Corning Subbasin Advisory Board

Members
Matt Hansen -- Dave Lester -- Steve Gruenwald -- Ian Turnbull (Alternate)
John Amaro -- Brian Mori -- Jim Yoder -- Grant Carmon (Alternate)

Tehama County Flood Control and Water Conservation District

Corning Subbasin Advisory Board Meeting

August 6, 2025 | 1:30 p.m.
In-Person Location:
City of Corning Council Chambers
794 Third Street
Corning, CA 96021

Due to limited parking for Corning City Hall, meeting attendees are asked to park their vehicles in the parking lot across from City Hall, next to the railroad tracks.

Remote Public Participation Option:
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1. **Call to Order**

   The meeting will be called to order.

2. **Roll Call**

   Staff will conduct roll call.

3. **Meeting Minutes**

   a. *Approval of April 2, 2025 meeting minutes.

   Draft meeting minutes are attached.

   Attachments:

   - April 2, 2025 CSAB meeting minutes

Corning Subbasin Advisory Board
April 2, 2025 | 1:30p.m.
Location | 794 Third Street, Corning, CA 96021
And Teleconference

Meeting Minutes

1. Call to Order

Member Hansen called the Corning Subbasin Advisory Board (CSAB) meeting to order at 1:33 p.m.

2. Roll Call

Tehama County Flood Control and Water Conservation District (TCFCWCD)		Corning Sub-basin Groundwater Sustainability Agency (GSA) (CSGSA)	
X	Matt Hansen		John Amaro
X	David Lester	X	Brian Mori
X	Steve Gruenwald		Jim Yoder
X	Ian Turnbull (Alternate)		Grant Carmon (Alternate)

Other participants: Lisa Hunter (Glenn County), Justin Jenson (Tehama County), Lena Sequeira (Tehama County), Eddy Teasdale (Luhdorff & Scalmanini Consulting Engineers (LSCE)), Will Anderson (LSCE), Maddie Munson, Michael Ward, Martin Spannaus, Karen Jones, Bill Davis, *Todd Turley, *Pete Dennehy, *Jaime Lely * = Online Participant

3. Period of Public Comment

There was no public comment.

4. Presentation: Corning Subbasin Groundwater Sustainability Plan Approval

Eddy Teasdale with LSCE presented DWR's comments on the approved Corning Subbasin GSP as well as recommended corrective actions.

During the comments on Degraded Water Quality Member Lester commented that the Irrigated Lands Program requires water well testing and suggested utilizing that data rather than duplicating efforts; whereby, Mr. Teasdale indicated the data is not readily accessible by the public.

Member Mori asked how this quantifies seasonal streams during the comments of Stream Depletion. Discussion ensued on how little control a GSA has over surface water flows, for instance the Sacramento River headwaters, and downstream impacts. There was some disagreement with the criteria for DWR evaluation. There was additional discussion relating to stream depletion, water

rights, stream gaging, and recharge. It was also noted that there is a stream gage and some monitoring relating to Thomas Creek. Mr. Teasdale discussed grant funding available for more well monitoring and stream gages. Mr. Jenson shared information relating to funding approval for stream gages, some of which are at higher elevations.

5. Presentation: Corning Subbasin Water Year 2024 Annual Report

Eddy Teasdale with LSCE presented the results of the Water Year 2024 Annual Report. The presentation consisted of an overview of Groundwater Conditions, Water Supply and Water Use (Water Budget), Progress Towards GSP Implementation, where we are currently, and where we are headed.

There were clarification and discussion on groundwater elevations, minimum thresholds, short-term and long-term groundwater trends and storage, and the effects that late spring rain has on delayed irrigation and available groundwater, modeling, monitoring, estimated crop water use, and land subsidence. There was significant discussion on groundwater level averages and trendlines and concerns relating to the current calculation method.

6. Groundwater Sustainability Plan Implementation

a. Well Mitigation Program

1. Updates from CSGSA

Ms. Hunter stated The CSGSA Ad Hoc is looking at an application process being used in another area as an example. They are also looking to schedule a meeting with the Tehama County group to compare and collaborate.

2. Updates from Tehama County GSA

Mr. Jenson stated they put together a database of well mitigation programs across the state to see what others are doing. The team requested a couple more meetings before taking to the bigger group.

3. *Discussion on potential coordination of programs and/or recommendations to the GSA's

There was discussion on getting both Ad Hoc groups together and how that will be helpful.

b. Demand Management Program

1. Updates from CSGSA

CSGSA has a coordinating members group which is similar to an Ad Hoc. The group met a few times and is scheduling a meeting with Tehama County to coordinate and go over details. They have also been looking at what framework is being used in the Colusa Subbasin. There has been really great discussion on the topics.

Member Hansen asked if Colusa has a draft and Ms. Hunter replied that they do not and that they are in a similar position.

Member Turnbull asked if the working groups would be getting together, Ms. Hunter responded that they plan to meet soon, and they are having challenges finding a date that works for everyone.

Ms. Hunter further reported that their counsel gave a good presentation talking on the challenges of the water rights systems in California and how it relates to development of Demand Management programs.

2. **Updates from Tehama County**

   Mr. Jenson talked about the Demand Management meeting that took place today. The consultants presented a basic overview outline. They also talked about a STRAW proposal. Mr. Jenson will create a STRAW proposal program and estimates about two months to produce.

   Member Hansen asked about the timeline for this in coordination with upcoming events and Mr. Jenson responded that at this time coordination is in a good spot.

   Mr. Teasdale added comments about Davids Engineering and ERA helping and reviewed the tentative process that includes Demand Management framework, workplan, and implementation. He then reviewed a Draft Technical Memorandum (Demand Management Framework Outline). Discussion ensued on this topic including funding, timing, legal input, public outreach, and the potential for having a Demand Management program that is mainstream across all the counties as a more regional approach. It is thought that this unity would be easier to manage the programs.

3. ***Discussion on potential coordination of programs and/or recommendations to the GSA's**

   There was discussion on getting both Ad Hoc groups together and how that will be helpful.

c. ***Discussion and potential recommendation to GSAs on Corning Subbasin model and options for the periodic evaluation.**

   Mr. Teasdale discussed the different models that could be used for the periodic evaluation focusing on SVSim and C2VSim. There was also some discussion on models being used in neighboring basins. A bullet point pros and cons list comparing the two models was requested for the next meeting.

d. Update on Sustainable Groundwater Management (SGM) Implementation Grant.

Mr. Teasdale reviewed the grant tasks and spending by task. It was noted there are grant funds available to enhance streamflow monitoring, which will allow the placement of a few shallow wells and additional stream gages.

