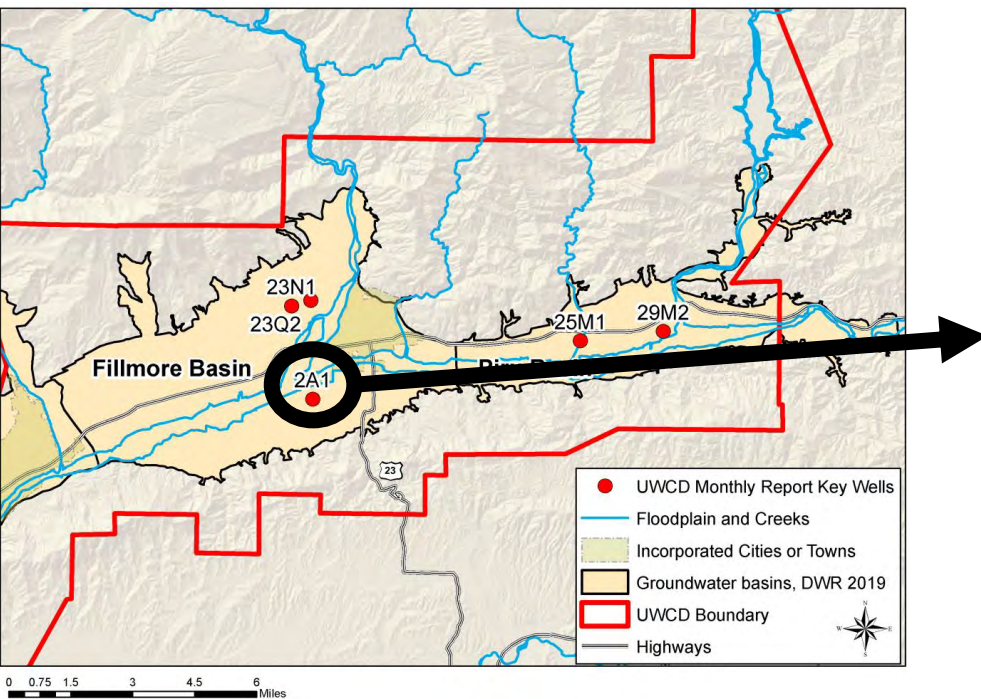
Well 04N18W29M02S (29M2)



(UWCD's Monthly Hydrologic Conditions Reports:
<https://www.unitedwater.org/reports-5/groundwater-conditions>)

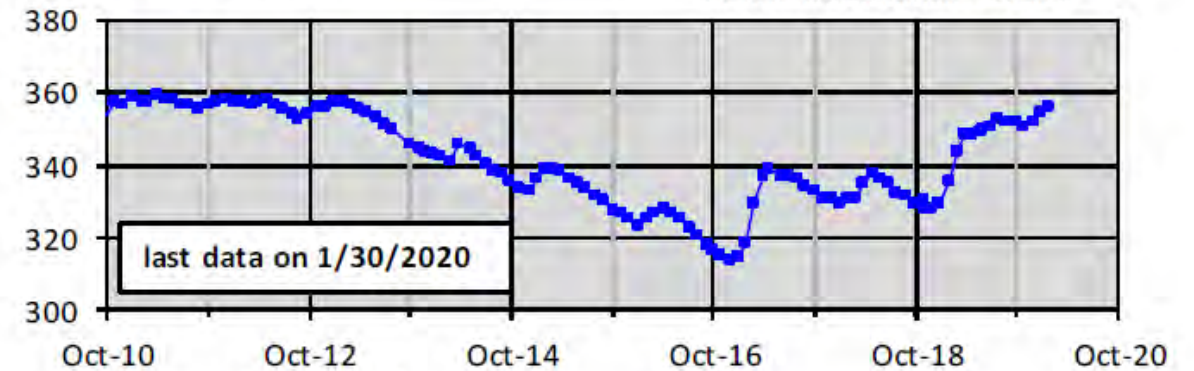
Groundwater Well Hydrographs - Fillmore

Well 03N20W02A01S (2A1)



