

SACRAMENTO GROUNDWATER AUTHORITY
REGULAR MEETING OF THE BOARD OF DIRECTORS
Thursday, June 10, 2021; 9:00 a.m.

AGENDA

The Board will discuss all items on this agenda, and may take action on any of those items, including information items and continued items. The Board may also discuss other items that do not appear on this agenda but will not act on those items unless action is urgent, and a resolution is passed by a two-thirds (2/3) vote declaring that the need for action arose after posting of this agenda.

The public shall have the opportunity to directly address the Board on any item of interest before or during the Board's consideration of that item. Public comment on items within the jurisdiction of the Board is welcomed, subject to reasonable time limitations for each speaker. Public documents relating to any open session item listed on this agenda that are distributed to all or a majority of the members of the Board of Directors less than 72 hours before the meeting are available for public inspection on SGA's website. In compliance with the Americans with Disabilities Act, if you have a disability and need a disability-related modification or accommodation to participate in this meeting, please contact cpartridge@rwah2o.org. Requests must be made as early as possible, and at least one full business day before the start of the meeting.

Note: Pursuant to the Governor's Executive Order N-29-20 and given the state of emergency regarding the threat of COVID-19, the meeting will be held via teleconference.

We encourage Board members and participants to join the meeting 10 minutes early. Note that we will use GoToMeeting to share slides and other information during the meeting. Use the link below to join GoToMeeting. If you have a microphone that you can use with your computer, it should be possible to both listen to, and participate in, the meeting through GoToMeeting. If you do not have a microphone, or a headset with a microphone, that plugs into your computer via USB port, you will need to call into the conference line to listen and comment, although you still should be able to view the meeting materials on GoToMeeting. Please do not simultaneously use a microphone through GoToMeeting and the telephone conference line. That combination results in audio problems for all participants.

Meeting Information:

SGA Board Meeting
Thu, Jun 10, 2021 9:00 AM - 11:00 AM (PDT)

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Access Code: 502-815-029

1. CALL TO ORDER AND ROLL CALL

2. PUBLIC COMMENT: Members of the public who wish to address the Board may do so at this time. Please keep your comments to less than three minutes.

3. CONSENT CALENDAR

3A. Minutes of April 8, 2021 meeting

3B. Fiscal Year 2020 - 2021 Budget Carryover Request

Action: Approve All Consent Items

4. SACRAMENTO CENTRAL GROUNDWATER AUTHORITY UPDATE

Discussion: Jim Peifer, Executive Director

5. SUSTAINABLE GROUNDWATER MANAGEMENT ACT (SGMA) AND GROUNDWATER MANAGEMENT PROGRAM UPDATE

Discussion: Rob Swartz, Manager of Technical Services

6. LEGISLATIVE UPDATE

Discussion: Ryan Ojakian, Legislative and Regulatory Affairs Manager

7. EXECUTIVE DIRECTOR'S REPORT

8. DIRECTORS' COMMENTS

ADJOURNMENT

Next SGA Board of Director's Meeting – August 12, 2021, 9:00 a.m. at the RWA/SGA office, 5620 Birdcage Street, Ste. 110, Citrus Heights. The location is subject to change depending on the COVID-19 emergency.

Notification will be emailed when the SGA electronic packet is complete and posted on the SGA website at <https://www.sgah2o.org/meetings/board-meetings/>.

2021 SGA BOARD MEMBERS

Organization	Representative/Alternate	Appointing Authority
California American Water	S. Audie Foster Christina Baril (alternate)	Sacramento City Council
Carmichael Water District	Paul Selsky Jeff Nelson (alternate)	Sacramento County
Citrus Heights Water District	Caryl Sheehan, David Wheaton (alternate)	Citrus Heights City Council
City of Folsom	Marcus Yasutake Vice Chair Kerri Howell (alternate)	Folsom City Council
City of Sacramento	Jeff Harris Brett Ewart (alternate) Chair Larry Carr (alternate)	Sacramento City Council
County of Sacramento	Sue Frost Darrell Eck (alterante) Linda Dorn (alternate)	Sacramento County
Del Paso Manor Water District	Robert Matteoli Vacant (alternate)	Sacramento City Council
Fair Oaks Water District	Randy Marx Michael McRae (alternate)	Sacramento County
Golden State Water Company	Paul Schubert Lawrence Dees (alternate)	Sacramento City Council
Natomas Central MWC	Matt Lauppe Brett Gray (alternate)	Sacramento City Council
Orange Vale Water Company	John Wingerter Craig Davis (alternate)	Sacramento County
Rio Linda/Elverta CWD	Mary Harris Robert Reisig (alternate)	Sacramento County
Sacramento Suburban Water District	Bob Wichert Kevin Thomas (alternate) Dave Jones (alternate) Craig Locke (alternate) Kathleen McPherson (alternate)	Sacramento City Council
San Juan Water District	Ted Costa Pam Tobin (alternate) Marty Hanneman (alternate)	Sacramento County
Agriculture	Mike DeWit	Sacramento County
Self-Supplied Industry	Larry Johnson	Sacramento City Council