Will Anderson with LSCE went over recharge data, studies, and results. He shared information relating to the Thomes and Elder Creek Diversions, the Casino's plans for a water storage pond, and the CA Olive Ranch project. He also provided an update on the Stony Creek Diversion project, stating everything was in place and ready to go, but the criteria were not met to divert water.

There was discussion on water rights, permitting for new recharge sites, storing stormwater and triggers being set to alert when the water could be diverted.

LSCE has a draft project ranking matrix in development for use of full-service water allocations. This will rank 16 projects in order to prioritize which projects should be funded first.

There was discussion and clarification on various GSP grant updates.

7. Groundwater Sustainability Agency Updates

Ms. Hunter reiterated that the stream gages funded through CalSIP will be helpful in filling some data gaps. They also got news that the Corning Subbasin Facilitation Support Services, funded by DWR, was approved. This will provide meeting support and support in Well Mitigation and Demand Management development for the entire Corning Subbasin.

Mr. Jenson echoed Ms. Hunter regarding the value of stream gage monitoring paid for by the state. This will benefit both groups to divert water in the future. Mr. Jenson touched on the fact that having facilitation support will be very helpful for Glenn County. Having the meeting support has been helpful for the Tehama group.

8. Corning Subbasin Advisory Board Member Reports and Comments

None.

9. Next Meeting

The next meeting will be June 4, 2025. There will most likely be a special meeting before then with the date TBD.

10. Adjourn

With no further business, the meeting adjourned at 3:57 PM.

4. Period of Public Comment

Members of the public are encouraged to address the Corning Subbasin Advisory Board. Public comment will be limited to three minutes. No action will be taken on items under public comment.

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5. Groundwater Sustainability Plan Implementation

a. Well Mitigation Program

   1. Status update from CSGSA on their development of a well mitigation program for the Glenn County portion of the Corning Subbasin.
   2. Status update from Tehama County GSA on their development of a well mitigation program for the Tehama County portion of the Corning Subbasin.
   3. *Discussion to identify potential opportunities for coordination of the programs. As appropriate, provide recommendations to GSAs.

b. Demand Management Program

   1. Receive overview of County of Tehama and Corning Subbasin Groundwater Demand Management Framework Technical Report.
   2. Status update from CSGSA on their development of a demand management program for the Glenn County portion of the Corning Subbasin.
   3. Status update from Tehama County GSA on their development of a demand management program for the Tehama County portion of the Corning Subbasin.
   4. *Discussion to identify potential opportunities for coordination of the programs. As appropriate, provide recommendations to GSAs.

c. *Discussion and potential recommendation to GSAs on Corning Subbasin model and options for the periodic evaluation.

d. Update on Sustainable Groundwater Management (SGM) Implementation Grant.

Well Mitigation Program

As part of the Corning Subbasin GSP revision process, each GSA adopted a resolution establishing a Well Mitigation Program for the Corning Subbasin. The Program shall be developed and implemented by January 1, 2026.

The CSAB is integral to enhance the coordination between the GSAs to develop the program(s) and to provide input and recommendations to the GSAs. It is anticipated there will be updates from the GSAs and discussion on potential coordination of

programs and/or recommendations to the GSAs. Among other topics, this may include considerations for program development and coordination of ad hoc committees.

Demand Management Program

As part of the Corning Subbasin GSP revision process, each GSA adopted a resolution Establishing a Demand Management Program for the Corning Subbasin. The Program shall be developed and implementation shall begin no later than January 1, 2027.

The CSAB is integral to enhance the coordination between the GSAs to develop the program(s) and to provide input and recommendations to the GSAs. It is anticipated there will be updates from the GSAs and discussion on potential coordination of programs and/or recommendations to the GSAs. Among other topics, this may include considerations for program development and coordination of ad hoc committees.

Over the past several months, the consultant team has utilized grant funding to develop a *County of Tehama and Corning Subbasin Groundwater Demand Management Framework Technical Report.* The CSAB will receive an overview of the draft Technical Report and provide feedback and recommendations, if appropriate.

Corning Subbasin Model

At the April 2, 2025 meeting, the CSAB held discussion on potential recommendations to the GSAs on a Corning Subbasin model and options for the periodic evaluation. Following the discussion, it was requested that LSCE prepare a comparison of the SVSim and C2VSim modeling platforms that were used in GSP development for Tehama County Subbasins and the Corning Subbasin respectively. The requested Technical Memorandum is attached.

Additionally, discussions have been occurring across the region on the potential for more coordinated regional modeling efforts. These discussions are taking place generally through the inter-basin coordination work and through a grant project led by basins within Butte County. During GSP development, the inter-basin coordination group compiled information about modeling tools used for SGMA in the Northern Sacramento Valley and highlights of observations, the results of which are attached. More information about the inter-basin coordination work can be found at: https://www.buttecounty.net/1234/Inter-Basin-Coordination and information related to the inter-basin coordination analysis and modeling project can be found at: https://www.vinagsa.org/inter-basin-coordination-analysis-and-modeling-project-implemented-by-butte-county.

Sustainable Groundwater Management (SGM) Implementation Grant

Luhdorff & Scalmanini Consulting Engineers (LSCE) are leading the Tehama County GSP Implementation Project, which includes the Corning Subbasin. This project is generally funded through the SGM Implementation Grants awarded to the Corning

Subbasin and other subbasins in Tehama County. The following tasks are included in the project:

- Task 1. Grant Management and Administration
- Task 2. GSP Implementation, Outreach, and Compliance Activities
- Task 3. Ongoing Monitoring, Data Gaps, and Enhancements
- Task 4. Projects and Management Actions- Recharge Focused
- Task 5. Projects and Management Actions- Regional Conjunctive Use
- Task 6. General Consulting Services on an As Needed

LSCE and GSA staff will provide an update on the SGM Implementation Grant tasks.

Attachments:

- Technical Memorandum: Evaluation of Modeling Platforms for Corning and Tehama County GSAs
- Northern Sacramento Valley Inter-basin Coordination: Modeling Tools Being Used for SGMA in the Northern Sacramento Valley

Luhdorff & Scalmanini
Consulting Engineers

TECHNICAL MEMORANDUM

DATE: June 16, 2025 Project No. 23-1-099

TO: Corning Subbasin Advisory Board (CSAB)

FROM: Eddy Teasdale, PG, CHG

SUBJECT: Evaluation of Modeling Platforms for Corning and Tehama County GSAs

INTRODUCTION

As requested by the Corning Subbasin Advisory Board (CSAB), Luhdorff & Scalmanini Consulting Engineers (LSCE) has prepared this Technical Memorandum to evaluate and recommend a preferred groundwater modeling platform that can effectively support the ongoing and future groundwater management needs of both the Corning Groundwater Sustainability Agency (GSA) and the Tehama County GSA.

