

Operations & Engineering Workgroup

August 13, 2025



Agenda

1.1 – CALSIM 3 - 2040 modeling analysis and results

2 – Engineering and Construction Manager's Report

Agenda Item 1.1

CALSIM 3 Modeling Analysis and Results

Ali Forsythe / Chad Whittington / Reed Thayer



Topics Today

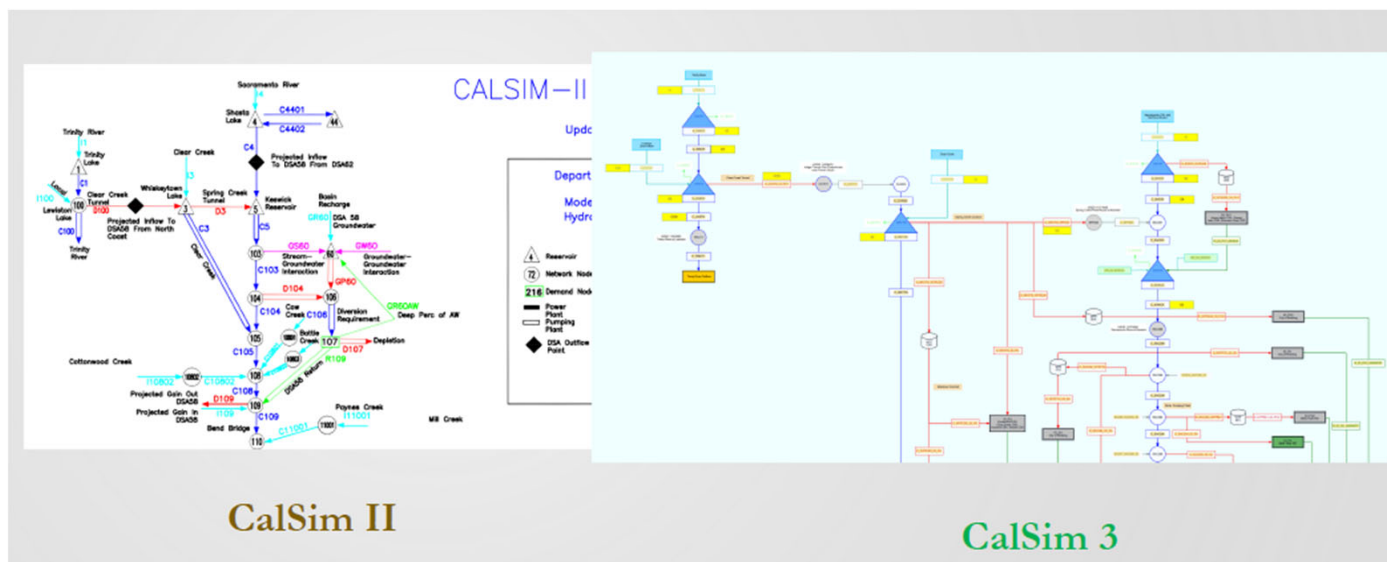
- Overall model take aways
 - Assumptions
 - Results
- Trend Report and Participant Dashboard
- Next Steps

CALSIM 3 – 2040

Overall Model Take Aways

CalSim II vs CalSim 3

	CalSim II	CalSim 3
Period of Simulation	WY 1922-2003	WY 1922-2021
Timestep	Monthly	
Spatial Resolution	Medium	High
Upper Watersheds	No	Yes
SW-GW Interaction	Basic	Dynamic



Baseline Model

- 2024 BiOp (based on CalSim 3 model provided by Reclamation) with:
 - No Healthy Rivers & Landscapes (to be included in future sensitivity analyses)
 - Daily flow estimates in the Upper Sacramento River to more accurately determine weir spills into the Sutter Bypass and Yolo Bypass
- Existing facilities
- 2040 median hydrology with 15cm sea-level rise
 - CalSim II modeling from the Sites Operations ITP included 2035 hydrology with 15cm sea-level rise
- Demand condition
 - Projected land use based on recent historical
 - Projected urban demands based on 2040 estimated in 2020 UWMPs

