

2025 Draft State Water Project (SWP) Delivery Capability Report (DCR)



Credit: DWR Pixel, May 13, 2023



Outline

- Introduction- DCR
- Assumptions Overview
 - Existing Conditions
 - Future Conditions
 - DCR 2023 Differences
- Next steps
- Q&A



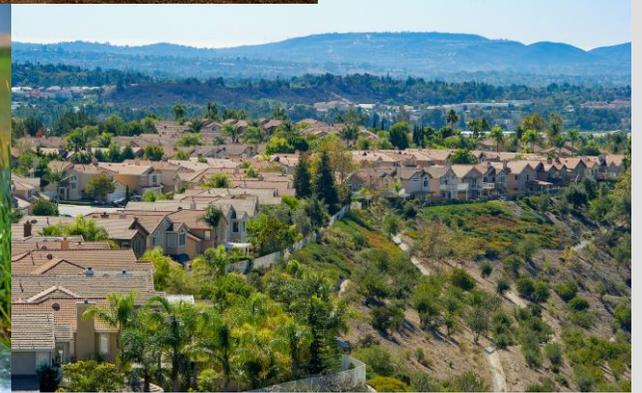
Delivery Capability Report (DCR)

- Bi-annual report of existing delivery capability
 - Over a range of hydrologic conditions
 - Historic extended dry cycle
 - Long-term average
- Future delivery capability added in 2007 looking 20-years into the future (business as usual + climate change)

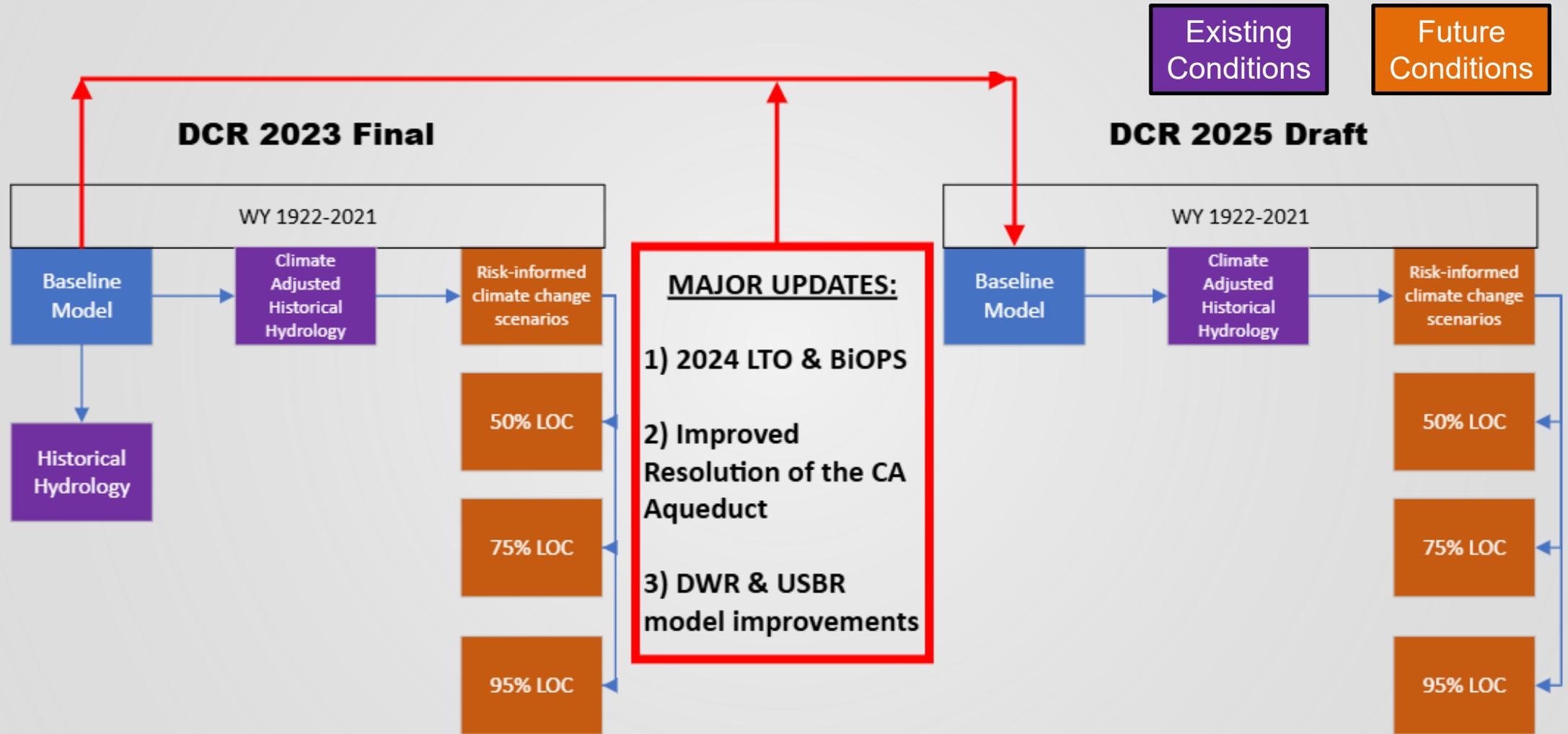


Why the DCR?