This recommendation is intended to guide future modeling efforts related to SGMA implementation, including annual reporting, five-year (periodic) evaluation updates, projects and management action evaluation, and inter-basin coordination across jurisdictional boundaries

Selecting a single, unified model for both the Tehama and Glenn County portions of the Corning Subbasin also promotes consistency in assumptions, streamlines inter-agency coordination, and reduces duplicated technical efforts—ultimately improving the effectiveness of regional groundwater management.

EVALUATION OVERVIEW

When evaluating both Tehama IHM (SVSim-based) and C2VSimFG (Corning-specific), multiple technical and planning-related criteria were considered to assess their ability to support groundwater sustainability planning, reporting requirements, and inter-basin coordination. Each model was evaluated based on previous modeling investment, representation of the Corning Subbasin within the model domain, model layering and stratigraphy, data input quality and verification, calibration period and approach, parameterization for local aquifer heterogeneity, ease of updating datasets and simulations with assistance from the California Department of Water Resources (DWR), and effectiveness in inter-basin and intra-basin reporting and coordination.

Both Tehama IHM and C2VSimFG utilize statewide hydrologic datasets; however, Tehama IHM incorporates additional refined datasets, including remote sensing from LandIQ, the USDA Cropland Data Layer, to enhance accuracy in land use and return-flow calculations. Tehama IHM features a more detailed vertical layering structure with nine aquifer layers, which facilitates more precise simulations of groundwater and surface water interactions. This finer vertical discretization supports more accurate stream depletion modeling, a critical factor in addressing DWR-identified Groundwater Sustainability Plan

(GSP) corrective actions. Updating the Corning-specific C2VSimFG model involves significant effort and a heavy reliance on the DWR, including basin-wide recalibration cycles that require coordination. In contrast, Tehama IHM was explicitly designed for incremental and localized updates, enabling regional GSAs to efficiently integrate new geologic, hydrologic, or land-use data without extensive reliance on DWR. This local control significantly reduces resource demands and response time for incorporating emerging data or conditions.

SUMMARY AND CONCLUSIONS

In summary, the SVSim-based Tehama Integrated Hydrologic Model (Tehama IHM) is better suited to support future groundwater sustainability efforts within the Corning Groundwater Sustainability Agency (GSA) and across the broader Tehama County subbasins. Tehama IHM's technical strengths, including its refined input datasets, enhanced vertical resolution, and streamlined update process, provide significant advantages for ongoing planning, reporting, and inter-basin coordination.

While both Tehama IHM and C2VSimFG utilize statewide hydrologic datasets and each offers unique strengths, Tehama IHM provides:

- Greater flexibility for integrating updated data and running localized scenarios without full-basin recalibration
- Improved vertical and spatial resolution to support more accurate simulation of groundwater/surface water interactions
- A more efficient and locally manageable path for model maintenance and updates, reducing dependency on DWR

Additionally, using a single, unified modeling platform (Tehama IHM) to manage the Corning Subbasin—spanning both Tehama and Glenn counties—offers substantial benefits. It promotes:

- Consistency in technical assumptions across GSA boundaries
- Streamlined inter-agency collaboration
- More efficient use of resources, avoiding duplicative efforts and model divergence

To support this recommendation, the two tables below provide further context:

- Table 1 presents a scoring matrix with a generalized ranking of the two models across key evaluation categories
- Table 2 includes a detailed comparison of the technical features, data inputs, and operational considerations for Tehama IHM and C2VSimFG

Taken together, these findings confirm that Tehama IHM is the preferred modeling platform to support long-term sustainable groundwater management in the Corning Subbasin.

Table 1. Score and Rank of Corning C2VSimFG and Tehama IHM Models

1 - Advantage 0 - Parity -1 - Disadvantage		Previous Modeling Investment	Representation of Corning Subbasin within Model Domain	Model Layering / Stratigraphy	Quality of Input Datasets	Calibration Period	Calibration and Parameterization	Ease of Model Updates	Independence from DWR	Inter-basin Water Budget Accounting	Intra-Basin Coordination	Previous Modeling Investment	SCORE SUM	RANK
LSCE SCORE	Tehama IHM	0	-1	1	1	1	1	1	1	1	1	1	**8**	1
	Corning C2vSimFG	0	1	-1	-1	-1	-1	-1	-1	-1	-1	-1	**-8**	2

Table 2. Technical Summary of Model Platforms

Topic	Corning C2VSimFG	Tehama IHM
Previous Modeling Investment	Corning GSA invested ~$250 K to refine the C2VSimFG model into the Corning-specific C2VSimFG model.	First full deployment in the full Corning GSA boundary; minor updates required to expand model domain to incorporate the entirety of the Corning Subbasin. Includes significant development in refining the SVSim model into the Tehama IHM to include more localized stratigraphic and hydraulic conditions.
Representation of Corning Subbasin within Model Domain	100% of Corning GSA.	~90 % of Corning GSA; minor update required within the black rectangle area (Figure 3).
Model Layering/Stratigraphy	4 aquifer layers (1 upper, 3 lower); Upper aquifer represented as one thick layer. • Less accurate simulated stream depletion.	9 aquifer layers (5 upper, 4 lower) with finer vertical resolution (Figure 1, 2). • More accurate stream depletion simulation (better supports addressing of GSP corrective actions).
Quality of Input Datasets	Verified historical IWFM inputs span from 1922 to 2015 (WY). • Data before 1974 were carried over essentially unchanged from the earlier coarse grid model, but pre-1988 land-use inputs were found inaccurate and replaced with (WY) 1988 data.	Historical inputs run (WY) 1985-2019. • 2016-2019 data layers were built with supplemental local monitoring data, LandIQ, and USDA CDL imagery that is not incorporated into Corning C2VSimFG. • 672 new well logs for texture, updated CIMIS-based ET and SEBAL/METRIC actual-ET, and updated local diversion and small-watershed flow time series.
Calibration Period	Historical simulation: WY 1922-2015, but all input datasets were reviewed and updated only from (WY) 1974 forward. Corning C2VSimFG calibration period: (WY) 1974 - 2015 • Adopted the valley-wide C2VSimFG calibration—manual water-budget tuning for (WY) 1974-2015 and PEST-facilitated aquifer calibration for WY (1985-2015). • The Corning C2VSimFG team did calibration-verification only; no new parameter estimation was run, so the Corning-specific sub-model inherits the C2VSim Central-Valley calibration span.	Historical simulation: (WY) 1985 – 2019 with verified input data. Tehama IHM calibration period: (WY) 1990 – 2018. • Warm-up period from (WY) 1985-1989, then automated (UCODE) + manual calibration for (WY) 1990-2018, chosen to satisfy SGMA regulations regarding water budget base period.

