CARMICHAEL WATER DISTRICT

SPECIAL BOARD MEETING
AGENDA PACKET

August 7, 2025

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POSTED: AUGUST 5, 2025

CARMICHAEL WATER DISTRICT

Special Board Meeting - Thursday, August 7, 2025, 4:00 p.m.

Carmichael Water District Board Room
7837 Fair Oaks Boulevard
Carmichael, CA 95608

AGENDA

The Board will discuss all items on its agenda, and may take action on any of those items, including information items and continued items. The Board will not take action on or discuss any item not appearing on the posted agenda, except: (a) upon a determination by a majority vote of the Board that an emergency situation exists; or (b) upon a determination by a two-thirds vote of the Board members present at the meeting, or, if less than two-thirds of the members of the Board are present, a unanimous vote of those members present, that the need to take immediate action became apparent after the agenda was posted. Agenda packets can be found at our website at carmichaelwd.org.

The Board of Directors welcomes and encourages participation in meetings. Public comment may be given on any agenda item as it is called and limited to three minutes per speaker. Matters not on the posted agenda may be addressed under Public Comment. Please follow Public Comment Guidelines found on the District's website at carmichaelwd.org/public-comment-guidelines/.

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 the General Manager at 483-2452. Requests must be made as early as possible, and at least one full business day before the start of the meeting.

CALL TO ORDER AND STATEMENT REGARDING PUBLIC PARTICIPATION: President Greenwood

ROLL CALL

PRESIDENTS COMMENTS

PUBLIC COMMENT:

1. **Public Comment**
   Any member of the public may address the Board on any item of interest to the public that is within the subject matter jurisdiction of the Board.

ACTION CALENDAR:

2. **Sacramento Regional Water Bank Update and Starting Balance**
   Staff recommends that the Board of Directors discuss the item and provide direction or consider an action as appropriate.

The next meeting of the Board of Directors will be a Regular Board Meeting held on:
Monday, August 18, 2025 at 6:00 p.m.

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Topic: Sacramento Regional Water Bank – Starting Balance
Date: August 5, 2025
Item For: Action

Submitted By: Cathy Lee, General Manager

BACKGROUND

As reported to the Board previously, the Sacramento Regional Water Bank is considering a "starting balance" for water that has previously been banked from the conjunctive use practice via in-lieu groundwater recharge. The goal of "starting balance" is to evaluate the amount of previously banked water that the regional conjunctive use participates may receive as a starting balance.

At the January 2025 Regular Board meeting, the Board approved the Sacramento Regional Water Bank, Starting Balance Modeling Analysis Program Agreement with the Regional Water Authority (RWA). The Starting Balance Funding Group participating agencies are City of Sacramento, Sacramento County Water Agency, Sacramento Suburban Water District, Golden State Water Company, and the District.

SUMMARY/DISCUSSION

The portion of groundwater basin within the Sacramento Groundwater Authority (SGA) appears to be in good condition due to past conjunctive use efforts allowing water to be "banked" to achieve groundwater level goals. The Starting Balance Modeling Analysis is to address the question:

> *"How much water has been banked (recharged) in the North American and South American subbasins (NASb &SASb) by Water Bank Participating Agencies that is above and beyond what (1) is needed for sustainability under SGMA developed GSPs, (2) has already been transferred, and (3) has been lost from the subbasins?"*

RWA selected Woodard & Curran to conduct the modeling analysis using the region's CoSANA model and Trevor Joseph, RWA's Manager of Technical Services will be in attendance to present the draft results.

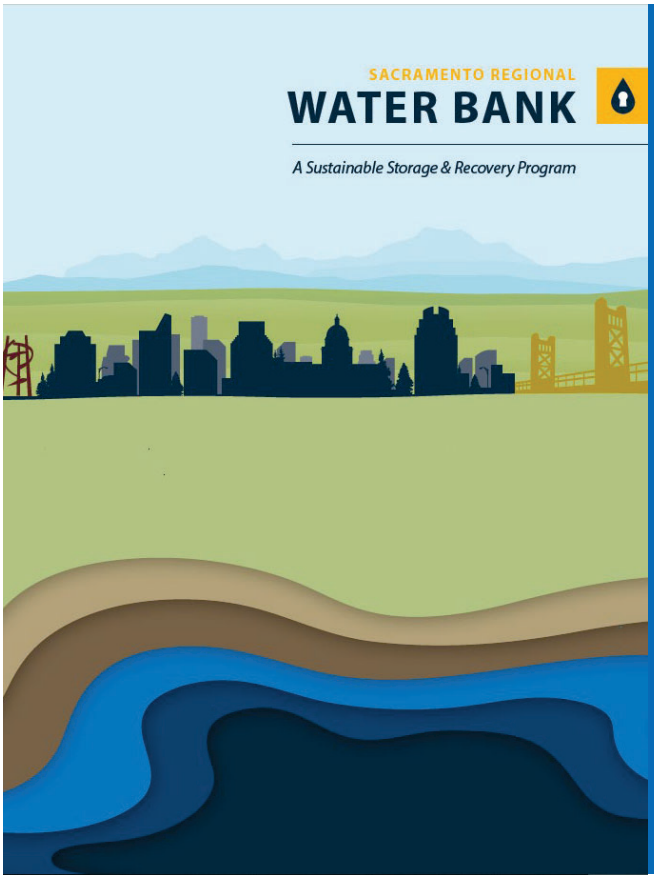
Additionally, the environmental community has taken a keen interest in the Water Bank and RWA staff also received comments from Environmental Council of Sacramento (ECOS) seeking clarification on the Water Bank's loss, water accounting, leave behind policy, interaction with GSAs, and public interaction. This modeling would provide some technical analysis to address some of the comments.

RECOMMENDATION

Staff recommends that the Board of Directors discuss the item and provide direction or consider an action as appropriate.

ATTACHMENT(S)

1. Water Bank – Project update to Carmichael Water District



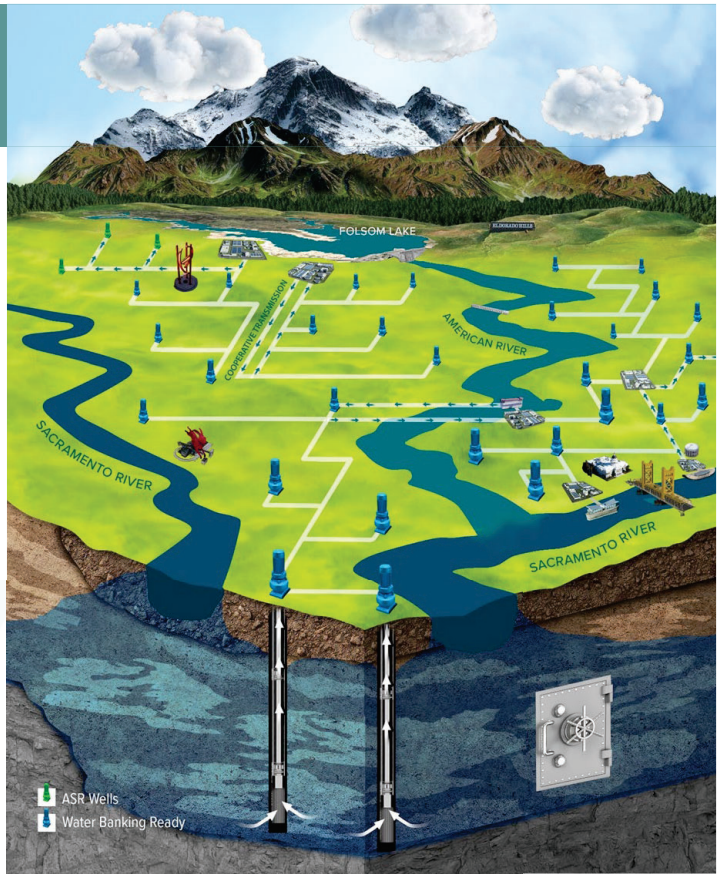
Water Bank – Project Update to Carmichael Water District

August 7, 2025

RWA
Regional Water Authority
BUILDING ALLIANCES IN NORTHERN CALIFORNIA

Water Bank Project Update

- Project Background & Overview
- Project Development & Status Update
- Water Bank Starting Balance
  - Background
  - Analysis
  - Results



