Vina Groundwater Sustainability Agency
308 Nelson Avenue
Oroville, CA 95965
(530) 552-3592

Agenda Prepared: 10/8/2020
Agenda Posted: 10/9/2020
Prior to: 5:30 p.m.

VINA GROUNDWATER SUSTAINABILITY AGENCY BOARD MEETING

Regular Meeting Agenda
October 14, 2020, 5:30 p.m.
ONLINE MEETING ONLY VIA ZOOM

Materials related to an item on this Agenda are available for public inspection in the City of Chico Public Works Operation & Maintenance Office at 965 Fir Street, Chico, during normal 8 am to 5 pm business hours or online at https://www.vinagsa.org/

PUBLIC PARTICIPATION:

This meeting is being conducted via teleconference in accordance with Executive Order N-25-20 and N-29-20. Members of the public may virtually attend the meeting remotely using the ZOOM platform.

The public may listen to and/or participate in the Vina Groundwater Sustainability Agency (GSA) Board Meetings via landline or mobile telephone or via computer, with both video and audio enabled or audio only. If you wish to comment on an item, but do not wish to participate during the meeting, the public may submit comments prior to the meeting via email to **vinagsapubliccomments@chicoca.gov**. Please submit emails with the subject line "**PUBLIC COMMENT ITEM NO.__".** The public is encouraged to not send more than one email per item or comment on numerous items in one email.

ZOOM MEETING INFORMATION:

To access the live meeting, you have the following options:

1. Join Zoom Meeting
    a. https://us02web.zoom.us/j/86983600705
2. From a web browser https://zoom.us/join
    a. When prompted, use Meeting ID: 869 8360 0705
3. Directly from your mobile phone you can tap:
    a. +16699006833, 86983600705# US (San Jose)
4. Dial-in using your landline or mobile phone to:
    a. 1 669 900 6833
    b. When prompted, use Meeting ID: 869 8360 0705
5. If you are having any issues connecting to the meeting, please call or text Kamie Loeser, Durham Irrigation District, at (530) 680-7222 for assistance.

Please note that when you access the meeting, ***you will be placed into a waiting room and admitted*** into the meeting by the meeting host

---

Please contact the City of Chico Public Works Department at (530) 894-4200 if you require an agenda in an alternative format or if you need to request a disability-related modification or accommodation. This request should be received at least three working days prior to the meeting.

---

1. REGULAR BOARD MEETING

1.1. Call to Order

1.2. Roll Call

2. CONSENT AGENDA - all matters listed under the consent agenda are to be considered routine and enacted by one motion.

2.1. APPROVAL OF 9/09/20 VINA GSA BOARD MEETING MINUTES

Action: Approve minutes of Vina GSA Board meeting held on 9/09/20.

2.2. APPROVAL OF THE REVISED 2020-2021 VINA GSA BUDGET

The 2020-2021 annual budget was approved by the Board on 8/12/20. The Auditor is requiring a few minor adjustments to the budget.

Action: Approve the revised annual budget for fiscal year 2020-2021.

2.3. APPROVAL OF THE VINA GSA MONTHLY FINANCIAL STATUS REPORT

Action: Approve the Vina GSA Financial Status Report for the period of 7/1/2020 to 10/6/2020.

3. ITEMS REMOVED FROM CONSENT – IF ANY

4. BUSINESS FROM THE FLOOR

Members of the public may address the Board at this time on any matter not already listed on the agenda; comments are limited to three minutes. The Board cannot take any action at this meeting on requests made under this section of the agenda.

5. NOTICED PUBLIC HEARINGS NONE

6. REGULAR AGENDA

6.1. DISCUSSION OF THE DRAFT BASIN SETTING CHAPTER FOR THE VINA GROUNDWATER SUSTAINABILITY PLAN (GSP)

Staff will provide a summary of the draft basin setting chapter. ***(Report - Dr. Christina Buck).***

Recommendation: Accept as an informational item and possible direction to Staff.

6.2. UPDATE ON THE DEVELOPMENT OF THE VINA GSP

Staff will provide an update on the development of the GSP. **(*Presentation – Paul Gosselin*).**

Recommendation: None this is an informational item only

7. COMMUNICATIONS AND REPORTS

These items are provided for the Board's information. Although the Board may discuss the items, no action can be taken at this meeting. Should the Board determine that action is required, the item or items may be included for action on a subsequent posted agenda.

7.1 Vina GSA Management Committee Updates
- 7.1.1 Vina Stakeholder Advisory Committee Update ***(Report -Kelly Peterson)***
- 7.1.2 Prop 1 Grant Update ***(Report-Paul Gosselin)***
- 7.1.3 Tuscan Water District Update ***(Verbal Report-Paul Gosselin)***

8. *ADJOURNMENT* – The meeting will adjourn to the next regular Vina GSA Board meeting on 11/18/20.

Vina Groundwater Sustainability Agency
308 Nelson Avenue
Oroville, CA 95965
(530) 552-3592

MINUTES
VINA GROUNDWATER SUSTAINABILITY AGENCY
BOARD MEETING

Regular Meeting Agenda
September 9, 2020, 5:30 p.m.
ONLINE MEETING ONLY VIA ZOOM

NOTE: **PUBLIC PARTICIPATION:** This meeting was conducted via teleconference in accordance with Executive Order N-25-20 and N-29-20. The public was able to view the meeting via the ZOOM platform.

Public comments were also accepted by email sent to vinagsapubliccomments@chicoca.gov before and during the meeting, prior to the close of public comment on an item.

---

1. REGULAR BOARD MEETING

1.1 Call to Order

Called to order by Chair Schwab at 5:30 p.m.

1.2 Roll Call

Board Members Present:
Evan Tuchinsky
Ann Schwab
Steve Lambert
Jeffrey Rohwer
Raymond Cooper

Board Members Absent:
None

Staff Present:

Erik Gustafson (City of Chico Public Works Director), Paul Gosselin (BCDWRC Director), Kelly Peterson (BCDWRC Water Resource Scientist), Kamie Loeser (Durham Irrigation District), Valerie Kincaid (Attorney O'Laughlin & Paris LLP), Linda Herman (City of Chico Park and Natural Resources Manager)

2. CONSENT AGENDA – all matters listed under the consent agenda are to be considered routine and enacted by one motion.

2.1 APPROVAL OF 8/12/20 VINA GSA BOARD MEETING MINUTES

Action: Approve minutes of Vina GSA Board meeting held on 8/12/20.

2.2 APPROVAL OF THE AUGUST 2020 VINA GSA MONTHLY FINANCIAL STATUS REPORT

Action: Approve the Vina GSA Financial Status Report for the month of August 2020.

Board member Tuchinsky questioned Item 2.2 on the consent agenda stating that the Financial Status Report appeared to be missing in the agenda packet. Staff informed the Board that the August report would be put on the Board's October meeting agenda.

A motion was made by Board Member Tuchinsky and seconded by Board Member Rohwer to approve the consent agenda except Item 2.2.

The motion carried by the following vote:

AYES: Board Member Tuchinsky, Board Member Cooper, Board Member Rohwer, Board Member Lambert, Chair Schwab

NOES: None

3. ITEMS REMOVED FROM CONSENT

4. BUSINESS FROM THE FLOOR

Members of the public may address the Board at this time on any matter not already listed on the agenda; comments are limited to three minutes. The Board cannot take any action at this meeting on requests made under this section of the agenda.

5. NOTICED PUBLIC HEARINGS – NONE

6. REGULAR AGENDA

6.1 UPDATE ON THE DEVELOPMENT OF THE GROUNDWATER SUSTAINABILITY PLAN (GSP) FOR THE VINA SUBBASIN

Staff provided an update on the development of the GSP and schedule. **(Presentation – Paul Gosselin)**

Chair Schwab opened the hearing to public comments. Jim Brobeck and Deborah Lucero addressed the Board.

6.2 CONSIDERATION OF A GSP EXTENSION LETTER TO THE GOVERNOR

At its meeting on 8/18/20, the Vina Stakeholder Advisory Committee (SHAC) recommended that the Vina GSA Board approve sending a letter to Governor Newsom requesting a six-month extension to submit the Vina GSP. **(Report – Paul Gosselin)**

Chair Schwab opened the hearing to public comments. Email comments were received from Greg Sohnrey. Jim Brobeck, Deborah Lucero and Bruce Smith addressed the Board.

Board member Rohwer asked if there are other agencies in other nearby subbasins who may also want to be signatories to the letter. Staff responded that the Butte County Water Commission recommended the Board of Supervisors send a request to Governor Newsom seeking support for an extension to the GSP deadline. The Board of Supervisors will consider the item at their September 29, 2020 meeting. Staff would also reach out to other GSAs in the area.

A motion was made by Board Member Tuchinsky and seconded by Board Member Cooper to edit the letter to Governor Newsom requesting a two-year extension to submit the Vina GSP and emphasizing that the Vina subbasin is not in an overdraft condition.

The motion carried by the following vote:

AYES: Board Member Tuchinsky, Board Member Cooper, Board Member Rohwer, Board Member Lambert, Chair Schwab

NOES: None

6.3 RESCHEDULE NOVEMBER 11, 2020 VINA GSA BOARD MEETING

At its 8/12/20 meeting, the Board approved a 2020 calendar for Vina GSA Board meetings to be held on the 3rd Wednesday of each month. The Board was requested to reschedule the November 11, 2020 Board meeting date due to the Veteran's Day holiday. **(Report – Linda Herman)**

Chair Schwab opened the hearing to public comments. Jim Brobeck addressed the Board.

A motion was made by Board Member Tuchinsky and seconded by Board Member Lambert to reschedule the November 11, 2020 Board meeting to November 18, 2020.

The motion carried by the following vote:

AYES: Board Member Tuchinsky, Board Member Rohwer, Board Member Cooper, Board Member Lambert, Chair Schwab

NOES: None

7. COMMUNICATIONS AND REPORTS

Staff provided and presented the following items for the Board's information an no action or requests to agendize items for a future meeting were considered.

7.1 Vina GSA Management Committee Updates

7.1.1 Vina Stakeholder Advisory Committee Update **(Report – Kelly Peterson)**
7.1.2 Rock Creek Reclamation District Memorandum of Understanding **(Report – Paul Gosselin)**
7.1.3 Tuscan Water District Update **(Verbal Report – Paul Gosselin)**

8. ADJOURNMENT

The meeting was adjourned at 6:37 p.m. to the next regular Vina GSA Board meeting on October 14, 2020.

Date Approved: __/__/__

Prepared By:

_____ _____
Becky Anderson, Office Assistant Date

	Vina **Groundwater Sustainability Agency** **Agenda Transmittal**	**Agenda Item: 2.2**

Subject: Revised 2020-2021 Vina GSA Annual Budget

Contact: Kelly Peterson	**Phone: 530-552-3588**	**Meeting Date: 10-14-20**	**Consent Agenda**

Department Summary: Attached is the revised annual budget for the Vina GSA for the 2020-2021 fiscal year (7/1/20 - 6/30/21).

The 2020-2021 annual budget was approved by the Vina GSA Board at the August 2020 Board meeting.

According to section 12.2 of the JPA, Butte County serves as the treasurer and controller for the GSA. The Butte County Auditor's office is requiring a few minor adjustments to the budget including:

1. Detail regarding anticipated revenue sources (Member Agency Contributions)
2. Detail of fund and account numbers for each budget item
3. Final budget GSA Board approval date
4. Reflection of increased insurance expenses for 2020 of $300 in the budget. The increase in 2020 is due to an increase in the vendor's minimum charges. The carry-over balance from fiscal year 2019 will fund this increased cost.

In addition staff added budget line items for website service fees ($240 / year) and accrued interest ($120 / year) and decreased the contingency budget line item from $1,500 to $1,080 to balance planned expenditures and revenue.

Fiscal Impact: None

Staff Recommendation: Approve the revised annual budget for fiscal year 2020-2021

Vina Groundwater Sustainability Agency

Budget – Fiscal Year 2020-2021

Final Approved *Month date, year*

Fund: 2092

Expenditures	**Account**	**Amount**	**Notes**
GSP Development		*	Prop 1 Grant
GSA Administration		*	In-kind staff assignments
Legal Services	539020	$10,000	
Insurance	526000	$ 1,800	Minimum insurance policy increased by $300 this year
Audit	539020	$ 2,000	
Contingency	580010	$ 1,080	
Website	533000	$ 240	
Total Expenditures		$15,120	

Revenue	**Account**	**Amount**	**Notes**
Member Agency Contribution – City of Chico	473012	$ 5,000	
Member Agency Contribution – County of Butte	473012	$ 5,000	
Member Agency Contribution – Durham Irrigation District	473012	$ 5,000	
Interest	441000	$ 120	
Total Revenue		$15,120	

*No direct cost to GSA, costs covered by Prop 1 grant paid through Butte County Department of Water and Resource Conservation and member agency in-kind staff assignments.

* Carryover balance from the previous fiscal year (2019-2020) is $ 9,377.51(equity).

Vina
Groundwater Sustainability Agency
Agenda Transmittal

Agenda Item: 2.3

Subject: Vina GSA Financial Report

Contact: Kelly Peterson	**Phone: 530-552-3588**	**Meeting Date: 10-14-20**	**Consent Agenda**

Department Summary: Attached is the financial report for the 2020-2021 fiscal year for the Vina GSA as of 10/6/20.

Fiscal Impact: None

Staff Recommendation: Approve the financial report.

Vina GSA Financial Report		Fund Balance:	$ 12,504.50
FY 2020-2021 (7/1/2020 - 6/30/2021)		Balance Date:	10/6/2020
Expenditures			
Budget Item	Date	Amount	Notes
Legal			
O'Laughlin & Paris	8/25/20	$ 1,785.00	
O'Laughlin & Paris	10/6/20	$ 1,330.00	
Total Legal Spent		$ 3,115.00	
Legal Budget		$ 10,000.00	
% of Legal Budget Spent		31%	
Insurance			
Golden State Risk Management Authority	7/7/20	$ 1,800.00	GSA insurance
Total Insurance Spent		$ 1,800.00	
Insurance Budget		$ 1,800.00	
% of Insurance Budget Spent		100%	2020 fees increased by $300
Audit			
Total Audit Spent		$ -	
Audit Budget		$ 2,000.00	
% of Audit Budget Spent		0%	
Contingency			
Total Contingency Spent		$ -	
Contingency Budget		$ 1,080.00	
% of Contingency Budget Spent		0%	
Website			
Total Website Spent		$ -	
Website Budget		$ 240.00	
% of Website Budget Spent		0%	
All Expenditures		**$ 4,915.00**	
Total Budget for Expenditures		**$ 15,120.00**	
% of Budget Spent		**33%**	

Vina GSA Financial Report

FY 2020-2021 (7/1/2020 - 6/30/2021)

Revenue

Budget Item	Date	Amount	Notes
Member Agency Contributions			
City of Chico	7/28/20	$ 5,000.00	
Durham Irrigation District	9/17/20	$ 1,000.00	
Durham Irrigation District	9/17/20	$ 1,000.00	
Durham Irrigation District	9/29/20	$ 1,000.00	Additional $2K in payments are planned
Total Member Agency Contributions Received		$ 8,000.00	Note: Butte County's FY 20-21 contributions ($7K)were posted in previous FY and included in carry over balance
Total Member Agency Contributions Budget		$ 15,000.00	
% of Member Agency Contributions Budget Received		100%	
Interest	7/1/20	$ 41.99	Interest from last quarter
Total Interest Received		$ 41.99	
Total Interest Budget		$ 120.00	
% of Interest Budget Received		35%	
All Revenue		**$ 8,041.99**	
Total Budget for Revenue		**$ 15,120.00**	
% of Budget Received		**53%**	

Fund Balance

Starting Balance 7/1/2020	$	9,377.51
Expenses	$	4,915.00
Revenue	$	8,041.99
Fund Balance 10/6/20	**$**	**12,504.50**

	Vina **Groundwater Sustainability Agency** **Agenda Transmittal**	**Agenda Item: 6.1**

Subject: Discussion of the draft Basin Setting chapters of the Vina Groundwater Sustainability Plan and public comments received.