- Fundamental for drought planning
- Important input for Groundwater, Urban Water, Agricultural, and Integrated Regional Water Management Plans



Assumptions Overview



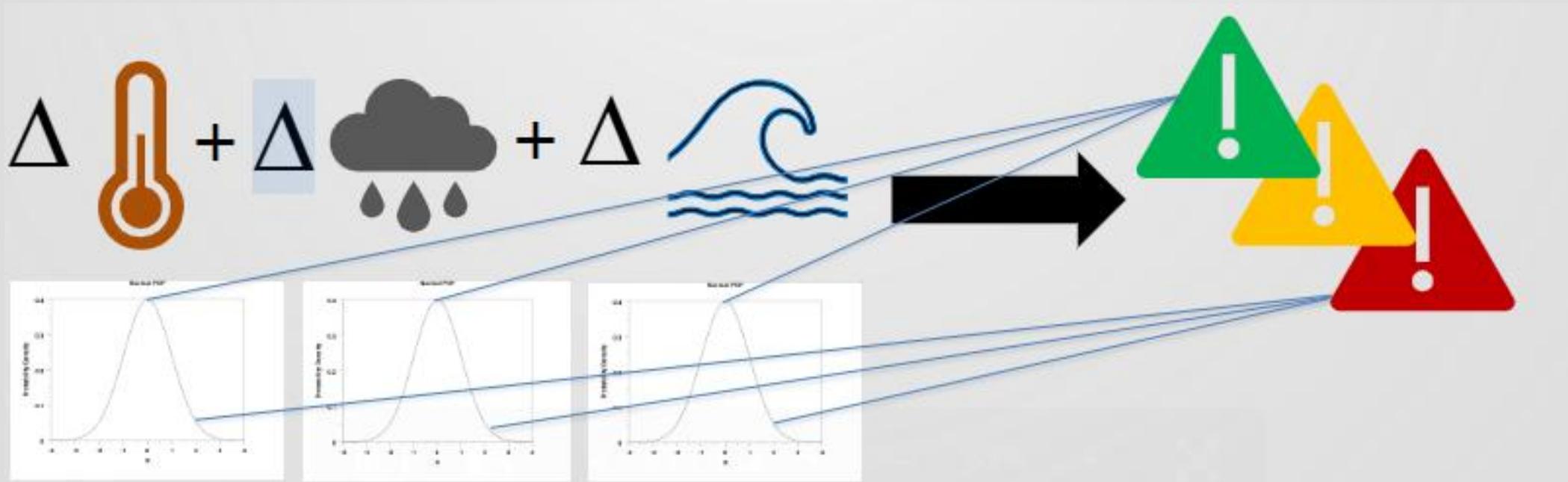
Assumptions: Existing Condition

- CalSim 3
- Hydrology:
 - Climate adjusted historical hydrology
 - Simulation period- 100 years (Water Year 1922-2021)
 - Level of development- 2020
- Regulations:
 - **2024 Incidental Take Permit (ITP) for SWP**
 - **2024 Biological Opinions (BiOPS)**
- **Model Improvements- DWR and USBR updates**
- **SWP Demand- Full Table A**



Assumptions: Future Condition

- Using risk-informed climate change hydrology, operations and regulations assumptions remain the same



Differences Between the 2023 and 2025 DCR

	Final DCR 2023 Existing Conditions	Draft DCR 2025 Existing Conditions
Simulation Period	1922-2021	Same as DCR 2023
Hydrology	Adjusted Historical	Same as DCR 2023
Regulations	<ul style="list-style-type: none"> • 2020 SWP ITP • 2019 BiOPS 	<ul style="list-style-type: none"> • 2024 SWP ITP • 2024 BiOPS
Model Improvements	-	<ul style="list-style-type: none"> • Improved Resolution of the CA Aqueduct • USBR Updates • Feather River Settlement Agreement Updates



2024 ITP and BiOPS

- New regulations issued in 2024:
 - ITP issued by CA Dept. of Fish and Wildlife (CDFW) on 11/04/2024
 - <https://water.ca.gov/News/News-Releases/2024/Nov-24/New-Operating-Permit-Issued-for-Californias-State-Water-Project>
 - Biological Opinion issued by US Fish and Wildlife Service (USFWS) on 11/08/2024
 - https://www.usbr.gov/mp/bdo/docs/11.8.24_Ito-final-biological-opinion.pdf
 - Biological Opinion issued by National Marine Fisheries Service (NMFS) on 12/06/2024
 - <https://www.fisheries.noaa.gov/resource/document/endangered-species-act-section-7a2-programmatic-biological-opinion-reinitiation>



2024 ITP and BiOPS

(continued)

- What changed?
 - Changes to Old Middle River (OMR) Flows
 - Spring Outflow Requirement
 - Expanded window of 10,300 cfs Banks Pumping Plant Capacity
 - Suisun Marsh Salinity Control Gate (SMSCG) Summer/Fall Operation
 - North Bay Aqueduct Diversion Constraints
 - Land Fallowing for Dedicated Delta Outflow



2024 ITP and BiOPS

(continued)

- What changed?
 - CVP Operation Assumptions
 - Shasta End-of-September Carryover Target
 - Minimum flow below Goodwin Dam
 - CVP Allocation
 - Settlement/Exchange
 - Refuges
 - Agricultural Service
 - Municipal & Industrial Service



Improved Resolution of the CA Aqueduct

- The California Aqueduct is now simulated at the “sub-pool” resolution
 - Resolution was added to the CA Aqueduct between Banks Pumping Plant and Edmonston Pumping Plant
 - It dis-aggregated diversions to more closely reflect the real locations



