Yolo Subbasin Groundwater Agency
2022 Groundwater Sustainability Plan

Yolo County, CA

Appendix C

Public Comments Received and YSGA Response

Contents

Comment #	Commenter	Representing	GSP Reference (Public Draft)	Remark	YSGA Response
12	Dave Pratt	Individual	General Comment	(See full letter) The big issue for the GSP is groundwater levels. The GSP is good on how to assess the situation: It establishes reasonable minimum thresholds for groundwater levels and then proposes a reasonable way to use these to decide what makes an "undesirable result" for the Basin. But then it says nothing at all about who does what in an attempt to correct any undesirable results. If control of ground water is to be kept local as much as possible, the GSP will have to include this. Maybe it's not the job of GEI to discuss this, but somebody has to.	Thank you for your comment. We do recognize that there are many more details involved in ensuring undesirable results are avoided, such as implementing projects and if necessary, demand management strategies. We have received similar comments and recognize this problem will need to be addressed as part of GSP implementation.
13	Dave Pratt	Individual	p. 1-25	(See full letter) Has a farmer really ever had to wait 6 weeks to get water on a crop?	During 'waiting lists' a typical wait time might be a few days to one week. This sentence is supposed to mean that 'waiting lists' as imposed by the YCFC&WCD may last up to six weeks during the hottest part of the summer, during high demand periods, for growers within our service area. An individual farmer does not have to wait six weeks for water. The sentence has been revised for clarity in the GSP.
14	Dave Pratt	Individual	p. 1-25	(See full letter) well permitting process: Does the county, at present, have any authority to refuse a permit on the grounds that there isn't enough water or that the proposed use of the water is not in the public interest? Control of issuing permits ought to be worth a major discussion in the GSP.	The County well permitting process only covers the proper construction of the well, not location or amount of water to be pumped. However, the County does have land use authority and could implement more regulations on location of new wells (setback requirements) or request additional information related to the quantity of water pumped. The YSGA is coordinating closely with the County to improve the data collecting in the well permitting process. Additional coordination with the County as a land use authority is an ongoing effort of the YSGA, as indicated in Management Action 2 and in the GSP Preface.
15	Dave Pratt	Individual	Table 1-4	(See full letter) Public Meetings and workshops: Many of these are listed as YSGA Executive Committee meetings. Weren't these actually solo efforts by Tim O'Halloran?	This table lists public meetings of the YSGA Executive Committee, which includes the YSGA Chair, Vice Chair, an additional Director, Executive Officer, and County staff (meant to serve as equal representation of the ag and urban sectors). Between 2014 and 2016, YCFC&WCD and YSGA staff presented at more than 115 public meetings of various groups, such as Farm Bureau events, Chambers of Commerce, City Council, IRWM, neighboring counties, and other groups.
16	Dave Pratt	Individual	p. 3-1	(See full letter) The word should be sustainably rather than sustainability.	Changed sustainability to sustainably.
17	Dave Pratt	Individual	Figure 3-2	(See full letter) If this figure is to be used for anything important, there should be a discussion about the accuracy of drawing lines in places where there are few data points. For example, how can it be that the 10, 20, 30, 40, 50, 60, and 70 contours of minimum threshold elevations in the southeast part of the county extend right to the Sacramento River, which is essentially at sea level?	The values of these contours are -70, -60, -50, -40, -30, -20, -10, and 0 feet, relative to sea level. The land surface elevations in the southeast portion of the Yolo Subbasin are close to sea level, so groundwater levels below sea level can be observed.
18	Dave Pratt	Individual	Table 3-1	(See full letter) Were some wrong numbers entered for well 249? From the numbers as entered, you would conclude that the ground elevation at the well was sea level, which doesn't figure for central Yolo County. (The maps of well locations don't seem to show this well at all.)	Thank you for bringing this to our attention. Well 249 was not supposed to be in that table. It has been removed.
20	Carrie McGregor	Individual	General Comment	I am concerned about the declining groundwater levels. I ask that those who live and work in the area of Hungry Hollow be supported by delaying or ending continued development of unirrigated land, i.e. a moratorium on further well drilling and groundwater extraction for development of new irrigated lands. I urge you to listen to those who have witnessed the water levels dropping over the decades. Those whose desire is to grow large crops for the worldwide market are not considering the needs of the good people who call this area their home. The good people who have worked as farmers, for decades and generations, to grow food for their own and neighboring communities. We have a lovely system, a genuine community of people who care about each other: farmers and consumers interacting on a face to face basis--not a corporation looking to extract what to them comes down to money. There are more valuable things here to consider. Thank you for your time.	Thank you for your comment. We have received similar comments and recognize this problem will need to be addressed as part of GSP implementation. We encourage you to continue to participate in this process and to provide your feedback in upcoming advisory committee, working group, and board meetings. This will be considered in our process for updating the GSP by 2027.

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24	Cynthia Goldberg	Individual	General Comment	I tried to make sense as a non-water scientist, but it was difficult to understand all the details. I have one big overriding concern. Clearly drought and groundwater management are critical problems to solve and managing groundwater (in addition to use of surface water) is long overdue. Water resources have been limited and of major concern since I move to CA in 1991. BUT...why are farms, especially large corporate farms able to plant new nut tree orchards at the present time. Nut trees are a great income producer and export product, but it seems to me we must focus on basic food needs and those who grow with existing farms rather than allow diversion of very limited water to nurture trees that produce nuts in 5 years. I read through the Projects & Management Actions and nowhere did I read creating a process for oversight and control of who is farming what and where. Nowhere did I see a 'freeze' or 'moratorium' on new farming or managing food resources use of the water as a priority. And gosh I really think my ability to purchase healthy affordable local food to cook with is more critical than an almond or pistachio orchard. Can our region support MORE irrigated farmland/ranches? I don't think so when current farmers are without enough water. And what do we really know about aquifers and deep wells? Not much at this point. The recharge process may take years or decades or longer...and we don't know how much we are using future water resources. We humans have a lousy track record for being good stewards of the planetary resources....how much more foolish about this will we be. You have the opportunity to push the PAUSE BUTTON before this gets worse. I really don't understand much more than the simple reality of drought, heat, climate change, irrigation needed for food I need to eat. If we are sort-of in balance now, how can we tip the scales by allowing more and bigger new irrigated farms? Not at all I think.	Thank you for your comment. We have received similar comments and recognize this problem will need to be addressed as part of GSP implementation. We encourage you to continue to participate in this process and to provide your feedback in upcoming advisory committee, working group, and board meetings. This will be considered in our process for updating the GSP by 2027.
27	Heather Rowan	Individual	General Comment	I agree with Good Humus Produce, who have been farming in Capay for decades: • Accountability of our groundwater usage-We are suggesting a moratorium on further groundwater extraction for development on what have been historically non-irrigated lands until there is an understanding of groundwater sustainability in the Dunnigan hills and other “special concern” areas. • Accountability by our community- To move forward in the change of climate we suggest an active informative educational process to help agricultural landowners and urban dwellers how to go into the future on how we each can participate in decreasing water usage together.	Thank you for your comment. We have received similar comments and recognize GSP implementation will need to consider the framework for executing accountability of groundwater usage in the near and long-term future. We encourage you to continue to participate in this process and to provide your feedback in upcoming advisory committee, working group, and board meetings. This will be considered in our process for updating the GSP by 2027.
28	Katie Demers	Individual	General Comment	Accountability of our groundwater usage-We are suggesting a moratorium on further groundwater extraction for development on what have been historically non-irrigated lands until there is an understanding of groundwater sustainability in the Dunnigan hills and other “special concern” areas. Accountability by our community- To move forward in the change of climate we suggest an active informative educational process to help agricultural landowners and urban dwellers how to go into the future on how we each can participate in decreasing water usage together.	Thank you for your comment. We have received similar comments and recognize GSP implementation will need to consider the framework for executing accountability of groundwater usage in the near and long-term future. We encourage you to continue to participate in this process and to provide your feedback in upcoming advisory committee, working group, and board meetings. This will be considered in our process for updating the GSP by 2027.
29	Ashlie Kirby	Individual	General Comment	I suggest a moratorium on further groundwater extraction for development on what have been historically non-irrigated lands until there is an understanding of groundwater sustainability in Dunnigan Hills and other “special concern areas.” To move forward in the change of climate I suggest an active informative educational process to help agricultural landowners and urban dwellers know how to go into the future on how we each can participate in decreasing water usage together. Please help small farms like Good Humus continue to provide local food to the Sacramento area.	Thank you for your comment. We have received similar comments and recognize this will need to be addressed as part of GSP implementation. We encourage you to continue to participate in this process and to provide your feedback in upcoming advisory committee, working group, and board meetings. This will be considered in our process for updating the GSP by 2027.
30	Chris Noey	Individual	General Comment	I support proposing a moratorium on further groundwater extraction for development of unirrigated lands. Additionally, I believe further education is needed on how we each can participate in increasing groundwater recharge and decrease water usage.	Thank you for your comment. We have received similar comments and recognize this will need to be addressed as part of GSP implementation. We encourage you to continue to participate in this process and to provide your feedback in upcoming advisory committee, working group, and board meetings. This will be considered in our process for updating the GSP by 2027.

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31	Cathy Marcinkevage/ Amanda Cranford	NMFS	General Comment	(See full letter) The GSA should describe what conditions within the subbasin would constitute an undesirable result with regard to streamflow depletion, ensuring that the description accounts for impacts to instream habitat that support all life-stages of ESA-listed species. The currently proposed sustainable management criteria for streamflow depletion do not include any explanation of how they will meet this requirement. For instance, the Lower Cache Creek streamflow depletion minimum threshold of "the recurrence of the spring (March-May) average measurement for 1975 to present in at least one spring in every seven (7) years" (p 3-24) has no apparent basis in ecology or any linkage to the aquatic habitat degradation caused by streamflow depletion that ultimately influences whether migrating and spawning salmon, steelhead, and sturgeon survive. If a lack of available data prevents such an effort, NMFS recommends the GSA follow guidance from California Department of Fish and Wildlife (2019) and develop conservative streamflow depletion thresholds as a precautionary principle until the surface flow/groundwater dynamic in the Yolo subbasin is better studied and understood.	Thank you for the comment, the YSGA added the following to section 3.8.2.1 Criteria for establishing minimum thresholds (p 3-24). The primary sustainability criteria for establishing minimum thresholds for interconnected surface waters is to maintain interconnection of the local groundwater system to critical surface water bodies at levels consistent with recent conditions. In this manner, the YSGA is establishing sustainable management criteria that protects the existing level of interconnection, which in turn supports existing habitat and ecosystem conditions associated with critical surface water bodies, while preventing further degradation.
32	Cathy Marcinkevage/ Amanda Cranford	NMFS	General Comment	(See full letter) If the GSA intends to propose groundwater elevations as a minimum threshold for streamflow depletion, the GSA should provide an explanation, with supporting best available science, for why groundwater levels are a reasonable proxy for interconnected surface water depletion. In addition, please explain why those levels are sufficient to avoid streamflow depletion that significantly impacts surface water beneficial uses.	Thank you for the comment, please see our response to Comment 31. The YSGA is setting criteria to maintain historical conditions and prevent further degradation. The YSGA added the following statement to section 3.8.2.1: The established minimum thresholds have been developed to maintain interconnection of local groundwater systems to the adjacent water body at levels consistent with recent conditions, thereby, supporting existing habitat and ecosystem conditions associated with the water bodies, while preventing further degradation.
33	Cathy Marcinkevage/ Amanda Cranford	NMFS	General Comment	(See full letter) Proposing groundwater elevations from the 2011-2016 period as streamflow depletion minimum thresholds and measurable objectives is likely inappropriate for avoiding significant impacts to ESA-listed species and their critical habitats, and EFH for Pacific Coast salmon. A basic hydraulic principle is that groundwater flow is proportional to the difference between groundwater elevations at different locations along a flow path. Using this basic principle, groundwater flow to a stream or, conversely, seep from a stream to the underlying aquifer is proportional to the difference between water elevation in the stream and groundwater elevations at locations away from the stream. Minimum thresholds and measurable objectives consistent with groundwater elevations seen during California's recent historic drought, such as that crafted for the Upper Sacramento River (p 3-25), would likely create historically high streamflow depletion rates and result in instream conditions that negatively affect ESA-listed species and their critical habitats, and EFH for Pacific Coast salmon. If a lack of data prevents the development of appropriate sustainable management criteria, the GSA should commit to designing and implementing studies that better inform appropriate "ecologically-based" minimum thresholds and measurable objectives for streamflow depletion.	Thank you for the comment, please see our response to Comment 31. The intent of establishing the selected MTs and MOs was to maintain historical conditions and prevent further degradation.

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34	Cathy Marcinkevage/ Amanda Cranford	NMFS	General Comment	(See full letter) We suspect that groundwater recharge projects are likely to be an important action implemented as part of the effort to achieve groundwater sustainability in the Yolo subbasin. NMFS encourages the GSA to consider implementing recharge projects that facilitate floodplain inundation and offer multiple benefits, including downstream flood attenuation, groundwater recharge, and ecosystem service. Managed floodplain inundation can recharge floodplain aquifers, which in turn slowly release stored water back to the stream during summer months. These projects also reconnect the stream channel with floodplain habitat, benefitting juvenile salmon, steelhead, and sturgeon by creating off-channel habitat characterized by slow water velocities, ample cover in the form of submerged vegetation, and high food availability. As an added bonus, these types of multi-benefit projects likely have more diverse grant funding streams that can lower their cost as compared to traditional off-channel recharge projects. NMFS is available to work with any GSA interested in designing and implementing floodplain recharge projects.	Two sentences were added to MA 4 describing multi-benefit recharge projects and managed wetlands recharge projects.
35	Eliza Gregory	Individual	General Comment	Accountability of our groundwater usage: I want to see a moratorium on further groundwater extraction for development on what have historically been non-irrigated lands until there is an understanding of groundwater sustainability in the Dunnigan hills and other "special concern" areas. Accountability by our community: I would like to see an active informative educational process to help agricultural landowners and urban dwellers make intentional choices going into the future so that we can all participate in decreasing water usage together. I am deeply concerned with groundwater regulation in California and want to see policies that prioritize small farming operations over large companies. I worry about hedge fund and venture funded operations that have no stake in the local impact of their companies' activities doing material harm to our ecosystems, water supply and economy.	Thank you for your comment. We have received similar comments and recognize GSP implementation will need to consider the framework for executing accountability of groundwater usage in the near and long-term future. We encourage you to continue to participate in this process and to provide your feedback in upcoming advisory committee, working group, and board meetings. This will be considered in our process for updating the GSP by 2027.
36	Jill Shirley	Individual	General Comment	I would like to see a moratorium on further groundwater extraction for development on what have been historically non-irrigated lands until there is an understanding of groundwater sustainability in the Dunnigan Hills and other "special concern" areas. It is CRAZY to allow development until the security and sustainability of water supplies are assured.	Thank you for your comment. We have received similar comments and recognize this will need to be addressed as part of the GSP implementation. We encourage you to continue to participate in this process and to provide your feedback in upcoming advisory committee, working group, and board meetings. This will be considered in our process for updating the GSP by 2027.
37	Oscar Villegas	County Supervisor, District 1	p. 2-54	Supervisor Villegas expressed concerns over potential seawater intrusion as a result of changes in Delta operations. If the proposed Delta tunnels are completed, there is the potential for seawater intrusion to occur in the surface water system, and then into the groundwater system.	The following was added to Section 2.2.3: There is the potential for changes in surface water conditions within the Sacramento-San Joaquin River Delta. Sea level rise, Delta water conveyance modifications, and changing land use have the potential to allow surface water with higher salinity values to move farther into the Delta than they have in the recent historic period. This has the potential to affect the South Yolo and Clarksburg Management Areas. These actions or projects are related to surface water management, and are not directly considered in this plan; however, the quality of groundwater, specifically the increase or intrusion of salinity in the South Yolo and Clarksburg Management Areas will be considered when potential changes are proposed in the Delta within the Degraded Water Quality Sustainable Management Criteria.
38	Mary Kaltenbach	Individual	General Comment	GSP, As the groundwater declines during drought conditions and during an unprecedented development of our diminishing groundwater resource, we would like to ask GSP to consider the following: · Accountability of our groundwater usage-We are suggesting a moratorium on further groundwater extraction for development on what have been historically non-irrigated lands until there is an understanding of groundwater sustainability. · Accountability by our community- To move forward in the change of climate we suggest an active informative educational process to help agricultural landowners and urban dwellers how to go into the future, on how we each can participate in decreasing water usage together. Please consider our request, for the future generations of farmers hoping to grow food for our community. Sincerely, Mary Kaltenbach and family	Thank you for your comment. We have received similar comments and recognize GSP implementation will need to consider the framework for executing accountability of groundwater usage in the near and long-term future. We encourage you to continue to participate in this process and to provide your feedback in upcoming advisory committee, working group, and board meetings. This will be considered in our process for updating the GSP by 2027.

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39	Stephen Kaltenbach	Individual	General Comment	GSP, As the groundwater declines during drought conditions and during an unprecedented development of our diminishing groundwater resource, we would like to ask GSP to consider the following: · Accountability of our groundwater usage-We are suggesting a moratorium on further groundwater extraction for development on what have been historically non-irrigated lands until there is an understanding of groundwater sustainability. · Accountability by our community- To move forward in the change of climate we suggest an active informative educational process to help agricultural landowners and urban dwellers how to go into the future, on how we each can participate in decreasing water usage together. Please consider our request, for the future generations of farmers hoping to grow food for our community. Sincerely, Stephen Kaltenbach	Thank you for your comment. We have received similar comments and recognize GSP implementation will need to consider the framework for executing accountability of groundwater usage in the near and long-term future. We encourage you to continue to participate in this process and to provide your feedback in upcoming advisory committee, working group, and board meetings. This will be considered in our process for updating the GSP by 2027.
41	Marguerite Fleming	Individual	General Comment	I'm greatly concerned by water use of new nut farms that have popped up on so many county roads, and would like a moratorium on water extraction on currently unirrigated land until we know that currently farmed land and homes will have adequate water for their current uses. Find a way to make water users accountable for use. Everyone needs to work together on this, especially in this time of climate change.	Thank you for your comment. We have received similar comments and recognize this problem will need to be addressed as part of GSP implementation. We encourage you to continue to participate in this process and to provide your feedback in upcoming advisory committee, working group, and board meetings. This will be considered in our process for updating the GSP by 2027.
42a	Shaundra Cashdollar	CDFW	p. 2-101	(See full letter) Comment #1 – i. Interconnected Surface Water Systems (2.2 Groundwater Conditions, 2.2.6 Interconnected Surface Water Systems; starting p 2-101): The GSP should add clarity to its description of interconnected surface waters (ISW) within the subbasin. a. Issues: i. Groundwater Elevations: The GSP states that to identify ISW within the subbasin, the "minimum groundwater elevation" from water years 2006-2015 was compared with stream surface elevations (p 2-103, line 27). Presumably this should say either maximum groundwater elevation, or minimum depth to groundwater, as indicated in Figure 2-47. Additionally, groundwater levels should be compared to the streambed elevation, rather than the stream surface elevation, for assessment of interconnectedness. Recommendations: i. Groundwater Elevations: The GSP should be revised to clarify whether the ISW methodology used the minimum or maximum groundwater elevations. The Department recommends using the maximum groundwater elevations to be inclusive when identifying ISW within the subbasin. The methodology should be narrowly updated to compare groundwater levels with the streambed elevation, rather than the stream surface.	The statement on page 103, line 27 (in the Public Draft) was revised to reflect that maximum groundwater elevation was used. Language in Section 2.2.6.1 was added to more explicitly explain the estimation of stream bottom elevation.
42b	Shaundra Cashdollar	CDFW	p. 2-110	(See full letter) Comment #1 – ii. Quantity and Timing of Depletions: Though Table 2-17 (p 2- 110) presents the modeled annual average seep volumes from ISW within the subbasin, the GSP does not include sufficient detail on the timing of depletions as required by 23 CCR § 354.16(f). In order to adequately assess ISW that may be gaining or losing at different times of the year, it is preferential to present seep values by month, rather than by year. Additionally, the Department recommends including seep values for the Upper Sacramento River and Lower Sacramento River separately. Figure 2-47 appears to show the Upper Sacramento as a primarily losing reach while the Lower Sacramento is a gaining reach. Aggregating seep values across the entire Sacramento River makes it difficult to assess current conditions within shorter river segments. As the ISW sustainable management criteria (SMC) sets thresholds separately for the Upper and Lower Sacramento River, presenting current conditions in the same manner would allow for a more direct comparison of baseline conditions and those that would occur under the SMC. b. Recommendations: ii. Quantity and Timing of Depletions: The Department recommends updating Table 2-17 to include average depletions by month. Information for the Upper and Lower Sacramento River should be presented individually.	Table 2-17 has been modified to present monthly average seep values. The values presented for the Sacramento River have been split into two reaches corresponding to the interconnected surface water management zones.

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43	Shaundra Cashdollar	CDFW	p. 2-109	(See full letter) Comment #2 – Groundwater Dependent Ecosystems (2.2 Groundwater Conditions, 2.2.7 Groundwater Dependent Ecosystems; starting p 2-109): The GSP does not include sufficient detail or metrics on how the assessment of GDEs within the subbasin will be used to evaluate undesirable results or guide management criteria and actions. a. Issues: i. GDE Unit Susceptibility: The Department recognizes and appreciates the conservative approach to identifying GDEs with the subbasin, as well as the subsequent analysis assessing trends in Normalized Difference Vegetation Index (NDVI), groundwater levels, species dependence, and biodiversity values for GDE units. However, other than assessing trends within the subbasin, the GSP does not identify specific targets or metrics associated with these GDE trends that would indicate an undesirable result or trigger management actions within the subbasin. ii. Special Status Species: Table 2-20 (p 2-124) lists the number of freshwater species present in each GDE unit, subcategorized by listed species, vulnerable species, and endemic species. The GSP does not specifically identify which special status species are present within the subbasin, and it is unclear whether this assessment included aquatic species supported by ISW within the subbasin. b. Recommendations: i. GDE Unit Susceptibility: To leverage the robust GDE analysis for meaningful groundwater management, the Department recommends the GSP clarify what constitutes an undesirable result for GDEs and how potential undesirable results will be avoided under the proposed SMC. The GSP should identify monitoring metrics for GDEs that will enable the YSGA to characterize GDE vulnerability to groundwater depletion and associated undesirable results, and to undertake management intervention accordingly. If undesirable results are occurring before minimum thresholds (MTs) are reached, SMC should be adjusted (See Comment #3). ii. Special Status Species: The Department recommends the GSP clarify whether the species identification included aquatic species supported by ISW within the subbasin. The GSP should include a discussion of listed aquatic species present in ISW within the subbasin, including the federally threatened California Central Valley steelhead (O. mykiss), state and federally endangered winter-run Chinook salmon (O. tshawytscha), state and federally threatened spring-run Chinook salmon (O. tshawytscha), and the federally threatened Southern distinct population segment of the North American green sturgeon (A. medirstris). The Department recommends the YSGA consider including a supplemental list of the identified special status species within the subbasin as an appendix to the GSP.	The YSGA has considered the presence and impact of sustainable management criteria on GDEs. The YSGA has also established SMC to protect existing conditions of groundwater levels and interconnected surface waters, which in turn support existing levels of habitats and GDEs. The YSGA will also continue to evaluate the presence of GDE's in the Subbasin and the effects of groundwater conditions on those habitats. Clarification statements were added to Section 3.6.2.1. An appendix including the groundwater dependent species in the Yolo Subbasin was added to the GSP - Appendix G.

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44	Shaundra Cashdollar	CDFW	p. 3-3	Comment #3 – Sustainable Management Criteria (3.3 Chronic Lowering of Groundwater Levels, 3.6 Depletion of Interconnected Surface Water; starting p 3-3): Groundwater level and interconnected surface water SMC may not protect against undesirable results for fish and wildlife beneficial uses and users... (continues in letter)	Thank you for the comment, please see the response to Comment 43.
45	Shaundra Cashdollar	CDFW	p. 4-29	(See full letter) Comment #4 – Monitoring Networks (4.11 Monitoring Network Improvement Plan, 4.11.2.3 Surface Water, Interconnected Surface Water, and Groundwater Dependent Ecosystem Monitoring Network; starting p 4-29): Improvements to the monitoring network are necessary to better characterize GDEs and ISW within the subbasin. a. Issue: The GSP identifies improvements to the subbasin monitoring network that would allow for better characterization of ISW and GDEs, including the installation of additional shallow, near-stream nested monitoring wells, piezometers, and streamflow gages. It is unclear whether the YSGA intends to move forward with these identified improvements to the monitoring network. Figure 2-46 identifies existing stage and flow gages within the subbasin, but the GSP does not include these streamflow gages in the monitoring network for interconnected surface waters. The GSP states that gages are influenced by multiple factors, leading to difficulty in characterizing the specific impacts of groundwater pumping on streamflow depletion (p 3-22, line 6). Though the GSP relies on groundwater levels as a proxy for assessing ISW, it is still necessary to tie the impacts of groundwater pumping to the volume of groundwater depletions. Paired flow gages and monitoring wells can help to better characterize ISW and the volume and timing of depletions and refine subbasin modeling of surface-groundwater interactions, leading to a more robust assessment of potential impacts to ISW within the subbasin. b. Recommendation: The Department recommends that the GSP include specific plans and timelines associated with improvements to the monitoring network that will better characterize ISW and GDEs within the subbasin. The ISW monitoring network should include paired streamflow gages and shallow monitoring wells to better characterize the volume and timing of depletions related to groundwater pumping.	Table 4-5 was created and inserted into the GSP to provide guidance and actions that can be taken to improve the understanding of ISWs and GDEs within the Yolo Subbasin. The monitoring network chapter has been modified to reflect the ongoing evaluation of data from streamflow gages.
46	Shaundra Cashdollar	CDFW	p. 5-4	(See full letter) Comment #5 – Projects and Management Actions (5.2.1 Projects and Management Actions; starting p 5-4): The GSP does not include projects and management actions that relate to demand management within the subbasin. a. Issue: The GSP indicates that the subbasin is expected to operate within its sustainable yield with the listed projects and management actions (PMAs) to ensure that undesirable results are avoided. The identified PMAs focus primarily on supply augmentation, conjunctive use, or infrastructure improvements. Given the cost and timing challenges of implementing supply augmentation projects, if undesirable results occur within the subbasin, it may be necessary to implement additional demand management projects to produce groundwater benefits. b. Recommendation: The Department recommends that the GSP include provisions or plans for demand management PMAs that could be implemented on a shorter timeframe if necessary to maintain basin sustainability.	Thank you for the recommendation. As part of the Yolo Subbasin GSP Preface, please find an acknowledgement of this deficiency and the YSGA's work to consider appropriate planning strategies as part of drought year cycles.

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47	Shaundra Cashdollar	CDFW	General Comment	(See full letter) In conclusion, though the draft GSP thoughtfully identifies environmental beneficial users of groundwater and provides detailed characterization of subbasin groundwater conditions, the GSP can further refine its management criteria and analyses in relationship to GDEs and ISW to better avoid potential impacts to environmental beneficial users of groundwater. The Department recommends that the Yolo Subbasin Groundwater Agency address the above comments before GSP submission to DWR to best prepare for the following regulatory criteria for plan evaluation: 1. The assumptions, criteria, findings, and objectives, including the sustainability goal, undesirable results, minimum thresholds, measurable objectives, and interim milestones are not reasonable and/or not supported by the best available information and best available science (23 CCR § 355.4(b)(1)). (See Comment #1, 2, 3) 2. The GSP does not identify reasonable measures and schedules to eliminate data gaps. (23 CCR § 355.4(b)(2)) (See Comment #4) 3. The interests of the beneficial uses and users of groundwater in the basin, and the land uses and property interests potentially affected by the use of groundwater in the basin, have not been considered. (23 CCR § 355.4(b)(4)) (See Comment #2, 3) 4. The projects and management actions are not feasible and/or not likely to prevent undesirable results and ensure that the basin is operated within its sustainable yield. (23 CCR § 355.4(b)(5)) (See Comment #5)	Thank you for the comment, please see the response to Comments 42a-46.
48	Ben King	Individual	Appendix A	The YSGA JPA should be updated to represent the current policies and objectives of its Member Agencies and the State of California. It should also be updated to reflect the changing dynamic in farmland ownership in the Yolo Subbasin from traditional family owned farmland to increasing institutional ownership focused on water related assets and infrastructure. While it is a good objective to balance the interest of the municipal Member agencies with the legacy rural Member agencies and stakeholders, the JPA as a whole should reconsider the tension of this balance in the context of the recent policy changes of the State of California and changing social policies of its Member agencies. Water and food production are central to most policy issues and concerns for the residents of the State of California and the Yolo Subbasin in particular.	Thank you for your comment. As part of the JPA re-opener that will be investigated in 2022, we will take your comments into consideration. We do acknowledge that the YSGA JPA structure will need to be modified in the future to more equitably distribute the true costs of groundwater sustainability. The governance structure can be strengthened to better represent areas that are currently underrepresented.
49	Ben King	Individual	Appendix A	In April of 2021, the DWR formally adopted a Human Right to Water (HRTW) Policy in its Departmental Administrative Manual and the SWRCB recently adopted a HRTW Resolution recognizing HRTW as a core value – should the JPA Recitals reflect this policy change? What are the positions and policies or the JPA Members regarding HRTW that should be included in the JPA Recitals and provisions generally ? What is the County of Yolo's policy regarding resilient supply to fresh water to all its residents and specifically those residents without access to Sacramento River water supply?	Thank you for your comment. The YSGA Board has not discussed the State Water Board's recent Human Right to Water Policy to-date. The County of Yolo has a groundwater ordinance that states the following "The groundwater underlying Yolo County has historically provided the people and lands of Yolo County with water for agricultural, domestic, municipal and other purposes. The Board recognizes that the principle developed in the case law of California that water may be appropriated from a groundwater basin if the groundwater supply is surplus and exceeds the reasonable and beneficial needs of overlying users. It is essential for the protection of the health, welfare, and safety of the residents of the County, and the public health of the State, that groundwater resource of Yolo County be protected from harm resulting from the extraction of groundwater for use on lands outside of the County, until such time as needed additional surface water supplies are obtained for use on lands on the County, or overdrafting is alleviated, to the satisfaction of the Board." (https://www.yolocounty.org/home/showdocument?id=1899).
50	Ben King	Individual	Appendix A	The SWRCB is currently drafting a Racial Equity Resolution and YSGA Members have updated there policies regarding Diversity, Equity and Inclusion - should these objective be included in the JPA Recitals? How does the JPA further the interest of DEI policy and objectives when it comes to HRTW concerns? Are there adverse racial outcomes just by the fact that some Yolo Subbasin residents have access to Sacramento River supplies while others have long term concerns regarding water supply and/or quality and if so how can the governance provisions of the JPA help mitigate these adverse racial outcomes?	Thank you for the comment. The YSGA Board has not discussed this to-date, but as part of the JPA re-opener, this may be considered and future policies may be developed.

Comment #	Commenter	Representing	GSP Reference (Public Draft)	Remark	YSGA Response
51	Ben King	Individual	Appendix A	The trend toward institutional ownership in farmland continues to evolve in the Yolo Subbasin whereby institutional capital managed for non-resident investors have been purchasing farmland and specifically water rich farmland in the Yolo Subbasin. What are the long term concerns for Member agencies regarding this trend and how do the Member Agencies balance their participation in the JPA with protecting their municipal sovereign interest versus the profit driven objectives of investors and specifically non-resident investors? Perhaps institutional investors should be encouraged to become signatories of the United Nations Principles for Responsible Investment Guidance for Investment in Farmland (see Responsible investment in farmland | Technical guide | PRI (unpri.org)). Should there be a residency requirement for each Board Member? Should the Environmental, Social and Governance requirements of the California State Pension Plan mangers be guidance for institutional investor Members of the YSGA JPA?	Thank you for the comment. The YSGA Board has not discussed this to-date, but as part of the JPA re-opener, this may be considered. We appreciate your thoughtful considerations to ensure there is limited conflict of interest and bias within the YSGA's governance.
52	Ben King	Individual	Appendix A	What are the indemnification protections of Member Agencies regarding law suits directed toward settlement contractor Member agencies. Currently there is litigation from Aqua Alliance regarding the use of groundwater substitution for water transfers and it is foreseeable that litigation regarding water transfers will continue. What are the legal and financial protections of Member agencies not involved in water transfers from this type of litigation? What are the protections from one Member suing another Member?	Thank you for the comment. We have raised this question with our legal counsel, and hope to be better prepared for this question or situation in the future.
53	Ben King	Individual	Appendix A	How should Management Areas be implemented and how does the implicit jurisdictional control given via a Management Area potentially conflict with the goals and objectives of individual Member agencies and specifically municipal Member agencies. Can municipal Member agencies achieve their DEI and/or HRTW objectives if they have ceded authority for such objectives to the establishment of a Management Area. How is the procedural due process rights inherent in Stakeholder participation infringed on by the imposition of a Management Area. Should Management Areas be used solely for Management Actions needed to achieve or maintain resilience or sustainability rather than just jurisdictional convenience of a particular Member or Members?	Thank you for the thoughtful comment. As part of GSP implementation, we intend to form Advisory Committees for the Management Areas and as part of this process we intend to consider these questions/thoughts, along with many other to ensure a fair, responsible, transparent governance is in place to ensure undesirable results are avoided and MA/Projects are implemented.
54	Frances Burke	Individual	General Comment	There needs to be a moratorium on any new wells drilled on historically non-irrigated land.	Thank you for your comment. We have received similar comments and recognize this will need to be addressed as part of the GSP implementation. We encourage you to continue to participate in this process and to provide your feedback in upcoming advisory committee, working group, and board meetings. This will be considered in our process for updating the GSP by 2027.
55	Susan O		General Comment	Consider moratorium on further groundwater extraction for development on what have been non-irrigated lands until there is an understanding to sustain groundwater in the Dunnigan Hills and other "special concern" areas. Thank you.	Thank you for your comment. We have received similar comments and recognize this will need to be addressed as part of the GSP implementation. We encourage you to continue to participate in this process and to provide your feedback in upcoming advisory committee, working group, and board meetings. This will be considered in our process for updating the GSP by 2027.

Comment #	Commenter	Representing	GSP Reference (Public Draft)	Remark	YSGA Response
56	Christopher Foe	Individual	General Comment	(See full letter) I remain skeptical about the predictive ability of the YSGA model because of shortcomings discussed below. The ongoing drought may provide a unique opportunity to assess the model's accuracy and increase stakeholder confidence in its ability to predict future water elevation levels. The model could be used to predict groundwater levels at all compliance stations this fall. Model predictions can be compared with field measurements made this fall to assess model accuracy and precision in each sub basin. If the analysis is done, the results and a statistical analysis should be posted online for stakeholder evaluation. A robust model could be of great utility to landowners. If strong statistical correlations are obtained between predicted and observed values, then the model can be used with precipitation information collected this rainy season to predict groundwater levels at the end of the 2022 irrigation season. This will help landowners decide whether they need to be lowering their pumps this winter and spring and/or drilling new wells to reduce the chance of experiencing a dry well next year.	The YSGA model has been extensively calibrated. Please see Section 3.1 of the Model documentation appendix. We have calibrated to historical stream flows, reservoir storage, water deliveries, applied water, and to groundwater elevations. This has been a major effort that improved upon earlier efforts. We capture deep droughts – 1976-77, late 80's, and recent droughts. Please see also Figure 12 of the Water Budget appendix which shows observed groundwater levels against modeled groundwater storage over 48 years. The YSGA model- like any model- can improve with more data, especially regarding lands and pumping. We expect to produce a future land use projection in the next GSP update. This will help in understanding more about the uncertainty related to future groundwater pumping.
57	Christopher Foe	Individual	General Comment	(See full letter) The report is remiss in not including sustainability goals for water quality. Abundant groundwater of a degraded quality is of limited value to stakeholders. The YSGA is to be commended for coordinating the collection of groundwater monitoring data with other agencies. However, the YSGA needs to develop, a priori, sustainable management goals to evaluate this data and determine whether water quality management plans are needed. This is particularly true for nitrate contamination. Available data suggest that current nitrate levels in some regions exceed the primary MCL and constitute an ongoing human health drinking water hazard. The water quality problem is likely to become significantly worse if not promptly addressed. At a minimum, the YSGA should insure that all rural domestic drinking water wells in sub basins of concern are tested to determine nitrate levels. In addition, all new domestic drinking water wells should be tested as part of the construction process. This should occur whether the landowner is part of the Regional Board's Irrigated Lands Regulation Program or not. Nitrate may be removed from drinking water by ion exchange, distillation or reverse osmosis. However, landowners must be educated about the hazard and how to protect themselves. This should be an immediate YSGA management action.	Thank you for the comment. The YSGA has added a monitoring network for water quality and SMCs for TDS. The MT for TDS is 1000 ppm and the MO is 750 ppm. We have also identified data gaps in the water quality monitoring section and plans to address those data gaps.
58	Christopher Foe	Individual	General Comment	(See full letter) The Sustainability Plan is silent about what happens when minimum thresholds/measurable objectives are exceeded. There should be an explicit commitment by the JPA to undertake immediate corrective action when this occurs. The purpose of the corrective action is to slow/reverse the development of negative groundwater conditions and spur implementation of longer term actions. At a minimum, potential actions should include an immediate moratorium on new well construction in threaten sub basins.	Thank you for your comment; this is an obvious deficiency in our articulation of applying the sustainable management criteria. The intent is for projects and management actions to be implemented prior to exceeding a minimum threshold. The YSGA intends to be proactive in managing the groundwater resources and there will be continual reporting that will ensure we are monitoring conditions and the proximity to or downward trend towards a minimum threshold.
59	Christopher Foe	Individual	p. 1-24	(See full letter) · The City of Davis and Woodland have percolation basins receiving storm runoff. These actions should be acknowledged, the amount of groundwater infiltration calculated, and in the management section, construction of additional percolation basins encouraged.	Added "Additionally, percolation basins receiving storm runoff exist in the Yolo Subbasin, notably in the Cities of Davis and Woodland." in section 1.5.3.2.
60	Christopher Foe	Individual	p. 2-69	(See full letter) · Please be consistent with units: TDS in figures 2-26 and 2-27 are in mg/l while on p 2-69 line 16 are in ppm. The different units result in the same numeric value but the general reader may not know that.	The units of all TDS descriptions have been reviewed and modified as necessary for consistency.

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61	Christopher Foe	Individual	p. 2-70	(See full letter) There is a similar problem with units for nitrate. The discussion appears to bounce around between concentrations reported as total nitrate and as N. For example Figure 2-29 are as total nitrate while figures 2-30 and 2-31 are as N. Sometimes in the text it is difficult to determine what the units being used are. Unlike with TDS, the different units result in different values. To eliminate confusion the text should use only one set of units. The most scientifically acceptable term is as N (example 10 mg-N/l).	The units of all nitrate descriptions have been reviewed and modified for consistency, and additional explanation of the nitrate units provided has been added to the text.
62	Christopher Foe	Individual	p. 2-70	(See full letter) Shallow groundwater nitrate contamination may be greater than pictured in the Nitrate Basin wide Condition section. The most recent figure is for the 2000-2016 time period (5 to 21 years ago) and shows wide spread concentrations greater than 5 mg-N/l in the Central, South and North basins. The 5 mg-N/l is often considered the leading edge of the nitrogen contamination plume. Monitoring data shows that nitrate concentrations in 50 percent of shallow Central Valley groundwater wells increased from 5 to 10 mg-N/l or greater in five years (in Levy et al 2021). About 75 percent of these wells had concentrations greater than 10 mg-N/l in ten years. The 10 mg-N/l concentration is the primary federal drinking water MCL for safe human consumption.	Future WQ monitoring will be conducted and reported annually to ensure that current data and standards are considered and potential linkages to groundwater management activities are identified. These updated reviews will be part of the Annual Report submitted to DWR, as described in the Water Quality Monitoring Network Protocols and Standards.
63	Christopher Foe	Individual	Table 2-13	(See full letter) What year was data in Table 2-13 collected?	Added "Data collected from SDWIS in September 2020". This comment is referring to now Table 2-14. Summary of Nitrate Prevalence Among Community Water Systems.
64	Christopher Foe	Individual	p. 2-71	(See full letter) A map of the location of current and historical dairies and horse boarding facilities would be useful to determine whether septic or animal facilities are the primary source of animal derived nitrogen.	Thank you for the comment. The Central Valley Dairy Representative Monitoring Network might be a useful resource in the future to map historic dairies. As of January 2021, there are no CVDRMP wells being monitored on dairies in the Yolo Subbasin.
65	Christopher Foe	Individual	p. 2-71	(See full letter) · The nitrate section should be expanded to include more on the sources, transport and fate of nitrate. The section identifies that fertilizer application in agriculture is the major source of nitrate. The document should continue and identify nitrogen application rates (lbs/acre/yr) by the major crop types grown in the basin (Figure 1-4). Landon et al 2009 found that nitrate concentration in shallow groundwater (<200 ft) on the eastside of the San Joaquin Basin was positively correlated with percent orchard and vineyard land use. There was no relationship with other crop types suggesting that these two land uses were a major source of groundwater nitrogen. The discussion should also include a section on the fate of nitrate. Groundwater contamination is very expensive and difficult to remediate. Nitrate is slowly converted to gaseous nitrogen in anaerobic environments and lost from the soil profile to the atmosphere. But this is a slow process with the result that nitrate tends to accumulate in groundwater. Finally, Levy et al 2021 has shown a positive correlation between groundwater drawdown during droughts and an increase in nitrate concentration. Apparently, nitrate is sufficiently mobile and soluble that it remains in solution and is concentrated as water levels are drawn down. Understanding nitrate cycling is essential for understanding and managing contamination.	The YSGA will rely on the CV-SALTS as it continues its work on nitrate management. As that program develops in Yolo County, the YSGA will coordinate and review data developed by CV-SALTS to ensure that nitrate concentrations in the Subbasin are not increased due to groundwater management activities.
66	Christopher Foe	Individual	p. 2-76	(See full letter) Figure 1-7 shows the distribution of domestic wells in the basin. Most of these wells likely draw water from the upper groundwater zone. Figure 1-7 should be overlaid on Figure 2-30 to identify the location of domestic drinking water wells at risk from elevated nitrate levels. An additional table should be included estimating how many domestic wells are likely contaminated with <2.5, 2.5-5.0, 5.0-7.5, 7.5-10.0 and >10.0 mg-N/l by sub basin. This information is essential for identifying the location and evaluating the magnitude of the human health nitrate contamination problem.	Figure 2-30 is from an older report (Ludhorff & Scalmanini, 2004 Groundwater Management Plan) and unfortunately, we do not have the ability to modify or manipulate the data. We appreciate your comment and agree this would be a beneficial analysis that will be completed in the future.

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67	Christopher Foe	Individual	Figure 2-56	(See full letter) · Figure 2-56 is meaningless and should be discarded or significantly amended. The upper graph is a valid projection of future urban water use. The bottom graph for agriculture is misleading and should not be presented. It apparently is based on 2016 land use consumption values and used to make projections through 2061. Agricultural land use is rapidly changing in the basin. Table 2-21`shows that deciduous and vine crops have increased by 11.7 and 5.6 percent per year between 2008 and 2016. I believe the rate at which new orchards are being planted has continued or increased since then. In contrast, table 2-56 shows that grain, field crops and pasture acreage have all decreased. Orchards and vineyards almost exclusively rely on groundwater while row and field crops use surface water. Has an agricultural water use sensitivity analysis been done? Such an analysis is important because the pie charts in Figure 2-56 demonstrate that agriculture uses more than 95 percent of the water in the basin. Changes in agricultural use, not urban use, will drive changes in the water budget. Similar comments apply to the remainder of the groundwater elevation and storage discussion[1]. [1] At this land use conversion rate the entire 640,000 acre basin would be planted in orchards within the next 15 years, well within the proposed 20 year implementation period. My projection for the magnitude of new orchard acreage is obviously flawed but is included to emphasize the present rate of change of land use in the basin and the danger of extrapolating 6 year old agricultural land use date through 2070.	We do not agree that Fig 2.56 is meaningless. It gives us a good sense of how climate alone could influence the Yolo subbasin, given recent land use. We know and agree that land use projections will be important to consider. We did not have the budget to implement a land use projection at this stage. We will certainly include a land use projection in the next GSP update. A sensitivity analysis is included in version 2 of the Model Documentation Appendix. It shows that the YSGA model is most sensitive to uncertainties In land use.
68	Christopher Foe	Individual	p. 3-3	(See full letter) · Please explain the rationale behind the determination that an undesirable result has occurred when the minimum threshold was exceeded in 51 percent of monitoring wells in two sub basins. A following section entitled “Criteria for establishing minimum thresholds” also does not explain the selection of the 51 percent value in two sub basins.	Added the following to section 3.3.1: "This 51% value was selected to allow for interim projects and management actions to take place within the subbasin. This value was selected and agreed to by the YSGA member entities and the YSGA Board of Directors."
69	Christopher Foe	Individual	p. 3-4	(See full letter) Several questions. First, is the period of exceedance a calendar or water year? Second, does this mean that both the fall and spring measurements need to be below the minimum threshold for two years or only one measurement in each of two consecutive years? Finally, is this calculated from static or sustained groundwater pumping level?	Revised section 3.3.2.1 to state: "A well violates the minimum threshold when the groundwater elevation exceeds the historic (pre-2016) minimum elevation in the period of record of each Representative Well in two consecutive fall measurements." Also added a sentence stating: "Minimum thresholds for groundwater levels and groundwater storage will be evaluated using static water levels."
70	Christopher Foe	Individual	p. 5-1	(See full letter) The groundwater pumping values for all scenarios are very precise. There is clearly great uncertainty about future changes in both climate and urban and agricultural land use. Ninety-five percent confidence limits around these values would strengthen the discussion and emphasize the need for high quality monitoring data and a wide range of management options.	The new section on sensitivity analysis in the Model Documentation appendix adds information on uncertainty to model parameters, surface water rights in certain areas and model parameters. The YSGA model is a process based model, not a statistical model. Through scenario analysis we can bracket the futures; however there is no straightforward analogy that can be drawn to the confidence limits of purely statistical models. The results across the scenarios are the way we evaluate the uncertainties. In the case of climate change, the different pumping values in Table 2-56 provide a range of uncertainty. Future modeling efforts will address land use uncertainty.
71	Christopher Foe	Individual	Table 5-1	(See full letter) Three possible additional management actions are: first, inject treated UC Davis surface water into an intermediate aquifer and use the stored water to augment surface water supplies for irrigating research plots. Second, encourage the Cities of Davis, Woodland, and Winters to divert all storm runoff into percolation ponds for groundwater recharge. Finally, multiple off-channel gravel pits exist along Cache Creek. Winter storm runoff could be diverted into the pits and used for groundwater recharge and/or release into Cache Creek for downstream use during the irrigation season.	Suggestion 1. Injecting treated water is also called ASR (Aquifer Storage and Recovery). The City of Woodland has begun installing a system of multiple ASR wells. The City of Davis opted to drill deeper wells and depend on native deep water of better water quality instead of rely on shallow groundwater. Planning documents from WDCWA and the City of Davis UWMP explain this decision making process.----------Suggestion 2. Please see the 2019 Yolo County Stormwater Resources Plan appendix F to the Sac Westside IRWMP for analysis of stormwater percolation ponds. https://www.westsideirwm.com/irwm-plan/ ----------Suggestion 3. Using gravel mining pits for recharge has been suggested many times over the years. Please see such documents as p 12 of http://www.ycfcwcd.org/documents/YCFCEnhancedCanalRechargeFeasibilityAugust2012.pdf and Section 6 of http://www.ycfcwcd.org/documents/TM-UsingYCIGSMforEvaluationofRegionalSurfaceWaterSupplyandCCGRRPProjects.pdf

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72	Christopher Foe	Individual	Table 5-1	(See full letter) All rural domestic drinking water wells should be tested for nitrate concentration. New wells should be tested as part of their construction. Landowners should be educated about the threat of drinking nitrate contaminated well water and instructed on how to treat it.	Currently, only public drinking water supplies are regulated for water quality. Privately used wells are not regulated. Many water quality issues exist, in addition to nitrate. Pleases see Appendix F of the 2012 Nitrate Fingerprinting Report, on regulation of water quality in private wells. http://www.ycfcwcd.org/documents/NitrateFingerPrintingandGroundwaterAgeDecember2012.pdf---------- Currently all new well construction permitted by the Yolo County Environmental Health Department is required to submit a one-time nitrate test for new wells. This is for monitoring purposes only. Nitrate fact sheets are provided in English and Spanish to well owners. Use of high nitrate water is still allowed in private wells.---------- The Irrigated Land Regulatory Program (ILRP) of the Central Valley Regional Water Quality Control Board has started to require testing and reporting of nitrate from private drinking water wells an irrigated parcels. So far this is for monitoring information only. Ongoing coordination with these programs and analysis of this data is included in the monitoring network improvement plan.
73	Annie Main	Good Humus	General Comment	(See full letter) The Hungry Hollow where we live and have been farming for the last 37 years has been historically a dry farmed region. This means that there have been no wells for YSGA to collect data on. Our area is now labeled a special concern region and SGMA is lacking historical groundwater data to compare with past use and future needs. The fringe areas, including our land, are among areas seeing accelerated water decline which is an indicator of unsustainable usage. Therefore more time is needed to collect data, to find wells to monitor so that more complete information can be collected to understand the usage and recharge levels. How can we find sustainability with new wells bring drilled that are changing the water usage with every new hole in the ground? There needs to be a 10 year moratorium on any new wells drilled on historically non-irrigated land. This will give time to collect data and to more fully understand the groundwater levels	Thank you for your comment. We have received similar comments and recognize this will need to be addressed as part of the GSP implementation. We encourage you to continue to participate in this process and to provide your feedback in upcoming advisory committee, working group, and board meetings. This will be considered in our process for updating the GSP by 2027.
74	Annie Main	Good Humus	General Comment	(See full letter) Access to water, groundwater and surface water is a community resource. How can this resource be shared equally, and not monopolized by any one person or corporation that has the enough money for a pipeline to take care of their personal needs? This water is community water; therefore it should be used for the entire community not serving a few that can afford to pay for a pipeline to their landholdings. Landowners that are dependent on a pipeline allow them the ability to develop more land, and during the summer months when water from this pipeline is not available, those land owners are going to use groundwater. Our Hungry Hollow our water is very good water, lacking salts and boron that is prevalent in Cache Creek water, therefore piping Cache Creek water into the Hungry Hollow will degrade the quality of water. Pipelines are not for the good of the entire community, they will advance land development, increase groundwater usage, and degrade water quality.	Thank you for your comment. We have received similar comments and recognize this will need to be addressed as part of the GSP implementation. We encourage you to continue to participate in this process and to provide your feedback in upcoming advisory committee, working group, and board meetings. This will be considered in our process for updating the GSP by 2027.

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75	Annie Main	Good Humus	General Comment	(See full letter) Generally the SGMA plan does not seem to include the inhabitants of the landscape, but more importantly it does not include the potential of our community to make a difference in water usage. I feel that if we are looking into the future of water as a diminishing resource, then our communities need to be involved and participating in the management of water usage in their daily lives. Agriculture is the main user of the groundwater and surface water, and can have the biggest effect of groundwater recharge, surface water usage and what sustainability will look like for the future. To understand sustainability is one part of the puzzle, but more importantly how will we achieve sustainability in our communities is another question. Our communities need to be involved in the process. In my mind this means that we need to be innovative, willing to learn, and to incorporate new farming practices that will enhance water storage in our orchards and fields. Our community needs to learn from other farmers, participate in research in collaboration with organizations working towards these goals. We need to work together, share information, actively doing trials, tests, and experimentation on different management practices to achieve reduction in water usage. The future of Agriculture in California can be protected by working today to adjust our management practices. Our communities need to work together; sacrifice equally making changes as how we live on the land, how to use our shared natural resources and learn how to store more of our water in the soils, and reduce our annual water extraction needs.	Information was added to the GSP to improve the characterization of domestic wells users in the Yolo Subbasin. A section on DACs and tribes was added. Additionally, a well impact analysis was added as an appendix to the GSP.
76	Annie Main		General Comment	We need to establish working groups that include our agricultural leaders in our communities to come together to initiate a proactive drought conservation management practices that have the goal of minimizing water usage and maximizing water retention in our soils, starting from the top of the watershed down into the valley floor. These working groups offer hands on opportunities, sharing results of these experimental practices among our agricultural community so that we can learn together what is working and what is not.	Yes, excellent idea and thank you for your thoughtful, productive comment. As part of GSP implementation and the establishment of Management Area Advisory Committees, we will take your thoughts into consideration so that the stakeholders and thought leaders in the community are at the table for developing creative and responsive solutions.
77	Katherine and George Spanos	Individual	General Comment	(See full letter) A 10-year moratorium on any new wells drilled for groundwater extraction on what have been historically non-irrigated land. This will give time to collect data and to more fully understand the groundwater levels and what is groundwater sustainability in the Dunnigan Hills and other “special concern” areas.	Thank you for your comment. We have received similar comments and recognize this will need to be addressed as part of the GSP implementation. We encourage you to continue to participate in this process and to provide your feedback in upcoming advisory committee, working group, and board meetings. This will be considered in our process for updating the GSP by 2027.
78	Katherine and George Spanos	Individual	General Comment	(See full letter) Additional input from the community. Establish working groups that include local community agricultural leaders to come together to initiate proactive drought conservation management practices that have the goal of minimizing water usage and maximizing water retention in our soils, starting from the top of the watershed down into the valley floor. These working groups can offer hands-on opportunities, sharing results of these experimental practices among our agricultural community so that we can learn together what is working and what is not, including monitoring the effects of different practices with regard to water usage and water recharge.	Yes, excellent idea and thank you for your thoughtful, productive comment. As part of GSP implementation and the establishment of Management Area Advisory Committees, we will take your thoughts into consideration so that the stakeholders and thought leaders in the community are at the table for developing creative and responsive solutions.

Comment #	Commenter	Representing	GSP Reference (Public Draft)	Remark	YSGA Response
79	Alison Main	Good Humus	General Comment	First and foremost, I want to thank you for the work that you are embarking upon, as it is vitally important to the future of our community. From my understanding of SGMA, we are forming a plan to begin the process of understanding and implementing a sustainable use and management of our finite groundwater resources. This is to be a 20 year process from the formation of the plan, to enforcement of said plan. As a resident of Hungry Hollow, and someone who dreams of building a future in agriculture here, I would like to bring the attention of your committee to our region. I have watched as our water levels drop at an unprecedented rate, especially in the last year. I have simultaneously watched as perennial investment agriculture has moved in, drilling wells without any thought to the health nor future of the aquifer. From my communication with members of your committee, it is clear that there is almost no historical data available to help us understand the water levels of the Dunnigan hills and surrounding area. Without the baseline understanding of the Dunnigan Hills aquifer and water sources, how can we possibly begin to understand how to manage or reach sustainability? Therefore, I believe we need to place a 15 year hold on all new wells being drilled on previously unirrigated land. This will enable SGMA to gather information and understand the aquifer and what resources we have to work with. A YSGA committee member mentioned that we would need 15-20 years to stabilize and understand the impact of the significant influx of ag wells being drilled into our little region. In short, I believe it to be crucial that we better understand the capabilities of our existing water sources before allowing the further drilling of any more new wells. Thank you for your time and consideration in these unprecedented times.	Thank you for your comment. We have received similar comments and recognize this will need to be addressed as part of the GSP implementation. We encourage you to continue to participate in this process and to provide your feedback in upcoming advisory committee, working group, and board meetings. This will be considered in our process for updating the GSP by 2027.
80	Ben King	Individual	1.2 (Model Documentation)	1.2 – typo Reference not found	Thank you for the comment , this has been resolved.
81	Ben King	Individual	13 (Model Documentation)	p 13 – typos	Thank you for the comment , this has been resolved.
82	Ben King	Individual	15 (Model Documentation)	p 15 – same typo	Thank you for the comment , this has been resolved.
83	Ben King	Individual	16 (Model Documentation)	p 16 – same	Thank you for the comment , this has been resolved.
84	Ben King	Individual	30 (Model Documentation)	p 30 -same	Thank you for the comment , this has been resolved.
85	Ben King	Individual	35 (Model Documentation)	p 35 same	Thank you for the comment , this has been resolved.
86	Ben King	Individual	37 (Model Documentation)	p 37 -same	Thank you for the comment , this has been resolved.
87	Ben King	Individual	44 (Model Documentation)	p 44 – Water Rights Restrictions – Header Format Typo	Thank you for the comment , this has been resolved.
88	Ben King	Individual	2.1.5.1.2.1 (Model Documentation)	2.1.5.1.2.1 - The CVP Critical Year assumptions should be updated to include the 2021 SWRB Curtailment Scenario. Worst Case assumptions are too optimistic vs the current 2021 Scenario	Thank you for the comment, please note that this comment is about 2021, but the section referred to is talking about the historical model which was built up to the 2018 Water Year for historical period. Model documentation was written in 2019-2020. Future GSP updates will likely include surface water availability scenarios that reflect recent surface water diversion restrictions such as those that occurred in 2021. For additional information, please see the preface to the GSP.
89	Ben King	Individual	1.5.1.2.4 (Model Documentation)	.1.5.1.2.3 The Term 91 diversions are subject to 100% restrictions by the current SWRCB curtailments	Thank you for the comment, see response to Comment 88.
90	Ben King	Individual	2.1.5.1.2.4 (Model Documentation)	2.1.5.1.2.4 - There is enough information to assume that these diversions are zero under the current SWRCB restrictions and should be reflected in the Model assumptions.	Thank you for the comment, see response to Comment 88.