Contact: Christina Buck **Phone: 530.552.3593** **Meeting Date: 10/14/20** **Regular Agenda**

Department Summary: Staff will provide a summary of the draft basin setting chapters and the public comments received for Board discussion and possible direction to staff.

Fiscal Impact: None

Staff Recommendation: Accept as an informational item and possible direction to staff.

MEMORANDUM

DATE: October 7, 2020

TO: Vina GSA Board

FROM: Christina Buck, Assistant Director

RE: Public Comments on Basin Setting Drafts

Public Comment Overview

Drafts of the Basin Setting and Monitoring Network Chapters were made available August 7, 2020 for a public comment period. The comment period ended on Tuesday September 8, 2020.

The documents are available online at VinaGSA.org:

https://www.vinagsa.org/groundwater-sustainability-plan-gsp-basin-setting-chapters-public-comment-open

In addition, a presentation was given as a technical webinar in two parts providing an overview of the Basin Setting content. These presentations are also available online for reference: https://www.vinagsa.org/2020-06-16-stakeholder-advisory-committee-meeting

Comments were received from three individuals and are attached to this report. Several themes emerged which are summarized in the bullets below:

- Commenters highlight the importance of the multiple aquifer zones that are present in the subbasin and the pressurized nature of the deeper zones. This has implications for understanding flow paths, vertical gradients, groundwater conditions and connectivity between zones, interbasin flow in the pressurized deep aquifer zone, connection of shallow groundwater to deeper zones and vulnerability of groundwater dependent ecosystems (GDEs), efficacy of recharge projects to provide benefits to shallow vs. deep zones, delayed and long lasting potential effects of deep pumping on stream-groundwater interactions.
- Commenters point out that monitoring the four defined aquifer zones is a data gap that should be filled with monitoring groundwater levels in each zone. The aquifer zones should also be better defined using well logs, cross sections to understand connectivity between zones, groundwater flow paths, and changes in vertical gradients over time.
- Monitoring of the shallowest portion of the groundwater system was identified as a need to identify baseline and dynamic water levels that support groundwater dependent ecosystems.

Comments suggest a shallow monitoring network needs to be developed and implemented to understand conditions in the shallowest portions of the aquifer system.
- A comment suggested that the rooting depth of the Valley Oak is incorrectly limited by The Nature Conservancy documentation on GDEs to 30 feet. Sources listed by the US Forest Service identify a rooting depth of 80 feet. The urban forest in Chico should also be identified and considered as a GDE and habitat monitoring should survey and monitor impacts on wetlands and other GDE areas.
- A number of clarification questions and comments were submitted
- Comments largely relate to the Hydrogeologic Conceptual Model and have implications for expansion of monitoring to address identified data gaps.

Other significant issues that have been raised include:
- Importance of understanding and characterizing interbasin flows (i.e. groundwater flow between subbasins)
- Climate change impact assessment- concern has been raised that the 2030/2070 climate change scenarios utilized by the water budget analysis in the Basin Setting Chapter do not include the potential for multi-decade drought (i.e. megadrought).

All received comments have been compiled and attached with this memo. In the near future staff will address or respond to each comment. This information is provided for discussion and possible direction to staff. These Groundwater Sustainability Plan (GSP) chapters remain in draft form and will not be considered final until they are combined with the rest of the GSP for review and public comment in mid-2021. Public review and comment now provides a foundation for moving into development of Sustainable Management Criteria (SMC) and other portions of the GSP this fall. Comments received also help inform the Vina Stakeholder Advisory Committee (SHAC) and GSA Board of significant issues that may need to be considered during development of SMCs and Projects and Management Actions (PMAs).

SHAC Discussion

Staff presented highlights from the Basin Setting documents and public comments to the SHAC at their September meeting. The SHAC discussed contents of the documents as well as issues surrounding a shallow monitoring network and evaluation of climate change.

Although the SHAC discussion did not result in a formal recommendation to the Vina GSA Board, their discussion reached the following general agreement on these topics:

1. Understanding the shallow zone is important. The SHAC is interested in establishing monitoring networks (well, vegetation, stream monitoring, etc.) to address this data gap. The SHAC discussed this mostly in relation to protecting shallow domestic wells.
2. It is important to consider the climate change analysis being done by other local efforts (e.g. City and County Climate Action Plans) to ensure consistency and alignment between and among those efforts, when possible. The SHAC would like to review those plans (assumptions and information) before recommending incorporating set analysis into the GSP. However, the SHAC reached high level agreement that it is important to align with and reference other relevant planning efforts taking place.

Consideration by the Vina GSA Board

An overview of the draft Basin Setting documents and public comments will be presented to the Board for information and discussion. It would be helpful to get a sense from Board members whether they see significant issues raised by the Basin Setting or public comments, and how they would like to see any issues be addressed in the next phase of GSP development.

Please note that work regarding identification of GDEs is underway and will be added to the documentation when complete. The analysis will be available for and incorporated into the SMC development process.

A couple of issues for potential Board discussion:

1) Shallow Monitoring Network
   The document, public comment, and the SHAC identify the limited extent of existing monitoring in the shallowest portions of the aquifer system as an important data gap. Staff agrees that monitoring groundwater conditions in the shallow zone should be improved. There are options on how to improve the shallow monitoring network. Funding will be available after submission of the GSP in 2022 to support implementation of the Plan. Alternatively, the Vina Subbasin could pursue Technical Support Services from the Department of Water Resources for shallow monitoring wells. Either implementation option will require design and development of a shallow monitoring network. The development of the design for a shallow monitoring network and securing the resources for implementation will occur after GSP submission. There may be regional interest in pursuing resources to improve the shallow monitoring network as well. Staff are seeking direction from the Board regarding whether development of a shallow monitoring network be prioritized to address the identified data gap.

2) Climate Change and Water Budget Sensitivity
   The SHAC discussed the approaches used by the Basin Setting work to evaluate the sensitivity of the groundwater system and water budget to changes in climate. Climate change water budget scenarios (run using the Butte Basin Groundwater Model) utilized the 2030 and 2070 Central Tendency climate change datasets provided by DWR. This is an approach used by GSPs throughout the Central Valley. The SHAC suggested evaluating the information and approach utilized by other local climate change planning efforts such as the City of Chico and Butte County Climate Action Plans (CAP) and aligning GSP climate change evaluation with approaches/methods used by the CAPs. The next step would be for staff to evaluate the CAPs to understand how their approach compare to the methodology used for the Basin Setting work. This could inform how climate change is considered when evaluating PMAs developed for inclusion in the GSP. However, if a change to the methodology is needed to align with approaches used by the CAPs, this would need to occur under the 5 year update of the GSP since time and resources are not available to rework the Basin Setting results under current GSP development. Waiting five years for additional analysis would not limit the Board from being more protective in development of the Sustainable Management Criteria now. Climate change scenarios are one of many GSP elements with inherent uncertainties. The Board could determine based on the level of uncertainties and other considerations to set more protective standards in the GSP.

The Basin Setting serves to provide information to understand the current conditions of the groundwater basin and to inform our understanding of its sensitivity to change (whether driven by growth, increased water demand, climate change, etc.). Water budget results from the scenario runs provide ample opportunity to explore the system's sensitivity to a variety of changed conditions. The water budget results point out the large variation in groundwater storage that occurs driven by wet and dry cycles in the region's highly variable hydrology. Climate change and changes in demand exacerbate these swings (see Figure 1-36). Sustainably managing the Vina subbasin will largely hinge on drought resiliency planning to somewhat smooth out the extremes. Discussion and/or direction from the Board will help staff understand what issues the Board is most concerned about and therefore guide how best to use the Basin Setting results to inform the next phase of GSP development. The water budget results do not provide answers on what to do or not do, but rather contributes additional information to the decision-making process to support risk assessment and guide what to plan for.

Groundwater Sustainability Plan - Basin Setting and Monitoring Network Chapters
Public Review Draft- Summer 2020
Compiled Comments, 9/9/2020

#	Commenter Name	Commenter Organization	Chapter* (BaS or MoN)	Section	Line #s or Figure #	Comment
1	James Brobeck	Vina SHAC	BaS			(As of 8/10/2020) My questions about the interbasin flow volume discrepancy remain unanswered. The draft author (Davids Engineering?) replaced the contradictory interbasin flow data in the initial Butte and the Vina drafts with the following data-less paragraph: "Interbasin flows are dependent on conditions in adjacent basins. It is recommended that GSAs refine estimates of subsurface groundwater flows from and to neighboring basins through coordination with GSAs in neighboring basins during or following GSP development and through review of modeling tools that cover the Sacramento Valley region, including the C2VSim and SVSim integrated hydrologic model applications developed by DWR." County staff has advocated for artificial recharge since the days of Ed Craddock, despite extensive past and present opposition and significant legal water rights issues. Staff and consultants continue to do so by shepherding the Tuscan Water District intention to facilitate expanded conjunctive use to experiment with in-lieu recharge. The efficacy of artificial recharge and the ability to achieve sustainable goals would be predicated to some extent on how groundwater flows between GSA "basins". The initial basin setting graphs and maps are not in the draft documents, but may still indicate the assumptions of water purveyors in these GSAs and beyond.
2	James Brobeck	Vina SHAC	BaS		143+	Line 143: "it is recognized that groundwater flows across each of the defined boundary lines to some degree." There is general agreement that subsurface flows move from the VS (Vina Subbasin) from the NE to the SW…especially from VS into Glenn/Colusa Counties and into the BS (Butte Subbasin). Line 150 Bottom of the Basin: It must be emphasized that the "base of freshwater" in the VS normally operates with robust piezometric pressure that prevents downwater leakage and supports overlying freshwater strata. The total absence of reference to the pressurized dynamics of this freshwater system in the setting is conspicuously absent from the document. The actual depth to the lowest portion of the aquifer system may be 700-1200' BGL while the piezometric pressure may present leakage as high as ground level when the pressure reaches artesian pressure. DWR previously divided the Sac Valley aquifers into four zones. We therefor would be well served by having four GW elevation maps, one for each zone, to get an accurate representation of the lateral and vertical groundwater flow directions. They might be different for each zone and between zones at different times of the year. These maps should be done for each sampling event to see if there's a significant change in direction of flow. This level of monitoring would help us understand if pumping in one area during the irrigation season significantly change flow direction of the source(s) of water to the pumps or cause drawdowns in areas that wouldn't be expected looking at the non-pumping contours. Since they're there to help we should ask DWR to produce GW contour maps for each of the 4 zones or we might make significant errors in basin management.
3	James Brobeck	Vina SHAC	BaS		269+	Line 269 "Geologically, the 269 Upper Watershed consists primarily of volcanic, granitic, and metamorphic 270 rocks that do not have any appreciable primary porosity. Fracturing within 271 these rock units may occur locally but the fractures are not pervasive on a 272 regional scale, which limits the amount of water that can percolate into the 273 bedrock geologic units and the volume of groundwater available to migrate to 274 other regions such as the valley alluvial groundwater basin on the Valley Floor" The existence of reliable producing deep (600-900') wells in Cohasset and (possibly) Forest Ranch belies this long-standing characterization of relatively unreliable shallow "fractured rock" wells in these foothill/mountain communities. There is some indication that these deep mountain wells are tapping geological and recharge connection to the lower Tuscan Aquifer system. These deep wells are relatively new, have significant piezometric pressure, and should be on file with Butte County Environmental Health well construction logs.
4	James Brobeck	Vina SHAC	BaS		315+	315 "precipitation on the valley floor and in the Lower Foothill 316 area is a predominant source of recharge for much of the Vina Subbasin." The mechanism of recharge that creates piezometric pressure in the lowest portion of the Tuscan aquifer as well as in the deep mountain/foothill wells must be considered as we attempt to identify and manage the recharge source zones.
5	James Brobeck	Vina SHAC	BaS		323+	323 "This dataset can serve as a starting point indication for areas 324 conducive to natural or managed recharge. Large portions of the Subbasin 325 generally received a moderately good to good rating (Figure 1-7), except for in 326 the southeastern area of the Subbasin. Additional considerations will be 327 important for specific evaluation of any proposed recharge project." Presumptions of the efficacy of applied water for intentional recharge may be logical for unconfined shallow aquifer zones but are illogical when attempting to maintain/restore deep confined pressurized zones. The setting document makes no effort to differentiate recharge efficacy between the different zones when discussing recharge projects that dominate the management action discussions.

#	Commenter Name	Commenter Organization	Chapter* (BaS or MoN)	Section	Line #s or Figure #	Comment
6	James Brobeck	Vina SHAC	BaS		381+	381-426: The detailed description of the Tuscan formation describes 4 layers. This may be the origin of the DWR description of Sacramento Valley aquifers divided into 4 zones. The setting description of Tuscan 'a' & 'b' fails to describe the important piezometric pressure that exists under normal conditions that may be destabilized by over "exercising" of the lower Tuscan layers. The deepest portion of Tuscan 'a' extends into Glenn County where the deepest Tuscan wells are located. Assuming that the 3000-5000 GPM wells that GCID has to supplement their river supplies, this information is critical for our efforts to compose inter-basin cooperation.
7	James Brobeck	Vina SHAC	BaS		507+	507 "In addition, all of the layers can now be represented as having 508 more realistic lateral changes in sediment type (gravel/sand vs. silt/mud), 509 which can be related to hydraulic conductivity and confined/unconfined 510 conditions for more detailed groundwater studies." Details that help us model lateral aquifer response to pumping are important considering the pressurized lower Tuscan foundation is shared by several GSAs. Details that help us model lateral aquifer response to pumping are important considering the pressurized lower Tuscan foundation is shared by several GSAs. The impacts to surface water and shallow wells resulting from pulling deep water is both delayed and long-lasting. According to a 2014 report by Davids Engineering "Management of connected surface and groundwater systems is challenging for several reasons. First, the duration of streamflow depletions caused by pumping depends on the spatial scale: in general (depending on soil conditions and strata) the greater the distance or depth between groundwater pumping and an affected stream, the lower the magnitude but the longer the timescale of depletions. As a consequence, the ultimate effects of pumping can occur significantly after pumping starts, or even after pumping has ceased. The timescales involved in aquifer responses to pumping and other stresses can be on the order of decades, making it difficult to associate cause with effect. As such, monitoring must account for this lag in impacts. In general, the longer the timeframe for effects to be observed at a given monitoring point once they become evident, the longer those effects will persist, even if the pumping causing the effects is halted immediately." The Northern California Water Association ("NCWA") document, Sacramento Valley Groundwater Assessment Active Management – Call to Action, underscores the importance of long-term monitoring to understand the impacts of groundwater pumping on basin recovery and impacts to streams.
8	James Brobeck	Vina SHAC	BaS		603+	603 "This leaky aquifer system has varied hydraulic connectivity 604 between different depth zones in different areas of the subbasin." This paragraph admits there are data gaps in the understanding of vertical flow patterns and should describe how water can leak upwards when the potentiometric pressure of the deep confined aquifer is greater than the overlying layers. Vertical flows direction and volume will change during deep pumping. A single groundwater elevation contour map doesn't say anything about vertical flow direction. The maps of changes in depth to groundwater might give a better indication of the general areas where changes in vertical flow are occurring. Areas of greater change in depth, likely mean there is also greater reduction in groundwater levels between two or more adjacent aquifer zones, suggests that there might be changes in vertical flow direction. To be accurate, you need the actual change in groundwater elevations between the different zones for different times, such as the four DWR zones in spring and fall. You would also want to know what the magnitude, gradient, and any change in the direction if the vertical flow. With the groundwater elevation differences in each adjacent aquifer zone you can determine the magnitude of the change in vertical gradient, and the direction of the change, a reduction or increase in upward (+) or downward (-) flow. You need to have the vertical groundwater elevation change for two sampling periods and the distance between the average elevation of the screened zones of the wells. With that information you could make a map of the magnitude of vertical elevation change, change in vertical gradient, along with the change in direction either upward (+) and negative (-). For example, if I have a shallow water table aquifer overlying a deeper confined aquifer, a clay layer separates the two aquifer zones. If the static condition, non-pumping, has the elevation of the confined aquifer piezometric surface above the shallow aquifer water table elevation, then the vertical flow direction is upwards (+). If pumping causes the confined aquifer piezometric elevation to drop, but it still remains above the shallow water table, the flow direction is still upwards, but the magnitude (gradient) is less. The shallow aquifer may be receiving less recharge from the deeper aquifer, or at least there's no condition to cause leakage downward. If the pumping causes the confined aquifer piezometric elevation to drop below the shallow water table elevation, now the vertical flow is downward (-). The shallow aquifer now has a condition where there may be downward leakage and it's being drained. If pumping is in an aquifer zone that's vertically between a shallower and deeper zone, the pumping can reduce recharge to adjacent zones, induce downward flow from the shallow zone, or induce upward flow from the deeper zone. It all depends on the magnitude of the groundwater level changes and the initial static or the non-pumping condition.

