

EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY

Joint Exercise of Powers

Board of Directors Meeting

AGENDA

Wednesday, March 14, 2018
9:30 a.m. – 12:00 p.m.

San Joaquin County – Robert J. Cabral Agricultural Center
2101 E. Earhart Avenue – Assembly Room #1, Stockton, California

I. Call to Order/Pledge of Allegiance & Safety Announcement/Roll Call

II. SCHEDULED ITEMS

A. Discussion/Action Items:

1. Approval of Minutes of February 14, 2018 (See Attached)
2. Discussion and Possible Action to Authorize Submittal of a Groundwater Sustainability Plan Initial Notification Form to the Department of Water Resources (See Attached)
3. Discussion and Possible Action to Apply for Department of Water Resources Technical Support Services (See Attached)
4. Discussion and Possible Action to Adopt a New Logo for the Eastern San Joaquin Groundwater Authority
5. Presentation by Woodard & Curran on GSP Development Process
 - i. Project Roadmap and Schedule
 - ii. Stakeholder Engagement and Outreach Approach
 - iii. Planning Advisory Committee Formation

B. Informational Items (see attached):

1. February 20, 2018, sacbee.com, “Facing Specter of Drought, California Farmers Are Told to Expect Little Water”
2. February 28, 2018, lodinews.com, “County Groundwater Project Rejected; Follow-up Meeting Scheduled for Today
3. February 28, 2018, newsdeeply.com, “How Much Snow Nest Winter? It May Not Remain a Mystery Much Longer”

III. Public Comment

IV. Directors’ Comments

(Continued on Next Page)

EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY
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AGENDA
(Continued)

- V. **Future Agenda Items**
- VI. **Workshop/Shirtsleeve Session:** No Items for Discussion
- VII. **Adjournment**

Next Regular Meeting
April 11, 2018 at 9:30 a.m.

San Joaquin County - Robert J. Cabral Agricultural Center
2101 E. Earhart Ave., Assembly Rm. #1, Stockton, California

Action may be taken on any item

Agendas and Minutes may also be found at <http://www.ESJGroundwater.org>

Note: If you need disability-related modification or accommodation in order to participate in this meeting, please contact San Joaquin County Public Works Water Resources Staff at (209) 468-3089 at least 48 hours prior to the start of the meeting.

EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY
Board Meeting Minutes
February 14, 2018

I. Call to Order/Pledge of Allegiance & Safety Announcement

The Eastern San Joaquin Groundwater Authority (GWA) Board meeting was convened by Chair Chuck Winn at 9:35 a.m., on February 14, 2018, at the Robert J. Cabral Agricultural Center, 2101 E. Earhart Ave. Stockton, CA. Following the Pledge of Allegiance, a representative of the San Joaquin County Office of Emergency Services provided the required safety information.

In attendance were Chair Chuck Winn, Vice-Chair Mel Panizza, Directors John Freeman, George Biagi, Jr., Grant Thompson, Stephen Salvatore, Alan Nakanishi, Rich Silverman, Russ Thomas, David Fletcher, Mike Henry, Tom Flinn, Eric Thorburn, Dale Kuil, Alternate Directors Mel Lytle and Doug Heberle, and Secretary Kris Balaji. Opening remarks were provided by Chair Winn recognizing the accomplishments of this group on meeting several momentous milestones of the Sustainable Groundwater Management Act (SGMA). He also thanked the Department of Water Resources (DWR) for their assistance in doing so.

II. SCHEDULED ITEMS

A. Discussion/Action Items:

1. Approval of Minutes of November 8, 2017

Motion: Vice-Chair Panizza moved, and Director Silverman seconded, approval of the November 8, 2017 minutes. The motion passed unanimously.

2. Notice of 2017/2018 Statement of Economic Interests Form 700 Annual Filing

Mr. Nakagawa stated that the required Form 700 Conflict of Interest Forms are due April 2, 2018 and reminded Board members of the Conflict of Interest Code adopted by the GWA. Completed forms should be sent to San Joaquin County Department of Public Works at 1810 E. Hazelton Ave., Stockton, CA 95205.

3. Discussion and Possible Action to Approve the Proposed Local Cost Share Allocation for the Groundwater Sustainability Plan *Requires 2/3 Vote by Directors Present*

Mr. Nakagawa provided an update on Groundwater Sustainability Plan (GSP) development. GEI Consultants, Inc. developed a GSP Work Plan, Budget and Schedule totaling \$2,176,420 and submitted the grant application on behalf of the GWA to DWR on November 10, 2017. The application included a Disadvantaged Community (DAC) Waiver that, if awarded, reduces the local cost share. The total maximum grant award of \$1,500,000 was applied for, assuming the DAC waiver would be granted. He identified several community supporters of the DAC waiver component of the application. The application received a perfect score of 19 out of 19 from DWR. DWR has recommended award amounts for GSP grant applicants, which is open to public comment currently. DWR recommended the full grant award amount to the GWA and also approved the DAC waiver.

Mr. Nakagawa reviewed the local cost share allocation methodology to fund the GSP, which is based on the \$1,500,000 grant award. The resulting assumed local cost share amount is \$676,420 and is distributed as follows: 1) \$39,789 from the Eastside GSA; 2) \$11,664 from each of the 16 GWA member agencies within San Joaquin County; and 3) \$450,000 from Zone 2. The cost share amounts would be paid across two fiscal years. He stated that each member was asked at the last meeting to seek concurrence with their Boards/Councils regarding this proposal, so that the GWA Board today may approve the cost share allocation amounts. Mr. Nakagawa stated that a funding agreement with DWR is forthcoming following the recent award announcement. Therefore, the proposed action (Agenda Item II.A.4) is to have authorization to enter into the funding agreement with DWR, once drafted.

There was discussion regarding potential risk of beginning the work before the funding agreement was finalized. At the Chair's approval, Agenda Items II.A.5. and II.A.6. were discussed in conjunction with this agenda item to clarify the process and address any potential risk. Mr. Nakagawa stated that a budget adjustment is being recommended based on updated cost projections and the anticipated grant award.

The proposed adjusted budget includes \$35,000 in a contribution from Zone 2 to fund GWA operating expenses. In addition, Zone 2 will also contribute \$450,000 towards the GSP development. With this initial funding in place, staff recommends that the GWA Board approve the authority to enter into a consulting services agreement with Woodard & Curran for the development of the GSP for a total not-to-exceed amount of \$2,176,420. Mr. Nakagawa stated that while the funding agreement is not yet finalized with DWR, the greatest risk is being behind schedule on the GSP with a relatively short timeline. County staff recommends immediately starting the GSP development process using Zone 2 funds and entering into contract with Woodward & Curran in order to stay on schedule. County staff would invoice GSAs for their local share allocations, with half being due July 1, 2018 and the second half due July 1, 2019.

In the unlikely event of a reduced \$1.5M funding agreement, the “worst case” scenario is that consultant work would stop immediately and the GWA would consider how best to move forward with both a revised scope and local cost share match. Director Biagi expressed concern over a potentially large price tag for his agency given its minimal groundwater use. Mr. Paul Wells, Regional Coordinator of the DWR, stated that DWR has recommended the full funding of \$1.5M for this basin and the State is currently allowing the public to comment on the matter until February 21, 2018. He further stated there is sufficient funding to cover nearly all requests for GSP development grant funding. Directors and audience discussed that the cost of developing a GSP would be significantly greater if a GSA were to do so on its own, and that the JPA does allow for members to withdraw. Each entity that elected to become a GSA was motivated to do so in order to guide its own destiny in SGMA and, if a GSA retains its status, it is required to have a GSP.