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91	Ben King	Individual	2.1.5.4 (Model Documentation)	2.1.5.4 - There should be discussions about the impact of the Stanford Vina litigation regarding the priority of instream rights under the Bay Delta Plan for all the Settlement Contractor Reclamation Districts. There should also be a table setting out in basin and out of basin water transfers and a notation about how these water transfers are incorporated in the Model. Finally there should be a discussion on groundwater substitution pumping extraction which are used as a basis for water transfers under the jurisdiction of the Bureau of Reclamation.	Thank you for the comment, the modeling team did discuss including water transfers as a scenario feature but found little information available. Future updates could implement transfers as a reduction in surface water availability which would then result in additional groundwater pumping and/or field fallowing.
92	Ben King	Individual	Table 3.7 (Model Documentation)	The discussion regarding the fact that Dunnigan Water District only uses 2AF seems impossible on a recurring basis according to the Model's own WEAP and Actual ET in Table 3.7. Almonds use approximately 4 AF. Maybe Donita Hendrix is on to something regarding a special ET zone but perhaps water is being transferred via the Warren Act or groundwater is being used. This would seem to be a real concern about the current use of groundwater and the potential for unaccounted groundwater use in the Model assumptions. Don't understand how the Model construction would leave this issue unresolved and relied upon.	The historical estimates of 2AF/acre come from the work of Davids Engineering for Dunnigan Water District and are averages across all crops in DWD, not just almonds. The justification and citation are on p 61, to quote- "it is also stated in the District's Groundwater Management Plan (Davids Engineering Inc, 2007) that growers irrigate on average, 2 AF per acre, which is quite low compared to other regions in the county. This is confirmed by conversations with Donita Hendrix from the District who stated that growers under-irrigate and that not all land is cultivated each year…" Based on this information irrigation was constrained in the historical period by limiting surface water deliveries to the reported values provided by Dunnigan Water District and limiting groundwater pumping so that the average total applied water was about 2 AF/ac. In the future simulations, surface water deliveries are limited to the District's water right and groundwater is pumped to satisfy the remaining demand. The Model Documentation text has been edited to clarify this point.
93	Ben King	Individual	80 (Model Documentation)	p 80 same reference typo	Thank you for the comment , this has been resolved.
94	Ben King	Individual	81 (Model Documentation)	p 81 The discussion regarding the unexplained results and adjustments regarding lack of information in the Dunnigan and Yolo Zamora is concerning especially due to the subsidence observations. If the Model documentation states that there is " the lack of information in the region.." – this is definitely a great concern especially with subsidence concerns.	Thank you for the comment, the "lack of information" discussed on p 81 refers to the lack of information on the hydrogeology of the Dunnigan Hills and regions to the west of the Hills. Future modeling efforts should address this uncertainty. The discussion of the Dunnigan Water District and Yolo Zamora area refer to the model underprediction of water table elevations while using the irrigation efficiencies applied throughout the model domain. Research by David's Engineering (2007) indicate that irrigation efficiencies in this area are relatively high presumably due to limited surface water availability. After an adjustment to the model irrigation efficiencies, simulated heads were more realistic.
95	Ben King	Individual	86 (Model Documentation)	p 86 Dunnigan Hills - Model "consistently overestimates water table elevation in layer 1" Is this included in the appropriate sections of the GSP?	Thank you for pointing this out - we have incorporated a summary of the model's uncertainty, comparison to previous modeling, and calibration results in the main text of the GSP (Section 2.3.8).
96	Ben King	Individual	87 (Model Documentation)	p 87 North Yolo – Upwhelling from lower stratas is common in the Sacramento Valley – there is no reference to this phenomenon in the Model. Concern would be redox conditions and possible upward movement of high TDS and other natural occurring contaminants with low drawdowns during critically dry years.	The MODFLOW platform is capable of simulating upwelling, however, adjustment to the model layer structure and boundary conditions may be needed to capture this phenomena. The present uncertainty about the elevation of base of fresh water is addressed in the monitoring network improvement plan and the plan to address data gaps.
97	Ben King	Individual	89 (Model Documentation)	p 89 - Uncertainty should include possible change in geology due to movement of Dunnigan Fault and Willows Fault due to seismic activity. The effects of redox and potential vertically movement of TDS and arsenics especially on the eastern side of North Yolo.	Uncertainty about the base of fresh water is addressed in Section 2.11.
98	Ben King	Individual	90 (Model Documentation)	p 90 – As mentioned earlier there seems to be a missing Sensitivity section.	A section on Sensitivity analysis been added in the 2nd version of the Model Documentation appendix.
99	NGO Consortium (GLF)	NGO Consortium	General Comment	(See full letter) Describe and map the locations of DACs and provide the size of each DAC population. The DWR DAC mapping tool can be used for this purpose.	A description and map of DACs was added to the Section 1.5.2.
100	NGO Consortium (GLF)	NGO Consortium	General Comment	(See full letter) Provide a map of tribal lands and describe the tribal population within the subbasin.	A description of tribal lands was added to Section 1.5.2..
101	NGO Consortium (GLF)	NGO Consortium	General Comment	(See full letter) Include a map showing domestic well locations and average well depth across the subbasin.	Added Figure 1-9 showing average domestic well depth.
102	NGO Consortium (GLF)	NGO Consortium	General Comment	(See full letter) Identify the sources of drinking water for DAC members, including an estimate of how many people rely on groundwater (e.g., domestic wells, state small water systems, and public water systems).	Added Table 1-3 identifying DACs and source of drinking water.

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103	NGO Consortium (GLF)	NGO Consortium	Figure 2-47	(See full letter) Clarify in the GSP text that reaches marked as 'uncertain' on Figure 2-47 are retained as potential ISWs in the GSP.	Added a sentence to this effect in Section 2.2.6.1.
104	NGO Consortium (GLF)	NGO Consortium	General Comment	(See full letter) Include an inventory of the fauna and flora present within the subbasin's GDEs (see Attachment C of this letter for a list of freshwater species located in the Yolo subbasin). Note any threatened or endangered species.	The full inventory of species present in the Subbasin has been added as an appendix to the GSP.
105	NGO Consortium (GLF)	NGO Consortium	General Comment	(See full letter) We recommend a depth-to-groundwater threshold of 75 feet be used instead of the 50 feet threshold, when verifying whether valley oak polygons from the NC Dataset are connected to groundwater.	Changed depth to water cutoff for Valley oaks to 75', and updated maps based on this change.
106	NGO Consortium (GLF)	NGO Consortium	General Comment	(See full letter) Quantify and present all water use sector demands in the historical, current, and projected water budgets with individual line items for each water use sector, including managed wetlands. If this is identified as a current data gap, then include a description of how it will be addressed, including a timeline for completion.	Thank you for the comment, A new section has been added to the GSP (section 2.3.2.1 and 2.3.2.2) which details the water use of Natural Vegetation and Managed Wetlands land cover classes. This includes recommendations to set work with a technical advisory committee on Managed Wetlands, as part of the next GSP update, to assist in estimating future managed wetland area. The plan to fill data gaps has been supplemented with an additional table (Table 4-7).
107	NGO Consortium (GLF)	NGO Consortium	General Comment	(See full letter) In the historical, current, and projected water budgets, include an individual line item for native vegetation, instead of lumping it together with agricultural evapotranspiration.	Thank you for the comment, A new section has been added to the GSP (section 2.3.2.1 and 2.3.2.2)which details the water use of Natural Vegetation and Managed Wetlands land cover classes. This includes recommendations to set work with a technical advisory committee on Managed Wetlands, as part of the next GSP update, to assist in estimating future managed wetland area. The plan to fill data gaps has been supplemented with an additional table (Table 4-7).
108	NGO Consortium (GLF)	NGO Consortium	General Comment	(See full letter) Include a stand-alone, detailed and robust Stakeholder Communication and Engagement Plan that describes active and targeted outreach to engage DACs, domestic well owners, environmental stakeholders, and tribal stakeholders during the remainder of the GSP development process and throughout the GSP implementation phase. Refer to Attachment B for specific recommendations on how to actively engage stakeholders during all phases of the GSP process.	The stakeholder communication and engagement plan has been updated and attached as an appendix to the GSP.
109	NGO Consortium (GLF)	NGO Consortium	General Comment	(See full letter) Describe efforts to consult and engage with DACs and domestic well owners within the subbasin.	The Stakeholder Communication and Engagement Plan has been attached as an Appendix to this GSP. Unfortunately, due to the threat of COVID-19 there were not many opportunities for in-person workshops or formal engagement events. We hosted a few virtual workshops and targeted the rural areas of the County where DACs and domestic well owners are located via mailing postcards; however, we recognize that not all people located in a DAC have access to a phone or internet for a virtual meeting. In addition to GSP development outreach meetings, there have been updates at the Yolo County Board of Supervisors meetings. As part of our Management Area Advisory Committees, we intend to conduct more on-the-ground outreach and engage a more diverse set of stakeholders.
110	NGO Consortium (GLF)	NGO Consortium	General Comment	(See full letter) Utilize DWR's tribal engagement guidance to comprehensively address all tribes and tribal interests in the subbasin within the GSP.	Thank you for the comment. The Stakeholder Communication and Engagement Plan has been attached as an Appendix to this GSP. The YSGA works very closely with the Yocha Dehe Environmental Department, and the Yocha Dehe Wintun Nation is a member of the YSGA JPA. Yocha Dehe Wintun Nation provides the YSGA with the appropriate guidance for comprehensively addressing the Tribe's interested within the GSP. Additionally, language in the GSP has been updated to better reflect this dynamic.
111	NGO Consortium (GLF)	NGO Consortium	General Comment	(See full letter) Describe efforts to consult and engage with environmental stakeholders within the subbasin.	The Stakeholder Communication and Engagement Plan has been attached as an Appendix to this GSP. The YSGA had various meetings with environmental stakeholders to discuss the development of the Yolo Subbasin GSP, including The Nature Conservancy, Audubon, Yolo County Resources Conservation District, California Department of Fish and Wildlife, The Yolo Habitat Conservancy, and the Yolo Basin Foundation.
112	NGO Consortium (GLF)	NGO Consortium	General Comment	(See full letter) Describe direct and indirect impacts on DACs, drinking water users, and tribes when describing undesirable results for chronic lowering of groundwater levels.	A general statement is provided in section 3.3.1.2 relative to all users and uses in the Subbasin. Additionally, the goals of the YSGA is to maintain groundwater levels at levels experienced from 2001 to 2011, thereby avoiding any additional impacts to users and uses.
113	NGO Consortium (GLF)	NGO Consortium	General Comment	(See full letter) Consider and evaluate the impacts of selected minimum thresholds and measurable objectives on DACs, drinking water users, and tribes within the subbasin. Further describe the impact of passing the minimum threshold for these users. For example, provide the number of domestic wells that would be de-watered at the minimum threshold.	Thank you for your comment. A well impact analysis has been added as an Appendix to the GSP. This includes domestic, municipal, and agricultural wells.

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114	NGO Consortium (GLF)	NGO Consortium	General Comment	(See full letter) Establish SMC for the identified COCs in the subbasin that may be impacted or exacerbated by groundwater use and/or management. Ensure they align with drinking water standards. Also, evaluate the cumulative or indirect impacts of proposed criteria 11 for degraded water quality on DACs, drinking water users, and tribes.	The YSGA will rely on other water quality monitoring and regulatory entities to collect data, establish standards and enforce regulations for the protection of water quality for all users in the Subbasin. The YSGA will annually review water quality data to determine if water quality is effected by groundwater management activities.
115	NGO Consortium (GLF)	NGO Consortium	General Comment	(See full letter) Describe direct and indirect impacts on DACs, drinking water users, and tribes when defining undesirable results for degraded water quality. For specific guidance on how to consider these users, refer to "Guide to Protecting Water Quality Under the Sustainable Groundwater Management Act."	A general statement is provided in section 3 relative to all users and uses in the Subbasin. Additionally, the goals of the YSGA is to maintain groundwater quality at current levels, thereby avoiding any additional impacts to users and uses. The YSGA will be coordinating with other entities with specific jurisdiction over water quality monitoring and regulation.
116	NGO Consortium (GLF)	NGO Consortium	General Comment	(See full letter) When defining undesirable results for chronic lowering of groundwater levels, provide specifics on what biological responses (e.g., extent of habitat, growth, recruitment rates) would best characterize a significant and unreasonable impact to GDEs. Undesirable results to environmental users occur when 'significant and unreasonable' effects on beneficial users are caused by one of the sustainability indicators (i.e., chronic lowering of groundwater levels, degraded water quality, or depletion of interconnected surface water). Thus, potential impacts on environmental beneficial uses and users need to be considered when defining undesirable results in the subbasin. Defining undesirable results is the crucial first step before the minimum thresholds can be determined.	The YSGA has considered the presence and impact of sustainable management criteria on GDEs. The YSGA has also established SMC to protect existing conditions of groundwater levels and interconnected surface waters, which in turn support existing levels of habitats and GDEs. The YSGA will also continue to evaluate the presence of GDE's in the Subbasin and the effects of groundwater conditions on those habitats. Clarification statements were added to Section 3.6.2.1.
117	NGO Consortium (GLF)	NGO Consortium	General Comment	(See full letter) When establishing SMC for the basin, consider that the SGMA statute [Water Code §10727.4(l)] specifically calls out that GSPs shall include "impacts on groundwater dependent ecosystems".	See response to Comment 116.
118	NGO Consortium (GLF)	NGO Consortium	General Comment	(See full letter) When defining undesirable results for depletion of interconnected surface water, include a description of potential impacts on instream habitats within ISWs when minimum thresholds in the subbasin are reached. The GSP should confirm that 15 minimum thresholds for ISWs avoid adverse impacts to environmental beneficial users of interconnected surface waters as these environmental users could be left unprotected by the GSP. These recommendations apply especially to environmental beneficial users that are already protected under pre-existing state or federal law.	See response to Comment 116
119	NGO Consortium (GLF)	NGO Consortium	General Comment	(See full letter) Incorporate climate change into surface water flow inputs for the projected water budget.	Climate change impacts on river flows and reservoir operations are explicitly modeled for the Cache Creek watershed in climate change scenarios, since climate-driven hydrology is simulated from the headwaters in Clear Lake down through Yolo county. Cache creek supplies approximately half of the irrigation water in Yolo County. For the other boundary flows: • Sacramento head flow, Sacramento weir, Knights Landing Ridge cut diversions into the Bypass, and head flows in American and Feather: Historical flows are repeated. It was determined that this is sufficient for the future scenarios. These flows are not constraining in the model, they are largely included for surface water/groundwater interactions. Sacramento river flows are very large relative to volumes withdrawn for beneficial use in the Yolo sub-basin; hence the uses within the Yolo subbasin are not expected to be sensitive to climate change impacts on Sac river flows themselves. Rather, CVP allocations and Term 91 curtailments will impact water uses and users more – and these are modeled by the YSGA model in all scenarios including climate scenarios based on results from the CalSIM model runs provided by DWR. • Putah Creek head flow: Historical flows are repeated. The Putah Creek Accord (signed in 2000) came online part way through the historical simulation period (WY 1971-WY 2018). We assessed whether there would have been sufficient water in the creek from the start of data available (1970) to meet the Accord in all years, even before the Accord was in place. When simulated historical flows from 1970-2018 in Putah Creek at I80 were compared with the Putah Creek Accord for the entire time period, the Accord is only violated 3 days out of 576 days of flows. With Monticello Dam providing a large volume of storage and the Accord ensuring current and future environmental flows downstream, we assessed that repeating the historical flows for the future runs was reasonable. • Section 2.1.4 of the model documentation has been edited for clarity.

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120	NGO Consortium (GLF)	NGO Consortium	Section 2.3.7	(See full letter) Calculate sustainable yield based on the projected water budget with climate change incorporated.	The Water Budget Chapter includes more detail on the calculation of Sustainable Yield. The GSP has been modified to include this detail in Section 2.3.7. An additional analysis of the future model scenarios that supports the sustainable yield estimate has also been added.
121	NGO Consortium (GLF)	NGO Consortium	Section 5	(See full letter) Incorporate climate change scenarios into projects and management actions.	As we implement and enhance the Yolo Subbasin GSP, we intend to enhance the climate and land use change scenarios that are applied in the Yolo Subbasin model. These modeled scenarios will be helpful in investigating the appropriate management actions for the Subbasin. As part of project feasibility investigations, the appropriate modeling will occur to determine how the project will assist under certain climate and land use change scenarios, to evaluate the potential benefits and, to properly rank projects.
122	NGO Consortium (GLF)	NGO Consortium	Section 4	(See full letter) Establish a monitoring network for the groundwater quality condition indicator.	Section 4.6 was added to show monitoring network information. Table 4-2 now shows the locations of monitoring network sites, and Table 4-3 gives additional information about these sites.
123A	NGO Consortium (GLF)	NGO Consortium	Section 4	(See full letter) Provide maps that overlay current and proposed monitoring well locations with the locations of DACs, domestic wells, tribes, GDEs, and ISWs to clearly identify potentially impacted areas.	Figure 4-2 has been added to the GSP showing the representative monitoring network overlaid with key beneficial users.
123B	NGO Consortium (GLF)	NGO Consortium	Section 4	(See full letter) Increase the number of RMWs in the shallow aquifer across the subbasin as needed to adequately monitor all groundwater condition indicators. Prioritize proximity to DACs, domestic wells, tribes, and GDEs when identifying new RMWs.	Added sentence regarding intention to prioritize proximity to DACs, domestic wells, tribes, and GDEs when filling data gaps (Section 4.11.2).
124	NGO Consortium (GLF)	NGO Consortium	Section 4	(See full letter) Further describe the biological monitoring that can be used to assess the potential for significant and unreasonable impacts to GDEs or ISWs due to groundwater conditions in the subbasin.	Table 4-5 has been added to the GSP with specific data gap improvement actions and timelines.
125	NGO Consortium (GLF)	NGO Consortium	Table 5-1	(See full letter) For DACs and domestic well owners, include a drinking water well impact mitigation program to proactively monitor and protect drinking water wells through GSP implementation. Refer to Attachment B for specific recommendations on how to implement a drinking water well mitigation program. The GSP includes a brief discussion of a domestic well Impact mitigation program in Table 5-1, but very few details are provided.	Thank you for the comment. As part of the 2021 Drought, the YSGA has formed an Ad-Hoc Drought Contingency Planning Committee that is considering planning strategies the YSGA and County can work on collaboratively during drought years. The Domestic Well Impact Mitigation Program (Management Action #7) is being considered as a strategy that needs further development. We appreciate you providing a link to the Self-Help Enterprises, Leadership Counsel for Justice and Accountability, and the Community Water Center's Framework for a Drinking Water Well Impact Mitigation Program; that document was paramount to us including the Management Action in the Yolo Subbasin GSP.
126	NGO Consortium (GLF)	NGO Consortium	General Comment	(See full letter) For DACs and domestic well owners, include a discussion of whether potential impacts to water quality from projects and management actions could occur and how the GSA plans to mitigate such impacts.	See response to comment 114.
127	NGO Consortium (GLF)	NGO Consortium	General Comment	(See full letter) Recharge ponds, reservoirs, and facilities for managed aquifer recharge can be designed as multiple-benefit projects to include elements that act functionally as wetlands and provide a benefit for wildlife and aquatic species. The GSP mentions creation of seasonal wetlands in Table 5-1 under the 'Groundwater Recharge and Managed Aquifer Recharge Projects'. For further guidance on how to integrate multi-benefit recharge projects into your GSP, refer to the "Multi-Benefit Recharge Project Methodology Guidance Document."	Added sentence in Table 5-1 under the Increased Groundwater Recharge and Managed Aquifer Recharge Projects.
128	NGO Consortium (GLF)	NGO Consortium	General Comment	(See full letter) Develop management actions that incorporate climate and water delivery uncertainties to address future water demand and prevent future undesirable results.	This is an excellent suggestion. We intend to expand our analyses of the impact of climate and reduced surface water supplies to the Subbasin to better define management actions for ensuring sustainability. Over the past year, we have investigated potential reductions in surface water supplies within the North Yolo Management Area and how that may impact the operational needs of the beneficial users. We intend to continue to develop these investigations to ensure our management actions are assisting in preventing future undesirable results.

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129	Ben King	Individual	Ap.p.endix E (now Ap.p.endix H)	This Appendix is an example where the YSGA can work with the DWR and SWRCB to protect HRTW and DEI rights and policies and also to give stakeholders access to material concurrent information to protect and advocate for these rights. As you know the Yolo Subbasin is the only priority subbasin in the Sacramento Valley under the CV Salts priority system due to the prevailing Boron contamination issues – if this is the case how do stakeholders and the State protect the HRTW and related DEI concerns without some type of contemporaneous public disclosure around long term contamination trends and groundwater heads from the various observed vertical aquifer stratas?	Thank you for the comment. This appendix is mainly intended to illustrate the SMC values at the representative wells. The YSGA GSP has been updated since this comment was submitted. We have acknowledged HRTW in section 1.5.3.1.7 and 2.2.4.6. Water quality and groundwater level data will be provided to the public in the annual reports published by the YSGA.
130	Ben King	Individual	Ap.p.endix E (now Ap.p.endix H)	An easy first step would be to include water level and groundwater quality observations from all multi-completion wells so as to have a continuing data set of both water levels and water quality for all the multi-completion wells. To the extent possible deep wells not included but easily obtainable should be included in the appendix and water level and water quality data should be included and updated.	This is outside the scope of this appendix, but the YSGA will consider expanding water quality monitoring in the Yolo Subbasin in the future. Some of these multi-completion wells have been measured for water quality in the past by DWR, so there may be some historic data to utilize.
131	Ben King	Individual	Ap.p.endix E (now Ap.p.endix H)	Regarding the North Yolo area – the multi-completion well data is more critical because of the known fact that upwelling is common in the Sacramento Valley. This is mentioned in the GSP but not highlighted. Recent USGS publications by Susan Thiros and Laura Bexfield highlight the issues of redox and the potential for freshwater aquifer degradation due to over pumping and especially the potential adverse outcomes from redox when previously anoxic groundwater is exposed to the atmosphere due to over pumping. As you know I believe this is a reason for the presence of arsenic within the scope of the Sutter Buttes Rampart which would include portions of the eastern and northeastern part of subbasin. Again – head gradients from the multi-completion intakes for the same wells should be included and water quality observation trends should be included in the Appendix.	Multi-completion wells are an important source of information that should be utilized. In this version of the GSP, we have water levels for some multi-completion wells in the subbasin. The data from multi-completion wells will continue to be measured and recorded by DWR and stored in the Water Data Library. The YSGA can update the representative monitoring network in the annual reports. The YSGA will review multi-completion well data and determine if those wells should be included as representative monitoring wells.
132	Ben King	Individual	Ap.p.endix E (now Ap.p.endix H)	Regarding the Dunnigan Hills Area – it is glaringly obvious that this disclosure is insufficient disclosure for HRTW and DEI interested stakeholders and stakeholders in general. The three wells are at the very bottom of the Management Area with no representation for approximately 80 percent of the Management Area. Of particular concern should be the area west of the public supply system for Dunnigan and all the domestic wells west of I-5 immediately south of the Colusa County boundary. There are probably 200 to 300 housing units around the western rest stop including 100 to 200 housing units in the mobile home park on the west side of I-5 and north of the rest stop.	Thank you for the comment. Yes, you are correct, we acknowledge that the Dunnigan Hills are a data gap, and we have poor historical data measurements in this area. The YSGA has developed a plan to address data gaps, section 4.11.2. The 200 to 300 housing units that you refer to are in the North Yolo Management Area. We acknowledge that water quality in domestic wells is a data gap. As a result of comments like this, we added an SMC for TDS in the Yolo Subbasin.
133	Carol Scianna	Individual	Figure 2-24	The City of Winters is not included on this map.	Thank you for bringing this to our attention. This Figure has been corrected to display the correct boundary for the City of Winters.
134	Claire Main	Good Humus	General Comment	(See full letter) There needs to be a 10 year moratorium on any new wells drilled on historically non-irrigated land. This will give time to collect data and to more fully understand the groundwater levels.	Thank you for your comment. We have received similar comments and recognize this will need to be addressed as part of the GSP implementation. We encourage you to continue to participate in this process and to provide your feedback in upcoming advisory committee, working group, and board meetings. This will be considered in our process for updating the GSP by 2027.
135	Claire Main	Good Humus	General Comment	(See full letter) Pipelines are not for the good of the entire community, they will advance land development, increase groundwater usage, and degrade water quality. They are also not a long-term solution to our issues.	Thank you for your comment. We understand your perspective, but we believe that extending surface water deliveries can realize a positive benefit to the community and reduce the reliance on groundwater.
136	Claire Main	Good Humus	General Comment	(See full letter) We need to establish working groups that include our agricultural leaders in our communities to come together to initiate a proactive drought conservation management practices that have the goal of minimizing water usage and maximizing water retention in our soils, starting from the top of the watershed down into the valley floor.	Yes, excellent idea and thank you for your thoughtful, productive comment. As part of GSP implementation and the establishment of Management Area Advisory Committees, we will take your thoughts into consideration so that the stakeholders and thought leaders in the community are at the table for developing creative and responsive solutions.
137	Claire Main	Good Humus	General Comment	(See full letter) These working groups offer hands on opportunities, sharing results of these experimental practices among our agricultural community so that we can learn together what is working and what is not.	Yes, excellent idea and thank you for your thoughtful, productive comment. As part of GSP implementation and the establishment of Management Area Advisory Committees, we will take your thoughts into consideration so that the stakeholders and thought leaders in the community are at the table for developing creative and responsive solutions.

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138	Ben King	Individual	Ap.p.endix F (Now Ap.p.endix J)	Overall a great list representing a lot of work by a lot of stakeholders. The YSGA was very open to PMA submittals and made the submission process easy.	Thank you for the feedback.
139	Ben King	Individual	Ap.p.endix F (Now Ap.p.endix J)	Going Forward – can you provide a link where public stakeholders can review each PMA Submittal. For example, could you provide the public information regarding the O'Halloran off-stream reservoir site Project 73 – what public access is there for the documentation and communications for this Project?	Projects will be made available to the public on our website in addition to all necessary components of the Brown Act. Added under section 5.1.3 "All projects funded or considered for implementation by the YSGA will be posted under a 'Projects' page on the yologroundwater.org website."
140	Ben King	Individual	Ap.p.endix F (Now Ap.p.endix J)	Since many of these Projects are being worked on by consultants that have legacy relationships with Project proponents it is important that submissions and communications regarding these projects remain in the public domain. Especially if the Project has HTRW and DEI consequences. How does the requirements for transparency impact the breadth and ease of access regarding potential Projects impact how the YSGA should make this information available to the public? Many of these Projects will rely on public funds and the disclosure should be fully open and transparent.	Added "The YSGA is committed to an open and transparent process in identifying and implementing projects and management actions. "
141	Ben King	Individual	Ap.p.endix F (Now Ap.p.endix J)	There is a material omission in the list of Projects and that is the proposed Sites Project. The YSGA should incorporate the Sites project into this list and specifically include the portion of the Sites Project that concerns the pipeline interconnect proposed south of Dunnigan that will transport Sites water to the Colusa Basin Drain and ultimately to the Sacramento River either via the Colusa Basin Drain and/or the companion proposed pipeline from the Colusa Basin Drain directly east to the Sacramento River. Yolo County departments may and HRTW and DEI focused stakeholders in particular may benefit from this inclusion. Perhaps there should be considerations about whether some of this Sacramento River water could be used for domestic water and public supply uses to equalize the access of Sacramento River water to a wider resident population with rural Yolo County. As it stands now Davis has access to fresh water from the Sacramento River but the residents in northern Yolo County many which are poor and/or people of color do not. These HRTW and DEI consideration are part of the rational proposed Project No. 26 which would envision using the stored water at Sites for sustainable and resilient fresh water supply for the residents on the west side of I-5 from Tehama to Yolo Counties.	This comment addresses very important issues of DEI and HRTW. As the commenter states, Project 26 explicitly address drinking water from Sites, focusing on rural areas of northern Yolo County, so there appears to be no omission of the Site project from the list. The Sites project is also included as a part of Project 10. The use of Sites for a drinking water source could be very impactful, whether it is used for recharging the aquifer for use in drinking water wells or treated in a surface water treatment plant.
143	William Vanderwaal	Individual	p. 3-17	MT & MO for North Yolo Mgmt. Area was set higher because the Colusa GSA had wildly higher MT/MO's in the original draft (6-7 inches subsidence per year). Colusa GSA has recently revised its MT/MO to more conservative and reasonable levels. I recommend revising the North Yolo MA MT/MO for Subsidence to match the Colusa GSA, which are: 0.5 ft over 5 years (MT) and 0.25 ft over 5 years (MO), which will also match MT/MO's for Subsidence in the majority of GSA's within the central Sacramento River Valley (Butte Co., Sutter Co., Glenn Co. Tehama Co.).	Table 3-2 and Table 3-3 have updated MTs and MOs for subsidence for the North Yolo MA.

Comment #	Commenter	Representing	GSP Reference (Public Draft)	Remark	YSGA Response
144	James Strong	Deseret Farms of California	p. 3-15	(See full letter) The draft GSP lacks specific sustainable management criteria for degraded water quality in the Subbasin. The Sustainable Groundwater Management Act (SGMA) requires a GSP to include, among other things, descriptions of sustainable management criteria (SMC) for each applicable sustainability indicator, as identified by SMGA. (Cal. Code Regs., tit. 23, § 354.22 et seq.) Notably, the draft GSP expressly provides that "[t]he YSGA has not established specific sustainable management criteria for water quality in the Subbasin. . . ." (Pg. 3-15, Lines 2 – 3.) Instead, YSGA plans to rely on "current and future water quality standards established for drinking water and agricultural water uses by State and county regulatory agencies." (Pg. 3-15, Lines 2 – 4.) To avoid a finding of "incomplete" by DWR, YSGA must address this matter and develop a SMC for degraded water quality. Further, while YSGA is developing this missing component of its GSP, we assume that it will rely on this existing language within its draft GSP. That means that, in the meantime, YSGA will rely on water quality standards established by State and county regulatory agencies. In doing so, we recommend that YSGA impose State regulatory water quality standards on agricultural water supplies and county regulatory water quality standards on public water supplies. Agricultural groundwater users within the Subbasin require regulatory certainty. Therefore, if YSGA were to upend the current structure of water quality regulations, it would risk placing these agricultural groundwater users in violation of standards that they would otherwise be in compliance with and create an inaccurate portrayal of noncompliance within the Subbasin.	Thank you for the comment. The SMC language for water quality has been revised based on your comment and others like it.
145	James Strong	Deseret Farms of California	p. 3-11	(See full letter) The draft GSP should revise the Measurable Objectives and Minimum Thresholds for Chronic Lowering of Groundwater Levels SMC and the Reduction of Groundwater Storage SMC. The Measurable Objectives (MO) and Minimum Thresholds (MT) for the Chronic Lowering of Groundwater SMC go beyond what is required to achieve YSGA's sustainability goal for the Subbasin. As expressly provided in the draft GSP, "the Yolo Subbasin is a relatively stable basin, with groundwater levels maintaining a relatively consistent long-term average elevation or depth to groundwater." (Pg. 3-4, Lines 4 – 6.) Nonetheless, YSGA relies on overly aggressive MOs and MTs that will ultimately inhibit landowners' ability to achieve these goals. Therefore, we recommend that the MOs and MTs for the Chronic Lowering of Groundwater SMC be lowered to allow for greater operational flexibility. Further, the methodology used to establish the MOs for the Chronic Lowering of Groundwater SMC and the Reduction of Groundwater Storage SMC should be revised to provide clarity. Specifically, regarding both SMCs, the draft GSP provides: Measurable objective is equal to the average fall (Sep-Dec) groundwater elevation for the water period of 2000 to 2011 at each Representative well. Performance of the measurable objective will be measure as the five (5) year running average of the minimum fall (Sep-Dec) groundwater elevation. It is unclear how YSGA will rely on and apply both "the water period of 2000 to 2011" and "the five (5) year running average." Therefore, additional clarity is needed to understand the interplay between these two seemingly contradictory sets of data. Further, the draft GSP does not provide any background or basis as to how these two time periods were established. To that end, we recommend either that the GSP: (A) expand the "water period of 2000 to 2011" to the "water period of 2000 to 2018;" or (B) expand the "five (5) year running average" to a "ten (10) year running average." Either option would incorporate a larger amount of data that would likely provide landowners the additional support necessary achieve the purpose of the MOs.	Thank you for your comment. The MOs and MTs for groundwater levels and storage were established through an extensive stakeholder process. The period of 2001 to 2011 represents a stable period in the groundwater basin that stakeholders wanted to "typically" manage to and that would be protective of groundwater users and support current level of groundwater production and the economies supported by that level of groundwater use. The MO is a single value (GW elevation) at each representative well that cannot be realistically managed to on an annual basis, therefore, we identified a reasonable period of 5-years to calculate a rolling average value for the MO. In this way there is increased flexibility to manage short-term fluctuations in groundwater levels and provide opportunity for recovery as has historically been experienced. The reasonableness of the 5-year period is also weighed against the potential acceptance by DWR and the State Board, it is likely that periods longer than 5 years will not be generally acceptable.

Comment #	Commenter	Representing	GSP Reference (Public Draft)	Remark	YSGA Response
146	Annie Main	Good Humus	General Comment	(See full letter) Special Concerns Areas need more data collection. The Hungry Hollow where we live and have been farming for the last 37 years has been historically a dry farmed region. This means that there have been no wells for YSGA to collect data on. Our area is now labeled a special concern region and SGMA is lacking historical groundwater data to compare with past use and future needs. The fringe areas, including our land, are among areas seeing accelerated water decline which is an indicator of unsustainable usage. Therefore more time is needed to collect data, to find wells to monitor so that more complete information can be collected to understand the usage and recharge levels. How can we find sustainability with new wells bring drilled that are changing the water usage with every new hole in the ground? There needs to be a 10 year moratorium on any new wells drilled on historically non-irrigated land. This will give time to collect data and to more fully understand the groundwater levels.	Thank you for your comment. We have received similar comments and recognize this will need to be addressed as part of GSP implementation. We agree that additional data needs to be collected to provide us with a baseline in the "data gaps" of the region. We encourage you to continue to participate in this process and to provide your feedback in upcoming advisory committee, working group, and board meetings. This will be considered in our process for updating the GSP by 2027.
147	Annie Main	Good Humus	General Comment	(See full letter) Moving Surface Water via Pipelines. Access to water, groundwater and surface water is a community resource. How can this resource be shared equally, and not monopolized by any one person or corporation that has the enough money for a pipeline to take care of their personal needs? This water is community water; therefore it should be used for the entire community not serving a few that can afford to pay for a pipeline to their landholdings. Landowners that are dependent on a pipeline allow them the ability to develop more land, and during the summer months when water from this pipeline is not available, those land owners are going to use groundwater. Our Hungry Hollow water is very good water, lacking salts and boron that is prevalent in Cache Creek water, therefore piping Cache Creek water into the Hungry Hollow will degrade the quality of water. Pipelines are not for the good of the entire community, they will advance land development, increase groundwater usage, and degrade water quality.	Thank you for your comment. We understand your perspective, but we believe that extending surface water deliveries can realize a positive benefit to the community and reduce the reliance on groundwater.
148	Annie Main	Good Humus	General Comment	(See full letter) How will we achieve sustainability? Generally the SGMA plan does not seem to include the inhabitants of the landscape, but more importantly it does not include the potential of our community to make a difference in water usage. I feel that if we are looking into the future of water as a diminishing resource, then our communities need to be involved and participating in the management of water usage in their daily lives. Agriculture is the main user of the groundwater and surface water, and can have the biggest effect of groundwater recharge, surface water usage and what sustainability will look like for the future. To understand sustainability is one part of the puzzle, but more importantly how will we achieve sustainability in our communities is another question. Our communities need to be involved in the process. In my mind this means that we need to be innovative, willing to learn, and to incorporate new farming practices that will enhance water storage in our orchards and fields. Our community needs to learn from other farmers, participate in research in collaboration with organizations working towards these goals. We need to work together, share information, actively doing trials, tests, and experimentation on different management practices to achieve reduction in water usage. The future of Agriculture in California can be protected by working today to adjust our management practices. Our communities need to work together; sacrifice equally making changes as how we live on the land, how to use our shared natural resources and learn how to store more of our water in the soils, and reduce our annual water extraction needs.	Yes, excellent idea and thank you for your thoughtful, productive comment. As part of GSP implementation and the establishment of Management Area Advisory Committees, we will take your thoughts into consideration so that the stakeholders and thought leaders in the community are at the table for developing creative and responsive solutions. We hope that you will also continue to participate in the discussion and help us to determine the appropriate solution for ensuring sustainability.

Comment #	Commenter	Representing	GSP Reference (Public Draft)	Remark	YSGA Response
149	Annie Main	Good Humus	General Comment	(See full letter) We need to establish working groups that include our agricultural leaders in our communities to come together to initiate a proactive drought conservation management practices that have the goal of minimizing water usage and maximizing water retention in our soils, starting from the top of the watershed down into the valley floor. These working groups offer hands on opportunities, sharing results of these experimental practices among our agricultural community so that we can learn together what is working and what is not. These management practices need to be monitored as to the effects that they make, the differences of water usage and water recharge with these practices.	Yes, excellent idea and thank you for your thoughtful, productive comment. As part of GSP implementation and the establishment of Management Area Advisory Committees, we will take your thoughts into consideration so that the stakeholders and thought leaders in the community are at the table for developing creative and responsive solutions.
150	Ricardo Amon & Judy Corbett	Individual	General Comment	See Letter	Thank you for submitting this thoughtful comment. We appreciate your thoughts on the regenerative agricultural practices that can be implemented in the Yolo Subbasin to slow and spread water so that it can effectively sink in and recharge the groundwater.
151	Ben King	Individual	Water Budget (now Ap.p.endix F)	– There should be discussion regarding the current prohibition of Sacramento River curtailments by the SWRCB and how this surface water deficit will impact the assumptions. With the Stanford Vina lawsuit, it is clear that the instream protections and the Public Trust doctrine will govern water allocations. Discussions regarding Voluntary Settlement agreements elsewhere in the GSP are speculative especially in context of the recent actions taken by the SWRCB.	Future modeling scenarios will include surface water constraints based on the experience of the 2021 water year.
152	Ben King	Individual	Water Budget (now Ap.p.endix F)	Discussion regarding 100 pct curtailments in the current SWRCB scenario should be analyzed. Also -some discussion regarding the potential for increased supply for Northern Yolo County from the Sites Reservoir should be discussed.	Future modeling scenarios will include surface water constraints based on the experience of the 2021 water year.
153	Ben King	Individual	Water Budget (now Ap.p.endix F)	Discussion regarding the impact on groundwater storage and recharge from updated BFW modeling done consistent with the work done by the DWR and presented by Springhorn at the US Geological Society in 2013 (reference to previous email regarding BFW Assumptions). Discussion should also include discussion on the impact of higher standards for the determination of fresh water rather than the assumed EC levels in Olmstead and Davis in 1961. The definition for Groundwater Overdraft assumes that there is fungibility in water quality. The Budget assumptions should not allow substandard water quality extractions to offset conforming water quality pumping and surface water allocations. Think of a water bank as a FDIC insured account – deposits and withdrawals have to be done in legal tender – otherwise there will be an incentive to pump for quantity rather than quality and sell fresh surface water downstream.	The MODFLOW platform is capable of simulating upwelling, however, adjustment to the model layer structure and boundary conditions may be needed to capture this phenomena. The present uncertainty about the elevation of base of fresh water is addressed in the monitoring network improvement plan and the plan to address data gaps.
154	Ben King	Individual	Water Budget (now Ap.p.endix F)	The Groundwater Storage in North Yolo is probably less than assumed when the elevated TDS levels of lower stratas are disregarded. This is probably the case in eastern and north eastern Yolo County since this area is within the scope of the impact of the Sutter Buttes Rampart and the body of connate sea water present around the Buttes and southward down the Valley floor from the Sutter Buttes. See the discussion of upwelling salt water brines cause by over pumping in the Sutter- Yuba Investigations. Groundwater contamination from over pumping goes back to the 1930s in the area around Robbins. It is likely that this is occurring or has the potential to occur in the Township 12 N Range.	The MODFLOW platform is capable of simulating upwelling, however, adjustment to the model layer structure and boundary conditions may be needed to capture this phenomena. The present uncertainty about the elevation of base of fresh water is addressed in the monitoring network improvement plan and the plan to address data gaps.
155	Ben King	Individual	Water Budget (now Ap.p.endix F)	- The Uncertainties discussed should reference the data gaps and lack of understanding referenced in the YSGA Model. Particularly the uncertainty regarding the use of only 2AF in the Dunnigan Hills on p 61 of the Model Appendix and the uncertainties on ps 80 and 81 regarding Dunnigan Hills and the Yolo Zamora area	Please see the response to comment 92.
156	Ben King	Individual	Water Budget (now Ap.p.endix F)	How will Sustainable Yield be affected by updated BFW Assumptions.	The MODFLOW platform is capable of simulating upwelling, however, adjustment to the model layer structure and boundary conditions may be needed to capture this phenomena. The present uncertainty about the elevation of base of fresh water is addressed in the monitoring network improvement plan and the plan to address data gaps.

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157	Ben King	Individual	Water Budget (now Ap.p.endix F)	Future scenarios Assumptions – how would the scenario like the current SWRCB Scenario affect Dunnigan Hills. What are the risks and opportunities from potential supply from the potential construction of Sites. Better understanding of the data uncertainties highlighted on p 61 of the Model Documentation.	Future modeling scenarios will include surface water constraints based on the experience of the 2021 water year.
158	Ben King	Individual	Water Budget (now Ap.p.endix F)	1. How would revised BFW contours affect assumed water storage for North Yolo? The future assumption that Dunnigan Water District remains at a full water right and that all other water rights remain the same is not reasonable given the outcome of the Stanford Vinal litigation and the recent zero diversion curtailment by the SWRCB. Potential restrictions due to lateral movement and upwelling of high TDS and arsenic, boron and other potential natural contaminants should be considered in the Budget for North Yolo.	The MODFLOW platform is capable of simulating upwelling, however, adjustment to the model layer structure and boundary conditions may be needed to capture this phenomena. The present uncertainty about the elevation of base of fresh water is addressed in the monitoring network improvement plan and the plan to address data gaps.
159	Ben King	Individual	General Comment	Please accept this version of my general comments regarding the BFW assumptions in the Water Budget and HCM. I had previously confused Olmstead and Davis, 1961 with the tectonic work of Harwood and Helley. The reliance on Olmstead and Davis which completed 60 years ago will not give an accurate accounting of water storage for the water budget and does not represent empirical BFW observations especially when the contemporary water quality standards are considered. It is unfortunate that this GSP does not include the updated BFW modeling but there should be discussion around the reasonableness on relying on the extremely dated work by Olmstead and Davis. As you can see in the Springhorn attachment the DWR has updated the work done by Berkstresser in 1973. Springhorn , Hightower, Bedegrew and Bonds from the DWR presented a poster board with updated BFW contours at the Geological Society of America in May 2013. Does the GSP incorporate the work done by Berkstresser in addition to Olmstead and Davis?	The MODFLOW platform is capable of simulating upwelling, however, adjustment to the model layer structure and boundary conditions may be needed to capture this phenomena. The present uncertainty about the elevation of base of fresh water is addressed in the monitoring network improvement plan and the plan to address data gaps.
160	Linda Bell	Individual	General Comment	Are Historic Water Cycles Still Valid Predictors of Future Climate Cycles? (CCR 354.18 c) 3) A)) states that “Projected hydrology shall utilize 50 years of historical precipitation, evaporation, and streamflow information as the baseline condition for estimating future hydrology.”. Though past weather patterns are still part of climate studies, recent climate and hydrology research sees a future with more extremes of precipitation and temperature....(Letter continues)	Excellent question. It is important to note that the 2030 and 2070 centered model scenarios are not repeating historical climate patterns. The distribution of wet and dry years is centered on the precipitation and ET scenarios in 2030 and 2070. These datasets represent the best available science provided by the Department. Climate change models always use historical data to calibrate and downscale to, it is reasonable to assume that they will start showing more frequently occurring droughts as time moves forward. We are hoping to improve our climate change assumptions and modeling in future GSP updates, and we appreciate you bringing credible sources of data/information to our attention for consideration in our planning process.
161	Linda Bell	Individual	General Comment	(See full letter) Can The Choice of a Specific Time Span Influence Predictions? The fact that the 48 year historic baseline (1971-2018) of the Plan’s water budget starts just before the Indian Valley Reservoir comes on line is very important. Indian Valley Reservoir is operated to meet current year demand, not to maximize carryover storage; so its releases are important to the flow of Cache Creek. “Since completion of the Indian Valley Reservoir in 1975, the District’s water resources became less vulnerable to the dry years that periodically limit water resources in Yolo County.” “The conjunctive water management benefits associated with the Indian Valley Reservoir, and other District operations are directly evident in long-term hydrography for representative wells that show recovered groundwater levels after the reservoir came on line in 1977 to 1978.” (Borcalli, 2000) and (Ludhorff & Scalmanini, 2004) (Letter continues)....	Thank you for your comment. The 48 year baseline was initially 1970 - 2009 in earlier modeling studies based on the availability of data and the fact that the time period contained a series of droughts and wet periods. More recently researchers at UC Davis extended the period to 2015. During the development of the GSP, the modeling team extended the simulation to 2018 in order to assess model performance following the intense drought years of 2014 and 2015. Regarding the criteria thresholds, this is our first draft or effort in establishing criteria and we intend to adaptively manage the process and Subbasin to ensure the criteria are set at the appropriate levels and will ensure future sustainability. We appreciate and encourage your continued participation in this process.

Comment #	Commenter	Representing	GSP Reference (Public Draft)	Remark	YSGA Response
162	Linda Bell	Individual	General Comment	(See full letter) "Each Agency may define one or more management areas within a basin if the Agency has determined that creation of management areas will facilitate implementation of the Plan. Management areas may define different minimum thresholds and be operated to different measurable objectives than the basin at large, provided that undesirable results are defined consistently throughout the basin. A basin that includes one or more management areas shall describe: (a) The reason for the creation of each management area." (CCR 354.20 (a)) The Agency established six management areas. Though these management areas are used throughout the basin description to show the distribution of hydrologic soils; their formal description in Section 2.3 is unable to give a concise reason for their delineation. It states that "Management areas were developed based on prior investigations, which delineated somewhat different subbasin areas, and have been adapted to the purpose of this GSP." The description continues on, but with no clear summation of the various changes. (Letter continues)...	Thank you for your comment. We apologize for any confusion. The Management Areas developed in the Yolo Subbasin GSP are primarily consistent with the hydrogeologic distinctions of the Subbasin and were considered appropriate delineations for establishing the sustainable management criteria (minimum thresholds, measurable objectives, etc.). In forming the YSGA Advisory Committees, we are intending for the on-the-ground stakeholders and groundwater experts to assist us in the implementation of the plan and to provide the YSGA better detail and information on the internal needs of these smaller hydrogeologic units (than the Management Areas). A Management Area or smaller unit is more than welcome to develop and present to the YSGA for consideration sustainable management criteria that they feel is more appropriate to their region. The GSP is meant to provide sustainability for the Subbasin as a whole based on the intent of the legislation.
163	Linda Bell	Individual	General Comment	(See full letter) Bulletin 118 "Non-Basin Areas" DWR's Bulletin 118 creates a regulatory gap by defining only alluvial basins and not fractured, hard-rock and volcanic aquifers (which it labels "non-basin areas"). The western edge of the Central Yolo Management Area forms the border with the "non-basin" Capay Hills and Coast Range. The Hungry Hollow area borders the Capay Hills and Winters borders the Coast Range. Both of these areas are designated as Areas of Concern by the GSP. Groundwater in fractured hard-rock aquifers are very vulnerable to overdraft since their pore spaces are smaller than alluvial aquifers. The predictability of a well's yield can also vary depending on their location in the aquifer.(Letter continues)....	Thank you for your comment. We have received similar comments and recognize this will need to be addressed as part of the GSP implementation. We agree that areas of special concern should be separate management units - we intend to work with the stakeholders to promote the development of coalitions or subcommittees that will help us to think through creative and nuanced solutions for ensuring sustainability within these areas. We encourage you to continue to participate in this process and to provide your feedback in upcoming advisory committee, working group, and board meetings. This will be considered in our process for updating the GSP by 2027.
164	Linda Bell	Individual	General Comment	(See full letter) Land Use data for the Draft Water Budget Model was held constant from 2016 to 2018, since data after 2016 was not available when the model was programed. This means that part of the increase in water demand created by new residential and agricultural land use is missing from the water budget. This loss is especially critical in the areas of the Dunnigan Hills and Hungry Hollow where new agricultural development, especially perennial crops, such as orchards, has been especially strong. Both of these areas have not been adequately studied to assess this impact on groundwater. The Water budget needs to be re-calculated with the new numbers on both residential and agricultural land use.	Thank you for the comment; the YSGA TAC will work to develop a future land use projection to be included in the 5-year update to the model - see P2 in Table 5-1.
165	Linda Bell	Individual	General Comment	(See full letter) The Minimum Thresholds for Chronic Lowering of Groundwater Levels and Groundwater Storage in the North Yolo Management Area, which is here proposed as a measure to compensate for Voluntary Agreements; is an interesting combination of farmer and environmental beneficiaries issues. The threshold is described as: "Exceedance of the historic elevation in the period of record of each Representative Well plus 20 percent of the depth between the historic maximum and historic minimum elevation for the period of record of the Representative Well in two consecutive years." The explanation is that "The minimum thresholds for the North Yolo management area are set lower than historic conditions recognizing that water districts, such as 108, in this area may experience reductions in surface water deliveries from the Sacramento River as the Voluntary Agreements with the State Water Resource Board are implemented. " (Letter continues)...	Thank you for the comment. Minimum thresholds were developed in a collaborative process by the Working Group, taking into account all beneficial uses of groundwater, coordinated with neighboring subbasins, and approved by the Board of Directors. Groundwater elevations will be monitored and evaluated relative these thresholds to adaptively manage the Subbasin and ensure sustainability into the future.

Comment #	Commenter	Representing	GSP Reference (Public Draft)	Remark	YSGA Response
166	Linda Bell	Individual	General Comment	(See full letter) The Assumption that the Yolo Subbasin is a relatively stable basin where groundwater levels will rebound after drought, or heavy groundwater use, is a response that the Agency gives to all the situations where minimum thresholds are set at historic, or lower than historic, levels. The argument is that: “In the Yolo Subbasin, groundwater storage changes are positive in wet years and negative in dry year, with no significant trend (decline or increase) over the past 50 years.” (Appendix C, p 1) Though this kind of a cycle has occurred in the past,…. is a “stable” cycle of drought-and-flood, or large declines and increases, a pattern that we want to accept by declaring historic minimum groundwater elevations sustainable conditions? The Sustainable Groundwater Management Act was written in 2014 because of the repercussions of such a cycle. It would seem that the setting of minimum threshold levels at historic lows over consecutive years is perpetuating, not improving, the sustainability of the Yolo Subbasin. I would like the Agency to explain why setting minimum thresholds at such low levels is a sustainable management practice.	Thank you for your comment. As noted in the GSP, we consider this to be a stable pattern for the Yolo Subbasin as a whole, with historic low groundwater elevations recovering to historic high groundwater elevations. We realize this is not the case on a smaller scale or in more localized "hot spots" of the Subbasin. As part of developing the GSP, we wanted to the document to be based on the empirical data from our robust groundwater monitoring network and did not want to overcomplicate things with expensive modeling. This is considered our first take at this process and may be consider a "low bar" at this time, but is something that we hope to observe and adaptively manage to moving forward. Please continue to participate in our meetings and provide your valuable perspective.
167	Linda Bell	Individual	Section 2.2.3	(See full letter) The Plan, in Section 2.2.3 (p 2-54) decides to not set a minimum threshold for Saltwater Intrusion because “Seawater intrusion, as observed in California’s coastal aquifers, will not likely occur within the Yolo Subbasin because the ocean is over 50 miles away, farther if measured along the waterways. The southern portion of the Yolo Subbasin is located within the Sacramento-San Joaquin Delta and has been subject to salinity intrusions during the early part of the last century, but not since 1944 and 1990 (DWR 1995) and probably not thereafter due to the state management of flows through the Delta to prohibit salinity intrusion.” Even if the southern portion of the Yolo Subbasin is outside of direct seawater contact, the Yolo Basin could be indirectly affected. The Basin’s Sacramento River water supplies could be cut to: 1) provide for the immediate flows needed to push back salt water intrusions in the lower Delta, or 2) to retain reservoir water for a future need to curtail salt water intrusions. In either case, there would be indirect effects. The Plan needs to explain how it would replace these surface water supplies in such a situation. The September 21st 2021 Water Resources Control Board Meeting was talking about just such a condition; so the Plan should explain how it would replace these water resources.	Thank you for the comment, Section 2.2.3 was expanded upon in response to this comment and other similar comments that were received.
168	Linda Bell	Individual	General Comment	(See full letter) SGMA requires coordination with Land Use Planning Agencies. CA Water Code 10727.4 states that “…a groundwater sustainability plan shall include, where appropriate and in collaboration with the appropriate local agencies, all the following:… (k) Processes to review land use plans and efforts to coordinate with land use planning agencies to assess activities that potentially create risks to groundwater quality or quantity..” Table 1-3 (p 1-21) shows which member agencies, and affiliated members, implement water resources programs, but it does not present a working relationship with planning departments and permitting agencies. Management Action 2 is titled: “Continue coordination efforts with other management and monitoring entities.”, but there are still no details as to the success of these efforts. The SGA Board has recently been negotiating the form of a group which would interface with the Board of Supervisors, but the role of the representatives is still being decided. There is a hesitancy to take any direct actions in the land planning and well permitting processes.	Thank you for pointing out this deficiency. We have added some additional language to the GSP to articulate the recent coordination efforts that have occurred with the YSGA and the Yolo County Board of Supervisors and staff related to the drought and ways to improve the well permitting process.

Comment #	Commenter	Representing	GSP Reference (Public Draft)	Remark	YSGA Response
169	Linda Bell	Individual	Section 5	(See full letter) Projects and Management Actions (354.44 (a)) states: "Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin." One set of projects, numbers 56 through 59, looks at the Capay watershed and the community as an integrated whole. Together they work to improve the hydrological state of the watershed; improve farming practices to increase water infiltration and water holding capacity; develop a restoration plan for the native vegetation communities of the Capay Valley; and establish an equipment and knowledge hub for the human community. Copay is a unique location, but the ideas could be scaled to other areas. Together these projects do plan for a changing climate.	Sentences have been added to Projects 56 and 59 recognizing that similar projects can be expanded to the entire Subbasin.
170	Linda Bell	Individual	General Comment	(See full letter) In summary, I feel like the beginning (Basin Setting) and end sections (Appendices) of the Draft plan were very helpful for understanding the Plan, but the summation of this information in the middle sections, such as the Sustainable Management Criteria, were not as well thought through.	Thank you for your comment. We recognize that the Sustainable Management Criteria is currently written to fit within the State's SGMA process; the language and framework for thinking through the issue of sustainability is defined based on the necessary components of the SGMA regulations and may not completely make sense in an application sense. As we implement the Yolo Subbasin GSP, we intend to better articulate and document the realities of applying these minimum thresholds and measurable objectives to avoid undesirable results. This is the first plan that has comprehensively examined groundwater sustainability for the entire County and we are working with the resources that are available to us at this time. We will continue to strive for improvement as we move forward in monitoring and managing our valuable water resources.
171	William Vanderwaal	DWD	Section 5	Boards in program. This would be voluntary or financially incentivized to have landowners keep the spill boards in on their rice fields in the winter to hold rainfall on their fields. Even though they tend to be low infiltration due to higher clay content, there could still be recharge benefits out of this sort of program. The alternative (board not in) has the water run off the fields into drains and into the river losing the chance to recharge the aquifer.	The Boards In Program was added to Table 5-1.
172	Beverly Schmidkunz Boido	Individual	General Comment	*Accountability of our groundwater usage a moratorium on further groundwater extraction for development on what have been historically non-irrigated lands until there is an understanding of groundwater sustainability in the Dunnigan hills and other "special concern" areas. **Accountability by our community- To move forward in the change of climate we suggest an active informative educational process to help agricultural landowners and urban dwellers how to go into the future on how we each can participate in decreasing water usage together.	Thank you for your comment. We have received similar comments and recognize this will need to be addressed as part of the GSP implementation. We encourage you to continue to participate in this process and to provide your feedback in upcoming advisory committee, working group, and board meetings. This will be considered in our process for updating the GSP by 2027.
173	Gwyn-Mohr Tully	City of West Sacramento	Figure 1-3	(See full letter) Figure 1-3 on p 1-13 indicates that the City is not a "groundwater dependent community." The City has diversified its water supply portfolio and part of that portfolio remains groundwater. Thus, although we are not "wholly dependent" I think the City considers groundwater a part of its usable water asset portfolio in much the same way as the City of Davis and City of Woodland (both integrated with surface supplies delivered from WDCWA) that are depicted as groundwater dependent communities.	A footnote was added to Figure 1-3 denoting this distinction.
174	Gwyn-Mohr Tully	City of West Sacramento	Figure 1-4	(See full letter) Figure 1-4 shows a distribution of grain and hay crops throughout the City of West Sacramento's service area. Although this may have been true in the past, much of the area depicted in this graphic is fully developed and devoid of agricultural production.	This map is based on 2016 land use data from DWR. The 2018 data from DWR also appears to show this as agricultural land. Looking at aerial imagery, it appears some of this land may have been fallowed, recently. Land use classifications will be updated when new data sets are released by DWR.
175	Gwyn-Mohr Tully	City of West Sacramento	Figure 1-6 through 1-8	(See full letter) Figures 1-6 through 1-8 show a wide distribution of various agricultural, domestic, and municipal wells within the City of West Sacramento. We would appreciate a citation to this data source (or sources) to ensure that it stays up to date with the City's well management activities.	The source of this data is DWR's Well Completion Report database, https://data.cnra.ca.gov/dataset/well-completion-reports. It is cited in the figures and in text in Section 1.5.2.
176	Gwyn-Mohr Tully	City of West Sacramento	p. 1-31	(See full letter) The City would like its 2020 update to its General Plan Housing Element noted in the statement about the City's General Plan.	Added "The City of West Sacramento adopted the 2021-2029 Housing Element Update on July 14, 2021"
177	Gwyn-Mohr Tully	City of West Sacramento	p. 2-20	(See full letter) There appear to be a couple typographical errors on this p and on p 2-32 the word "southwestern" is misspelled.	Several typos on this page were fixed.