#	Commenter Name	Commenter Organization	Chapter* (BaS or MoN)	Section	Line #s or Figure #	Comment
9	James Brobeck	Vina SHAC	BaS		632	632 “Due to the variance in hydraulic connectivity between zones in different areas 633 of the Subbasin and between different depths, a single principal aquifer is 634 defined. In most cases, patterns of groundwater levels in nested wells suggest 635 some degree of connectivity.” The “single principal aquifer” defined seems to simplify the complexity of our shared aquifer system. Vertical connectivity between layers interspersed with aquitards is clear but piezometric elevation differences indicate more dynamic complexity than what seems to be implies by “single principal aquifer”.
10	James Brobeck	Vina SHAC	BaS		649	649 “Relatively 650 shallow groundwater in some areas of the subbasin support Groundwater 651 Dependent Ecosystems and stream flows.” The TNC GDE guidelines incorrectly limit GDE depths to <30’. Valley Oak Woodlands require access to water tables as deep as 80’ according to the USDA Forest Service. The urban forest of Chico provides many environmental services and should be considered as we expand our GDE GW monitoring network
11	James Brobeck	Vina SHAC	BaS		777+	777 “However, comparison of the 778 reports illustrates how in the period between their issuance, groundwater 779 conditions have tightened, and as forces ranging from population growth to 780 climate change play out, the value of well-informed water management policies 781 and practices is likely to increase.” “forces” should emphasize the expansion of GW irrigated agriculture that may occur as some rice farms switch from SW irrigated rice to GW irrigated orchards as well as new ground that is likely to be developed without regional land use planning that might preserve unirrigated grazing land. Population growth/urban expansion is less likely to increase demand than agriculture, especially if urban planners encourage xeriscape landscaping and water recycling.

#	Commenter Name	Commenter Organization	Chapter* (BaS or MoN)	Section	Line #s or Figure #	Comment
12	James Brobeck	Vina SHAC	BaS		801+	801 “Wells showing depths to first encountered groundwater deeper than 802 500 feet were eliminated from the data set. The remaining readings were 803 sorted by well depth. Wells having identical state well number site codes 804 were then filtered to select the shallowest well from each nested well 805 cluster.” This paragraph implies that flow directions will be based on lateral flow in the shallow aquifer. It is vitally important to understand flow direction, both vertical and lateral, in all portions of the freshwater aquifer. Eliminating deep aquifer data eliminates piezometric influences on GW flow patterns.
13	Mike Crump	Stakeholder	BaS/Mon			It would help identify location and boundaries of the various items illustrated on all the Figures/maps if major county roads were also shown in addition to the state highways. Also on Figure 1-6, I could not find what the various colors meant.
14	James Brobeck	Vina SHAC	Mon		9	The long-term health of native phreatophytic valley oak habitat is associated with maintaining a minimum range of groundwater levels. Baseline habitat monitoring is an important data collection objective because it allows for a better understanding of the existing water resource requirements of the native habitat and the evaluation of potential impacts associated with potential changes in water resource management practices. In order to identify potential habitat impacts associated with potential changes in water management practices, a program-specific network of shallow monitor monitoring wells should be developed to detect changes in water levels over the shallowest portion of the aquifer.
15	James Brobeck	Vina SHAC	Mon		21	Because fresh water is not as dense as salt water fresh water in the Sacramento Valley floats on top of vast deposits of saltwater. If excessive pumping occurs, a cone of depression develops in the fresh groundwater, and a cone of ascension forms in the underlying salty groundwater causing intrusion into the fresh aquifer system.
16	James Brobeck	Vina SHAC	Mon		30	The existing network has significant deficiencies resulting in critical data gaps. 1) Vertical interbasin flow patterns need to be assessed. 2) Habitat monitoring of the shallowest portion of the system must be expanded to identify baseline and dynamic water levels that support phreatophytic ecosystems.
17	James Brobeck	Vina SHAC	Mon		53	MTs for the Chico Urban Area should honor the BMOs established by the community: Basin Management Objectives for the Chico Urban Area reflect groundwater levels adequate to sustain municipal, agricultural and domestic use and the quality of streams and groundwater dependent vegetation. These groundwater levels reflect the natural seasonality of the groundwater systems.

#	Commenter Name	Commenter Organization	Chapter* (BaS or MoN)	Section	Line #s or Figure #	Comment
18	James Brobeck	Vina SHAC	Mon		134	The well table should show screen levels (both standard elevation above sea level and depth below surface). Habitat Monitoring The long-term health of riparian vegetation, wetland species, and number of other native habitat are commonly associated with maintaining a minimum range of groundwater levels and an appropriate level of interaction between surface water and groundwater resources. The lowering of groundwater levels due to natural climatic changes or the interception of groundwater underflow to surface water systems due to the increased groundwater extraction associated with water management programs, have the potential to impact the native habitat areas. Baseline habitat monitoring is an important data collection objective because it allows for a better understanding of the existing water resource requirements of the native habitat and the evaluation of potential impacts associated with potential changes in water resource management practices. In order to identify potential habitat impacts associated with potential changes in water management practices, a program-specific network of shallow monitor monitoring wells should be developed to detect changes in water levels over the shallowest portion of the aquifer. In evaluating impacts to certain wetlands species, it is important to discern both the rate of groundwater level change, as well as the cumulative change over the entire year. Data collection and monitoring frequency should be appropriately selected to support the temporal and long-term evaluations. TNC guidelines that limit GDE monitoring to <30' are insufficient to measure Valley Oak Woodland habitat that requires access to the capillary fringe of water table as deep as 80'. Existing Valley Oak groves should be surveyed and monitored. Urban forests that have unirrigated trees that remain robustly foliated during summer/fall drought should be considered as GDE. Urban forests are know to provide a range of environmental services to residents. We must identify the root depth of urban trees, establish a monitoring network sufficient to protect this valuable GDE.
19	James Brobeck	Vina SHAC	Mon		386	It is normal to have five or more nodes to resolve a feature of interest but the monument spacing is shown to be 3-10 miles. This implies that subsidence that may occur in a 1-3 miles zone may be invisible to the monitoring grid. Will satalite monitoring be frequent and nimble enough to observe the intitial stages of subsidence?
20	James Brobeck	Vina SHAC	Mon		53	Summertime stream monitoring of BCC, LCC,BC, Mud Creek and Rockcreek to identify the timing and location of dewaterings as well as the presence of listed species in spawning as well as rearing cycles should be implimented.
21	Bruce Smith	Citizen	BaS	1.1.6.1	553, 554 Fig 1-9A	Important to note electric logs used to devine formation boundaries in AEM cross section
22	Bruce Smith	Citizen	BaS	1.1.8, 1.1.8.1	599-605	There are four principal aquifers in the Vina Subbasin. The shallow Aquifer, the intermediate aquifer and the upper and lower deep aquifers. This data gap needs to be better defined using well logs and cross sections and conceptual models that show flow paths. This section from 599-605 implies one principal aquifer. Gives the false impression that surface recharge then recharges other/lower aquifers. They may not be connected.
23	Bruce Smith	Citizen	BaS	1.1.8.2	649-651	Groundwater Dependent Ecosystems requires more discussion
24	Bruce Smith	Citizen	BaS	1.1.8.3	730, 731	The term release large amounts (What is a large amount)
25	Bruce Smith	Citizen	BaS	1.1.9.8	765-760	Can AEM do stream flow paths?

	Vina Groundwater Sustainability Agency Agenda Transmittal	Agenda Item: 7.1.1

Subject: Management Committee Report - Vina GSA Stakeholder Advisory Committee Update

Contact: Kelly Peterson Phone: (530) 552-3588 Meeting Date: October 14, 2020 Regular Agenda

Department Summary: The Vina GSA Stakeholder Advisory Committee (SHAC) met virtually last month on September 15, 2020 and developed one formal recommendation from the SHAC to the GSA Board after coming to agreement on recommended modifications to the Vina SHAC Charter.

The SHAC recommends that the Vina GSA Board approve proposed revisions to the group's Charter focusing on 1.) incorporating clarification on the process for SHAC members to include items on their meeting agendas 2.) outlining the level of detail to be included in the meeting notes in regards to who agreed or disagreed when making decisions 3.) requiring a quorum of SHAC members for decision making including formal recommendations to the Vina GSA Board. This item is planned be brought to the Vina GSA Board at the November 2020 Board meeting for consideration after it undergoes legal review.

Additionally at the last meeting, the SHAC:

- Approved the meeting notes from the previous meeting
- Received an update from the Management Committee regarding the September Vina GSA Board meeting
- Received an overview presentation of draft Basin Setting documents and a summary of public comments received (potential Basin Setting recommendations to the Vina GSA Board of Directors were discussed however; no formal recommendations came forward from the group).

The SHAC also held a brief discussion regarding next steps with the proposed Project and Management Actions (PMA) Process for GSP development.

SHAC membership details, meeting materials, detailed meeting notes and recordings of the meetings are on the Vina GSA website: https://www.vinagsa.org/. All SHAC meetings are open to the public and scheduled for the third Tuesday of each month from 9:00 a.m. – 12:00 p.m. in an online format using Zoom. The SHAC will meet again via video conference on October 20, 2020 at which time they will consider in addition to other items, approval of the September 2020 meeting summary, which will provide more detail.

Fiscal Impact: None

Staff Recommendation: Accept as an information item.

Basin Setting Public Review Documents- Highlights and Discussion

Christina Buck, PhD
Assistant Director
Butte County Water and Resource Conservation

Vina GSA Board
October 14, 2020

Basin Setting Project- Technical Foundation

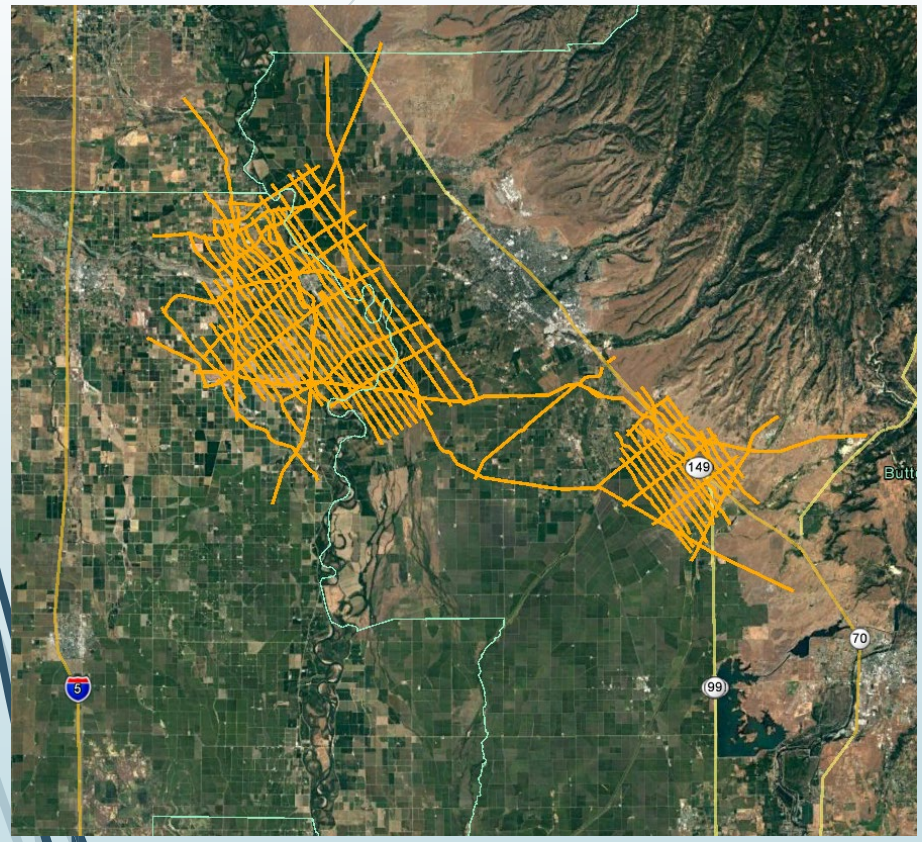
Groundwater Sustainability Plan (GSP)

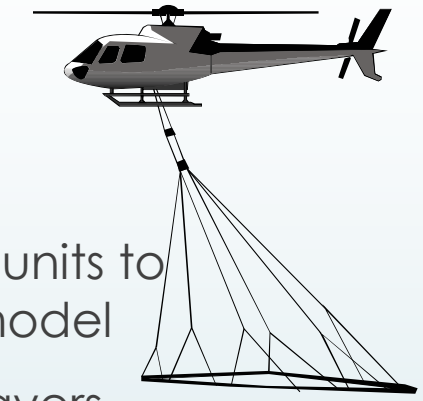
- **1. Administrative Information**
- **2. Basin Setting**
  - Hydrogeologic Conceptual Model
  - Groundwater Conditions
  - Water Budget
  - Management Areas
- **3. Sustainable Management Criteria**
  - Sustainability Goal
  - Undesirable Results
  - Minimum Thresholds
  - Measurable Objectives
- **4. Monitoring Networks**
  - Monitoring Network
  - Representative Monitoring
  - Assessment & Improvement
  - Reporting Monitoring Data
- **5. Projects and Management Actions**

Groundwater Dependent Ecosystems (GDEs)