Sites Operations Assumptions

- Diversions to fill are subject to criteria in the CDFW Sites Operations ITP
 - Diversion criteria is summarized on next slide
 - Since CalSim II:
 - Wilkins Slough bypass changed from 10,700 cfs to 10,930 cfs
 - Flow Dependent Diversion criteria replaces Bend Bridge Pulse Protection
- Amendment 3 Participation Levels
- Reclamation participation level of 16%
 - Since CalSim II:
 - Releases from Reclamation's account are not implemented in Wet, Above Normal, or Below Normal years, which increases the long-term yield in CVP delivery
- Environmental water supply for Refuge Level 4
 - Since CalSim II:
 - Storage capacity for Refuge L4 water supply was increased from 124 TAF to 244 TAF
 - Storage capacity for Yolo Bypass habitat supply was reduced from 120 TAF to 0 TAF
- Includes exchange operations with Oroville and in real-time with GCID
 - Since CalSim II:
 - Excludes exchange operations with Shasta

Sites Operations Assumptions

Sites Modeling Diversion Criteria	
Sites Storage Capacity	1.5 MAF
Red Bluff diversion capacity	2,100 cfs
Hamilton City diversion capacity	1,800 cfs & variable winter capacities
GCID Main Canal maintenance	Last week in Jan, first week in Feb
Wilkins Slough Bypass	10,930 cfs
Balanced Conditions	No diversions when Delta is in Balanced conditions
Fully Appropriated Streamflow	No diversion from Jun 15 to Aug 31
Flow Dependent Diversions	Diversions limited by flow at Bend Bridge and Hamilton City (per Section 9.14 of the Sites Ops ITP)
Near Excess conditions	Limit diversions to not use first 3,000 cfs of Surplus Delta Outflow
Shasta Spring Pulse	Limit diversions in months with Shasta releases for Spring Pulse objectives

Storage Capacities (TAF)

Participant Group	CalSim II	CalSim 3
North of Delta	238	232
TCCA	126	122
GCID	29	29
RD108	25	23
County of Colusa	58	58
South of Delta	728	734
CVP Operational Flexibility	230	230
WSIP (Prop 1)	244	244
Refuge L4 Water Supply	124	244
Yolo Bypass	120	0