Photo: DWR pixel, October 2022

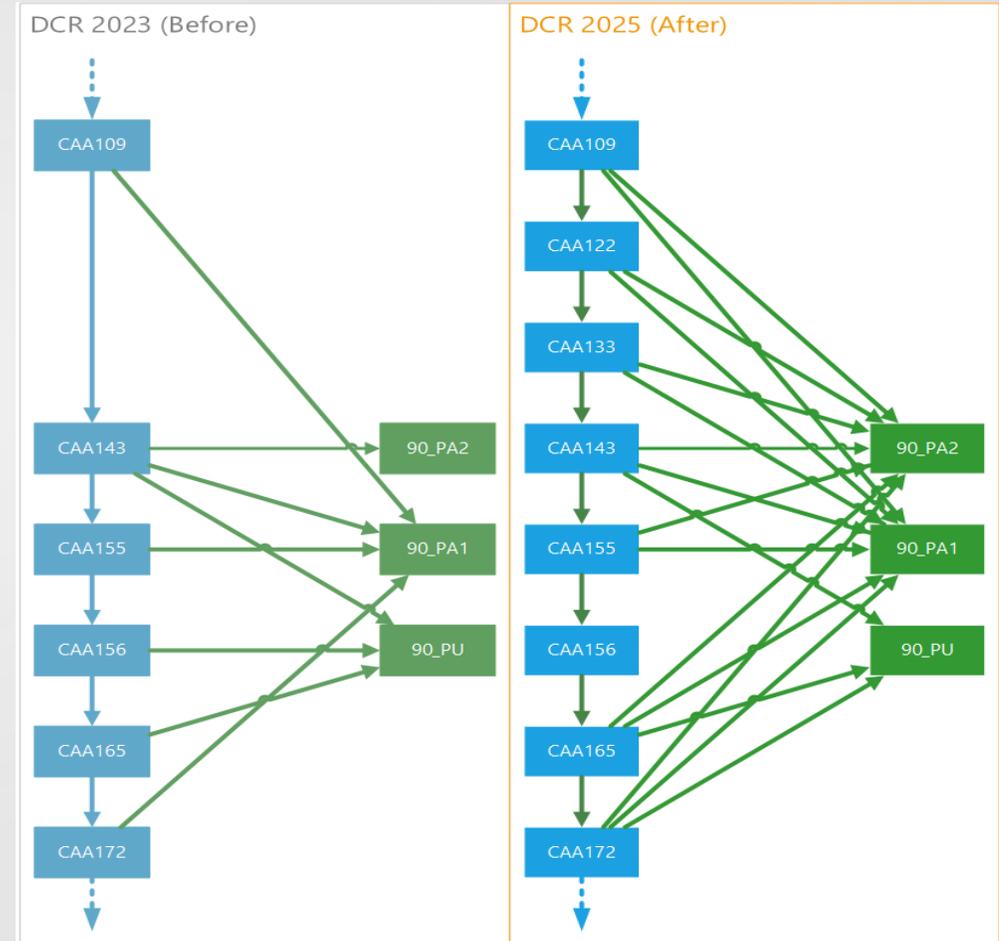
https://pixel-ca-dwr.photoshelter.com/search?terms=2022_10_12_FL_0130_Check_24_Drone.jpg



Improved Resolution of the CA Aqueduct

(continued)

- The additional resolution allows CalSim3 to simulate varied hydraulic conveyance capacity at the “pool” level



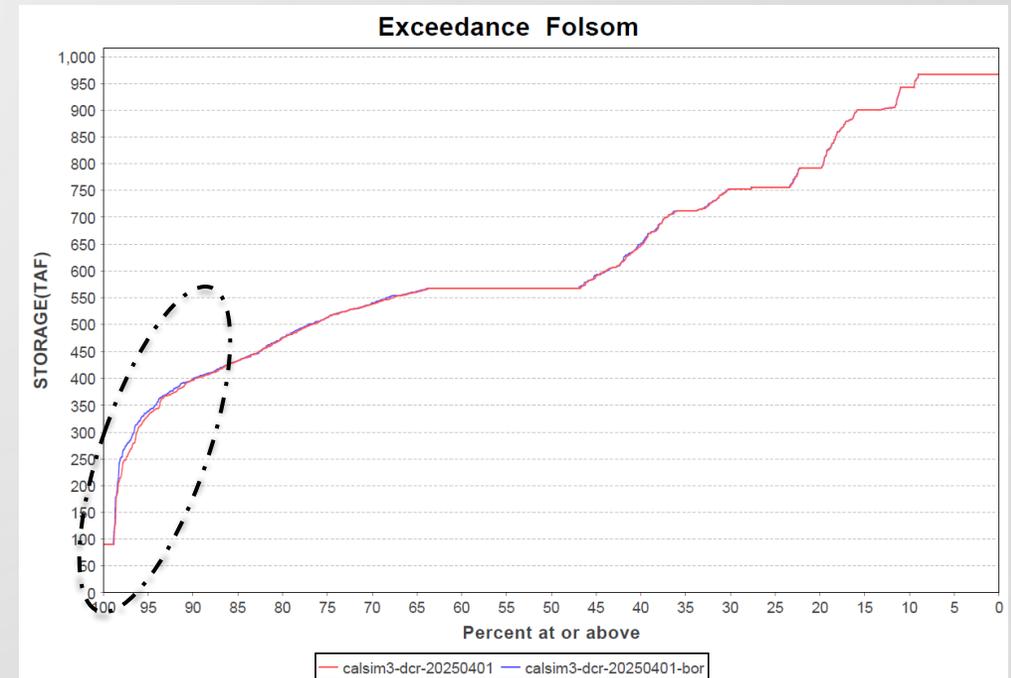
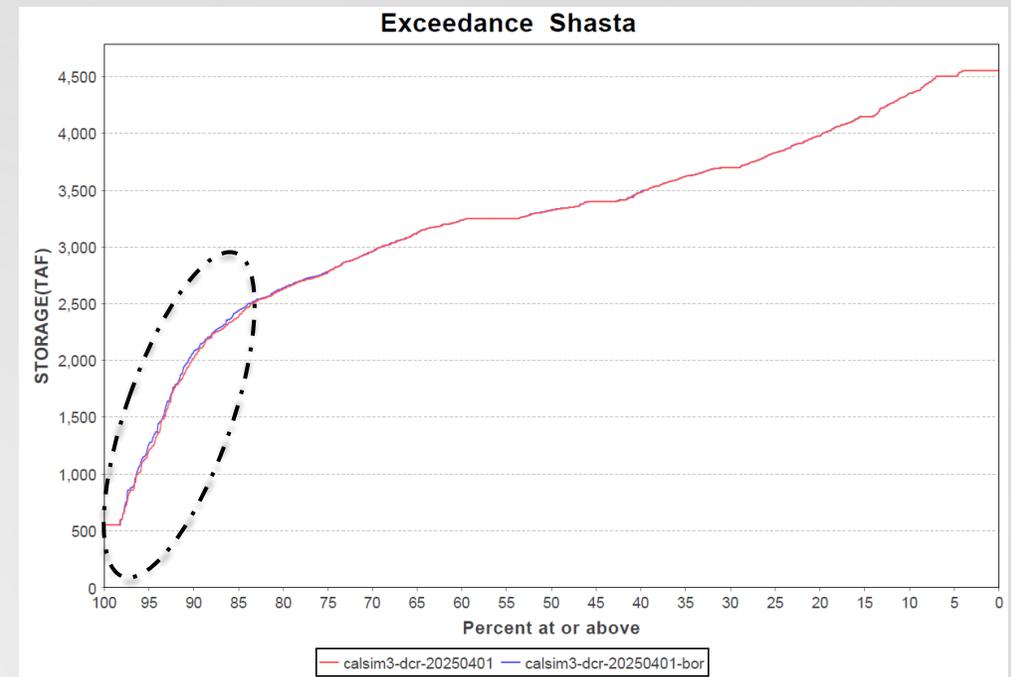
USBR Updates