Table 2. Technical Summary of Model Platforms		
Topic	**Corning C2VSimFG**	**Tehama IHM**
Parameterization	The Corning-specific C2VSimFG model inherits the valley-wide C2VSimFG hydraulic dataset produced with Texture2Par: • 96 pilot-points distributed among three broad depositional zones and a single Central-Valley percent-coarse texture model, applied to the 4-layer grid. No new pilot-points added for Corning; local edits limited to Black Butte Lake elements (converted a general-head boundary to a simulated lake), land-surface/curve-number tweaks, and minor streambed conductance changes to improve local fit.	Fresh texture dataset • Rebuilt the percent-coarse model with 672 Well Completion Reports (615 inherited from the SVSim library plus 57 newly digitized logs that filled lateral and vertical gaps). Four geologic parameter zones • Every node is tagged as Alluvium, Tuscan Fm., Tehama Fm., or Non-Tuscan/Non-Tehama to honor mapped formations. Aquifer parameters assigned using refined texture model. • The new percent-coarse grids were used to assign K, Sy, and Ss for all nine layers, then scaled with zone-specific multipliers that were treated as calibration parameters. Updated zone multipliers • UCODE-assisted calibration (WY 1990-2018) yielded the multipliers. These multipliers replace the valley-average values supplied with SVSim and drive the final layer-by-layer hydraulic fields in Tehama IHM. No regional pilot-point mesh • Tehama IHM discarded SVSim's 93 texture pilot points; instead, the calibrated zone multipliers act directly on the new texture surfaces, so hydraulic properties are tuned to Tehama heterogeneity without relying on Central Valley pilot-point interpolation.
Calibration	C2VSimFG was calibrated with a three-step PEST routine against observations for (WY) 1985-2015. The Corning team performed calibration verification only. • No new pilot-point estimation. • Hydraulic properties remain regional.	Full Tehama IHM sub-model calibration for (WY) 1990-2018 using UCODE-2014 plus targeted manual adjustments. • Optimized aquifer parameters. • Calibrated zone multipliers resulted in locally tuned streambed conductivity and specific yield, reflecting Tehama County heterogeneity.
Ease of Model Updates	Effort & workflow: High-effort, DWR-driven. • Any change to wells, airborne electromagnetic data, land use, or stresses first passes through the Central Valley texture model managed by DWR. New percent coarse grids must then be pushed through Texture2Par to rebuild four-layer hydraulic fields. • Because calibration used a valley scale three-step PEST procedure with eighty aquifers and sixteen Corcoran Clay pilot points, even modest texture edits usually start a full recalibration cycle and review of boundary conditions. • The Corning C2VSimFG model documentation advises that such work "entails significant effort" and should be folded into the five-year GSP update schedule.	Effort & workflow: Moderate effort, locally controlled. • The nine-layer grid is already refined along streams and within Tehama County, so most updates involve three steps: refresh the local percent coarse grid with new logs or AEM picks, rerun Texture2Par, and rerun the existing UCODE calibration focused on the four parameter zones and a few streambed terms. • Tehama IHM model documentation encourages agencies to add new monitoring data "as available" and notes that targeted recalibration can be done efficiently without rebuilding the full Sacramento Valley model.
	Typical scope • Updates are basin-wide and require coordination with DWR because the underlying Central Valley framework is shared by many subbasins. • Finer vertical slicing would require a new grid plus another complete calibration run.	Typical scope • Updates are locally scoped. Adding a few layers, streams or small grid extensions can be done inside the existing finite-element mesh. Extending time-series beyond water year 2018 largely requires new input files and a brief check run.
	Estimated turnaround. • Months, and normally aligned with the five-year GSP cycle.	Estimated turnaround. • Weeks to a few months, depending on data volume, and can be scheduled by the county GSA at any time.

Table 2. Technical Summary of Model Platforms		
Topic	**Corning C2VSimFG**	**Tehama IHM**
Independence from DWR	The sub-model, Corning C2VSimFG, is a slice of the DWR-maintained Central Valley model. Future official releases, texture revisions, or code updates are expected to come from DWR, and local GSAs are encouraged to adopt those releases for consistency. Significant refinements, therefore, rely on DWR resources and timelines, and local recalibration is recommended only during scheduled five-year GSP updates.	Tehama IHM was carved out of the SVSim beta but is now maintained by the county GSA and consultants. All inputs, calibration files and scripts are publicly documented, allowing the local team to refresh datasets or incorporate new methods without waiting for DWR approvals. The model can therefore evolve independently while still drawing on regional datasets when they are helpful.
Inter-basin Water Budget Accounting	Subbasin activity summaries require additional aggregation. • C2VSimFG reports water budgets by twenty-one large “DSA” (Depletion Study Areas) subregions that span multiple SGMA subbasins; GSAs must post-process considerable of element-level outputs to create true subbasin or cross-boundary budgets. The model can deliver budgets for any user-defined zone. However, DWR notes that accuracy at scales smaller than a subregion depends on the quality of the underlying land-use and pumping data. Therefore, local agencies must re-check and reconcile the results before comparing them with neighboring basins.	Subregions follow GSA boundaries for easier subbasin-level reporting. • The SVSim grid was built to conform to Bulletin 118 basin edges and preliminary GSA boundaries; Tehama IHM retained the original grid structure. Grid alignment along subbasin boundaries allows for easy processing of subbasin water budgets, including analysis of inter-basin flows.
Intra-Basin Coordination	Applying changes to 2 model platforms produces uncertain values between them. • Post-processing required. C2VSimFG summarizes flows and storage for the 21 Central-Valley “subregions” that were inherited from Depletion Study Areas, not from Bulletin 118 subbasins or current GSA boundaries. Corning must therefore aggregate hundreds of element-level results and apportion them to the Corning Subbasin and its neighboring Tehama GSAs before budgets can be compared. Because land- and water-use inputs are calibrated only at the subregion scale, accuracy at the GSA scale depends on local re-checks and can vary markedly across internal boundaries. The extra bookkeeping makes “apples-to-oranges” comparisons likely when adjacent subbasins rely on a different platform, such as SVSim.	A single platform across subbasins streamlines regional coordination across Tehama County. • Built-in alignment. The SVSim grid (retained as part of Tehama IHM) was deliberately generated to follow Bulletin 118 subbasin lines, preliminary GSA boundaries, and even local model edges, so each administrative unit is already a model subregion. This yields immediately comparable inter- and intra-basin budgets without additional aggregation. This single-platform approach allows Tehama GSAs to share consistent budgets, boundary conditions, and management-action simulations across the county.