CalSim II assumes Amendment Level 2 participation levels for NoD & SoD members

CalSim 3 assumes Amendment Level 3 participation levels for NoD & SoD members

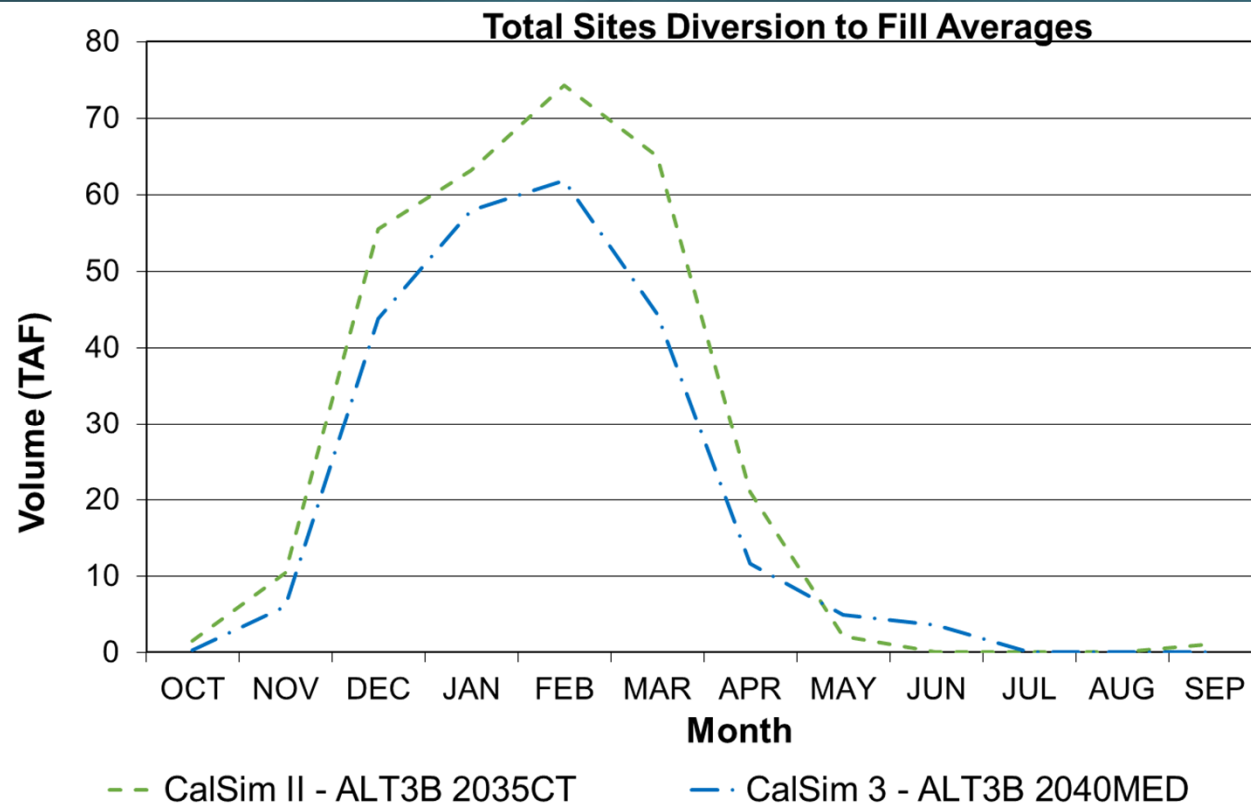
NoD Account Utilization and SoD Transfers

- CalSim 3 includes revised NoD account assumptions to reflect more utilization of their water supply
 - Transferring more water from NoD to SoD in general and under more water year types
 - In CalSim 3, a higher proportion of the water supply from TCCA, GCID, and RD108 is used for transfers to SoD members relative to CalSim II
 - More utilization of County of Colusa's account
 - Annual delivery target in CalSim II = 10 TAF
 - Annual delivery target in CalSim 3 = 40 TAF