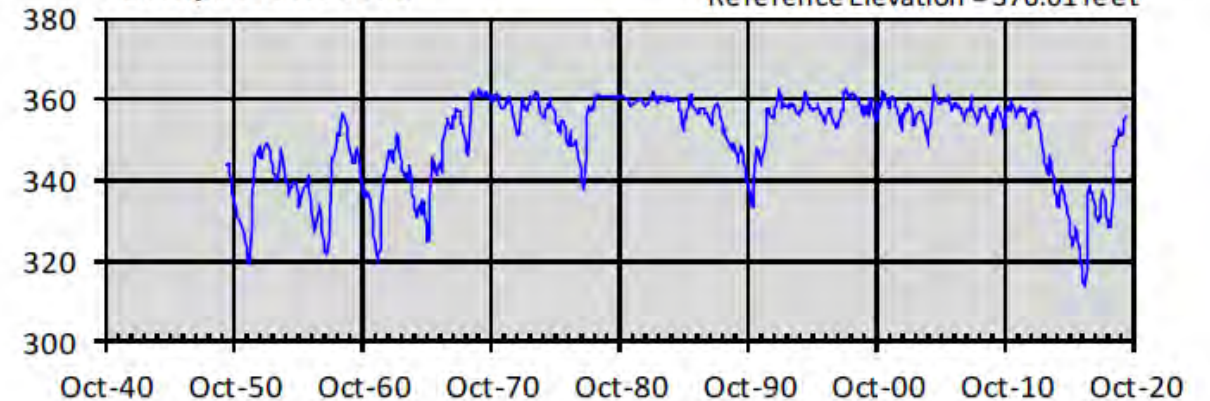
Last 10 Years

Reference Elevation = 376.61



Complete Record

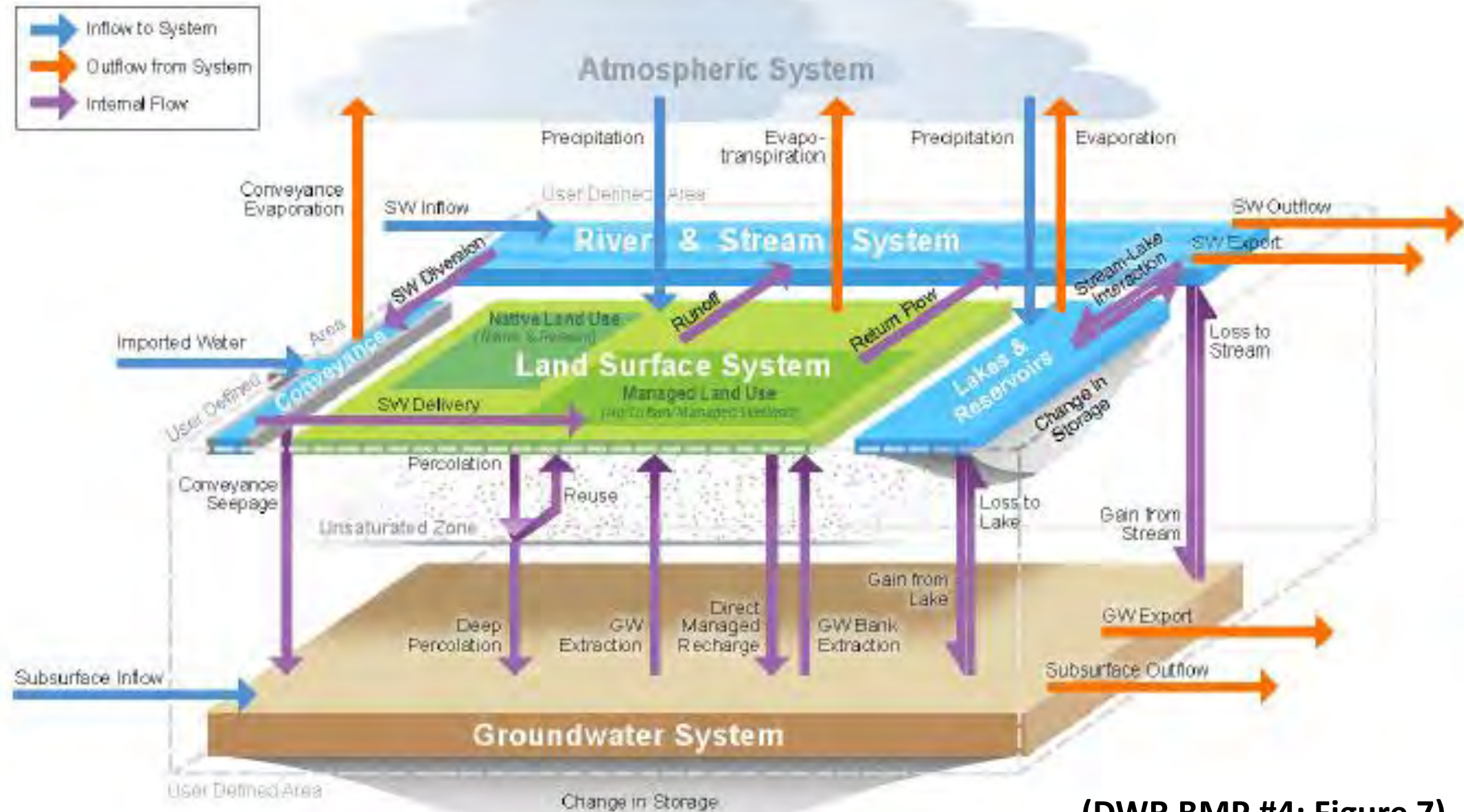
Reference Elevation = 376.61 feet



(UWCD's Monthly Hydrologic Conditions Reports:

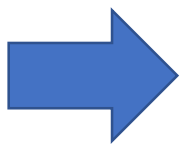
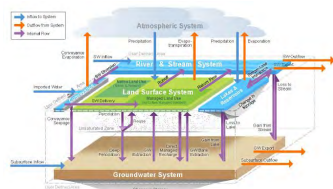
<https://www.unitedwater.org/reports-5/groundwater-conditions>)