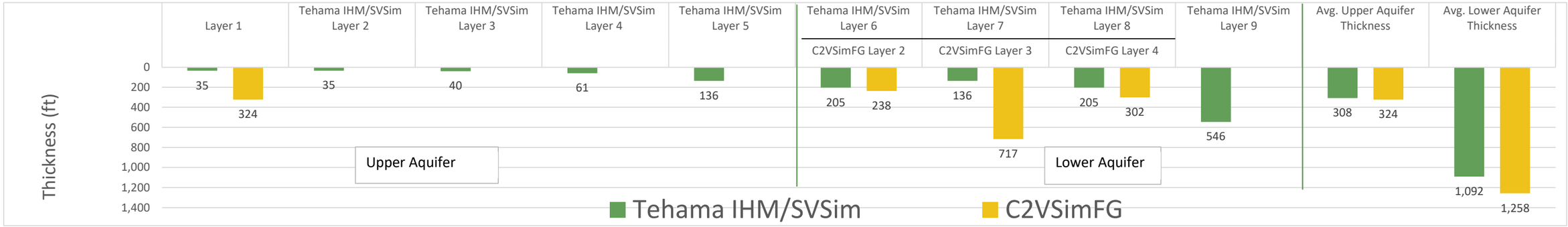


Figure 1. Number of model layers and associated thickness for the SVSim (Tehama IHM) model and the Corning Subbasin C2VSim (fine grid) model

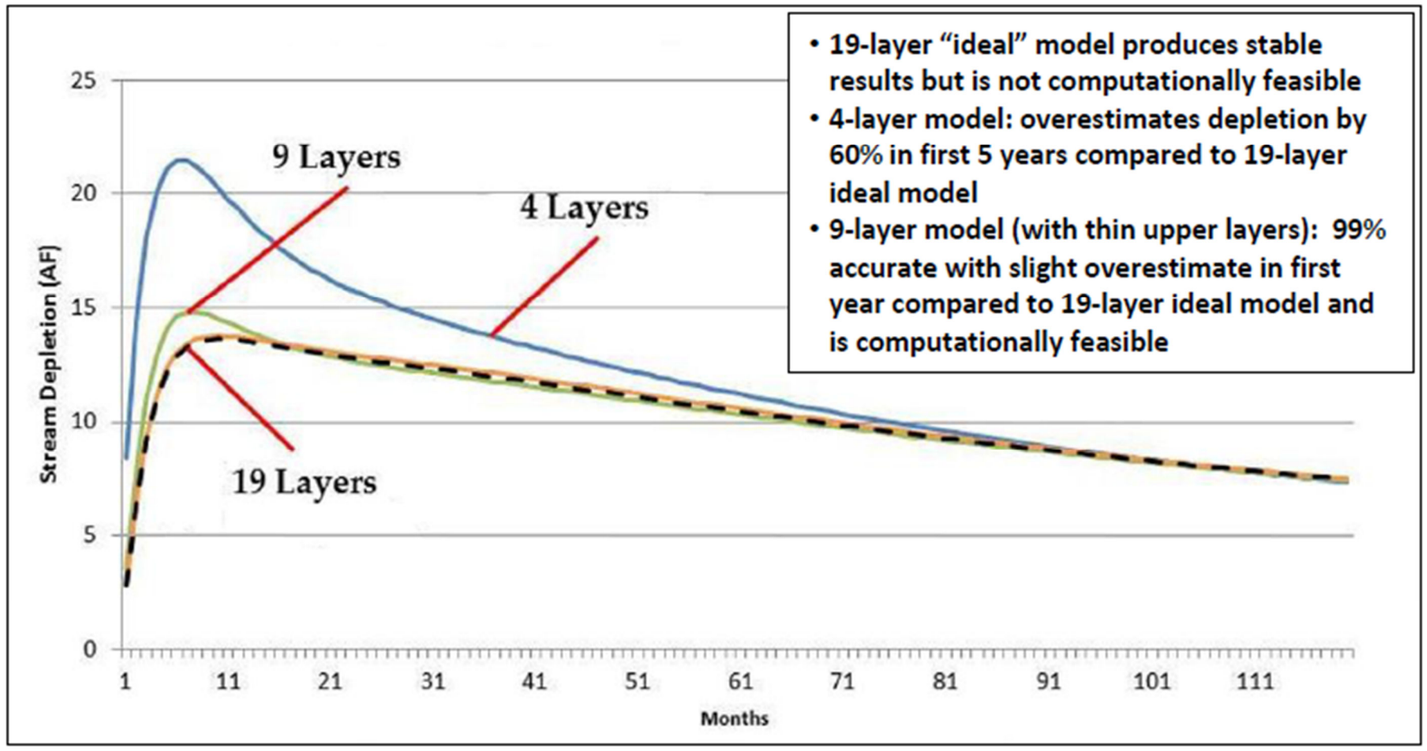


Figure 2. Sensitivity tests (documented in SVSim TM-1A and TM-1B) indicate that SVSim very closely replicates ideal stream depletion scenarios (within 99% accuracy) under various pumping conditions

