

Staff Workshop: Draft Staff Report for Sacramento/Delta Update to the Bay-Delta Water Quality Control Plan (Bay-Delta Plan)

Start time: 9:30 AM
October 19, 2023



State Water Resources Control Board

Workshop Logistics and Purpose

- Workshop is being recorded and will be available on the Bay-Delta webpage: bit.ly/sac-delta-update
- **To watch the workshop only:** view the webcast at video.calepa.ca.gov (closed captioning available)
- **To ask questions:** must be on Zoom platform
 - Zoom: submit questions using Q&A function or raise your hand to ask question verbally
 - Phone: press *9 to raise and lower your hand
- Email SacDeltaComments@waterboards.ca.gov for assistance
- Purpose of workshop is to provide information on draft Staff Report and answer questions to facilitate public comments at hearing/in writing
- Additional modeling workshop on November 2

Submitting Comments on Draft Staff Report

- Participants should reserve comments for public hearing, where Board members will be in attendance, and for the written comment period
- **To provide oral comments:** attend public hearing (scheduled for November 17, December 1, and December 11)
- **To submit written comments:** email comments to SacDeltaComments@waterboards.ca.gov with the subject “Comment Letter – Sacramento/Delta Draft Staff Report” by December 15, 2023
- Additional information available in September 28, 2023 Notice: https://www.waterboards.ca.gov/board_info/calendar/docs/2023/notice-sacdeltastffrpt-092823.pdf

Agenda

- State Water Resources Control Board (State Water Board or Board) staff presentation
 - Brief Background on Board and Bay-Delta Plan
 - Activities to-date
 - Overview of Draft Staff Report
 - Next steps, schedule, and resources
- Remarks from Department of Water Resources and Department of Fish and Wildlife
- Question and Answer Session

State Water Board

- Mission – To preserve, enhance, and restore the quality of California's water resources and drinking water for the protection of the environment, public health, and all beneficial uses, and to ensure proper water resource allocation and efficient use, for the benefit of present and future generations
- Responsible for allocating surface water rights and protecting water quality, while protecting the public trust and public interest and preventing the waste and unreasonable use of water
- Responsibilities converge in the Bay-Delta

Bay-Delta Plan

- Identifies beneficial uses of water, water quality objectives to protect those uses, a program of implementation to achieve the objectives, and monitoring and special studies
 - Beneficial uses: municipal and industrial, agricultural, fish and wildlife
 - Water quality objectives: narrative and numeric (primarily flow-dependent)
 - Program of Implementation: flow and nonflow actions
 - Monitoring and evaluation to assess compliance and effectiveness of implementation actions

Bay-Delta Plan Relationship to Regional Water Board Basin Plans

- Bay-Delta Plan overlays two Basin Plans:
 - Water Quality Control Plan for the Sacramento and San Joaquin River Basins developed by the Central Valley Regional Water Quality Control Board (Regional Water Board)
 - Water Quality Control Plan for the San Francisco Bay Region developed by the San Francisco Bay Regional Water Board
- Regional Boards focus on National Pollutant Discharge Elimination System (NPDES) and Waste Discharge Requirements (WDR)
- All three plans are intended to be complimentary to one another and require periodic/triennial review