Comment #	Commenter	Representing	GSP Reference (Public Draft)	Remark	YSGA Response
178	Gwyn-Mohr Tully	City of West Sacramento	Figure 2-14	(See full letter) 1. Figure 2-14 on p 2-37 does not appear to show the City's point of diversion for Permit 18150.	Confirmed the point of diversion for Permit 18150 is shown on the map, about 2.5 mi south of the Port of Sacramento. The location matches what is shown in eWRIMS.
179	Gwyn-Mohr Tully	City of West Sacramento	Figure 2-24	(See full letter) Figure 2-24 on p 2-63 should list the City as a Public Water System in the legend and the figure should include a spatial recognition of the City's service area.	Thank you for bringing this to our attention. The City of West Sacramento has been added to this figure.
180	Gwyn-Mohr Tully	City of West Sacramento	Table 2-12 through 2-15	(See full letter) Tables 2-12 through 2-15 do not show the City as a Public Water System or show the water quality information that would apply to the City in those tables.	Thank you for the comment, based on the SDWIS database, and communication with the State Water Board, we modified some language in the GSP. We modified Table 2-11 and added the following sentence in Section 2.2.4.4: "The City of West Sacramento is a public water system, No. CA5710003, that was not considered in this table. Information about the City's water system and water use can be found in its recently adopted 2020 Urban Water Management Plan. " The City of West Sacramento was not initially included because water quality data is not currently measured since their wells are not actively used for drinking water supply.
181	Gwyn-Mohr Tully	City of West Sacramento	p. 2-203	(See full letter) p 1-203 cites The Nature Conservancy's water model. The City notes the following disclaimer that TNC shows at the identified link that should be incorporated into the text as it indicates that there is some uncertainty with what could be concluded from the information. The link states: "This map categorizes the rivers and streams in the Central Valley on the likelihood that they are ISW, using groundwater depth as a proxy to determine if the surface water is hydraulically connected to groundwater." (highlight added). Perhaps this would be well-suited for a footnote since The Nature Conservancy notes that the output is a "likelihood" rather than something more definitive.	A caveat was added to this section clarifying that the methodology contains uncertainty, "This approach categorizes the water bodies using an estimate of stream bed elevation and groundwater depth as a proxy to determine if the water body is hydraulically connected, and therefore represents a likelihood that contains some uncertainty. A representation of that uncertainty is shown in the yellow areas on Figure 2-47. For the purposes of this GSP, reaches categorized as "uncertain" are considered connected to groundwater to ensure a conservative approach. "
182	Gwyn-Mohr Tully	City of West Sacramento	p. 2-104	(See full letter) There seems to be some speculation related to groundwater substitution transfers in this section. These transfers are highly controversial for a number of reasons and we think that adding language about the interconnectivity of surface water and groundwater in this instance is misplaced. The DWR Water Transfer Whitepaper is not law but is instead policy generated by DWR staff that has not yet been formerly ratified or challenged. We would encourage the Agency to simply delete this text and provide more generalized language about hydraulic connectivity between surface water and groundwater.	Thank you for the comment. We revised this section to remove any speculation and stay within the scope of groundwater/surface water interconnection.
183	Gwyn-Mohr Tully	City of West Sacramento	p. 2-109	(See full letter) There appears to be a typo in lines 13 and 14.	Fixed
184	Gwyn-Mohr Tully	City of West Sacramento	General Comment	(See full letter) One source of groundwater recharge certainly applies to sources of water that are applied to land through irrigation (and other overland-spreading activities). Additional methods of groundwater recharge may need to be added to the characterization of recharge for groundwater basins even if the discussion is merely qualitative. Examples may include diversion of flood flows through the Yolo bypass, water regularly moving through the drain in the Yolo Bypass, water moving in the deep water ship channel, application of irrigation water above the ET amounts to crops, and application of irrigation water in urban landscapes	Thanks for the comment. We agree that there are other groundwater recharge opportunities such as those you've mentioned. We updated the groundwater recharge management action accordingly.
185	Gwyn-Mohr Tully	City of West Sacramento	p. 2-130	(See full letter) Section 2.2.9 on p 2-130 should include a brief discussion about the conversion of agricultural acreage to urban acreage. This is a particularly important component in the City's service area because significant water conservation has been achieved in the City's service area on a per acre basis when land is converted from agricultural production to urban landscapes. Much of that conserved water benefits the Yolo Subbasin groundwater conditions in the South Yolo Management Area.	Added the following language to the GSP: "Another important change in land use is the conversion of agricultural areas to urban areas"
186	Gwyn-Mohr Tully	City of West Sacramento	Figure 2-56	(See full letter) Figure 2-56 on p 2-132 shows future use over 65,000 but the number in the side table in the figure says 50,270. We are unclear on the data correlation in this table and suggest it could be explained in words if the data shown is correct.	The table on the right is the average annual urban demand, the graph on the left starts with urban demand around 40,000 AF and ends around 65,000 AF - with the average being 50,270 AF annually. Added the following language: "Figure 2-56 shows the average annual urban demand for the future scenarios as 50,270 AF/year. In the future scenarios, the urban demand rise steadily, resulting in modeled urban demand that is higher at the end of the future period than at the beginning."
187	Gwyn-Mohr Tully	City of West Sacramento	Table 2-22	(See full letter) Table 2-22 on p 2-134 needs a units characterization.	The water year index and water year type sources are identified on p 2-131. Added a footnote to Table 2-22 with the following language: Note: additional information on the Water Year Index for the Sacramento Valley can be viewed in DWR's Sustainable Groundwater Management Act Water Year Type Dataset Development Report (DWR, 2021)."

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188	Gwyn-Mohr Tully	City of West Sacramento	p. 2-139	(See full letter) p 2-139 identifies 346 TAF as the sustainable yield of the entire Yolo Subbasin. We recognize that components of this figure are aggregated among the various management areas.	Thank you for the comment.
189	Gwyn-Mohr Tully	City of West Sacramento	p. 2-146	(See full letter) Section 2.3.5 on p 2-146 should recognize that the City's water use history in a little more detail. We recommend the following language be added after the first sentence on line 16: "The City historically delivered groundwater to its customers as the exclusive source of water for many years before building its surface water diversion and treatment facilities. The City continues to preserve and use groundwater in its service area for various purposes and is looking to improve its groundwater system to provide necessary system redundancy to ensure safe and reliable water supplies for all of the City's residents and businesses." We would also ask that the last sentence with the word "dependency" in it be deleted that starts on line 16. Also, the word "city" should be capitalized in the first sentence on line 16.	Added and changed language in section 2.3.5 to reflect the comment submitted.
190	Gwyn-Mohr Tully	City of West Sacramento	p. 4-7	(See full letter) There is a typographical error in the Table legend.	Thank you for the comment, this typo has been fixed.
191	Gwyn-Mohr Tully	City of West Sacramento	p. 5-20	(See full letter) p 5-20, P 68 and P 69 in the table are projects for the City of West Sacramento. We would prefer that P 68 be titled "West Sacramento Well Improvements that may include Aquifer Storage and Recovery."	Changed title of this project
192	Gwyn-Mohr Tully	City of West Sacramento	Ap.p.endix p. 47	(See full letter) Appendix p 47 PDF has the same figure as shown in Figure 2-56 on p 2-132 that may require more explanation.	The table on the right is the average annual urban demand, the graph on the left starts with urban demand around 40,000 AF and ends around 65,000 AF - with the average being 50,270 AF annually. Added the following language: "Figure 2-56 shows the average annual urban demand for the future scenarios as 50,270 AF/year. In the future scenarios, the urban demand rise steadily, resulting in modeled urban demand that is higher at the end of the future period than at the beginning."
193	Gwyn-Mohr Tully	City of West Sacramento	Model Documentation p. 44	(See full letter) 1.Section 2.1.5.2.2 of the Appendix (p 209 of Appendix PDF) should probably be modified in a few ways. a.The characterization of the NDWA contract should be modified and redact the word "unlimited" and add "highly reliable" instead. The rest of that sentence after the comment should be deleted. b.The sentence that states "This is not implemented into the model at this time" is somewhat concerning. The City's ability to use groundwater should be in the model and we are not sure what this sentence is conveying. In addition, the notations in Figures 1-6 through 1-8 indicate that well water is being used within the City which should be incorporated into the model. c.The City sends its wastewater to SRCSD not the City of Sacramento as noted in the sentence starting with "Although." d. The table depicting "Sources of Information" for the City of West Sacramento. A few things here: the City's CVP Contract is number 0-07-20-W0187-P rather than what is depicted in that table. Also, the City is in the final stages of updating its 2020 UWMP and has updated its Housing Element in 2020 for its General Plan (the GP is cited elsewhere (p 1-31) in the GSP so should be cited in this table). If a reference could be made that these data will be modified based upon future updates to planning documents, that would be helpful.	a.) The text has been changed. b.) The model does use groundwater if all surface supplies are exhausted. The text has been clarified to reflect this. c.) The correct name for the treatment plant has been used in the text. d.) The contract 14-06-200-1779A-R-1 is the RD 900 contract. A reference for contract 0-07-20-W0187 has been added. A link for the general plan has been added to the sources table. Text has been added stating future model updates will reflect updated planning documents.

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194	Jeff Main	Good Humus	General Comment	(See full letter) First, it is clear that the speed and power of the financial investment and development groups to alter existing landscape and community resource norms in our area has far outstripped the speed with which we are reacting to the changes that are introduced. The continuous purchase and reconfiguring of hill ground in Western Yolo County combined with the indiscriminate extraction of a diminishing community water resource without regard for the needs of the local community has avalanched in the midst of a historic drought that demands rather, greater care and preservation efforts from all of us. It is essential that we use all the powers of our elected public officials and governmental bodies to re-establish the rights of all to a reasonable share of a sustained essential resource.	Thank you for your thoughtful comment. We look forward to working with you and other Hungry Hollow area community members, along with the County Board of Supervisors and staff to appropriately address your concerns and the mutual desire of preserving groundwater resources and ensuring sustainability into the future.
195	Jeff Main	Good Humus	General Comment	(See full letter) Second, it should be noted that there is a likely geologic delineation between the aquifers to the north of Rd 16A in Hungry Hollow and the aquifers to the south. This delineation should show clearly in the difference between the water qualities of these two regions. If there is indeed a delineation it should be acknowledged as a goal of the YSGA to protect the higher quality waters to the north from the introduction of lower quality water from sources to the south.	Thank you for your comment. This is helpful information to assist us in learning more about the subsurface hydrogeology of the region. We will consider this information as we expand the monitoring network and document any anecdotal/observed data. It seems that there could be a simple water quality sampling and analysis in the future to confirm.
196	Jeff Main	Good Humus	General Comment	(See full letter) Finally, I would hope that in addition to concerns about the mingling of waters of differing quality, that the idea of allowing additional development of land through the pumping of water from the Cache Creek Canals will be carefully studied for its potential for increasing groundwater pumping and resulting overdraft during periods of greatest concern.	Thank you for the thoughtful comment. Future degradation of water quality will be considered and avoided in the implementation of GSP projects. In addition, the YSGA will consider whether future development of unirrigated land should continue/be allowed in regions where there may not be a sustainable groundwater supply.
197	Paul Muller	Full Belly Farm	General Comment	(See full letter) See Letter	Thank you for your thoughtful, productive comments. As part of GSP implementation and the establishment of Management Area Advisory Committees, we will take your thoughts into consideration so that the stakeholders and thought leaders in the community are at the table for developing creative and responsive solutions.
198	Allen Barnes & Kim Ohlson	Good Humus	General Comment	(See full letter) We would like to provide feedback on the Public Draft of the Groundwater Sustainability Plan (GSP) as it relates to Hungry Hollow and other special concern areas on the west side of the valley from Winters to Zamora. We strongly support the position taken by Good Humus Produce and others that there should be a 10-year moratorium on any new wells drilled on historically non-irrigated land. This time would allow a thorough and much-needed study of the effect of new deep water wells on the water table in the Hungry Hollow area, as well as other potentially affected areas. (Letter continues)...	Thank you for your comment. We have received similar comments and recognize this will need to be addressed as part of the GSP implementation. We encourage you to continue to participate in this process and to provide your feedback in upcoming advisory committee, working group, and board meetings. We also believe it will require a nuanced, creative solution. This will be considered in GSP implementation and will be expanded on textually in the 2027 GSP Update.
199	Ben King	Individual	p. 1-23	p 1-23 There should be a discussion of the recent adoption of a Human Right to Water (HRTW) Policy in the Department Administrative Manual which outlines how the HRTW should be included in DRW decision making, program activities and public engagement. Since the HTRW legislation predates SGMA but is now an emerging issue it is important for the GSP to highlight the adoption by the DRW and highlight the HTRW commitment for public engagement purposes. It should probably be noted that the SWRCB has also recognized HRTW as a core value and is in the process of drafting a Racial Equity Resolution as it relates to Diversity, Equity and Inclusion (DEI) issues relating to water policy in the State of California.	A paragraph discussing this policy has been added to Section 1.5.
200	Ben King	Individual	p. 1-31	Are there HTRW policies and directives for the municipal Members that should be highlighted? Are there DEI policy directives that relate to water use and equity for the municipal Members that should be highlighted for future stakeholder engagement. Also please note the typo reference source at bottom of p.	We did not find any mentions of human right to water with the City of Davis, City of Woodland, or City of West Sacramento online. The reference typo was also addressed.
201	Ben King	Individual	p. 2-1	2-1 line 27 (Figure ?)	The reference to Figure 2-1 has been fixed.

Comment #	Commenter	Representing	GSP Reference (Public Draft)	Remark	YSGA Response
202	Ben King	Individual	General Comment	As mentioned in previous emails - the Olmstead and Davis, 1961 is not most recent or reliable BFW vertical depths both because they are not observed empirically and because the water quality parameters are much too high compared to current water quality standards. See the email regarding the Springhorn BFW presentation to the US Geological Society in 2013. Once updated the BFW assumptions will most likely materially change the Water Budget assumptions for the northern Yolo County Management Areas	A reference to recent and upcoming studies, as well as utilizing AEM surveys was added in section 4.11.2.4 to address BFW gaps and data gaps related to the HCM.
203	Ben King	Individual	p. 2-15	This section should include a discussion about the unique Geomorphology of the Sutter Buttes and the presence of the Willows Fault to the north and east of the northeast corner of the Yolo Subbasin. See the work of Springhorn (2008) and Curtin (1971). Springhorn recommended in his "Future Work" section that the presence of arsenic near the footprint of the Sutter Buttes Rampart be studied. Note that it likely that arsenic is desorbing from the metal oxide volcanic material of the Sutter Buttes and has contaminated the public water supply for Grimes and the well for the Meridian elementary school. Both of these sites have arsenic observations of approximately 28 u/gL and are located just north of the Yolo Subbasin. Figure 2-7 should note the location of the western spur of the Willows Fault that runs southerly from Colusa southward toward Grimes and the Sutter Buttes since it is source of connate sea water that upwells in to the fresh water aquifer as the Sacrament Valley floor descends to lower elevations from the south façade of the ancient volcanic structure of the Sutter Buttes.	Language was added to Section 4.11.1.5, Hydrogeologic Conceptual Model Data Gaps, referencing the review of upcoming and recent studies, in addition to AEM surveys that may be useful in improving aquifer characteristics in the Yolo Subbasin
204	Ben King	Individual	p. 2-32	What is the rationale for the statement "Diversions from Sacramento River water are not considered importation …" The Sacramento Water from the Tehama Colusa Canal comes from the pumping plant in Tehama County and/or the GCID interconnect in Colusa County and make its way at unnatural elevations on the west side of the Sacramento Valley. The flows are impacted by the use of the Warren Act and CVP contracts which should be discussed. Just to be clear the Sacramento River water delivered via the Tehama Colusa Canal is all the result of politics and money and has and will continue to have material impacts on the hydrology, environment and economy of the Yolo Subbasin.	The previous paragraph on p 2-31 identifies Tehama Colusa Canal water as imported to the County. To avoid confusion, the sentence referred to in the comments was changed to, "Diversions from Sacramento River are not considered importation where the Sacramento River flows along the eastern boundary of the Subbasin."
205	Ben King	Individual	Section 2.1.10	Perhaps there should be some general summary of the various water rights and them reference to the sections of the Model Documentation Appendix where the specific water rights for each Management Area is covered in detail.	A sentence referring to the Model Documentation Appendix was added in this section.
206	Ben King	Individual	Section 2.1.11	Data gaps to be considered are the likely update of BFW based on DWR work highlighted by Springhorn in his 2013 posterboard at the US Geological Society, the Future Work section of Springhorn's 2008 Master's Thesis regarding the presence of arsenic within the scope of the Sutter Buttes Rampart on the north east and eastern portion of the Yolo Subbasin. The presence of redox conditions that are likely aggravated by lowered groundwater levels due to over pumping as highlighted in the recent USGS publications of Laura Bexfield and Susan Thiros et al. The presence of upwelling in the Sacramento Valley as widely observed by the DWR and others. In addition there are distinct data gaps that were highlighted in the YSGA Model particularly pertaining to water use in the Dunnigan Hills and other issues in the Dunnigan Zamora area.	Please see the response to comment 96. The BFW is identified in the HCM data gaps (Section 2.1.11), and the plan to address data gaps (Section 4.11.2). Data gaps such as the Dunnigan Hills area are identified in Section 4.11.
207	Ben King	Individual	Section 2.1.12	Add Springhorn (DWR) BFW work, Springhorn 2008 Paper regarding the Sutter Buttes , Curtin 1971 Paper regarding stratigraphy and water quality south of the Sutter Buttes and Susan Thiros and Laura Bexfield where arsenic,TDS and redox is discussed. Reference excerpts attached.	A reference to recent and upcoming studies, as well as utilizing AEM surveys was added in section 4.11.2.4 to address bfw gaps and data gaps related to the HCM. Additionally, this was added as a data gap in the Basin Setting Chapter.

Comment #	Commenter	Representing	GSP Reference (Public Draft)	Remark	YSGA Response
208	Ben King	Individual	Section 2.2.1	2.2.1.3 It is wrong to say that water gradient is upward only in discharge areas. Upwhelling is common across the Sacramento Valley floor. Most recently this was observed at a new DWR multi-completion well on Hahn Road just west of I-5 which is not a discharge area. The interrelationship between upwelling and redox conditions has potential material adverse outcomes due to over pumping and potentially from the head gradient from the potential Sites Reservoir which will be as high as 500 feet above sea level and 700 to 800 feet from public supply and domestic wells at lower elevations of the west side of the Sacramento Valley. This potential for degradation of the fresh water aquifer has HTRW and DEI related outcomes also.	You are correct, there is upward movement of groundwater elsewhere in the subbasin. This is addressed in the final sentence of Section 2.2.1.3 "The vertical gradient is downward from the shallow zone to the upper intermediate zone, somewhat upward between the lower and upper intermediate zones, and upward from the deep zone to the intermediate zone." Also changed "which would be" to "like areas found".
209	Ben King	Individual	Tabel 2-8	Table 2-8 p 2-53. This table represents the empirical evidence of the upwelling phenomenon. It is important not to just characterize this a something that is only observed in discharge areas because that is not empirically substantiated. Upwhelling is a common occurrence which has the potential to permanently degrade the fresh water aquifer if it is not managed. Too deep of wells focused on quantity rather than quality, over pumping causing aggravated redox conditions and the potential for upward and lateral movement or desorption of naturally occurring contaminants such as arsenic are all serious concerns and have HTRW consequences.	The following sentence was added to the first paragraph in Section 2.2.1.3: "Upward movement of groundwater can occur from the deep aquifer to the intermediate aquifer, and intermediate to shallow"
210	Ben King	Individual	Section 2.2.2	Change in Storage Calculations – these calculations will most likely be materially reduced by new updated BFW levels from the DWR as discussed.	Please see the response to comment 96.
211	Ben King	Individual	Section 2.2.4	2.2.4 p 2-56. The DWR's and SWRCB new adoption of HTRW and Racial Equity policies should be discussed in this section . The efforts of NCWA are good but at this point the effort is in early stages and there is no indication that there is a strong representation for domestic water systems. Most NCWA stakeholders are Settlement Contractors with a focus on a collaborative use of surface water while protecting the economic interest of surface water rights.	Thank you for your comment. It is not clear to us what the water quality implications will be of DWR's participation in the California Capitol Collaborative on Race & Equity, or how the State Water Board's water quality programs will be revised based on implementation of AB 685 (HRTW). As we learn more about the connection between these policies and on-the-ground water quality monitoring programs, we will discern whether the water quality section should be updated to reflect the nexus. We will also continue to participate in NCWA's meetings relating to this topic.
212	Ben King	Individual	Section 2.2.4	CV Salts only has one priority subbasin in the Sacramento Valley and it is the Yolo Subbasin. CV Salts focuses on point of source contaminants and does not adequately focus on naturally occurring contaminants and does not prioritize most of the Sacramento Valley in it focus.	Added the following to Section 2.2.4.1: "CV-SALTS has historically been a point source program."
213	Ben King	Individual	Section 2.2.4	The discussion of all the various State and Federal water quality reporting jurisdiction highlights the difficulty in stakeholders getting a clear understanding of water quality trends and potential issues. There should be some consolidated accessible reporting link where this data can be easily obtained and monitored by stakeholders	Thank you for the comment. We have modified the water quality section in response to your comments and other like them. Updates on water quality constituents of concern will be included and released to the public in the annual reports provided to DWR.
214	Ben King	Individual	Tabel 2-10	Table 2-10 – the TDS standard for domestic and agricultural purposes should be included on Table 2-10	Added TDS Standard to Table 2-10.
215	Ben King	Individual	Section 2.2.4	There should be discussion and identification of the domestic wells north and west of the Cal American Water Supply system near Dunnigan. There are 200 to 300 households in houses and trailer parks which I do not believe are included. There are HTRW and DEI protections needed for these residents.	A well impact analysis has been added as an appendix to the GSP, the wells you are referring to are located in 12 N 01W.
216	Ben King	Individual	Figure 2-25	Figure 2-25 p 2-66 – Water quality samples for deep multi-completion wells in the eastern and north eastern corner of the Subbasin should be included. Arsenic levels in the shallow public supply system for Grimes , the elementary school in Meridian is approximately 28 ug/L which is probably the result of desorption in lower aquifers with elevated pH levels. Curtin observed EC levels as high as 10,000 near Oswald Road T 12 N across the River in the Sutter Basin so it is likely that deep aquifers on the eastern portion of the Yolo Basin also have high EC and TDS levels.	Thank you for the comment, the water quality section of the GSP has been expanded. Water quality samples taken by other entities in deep multi-completion wells will be evaluated. In the future, the YSGA may consider developing a monitoring program for these wells.
217	Ben King	Individual	p. 2-80	p 2-80 – The observations north and east of the Yolo Subbasin should be noted as discussed above and reference should be made to Springhorn's Future Work in his 2008 Paper and the predictive arsenic outcomes in Thiros USGS Paper based of expected arsenic desorption in the high pH water south of the Sutter Buttes as discussed previously.	A reference to recent and upcoming studies, as well as utilizing AEM surveys was added in Section 4.11.2.4 to address data gaps related to BFW and the HCM. Additionally, this was added as a data gap in the Basin Setting Chapter.

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218	Ben King	Individual	p. 2-89	There is a Figure reference mission on p 2-89	This missing figures reference has been updated.
219	Ben King	Individual	Section 2.2.4	There should be a discussion regarding Non-Point Source natural occurring contaminants and that CV Salts is a point source regime. Discussion should include the recent findings of Thiros USGS publications and the potential for lateral and vertical movement of this contaminants due to movement via faults and upward due to upwelling and over pumping especially in redox conditions.	Added the following to section 2.2.4.1: "CV-SALTS has historically been a point source program."
220	Ben King	Individual	p. 2-128	p 2-128 See Model and Water Budget Comments in previous emails	Please see the response to comment 96.
221	Ben King	Individual	p. 2-137 & 2-139	p 2-137 and 2-139 See previous comments regarding BFW vertical levels and impact on Groundwater Storage calculations and Sustainable Yield	Please see the response to comment 96.
222	Ben King	Individual	Section 3.2	Section 3-2 Criteria for Sustainable Management Criteria – HTRW and DEI concerns and objectives should be included in the Criteria. Domestic Water use is a historical priority use and HTRW and DEI raises this priority to a Human Right and protected interest group.	Thank you for your comment. The GSP has been revised to better recognize HRTW and DEI concerns in text, such as domestic wells, DACs, and tribal lands. A well impact analysis has been added as an Appendix to the GSP, providing additional consideration of the impact of the SMC's on domestic well owners. As stated in text, SMCs have been designed to protect all beneficial users of groundwater, including domestic users.
223	Ben King	Individual	Section 3.2	Section 3-2. The YSGA MUST establish specific sustainable management criteria for water quality as part of this GSP. The HTRW is a recognized Human Right and without standards there cannot be any certainty that this Human Right will be protected. Without standards and without the benefit of revised BFW modeling from the DWR as discussed there is significant risk that domestic water supply systems and aquifers could become permanently degraded. The reliance of CV Salts and the other regulatory programs do not provide an easy access for stakeholders to understand and monitor these risk to fresh water supplies. From a DEI perspective the proposed SMC approach just highlights the two tier access to fresh Sacramento River water supply where Davis residents have access and those in rural areas like Dunnigan and domestic well users generally do not .	Thank you for your comment. The monitoring network and SMC's for water quality have been revised based on your comments and others like them.
224	Ben King	Individual	p. 3-15	p 3-15 Potential Causes – To reiterate – Redox – Upwhelling – over pumping – lateral movement via faults and combinations thereof.	Thank you for your comment. We acknowledge that groundwater quality is impacted by a large variety of processes and continued WQ monitoring will provide more clarity on the causes of WQ changes. New insights will be incorporated into future revisions to the GSP.
225	Ben King	Individual	Section 4.4 & 4.6	Section 4-4 and 4-6 – Monitoring for Groundwater Levels and Water Quality. The Monitoring Network that includes multi-completion wells should report data regarding groundwater head and groundwater quality observations for TDS, Arsenic and Boron across the Subbasin Network to track trends in upwelling and the potential water quality trends due to lateral and vertical movement and redox conditions. Monitoring trends in upwelling and water quality is very important to understand and protect fresh groundwater aquifers. If Sites is built the potential for additional movement of TDS and arsenic is heightened due the head gradient between the top of the reservoir and the Valley floor. Events such as an earthquake could change the potential risk of this materially and this data set would easily catch any changes in long run trends if this set of multi-completion data is monitored and reported.	Thank you for the comment, the water quality section of the GSP has been expanded. Water quality samples taken by other entities in deep multi-completion wells will be evaluated and published in the annual reports.
226	Ben King	Individual	Section 4.6	The reliance on the various reporting databases in section 4.6 and the protocols in 4.9 are cumbersome and leads to the lack of information. Personally I know this since I have tried to access this information. The protection of the HTRW will best be met by the YSGA consolidating this data and making the consolidated data publicly available in a way that a disadvantages stakeholder can access since poor people of color usually have access to the worse quality supply systems. Without the YSGA involved in this process it will not be in a position to protect the HRTW and protect DEI interests.	Thank you for the comment. Water quality updates will be provided to the public on an annual basis in the GSP Annual reports published by the YSGA. The GSP text has been revised to make this clear.
227	Ben King	Individual	Section 4.11.1	4.11.1 The YSGA should participate in a multi-basin study to follow up on the Future Work section of Springhorn's 2008 paper to understand arsenic contamination issues around and south of the Sutter Buttes. This is included in the Management Action proposals.	Thank you for the input. As the commenter points out, this is already included in the Projects and Management Actions Table as P-27.

Comment #	Commenter	Representing	GSP Reference (Public Draft)	Remark	YSGA Response
228	Ben King	Individual	Section 5	Section 5 - The proposed Sites Project should be included and discussed. Specifically the plans for the interconnect pipelines from the Tehama Colusa Canal to the Colusa Basin Drain and the proposed companion pipeline from the Colusa Basin Drain to the Sacramento River. Since this project is in the initial study stage now is the time for stakeholders to become aware of the project and the risks and opportunities this massive project will bring to the Yolo subbasin. As discussed, this is a great opportunity to guarantee a fresh water supply for the residents northern Yolo County and much of the West Side of the Sacramento Valley if the Sites Project was combined with a water filtration system. Now is the time for the municipal Members of the YSGA to think about what this project would mean for Yolo County and its residents. From a HTRW and DEI perspective it would guarantee the HRTW to much of Yolo County without access to fresh water from the Sacramento River and would bring Equity to poor and people of color to places like the outskirts of Dunnigan.	Please see the response to Comment #141
229	Samantha Arthur	Audubon	Section 1	(See full letter) Identification of managed wetlands: While the GSP notes “managed and native wetlands” within the descriptive paragraph of beneficial users in the introductory section (see GSP p. 1-32), the accompanying land use figures do not show any managed wetlands (see GSP Figure 1-4). The Yolo Bypass Wildlife Area includes significant acres of managed wetlands that should be more clearly identified in land use maps and reflected in the acreage used in the water budget.	Figure 1-4 is based on DWR's Statewide Crop Mapping Dataset from 2016. The figure was revised to show Managed Wetlands when "Crop2016" = "Managed Wetland". The water budget will be revised in the 5-year update to better reflect managed wetland acreage.
230	Samantha Arthur	Audubon	Water Budget (now Ap.p.endix F)	(See full letter) Water budget: Managed wetlands appear to be missing from the water budgets detailed in Appendix C. As represented in various tables in Appendix C (e.g., GSP Appendix C Table 11 and Table 41), the GSP appears to assume zero acres of managed wetlands in 2016 and less than 500 acres in prior years, as well as zero acres for the Yolo Bypass area for 1989 through 2016. Furthermore, there is no recognition of potentially expanded future acres of managed wetlands under proposals being considered by EcoRestore, the Putah Creek Preserve, and the Yolo Bypass Wildlife Area.	Please see the new section on Native vegetation and Managed Wetlands; and response to comment #106.
231	Samantha Arthur	Audubon	p. 4-46 and 4-29	(See full letter) Identification of data gaps: Audubon appreciates that the representation and characterization of managed wetlands is recognized as a data gap (see GSP p. 4-26 and 4-29).	Thank you for the comment.
232	Samantha Arthur	Audubon	Section 5	(See full letter) Consideration of managed wetlands: While the GSP indicates long-term sustainability, it does include some projects and management actions. Including managed wetlands in the projects and management actions can help achieve multiple benefits, providing both recharge and wildlife habitat. Furthermore, any consideration of projects that may redirect water for recharge should assure that existing native and managed wetlands are not adversely impacted.	Included a sentence about TNC's Multi-benefit recharge project document in Section 5.
233	Samantha Arthur	Audubon	p. 1-13	(See full letter) The basin also includes significant acres of managed wetlands, which should be a different designation than “native vegetation” as these lands are actively managed for migratory bird habitat. The identification and representation of managed wetlands needs further improvement to reflect known managed wetland areas.	Added sentence to Section 1.5.2 acknowledging managed wetland acreage in the Subbasin.
234	Samantha Arthur	Audubon	p. 1-16	(See full letter) Managed wetlands should be listed as a unique land use.	Updated Figure 1-4 to show Managed wetlands as a separate category, based on DWR's "Crop2016" designation.
235	Samantha Arthur	Audubon	p. 2-120	(See full letter) When viewed in combination with Figure 1-4 (Land Use), it appears that managed wetlands are being potentially mischaracterized or missing altogether. In Figure 1-4, much of the Yolo Bypass is designated as “riparian vegetation” while Figure 2-51 indicates some of this same land is “iGDE.” In both figures, known managed wetlands at the Yolo Bypass Wildlife Area are not identified. These managed wetlands are different than riparian vegetation and groundwater dependent ecosystems because they apply surface or groundwater to flood migratory bird habitat from fall to spring.	Updated Figure 1-4 to show Managed wetlands as a separate category, based on DWR's "Crop2016" designation. Updated figure 2-51 to show managed wetlands separately from GDEs.

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236	Samantha Arthur	Audubon	p. 2-130	(See full letter) The GSP indicates that future baseline land use holds constant the land use acres represented for the 2016 baseline and "relies on the historical land use datasets in Table 2-21." However, as represented in Table 2-21, there are zero acres of managed wetlands represented in 2016. Thus, the GSP is projecting the future condition to have zero acres of managed wetlands, which is inaccurate.	Please see the new section on Native vegetation and Managed Wetlands; and response to comment #106. We did add some acres for managed wetlands from 2018 land use data; however we acknowledge that overall managed wetlands need more focus before the next GSP update.
237	Samantha Arthur	Audubon	p. 2-131	(See full letter) This table indicates zero managed wetlands in 2016 and less than 500 acres of managed wetlands in any prior year. This is incorrect as there are managed wetland acres in the Yolo Bypass Wildlife Area and other locations in the subbasin. Furthermore, as commented previously, this 2016 condition is used to represent the future baseline condition. Managed wetland acres may increase above current conditions, as a result of on-going efforts in the Yolo Bypass and the Putah Creek watershed. The information in Appendix C, Table 25 (p 69) indicates the acres in Table 2-21 are all from the subarea named "Central Yolo Subregion" and zero acres of managed wetlands are included in the subarea named "South Yolo MA" (see Appendix C, Table 41, p 101). Figure 4 in Appendix C indicates the South Yolo MA is the area generally covering the Yolo Bypass, including the Yolo Bypass Wildlife Area, so managed wetland acres should be represented in this management area.	Please see the new section on Native vegetation and Managed Wetlands; and response to comment #106. We did add some acres for managed wetlands from 2018 land use data; however we acknowledge that overall managed wetlands need more focus before the next GSP update.
238	Samantha Arthur	Audubon	p. 2-146	(See full letter) The description of the South Yolo Management Area should include discussion of managed wetlands associated with the Yolo Bypass Wildlife Area and other public and private wetland easements. This is a significant and important habitat area for migratory birds, fisheries (e.g. as planned by EcoRestore), and other important native species. Many of the lands within the Yolo Bypass actively apply surface or groundwater to create and maintain important habitat and wildlife food sources.	Added acknowledgement of YBWA and other managed wetlands in the South Yolo Management Area.
239	Samantha Arthur	Audubon	p. 4-26	(See full letter) Audubon appreciates that the YGSA recognizes the significant data gap regarding properly identifying and incorporating managed wetlands into the GSP. Audubon is developing a dataset of the spatial extent of managed wetlands in the Central Valley, which we will share for inclusion in future GSP updates. We recommend current acreage estimates in the Yolo Bypass Wildlife Area be used initially to include a more accurate estimate of managed wetland acres in the GSP for submission to DWR in January 2022.	Included acreage estimate of managed wetlands based on 2016 DWR Crop Mapping in Section 4.11.1, and included Audubon's planned managed wetlands dataset in Section 4.11.2
240	Samantha Arthur	Audubon	p. 4-29	(See full letter) Same comment as provided for Section 4.11.1.	Included acreage estimate of managed wetlands based on 2016 DWR Crop Mapping in Section 4.11.1, and included Audubon's planned managed wetlands dataset in Section 4.11.2
241	Samantha Arthur	Audubon	p. 5-5	(See full letter) Managed wetlands provide opportunities for multi-benefit recharge and should be part of discussions about Managed Aquifer Recharge programs.	Added sentence to Table 5-1 identifying managed wetlands as an existing source of multi-benefit recharge, and a future source of information sharing and recharge projects.
242	Samantha Arthur	Audubon	p. 5-8	(See full letter) Audubon appreciates the inclusion of managed wetlands specifically as a model-improvement need under this designated project.	Thank you for the comment.
243	Samantha Arthur	Audubon	Water Budget (now Ap.p.endix F)	(See full letter) As represented in the comments specific to the GSP, Audubon has several concerns with the water budgets developed and documented within Appendix C. These range from under-represented managed wetland land use acres to questions about how the water needs and water sources for the few acres of managed wetlands included were derived. Appendix C indicates use of crop coefficients and CIMIS data (e.g. Table 6, p 23) to estimate water needs. However, managed wetlands have unique crop coefficients and the water sources – both surface and groundwater – may be unique for given managed wetland areas. These crop coefficients will need refinement for managed wetlands and should be identified as a data gap for further improvement.	Please see the new section on Native vegetation and Managed Wetlands; and response to comment #106. We did add some acres for managed wetlands from 2018 land use data; however we acknowledge that overall managed wetlands need more focus before the next GSP update.
244	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	General Comment	(See full letter) Overarching comment: Increase attention given to community input.	Thank you for your comment. We have done our best to be responsive to community input as part of the GSP development process. Unfortunately, in your May 2021 comments we misunderstood your desire for us to include or integrate our responses to your comments into the Yolo Subbasin GSP. Now that the intention is clearer as outlined in your 43-p comment letter, we have done our best to incorporate your suggestions within the plan as we have felt it to be appropriate. We appreciate your participation in this process and the time you have invested in improving the Yolo Subbasin GSP.

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245	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	General Comment	(See full letter) Overarching comment: The plan needs for (sic) dispute resolution process	Agreed. Thank you for your comment. As part of the GSP implementation process and Management Area Advisory Committees, we intend to develop a dispute resolution process to resolve conflicts and avoid litigation related to groundwater.
246	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	General Comment	(See full letter) Overarching comment: More clarity needed around the responsibility for sustainably managing the Subbasin's groundwater	Thank you for the comment. We recognize this to be a deficiency in the plan and our process to-date. We had hoped to have more work completed at the Management Area-level by the time of submitting the Yolo Subbasin GSP; however, that is not our current reality. We have done our best to develop the first cut of what sustainable management criteria may be appropriate for the Yolo Subbasin. This will be an adaptive management process and we will continually improve the plan as we learn more about what sustainability means for the Subbasin. As part of implementing the plan, we intend to create advisory committees in each of the Management Areas for the local water managers and entities, along with landowners and other stakeholders, to discuss and define the framework for local responsibility. We know you will be a big asset to that process in the Capay Valley.
247	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	General Comment	(See full letter) Overarching comment: Changes between the first published drafts and the current final draft in wells included for measuring trends in groundwater level show that more robust analysis should be done for choice and number of monitor wells used to measure minimum thresholds	The old Figure 2-20 the comment refers to is a hydrograph consisting of 113 wells only within the YCFCWCD Service Area, and is available here for reference: https://www.yologroundwater.org/groundwater-levels-in-yolo-county. The figure was not used for the selection of representative wells, or for the determination of sustainable management criteria, and is only intended to represent historical groundwater conditions. Between drafts, the figure was remade using the representative wells presented in Chapter 4 (At the time, there were 64 representative wells; there are now 62 due to lack of future monitoring access). This gives a picture of groundwater levels within the entire Subbasin, rather than only the YCFCWCD Service Area, which covers only Capay and Central Yolo MAs. The Figures should not be considered to represent the same area. The number and selection of wells used in this Figure has changed in order to accommodate an even spatial density throughout the Subbasin. An explanation of the wells used to make this Figure has been added to the text. The criteria and justification for choice of representative wells used to establish SMC's is presented in Chapter 4. The YSGA will continue to monitor all monitoring wells in the Subbasin, not only representative wells. In addition, the groundwater data for the YSGA's entire network is publicly accessible for the non-technical user at sgma.yologroundwater.org - WRID access is not necessary for the average user. The hydrographs of the representative wells have been reviewed for anomalies in the preparation of the final GSP.
248	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	General Comment	(See full letter) Overarching comment: Potential future scenarios for groundwater sustainability need to account more robustly for climate change variability	The current analysis uses the climate change scenarios provided by the Department of Water Resources. The analysis includes scenarios covering a range of conditions including the "dry-extreme warming" scenario. Future versions of the model could include other scenarios as they become available. The DWR climate change model uses the best available data and science. DWR's process for creating the climate change datasets was extensive and occurred over many years. DWR will release new climate change models as they deem appropriate when new data and methods necessitate new models. We are hoping to update the YSGA model in the future (5-year updates) with updated land use, additional projects, and climate change data – as available. When the next iteration of climate projections is available, the YSGA will be informed, and can convey that information to interested parties. This is included in the 'Projects and Management Actions' Chapter of our GSP.
249	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	General Comment	(See full letter) Overarching comment: Projects are very comprehensive and appreciated – the report could provide more direction for the primary directions for implementation	Thank you for the comment. As part of GSP implementation, the YSGA will guide project proponents and beneficiaries to develop projects in more detail so they are prepared for state and federal grant solicitations.
250	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	p. 1-11	(See full letter) for Capay Valley, who then is the "responsible" entity for implementing the plan? How does this entity exercise this responsibility?	The Capay Valley Management Area members are the responsible entities for implementing the GSP in the Capay Valley: Rumsey Water Users Association, Yolo County, Yolo County Farm Bureau, YCFC&WCD, and the YSGA Environmental Representative. Once the GSP is adopted, the framework for creating Management Area Advisory Committees will be developed. These Committees will include members of the public that reside in each Management Area and desire to be part of the process.
251	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	Figure 1-3	(See full letter) seems that communities in the Capay Valley are all groundwater dependent, at least for domestic water. Other areas are also, although they may not have a situation similar to Davis, for example, where a centralized water agency supplies groundwater to all homes. The title should be along the lines of "Public Water Service Areas Dependent on Groundwater" so it does not seem out of sync with p 17	The title of Figure 1-3 has been revised to "Groundwater Dependent Public Water Systems".

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252	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	p. 1-26	(See full letter) SAGBI –It would be informative to add that the rating depends on current soil conditions, but these can be changed by human action. Suggest: Characteristics used to rate ground surface areas for SAGBI should be able to be improved for recharge by human action.	Added sentence to this effect in Section 2.1.5.
253	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	Seciton 1.5	(See full letter) (Comment a) We did not find information on population, economic sectors, dependence on water use and resources in section 1.5 'Description of Plan Area'	While a full economic review is out of the scope of the GSP, Sections 1.5.2.1, Disadvantaged Communities, and Section 1.5.2.2, Tribal Lands were added to give additional context for dependence of water use within the Yolo Subbasin.
254	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	Figure 2-1	(See full letter) (Comment b) Physical Subbasin Boundaries – this section is very clear and very much appreciated. It would be good to include this map (adjacent subbasins) and information in the plan; the map sent in the response document is not in the current draft.	Figure 2-1 shows the adjacent Subbasins.
255	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	p. 205	(See full letter) (Comment c) Could the text provide definitions of "aquifer" and "aquitard," in addition to why we care about aquifer locations for the GSP? It would help us non-technical people interpret the rest of the section better….We did not find these definitions in the current draft	An aquifer is a body of rock or sediment that is sufficiently porous and permeable to store, transmit, and yield significant quantities of groundwater to wells and springs. An aquitard is a confining bed or formation composed of rock or sediment that retards but does not prevent the flow of water to or from an adjacent aquifer. It does not readily yield water to wells or springs but stores groundwater. These definitions have been added to the text.
256	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	p. 2-7	(See full letter) (Comment d) Our conclusion, suggestion was that we think a very shallow well category is needed – this was not taken up.	Added the sentences "In the Capay Valley, more information about the aquifer conditions is needed. There are many wells in this area with total depths of less than 100'. For additional information, please refer to the Plan to Address Data Gaps (Section 4.11.2)."
257	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	p. 2-7	(See full letter) (Comment e) Why would the deeper well have higher discharge? And, does it really mean "deeper" or with the greatest change in depth to water (presumably h0-h denotes this. And the real question here for readers, is what is the implication of the intermediate wells having lower specific capacity. This response implies that it is nearly tautological that the intermediate zone wells will have lower specific capacity than the shallow zone wells because they are deeper, so what is the point of even mentioning it.	Thank you for the comment, the previous textual response may not have adequately addressed your question. Specific yield is related to the amount of water that a well can produce. Saturated sands and gravels will produce more water than clays, and thus have higher specific capacities. Section 2.1.1.4 states that in the western alluvial plain, there are areas where the intermediate zone produces less water (per unit volume) than the shallow zone. Please see section 2.1.1.6 for a technical definition of specific yield.
258	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	Tabel 2-1	(See full letter) (Comment f) This table seems to imply that the capacity of major aquifers in the subbasin have been identified. Is this correct? But then, there is only information on transmissivity for Capay Valley, not Storage Coefficient. Why is this?...Not sure we totally understand the response, except that the values have been modeled.	The title of Table 2-2 has been revised. The values used by the YSGA model for Capay Valley come from Table 2-2, not Table 2-1 - added this clarification to the text.
259	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	p. 2-9	(See full letter) (Comment h) Aquifer Properties is full of interesting information but what specifically does it portend for sustainable groundwater management? A summary at the end of such sections would be very helpful….We did not see this suggestion taken up	A sentence has been added to the beginning of Section 2.1.1.6 explaining how aquifer parameters are used. Specific parameters are explained in bullet points within this section.
260	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	Section 2.1.3.4	(See full letter) (Comment i) RE: Introductory paragraph: Interesting explanation, but we don't ask only for ourselves, our suggestion was that it would help the non-technical reader to have this in the report. We didn't see it there.	Added brief explanation of how geology affects the aquifer to the beginning of Section 2.1.5.
261	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	p. 2-29	(See full letter) (Comment l) Indeed, Figure 1-9 appear to show pretty good coverage in the Valley proper-just not in the far upland hills, which is logical. Could this not be noted, and reference to the map made here in Chapter 2? Also, It would be informative to add that the rating depends on current soil conditions, but these can be changed by human action.	Added reference to Figure 1-9 in this section, and added sentence to this effect in text. "The index is based on large-scale current soil conditions; local site conditions can be changed by human action. "
262	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	Table 2-6	(See full letter) (Comment m) This makes sense, but we don't ask just for ourselves; this explanation would help others to understand. A further comment: There is a strange ordering to this table, From Excellent to good etc. to very poor, and then the last two rows are summaries of groupings of rows above, but this is not clear…they should be set off or placed appropriately to show this. It is important for Capay Valley, as it shows the highest potential for recharge in all the subbasin.	Added a brief explanation of this difference in text, and modified formatting of Table 2-6. "In contrast, the NRCS dataset in Table 2-5 has full coverage of the Capay Valley MA and illustrates a fairly high runoff potential in the area. "

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263	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	p. 2-30	(See full letter) (Comment n) It seems our question- “Is it correct to conclude from the following quotes that slowing Cache Creek could likely have recharge benefits into the subbasin beyond the Capay Valley Management Area?” would need more analysis, and is likely to be small…nonetheless, Still not certain about if Capay recharge would help the Yolo Subbasin generally recharge to the shallow zone occurs from infiltration along Cache and Putah Creeks. Aquifers and bodies are probably weakly connected to sand bodies surrounding major streams. Additional recharge likely occurs by deep percolation of precipitation and irrigation. The shallow zone is probably unconfined. Etc.	Thank you for the comment. Additional investigation of the hydrogeology of the Capay Valley is a planned project.
264	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	p. 2-32	(See full letter) Our question: Water rights – does this apply only to rights for surface water?	Yes, this only refers to surface water.
265	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	p. 2-32	(See full letter) Our comment: Data gaps about aquifer connectivity – Excellent. More data on interdependence (and lack of it) of aquifers is very welcome!	Thank you for the comment.
266	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	p. 2-34	(See full letter) (Comment r) These tables, giving numbers and depths of groundwater monitoring wells over time in the CASGEM and WRID networks, have been removed from the draft- yet they were among the most interesting to us and the question above still remains- we’d like to see these numbers and understand better what they mean in terms of overall groundwater monitoring networks in place. Perhaps this is found in later chapters, but it would be most useful here.	The previous draft tables summarizing the number and depth of monitoring wells over time were based on erroneous data and dramatically under represented the total number of monitoring wells in the network. For this reason the tables were removed. Unfortunately, budget and timeline did not allow the tables to be re-created. However, the entire monitoring database is available for free on-line, where well depth and chronological extent of any area in the Yolo Subbasin can be explored.
267	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	p. 2-42	(See full letter) Our comment: All bullet points say “depth to groundwater increased.” These references need to include information on relative to what. The language in line 31 “Depths to groundwater recovered between 1978 and 1984” shows an effective way to describe what is happening. Possibly this section could say throughout, after depths to groundwater fell….	A sentence has been added to the noted section prior to the bullet points explaining the meaning of depth to water.
268	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	Figure 2-15 to 2-19	(See full letter) (Comment s) Not sure this was resolved. Sources of data for tables were given as: Figure 2-15SGMA data viewer Figure 2-16SGMA data viewer Figure 2-17no source given Figure 2-18SGMA data viewer Figure 2-19SGMA data viewer Your explanation above helps to understand data sources and what you mean by SGMA data, but we don’t ask just for ourselves, this would be helpful for all readers. Figures 2-17 and 2-20 gives no source,- yet the data for Figure 2-20 is critical to the whole plan. More general comment (seeking greater understanding) is that we think The data are unlikely to be the same. Does this mean that the wells are all the same, but there are differences among the CASGEM, WRID, etc., in how recent the data for each well is? If this is so, then all the sets of wells should have the same number of wells, but I don’t think they do. Once this is clear, there may be more questions.	A link to the SGMA Data viewer was added to the description of Figures 2-15, 2-16, 2-17, 2-18, and 2-19. The following was added to Section 2.2.1.2: "All of the data utilized to create Figure 2-20 is within the WRID. Most of these measurements are also stored within the SGMA Data Viewer and the Water Data Library." Regarding Figure 2-20, the following text was added to the GSP: The 64 wells shown in Figure 2-20 are the 62 representative wells for groundwater levels that are described in Section 4.4 and two additional wells with long-term data that cannot be monitored in the future (SWN 09N02E35E001M and 11N02W26A001M)."

Comment #	Commenter	Representing	GSP Reference (Public Draft)	Remark	YSGA Response
269	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	Figure 2-20	(See full letter) (Comment t) Our original concern with the original Figure 2-20 graph was that we saw it as documenting that "the average groundwater level is on a declining trajectory from 2006 until today if you focus on the peaks in groundwater level. Nothing since 2006 has topped the groundwater level of that year – not even 2019 which was a very wet year that followed a very wet year in 2017. Further, the lows in 2014-15 are lower than the lows in 1991-92, even though more dry and critical years preceded 1991-92 than preceded 2014-15. The NEW figure 2-20 and text does not answer these questions, but instead, with less wells, attenuates these perceived trends. We'd like to know why the data was changed from 113 to 64, where the data comes from, and what were the criteria that changed to reduce the number of wells. It may be normal to throw out outliers, but in general, more data leads to more statistically reliable results…and the whole plan hinges on this data. Note that few if any non-technical people will consult the WRID database, the plan should not require that to understand what is proposed. The explanation provided in the 26 May 2021 response still refers to "more than 100 wells". We appreciate the note about scale, but remain convinced that we need to look at any downward heading trends in our subbasin; Tulare and San Joaquin did not do this	The old figure 2-20 the comment refers to is a hydrograph consisting of 113 wells only within the YCFCWCD Service Area. Between drafts, the figure was remade using the representative wells presented in Chapter 4 (At the time, there were 64 representative wells; there are now 62 due to lack of future monitoring access). This gives a picture of groundwater levels within the entire Subbasin, rather than only the YCFCWCD Service Area, which covers only Capay and Central Yolo MAs. The Figures should not be considered to represent the same area. The number and selection of wells has changed in order to accommodate an even spatial density of representative wells. An explanation of the wells used to make this Figure has been added to the text. In addition, groundwater data is publicly accessible for the non-technical user at sgma.yologroundwater.org - WRID access is not necessary for the average user. Any trends in the data will continue to be evaluated for each well in the annual reports to be published by the YSGA.
270	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	p. 2-50	(See full letter) (Comment u) Future years are expected to be variable and possibly more extreme which will require vigilant attention to hydrologic conditions and a flexible management plan for surface water and groundwater. We noted that this observation is relevant in light of our later comments on climate change, and how climate change is addressed in the plan, and scenarios...Not sure this has been addressed	Figure 2-20 displays the average historical depth to water in the 62 representative wells and two additional wells. This graph does not incorporate future scenarios into it. The bars on the back of the graph do show the historic water year types. Section 2.3 explains the consideration of various climate scenarios within the plan, representing the best available science from DWR. We agree that flexible management and consideration of climate change are vital for ensuring sustainability. See response to Comment 248.
271	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	Section 2.2.1.3	(See full letter) Our comment: The value of this information is not clear. Intuitively, vertical gradients should be significant to a GSP, but the hydrographs and text do not give a good sense of what this actually tells us about groundwater sustainability.	Text states, " Groundwater pumping can alter these natural gradients seasonally and over time as groundwater is withdrawn from the Subbasin."
272	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	Figure 2-23	(See full letter) (Comment w) Thank you for the explanation; we feel this is a trend that merits a close watch, and the explanation would be helpful within the plan, not just to us.	Added the total storage estimate and % loss estimates, as well as a caveat about spatial scale and model uncertainty, to the text in Section 2.2.2.1.
273	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	p. 2-56	(See full letter) (Comment x) We did not see that this suggestion was taken up; we understand the YSGA is not going to undertake this monitoring itself, but will it not report on as done by different agencies, and make trends available to the public in one place?	A table was added to Section 2.2.4 summarizing the existing water quality databases. In addition, Chapter 4 provides additional detail on how the data will be reported in the annual reports submitted by the YSGA.
274	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	p. 2-56	(See full letter) (Comment y) Typo corrected; not sure the questions have been answered (though sentence on domestic wells was added). The explanation in the response would be helpful in the draft plan itself.	The Water Quality section of this GSP has been revised based on comments received, including this one.
275	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	p. 2-65	(See full letter) (Comment bb) Should the fact that many rural residents use private wells since no water system is available be mentioned under Water Quality Evaluation as well as the steps were taken to address private wells – or the rationale for not addressing them? Water quality in such wells, used for domestic purposes, is an important issue.	Added text acknowledging domestic wells in this section. Water quality in domestic wells is included as a data gap in Section 4.

Comment #	Commenter	Representing	GSP Reference (Public Draft)	Remark	YSGA Response
276	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	p. 2-65	(See full letter) An additional sentence would be helpful after “To better represent the groundwater quality of the principal aquifers, community water system water quality was evaluated” explaining why the community water system quality best represents the groundwater quality of principle aquifers. The rationale that the public water systems wells are deeper so give a more representative picture seems confusing given information later that in general, the deeper aquifers show lower concentrations of contaminants.(Comment cc) Suggestion was not taken up, question was not answered.	The paragraph has been rephrased and supplemented to include domestic wells. Community water systems were used in the evaluation because they have the most reliable data sets.
277	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	p. 2-62 to 2-91	(See full letter) (Comment dd) Data: Much of the data seemed quite old, including the 2004 data. Given that contamination would seemingly be in constant flux, conditions could be quite different today than even from 2014 or 2016, to the degree that 2004 data would be irrelevant except possibly to display trends. Then because of the statement on P87 that “At the time of this evaluation, data in the WRID after 2004 were not easily accessible” I thought maybe there was not much data after the 2004 study. However, P94 states “Water quality data used was collected between 2010 and 2020.” Maybe these statements apply to different constituents, but then it would help to make this clearer in the text. Some of the maps (e.g.: 2-31) are labeled “2000-2016” leaving open the question of when the data really was collected. Finally, though, we had the impression from your discussion in a Working Group Meeting that an entity – maybe the Northern California Water Association – had provided fairly up to the minute data on contaminants. Did we misunderstand this? (Comment dd) Not changed from before as far as we can tell…	The water quality section has been revised for clarity. An updated review of water quality data will be provided in the annual reports and 5-year updates to the GSP.
278	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	p. 2-85	(See full letter) Section 2.2.4.5 was very helpful at understanding what you concluded about water quality in the Subbasin. It would be even better if placed at the beginning of the quality evaluation section as it would provide a context for what readers were reading and clues as to assessing the information in the rest of the section. (Comment ee) Not changed from before as far as we can tell…	A sentence was added to the beginning of Section 2.2.4 stating: "A summary of groundwater quality findings for community water systems is included in Section 2.2.4.5." Thank you for the comment, we believe that whole summary is better suited at the end of this section.
279	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	p. 2-69	(See full letter) (Comment gg) Not changed from before as far as we can tell… As mentioned in the comments when this was a draft chapter this section is titled “Salinity – Public Water Systems when it is primarily about agricultural water. Further comment here on final draft: p.2-69:11 “Extreme climatic conditions have the potential to introduce brackish waters into the subbasin again…, depending on future sea level rise and mitigation. However, further chemical analysis must be performed to robustly identify potential seawater intrusion.” P2-54 should reference this information also. As it is, it gives the impression that sea intrusion is no risk at all. And, will this testing and analysis be done?	The section is now titled "Salinity - Basinwide conditions". The following sentence was added to 2.2.1.8.1: "Currently, the Basin has some areas with elevated salinity as indicated by either Electrical Conductivity (EC) or Total Dissolved Solids (TDS). Salinity in deeper groundwater zones is generally lower than in the shallow and intermediate zone. " More details about the conditions for seawater intrusion have been added to the Seawater Intrusion section and the referenced paragraph.

