

## Meeting Brief

- **Overview:** Representatives from Antelope, Bowman, Butte, Colusa, Corning, Los Molinos, Red Bluff, Sutter, Vina, Wyandotte Creek, and Yolo subbasins held the fourth inter-basin coordination meeting. Subbasin staff and their consultant teams met with the goals of (1) discussing preliminary findings from technical information-sharing template to identify information gaps, initial concerns, and determine next steps, (2) considering opportunities for regional outreach efforts related to ongoing inter-basin coordination efforts, and (3) sharing updates on their GSP development status.
- **Next Steps:** Staff and consultants will meet again when all water budget results are available for comparison and integrated into the information-sharing template (February-April 2021) to review compiled data, identify any significant differences, and discuss potential ways to reconcile those differences, as warranted. Meanwhile, technical teams from adjacent subbasins will meet to identify appropriate ways to compare and communicate information on model assumptions, cross-boundary flows, and stream-aquifer interactions at boundaries. Subbasin representatives will provide regular inter-basin coordination updates at their respective public venues.
- **Next meeting:** The facilitation team will work on scheduling the next meeting with staff and consultants next spring (between February-April 2021).

## Action Items

Item	Lead	Completion
<input type="checkbox"/> Incorporate feedback and integrate changes in the inter-basin coordination documents (i.e., flyer, information-sharing template, presentation).	CBI	Ongoing
<input type="checkbox"/> Provide written feedback on inter-basin coordination outreach materials (PowerPoint presentation and flyer)	All subbasin representatives	Done
<input type="checkbox"/> Complete information on cross-boundary flows, stream-aquifer interactions, and common hydrogeologic understanding.	Consulting Teams	As water budgets are finalized
<input type="checkbox"/> Meet to review model results for the Corning-Vina-Butte subbasin boundaries.	Christina Buck, Byron Clark, and Lisa Porta	Done
<input type="checkbox"/> Schedule next meeting(s)	CBI	Early 2021
<input type="checkbox"/> Update draft inter-basin coordination map, with edits from Sutter	Christina Buck (Butte County)	Early 2021
<input type="checkbox"/> Update inter-basin coordination website.	Christina Buck (Butte County)	Ongoing <a href="#">Access Here</a>
<input type="checkbox"/> Refine results from the modeling tab and add an introduction highlighting key findings.	Christina Buck (Butte County)	Done <a href="#">Access Here</a>
<input type="checkbox"/> Provide inter-basin coordination updates to advisory boards and relevant public meetings. Share key questions and concerns at next meeting.	CBI and subbasin representatives	Ongoing

## Summary

### 1. Meeting Purpose and Introduction

This was the fourth meeting for the Northern Sacramento Valley (NSV) inter-basin coordination effort, and the second meeting with subbasin staff and consulting teams. The aim of this effort is to foster information-sharing and coordination across NSV subbasins as they develop their Groundwater Sustainability Plans (GSPs). Groundwater Sustainability Agency (GSA) representatives from NSV subbasins – Antelope, Bowman, Butte, Colusa, Corning, Los Molinos, Red Bluff, Sutter, Vina, Wyandotte Creek, and Yolo– met to:

- Discuss preliminary findings from technical information-sharing template and identify information gaps, initial concerns, and identify next steps
- Consider opportunities for regional outreach efforts related to ongoing inter-basin coordination efforts
- Share updates on GSP development status

#### Meeting Materials:

1. Agenda
2. Meeting Summary (8/24/20)
3. NSV Inter-basin Coordination Directory
4. Partially compiled draft NSV Technical Information-Sharing Template
5. Draft Inter-Basin Coordination Flyer ([available here](#))

#### Desired objectives for the meeting:

Participants were asked what they considered most important to accomplish during the meeting. Some of the responses included:

- Gain understanding of other subbasins GSP work and consider options for regional coordination
- Get on the same page and foster coordination in GSP development
- Complete and review technical information template (identify what numbers do not match)
- Identify next steps for understanding differences in flow estimates and craft external messaging
- Determine overall modeling coordination goals and map out next steps for technical coordination/collaboration, relative to GSP development for 2022.

### 2. Meeting Summary

Participants made revisions to the previous meeting summary (8/24/20). CBI will make those changes and bring back to the group for confirmation.