Water Budget Fundamentals



(DWR BMP #4; Figure 7)

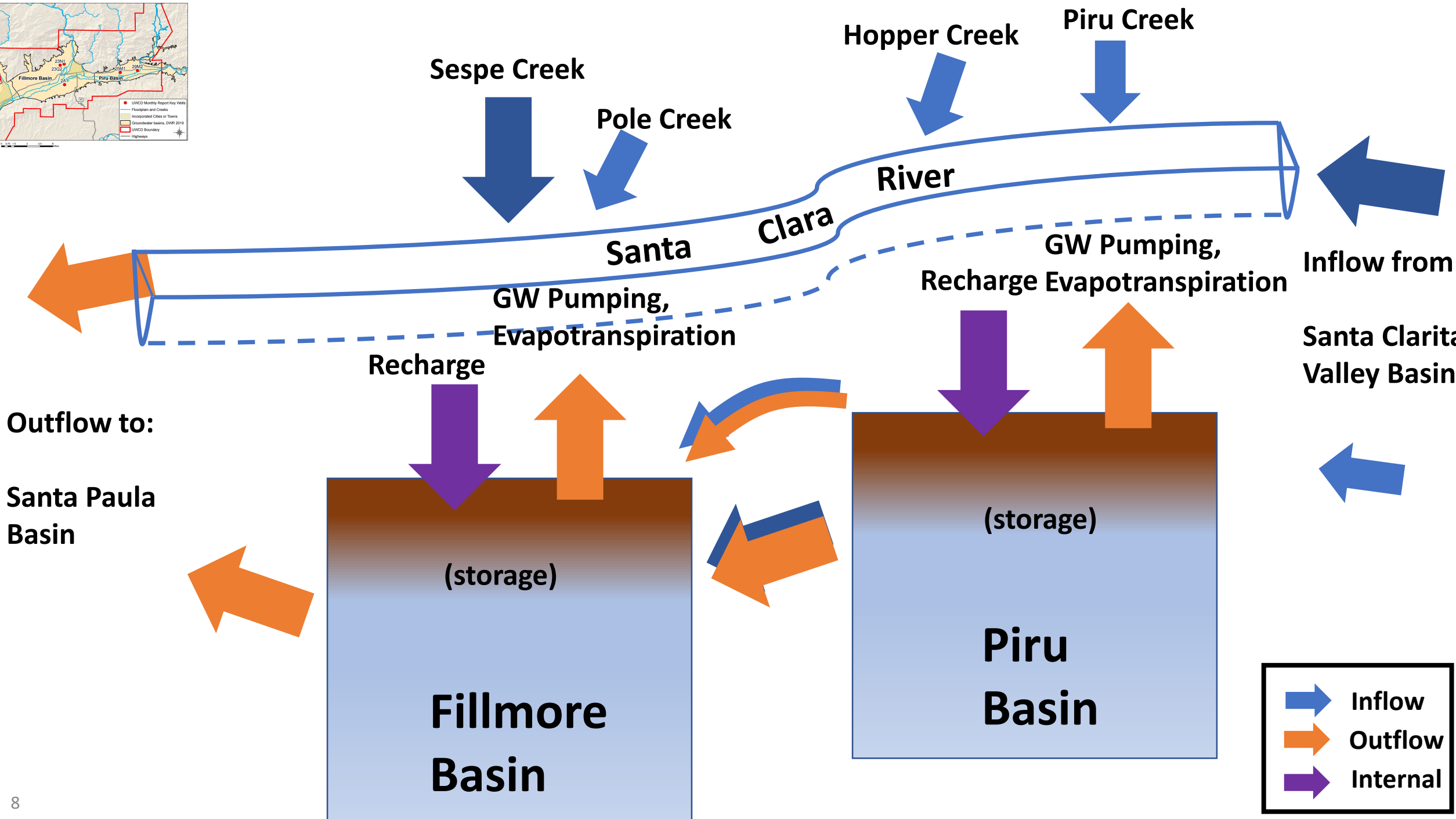
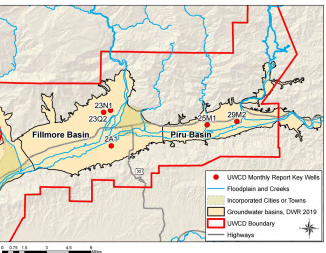
Water Budget Fundamentals



INFLOWS		OUTFLOWS	
Inflow Source	Volume (af/yr)	Outflow Sink	Volume (af/yr)
Surface Water Inflow ^{\1}		Surface Water Outflow ^{\1}	
Precipitation		Evapotranspiration ^{\4}	
Subsurface Groundwater Inflow		Subsurface Groundwater Outflow	
Total Basin Inflow		Total Basin Outflow	
Subsurface Groundwater Inflow		Subsurface Groundwater Outflow	
Infiltration of Precipitation		Groundwater Extraction ^{\1}	
Infiltration from Surface Water Systems ^{\2}		Discharge to surface water systems ^{\2}	
Infiltration of Applied Water ^{\3}		Total Groundwater Outflow	
Total Groundwater Inflow			
Change in Surface Storage Volume		Change in Groundwater Volume	
\1 by water source type			
\2 lakes, streams, canals, springs, conveyance systems			
\3 includes applied surface water, groundwater, recycled water, and reused water			
\4 by water use sector			