Comment #	Commenter	Representing	GSP Reference (Public Draft)	Remark	YSGA Response
280	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	p. 2-69	(See full letter) Land Subsidence: this section is definitely the most technical of all the sections. My sense was that organizing it by data source put an unrealistic expectation on the non-technical reader to be able to evaluate the validity of each of the methods and keep the many various results in one's head to try to come to some conclusion about the severity of subsidence in the Subbasin. I think a summary paragraph after the intro paragraph would help if it said something along the lines of: This data suggests that subsidence is not generally a problem in the Subbasin. The different methodologies show a range of subsidence in the Valley between X and Y. The difference between the top and bottom of the range seems likely to have arisen because in the differences in methodologies, however even the top of the range does not indicate a subsidence rate likely to be unsustainable. Nonetheless, there are X areas where subsidence is of concern: A, B and C. [You could then possibly use a table to show the data of concern for each site]. We must continue to collect data on these areas. Etc.… whatever you folks think. Such a paragraph would provide a guide for the reader to help sort through the rest of section and decide if the rest supports the conclusion.(Comment hh) Suggestion was not taken up.	A brief summary paragraph has been added to this section.
281	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	p. 2-127	(See full letter) (Comment ii) Thank you for this explanation; since our projects will focus on root zone water, it would be good to explain this within the plan. If we are to work to increase the soil sponge we will need to figure out how changes can be reflected in the model.	Added clarification within text that the root zone storage is modeled in the land surface budget, and inflow from the root zone is modeled as deep percolation in the groundwater budget
282	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	p. 2-127	(See full letter) (Comment kk) Indeed, we think it is absolutely critical to include future land use trends in the model	Thank you for the comment; future land use trends will be included in the 5-year update of the model.
283	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	p. 2-130	(See full letter) (Comment kk) The report needs to present justification for choosing to use higher cumulative and average precipitation for all the scenarios (except for the future baseline which is based on the same rainfall as the historical data. Readers need to know what climate change models are you used and why you selected those specific ones as well as which models you considered and rejected? Why is there not one scenario with lower cumulative or average precipitation, even for the so-called "dry extreme weather" scenario. For a genuine sensitivity analysis to assess risk of reaching unsustainable conditions, shouldn't the plan include least one scenario with drier weather than historical (and also increasing demands from tree crops?)	Please see Section 2.1.4 of the Model Documentation appendix, which describes the source of the climate projections provided by DWR, and its processing, in detail. If the climate projections are updated, we may be able to get drier projections to run for the next GSP update. Also please note Table 9 of the Water Budget appendix. Although these climate projections are wetter, reference ET is higher because of warming. The differences in reference ET are larger than the differences in precipitation compared to the historical climate. The climate change models that the YSGA model uses come from DWR. The DWR climate change model uses the best available data and science. Please refer to the DWR Climate Change Resource Guide. DWR's process for creating the climate change datasets was extensive and occurred over many years. DWR will release new climate change models as they deem appropriate when new data and methods necessitate new models. We are hoping to update the YSGA model in the future (5-year updates) with updated land use, additional projects, and climate change data – as available. When the next iteration of climate projections is available, the YSGA will be informed, and can convey that information to interested parties. This is included in the 'Projects and Management Actions' Chapter of our GSP.
284	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	p. 2-131	(See full letter) (Comment mm) Some explanation provided in section 2.2.9, that "An important feature of land use changes in the Subbasin is an increasing acreage of perennials crops (deciduous, subtropical, and vines), which have partly replaced field crops, and brought previously uncultivated area into production in some regions." And the response above is helpful, it would be good to have this mentioned in the plan. (but second question not yet answered)	Added clarification to text that individual crops within each land use category are modeled, and pointed to Model Documentation Appendix for more information.
285	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	p. 2-130	(See full letter) (Comment nn) Not sure; is it not still true that higher precipitation is predicted for all future scenarios? The confusion could be reduced by the adding a sentence (in italics) as follows: …Subbasin is higher in all climate projections, compared to that in the 'Historical' scenario." The Future Baseline is not a climate projection in that it keeps climate the same and varies only …..	Added paragraph to Section 2.2.8 Model Overview explaining what is and is not a climate change scenario.

Comment #	Commenter	Representing	GSP Reference (Public Draft)	Remark	YSGA Response
286	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	p. 2-134	(See full letter) (Comment pp) Thank you for this; it would be good to indicate this definition/reference in the chapter	Added this definition to the text in Section 2.2.8 Model Overview.
287	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	p. 2-134	(See full letter) (Comment qq) Thank you for this explanation; it would be helpful to include this in the current plan.	This explanation has been added to the text in Section 2.3.4 Land Surface Water Budget and 2.3.5 Groundwater Budget
288	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	p. 2-138	(See full letter) (Comment rr)This key claim in the discussion of groundwater storage "The groundwater storage trace implies that the climate signal has dominated over this historical period at the Basin-wide level" really calls out that the plan needs much more discussion of and justification for the climate change assumed in the plan. The plan demonstrates at length that the recharge potential for the Subbasin is uncompromised – that declines in groundwater follow directly from droughts and that groundwater returns to high levels when rain is good. Thus, it is not recharge potential, but climate that determines groundwater levels. Since this is so, great care needs to go into selecting the climate change scenarios used, as well as realistically assessing the risks that climate change poses for the Subbasin.	Please see response to comment 248
289	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	p. 2-123	(See full letter) (Comment ss) This explanation would be helpful within the plan.	Explanation of the climate scenarios is available in Section 2.2.8 Model Overview. Added text to plan, "These decadal changes represent the historical scenario; the groundwater storage predicted in future scenarios is based on future climate signals and is presented in Figure 2-60. "
290	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	p. 2-138	(See full letter) (Comment tt) Now Figures 2-59-60 The axis has not been changed, and this explanation would be very helpful in the plan.	Figure 2-58 has been amended to show future scenarios in the future. An additional paragraph and table in Section 2.3.1 were inserted to explain what the inputs to the model are. The figure and table the comment refers to are both model outputs.
291	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	p. 2-139	(See full letter) (Comment uu) This is very helpful- but we did not ask for ourselves alone, this would be good to explain in the plan. Also what is TAF? It does not seem to be defined…we can guess total acre feet, but this should be clear.	Additional explanation and justification was added to Section 2.2.13. TAF stands for thousand acre-feet. We made sure this is clear in the first appearance of the acronym as well as the sustainable yield section.
291	Barbara Gemmill-Herren	Capay Valley Regeneration/ Capay Valley Vision	General Comment	(See full letter) We have copied below the relevant definitions and criteria, as the apply to the Capay Valley Management Area. We understand that the basin-wide "undesirable results" relate to the subbasin as a whole. But the measurable objective, and the minimum thresholds are specific to each management area. We have had questions previously about the monitoring wells chosen for Capay Valley and as we note in the overarching comment 4, there is a great sensitivity in the results for measurable objectives and minimum thresholds according to the number and selection of wells included in the plan. We need to be convinced that these provide representative average picture in our management area; we ask that analysis is undertaken, and shared with the public show that the number and wells chosen have the best likelihood of revealing the true mean for groundwater levels each year for the Subbasin and the management areas.	Thank you for your comment. In reviewing the data, we believe the wells selected as representative wells in the Capay Valley share the same characteristics of all the wells in the Capay Valley, which includes total depth and screened intervals. The spatial coverage of representative wells in the Capay Valley Management Area covers the entire extent of the Valley and provides adequate coverage. Additionally, we have revised the text in the Capay Valley Management Area Section 2.4.3 to acknowledge the shallow wells in the area. Well construction information was also included in the well impact analysis - See Appendix I. We look forward to scheduling a meeting with you to discuss this in more detail.
293	Sara O'Connell	Individual	General Comment	Overall, I ask that the plan better address the need for accountability for our groundwater usage and community accountability. In particular, I recommend pausing permits on new extraction for development on historically non-irrigated lands until there is more complete analysis on the Dunnigan Hills and other "special concern" areas. I also support improving community outreach for increased awareness on groundwater sustainability across all community members -- in rural and more developed areas.	Thank you for your comment. Once the Final GSP is submitted to the DWR, the YGA will create the framework and approach for implementing the plan. A big part of this process, will be the development of Advisory Committees for Management Areas, which will allow for local entities and stakeholders to consider the appropriate implementation strategy for sustainable groundwater management within the Management Area. During the formation of the Advisory Committees, we expect a more thorough consideration and development of local accountability practices. Local projects will be considered for implementation, and the Advisory Committees will think through strategies that may be necessary for dispute resolution. We recognize the areas of special concern may need their own subcommittees to these advisory committees and we will work with the landowners and stakeholders in those areas of special concern to ensure their a focused effort in avoiding localized overdraft and ensuring long-term sustainability.

Comment #	Commenter	Representing	GSP Reference (Public Draft)	Remark	YSGA Response
294	Lia Kollen	Yolo DEH	Table 2-11	•The GSP proposes to set an undesirable effect for total dissolved solids. A drinking water standard is given (Table 2-11) but this is considered a recommendation for aesthetic affects rather than health effects. Perhaps a footnote could be provided to identify that this standard isn't equivalent to those that are regulated for public health, such as nitrate and arsenic.	A footnote was added to this effect
295	Lia Kollen	Yolo DEH	Section 1.5.3.3, 1.5.3.4	"California Well Standards" can be more specifically defined as California Department of Water Resource's Bulletins 74-81 and 74-90 (Section 1.5.3.3, 1.5.3.4).	A parenthetical was added further defining this term.
296	Lia Kollen	Yolo DEH	Figure 1-8	A quantitative rather than qualitative map can be produced for current municipal wells (Sec 1.5.2, Fig. 1.8). The well locations for municipal wells are available through SWRCB's Geotracker map. Additionally, YCEH has recorded and can provide GPS coordinates for all wells utilized by the small public water systems that we permit (water systems with less than 200 service connections).	Thank you for the comment, we will coordinate with YCEH to update this map in a future version of the GSP.
297	Lia Kollen	Yolo DEH	Figure 1-4	In Fig. 1-4, one of the colors in the index is not labeled	Fixed
298	Lia Kollen	Yolo DEH	Section 1.2.3.4	•The "Water Well Requirements for Building Project" handout would not be the best reference for Sec. 1.5.3.4(H), as the main purpose of this handout is to describe our drinking water source policy to building permittees. It would be better to reference the California Department of Water Resource's Bulletin 74-81 and 74-90 for our requirements for well construction.	This reference was changed accordingly
299	Lia Kollen	Yolo DEH	Section 2.2.3.4	•The water quality data maps do not include the Clarksburg management area. Arsenic in this area may be an important data gap (Sec 2.2.3.4. & Fig 2.35). We have seen elevated arsenic levels in wells in the Clarksburg management area from required public water system water sampling.	Thank you for the comment. As the plan states, water quality data for constituents other than nitrate and TDS will be updated in annual report submissions for the entire Subbasin. We will continue coordination with YDEH on arsenic issues in this area and other water quality concerns throughout the Subbasin.
300	Lia Kollen	Yolo DEH	Section 2.2.4.5.2	•In Section 2.2.4.5.2 it is noted that "nitrate is not considered a concern for community water systems, which most likely have deeper wells and annular seals". I would not consider this accurate as stated, as there are community water systems in Yolo County that have to contend with elevated nitrate levels in their wells (e.g. North Davis Meadows).	The sentence has been rephrased in response to this comment.

Letter to the Yolo Subbasin Groundwater Agency (YSGA), with comments about the 2021, Draft Groundwater Sustainability Plan (GSP)[1], for the Sustainable Groundwater Management Act (SGMA)

Comments Submitted to: YSGA via email at: info@yolosga.org
From: Ricardo Amon ricardoamon@sbcglobal.net and Judy Corbett, judycorbett@sbcglobal.net

October 27, 2021

Dear Colleagues, we appreciate your efforts creating the YSGA and delivering the draft GSP report. We would also like to thank you for conducting webinars to inform the public. These webinars are an important way for people to express their worry about groundwater depletion in rural household water wells. Rural residents are facing competition to their aquifers mostly from year-round pumping, from deeper wells used to irrigate nut orchards. It was uncomfortable to hear people struggle, having to use savings to drill deeper wells, and then spend more on power to pump from deeper depths.

Context:

Residents in Yolo County have seen large growth in almond and pistachio orchards populating the agricultural landscape. Land that was previously planted with tomatoes, in a 3-year rotation with corn and winter wheat, is now developed to grow nut trees; drilling deeper wells with bigger pumps to generate the power to extract, filter, and pressurize water for irrigation. These pumps are operated nearly all summer, in order to meet crop evapotranspiration requirements.

We have collected data regarding agricultural land use changes, from annual rotational systems to perennial plantation systems. We have conducted interviews with stakeholders about increasing agricultural land prices, agricultural land speculation and landowners advocating to lease their land, preferably, for nut tree orchards. We know that Wall Street investment houses identified almond production as an attractive investment option, creating LLC's to develop and manage nut orchards, many hiring agricultural management companies. Other speculators have developed nut orchards to "flip" them within four to five years.

This behavior has led to a significant increase in almond acreage planted between 2010 to 2020, as shown in table 1.

Table 1. Yolo County Almond Bering and non-Bearing Acreage 2010 - 2020[2]

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Acres	14,551	16,609	17,741	23,166	27,832	30,211	33,555	40,400	45,100	43,600	48,600
% Change		1.14	1.07	1.31	1.20	1.09	1.11	1.20	1.12	0.97	1.11

Between 2010 and 2020, there has been a 334% growth rate in almond acreage. Figure 1, provides the results of an eight-year forecast, showing a potential increase in almond acreage to almost 80,000 acres, by 2028, an additional 165% increase.

[1] Yolo Groundwater Sustainability Plan - Yolo Subbasin Groundwater Agency
[2] Yolo County Agricultural Commissioner, Crop Statistics.

In 2020, there were almost 350,000 acres of agricultural land planted in Yolo County, including 30,700 acres in tomatoes and 146,970 acres with field crops. This is the type of land that has been previously converted to nut orchards, providing available land to continue to grow the almond crop in Yolo county.

The question remains if there is enough water to feed this crop and maintain aquifer sustainability?

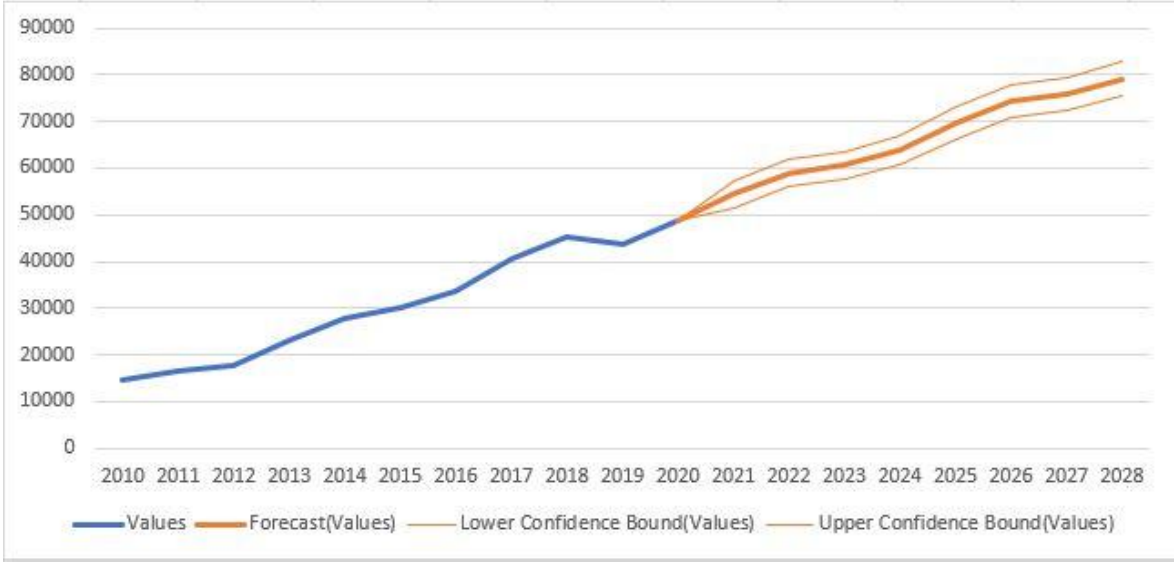

Figure 1. Almond Acreage in Yolo County 2010-2020

Back in 2018, almonds displaced tomatoes as the highest revenue crop in Yolo County, and "almonds are likely to hold that top spot for the foreseeable future," according to Agricultural Commissioner John Young, as reported by *The Davis Enterprise* in 2019[3]. Almond production is forging a path to higher economic returns for investors and higher reassessed values for county tax revenues. These revenues will not materialize until after the almond orchards produce a mature crop, within five years from planting. Before that stage of growth, almond industry investors will either decide to invest in Yolo-based almond processing and storage infrastructure, or truck almonds and hulls to out-of-county processing facilities, watching the almond harvest earn processing revenues and taxes in other counties.

In 2019*, The Davis Enterprise* also mentions that members of the Yolo Board of Supervisors spoke about their conversations with almond industry processors, who expressed that "there are challenges facing processors in Yolo County" because "the local air quality control district won't allow them to burn waste products at their plants." Adding that "Colusa County will let them hull it up there and they can burn it up there, so they said", ending their comments with a warning that "We're not going to build any more plants in Yolo County unless you guys work with us." [4] The Yolo County Board of Supervisors' dilemma to attract new almond processing facilities will be to create favorable economic conditions without compromising environmental air quality standards, to build the facilities that could be processing 50 to 80 thousand acres of bearing almonds, within the next five to ten years.

Unfortunately, long-term air quality has already being compromised by the dust particulates that will be generated during almond harvesting, and the drift from dormant tree spraying practices. There are

[3] Davis Enterprise July 25, 2019. 636999922327970000 (yolocounty.org)
[4] Davis Enterprise July 25, 2019. 636999922327970000 (yolocounty.org)

many stories about San Joaquin Valley communities negatively impacted by almond harvest dust particulate emissions. Measurements by the SJV Air District have shown that "average levels of PM10 increased during August and September, with the Fall dust problem getting worse, and increased almond acreage has to be most of the cause."[5]

The other topic discussed at the Yolo County Board of Supervisors' meeting was water. The Agricultural Commissioner identified the expansion of perennial crops and the expected increase in water demand, as a "water system that is virtually unchanged, other than adding all the wells and drip lines." Mr. Young provided a roadmap of understanding by recognizing that, "there's a change in the way we use water. We're not in a place where we have a problem today, but if the trend continues without us recognizing potential problems, I think we get in trouble." His recommendation was for "the county to study all the acreage in use, how it is irrigated, how much water is coming in and how much is going out, so we really have an idea of the sustainability." [6]

Some Recommendations:

We support Mr. Young's recommendation. A research study could be designed to understand potential consequences to groundwater aquifers, derived from changes to agricultural land use patterns. We recognize that the GSP speaks of the fact that this subject was not addressed in this draft, but it has been identified as a future to-do project. We recommend this study to be a priority.

The study should also conduct an aquifer-specific data collection and analysis effort, to understand the environmental impact from nut crops already planted in the Dunnigan Hills. Because nuts are a year-round water consumer, these orchards are 100% dependent on groundwater to grow almond and pistachio trees. If there is any preliminary indication of negative consequences to the aquifer, there could be a reduction of new well permits, or a moratorium could be established to limit unsustainable groundwater demand.

These almond and pistachio orchards are economically possible because of current market prices paid (per pound produced), that cover water pumping costs to generate a profit. Our concerns about the Yolo Subbasin, are founded on the deep impact the agricultural industry has had on groundwater aquifers in the San Joaquin Valley (SJV), with massive overdrafts and land subsidence consequences.

Some of these consequences are derived from the significant increase in nut tree plantations. A 2019, UC Davis research paper points out, "the Central Valley has undergone a shift to perennial (tree and vine) crops in recent decades, which has increased water demand amid a series of severe droughts and emerging regulations on groundwater pumping." The study is specific to "the expansion of perennial crops in the Tulare Lake Basin," where "perennial crop acreage has nearly tripled over this period, and currently accounts for roughly 60% of planted area and 80% of annual revenue." [7]

A concerning conclusion from this study recognizes that "these trends show little relationship with water availability and have been driven primarily by market demand."[8] Similar to what is happening in the Dunnigan Hills, a rainfed land area used for grazing and winter wheat, with limited access to

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[5] Dust and Almonds: Clearing the Air - November 2014 - Community Alliance (fresnoalliance.com)

[6] Davis Enterprise July 25, 2019. 636999922327970000 (yolocounty.org)

[7] Water shortage risks from perennial crop expansion in California's Central Valley
Natalie K Mall and Jonathan D Herman, Published 15 October 2019 • © 2019 The Author(s). Published by IOP

[8] Et al, Mall and Herman, 2019.

developed surface water. Other accounts relate that there are SJV farming interests acquiring marginal lands within targeted groundwater basins and drilling wells to establish groundwater pumping records for their "historical use"[9], hoping to transfer pumping rights to better land when their GSP's start to enforce conservation practices.

Another result from the UC Davis study, suggests "that under a range of plausible future regulations on groundwater pumping, ranging from 10% to 50% of the water supplies may fail to consistently meet demands, increasing losses by up to 30% of annual revenues.[10] The YSGA could learn more about these results and be aware that the "datasets developed" by the UC Davis work can support "the development of dynamic models under uncertain climate and regulatory changes." These models may help our region "understand the combined impacts of water supply shortages and intensifying irrigation demand."[11] Hopefully, this will help us avoid repeating mistakes so many SJV communities now regret.

Another concern is that although new tax revenues from the nut industry are always welcomed, they create a conflict of interest with local elected officials entrusted with the stewardship of natural resources. SJV residents may wish they had been given more say in the management of their land, water, and air resources.

The next recommendation for the GSP, is to consider the magnitude of the nut industry's-driven economic development currently emerging in the Yolo Subbasin. The main attraction is the opportunity to tap shallow groundwater aquifers. There are new LLC's representing farmer interests and investors buying land to establish their future almond and pistachio orchards in the Northern Sacramento Valley region. With land available, more surface water and shallower groundwater tables, the migration of nut tree plantations from South to North is underway; and with it, the hardening of groundwater demand for the Yolo Subbasin.

Another recommendation is for the GSP to reflect a more concerning reality about the future of the basin, rather than the one offered based on past performance. There is nothing static in the new landscape to assume that past performance, based on annual crop rotations, will behave the same way under a year-round water demand nut plantation production system.

There is a desire to say that "Yolo is in good shape". A Yolo County tomato farmer recently spoke to the Arkansas Online report, to say "In Yolo County, we have relatively stable groundwater and replenishment of the aquifer. It's like having money in the bank, so we're pumping water out of the ground like a withdrawal."[12]

The bank account, however, was built using the annual crop rotational farming system, offering the flexibility of fallowing row crop land under water scarcity conditions, mostly because the price to be paid for the commodity would not cover the groundwater pumping costs. Under the nut tree plantation

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[9] Mark Arax, The Dreamt Land, 2019.

[10] Water shortage risks from perennial crop expansion in California's Central Valley
Natalie K Mall and Jonathan D Herman, Published 15 October 2019 • © 2019 The Author(s). Published by IOP Publishing Ltd Environmental Research Letters, Volume 14, Number 10

[11] Water shortage risks from perennial crop expansion in California's Central Valley
Natalie K Mall and Jonathan D Herman, Published 15 October 2019 • © 2019 The Author(s). Published by IOP

[12] Tomato growers in pinch (arkansasonline.com)

system, the costs of groundwater pumping are covered with the prices paid per pound, encouraging farmers and management companies to continuously pump water to maximize production. This change in water use dynamics diminishes the flexibility to manage groundwater resources under water scarcity conditions, hardening the demand for water to ensure the sustainability of nut plantations.

Remarks:

There is a long-term responsibility to ensure the health of the aquifers. The growth and development of agricultural interests cannot be ahead of community interests, concerning natural resources and the health of the environment. Rural residents should not be spending money drilling deeper wells in order to catch up with lower water tables. The impact on our rural residents is a new reality. Even during drought conditions, the overdraft is a result of year-round pumping from nut orchards. The groundwater bank is not working for shallow residential wells, as deeper water extraction goes unchecked.

Concerns:

It is very concerning to witness the negative impact that industrial agriculture is having on the land, water, and people in the San Joaquin Valley. We want to avoid repeating these same mistakes, driven by profits and tax collections. We should read Mark Arax, as he has documented the politics of special interests to gain wealth from exploiting California's natural resources. He provides historical context to older-day California's agricultural wheat barons and cotton kings, and for the contemporary almond aristocrats.

It is heartbreaking knowing that water contamination is now added to the list of poor living conditions for farm workers and rural residents. Exposed to contaminated water, another burden "where families now can't cook, clean and shower with their well water, if there is access to well water."[13] Closer to home, *The Sacramento Bee's* recent drought report, details the extent to which rural residents are losing their well water sources, creating emergency-like conditions to procure clean water for people.[14] Since August 2021, Glenn County has imposed a six-month moratorium in the permitting of new agricultural wells.[15] The SJV experience is moving North, with the almond migration and the resulting hardening of demand, adding pressure on groundwater resources under drought conditions.

Requests for Information and Final Suggestions:

Please provide information about the regulatory instruments that are available for YSGA, to enforce land use policies that may be detrimental to the sustainability of the aquifers? Does the YSGA have the authority to impose a moratorium in new well permits for the Dunnigan Hills?

We suggest documenting the situation of people dealing with overdraft issues, providing financial and technical support if possible. Please study the broader social and environmental implications of current agricultural landscape changes. Please become a leader for the community, understanding that water is more than a commodity.

[13] Mark Arax, The Dreamt Land, 2019.
[14] Dry Wells, Drastic cutbacks. For Many Californians, drought hardships have already arrived. Sacramento Bee, October 3, 2021.
[15] Glenn County passes six-month moratorium on new well permits - Water Education Foundation

Audubon | CALIFORNIA

October 27, 2021

Yolo Subbasin Groundwater Agency
34274 CA-16
Woodland, CA 95695

Sent via email to: info@yolosga.org.

Re: Comments on the Draft Groundwater Sustainability Plan for the Yolo Subbasin Groundwater Agency

To Yolo Subbasin Groundwater Agency,

Audubon California appreciates the opportunity to provide public comment on the draft Groundwater Sustainability Plan (GSP) for the Yolo Subbasin Groundwater Agency (YSGA). Audubon California is a statewide nonprofit organization with a mission to protect birds and the places they need. Our organization has a long history of solutions-focused work in the Central Valley in collaboration with state and federal agencies, water districts, non-profits, and landowners. Audubon is reviewing draft GSPs as a stakeholder for the environment with a particular focus on managed wetlands. We are commenting on draft GSPs to provide technical assistance to Groundwater Sustainability Agencies (GSAs) to improve their GSPs prior to the deadline to submit final GSPs to the Department of Water Resources in January 2022. Audubon would also like to identify areas of opportunity to partner with landowners and GSAs to provide groundwater and wildlife habitat benefits in the implementation of the Sustainable Groundwater Management Act (SGMA).

Over 90 percent of historic wetlands in the Central Valley have been replaced with agriculture or urban development. Disconnected from natural water sources as a consequence of surface water diversions and groundwater over-pumping, wetland landowners must utilize surface water deliveries or pump groundwater to provide flooded habitat. But managed wetlands provide outsized public trust benefits for their minor water use.

The remaining wetlands in the Central Valley are a critical component of the Pacific Flyway, supporting millions of migratory waterfowl, hundreds of thousands of shorebirds, and state listed species like the Tricolored Blackbird. Central Valley managed wetlands are part of California's commitment to national and international Pacific Flyway agreements and provide significant public trust benefits, including habitat for migratory birds, recharge of overdrafted aquifers, carbon sequestration, and recreation opportunities for birders, hunters, and disadvantaged communities.

Managed wetlands require specific consideration in GSPs under SGMA statute and regulations, as detailed below. GSAs are required to identify managed wetlands as beneficial users of groundwater and as land uses and property interests and should recognize this land use consistent with other active users of surface and groundwater. The overall basin water budget must include managed wetlands as a specific water use sector and the GSP is required to consider the effects of the GSP on managed wetlands as a beneficial user or land use.

When GSPs fail to adequately consider the water needs and recharge contributions of managed wetlands, projects and management actions may ignore managed wetlands, their need for protection as public trust resources, and their potential to be part of sustainability solutions. If future actions include groundwater allocations, managed wetlands face the potential of being excluded if not recognized in the GSP, risking further loss in critical wetland acreage.

SGMA Requirements Related to Managed Wetlands

A primary requirement for GSAs during GSP development is the consideration of the interests of "all beneficial uses and users of groundwater" [Water Code Section 10723.2], which includes "[e]nvironmental users of groundwater" [Water Code Section 10723.2(e)].

Articulated into the SGMA regulations, the concept of beneficial uses and users of groundwater is first represented in CCR, Title 23, Section 354.10. Notice and Communication, which directs the GSP to "…include a summary of information relating to notification and communication by the Agency with other agencies and interested parties including the following: (a) A description of the beneficial uses and users of groundwater in the basin, including the land uses and property interests potentially affected by the use of groundwater in the basin, the types of parties representing those interests, and the nature of consultation with those parties." [emphasis added].

Furthermore, the SGMA regulations provide a definition that explicitly includes managed wetlands as a beneficial user where:

> "'Water use sector' refers to categories of water demand based on the general land uses to which the water is applied, including urban, industrial, agricultural, managed wetlands, managed recharge, and native vegetation." CCR, Title 23, Section 351(al) [emphasis added].

GSAs are then directed to include all water user sectors in the description of the GSP area and to quantify groundwater use by these sectors in the historic, current and projected budgets [emphasis added]:

> CCR §354.8. Description of Plan Area: Each Plan shall include a description of the geographic areas covered, including the following information:
>
> (a) One or more maps of the basin that depict the following, as applicable:
>
> (4) Existing land use designations and the identification of water use sector and water source type.
>
> and,
>
> CCR §354.18. Water Budget:
>
> (b) The water budget shall quantify the following, either through direct measurements or estimates based on data:
>
> (3) Outflows from the groundwater system by water use sector, including evapotranspiration, groundwater extraction, groundwater discharge to surface water sources, and subsurface groundwater outflow.

Given these explicit requirements, GSAs are required to identify and map managed wetlands and include their water needs in water budgets in the GSP.

Furthermore, each GSP is also required to describe "undesirable results" where such included:

> "Potential effects on the beneficial uses and users of groundwater, on land uses and property interests, and other potential effects that may occur or are occurring from undesirable results." CCR, Title 23, Section 354.26(b)(3) [emphasis added]

Comment Overview

GSAs are required to consider public trust resources in their GSPs, including managed wetlands. Managed wetlands are beneficial users that require the application of surface or groundwater to provide wildlife habitat. The Yolo GSP does not adequately identify managed wetlands in land use maps and as a distinct water sector in the basin water budget.

Our comments are summarized as follows:

1. Identification of managed wetlands: While the GSP notes "managed and native wetlands" within the descriptive paragraph of beneficial users in the introductory section (see GSP p. 1-32), the accompanying land use figures do not show any managed wetlands (see GSP Figure 1-4). The Yolo Bypass Wildlife Area includes significant acres of managed wetlands that should be more clearly identified in land use maps and reflected in the acreage used in the water budget.
2. Water budget: Managed wetlands appear to be missing from the water budgets detailed in Appendix C. As represented in various tables in Appendix C (e.g., GSP Appendix C Table 11 and Table 41), the GSP appears to assume zero acres of managed wetlands in 2016 and less than 500 acres in prior years, as well as zero acres for the Yolo Bypass area for 1989 through 2016. Furthermore, there is no recognition of potentially expanded future acres of managed wetlands under proposals being considered by EcoRestore, the Putah Creek Preserve, and the Yolo Bypass Wildlife Area.
3. Identification of data gaps: Audubon appreciates that the representation and characterization of managed wetlands is recognized as a data gap (see GSP p. 4-26 and 4-29).
4. Consideration of managed wetlands: While the GSP indicates long-term sustainability, it does include some projects and management actions. Including managed wetlands in the projects and management actions can help achieve multiple benefits, providing both recharge and wildlife habitat. Furthermore, any consideration of projects that may redirect water for recharge should assure that existing native and managed wetlands are not adversely impacted.

Draft Groundwater Sustainability Plan Page-by-Page Comments

Additional page-by-page comments on YSGA's draft GSP are detailed below. We welcome any follow up questions and look forward to seeing the issues raised below addressed in the final GSP submission in January 2022.

> Section 1.5.2, page 1-13: The basin also includes significant acres of managed wetlands, which should be a different designation than "native vegetation" as these lands are actively managed for migratory bird habitat. The identification and representation of managed wetlands needs further improvement to reflect known managed wetland areas.
>
> Figure 1-4, page 1-16: Managed wetlands should be listed as a unique land use.
>
> Figure 2-51, page 2-120: When viewed in combination with Figure 1-4 (Land Use), it appears that managed wetlands are being potentially mischaracterized or missing altogether. In Figure 1-4, much of the Yolo Bypass is designated as "riparian vegetation" while Figure 2-51 indicates

some of this same land is "iGDE." In both figures, known managed wetlands at the Yolo Bypass Wildlife Area are not identified. These managed wetlands are different than riparian vegetation and groundwater dependent ecosystems because they apply surface or groundwater to flood migratory bird habitat from fall to spring.

Section 2.2.9, page 2-130: The GSP indicates that future baseline land use holds constant the land use acres represented for the 2016 baseline and "relies on the historical land use datasets in Table 2-21." However, as represented in Table 2-21, there are zero acres of managed wetlands represented in 2016. Thus, the GSP is projecting the future condition to have zero acres of managed wetlands, which is inaccurate.

Table 2-21, page 2-131: This table indicates zero managed wetlands in 2016 and less than 500 acres of managed wetlands in any prior year. This is incorrect as there are managed wetland acres in the Yolo Bypass Wildlife Area and other locations in the subbasin. Furthermore, as commented previously, this 2016 condition is used to represent the future baseline condition. Managed wetland acres may increase above current conditions, as a result of on-going efforts in the Yolo Bypass and the Putah Creek watershed. The information in Appendix C, Table 25 (page 69) indicates the acres in Table 2-21 are all from the subarea named "Central Yolo Subregion" and zero acres of managed wetlands are included in the subarea named "South Yolo MA" (see Appendix C, Table 41, page 101). Figure 4 in Appendix C indicates the South Yolo MA is the area generally covering the Yolo Bypass, including the Yolo Bypass Wildlife Area, so managed wetland acres should be represented in this management area.

Section 2.3.5, page 2-146: The description of the South Yolo Management Area should include discussion of managed wetlands associated with the Yolo Bypass Wildlife Area and other public and private wetland easements. This is a significant and important habitat area for migratory birds, fisheries (e.g. as planned by EcoRestore), and other important native species. Many of the lands within the Yolo Bypass actively apply surface or groundwater to create and maintain important habitat and wildlife food sources.

Section 4.11.1, page 4-26: Audubon appreciates that the YGSA recognizes the significant data gap regarding properly identifying and incorporating managed wetlands into the GSP. Audubon is developing a dataset of the spatial extent of managed wetlands in the Central Valley, which we will share for inclusion in future GSP updates. We recommend current acreage estimates in the Yolo Bypass Wildlife Area be used initially to include a more accurate estimate of managed wetland acres in the GSP for submission to DWR in January 2022.

Section 4.11.2.3, page 4-29: Same comment as provided for Section 4.11.1.

Table 5-1, MA 4, page 5-5: Managed wetlands provide opportunities for multi-benefit recharge and should be part of discussions about Managed Aquifer Recharge programs.

Table 5-1, P2, page 5-8: Audubon appreciates the inclusion of managed wetlands specifically as a model-improvement need under this designated project.

Appendix C: As represented in the comments specific to the GSP, Audubon has several concerns with the water budgets developed and documented within Appendix C. These range from under-represented managed wetland land use acres to questions about how the water needs and water sources for the few acres of managed wetlands included were derived. Appendix C indicates use

of crop coefficients and CIMIS data (e.g. Table 6, page 23) to estimate water needs. However, managed wetlands have unique crop coefficients and the water sources – both surface and groundwater – may be unique for given managed wetland areas. These crop coefficients will need refinement for managed wetlands and should be identified as a data gap for further improvement.

Thank you for your consideration of Audubon California's comments. If you would like to discuss this matter further, please do not hesitate to contact me at (916) 737-5707 or via email at samantha.arthur@audubon.org.

Sincerely,

Samantha Arthur
Working Lands Program Director
Audubon California

Sarah Leicht

From: linda bell [redacted]
Sent: Wednesday, October 27, 2021 1:12 PM
To: Info
Subject: Draft GSP Comments

October 27, 2021

Submitted online via: info@yolosga.org

Re: Yolo Groundwater Sustainability Plan

Dear Yolo SGA Staff,

I appreciate the opportunity to comment on the Yolo Groundwater Sustainability Plan, and I thank all of the staff who have helped reviewers, such as I, to understand the information in the Draft Plan. It has been a very informative process, and I will continue to read about the intricacies of California's water environment and legal policies.

Reading, and commenting on this topic, while California was experiencing record temperatures, fire, and rainfall…. I believe made all of us realize that though we are experiencing a weather cycle…it is time to review our idea of what is normal.

Defining the Future by the Past

Are Historic Water Cycles Still Valid Predictors of Future Climate Cycles?
(CCR 354.18 c) 3) A)) states that "Projected hydrology shall utilize 50 years of historical precipitation, evaporation, and streamflow information as the baseline condition for estimating future hydrology.". Though past weather patterns are still part of climate studies, recent climate and hydrology research sees a future with more extremes of precipitation and temperature.

""There is growing evidence that global warming is changing the water cycle in terms of altering the spatial and temporal distributions of water availability worldwide. Specifically changes in the magnitude, timing, frequency, and form of precipitation (rainfall/snowfall) and runoff (rained runoff/snow melt/..)…"

"The determination and application of the water year classification, runoff quantities and drought indices are based on the *stationary* assumption that the future hydro climate in California would mimic the historical condition. However, existing research has reported non-stationary changes in hydroclimatic variables across the State. " "Indices that are calculated under the stationarity assumption will become less informative further into the future when higher warming and larger changes (I.e., stronger non-stationarity) in precipitation are projected." (Projected Changes in Water Year Types and Hydrological Drought in California's Central Valley in the 21st Century (2021) Me, Anderson, Lynn and Arnold)

The implications for water infrastructure/management are that "Greater amounts of winter-season runoff combined with static flood protection rules would lead to greater uncontrolled releases from SWP and CVP reservoirs. Reduced spring-season runoff into the reservoirs would lead to decreased water supplies and deliveries to SWP and CVP water users."(Progress on incorporating climate change into management of California's water resources" (2008) Anderson, Chung, Anderson, Brekke, Easton, Ejeta, Peterson and Snyder.)

Can The Choice of a Specific Time Span Influence Predictions?
The fact that the 48 year historic baseline (1971-2018) of the Plan's water budget starts just before the Indian Valley Reservoir comes on line is very important. Indian Valley Reservoir is operated to meet current year demand, not to maximize carryover storage; so its releases are important to the flow of Cache Creek. "Since completion of the Indian Valley Reservoir in 1975, the District's water resources became less vulnerable to the dry years that periodically limit water resources in Yolo County." "The conjunctive water management benefits associated with the Indian Valley Reservoir, and other District operations are directly evident in long-term hydrography for representative wells that show recovered groundwater levels after the reservoir came on line in 1977 to 1978." (Borcalli, 2000) and (Ludhorff & Scalmanini, 2004)

The importance of the Indian Valley Reservoir was also noted in Appendix C (page 87) for the Dunnigan Hills Subregion. It states that "Drought years like the 1976-1977 would not result in as severe a depletion as they did in the past, primarily because of increased surface water availability (e.g. Indian Valley Reservoir surface water) and to some extent by overall increased irrigation efficiencies."

The Plan needs to address a future with less predictable water resources by setting more conservative criteria thresholds. The Agency has assumed that "…..the Yolo Subbasin is a relatively stable basin, with groundwater levels maintaining a relatively consistent long-term average elevation or depth to groundwater. While groundwater levels decline during dry conditions…….groundwater levels substantially recover during wet years." This assumption has led to minimum thresholds that could lead to undesirable results in management areas. This assumption is found throughout the Plan as a reason for determining minimum thresholds

Management Areas

"Each Agency may define one or more management areas within a basin if the Agency has determined that creation of management areas will facilitate implementation of the Plan. Management areas may define different minimum thresholds and be operated to different measurable objectives than the basin at large, provided that undesirable

results are defined consistently throughout the basin. A basin that includes one or more management areas shall describe: (a) The reason for the creation of each management area." (CCR 354.20 (a))

The Agency established six management areas. Though these management areas are used throughout the basin description to show the distribution of hydrologic soils; their formal description in Section 2.3 is unable to give a concise reason for their delineation. It states that "Management areas were developed based on prior investigations, which delineated somewhat different subbasin areas, and have been adapted to the purpose of this GSP." The description continues on, but with no clear summation of the various changes.

The confusion in what were the reasons that Capay Valley, the Dunnigan Hills, Central Yolo, South Yolo, and North Yolo were originally separated as distinctive management areas; is then compounded by the fact that four of them are immediately regrouped into one minimum threshold for defining Chronic Lowering of Groundwater Levels and Reduction of Groundwater Storage.

The Agency needs to define the characteristics of each area that led to their original selection as separate management areas; and then explain how their common threshold level will not result in undesirable results in one, or more, of the areas.

Setting the minimum threshold for the Dunnigan Hills and Hungry Hollow (which is part of the Central Yolo management area) at "Exceedance of the historic minimum elevation in the period of record of each Representative Well in two consecutive years." could definitely lead to undesirable results. Both of these areas are already showing signs of overdraft.

Data Gaps

Bulletin 118 "Non-Basin Areas"

DWR's Bulletin 118 creates a regulatory gap by defining only alluvial basins and not fractured, hard-rock and volcanic aquifers (which it labels "non-basin areas"). The western edge of the Central Yolo Management Area forms the border with the "non-basin" Capay Hills and Coast Range. The Hungry Hollow area borders the Capay Hills and Winters borders the Coast Range. Both of these areas are designated as Areas of Concern by the GSP.

Groundwater in fractured hard-rock aquifers are very vulnerable to overdraft since their pore spaces are smaller than alluvial aquifers. The predictability of a well's yield can also vary depending on their location in the aquifer.

Updates, since the Plan has been printed, show that in the years between 1997 and 2016 perennial crop acreage has increased from about 2800 to 4800 acres in the Winter's area. Hungry Hollow has also seen large increases in perennial crops with acreage between 1994 and 2018 increasing from about 4000 to 17500 acres. (The acres on both of these sets of numbers has been taken off bar graphs. The Winters graph is in 1000 acre intervals, and the Hungry Hollow at 5000 acre intervals; so I may be a little off in my count.)

The summary accompanying these charts listed: 1) Potential trend emerging around Winters and Hungry Hollow with declining groundwater levels. 2) Areas near the rangeland/ farming interface seem to be changing more quickly. 3) Proximity of newly drilled wells to areas with largest changes, and 4) Trends in land use change, and potential hardening of water demand.

These two areas, Hungry Hollow and Winters, should be set into a separate Management Area to investigate the effects on groundwater availability of: 1) proximity to the fractured rock/volcanic influence of the Capay Hills and Coast Range; and 2) increased perennial agriculture.

The Yolo County HCP/NCCP Application form contains a map of 18 Planning Units that breaks out a number of planning units along this western edge of the Plan Area. The northern portion of this zone is called the Capay Hills and the southern the South Blue Hills. The North Blue Hills encompasses the area called the Capay Valley in the Yolo Plan. This is a map that should be reviewed by the GSA. Since it is already on the Yolo County Agency website, it would be helpful. The link to the Yolo Habitat Conservancy Geomapper is: Yolo Habitat Conservancy Geomapper

Land Use Data Gap

Land Use data for the Draft Water Budget Model was held constant from 2016 to 2018, since data after 2016 was not available when the model was programed. This means that part of the increase in water demand created by new residential and agricultural land use is missing from the water budget. This loss is especially critical in the areas of the Dunnigan Hills and Hungry Hollow where new agricultural development, especially perennial crops, such as orchards, has been especially strong. Both of these areas have not been adequately studied to assess this impact on groundwater.

The Water budget needs to be re-calculated with the new numbers on both residential and agricultural land use.

Environmental Benefits

General Principles (9350.4 (e)) states that "An Agency shall have the responsibility for adopting a Plan that defines the basin setting and establishes criteria that will maintain or achieve sustainable groundwater management, and the Department shall have the ongoing responsibility to evaluate the adequacy of that Plan and the success of its implementation"

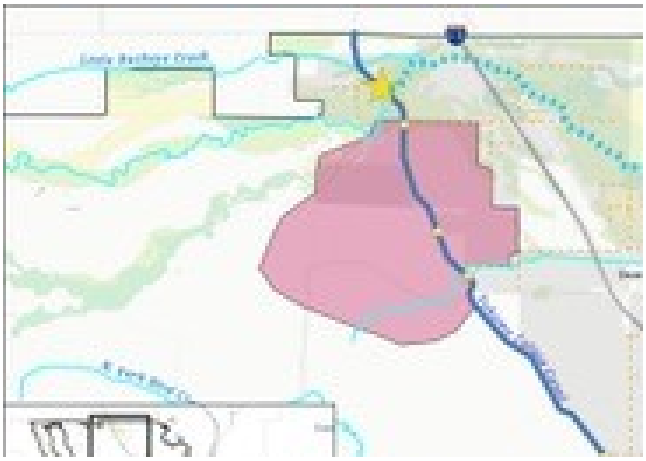
Though the Yolo GSP starts with a thorough portrayal of the geological and hydrological elements of the Yolo Basin setting, it lacks a comprehensive biological/ecological view of the above-ground community resources of the Basin. Very little of the report, only 18 pages, is devoted to the discussion of how measurable goals and minimum thresholds relate to the species of plants and wildlife that live in the environment in which the Representative Wells are drilled.

The 18 pages mentioned above, include Section 2.2.7 (page 2-109), the Groundwater Dependent Ecosystems Section, and a Section 2.2.7.4 (page 2-123) referred to as "Additional Ecological Data". Table 2-20 (page 2-124) lists Species Present in California Freshwater Species Database, but they are aggregated at a HUC 12 GDE Unit Scale. This is at a very broad scale that does not adequately address the impacts that land use, and Plan projects, may have on environmental beneficiaries.

This was evident in the recharge project (Project 19) which has already been approved by the GSA Board as a test pilot for recharge in the Basin. Project 19, and (I believe) Project 20, are in the immediate area of "Critical Habitat" for the California Tiger Salamander, a species listed as both State and Federally Threatened. The accompanying map shows the location of Project 19 as the large star just north of the critical habitat area. The small stars are described as "Future Recharge Diversion Points". These 3 diversion points, which I believe are Project 20, are located directly in the Critical Habitat Area for the California Tiger Salamander.

The Recovery Plans for the California Tiger Salamander need to be included in the Plan and addressed before these projects are fully approved.

The Agency needs to address plant and wildlife species outside of the riparian and wetland areas, because these species will be effected as surface and groundwater resources are impacted by expanding agriculture/municipalities. The permitting of wells in un-developed, open spaces can also lead to the removal of native vegetation to accommodate agricultural crops and structures. Oak Woodland areas are a favorite of developers, and many of these oak communities are situated in areas considered "non-basin", and so not presently covered by SGMA.



The Minimum Thresholds for Chronic Lowering of Groundwater Levels and Groundwater Storage in the North Yolo Management Area, which is here proposed as a measure to compensate for Voluntary Agreements; is an interesting combination of farmer and environmental beneficiaries issues. The threshold is described as: "Exceedance of the historic elevation in the period of record of each Representative Well **plus** 20 percent of the depth between the historic maximum and historic minimum elevation for the period of record of the Representative Well in two consecutive years." The explanation is that "The minimum thresholds for the North Yolo management area are set lower than historic conditions recognizing that water districts, such as 108, in this area may experience reductions in surface water deliveries from the Sacramento River as the Voluntary Agreements with the State Water Resource Board are implemented. "

In the Voluntary Agreement I read online for the San Francisco/Sacramento-San Joaquin Delta Estuary and Watershed …"The SRSCs propose that during above normal, below normal and dry years, which cumulatively total about 58% of all years according the Sacramento Valley 8-station index, they would make available 100,000 acre-feet through land fallowing/crop shifting (or limited groundwater substitution) within their service areas. This supply would be made available to Reclamation and Reclamation…."

If the North Yolo Agreement is similar to the above Agreement, then a threshold as severe as this would seem to be over favoring the SRSC's interests.

The Agency's explanation is then followed by the statement "Historical performance of the North Yolo management areas shows that groundwater levels typically recover to a long-term average during wet periods. Therefore, setting the minimum threshold lower than the historical low is not expected to create long-term undesirable effects on groundwater levels."

The Assumption that the Yolo Subbasin is a relatively stable basin

The Assumption that the Yolo Subbasin is a relatively stable basin where groundwater levels will rebound after drought, or heavy groundwater use, is a response that the Agency gives to all the situations where minimum thresholds are set at historic, or lower than historic, levels. The argument is that: "In the Yolo Subbasin, groundwater storage changes are positive in wet years and negative in dry year, with no significant trend (decline or increase) over the past 50 years." (Appendix C, page 1)

Though this kind of a cycle has occurred in the past,…. is a "stable" cycle of drought-and-flood, or large declines and increases, a pattern that we want to accept by declaring historic minimum groundwater elevations sustainable conditions? The Sustainable Groundwater Management Act was written in 2014 because of the repercussions of such a cycle.

It would seem that the setting of minimum threshold levels at historic lows over consecutive years is perpetuating, not improving, the sustainability of the Yolo Subbasin.

I would like the Agency to explain why setting minimum thresholds at such low levels is a sustainable management practice.

Sustainable Management Criteria

The Plan, in Section 2.2.3 (page 2-54) decides to not set a minimum threshold for Saltwater Intrusion because "Seawater intrusion, as observed in California's coastal aquifers, will not likely occur within the Yolo Subbasin because the ocean is over 50 miles away, farther if measured along the waterways. The southern portion of the Yolo Subbasin is located within the Sacramento-San Joaquin Delta and has been subject to salinity intrusions during the early part of the last century, but not since 1944 and 1990 (DWR 1995) and probably not thereafter due to the state management of flows through the Delta to prohibit salinity intrusion."

Even if the southern portion of the Yolo Subbasin is outside of *direct* seawater contact, the Yolo Basin could be indirectly affected. The Basin's Sacramento River water supplies could be cut to: 1) provide for the immediate flows needed to push back salt water intrusions in the lower Delta, or 2) to retain reservoir water for a future need to curtail salt water intrusions. In either case, there would be *indirect* effects.

The Plan needs to explain how it would replace these surface water supplies in such a situation. The September 21st 2021 Water Resources Control Board Meeting was talking about just such a condition; so the Plan should explain how it would replace these water resources.

The GSP and Local Governmental Agencies

SGMA requires coordination with Land Use Planning Agencies. CA Water Code 10727.4 states that "…a groundwater sustainability plan shall include, where appropriate and in collaboration with the appropriate local agencies, all the following:… (k) Processes to review land use plans and efforts to coordinate with land use planning agencies to assess activities that potentially create risks to groundwater quality or quantity.."

Table 1-3 (page 1-21) shows which member agencies, and affiliated members, implement water resources programs, but it does not present a working relationship with planning departments and permitting agencies.

Management Action 2 is titled: "Continue coordination efforts with other management and monitoring entities.", but there are still no details as to the success of these efforts. The SGA Board has recently been negotiating the form of a group which would interface with the Board of Supervisors, but the role of the representatives is still being decided. There is a hesitancy to take any direct actions in the land planning and well permitting processes.

Projects

Projects and Management Actions (354.44 (a)) states:"Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin."

One set of projects, numbers 56 through 59, looks at the Capay watershed and the community as an integrated whole. Together they work to improve the hydrological state of the watershed; improve farming practices to increase water infiltration and water holding capacity; develop a restoration plan for the native vegetation communities of the Capay Valley; and establish an equipment and knowledge hub for the human community. Copay is a unique location, but the ideas could be scaled to other areas. Together these projects do plan for a changing climate.

Summary

In summary, I feel like the beginning (Basin Setting) and end sections (Appendices) of the Draft plan were very helpful for understanding the Plan, but the summation of this information in the middle sections, such as the Sustainable Management Criteria, were not as well thought through.

Thank you again for the opportunity to read this report,

Linda Bell

State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
North Central Region/Region 2
1701 Nimbus Road
Rancho Cordova, CA 95670
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GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

October 20, 2021

Kristin Sicke
Executive Director
Yolo Subbasin Groundwater Agency
34274 CA-16
Woodland, CA 95695
info@yolosga.org

Subject: CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE COMMENTS ON THE YOLO SUBBASIN DRAFT GROUNDWATER SUSTAINABILITY PLAN

Dear Ms. Sicke:

The California Department of Fish and Wildlife (Department) appreciates the opportunity to provide comments on the Yolo Subbasin Draft Groundwater Sustainability Plan (GSP) prepared by the Yolo Subbasin Groundwater Agency (YSGA) pursuant to the Sustainable Groundwater Management Act (SGMA). The Basin is designated as high priority under SGMA and must be managed under a GSP by January 31, 2022.

The Department is writing to support ecosystem preservation and enhancement in compliance with SGMA and its implementing regulations based on Department expertise and best available information and science. As trustee agency for the State's fish and wildlife resources, the Department has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and the habitat necessary for biologically sustainable populations of such species (Fish & Game Code §§ 711.7 and 1802).

Development and implementation of GSPs under SGMA represents a new era of California groundwater management. The Department has an interest in the sustainable management of groundwater, as many sensitive ecosystems, species, and public trust resources depend on groundwater and interconnected surface waters (ISWs), including ecosystems on Department-owned and managed lands within SGMA-regulated basins.

SGMA and its implementing regulations afford ecosystems and species specific statutory and regulatory consideration, including the following as pertinent to GSPs:

- GSPs must **consider impacts to groundwater dependent ecosystems** (GDEs) (Water Code § 10727.4(l); see also 23 CCR § 354.16(g));
- GSPs must consider the interests of all beneficial uses and users of groundwater, including environmental users of groundwater (Water Code § 10723.2) and GSPs must **identify and consider potential effects on all beneficial uses and users of groundwater** (23 CCR §§ 354.10(a), 354.26(b)(3), 354.28(b)(4), 354.34(b)(2), and 354.34(f)(3));
- GSPs must **establish sustainable management criteria that avoid undesirable results** within 20 years of the applicable statutory deadline, including **depletions of**

interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water (23 CCR § 354.22 *et seq*. and Water Code §§ 10721(x)(6) and 10727.2(b)) and describe monitoring networks that can identify adverse impacts to beneficial uses of interconnected surface waters (23 CCR § 354.34(c)(6)(D)); and

- GSPs must **account for groundwater extraction for all water use sectors,** including managed wetlands, managed recharge, and native vegetation (23 CCR §§ 351(al) and 354.18(b)(3)).

Furthermore, the Public Trust Doctrine imposes a related but distinct obligation to consider how groundwater management affects public trust resources, including navigable surface waters and fisheries. Groundwater hydrologically connected to surface waters is also subject to the Public Trust Doctrine to the extent that groundwater extractions or diversions affect or may affect public trust uses. (*Environmental Law Foundation v. State Water Resources Control Board* (2018), 26 Cal. App. 5th 844; *National Audubon Society v. Superior Court* (1983), 33 Cal. 3d 419.) The groundwater sustainability agency (GSA) has "an affirmative duty to take the public trust into account in the planning and allocation of water resources, and to protect public trust uses whenever feasible." (*National Audubon Society*, *supra*, 33 Cal. 3d at 446.) Accordingly, groundwater plans should consider potential impacts to and appropriate protections for ISWs and their tributaries, and ISWs that support fisheries, including the level of groundwater contribution to those waters.

In the context of SGMA statutes and regulations, and Public Trust Doctrine considerations, groundwater planning should carefully consider and protect environmental beneficial uses and users of groundwater, including fish and wildlife and their habitats, GDEs, and ISWs.

The Department recognizes and appreciates the effort of the YSGA to characterize environmental users of groundwater in the subbasin and present a thorough analysis of current and historical groundwater conditions. However, the Department believes the GSP could establish more protective management criteria and improve its assessment of what constitutes an undesirable result for environmental users. The Department is providing additional comments and recommendations in Attachment A.

If have any questions related to the Departments comments and/or recommendations on the Yolo Subbasin Draft GSP please contact Bridget Gibbons, Environmental Scientist, at bridget.gibbons@wildlife.ca.gov.