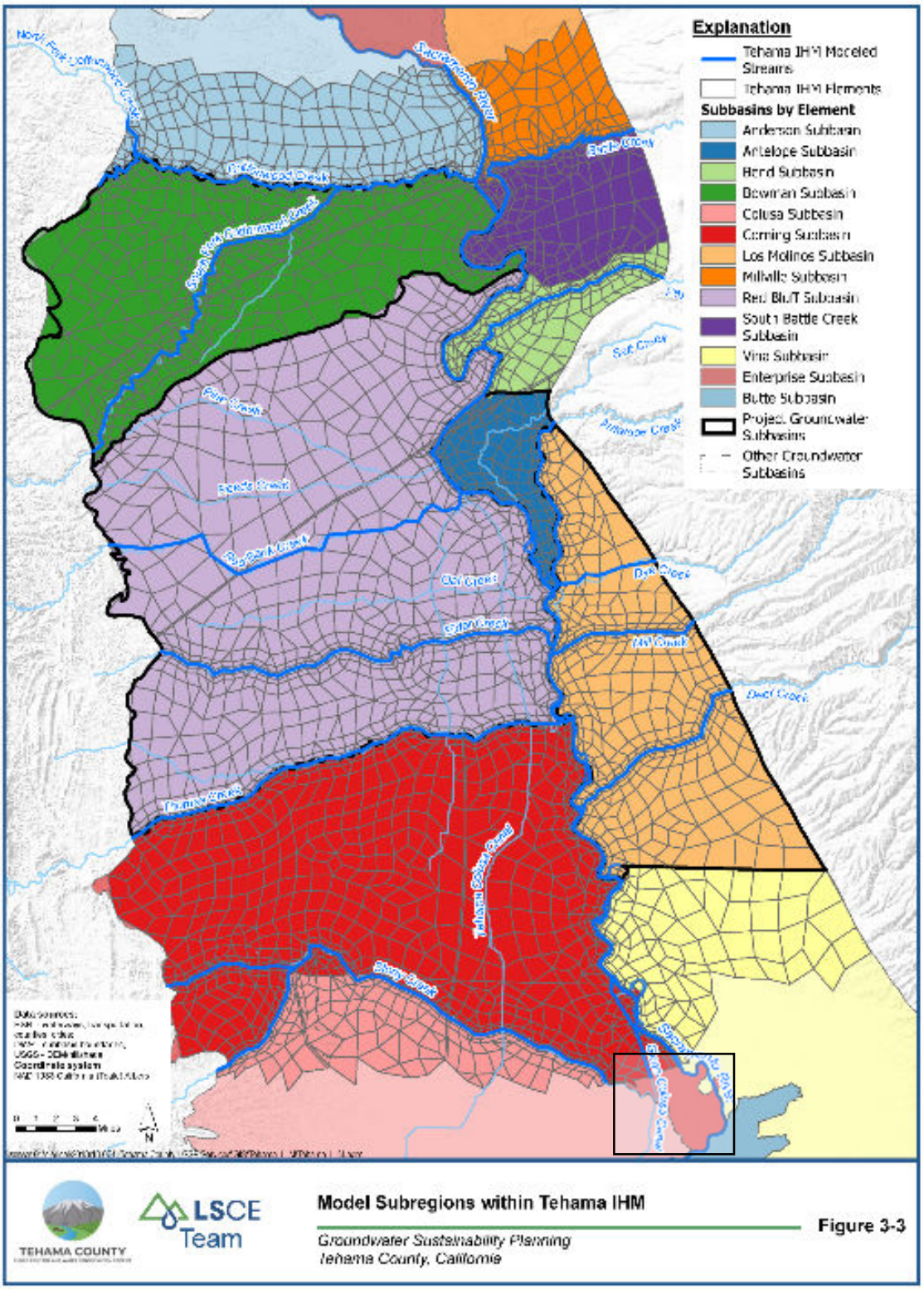


Figure 3. Map of the currently defined subregions within the Tehama IHM model framework. The current domain covers ~90% of the Corning GSA, with the remaining portion of the GSA not covered outlined in black.

REFERENCES

California Department of Water Resources (DWR), 2015, *Sacramento Valley Groundwater-Surface Water Simulation Model Technical Memorandum 1A: Modeling Approach for C2VSim Enhancement.* April 6, 2015.

California Department of Water Resources (DWR), 2016, *Sacramento Valley Groundwater-Surface Water Simulation Model Technical Memorandum 2: Model Grid Development.* September 23, 2016.

California Department of Water Resources (DWR), 2020, *California Central Valley Groundwater-Surface Water Simulation Model – Fine Grid (C2VSimFG) Development and Calibration, Version 1.0.* December 2020.

California Department of Water Resources (DWR), 2021, *Sacramento Valley Groundwater-Surface Water Simulation Model Technical Memorandum 1B: Development of Hydrogeologic Conceptual Model and Aquifer Parameters* (rev. July 2, 2021).

California Department of Water Resources (DWR), 2021, *Sacramento Valley Groundwater-Surface Water Simulation Model Technical Memorandum 3: Development of SVSim Version 1.0 Model Input Files.* May 18, 2021.

California Department of Water Resources (DWR), 2021, *Sacramento Valley Groundwater-Surface Water Simulation Model Technical Memorandum 4: Model Calibration and Sensitivity Analysis.* December 10, 2021.

Luhdorff & Scalmanini, Consulting Engineers (LSCE), 2021, *Tehama IHM Model Documentation.* Prepared for Tehama County Flood Control and Water Conservation District, October 2021.

Porta, L., Wickham, P., & Brush, C. (Hydrolytics), 2021, *Corning Subbasin GSP Appendix 4A: Evaluation of and Revisions to Integrated Modeling Platform.* Revised September 7, 2021.

Porta, L., Wickham, P., & Brush, C. (Hydrolytics), 2021, *Corning Subbasin GSP Appendix 4B: Interaction of Water Budget Components as Simulated by C2VSimFG Version 1.0.* 2021.