Mainly code updates pertaining to:

- Temporary Urgency Change Petition (TUCP) actions- for code consistency, but toggled off
- CVP Municipal & Industrial (MI) delivery/shortage
- Delta Cross Channel (DCC) days opening in response to Shasta conditions

Key results:

- Minor impact on long term annual average values of Net Delta Outflow Index (NDOI), Delta exports, and SWP deliveries
- Minor improvement in Shasta and Folsom storages during dry periods

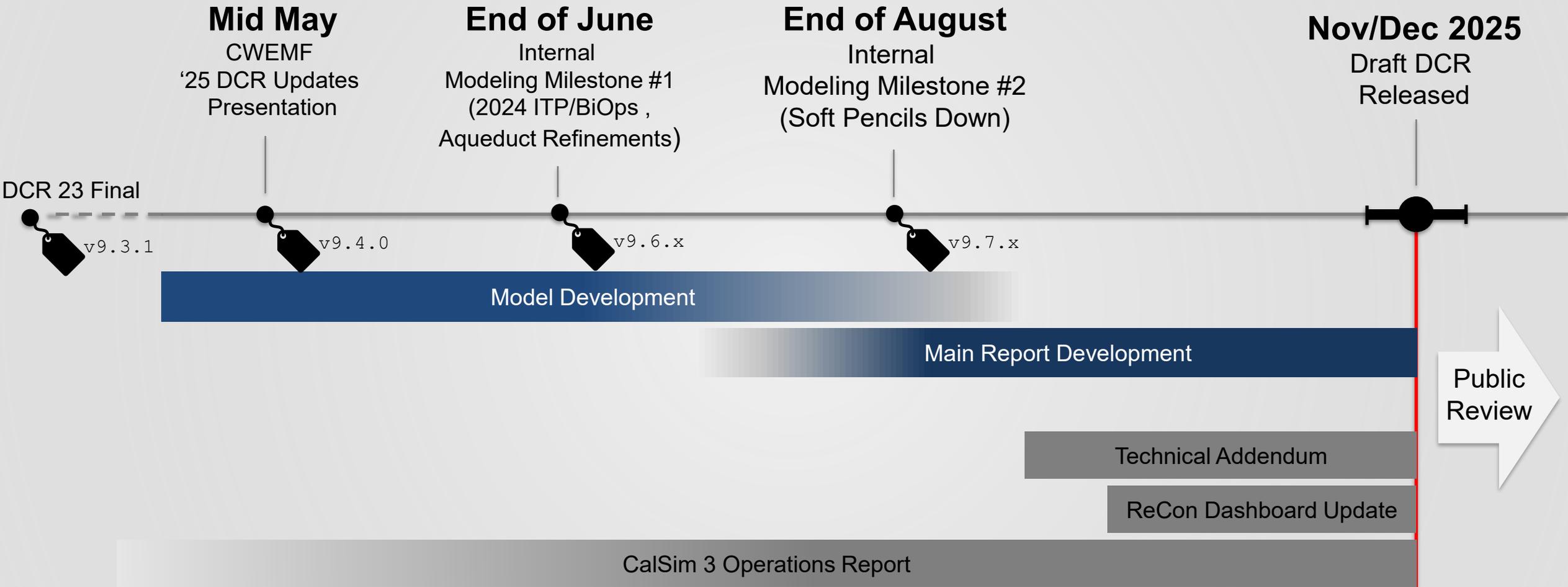


Feather River Settlement Agreement (FRSA)

- Adjusted code to make it more consistent with FRSA
 - Tracking of 145 TAF of contracted water to Western Canal Water District, aka WCWD, (i.e. from Upper Feather storage release to Thermalito Afterbay to WCWD)
 - Joint Water District Board agencies entitlement of up to 35 TAF of additional water in any year in which a temporary shortage occurs due to drought
 - Sutter Extension Water District increase in entitlement from 50 TAF to 65 TAF during wet years
- Overall, minimal impact on the original FRSA results



2025 Delivery Capability Report Timeline



Additional References

- DCR ReCon Dashboard
 - [Results Console](#)

- DCR Deliverables
 - <https://water.ca.gov/Library/Modeling-and-Analysis/Central-Valley-models-and-tools/CalSim-3/DCR>

- CalSim On Demand Training
 - [Training Overview - CalSim 3 Documentation](#)

The State Water Project Delivery Capacity Report 2023
July 2024

Welcome to the Delivery Capacity Report Results Console (ReCon), an interactive dashboard designed to complement the 2023 Delivery Capacity Report.