- Work is underway
- Documentation still to be added to the Basin Setting Document

Airborne Electromagnetic (AEM) Survey





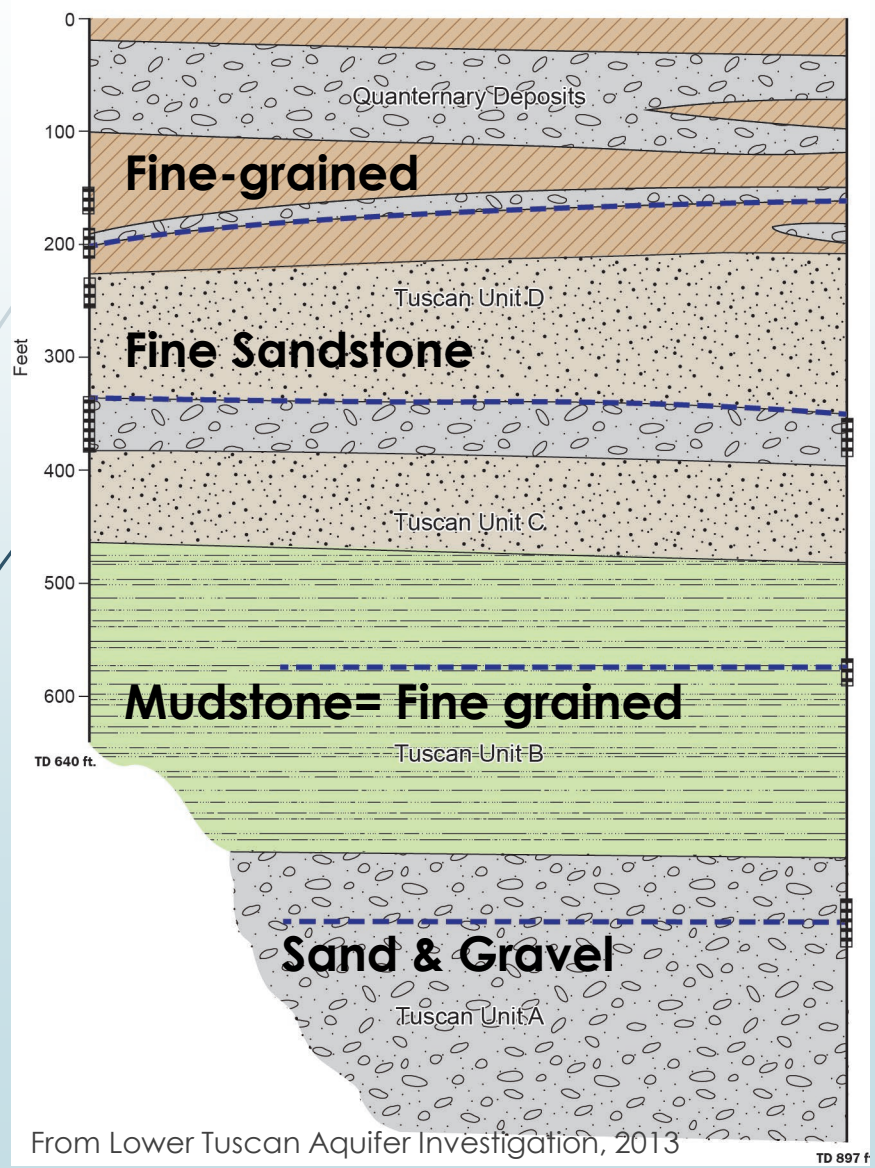
- **What are we hoping to learn?**
- Delineate major aquifer and aquitard units to improve hydrogeologic conceptual model
- Assess spatial distribution of clay-rich layers. How extensive are they?
- Examine level of connectivity between upper and lower portions of the Tehama/Tuscan aquifer systems
- Identify hydrostatigraphic layers with similar aquifer characteristics (transmissivity, specific yield, boundaries, surface water-groundwater relationships) for use in groundwater model development

Vertical Connectivity??

https://www.buttecounty.net/waterresourceconservation/AEM-Project
https://mapwater.stanford.edu/

Hydrogeologic units vs. Stratigraphic units

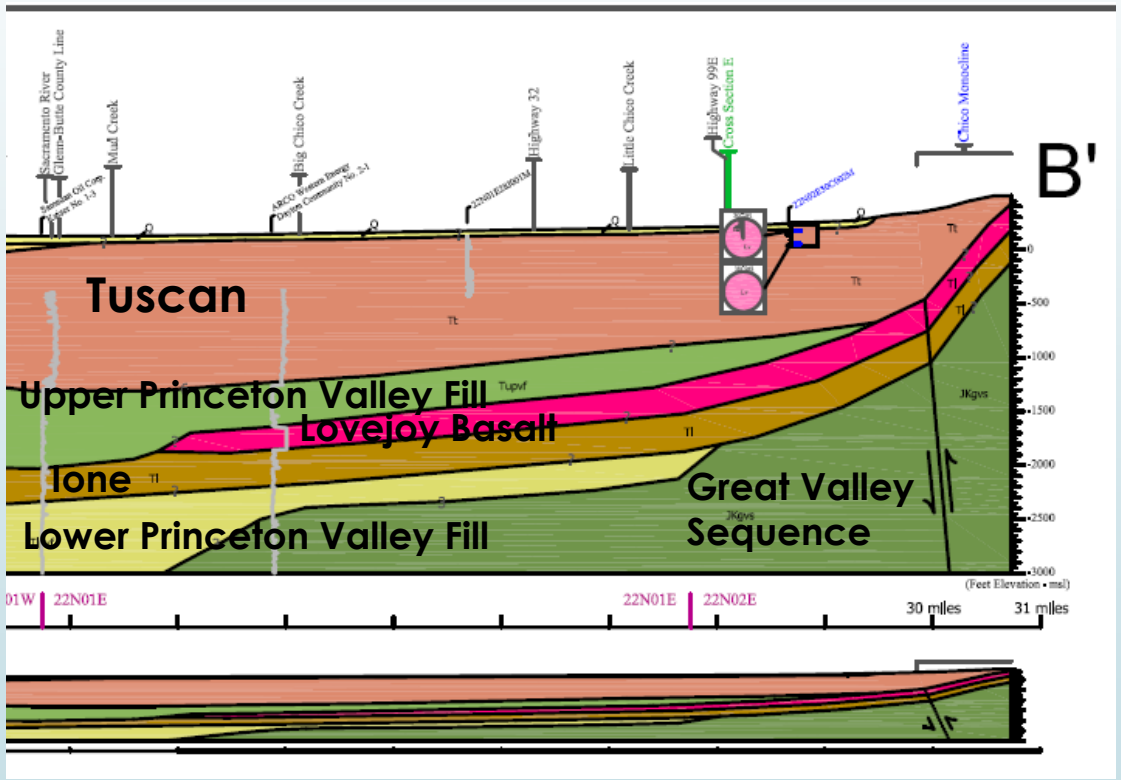
Sediment Type= Fine vs. Course grained



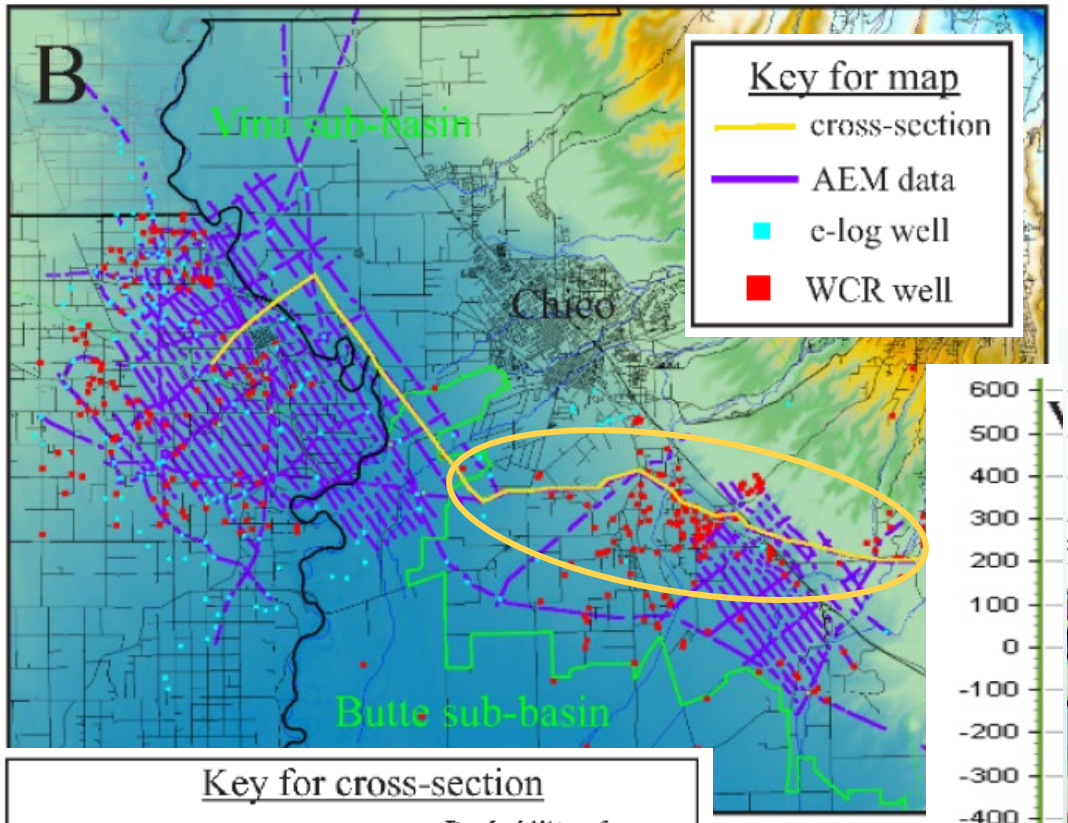
From Lower Tuscan Aquifer Investigation, 2013

Geologic Formations

- **Quaternary Deposits**
- **Tuscan**
- **Tehama**

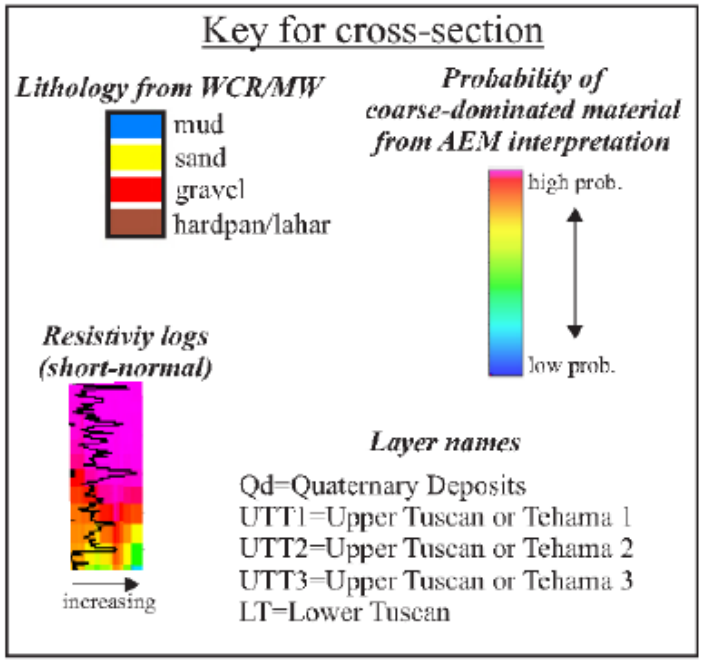


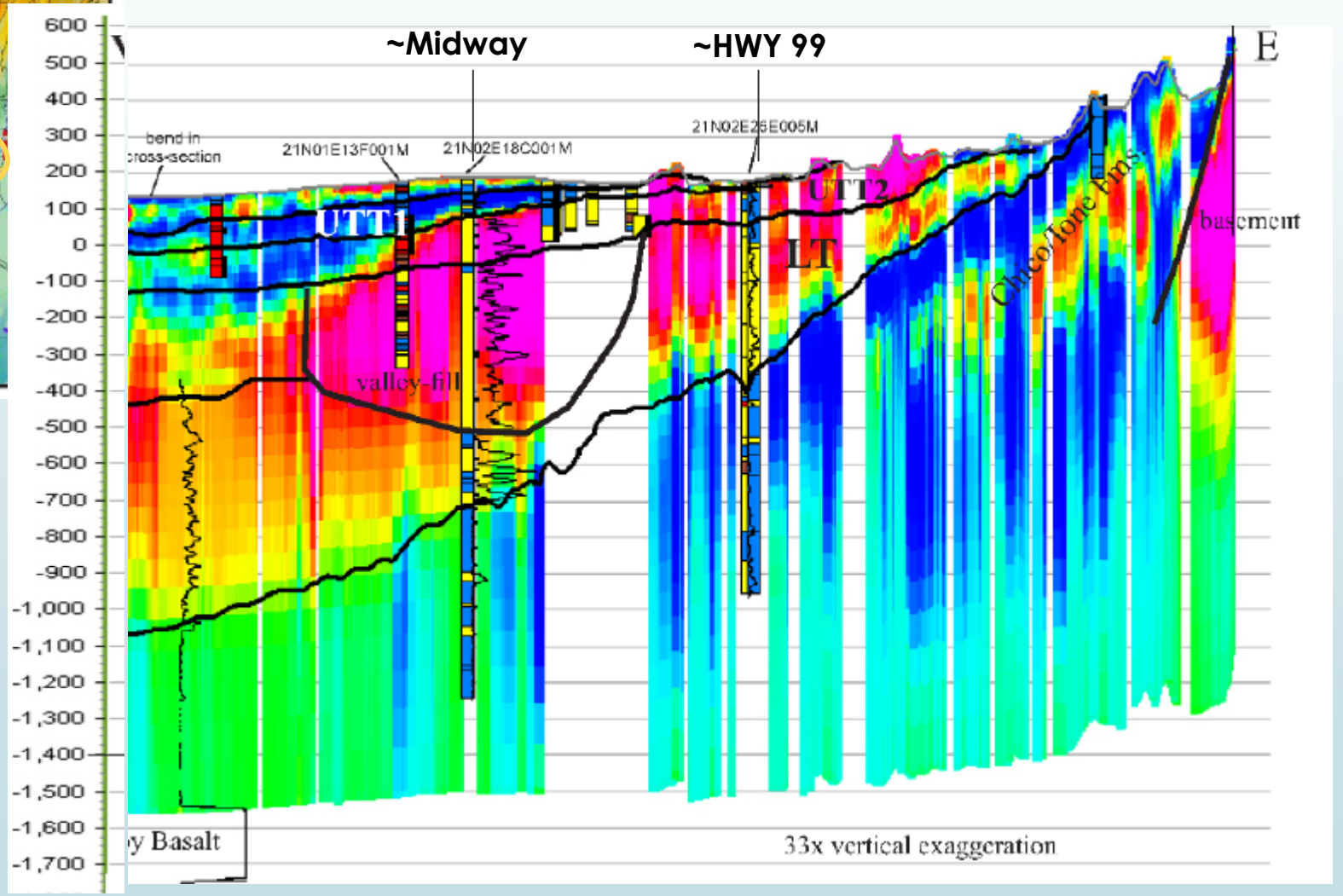
Portion of DWR Cross Section B-B' from 2014 Geology of Northern Sacramento Valley Report