Sincerely,

DocuSigned by:
Kevin Thomas
A2A0A9C574C3445...

Kevin Thomas
Regional Manager, North Central Region

Enclosures (Attachments A, B)

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Attachment A

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE COMMENTS ON THE YOLO SUBBASIN DRAFT GROUNDWATER SUSTAINABILITY PLAN

COMMENTS AND RECOMMENDATIONS

The Department's comments are as follows:

1. **Comment #1** – **Interconnected Surface Water Systems** (2.2 Groundwater Conditions, 2.2.6 Interconnected Surface Water Systems; starting page 2-101): The GSP should add clarity to its description of interconnected surface waters (ISW) within the subbasin.
    a. Issues:
        i. Groundwater Elevations: The GSP states that to identify ISW within the subbasin, the "minimum groundwater elevation" from water years 2006-2015 was compared with stream surface elevations (page 2-103, line 27). Presumably this should say either maximum groundwater elevation, or minimum depth to groundwater, as indicated in Figure 2-47. Additionally, groundwater levels should be compared to the streambed elevation, rather than the stream surface elevation, for assessment of interconnectedness.
        ii. Quantity and Timing of Depletions: Though Table 2-17 (page 2-110) presents the modeled annual average seepage volumes from ISW within the subbasin, the GSP does not include sufficient detail on the timing of depletions as required by 23 CCR § 354.16(f). In order to adequately assess ISW that may be gaining or losing at different times of the year, it is preferential to present seepage values by month, rather than by year. Additionally, the Department recommends including seepage values for the Upper Sacramento River and Lower Sacramento River separately. Figure 2-47 appears to show the Upper Sacramento as a primarily losing reach while the Lower Sacramento is a gaining reach. Aggregating seepage values across the entire Sacramento River makes it difficult to assess current conditions within shorter river segments. As the ISW sustainable management criteria (SMC) sets thresholds separately for the Upper and Lower Sacramento River, presenting

current conditions in the same manner would allow for a more direct comparison of baseline conditions and those that would occur under the SMC.

b. Recommendations:
    i. Groundwater Elevations: The GSP should be revised to clarify whether the ISW methodology used the minimum or maximum groundwater elevations. The Department recommends using the maximum groundwater elevations to be inclusive when identifying ISW within the subbasin. The methodology should be narrowly updated to compare groundwater levels with the streambed elevation, rather than the stream surface.
    ii. Quantity and Timing of Depletions: The Department recommends updating Table 2-17 to include average depletions by month. Information for the Upper and Lower Sacramento River should be presented individually.

2. **Comment #2** – **Groundwater Dependent Ecosystems** (2.2 Groundwater Conditions, 2.2.7 Groundwater Dependent Ecosystems; starting page 2-109): The GSP does not include sufficient detail or metrics on how the assessment of GDEs within the subbasin will be used to evaluate undesirable results or guide management criteria and actions.
    a. Issues:
        i. GDE Unit Susceptibility: The Department recognizes and appreciates the conservative approach to identifying GDEs with the subbasin, as well as the subsequent analysis assessing trends in Normalized Difference Vegetation Index (NDVI), groundwater levels, species dependence, and biodiversity values for GDE units. However, other than assessing trends within the subbasin, the GSP does not identify specific targets or metrics associated with these GDE trends that would indicate an undesirable result or trigger management actions within the subbasin.
        ii. Special Status Species: Table 2-20 (page 2-124) lists the number of freshwater species present in each GDE unit, subcategorized by listed species, vulnerable species, and endemic species. The GSP does not specifically identify which special status species are present within the subbasin, and it is unclear whether this assessment included aquatic species supported by ISW within the subbasin.
    b. Recommendations:
        i. GDE Unit Susceptibility: To leverage the robust GDE analysis for meaningful groundwater management, the Department

recommends the GSP clarify what constitutes an undesirable result for GDEs and how potential undesirable results will be avoided under the proposed SMC. The GSP should identify monitoring metrics for GDEs that will enable the YSGA to characterize GDE vulnerability to groundwater depletion and associated undesirable results, and to undertake management intervention accordingly. If undesirable results are occurring before minimum thresholds (MTs) are reached, SMC should be adjusted (See Comment #3).

ii. Special Status Species: The Department recommends the GSP clarify whether the species identification included aquatic species supported by ISW within the subbasin. The GSP should include a discussion of listed aquatic species present in ISW within the subbasin, including the federally threatened California Central Valley steelhead (*O. mykiss)*, state and federally endangered winter-run Chinook salmon (*O. tshawytscha*), state and federally threatened spring-run Chinook salmon (*O. tshawytscha*), and the federally threatened Southern distinct population segment of the North American green sturgeon (*A. medirstris*). The Department recommends the YSGA consider including a supplemental list of the identified special status species within the subbasin as an appendix to the GSP.

3. **Comment #3** – **Sustainable Management Criteria** (3.3 Chronic Lowering of Groundwater Levels, 3.6 Depletion of Interconnected Surface Water; starting page 3-3): Groundwater level and interconnected surface water SMC may not protect against undesirable results for fish and wildlife beneficial uses and users.
    a. Issue:
        i. Minimum Thresholds: MTs for groundwater levels are set as the historic lows over the period of record, or in the case of the North Yolo management area, at levels below the historic low. Similarly, ISW MTs are set at the historic lows for Upper Cache Creek, Putah Creek, and the Lower Sacramento River, and at levels below the historic low for the Upper Sacramento River. The GSP asserts that establishing MTs at or below historic lows is acceptable because undesirable results have not previously occurred within the basin; however, the GSP does not include sufficient analysis or discussion to support this claim. In 2015, the second of back-to-back critically dry water years in the Sacramento Valley which resulted in low groundwater levels, vegetated and aquatic GDEs experienced adverse impacts including stressed or dying riparian vegetation, poor instream habitat availability, and increased water

temperatures (DFW 2019). The groundwater level MTs listed in Table 3-1 (page 3-12) show that for many representative wells across the subbasin management areas, water levels that have historically been shallow enough to support GDEs would be permitted to fall below root zones, removing groundwater as an available water source to some GDEs; undesirable results, therefore, will likely be experienced before MTs are reached. It is also unclear what levels of streamflow depletion are projected to occur at the established MTs. The GSP does not characterize the relationship between depletions and impacts to environmental users, such as listed aquatic species, monthly river flows, or water temperatures. The ISW MT for Lower Cache Creek is the "recurrence of the spring average measurement for 1975 to present in at least one spring in every seven years" (page 3-24). It is the Department's understanding that this MT does not establish a true lower threshold for water levels, because any degree of depletion would be theoretically permissible for a period of 6-years, provided that in the 7th year the spring 1975 to present average water level is reached. This MT creates a system in which there may be no action taken during periods of significant groundwater level decline due to the length of time allowed to assess whether the MT has been exceeded. Though the historic hydrologic expectation is one of reoccurring groundwater table recovery, depending on the severity of groundwater depletion during the intervening years, one year of higher water levels out of every seven may not be sufficient to avoid undesirable results for environmental users, particularly as the frequency and intensity of dry water year types is expected to increase in California (Mann & Gleick 2015).

ii. Undesirable Results: To trigger a basin-wide undesirable result, minimum thresholds must be exceeded in two subbasin management zones. Under this definition, a single management zone could experience localized exceedances of groundwater level or ISW MTs for multiple years without triggering a basin-wide undesirable result or management intervention. While environmental users of groundwater are adapted to short-term lowering of groundwater levels during dry periods, extended periods of low groundwater levels may cause environmental users to experience significant stress or potentially irreversible mortality.

b. Recommendation:

i. Minimum Thresholds: The Department recommends the GSP reselect groundwater level and ISW MTs that would better protect

environmental uses and users of groundwater, rather than allowing groundwater levels to reach or fall below historic lows, and that could trigger meaningful action on timescales shorter than seven years. The GSP should include additional analysis to demonstrate that MTs will not lead to undesirable results for beneficial users of groundwater, including environmental uses and users. Groundwater level MTs at representative monitoring wells near identified GDE areas should be assessed to ensure that GDEs will not lose access to groundwater before MTs are reached. The additional information and trends analyzed for GDEs, including NDVI, should also be tied to specific management criteria and metrics for implementing projects and management actions (See Comment #2). The GSP should discuss projected streamflow depletions that would result from the established MTs and then demonstrate that the SMCs will not lead to adverse impacts for environmental users of ISW, including listed aquatic species, related to water temperature or flows necessary for passage.

ii. Undesirable Results: Additional discussion is needed to characterize how the GSP will address local undesirable results to protect groundwater beneficial users, even if the two-management zone threshold is not met to trigger a basin-wide undesirable result.

4. **Comment #4 – Monitoring Networks** (4.11 Monitoring Network Improvement Plan, 4.11.2.3 Surface Water, Interconnected Surface Water, and Groundwater Dependent Ecosystem Monitoring Network; starting page 4-29): Improvements to the monitoring network are necessary to better characterize GDEs and ISW within the subbasin.
    a. Issue: The GSP identifies improvements to the subbasin monitoring network that would allow for better characterization of ISW and GDEs, including the installation of additional shallow, near-stream nested monitoring wells, piezometers, and streamflow gages. It is unclear whether the YSGA intends to move forward with these identified improvements to the monitoring network. Figure 2-46 identifies existing stage and flow gages within the subbasin, but the GSP does not include these streamflow gages in the monitoring network for interconnected surface waters. The GSP states that gages are influenced by multiple factors, leading to difficulty in characterizing the specific impacts of groundwater pumping on streamflow depletion (page 3-22, line 6). Though the GSP relies on groundwater levels as a proxy for assessing ISW, it is still necessary to tie the impacts of groundwater pumping to the volume of groundwater depletions. Paired flow gages and monitoring wells can help

to better characterize ISW and the volume and timing of depletions and refine subbasin modeling of surface-groundwater interactions, leading to a more robust assessment of potential impacts to ISW within the subbasin.

b. Recommendation: The Department recommends that the GSP include specific plans and timelines associated with improvements to the monitoring network that will better characterize ISW and GDEs within the subbasin. The ISW monitoring network should include paired streamflow gages and shallow monitoring wells to better characterize the volume and timing of depletions related to groundwater pumping.

5. **Comment #5** – **Projects and Management Actions** (5.2.1 Projects and Management Actions; starting page 5-4): The GSP does not include projects and management actions that relate to demand management within the subbasin.
    a. Issue: The GSP indicates that the subbasin is expected to operate within its sustainable yield with the listed projects and management actions (PMAs) to ensure that undesirable results are avoided. The identified PMAs focus primarily on supply augmentation, conjunctive use, or infrastructure improvements. Given the cost and timing challenges of implementing supply augmentation projects, if undesirable results occur within the subbasin, it may be necessary to implement additional demand management projects to produce groundwater benefits.
    b. Recommendation: The Department recommends that the GSP include provisions or plans for demand management PMAs that could be implemented on a shorter timeframe if necessary to maintain basin sustainability.

CONCLUSION

In conclusion, though the draft GSP thoughtfully identifies environmental beneficial users of groundwater and provides detailed characterization of subbasin groundwater conditions, the GSP can further refine its management criteria and analyses in relationship to GDEs and ISW to better avoid potential impacts to environmental beneficial users of groundwater. The Department recommends that the Yolo Subbasin Groundwater Agency address the above comments before GSP submission to DWR to best prepare for the following regulatory criteria for plan evaluation:

1. The assumptions, criteria, findings, and objectives, including the sustainability goal, undesirable results, minimum thresholds, measurable objectives, and interim milestones are not reasonable and/or not supported by the best available information and best available science (23 CCR § 355.4(b)(1)). (See Comment #1, 2, 3)

2. The GSP does not identify reasonable measures and schedules to eliminate data gaps. (23 CCR § 355.4(b)(2)) (See Comment #4)
3. The interests of the beneficial uses and users of groundwater in the basin, and the land uses and property interests potentially affected by the use of groundwater in the basin, have not been considered. (23 CCR § 355.4(b)(4)) (See Comment #2, 3)
4. The projects and management actions are not feasible and/or not likely to prevent undesirable results and ensure that the basin is operated within its sustainable yield. (23 CCR § 355.4(b)(5)) (See Comment #5)

Attachment B

LITERATURE CITED

Department of Fish and Wildlife. 2019. Statewide Drought Response: Stressor Monitoring.

Mann, Michael E. & Gleick, Peter H. Climate change and California drought in the 21st century. *Proceedings of the National Academy of Sciences of the United States of America. 112*(13): 3858-3859.

Comments and inputs from Capay Valley Regeneration/Capay Valley Vision on the

Public Draft
Yolo Subbasin Groundwater Agency
2022 Groundwater Sustainability Plan

Thank you very much for the opportunity to comment on the final draft of the Yolo Subbasin's Groundwater Sustainability Plan (GSPs). We congratulate you on this effort. We have seen some reviews of GSPs submitted from throughout California and the Yolo Subbasin plan appears to be a comprehensive and forward-thinking document compared to many others. Given this, the Yolo Subbasin plan has the potential to be a truly transformational plan. Our **overarching comments** on the plan, which we hope lead in that direction are below, followed by **specific comments on Chapters 1 and 2**, **and questions around the criteria of Chapter 3**.

Overarching comments:

1. Increase attention given to community input.

A hallmark of the Sustainable Groundwater Management Act (SGMA) is that local governance and development of GSPs as well as extensive public involvement is the key to achieving the statewide overarching goals by local implementations that fully accounts for differences among locales. Furthermore, local public involvement nurtures trust and ownership of GSPs so communities are more likely to follow the plans' guidance.

The YSGA made a concerted effort to present the GSP at community meetings of any group requesting them. The YSGA held at least 5 meetings in the Capay Valley Management area of the subbasin, in addition to numerous other meetings in other communities. The YSGA also made available to the public chapters of the report for comment and now has posted the entire final draft for addition comment. The willingness to listen has been exemplary, however listening has not necessarily resulted in true effect on the GSP.

We submitted many comments to the drafts of individual chapters but did not see many of them reflected in the draft final report. Many comments were made with the intent of making the plan more accessible to non-technical readers, like the general public. One UC Davis Emeritus professor from a science discipline remarked to us that documents we created to *simplify* the plan information for our Capay Valley public were much too complicated, disinviting people from reading them. Much of chapter 2 is a collection of facts, with little summary text to orient the reader in evaluating them. Thus, it is very tempting to skip over them, but they form the foundation for the plan's conclusions about sustainability and minimum thresholds.

Beyond the text of the report itself, we believe it important to acknowledge concerned input about things missing from the plan. For example, some residents of the Dunnigan Hills have expressed profound concern about the likelihood of their wells being able to continue to meet their needs with current rates of land use change to irrigated agriculture with a great acceleration of well creation. However, this is not acknowledged in the report.

2. The plan needs for dispute resolution process.
Another hallmark of SGMA is its potential to reduce the amount of litigation over groundwater rights. A process to resolve disputes is imperative to this aim as individual actions affect the amount of water available to groundwater users as a whole. The plan needs to include a framework for resolving disputes. The plan says, "the intent of the members under the JPA [joint powers agreement to create the Yolo Subbasin Groundwater Sustainability Agency] is to provide each member with the responsibility to implement SGMA and the GSP adopted by the YSGA within their respective Management Area, as delineated by this GSP (page 1-11)." Would the YSGA members within each management area possibly develop a process for resolving disputes if groundwater users perceive that activities of other users decrease their access to groundwater? Would the entire agency work to review disputes the Management Areas cannot resolve?

Such a resolution process needs to be in place very soon for the Yolo Subbasin as some areas already show signs of unsustainability, particularly the Winters and Dunnigan Hills areas designated as areas of special concern due to falling groundwater levels. Farmers in the Dunnigan Hills have urgently asked the YSGA to address falling groundwater levels as more acreage has been pressed into irrigation and more, very deep wells have been dug. Stakeholders need a way for their concerns to be meaningfully heard and accounted for.

3. More clarity is needed around the responsibility for sustainably managing the Subbasin's groundwater.

As mentioned above, page 1-11 of the draft report says, "the intent of the members under the JPA is to provide each member with the responsibility to implement SGMA and the GSP adopted by the YSGA within their respective Management Area, as delineated by this GSP." Does this mean that the YSGA itself does not have responsibility for implementing SGMA? This relationship between members and agency regarding responsibility for implementing SGMA needs to be clarified. This clarification needs to explain the status of member agencies in respect to each other for implementing SGMA: do the members need to act in concert, or may they act unilaterally? Another question is which members are part of which management areas – the ones that have been shown as part of the advisory committees for the management areas? Finally, the authority of the Agency and of the members to implement SGMA needs clarification.

4. Changes between the first published drafts and the current final draft in wells included for measuring trends in groundwater level show that more robust analysis should be done for choice and number of monitor wells used to measure minimum thresholds.

As we noted in our comments on the initial review draft for Chapter 2, Figure 2-20 based on 113 wells seemed to show that "the average groundwater level is on a declining trajectory from 2006 until today if you focus on the peaks in groundwater level. Nothing since 2006 has topped the groundwater level of that year – not even 2019 which was a very wet year that followed a very wet year in 2017. Further, the lows in 2014-15 are lower than the lows in 1991-92, even though more dry and critical years preceded 1991-92 than preceded 2014-15." However, Figure 2-20 in the current final draft does not show such trends. This changed graph is based on data from only 64 wells.

As stated in our detailed line comments below, we'd like to know why the number of wells was changed from 113 to 64, where the data comes from, and what were the criteria that changed to reduce the number of wells. Of equal or greater importance is that this change in the graph from draft to draft demonstrates the sensitivity to the conclusion for the number of wells included in an analysis. This difference raises into high relief the question of which monitoring wells to use for determining if management areas and the Subbasin have exceeded minimum thresholds for groundwater levels and storage. The plan envisions using only 8 monitoring wells per management area to assess groundwater level sustainability (about equal to the number of wells used in the data for the current final draft graph). Analysis needs to occur to show that the number and wells chosen have the best likelihood of revealing the true mean for groundwater levels each year for the Subbasin and the management areas. Also, as we commented earlier on the draft of Chapter 3, some of the monitoring wells selected for the Capay Valley management area appear to have very low points of groundwater levels suggesting problems with the data. If data from such wells will be used in measuring sustainability criteria, data anomalies need to be investigated to see if they are correct or reflect some problem in the measurement. Please refer to our comments here on Chapter 3.

5. Potential future scenarios for groundwater sustainability need to account more robustly for climate change variability. All three scenarios that the plan projects for likely groundwater sustainability into 2040 and 2070 predict that the Yolo Subbasin will have more precipitation than historically. We understand that the DWR models used show this, however as the YSGA's **Synthesis of Responses to Climate Change Comments** Reports "in the Yolo Subbasin, … we are right at the cusp of jet stream impacts. If the jet stream moves north or south in future climates, precipitation patterns could change accordingly – modeling for that future is very challenging." To be fully proactive for the possibility that the precipitation patterns could change and result in less precipitation, we urge that the plan include at least one scenario with less precipitation than experienced historically. The fact that, as the **Synthesis of Responses** states "Another important thing to note is that although we are seeing higher

precipitation values in the Yolo Subbasin in the model, less of that water is being modeled as reaching the aquifer." As we understand it, less precipitation will percolate to the aquifers because higher temperatures will lead to higher evapotranspiration. However, even less will percolate to the aquifers if there is less precipitation as the temperatures will still be high, but the precipitation will be even less.

6. Projects are very comprehensive and appreciated – the report could provide more direction for the primary directions for implementation. We are very gratified that projects we suggested for the Capay Valley are included in the draft final report. We think the ecological/biological projects we propose offer very cost effective – and groundwater effective – sustainability measures. We echo the points that Paul Muller has made in his letter on the plan. We think that the projects proposed for Capay Valley would achieve the aims Mr. Muller describes and some could be implemented Subbasin-wide to benefit groundwater sustainability.

Specific comments on Chapters 1 and 2:

1 Introduction

New comment, page number
Page 1-11.7-10
Text in final draft: The intent of the members under the JPA is to provide each member with the responsibility to implement SGMA and the GSP adopted by the YSGA within their respective Management Area, as delineated by this GSP. The members and affiliated parties worked collaboratively to develop this GSP for the Subbasin in compliance with SGMA.
for Capay Valley, who then is the "responsible" entity for implementing the plan? How does this entity exercise this responsibility?

New comment, page number
Page 1-15 Title Figure 1-3
Text in final draft: Groundwater Dependent Communities
seems that communities in the Capay Valley are all groundwater dependent, at least for domestic water. Other areas are also, although they may not have a situation similar to Davis, for example, where a centralized water agency supplies groundwater to all homes. The title should be along the lines of "Public Water Service Areas Dependent on Groundwater" so it does not seem out of sync with p 17

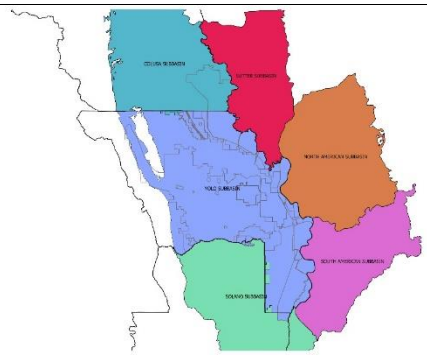
New comment, page number
Page 1-26.17-20
Text in final draft: California Resource Lab at University of California, Davis developed a Soil Agricultural Groundwater Banking Index (SAGBI) for groundwater recharge on agricultural land. As shown in Figure 1-9, approximately 20% of the subbasin has moderately good to excellent rating whereas approximately 63% of the area has poor to very poor rating.
SAGBI –It would be informative to add that the rating depends on current soil conditions, but these can be changed by human action. Suggest: Characteristics used to rate ground surface areas for SAGBI should be able to be improved for recharge by human action.

2 Basin Setting

(The comments here mostly refer to our earlier comments, Jack's 26May2021 response letter, and if we now see them resolved in the current (final) plan. Please keep in mind, we do not mean to be overly critical or nit-picking, but we've all put a lot of time into this and have provided comments that we think can clarify the plan for non-specialists; it would be valuable to respond not only to us, but to include the your valuable responses and explanations in the plan).

New comment number, page number	(in relation to old comment letter, page number)	Resolved or Not answered
a. Page 2-1	**a; page 1**	
Text in final draft	**Our earlier comment**	
The Basin setting section is made up of the hydrogeologic conceptual model; the current and historical groundwater conditions; the water budget for the Yolo Subbasin; and the description of the six Subbasin management areas. This section provides the local and regional details as context for defining reasonable sustainable management criteria and projects and management actions for the Yolo Subbasin.	It would help readers to possibly start with some social and economic context, before introducing the Hydrogeologic Conceptual Model (HCM). Information that would help to frame the information in this chapter could include: the population distribution (incorporated cities, suburban, rural), major institutions, major economic sectors, importance to the State and how these are dependent on/relate to/determine/are determined by water use and resources.	
26May2021 RESPONSE:	We tried to put a lot of the background information into Chapter 1, and we are hoping that when the entire document is synthesized, that information will be present. This information is included in Section 1.5 'Description of Plan Area'	
Current comment:	We did not find information on population, economic sectors, dependence on water use and resources in section 1.5 'Description of Plan Area'	

New comment number, page number	(in relation to old comment letter, page number)	Resolved or Not answered
b. Page 2	**b; page 2**	
Text in final draft	**Our earlier comment**	
Same Figure 2.1 as before	Is there a map of the adjacent subbasins?	
26May2021 Response	This information can be found online at DWR's SGMA data viewer, which is a great user-friendly resource: https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer#boundaries 'Bulletin 118 Groundwater Basins – 2018' shows all of the Basin boundaries. Also, we'll include a map similar to the one below in the Basin Setting to provide context	

	
Current comment:	Physical Subbasin Boundaries – this section is very clear and very much appreciated. It would be good to include this map and information in the plan; the map sent in the response document is not in the current draft.

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New comment number, page number	(in relation to old comment letter, page number)	Resolved or Not answered
c. Page 2-5	**c; page 2**	
Text in final draft	**Our earlier comment**	
2.1.3 Principal Aquifers and Aquitards	Could the text provide definitions of "aquifer" and "aquitard," in addition to why we care about aquifer locations for the GSP? It would help us non-technical people interpret the rest of the section better.	
26May2021 Response	Yes, these should be defined - we are working with the consultants to incorporate a SGMA definition of aquifer and aquitard. In general, the aquifer is the medium in which groundwater can occupy. An aquitard is a geologic feature that restricts the flow of groundwater from one aquifer to another.	
Current comment:	We did not find these definitions in the current draft	

New comment number, page number	(in relation to old comment letter, page number)	Resolved or Not answered
d. Page 6	**d; page 2-7**	
Text in final draft	**Our earlier comment**	
2.1.3.1 Shallow Zone The shallow zone extends from the surface to a depth of about 220 feet below ground surface (bgs) and consists predominantly of alluvium as well as the upper portion of the	Given that most of the wells- including monitoring wells – in Capay Valley are far more shallow than the 220 depth of shallow wells, would it not make sense to elaborate more on this zone, and something of shallow wells and their production- typically quite low, not at all 1500 to 100 gpm as mentioned in the text. The	

<table>
<tr>
<td>Tehama Formation. The deposits consist of thick sand and gravel deposits within a mile or two of the major sediment sources of Cache and Putah Creeks. The coarse beds appear to thin laterally from the present stream channels with thinner distributary channel, and sheet flood sand deposits occurring under the more distal alluvial plains. Well yields can be relatively high where thick channel deposits are encountered with yields of several hundred to 1,500 gallons per minute (gpm). Specific capacities range up to 100 gpm per foot of drawdown or greater in this setting. More modest production (e.g., up to 500 gpm yields) likely results from wells constructed in thin sandsthat are more distant from stream channels and have lower specific capacities. Wells completed in even just a fewthin sand beds produce sufficient quantities for domestic use.</td>
<td>report states that “Wells completed in even just a few thin sand beds produce sufficient quantities for domestic use.”. Is there any further information on the sustainability of shallow, sand-bed based wells, and what is considered sufficient for domestic use?

We linked this with the data provided later in this earlier draft (but not repeated in the August draft), that

“The CASGEM network includes 145 wells, including 144 active wells and one well with data through October 2013. Total depth is known for 126 CASGEM wells (87%), including 56 wells in the Shallow Zone, 63 wells in the Intermediate Zone, and seven wells in the Deep Zone. The average depths of these three groups of wells is 118 feet, 359 feet, and 739 feet, respectively.”</td>
</tr>
<tr>
<td>26May2021 Response</td>
<td rowspan="2">We have information on well depths in the Capay Valley, although they are not currently included in this GSP – they can be viewed using the WRID. The table below shows the total well depths of the representative wells for Capay Valley. The distribution of these representative wells is similar to the total distribution of all wells in the Capay Valley MA.

<table>
<tr><th>State Well Number</th><th>Total Well Depth</th></tr>
<tr><td>10N02W16R001M</td><td>Unknown</td></tr>
<tr><td>10N02W18F001M</td><td>Unknown</td></tr>
<tr><td>10N03W02R002M</td><td>55</td></tr>
<tr><td>11N03W09Q001M</td><td>55</td></tr>
<tr><td>11N03W23L001M</td><td>66</td></tr>
<tr><td>11N03W23N001M</td><td>136</td></tr>
<tr><td>11N03W33F001M</td><td>75</td></tr>
<tr><td>12N03W20D001M</td><td>26</td></tr>
<tr><td>11N03W35D003M</td><td>152</td></tr>
<tr><td>10N03W24B002M</td><td>207</td></tr>
</table>

Wells in the shallow zone are between 0 and 220 feet in total depth. The average depth of the shallow wells is 118 feet.</td>
</tr>
<tr>
<td></td>
</tr>
</table>

Current comment:	Our conclusion, suggestion was that we think a very shallow well category is needed – this was not taken up.

New comment number, page number	(in relation to old comment letter, page number)	Resolved or Not answered
e. Page 2-7	**e; page7**	
Text in final draft	**Our earlier comment**	
Specific capacities for wells completed in the intermediate zone are comparatively lower than those for the shallow zone. Intermediate zone wells in the western alluvial plain likely have poor to low yields due to the lack of sand beds, in comparison to wells in the eastern alluvial plain. However, thick sand beds are less prevalent in the intermediate zone than the shallow zone	This seemed surprising, that "Specific capacities for wells completed in the intermediate zone are comparatively lower than those for the shallow zone". Can you provide insight as to why so many people drilling deeper wells?	
26May2021 Response	Specific Capacity is the volume of water discharged from a pump divided by the change in depth to water of the well. When comparing two wells in the same location with similar properties, but different depths, the deeper well will have higher discharge (more water) but will also have a larger change in depth to water. $S_c = \frac{Q}{h_0 - h}$ That means that the specific capacity will be lower for the well.	
Current comment:	Thank you for this explanation, though maybe not finished.- "That means that the specific capacity will be lower for the well"- do you mean deeper well? We actually have more questions, on this point: Why would the deeper well have higher discharge? And, does it really mean "deeper" or with the greatest change in depth to water (presumably h0-h denotes this. And the real question here for readers, is what is the implication of the intermediate wells having lower specific capacity. This response implies that it is nearly tautological that the intermediate zone wells will have lower specific capacity than the shallow zone wells because they are deeper, so what is the point of even mentioning it.	

New comment number, page number	(in relation to old comment letter, page number)	Resolved or Not answered
f. 2-8, re Table 2.1	**f; page 8**	
Text in final draft	**Our earlier comment**	
See table.	This table seems to imply that the capacity of major aquifers in the subbasin have been identified. Is this correct? But then, there is only information on transmissivity for Capay Valley, not Storage Coefficient. Why is this? We see that on [Page 9] the Storage Coefficient (S): (defined as: Volume of water that is released from or takes into storage per unit surface area per unit change in water level (head); would this not be an l parameter/monitoring point for Capay Valley? Perhaps this is provided in Table 2-2…why not in Table 2.1?	
26May2021 Response	Capacity/storage of the major aquifers has been modeled. Transmissivity is the hydraulic conductivity*saturated thickness. So if you have transmissivity, and saturated thickness (depth to water) you can calculate hydraulic conductivity. Table 2-1 and Table 2-2 are from different sources. It looks like the Table titles may be incorrect. Table 2-2 should be (RMC, 2016). The hydcaulic conductivity, storage coefficients that are used in the YSGA model for Capay Valley come from the 2016 Capay Valley IGSM report from RMC Water and Environment (formerly WRIME).	
Current comment:	Not sure we totally understand the response, except that the values have been modeled.	

New comment number, page number	(in relation to old comment letter, page number)	Resolved or Not answered
g. page 2-9,	**g; page 10**	
Text in final draft	**Our earlier comment**	
However, wells are not typically installed (screens) in the fine-grained layers so hydraulic properties have not been measured directly.		
Current comment:	Small typographic error in earlier text now corrected	

New comment number, page number	(in relation to old comment letter, page number)	Resolved or Not answered
h. p. 2-9	**h; pages 8-11**	
Text in final draft	**Our earlier comment**	
2.1.3.4 Aquifer Properties	**Aquifer Properties** is full of interesting information but what specifically does it portend for sustainable groundwater management? A summary at the end of such sections would be very helpful	
26May2021 Response	Yes, the importance of this information should be explained.	
Current comment:	We did not see this suggestion taken up	

New comment number, page number	(in relation to old comment letter, page number)	Resolved or Not answered
i. p. 2-10	**i; page 15**	
Text in final draft	**Our earlier comment**	

2.1.3.4 Topography	Equally for **2.1.4 Topography,** could there be an introductory paragraph that explains the relationship between aquifers and geology, assuming there is one. If there is not a relationship, then maybe the paragraph could explain why understanding the geology is important to groundwater planning. A concluding paragraph to the geology section could sum up what the geologic discussion tells us about Yolo Subbasin groundwater and groundwater planning.	
26May2021 Response	Storage, transmissivity, hydraulic conductivity are all aquifer properties that are determined by geology. The aquifer refers to the subsurface geology – it can contain water but doesn't necessarily have to.	
Current comment:	Interesting explanation, but we don't ask only for ourselves, our suggestion was that it would help the non-technical reader to have this in the report. We didn't see it there.	
New comment number, page number	**(in relation to old comment letter, page number)**	Resolved or Not answered
j. 2-21 to 2-29	**j; page 21-23**	
Text in final draft	**Our earlier comment**	
Figures 2-7, 2-8 and 2-9	The cross-sections are really cool!	

New comment number, page number	**(in relation to old comment letter, page number)**	Resolved or

		Not answered
k. Page 2-29	**k; page 28-30**	
Text in final draft	**Our earlier comment**	
2.1.5.3 Soils Information on soils within the Yolo Subbasin were obtained from the Soil Survey Geographic Database (SSURGO) of the Natural Resources Conservation Service (NRCS). The SSURGO data included two categories of information relevant to the GSP: taxonomic soil orders and hydrologic soil groups. Taxonomic data include general characteristics of a soil and the processes of formation while hydrologic data relate to the soil's ability to transmit water under saturated conditions and is an important consideration for hydrology and groundwater recharge. In addition, the Soil Agricultural Groundwater Banking Index (SAGBI) was developed by the University of California at Davis and provides a rating of suitability of the soils for groundwater recharge. SAGBI is based on the hydrologic soil groups but includes considerations for topography, soil surface conditions, and chemical limitations. The following section describes the soils of Yolo Subbasin.	The paragraph under 2.1.5.3 is an example of explaining the kind of context/introduction to sections that help the reader understand the material that comes afterwards. The paragraph did a great job at explaining relationship between soils and groundwater planning. It really helped us in understanding the rest of the section.	

New comment number, page number	**(in relation to old comment letter, page number)**	Resolved or Not answered
l. Page 2-29	**l; pages 28-30**	(not completely resolved)
Text in final draft	**Our earlier comment**	
Section on **Soil Agricultural Groundwater Banking Index**	Is there a map of the location of the different hydrologic soil groups and of the SAGBI distributions? (noting that portions of Capay Valley have not been mapped as explained on page 30: "SAGBI values are not available for over half of the areas within the Capay Valley MA and Dunnigan Hills MA." But are the values, and maps available for those that have data?	
26May2021 Response	Yes, this is included on page 30 of the Introduction Chapter. It can also be viewed here (SAGBI map): https://casoilresource.lawr.ucdavis.edu/sagbi/	
Current comment:	Indeed, Figure 1-9 appear to show pretty good coverage in the Valley proper-just not in the far upland hills, which is logical.	

	Could this not be noted, and reference to the map made here in Chapter 2? Also, It would be informative to add that the rating depends on current soil conditions, but these can be changed by human action.

New comment number, page number	(in relation to old comment letter, page number)	Resolved or Not answered
m. Page 2	**m; page 30**	(not completely resolved)
Text in final draft	**Our earlier comment**	
Table 2-6	Yay that 46% of CV has excellent to moderately good SAGBI. Interesting that this is the highest percent of good and above SAGBI of any management area, even though run-off potential for the MA is fairly high according to table 2-6. Could any interpretation be provided to explain, hypothesize why this is so?	
26May2021 Response	The runoff data comes from the NRCS, which has soils data for the entire 'Capay Valley' area within the Yolo Subbasin – including the steep terrain and hilly rangelands. The SAGBI map has less spatial coverage in the Capay Valley.	
Current comment:	This makes sense, but we don't ask just for ourselves; this explanation would help others to understand. A further comment: There is a strange ordering to this table, From Excellent to good etc. to very poor, and then the last two rows are summaries of groupings of rows above, but this is not clear…they should be set off or placed appropriately to show this. It is important for Capay Valley, as it shows the highest potential for recharge in all the subbasin.	

New comment number, page number	(in relation to old comment letter, page number)	Resolved or Not answered
n. Page 2-30 to 2-31	**n; page 31**	
Text in final draft	**Our earlier comment**	
Section 2.1.6- text remains the same and has not been elaborated upon in the current draft	Is it correct to conclude from the following quotes that slowing Cache Creek could likely have recharge benefits into the subbasin beyond the Capay Valley	

	Management Area? “Recharge to the intermediate zone occurs generally through precipitation recharge at outcrop areas and by interconnection” and “leakage from the overlying shallow zone, including possibly from the Sacramento River, Cache Creek, and Putah Creek via the shallow alluvium.” “Recharge to the deep zone beneath the eastern alluvial plain is believed to be from leakage from overlying aquifers, probably sourced from Sacramento River and Cache Creek to the north. The western alluvial plain deep zone is probably recharged from the overlying units and Tehama Formation outcrops to the west, especially those units associated with Cache and Putah Creeks. The deep zone is an increasingly confined system due to the presence of extensive overlying clay units and its overall depth.”
26May2021 Response	In general, the longer that water remains in the Cache Creek watershed, the more water will percolate into the shallow aquifer. There may be opportunities to increase retention time during storm runoff events, thus increasing deep percolation. We could look at some of the model outputs to see what the exchanges are between the Capay Valley MA and the Central Yolo MA. The boundary that is shared by the Capay Valley MA and the Central Yolo MA is relatively small, so there is likely not a lot of groundwater exchange between these two MAs.
Current comment:	It seems our question- “Is it correct to conclude from the following quotes that slowing Cache Creek could likely have recharge benefits into the subbasin beyond the Capay Valley Management Area?” would need more analysis, and is likely to be small…nonetheless, Still not certain about if Capay recharge would help the Yolo Subbasin generally. 9-10 recharge to the shallow zone occurs from infiltration along Cache and Putah Creeks. Aquifers and bodies are probably weakly connected to sand bodies surrounding major streams. Additional recharge likely occurs by deep percolation of precipitation and irrigation. The shallow zone is probably unconfined. Etc.

New comment number, page number	(in relation to old comment letter, page number)	Resolved or Not answered
o. Page 2-30 to 2-31	**o; page 31**	
Text in final draft	**Our earlier comment**	
Precipitation and runoff strongly influence local hydrology. According to Scott and Scalmanini (1975) precipitation occurs in cyclonic storm fronts where most of the rainfall occurs during 6 to 12-hour periods. Topographic characteristics result in high percentages of runoff from the mountains and foothills and the potential for flooding.	Is it correct to conclude from the following quotes that slowing down Cache Creek and tributaries could reduce flooding? "Precipitation and runoff strongly influence local hydrology. According to Scott and Scalmanini (1975) precipitation occurs in cyclonic storm fronts where most of the rainfall occurs during 6 to 12-hour periods. Topographic characteristics result in high percentages of runoff from the mountains and foothills and the potential for flooding."	
26May2021 Response	'Slowing'Cache Creek by changing the rainfall-runoff relationship seems to make sense: https://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17752.wba This would decrease 'peak' flows reaching Cache Creek, increase the width of the hydrographs, and may decrease the total amount of surface runoff reaching Cache Creek.	
Current comment:	Thank you for this explanation	

New comment number, page number	(in relation to old comment letter, page number)	Resolved or Not answered
p. Page 2-32	**p. page 32**	
Text in final draft	**Our earlier comment**	
Text has been corrected	small correction- "Diversions from Sacramento River water are not considered importation because the Sacramento River flow along" should be "Diversions from Sacramento River water are not considered importation because the Sacramento River flows along"	

New comment, page number
Page 2-32: 13
Text in final draft: 2.1.10 Water Rights A water right is a legal entitlement authorizing water to be diverted from a specified source and put to beneficial use. Based on the State Water Resources Control Board (SWRCB) water rights database, there are approximately 243 water right holders in the Yolo Subbasin. Figure 2-14 shows the active points of diversion in the Yolo Subbasin.
Our question: Water rights – does this apply only to rights for surface water?

New comment, page number

Page 2-32: 18
Text in final draft: 2.1.11 Data Gaps in the Hydrogeologic Conceptual Model
Our comment: Data gaps about aquifer connectivity – Excellent. More data on interdependence (and lack of it) of aquifers is very welcome!

New comment number, page number	(in relation to old comment letter, page number)	Resolved or Not answered
q. Page 2-34	**q; page 37**	
Text in final draft	**Our earlier comment**	
The freshwater aquifer system in the Yolo Subbasin includes the shallow alluvium and upper Tehama Formation, which together have been divided into the shallow, intermediate and deep zones.	our question was: In the end are you identifying just two main 2 aquifers each with 3 zones? Is there then at least some rough numbers of their locations and capacities?	
26May2021 Response	The Yolo Subbasin, in general is broken up into three zones: - The shallow zone is from 0 – 220' below ground surface - The intermediate zone is from 220' to 600' - The intermediate zone is from 600' to 1500'. This is a broad characterization of the entire Yolo Subbasin aquifer that water is drawn from. This characterization may not perfectly describe areas within the basin, but this delineation was chosen to best characterize the subbasin as a whole.	
Current comment:	Okay, three zones in essentially one aquifer.	

New comment number, page number	(in relation to old comment letter, page number)	Resolved or Not answered
r. Page 2-34	**r; pages 38-39**	
Text in final draft	**Our earlier comment**	
Referring to previous tables, no longer in current draft	The numbers in tables 2-7 to 2-9 are not clear. I took the numbers to be the number of wells monitored in each period, but this did not make sense when these numbers were summed to show total wells. So I think the numbers must mean "new wells added in each time period" but I'm not 100% sure. A description of the meaning of the numbers would resolve the uncertainty.	

26May2021 Response	Max has re-written this section to describe the existing monitoring program more accurately and succinctly.
Current comment:	These tables, giving numbers and depths of groundwater monitoring wells over time in the CASGEM and WRID networks, have been removed from the draft- yet they were among the most interesting to us and the question above still remains- we'd like to see these numbers and understand better what they mean in terms of overall groundwater monitoring networks in place. Perhaps this is found in later chapters, but it would be most useful here.

New comment, page number
Page 2-42
Text in final draft: bullet points on page 2-42
Our comment: All bullet points say "depth to groundwater increased." These references need to include information on relative to what. The language in line 31 "Depths to groundwater recovered between 1978 and 1984" shows an effective way to describe what is happening. Possibly this section could say throughout, after depths to groundwater fell….

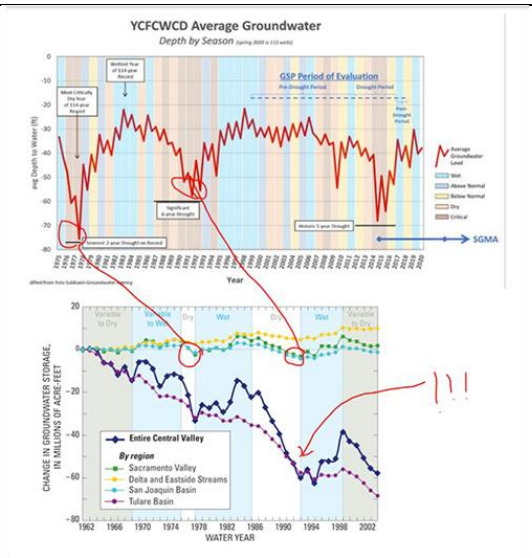
New comment number, page number	**(in relation to old comment letter, page number)**	Resolved or Not answered
s. Page 2-43 to 2-49	**s; pages 40-47**	
Text in final draft	**Our earlier comment**	
Referring to Figures 15-20	Figures 2-15 to 2-19 could be more transparent in labeling the data sources. 2-15, 2-16, and 2-19 say the SGMA data viewer. Page 38 says: "Groundwater levels have been measured at numerous wells in the Yolo Subbasin for the last 90 years, starting the early 1930s. These data are available from the California Statewide Groundwater Elevation Monitoring (CASGEM) program and the Yolo County Water Resources Information Database (WRID), as well as the DWR SGMA Data Viewer2, and various historical reports, including groundwater management plans." Does this mean that the Data Viewer has the data from all the preceding sources in the sentence (CASGEM and WRID)? Do CASGEM and WRID all have the same data? If the sentence could be clarified, it would help. Figures 2-17 and 2-18 show representative monitoring wells,	

	but do not say the data is from these wells. Maybe it seems that this would be obvious, but it might not hurt to say the data is from these wells if it is so. Figure 2-20 says the data is from 113 wells – are these wells all in WRID? Does WRID comprise these wells ONLY. Maybe a Venn type diagram of the various data sets would help make it clearer.
26May2021 Response	The underlying data in all of these figures is the same. The biggest difference is that some of the databases are updated more often. Wells that are not entered into the WRID by YCFCWCD/YSGA but have data collected by the state are entered into CASGEM & WDL & SGMA Data viewer. For example, when YCFCWCD collects data from their wells, it is immediately uploaded to the WRID. Then, YCFCWCD submits the data to CASGEM. CASGEM and the WDL will post the data shortly after that is done. Figure 2-15, Figure 2-16, Figure 2-17, Figure 2-18, and Figure 2-19 all come from the SGMA Data Viewer. Figure 2-17 will be updated to include the data source. We are working to coordinate databases. For CASGEM wells – a subset of the WRID – CASGEM and the WRID have the same data. There are wells in the WDL (Water Data Library) that have more recent data than the WRID. The wells that are displayed in these maps have long periods of record. This section is currently being revised.
Current comment:	Not sure this was resolved. Sources of data for tables were given as: Figure 2-15 SGMA data viewer Figure 2-16 SGMA data viewer Figure 2-17 no source given Figure 2-18 SGMA data viewer Figure 2-19 SGMA data viewer Your explanation above helps to understand data sources and what you mean by SGMA data, but we don't ask just for ourselves, this would be helpful for all readers.

	Figures 2-17 and 2-20 gives no source,- yet the data for Figure 2-20 is critical to the whole plan. More general comment (seeking greater understanding) is that we think The data are unlikely to be the same. Does this mean that the *wells* are all the same, but there are differences among the CASGEM, WRID, etc., in how recent the data for each well is? If this is so, then all the sets of wells should have the same number of wells, but I don't think they do. Once this is clear, there may be more questions.

New comment number, page number	**(in relation to old comment letter, page number)**	Resolved or Not answered
t. Page 2-49	**t; page 48**	
Text in final draft	**Our earlier comment**	
This sentence in the earlier draft: "The subset of 113 wells shown in **Figure 2-20** capture YCFCWCD's wells with a current water level measurement and a long data record. The YCFCWCD provides this bi-annual summary of this hydrograph to illustrate the state of the central-western portion of the Yolo Subbasin." Has been changed to: "The 64 wells shown in Figure 2-20 capture a subset of wells in the subbasin with a current water level measurement and a long data record."	We had previously asked: How do the WRID's 113 wells relate to the other wells discussed earlier? But now, the new Figure 2-20 does not give the source of data, and is somewhat similar to the earlier draft Figure 2-20 but with much higher low points, and other differences- can we understand why this has changed? The earlier graph showed, as we mentioned that "the average groundwater level is on a declining trajectory from 2006 until today if you focus on the peaks in groundwater level. The new graph does not show this…Also, as we had mentioned in the earlier graph the lows in 2014-15 are lower than the lows in 1991-92, even though more dry and critical years preceded 1991-92 than preceded 2014-15., yet the new graph also does not indicate such a trend.	
26May2021 Response	Max has substantially revised this section of Chapter 2 to make it easier to read and understand. The revisions that are made here may also help clarify comment q. There are 4,854 total wells in the WRID. They do not all have depth to water data. Certainly, these wells are important, and many of these wells will still be used to understand groundwater levels in the Yolo Subbasin. The 113 wells that you are referring to (Figure 2-20) in the WRID have long	

	periods of record and are monitored twice yearly by YCFCWCD. These wells do not have the same spatial extent as all of the wells in the Yolo Subbasin, as they are generally within the YCFCWCD service area. Your viewing permissions in the WRID may need to be changed, so you can see the 'All Wells' layer. Further response (and graphic): Thank you for the feedback. Figure 2-20 on page 48 is one of our most important figures in the entire GSP document. There are many details and caveats that probably deserve more explanation in the text. 1. The first detail is that this hydrograph is an average of more than 100 wells representing more than 200,000 acres and only in the YCFC&WCD service area, not the entire subbasin. The general patterns seen in this average hydrograph may not represent smaller sub areas within the YCFC&WCD service area. For smaller areas, the water balances by Management Area and YSGA Entity will give a better picture. 2. The second detail is probably a question of scale. This hydrograph actually shows amazing stability of groundwater levels and significant and complete recovery after 3 different drought cycles ('77, '91, and '14). The 2019 high is only 10 feet lower than the 1998 high, and only 5 feet lower than the 2006 high. A change of 5 or 10 feet off the maximum should be compared to other basins to the south, where groundwater level drops of hundreds of feet occur. For example, Page 77 in https://pubs.**usgs**.gov/pp/1401a/report.pdf. Check out the Tulare Basin.

	
Current comment:	Our original concern with the original Figure 2-20 graph was that we saw it as documenting that "the average groundwater level is on a declining trajectory from 2006 until today if you focus on the peaks in groundwater level. Nothing since 2006 has topped the groundwater level of that year – not even 2019 which was a very wet year that followed a very wet year in 2017. Further, the lows in 2014-15 are lower than the lows in 1991-92, even though more dry and critical years preceded 1991-92 than preceded 2014-15. The NEW figure 2-20 and text does not answer these questions, but instead, with less wells, attenuates these perceived trends. We'd like to know why the data was changed from 113 to 64, where the data comes from, and what were the criteria that changed to reduce the number of wells. It may be normal to throw out outliers, but in general, more data leads to more statistically reliable results…and the whole plan hinges on this data. Note that few if any non-technical people will consult the WRID database, the plan should not require that to understand what is proposed. The explanation provided in the 26 May 2021 response still refers to "more than 100 wells". We appreciate the note about scale, but remain convinced that we need to look at any

	downward heading trends in our subbasin; Tulare and San Joaquin did not do this.

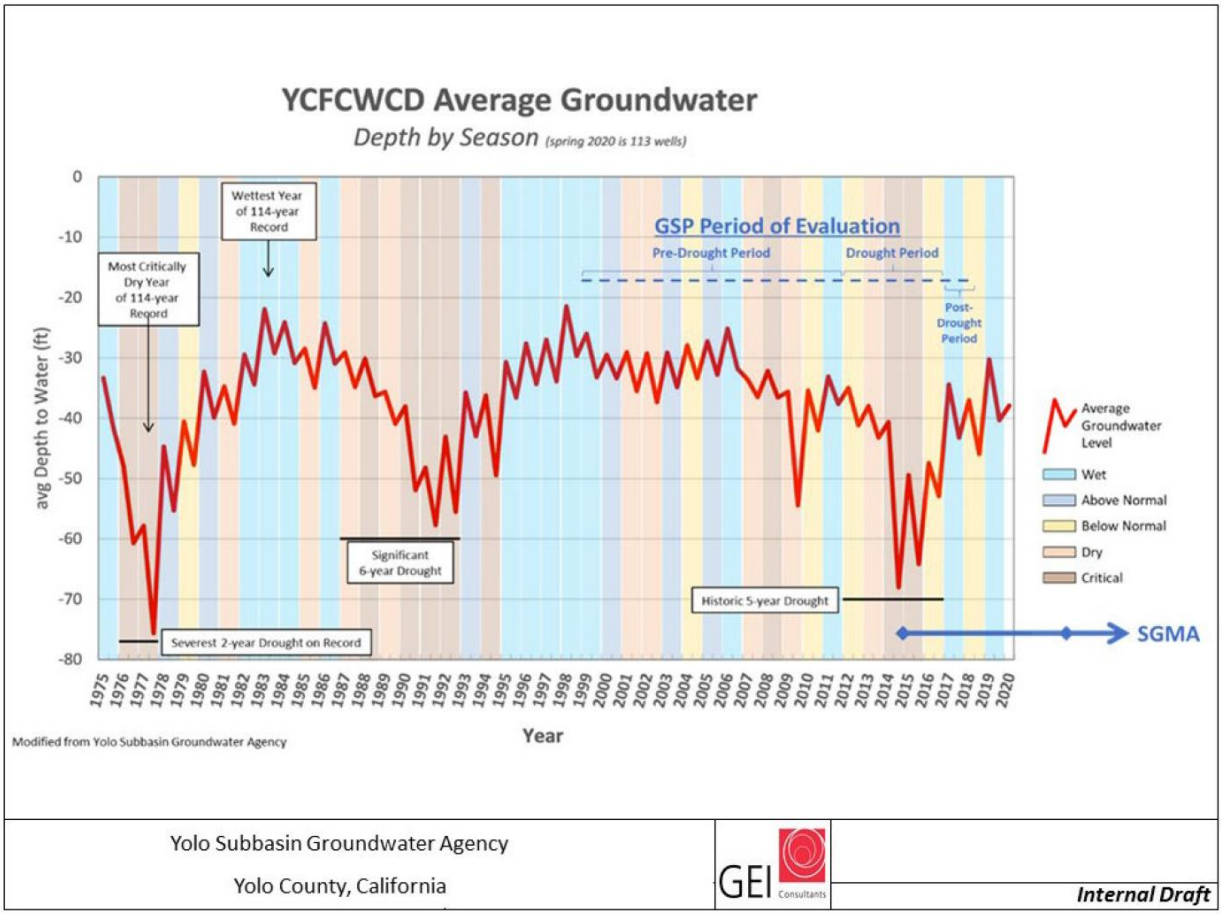


Figure 2-20. Historical Average Depth to Groundwater in YCFCWCD Service Area.

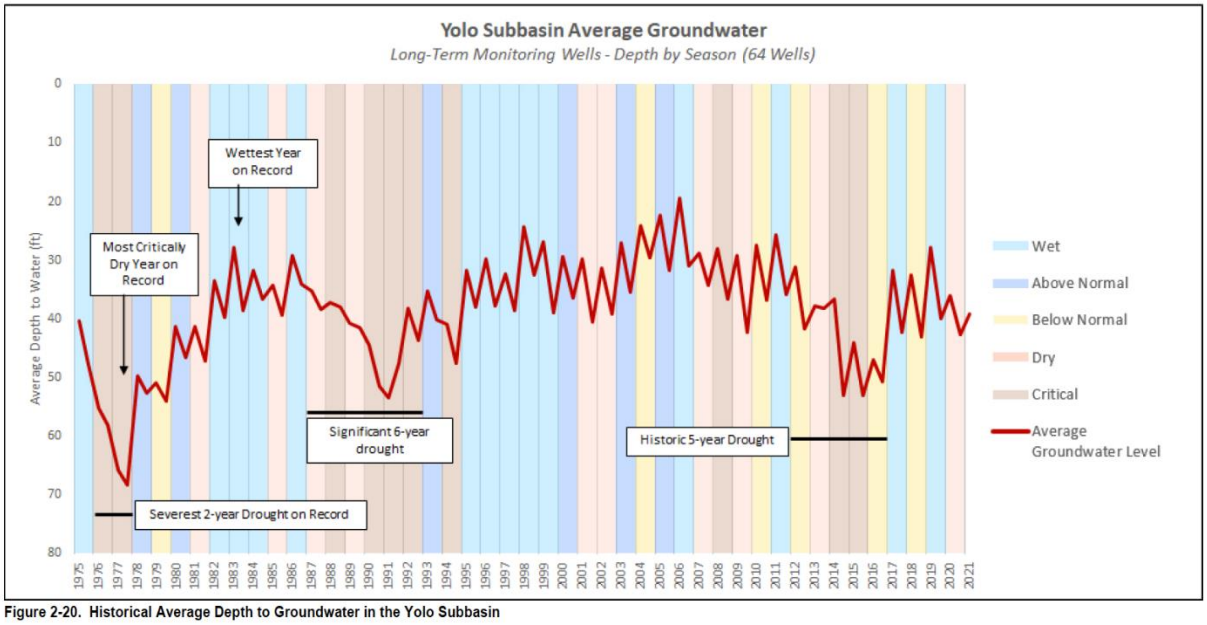


Figure 2-20. Historical Average Depth to Groundwater in the Yolo Subbasin

New comment number, page number	(in relation to old comment letter, page number)	Resolved or Not answered
u. Page 50	**u; page 50**	
Text in final draft	**Our earlier comment**	
Future years are expected to be variable and possibly more extreme which will require vigilant attention to hydrologic conditions and a flexible management plan for surface water and groundwater.	We noted that this observation is relevant in light of our later comments on climate change, and how climate change is addressed in the plan, and scenarios	
Current comment:	Not sure this has been addressed	

New comment, page number
Page 2-50
Text in final draft: section 2.2.1.3 – Vertical Groundwater Gradients
Our comment: The value of this information is not clear. Intuitively, vertical gradients should be significant to a GSP, but the hydrographs and text do not give a good sense of what this actually tells us about groundwater sustainability.