### 3. Technical Information-Sharing

#### Information-Sharing Template:

CBI refined the technical information-sharing template based on feedback received during the previous meeting. The template is closely aligned with [Article 8 §357.2 \(b\) \(1\) through \(4\)](#). During the previous meeting, subbasin representatives agreed to complete this template in phases [[access template](#)]. During Phase 1, technical

consultants filled out information about the integrated hydrologic models (surface water-groundwater models) used to support the development of their Groundwater Sustainability Plans (GSPs). In Phase 2, consultants would provide information on cross-boundary flows, stream-aquifer interactions, and common hydrogeologic understanding. CBI coordinated with subbasin representatives to compile and present the information to guide discussions and identify any significant differences and potential issues. Since subbasins are at different stages in GSP development, not all water budget results were ready for comparison to fully complete the second phase. Below is a summary of key discussion themes, preliminary findings, and next steps related to technical information-sharing.

**Integrated Hydrological Models**

Integrated hydrological models simulate surface water-groundwater dynamics to estimate water budgets. The table below summarizes the different models utilized in the Northern Sacramento Valley to support Groundwater Sustainability Plan (GSP) development.

<b>Subbasin</b>	<b>Model</b>
Butte	Butte Basin Groundwater Model 2020
Vina	Butte Basin Groundwater Model 2020
Wyandotte Creek	Butte Basin Groundwater Model 2020
Corning	Refined version of C2VSim-FG v.1.0
Colusa	Refined version of C2VSimFG Beta 2
Antelope	Tehama County Integrated Hydrologic Model (revised SVSim model)
Bend	Tehama County Integrated Hydrologic Model (revised SVSim model)
Bowman	Tehama County Integrated Hydrologic Model (revised SVSim model)
Red Bluff	Tehama County Integrated Hydrologic Model (revised SVSim model)
South Battle Creek	Tehama County Integrated Hydrologic Model (revised SVSim model)

The group agreed this information was ready to be shared publicly at respective subbasin public venues, as long as it is accompanied with a narrative introducing the document and highlighting key findings.

**Cross-boundary Flows**

Accounting for and understanding cross-boundary flows in hydrologically connected basins is key to successfully implement the Sustainable Groundwater Management Act (SGMA). Since the subbasins are using different models, the intention is to compile estimated flows at specific boundaries to assess whether model results suggest flows between basins occur in the same direction (i.e., are net flow directions between subbasins consistent?) and whether orders of magnitude are comparable.

## *Information Gaps:*

- **Bowman, Antelope, Los Molinos, and Red Bluff** will have preliminary water budget results January or February 2021.
- **Sutter** will have their results February or March 2021.
- **North Yuba:** estimates can be extracted from the completed GSP.
- **Yolo:** Representatives agreed to follow up with more information after the meeting. The following information was shared via written correspondence: “There is no flow exchange [between Colusa subbasin] with Sutter by design. The UC Davis IWFM model that Yolo’s model is based on does not have a general head boundary along that portion of the Sacramento River. In that model it was assumed that there is little exchange across that boundary based on analysis of the heads around the river. Representatives will continue to refine groundwater fluxes across basin boundaries and share relevant numbers for illustration purposes.”

## *Discussion:*

Preliminary water budget information for Butte, Colusa, Corning, Vina, and Wyandotte Creek were ready. Initial results show some differences in the Vina-Corning, Corning-Butte, and Colusa-Butte boundaries. Consulting teams emphasized these estimates are not final and are still subject to changes to ensure model outputs that are compared are done so in as consistent a way as possible, or reasons for differences can be identified. Further, it may be useful to consider including all available output from other models at boundaries, and additional information (e.g., initial conditions, contours, aquifer depths, etc.).

## **Stream-aquifer interactions at boundaries**

Participants shared the following discussion questions in advance of the meeting to guide the conversation around stream-aquifer interactions:

1. Are all models consistently simulating gaining or losing streams for the same reaches? (again, looking at direction of flow between aquifer and streams)
2. Are the orders of magnitude comparable?

*Information Gaps:* Same as above. Sutter representatives shared that although their numbers are not available yet, knowing outputs from other models is helpful to be able to identify and address differences early on.

## *Discussion:*

Preliminary data for Butte, Colusa, Corning, Vina, and Wyandotte Creek for cross-boundary flows and stream-aquifer interactions were ready. Initial results show all models consistently simulating gaining or losing streams for the same reaches, except at the Butte-Corning boundary. Similar to cross-boundary flow results, preliminary estimates show some differences in the Vina-Corning, Corning-Butte, and Colusa-Butte boundaries, as well as at Stony Creek. The Butte Basin Groundwater Model (BBGM)’s boundary overlaps with the Sacramento River; therefore, when they combine cross-boundary flows and stream-aquifer interactions at boundaries, the difference decreases significantly.