The Delivery Capacity Report is used widely both within and outside the SWP for water supply planning. The information in these reports is a key component of the drought planning done by the SWP and is fundamental to the drought planning done by the Public Water Agencies that receive SWP and Central Valley Project water. The Report provides the information needed by these agencies to develop and manage their own water supply portfolios and is an important input for Sustainable Groundwater Management Plans, Urban Water Management Plans, Agricultural Water Management Plans, and Integrated Regional Water Management Plans.

The most salient findings of the DCR 2023 are:

- Under existing conditions, the estimated average annual delivery of Table A water for this report is 2,202 TAF/year, 119 less than the 2,321 TAF/year estimated for the 2021 Report.
- The likelihood of existing condition SWP Article 21 deliveries being greater than 20 TAF/year has increased by 4 percent relative to the likelihood presented in the 2021 Report.
- Under the climate change scenarios, the estimated average annual delivery of Table A water shown in the three scenarios is 13 percent to 22 percent lower than under existing conditions.

Comments, questions and suggestions can be emailed to CVMsupport@water.ca.gov

Additional Resources

- [The DCR Report and Models](#)
- [Central Valley Modeling GitHub](#)
- [Climate Adjusted Historical Documentation](#)
- [Risk-Informed Future Climate Scenario Documentation](#)

Scenario Descriptions

- [DCR_21_Hist](#)
- [DCR_23_A6j](#)
- [DCR_23_CC50](#)
- [DCR_23_CC75](#)
- [DCR_23_CC95](#)

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Delivery Capability Report and Studies

The California Department of Water Resources released the Final State Water Project Delivery Capability Report for 2023. The Delivery Capability Report is used widely both within and outside the SWP for water supply planning. The information in these reports is a key component of the drought planning done by the SWP and is fundamental to the drought planning done by the Public Water Agencies that receive SWP and Central Valley Project water. The Report provides the information needed by these agencies to develop and manage their own water supply portfolios and is an important input for Sustainable Groundwater Management Plans, Urban Water Management Plans, Agricultural Water Management Plans, and Integrated Regional Water Management Plans.

Previous Delivery Capability Reports in digital format or hard copy are available upon request.

Please direct report requests, comments and questions to CVMsupport@water.ca.gov or **California Department of Water Resources**
SWP Delivery Capability Report- Attn: Madusha Yakupitiyage
P.O. Box 942836
Sacramento, CA 94236-0001

CalSim 3 Documentation

Search docs

Home
Hello CalSim
Post-Processing
Model Setup
Lookup Tables
Common CalSim 3 Variables
Common CalSim 2 Variables (Legacy)
Glossary
FAQ

CALSIM TRAINING (2025)

Training Overview

- Session 0 - Tech Setup
- Session 1 - Intro
- Session 2 - Upper Watersheds and Delta Hydrology
- Session 3 - Hydrology Part 1
- Session 4 - Modeling for Change and Access to Water
- Session 5 - Regulations and Operations

Note
Under Development

CalSim On-Demand Training

Welcome! The California Department of Water Resources Modeling Support Office hosted a 6 session, 18-hour CalSim 3 fundamentals training workshop in Winter 2025 to provide participants with an overview of WRIMS and CalSim 3.

Topics covered during the workshop ranged from a high-level conceptual understanding of CalSim 3 to ground-level code implementation of facilities, hydrology, regulations, and operations.

At the end of this workshop, participants should be able to:

- Understand the role of CalSim 3 and its application as a planning model
- Obtain an overview of the CVP-SWP system as it is modeled in CalSim 3
- Identify key assumptions and limitations of the model
- Understand hydrology development in CalSim 3, including sources of Input Data
- Understand how the Delta and its requirements are simulated within CalSim 3
- Understand how reservoirs and allocations are simulated within CalSim 3
- Analyze and Interpret Study results, including post-processing tools

Session
Session 0: Technical Setup

For More Information

- **Tuesday, May 13th, 8-9:45am, Session 13: Themes in CalSim Development (Zachary Roy, DWR)**
 - CalSim Results Visualization- Raymond Hoang
- **Wednesday, May 14th, 3:15-5pm, Session 33: Hydrology and Climate Change (James Polsinelli, DWR)**
 - State Water Project Climate Adaptation Plan 2025- Andrew Schwarz
 - 2085 Climate Change Operational Impacts and Baseline Assumptions- Puneet Khatavkar