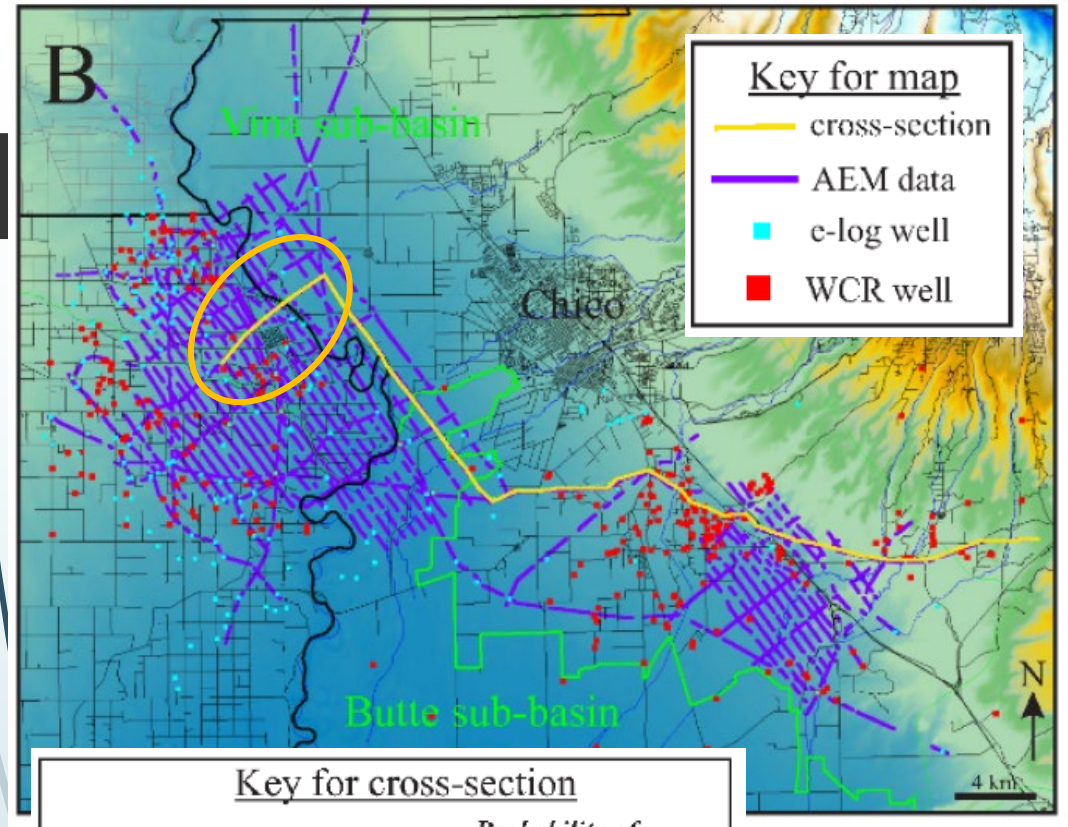


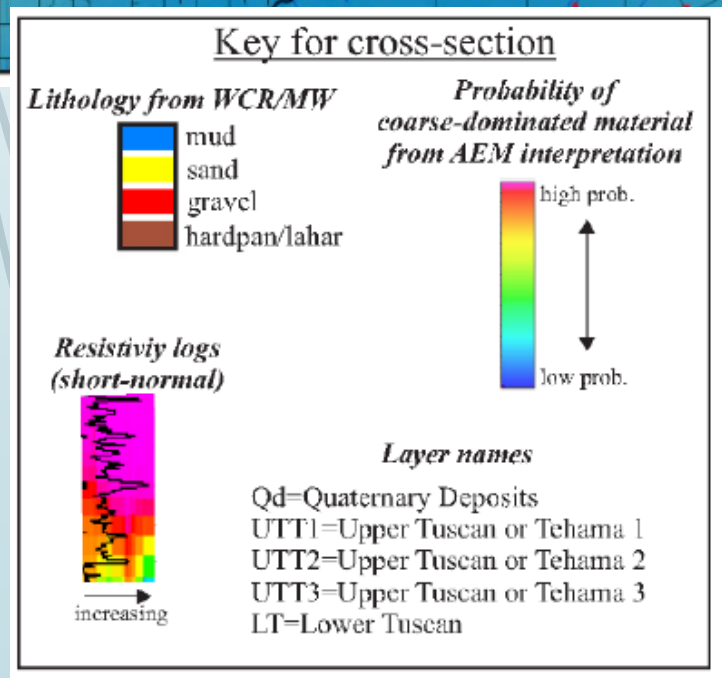
Common Terms:

- Coarse grained material, coarse dominated= sands/gravels
- Fine grained material, fine-dominated= silt/clay



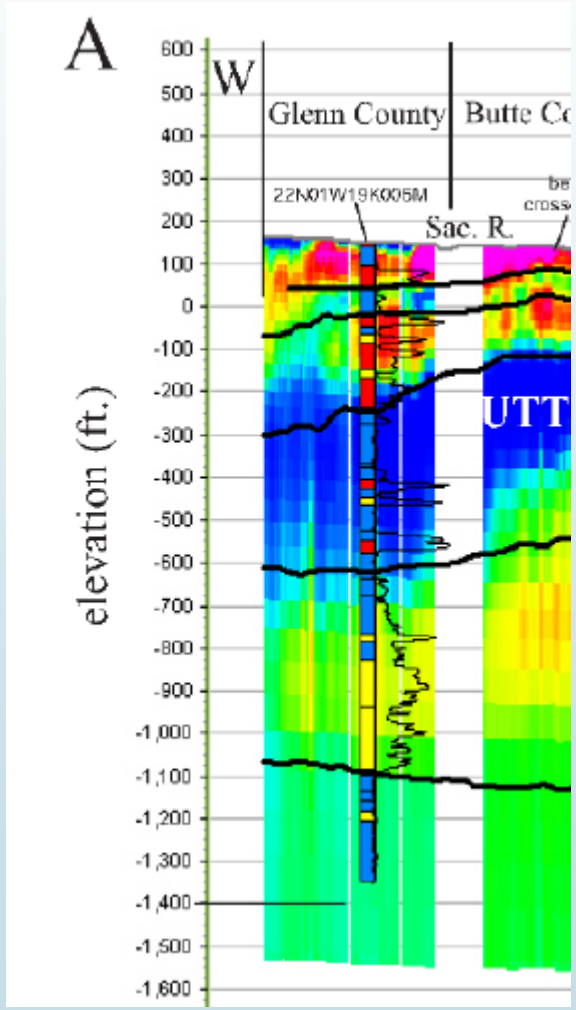






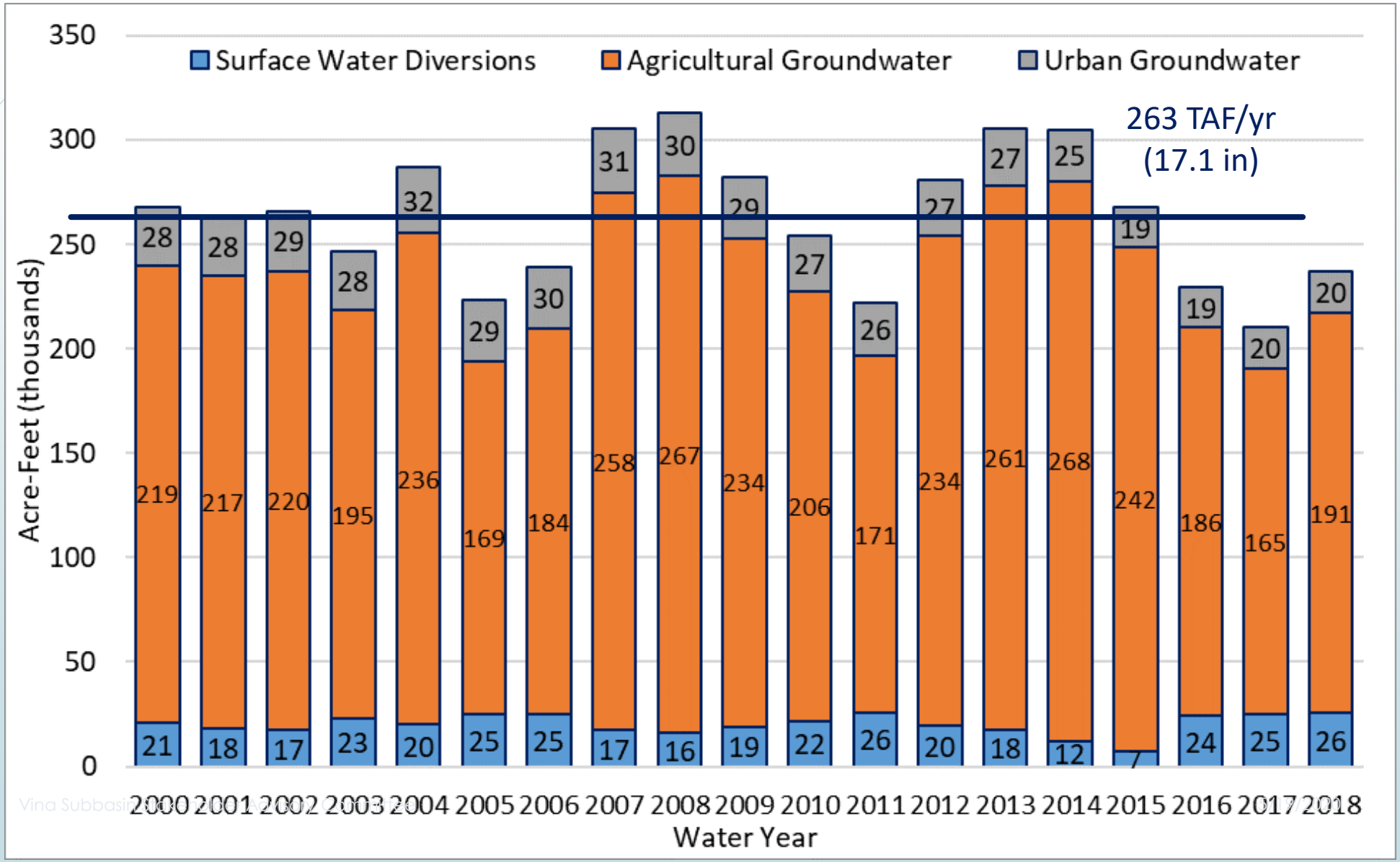
Common Terms:

- Coarse grained material, coarse dominated, aquifer material= sands/gravels
- Fine grained material, fine-dominated, aquitard material= silt/clay