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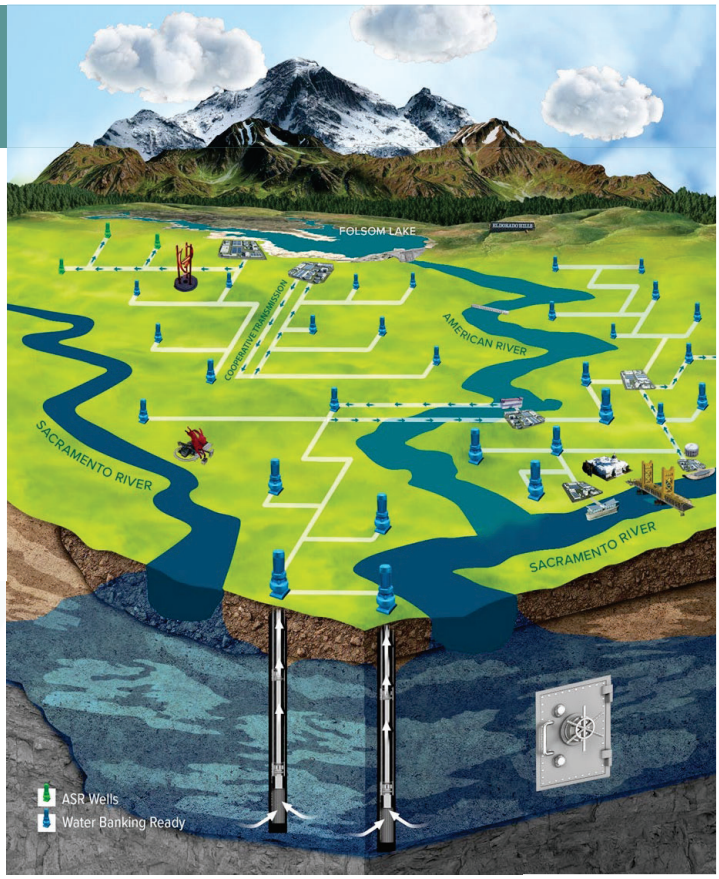
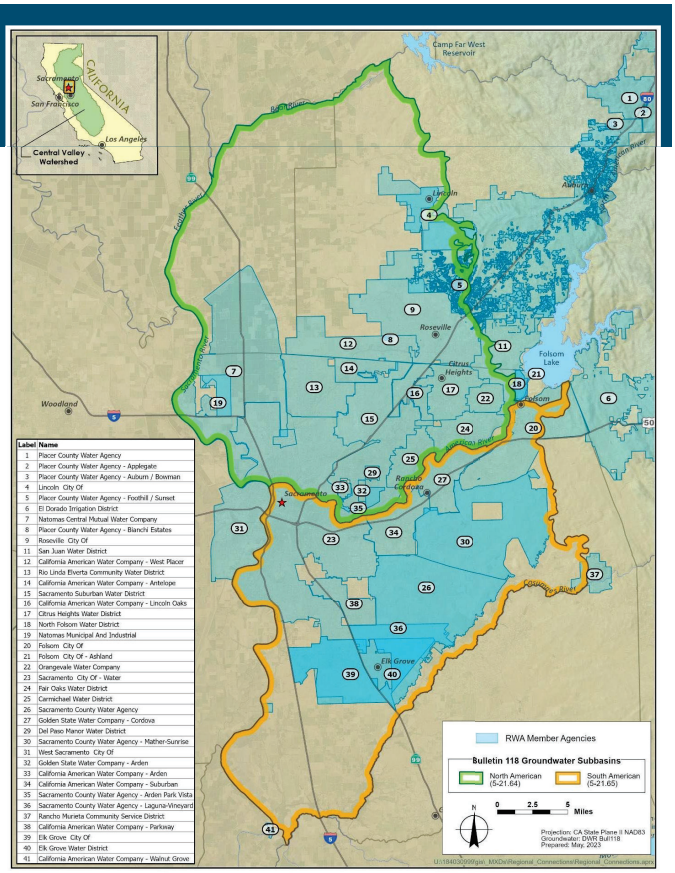


Sacramento Regional Water Bank Participating Agencies



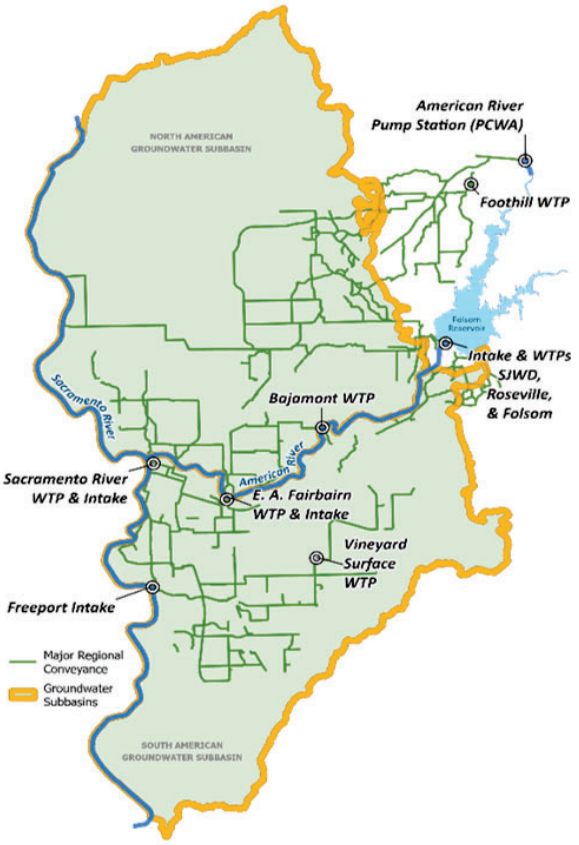
Carmichael Water District — August 7, 2025

Water Bank Overview

Expand conjunctive use in the region to:

1. Improve long-term regional reliability and provide statewide water supply opportunities when possible; and
2. Support healthy ecosystem function on the lower American River.

- With existing infrastructure:
  - recharge up to 65,000-acre feet per year during wet periods
  - recover up to 55,000-acre feet per year during dry periods.
- Up to 35,000-acre feet per year of banked water supplies year may be transferred out of the basin.

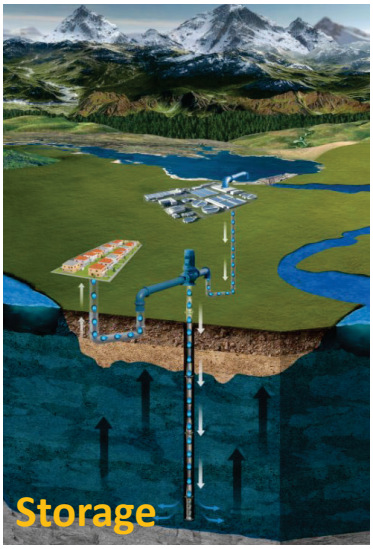


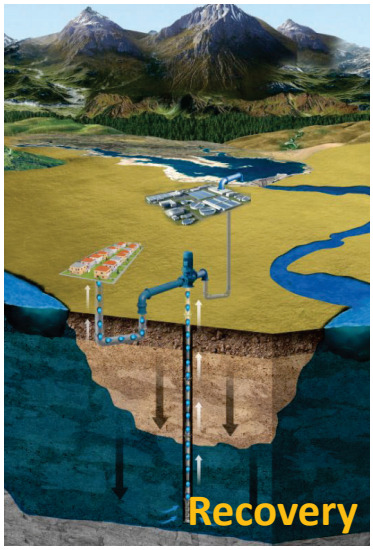
Why a Water Bank?