AGENDA ITEM 3: CONSENT CALENDAR

3A. Minutes of April 8, 2021 meeting

3B. Fiscal Year 2020 - 2021 Budget Carryover Request

Action: Approve All Consent Items

Attachments:

April 8, 2021 Meeting Minutes

Fiscal Year 2020 - 2021 Budget Carryover Request

AGENDA ITEM 3a: MINUTES

Minutes of the April 8, 2021 Board of Directors meeting



1. CALL TO ORDER

Chair Ewart called the meeting of the Board of Directors to order at 9:00 a.m. as a teleconference meeting. Individuals in attendance are listed below:

Board Members

Audie Foster, California American Water
Mark Emmerson, Carmichael Water District
Caryl Sheehan, Citrus Heights Water District
Marcus Yasutake, City of Folsom
Brett Ewart, City of Sacramento
Linda Dorn, County of Sacramento
Robert Matteoli, Del Paso Manor Water District
Randy Marx, Fair Oaks Water District
Paul Schubert, Golden State Water Company
Brett Gray, Natomas Central Mutual Water Company
John Wingerter, Orange Vale Water Company
Mary Harris, Rio Linda/Elverta Community Water District
Bob Wichert, Sacramento Suburban Water District
Ted Costa, San Juan Water District
Mike DeWitt, Agriculture
Larry Johnson, Self-Supplied

Staff Members

Jim Peifer, Rob Swartz, Ryan Ojakian, Michelle Banonis, Josette Reina-Luken, Cecilia Partridge and Chris Sanders, legal counsel

Others in Attendance

Robert Reisig, Kevin Thomas, Craig Locke, Dan York, Paul Selsky, Brian Hensley, Pam Tobin, David Wheaton, Dave Jones, Kathleen McPherson, William Roberts, Tim Shaw, Hilary Straus, Alan Vail, John Woodling, Paul Helliker, Cathy Lee, Vanessa Nishikawa, and Rob Roscoe.

2. PUBLIC COMMENT

None.

3. CONSENT CALENDAR

Minutes of the February 11, 2021 SGA Board meeting.

Motion/Second Carried (M/S/C) Ms. Harris moved, with a second by Mr. Schubert to approve the February 11, 2021 SGA Board meeting minutes. Audie Foster, California American Water, Mark Emmerson, Carmichael Water District, Caryl Sheehan, Citrus Heights Water District, Marcus Yasutake, City of Folsom, Brett Ewart, City of Sacramento, Linda Dorn, County of Sacramento, Robert Matteoli, Del Paso Manor Water District, Randy Marx, Fair Oaks Water District, Paul Schubert, Golden State Water Company, Brett Gray, Natomas Central Mutual Water Company, John Wingerter, Orange Vale Water Company, Mary Harris, Rio Linda/Elverta Community Water District, Robert Wichert, Sacramento Suburban Water District, Ted Costa, San Juan Water District, Mike DeWitt, Agriculture and Larry Johnson, Self-Supplied voted yes. The motion carried by a majority vote of all directors present.

4. SGA FISCAL YEAR 2021 – 2022 BUDGET

Ms. Reina-Luken, Financial and Administrative Services Manager, gave an overview of the 2021-2022 FYE budget summary, major assumptions, proposed operating budget projections and administrative budget fee structure. She gave a power point presentation explaining how the base fee and groundwater fees are determined, what the additional staffing needs are, the CalPERS and PERS unfunded liability, OPEB, the SGMA/GSP program budget, SGA designations and the SGA budget outlook. The FY22 fee increase is 15% as projected in the FY21 budget. Each agency's fee is different based on their groundwater pumping. At the board's direction, a project manager position was added to staff at a salary budgeted at the top level of the Associate Project Manager. Currently, employees pay the entire employee share of SGA PERS. The employer PERS cost will increase with additional staffing. Staff recommends keeping the current level of PERS funding until the FY22 evaluation report. SGA shares OPEB costs with RWA and those costs are declining with additional annual payments being made. SGA designations include a set aside for SGA's share of FY27 GSP 5-year update. There will also be a designation for a possible office expansion and relocation in FY22.

It was suggested that a committee be formed to review the minimum base fee. There was discussion on additional staffing, the scope of work for the anticipated position, and the need for additional office space in the short term and long term. Mr. Swartz said that additional staff would work on implementation of SGMA, work on water quality, water elevations, and annual reporting. The position would be funded by SGA.