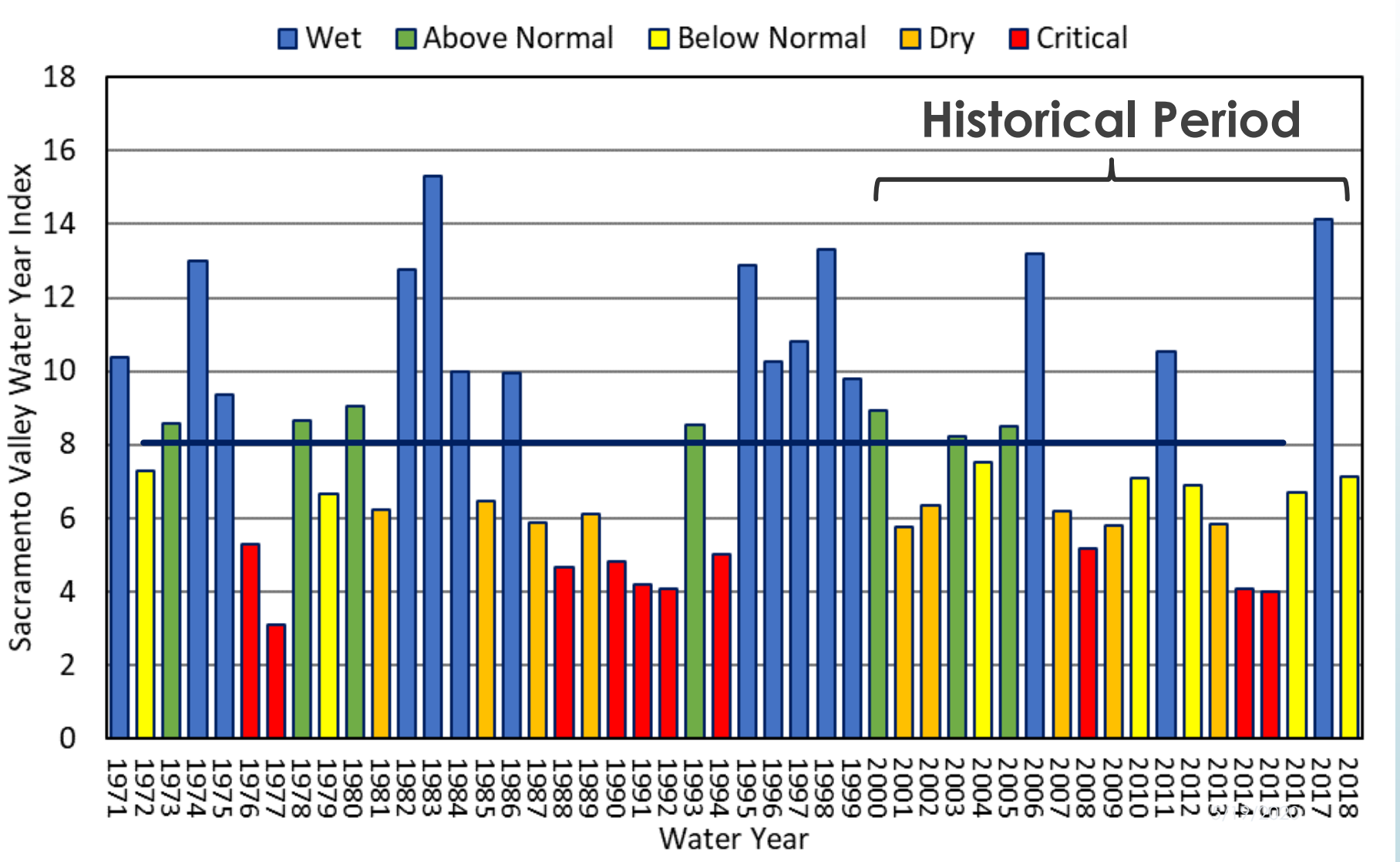
Water Supplies in the Vina Subbasin

- Ag Surface Water:
  - 8%
- Ag Pumping:
  - 82%
- Urban Pumping:
  - 10%



Hydrologic Variability

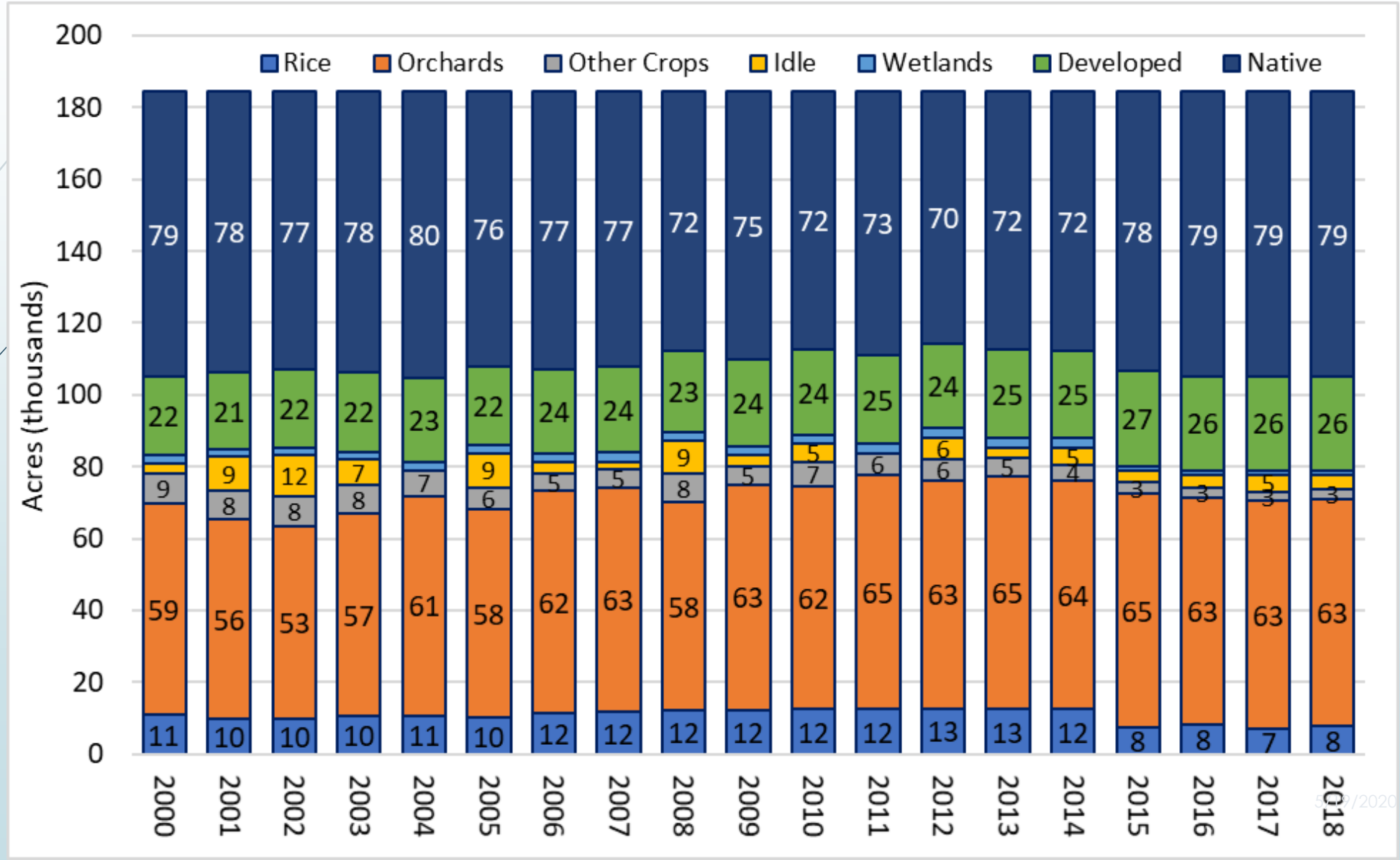
- Sacramento Valley Index
  - 1906 to 2018 avg. = 8.1
  - 1971 to 2018 avg. = 8.0
- Precipitation
  - 1906 to 2018 avg. = 24.8 in
  - 1971 to 2018 avg. = 26.3 in
  - 2000 to 2018 avg. = 26.7 in



Land Use

Native vegetation includes grasslands, riparian, and wetlands.

- Agriculture: 45%
- Developed: 13%
- Native: 42%



Water Budget Results

- Water Budget Results:
  - Historical- 2000-2018
  - "Current"- 2016 land use, 2016-2018 urban demands
  - Future Conditions
  - Climate Change
- Main changes to inputs:
  - Land Use foot print
  - Hydrology (precipitation, stream inflows, evapotranspiration)

Table 1-8. Water Budget Summary: Groundwater System.

Component	Historical (AFY)	Current (AFY)	Future, No Climate Change (AFY)	Future, 2030 Climate Change (AFY)	Future, 2070 Climate Change (AFY)
Inflows					
Subsurface Inflows	137,400	143,200	142,800	144,600	145,500
Foothill Area	*45,700*	*50,100*	*49,700*	*50,600*	*50,600*
Los Molinos Subbasin	*63,000*	*67,000*	*67,300*	*67,900*	*68,100*
Butte Subbasin	*28,600*	*25,900*	*25,500*	*25,800*	*26,600*
Wyandotte Creek Subbasin	*200*	*300*	*200*	*300*	*300*
Deep Percolation	192,700	191,800	189,300	194,500	196,800
Precipitation	*120,200*	*125,400*	*120,400*	*123,500*	*123,600*
Applied Surface Water	*4,800*	*5,600*	*5,600*	*4,900*	*4,500*
Applied Groundwater	*67,600*	*60,900*	*63,300*	*66,100*	*68,700*
Seepage	24,000	27,700	27,800	27,800	27,400
Streams	*20,800*	*24,100*	*24,200*	*24,600*	*24,400*
Canals and Drains	*3,200*	*3,600*	*3,600*	*3,200*	*3,000*
Total Inflow	***354,100***	***362,700***	***359,900***	***366,900***	***369,700***
Outflows					
Subsurface Outflows	70,400	76,200	72,000	70,700	67,800
Foothill Area	*300*	*200*	*200*	*200*	*200*
Los Molinos Subbasin	*4,700*	*900*	*900*	*900*	*900*
Butte Subbasin	*65,400*	*75,100*	*70,800*	*69,500*	*66,600*
Wyandotte Creek Subbasin	*0*	*0*	*0*	*0*	*0*
Groundwater Pumping	243,500	209,200	215,800	225,900	238,000
Agricultural	*209,100*	*185,500*	*184,800*	*194,700*	*206,800*
Urban and Industrial	*26,500*	*20,100*	*27,500*	*27,500*	*27,500*
Managed Wetlands	*8,000*	*3,500*	*3,500*	*3,600*	*3,700*
Stream Gains from Groundwater	3,700	1,100	1,000	1,000	1,000
Western Boundary Net Outflows	56,100	77,400	73,000	71,000	65,600
Total Outflow	***373,700***	***363,900***	***361,800***	***368,600***	***372,400***
Change in Storage (Inflow - Outflow)	***-19,600***	***-1,100***	***-1,700***	***-1,700***	***-2,600***

Historical Results: Groundwater Change in Storage

- Groundwater demand is sensitive to water year type
- Change in Storage is sensitive to water year type also
- Overall Change in Storage over the Historical Period is about 400,000 AF from 2000 to 2018
  - Average almost 20,000 AF annually (from Table 1-8 on previous slide)

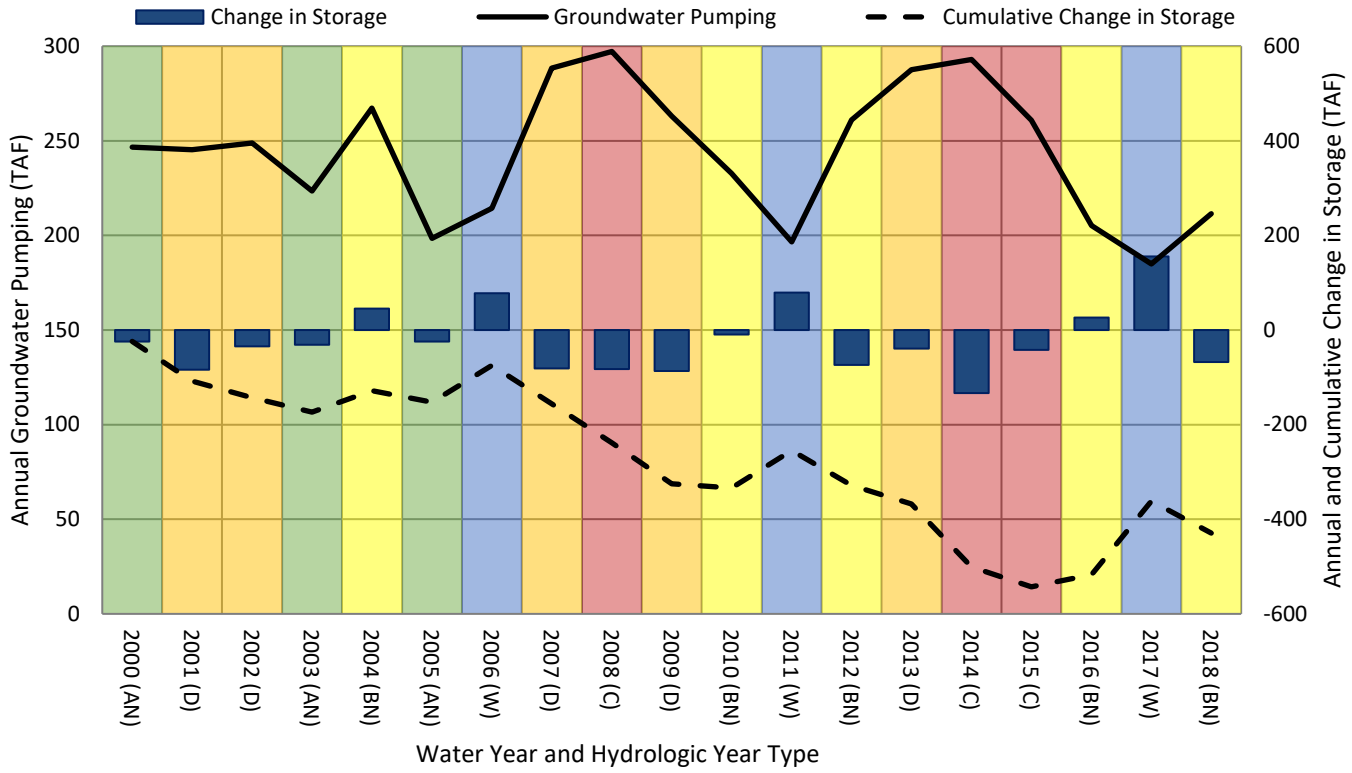


Table 1-9. Historical Water Supplies and Change in Groundwater Storage by Hydrologic Water Year Type

Water Year Type	Surface Water Deliveries (AFY)	Groundwater Pumping (AFY)	Total Supply (AFY)	Change in Groundwater Storage (AFY)
Wet	24,000	198,600	222,700	117,900
Above Normal	21,100	222,800	243,900	10,700
Below Normal	20,600	235,500	256,200	-19,200
Dry	17,300	266,600	284,000	-82,000
Critical	12,200	283,700	295,800	-84,500

Water Budget Scenarios

Water Budget Sensitivity- How does the system respond to changes in Land Use (Current/Future) and Climate Changed-Hydrology (CC 2030 and CC 2070)?

Table 1-8. Water Budget Summary: Groundwater System.

Component	Historical (AFY)	Current (AFY)	Future, No Climate Change (AFY)	Future, 2030 Climate Change (AFY)	Future, 2070 Climate Change (AFY)
Inflows					
Subsurface Inflows	137,400	143,200	142,800	144,600	145,500
Foothill Area	*45,700*	*50,100*	*49,700*	*50,600*	*50,600*
Los Molinos Subbasin	*63,000*	*67,000*	*67,300*	*67,900*	*68,100*
Butte Subbasin	*28,600*	*25,900*	*25,500*	*25,800*	*26,600*
Wyandotte Creek Subbasin	*200*	*300*	*200*	*300*	*300*
Deep Percolation	192,700	191,800	189,300	194,500	196,800
Precipitation	*120,200*	*125,400*	*120,400*	*123,500*	*123,600*
Applied Surface Water	*4,800*	*5,600*	*5,600*	*4,900*	*4,500*
Applied Groundwater	*67,600*	*60,900*	*63,300*	*66,100*	*68,700*
Seepage	24,000	27,700	27,800	27,800	27,400
Streams	*20,800*	*24,100*	*24,200*	*24,600*	*24,400*
Canals and Drains	*3,200*	*3,600*	*3,600*	*3,200*	*3,000*
Total Inflow	***354,100***	***362,700***	***359,900***	***366,900***	***369,700***
Outflows					
Subsurface Outflows	70,400	76,200	72,000	70,700	67,800
Foothill Area	*300*	*200*	*200*	*200*	*200*
Los Molinos Subbasin	*4,700*	*900*	*900*	*900*	*900*
Butte Subbasin	*65,400*	*75,100*	*70,800*	*69,500*	*66,600*
Wyandotte Creek Subbasin	*0*	*0*	*0*	*0*	*0*
Groundwater Pumping	243,500	209,200	215,800	225,900	238,000
Agricultural	*209,100*	*185,500*	*184,800*	*194,700*	*206,800*
Urban and Industrial	*26,500*	*20,100*	*27,500*	*27,500*	*27,500*
Managed Wetlands	*8,000*	*3,500*	*3,500*	*3,600*	*3,700*
Stream Gains from Groundwater	3,700	1,100	1,000	1,000	1,000
Western Boundary Net Outflows	56,100	77,400	73,000	71,000	65,600
Total Outflow	***373,700***	***363,900***	***361,800***	***368,600***	***372,400***
Change in Storage (Inflow - Outflow)	***-19,600***	***-1,100***	***-1,700***	***-1,700***	***-2,600***