Mary Elizabeth, member of the public, offered comment regarding the proposed local cost share allocation, objecting to the use of Zone 2 funds for the San Joaquin No. 2 GSA because it is a CalWater area, stating CalWater should completely fund that GSA. Secondly, she stated that most of the DACs are within urban areas and she would like to see the DAC grant funding focused specifically on outreach to small well owners. She clarified that the Sierra Club member who wrote the letter of recommendation for the DAC waiver of the GSP grant application represents Sierra Club California (not the local chapter).

Motion: Vice-Chair Panizza moved, and Director Kuil seconded, a motion to approve the local cost share allocation for the GSP as proposed. The Chair requested a roll call vote. Motion passed unanimously, with Central Delta Water Agency (CDWA) abstaining.

4. Discussion and Possible Action to Enter into a Funding Agreement with the DWR to Receive up to \$1,500,000 from DWR for the Development of a GSP *Requires 2/3 Vote by Directors Present*

Discussion occurred with Agenda Item II.A.3. **Motion:** Director Silverman moved and Director Fletcher seconded a motion to enter into Funding Agreement with DWR to receive up to \$1.5 M for the development of the GSP. The Chair requested a roll call vote. Motion passed unanimously, with CDWA abstaining.

5. Discussion and Possible Action to approve the Necessary Adjustments to the 2017-2018 GWA Budget *Requires 2/3 Vote by Directors Present*

Discussion occurred with Item Agenda II.A.3. **Motion:** Director Silverman moved and Director Thomas seconded a motion to approve the proposed necessary adjustments to the 2017-2018 GWA Budget, contingent upon entering into funding agreement, as identified in Agenda Item II.A.4., by June 30, 2018. The Chair requested a roll call vote. Motion passed unanimously, with CDWA abstaining.

6. Discussion and Possible Action to Enter into a Consulting Services Agreement with Woodard & Curran for the Development of the Eastern San Joaquin Subbasin GSP for a Not-to-Exceed Cost of \$2,176,420 *Requires 2/3 Vote by Directors Present*

Discussion occurred with Item Agenda II.A.3. Mr. Nakagawa stated that the GWA Consultant Selection Committee selected Woodard & Curran as the firm to develop the GSP. He highlighted the consultant selection process, identified the members of the selection committee, and stated that it was a consensus selection. Following approval of this consulting agreement, a Notice to Proceed may immediately be issued. **Motion:** Director Flinn moved and Director Kuil seconded the motion to enter into a consulting services

agreement with Woodward & Curran for GSP development for a total not-to-exceed cost of \$2,176,420. The Chair requested a roll call vote. Motion passed unanimously, with CDWA abstaining.

7. Presentation by Woodard & Curran on GSP Development Process

Ms. Alyson Watson, President of Woodard & Curran and project manager for GSP development, presented a preliminary overview of the project. Her presentation included the following segments: 1) Making best use of available time will be critical; 2) One of our first tasks will be to engage the multiple types and levels of stakeholders to the process; 3) Information flow will provide opportunities for broad input while preserving GWA JPA Authority; 4) The ESJ SGMA “project roadmap” lays out key decision points and makes best use of available time; and 5) Immediate-term actions (which, in part, includes assembling an advisory committee, updating webpage and preparing stakeholder outreach plan). A copy of her PowerPoint presentation has been made available on esjgroundwater.org. Following the presentation, discussion amongst the directors focused on an outreach plan led by Crocker & Crocker, (subconsultant to Woodard & Curran, which includes public education), plan for additional monitoring wells, communicating schedule and progress reports back to the GWA Board, plan for website enhancements and timeliness, appointments to advisory committee and soliciting additional outside funding options. Chair Winn mentioned he will be meeting with County staff regarding establishment of the advisory committee.

B. Informational Items:

1. November 8, 2017, written public comments from Jane Wagner-Tyack at GWA meeting
2. January 13, 2018, lodinews.com, “North San Joaquin Water Official Explains Upcoming Groundwater Project”
3. January 22, 2018, newsdeeply.com, “As California Groundwater Regulation Unfolds, Some Feel Left Out”
4. January 29, 2018, mantecabulletin.com, “Lathrop Seeks to Switch Basins for Groundwater Rules”

III. Public Comment: Ms. Elizabeth stated that GSAs may join together to form a single GSA (as Stanislaus and Calaveras Counties did) noting that as time goes on some of the smaller GSAs may be better off combining. She encouraged directors to bring a copy of the JPA to the meeting to reference. She recollected that water budget information shared at the October 2017 technical advisory meeting had grouped areas differently, and stated that SGMA calls for each GSA to have its own water budget. She stated that discussion should take place between GSAs regarding movement of water between boundaries. She added that at the November 2017 GWA meeting, a DWR stakeholder grant spreadsheet was shared and she wondered about the status of incorporating this effort. Finally, she offered a reminder that the GWA logo needs to be updated. Mr. Rod Attebery, GWA Counsel, mentioned he has copies available of the updated edition of the A Public Official’s Guide to the Brown Act.

IV. Directors’ Comments: Director Flinn mentioned there will be a public meeting on February 15, 2018, regarding an upcoming decision to build a new delivery system, hosted by League of Women Voters and North San Joaquin Water Conservation District and San Joaquin County.

V. Future Agenda Items: No items were discussed

VI. Workshop/Shirtsleeve Session: No items for discussion

VII. Adjournment: Chair Winn closed the board meeting at 11:34 a.m.

Next Regular Meeting: March 14, 2018 at 9:30 a.m.

San Joaquin County - Robert J. Cabral Agricultural Center 2101 E. Earhart Ave., Assembly Rm. #1, Stockton, CA

Submitted by: Kelly Villalpando, San Joaquin County






MEMBER SIGN-IN SHEET

Location: SJ COUNTY ROBERT J. CABRAL AG CENTER Date: 2/14/18 Time: 9:30 AM

INITIAL	Member's Name	GSA	Phone	Email
JF	John Freeman	Cal Water Member	209-547-7900	jfreeman@calwater.com
SC	Steve Cavallini	Cal Water Alternate	209-464-8311	scavallini@calwater.com
GB	George Biagi, Jr.	Central Delta Water Agency Member	209-481-5201	gbiagi@deltabluegrass.com
	Dante Nomellini	Central Delta Water Agency Alternate	209-465-5883	ngmplcs@pacbell.net
	Grant Thompson	Central San Joaquin Water Conservation District Member	209-639-1580	gtom@velociter.net
	Reid Roberts	Central San Joaquin Water Conservation District Alternate	209-941-8714	reidwroberts@gmail.com
	Stephen Salvatore	City of Lathrop Member	209-941-7430	ssalvatore@ci.lathrop.ca.us
GG	Greg Gibson	City of Lathrop Alternate	209-941-7430	ggibson@ci.lathrop.ca.us
	Alan Nakanishi	City of Lodi Member	209-333-6702	anakanishi@lodi.gov
	Charlie Swimley	City of Lodi Alternate	209-333-6706	cswimley@lodi.gov
	Rich Silverman	City of Manteca Member	209-456-8017	rsilverman@ci.manteca.ca.us
	Mark Houghton	City of Manteca Alternate	209-456-8416	mhoughton@ci.manteca.ca.us
	Elbert Holman	City of Stockton Member	209-937-8244	hoytjr63@yahoo.com
ML	Mel Lytle	City of Stockton Alternate	209-937-5614	mel.lytle@stocktonca.gov