The technical teams determined they need more information to determine what could and should be adjusted. For example, it would be important to identify where those differences occur (deeper or shallow aquifer), initial conditions, initial heads, and what each model considers to be the bottom of the basin. A potential next step could be to compare initial estimates with simulated contour levels.

Representatives shared their perspectives on what constitutes a significant difference vs. negligible difference between models. The technical teams understand the values will never match perfectly, so it would be important to determine what % difference the subbasin GSAs are okay living with? 10%, 15%, 20%? What are the implications of % difference? Some believed it would be hard to define a single number, as it would depend on data calibration. Others suggested that the differences in the models may not be as important as long as they are similar, since sustainability is tied to the Sustainable Management Criteria (SMC) set which relies on observed conditions based on monitoring. Participants agreed it would be important to revisit these questions at a later meeting.

It will be important to complete discussions as suggested and attempt to resolve or at least understand causes of substantial differences before distributing this information broadly. Ultimately, it will be important to set expectations reasonably, given that initial GSP development is underway, and models, water budgets, etc. will likely be updated over time. These numbers may be reconciled at the 5-year GSP updates.

## Hydrogeologic (HG) Conditions

Participants shared their thoughts regarding their desired approach to gather and compare information regarding HG conditions. Suggestions included sharing cross-sections from GSPs, focus on discussion on principle aquifer definitions, and potentially considering the Airborne Electromagnetic (AEM) Survey conducted primarily in Butte and Glenn Counties (overlying portions of the Vina, Corning, Colusa, and Butte subbasins) to determine how to include survey results (or not) consistently across subbasins.

## Outcomes | Next Steps

- + The technical teams from adjacent subbasins (ex. Butte, Colusa, Corning, and Vina) will meet to better understand the methods and assumptions used in the different models and identify appropriate ways to compare and communicate the information on cross-boundary flows, and stream-aquifer interactions at boundaries with the public. Smaller groups will provide an update at the next meeting.
- + The full group will meet again when all water budget results are available (between late February-April).

## 4. Outreach & Engagement

Participants considered opportunities for regional outreach efforts and refined materials to communicate progress from ongoing inter-basin coordination efforts in their respective public venues (e.g., board meetings, advisory committees, etc.). The main information to communicate with the public includes the frequency of meetings, agencies involved, updates on ongoing coordination among technical consultants, timeline of efforts,

and clarification that this is not a decision-making group. These meetings could make individual GSPs better by identifying and addressing differences before GSPs are finalized and submitted and encouraging transparent communication across subbasins.

**Outreach materials:** Participants reviewed communication materials developed so far and provided input.

- + Inter-basin Coordination Website [[Access Here](#)]
- + Inter-basin Coordination Flyer [[Access Here](#)]
- + Inter-basin Coordination Presentation [[Access Here](#)]
- + Compiled Modeling Tools Highlights [[Access Here](#)]

**Regional Public Meeting:** Representatives considered the possibility of hosting a regional public meeting to discuss inter-basin coordination efforts and inviting board members to participate. Some suggested hosting the meeting during the process to establish SMCs and Project and Management Actions (PMAs), other suggested September would be better to show regional commitment to coordination throughout GSP implementation and to communicate lessons learned. Participants agreed to continually communicate questions and concerns expressed during their respective meetings, so that the group can address issues as they emerge.

## Outcomes | Next Steps

- + CBI will make suggested revisions to the NSV flyer

## 5. GSP Development Status

Due to time limitations, not all subbasin representatives gave a brief update on current Groundwater Sustainability Plan (GSP) development status. Some shared key highlights since the last meeting:

- **Antelope, Bowman, Los Molinos, and Red Bluff Subbasins:** Tehama County experimented with different outreach strategies, including webinars and small “tailgate” meetings. Overall, webinars were more successful, as not as many people attended tailgates.
- **Colusa Subbasin:** The Colusa Subbasin will host two virtual public meetings on December 9<sup>th</sup> and December 10<sup>th</sup>, more details on the website.