↑ Subsurface Inflows

↑ Deep Percolation

= Seepage

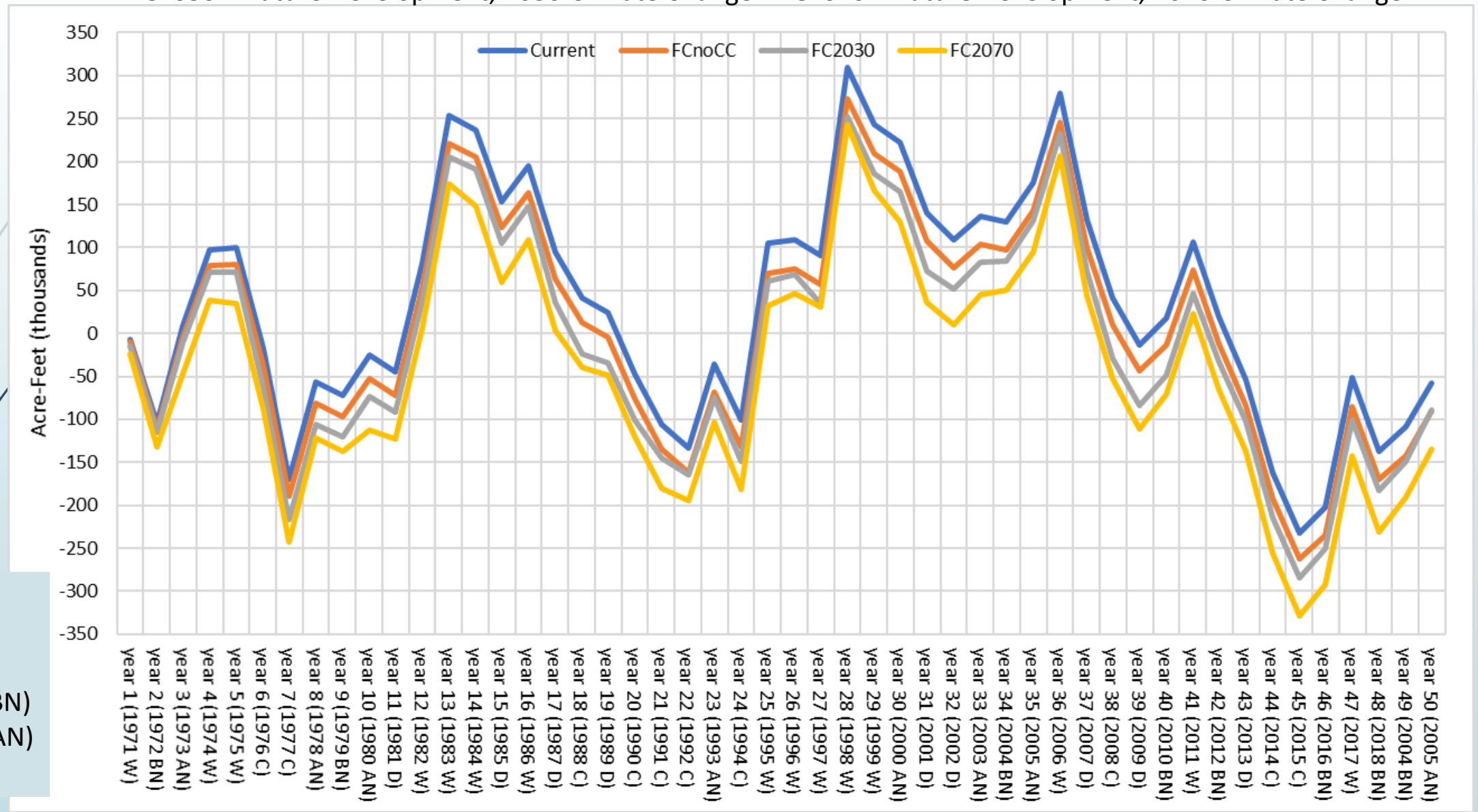
↓ Subsurface Outflows

↑ Groundwater pumping

↓ W. Boundary Net Outflows

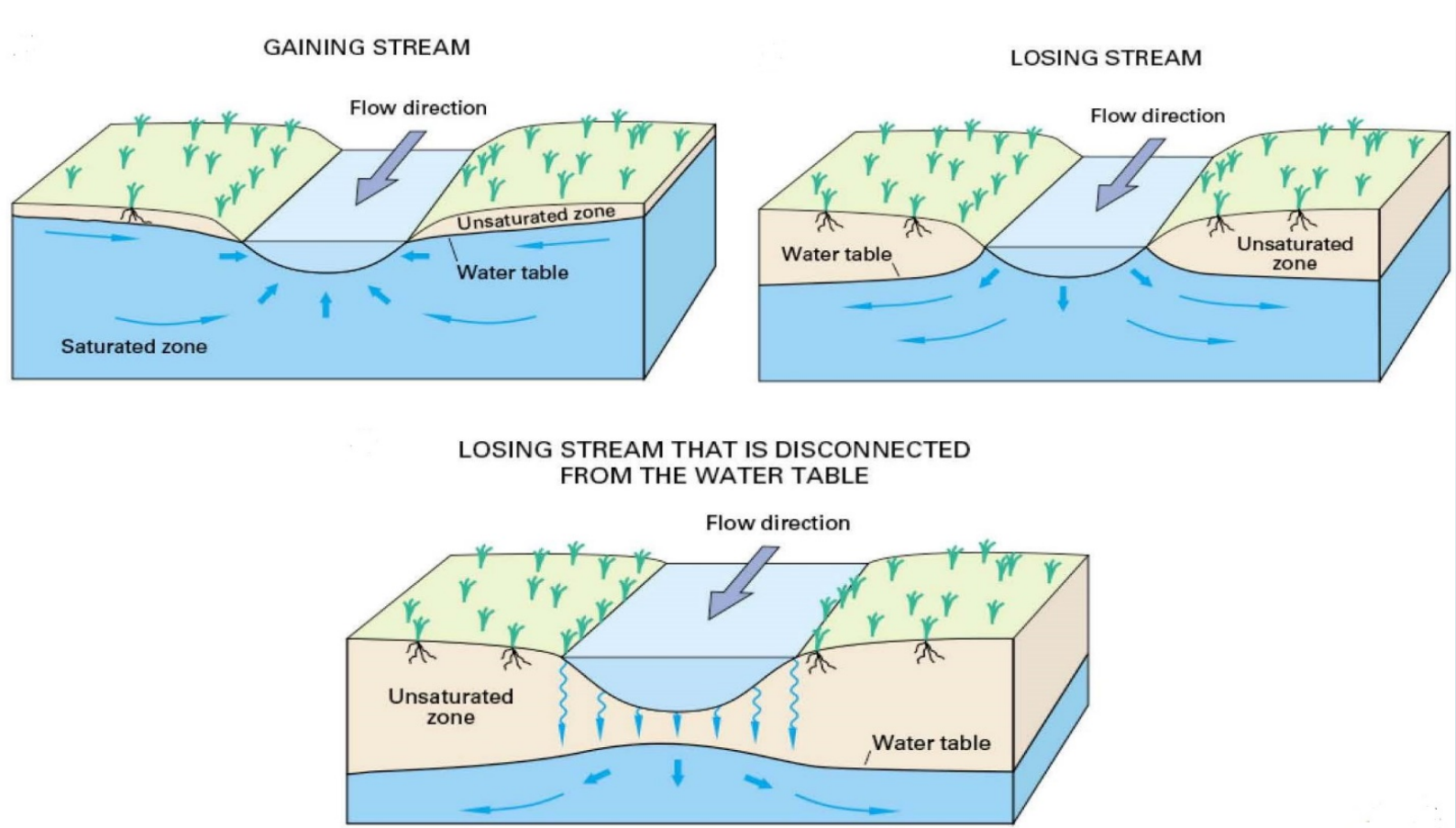
Change in Groundwater Storage

Current = Current Conditions **FCnoCC** = Future Development, No Climate Change
FC2030 = Future Development, 2030 Climate Change **FC2070** = Future Development, 2070 Climate Change



Year Types:
Critical (C)
Dry (D)
Below Normal (BN)
Above Normal (AN)
Wet (W)

Interconnected Surface Water



Interconnected Surface Water

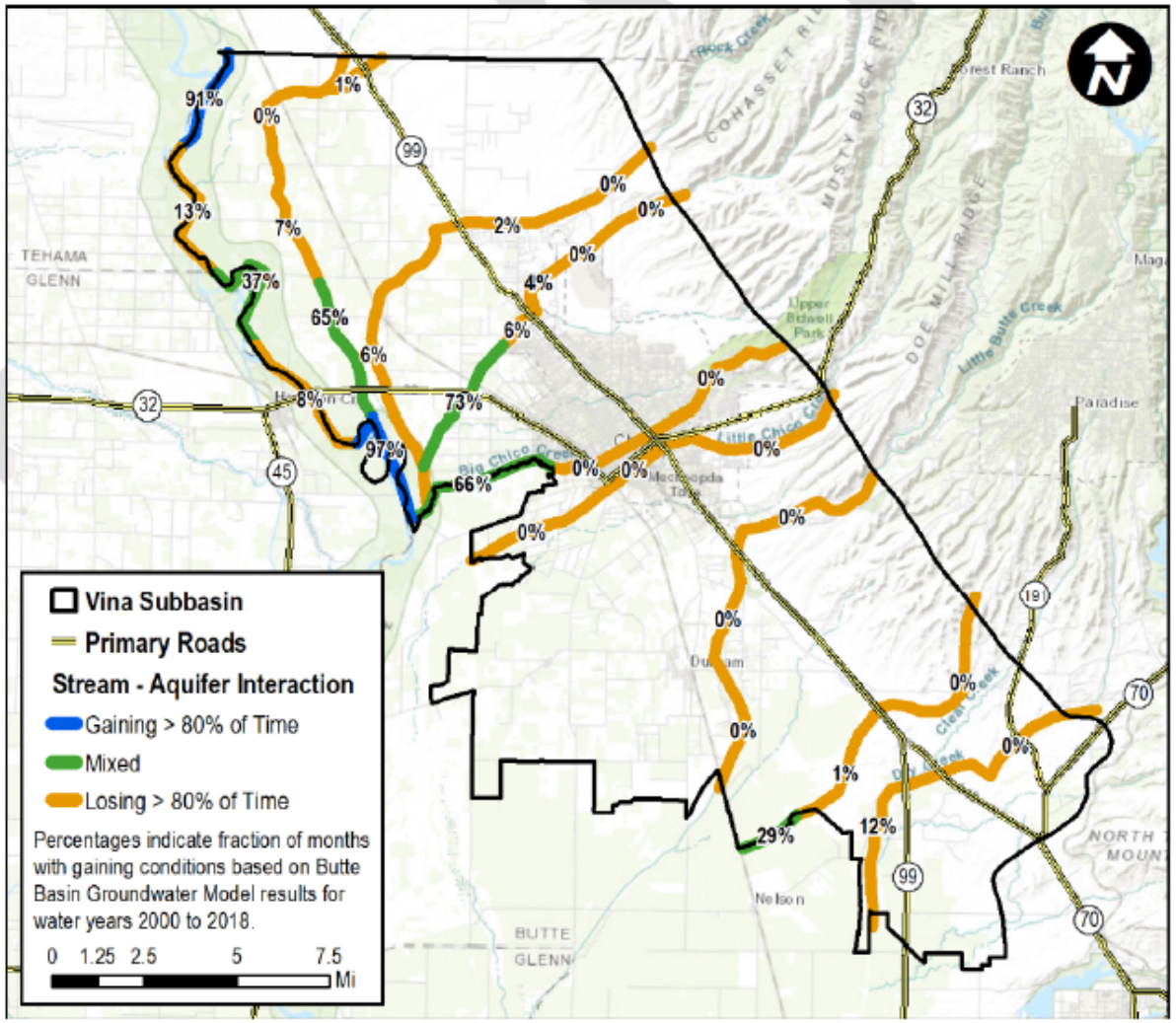
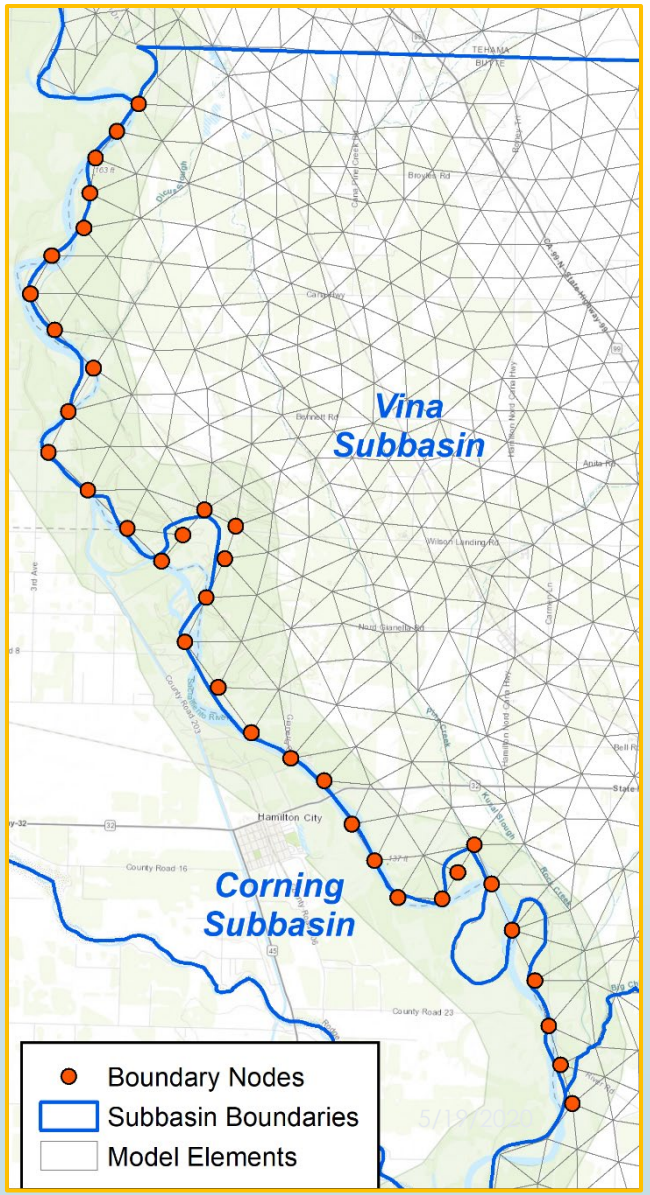


Figure 1-22. Vina Subbasin Gaining and Losing Stream Reaches based on BBGM, Water Year 2000 to 2018

Western Boundary (Sacramento River)

- Edge of Model Domain
- Groundwater Levels at 39 Boundary Nodes Based on Earlier DWR C2VSim Model
- Combination of
  - Sacramento River Interaction
  - Corning Subbasin Interbasin Flows
- Split Between River Interaction and Interbasin Flows Highly Uncertain
- Groundwater level contours from monitoring data provide insight into interbasin flow
- Interbasin Coordination effort underway- comparing water budget numbers from regional models used by neighbors



Summary of Comments from Staff Memo

Several themes emerged which are summarized in the bullets below:

- Commenters highlight the importance of the multiple aquifer zones that are present in the subbasin and the pressurized nature of the deeper zones. This has implications for understanding flow paths, vertical gradients, groundwater conditions and connectivity between zones, interbasin flow in the pressurized deep aquifer zone, connection of shallow groundwater to deeper zones and vulnerability of groundwater dependent ecosystems (GDEs), efficacy of recharge projects to provide benefits to shallow vs. deep zones, delayed and long lasting potential effects of deep pumping on stream-groundwater interactions.
- Commenters point out that monitoring the four defined aquifer zones is a data gap that should be filled with monitoring groundwater levels in each zone. The aquifer zones should also be better defined using well logs, cross sections to understand connectivity between zones, groundwater flow paths, and changes in vertical gradients over time.
- Monitoring of the shallowest portion of the groundwater system was identified as a need to identify baseline and dynamic water levels that support groundwater dependent ecosystems. A shallow monitoring network needs to be developed and implemented to understand conditions in the shallowest portions of the aquifer system.
- A comment suggested that the rooting depth of the Valley Oak is incorrectly limited by The Nature Conservancy documentation on GDEs to 30 feet. Sources listed by the US Forest Service identify a rooting depth of 80 feet. The urban forest in Chico should also be identified and considered as a GDE and habitat monitoring should survey and monitor impacts on wetlands and other GDE areas.
- A number of clarification questions and comments were submitted

Comments largely relate to the Hydrogeologic Conceptual Model and have implications for expansion of monitoring to address identified data gaps.