Modeling Tools Being Used for SGMA in the Northern Sacramento Valley

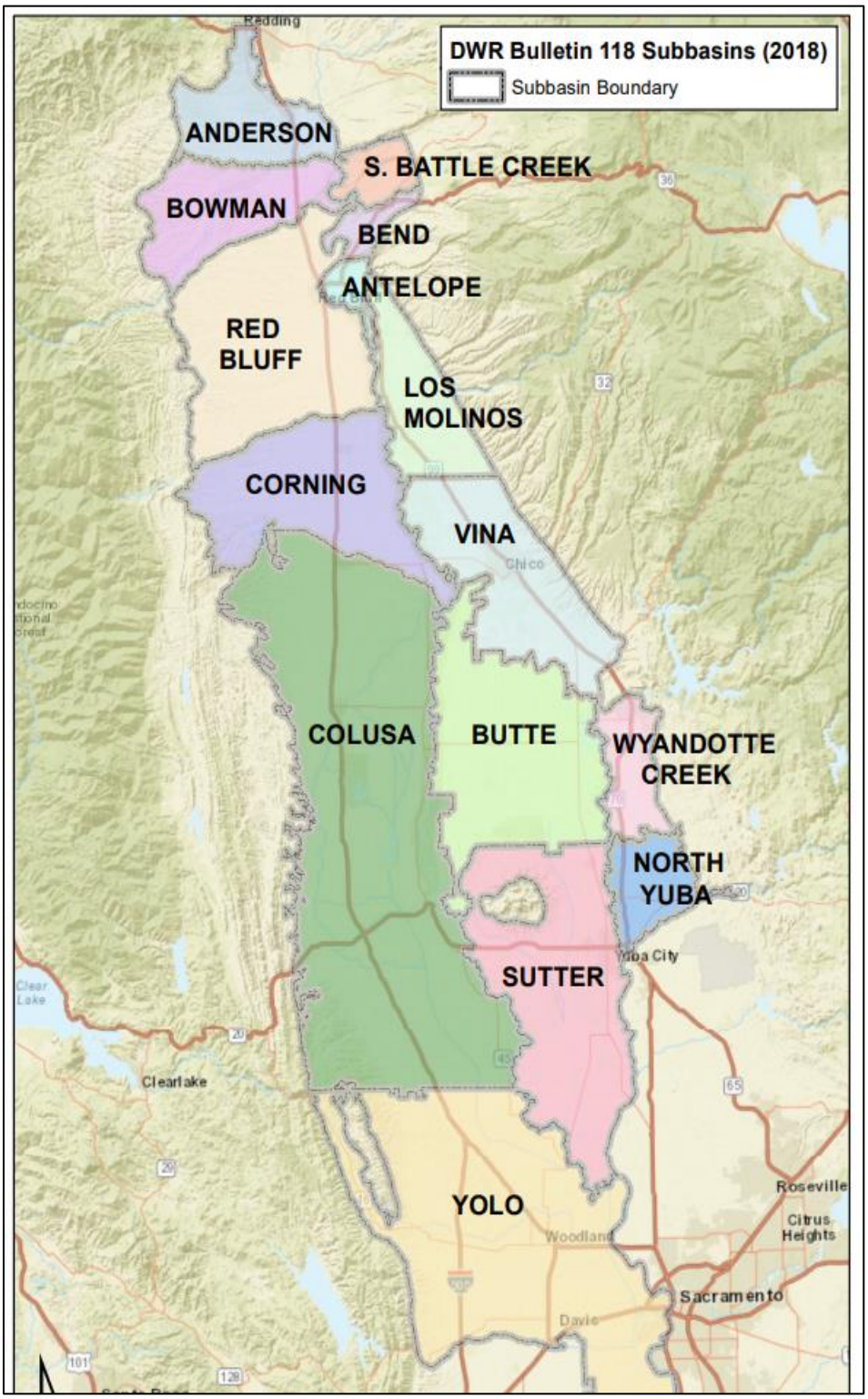
Integrated hydrologic models are useful for estimating and understanding water budgets for the interconnected surface water system, land surface system, and groundwater system. This type of modeling tool is being used by Groundwater Sustainability Agencies (GSAs) to support analysis and development of their Groundwater Sustainability Plans (GSPs) for the implementation of the Sustainable Groundwater Management Act (SGMA).

This fact sheet from an earlier Interbasin Groundwater Flow Project (2017) provides an explanation and overview of "why modeling?" https://www.buttecounty.net/wrcdocs/Reports/SpecialProjects/InterbasinGWFlow/FactSheet.pdf

Subbasins throughout the Northern Sacramento Valley are in various stages of developing and refining modeling tools to support GSP development and groundwater management in their subbasin. As part of the interbasin coordination effort, a table detailing the major characteristics of these modeling tools has been compiled. Here are a few highlights:

Highlights:

- In the 14 subbasins shown in the map, 7 different models are being developed and used (Anderson excluded)
- Two of these models were in use by local agencies before SGMA (by Butte County and Yuba Water Agency)
- Another three of these models are locally refined versions of C2VSim which is a Central Valley wide model developed by the Department of Water Resources (DWR). C2VSim also existed before SGMA and is in ongoing development by DWR. The SGMA states that DWR would provide C2VSim to GSAs as part of their technical support services role.
- Subbasins in Tehama County are using a refined version of another DWR developed model called SVSim, the Sacramento Valley Simulation Model.
- The model developed for the Yolo subbasin is a coupled Water Evaluation and Planning (WEAP) model with USGS's MODFLOW model. This couples a surface water model (WEAP) with a groundwater model (MODFLOW). The WEAP model was in use prior to the SGMA effort.
- These models (except Yolo) use the same groundwater-surface water modeling code (Integrated Water Flow Model (IWFM)) so there is consistency in the approach for estimating the water budget components. This is especially helpful for estimating irrigation water demands and stream-groundwater interaction.
- Each subbasin is refining the model for their respective area and particular objectives. All models have strengths and limitations and are best suited for addressing the questions that drove their development.
- Although there are many similarities between these models (the data and approaches they use), varying assumptions and refinements create localized differences in resulting water flows within and between subbasins.
- Consultants working on these models throughout the region are working together as they develop them to understand how these models compare or differ, and ensure that the basis for comparison is as consistent as possible, given local assumptions and data availability (this is a challenging task that even agencies that develop models, such as the USGS and DWR, have grappled with for a long time).


DWR Bulletin 118 Subbasins (2018)
Subbasin Boundary
ANDERSON
S. BATTLE CREEK
BOWMAN
BEND
ANTELOPE
RED BLUFF
LOS MOLINOS
CORNING
VINA
COLUSA
BUTTE
WYANDOTTE CREEK
NORTH YUBA
SUTTER
YOLO
Redding
Chico
Clear Lake
Clearlake
Roseville
Citrus Heights
Woodland
Davis
Sacramento

READ ME

Model Name of model
Model Ownership GSA or agency developing/maintaining the model
Technical Contact Name and contact information
Integrated Model Yes or No
Geographic Area List all the subbasins covered in part of in whole by the model domain or specify Sacramento Valley/Northern Sacramento Valley as model extent.
Basis for Model Layering Ex. DWR Geologic Cross sections or Aquifer Characteristics (pumping zones,unconfined/confined)
Boundary Conditions Brief narrative description