Acknowledgements

DWR

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Jacobs



Q&A

**For detailed inquiries, please reach out at:
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Supplemental Slides

Track record - Past DCRs

2008/09
BiOps

BDCP Scenario
Sensitivity Analysis

2020
ITP/BiOps

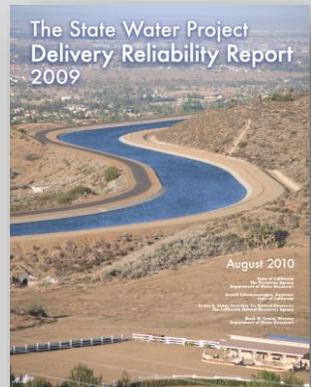
Debut of
CalSim 3

Adjusted Hydrology,
Risk-Informed Climate
Change Scenarios

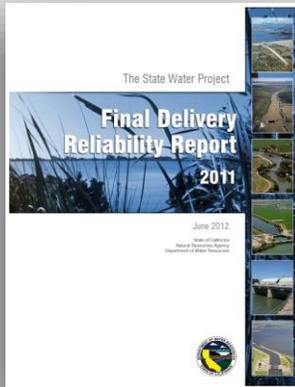
Technical Updates

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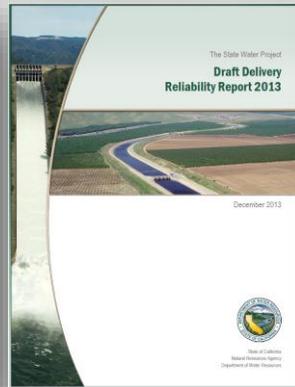
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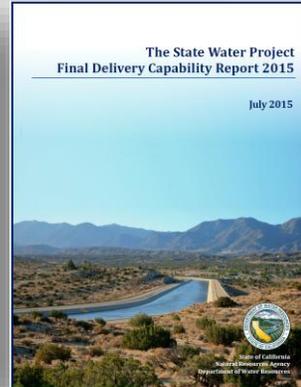
DRR 2009



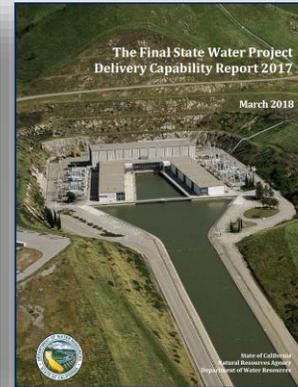
DRR 2011



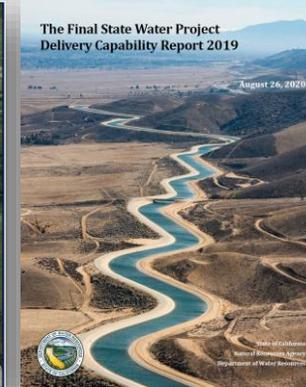
DRR 2013



DCR 2015



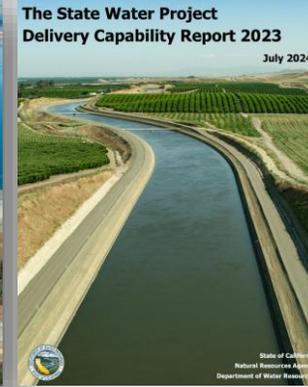
DCR 2017



DCR 2019



DCR 2021



DCR 2023

Past Delivery Capability reports show the evolution of model assumptions, including regulatory changes, hydrology updates and model improvements.

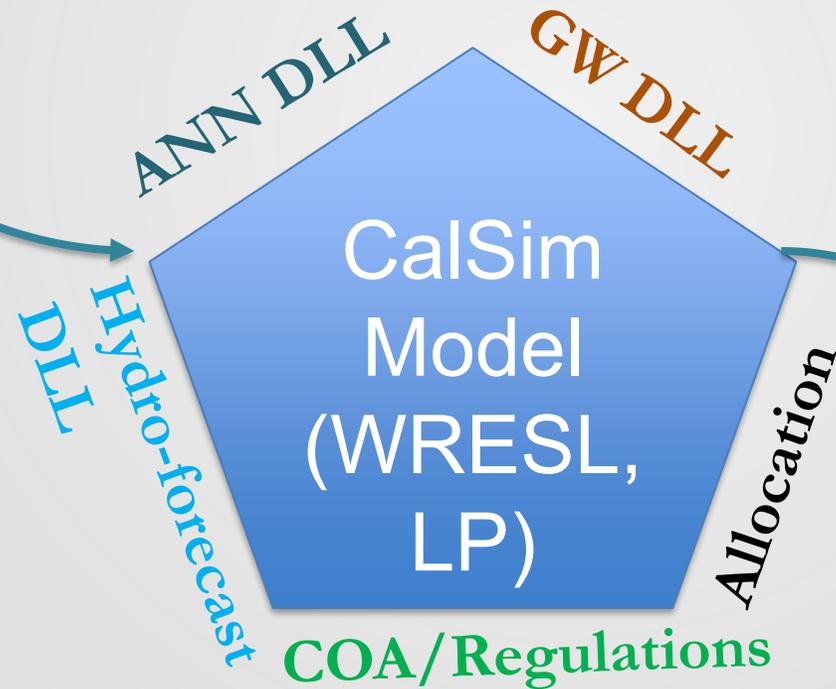


Upstream and Downstream of CalSim

Input:

- ✓ Hydrology (CalSim Hydro)
- ✓ Water rights and demands
- ✓ Goals and Constraints (WRESL)

ANN = Artificial Neural Network
COA = Coordinated Operation Agreement
DLL = Dynamic Link Library
GW = Groundwater
LP = Linear Programming
WRESL = Water Resources Simulation Language



Output:

- ✓ Flow, Storage, Salinity
- ✓ Post-processing tools
- ✓ Biological models
- ✓ Reports