M/S/C Mr. Schubert moved, with a second by Mr. Emmerson to adopt Resolution No. 2021-01 to fund the administrative and program budgets for FY 2021 – 2022 and provide for the collection of said funds. Audie Foster, California American Water, Mark Emmerson, Carmichael Water District, Caryl Sheehan, Citrus Heights Water

District, Marcus Yasutake, City of Folsom, Brett Ewart, City of Sacramento, Linda Dorn, County of Sacramento, Robert Matteoli, Del Paso Manor Water District, Randy Marx, Fair Oaks Water District, Paul Schubert, Golden State Water Company, Brett Gray, Natomas Central Mutual Water Company, John Wingerter, Orange Vale Water Company, Mary Harris, Rio Linda/Elverta Community Water District, Robert Wichert, Sacramento Suburban Water District, Ted Costa, San Juan Water District, Mike DeWitt, Agriculture and Larry Johnson, Self-Supplied voted yes. The motion carried by a majority vote of all directors present.

5. SACRAMENTO CENTRAL GROUNDWATER AUTHORITY UPDATE

Mr. Peifer said that this is a standing agenda item. Staff is moving through the process with the Department of Water Resources who have approved facilitation services for the Water Forum. Gina Bartlett, Consensus Builders Institute, is acting as the facilitator. A meeting will be scheduled with Ms. Bartlett to prepare for the next Board meeting to discuss this item and other work that needs to be done.

6. SUSTAINABLE GROUNDWATER MANAGEMENT ACT (SGMA) AND GROUNDWATER MANAGEMENT PROGRAM UPDATE

Mr. Swartz reported on activities to develop the GSP. He gave an updated status report on SGMA. There is a recording available of a detailed model and water budget meeting that was held. Staff intends to continue to interact with the public to discuss and coordinate evaluation of projects and management actions. Staff continues to develop a GSA Implementation Agreement with the other four Groundwater Sustainability Agencies in the North American Subbasin. Under SGMA, groundwater budgets need to be prepared under four different conditions including recent historical conditions, a current conditions budget, a projected groundwater budget and a projected with climate change simulations.

Mr. Swartz provided information on expanding conjunctive use where more groundwater is used during dry periods and surface water is used during wet periods. He gave an update on groundwater pumping, the balance between the inflows and outflows to determine the change in storage and surface water usage in municipal areas. We are in a positive state of storage in the basin with the next analysis to be done is a to project conditions using 50 years of hydrology as a simulation going forward. We will be in a constant state of updating both our modeling and our groundwater sustainability plan every five years. As some of the projects come to more certainty and we learn more, we can run simulations and understand what those impacts would be. Many agencies worked with RWA on a recently completed American River Basin Study and one of the highlights of that was to develop a better estimate of climate change projections at a regional scale with the American River watershed.

In terms of modeling, the conclusions that can be reached now are the basin is in good health today and we can absorb a certain amount of future projected growth. The climate change modeling suggests that there is a possibility that we could have a future shortage. We will want to look at projects and management actions to expand conjunctive use in the urban areas. Staff expects to continue to do some evaluations along those lines. Under SGMA, there remains work to be done with sustainable management criteria with proposed management objectives and minimum thresholds.

Staff continues to work on projects and management actions as we work to complete the GSP public review draft. Staff is also coordinating closely with the South American Subbasin to ensure consistency between the respective GSPs.

7. LEGISLATIVE UPDATE

Ryan Ojakian, Legislative and Regulatory Affairs Manager, gave a summary on the legislative cycle from bill introduction to early April. There have not been many bills introduced specifically related to groundwater. The state budget is in a surplus, while the long-term budget remains in a slight deficit. The Senate has proposed \$3.4 billion of the surplus to address drought related issues with \$300 million for implementation of SGMA. Any funds that become available will go towards implementation. Staff continues to advocate for dedicated funding for implementation of conjunctive use. A bill that needs to be monitored is AB 252 that focuses on critically overdraft basins and relates to the ability to provide grant funding for land use, repurposing and multi benefit projects. AB 754 is a work in progress that would delay the due date for GSP for high and medium priority basins by a year. AB 588 on MCL compliancy would create a period of time after an MCL is established for compliance. AB 1434 would lower the indoor water use efficiency standards as part of the larger water objectives.

8. EXECUTIVE DIRECTOR'S REPORT

Mr. Peifer's Executive Director's Report was included in the SGA Board meeting electronic packet.

9. DIRECTORS' COMMENTS

Ms. Dorn, County of Sacramento, reported that the county has a SGMA update workshop with the Board of Supervisors on April 20th. The workshop will include all four subbasins in the county.

Mr. Ewart reported that the City of Sacramento in partnership with Sacramento Suburban Water District is preparing to participate in a groundwater substitution transfer. He will keep the SGA Board updated as things progress.

ADJOURNMENT

With no further business to come before the Board, Chair Ewart adjourned the meeting at 10:53 a.m.

