

MANAGEMENT STRATEGY · THE DELTA AS A LIVING PLACE

Increase Shasta carry-over storage

A management strategy in the COEQWAL scenario library

This strategy targets a consistent 20% increase (relative to the historical Current Operations reference) in end-of-September (carryover) Shasta Reservoir. The increased carryover storage is achieved through modifications to CVP allocations in the spring months. Because CalSim sets allocations before the year's water supply is fully known, the carryover condition is not guaranteed to be met in a given year. The goal of the scenario is to explore the effects of actions taken specifically to increase storage at Shasta Reservoir via allocation adjustments, separate from flow, demand, regulation, and other modifications.

This brief describes *a scenario that features actions to increase Shasta carry-over storage*, one of 28 management strategies in the COEQWAL scenario library. Each strategy is simulated once under each of five hydroclimates; the references note at the end of this brief lists the model runs.

§2 WHAT THIS STRATEGY CHANGES

This scenario targets a 20% increase in Shasta Reservoir carryover storage, relative to the Current Operations scenario, via reductions in CVP allocations. Starting in February of each year, estimates of current and projected supply along with empirical estimates of Shasta storage drawdown conditional on the supplies and proposed allocations are used to forecast April and September Shasta storage levels. If a storage shortfall is projected, the allocations are adjusted by a factor tied to that shortfall amount. The calculations and adjustments are updated each

month through April. CVP agricultural contractor and Settlement Contractor allocations may be reduced as needed to meet the storage target according to estimated seasonal water supply and projected Shasta storage shortfalls.

Because of uncertainty in water supply at the time allocations are set in CalSim3 — the use of internally generated seasonal forecasts means the model does not “know” how much water the year will bring — the carry-over condition is not guaranteed to be met in a given year.

The modified allocations, Shasta storage, and deliveries may affect hydrology and reservoir conditions in parts of the system not targeted by this strategy's actions. This is a consequence of the interconnections in the Central Valley water management and hydrologic system, as reflected in a complex but incomplete model.

§3 THE CONFIGURATION IN DETAIL

The table compares the eight operational fields that define this strategy against current operations — the strategy that represents existing operational rules, recent (2020) land use, and TUCPs. Rows that match current operations are shown in light gray; rows that differ are highlighted.

ASPECT	CURRENT OPERATIONS	THIS STRATEGY
TUCP actions	Active	Active
SGMA actions	None	None
Land use	2020 LandIQ	2020 LandIQ
Delta regulations	Standard	Standard
BiOps	2019 / 2020 ITP	Modified versions of 2019 / 2020 ITP
Infrastructure	Standard	Standard
Flows	Standard	Standard
Allocation / priorities	Standard	CVP Settlement Contractor allocations may be reduced as needed to increase Shasta storage

§ 4 LINEAGE AND SOURCE

This strategy was developed by the COEQWAL team, in part by adapting the allocation logic of USBR's Alt3 (Modified Natural Hydrograph) scenario onto the COEQWAL Current Operations scenario base. This scenario uses DWR's adjusted historical hydrology with the 2020 LandIQ land-use dataset. The CalSim model files for this strategy are referenced by the run IDs in the references note at the end of this brief.

§ 5 RELATED STRATEGIES

RELATED STRATEGIES — THE DELTA AS A LIVING PLACE

Increase Delta outflows (65% unimpaired flow target). USBR Alternative 3 for the Long-Term Operation of the Central Valley Project, with Delta outflow requirements set to roughly 65% of unimpaired volume.

Reduce Delta outflows (35% unimpaired flow target). USBR Alternative 3 for the Long-Term Operation of the Central Valley Project, with Delta outflow requirements set to roughly 35% of unimpaired volume.

Maintain Delta outflows (45% unimpaired flow target). USBR Alternative 3 for the Long-Term Operation of the Central Valley Project, with Delta outflow requirements set to roughly 45% of unimpaired volume.

Increase Delta outflows (55% unimpaired flow target). USBR Alternative 3 for the Long-Term Operation of the Central Valley Project, with Delta outflow requirements set to roughly 55% of unimpaired volume.

Relax Delta salinity standards. Current operations with the fall X2 salinity requirement removed; other Delta flow and salinity requirements remain in place.

Delta Conveyance Project. The Delta Conveyance tunnel (6,000 cfs North Delta Diversion capacity) with 2025 voluntary-agreement flows and Sacramento Valley rice-fallowing actions.

§ 6 WHAT THIS DOESN'T SAY

This brief describes a scenario representation in CalSim, not a real-world policy proposal or implementation plan. The strategy as modeled may not capture all details necessary to support direct translation to actual operations. The brief does not predict, evaluate, or recommend any outcome — it describes what the scenario changes about CalSim's representation of the system. For what the model produces under this strategy, see the result briefs referenced in §7.

§ 7 SEE RESULTS FOR THIS STRATEGY

To see modeled outcomes under this strategy across all nine key outcomes at the reference hydroclimate, see the *The Delta as a living place* theme brief.

To see outcomes at a specific location of interest, see the relevant LOI briefs — particularly those for Shasta reservoir and locations on the Sacramento River.

Compare this strategy in the data explorer → (<https://coeqwal.org/explore?strategy=s0044>)

REFERENCES — MODEL RUNS

Each strategy is simulated once under each of five hydroclimates. The table lists the model run behind this strategy and the current-operations run it is compared against, for each hydroclimate, so any reader can trace this page to specific CalSim runs.

HYDROCLIMATE	THIS STRATEGY	CURRENT OPERATIONS
Historical hydroclimate (adjusted)	s0044	s0020
Moderate climate stress (EC-Earth3-Veg)	s0154	s0134
Moderate-high climate stress (cc50)	s0082	s0047
High climate stress (cc95)	s0102	s0056
Extreme climate stress (TaiESM1)	s0128	s0108

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RunID s0044_DCRadjHist_2020LU_ShastaCarryOver20 Web platform ID 6.1

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