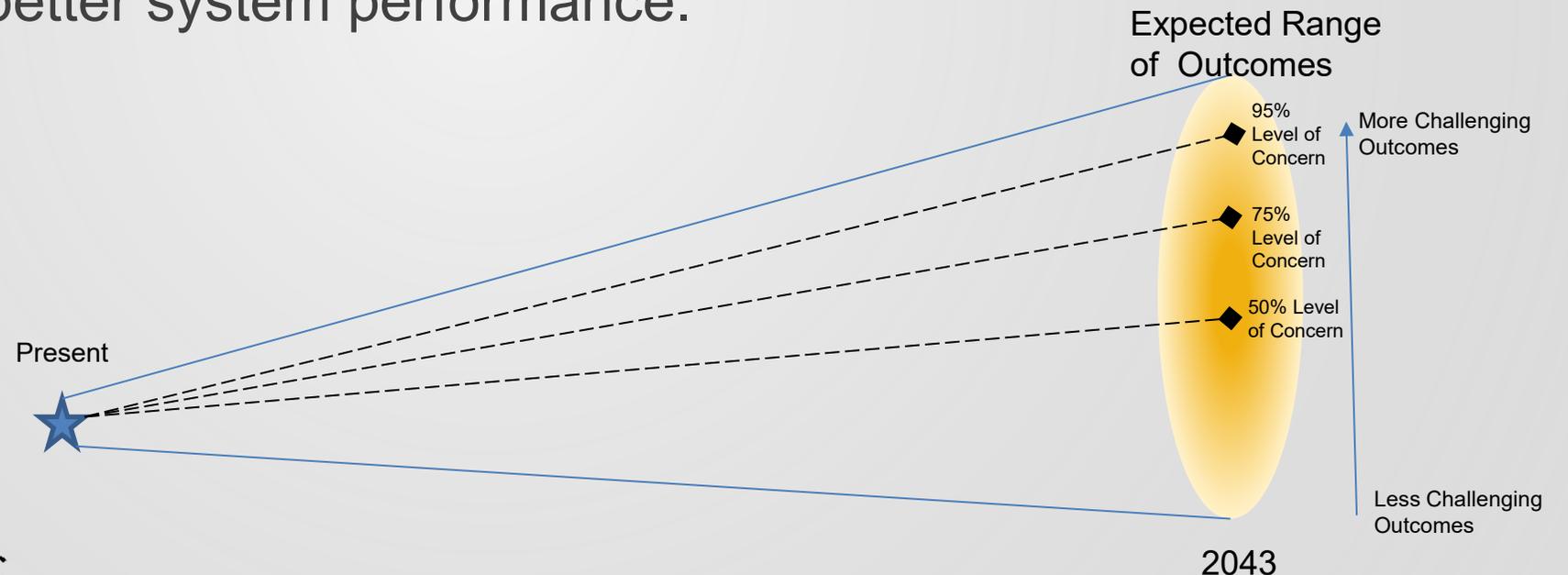
Climate Adjusted Historical Hydrology

- Accounts for the climate changes that have *already* occurred
- Estimation of *current* SWP capacity and reliability for use in operations and planning studies



Risk Informed Future Climate Scenarios

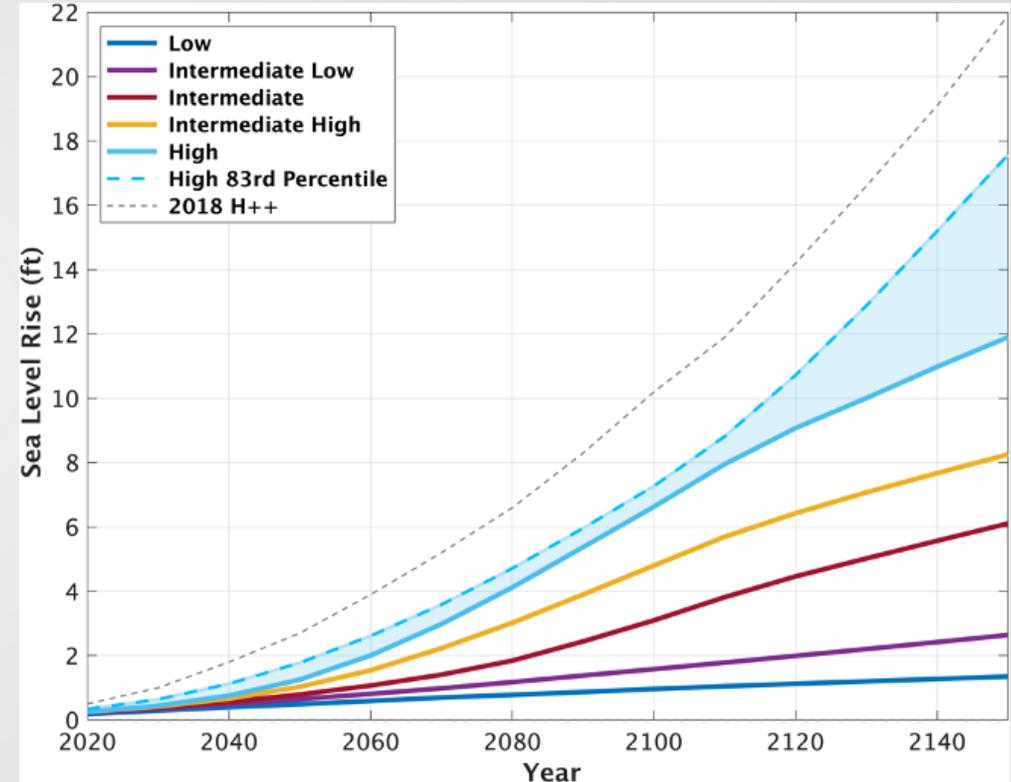
- Future conditions scenarios evaluate combinations of climate changes (temperature, precipitation, and sea level rise) that represent different levels of risk - Defined as **“Levels of Concern”**. The quasi-probability number describes the percent of model informed climate outcomes that would result in better system performance.