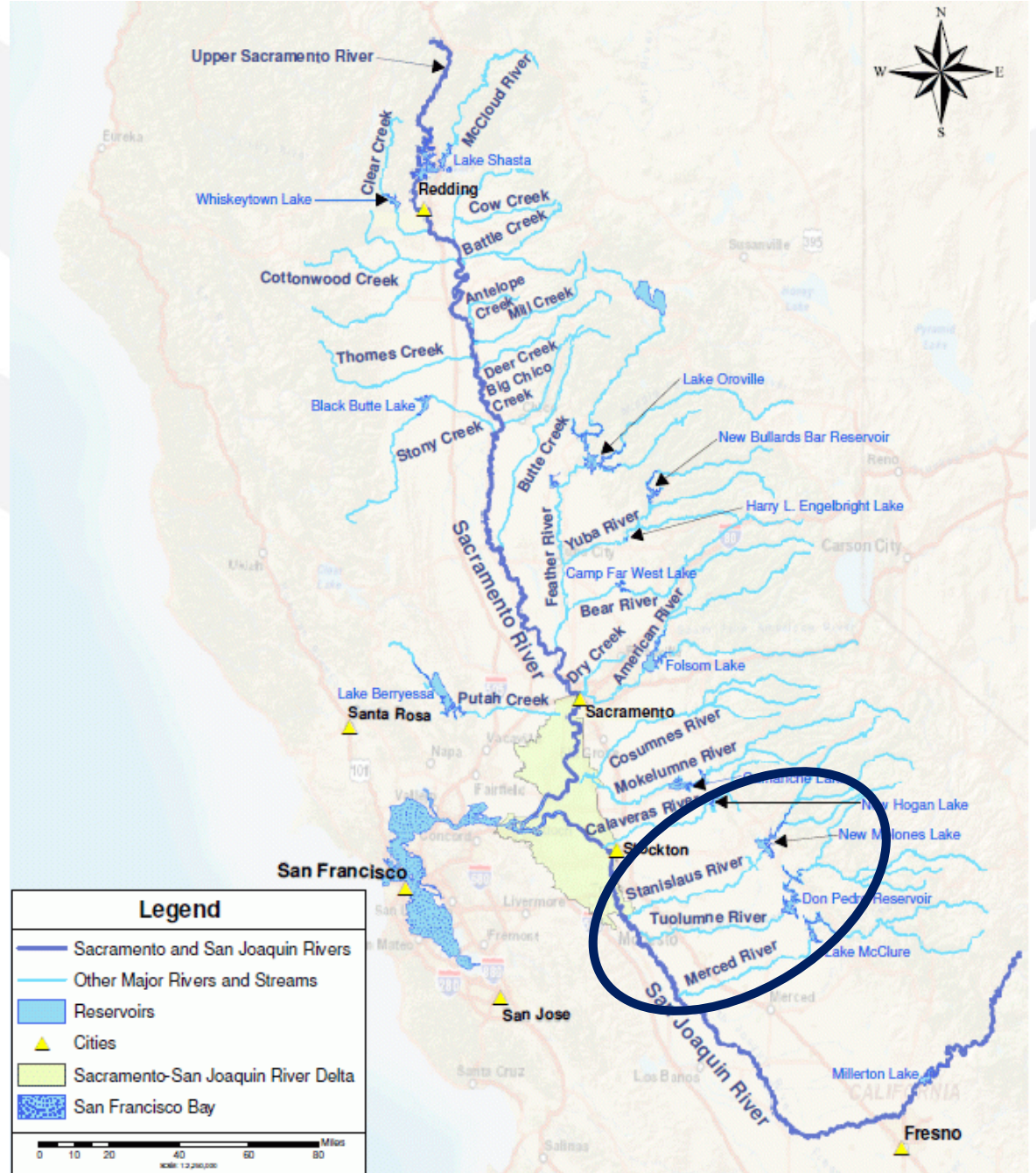
San Francisco Bay/ Sacramento-San Joaquin Delta (Bay-Delta) Watershed