By:

Chairperson

Attest:

Josette Reina-Luken, Board Secretary/Treasurer

AGENDA ITEM 3B: FISCAL YEAR 2020 - 2021 BUDGET CARRYOVER REQUEST

BACKGROUND:

At the April 8, 2021 SGA Board meeting, the Board approved the SGA Fiscal Year 2021 – 2022 (FY22) Budget which indicated a projected use of program funds in Fiscal Year 2020 -2021 (FY21) in the total amount of \$35,000 under the following categories: \$15,000 for Groundwater Modeling, \$10,000 for Update GSP, and \$10,000 Annual Basin Management Report. Progress continues on the development of a draft Groundwater Sustainability Plan (GSP) for compliance with SGMA. However, some of these projected program expenses will not occur until after the end of the fiscal year. This item is to request approval for \$25,000 of the \$35,000 allocated to be rolled over from FY21 to FY22 budget to support ongoing Groundwater Modeling and Update GSP expenses.

AGENDA ITEM 4: SACRAMENTO CENTRAL GROUNDWATER AUTHORITY UPDATE

BACKGROUND:

Gina Bartlett from Consensus Builders Institute will serve as the facilitator for the matter of potentially consolidating the SGA and SCGA. Ms. Bartlett has conducted stakeholder assessments and will be presenting her findings and recommendations at a joint meeting of the RWA, SCGA and SGA board on June 7th.

A request has been made by some SGA Board members to have the opportunity to discuss the matter just with SGA Board members. This item allows for that opportunity.

Discussion: Jim Peifer, Executive Director

AGENDA ITEM 5: SUSTAINABLE GROUNDWATER MANAGEMENT ACT (SGMA) AND GROUNDWATER MANAGEMENT PROGRAM UPDATE

BACKGROUND:

Progress continues on the development of a draft Groundwater Sustainability Plan (GSP) for compliance with SGMA. As previously reported to the Board, a series of three North American Subbasin (NASb)-wide public engagement webinars are being held to educate, and receive input from, other users of groundwater in the basin (e.g., domestic well owners, agricultural well owners). The third meeting was held on May 10th that focused on projects and management actions to be included in the GSP. Staff has also held additional coordination meetings with the South American Subbasin to share information on our respective GSPs.

Staff had anticipated completing a draft GSP and releasing it for public comment in June 2021. We have experienced some delays and now anticipate a draft GSP in August 2021. This will still allow us to meet the state-mandated submission deadline of January 31, 2022. Staff will provide an update on activities related to SGMA, including water budget estimates, projects and management actions, and defining undesirable results.

Staff is continuing to collect monthly water elevations. An update on groundwater elevations in select monitoring wells will be provided to the Board.

Discussion: Rob Swartz, Manager of Technical Services

AGENDA ITEM 6: LEGISLATIVE UPDATE

BACKGROUND:

Bills that are “live” in the Legislature have moved through their first house, senate bills through the Senate and assembly bills through the Assembly. There are three groundwater related bills that staff continue to monitor. Those bills are:

AB 252 (Robert Rivas D- Hollister) Creates a multi-benefit land repurposing program in critically overdraft SGMA basins.

AB 350 (Villapudua D- Stockton) Creates, upon appropriation, a three-year grant program administered by CDFA to fund technical assistance to support landowners in critically overdrafted basin to reach water use reduction goals established pursuant to SGMA.

AB 754 (Mathis R- Visalia) -Gives DWR the ability to approve a 180-day extension on GSP submission.

Additionally, state budget negotiations continue. The Senate and Assembly have advanced \$3.7 billion for drought response and an additional \$3.7 billion for climate resilience. The full budget is required to be passed by June 15th, but budget actions, known as budget trailer bills, can be acted on until the Legislative session ends on September 10th. The expectation is that the details of water related funding will happen through budget trailer bills.

Discussion: Ryan Ojakian, Legislative and Regulatory Affairs Manager

AGENDA ITEM 7: EXECUTIVE DIRECTOR'S REPORT

JUNE 10, 2021

TO: SGA BOARD OF DIRECTORS

FROM: JIM PEIFER

RE: EXECUTIVE DIRECTOR'S REPORT

- a. Water Transfers** – Staff is supporting the City of Sacramento, Sacramento Suburban Water District, and Carmichael Water District in a proposed 2021 Groundwater Substitution Transfer. The entire transfer will occur within the Sacramento Groundwater Authority (SGA) area. SGA has provided a letter of concurrence for the proposed transfer as all participants are in compliance with the SGA Water Accounting Framework.

- b. Sacramento Regional Water Bank** – Water Bank, Phase 2 planning is getting underway. Program agreements are being executed by participating agencies. Phase 2 technical work will include: computer simulations of proposed operations to account for storage and recovery and ensure that operations are consistent with Sustainable Groundwater Management Act (SGMA) requirements; completion of environmental documentation; establishing governance; and continued outreach activities. Work is estimated to be completed in 2022.