Assumptions: Future Conditions

➤ Risk-informed climate change hydrology and sea-level rise

Level of Concern (Percentile)	2043 Change in Temperature	2043 Change in Precipitation	2043 Precipitation Intensification	2043 Sea Level Rise
50 th	+1.5°C	+1.5%	11%	15 cm
75 th	+1.7°C	+0.1%	12%	30 cm
95 th	+1.8°C	-1.8%	13%	30 cm

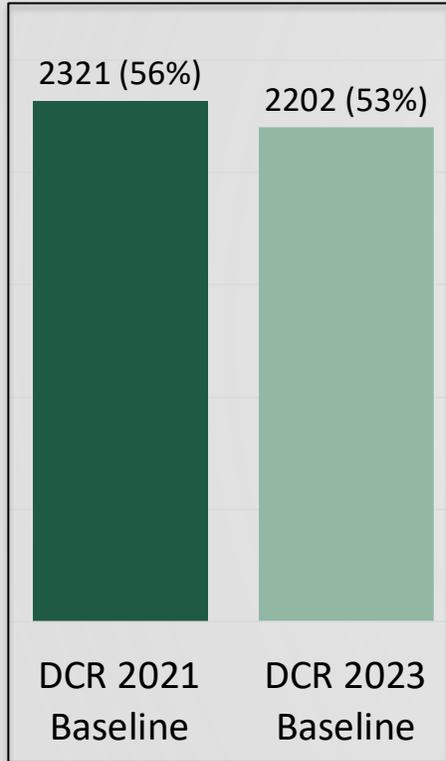


OPC, California Sea Level Rise Guidance: 2024 Science and Policy Update



SWP Table A Deliveries – Final DCR 2023

Long-term SWP Table A Deliveries [TAF/year] (Percent Allocation)



Under existing conditions, DCR 2023 shows a **119 TAF/year reduction in long-term Table A deliveries** compared to the DCR 2021.

Compared to the 2021 DCR, this represents:

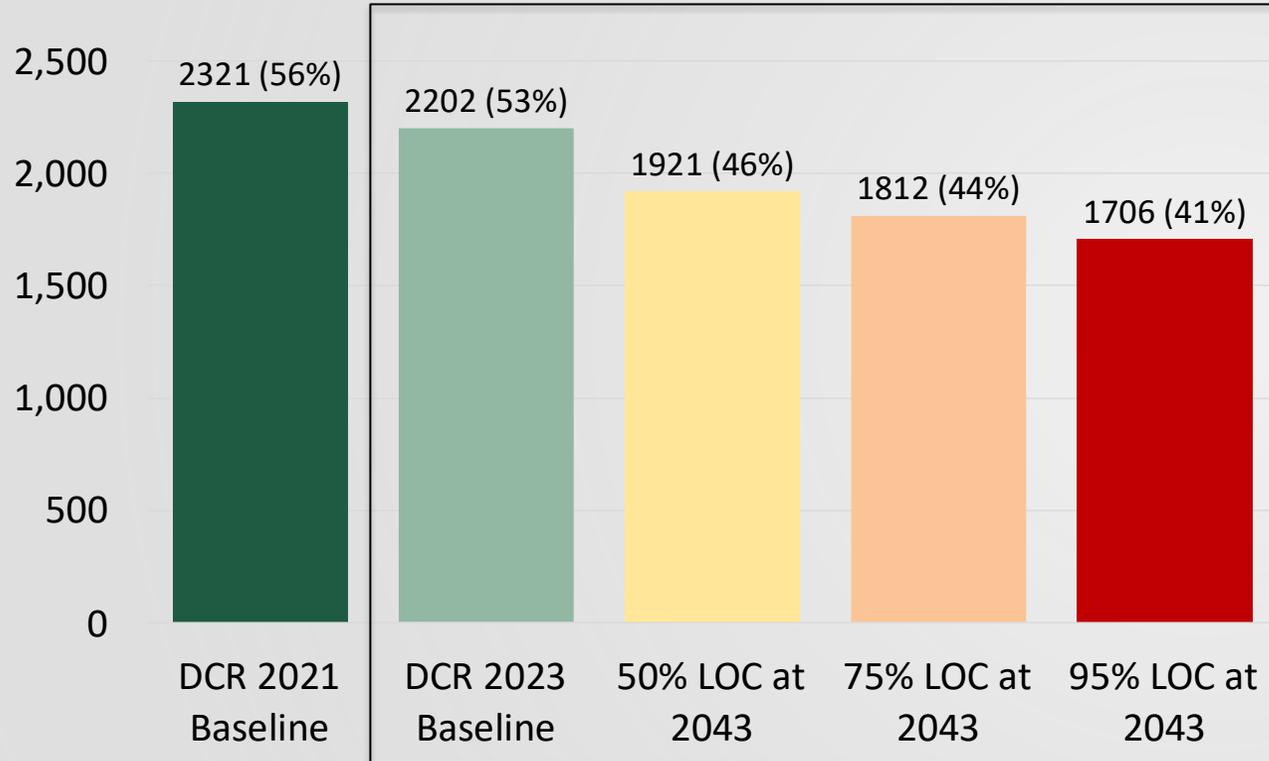
- 5% reduction in delivery volume
(2,321 → 2,202 TAF/year)
- 3% reduction in allocation
(56% → 53%)

These impacts are due to using Adjusted Historical Hydrology and updating Oroville reservoir bathymetry.



SWP Table A Deliveries – Final DCR 2023

Long-term SWP Table A Deliveries [TAF/year] (Percent Allocation)



Under future conditions, DCR 2023 shows up to **23% reduction in long-term Table A deliveries** compared to the existing conditions.

Compared to the 2023 DCR existing conditions, this represents:

- 13-23% reduction in delivery volume
(2202 → 1706-1921 TAF/year)
- 7-12% reduction in allocation
(56% → 41-56%)

These impacts are due to changing flow patterns and extreme weather shifts.