INITIAL	Member's Name	GSA	Phone	Email
RTS	Russ Thomas	Eastside San Joaquin GSA Member	209-480-8968	rthomasccwd@hotmail.com
	Walter Ward	Eastside San Joaquin GSA Alternate	209-525-6710	wward@envres.org
DDF	David Fletcher	Linden County Water District Member	209-887-3202	dqfpe@comcast.net
	Paul Brennan	Linden County Water District Alternate	209-403-1537	ptbrennan@verizon.net
MHB	Mike Henry	Lockeford Community Services District Member	209-712-4014	midot@att.net
	Joseph Salzman	Lockeford Community Services District Alternate	209-727-5035	lcsd@softcom.net
ESK	Eric Schmidt	Lockeford Community Services District Alternate	209-727-5035	lcsd@softcom.net
T.F.	Tom Flinn	North San Joaquin Water Conservation District Member	209-663-8760	tomflinn2@me.com
	Joe Valente	North San Joaquin Water Conservation District Alternate	209-334-4786	jcvalente@softcom.net
ET	Eric Thorburn, P.E.	Oakdale Irrigation District Member	209-840-5525	ethorburn@oakdaleirrigation.com
	Emily Sheldon	Oakdale Irrigation District Alternate	209-840-5509	esheldon@oakdaleirrigation.com
C	Chuck Winn	San Joaquin County Member	209-953-1160	cwinn@sigov.org
	Kathy Miller	San Joaquin County Alternate	209-953-1161	kmiller@sigov.org
	John Herrick, Esq.	South Delta Water Agency Member	209-956-0150	jherrlaw@aol.com
	Jerry Robinson	South Delta Water Agency Alternate	209-471-4025	N/A
DK	Dale Kuil	South San Joaquin GSA Member	209-670-5829	dkuil@ssjid.com
	Robert Holmes	South San Joaquin GSA Alternate	209-484-7678	rholmes@ssjid.com
MP	Melvin Panizza	Stockton East Water District Member	209-948-0333	melpanizza@aol.com
AW	Andrew Watkins	Stockton East Water District Alternate	209-948-0333	watkins.andrew@verizon.net
	Anders Christensen	Woodbridge Irrigation District Member	209-625-8438	widirrigation@gmail.com
DH	Doug Heberle	Woodbridge Irrigation District Alternate	209-625-8438	heberlewid@gmail.com

Eastern San Joaquin Groundwater Authority Staff & Support

INITIAL	Member's Name	Organization	Phone	Email
	Kris Balaji	San Joaquin County	468-3100	kbalani@sigov.org
	Fritz Buchman	San Joaquin County	468-3034	fbuchman@sigov.org
	Brandon Nakagawa	San Joaquin County	468-3089	bnakagawa@sigov.org
	Mike Callahan	San Joaquin County	468-9360	mcallahan@sigov.org
	Matthew Ward	San Joaquin County	468-3060	mward@sigov.org
	Lynn Hoffman	San Joaquin County	468-3531	mlhoffman@sigov.org
	Kelly Villalpando	San Joaquin County	468-3073	krvillalpando@sigov.org
	Danielle Barney	San Joaquin County	468-3089	dbarney@sigov.org
	Carolyn Lott	Carlton Consulting / Facilitator	402-2024	carolynlott@sbcglobal.net
	Rod Attebery	Neumiller & Beardslee / Legal Counsel	948-8200	rattebery@neumiller.com

OTHER INTERSTED PARTIES - SIGN-IN SHEET

Location: SJ COUNTY ROBERT J. CABRAL AG CENTER Date: 2/14/18 Time: 9:30 AM

INITIAL	Member's Name	Organization	Phone	Email
SB	Sam Bdogna	SSJID	209-456-1574	sbdogna@ssjid.com
DW	DENNIS WILKS	SACRAMENTO COUNTY		
PW	Paul Wells	DWR	916-376-9565	paul.wells@dwr.ca.gov
SC	Steve Cavallini	CAL WATER	404-834	scavallini@calwater.com
AW	Alyson Watson	W+C	415-321-3400	awatson@woodwardcurran.com
SM	Scott Moody	SIEM		
RS	RICH SILVERMAN	MANTECA		
CL	Cathy Lee	SEWD		
	Linda Dean	Sacramento County - DWR	916-874-1085	linda.dean@saccounty.net
EM	Elba Mijango	City of Manteca		
W	MARK WILLIAMS	GIS	916 (631) - 4559	
ME	Mary Elizabeth	Community + Sierra Club		
AL	Aaron Lewis	EKI, Environment & Water, Inc.	(650) 292-9108	alewis@ekiconsult.com
MS	MIA BROWN	SSJID	209 481 1548	mbrown@ssjid.com

ATTACHMENT II
A.2.



RESPONSES TO FREQUENTLY ASKED QUESTIONS: GSP INITIAL NOTIFICATION REQUIREMENTS, WHEN IS A COORDINATION AGREEMENT NECESSARY, AND WHAT IS A PLAN MANAGER

The purpose of this frequently asked questions document is to inform groundwater sustainability agencies (GSAs) about the groundwater sustainability plan (GSP) initial notification requirements, as described in the Sustainable Groundwater Management Act (SGMA) and the GSP Regulations. Additional details are also provided in this document regarding coordination agreements and the identification of a plan manager, as well as a basin-wide point of contact if multiple GSPs are expected.

1. WHAT ARE THE OPTIONS FOR DEVELOPING A GSP IN A BASIN?

GSAs have three options for developing and implementing GSPs in a basin. In accordance with Water Code §10727(b), a GSP may be any of the following:

- A single GSP covering the entire basin developed and implemented by one GSA.
- A single GSP covering the entire basin developed and implemented by multiple GSAs.
- Multiple GSPs implemented by multiple GSAs and coordinated pursuant to a single coordination agreement that covers the entire basin.

In each of the scenarios presented above, one or more GSP initial notifications are required and a plan manager(s) must be identified in order to submit the GSP (or GSPs) to the Department for review. However, identification of a plan manager as part of the GSP initial notification process is not mandatory, only requested by the Department for the purposes of coordinating with GSAs during GSP development.

2. WHAT IS A GSP INITIAL NOTIFICATION?

Pursuant to Water Code §10727.8(a), prior to initiating the development of a GSP, the GSA shall make available to the public and the Department a written statement describing the manner in which interested parties may participate in the development and implementation of the GSP. In the GSP Regulations a GSP initial notification is required per §353.6(a), which is stated below:

Each Agency (GSA) shall notify the Department, in writing, prior to initiating development of a Plan (GSP). The notification shall provide general information about the GSA's process for developing the GSP, including the manner in which interested parties may contact the GSA and participate in the development and implementation of the GSP. The GSA shall make the information publicly available by posting relevant information on the GSA's website.