(DWR BMP #4; Table 1)

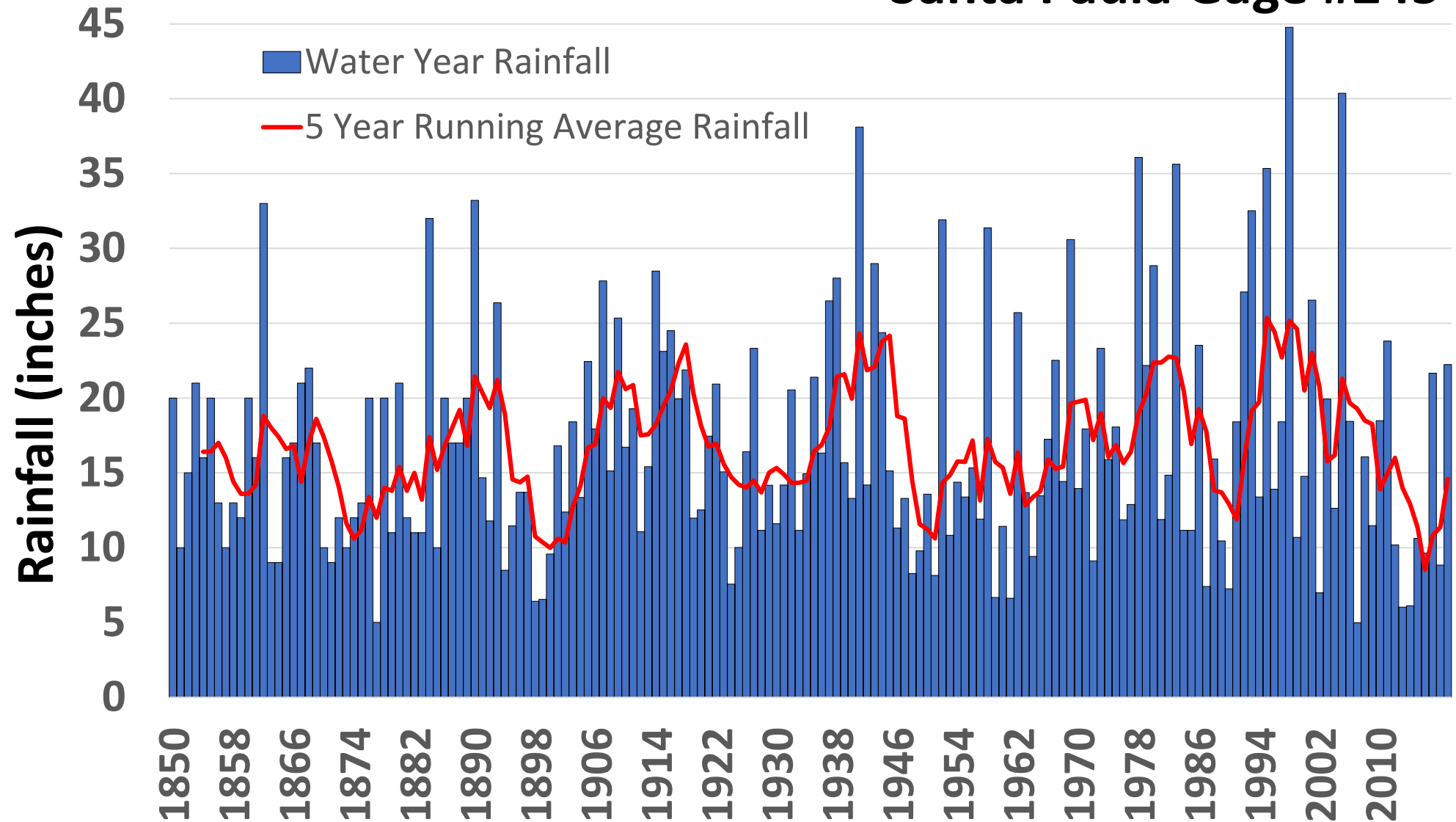
Table 1 – Simple Water Budget Tabulation Example