Subbasin	Model	Model Ownership	Lead Consultant Team	Integrated Model (Y/N)	Geographic Area	Timestep	Simulation Period (Water Years)	Number of Layers	Basis for Model Layering	Agricultural Demand Estimation Model	Stream-Aquifer Interaction Method	Boundary Conditions
Butte	Butte Basin Groundwater Model- 2020	Butte Co. Dept. of Water and Resource Conservation	Davids Engineering/Woodard and Curran	Yes	Boundaries: North - Deer Creek; West - Sacramento River; South - Yuba River; East - Sierra foothills	Daily	1971- 2018	9	Delineated based on DWR cross-sections of major geologic units within the model domain. Documentation under development.	IWFM Demand Calculator (IDC)	IWFM Version 2015 - Stream Configuration 4.0	North - No flow boundary; West - Specified head boundary condition using C2VSim; South - General head boundary condition using C2VSim; East - No flow boundary; stream inflows from outside of groundwater model domain
Vina	Butte Basin Groundwater Model-2020	Butte Co. Dept. of Water and Resource Conservation	Davids Engineering/Woodard and Curran	Yes	Boundaries: North - Deer Creek; West - Sacramento River; South - Yuba River; East - Sierra foothills	Daily	1971- 2018	9	Delineated based on DWR cross-sections of major geologic units within the model domain. Documentation under development.	IWFM Demand Calculator (IDC)	IWFM Version 2015 - Stream Configuration 4.0	North - No flow boundary; West - Specified head boundary condition using C2VSim; South - General head boundary condition using C2VSim; East - No flow boundary; stream inflows from outside of groundwater model domain
Wyandotte Creek	Butte Basin Groundwater Model-2020	Butte Co. Dept. of Water and Resource Conservation	Davids Engineering/Woodard and Curran	Yes	Boundaries: North - Deer Creek; West - Sacramento River; South - Yuba River; East - Sierra foothills	Daily	1971- 2018	9	Delineated based on DWR cross-sections of major geologic units within the model domain. Documentation under development.	IWFM Demand Calculator (IDC)	IWFM Version 2015 - Stream Configuration 4.0	North - No flow boundary; West - Specified head boundary condition using C2VSim; South - General head boundary condition using C2VSim; East - No flow boundary; stream inflows from outside of groundwater model domain
Corning	Refined version of C2VSim-FG v.1.0 (pending DWR release of v.1.0)	Corning Sub-basin GSA and Tehama County GSA (TCFCWCD)	Montgomery & Associates	Yes	Original model includes the entire Central Valley; Corning GSP model was revised to only include the Northern Sacramento Valley - from Redding Basin to the southern boundary formed approximately by a line south of Willows to Oroville - including portions of the Colusa and Butte Subbasins.	Monthly	1973-2015	4	Roughly major aquifer units	IWFM Demand Calculator (IDC)	IWFM Version 2015 - Stream Configuration 4.2	South- specified flow boundary using C2VSimFG; Small watersheds inflow at Sierra foothills and Costal Ranges; stream inflows from outside of groundwater model domain; main reservoir releases at model boundaries.
Colusa	Refined version of C2VSimFG Beta 2	CGA & GGA refinement of DWR model	Davids Engineering	Yes	Central Valley	Monthly	1922 - 2015	4	Roughly major aquifer units, as described by Brush et al. 2013. Fourth base layer later added by DWR for numerical stability; documentation by DWR not yet released.	IWFM Demand Calculator (IDC)	IWFM Version 2015 - Stream Configuration 4.2	Same as C2VSimFG as established by DWR: Small watersheds inflow at Sierra foothills and Coastal Ranges; stream inflows from outside of groundwater model domain; main reservoir releases at model boundaries.
Antelope	Tehama County Integrated Hydrologic Model (revised SVSim model)	Tehama County	Luhdorff & Scalmanini Consulting Engineers (LSCE)	Yes	Tehama County, plus 5 mile buffer to the north and to the south	Monthly	1973 - 2018	9	SVSim, uses refined textural database based on analysis of recent well logs	IWFM Demand Calculator (IDC)	IWFM Version 2015 - Stream Configuration	North and South - general head boundary conditions using water levels derived from C2VSim; small watersheds inflow at Sierra foothills and Coastal Ranges
Bend	Tehama County Integrated Hydrologic Model (revised SVSim model)	Tehama County	Luhdorff & Scalmanini Consulting Engineers (LSCE)	Yes	Tehama County, plus 5 mile buffer to the north and to the south	Monthly	1973 - 2018	9	SVSim, uses refined textural database based on analysis of recent well logs	IWFM Demand Calculator (IDC)	IWFM Version 2015 - Stream Configuration	North and South - general head boundary conditions using water levels derived from C2VSim; small watersheds inflow at Sierra foothills and Coastal Ranges
North Yuba												
Bowman	Tehama County Integrated Hydrologic Model (revised SVSim model)	Tehama County	Luhdorff & Scalmanini Consulting Engineers (LSCE)	Yes	Tehama County, plus 5 mile buffer to the north and to the south	Monthly	1973 - 2018	9	SVSim, uses refined textural database based on analysis of recent well logs	IWFM Demand Calculator (IDC)	IWFM Version 2015 - Stream Configuration 4.2	North and South - general head boundary conditions using water levels derived from C2VSim; small watersheds inflow at Sierra foothills and Coastal Ranges
Los Molinos	Tehama County Integrated Hydrologic Model (revised SVSim model)	Tehama County	Luhdorff & Scalmanini Consulting Engineers (LSCE)	Yes	Tehama County, plus 5 mile buffer to the north and to the south	Monthly	1973 - 2018	9	SVSim, uses refined textural database based on analysis of recent well logs	IWFM Demand Calculator (IDC)	IWFM Version 2015 - Stream Configuration 4.2	North and South - general head boundary conditions using water levels derived from C2VSim; small watersheds inflow at Sierra foothills and Coastal Ranges
Sutter	C2VSimFG	Sutter County GSA	Woodard & Curran	Yes	Tehama County, plus 5 mile buffer to the north and to the south	Monthly	1991-2015	4	C2VSim and Sacramento Valley hydrogeologic studies	IWFM Demand Calculator (IDC)	IWFM Version 2015 - Stream Configuration 4.3	Same as C2VSimFG as established by DWR
Red Bluff	Tehama County Integrated Hydrologic Model (revised SVSim model)	Tehama County	Luhdorff & Scalmanini Consulting Engineers (LSCE)	Yes	Tehama County, plus 5 mile buffer to the north and to the south	Monthly	1973 - 2018	9	SVSim, uses refined textural database based on analysis of recent well logs	IWFM Demand Calculator (IDC)	IWFM Version 2015 - Stream Configuration 4.2	North and South - general head boundary conditions using water levels derived from C2VSim; small watersheds inflow at Sierra foothills and Coastal Ranges
South Battle Creek	Tehama County Integrated Hydrologic Model (revised SVSim model)	Tehama County	Luhdorff & Scalmanini Consulting Engineers (LSCE)	Yes	Tehama County, plus 5 mile buffer to the north and to the south	Monthly	1973 - 2018	9	SVSim, uses refined textural database based on analysis of recent well logs	IWFM Demand Calculator (IDC)	IWFM Version 2015 - Stream Configuration 4.2	North and South - general head boundary conditions using water levels derived from C2VSim; small watersheds inflow at Sierra foothills and Coastal Ranges

6. Groundwater Sustainability Agency Updates

Groundwater Sustainability Agency staff and members may provide activity updates to the CSAB.

- Corning Sub-basin GSA
- Tehama County Flood Control and Water Conservation District GSA

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7. Corning Subbasin Advisory Board Member Reports and Comments

Members of the CSAB are encouraged to share information, reports, comments, and suggest future agenda items. Action cannot be taken on matters brought up under this item.

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8. Next Meeting

The next regular meeting is scheduled for October 1, 2025 at 1:30 p.m.

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9. Adjourn

The meeting will be adjourned.