New comment number, page number	(in relation to old comment letter, page number)	Resolved or Not answered
v. Page 50	**v; page 54**	
Text in final draft	**Our earlier comment**	
Sentence removed in new text	Is the following sentence "In addition, this model encompassed the old subbasin boundary, which included an area almost half of the current subbasin boundary" meant to express that the old model covered an area smaller than the current Subbasin? If so, do you think the sentence might be clearer stated as "In addition, this model encompassed only the original subbasin which included only about half the area of the current Yolo Subbasin"?	
Current comment:	resolved	

New comment number, page number	(in relation to old comment letter, page number)	Resolved or Not answered
w. Page 50	**w; page 55**	(not completely resolved)
Text in final draft	**Our earlier comment**	
While the change in groundwater storage in the Yolo Subbasin is generally positive and a substantial loss of storage cannot be seen over this period, the 2012 to 2016 drought showed a large decline in storage of nearly 400,000 acre-feet, similar to the drought of the late 1970's.	Figure 2-23 on groundwater storage change following the pattern of groundwater levels – shows a declining trajectory since 2006. The wet years of 2017 and 2019 did not return storage volumes even to 2011 level. In fact, the	

Change in storage increased to a positive value during 2017 due to a wet year, but then started decreasing again due to a below normal 2018. This illustration shows that the Subbasin responds quickly to variable recharge and pumping conditions.	decline trajectory is longer for storage than for groundwater level. Storage has declined since 1998, rising in 2006 compared to the years before it but not nearly as high as 1998, only to decline again until a small rise in the years 2011 and 12 before declining precipitously until the wet year of 2017. The dry year of 2018 immediately brought the storage area down to a level only seen in 1977. While 2019 was wet, 2020 and 21 have been noticeably dry, likely reducing groundwater storage to very low levels. Given this, the following edits to the conclusion for the groundwater storage section might be appropriate: While the change in groundwater storage in the Yolo Subbasin is generally positive and a substantial loss of storage cannot be seen over this period, the 2012 to 2016 drought showed a large decline in storage of nearly 400,000 acre-feet, similar to the drought of the late 1970's. Change in storage increased to a positive value during 2017 due to a wet year, but then started decreasing again due to a below normal 2018. This illustration shows that the while the Subbasin responds quickly to variable recharge and pumping conditions", the years since 2006 may suggest a declining trend in groundwater storage that demands careful attention to monitoring and management. [Note: we believe this comment is accurate even though I treated it as showing groundwater storage rather than cumulative change in groundwater storage. We are thinking the line graphs of both would have the same shape. If this is wrong, we will need some help understanding the graphs on cumulative change in storage. Finally, if graphs of both would have the same shape, what is the advantage to showing cumulative change over storage volumes?]

26May2021 Response	You are correct, cumulative change and storage volume will have the same shaped curves when plotted vs time. The advantage of cumulative change is that you can compare it to volume at time = 0 (1971) more easily. Figure 2-23 shows change in groundwater storage as calculated by a groundwater simulation model. The model is calibrated to actual measured groundwater, but it does have some assumptions that may make it more or less accurate. However, it is the best estimate we have for the overall changes in storage of the Yolo sub-basin. (Figure 2-20 only represents the YCFCWCD service area and shows actual groundwater level measurements.) The total storage (not change of storage) of the basin has been estimated at 13 million acre feet. So, on a percentage basis, the final year in Figure 2-23 shows a 'loss' since 1975 of less than 1.5%, while the maximum 'loss' in 1977 is around 3%. On a basin-wide scale, the Yolo sub-basin is doing great. Smaller, more localized areas may have concerns, such as the area around Winters, Yolo-Zamora, and near the Dunnigan Hills. At even smaller scale, some wells in the County are located in very specific perched or confined aquifers. These perched or confined aquifers may not recharge as quickly as other areas and will not sustainably produce water at certain pumping levels. In Yolo County, this tends to occur more often near hilly areas.
Current comment:	Thank you for the explanation; we feel this is a trend that merits a close watch, and the explanation would be helpful within the plan, not just to us.

New comment number, page number	**(in relation to old comment letter, page number)**	Resolved or Not answered
x. Page 50	**x; page 54**	
Text in final draft	**Our earlier comment**	
Groundwater quality monitoring and reporting is conducted through numerous public agencies. The following sections provide a summary of databases, programs and agencies that actively collect groundwater data, information on where the data is stored, and how it was used in the Basin Setting.	This section on monitoring existing water quality could be more easily understood by lay readers such as myself with a summary in the introductory paragraph about which data you use and for what. As an example of what I mean, one way to do this is to follow the last sentence in the intro	

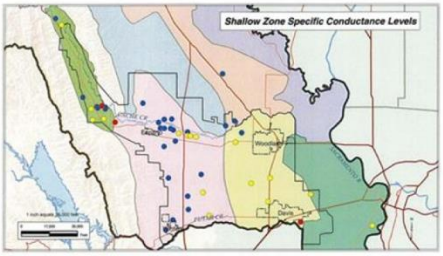
	paragraph with something like: "For constructing this plan, the YSGA used data from X, Y and Z. We used X because it gave us data about yada, yada, yada. Y provides data about yada, yada. The Y dataset complements the X data set because it has AAA that X data doesn't have…" …and so on. (a table might do this effectively with columns for Name of the data set, Agency, Data Description, Why necessary). But at the end of the day, we would want to know how water quality is being monitored, and in what form it will be made available and understandable to the general public.
26May2021 Response	Yes, this section on water quality could be improved by adding some context, we will work with the consultants to make sure this is addressed.
Current comment:	We did not see that this suggestion was taken up; we understand the YSGA is not going to undertake this monitoring itself, but will it not report on as done by different agencies, and make trends available to the public in one place?

New comment number, page number	**(in relation to old comment letter, page number)**	Resolved or Not answered
y. Page 50	**y; page 57**	(not completely resolved)
Text in final draft	**Our earlier comment**	
While ILRP allows for compliance of their regulatory program through coalitions that cover a broad, non-contiguous area based on similar land use, SGMA and CV-SALTS will both require management areas/zones to be contiguous areas regardless of land use. In January 2022, domestic wells on lands enrolled in the ILRP will require testing.	Does this mean that all land within the Yolo Subbasin then falls in the management plan, for both groundwater management and nitrate/quality? Does this then include domestic wells?	
26May2021 Response	The grammatical errors in this sentence were dixed, hopefully it will make more sense with the new wording. Under the YSGA, the entire subbasin will need to be sustainable in terms of groundwater quality and nitrates – this includes domestic wells. The ILRP and CV-SALTS programs are mentioned here as other programs that monitor groundwater	

	quality. The implication is that the YSGA may need to expand/find additional sources of groundwater quality data in some of the areas that ILRP does not currently cover.
Current comment:	Typo corrected; not sure the questions have been answered (though sentence on domestic wells was added). The explanation in the response would be helpful in the draft plan itself.

New comment number, page number	**(in relation to old comment letter, page number)**	Resolved or Not answered
z. Page 2-59	**z; page 60**	
Text in final draft	**Our earlier comment**	
In relation to the Department of Pesticide Regulation	Has the YSGA considered pesticide contamination of groundwater and used the Department of Pesticide Regulation data or any other data to evaluate if pesticides (including herbicides and fungicides) have contaminated Yolo Subbasin groundwater?	
26May2021 Response	Sustainable Management Criteria for water quality are currently in development. This information will be included in Chapter 3.	
Current comment:	Thanks for covering some of the organo chemical programs. Also for .27 Department of Pesticide Regulation coverage.	

New comment number, page number	**(in relation to old comment letter, page number)**	Resolved or Not answered
aa. Page 2-65	**aa; page 66**	
Text in final draft	**Our earlier comment**	
In the shallow groundwater zone, TDS is high (>1000 milligrams per liter [mg/l] or ppm) across a large portion of the eastern Subbasin, overlying West Sacramento, Davis, and Woodland. TDS values are also elevated in the Capay Valley. TDS is generally lower in the deeper groundwater zone, though patches of elevated TDS are present near Madison and north of Woodland, and concentrations in Capay Valley are uniformly above 500 mg/l.	This text and Figure 2.25 suggests (red dots) that this has been identified- some time ago- as a problem in lower portions of upper Cache Creek, within Capay Valley, and in Davis. Are they themselves flagging this as a problem?	

	
26May2021 Response	The minimum thresholds and measurable objectives for water quality are still under development for water quality in the Yolo Subbasin. Concerns about specific constituent water quality parameters should be addressed there.
Current comment:	Thank you for this explanation

New comment number, page number	**(in relation to old comment letter, page number)**	Resolved or Not answered
bb. Page 2-65	**bb; page 65**	(not completely resolved)
Text in final draft	**Our earlier comment**	
2.2.4.4 Water Quality Evaluation	Should the fact that many rural residents use private wells since no water system is available be mentioned under Water Quality Evaluation as well as the steps were taken to address private wells – or the rationale for not addressing them? Water quality in such wells, used for domestic purposes, is an important issue.	
26May2021 Response	Domestic wells will be considered under sustainable management criteria for water quality in the Yolo Subbasin.	
Current comment:	It would useful to provide this clarity, in this section, not just to us.	

New comment number, page number	**(in relation to old comment letter, page number)**	Resolved or Not answered
cc. Page 2-65	**cc; page 65**	
Text in final draft	**Our earlier comment**	
To better represent the groundwater quality of the principal aquifers, community water system water quality was evaluated.	An additional sentence would be helpful after "To better represent the groundwater quality of the principal aquifers, community water system water quality was evaluated" explaining why the community water system quality best represents the groundwater quality of principle aquifers. The rationale that the public water systems wells are deeper so give a more representative picture seems	

	confusing given information later that in general, the deeper aquifers show lower concentrations of contaminants.
26May2021 Response	We will discuss this with the consultants as well.
Current comment:	Suggestion was not taken up, question was not answered.

New comment number, page number	(in relation to old comment letter, page number)	Resolved or Not answered
dd. Page 2-62 to 2-91	**dd; pages 65-94**	
Text in final draft	**Our earlier comment**	
See text in 2.2.4.4. Water Quality Evaluation, from pp. 2-62 to 2-91:	Data: Much of the data seemed quite old, including the 2004 data. Given that contamination would seemingly be in constant flux, conditions could be quite different today than even from 2014 or 2016, to the degree that 2004 data would be irrelevant except possibly to display trends. Then because of the statement on P87 that "At the time of this evaluation, data in the WRID after 2004 were not easily accessible" I thought maybe there was not much data after the 2004 study. However, P94 states "Water quality data used was collected between 2010 and 2020." Maybe these statements apply to different constituents, but then it would help to make this clearer in the text. Some of the maps (eg: 2-31) are labeled "2000-2016" leaving open the question of when the data really was collected. Finally, though, we had the impression from your discussion in a Working Group Meeting that an entity – maybe the Northern California Water Association – had provided fairly up to the minute data on contaminants. Did we misunderstand this?	
26May2021 Response	We will discuss this with the consultants as well.	
Current comment:	Not changed from before as far as we can tell…	

New comment number, page number	(in relation to old comment letter, page number)	Resolved or Not answered
ee. Page 2-85	**ee; page 87**	
Text in final draft	**Our earlier comment**	
See Section 2.2.4.5	Section 2.2.4.5 was very helpful at understanding what you concluded about water quality in the Subbasin. It would be	

	even better if placed at the beginning of the quality evaluation section as it would provide a context for what readers were reading and clues as to assessing the information in the rest of the section.
26May2021 Response	Yes, this context might be useful on page 65-66. We will consider changing its location.
Current comment:	Not changed from before as far as we can tell…

New comment number, page number	**(in relation to old comment letter, page number)**	Resolved or Not answered
gg. Page 2-69 (does not follow page order of above)	**gg; page 70**	
Text in final draft	**Our earlier comment**	
Salinity – Public Water Systems	Salinity – Basinwide Conditions could be more easily understood with an introductory summary sentence along the lines of: Currently, the Basin has some areas with elevated salinity as indicated by either Electrical Conductivity (EC) or Total Dissolved Solids (TDS). Furthermore, salinity in shallow and intermediate groundwater zones appears to be increasing. Salinity in deeper groundwater zones appears lower and more stable.	
26May2021 Response	We will work to improve provide additional context on Salinity in the next version of Chapter 2.	
Current comment:	Not changed from before as far as we can tell… As mentioned in the comments when this was a draft chapter this section is titled "Salinity – Public Water Systems when it is primarily about agricultural water. Further comment here on final draft: p.2-69:11 "Extreme climatic conditions have the potential to introduce brackish waters into the subbasin again…, depending on future sea level rise and mitigation. However, further chemical analysis must be performed to robustly identify potential seawater intrusion." P2-54 should reference this information also. As it is, it gives the impression that sea intrusion is no risk at all. And, will this testing and analysis be done?	

New comment number, page number	(in relation to old comment letter, page number)	Resolved or Not answered
hh. Page 2-69 (does not follow page order of above)	**hh; page 95**	
Text in final draft	**Our earlier comment**	
2.2.5 Land Subsidence	Land Subsidence: this section is definitely the most technical of all the sections. My sense was that organizing it by data source put an unrealistic expectation on the non-technical reader to be able to evaluate the validity of each of the methods and keep the many various results in one's head to try to come to some conclusion about the severity of subsidence in the Subbasin. I think a summary paragraph after the intro paragraph would help if it said something along the lines of: This data suggests that subsidence is not generally a problem in the Subbasin. The different methodologies show a range of subsidence in the Valley between X and Y. The difference between the top and bottom of the range seems likely to have arisen because in the differences in methodologies, however even the top of the range does not indicate a subsidence rate likely to be unsustainable. Nonetheless, there are X areas where subsidence is of concern: A, B and C. [You could then possibly use a table to show the data of concern for each site]. We must continue to collect data on these areas. Etc… whatever you folks think. Such a paragraph would provide a guide for the reader to help sort through the rest of section and decide if the rest supports the conclusion.	
26May2021 Response	We will work to make the section of Chapter 2 easier for the reader to understand. Thank you for the written paragraph, that makes it easier to understand!	
Current comment:	Suggestion was not taken up.	

New comment number, page number	(in relation to old comment letter, page number)	Resolved or Not answered
ii. Page 2-127	**ii; page 112**	
Text in final draft	**Our earlier commentS**	
Land surface water budgets quantify all the inflows and outflows to a specified area, from the bottom of the root zone, up to the land surface.	We thought we understood from the water budget meetings that the root zone was not included in the water budget, but this implies that it is…is it or not? Note that Figure 2-49 has no component of root zone water. How have they modeled the water in the root zone, and how would you account for management measures increase the water storage in the root zone, in project evaluation?	
26May2021 Response	Water in the root zone that percolates into the groundwater system is included as an inflow into the shallow aquifer. There is interaction of water between the root zone and the shallow aquifer. The land surface water budget includes water in the root zone. Water that is 'stored' in the root zone is not included in the groundwater storage or water budget for the groundwater. Root zone water would be broken up	
Current comment:	Thank you for this explanation; since our projects will focus on root zone water, it would be good to explain this within the plan. If we are to work to increase the soil sponge we will need to figure out how changes can be reflected in the model.	

New comment number, page number	(in relation to old comment letter, page number)	Resolved or Not answered
jj. Page 2-127	**jj; page 112**	
Text in final draft	**Our earlier comment**	
Grammatical error, now corrected.		

New comment number, page number	(in relation to old comment letter, page number)	Resolved or Not answered
kk. Page 2-127 and 2-130	**kk; page 112**	
Text in final draft	**Our earlier comment**	
(page 2-127) Five future scenarios exist in the model. Urban demand in these five scenarios is based on Urban	Five future scenarios were incorporated where the demand is the same: urban demand is increased based on Urban	

Water Management Plan (UWMP) projections. The total urban demand is the same across the five modeled scenarios. Land use in the five future scenarios is held constant at 6 the 2016/2018 land use values. The differences between five future modeling scenarios are driven by the effect of the climate changes impacting irrigation demand, precipitation, and surface water supply availability.	Water Management Plan (UWMP) projections; the 2016/2018 irrigated crops are kept constant at 2016/2018 levels; and any change in irrigation demand is driven by the climate signal. Our comment on this was: The part in green says that for the five scenarios, demand is the same. The parts in yellow seem to say that changes in demand are considered. What am we not understanding? Among others, we question this assumption: in the model, the 2016/2018 irrigated crops are kept constant at 2016/2018 levels; and any change in irrigation demand is driven by the climate signal. Yet there have been, particularly over recent years, in the planting of irrigated tree crops in Yolo County: on what basis can we assume that this (totally economic, not climate signal related) demand will not continue to increase? It is even noted later [Page 114] that "An important feature of land use changes in the Yolo Subbasin is an increasing acreage of perennials, which have partly replaced field crops, and brought previously uncultivated area into production in some regions."- so we find it hard to reconcile these.
26May2021 Response	We have reworded this in the most recent draft of Chapter 2. It will need to be updated in the Water Budget Appendix as well. Essentially, what this sentence is trying to say is: The urban demand in all of the five future scenarios is the same amount, and that amount is an increase from the historical scenarios, based on UWMPs. The future agricultural demand is increased in these climate scenarios, based on changes in reference ET. The irrigated crops for the future scenarios are different from the historical scenarios. Within the future scenarios, all five cropping selections are the same. Future land use trends were not included in this version of the model. It is something

	that we are acutely aware of and will be incorporating this information into our 5-year updates. When the model was initially developed, land use trends were not included. See comments at the end of this document, **Synthesis of Responses to Climate Change Comments** .
Current comment:	Indeed, we think it is absolutely critical to include future land use trends in the model
…p. 130 The five scenarios are as follows and the cumulative and average precipitation for the Yolo Subbasin is higher in all climate projections, compared to that in the 'Historical' scenario.	The report needs to present justification for choosing to use higher cumulative and average precipitation for all the scenarios (except for the future baseline which is based on the same rainfall as the historical data. Readers need to know what climate change models are you used and why you selected those specific ones as well as which models you considered and rejected? Why is there not one scenario with lower cumulative or average precipitation, even for the so-called "dry extreme weather" scenario. For a genuine sensitivity analysis to assess risk of reaching unsustainable conditions, shouldn't the plan include least one scenario with drier weather than historical (and also increasing demands from tree crops?)
26May2021 Response	See comments at the end of document, **Synthesis of Responses to Climate Change Comments**

New comment number, page number	**(in relation to old comment letter, page number)**	Resolved or Not answered
ll. Page 2-127	**ll; page 112, 115**	
Text in final draft	**Our earlier comment**	
Land surface water budgets quantify all the inflows and outflows to a specified area, from the bottom of the root zone, up to the land surface.	We thought we understood from the water budget meetings that the root zone was not included in the water budget, but this implies that it is…is it or not? Note that Figure 2-49 has no component of root zone water. How have they modeled the water in the root zone, and how would you account for management measures increase the water storage in the root zone, in project evaluation?	
Current comment:	Addressed in ii, above	

New comment number, page number	(in relation to old comment letter, page number)	Resolved or Not answered
mm. Page 2-131	**mm; page 112, 115**	(not completely resolved)
Text in final draft	**Our earlier comment**	
Table 2-21. Land Use in the Yolo Subbasin.	On [previous] table 2-18, do "perennial crops" show up under "deciduous, subtropical and vine?" Also, native vegetation expanded significantly which most likely is perennial. However, it would not have the same effects on demand as agricultural production. Is it included as perennial acreage in the modeling?	
26May2021 Response	In the model, each crop has its own coefficient of water use. Almonds, walnuts, pistachios, vines are all have different water usage rates in the model. Page 34 of the model documentation shows the DWR Categories, and the crop input used in the model.	
Current comment:	Some explanation provided in section 2.2.9, that "An important feature of land use changes in the Subbasin is an increasing acreage of perennials crops (deciduous, subtropical, and vines), which have partly replaced field crops, and brought previously uncultivated area into production in some regions." And the response above is helpful, it would be good to have this mentioned in the plan. (but second question not yet answered)	

New comment number, page number	(in relation to old comment letter, page number)	Resolved or Not answered
nn. Page 2-130	**nn; page 115**	(not completely resolved)
Text in final draft	**Our earlier comment**	
An important feature of land use changes in the Subbasin is an increasing acreage of perennials crops (deciduous, subtropical, and vines), which have partly replaced field crops, and brought	This sentence "Since 'Future baseline' and 'Historical' scenarios have the same climate, the impact of current, increased perennial crop acreage within the Yolo	

previously uncultivated area into production in some regions. The Future Baseline and Historical scenarios have the same climate, but different land use inputs; Future Baseline holds 2016 land use constant, while the Historical scenario relies on the historical land use datasets in Table 2-21. Comparing the Future Baseline scenario to Historical demonstrates the impact of the increased perennial acreage in 2016 relative to historical land use data. Perennial acreage is generally associated with more efficient irrigation practices. Because these crops are permanent, they also decrease the flexibility of water demand ("demand hardening"). Throughout the following sections, the comparison of the Future Baseline and Historical scenarios demonstrate the effects of this changing land use, largely in evapotranspiration and deep percolation. A model scenario incorporating future changes in land use is outside the scope of the current modeling effort but will be considered in future improvements of the YSGA model.	Subbasin is apparent (less inefficient, or more efficient, irrigation practices are altering evapotranspiration and deep percolation quantities)" is confusing in light of the sentence on P113 "The five scenarios are as follows and the cumulative and average precipitation for the Yolo Subbasin is higher in all climate projections, compared to that in the 'Historical' scenario." The green highlighting up above -says "future baseline" and "historical" have the same climate, while the yellow says precipitation is higher for all scenarios than the 'historical' scenario. What are we missing?
26May2021 Response	Future baseline essentially looks at what would happen if we had the same climate as 1971 – 2016, and moved forward with 2016-2018 land uses. You are correct, that the Future_baseline and Historical should have the same precipitation amounts. The sentence could be worded better to clear up confusion – in this context 'Future_baseline' isn't really a climate projection, because it uses the historical climate and only changes land use/water infrastructure etc. That is why the precipitation amounts are the same on Table 2-20 (page 119). See comments at the end of this document, **Synthesis of Responses to Climate Change Comments**
Current comment:	Not sure; is it not still true that higher precipitation is predicted for all future scenarios? The confusion could be reduced by the adding a sentence (in italics) as follows: …Subbasin is higher in all climate projections, compared to that in the 'Historical' scenario." *The Future Baseline is not a climate projection in that it keeps climate the same and varies only …..*

New comment number, page number	**(in relation to old comment letter, page number)**	Resolved or

		Not answered
oo. Page 2-134	**oo; page 118**	
Text in final draft	**Our earlier comment**	
Table 2-22.	Could Table 2-19 explain how water year index is calculated?	
Current comment:	Information provided as "The Water Year Index and Water Year Type are provided from DWR, and "provide a classification to assess the amount of annual precipitation in a basin" 23 CCR §351(an). Additional information on the Water Year Index for the Sacramento Valley can be viewed in DWR's Sustainable Groundwater Management Act Water Year Type Dataset Development Report (DWR, 2021).	

New comment number, page number	**(in relation to old comment letter, page number)**	Resolved or Not answered
pp. Page 2-134 - 2-135	**pp; page 119**	(not completely resolved)
Text in final draft	**Our earlier comment**	
Compared to the Historical scenario, the Future Baseline scenario results in more evapotranspiration and less deep percolation, demonstrating the effect of increased perennial acreage. In all 4 climate scenarios, the effect of climate change results in more evapotranspiration and more deep percolation than the Historical and Future Baseline scenarios.	Could the meaning of climate change (here used in the bullet: "The effect of climate change results in more evapotranspiration and more deep percolation") for this plan be defined? Does it only include temperature change or temperature and precipitation?	
26May2021 Response	Additional information on Climate Change and the assumptions about climate change can be found in the 'Model Documentation' and 'Water Budget' Appendices. Essentially, climate change is modeled as 'change factors' for precipitation and reference evapotranspiration (Page 39 of the model documentation). See comments at the end of this document, **Synthesis of Responses to Climate Change Comments**	
Current comment:	Thank you for this; it would be good to indicate this definition/reference in the chapter	

New comment number, page number	**(in relation to old comment letter, page number)**	Resolved or

		Not answered
qq. Page 2-134 - 2-135	**qq; page 120**	
Text in final draft	**Our earlier comment**	
	Could the chapter explain why climate change is modelled as producing greater deep percolation? Some of the models I've seen for climate change predict that rain will occur over shorter time periods. In such cases, even if there is more precipitation (and I believe some climate change models predict lower precipitation) the likely result is more run-off, not necessarily more deep percolation unless measures are taken to improve water infiltration. Also, is the lower deep percolation from more perennial crops and irrigation changes expected to net out against the greater deep percolation due to climate change to produce the higher inflows than outflows for every scenario except DEW?	
26May2021 Response	The only scenario where deep percolation is greater than in the historical scenario is in the Future_2070_WMW scenario. Climate change scenarios have less deep percolation than the historical scenarios – when comparing the future scenarios, the deep percolation is less in the 'future baseline' (historical climate with 2016/2018 land use) than it is in the climate change scenarios. There is less deep percolation in all of the future scenarios, except 2070_WMW. We see less inflows into the groundwater system, in the future model, for every scenario except WMW (far right column of Table 2-21.). See comments at the end of this document, **Synthesis of Responses to Climate Change Comments**	
Current comment:	Thank you for this explanation; it would be helpful to include this in the current plan.	

New comment number, page number	**(in relation to old comment letter, page number)**	Resolved or Not answered
rr. Page 2-138	**rr; page 122**	
Text in final draft	**Our earlier comment**	
Text is the same	This key claim in the discussion of groundwater storage "The groundwater	

	storage trace implies that the climate signal has dominated over this historical period at the Basin-wide level" really calls out that the plan needs much more discussion of and justification for the climate change assumed in the plan. The plan demonstrates at length that the recharge potential for the Subbasin is uncompromised – that declines in groundwater follow directly from droughts and that groundwater returns to high levels when rain is good. Thus, it is not recharge potential, but climate that determines groundwater levels. Since this is so, great care needs to go into selecting the climate change scenarios used, as well as realistically assessing the risks that climate change poses for the Subbasin.
26May2021 Response	Yes, the points made above are appropriate. What we see in the future scenarios is less water reaching the groundwater aquifer (decreases in deep percolation) in 4 of the 5 future scenarios. See comments at the end of this document, **Synthesis of Responses to Climate Change Comments**
Current comment:	And I would add, addressing increasing demands for groundwater, through increased acreage of crops

New comment number, page number	**(in relation to old comment letter, page number)**	Resolved or Not answered
ss. Page 2-123	**ss; page 122**	(not completely resolved)
Text in final draft	**Our earlier comment**	
Commenting on Table 2-26	According to [previous] Table 2-23, the two most recent decades of the last 5 decades show a groundwater storage decline of more than 590,000-acre-feet, wiping out the increases in 1990-2000 decade that single-handedly provided the only real increase in groundwater in the last 50 years (if we are reading the table correctly). 2/5ths of decades showed sharp declines in storage (2001-2010 and 2011-2018), 1/5th showed a significant increase (1990-2000) and 2/5ths of decades (1971-80 and 1981-90) showed little change. It	

	seems to us this short period in terms of definitive climate patterns – with its particular alternating pattern of wet and dry periods – has too much variability to draw any strong conclusions about the future. It seems especially risky to give any weight at all to the earlier decades. Rather, the later decades are more likely to be representative given the general scientific consensus that the climate is currently undergoing accelerating and unprecedented change.
26May2021 Response	That is essentially what the 2030 and 2070 centered future runs are doing. The distribution of wet and dry years is centered on the precipitation and ET scenarios in 2030 and 2070. Climate change models always use historical data to calibrate and downscale to, it is reasonable to assume that they will start showing more frequently occurring droughts as time moves forward. Additionally, the future scenarios take the most recent land use into account, as well as the most recent water rights and associated infrastructure into account.
Current comment:	This explanation would be helpful within the plan.

New comment number, page number	**(in relation to old comment letter, page number)**	Resolved or Not answered
tt. Page 2-138	**tt; page 123**	(not completely resolved)
Text in final draft	**Our earlier comment**	
Commenting on Table 2-26	For Figure 2-52, did the plan's methodology consist of starting with 1969 groundwater date and then using the data from Table 2-21 to run the model out until 2018? How was the data in table 2-21 arrived at?	
26May2021 Response	The x-axis 'dates' on 2-52 make it confusing. It would make more sense if it said 'Year 1' 'Year 2' 'Year 3'. The red line is what happened between 1970 and 2016. The other five lines are the future scenarios, and they are overlaid on the historical data to highlight the relative changes.	

Current comment:	Now Figures 2-59-60 The axis has not been changed, and this explanation would be very helpful in the plan.

New comment number, page number	(in relation to old comment letter, page number)	Resolved or Not answered
uu. Page 2-139	**uu; page 123**	(not completely resolved)
Text in final draft	**Our earlier comment**	
2.2.13 Sustainable Yield Based on the information presented above, a Sustainable Yield of 346 TAF per year is being proposed for the Yolo Subbasin. Figure 2-61 shows the modeled pumping time series for the historical period with the future scenarios included along with the proposed sustainable yield (the horizonal reference line).	For what purpose will the sustainable yield be used?	
26May2021 Response	The sustainable yield will be an additional tool to utilize in the decision-making process. Currently, the sustainable yield is not used in the establishment of minimum thresholds or measurable objectives; however, DWR will use the sustainable yield and annual reports to evaluate how the Subbasin is performing or working towards meeting objectives and overall sustainability. The sustainable yield value that is in Chapter 2 of the GSP may be used to develop a more in-depth water budget. Exactly how the sustainable yield will be used in the Yolo Subbasin is still in development.	
Current comment:	This is very helpful- but we did not ask for ourselves alone, this would be good to explain in the plan. Also what is TAF? It does not seem to be defined…we can guess total acre feet, but this should be clear.	

Synthesis of Responses to Climate Change Comments

The climate change models that the YSGA model uses comes from DWR. The DWR climate change model uses the best available data and science. This is a good resource with lots of additional information: DWR Climate Change Resource Guide. DWR's process for creating the climate change datasets was extensive and occurred over many years. DWR will release new climate change models as they deem appropriate when new data and methods necessitate new models. We are hoping to update the YSGA model in the future (5-year updates) with updated land use, additional projects, and climate change data – as available. When the next iteration of climate

projections is available, the YSGA will be informed, and can convey that information to interested parties. This should be included in the 'Projects and Management Actions' Chapter of our GSP.
In climate change models, generally, temperature is higher in all projections – this means that ET demand will be higher. Precipitation projections of climate models have always been much more variable. Different models show different trends. According to SEI, this is especially true in the Yolo Subbasin, where we are right at the cusp of jet stream impacts. If the jet stream moves north or south in future climates, precipitation patterns could change accordingly – modeling for that future is very challenging.
SEI and YCFCWCD worked together, previously, to create some scenarios that were of interest to YCFCWCD – deeper, consecutive droughts, based on paleoclimate reconstructions, and not on climate change model output – Here is a link to that document: http://calag.ucanr.edu/Archive/?article=ca.2018a0005
Another important thing to note is that although we are seeing higher precipitation values in the Yolo Subbasin in the model, less of that water is being modeled as reaching the aquifer. The deep percolation values in the future scenarios are less than in the historical scenarios, except in the WMW case. From the aquifer's perspective, less water is coming in in the future scenarios. See the far right column of Table 2-21 (page121) below: [now Table 2-24]

Table 2-21. Average Annual Groundwater Budget

Average Annual Groundwater Budget (TAF)												
	Outflows				Varying Flows				Inflows			
	Pumping: Urban	Pumping: Irrigation	Drainage	Total Outflows	GW-SW Exchange	Lateral GW Flow: Outside Yolo	Lateral GW Flow	Total Varying Flows	Deep Percolation	YCFC Canal Recharge	Managed aquifer recharge:	Total Inflows
Entire Basin												
Historical	-33	-313	-28	-374	15	-28	0.0	-13	353	33	0.04	386
Future_Baseline	-16	-304	-16	-336	25	-40	0.0	-15	308	37	1.37	346
Future_2030	-15	-322	-15	-352	23	-37	0.0	-15	321	39	1.43	361
Future_2070	-15	-343	-15	-373	22	-35	0.0	-13	340	40	1.31	381
Future_2070_DEW	-15	-385	-13	-413	46	-6	0.0	39	323	37	1.30	360
Future_2070_WMW	-14	-311	-24	-348	-29	-79	0.0	-108	424	43	1.40	468

From the aquifer's perspective, there are less inflows in the future scenarios than in the historical.
Additionally, we will still be using empirical/observed data to continuously monitor all sustainable management criteria that apply to the Yolo Subbasin. We are not solely relying on the model outputs to make management decisions, or to establish minimum thresholds or measurable objectives. Continued monitoring of groundwater in the Yolo Subbasin will be an important part of a sustainable future. The model is one tool of many that will be used to ensure this sustainable future

3 Sustainable Management Criteria

New comment, page number
Page 1-11.7-10
Text in final draft: 3 Sustainable Management Criteria
Comment: We have copied below the relevant definitions and criteria, as the apply to the Capay Valley Management Area. We understand that the basin-wide "undesirable results" relate to the subbasin as a whole. But the measurable objective, and the minimum thresholds are specific to each management area. We have had questions previously about the monitoring wells chosen for Capay Valley and as we note in the **overarching comment 4**, there is a great sensitivity in the results for measurable objectives and minimum thresholds according to the number and selection of wells included in the plan. We need to be convinced that these are provide representative average picture in our management area; we ask that analysis is undertaken, and shared with the public show that the number and wells chosen have the best likelihood of revealing the true mean for groundwater levels each year for the Subbasin and the management areas.

The basin-wide definition of ***"undesirable results"*** *for the chronic lowering of groundwater levels is as follows: The point at which significant and unreasonable impacts over the planning and implementation horizon, as determined by depth or elevation of ground water, affect the reasonable beneficial use of, and access to, groundwater by overlying users. An undesirable result occurs when the minimum threshold criteria is exceeded in 51% or more of representative monitoring wells in two (2) management areas*

Measurable objective *is equal to the average fall (Sep-Dec) groundwater elevation for the water year period of 2000 to 2011 at each Representative Well. Performance of the measurable objective will be measured as the five (5) year running average of the minimum fall (Sep-Dec) groundwater elevation.*

Minumum thresholds

To establish the minimum thresholds and measurable objectives for the Yolo Subbasin, the YSGA reviewed available well data and selected a subset of Representative Wells that would be used to establish minimum threshold values. These Representative Wells, shown in Figure 3-1, were selected because the well maintained a sufficient period of record to be representative of surrounding groundwater conditions and included sufficient spring and fall elevation data for the period of 2001 to 2011. Representative Wells were reviewed with stakeholders from the Management Area in which they are located to ensure the selected wells represented the best available data and were representative of local groundwater conditions. Based on historic, current, and projected groundwater conditions in the Subbasin, the YSGA developed several methodologies for establishing the minimum threshold value for each representative well, based on Management Area boundaries. The hydrographs for all Representative Wells used to establish minimum thresholds and measurable objectives are provided in Appendix E. The methodology for each Management Area is described below.

Capay Valley, Dunnigan Hills, Central Yolo, and South Yolo:
Exceedance of the historic minimum elevation in the period of record of each Representative Well in two consecutive years. The minimum threshold established with this methodology protect groundwater levels from chronically lowering to levels below the historical experience and recognize that groundwater conditions in these management areas is expected to behave similarly to historic conditions. No significant decreases in groundwater conditions are expected under future projected conditions.

Table 3-1 Yolo Subbasin Representative Wells and Minimum Threshold and Measurable Objective Values.

Management Area	YSGA Representative Well Number	State Well Number	Measurable Objective (ft)		Minimum Threshold (ft)	
			Depth to Water	*Groundwater elevation*	*Depth to Water*	*Groundwater elevation*
Capay Valley	276	10N02W16R001M	14.4	215.1	21.9	207.7
	277	10N02W18F001M	20.1	315.9	31.8	304.2
	280	10N03W02R002M	18.3	319.8	29.9	308.2
	285	11N03W09Q001M	21.2	382.9	48.3	355.8
	287	11N03W23L001M	15.1	296.1	24	287.2
	288	11N03W23N001M	34.6	285.5	49.1	271
	289	11N03W33F001M	19.6	351.2	29.6	341.2
	293	12N03W20D001M	21.5	381.1	26.2	376.4
	415	11N03W35D003M	28.5	280.7	36.3	273
	416	10N03W24B002M	68.1	322.1	109.1	281.1

My name is Christopher Foe. My wife and I have lived for 30 years at the intersection of County Road 29 and 95 and are located in the Central Yolo Groundwater Sub basin. Like all our neighbors, we are on a domestic well and so are very interested in the successful implementation of the groundwater management plan. Continuing to have access to groundwater of a high quality and of sufficient magnitude for our domestic use is an important component of the quality of our lives and of the continued value of our property.

The Yolo Sub basin Groundwater Agency (YSGA) is to be complimented for assembling a high quality document with many excellent analyses. The Yolo County Flood Control and Water Conservation District is also to be complimented for having the foresight to begin collecting groundwater elevation data half a century ago. This data has provided significant insight into seasonal and inter annual changes in groundwater elevation and made it possible to model future groundwater conditions. The comments provided below are intended to improve the document and make future management plans more successful.

Major comments

- I remain skeptical about the predictive ability of the YSGA model because of shortcomings discussed below. The ongoing drought may provide a unique opportunity to assess the model's accuracy and increase stakeholder confidence in its ability to predict future water elevation levels. The model could be used to predict groundwater levels at all compliance stations this fall. Model predictions can be compared with field measurements made this fall to assess model accuracy and precision in each sub basin. If the analysis is done, the results and a statistical analysis should be posted online for stakeholder evaluation.

  A robust model could be of great utility to landowners. If strong statistical correlations are obtained between predicted and observed values, then the model can be used with precipitation information collected this rainy season to predict groundwater levels at the end of the 2022 irrigation season. This will help landowners decide whether they need to be lowering their pumps this winter and spring and/or drilling new wells to reduce the chance of experiencing a dry well next year.

- The report is remiss in not including sustainability goals for water quality. Abundant groundwater of a degraded quality is of limited value to stakeholders. The YSGA is to be commended for coordinating the collection of groundwater monitoring data with other agencies. However, the YSGA needs to develop, *a priori,* sustainable management goals to evaluate this data and determine whether water quality management plans are needed. This is particularly true for nitrate contamination. Available data suggest that current nitrate levels in some regions exceed the primary MCL and constitute an ongoing human health drinking water hazard. The water quality problem is likely to become significantly worse if not promptly addressed. At a minimum, the YSGA should insure that all rural domestic drinking water wells in sub basins of concern are tested to determine nitrate levels. In addition, all new domestic drinking water wells should be tested as part of the construction process. This should occur whether the landowner is part of the Regional Board's Irrigated Lands Regulation Program or

not. Nitrate may be removed from drinking water by ion exchange, distillation or reverse osmosis. However, landowners must be educated about the hazard and how to protect themselves. This should be an immediate YSGA management action.

- The Sustainability Plan is silent about what happens when minimum thresholds/measureable objectives are exceeded. There should be an explicit commitment by the JPA to undertake immediate corrective action when this occurs. The purpose of the corrective action is to slow/reverse the development of negative groundwater conditions and spur implementation of longer term actions. At a minimum, potential actions should include an immediate moratorium on new well construction in threaten sub basins.

Minor comments

- Page 1-24 line 33. The City of Davis and Woodland have percolation basins receiving storm runoff. These actions should be acknowledged, the amount of groundwater infiltration calculated, and in the management section, construction of additional percolation basins encouraged.

- Page 2-29 line 16. Please be consistent with units: TDS in figures 2-26 and 2-27 are in mg/l while on p 2-69 line 16 are in ppm. The different units result in the same numeric value but the general reader may not know that.

- Around Page 2-70. There is a similar problem with units for nitrate. The discussion appears to bounce around between concentrations reported as total nitrate and as N. For example Figure 2-29 are as total nitrate while figures 2-30 and 2-31 are as N. Sometimes in the text it is difficult to determine what the units being used are. Unlike with TDS, the different units result in different values. To eliminate confusion the text should use only one set of units. The most scientifically acceptable term is as N (example 10 mg-N/l).

- Page 2-70 Shallow groundwater nitrate contamination may be greater than pictured in the *Nitrate Basin wide Condition* section. The most recent figure is for the 2000-2016 time period (5 to 21 years ago) and shows wide spread concentrations greater than 5 mg-N/l in the Central, South and North basins. The 5 mg-N/l is often considered the leading edge of the nitrogen contamination plume. Monitoring data shows that nitrate concentrations in 50 percent of shallow Central Valley groundwater wells increased from 5 to 10 mg-N/l or greater in five years (in Levy et al 2021). About 75 percent of these wells had concentrations greater than 10 mg-N/l in ten years. The 10 mg-N/l concentration is the primary federal drinking water MCL for safe human consumption.

- Page 2-71 Table 2-13. What year was data in Table 2-13 collected?

- Page 2-71 A map of the location of current and historical dairies and horse boarding facilities would be useful to determine whether septic or animal facilities are the primary source of animal derived nitrogen.

- Page 2-71 or thereabouts. The nitrate section should be expanded to include more on the sources, transport and fate of nitrate. The section identifies that fertilizer application in

agriculture is the major source of nitrate. The document should continue and identify nitrogen application rates (lbs/acre/yr) by the major crop types grown in the basin (Figure 1-4). Landon et al 2009 found that nitrate concentration in shallow groundwater (<200 ft) on the eastside of the San Joaquin Basin was positively correlated with percent orchard and vineyard land use. There was no relationship with other crop types suggesting that these two land uses were a major source of groundwater nitrogen. The discussion should also include a section on the fate of nitrate. Groundwater contamination is very expensive and difficult to remediate. Nitrate is slowly converted to gaseous nitrogen in anaerobic environments and lost from the soil profile to the atmosphere. But this is a slow process with the result that nitrate tends to accumulate in groundwater. Finally, Levy et al 2021 has shown a positive correlation between groundwater drawdown during droughts and an increase in nitrate concentration. Apparently, nitrate is sufficiently mobile and soluble that it remains in solution and is concentrated as water levels are drawn down. Understanding nitrate cycling is essential for understanding and managing contamination.

- Page 2-76. Figure 1-7 shows the distribution of domestic wells in the basin. Most of these wells likely draw water from the upper groundwater zone. Figure 1-7 should be overlaid on Figure 2-30 to identify the location of domestic drinking water wells at risk from elevated nitrate levels. An additional table should be included estimating how many domestic wells are likely contaminated with <2.5, 2.5-5.0, 5.0-7.5, 7.5-10.0 and >10.0 mg-N/l by sub basin. This information is essential for identifying the location and evaluating the magnitude of the human health nitrate contamination problem.

- Figure 2-56. Figure 2-56 is meaningless and should be discarded or significantly amended. The upper graph is a valid projection of future urban water use. The bottom graph for agriculture is misleading and should not be presented. It apparently is based on 2016 land use consumption values and used to make projections through 2061. Agricultural land use is rapidly changing in the basin. Table 2-21` shows that deciduous and vine crops have increased by 11.7 and 5.6 percent per year between 2008 and 2016. I believe the rate at which new orchards are being planted has continued or increased since then. In contrast, table 2-56 shows that grain, field crops and pasture acreage have all decreased. Orchards and vineyards almost exclusively rely on groundwater while row and field crops use surface water. Has an agricultural water use sensitivity analysis been done? Such an analysis is important because the pie charts in Figure 2-56 demonstrate that agriculture uses more than 95 percent of the water in the basin. Changes in agricultural use, not urban use, will drive changes in the water budget. Similar comments apply to the remainder of the groundwater elevation and storage discussion[1].

- Page 3-3 line 7 Please explain the rationale behind the determination that an undesirable result has occurred when the minimum threshold was exceeded in 51 percent of monitoring wells in two sub basins. A following section entitled "*Criteria for establishing minimum thresholds*" also does not explain the selection of the 51 percent value in two sub basins.

[1] At this land use conversion rate the entire 640,000 acre basin would be planted in orchards within the next 15 years, well within the proposed 20 year implementation period. My projection for the magnitude of new orchard acreage is obviously flawed but is included to emphasize the present rate of change of land use in the basin and the danger of extrapolating 6 year old agricultural land use date through 2070.

- Page 3-4 line 22. Several questions. First, is the period of exceedance a calendar or water year? Second, does this mean that both the fall and spring measurements need to be below the minimum threshold for two years or only one measurement in each of two consecutive years? Finally, is this calculated from static or sustained groundwater pumping level?

- Page 5-1 lines 11 to 15. The groundwater pumping values for all scenarios are very precise. There is clearly great uncertainty about future changes in both climate and urban and agricultural land use. Ninety-five percent confidence limits around these values would strengthen the discussion and emphasize the need for high quality monitoring data and a wide range of management options.

- Table 5-1. Three possible additional management actions are: first, inject treated UC Davis surface water into an intermediate aquifer and use the stored water to augment surface water supplies for irrigating research plots. Second, encourage the Cities of Davis, Woodland, and Winters to divert all storm runoff into percolation ponds for groundwater recharge. Finally, multiple off-channel gravel pits exist along Cache Creek. Winter storm runoff could be diverted into the pits and used for groundwater recharge and/or release into Cache Creek for downstream use during the irrigation season.

- Table 5-1. All rural domestic drinking water wells should be tested for nitrate concentration. New wells should be tested as part of their construction. Landowners should be educated about the threat of drinking nitrate contaminated well water and instructed on how to treat it.

References

Landon, M.K., K. Belitz, B. Jurgens, J. Kulongoski and T. Johnson. 2009. Status and understanding of groundwater quality in the central-eastside San Joaquin Basin, 2006: California GAMA Priority Basin Project. USGS Scientific Investigations Report 2009-5266.

Levy, Z., C Jurgens, K. Burow, S. Voss, K. Faulkner, J. Arroyo-Lopez, and M. Fram. 2021. Critical aquifer overdraft accelerates degradation of groundwater quality in California's Central Valley during Drought. Geophysical Research Letters 48 (17)

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OCTOBER 27, 2021

VIA E-MAIL and U.S. MAIL

Yolo Subbasin Groundwater Agency
34274 State Highway 16
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Email: info@yolosga.org

RE: Yolo Subbasin GSP Comments

Dear Board Members:

The purpose of this letter is to provide Yolo Subbasin Groundwater Agency (YSGA) with the comments of Deseret Farms of California to YSGA's draft groundwater sustainability plan (GSP).

First and foremost, we appreciate the time and effort YSGA's management staff, committees, and consultants have committed to preparing this draft GSP. Further, we appreciate the opportunity to provide comments to YSGA regarding its draft GSP. We hope YSGA will consider the following comments in finalizing the draft GSP for submission to the Department of Water Resources (DWR). In considering the following comments, we recognize that this draft GSP is a "living document," and will undergo updates and modifications as more information is gathered to help the Subbasin reach sustainability by 2042 and beyond.

Provided are our specific comments:

1. **The draft GSP lacks specific sustainable management criteria for degraded water quality in the Subbasin.**

The Sustainable Groundwater Management Act (SGMA) requires a GSP to include, among other things, descriptions of sustainable management criteria (SMC) for each applicable sustainability indicator, as identified by SMGA. (Cal. Code Regs., tit. 23, § 354.22 et seq.) Notably, the draft GSP expressly provides that "[t]he YSGA has not established specific sustainable management criteria for water quality in the Subbasin. . . ." (Pg. 3-15, Lines 2 – 3.) Instead, YSGA plans to rely on "current and future water quality standards established for drinking water and agricultural water uses by State and county regulatory

agencies." (Pg. 3-15, Lines 2 – 4.) To avoid a finding of "incomplete" by DWR, YSGA must address this matter and develop a SMC for degraded water quality.

Further, while YSGA is developing this missing component of its GSP, we assume that it will rely on this existing language within its draft GSP. That means that, in the meantime, YSGA will rely on water quality standards established by State and county regulatory agencies. In doing so, we recommend that YSGA impose State regulatory water quality standards on agricultural water supplies and county regulatory water quality standards on public water supplies. Agricultural groundwater users within the Subbasin require regulatory certainty. Therefore, if YSGA were to upend the current structure of water quality regulations, it would risk placing these agricultural groundwater users in violation of standards that they would otherwise be in compliance with and create an inaccurate portrayal of noncompliance within the Subbasin.

2. The draft GSP should revise the Measurable Objectives and Minimum Thresholds for Chronic Lowering of Groundwater Levels SMC and the Reduction of Groundwater Storage SMC.

The Measurable Objectives (MO) and Minimum Thresholds (MT) for the Chronic Lowering of Groundwater SMC go beyond what is required to achieve YSGA's sustainability goal for the Subbasin. As expressly provided in the draft GSP, "the Yolo Subbasin is a relatively stable basin, with groundwater levels maintaining a relatively consistent long-term average elevation or depth to groundwater." (Pg. 3-4, Lines 4 – 6.) Nonetheless, YSGA relies on overly aggressive MOs and MTs that will ultimately inhibit landowners' ability to achieve these goals. Therefore, we recommend that the MOs and MTs for the Chronic Lowering of Groundwater SMC be lowered to allow for greater operational flexibility.

Further, the methodology used to establish the MOs for the Chronic Lowering of Groundwater SMC and the Reduction of Groundwater Storage SMC should be revised to provide clarity. Specifically, regarding both SMCs, the draft GSP provides:

> Measurable objective is equal to the average fall (Sep-Dec) groundwater elevation for the water period of 2000 to 2011 at each Representative well. Performance of the measurable objective will be measure as the five (5) year running average of the minimum fall (Sep-Dec) groundwater elevation.

It is unclear how YSGA will rely on and apply both "the water period of 2000 to 2011" and "the five (5) year running average." Therefore, additional clarity is needed to understand the interplay between these two seemingly contradictory sets of data. Further, the draft GSP does not provide any background or basis as to how these two time periods were established. To that end, we recommend either that the GSP: (A) expand the "water period of 2000 to 2011" to the "water period of 2000 to 2018;" or (B) expand the "five (5) year running average" to a "ten (10) year running average." Either option would incorporate

a larger amount of data that would likely provide landowners the additional support necessary achieve the purpose of the MOs.

Thank you for the opportunity to provide these comments. We appreciate the significance of the considerations and decisions YSGA must undertake, and we look forward to working with you further regarding these matters.

Very truly yours,

James Strong
General Manager

October 27, 2021

Yolo Subbasin Groundwater Agency (YSGA)
34274 State Highway 16
Woodland, CA 95695

Submitted via email: info@yolosga.org

Re: Public Comment Letter for Yolo Subbasin Draft GSP

Dear Kristin Sicke,

On behalf of the above-listed organizations, we appreciate the opportunity to comment on the Draft Groundwater Sustainability Plan (GSP) for the Yolo Subbasin being prepared under the Sustainable Groundwater Management Act (SGMA). Our organizations are deeply engaged in and committed to the successful implementation of SGMA because we understand that groundwater is critical for the resilience of California's water portfolio, particularly in light of changing climate. Under the requirements of SGMA, Groundwater Sustainability Agencies (GSAs) must consider the interests of all beneficial uses and users of groundwater, such as domestic well owners, environmental users, surface water users, federal government, California Native American tribes and disadvantaged communities (Water Code 10723.2).

As stakeholder representatives for beneficial users of groundwater, our GSP review focuses on how well disadvantaged communities, drinking water users, tribes, climate change, and the environment were addressed in the GSP. While we appreciate that some basins have consulted us directly via focus groups, workshops, and working groups, we are providing public comment letters to all GSAs as a means to engage in the development of 2022 GSPs across the state. Recognizing that GSPs are complicated and resource-intensive to develop, the intention of this letter is to provide constructive stakeholder feedback that can improve the GSP prior to submission to the State.

Based on our review, we have significant concerns regarding the treatment of key beneficial users in the Draft GSP and consider the GSP to be **insufficient** under SGMA. We highlight the following findings:

1. Beneficial uses and users **are not sufficiently** considered in GSP development.
    a. Human Right to Water considerations **are not sufficiently** incorporated.
    b. Public trust resources **are not sufficiently** considered.
    c. Impacts of Minimum Thresholds, Measurable Objectives and Undesirable Results on beneficial uses and users **are not sufficiently** analyzed.
2. Climate change **is not sufficiently** considered.
3. Data gaps **are not sufficiently** identified and the GSP **does not have a plan** to eliminate them.

4. Projects and Management Actions **do not sufficiently consider** potential impacts or benefits to beneficial uses and users.

Our specific comments related to the deficiencies of the Yolo Subbasin Draft GSP along with recommendations on how to reconcile them, are provided in detail in **Attachment A.**

Please refer to the enclosed list of attachments for additional technical recommendations:

Attachment A	GSP Specific Comments
Attachment B	SGMA Tools to address DAC, drinking water, and environmental beneficial uses and users
Attachment C	Freshwater species located in the basin
Attachment D	The Nature Conservancy's "Identifying GDEs under SGMA: Best Practices for using the NC Dataset"
Attachment E	Maps of representative monitoring points in relation to key beneficial users

Thank you for fully considering our comments as you finalize your GSP.

Best Regards,

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Water Policy Analyst
Clean Water Action/Clean Water Fund

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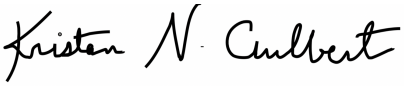


Kristan Culbert
Associate Director, California Central Valley River Conservation
American Rivers

Attachment A

Specific Comments on the Yolo Subbasin Draft Groundwater Sustainability Plan

1. Consideration of Beneficial Uses and Users in GSP development

Consideration of beneficial uses and users in GSP development is contingent upon adequate identification and engagement of the appropriate stakeholders. The (A) identification, (B) engagement, and (C) consideration of disadvantaged communities, drinking water users, tribes,[1] groundwater dependent ecosystems, streams, wetlands, and freshwater species are essential for ensuring the GSP integrates existing state policies on the Human Right to Water and the Public Trust Doctrine.

A. Identification of Key Beneficial Uses and Users

Disadvantaged Communities, Drinking Water Users, and Tribes

The identification of Disadvantaged Communities (DACs), drinking water users, and tribes is **insufficient**. We note the following deficiencies with the identification of these key beneficial users:

- The GSP fails to identify and map the locations of DACs, and describe the size of each DAC population within the subbasin.
- The GSP fails to identify and map tribal lands within the subbasin.
- The GSP provides a map of domestic well density in Figure 1.7, but fails to provide depth of these wells (such as minimum well depth, average well depth, or depth range) within the subbasin.
- The GSP fails to identify the population dependent on groundwater as their source of drinking water in the subbasin. Specifics are not provided on how much each DAC community relies on a particular water supply (e.g., what percentage is supplied by groundwater).

These missing elements are required for the GSA to fully understand the specific interests and water demands of these beneficial users, and to support the consideration of beneficial users in the development of sustainable management criteria and selection of projects and management actions.

RECOMMENDATIONS
• Describe and map the locations of DACs and provide the size of each DAC population. The DWR DAC mapping tool can be used for this purpose.[2]

[1] Our letter provides a review of the identification and consideration of federally recognized tribes (Data source: SGMA Data viewer) within the GSP from non-tribal members and NGOs. Based on the likely incomplete information available to our organizations for this review, we recommend that the GSA utilize the California Department of Water Resources' "Engagement with Tribal Governments" Guidance Document (https://water.ca.gov/Programs/Groundwater-Management/SGMA-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents) to comprehensively address these important beneficial users in their GSP.

[2] The DWR DAC mapping tool is available online at: https://gis.water.ca.gov/app/dacs/.

- Provide a map of tribal lands and describe the tribal population within the subbasin.
- Include a map showing domestic well locations and average well depth across the subbasin.
- Identify the sources of drinking water for DAC members, including an estimate of how many people rely on groundwater (e.g., domestic wells, state small water systems, and public water systems).

Interconnected Surface Waters

The identification of Interconnected Surface Waters (ISWs) is **incomplete**, based on incomplete identification of potential ISWs in the GSP.

We commend the YSGA for the thorough, comprehensive evaluation of ISWs in the subbasin. The methodology for the ISW analysis was adapted from The Nature Conservancy's ICONs map. The minimum groundwater elevation from water years 2006-2015 was intersected with the stream surface elevations. Gaining, losing, uncertain, and disconnected reaches are presented on Figure 2-47 (Interconnected Surface Water Bodies Under the Maximum Groundwater Elevation 2006-2015). The quantity and timing of depletions of interconnected surface waters is estimated by the Yolo Subbasin Groundwater Agency (YSGA) Model. The GSP presents the average annual stream seepage values and seasonal variability (spring and fall) of stream gains and losses as estimated by the model. Data gaps are identified and discussed in the text. The following recommendation would strengthen the clarity and completeness of the ISW evaluation.

RECOMMENDATION

- Clarify in the GSP text that reaches marked as 'uncertain' on Figure 2-47 are retained as *potential* ISWs in the GSP.

Groundwater Dependent Ecosystems

The identification of Groundwater Dependent Ecosystems (GDEs) is **insufficient**, due to the lack of a complete inventory, map, or description of fauna (e.g., birds, fish, amphibians) and flora (e.g., plants) species or habitat types in the subbasin's GDEs. Table 2-20 presents the number of species present in the subbasin's GDEs, but an inventory of those species is not provided.

Despite failing to identify fauna and flora, we commend the YSGA for their comprehensive evaluation of GDEs in the subbasin. The GSP mapped GDEs using the Natural Communities Commonly Associated with Groundwater dataset (NC dataset) (also referred to as the iGDE database in the GSP). The GSP presents a detailed discussion of the manner in which depth to groundwater, rooting depths, NDVI, and aerial imagery were used to establish GDE connection to groundwater. TNC's GDE Pulse tool was used to assess GDE vegetative health in the subbasin.

We commend the YSGA for their analysis of rooting depths of GDEs. The GSP states that where the depth to water was greater than 30 feet, GDEs were further evaluated based on an evaluation of the rooting depth of the dominant species within that polygon. The GSP states (2-114): "*Valley Oaks (Quercus lobata), for example, have a maximum rooting depth of nearly 25 feet. Studies suggest that the Valley Oak may be able to access groundwater much deeper, and up to nearly 80 feet in fractured rock ecosystems (Burgy, 1964).*" The GSP explains that the rooting depth is doubled as a conservative measure (in the case of valley oak, the 25 foot rooting depth is

doubled to 50 feet for the screening threshold). We recommend instead that a 75-foot threshold be used for Valley Oak, supported by recent research which confirms Burgy (1964) and shows further that Valley Oak polygons from the NC dataset exhibit the ability to extend deep in alluvial systems to reach groundwater (up to approximately 75 feet).[3]

RECOMMENDATIONS

- Include an inventory of the fauna and flora present within the subbasin's GDEs (see Attachment C of this letter for a list of freshwater species located in the Yolo subbasin). Note any threatened or endangered species.
- We recommend a depth-to-groundwater threshold of 75 feet be used instead of the 50 feet threshold, when verifying whether valley oak polygons from the NC Dataset are connected to groundwater.