Historical Rainfall Record

Water Years 1850 - 2019

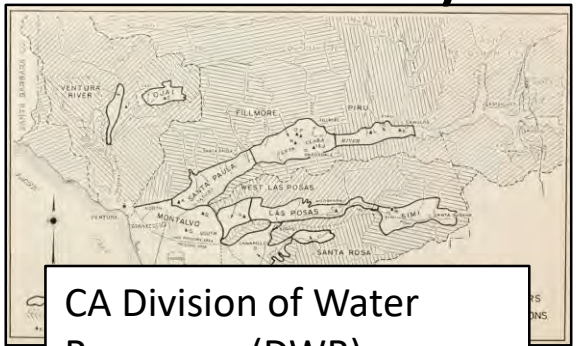
Santa Paula Gage #245



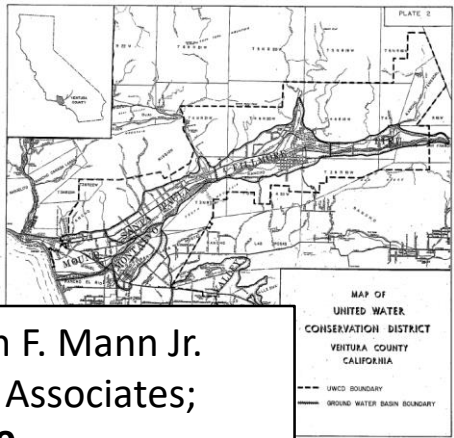
Water Year:
October 1 –
September 30

Summary of Previous Investigations

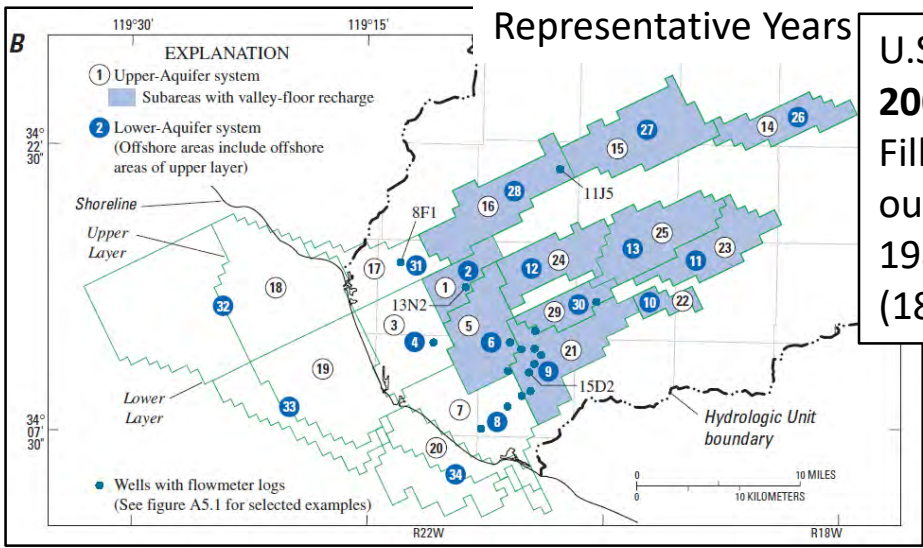
FORMAT:
Entity;
Year Published;
Fillmore/Piru budget components provided;
Representative Years



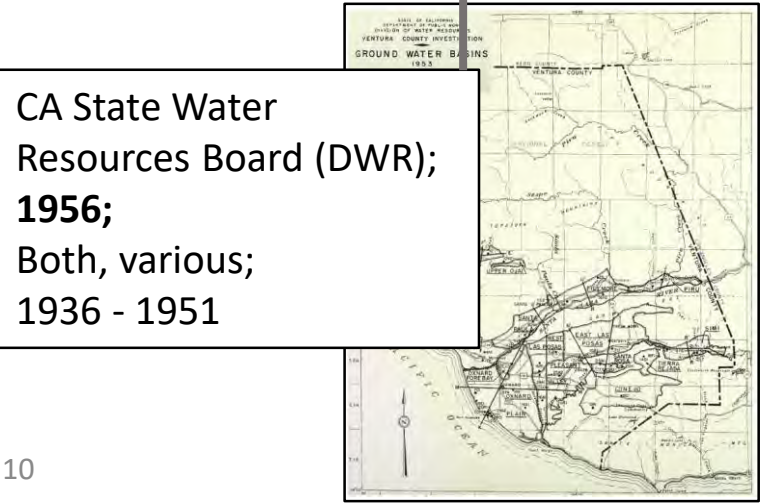
CA Division of Water Resources (DWR);
1933;
Both, various;
1927 - 1932;



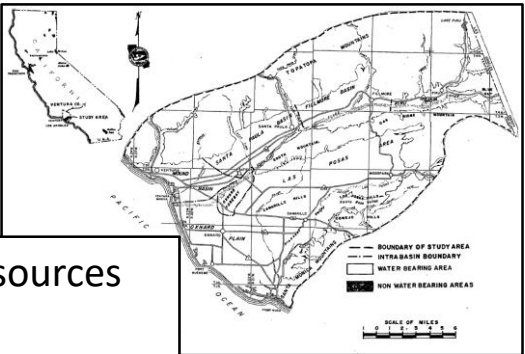
John F. Mann Jr. and Associates;
1959;
Both, various;
1936 - 1957



U.S. Geological Survey;
2003;
Fillmore, subsurface outflow;
1984 – 1993
(1891 – 1993 total)