RWA Regional Water Authority
BUILDING ALLIANCES IN NORTHERN CALIFORNIA

Carmichael Water District — August 7, 2025

- Advances, modernizes, and institutionalizes existing regional conjunctive use activities
  - Water supply reliability
  - Groundwater sustainability
  - Regional/State water transfers - offsets agency costs and further incentivizes CU Supports Healthy Rivers & Landscapes Program
  - Provided ecosystem benefits
  - Aids in delta outflow
  - Pumping energy savings
  - Advances regional water management





Water Bank Project Update

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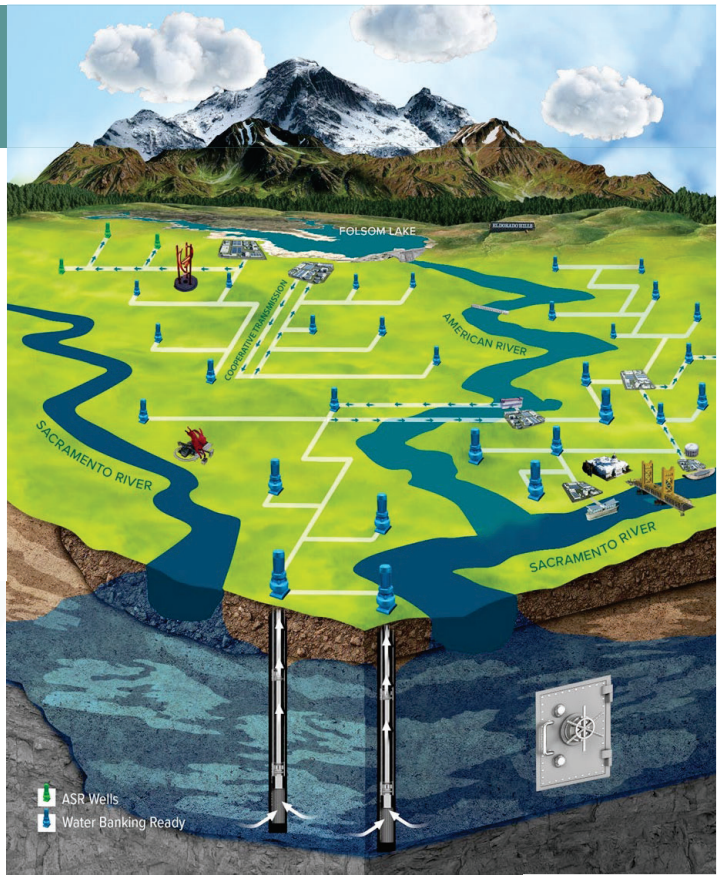
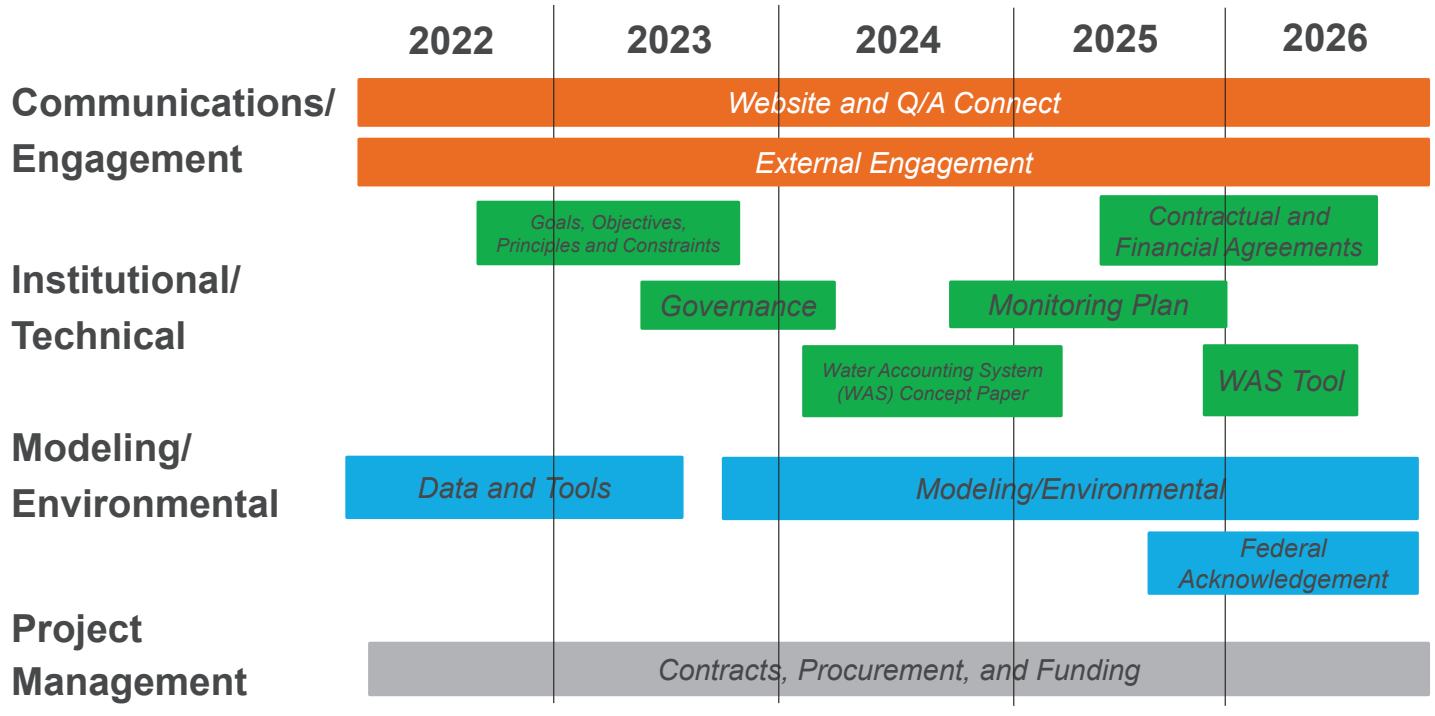


Water Bank Project — Tasks/Activities

Subject to change

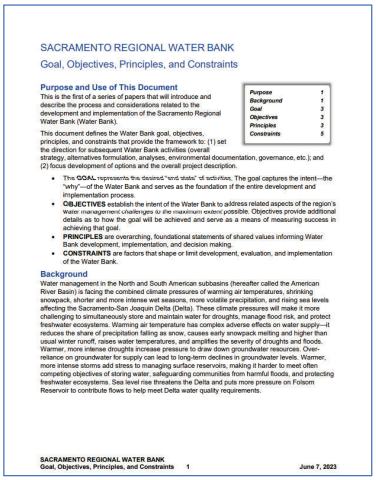
Regional Water Authority
BUILDING ALLIANCES IN NORTHERN CALIFORNIA

Carmichael Water District — August 7, 2025



Water Bank Key Documents

GOPC (completed June 2023)



SACRAMENTO REGIONAL WATER BANK

Goal, Objectives, Principles, and Constraints

Purpose and Use of This Document

This is the first of a series of papers that will introduce and describe the process and considerations related to the development and implementation of the Sacramento Regional Water Bank (Water Bank).

Purpose	1
Background	1
Goal	3
Objectives	3
Principles	3
Constraints	5

This document defines the Water Bank goal, objectives, principles, and constraints that provide the framework to: (1) set the direction for subsequent Water Bank activities (overall strategy, alternatives formulation, analyses, environmental documentation, governance, etc.); and (2) focus development of options and the overall project description.

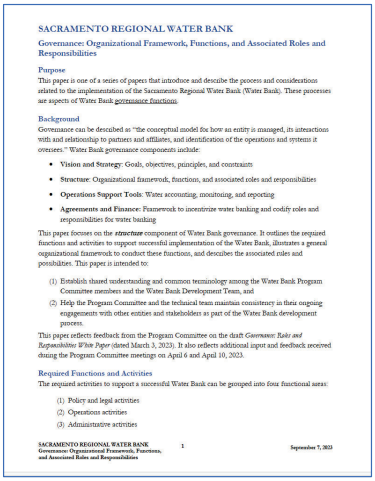
- The **GOAL** represents the desired "end-state" of activities. The goal captures the intent—the "why"—of the Water Bank and serves as the foundation of the entire development and implementation process.
- **OBJECTIVES** establish the intent of the Water Bank to address related aspects of the region's water management challenges to the maximum extent possible. Objectives provide additional details as to how the goal will be achieved and serve as a means of measuring success in achieving that goal.
- **PRINCIPLES** are overarching, foundational statements of shared values informing Water Bank development, implementation, and decision making.
- **CONSTRAINTS** are factors that shape or limit development, evaluation, and implementation of the Water Bank.