Staff has been coordinating with Reclamation Planning staff to obtain federal funding assistance. Next steps include Reclamation obtaining the services of an engineering consultant to conduct a portion of the work and an agreement with RWA. Reclamation will likely develop a feasibility study for the Groundwater Bank as part of the process, which may be helpful in obtaining additional federal assistance.

- c. Upcoming Dry Year Coordination Meeting** – [RWA is hosting a Drought Briefing on Friday, June 11 at 1 p.m.](#) on projected drought impacts on the region's water supplies and environment, and the actions underway by local water providers. The briefing is for SGA and RWA Board Members, water managers and local elected leaders on projected drought impacts on the region's water supplies and environment, and the drought-related actions underway by local water providers. See attached flyer for more information.

- d. Water Forum Negotiations** – The Water Forum will be analyzing water supply conditions in the future. More information on the analysis can be found in the attached Water Forum 2.0 - Initial Investigation Study Plan

Attachments

- 1. Drought Briefing Flyer**
- 2. Water Forum 2.0 - Initial Investigation Study Plan**

PLEASE ATTEND

Briefing on Drought Impacts to Water Supplies and the Environment

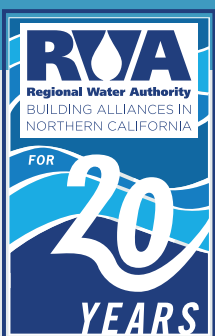
Friday, June 11, 1:00 - 2:30 p.m.

The Regional Water Authority is hosting a special briefing for RWA Board Members, water managers and local elected leaders on projected drought impacts on the region's water supplies and environment, and the drought-related actions underway by local water providers.

Key facts:

- This year's near-average snowpack evaporated or soaked into the soil rather than flowing into Folsom Reservoir.
- Folsom Reservoir storage levels are lower than historic drought conditions in 2014 and 2015.
- Conditions are projected to have severe impacts on the environment of the Lower American River, including the potential to lose a generation of steelhead trout.
- Water supplies are currently in good shape thanks to groundwater banking; however, continued dry conditions into 2022 would be concerning.

Join us to learn more about conditions, local actions and what you can do to help.



ACCESS INFORMATION:

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<https://global.gotomeeting.com/join/947864477>

You can also dial in using your phone.

United States: [+1 \(571\) 317-3122](tel:+15713173122)

Access Code: 947-864-477

Water Forum 2.0 – Initial Investigation Study Plan

Background

The Water Forum Successor Effort, also known as Water Forum 2.0, will help set policy for American River water interests for the foreseeable future. While this process will likely involve a wide range of studies, of particular interest at the onset of the process is an understanding of what could happen to water supply reliability and the American River fisheries under climate change and demand growth without any changes to the current agreement. Water Forum 2.0 participants have asked questions such as the following:

- How will climate change and growth affect the reliability of the region's water supply and the health of the lower American River?
- To what extent is the region currently prepared to provide reliable water supply in a way that preserves the fisheries, wildlife, recreation, and aesthetic values of the lower American River?
- What portfolio of actions will need to be taken to protect regional water supply reliability and health of the lower American River?

Each of these questions gets to a root question of, how will future conditions in the American River watershed compare to current conditions? Future conditions include both climate change and water diversions to support M&I demand growth within the watershed. Regulatory conditions in the American River and in the rest of the Sacramento-San Joaquin River Delta tributaries are assumed to remain constant, and water supply demand to other parts of the Federal Central Valley Project (CVP) and California State Water Project (SWP) are assumed to be limited by current contracts.

Study Introduction

This initial study will be conducted using previously developed and readily available modeling tools. CalSim II, jointly developed by the California Department of Water Resources (DWR) and the U.S. Bureau of Reclamation (Reclamation) will be used to simulate surface water resources for the CVP/SWP system, Reclamation's HEC-5Q water temperature model of Folsom Reservoir and the lower American River will be used to simulate water temperatures in the American River, and the Sacramento Groundwater Authority (SGA) tools will be used to evaluate effects of American River operations on local groundwater conditions.

The intent of this analysis is not to provide definitive answers about conditions, but to provide contextual information about the relative condition of American River water supplies and fisheries, compared to current conditions, and to provide insight about the relative effect of climate change and demand growth on future conditions. Understanding the relative effect of each of these factors could help inform and provide context for future conversations amongst Water Forum 2.0 participants. This study should be considered a starting point to direct future analyses.