CALSIM 3 – 2040 Model Runs – Results

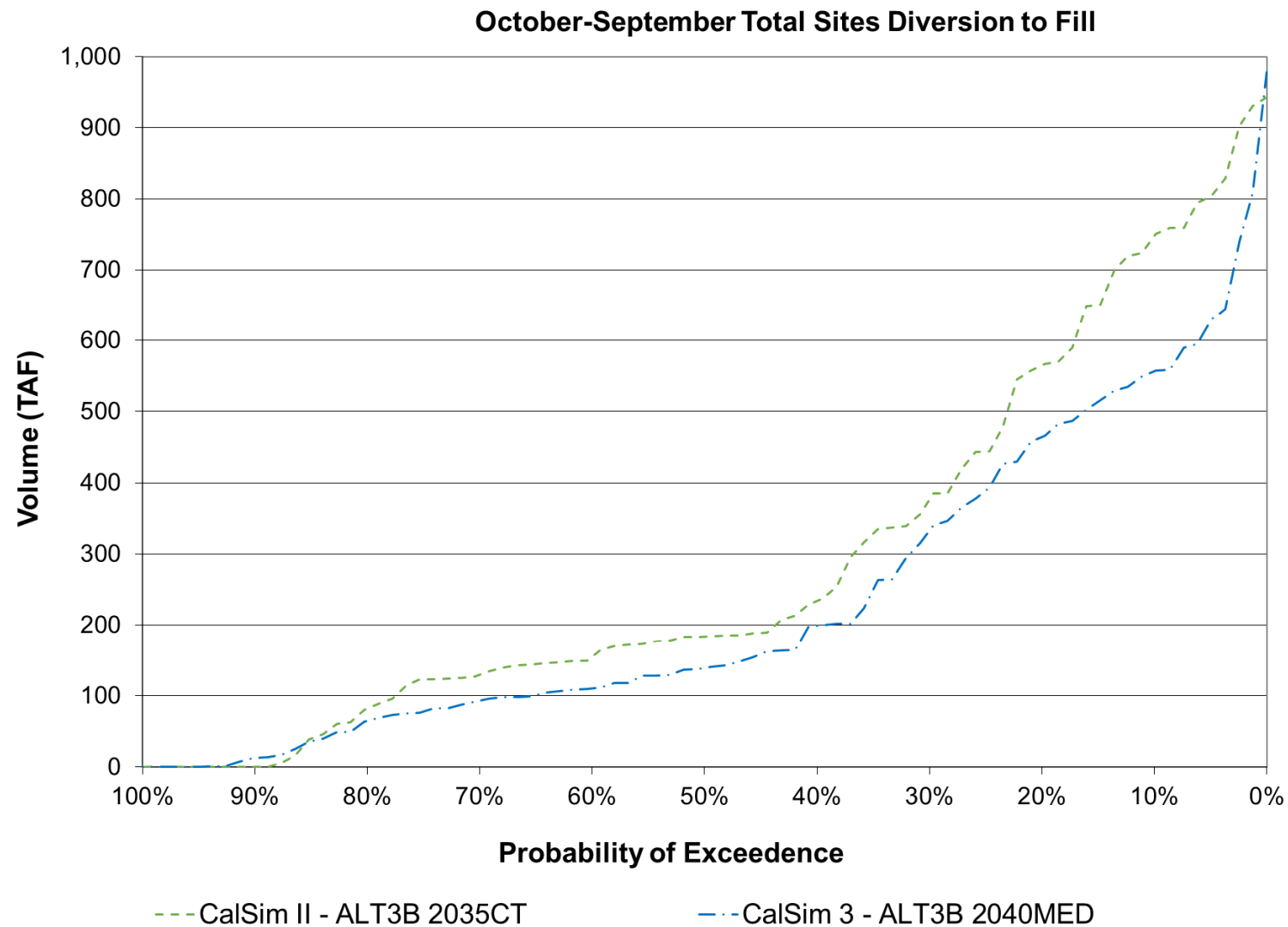
- The following slides compare results from
 - CalSim II modeling conducted for the Sites Operation ITP (2024 CDFW)
 - 1921 through 2003 simulation period (82 years)
 - 2040 CalSim 3 model results
 - 1921 through 2021 simulation period (100 years)