Background

Water management in the North and South American subbasins (hereafter called the American River Basin) is facing the combined climate pressures of warming air temperatures, shrinking snowpack, shorter and more intense wet seasons, more volatile precipitation, and rising sea levels affecting the Sacramento-San Joaquin Delta (Delta). These climate pressures will make it more challenging to simultaneously store and maintain water for droughts, manage flood risk, and protect freshwater ecosystems. Warming air temperature has complex adverse effects on water supply—it reduces the share of precipitation falling as snow, causes early snowpack melting and higher than usual winter runoff, raises water temperatures, and amplifies the severity of droughts and floods. Warmer, more intense droughts increase pressure to draw down groundwater resources. Over-reliance on groundwater for supply can lead to long-term declines in groundwater levels. Warmer, more intense storms add stress to managing surface reservoirs, making it harder to meet often competing objectives of storing water, safeguarding communities from harmful floods, and protecting freshwater ecosystems. Sea level rise threatens the Delta and puts more pressure on Folsom Reservoir to contribute flows to help meet Delta water quality requirements.

SACRAMENTO REGIONAL WATER BANK
Goal, Objectives, Principles, and Constraints 1 June 7, 2023

Governance (completed Sept 2023)



SACRAMENTO REGIONAL WATER BANK

Governance: Organizational Framework, Functions, and Associated Roles and Responsibilities

Purpose

This paper is one of a series of papers that introduce and describe the process and considerations related to the implementation of the Sacramento Regional Water Bank (Water Bank). These processes are aspects of Water Bank governance functions.

Background

Governance can be described as "the conceptual model for how an entity is managed, its interactions with and relationship to partners and affiliates, and identification of the operations and systems it oversees." Water Bank governance components include:

- **Vision and Strategy:** Goals, objectives, principles, and constraints
- **Structure:** Organizational framework, functions, and associated roles and responsibilities
- **Operations Support Tools:** Water accounting, monitoring, and reporting
- **Agreements and Finance:** Framework to incentivize water banking and codify roles and responsibilities for water banking

This paper focuses on the *structure* component of Water Bank governance. It outlines the required functions and activities to support successful implementation of the Water Bank, illustrates a general organizational framework to conduct these functions, and describes the associated roles and responsibilities. This paper is intended to:

(1) Establish shared understanding and common terminology among the Water Bank Program Committee members and the Water Bank Development Team, and
(2) Help the Program Committee and the technical team maintain consistency in their ongoing engagements with other entities and stakeholders as part of the Water Bank development process.

This paper reflects feedback from the Program Committee on the draft *Governance Roles and Responsibilities White Paper* (dated March 3, 2023). It also reflects additional input and feedback received during the Program Committee meetings on April 6 and April 10, 2023.

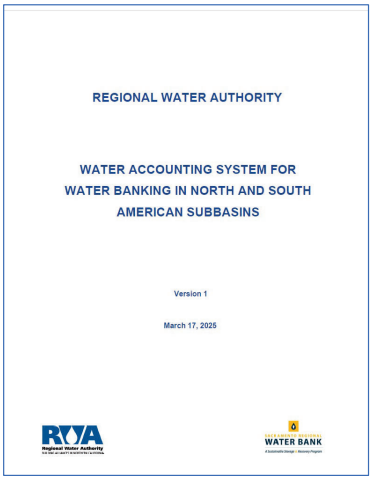
Required Functions and Activities

The required activities to support a successful Water Bank can be grouped into four functional areas:

(1) Policy and legal activities
(2) Operations activities
(3) Administrative activities

SACRAMENTO REGIONAL WATER BANK
Governance: Organizational Framework, Functions, and Associated Roles and Responsibilities 1 September 7, 2023

Water Accounting System (completed March 2025)



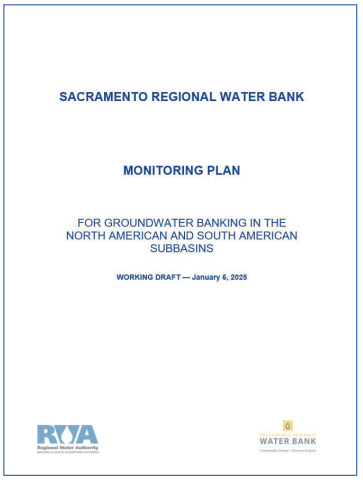
REGIONAL WATER AUTHORITY

WATER ACCOUNTING SYSTEM FOR WATER BANKING IN NORTH AND SOUTH AMERICAN SUBBASINS

Version 1

March 17, 2025

Monitoring Plan (in progress)



SACRAMENTO REGIONAL WATER BANK

MONITORING PLAN

FOR GROUNDWATER BANKING IN THE NORTH AMERICAN AND SOUTH AMERICAN SUBBASINS

WORKING DRAFT — January 6, 2026

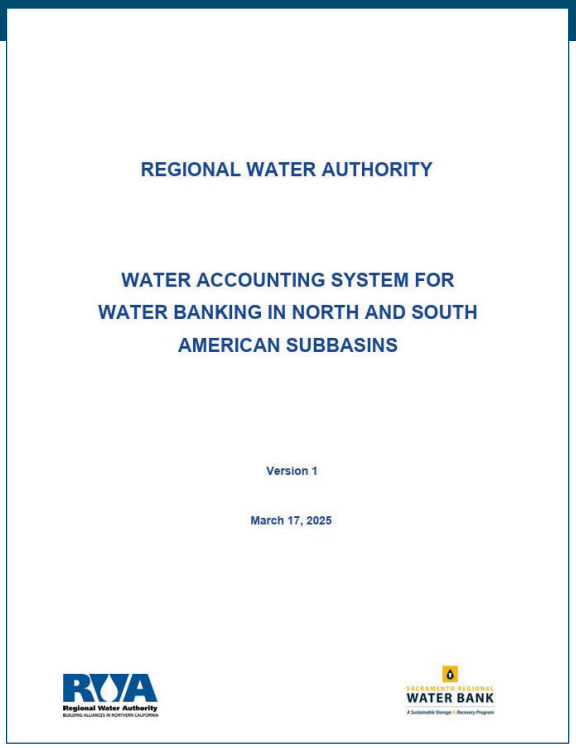
Stream Depletion (pending)

Modeling Appendix (pending)

CEQA (in progress)

NEPA (pending)

Water Bank Water Accounting System (WAS)



REGIONAL WATER AUTHORITY

WATER ACCOUNTING SYSTEM FOR WATER BANKING IN NORTH AND SOUTH AMERICAN SUBBASINS

Version 1

March 17, 2025

Purpose

The Water Accounting System (or WAS) is designed to effectively and transparently manage and monitor water banking activities within the North and South American Subbasins.

1. In-lieu and Direct Recharge Criteria/Methodology
2. Foundational Principles of Effective Banking
3. Integration of Sustainable Groundwater Management Act Requirements

Water Bank Layers of Protection

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Single Year Groundwater Substitution Transfers

Layer 4 – Mitigation Plan
(Identifies process to evaluate impacts after they occur)

Layer 3 – Monitoring Plan
(Monitoring groundwater conditions)

Layer 2 – SDF
(Recharge occurs through a quasi technically reduction)

Layer 1 – Historic lows
(No pumping if historic low groundwater levels reached)

Sacramento Regional Water Bank

Layer 7 – Dispute Resolution
(Process to advance equitable solutions if issues arise)

Layer 6 – Adaptative Management
(Specific provisions that consider hydrological conditions to guide operations and support groundwater sustainability)

Layer 5 – Enhanced Monitoring Plan
(Expanded monitoring of groundwater conditions, with use of sentry wells around the banking area to track operations)

Layer 4 - Geographically Balanced Recharge/Recovery
(Recharge and extraction from the same basin and area)

Layer 3 – Leave Behind Requirements
(Application of leave behind when surface water is transferred)

Layer 2 – Banking Losses Tracking
(Periodic calculation of contributions to streams and other basins accurately calculate recoverable balances)

Layer 1 - Recharge before recovery
(Only operating with a positive balance via verified deposits (in-lieu & direct recharge)