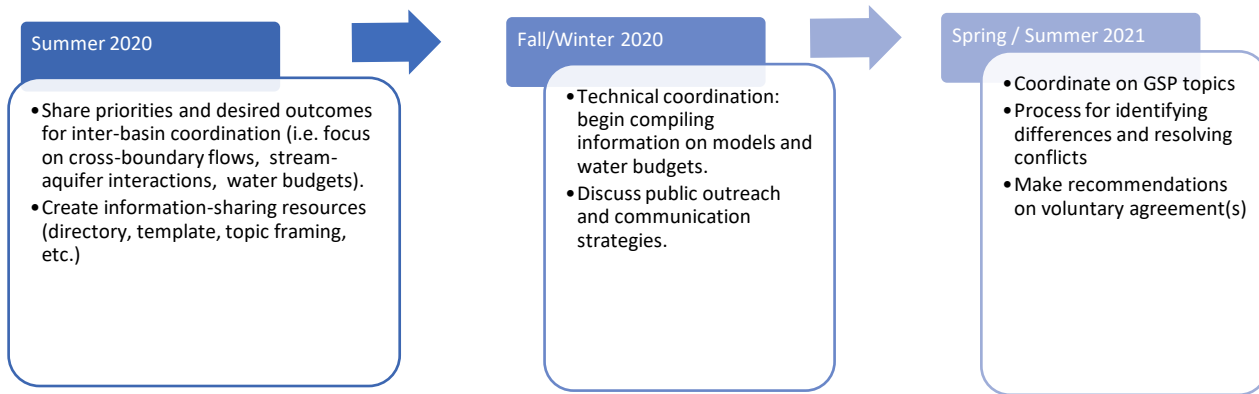
For more information, visit the subbasins’ websites in the table below.

Subbasin	Website
<b>Antelope</b>	<a href="#">Website</a>
<b>Bowman</b>	<a href="#">Website</a>
<b>Butte</b>	<a href="#">Website</a>
<b>Los Molinos</b>	<a href="#">Website</a>
<b>Red Bluff</b>	<a href="#">Website</a>
<b>Corning</b>	<a href="#">Website</a>

<b>Colusa</b>	Websites <a href="#">(Glenn)</a>   <a href="#">(Colusa)</a>
<b>Sutter</b>	<a href="#">Website</a>
<b>Vina</b>	Websites <a href="#">(Vina)</a>   <a href="#">(RCRD)</a>
<b>Wyandotte Creek</b>	<a href="#">Website</a>
<b>Yolo</b>	<a href="#">Website</a>

## 6. Inter-basin Coordination Road Map

The figure below outlines the inter-basin coordination road map. It will continue to be adapted and refined throughout the process.



## 7. Next Steps.

- + **Information-sharing template:** Technical teams from adjacent subbasins will meet to identify appropriate ways to compare and communicate information on model assumptions, cross-boundary flows, and stream-aquifer interactions at boundaries. Staff and consultants will meet again when all water budget results are available for comparison and integrated into the information-sharing template to review compiled data, identify any significant differences, and discuss potential ways to reconcile those differences, as warranted.
- + **Outreach and Communication:** CBI will make adjustments to the communication and outreach materials and redistribute. Subbasin representatives will provide regular inter-basin coordination updates at their respective public venues.
- + **Next meeting:** TBD (February-April 2021). May consider a staff-only meeting in January.

## Meeting Participants

<b>Participant</b>	<b>Representation/Affiliation</b>	<b>Subbasins</b>
<b>Staff</b>		
Christina Buck	Butte County	Butte, Vina, and Wyandotte Creek
Paul Gosselin	Butte County	Butte, Vina, and Wyandotte Creek
Mary Fahey	Colusa Groundwater Authority	Butte and Colusa
Lisa Hunter	Glenn County and Glenn Groundwater Authority	Butte, Colusa, and Corning
Ryan Teubert	Tehama County Flood Control and Water Conservation District	Antelope, Bowman, Corning, Los Molinos, and Red Bluff
Nichole Bethurem	Tehama County Flood Control and Water Conservation District	Antelope, Bowman, Corning, Los Molinos, and Red Bluff
Anjanette Shadley	Western Canal Water District	Butte
Kristin Sicke	Yolo County Flood Control & Water Conservation District	Yolo
Guadalupe Rivera	Sutter County	Sutter
<b>Consultants</b>		
Byron Clark	Davids Engineering	Butte and Colusa
Joe Turner	Geosyntec	Vina and Wyandotte Creek
Eddy Teasdale	Luhdorff & Scalmanini Consulting Engineers (LSCE)	Antelope, Bowman, Los Molinos, and Red Bluff
Lisa Porta	Montgomery & Associates	Corning
Lee Bergfeld	MBK Engineers	
Leslie Dumas	Woodard & Curran	Sutter
<b>Facilitation Team</b>		
Tania Carlone	Consensus Building Institute	Antelope, Bowman, Butte, Corning Los Molinos, Red Bluff, Vina, and Wyandotte Creek
Mariana Rivera-Torres	Consensus Building Institute	Antelope, Bowman, Butte, Los Molinos, Red Bluff, Vina, and Wyandotte Creek