Total Diversions to Fill Preliminary Results

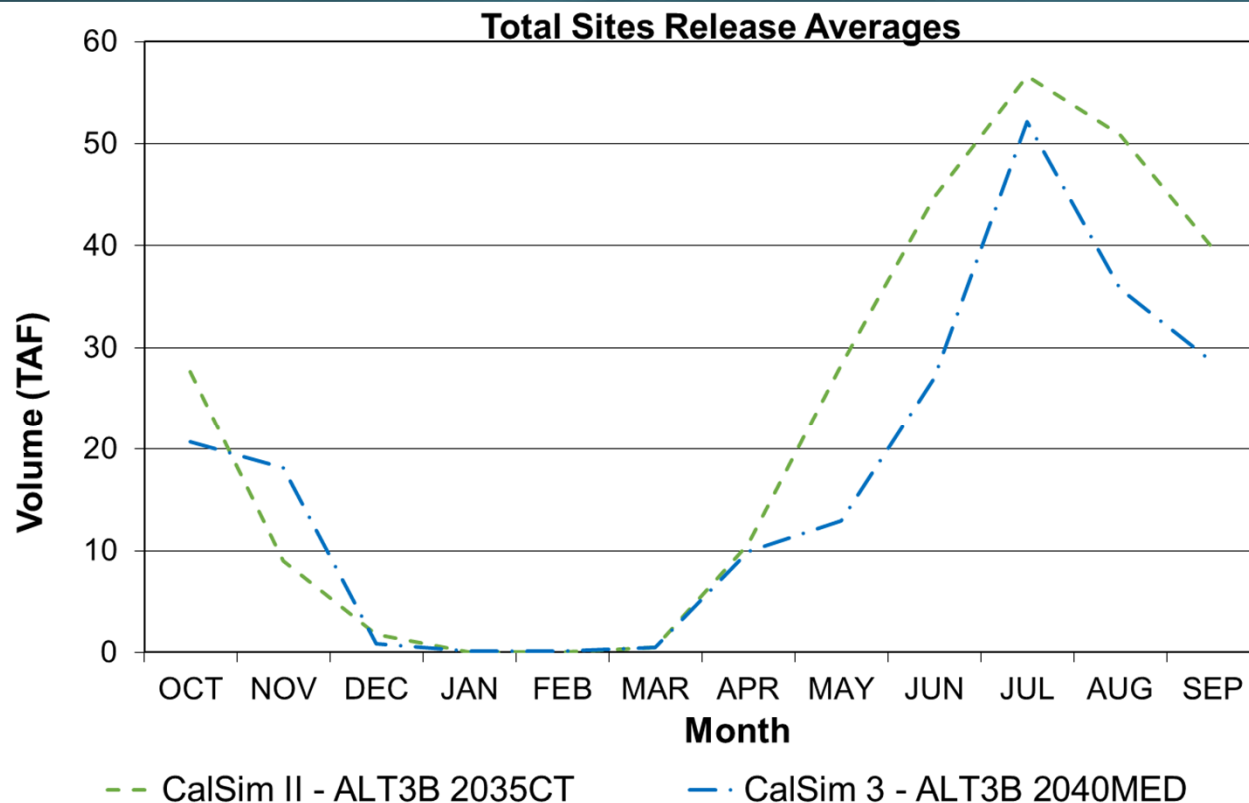


Scenario	Long-term Average Diversion (TAF)	Relative Change
CalSim II – ALT 3B 2035CT	294	-
CalSim 3 – ALT 3B 2040 MED	234	-60