Water Bank Project Update

- Project Background & Overview
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- **Water Bank Starting Balance**
  - **Background**
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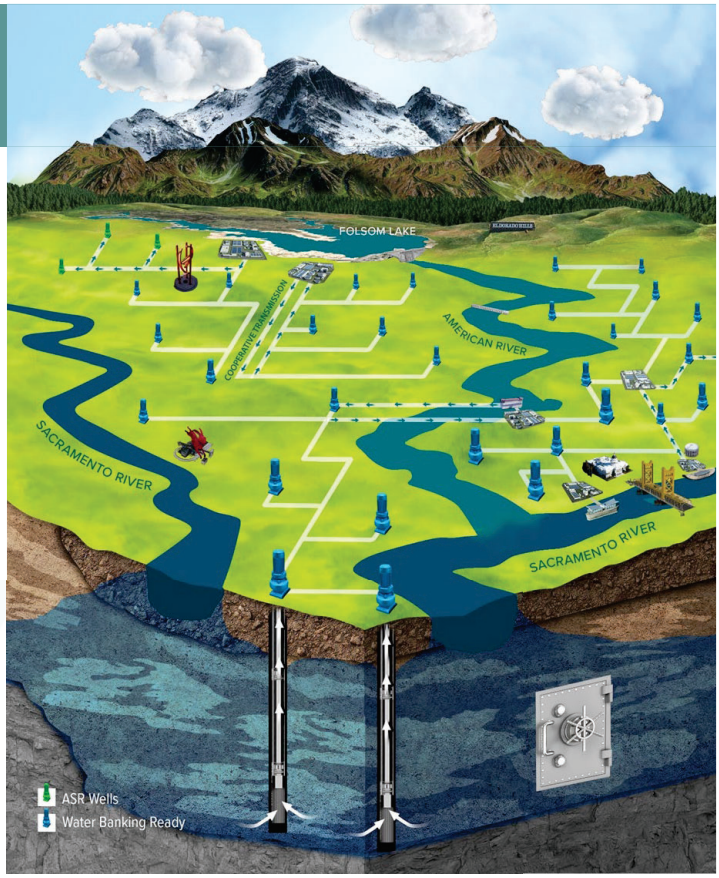
  - **Results**



Conjunctive Use and Banking History

1997
Cooperative Transmission Pipeline significantly advances NASb conjunctive use stabilizing groundwater conditions

2010
Freeport diversion and pipeline significantly advances SASb conjunctive use stabilizing groundwater conditions

2012
SGA's Water Accounting Framework (WAF) (established in 2010) including prior banked water (from late 1990s) provides annual documentation of conjunctive use volumes

2015
SGMA implementation begins

2021/2022
NASb and SASb GSPs adopted with Sac Water Bank as primary PMA

2022
Development of Sac Water Bank begins with goals to institutionalize and expand conjunctive through a recognized water bank

2023
DWR approves NASb and SASb GSPs as sustainable

2025
Prior conjunctive use and water banking volumes evaluated to ensure credibly balances are documented

Late 2025
Sac Water Bank environmental documentation and modeling with recognized starting balance continues

2027
Sac Water Bank completed, and implementation begins

Validation Criteria for PBW

Recharge Method

- Direct recharge or in-lieu recharge (surface water replacing groundwater use).

Established Baseline

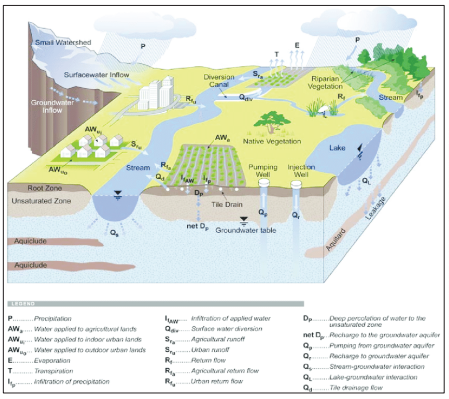
- Documented historical groundwater use.
- Demonstrable capacity to meet demand through groundwater use.

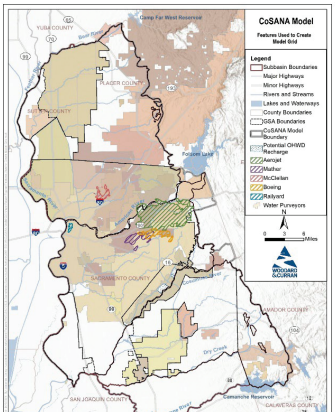
Operational Adjustment

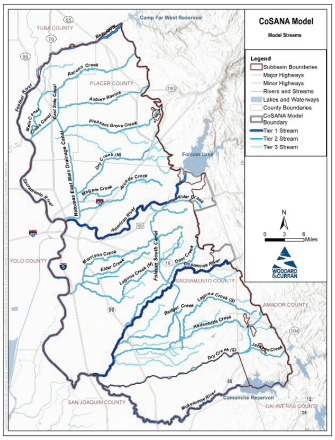
- Verified increase in surface water deliveries.

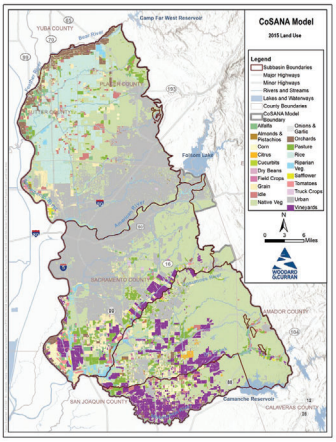
Cosumnes, South American, North American (CoSANA) Integrated Water Resources Model Features

- Recent version updated in 2021 to support the GSPs and SGMA implementation throughout the 3 Subbasins
- Hydrologic Period: WY 1970-2024
- Hydrogeologic features consistent with the GSP Hydrogeologic models
- Historical and projected land use conditions
- Historical and projected water supplies & operations
- Municipal and remediation wells
- Model Features:
  - Major and minor Streams
  - GSA Boundaries
  - Institutional and Jurisdictional Boundaries
  - Contamination Areas
  - Major Geological Features
- Calibrated to historical water budgets, GW levels, and Streamflows









CoSANA Modeling of PBW

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- Used the CoSANA historical groundwater model used for the NASb and SASb GSPs.
- Analyzed the conditions of the surface water and groundwater system during the historical period (1997-2024) with, and without PBW.
- Assumed that the historical conditions **are not different** between the with and without PBW scenarios, including trends of:
  - population, water demands
  - development, changes in land use
  - infrastructure, and regulatory environment.
- The composition of water supplies were adjusted to reflect more reliance on groundwater.
- The difference between the two scenarios produce the amount of remaining banked water that is available for use, after accounting for changes in stream seepage and subsurface flow dynamics.

Carmichael Water District — August 7, 2025

Documented and Verified PBW Amounts

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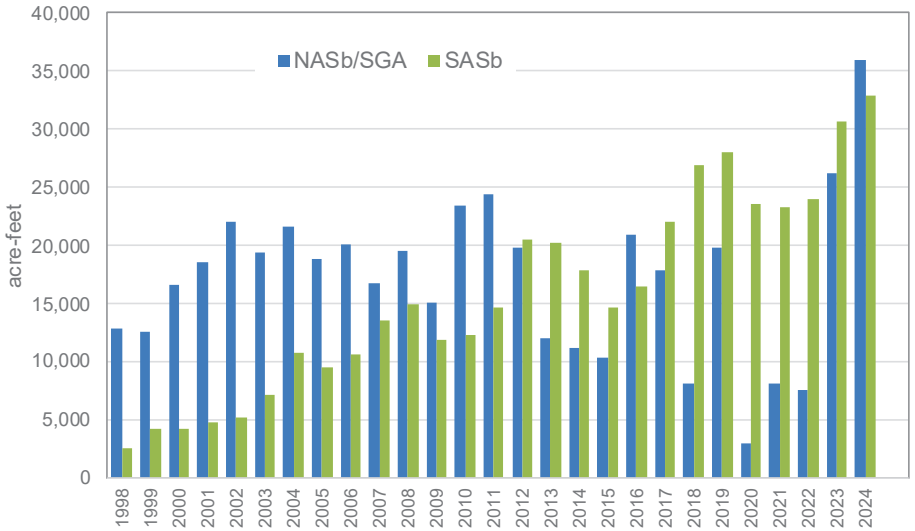
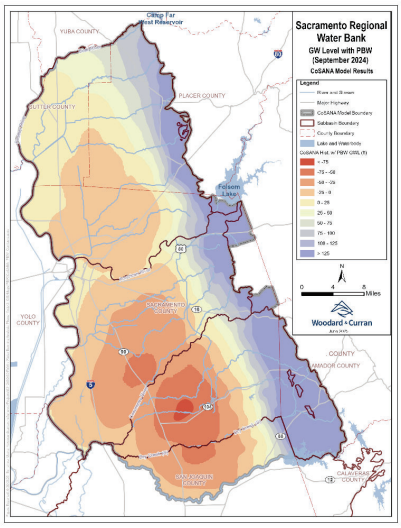
Agency	PBW (AF)
CalAm	17,102
COS	90,035
CWD	91,887
SSWD	268,541
NASb/SGA Subtotal	467,565
GSWC	215,166
SCWA	216,327
SASb Subtotal	431,493
TOTAL	**899,058**