Summary of Comments from Staff Memo- continued

Other significant issues that have been raised include:

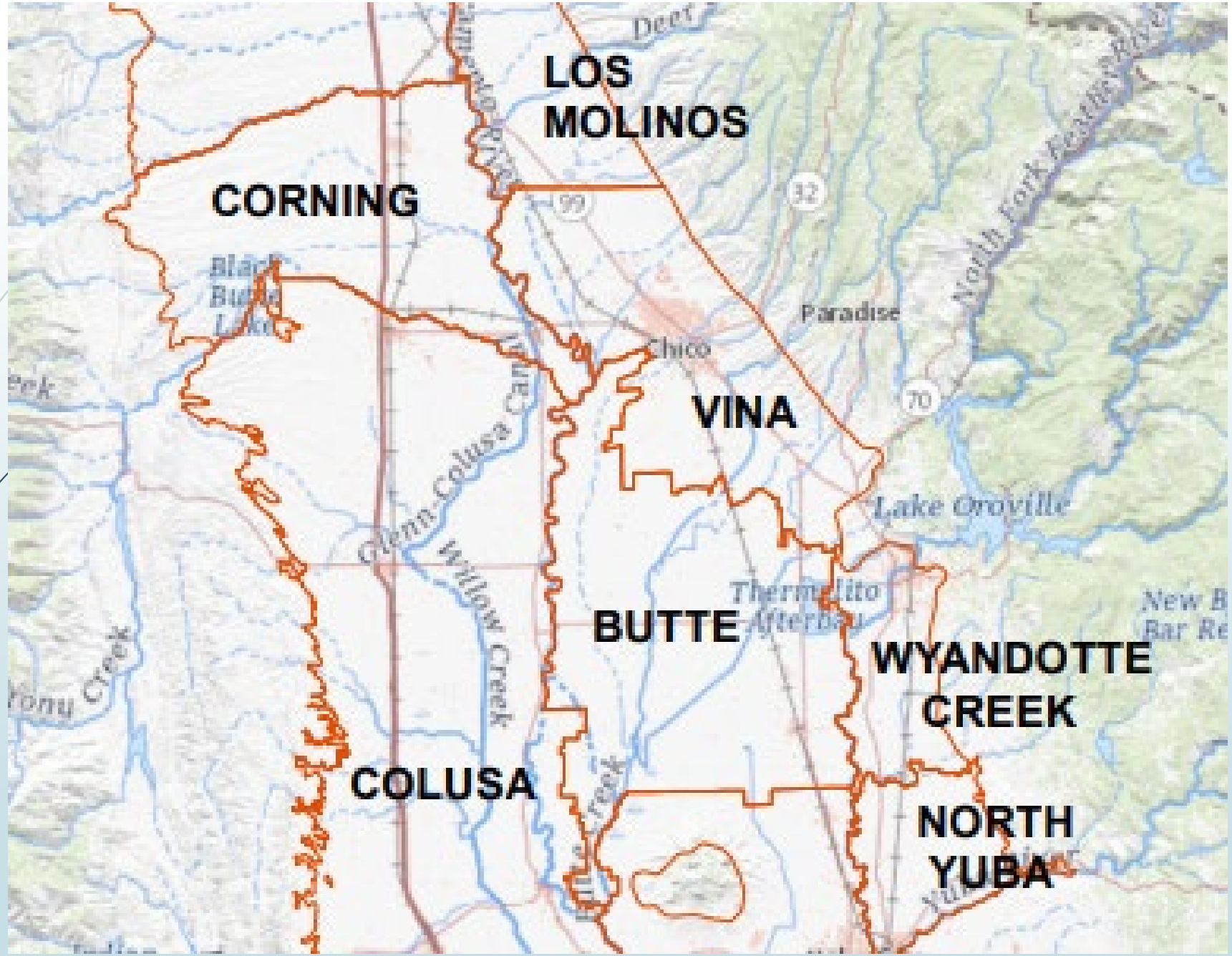
- Importance of understanding and characterizing interbasin flows
- Climate change impact assessment

Highlighted Topics for Possible Discussion/Recommendation

1. Shallow Monitoring Network
   - The document and public comment identify deficient monitoring in the shallowest portions of the aquifer system as an important data gap. The SHAC agreed that understanding the shallow zone is important and expressed interest in establishing a shallow monitoring network.
2. Climate Change and Water Budget Sensitivity
   - The SHAC indicated a desire to assess how the approach/data used for the Basin Setting compares to Climate Action Plans developed by the City of Chico and Butte County.

Discussion

Contact:
Christina Buck
cbuck@buttecounty.net


LOS
MOLINOS
CORNING
VINA
BUTTE
WYANDOTTE
CREEK
COLUSA
NORTH
YUBA
Chico
Paradise
Lake Oroville
Deer
Willow Creek
Glenn-Colusa Canal
99
32
70

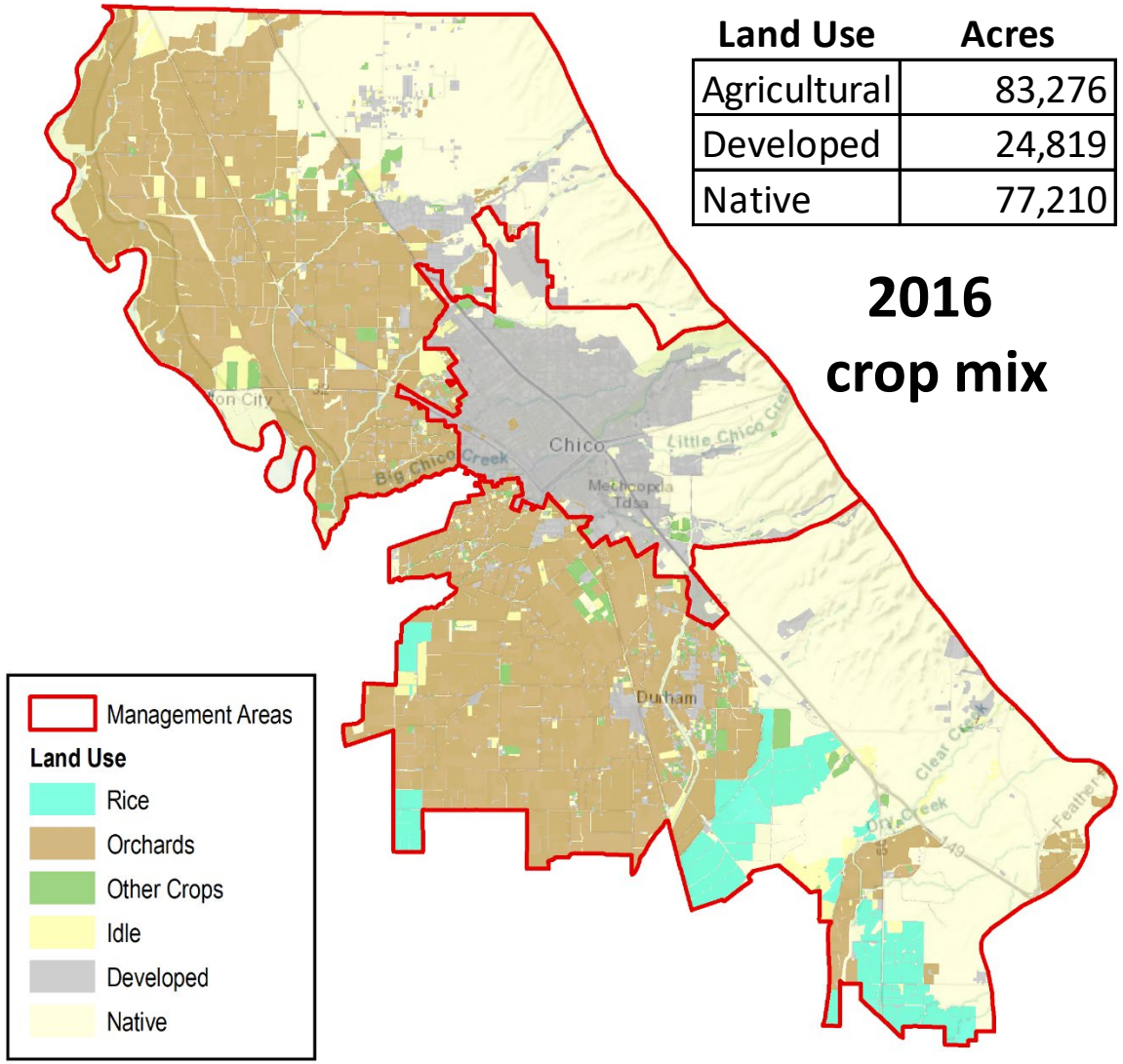
Land Use

Future Development Based on 2030 General Plan and Parcel Zoning

Current Conditions

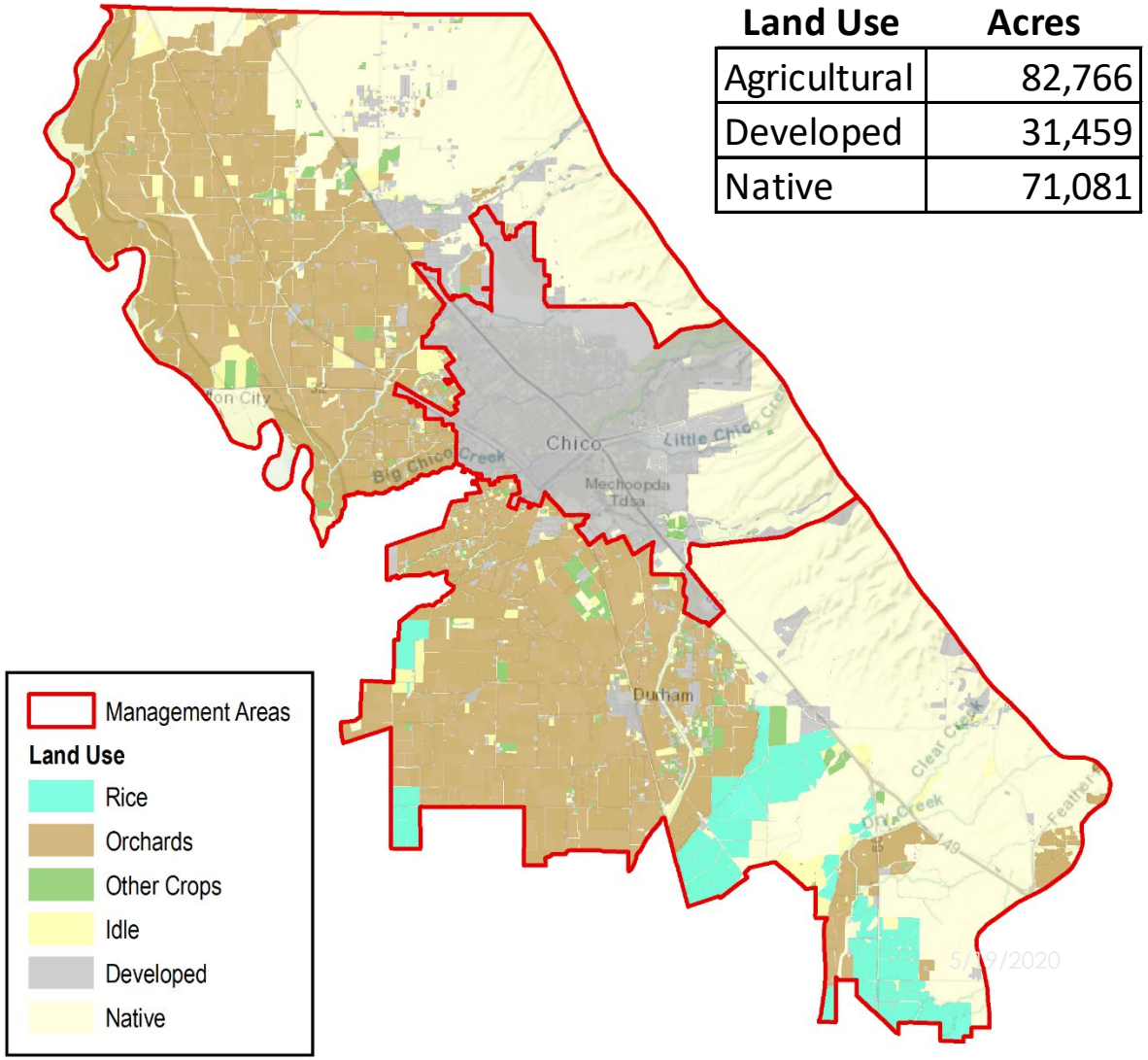
Land Use	Acres
Agricultural	83,276
Developed	24,819
Native	77,210

2016 crop mix



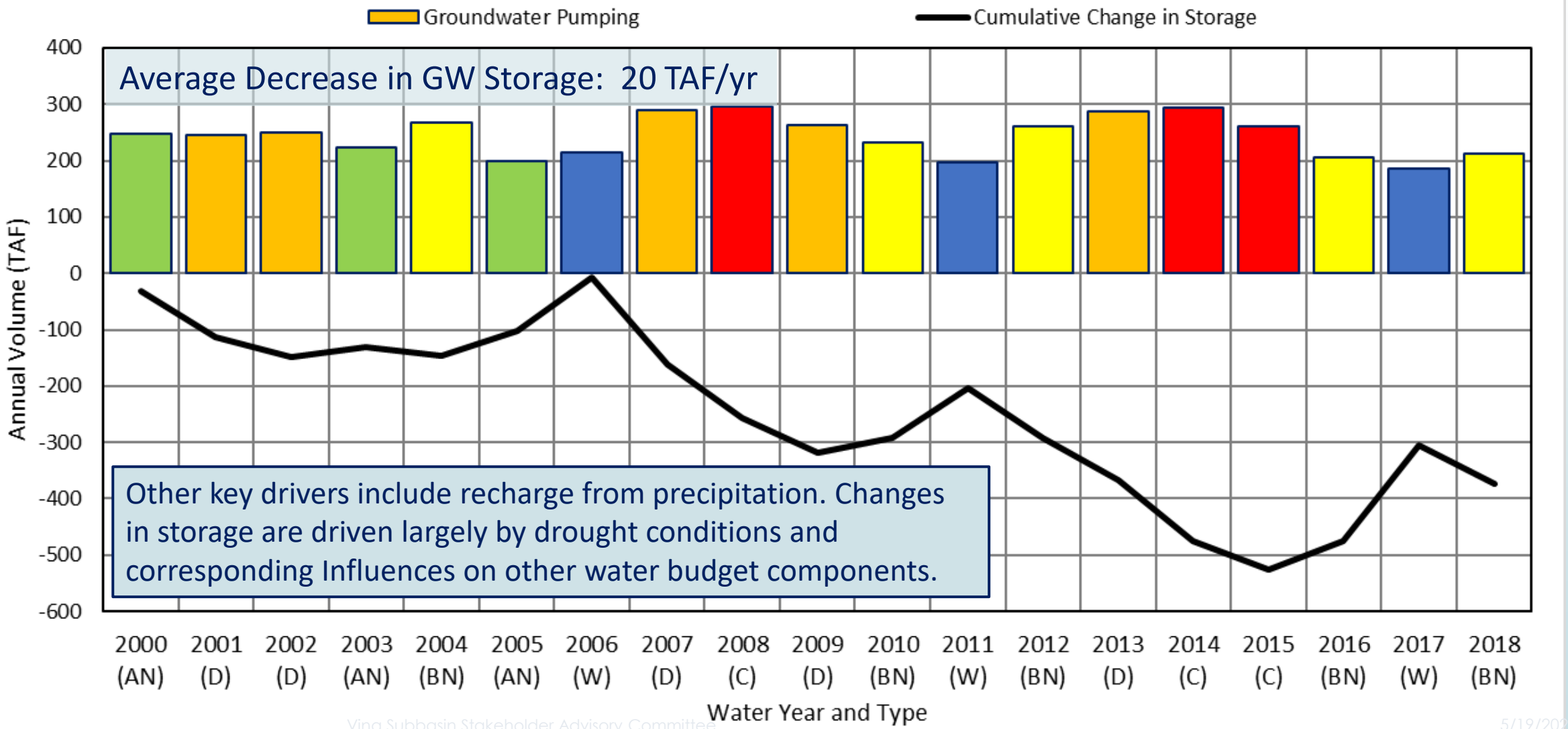
Future Conditions

Land Use	Acres
Agricultural	82,766
Developed	31,459
Native	71,081



Historical Water Budget Summary

Annual Groundwater Pumping and Cumulative Change in Storage



Year Types: Critical (C), Dry (D), Below Normal (BN), Above Normal (AN), Wet (W)