Analytical Approach

Historical data is non-static; each year is affected by different regulatory conditions, individual hydrological and climatological conditions, water supply usage variability, and new infrastructure. Rather than directly using historical data to understand how conditions could change in the future, variability in conditions can be limited through use of models. A particular element, such as changes in demands, can be isolated by comparing two model runs: one containing modifications representing a changed demand, and one that uses current demands. Differences in certain factors, such as deliveries or reservoir storage levels, are analyzed to determine the impacts of the element of interest. Model assumptions are generally believed to be more reliable in a comparative mode than in an absolute mode, all assumptions are the same for baseline and alternative model runs, except assumptions specific to the action under question, and the focus of the analysis can be on the differences in the results. Using this approach, model results are best interpreted using various statistical measures such as long-term or year-type averages.

Three model systems can be applied to the study: CalSim II, a hydrological operations model; HEC-5Q a water temperature model; and the Sacramento Integrated Water Flow Model, a groundwater model of the Sacramento region. Each of these models is described below.

CalSim II

CalSim II was jointly developed by Reclamation and DWR for performing planning studies related to CVP and SWP operations. The primary purpose of CalSim II is to evaluate the water supply reliability of the CVP and SWP at current and future levels of development (e.g., 2020, 2040), with and without various assumed future facilities, and with different modes of facility operations. Geographically, the model covers the drainage basin of the Delta, CVP and SWP deliveries to the Tulare basin, and SWP deliveries to the San Francisco Bay Area (Bay Area), Central Coast, and Southern California. CalSim II typically simulates system operations for an 82-year period using a monthly time step. The model assumes that facilities, land use, water supply contracts, and regulatory requirements are constant over this period, representing a fixed level of development. The historical flow record of October 1921 to September 2003, adjusted for the influence of land use changes, upstream flow regulations, and potentially climate change, is used to represent the possible range of water supply conditions

Assumptions

The Water Forum 2.0 study will be conducted using DWR's 2019 Delivery Capability Report (2019 DCR) model runs representing current (2020) hydrology, and a future (2040) climate representative of potential climate change. Water supply demands will be assessed using both current demands and projected 2040-level demands, as described by publicly available information. Current purveyor-specific agreement dry-year actions and the lower American

River modified flow management study, as described by the American River water agencies in their California Water Fix testimony¹, will be included.

Climate Scenarios

The 2020 scenario includes current climate conditions, and current Bay-Delta sea levels.

The 2040 scenarios include a future climate condition, as included in the 2019 DCR. The 2019 DCR Future Conditions scenario uses the same climate change hydrology inputs of the Incidental Take Permit (ITP)² climate change studies. ITP climate change scenario was developed centered around 2035 (2020-2049). This is best available climate change input hydrology to be used for DCR planning horizon (2040). DWR explains how the climate change projections conditions were developed:

“The climate projections were derived from the ensemble of 20 Coupled Model Intercomparison Project 5 (CMIP5) global climate projections selected by the California Department of Water Resources (DWR) Climate Change Technical Advisory Group (CCTAG) as the most appropriate projections for California water resources evaluation and planning (DWR CCTAG, 2015). The 20 climate projections, selected by CCTAG, were generated from 10 global climate models run with two emission scenarios, one optimistic (Representative Concentration Pathway [RCP] 4.5) and one pessimistic (RCP 8.5), identified by the Intergovernmental Panel on Climate Change (IPCC) for the Fifth Assessment Report (AR5) (2014).”

The 2019 DCR evaluated two sea-level rise (SLR) projections before establishing the final Future Conditions SLR. The final Future Conditions SLR selected the 1.5 ft SLR projection because of the 20-year “project lifespan” of DCR Future Conditions scenarios and after feedback from management and some State Water Project Contractors.

In 2017, the California Water Commission (CWC) developed a pair of 2070 climate change runoff projections for use in the Water Supply Investment Program (WSIP) grant application process. One set of climate change conditions, the 2070 Drier/Extreme-Warming (DEW) conditions represented, “Year 2070 future condition with projected climate and sea level conditions for a thirty-year period centered at 2070 (climate period 2056-2085) based on GCM HadGEM2-ES and emission scenario RCP 8.5.” The other, the “2070 Wetter/Moderate-Warming” (WMW) conditions represented “Year 2070 future condition with projected climate and sea level conditions for a thirty-year period centered at 2070 (climate period 2056-2085) based on GCM CNRM-CM5 and emission scenario RCP 4.5.” A pair of “far-future” scenarios using the 2070 climate change conditions and future demands can provide context for the range of potential effects of climate change in the future

¹ American River water agency testimony for the California Water Fix can be found at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/arwa.html

² Incidental Take Permit (ITP) for Long-Term Operation of the State Water Project <https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/State-Water-Project/Files/ITP-for-Long-Term-SWP-Operations.pdf>

American River Demands

The Water Forum will update the 2019 DCR American River demands to reflect both 2020 and 2040-level demands, as described by American River water purveyor's 2015 Urban Water Management Plans (UWMP). This data was assembled and used for Reclamation's American River Basin Study (ARBS); rather than generating all new demand data, demands from the ARBS will be used for this initial study. If the 2020 UWMPs become available within a reasonable timeframe, the forecasted demands will be compared to the 2015 UWMP demands. If differences between forecasted demands are substantial and meaningful, the ARBS demands could be revised with updated UWMP information. Table 1 provides a summary of the assumed demands for American River purveyors.