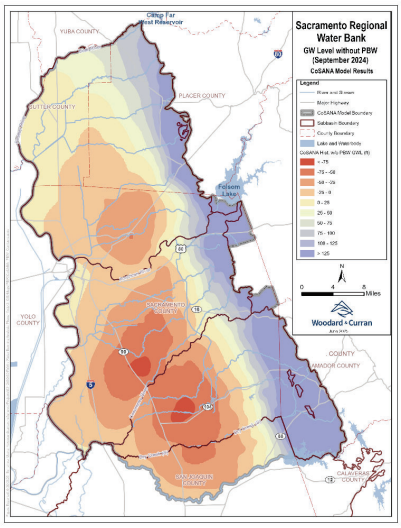
CoSANA Modeling of PBW

Regional Water Authority
BUILDING ALLIANCES IN NORTHERN CALIFORNIA

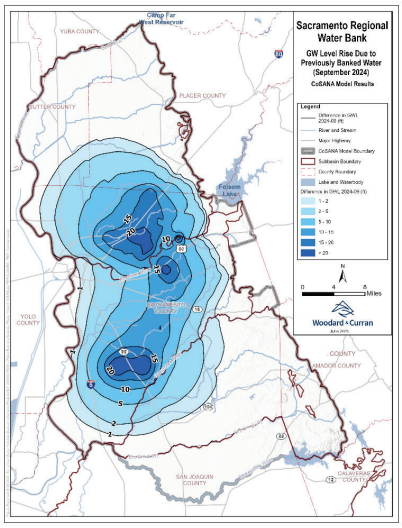
Groundwater level (GWL) contours at end of simulation period (Sep 2024)



Scenario 1: Historical Conditions **with** PBW

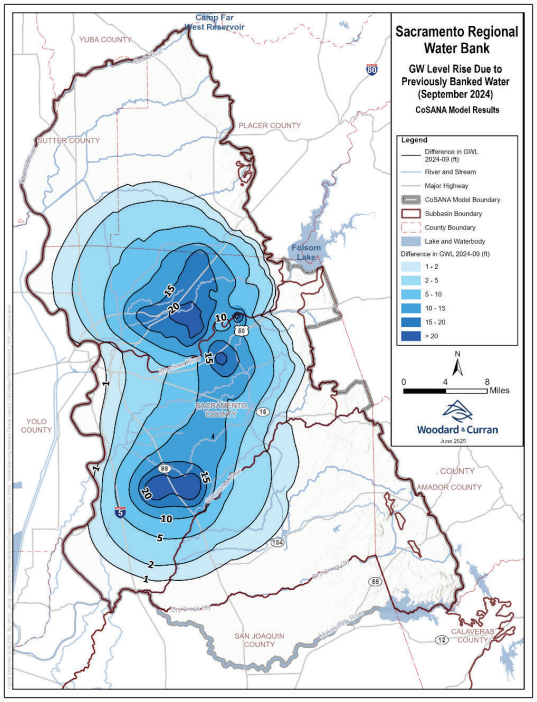


Scenario 2: Historical Conditions **without** PBW

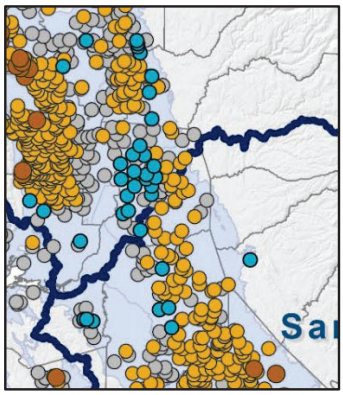


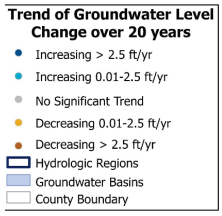
ΔGWL (Scenario 1 – Scenario 2) **Effect of PBW** on GWL

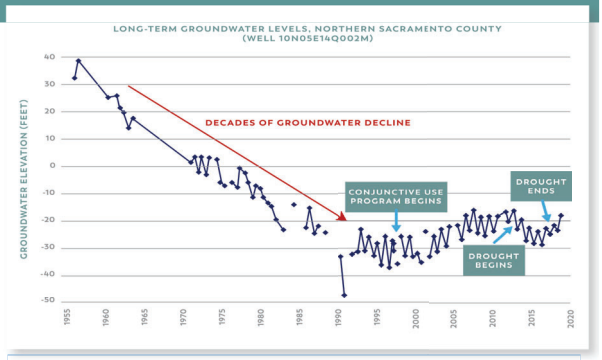
PBW has Resulted in Higher GW Storage

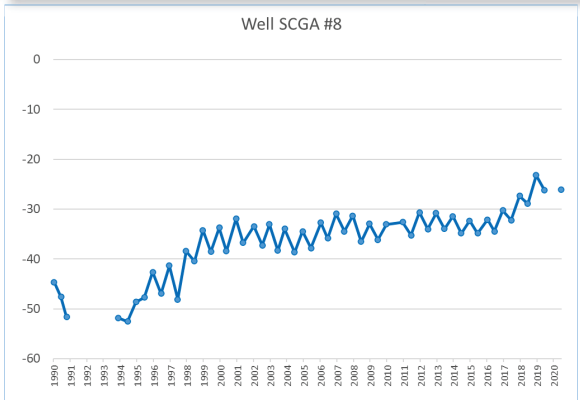


20-year Groundwater Level Trend (Water Years 2004 to 2024)

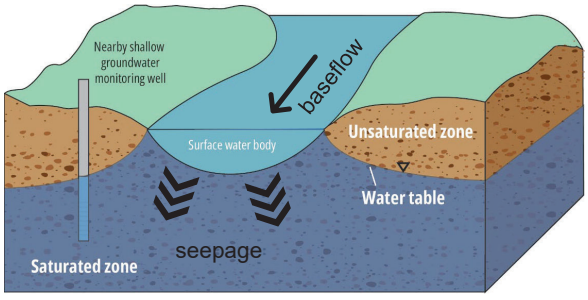






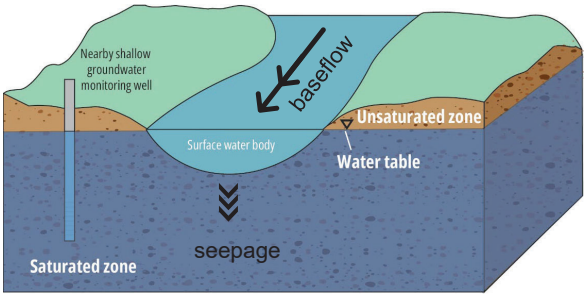


Higher Groundwater Levels Affect Seepage Conditions with the Interconnected Streams



Conditions without PBW

- Higher groundwater pumping
- Lower groundwater elevations
- More stream seepage
- Less baseflow in the streams



Conditions with PBW

- Lower groundwater pumping
- Higher groundwater level
- Less stream seepage
- More baseflow in the streams

PBW has Contributed to Changes in Stream Baseflows

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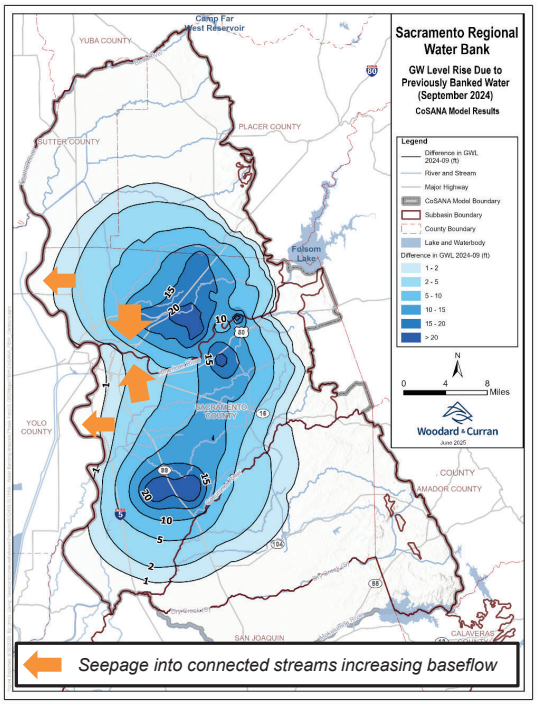
Changes in Seepage to/from Interconnected Surface Water Bodies:

- Higher groundwater levels due to PBW have resulted in less seepage from streams, and net increase in streams baseflow.
- PBW is reduced by amount equivalent to the net change in stream seepage (net increase in baseflow).