CA State Water Resources Board (DWR);
1956;
Both, various;
1936 - 1951



CA Dept. of Water Resources (DWR);
1974;
Piru, subsurface inflow;
1956 - 1967

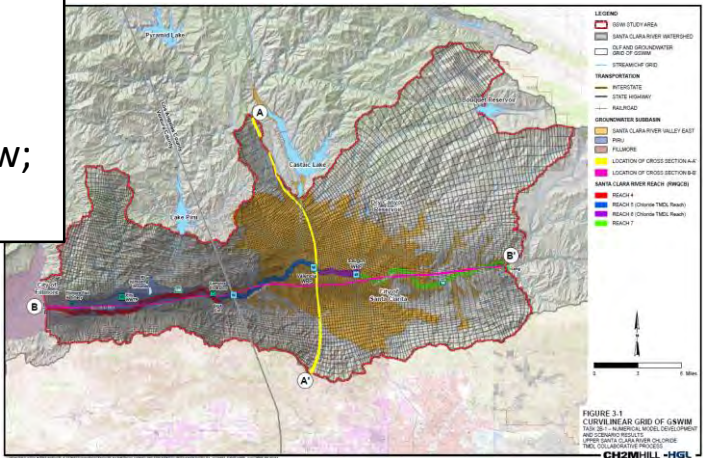
U.S. Geological Survey;
1995;
None;
1984-1989, 1989 – 2004
(hypothetical)

Law/Crandall, INC;
1993;
Fillmore, subsurface outflow;
1956 - 1990

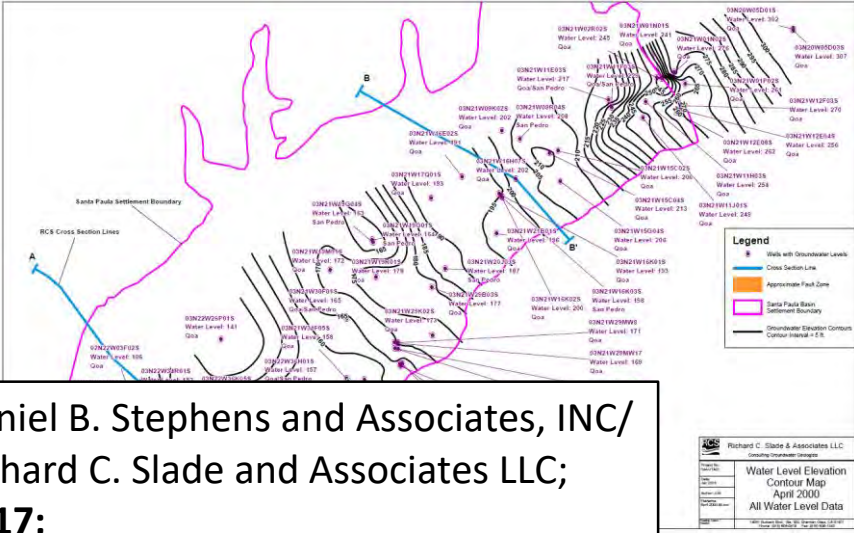
Summary of Previous Investigations

FORMAT:
Entity;
Year Published;
Fillmore/Piru budget components provided;
Representative Years

CH2M HILL/
HydroMetrics INC;
2008;
Piru, subsurface inflow;
1975 - 2005



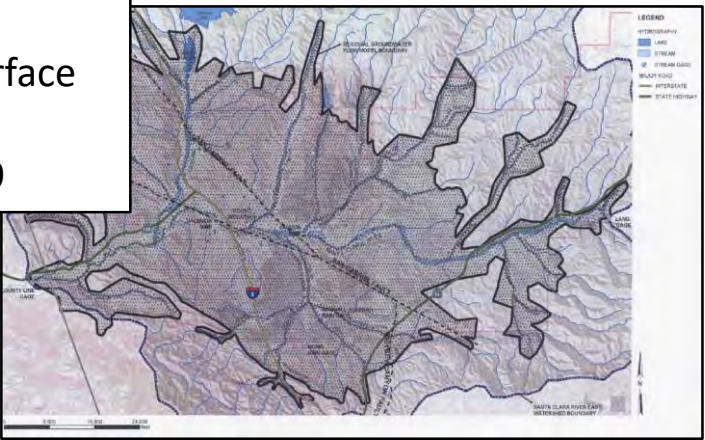
Dr. Steve Bachman;
2015;
Fillmore, subsurface
outflow;
1947 – 2014 (Wet/Dry)