Bay-Delta Plan Updates



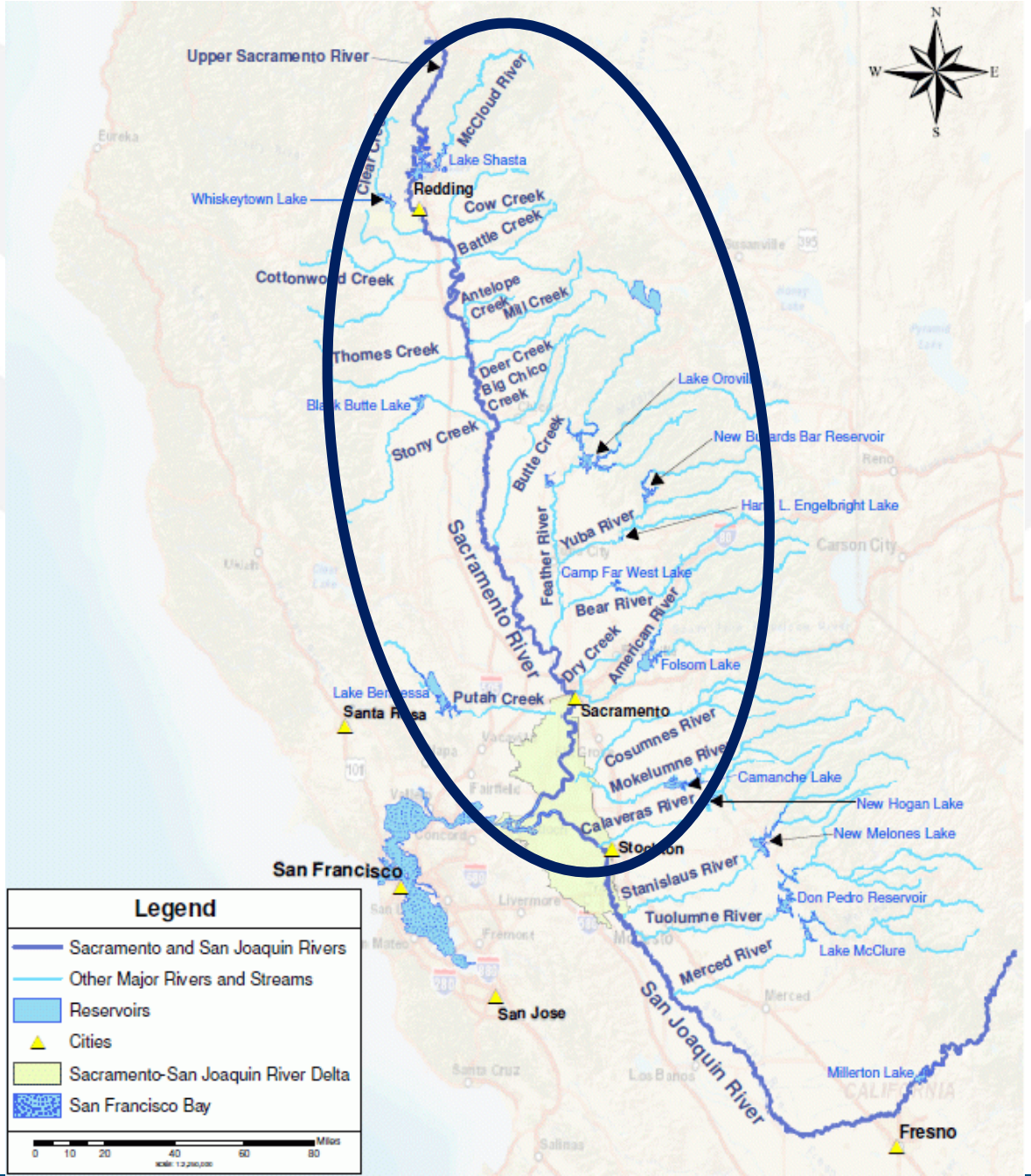
Bay-Delta Watershed

Lower San Joaquin River Flow/ Southern Delta Salinity (LSJR/SD) Updates to the Bay-Delta Plan