Total Diversions to Fill Preliminary Results

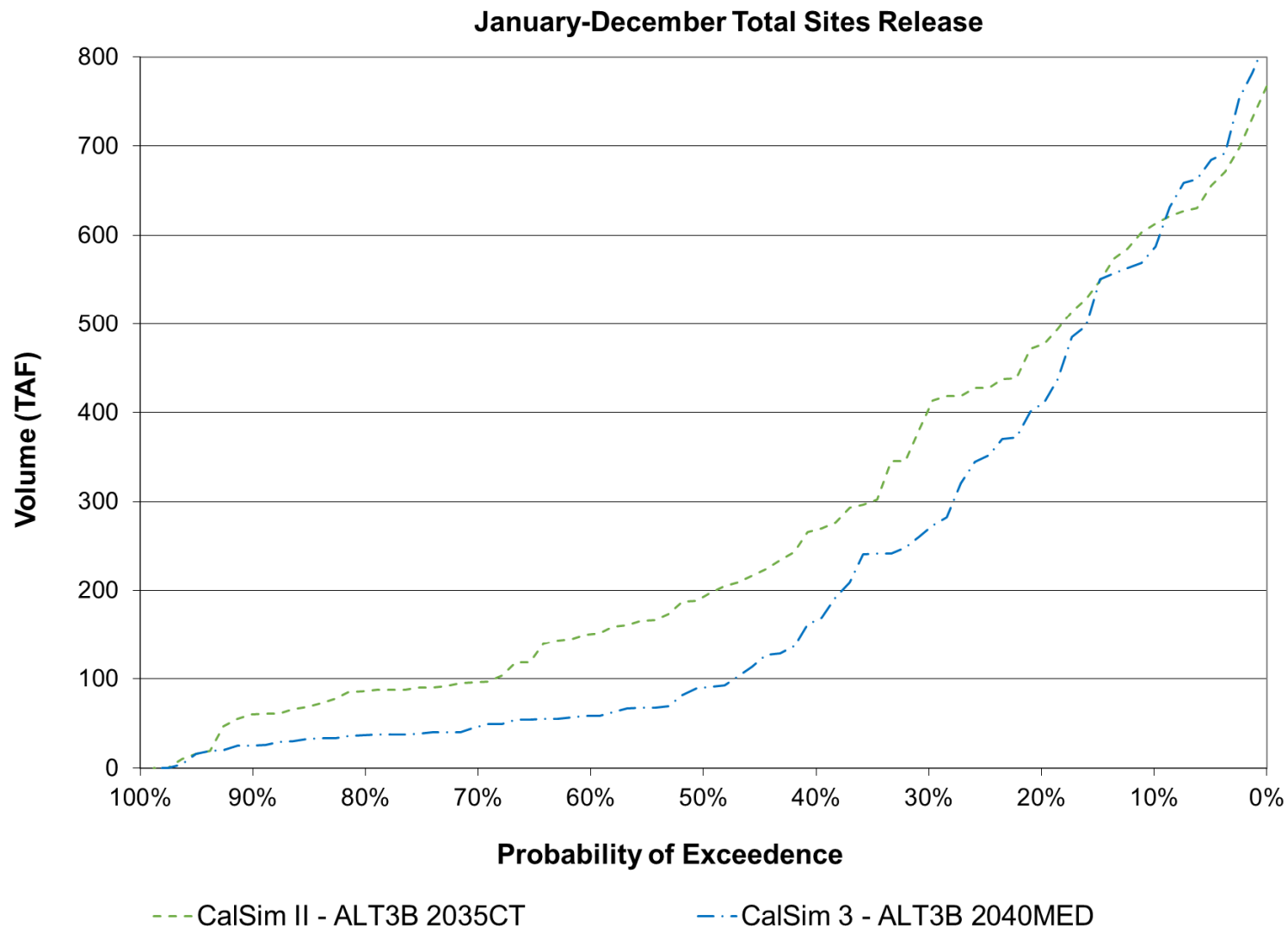


Total Releases Preliminary Results



Scenario	Long-term Average Release (TAF)	Relative Change
CalSim II – ALT 3B 2035CT	271	-
CalSim 3 – ALT 3B 2040 MED	215	-57

Total Releases Preliminary Results



Project Releases– CalSim II vs CalSim 3

Releases (TAF/year)	ALT 3B CalSim II (2035 CT)		ALT 3B CalSim 3 (2040 MED)	
	Average	Dry & Critical	Average	Dry & Critical
Releases for Authority PWA Deliveries – NoD	27	42	24	21
Assumed transfer from NoD to SoD	7	4	24	19
Releases for Authority PWA Deliveries - SoD	119	240	95	197
Releases for CVP Deliveries – Operational Flexibility	58	54	33	77
Releases for Refuge Water Supply	21	32	39	53
Releases for Yolo Bypass Habitat Water Supply	40	13	0	0
Total Releases	271	386	215	366

- Compared to CalSim II, CalSim 3 shows:
 - Lower total long-term average annual release, but more similar levels in Dry & Critically Dry years
 - Slightly lower average release for PWA
 - 11% reduction for NoD direct use (27 TAF/yr to 24 TAF/yr)
 - 6% reduction for SoD (126 TAF/yr to 119 TAF/yr)
 - 25 TAF/yr reduction in release from Reclamation's water supply (CVP OpFlex)
 - Most of the reduction in total Sites release (from CS II to CS 3) is due to the reduction in CVP OpFlex releases
 - CVP OpFlex releases are not implemented in Wet, Above Normal, or Below Normal years
 - As shown in the table above, there is an increase in CVP OpFlex releases for D&C years
 - Despite this reduction in CVP OpFlex releases, deliveries were not reduced (as shown on the next slide)
 - Higher releases for Refuges due to complete redistribution of Yolo Bypass Habitat water supply