The GSP initial notification can assist GSAs with fulfilling the requirement to consider the interests of the beneficial uses and users of groundwater in a basin (see Water Code §10723.2). If a GSA plans to establish an advisory committee consisting of interested parties for the purpose of developing a GSP, information regarding the advisory committee can be included in the GSP initial notification.

The following describes the GSP initial notification recommendations, depending on the decision to prepare a single GSP or multiple GSPs in a basin. In each scenario, the GSP initial notification must identify a website that makes GSP information publicly available.

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- *A single GSP covering the entire basin developed and implemented by one GSA.*
 - If there is a single GSA in the basin intending to develop a single GSP, the GSA must prepare a single GSP initial notification, which may be submitted by the basin's plan manager or an authorized representative of the GSA.
 - The plan manager can be the existing GSA point of contact or a new individual appointed through an agreement; however, identification of a plan manager is not a requirement of the GSP initial notification process.
- *A single GSP covering the entire basin developed and implemented by multiple GSAs.*
 - If there are multiple GSAs in a basin intending to develop a single GSP, then the GSAs must prepare a single GSP initial notification submitted on behalf of all the GSAs.
 - If the GSAs have identified a plan manager in an agreement, the plan manager may submit the GSP initial notification.
 - If multiple GSAs in a basin have identified a representative to submit a GSP initial notification on their behalf who is not the agreed upon plan manager, the representative should attach evidence of that designation.
- *Multiple GSPs implemented by multiple GSAs and coordinated pursuant to a single coordination agreement that covers the entire basin.*
 - Scenario 1 – A coordination agreement has been adopted by all GSAs in the basin.
 - Each GSP group must submit a GSP initial notification and each group may have its own plan manager, but a single point of contact for the basin is required. Identification of a basin-wide point of contact is a component of a coordination agreement.
 - The coordination agreement must be uploaded to the SGMA Portal.
 - Scenario 2 – A coordination agreement has not yet been adopted by all GSAs in the basin.
 - If multiple GSAs in a basin intend to develop multiple GSPs, then each GSP group must submit a GSP initial notification and each GSP group may identify a plan manager for their area.
 - If multiple GSAs in a basin have identified a representative to submit a GSP initial notification on their behalf who is not the agreed upon plan manager, the representative should attach evidence of that designation.
 - If a coordination agreement is not yet finalized when the GSP initial notification is submitted and a point of contact for the basin is not yet identified, then the timeline for completing the coordination agreement should be provided.

3. WHAT IS A PLAN MANAGER?

A plan manager is an employee or authorized representative of a GSA (or GSAs), appointed through a coordination agreement or other agreement, who has been delegated management authority for submitting the GSP *and* serving as the point of contact between the GSA (or GSAs) and the Department. A plan manager is required for all GSP submittal efforts, whether there is a single GSP or multiple coordinated GSPs in a basin, but is not a mandatory component of the GSP initial notification process.

- *“Plan manager”* is defined in §351(z) and discussed in §353.4(b) and §354.6(c) of the GSP Regulations. A GSP must include the name and contact information of the plan manager who has been delegated authority for submitting the GSP *and* who has been identified as the point of contact in the basin. If there are multiple GSPs in a basin there may be multiple plan managers; however, the required coordination agreement must identify a single point of contact with the Department.
- A *“coordination agreement”* is mandatory if multiple GSAs in a basin intend to develop and implement multiple GSPs for that basin (see GSP Regulations §357.4).

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- The content of an “other agreement” is not defined in the GSP Regulations, but the “other agreement” must identify a plan manager who has been delegated authority for submitting the single GSP in a basin *and* serving as the basin’s point of contact with the Department.

4. IS THE PLAN MANAGER REQUIRED TO SUBMIT THE GSP INITIAL NOTIFICATION?

A plan manager *can* submit a GSP initial notification but is not required to do so. A GSP initial notification can be submitted by any individual who has been authorized to act on behalf of the GSA (or GSAs) in the basin; however, the individual should attach evidence of that authorization. Evidence could include, but not be limited to, any of the following: a letter (or letters) signed by all GSAs in the basin; a coordination agreement or other agreement; a legal document; or a resolution prepared by the GSA (or GSAs) in a basin. The individual submitting the GSP initial notification could be the basin point of contact, a plan manager, a consultant, an attorney, or any authorized representative of the GSA.

5. ARE THERE FORMAL ADOPTION REQUIREMENTS RELATED TO GSP INITIAL NOTIFICATIONS?

Neither the statutory requirements of SGMA nor the regulatory components of the GSP Regulations identify a formal adoption process related to GSP initial notifications. However, GSAs will need to enter into a coordination agreement (a legal agreement) or “other agreement” to appoint a plan manager and a point of contact for the basin. Also, GSAs can modify a GSP initial notification at any time if GSP scenarios in a basin change – for example, if GSAs in a basin decide to develop a single GSP instead of multiple GSPs, or vice versa.

6. WHAT IS A COORDINATION AGREEMENT?

A coordination agreement is defined in SGMA in Water Code §10721(d) and “*means a legal agreement adopted between two or more GSAs that provides the basis for coordinating multiple agencies or GSPs within a basin.*” Coordination agreements are required if multiple GSAs in a basin submit multiple GSPs to the Department for review. The minimum content of a coordination agreement is addressed in Article 8, §357.4, of the GSP Regulations. The coordination agreement shall, among other items addressed in §357.4: describe a single point of contact for the basin; establish procedures for resolving conflicts between GSAs; ensure that the multiple GSAs developing multiple GSPs use the same data and methodologies for the assumptions described in Water Code §10727.6; and describe a coordinated data management system. In accordance with Water Code §10727.6, the GSP elements, at minimum, that must be coordinated in a basin include the following:

- Groundwater elevation data
- Groundwater extraction data
- Surface water supply
- Total water use
- Change in groundwater storage
- Water budget
- Sustainable yield

7. WHAT ARE OTHER RELATED REQUIREMENTS OF A GSP INITIAL NOTIFICATION?

In accordance with Water Code §10727.8, GSAs are required to provide the GSP initial notification written statement to the legislative body of any city, county, or city and county, located within the geographic area to be covered by the GSP to coordinate land use and water management planning. In addition, if the geographic area to be covered by the GSP includes a public water system regulated by the Public Utilities Commission, the GSA shall provide the written statement to the commission.

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Related to the GSP initial notification is a “maintenance of interested persons list” which is described in Water Code §10723.4. A GSA is required to establish a list of persons interested in receiving notices – any person may request, in writing, to be placed on the list of interested persons. Also, GSAs are required to encourage the active involvement of diverse social, cultural, and economic elements of the population within the groundwater basin prior to and during the development and implementation of the GSP.

8. CAN PUBLIC COMMENTS BE SUBMITTED FOR GSP INITIAL NOTIFICATIONS?

The SGMA Portal’s GSP initial notification system provides an opportunity for receiving and posting public comments. In accordance with §353.8 of the GSP Regulations, “*Any person may provide comments to the Department regarding a proposed or adopted Plan (GSP)*” and “*Comments received by the Department shall be posted on the Department’s website.*” GSP initial notification public comments will be copied via email to select Department staff and all GSA points of contact and plan managers in a basin. The Department requests that public comments be directly related to a basin’s GSP effort and reserves the right to withdraw inappropriate comments from its website.