PBW has Contributed to Changes in Inter-basin Subsurface Flows

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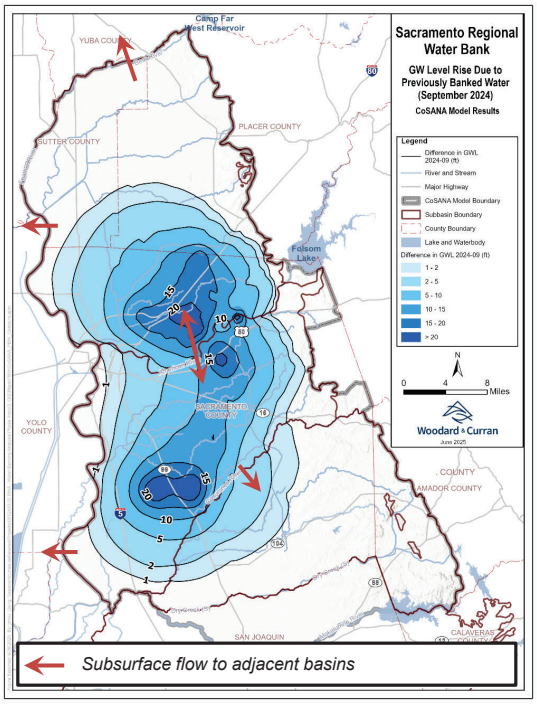
Changes in Subsurface Flow to/from Adjacent Basins:

- Higher groundwater levels due to PBW have resulted in net increased outflow to neighboring subbasins
- PBW is reduced by amount equivalent to the net increase in outflow to adjacent subbasins.



Remaining "In-Basin" Banked Water Accounts for Changes in Stream Seepage and Subsurface Flow

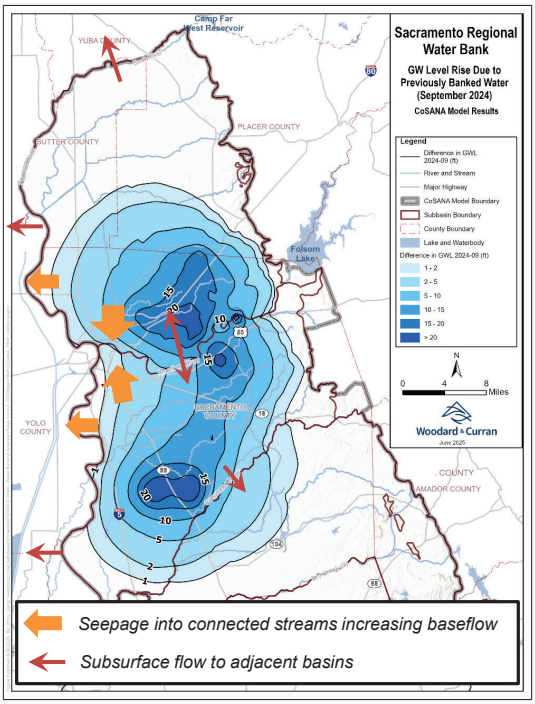
Remaining "In-Basin" Banked Water = PBW – A – B

PBW
- (A) Contribution to Streams
- (B) Subsurface Flow
- Remaining "In-Basin" Banked Water

PBW = Documented volume of water banked consistent with in-lieu and direct recharge methodology and criteria

A = PBW portion contributing to increased baseflow

B = PBW portion contributing to increased subsurface outflow to adjacent subbasins



Remaining "In-Basin" Banked Water Balances

PBW Volumes

NASb = 468 TAF

SASb = 431 TAF

Remaining "In-Basin" Banked Water

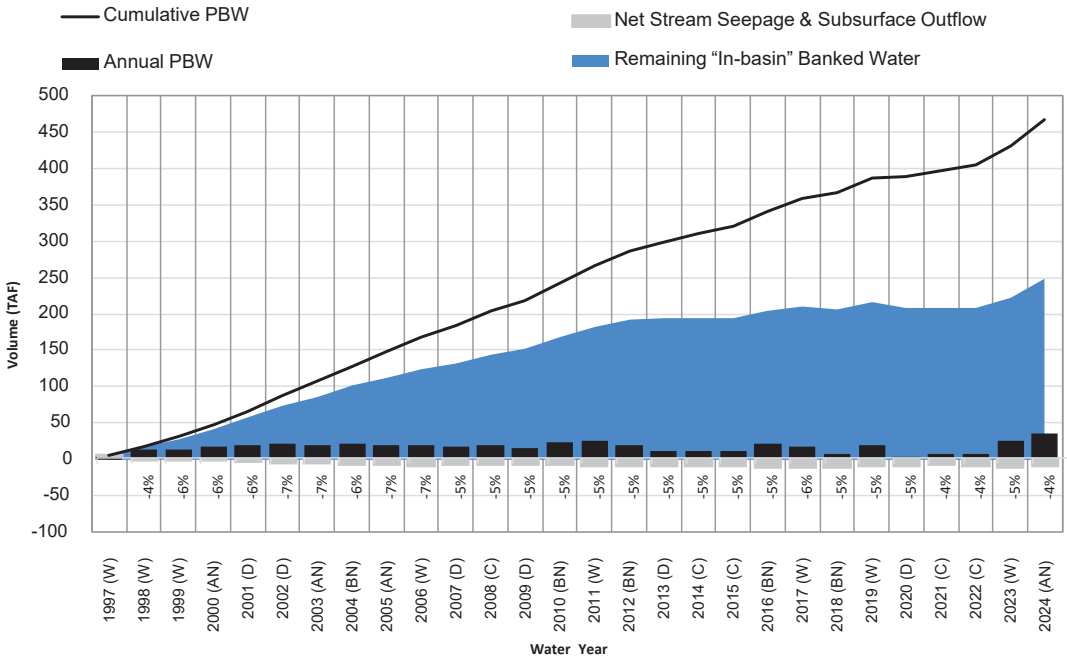
NASb = 248 TAF (53%)

SASb = 222 TAF (52%)

Agency	PBW (AF)	In-Basin PBW (AF)
CalAm	17,102	9,081
COS	90,035	47,807
CWD	91,887	48,791
SSWD	268,541	142,592
NASb/SGA Subtotal	467,565	248,271
GSWC	215,166	110,847
SCWA	216,327	111,446
SASb Subtotal	431,493	222,293
TOTAL	**899,058**	**470,564**

as of September 2024

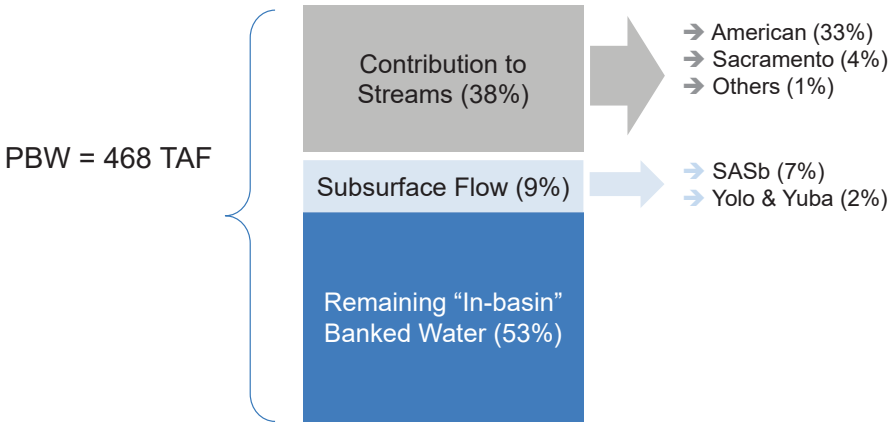
PBW Analysis - NASb



- Cumulative PBW = 468 TAF
- Remaining "In-basin" banked water = 248 TAF (53%)
- Remaining "In-basin" banked water reflects contribution to streams & subsurface outflow.
- Historical NASb contribution to streams & subsurface outflow ≈ 4 - 6% per year of banked water balance