WC1

Slide 17

WC1

This considers the assumed transfer from NoD to SoD

Whittington, Chad, 2025-05-06T23:33:13.553

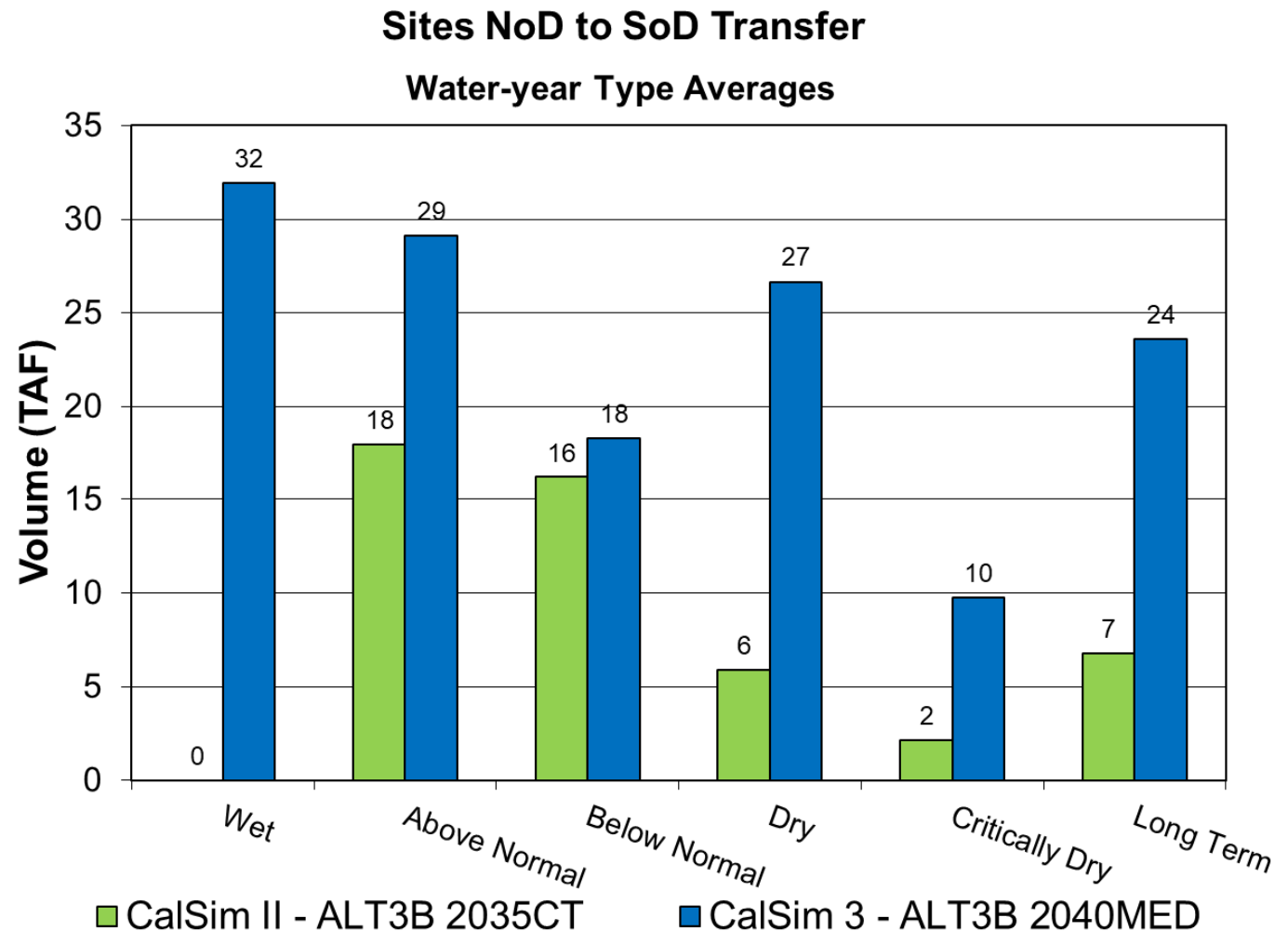
Project Deliveries (net of carriage losses) – CalSim II vs CalSim 3