9. WHAT IF I WANT TO SUBMIT MODIFIED GSA BOUNDARIES?

Modifications to GSA boundaries must be submitted via the GSA Formation Notification System on the SGMA Portal located here: <http://sgma.water.ca.gov/portal/#gsa>.

10. WHAT IF I HAVE ALREADY SUBMITTED A GSP INITIAL NOTIFICATION?

GSP initial notifications that have already been submitted to the Department are posted on the Department’s Sustainable Groundwater Management website located here: http://water.ca.gov/groundwater/sgm/gsp_in.cfm. The posted GSP initial notifications will be transferred to the SGMA Portal by Department staff.

11. WHERE DO I SUBMIT MY GSP INITIAL NOTIFICATION?

GSP initial notifications must be submitted to the SGMA Portal at <http://sgma.water.ca.gov/portal/>. The SGMA Portal will use existing GSA boundaries and GSA points of contact and will allow for new points of contact and plan managers to be identified.

If GSAs have questions about GSP initial notifications, please contact either the Regional Coordinators in the Department’s four region offices or staff from the Sustainable Groundwater Management Program in Sacramento. Contact information is provided below and can also be found on the Department’s Sustainable Groundwater Management-Communication and Outreach website located here: <http://water.ca.gov/groundwater/sgm/outreach.cfm>.

- **Northern Region:** Bill Ehorn (acting) at Bill.Ehorn@water.ca.gov
- **North Central Region:** Paul Wells at Paul.Wells@water.ca.gov
- **South Central Region:** Amanda Peisch-Derby at Amanda.Peisch@water.ca.gov
- **Southern Region:** Brian Moniz at Brian.Moniz@water.ca.gov
- **Sacramento:** Monica Reis at Monica.Reis@water.ca.gov

RELATED CALIFORNIA WATER CODE REQUIREMENTS

California Water Code, Division 6, Part 2.74

§10721. Definitions

(d) "Coordination agreement" means a legal agreement adopted between two or more groundwater sustainability agencies that provides the basis for coordinating multiple agencies or groundwater sustainability plans within a basin pursuant to this part.

§10723.4. Maintenance of Interested Persons List

The groundwater sustainability agency shall establish and maintain a list of persons interested in receiving notices regarding plan preparation, meeting announcements, and availability of draft plans, maps, and other relevant documents. Any person may request, in writing, to be placed on the list of interested persons.

§10727.

(b) A groundwater sustainability plan may be any of the following:

- (1) A single plan covering the entire basin developed and implemented by one groundwater sustainability agency.*
- (2) A single plan covering the entire basin developed and implemented by multiple groundwater sustainability agencies.*
- (3) Subject to Section 10727.6, multiple plans implemented by multiple groundwater sustainability agencies and coordinated pursuant to a single coordination agreement that covers the entire basin.*

§10727.8.

(a) Prior to initiating the development of a groundwater sustainability plan, the groundwater sustainability agency shall make available to the public and the department a written statement describing the manner in which interested parties may participate in the development and implementation of the groundwater sustainability plan. The groundwater sustainability agency shall provide the written statement to the legislative body of any city, county, or city and county located within the geographic area to be covered by the plan. The groundwater sustainability agency may appoint and consult with an advisory committee consisting of interested parties for the purposes of developing and implementing a groundwater sustainability plan. The groundwater sustainability agency shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the groundwater basin prior to and during the development and implementation of the groundwater sustainability plan. If the geographic area to be covered by the plan includes a public water system regulated by the Public Utilities Commission, the groundwater sustainability agency shall provide the written statement to the commission.

(b) For purposes of this section, interested parties include entities listed in Section 10927 that are monitoring and reporting groundwater elevations in all or a part of a groundwater basin managed by the groundwater sustainability agency.

§10733.4. State Evaluation and Assessment

(a) Upon adoption of a groundwater sustainability plan, a groundwater sustainability agency shall submit the groundwater sustainability plan to the department for review pursuant to this chapter.

(b) If groundwater sustainability agencies develop multiple groundwater sustainability plans for a basin, the submission required by subdivision (a) shall not occur until the entire basin is covered by groundwater sustainability plans. When the entire basin is covered by groundwater sustainability plans, the groundwater sustainability agencies shall jointly submit to the department all of the following:

Sustainable Groundwater Management Program

- (1) The groundwater sustainability plans.*
 - (2) An explanation of how the groundwater sustainability plans implemented together satisfy Sections 10727.2, 10727.4, and 10727.6 for the entire basin.*
 - (3) A copy of the coordination agreement between the groundwater sustainability agencies to ensure the coordinated implementation of the groundwater sustainability plans for the entire basin.*
- (c) Upon receipt of a groundwater sustainability plan, the department shall post the plan on the department's Internet Web site and provide 60 days for persons to submit comments to the department about the plan.*
- (d) The department shall evaluate the groundwater sustainability plan within two years of its submission by a groundwater sustainability agency and issue an assessment of the plan. The assessment may include recommended corrective actions to address any deficiencies identified by the department.*
- (e) Nothing in this section shall be construed to prohibit a groundwater sustainability agency from implementing a groundwater sustainability plan prior to evaluation and assessment of the groundwater sustainability plan by the department.*

RELATED GSP REGULATIONS

California Code of Regulations, Title 23, Division 2, Chapter 1.5, Subchapter 2.

§ 351. Definitions

- (a) "Agency" refers to a groundwater sustainability agency as defined in the Act.*
- (p) "Interested parties" refers to persons and entities on the list of interested persons established by the Agency pursuant to Water Code Section 10723.4.*
- (x) "Plan" refers to a groundwater sustainability plan as defined in the Act.*
- (z) "Plan manager" is an employee or authorized representative of an Agency, or Agencies, appointed through a coordination agreement or other agreement, who has been delegated management authority for submitting the Plan and serving as the point of contact between the Agency and the Department.*

§ 353.6. Initial Notification

- (a) Each Agency shall notify the Department, in writing, prior to initiating development of a Plan. The notification shall provide general information about the Agency's process for developing the Plan, including the manner in which interested parties may contact the Agency and participate in the development and implementation of the Plan. The Agency shall make the information publicly available by posting relevant information on the Agency's website.*
- (b) The Department shall post the initial notification required by this Section, including Agency contact information, on the Department's website within 20 days of receipt.*
- (c) Upon request, prior to adoption of a Plan, the Department shall provide assistance to an Agency regarding the elements of a Plan required by the Act and this Subchapter, however, the Agency is solely responsible for the development, adoption, and implementation of a Plan that satisfies the requirements of the Act and this Subchapter.*

§ 357.4. Coordination Agreements

- (a) Agencies intending to develop and implement multiple Plans pursuant to Water Code Section 10727(b)(3) shall enter into a coordination agreement to ensure that the Plans are developed and implemented utilizing the same data and methodologies, and that elements of the Plans necessary to achieve the sustainability goal for the basin are based upon consistent interpretations of the basin setting.*
- (b) Coordination agreements shall describe the following:*
- (1) A point of contact with the Department.*

Sustainable Groundwater Management Program

(2) The responsibilities of each Agency for meeting the terms of the agreement, the procedures for the timely exchange of information between Agencies, and procedures for resolving conflicts between Agencies.