Native Vegetation and Managed Wetlands

Native vegetation and managed wetlands are water use sectors that are required to be included into the water budget.[4,5] The integration of these ecosystems into the water budget is **insufficient**.

The water budget includes a separate item for evapotranspiration, but combines agriculture and native evapotranspiration into one term. The water budget did not explicitly include the current, historical, and projected demands of managed wetlands. The GSP states (4-29): "The YSGA water budget currently contains a data gap surrounding the consideration of managed wetlands. To ensure accurate consideration of managed wetlands moving forward, additional analysis and coordination will occur." We appreciate that managed wetlands are identified as a data gap in the budget, rather than left unrecognized. Please include a more detailed description of the process and timeline to address this data gap.

The omission of explicit water demands for native vegetation and managed wetlands is problematic because key environmental uses of groundwater are not being accounted for as water supply decisions are made using this budget, nor will they likely be considered in project and management actions.

RECOMMENDATIONS

- Quantify and present all water use sector demands in the historical, current, and projected water budgets with individual line items for each water use sector, including managed wetlands. If this is identified as a current data gap, then include a description of how it will be addressed, including a timeline for completion.
- In the historical, current, and projected water budgets, include an individual line item for native vegetation, instead of lumping it together with agricultural evapotranspiration.

[3] Groundwater dependence of riparian woodlands and the disrupting effect of anthropogenically altered streamflow

[4] "'Water use sector' refers to categories of water demand based on the general land uses to which the water is applied, including urban, industrial, agricultural, managed wetlands, managed recharge, and native vegetation." [23 CCR §351(al)]

[5] "The water budget shall quantify the following, either through direct measurements or estimates based on data: (3) Outflows from the groundwater system by water use sector, including evapotranspiration, groundwater extraction, groundwater discharge to surface water sources, and subsurface groundwater outflow." [23 CCR §354.18]

B. Engaging Stakeholders

Stakeholder Engagement during GSP development

Stakeholder engagement during GSP development is **insufficient**. SGMA's requirement for public notice and engagement of stakeholders is not fully met by the description in the Notice and Communication Section (Section 1.5.5) of the Plan.[6]

We note the following deficiencies with the overall stakeholder engagement process:

- The GSP does not provide a stand-alone Stakeholder Communication and Engagement Plan for the subbasin.
- The opportunities for public involvement and engagement during the GSP development phase are not provided in the GSP. Groundwater users are mentioned in Section 1.5.5 as being stakeholders for public outreach activities in the subbasin, however no detailed information is provided on the type of outreach and engagement activities that have been conducted specifically for DACs, domestic well owners, tribes, and environmental stakeholders.
- The plan does not include a plan for continual opportunities for engagement through the implementation phase of the GSP for DACs, domestic well owners, tribes, and environmental stakeholders.

RECOMMENDATIONS

- Include a stand-alone, detailed and robust Stakeholder Communication and Engagement Plan that describes active and targeted outreach to engage DACs, domestic well owners, environmental stakeholders, and tribal stakeholders during the remainder of the GSP development process and throughout the GSP implementation phase. Refer to Attachment B for specific recommendations on how to actively engage stakeholders during all phases of the GSP process.
- Describe efforts to consult and engage with DACs and domestic well owners within the subbasin.
- Utilize DWR's tribal engagement guidance to comprehensively address all tribes and tribal interests in the subbasin within the GSP.[7]
- Describe efforts to consult and engage with environmental stakeholders within the subbasin.

[6] "A communication section of the Plan shall include a requirement that the GSP identify how it encourages the active involvement of diverse social, cultural, and economic elements of the population within the basin." [23 CCR §354.10(d)(3)]

[7] Engagement with Tribal Governments Guidance Document. Available at: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/Guidance-Doc-for-SGM-Engagement-with-Tribal-Govt_ay_19.pdf

C. Considering Beneficial Uses and Users When Establishing Sustainable Management Criteria and Analyzing Impacts on Beneficial Uses and Users

The consideration of beneficial uses and users when establishing sustainable management criteria (SMC) is **insufficient**. The consideration of potential impacts on all beneficial users of groundwater in the basin are required when defining undesirable results and establishing minimum thresholds.[8,9,10]

Disadvantaged Communities and Drinking Water Users

For chronic lowering of groundwater levels, the GSP mentions impacts on drinking water users when defining undesirable results. The GSP does not, however, analyze direct and indirect impacts on DACs, drinking water users, or tribes when defining undesirable results, or evaluate the cumulative or indirect impacts of proposed minimum thresholds on these stakeholders.

The GSP identifies constituents of concern (COCs) in the subbasin as arsenic, hexavalent chromium, nitrate, chloride, sodium, boron, selenium, conductivity, and total dissolved solids (TDS). The GSP states (3-15): "*The YSGA has not established specific sustainable management criteria for water quality in the Subbasin but will rely on current and future water quality standards established for drinking water and agricultural water uses by State and county regulatory agencies."* However, SMC should be established for constituents in the subbasin that may be impacted or exacerbated by groundwater use and/or management, in addition to coordinating with water quality regulatory programs.

The GSP only includes a very general discussion of impacts on drinking water users when defining undesirable results and evaluating the cumulative or indirect impacts of proposed minimum thresholds. The GSP does not, however, mention or discuss direct and indirect impacts on DACs, drinking water users, or tribes when defining undesirable results for degraded water quality, nor does it evaluate the cumulative or indirect impacts of proposed minimum thresholds on these stakeholders.

RECOMMENDATIONS

Chronic Lowering of Groundwater Levels

- Describe direct and indirect impacts on DACs, drinking water users, and tribes when describing undesirable results for chronic lowering of groundwater levels.
- Consider and evaluate the impacts of selected minimum thresholds and measurable objectives on DACs, drinking water users, and tribes within the subbasin. Further describe the impact of passing the minimum threshold for these users. For example, provide the number of domestic wells that would be de-watered at the minimum threshold.

[8] "The description of undesirable results shall include [...] potential effects on the beneficial uses and users of groundwater, on land uses and property interests, and other potential effects that may occur or are occurring from undesirable results." [23 CCR §354.26(b)(3)]
[9] "The description of minimum thresholds shall include [...] how minimum thresholds may affect the interests of beneficial uses and users of groundwater or land uses and property interests." [23 CCR §354.28(b)(4)]
[10] "The description of minimum thresholds shall include [...] how state, federal, or local standards relate to the relevant sustainability indicator. If the minimum threshold differs from other regulatory standards, the agency shall explain the nature of and the basis for the difference." [23 CCR §354.28(b)(5)]

Degraded Water Quality

- Establish SMC for the identified COCs in the subbasin that may be impacted or exacerbated by groundwater use and/or management. Ensure they align with drinking water standards.[11] Also, evaluate the cumulative or indirect impacts of proposed criteria for degraded water quality on DACs, drinking water users, and tribes.

- Describe direct and indirect impacts on DACs, drinking water users, and tribes when defining undesirable results for degraded water quality. For specific guidance on how to consider these users, refer to "Guide to Protecting Water Quality Under the Sustainable Groundwater Management Act."[12]

Groundwater Dependent Ecosystems and Interconnected Surface Waters

Sustainable management criteria for chronic lowering of groundwater levels provided in the GSP do not consider potential impacts to environmental beneficial users. The GSP neither describes nor analyzes direct or indirect impacts on environmental users of groundwater when defining undesirable results. This is problematic because without identifying potential impacts to GDEs, minimum thresholds may compromise, or even destroy, these environmental beneficial users. Since GDEs are present in the subbasin, they must be considered when developing SMC for chronic lowering of groundwater levels.

Sustainable management criteria for depletion of interconnected surface water are established by proxy using groundwater levels at shallow near-stream representative monitoring wells. However, no analysis or discussion is presented to describe how the SMC will affect GDEs, or the impact of these minimum thresholds on GDEs in the subbasin. Furthermore, the GSP makes no attempt to evaluate the impacts of the proposed minimum threshold on environmental beneficial users of surface water. The GSP does not explain how the chosen minimum thresholds and measurable objectives avoid significant and unreasonable effects on surface water beneficial users in the subbasin, such as increased mortality and inability to perform key life processes (e.g., reproduction, migration).

RECOMMENDATIONS

- When defining undesirable results for chronic lowering of groundwater levels, provide specifics on what biological responses (e.g., extent of habitat, growth, recruitment rates) would best characterize a significant and unreasonable impact to GDEs. Undesirable results to environmental users occur when 'significant and unreasonable' effects on beneficial users are caused by one of the sustainability indicators (i.e., chronic lowering of groundwater levels, degraded water quality, or depletion of interconnected surface water). Thus, potential impacts on environmental beneficial uses and users need to be considered when defining undesirable results in the

[11] "Degraded Water Quality [...] collect sufficient spatial and temporal data from each applicable principal aquifer to determine groundwater quality trends for water quality indicators, as determined by the Agency, to address known water quality issues." [23 CCR §354.34(c)(4)]

[12] Guide to Protecting Water Quality under the Sustainable Groundwater Management Act https://d3n8a8pro7vhmx.cloudfront.net/communitywatercenter/pages/293/attachments/original/1559328858/Guide_to_Protecting_Drinking_Water_Quality_Under_the_Sustainable_Groundwater_Management_Act.pdf?1559328858.

subbasin. Defining undesirable results is the crucial first step before the minimum thresholds can be determined.[13,14]

- When establishing SMC for the basin, consider that the SGMA statute [Water Code §10727.4(l)] specifically calls out that GSPs shall include "impacts on groundwater dependent ecosystems".

- When defining undesirable results for depletion of interconnected surface water, include a description of potential impacts on instream habitats within ISWs when minimum thresholds in the subbasin are reached.[15] The GSP should confirm that minimum thresholds for ISWs avoid adverse impacts to environmental beneficial users of interconnected surface waters as these environmental users could be left unprotected by the GSP. These recommendations apply especially to environmental beneficial users that are already protected under pre-existing state or federal law.[6,16]

2. Climate Change

The SGMA statute identifies climate change as a significant threat to groundwater resources and one that must be examined and incorporated in the GSPs. The GSP Regulations require integration of climate change into the projected water budget to ensure that projects and management actions sufficiently account for the range of potential climate futures.[17] The effects of climate change will intensify the impacts of water stress on GDEs, making available shallow groundwater resources more critical for their survival. Condon *et al.* (2020) shows that GDEs are more likely to succumb to water stress and rely more on groundwater during times of drought.[18] When shallow groundwater is unavailable, riparian forests can die off and key life processes (e.g., migration and spawning) for aquatic organisms, such as steelhead, can be impeded.

The integration of climate change into the projected water budget is **incomplete**. The GSP does incorporate climate change into the projected water budget using DWR change factors for 2030 and 2070 and considers multiple climate scenarios (e.g., the 2070 dry-extreme weather and 2070 wetter-moderate warming climate scenarios) in the projected water budget.

The GSP incorporates climate change into key inputs (e.g., precipitation and evapotranspiration) of the projected water budget. However, climate change was not incorporated into surface water flow inputs. Furthermore, the GSP does not calculate a sustainable yield based on the projected water budget with

[13] "The description of undesirable results shall include [...] potential effects on the beneficial uses and users of groundwater, on land uses and property interests, and other potential effects that may occur or are occurring from undesirable results". [23 CCR §354.26(b)(3)]
[14] The description of minimum thresholds shall include [...] how minimum thresholds may affect the interests of beneficial uses and users of groundwater or land uses and property interests." [23 CCR §354.28(b)(4)]
[15] "The minimum threshold for depletions of interconnected surface water shall be the rate or volume of surface water depletions caused by groundwater use that has adverse impacts on beneficial uses of the surface water and may lead to undesirable results." [23 CCR §354.28(c)(6)]
[16] Rohde MM, Seapy B, Rogers R, Castañeda X, editors. 2019. Critical Species LookBook: A compendium of California's threatened and endangered species for sustainable groundwater management. The Nature Conservancy, San Francisco, California. Available at: https://groundwaterresourcehub.org/public/uploads/pdfs/Critical_Species_LookBook_91819.pdf
[17] "Each Plan shall rely on the best available information and best available science to quantify the water budget for the basin in order to provide an understanding of historical and projected hydrology, water demand, water supply, land use, population, climate change, sea level rise, groundwater and surface water interaction, and subsurface groundwater flow." [23 CCR §354.18(e)]
[18] Condon et al. 2020. Evapotranspiration depletes groundwater under warming over the contiguous United States. Nature Communications. Available at: https://www.nature.com/articles/s41467-020-14688-0

climate change incorporated. If the water budgets are incomplete, including the omission of projected climate change effects on surface water flow inputs, and sustainable yield is not calculated based on climate change projections, then there is increased uncertainty in virtually every subsequent calculation used to plan for projects, derive measurable objectives, and set minimum thresholds. Plans that do not adequately include climate change projections may underestimate future impacts on vulnerable beneficial users of groundwater such as ecosystems, DACs, tribes, and domestic well owners.

RECOMMENDATIONS

- Incorporate climate change into surface water flow inputs for the projected water budget.
- Calculate sustainable yield based on the projected water budget with climate change incorporated.
- Incorporate climate change scenarios into projects and management actions.

3. Data Gaps

The consideration of beneficial users when establishing monitoring networks is **insufficient**, due to lack of specific plans to increase the Representative Monitoring Wells (RMWs) in the monitoring network that represent water quality conditions and shallow groundwater elevations around DACs, domestic wells, tribes, GDEs, and ISWs in the subbasin.

The GSP states (p. 4-11): “Rather than developing a new monitoring program, the YSGA will rely on existing programs to monitor water quality in the Subbasin.” However, specific well names or locations are not provided for this monitoring network.

Figure 4-1 (Yolo Subbasin Groundwater Elevation Representative Monitoring Wells) shows that no groundwater elevation monitoring wells are located across portions of the subbasin near DACs, domestic wells, and tribes (see maps provided in Attachment E). Beneficial users of groundwater may remain unprotected by the GSP without adequate monitoring and identification of data gaps in the shallow aquifer. The Plan therefore fails to meet SGMA’s requirements for the monitoring network.[19]

The GSP provides some discussion of data gaps for GDEs and ISWs in Sections 4.8.5 (Data Gaps) and Section 4.11.2.3 (Surface Water, Interconnected Surface Water, and Groundwater Dependent Ecosystem Monitoring Network), however does not provide specific plans, such as locations or a timeline, to fill the data gaps.

RECOMMENDATIONS

- Establish a monitoring network for the groundwater quality condition indicator.
- Provide maps that overlay current and proposed monitoring well locations with the locations of DACs, domestic wells, tribes, GDEs, and ISWs to clearly identify potentially impacted areas. Increase the number of RMWs in the shallow aquifer across the subbasin as needed to adequately monitor all groundwater condition

[19] “The monitoring network objectives shall be implemented to accomplish the following: [...] (2) Monitor impacts to the beneficial uses or users of groundwater.” [23 CCR §354.34(b)(2)]

indicators. Prioritize proximity to DACs, domestic wells, tribes, and GDEs when identifying new RMWs.

- Further describe the biological monitoring that can be used to assess the potential for significant and unreasonable impacts to GDEs or ISWs due to groundwater conditions in the subbasin.

4. Addressing Beneficial Users in Projects and Management Actions

The consideration of beneficial users when developing projects and management actions is **insufficient**, due to the failure to completely identify benefits or impacts of identified projects and management actions to key beneficial users of groundwater such as GDEs, aquatic habitats, surface water users, DACs, drinking water users, and tribes. Therefore, potential project and management actions may not protect these beneficial users. Groundwater sustainability under SGMA is defined not just by sustainable yield, but by the avoidance of undesirable results for *all* beneficial users.

RECOMMENDATIONS

- For DACs and domestic well owners, include a drinking water well impact mitigation program to proactively monitor and protect drinking water wells through GSP implementation. Refer to Attachment B for specific recommendations on how to implement a drinking water well mitigation program. The GSP includes a brief discussion of a domestic well Impact mitigation program in Table 5-1, but very few details are provided.

- For DACs and domestic well owners, include a discussion of whether potential impacts to water quality from projects and management actions could occur and how the GSA plans to mitigate such impacts.

- Recharge ponds, reservoirs, and facilities for managed aquifer recharge can be designed as multiple-benefit projects to include elements that act functionally as wetlands and provide a benefit for wildlife and aquatic species. The GSP mentions creation of seasonal wetlands in Table 5-1 under the 'Groundwater Recharge and Managed Aquifer Recharge Projects'. For further guidance on how to integrate multi-benefit recharge projects into your GSP, refer to the "Multi-Benefit Recharge Project Methodology Guidance Document."[20]

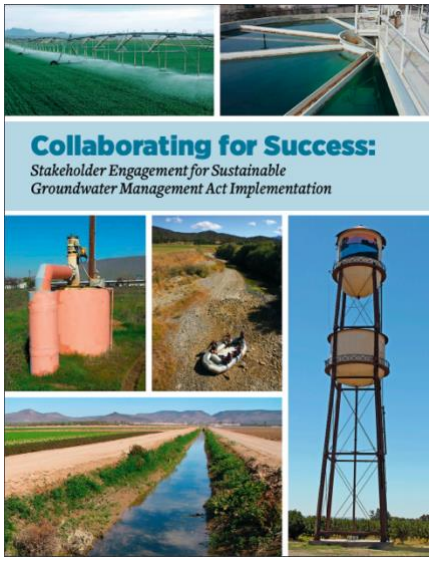
- Develop management actions that incorporate climate and water delivery uncertainties to address future water demand and prevent future undesirable results.

[20] The Nature Conservancy. 2021. Multi-Benefit Recharge Project Methodology for Inclusion in Groundwater Sustainability Plans. Sacramento. Available at: https://groundwaterresourcehub.org/sgma-tools/multi-benefit-recharge-project-methodology-guidance/

Attachment B

SGMA Tools to address DAC, drinking water, and environmental beneficial uses and users

Stakeholder Engagement and Outreach



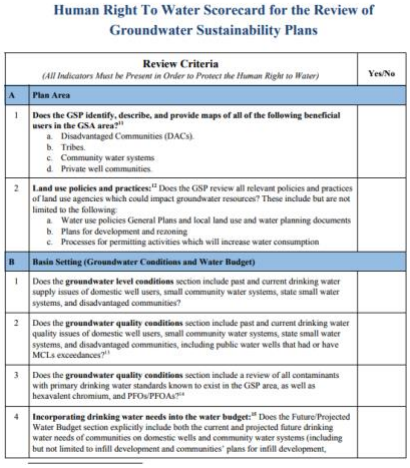
Clean Water Action, Community Water Center and Union of Concerned Scientists developed a guidance document called Collaborating for success: Stakeholder engagement for Sustainable Groundwater Management Act Implementation. It provides details on how to conduct targeted and broad outreach and engagement during Groundwater Sustainability Plan (GSP) development and implementation. Conducting a targeted outreach involves:

- Developing a robust Stakeholder Communication and Engagement plan that includes outreach at frequented locations (schools, farmers markets, religious settings, events) across the plan area to increase the involvement and participation of disadvantaged communities, drinking water users and the environmental stakeholders.

- Providing translation services during meetings and technical assistance to enable easy participation for non-English speaking stakeholders.

- GSP should adequately describe the process for requesting input from beneficial users and provide details on how input is incorporated into the GSP.

The Human Right to Water

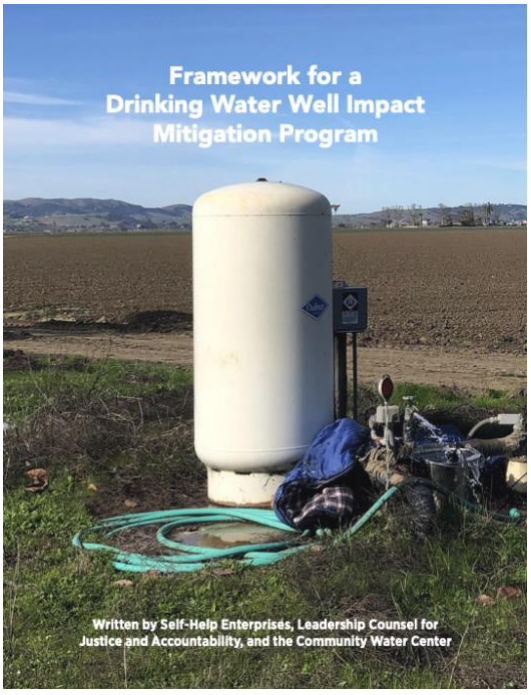


Human Right To Water Scorecard for the Review of Groundwater Sustainability Plans

	Review Criteria *(All Indicators Must be Present in Order to Protect the Human Right to Water)*	Yes/No
A	**Plan Area**	
1	**Does the GSP identify, describe, and provide maps of all of the following beneficial users in the GSA area?**[43] a. Disadvantaged Communities (DACs). b. Tribes. c. Community water systems. d. Private well communities.	
2	**Land use policies and practices:**[44] Does the GSP review all relevant policies and practices of land use agencies which could impact groundwater resources? These include but are not limited to the following: a. Water use policies General Plans and local land use and water planning documents b. Plans for development and rezoning c. Processes for permitting activities which will increase water consumption	
B	**Basin Setting (Groundwater Conditions and Water Budget)**	
1	Does the **groundwater level conditions** section include past and current drinking water supply issues of domestic well users, small community water systems, state small water systems, and disadvantaged communities?	
2	Does the **groundwater quality conditions** section include past and current drinking water quality issues of domestic well users, small community water systems, state small water systems, and disadvantaged communities, including public water wells that had or have MCLs exceedances?[45]	
3	Does the **groundwater quality conditions** section include a review of all contaminants with primary drinking water standards known to exist in the GSP area, as well as hexavalent chromium, and PFOs/PFOAs?[46]	
4	**Incorporating drinking water needs into the water budget:**[48] Does the Future/Projected Water Budget section explicitly include both the current and projected future drinking water needs of communities on domestic wells and community water systems (including but not limited to infill development and communities' plans for infill development,	

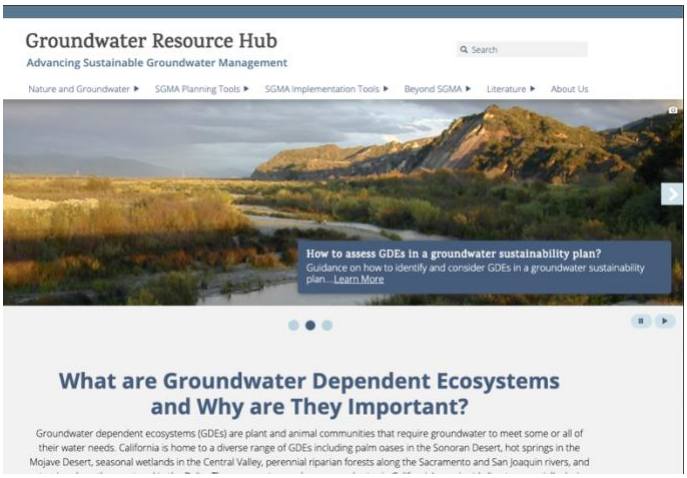
The Human Right to Water Scorecard was developed by Community Water Center, Leadership Counsel for Justice and Accountability and Self Help Enterprises to aid Groundwater Sustainability Agencies (GSAs) in prioritizing drinking water needs in SGMA. The scorecard identifies elements that must exist in GSPs to adequately protect the Human Right to Drinking water.

Drinking Water Well Impact Mitigation Framework



The Drinking Water Well Impact Mitigation Framework was developed by Community Water Center, Leadership Counsel for Justice and Accountability and Self Help Enterprises to aid GSAs in the development and implementation of their GSPs. The framework provides a clear roadmap for how a GSA can best structure its data gathering, monitoring network and management actions to proactively monitor and protect drinking water wells and mitigate impacts should they occur.

Groundwater Resource Hub



The Nature Conservancy has developed a suite of tools based on best available science to help GSAs, consultants, and stakeholders efficiently incorporate nature into GSPs. These tools and resources are available online at GroundwaterResourceHub.org. The Nature Conservancy's tools and resources are intended to reduce costs, shorten timelines, and increase benefits for both people and nature.

Rooting Depth Database

The Plant Rooting Depth Database provides information that can help assess whether groundwater-dependent vegetation are accessing groundwater. Actual rooting depths will depend on the plant species and site-specific conditions, such as soil type and

availability of other water sources. Site-specific knowledge of depth to groundwater combined with rooting depths will help provide an understanding of the potential groundwater levels are needed to sustain GDEs.

How to use the database

The maximum rooting depth information in the Plant Rooting Depth Database is useful when verifying whether vegetation in the Natural Communities Commonly Associated with Groundwater (NC Dataset) are connected to groundwater. A 30 ft depth-to-groundwater threshold, which is based on averaged global rooting depth data for phreatophytes[1], is relevant for most plants identified in the NC Dataset since most plants have a max rooting depth of less than 30 feet. However, it is important to note that deeper thresholds are necessary for other plants that have reported maximum root depths that exceed the averaged 30 feet threshold, such as valley oak (*Quercus lobata*), Euphrates poplar (*Populus euphratica*), salt cedar (*Tamarix spp.*), and shadescale (*Atriplex confertifolia*). The Nature Conservancy advises that the reported max rooting depth for these deeper-rooted plants be used. For example, a depth-to groundwater threshold of 80 feet should be used instead of the 30 ft threshold, when verifying whether valley oak polygons from the NC Dataset are connected to groundwater. It is important to re-emphasize that actual rooting depth data are limited and will depend on the plant species and site-specific conditions such as soil and aquifer types, and availability to other water sources.

The Plant Rooting Depth Database is an Excel workbook composed of four worksheets:

1. California phreatophyte rooting depth data (included in the NC Dataset)
2. Global phreatophyte rooting depth data
3. Metadata
4. References

How the database was compiled

The Plant Rooting Depth Database is a compilation of rooting depth information for the groundwater-dependent plant species identified in the NC Dataset. Rooting depth data were compiled from published scientific literature and expert opinion through a crowdsourcing campaign. As more information becomes available, the database of rooting depths will be updated. Please Contact Us if you have additional rooting depth data for California phreatophytes.

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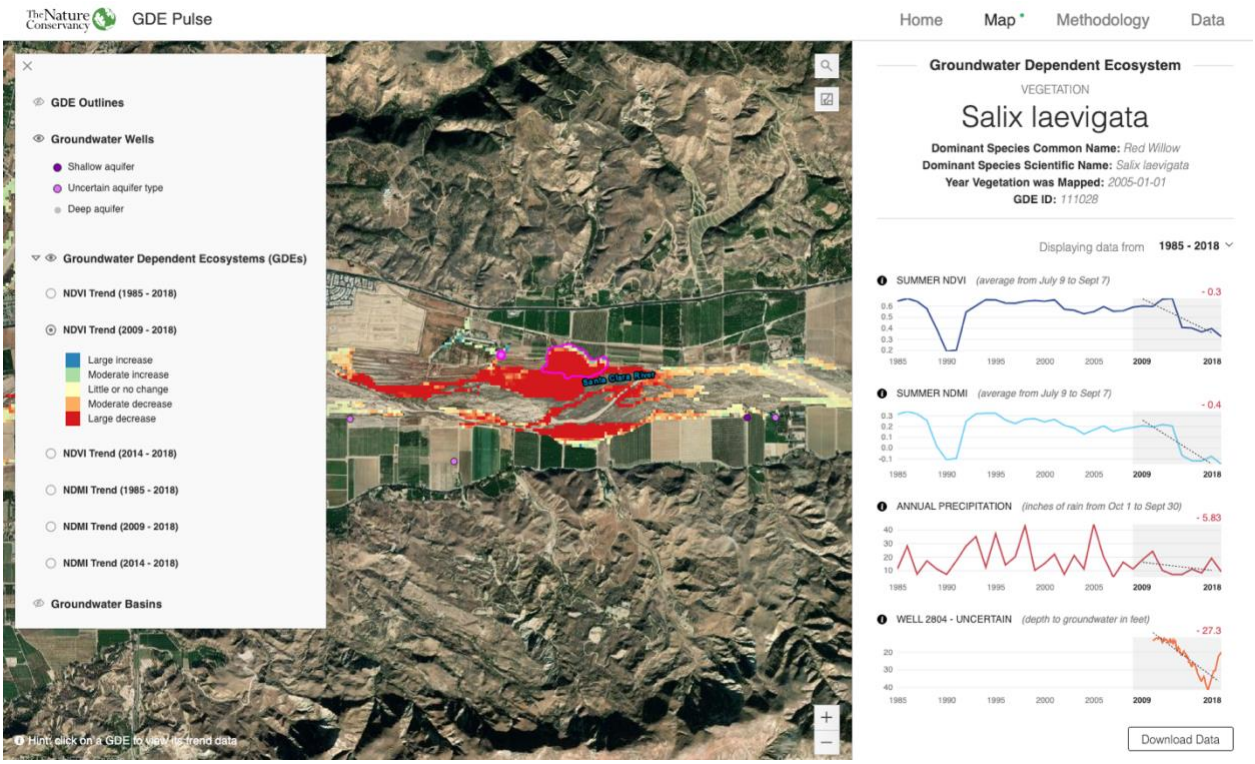
[1] Canadell, J., Jackson, R.B., Ehleringer, J.B. et al. 1996. Maximum rooting depth of vegetation types at the global scale. Oecologia 108, 583–595. https://doi.org/10.1007/BF00329030

GDE Pulse



GDE Pulse is a free online tool that allows Groundwater Sustainability Agencies to assess changes in groundwater dependent ecosystem (GDE) health using satellite, rainfall, and groundwater data. Remote sensing data from satellites has been used to monitor the health of vegetation all over the planet. GDE pulse has compiled 35 years of satellite imagery from NASA's Landsat mission for every polygon in the Natural Communities Commonly Associated with Groundwater Dataset. The following datasets are available for downloading:

Normalized Difference Vegetation Index (NDVI) is a satellite-derived index that represents the greenness of vegetation. Healthy green vegetation tends to have a higher NDVI, while dead leaves have a lower NDVI. We calculated the average NDVI during the driest part of the year (July - Sept) to estimate vegetation health when the plants are most likely dependent on groundwater.

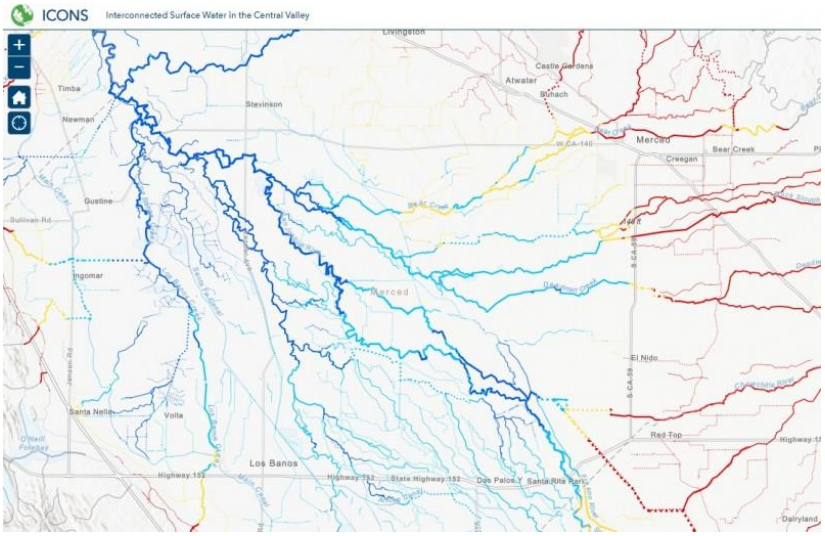
Normalized Difference Moisture Index (NDMI) is a satellite-derived index that represents water content in vegetation. NDMI is derived from the Near-Infrared (NIR) and Short-Wave Infrared (SWIR) channels. Vegetation with adequate access to water tends to have higher NDMI, while vegetation that is water stressed tends to have lower NDMI. We calculated the average NDVI during the driest part of the year (July–September) to estimate vegetation health when the plants are most likely dependent on groundwater.

Annual Precipitation is the total precipitation for the water year (October 1st – September 30th) from the PRISM dataset. The amount of local precipitation can affect vegetation with more precipitation generally leading to higher NDVI and NDMI.

Depth to Groundwater measurements provide an indication of the groundwater levels and changes over time for the surrounding area. We used groundwater well measurements from nearby (<1km) wells to estimate the depth to groundwater below the GDE based on the average elevation of the GDE (using a digital elevation model) minus the measured groundwater surface elevation.

ICONOS Mapper

Interconnected Surface Water in the Central Valley



ICONS maps the likely presence of interconnected surface water (ISW) in the Central Valley using depth to groundwater data. Using data from 2011-2018, the ISW dataset represents the likely connection between surface water and groundwater for rivers and streams in California's Central Valley. It includes information on the mean, maximum, and minimum depth to groundwater for each stream segment over the years with available data, as well as the likely presence of ISW based on the minimum depth to groundwater. The Nature Conservancy developed this database, with guidance and input from expert academics, consultants, and state agencies.

We developed this dataset using groundwater elevation data available online from the California Department of Water Resources (DWR). DWR only provides this data for the Central Valley. For GSAs outside of the valley, who have groundwater well measurements, we recommend following our methods to determine likely ISW in your region. The Nature Conservancy's ISW dataset should be used as a first step in reviewing ISW and should be supplemented with local or more recent groundwater depth data.

Attachment C

Freshwater Species Located in the Yolo Basin

To assist in identifying the beneficial users of surface water necessary to assess the undesirable result "depletion of interconnected surface waters", Attachment C provides a list of freshwater species located in the Yolo Basin. To produce the freshwater species list, we used ArcGIS to select features within the California Freshwater Species Database version 2.0.9 within the basin boundary. This database contains information on ~4,000 vertebrates, macroinvertebrates and vascular plants that depend on fresh water for at least one stage of their life cycle. The methods used to compile the California Freshwater Species Database can be found in Howard et al. 2015[1]. The spatial database contains locality observations and/or distribution information from ~400 data sources. The database is housed in the California Department of Fish and Wildlife's BIOS[2] as well as on The Nature Conservancy's science website[3].

Scientific Name	Common Name	Legal Protected Status		
		Federal	State	Other
BIRDS				
Actitis macularius	Spotted Sandpiper			
Aechmophorus clarkii	Clark's Grebe			
Aechmophorus occidentalis	Western Grebe			
Agelaius tricolor	Tricolored Blackbird	Bird of Conservation Concern	Special Concern	BSSC - First priority
Aix sponsa	Wood Duck			
Anas acuta	Northern Pintail			
Anas americana	American Wigeon			
Anas clypeata	Northern Shoveler			
Anas crecca	Green-winged Teal			
Anas cyanoptera	Cinnamon Teal			
Anas discors	Blue-winged Teal			
Anas platyrhynchos	Mallard			
Anas strepera	Gadwall			
Anser albifrons	Greater White-fronted Goose			
Ardea alba	Great Egret			
Ardea herodias	Great Blue Heron			
Aythya affinis	Lesser Scaup			
Aythya americana	Redhead		Special Concern	BSSC - Third priority

[1] Howard, J.K. et al. 2015. Patterns of Freshwater Species Richness, Endemism, and Vulnerability in California. PLoSONE, 11(7). Available at: https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0130710

[2] California Department of Fish and Wildlife BIOS: https://www.wildlife.ca.gov/data/BIOS

[3] Science for Conservation: https://www.scienceforconservation.org/products/california-freshwater-species-database

Aythya collaris	Ring-necked Duck			
Aythya marila	Greater Scaup			
Aythya valisineria	Canvasback		Special	
Botaurus lentiginosus	American Bittern			
Bucephala albeola	Bufflehead			
Bucephala clangula	Common Goldeneye			
Butorides virescens	Green Heron			
Calidris alpina	Dunlin			
Calidris mauri	Western Sandpiper			
Calidris minutilla	Least Sandpiper			
Chen caerulescens	Snow Goose			
Chen rossii	Ross's Goose			
Chlidonias niger	Black Tern		Special Concern	BSSC - Second priority
Chroicocephalus philadelphia	Bonaparte's Gull			
Cinclus mexicanus	American Dipper			
Cistothorus palustris palustris	Marsh Wren			
Coccyzus americanus occidentalis	Western Yellow-billed Cuckoo	Candidate - Threatened	Endangered	
Cygnus columbianus	Tundra Swan			
Egretta thula	Snowy Egret			
Empidonax traillii	Willow Flycatcher	Bird of Conservation Concern	Endangered	
Fulica americana	American Coot			
Gallinago delicata	Wilson's Snipe			
Gallinula chloropus	Common Moorhen			
Grus canadensis	Sandhill Crane			
Haliaeetus leucocephalus	Bald Eagle	Bird of Conservation Concern	Endangered	
Himantopus mexicanus	Black-necked Stilt			
Icteria virens	Yellow-breasted Chat		Special Concern	BSSC - Third priority
Ixobrychus exilis hesperis	Western Least Bittern		Special Concern	BSSC - Second priority
Limnodromus scolopaceus	Long-billed Dowitcher			
Lophodytes cucullatus	Hooded Merganser			
Megaceryle alcyon	Belted Kingfisher			
Mergus merganser	Common Merganser			
Mergus serrator	Red-breasted Merganser			
Numenius americanus	Long-billed Curlew			
Numenius phaeopus	Whimbrel			

Nycticorax nycticorax	Black-crowned Night-Heron			
Oxyura jamaicensis	Ruddy Duck			
Pelecanus erythrorhynchos	American White Pelican		Special Concern	BSSC - First priority
Phalacrocorax auritus	Double-crested Cormorant			
Phalaropus tricolor	Wilson's Phalarope			
Piranga rubra	Summer Tanager		Special Concern	BSSC - First priority
Plegadis chihi	White-faced Ibis		Watch list	
Pluvialis squatarola	Black-bellied Plover			
Podiceps nigricollis	Eared Grebe			
Podilymbus podiceps	Pied-billed Grebe			
Porzana carolina	Sora			
Rallus limicola	Virginia Rail			
Recurvirostra americana	American Avocet			
Riparia riparia	Bank Swallow		Threatened	
Setophaga petechia	Yellow Warbler			BSSC - Second priority
Tachycineta bicolor	Tree Swallow			
Tringa melanoleuca	Greater Yellowlegs			
Tringa semipalmata	Willet			
Tringa solitaria	Solitary Sandpiper			
Vireo bellii	Bell's Vireo			
Vireo bellii pusillus	Least Bell's Vireo	Endangered	Endangered	
Xanthocephalus xanthocephalus	Yellow-headed Blackbird		Special Concern	BSSC - Third priority
CRUSTACEANS				
Branchinecta conservatio	Conservancy Fairy Shrimp	Endangered	Special	IUCN - Endangered
Branchinecta lynchi	Vernal Pool Fairy Shrimp	Threatened	Special	IUCN - Vulnerable
Branchinecta mesovallensis	Midvalley Fairy Shrimp		Special	
Hyalella spp.	Hyalella spp.			
Lepidurus packardi	Vernal Pool Tadpole Shrimp	Endangered	Special	IUCN - Endangered
Linderiella occidentalis	California Fairy Shrimp		Special	IUCN - Near Threatened
Stygobromus spp.	Stygobromus spp.			
FISH				
Acipenser medirostris ssp. 1	Southern green sturgeon	Threatened	Special Concern	Endangered - Moyle 2013
Oncorhynchus mykiss - CV	Central Valley steelhead	Threatened	Special	Vulnerable - Moyle 2013

Oncorhynchus mykiss irideus	Coastal rainbow trout			Least Concern - Moyle 2013
Oncorhynchus tshawytscha - CV spring	Central Valley spring Chinook salmon	Threatened	Threatened	Vulnerable - Moyle 2013
Oncorhynchus tshawytscha - CV winter	Central Valley winter Chinook salmon	Endangered	Endangered	Vulnerable - Moyle 2013
Pogonichthys macrolepidotus	Sacramento splittail		Special Concern	Vulnerable - Moyle 2013
Spirinchus thaleichthys	Longfin smelt	Candidate	Threatened	Vulnerable - Moyle 2013
HERPS				
Actinemys marmorata marmorata	Western Pond Turtle		Special Concern	ARSSC
Ambystoma californiense californiense	California Tiger Salamander	Threatened	Threatened	ARSSC
Anaxyrus boreas boreas	Boreal Toad			
Anaxyrus boreas halophilus	California Toad			ARSSC
Dicamptodon ensatus	California Giant Salamander			ARSSC
Pseudacris regilla	Northern Pacific Chorus Frog			
Rana boylii	Foothill Yellow-legged Frog	Under Review in the Candidate or Petition Process	Special Concern	ARSSC
Rana draytonii	California Red-legged Frog	Threatened	Special Concern	ARSSC
Spea hammondii	Western Spadefoot	Under Review in the Candidate or Petition Process	Special Concern	ARSSC
Taricha torosa	Coast Range Newt		Special Concern	ARSSC
Thamnophis gigas	Giant Gartersnake	Threatened	Threatened	
Thamnophis sirtalis fitchi	Valley Gartersnake			Not on any status lists
Thamnophis sirtalis sirtalis	Common Gartersnake			
INSECTS & OTHER INVERTS				
Ablabesmyia spp.	Ablabesmyia spp.			
Aeshna interrupta interna				
Aeshnidae fam.	Aeshnidae fam.			
Ambrysus spp.	Ambrysus spp.			
Ameletus imbellis	A Mayfly			
Anax junius	Common Green Darner			
Anax walsinghami	Giant Green Darner			

Archilestes californica	California Spreadwing			
Argia emma	Emma's Dancer			
Argia lugens	Sooty Dancer			
Argia vivida	Vivid Dancer			
Caenis spp.	Caenis spp.			
Callibaetis fluctuans	A Mayfly			
Callibaetis spp.	Callibaetis spp.			
Centroptilum spp.	Centroptilum spp.			
Chironomidae fam.	Chironomidae fam.			
Chironomus spp.	Chironomus spp.			
Cladotanytarsus spp.	Cladotanytarsus spp.			
Coenagrionidae fam.	Coenagrionidae fam.			
Corixidae fam.	Corixidae fam.			
Cricotopus spp.	Cricotopus spp.			
Cryptochironomus spp.	Cryptochironomus spp.			
Dicrotendipes spp.	Dicrotendipes spp.			
Dubiraphia spp.	Dubiraphia spp.			
Enallagma carunculatum	Tule Bluet			
Enallagma civile	Familiar Bluet			
Erpetogomphus compositus	White-belted Ringtail			
Erythemis collocata	Western Pondhawk			
Fallceon quilleri	A Mayfly			
Glyptotendipes spp.	Glyptotendipes spp.			
Gomphus kurilis	Pacific Clubtail			
Gyrinus affinis				Not on any status lists
Helicopsyche spp.	Helicopsyche spp.			
Hetaerina americana	American Rubyspot			
Hydropsyche spp.	Hydropsyche spp.			
Ischnura cervula	Pacific Forktail			
Ischnura denticollis	Black-fronted Forktail			
Ischnura perparva	Western Forktail			
Labrundinia spp.	Labrundinia spp.			
Libellula forensis	Eight-spotted Skimmer			
Libellula luctuosa	Widow Skimmer			
Libellula pulchella	Twelve-spotted Skimmer			
Libellula saturata	Flame Skimmer			
Microchironomus spp.	Microchironomus spp.			
Microvelia spp.	Microvelia spp.			
Mideopsis spp.	Mideopsis spp.			
Nectopsyche spp.	Nectopsyche spp.			
Neoclypeodytes spp.	Neoclypeodytes spp.			

Ochthebius spp.	Ochthebius spp.			
Octogomphus specularis	Grappletail			
Oecetis spp.	Oecetis spp.			
Pachydiplax longipennis	Blue Dasher			
Pantala flavescens	Wandering Glider			
Pantala hymenaea	Spot-winged Glider			
Paraleptophlebia cachea	A Mayfly			
Paratanytarsus spp.	Paratanytarsus spp.			
Pentaneura spp.	Pentaneura spp.			
Plathemis lydia	Common Whitetail			
Polypedilum spp.	Polypedilum spp.			
Procladius spp.	Procladius spp.			
Progomphus borealis	Gray Sanddragon			
Rhagovelia distincta				Not on any status lists
Rheotanytarsus spp.	Rheotanytarsus spp.			
Rhionaeschna multicolor	Blue-eyed Darner			
Sperchon spp.	Sperchon spp.			
Sympetrum corruptum	Variegated Meadowhawk			
Tanytarsus spp.	Tanytarsus spp.			
Tramea lacerata	Black Saddlebags			
Tricorythodes spp.	Tricorythodes spp.			
Zoniagrion exclamationis	Exclamation Damsel			
MAMMALS				
Castor canadensis	American Beaver			Not on any status lists
Lontra canadensis canadensis	North American River Otter			Not on any status lists
Neovison vison	American Mink			Not on any status lists
Ondatra zibethicus	Common Muskrat			Not on any status lists
MOLLUSKS				
Anodonta californiensis	California Floater		Special	
Ferrissia spp.	Ferrissia spp.			
Gonidea angulata	Western Ridged Mussel		Special	
Gyraulus spp.	Gyraulus spp.			
Margaritifera falcata	Western Pearlshell		Special	
Physa spp.	Physa spp.			
PLANTS				
Alnus rhombifolia	White Alder			
Alopecurus carolinianus	Tufted Foxtail			
Alopecurus saccatus	Pacific Foxtail			

Arundo donax	NA			
Baccharis salicina				Not on any status lists
Bolboschoenus fluviatilis				Not on any status lists
Bolboschoenus glaucus	NA			Not on any status lists
Bolboschoenus maritimus paludosus	NA			Not on any status lists
Callitriche longipedunculata	Longstock Water-starwort			
Callitriche marginata	Winged Water-starwort			
Carex nudata	Torrent Sedge			
Cephalanthus occidentalis	Common Buttonbush			
Chloropyron palmatum	NA	Endangered	Special	CRPR - 1B.1
Cotula coronopifolia	NA			
Crassula aquatica	Water Pygmyweed			
Crypsis vaginiflora	NA			
Cyperus erythrorhizos	Red-root Flatsedge			
Damasonium californicum				Not on any status lists
Downingia insignis	Parti-color Downingia			
Downingia ornatissima	NA			
Downingia pulchella	Flat-face Downingia			
Elatine californica	California Waterwort			
Elatine rubella	Southwestern Waterwort			
Eleocharis acicularis acicularis	Least Spikerush			
Eleocharis macrostachya	Creeping Spikerush			
Elodea canadensis	Broad Waterweed			
Epilobium campestre	NA			Not on any status lists
Epilobium cleistogamum	Cleistogamous Spike-primrose			
Eryngium aristulatum aristulatum	California Eryngo			
Eryngium castrense	Great Valley Eryngo			
Eryngium jepsonii	NA			Not on any status lists
Eryngium vaseyi vaseyi	Vasey's Coyote-thistle			Not on any status lists
Euthamia occidentalis	Western Fragrant Goldenrod			
Helenium puberulum	Rosilla			
Hibiscus lasiocarpos occidentalis			Special	CRPR - 1B.2
Juncus uncialis	Inch-high Rush			

Lasthenia fremontii	Fremont's Goldfields			
Leersia oryzoides	Rice Cutgrass			
Lemna minor	Lesser Duckweed			
Lemna minuta	Least Duckweed			
Lilaeopsis masonii	Mason's Lilaeopsis		Special	CRPR - 1B.1
Limnanthes douglasii rosea	Douglas' Meadowfoam			
Limosella acaulis	Southern Mudwort			
Ludwigia hexapetala	NA			Not on any status lists
Ludwigia peploides montevidensis	NA			Not on any status lists
Ludwigia peploides peploides	NA			Not on any status lists
Lythrum californicum	California Loosestrife			
Marsilea vestita vestita	NA			Not on any status lists
Mimulus latidens	Broad-tooth Monkeyflower			
Mimulus pilosus				Not on any status lists
Mimulus tricolor	Tricolor Monkeyflower			
Myosurus minimus	NA			
Myosurus sessilis	Sessile Mousetail			
Myriophyllum aquaticum	NA			
Navarretia cotulifolia	Cotula Navarretia			
Navarretia heterandra	Tehama Navarretia			
Navarretia leucocephala bakeri	Baker's Navarretia		Special	CRPR - 1B.1
Navarretia leucocephala leucocephala	White-flower Navarretia			
Neostapfia colusana	Colusa Grass	Threatened	Endangered	CRPR - 1B.1
Paspalum distichum	Joint Paspalum			
Perideridia kelloggii	Kellogg's Yampah			
Persicaria lapathifolia				Not on any status lists
Persicaria maculosa	NA			Not on any status lists
Persicaria punctata	NA			Not on any status lists
Phyla nodiflora	Common Frog-fruit			
Pilularia americana	NA			
Plagiobothrys humistratus	Dwarf Popcorn-flower			
Plagiobothrys leptocladus	Alkali Popcorn-flower			
Plantago elongata elongata	Slender Plantain			
Pleuropogon californicus californicus				Not on any status lists

Pogogyne douglasii	NA			
Pogogyne zizyphoroides				Not on any status lists
Psilocarphus brevissimus brevissimus	Dwarf Woolly-heads			
Psilocarphus oregonus	Oregon Woolly-heads			
Psilocarphus tenellus	NA			
Puccinellia simplex	Little Alkali Grass			
Rorippa curvisiliqua curvisiliqua	Curve-pod Yellowcress			
Rumex conglomeratus	NA			
Rumex stenophyllus	NA			
Rumex transitorius				Not on any status lists
Salix babylonica	NA			
Salix exigua exigua	Narrowleaf Willow			
Salix exigua hindsiana				Not on any status lists
Salix gooddingii	Goodding's Willow			
Salix laevigata	Polished Willow			
Salix lasiandra lasiandra				Not on any status lists
Salix lasiolepis lasiolepis	Arroyo Willow			
Salix melanopsis	Dusky Willow			
Schoenoplectus acutus occidentalis	Hardstem Bulrush			
Schoenoplectus americanus	Three-square Bulrush			
Schoenoplectus pungens longispicatus	Three-square Bulrush			
Schoenoplectus pungens pungens	NA			
Scirpus microcarpus	Small-fruit Bulrush			
Sinapis alba	NA			
Stachys ajugoides	Bugle Hedge-nettle			
Stachys stricta	Sonoma Hedge-nettle			
Symphyotrichum lentum	Suisun Marsh Aster		Special	CRPR - 1B.2
Tuctoria mucronata	Mucronate Orcutt Grass	Endangered	Endangered	CRPR - 1B.1
Veronica anagallis-aquatica	NA			

Attachment D

July 2019

IDENTIFYING GDEs UNDER SGMA

Best Practices for using the NC Dataset

The Sustainable Groundwater Management Act (SGMA) requires that groundwater dependent ecosystems (GDEs) be identified in Groundwater Sustainability Plans (GSPs). As a starting point, the Department of Water Resources (DWR) is providing the Natural Communities Commonly Associated with Groundwater Dataset (NC Dataset) online[1] to help Groundwater Sustainability Agencies (GSAs), consultants, and stakeholders identify GDEs within individual groundwater basins. To apply information from the NC Dataset to local areas, GSAs should combine it with the best available science on local hydrology, geology, and groundwater levels to verify whether polygons in the NC dataset are likely supported by groundwater in an aquifer (Figure 1)[2]. This document highlights six best practices for using local groundwater data to confirm whether mapped features in the NC dataset are supported by groundwater.

Figure 1. Considerations for GDE identification.
Source: DWR[2]

[1] NC Dataset Online Viewer: https://gis.water.ca.gov/app/NCDatasetViewer/
[2] California Department of Water Resources (DWR). 2018. Summary of the "Natural Communities Commonly Associated with Groundwater" Dataset and Online Web Viewer. Available at: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Data-and-Tools/Files/Statewide-Reports/Natural-Communities-Dataset-Summary-Document.pdf

The NC Dataset identifies vegetation and wetland features that are good indicators of a GDE. The dataset is comprised of 48 publicly available state and federal datasets that map vegetation, wetlands, springs, and seeps commonly associated with groundwater in California[3]. It was developed through a collaboration between DWR, the Department of Fish and Wildlife, and The Nature Conservancy (TNC). TNC has also provided detailed guidance on identifying GDEs from the NC dataset[4] on the Groundwater Resource Hub[5], a website dedicated to GDEs.

BEST PRACTICE #1. Establishing a Connection to Groundwater

Groundwater basins can be comprised of one continuous aquifer (Figure 2a) or multiple aquifers stacked on top of each other (Figure 2b). In unconfined aquifers (Figure 2a), using the depth-to-groundwater and the rooting depth of the vegetation is a reasonable method to infer groundwater dependence for GDEs. If groundwater is well below the rooting (and capillary) zone of the plants and any wetland features, the ecosystem is considered disconnected and groundwater management is not likely to affect the ecosystem (Figure 2d). However, it is important to consider local conditions (e.g., soil type, groundwater flow gradients, and aquifer parameters) and to review groundwater depth data from multiple seasons and water year types (wet and dry) because intermittent periods of high groundwater levels can replenish perched clay lenses that serve as the water source for GDEs (Figure 2c). Maintaining these natural groundwater fluctuations are important to sustaining GDE health.

Basins with a stacked series of aquifers (Figure 2b) may have varying levels of pumping across aquifers in the basin, depending on the production capacity or water quality associated with each aquifer. If pumping is concentrated in deeper aquifers, SGMA still requires GSAs to sustainably manage groundwater resources in shallow aquifers, such as perched aquifers, that support springs, surface water, domestic wells, and GDEs (Figure 2). This is because vertical groundwater gradients across aquifers may result in pumping from deeper aquifers to cause adverse impacts onto beneficial users reliant on shallow aquifers or interconnected surface water. The goal of SGMA is to sustainably manage groundwater resources for current and future social, economic, and environmental benefits. While groundwater pumping may not be currently occurring in a shallower aquifer, use of this water may become more appealing and economically viable in future years as pumping restrictions are placed on the deeper production aquifers in the basin to meet the sustainable yield and criteria. Thus, identifying GDEs in the basin should done irrespective to the amount of current pumping occurring in a particular aquifer, so that future impacts on GDEs due to new production can be avoided. A good rule of thumb to follow is: *if groundwater can be pumped from a well - it's an aquifer*.

[3] For more details on the mapping methods, refer to: Klausmeyer, K., J. Howard, T. Keeler-Wolf, K. Davis-Fadtke, R. Hull, A. Lyons. 2018. Mapping Indicators of Groundwater Dependent Ecosystems in California: Methods Report. San Francisco, California. Available at: https://groundwaterresourcehub.org/public/uploads/pdfs/iGDE_data_paper_20180423.pdf
[4] "Groundwater Dependent Ecosystems under the Sustainable Groundwater Management Act: Guidance for Preparing Groundwater Sustainability Plans" is available at: https://groundwaterresourcehub.org/gde-tools/gsp-guidance-document/
[5] The Groundwater Resource Hub: www.GroundwaterResourceHub.org

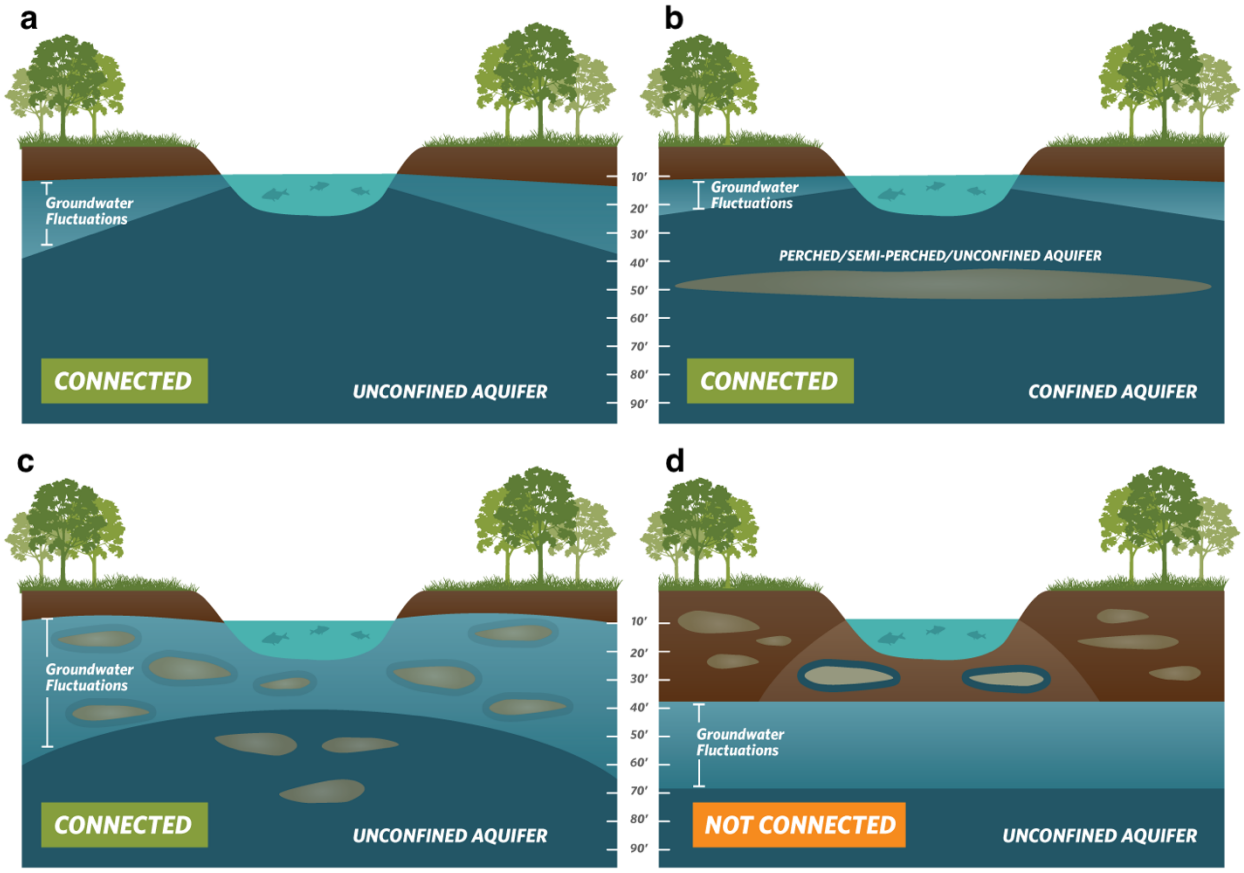


Figure 2. Confirming whether an ecosystem is connected to groundwater. Top: (a) Under the ecosystem is an unconfined aquifer with depth-to-groundwater fluctuating seasonally and interannually within 30 feet from land surface. **(b)** Depth-to-groundwater in the shallow aquifer is connected to overlying ecosystem. Pumping predominately occurs in the confined aquifer, but pumping is possible in the shallow aquifer. **Bottom: (c)** Depth-to-groundwater fluctuations are seasonally and interannually large, however, clay layers in the near surface prolong the ecosystem's connection to groundwater. **(d)** Groundwater is disconnected from surface water, and any water in the vadose (unsaturated) zone is due to direct recharge from precipitation and indirect recharge under the surface water feature. These areas are not connected to groundwater and typically support species that do not require access to groundwater to survive.