Table 1. Water Supply Diversion Demands for American River Purveyors [Waiting for data from the ARBS]

Description	CalSim II node	2019 DCR Demand	Water Forum Alternatives		
			2020 Demands	2040 Demands	2070 Demands
UPSTREAM OF FOLSOM RESERVOIR					
Placer County Water Agency (American River Pump Station)	D300	65,000			
FOLSOM RESERVOIR					
Sacramento Suburban Water District (PCWA Contract)	D8A	0			
City of Folsom	D8B	34,000			
Water Rights (includes P.L. 101-514)		27,000			
CVP Water-Service Contract		7,000			
Folsom State Prison	D8C	5,000			
San Juan Water District		82,200			
PCWA Contract	D8D	25,000			
Water Rights (includes P.L. 101-514)	D8E	33,000			
CVP Water Service Contract	D8E	24,200			
El Dorado County Water Agency (CVP Water-Service Contract)	D8I	15,000			
El Dorado Irrigation District	D8F	24,550			
Water Rights		17,000			
CVP Water-Service Contract		7,550			
City of Roseville	D8G	62,000			
PCWA Contract		30,000			
CVP Water-Service Contract		32,000			
Placer County Water Agency (CVP Water-Service Contract)	D8H	35,000			
FOLSOM SOUTH CANAL					
Southern California Water Co./Arden Cordova WC	D9AA	5,000			
California Parks and Recreation	D9AB	5,000			
SMUD	D9B	45,000			

Description	CalSim II node	2019 DCR Demand	Water Forum Alternatives		
			2020 Demands	2040 Demands	2070 Demands
Water Rights		15,000			
CVP Water-Service Contract		30,000			
FROM BELOW NIMBUS DAM TO H STREET					
Sacramento Suburban Water District	D302B	0			
Carmichael Water District	D302C	12,000			
City of Sacramento	D302A	230,000			
SACRAMENTO RIVER BELOW THE AMERICAN RIVER CONFLUENCE					
City of Sacramento	D167A	81,800			
Sacramento County Water Agency		77,600			
Sac River Diversion CVP Water-Service Contract (Fazio)	D167B	10,000			
Freeport CVP (From SMUD, and Fazio Balance)	D168C	35,000			
Other Water Supplies	D168C	15,000			
Appropriative Water Rights	D168C	17,800 ²			
EBMUD (CVP Water Service Contract)	D168B	133,000			

Modified Flow Management Standard

The Modified Flow Management Standard (MFMS) included five key elements that will be represented in the CalSim II modeling. Those elements are as follows:

- Hydrologic Index – Either Sacramento River Index or American River Index
- Minimum Release Requirements (MRR) from Nimbus Dam
- Redd Dewatering Protective Adjustments (RDPA) limiting changes in MRR to protect fall run Chinook salmon or steelhead redds
- March Pulse Flow to promote emigration
- End-of-December storage objective

The MFMS also included an end-of-May storage objective, but this element will not be included in Water Forum 2.0 modeling since it has not been a part of recent discussions with Reclamation, nor was it included in NMFS recent biological opinion.

Water Temperature Modeling

While several models have been developed to simulate implementation of the Automated Temperature Selection Protocols (ATSP), not all models are currently available for use in evaluating water temperatures resulting from American River operations for the Water Forum 2.0 process.

Temperatures within the American River from Folsom Reservoir to the confluence with the Sacramento River can be modeled using the USACE HEC-5Q model developed for the USBR Coordinated Long-Term Operation of the Central Valley Project and State Water Project Final Environmental Impact Statement. The USBR American HEC-5Q model estimates daily average temperatures based on assumed daily reservoir operations and 6-hour meteorology from the California Irrigation Management Information System (CIMIS) at Gerber and Nicolaus.

The temperature model was developed using integrated HEC-5 and HEC-5Q models. The HEC-5 component simulates daily reservoir and river flow, and the HEC-5Q component simulates mean daily reservoir and river temperatures based on the daily flow inputs and meteorological parameters specified on a 6-hour time step. The model includes logic for simulating the Folsom Water Supply and Intake Temperature Control Device (Folsom TCD), shutter positions of the intake towers, and power bypass options based on release temperature targets. The model has been adopted by USBR for similar impacts analyses and provides a consistent platform for comparison.

Model calibration and validation used daily American River flows, historic daily Folsom Lake storage, and 6-hour CIMIS data at Gerber and Nicolaus. The model validation compared observed and computed temperature profiles in Folsom Reservoir and daily average temperatures at downstream locations for the period from 2001 to 2010. The validation results indicate good agreement between simulated and observed temperatures.