(3) How the Agencies have used the same data and methodologies for assumptions described in Water Code Section 10727.6 to prepare coordinated Plans, including the following:

(A) Groundwater elevation data, supported by the quality, frequency, and spatial distribution of data in the monitoring network and the monitoring objectives as described in Subarticle 4 of Article 5.

(B) A coordinated water budget for the basin, as described in Section 354.18, including groundwater extraction data, surface water supply, total water use, and change in groundwater in storage.

(C) Sustainable yield for the basin, supported by a description of the undesirable results for the basin, and an explanation of how the minimum thresholds and measurable objectives defined by each Plan relate to those undesirable results, based on information described in the basin setting.

(c) The coordination agreement shall explain how the Plans implemented together, satisfy the requirements of the Act and are in substantial compliance with this Subchapter

(d) The coordination agreement shall describe a process for submitting all Plans, Plan amendments, supporting information, all monitoring data and other pertinent information, along with annual reports and periodic evaluations.

(e) The coordination agreement shall describe a coordinated data management system for the basin, as described in Section 352.6.

(f) Coordination agreements shall identify adjudicated areas within the basin, and any local agencies that have adopted an Alternative that has been accepted by the Department. If an Agency forms in a basin managed by an Alternative, the Agency shall evaluate the agreement with the Alternative prepared pursuant to Section 358.2 and determine whether it satisfies the requirements of this Section.

(g) The coordination agreement shall be submitted to the Department together with the Plans for the basin and, if approved, shall become part of the Plan for each participating Agency.

(h) The Department shall evaluate a coordination agreement for compliance with the procedural and technical requirements of this Section, to ensure that the agreement is binding on all parties, and that provisions of the agreement are sufficient to address any disputes between or among parties to the agreement.

(i) Coordination agreements shall be reviewed as part of the five-year assessment, revised as necessary, dated, and signed by all parties.



Before the Board of Directors

Eastern San Joaquin Groundwater Authority
A Joint Powers Agency, State of California

B-18-X

MOTION:

BOARD ORDER AUTHORIZING SUBMITTAL OF A GROUNDWATER SUSTAINABILITY PLAN INITIAL NOTIFICATION FORM TO THE DEPARTMENT OF WATER RESOURCES ON BEHALF OF THE EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY

THIS BOARD OF DIRECTORS hereby authorizes the submittal of a Groundwater Sustainability Plan (GSP) Initial Notification Form to the Department of Water Resources on behalf of the Eastern San Joaquin Groundwater Authority.

I HEREBY CERTIFY that the above order was passed and adopted on March 14, 2018 by the following vote of the Board of Directors, to wit:

AYES:

NOES:

ABSENT:

KRIS BALAJI, PMP, P.E.
Secretary of the
Eastern San Joaquin Groundwater Authority

ATTACHMENT II
A.3.

Villalpando, Kelly

From: Nakagawa, Brandon
Sent: Tuesday, March 06, 2018 5:25 PM
To: Villalpando, Kelly
Subject: FW: Technical Support Services

Brandon Nakagawa, P.E.
Water Resources Coordinator
San Joaquin County Department of Public Works
(209) 468-3089
(209) 468-2999 fax

From: Wells, Paul@DWR [mailto:Paul.Wells@water.ca.gov]
Sent: Thursday, March 01, 2018 12:53 PM
To: Nakagawa, Brandon <bnakagawa@sjgov.org>
Cc: Brewster, Bill@DWR <Bill.Brewster@water.ca.gov>; Callahan, Michael <mcallahan@sjgov.org>
Subject: RE: Technical Support Services

Good Afternoon Brandon,

Thank you for your interest in Technical Support Services (TSS). Following is a brief summary of the TSS application process:

- On-line applications for TSS are expected to be available in Spring 2018. I will contact you when the on-line application is available.
- Only one general application for TSS may be submitted per basin. GSAs must choose one person to serve as basin coordinator for the technical support services being requested.
- Initial priority for TSS will be given to projects located in critically overdrafted basins.
- The first round of TSS is expected to focus on the drilling of monitoring wells.
- To be eligible for TSS, a GSA will need to have initiated the GSP development process and have submitted a GSP Initial Notification(s) for the basin to DWR through the [GSP Initial Notification System](#).

A handout for TSS and a FAQ document are in development, but I don't believe they will be ready to include with the agenda for the Eastern San Joaquin JPA meeting on March 14th.

I can provide a brief summary and update on TSS at the meeting if you would like.

Let me know if you have any follow-up questions regarding TSS.

Sincerely,

Paul Wells
North Central Regional Office
Department of Water Resources
(916) 376-9656

From: Nakagawa, Brandon [mailto:bnakagawa@sjgov.org]
Sent: Thursday, March 01, 2018 11:32 AM

To: Wells, Paul@DWR <Paul.Wells@water.ca.gov>

Cc: Brewster, Bill@DWR <Bill.Brewster@water.ca.gov>; Callahan, Michael <mcallahan@sjgov.org>

Subject: Technical Support Services

<https://www.water.ca.gov/Programs/Groundwater-Management/Assistance-and-Engagement>

Paul,

We came across a the link above and am interested in applying for Technical Support Services (TSS). How do we begin? We have tons of ideas mainly to help get our CASGEM Plan more current and use the information for the GSP. This makes the timing very tough, but doable. We'd like to bring this opportunity up at the next Eastern San Joaquin JPA meeting in March. Any info we could attach to the agenda would be very helpful.

Thanks,

Brandon

Brandon Nakagawa, P.E.
Water Resources Coordinator
San Joaquin County Department of Public Works
(209) 468-3089
(209) 468-2999 fax

Before the Board of Directors

Eastern San Joaquin Groundwater Authority
A Joint Powers Agency, State of California

B-18-X

MOTION:

BOARD ORDER AUTHORIZING SUBMITTAL OF AN APPLICATION TO THE DEPARTMENT OF WATER RESOURCES FOR TECHNICAL SUPPORT SERVICES PROVIDED TO THE EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY

THIS BOARD OF DIRECTORS hereby authorizes the submittal of an application to the California Department of Water Resources for Technical Support Services (TSS) to support the Eastern San Joaquin Groundwater Authority in development of the Groundwater Sustainability Plan(s).

THIS BOARD OF DIRECTORS further designates the Secretary of the Eastern San Joaquin Groundwater Authority, or his designee, as the basin coordinator for the TSS requested.