BEST PRACTICE #2. Characterize Seasonal and Interannual Groundwater Conditions

SGMA requires GSAs to describe current and historical groundwater conditions when identifying GDEs [23 CCR §354.16(g)]. Relying solely on the SGMA benchmark date (January 1, 2015) or any other single point in time to characterize groundwater conditions (e.g., depth-to-groundwater) is inadequate because managing groundwater conditions with data from one time point fails to capture the seasonal and interannual variability typical of California's climate. DWR's Best Management Practices document on water budgets[6] recommends using 10 years of water supply and water budget information to describe how historical conditions have impacted the operation of the basin within sustainable yield, implying that a baseline[7] could be determined based on data between 2005 and 2015. Using this or a similar time period, depending on data availability, is recommended for determining the depth-to-groundwater.

GDEs depend on groundwater levels being close enough to the land surface to interconnect with surface water systems or plant rooting networks. The most practical approach[8] for a GSA to assess whether polygons in the NC dataset are connected to groundwater is to rely on groundwater elevation data. As detailed in TNC's GDE guidance document[4], one of the key factors to consider when mapping GDEs is to contour depth-to-groundwater in the aquifer that is supporting the ecosystem (see Best Practice #5).

Groundwater levels fluctuate over time and space due to California's Mediterranean climate (dry summers and wet winters), climate change (flood and drought years), and subsurface heterogeneity in the subsurface (Figure 3). Many of California's GDEs have adapted to dealing with intermittent periods of water stress, however if these groundwater conditions are prolonged, adverse impacts to GDEs can result. While depth-to-groundwater levels within 30 feet[4] of the land surface are generally accepted as being a proxy for confirming that polygons in the NC dataset are supported by groundwater, it is highly advised that fluctuations in the groundwater regime be characterized to understand the seasonal and interannual groundwater variability in GDEs. Utilizing groundwater data from one point in time can misrepresent groundwater levels required by GDEs, and inadvertently result in adverse impacts to the GDEs. Time series data on groundwater elevations and depths are available on the SGMA Data Viewer[9]. However, if insufficient data are available to describe groundwater conditions within or near polygons from the NC dataset, include those polygons in the GSP until data gaps are reconciled in the monitoring network (see Best Practice #6).

Figure 3. Example seasonality and interannual variability in depth-to-groundwater over time. Selecting one point in time, such as Spring 2018, to characterize groundwater conditions in GDEs fails to capture what groundwater conditions are necessary to maintain the ecosystem status into the future so adverse impacts are avoided.

[6] DWR. 2016. Water Budget Best Management Practice. Available at: https://water.ca.gov/LegacyFiles/groundwater/sgm/pdfs/BMP_Water_Budget_Final_2016-12-23.pdf

[7] Baseline is defined under the GSP regulations as "historic information used to project future conditions for hydrology, water demand, and availability of surface water and to evaluate potential sustainable management practices of a basin." [23 CCR §351(e)]

[8] Groundwater reliance can also be confirmed via stable isotope analysis and geophysical surveys. For more information see The GDE Assessment Toolbox (Appendix IV, GDE Guidance Document for GSPs[4]).

[9] SGMA Data Viewer: https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer

BEST PRACTICE #3. Ecosystems Often Rely on Both Groundwater and Surface Water

GDEs are plants and animals that rely on groundwater for all or some of its water needs, and thus can be supported by multiple water sources. The presence of non-groundwater sources (e.g., surface water, soil moisture in the vadose zone, applied water, treated wastewater effluent, urban stormwater, irrigated return flow) within and around a GDE does not preclude the possibility that it is supported by groundwater, too. SGMA defines GDEs as "ecological communities and species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface" [23 CCR §351(m)]. Hence, depth-to-groundwater data should be used to identify whether NC polygons are supported by groundwater and should be considered GDEs. In addition, SGMA requires that significant and undesirable adverse impacts to beneficial users of surface water be avoided. Beneficial users of surface water include environmental users such as plants or animals[10], which therefore must be considered when developing minimum thresholds for depletions of interconnected surface water.

GSAs are only responsible for impacts to GDEs resulting from groundwater conditions in the basin, so if adverse impacts to GDEs result from the diversion of applied water, treated wastewater, or irrigation return flow away from the GDE, then those impacts will be evaluated by other permitting requirements (e.g., CEQA) and may not be the responsibility of the GSA. However, if adverse impacts occur to the GDE due to changing groundwater conditions resulting from pumping or groundwater management activities, then the GSA would be responsible (Figure 4).

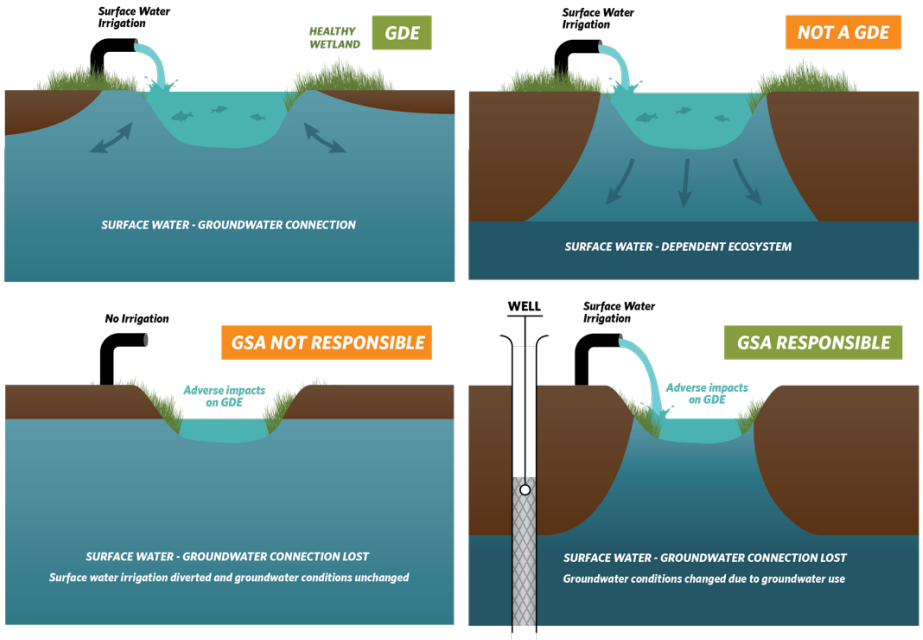


Figure 4. Ecosystems often depend on multiple sources of water. Top: (Left) Surface water and groundwater are interconnected, meaning that the GDE is supported by both groundwater and surface water. **(Right)** Ecosystems that are only reliant on non-groundwater sources are not groundwater-dependent. **Bottom: (Left)** An ecosystem that was once dependent on an interconnected surface water, but loses access to groundwater solely due to surface water diversions may not be the GSA's responsibility. **(Right)** Groundwater dependent ecosystems once dependent on an interconnected surface water system, but loses that access due to groundwater pumping is the GSA's responsibility.

[10] For a list of environmental beneficial users of surface water by basin, visit: https://groundwaterresourcehub.org/gde-tools/environmental-surface-water-beneficiaries/

BEST PRACTICE #4. Select Representative Groundwater Wells

Identifying GDEs in a basin requires that groundwater conditions are characterized to confirm whether polygons in the NC dataset are supported by the underlying aquifer. To do this, proximate groundwater wells should be identified to characterize groundwater conditions (Figure 5). When selecting representative wells, it is particularly important to consider the subsurface heterogeneity around NC polygons, especially near surface water features where groundwater and surface water interactions occur around heterogeneous stratigraphic units or aquitards formed by fluvial deposits. The following selection criteria can help ensure groundwater levels are representative of conditions within the GDE area:

- Choose wells that are within 5 kilometers (3.1 miles) of each NC Dataset polygons because they are more likely to reflect the local conditions relevant to the ecosystem. If there are no wells within 5km of the center of a NC dataset polygon, then there is insufficient information to remove the polygon based on groundwater depth. Instead, it should be retained as a potential GDE until there are sufficient data to determine whether or not the NC Dataset polygon is supported by groundwater.

- Choose wells that are screened within the surficial unconfined aquifer and capable of measuring the true water table.

- Avoid relying on wells that have insufficient information on the screened well depth interval for excluding GDEs because they could be providing data on the wrong aquifer. This type of well data should not be used to remove any NC polygons.

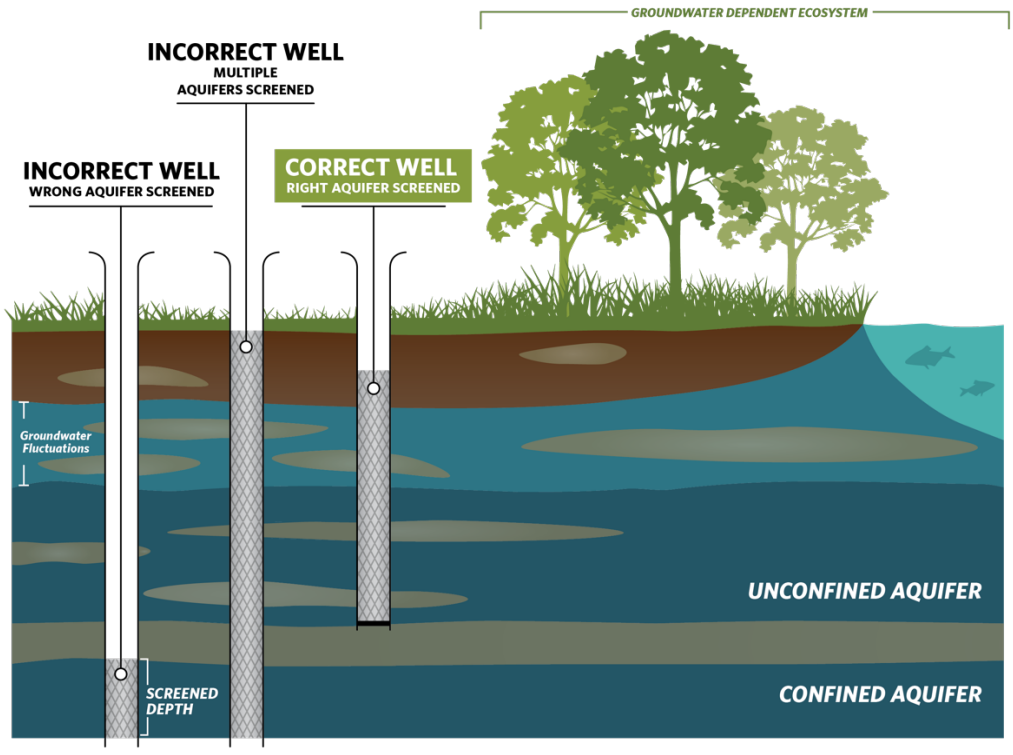


Figure 5. Selecting representative wells to characterize groundwater conditions near GDEs.

BEST PRACTICE #5. Contouring Groundwater Elevations

The common practice to contour depth-to-groundwater over a large area by interpolating measurements at monitoring wells is unsuitable for assessing whether an ecosystem is supported by groundwater. This practice causes errors when the land surface contains features like stream and wetland depressions because it assumes the land surface is constant across the landscape and depth-to-groundwater is constant below these low-lying areas (Figure 6a). A more accurate approach is to interpolate **groundwater elevations** at monitoring wells to get groundwater elevation contours across the landscape. This layer can then be subtracted from land surface elevations from a Digital Elevation Model (DEM)[11] to estimate depth-to-groundwater contours across the landscape (Figure b; Figure 7). This will provide a much more accurate contours of depth-to-groundwater along streams and other land surface depressions where GDEs are commonly found.

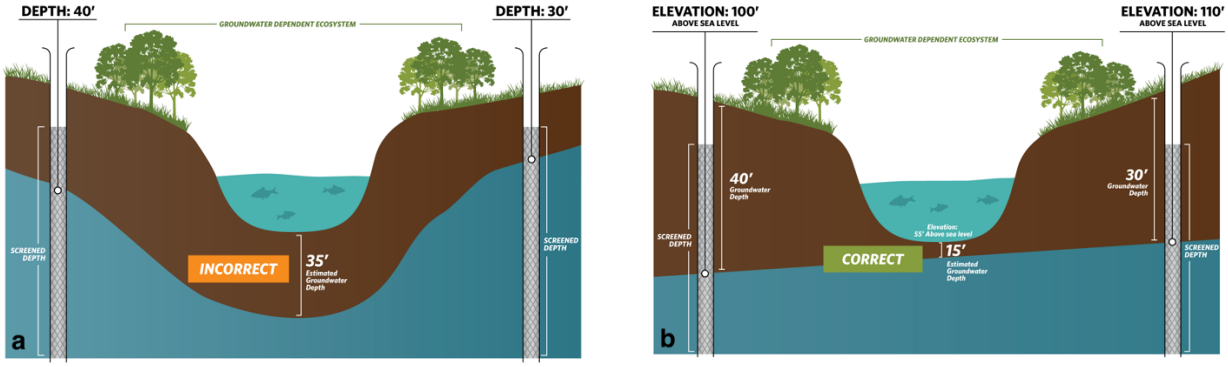


Figure 6. Contouring depth-to-groundwater around surface water features and GDEs. (a) Groundwater level interpolation using depth-to-groundwater data from monitoring wells. **(b)** Groundwater level interpolation using groundwater elevation data from monitoring wells and DEM data.

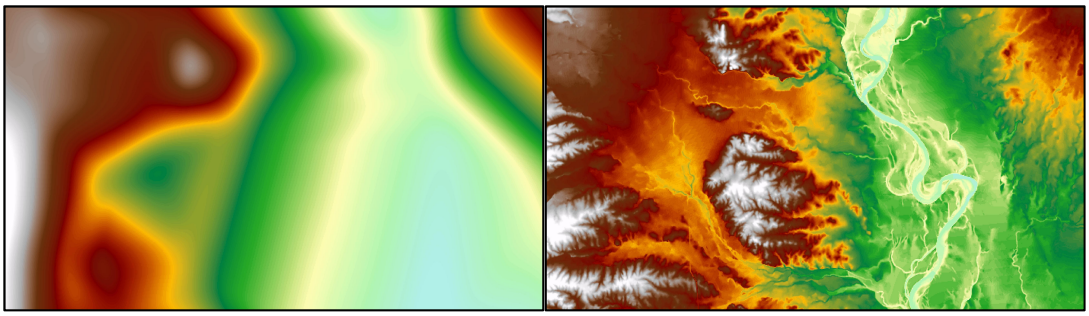


Figure 7. Depth-to-groundwater contours in Northern California. (Left) Contours were interpolated using depth-to-groundwater measurements determined at each well. **(Right)** Contours were determined by interpolating groundwater elevation measurements at each well and superimposing ground surface elevation from DEM spatial data to generate depth-to-groundwater contours. The image on the right shows a more accurate depth-to-groundwater estimate because it takes the local topography and elevation changes into account.

[11] USGS Digital Elevation Model data products are described at: https://www.usgs.gov/core-science-systems/ngp/3dep/about-3dep-products-services and can be downloaded at: https://iewer.nationalmap.gov/basic/

BEST PRACTICE #6. Best Available Science

Adaptive management is embedded within SGMA and provides a process to work toward sustainability over time by beginning with the best available information to make initial decisions, monitoring the results of those decisions, and using the data collected through monitoring programs to revise decisions in the future. In many situations, the hydrologic connection of NC dataset polygons will not initially be clearly understood if site-specific groundwater monitoring data are not available. If sufficient data are not available in time for the 2020/2022 plan, **The Nature Conservancy strongly advises that questionable polygons from the NC dataset be included in the GSP until data gaps are reconciled in the monitoring network.** Erring on the side of caution will help minimize inadvertent impacts to GDEs as a result of groundwater use and management actions during SGMA implementation.

KEY DEFINITIONS

Groundwater basin is an aquifer or stacked series of aquifers with reasonably well-defined boundaries in a lateral direction, based on features that significantly impede groundwater flow, and a definable bottom. *23 CCR §341(g)(1)*

Groundwater dependent ecosystem (GDE) are ecological communities or species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface. *23 CCR §351(m)*

Interconnected surface water (ISW) surface water that is hydraulically connected at any point by a continuous saturated zone to the underlying aquifer and the overlying surface water is not completely depleted. *23 CCR §351(o)*

Principal aquifers are aquifers or aquifer systems that store, transmit, and yield significant or economic quantities of groundwater to wells, springs, or surface water systems. *23 CCR §351(aa)*

ABOUT US

The Nature Conservancy is a science-based nonprofit organization whose mission is *to conserve the lands and waters on which all life depends*. To support successful SGMA implementation that meets the future needs of people, the economy, and the environment, TNC has developed tools and resources (www.groundwaterresourcehub.org) intended to reduce costs, shorten timelines, and increase benefits for both people and nature.

Attachment E

Maps of representative monitoring sites in relation to key beneficial users

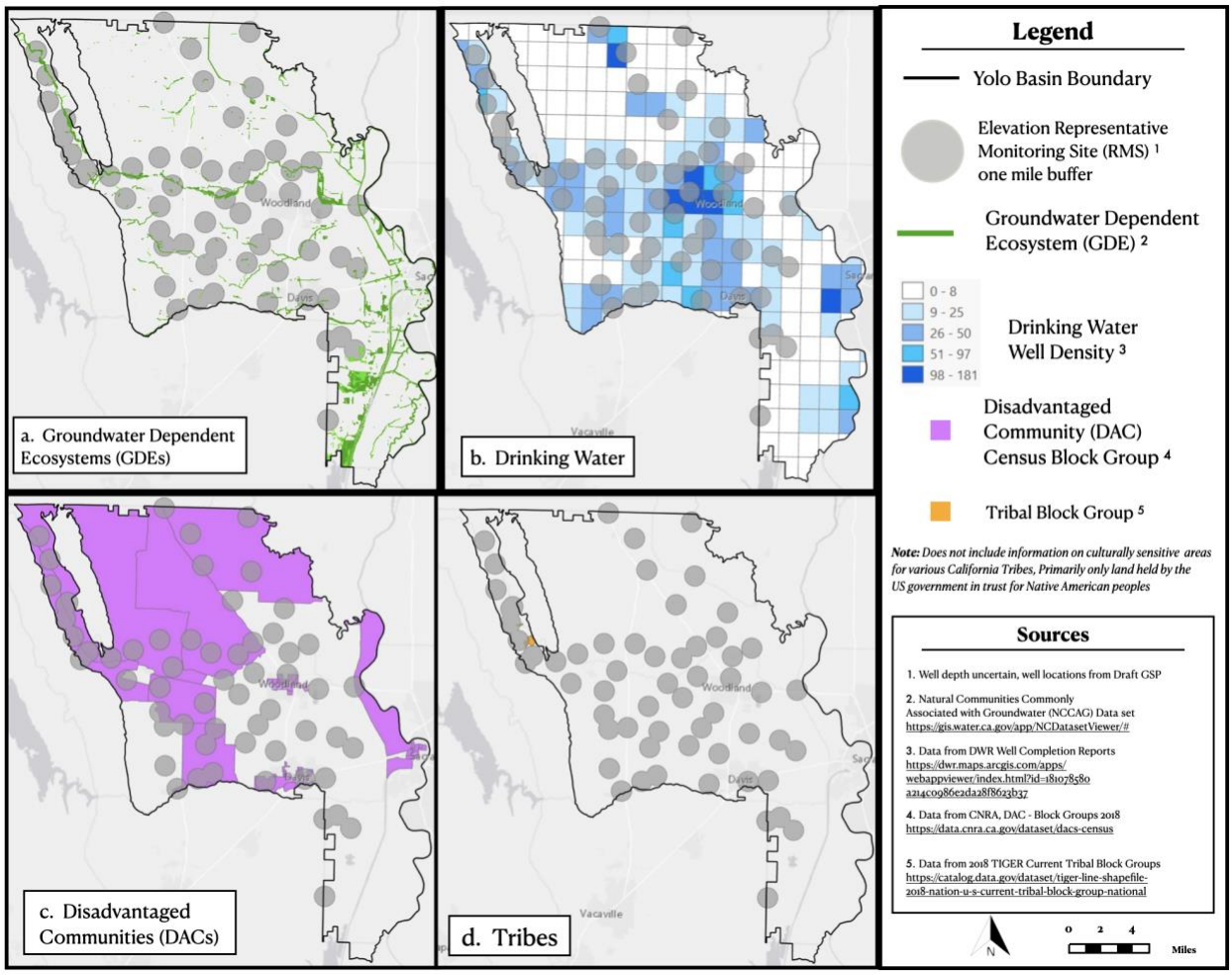


Figure 1. Groundwater elevation representative monitoring sites in relation to key beneficial users: a) Groundwater Dependent Ecosystems (GDEs), b) Drinking Water users, c) Disadvantaged Communities (DACs), and d) Tribes.

Special Concerns Areas need more data collection.

The Hungry Hollow where we live and have been farming for the last 37 years has been historically a dry farmed region. This means that there have been no wells for YSGA to collect data on. Our area is now labeled a special concern region and SGMA is lacking historical groundwater data to compare with past use and future needs. The fringe areas, including our land, are among areas seeing accelerated water decline which is an indicator of unsustainable usage. Therefore more time is needed to collect data, to find wells to monitor so that more complete information can be collected to understand the usage and recharge levels. How can we find sustainability with new wells bring drilled that are changing the water usage with every new hole in the ground?

- **There needs to be a 10 year moratorium on any new wells drilled on historically non-irrigated land. This will give time to collect data and to more fully understand the groundwater levels.**

Moving Surface Water via Pipelines.

Access to water, groundwater and surface water is a community resource. How can this resource be shared equally, and not monopolized by any one person or corporation that has the enough money for a pipeline to take care of their personal needs? This water is community water; therefore it should be used for the entire community not serving a few that can afford to pay for a pipeline to their landholdings. Landowners that are dependent on a pipeline allow them the ability to develop more land, and during the summer months when water from this pipeline is not available, those land owners are going to use groundwater. Our Hungry Hollow our water is very good water, lacking salts and boron that is prevalent in Cache Creek water, therefore piping Cache Creek water into the Hungry Hollow will degrade the quality of water.

- **Pipelines are not for the good of the entire community, they will advance land development, increase groundwater usage, and degrade water quality.**

How will we achieve sustainability?

Generally the SGMA plan does not seem to include the inhabitants of the landscape, but more importantly it does not include the potential of our community to make a difference in water usage. I feel that if we are looking into the future of water as a diminishing resource, then our communities need to be involved and participating in the management of water usage in their daily lives. Agriculture is the main user of the groundwater and surface water, and can have the biggest effect of groundwater recharge, surface water usage and what sustainability will look like for the future. To understand sustainability is one part of the puzzle, but more importantly how will we achieve sustainability in our communities is another question. Our communities need to be involved in the process. In my mind this means that we need to be innovative, willing to learn, and to incorporate new farming practices that will enhance water storage in our orchards and fields. Our community needs to learn from other farmers, participate in research in collaboration with organizations working towards these goals. We need to work together, share information, actively doing trials, tests, and experimentation on different management practices to achieve reduction in water usage. The future of Agriculture in California can be protected by working today to adjust our management practices. Our communities need to work together; sacrifice equally making changes as how we live on the land, how to use our shared natural resources and learn how to store more of our water in the soils, and reduce our annual water extraction needs.

- **We need to establish working groups that include our agricultural leaders in our communities to come together to initiate a proactive drought conservation management practices that have the goal of minimizing water usage and maximizing water retention in our soils, starting from the top of the watershed down into the valley floor.**
- **These working groups offer hands on opportunities, sharing results of these experimental practices among our agricultural community so that we can learn together what is working and what is not. These management practices need to be monitored as to the effects that they make, the differences of water usage and water recharge with these practices.**

Thank you for all of your efforts to include the community of Yolo County to make comments and to learn what is happening with the California mandate and SGMA plan. I do hope that my comments are helpful.

Sincerely,

Annie Main -Good Humus Produce

There needs to be a 10 year moratorium on any new wells drilled on historically non-irrigated land. This will give time to collect data and to more fully understand the groundwater levels.

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Access to water, groundwater and surface water is a community resource. How can this resource be shared equally, and not monopolized by any one person or corporation that has the enough money for a pipeline to take care of their personal needs? This water is community water; therefore it should be used for the entire community not serving a few that can afford to pay for a pipeline to their landholdings. Landowners that are dependent on a pipeline allow them the ability to develop more land, and during the summer months when water from this pipeline is not available, those land owners are going to use groundwater. In Hungry Hollow our water is very good water, lacking salts and boron that is prevalent in Cache Creek water, therefore piping Cache Creek water into the Hungry Hollow will degrade the quality of water.

- **Pipelines are not for the good of the entire community, they will advance land development, increase groundwater usage, and degrade water quality. They are also not a long-term solution to our issues.**

- **We need to establish working groups that include our agricultural leaders in our communities to come together to initiate a proactive drought conservation management practices that have the goal of minimizing water usage and maximizing water retention in our soils, starting from the top of the watershed down into the valley floor.**

- **These working groups offer hands on opportunities, sharing results of these experimental practices among our agricultural community so that we can learn together what is working and what is not.**
  These management practices need to be monitored as to the effects that they make, the differences of water usage and water recharge with these practices.

Thank you for all of your efforts to include the community of Yolo County to make comments and to learn what is happening with the California mandate and SGMA plan. I do hope that my comments are helpful.

Sincerely,

Claire Main

Comment on the Draft Yolo Subbasin Groundwater Agency Sustainability Plan

My wife and I have been farming in Hungry Hollow on the corner of Rd 15B and 84A since 1983. Our water supply for our 20 acre farm has consisted of a domestic well that has gone dry and a 500' agricultural well drilled in 1971. In 1987 PGE measured our ag well static water level at 99 ft. By January of 2017 that static level was measured at 172 ft. By January of 2020 the static level was down another 20 ft to 192 ft and this year during the early spring our submersible pump was dropped 60' deeper into the well to stop the pumping of air. Our static water level currently stands at 212 ft, after a summer that saw us pumping from below 220'. We are concerned for the future of our Hungry Hollow home because our children are currently involved in the family business that is wholly encompassed by the farm in Hungry Hollow, and plan to continue to provide food for the Sacramento region for the foreseeable future .

In the meantime, several of our neighbors domestic wells have been either re-drilled or their submersible pumps dropped lower. It is increasingly evident to those of us living and farming here that present use, exacerbated by groundwater demands of newly developed wells watering thousands of acres of perennial crops, and coupled with the effects of the current drought, have brought us not only to an overdraft , but to a severe overdraft of the aquifers we rely on for our domestic and agricultural water for our personal and business uses .

While a lack of monitoring wells in our area, and indeed all along the eastern bench of the Capay Hills and the Blue Ridge between Winters and Esparto, has hindered the establishment of a credible base to determine the extent of the problem, the fact that wellwaters in our area are dropping rapidly, indicating serious overdraft, requires us to take measures to:

1. Acquaint YSGA and SGMA with the need for immediate action
2. Provide data that substantiates the need through well drilling and repair data from the benchlands between Winters and Dunnigan
3. Ask for the immediate support of YSGA and the Board of Supervisors in providing the needed protections for the diminishing groundwater resource in our area, including severe restrictions on the additional development of groundwater resources until a stabilized return to pre 2020 groundwater levels can be assured.

A few final thoughts.

First, it is clear that the speed and power of the financial investment and development groups to alter existing landscape and community resource norms in our area has far outstripped the speed with which we are reacting to the changes that are introduced. The continuous purchase and reconfiguring of hill ground in Western Yolo County combined with the indiscriminate extraction of a diminishing community water resource without regard for the needs of the local community has avalanched in the midst of a historic drought that demands rather, greater care and preservation efforts from all of us. It

is essential that we use all the powers of our elected public officials and governmental bodies to re-establish the rights of all to a reasonable share of a sustained essential resource.

Second, it should be noted that there is a likely geologic delineation between the aquifers to the north of Rd 16A in Hungry Hollow and the aquifers to the south. This delineation should show clearly in the difference between the water qualities of these two regions. If there is indeed a delineation it should be acknowledged as a goal of the YSGA to protect the higher quality waters to the north from the introduction of lower quality water from sources to the south.

Finally, I would hope that in addition to concerns about the mingling of waters of differing quality, that the idea of allowing additional development of land through the pumping of water from the Cache Creek Canals will be carefully studied for its potential for increasing groundwater pumping and resulting overdraft during periods of greatest concern.

Jeff Main
Good Humus Produce
October 27, 2021

To Yolo County Flood Control and Water Conservation District

October 27.2021

Re: Comments on the Draft SGMA document,

Dear Yolo Sub Basin Groundwater Agency,

I am writing to express concerns about the whole of a more sustainable water future for the areas included in Yolo Counties Draft YSGA -GSA document. My comments are written without reading the whole draft that has been put forward for public comment, yet in spite of that deficiency, I am hoping the these comments might be considered.

In many presentations by Yolo County Flood Control, as well as in this draft document, the point is made how historical well monitoring going back to the 1950's demonstrates how the county water basins have periods of stress and then generally rebound over time. During this period, even with the addition of Indian Valley Reservoir to bolster recharge, there has been a significant change in the number of acres irrigated in permanent crops with those crops being grown in areas that have previously been dry farmed. The past 10 or so years are critical and most relevant to this analysis and much of the historical data may be less relevant to the discussion of Sustainability. The factors of Climate change and the impact on winter rains, the dependability of recharge of Indian Valley and Clear Lake, along with the changing cropping patterns in the basin may change the modeling. This analysis and projection should be a considered part of this plan. The year-round demand for water, the change in infiltration patterns from dry farmed, row crop agriculture and orchard systems will have a distinct impact on the future patterns of water use and should be factored into the analysis of sustainability.

The concept of water infiltration and soil permeability and SAGBI soil classifications should be considered with varying land use practices that could increase permeability and retention of the rain that does fall. It is clear that residual organic matter and living plants on the soil surface slow down water velocity, reduce the impact of heavy rains by breaking up water particles, reducing direct impact on soil surface and allowing more water to infiltrate. The critical factor of water infiltration from predicted weather events that may be more violent and intense require that a good look be taken of the factor of recharge from infiltration and amending the SAGBI analysis. A change in infiltration or 10% over the permeable land surface of the county would result in more than 650,000 acres absorbing – given an average of 30 inches of rainfall – 3 inches over those acres. Infiltration is increased with well managed residual dry matter, ground cover, cover crops, greater organic matter and slowing the velocity of water over the landscape. These are things that could be seriously considered and would have a tangible path to implementation, and already are incentivized through various NRCS partnerships. This is not the same as flooding

fields in high water events as a strategy in the county- a strategy with limited potential in loan and clay loam soils.

There should be areas set aside for study and integrated thinking – like Hungry Hollow where even moderate rainfall events create heavy runoff and flooding from hill areas and bare orchards. New partnerships with range land users to move cattle off when residual dry matter achieves a certain % of ground cover, new grazing practices encourage re-introduction of deep rooted perennials, and land use practices that increase water retention and storage should be measured and paid for by all who benefit from these practices. The upland areas of the Sub basin are critical in the long-term stability of our entire basin.

Although these are implementation steps, the principles of conservation, infiltration and retention should be stressed as a central strategy throughout the plan. Keeping the water here that falls on the Sub-basin lands requires slowing it down, spreading it out and allowing it to infiltrate. When an estimated 500,000 acre feet left the Cache Creek Watershed in 2018 thorough high water flows in Cache Creek, it represented a lost opportunity and a considerable part of the counties annual water budget. If even 10 % of this infiltrated, it would have been 50,000 acre feet that would have been released slowly into the larger environment. The report should stress more than conservation – It should look at new patterns of capture on all of the lands of the sub-basin.

It should also be stated strongly that the impacts to the basin under the purview of YSGA and GSP needs to guarantee that those on the edges of the foothills from Winters to Dunnigan are assured that they wont be the vicitms of overdraft- when evidence is showing that there seems to be the greatest impact of unsustainable groundwater management -within the basin as a whole-on those areas. I am sure that the data from monitoring wells is showing this impact- so that pumping in the basin as a whole may need to be reduced in order to assure equity in the application of the protections that should be afforded to all by SIGMA. This should start with your first point of a moritorium on new wells and the drilling of backup wells that are being drilled to be ahead of potential restrictions on drilling that may be coming. All new wells should be test pumped to determine the impact on neighboring wells and to determine the size of pump motor that could be installed. That is a round about way to potentially limit the size of new permanent crop plantings.

The GSA plan should be proactive here even though it is a politically sensitive issue. The lower San Joaquin Valley historically contained wetlands with valley lakes that have been drained, and water extraction beyond recharge has created the untenable situation that exists there. This report needs to be cognizant of the fact that overdraft is entirely possible here given the surge in year round demand and the potential for extreme events in terms of drying and warming weather.

There is discussion about pipeing water from Cache Creek north to Hungry Hollow. A thorough analysis is needed here. If that water is used to irrigate permanent crops- trees and vines, the issues of groundwater over draft would be accelerated in years when there is no cache creek water available and those permanent crops still need water. That would accelerate over draft in those years when water tables would likewise be challenged due to drought. It might be suggested that the water piped into the area should only be used on annual crops so that those fields could not be dependent upon year round irrigation and groundwater, and that those fields could lie fallow in periods of severe drought.

This will require leadership and collaborative discussion among many stakeholders on an ongoing basis. The YSGA and GSP process can facilitate this conversation- bringing many parties to the table to respond to changing conditions. 2040 may be far too late for intelligent response to factors that begin to show trends not anticipated in this draft.

It should be clear that groundwater is a shared resource available to property owners who use it efficiently for productive purposes. Over draft and unreasonable taking should not be a right but needs to be considered as a collective problem where solutions need be equitable, considering rights beyond individual rights. The process of entering into this discussion with property owners and water users needs to be part of YSGA and GSP- baked in- workshops on water conservation and infiltration, new collaborations with rangeland users. Innovative practices for slowing, pooling and retaining water in collaboration with filling unlined ditches when appropriate.

In many San Joaquin County communities the reality of having no water or water contaminated with nitrates or other forms of Ag pollution are real and may be beyond remediation. These realities fall most heavily upon those who can least afford their costs. There should be an economic component to the analysis- the burden of overdraft should not be borne by those least able to afford the costs of mitigating well loss. Trigger points for the edges of the basin should be considered to equitably deal with dwindling groundwater levels on the foothill areas of Dunnigan through Hungry Hollow to Winters.

I realize these comments are not specific to the Draft and specific language or ideas there in, however a much larger scale of thinking about sustainability of our water resources challenges us and the general ideas in this letter need consideration and investment. A change in awareness as part of long term implementation in water policy is needed with a comprehensive discussion about this shared resource that transcends purely individual interests of individual property owners.
Thanks for your consideration, Paul Muller

Thanks, Paul Muller

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
650 Capitol Mall, Suite 5-100
Sacramento, California 95814-4700

September 29, 2021

Kristin Sicke, Assistant General Manager
Yolo Subbasin GSA
34274 State Highway 16
Woodland, California 95695

Electronic transmittal only

Re: NOAA's National Marine Fisheries Service Comments on the Developing Groundwater Sustainability Plan for the Yolo Subbasin

Dear Ms. Sicke:
NOAA's National Marine Fisheries Service (NMFS) is the federal agency responsible for managing, conserving, and protecting living marine resources in inland, coastal, and offshore waters of the United States. We derive our mandates from numerous statutes, including the Federal Endangered Species Act (ESA) and the Magnuson-Stevens Fishery Conservation and Management Act (MSA). The purpose of the ESA is to conserve threatened and endangered species and their ecosystems.

The California Department of Water Resources (DWR) has designated the Yolo subbasin a "high" priority for groundwater management, necessitating the development of a Groundwater Sustainability Plan (GSP) by January 2022, as required under California's Sustainable Groundwater Management Act of 2014 (SGMA). Several waterways that overlie portions of the Yolo subbasin support federally threatened California Central Valley (CCV) steelhead (*Oncorhynchus mykiss*), endangered Sacramento River winter-run Chinook salmon (*O. tshawytscha*), threatened Central Valley (CV) spring-run Chinook salmon (*O. tshawytscha*), and the Southern distinct population segment of North American green sturgeon (*Acipenser medirstris*), henceforth referred to as ESA-listed species. In addition, the Yolo subbasin is designated as Essential Fish Habitat for Pacific Coast Chinook salmon [including CV fall-run Chinook salmon (*O. tshawytscha*) and CV late fall-run Chinook salmon (*O. tshawytscha*)], which are managed under the MSA. This letter transmits NMFS' comments concerning the draft Final GSP for the Yolo subbasin, released for public comment on August 28, 2021.

Surface water and groundwater are hydrologically linked in the Yolo subbasin, and this linkage is critically important in creating seasonal habitat for ESA-listed species. Where the groundwater aquifer supplements streamflow, the influx of cold, clean water is critically important for maintaining temperature and flow volume. Pumping water from these aquifer-stream complexes has the potential to affect salmon and steelhead habitat by lowering groundwater levels and interrupting the hyporheic flow between the aquifer and stream. NMFS is concerned that groundwater extraction in the Yolo subbasin is currently impacting ESA-listed species instream habitat, and submits the following comments to assist the Groundwater Sustainability Agency (GSA) in adequately addressing those impacts.

Comments

Avoiding Undesirable Results: We recommend the GSA adequately address the following requirement for minimum thresholds as spelled out in the SGMA regulations:

> "The relationship between the minimum thresholds for each sustainability indicator, including an explanation of how the Agency has determined that basin conditions at each minimum threshold will avoid undesirable results for each of the sustainability indicators." (CCR 23 §354.28(b)(2))

According to DWR (2021), "it is up to GSAs to define in their GSPs the specific significant and unreasonable effects that would constitute undesirable results and to define the groundwater conditions that would produce those results in their basins." The GSA should describe what conditions within the subbasin would constitute an undesirable result with regard to streamflow depletion, ensuring that the description accounts for impacts to instream habitat that support all life-stages of ESA-listed species. The currently proposed sustainable management criteria for streamflow depletion do not include any explanation of how they will meet this requirement. For instance, the Lower Cache Creek streamflow depletion minimum threshold of "the recurrence of the spring (March-May) average measurement for 1975 to present in at least one spring in every seven (7) years" (page 3-24) has no apparent basis in ecology or any linkage to the aquatic habitat degradation caused by streamflow depletion that ultimately influences whether migrating and spawning salmon, steelhead, and sturgeon survive. If a lack of available data prevents such an effort, NMFS recommends the GSA follow guidance from California Department of Fish and Wildlife (2019) and develop conservative streamflow depletion thresholds as a precautionary principle until the surface flow/groundwater dynamic in the Yolo subbasin is better studied and understood.

Using Groundwater Elevations as a Proxy for Streamflow Depletion: If the GSA intends to propose groundwater elevations as a minimum threshold for streamflow depletion, the GSA should provide an explanation, with supporting best available science, for why groundwater levels are a reasonable proxy for interconnected surface water depletion. In addition, please explain why those levels are sufficient to avoid streamflow depletion that significantly impacts surface water beneficial uses.

Basing Sustainable Management Criteria on Historical Drought Conditions: Proposing groundwater elevations from the 2011-2016 period as streamflow depletion minimum thresholds and measurable objectives is likely inappropriate for avoiding significant impacts to ESA-listed species and their critical habitats, and EFH for Pacific Coast salmon. A basic hydraulic principle is that groundwater flow is proportional to the difference between groundwater elevations at different locations along a flow path. Using this basic principle, groundwater flow to a stream or, conversely, seepage from a stream to the underlying aquifer is proportional to the difference between water elevation in the stream and groundwater elevations at locations away from the stream. Minimum thresholds and measurable objectives consistent with groundwater elevations seen during California's recent historic drought, such as that crafted for the Upper Sacramento River (page 3-25), would likely create historically high streamflow depletion rates and result in

instream conditions that negatively affect ESA-listed species and their critical habitats, and EFH for Pacific Coast salmon. If a lack of data prevents the development of appropriate sustainable management criteria, the GSA should commit to designing and implementing studies that better inform appropriate "ecologically-based" minimum thresholds and measurable objectives for streamflow depletion.

NMFS recommendation for future Projects and Management Actions: We suspect that groundwater recharge projects are likely to be an important action implemented as part of the effort to achieve groundwater sustainability in the Yolo subbasin. NMFS encourages the GSA to consider implementing recharge projects that facilitate floodplain inundation and offer multiple benefits, including downstream flood attenuation, groundwater recharge, and ecosystem service. Managed floodplain inundation can recharge floodplain aquifers, which in turn slowly release stored water back to the stream during summer months. These projects also reconnect the stream channel with floodplain habitat, benefitting juvenile salmon, steelhead, and sturgeon by creating off-channel habitat characterized by slow water velocities, ample cover in the form of submerged vegetation, and high food availability. As an added bonus, these types of multi-benefit projects likely have more diverse grant funding streams that can lower their cost as compared to traditional off-channel recharge projects. NMFS is available to work with any GSA interested in designing and implementing floodplain recharge projects.

Please direct questions regarding this letter to Amanda Cranford, of my staff, at Amanda.Cranford@noaa.gov or (916) 930-3706.

Sincerely,

A. Catherine Marcinkevage

Cathy Marcinkevage
Assistant Regional Administrator
California Central Valley Office

References:

California Department of Fish and Wildlife. 2019. Fish & Wildlife Groundwater Planning Considerations. California Department of Fish and Wildlife, Groundwater Program. June 2019. 28 pp. Available at: https://cawaterlibrary.net/document/fish-wildlife-groundwater-planning-considerations/

California Department of Water Resources. 2021. Letter from Craig Altare (DWR) to Taylor Blakslee (Cuyama Basin GSA), re. Cuyama Valley - 2020 Groundwater Sustainability Plan. Available at https://sgma.water.ca.gov/portal/gsp/assessments/32

Cc: To the File ARN 151422-WCR2021-SA00121

Electronic copy only:

Angela Murvine, California Department of Fish and Wildlife Statewide SGMA Coordinator, Angela.Murvine@wildlife.ca.gov

Bridget Gibbons, California Department of Fish and Wildlife Central Valley SGMA Biologist, Bridget.Gibbons@wildlife.ca.gov

Craig Altare, California Department of Water Resources, Supervising Engineering Geologist, Craig.Altare@water.ca.gov

Barrett Kaasa, Yolo Subbasin SGMA Point of Contact, California Department of Water Resources, Barrett.Kasaa@water.ca.gov

Dave Pratt comments on Public Draft chapters 1, 3, 4, 5 of the Yolo GSP

General comment: The big issue for the GSP is groundwater levels. The GSP is good on how to assess the situation: It establishes reasonable minimum thresholds for groundwater levels and then proposes a reasonable way to use these to decide what makes an "undesirable result" for the Basin. But then it says nothing at all about who does what in an attempt to correct any undesirable results. If control of ground water is to be kept local as much as possible, the GSP will have to include this. Maybe it's not the job of GEI to discuss this, but somebody has to.

Specific comments:

Page 1-25, lines 5-7: Has a farmer really ever had to wait 6 weeks to get water on a crop?

Page 1-25, well permitting process: Does the county, at present, have any authority to refuse a permit on the grounds that there isn't enough water or that the proposed use of the water is not in the public interest? Control of issuing permits ought to be worth a major discussion in the GSP.

Table 1-4, Public Meetings and workshops: Many of these are listed as YSGA Executive Committee meetings. Weren't these actually solo efforts by Tim O'Halloran?

Page 3-1, line 22: The word should be sustainably rather than sustainabilty.

Figure 3-2, page 3-9: If this figure is to be used for anything important, there should be a discussion about the accuracy of drawing lines in places where there are few data points. For example, how can it be that the 10, 20, 30, 40, 50, 60, and 70 contours of minimum threshold elevations in the southeast part of the county extend right to the Sacramento River, which is essentially at sea level?

Table 3-1, pages 3-12 to 3-13: Were some wrong numbers entered for well 249? From the numbers as entered, you would conclude that the ground elevation at the well was sea level, which doesn't figure for central Yolo County. (The maps of well locations don't seem to show this well at all.)

Comment on Groundwater Plan

Our family has been a subscriber to Good Humus Produce (one of the early Community Supported Agriculture farms which are icons of California's family farming community) for close to 30 years. Our family was one of the early families in California to appreciate the amazing resource provided by Good Humus Produce (and other similar farms) and its value for California and the environment. We are thankful to be able to take advantage of this opportunity to (1) know the source of our weekly fruits and vegetables, (2) know that the food was coming from land where the farmers were caretakers of the soil and the related environment and (3) support small family farms that are critical to the mosaic of farming, urban and wildlife habitat that makes California unique.

Good Humus Produce is located in the Dunnigan Hills Management Area of the Yolo Subbasin of the Sacramento Valley Groundwater Basin. Farmers in Yolo County, and especially those from the Yolo Subbasin, have been leaders in encouraging the development of these kinds of farms. With this in mind, we are commenting on the Draft Yolo Subbasin Groundwater Agency 2022 Groundwater Sustainability Plan (Draft Plan) and we are also asking Yolo County supervisors to consider the following comments and requests as Yolo County considers its future development.

Water Code Section 113 (enacted by SGMA) states that "[I]t is the policy of the state that groundwater resources be managed sustainably for long-term reliability and multiple economic, social, and environmental benefits for current and future beneficial uses." In enacting SGMA, the Legislature recognized the importance for communities, farms, and the environment of properly managing groundwater resources and recognized that failure to manage groundwater to prevent long-term overdraft infringes on groundwater rights. SGMA states the Legislature's intent to "enhance local management of groundwater consistent with rights to use or store groundwater and Section 2 of Article X of the California Constitution" (Water Code Section 10720.1).

Section 1.3 of the Draft Plan identifies a subgoal to “Achieve sustainable groundwater management in the Yolo Subbasin by maintaining or enhancing groundwater quantity and quality through the implementation of projects and management actions to support beneficial uses and users”. The Draft Plan states (Section 2.3.1 at page 2-145) that in the Dunnigan Hills Management Area, in the past 15 years, many thousands of acres of olives, grapes, and almonds have been planted and that many new wells have been drilled to service these new plantings. With regard to the Capay Valley, Dunnigan Hills, Central Yolo, and South Yolo Management Areas, the Draft Plan states (page 3-4) that the minimum threshold established with the methodology of the Draft Plan would “protect groundwater levels from chronically lowering to levels below the historical experience recognizing that groundwater conditions in these management areas are expected to behave similarly to historic conditions”. The Draft Plan (also at page 3-4) concludes that “No significant decreases in groundwater conditions are expected under future projected conditions”.

I believe that you have heard from Good Humus Produce and others that they have observed a growing amount of investment agriculture developing land and water resources on unirrigated lands in the Dunnigan Hills and other areas of ‘special concern. It appears that there have been significant increases in “investment” perennial crops in the area on land not previously irrigated and dramatic drops in water levels of its wells, as a result of increases in groundwater extracted from an apparently declining aquifer. These observations are not consistent with a conclusion that no significant decreases in groundwater conditions are expected under future project conditions.

The lowering of the groundwater in Hungry Hollow, the area where Good Humus Produce is located, has spread additional costs for well drilling, pumps lowering and operating costs and may threaten the ability of some farms to access water needed to supply their needs. These types of impacts affect both homeowners and farmers who have chosen to live and work in Yolo Subbasin, and who have provided many economic, social and

environmental benefits for the area. While certainly the current drought may have contributed to some of apparent decline, it seems pretty clear that some of the decline is a result of recent increases in irrigated agriculture.

Although the Draft Plan identifies several projects and management actions, it is not at all clear that such actions would provide adequate groundwater for "historic" water users, much less for recent (within the last 10-15 years) or for planned future withdrawals. The focus of SGMA is "sustainable groundwater management". However, neither SGMA nor the Draft Plan deal with the actual determination of how to achieve sustainability. It does not appear that Yolo County and/or relevant water agencies have really addressed that question. Continuing agricultural development (and quite likely recent past agricultural development) cannot continue without adversely affecting current and future economic, social, and environmental beneficial uses. Apparently, some plans have been proposed that would include bringing surface water of questionable water quality via pipelines to some farms in the area. The Draft Plan does not address the question of reduced pumping and/or taking land out of production. Difficult choices may have to be made. The process going forward at both the Draft Plan level and Yolo County planning should take into consideration: the impact of climate change on groundwater management; the nature of different agricultural operations and their impacts on society, local economies and the environment; and, if they become necessary, how pumping restrictions should be allocated, including limits based on historic pumping.

Given the level of current knowledge of ground water levels and effects of current and future planned agricultural development, we strongly support the following recommendations of Good Humus Produce which we think make a lot of sense.

- **A 10-year moratorium on any new wells drilled for groundwater extraction on what have been historically non-**

irrigated land. This will give time to collect data and to more fully understand the groundwater levels and what is groundwater sustainability in the Dunnigan Hills and other “special concern” areas.

- **Additional input from the community.** Establish working groups that include local community agricultural leaders to come together to initiate proactive drought conservation management practices that have the goal of minimizing water usage and maximizing water retention in our soils, starting from the top of the watershed down into the valley floor. These working groups can offer hands-on opportunities, sharing results of these experimental practices among our agricultural community so that we can learn together what is working and what is not, including monitoring the effects of different practices with regard to water usage and water recharge.

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October 27, 2021

Kristin Sicke
Executive Director
Yolo Subbasin Groundwater Agency
ksicke@yologsa.org

Dear Ms. Sicke,

The City of West Sacramento would like to express its gratitude for the time and effort that the Yolo Subbasin Groundwater Agency's Board and Staff (Agency) continually provide to address the groundwater management issues throughout the Yolo Subbasin. We recently reviewed the Public Draft Groundwater Sustainability Plan (GSP) and would like to provide some input for the Agency's consideration. As we discussed on the telephone, the City is a participating member of the Agency's Board and offers these observations in the context of further enhancing the GSP. As such, please note the following for your consideration:

1. Figure 1-3 on page 1-13 indicates that the City is not a "groundwater dependent community." The City has diversified its water supply portfolio and part of that portfolio remains groundwater. Thus, although we are not "wholly dependent" I think the City considers groundwater a part of its usable water asset portfolio in much the same way as the City of Davis and City of Woodland (both integrated with surface supplies delivered from WDCWA) that are depicted as groundwater dependent communities.
2. Figure 1-4 shows a distribution of grain and hay crops throughout the City of West Sacramento's service area. Although this may have been true in the past, much of the area depicted in this graphic is fully developed and devoid of agricultural production.
3. Figures 1-6 through 1-8 show a wide distribution of various agricultural, domestic, and municipal wells within the City of West Sacramento. We would appreciate a citation to this data source (or sources) to ensure that it stays up to date with the City's well management activities.
4. Page 1-31 – the City would like its 2020 update to its General Plan Housing Element noted in the statement about the City's General Plan.
5. Page 2-20 – there appear to be a couple typographical errors on this page and on page 2-32 the word "southwestern" is misspelled.
6. Figure 2-14 on Page 2-37 does not appear to show the City's point of diversion for Permit 18150.

7. Figure 2-24 on page 2-63 should list the City as a Public Water System in the legend and the figure should include a spatial recognition of the City's service area.
8. Tables 2-12 through 2-15 do not show the City as a Public Water System or show the water quality information that would apply to the City in those tables.
9. Page 1-203 cites The Nature Conservancy's water model. The City notes the following disclaimer that TNC shows at the identified link that should be incorporated into the text as it indicates that there is some uncertainty with what could be concluded from the information. The link states: "This map categorizes the rivers and streams in the Central Valley on the likelihood that they are ISW, using groundwater depth as a proxy to determine if the surface water is hydraulically connected to groundwater." (highlight added). Perhaps this would be well-suited for a footnote since The Nature Conservancy notes that the output is a "likelihood" rather than something more definitive.
10. Page 2-104 lines 6 through 12. There seems to be some speculation related to groundwater substitution transfers in this section. These transfers are highly controversial for a number of reasons and we think that adding language about the interconnectivity of surface water and groundwater in this instance is misplaced. The DWR Water Transfer Whitepaper is not law but is instead policy generated by DWR staff that has not yet been formerly ratified or challenged. We would encourage the Agency to simply delete this text and provide more generalized language about hydraulic connectivity between surface water and groundwater.
11. Page 2-109 - There appears to be a typo in lines 13 and 14.
12. General comment – one source of groundwater recharge certainly applies to sources of water that are applied to land through irrigation (and other overland-spreading activities). Additional methods of groundwater recharge may need to be added to the characterization of recharge for groundwater basins even if the discussion is merely qualitative. Examples may include diversion of flood flows through the Yolo bypass, water regularly moving through the drain in the Yolo Bypass, water moving in the deep water ship channel, application of irrigation water above the ET amounts to crops, and application of irrigation water in urban landscapes.
13. Section 2.2.9 on page 2-130 should include a brief discussion about the conversion of agricultural acreage to urban acreage. This is a particularly important component in the City's service area because significant water conservation has been achieved in the City's service area on a per acre basis when land is converted from agricultural production to urban landscapes. Much of that conserved water benefits the Yolo Subbasin groundwater conditions in the South Yolo Management Area.
14. Figure 2-56 on page 2-132 shows future use over 65,000 but the number in the side table in the figure says 50,270. We are unclear on the data correlation in this table and suggest it could be explained in words if the data shown is correct.

15. Table 2-22 on page 2-134 needs a units characterization.
16. Page 2-139 identifies 346 TAF as the sustainable yield of the entire Yolo Subbasin. We recognize that components of this figure are aggregated among the various management areas.
17. Section 2.3.5 on page 2-146 should recognize that the City's water use history in a little more detail. We recommend the following language be added after the first sentence on line 16: "The City historically delivered groundwater to its customers as the exclusive source of water for many years before building its surface water diversion and treatment facilities. The City continues to preserve and use groundwater in its service area for various purposes and is looking to improve its groundwater system to provide necessary system redundancy to ensure safe and reliable water supplies for all of the City's residents and businesses." We would also ask that the last sentence with the word "dependency" in it be deleted that starts on line 16. Also, the word "city" should be capitalized in the first sentence on line 16.
18. Page 4-7 there is a typographical error in the Table legend.
19. Page 5-20, P 68 and P 69 in the table are projects for the City of West Sacramento. We would prefer that P 68 be titled "West Sacramento Well Improvements that may include Aquifer Storage and Recovery."
20. Appendix page 47 PDF has the same figure as shown in Figure 2-56 on page 2-132 that may require more explanation.
21. Section 2.1.5.2.2 of the Appendix (page 209 of Appendix PDF) should probably be modified in a few ways.
    a. The characterization of the NDWA contract should be modified and redact the word "unlimited" and add "highly reliable" instead. The rest of that sentence after the comment should be deleted.
    b. The sentence that states "This is not implemented into the model at this time" is somewhat concerning. The City's ability to use groundwater should be in the model and we are not sure what this sentence is conveying. In addition, the notations in Figures 1-6 through 1-8 indicate that well water is being used within the City which should be incorporated into the model.
    c. The City sends its wastewater to SRCSD not the City of Sacramento as noted in the sentence starting with "Although."
    d. The table depicting "Sources of Information" for the City of West Sacramento. A few things here: the City's CVP Contract is number 0-07-20-W0187-P rather than what is depicted in that table. Also, the City is in the final stages of updating its 2020 UWMP and has updated its Housing Element in 2020 for its General Plan (the GP is cited elsewhere (page 1-31) in the GSP so should be cited in this table).

If a reference could be made that these data will be modified based upon future updates to planning documents, that would be helpful.

We greatly appreciate the opportunity to provide additional input to the Agency's GSP. And we look forward to reviewing the next draft as it becomes available. If you have any questions or need further discussion about any of the items noted in this letter, please do not hesitate to contact me.

Sincerely,

Gwyn-Mohr Tully

Gwyn-Mohr Tully
Tully & Young, Inc.