Deliveries (TAF/year)	ALT 3B CalSim II (2035 CT)		ALT 3B CalSim 3 (2040 MED)	
	Average	Dry & Critical	Average	Dry & Critical
Authority PWA Deliveries	115	240	114	186
NOD	27	42	24	21
SOD (includes NOD transfer amounts)	88	198	90	165
CVP Operational Flexibility	7	3	29	73
Sub-Total Supplemental Deliveries for Water Supply	123	244	142	259
Refuge Water Supply	18	27	31	42
NOD (Level 4)	4	5	8	10
SOD (Level 4)	13	21	23	32
Yolo Bypass Habitat Water Supply	35	11	0	0
Total Authority Deliveries	175	282	173	300

- Compared to CalSim II, CalSim 3 shows:
 - Similar average annual delivery to NOD and SOD members of the Project
 - Greater delivery from Reclamation's account ("CVP Operation Flexibility")
 - Greater Refuge L4 delivery and zero Yolo Bypass delivery
 - In CalSim 3, all Yolo Bypass Habitat water supply was reallocated to Refuge L4 water supply
 - 2 TAF/yr less total delivery in the long-term, but 18 TAF/yr greater delivery in Dry & Critically Dry years (primarily attributed to more CVP OpFlex releases in drier year types)

North-of-Delta to South-of-Delta Within Reservoir Transfers

- CalSim 3 model includes new assumptions based on recent discussions with NoD members, increasing the frequency and volume of NoD – SoD transfers



Trend Report and Participant Dashboard

Slide 20

AF1

We have never actually sent the Participants the trend report previously.

However I copied and adjusted these slides from our presentation of the participant dashboard at our June 2023 meeting

Alicia Forsythe, 2025-08-07T18:06:33.921

Trend Report – Purpose

- Provide easy to navigate model results for a number of statewide parameters
 - Used extensively with regulatory agencies and within the Sites Team
- Easily convey model results for areas of key interest for a variety of different parties

Trend Report Demonstration

- Transition to spreadsheet demo

Participant Dashboard – Purpose

- Provide information to Participants regarding the modeled operations
 - Summary of modeled assumptions
 - Illustrate modeled diversions and releases for each Participant
- Help Participants evaluate their participation in the Project
- Results provided for both:
 - 2040 Median hydrology (2040 MED)
 - 2022 Median hydrology (2022 MED)

Participant Dashboard Demonstration

- Transition to spreadsheet demo

Modeling Next Steps

Modeling Next Steps

- Team is focused on:
 - CALSIM 3 – 2022 modeling for Federal ESA consultation
 - Downstream modeling (temperature, water quality, etc)
 - SOD delivery constraints analysis
- Are there other items / analyses / results that would be helpful for your agencies participation decision?

Engineering and Construction Manager's Report

JP Robinette

Engineering and Construction Manager's Report

- Future Agenda Items
 - Program Baseline Report
 - Construction Administration and Quality Strategy

Questions?



Thank you!

Upcoming Meetings:

Environmental Planning and Permitting Workgroup:

Wed Aug 14 – 1 to 2 pm

Reservoir Committee and Authority Board:

Friday Aug 22 – 9 am to 12 pm

O&E Workgroup:

Wed Sept 10 – 1 to 3:30 pm