I HEREBY CERTIFY that the above order was passed and adopted on March 14, 2018 by the following vote of the Board of Directors, to wit:

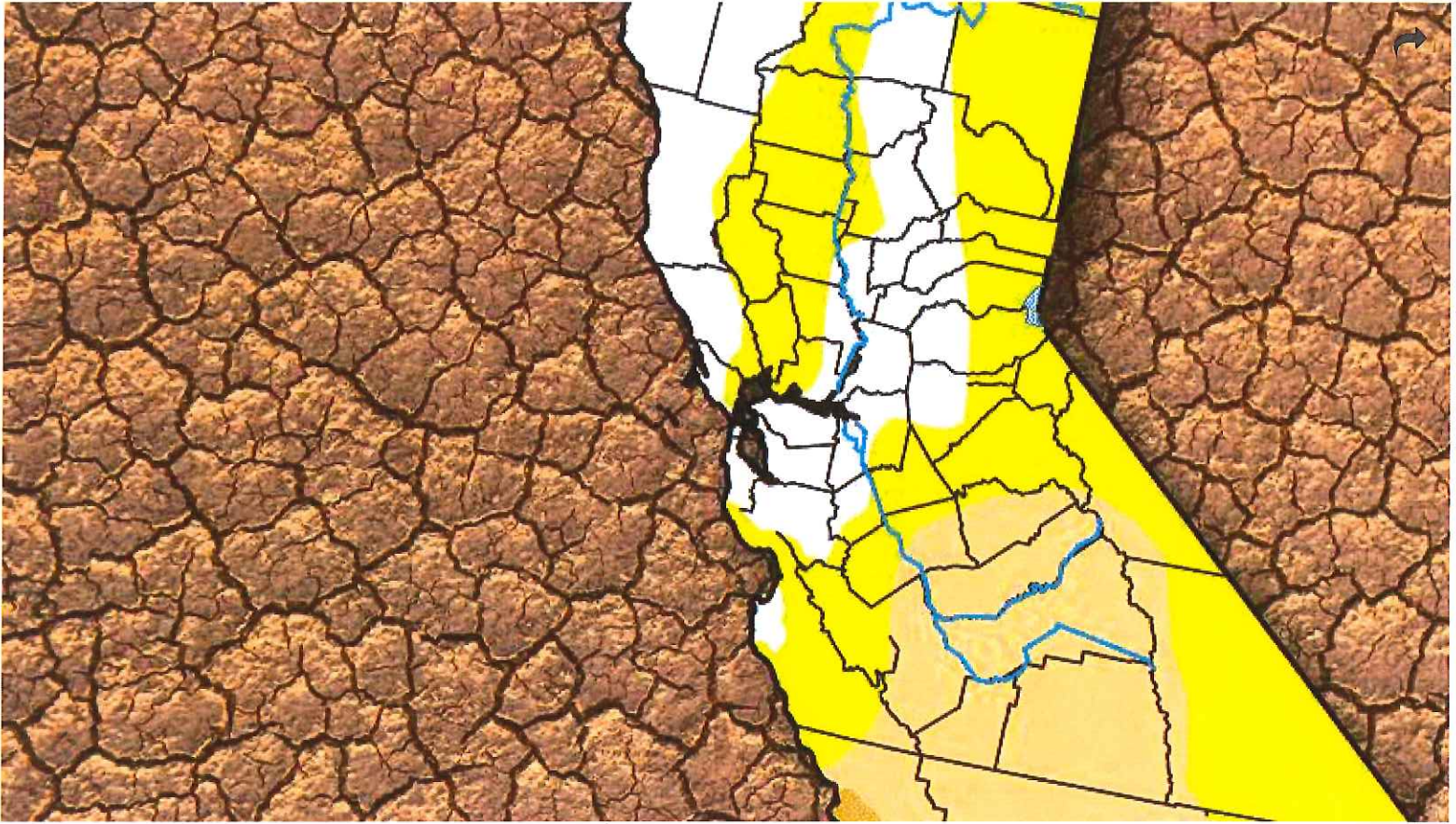
AYES:

NOES:

ABSENT:

KRIS BALAJI, PMP, P.E.
Secretary of the
Eastern San Joaquin Groundwater Authority

ATTACHMENT II
B.1-3.



WATER & DROUGHT

Facing specter of drought, California farmers are told to expect little water

BY DALE KASLER
dkasler@sacbee.com

February 20, 2018 01:54 PM

Updated February 20, 2018 09:10 PM

It's starting to look like a drought year for California farmers who depend on water from the federal government.

The U.S. Bureau of Reclamation announced Tuesday that most farmers south of the Sacramento-San Joaquin Delta who get water from the federal Central Valley Project will receive just 20 percent of their requested allocation this year.

Although the numbers could change and the allocations could increase this spring, the initial figures reflect the abysmal precipitation California has received so far this winter. "We have extremely low snowpack and limited anticipated runoff," said David Murillo, the bureau's regional director.

The agency said it can't yet provide an initial allocation figure for many Sacramento Valley water agencies because of the lack of rain and the legal requirement that plenty of water be kept in Shasta Lake, the largest reservoir in California, to protect endangered species of Chinook salmon.

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Those left in the dark for the time being includes some urban agencies in the Sacramento area such as Placer County Water Agency and the San Juan Water District, although officials stressed that those agencies aren't in danger of running short of water.

Still, the announcement was sobering. Despite last winter's record rainfall, Californians must "prepare for the potential of return to drought conditions," said Federico Barajas, deputy regional manager of the bureau.

The Sierra Nevada snowpack is just 20 percent of normal and most of the state has received rainfall levels that are well below average.

So far, however, conditions aren't as bad as during the worst of California's five-year drought. In some years, farmers south of the Delta received no water from the Central Valley Project, prompting many of them to dramatically increase the amount of water they pumped out of the ground.

Last winter's record Northern California rainfall filled most of the state's reservoirs and will ensure that most of the irrigation districts and municipal agencies that belong to the CVP will get at least some water from the feds.

At the San Juan Water District in suburban Sacramento, for instance, the reservoir conditions provide a cushion against the uncertainty of not receiving an initial allocation.

"The good news is that Folsom Lake has a lot of water in it," said San Juan general manager Paul Helliker, whose agency pulls water from the reservoir and has supplies outside of the Central Valley Project. "That does give us some comfort."

The State Water Project has set an initial allocation of 20 percent for all of its farm and municipal customers. The CVP doesn't distribute its water equally, however, because some of its customers have special historic water rights that provide for more generous deliveries. While many of the farmers in the San Joaquin Valley are getting an initial allocation of only 20 percent, others have been told to expect 30 percent or more. The "settlement contractors," a select group of Sacramento Valley rice farmers, have been given an initial allocation of 100 percent.

The short-term weather forecast does offer some relief. The National Weather Service said the Sierra is expected to get as much as 8 inches of new snow starting late Wednesday. Because it's so cold, snow levels could drop to as low as 1,000 feet. However, forecasters said the incoming storm isn't expected to bring heavy precipitation.

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Sierra Nevada snow picture brightens, but is still just a fraction of normal

COMMENTS

County groundwater project rejected; follow-up meeting scheduled for today

By John Bays/News-Sentinel Staff Writer | Posted: Wednesday, February 28, 2018 7:00 am

After Lodi voters rejected a proposed irrigation plan on Monday, the North San Joaquin Water Conservation District will explore other options during a meeting today.

The South System Groundwater Improvement Project was defeated by a narrow margin, according to Joe Valente, NSJWCD president Joe Valente. Valente added that a significant number of landowners in the project's proposed area did not vote, although ballots were mailed out more than a month ago.

"When all was said and done, about 49.5 percent voted in favor of the project and about 50.5 percent opposed it, so it was extremely, extremely close. It looked like about 50 percent, maybe less, of property owners actually voted," Valente said.

Gloria Bodner, a Lodi resident whose family has farmed their 20-acre parcel for over 45 years, was one of the project's opponents.