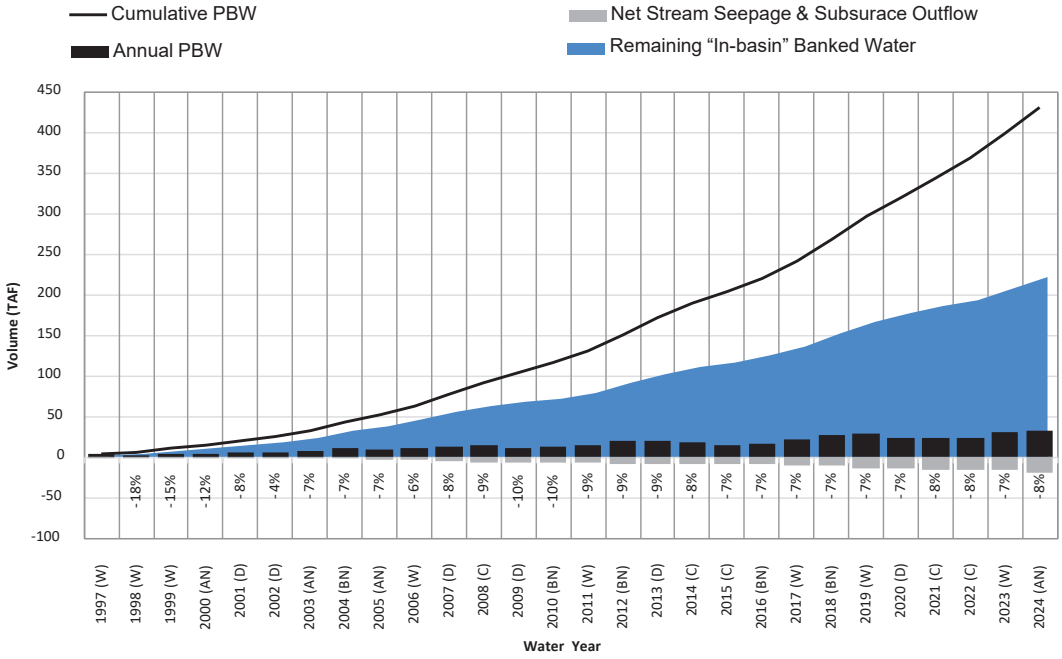
PBW Analysis - NASb

NASb's PBW Balance after 27 years (as of September 2024)



- Historical NASb contribution to streams & subsurface outflow ≈ 4 - 6% per year of banked water balance

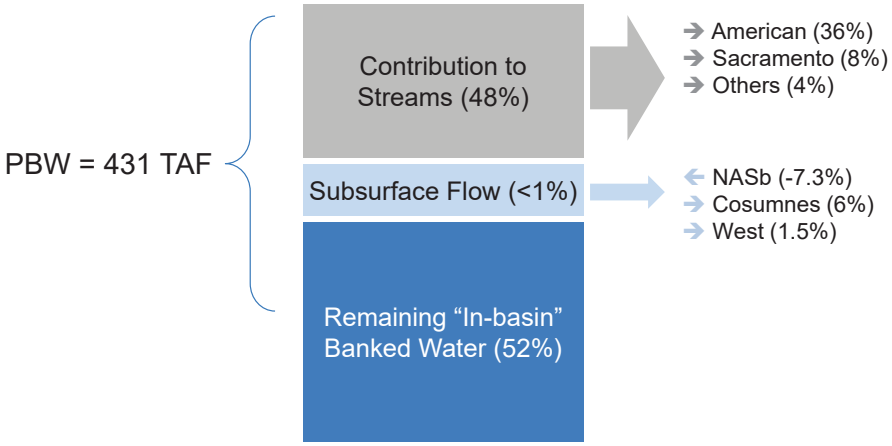
PBW Analysis - SASb



- Cumulative PBW = 431 TAF
- Remaining "In-basin" banked water = 222 TAF (52%)
- Remaining "In-basin" banked water reflects contribution to streams & subsurface outflow.
- Historical SASb contribution to streams & subsurface outflow ≈ 7 - 8% <u>per year of banked water balance</u>

PBW Analysis - SASb

<u>SASb's PBW Balance after 27 years (as of September 2024)</u>



- Historical SASb contribution to streams & subsurface outflow ≈ 7 - 8% <u>per year of banked water balance</u>

Banked Water Provides Multiple Benefits

- Ecosystem benefits
- Delta outflow
- Downstream
- Support Healthy Rivers & Landscapes

Connected streams → Contribution to Streams

- Groundwater sustainability
- Water reliability

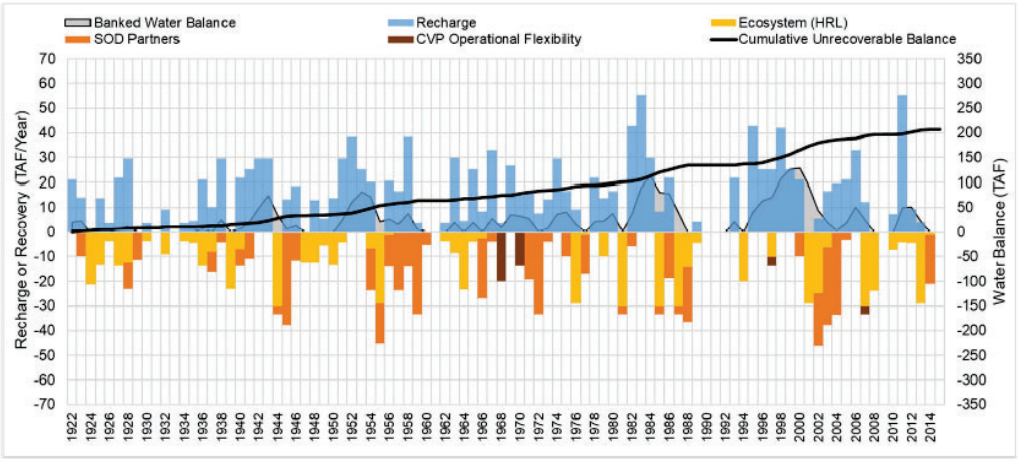
Adjacent Basins → Subsurface Flow

Remaining "In-basin" Banked Water

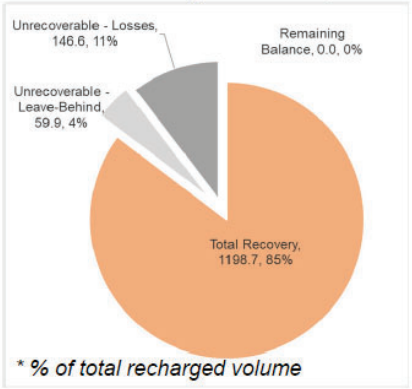
- Groundwater sustainability
- Water supply reliability
- Pumping energy savings
- Regional/State Water Transfers to offset Participating Agency costs and incentivize conjunctive use
- Support Healthy Rivers & Landscapes, American River Climate Adaptation Plan, etc.

Water Bank operations maximize In-Basin Banked Water

- Water Bank operations can be optimized to minimize losses because of the active recovery operations.



Cumulative Recharge volume = 1,400 TAF



Loss Factor = 6%
Leave-behind = 5%

Sacramento Regional Water Bank contact information:
waterbankinfo@rwah2o.org

Sacramento Regional Water Bank website: https://sacwaterbank.com

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