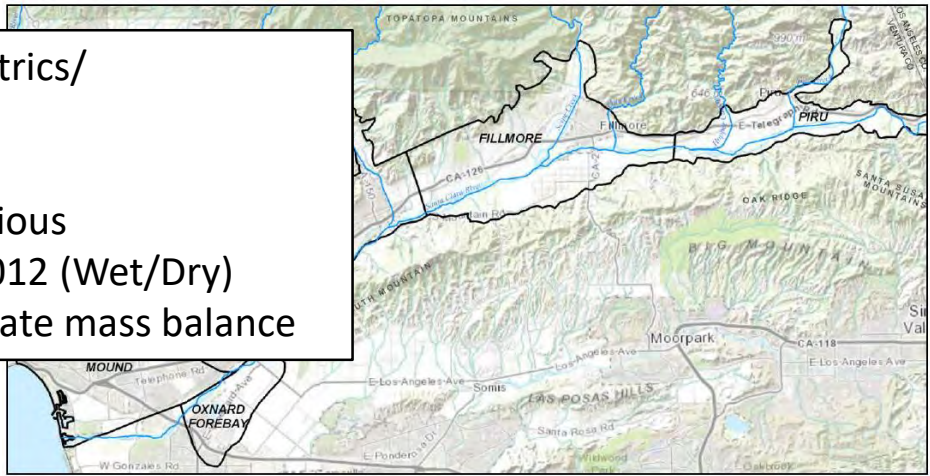
Daniel B. Stephens and Associates, INC/
Richard C. Slade and Associates LLC;
2017;
Fillmore, subsurface outflow;
1999 - 2012

CH2M HILL;
2005;
Piru, subsurface
inflow;
1980 - 2005

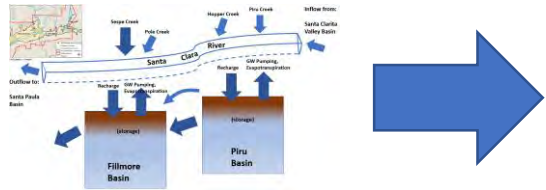
CH2M HILL;
2004;
Piru, subsurface
inflow;
1980 - 1999



HydroMetrics/
Others;
2015;
Both, Various
1996 – 2012 (Wet/Dry)
Steady-State mass balance