Bodner felt the \$18.75 million project, which would have pumped pressurized surface water from the Mokelumne River along seven miles of new pipeline to Bear Creek and Pixley Slough, would not deliver enough water to justify its cost.

"In the past, the system was poorly maintained and often, service was denied due to lack of water. For a farm to be profitable, we need a predictable source of water and predictable costs," Bodner said.

The NSJWCD board will explore alternative projects during a meeting at 2 p.m. today, Valente said.

The meeting will be held at the Lodi Public Library, 201 W. Locust St., and is open to the public.



01_12_18_PIPELINE_01.JPG

BEA AHBECK/NEWS-SENTINEL North San Joaquin Water Conservation District director Joe Valente talks about the South System Groundwater Improvement Plan by the fish strainer at the water pump station in the Mokelumne River in Lodi Friday, Jan. 12, 2018.

How Much Snow Next Winter? It May Not Remain a Mystery Much Longer

A new forecasting tool may be able to predict mountain snowpack in the West up to eight months in advance, potentially revolutionizing many aspects of water management. It's no longer the realm of fantasy, as scientist Sarah Kapnick explains.

WRITTEN BY
 Matt Weiser

PUBLISHED ON
 Feb. 28, 2018

READ TIME
 Approx. 5 minutes



A skier threads his way through patches of dry ground at California's Squaw Valley Ski Resort on March 21, 2015, when the state experienced one of its driest winters ever. A new forecasting tool could one day be able to predict such poor mountain snowpack conditions as much as eight months in advance. Max Whittaker/Getty Images

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IF WE HAD known a year ago that this winter would be so dry, would we have conserved water more aggressively last summer? Would ski resorts have installed more snowmaking equipment? Would farmers buy different seeds to plant this spring?

These are among the tantalizing questions raised by a team of government and university scientists, who believe they have developed a tool to predict mountain snowpack in the West up to eight months in advance – long before the first winter snowflake has fallen.

The tool, a powerful computer model, is described in a [new study](#) recently published in the Proceedings of the National Academy of Sciences. It is still experimental, but it seems capable at this stage of giving a thumbs-up or -down signal about whether March 1 snowpack will be heavy. And it can do so at the scale of a particular mountain range, offering some indication about potential spring runoff for individual watersheds.

The one exception is the southern Sierra Nevada range in California, which presents unique forecasting challenges thanks to its extreme topography.

To understand this new forecasting tool a bit better, along with its potential to change water management in the West, Water Deeply talked to the study's lead author, Sarah Kapnick, a research physical scientist at National Oceanic and Atmospheric Administration's Geophysical Fluid Dynamics Laboratory at Princeton University in New Jersey.

Water Deeply: This seems like science fiction. How did you do it?

Sarah Kapnick: The prediction system we developed is a set of three global climate models. One has atmospheric and land surface resolution at 200km [124 miles], 50km [31 miles] and 25km [15 miles]. We put together what the actual state of the ocean is, the atmosphere and the land, using a snapshot of July 1. We start them on July 1 with all the available information we have. Then we run the model for a year. We run it 10 times for each surface resolution. What that creates is an ensemble of what multiple future paths of a March 1 snowpack



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NOAA research scientist Sarah Kapnick has helped develop a new tool that could help predict mountain snowpack in the western U.S. months in advance.

(Photo Courtesy Sarah Kapnick)

will look like. We ask what is the average prediction of all those potential futures, and we use that information for our prediction.

Water Deeply: So you include lots of actual Earth observation data feeding into the model?

Kapnick: To start the model, we're using satellite information that's observing the state of the ocean, land surface and atmosphere. We're also using [Argo floats](#). The best way

to describe them is like unmanned drones in the ocean; they go in the ocean and then dive to depth. They're taking measurements of temperature and salinity and pressure as they go down and as they come back up, collecting data points across the ocean.

We have a separate model that takes all these data and combines them together into gridded information that can start the model. This is a global, fully coupled model that is modeling the ocean, atmosphere and land surface together using the physics of how all these factors interact.

And then to verify the model and the predictions, in this paper we are using point measurements of snowpack across the American West.

Water Deeply: And how accurate are the forecasts you're generating?

Kapnick: We are working toward making probabilistic estimates, which can be described as estimates of likely ranges for potential futures. In the future we can give a range and use it to test the prediction skill.

We have all this modeling and it generates predictions of snowpack and, really, of climate in general. We actually also looked at temperature, precipitation and storm track. We cut up the western United States into tiny boxes and we produce predictions on these

REPUBLIC THIS ARTICLE

boxes. Then we cut up the regions into mountain ranges and tested our prediction skill over the different mountain ranges. What we find is, actually, the models were producing prediction skill over everywhere in the western U.S., all the mountain ranges, except for the southern Sierra Nevada.

For the snowpack predictions, we've produced "hindcasts," where you reproduce what the predictions would have been in the past for the 1981 through 2016 March snowpack. The metric we use is a correlation, which gives a number between -1 and 1 of how well the modeled ensemble mean correlates with the observed snowpack (1 being perfect, -1 being perfectly in reverse). We find the predictions are positively correlated (above 0.4 in most of the West) and statistically significant (better than guessing).

The model does need work, clearly, since we don't have the southern Sierra Nevada. There are certain aspects we think we can improve on.

The more pessimistic viewpoint is that perhaps the true prediction skill is not ever going to be perfect. Perhaps there are certain chaotic elements to predicting snowpack that will limit our prediction skill.

The study gives us a proof of concept that there is prediction skill in the western U.S. It's a starting point. But now, going into the future, we need to develop these models further and really explore what the limits of prediction are.

Water Deeply: What's the prediction problem in the southern Sierra Nevada?

Kapnick: South of about 39 degrees latitude – about where Stockton is – in that region of the Sierras you just have a lot more variability in precipitation and our model is not capturing the extreme variability year to year. In the southern Sierra, 50 percent of total precipitation in a year can occur in only five to 10 days of storms. Even one storm or two can actually generate the majority of the precipitation for a year. So it makes it more difficult to predict how much snowpack there will be because there are so few storms.

The southern Sierra is also extremely narrow and also much higher in elevation. Our model, even at 25km [15-mile] resolution, may not

have high enough resolution. There are also certain dynamics about what causes precipitation in really narrow mountain ranges that maybe isn't captured in our model.

Water Deeply: Can these forecasts help us plan ahead for winter?

Kapnick: As of now, this paper is purely for research. I'm not using it for [forecast] operations and it's not currently being transitioned to operations. But I work at NOAA, and I am doing the research, and our hope is to further develop the prediction system so these seasonal predictions will ultimately be transitioned to operations – either operational prediction of snowpack or operational forecasts in general. The major focus of my work right now is to improve these systems so they can be used operationally.

Water Deeply: How do you imagine it being useful, ultimately?

Kapnick: I have some ideas. Like, water managers will be able to use this information for managing year-to-year variability. But I'm sure there are lots of other uses. There's a hope a farmer might be able to use information like this to determine what to plant when. If you have a particularly dry year coming, it might influence what you decide to plant. ■

CLIMATE # SNOWPACK # WEATHER

About the Author



Matt Weiser

Matt Weiser is a contributing editor at Water Deeply. Contact him at matt@newsdeeply.org or via Twitter at [@matt_weiser](https://twitter.com/matt_weiser).

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