A module included with the HEC-5Q model converts CalSim II monthly flows for use in the HEC-5Q model by downscaling them using historical patterns. The Folsom Reservoir daily inflows and water supply diversions were patterned after historical flows scaled to match monthly CalSim inflow and diversion volumes. Folsom Reservoir daily outflows and storages were derived by applying temporal downscaling methods to convert monthly CalSim II flows to daily flows. The American River HEC-5Q model represents the flows and temperatures between Folsom Reservoir and the American River's confluence with the Sacramento River.

Reclamation's HEC-5Q model includes implementation of six climate conditions for use in driving the meteorological conditions:

- Q0 – Current Climate
- Q1 – Drier, Less warming scenario
- Q2 – Drier, more warming scenario
- Q3 – Wetter, more warming scenario
- Q4 – Wetter, less warming scenario
- Q5 – Central tendency scenario

The Q5 climate scenario is the one that most closely matches the CalSim II hydrology proposed for representing the 2040 climate conditions, but several scenarios could be run, if needed, to provide contextual information about the effects of climate change. It is not known if 2070 climate change temperature models are available; using the available conditions will provide, at a minimum, an evaluation of the effect of changes in storage and lower American River flows on water temperatures even if it does not include meteorological changes..

Groundwater Modeling

The CoSANA model is a new application using DWR's Integrated Water Flow Model (IWFM) platform. Local Groundwater Sustainability Agencies (GSAs) within the Water Forum area of interest worked closely together to develop a seamless model application that extends from Bear River on the north to the Mokelumne River on the south and from the Feather and Sacramento rivers on the west to the Sierra Nevada Foothills on the east. The CoSANA model calibration covers the hydrological period from 1990 through 2018. The GSAs in the North American, South American, and Cosumnes subbasins are using the model for developing historical, projected, and projected with climate change comprehensive water budget analysis as required under the Sustainable Groundwater Management Act.

The IWFM is a computer program used for water resources management and planning within a basin. It calculates groundwater flows, soil moisture movement in the topsoil, stream flows, land surface flows and flow exchange between the groundwater, streams and land surface as generated by rainfall, agricultural irrigation, and municipal and industrial water use. IWFM also calculates agricultural water demands based on crop types, crop acreages, soil types, irrigation methods and rainfall rates, as well as the municipal and industrial water demands based on population and per-capita water use rates.

CoSANA's grid includes over 24,000 elements, and 22,000 nodes to represent the North American, South American, Cosumnes, and Eastern San Joaquin subbasins. It includes layers to represent regional geological formation of Alluvium, Laguna formation, Mehrten formation, the Valley Springs formation, and the lone formation. CIMIS data at stations throughout the area are used for reference evapotranspiration data. Monthly crop factors and irrigation efficiency were adjusted to match known surface water deliveries.

The current application was developed using water demands from the 2015 UWMPs for 2020 and 2040, and was used for the American River Basin Study, in alignment with CalSim, using both 2020 and 2075 central tendency climate conditions. For this study, results from ARBS-related scenarios will be evaluated and compared against CalSim II scenarios. If sufficiently large differences in surface water usage exist between the two models, additional CoSANA scenarios could be run.

Analysis

Six model scenarios will be simulated:

- 2020 Hydrology, 2020 Demands
- 2020 Hydrology, 2040 Demands
- 2040 Hydrology, 2020 Demands
- 2040 Hydrology, 2040 Demands
- 2070 DEW Hydrology, 2070 Demands
- 2070 WMW Hydrology, 2070 Demands

Comparisons between these scenarios will help characterize the effects of climate change and demand changes on hydrological and aquatic resource areas. The 2070 scenarios represents more speculative conditions, but will provide insight into a range of potential conditions in the far future.

Hydrological Effects

The following model output will be compared between the 2020 and 2040 scenarios to assess potential effects.

- Folsom Reservoir end-of-month storage;
- CVP M&I Allocations;
- Frequency of Hodge restrictions on lower American River flows;
- Annual surface water deliveries to individual purveyors; and
- Annual groundwater diversions.

All results will be presented by long-term and water year-type average.

Fishery Effects

Analysis of the effects of climate and demand changes on fisheries will be conducted at a reasonably high level, using data and, to the extent possible, using approaches previously developed and applied in other lower American River evaluations. In particular, comparisons will include the following:

- Changes in the availability of flow-related habitat for fall run Chinook salmon and steelhead spawning during various life stages.
- Changes in water temperatures at critical locations and during critical times of the year for various life stages for fall-run and steelhead.

While water temperatures could be available at sub-monthly timesteps, flows will be evaluated using monthly data rather than applying some of the monthly-to-daily disaggregation processes previously used, recognizing that this would preclude any dewatering analysis due to uncertainty around previously-used disaggregation processes.

AGENDA ITEM 8: DIRECTORS' COMMENTS