Summary of Previously Reported Water Budget Components



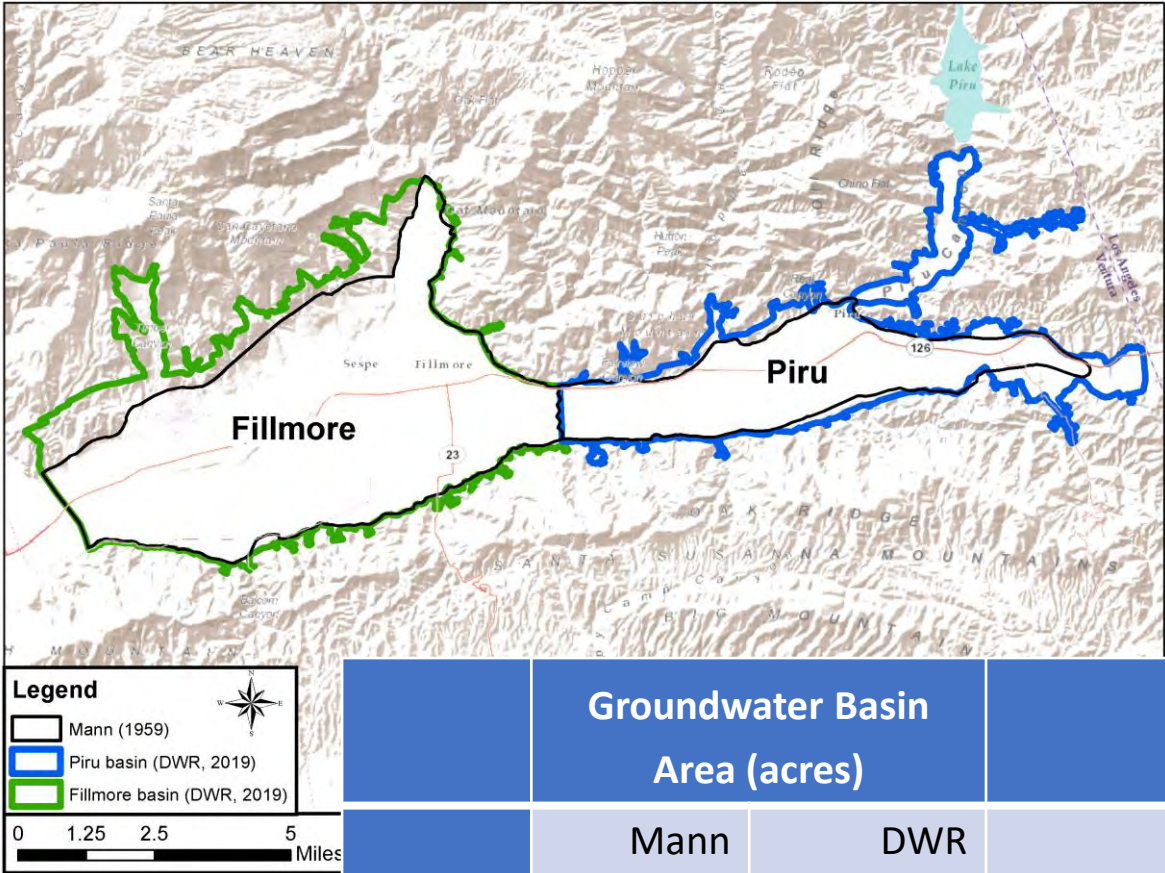
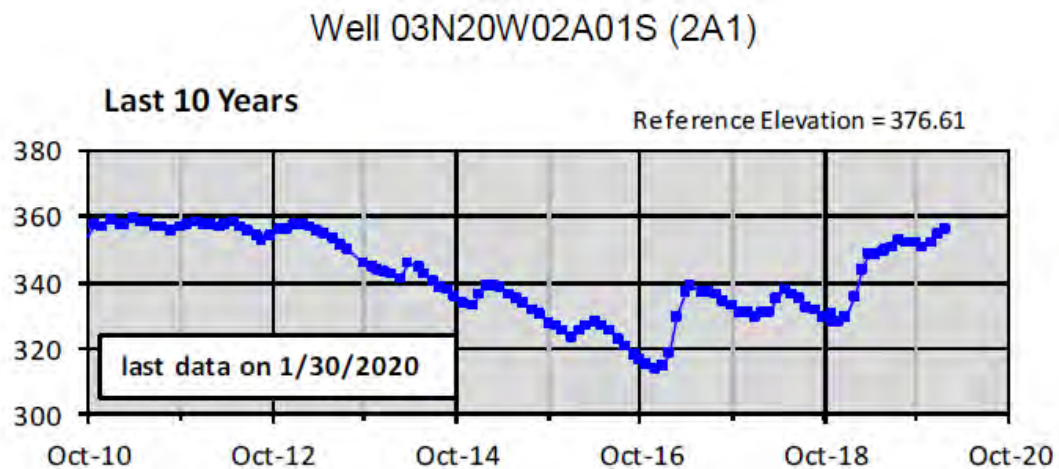
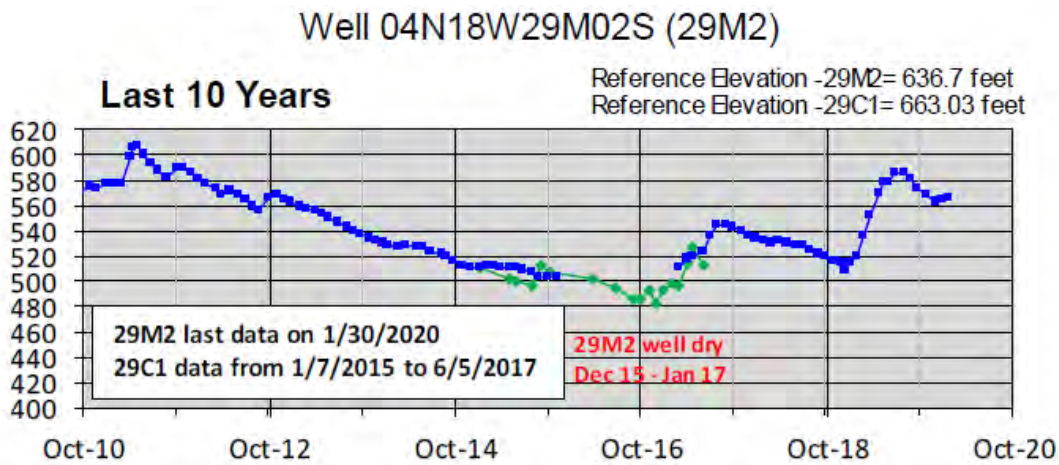
	Piru Range of values			Fillmore Range of values	
Budget Components (AFY)	<i>Lower</i>	<i>Upper</i>		<i>Lower</i>	<i>Upper</i>
Inflows					
Subsurface underflow	240	18802		12570	35700
Stream percolation	6400	61850		1790	49130
Precipitation recharge	190	20200		470	54200
Mountain front recharge	2620	2620		3530	3530
Managed recharge	0	11800		--	--
Imported	0	5840		4900	11770
Total inflow¹	9450	121112		23260	154330
Outflows					
Subsurface underflow	12570	35700		3900	25244
Rising groundwater	0	37800		6030	48200
Consumptive use ²	6820	15000		20590	36200
Exported	2200	6450		0	5160
Total outflow¹	21590	94950		30520	114804
Change in groundwater storage³	-19600	44600		-20170	49300
Available Storage	0	113000		0	80000

¹Total inflow and outflow calculated from values reported in this table

²Of applied water and precipitation on basin (including phreatophytes)

³Reported changes in storage, not representative of calculated total (inflow - outflow) values above

Review of current basin conditions



	Groundwater Basin		
	Area (acres)		
	Mann (1959)	DWR (2019)	% increase
Fillmore	18497	22583	22
Piru	7201	10896	51

Moving Forward

- Continued UWCD numerical model calibration and development
- Continued UWCD internal writing and review of water budget documentation for GSPs
 - Historical
 - Current
 - Projected (Future)

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<https://doi.org/10.1029/95WR02328>

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<https://pubs.er.usgs.gov/publication/wri024136>

Thank You

Questions?

Zach Hanson, PhD, Assistant Hydrogeologist, United Water Conservation District
zhanson@unitedwater.org