Bay-Delta Watershed

Sacramento/Delta Update to the Bay-Delta Plan



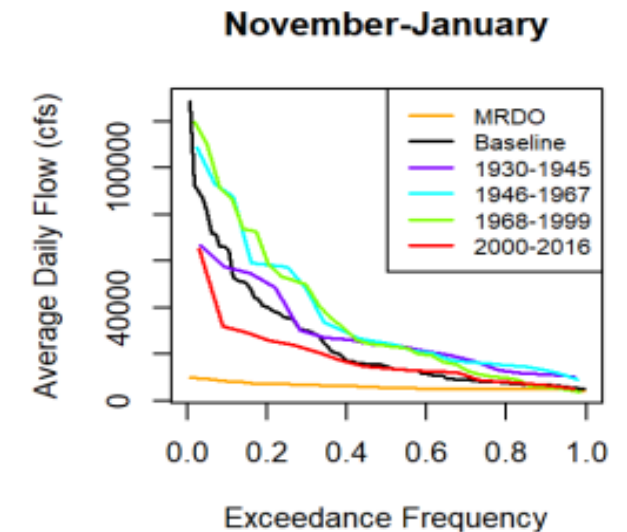
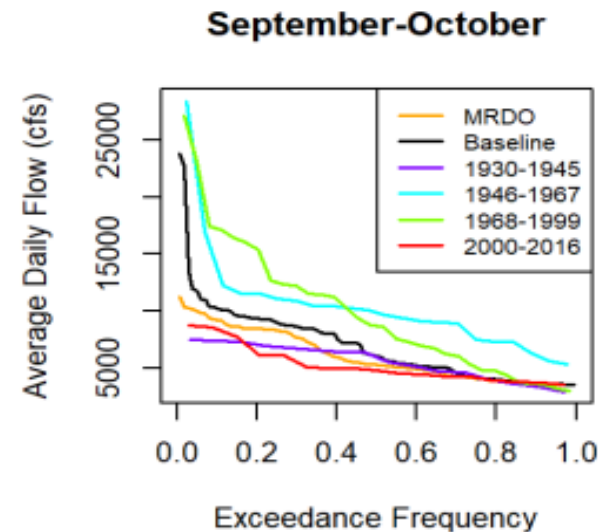
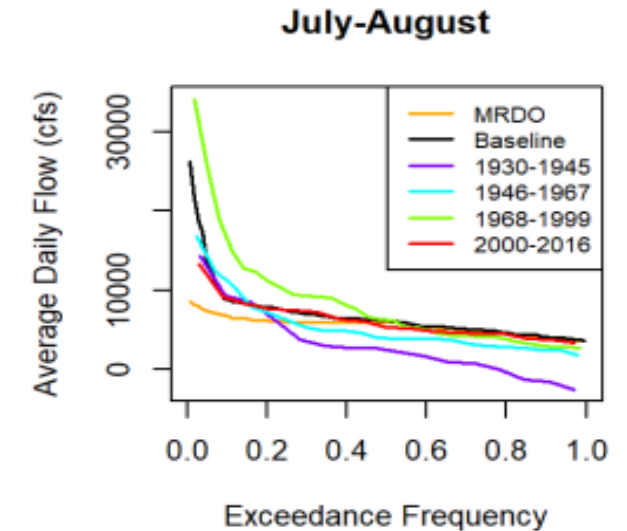
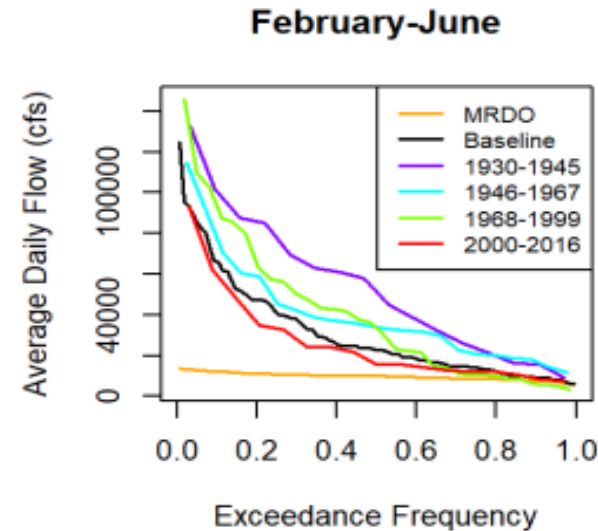
Purpose of Updates to the Bay-Delta Plan

- Native species have undergone substantial population declines
- Aquatic ecosystem stressors:
 - Flow alteration
 - Habitat loss
 - Water quality
- Bay-Delta Plan updates are intended to establish flow and related measures to protect native species
- Those measures are then implemented through subsequent water right/water quality actions



Existing Delta Outflows

- Existing Delta outflows are often higher than minimum required Delta outflows (MRDO), particularly during winter and spring
- Existing Delta outflow requirements are not adequate to ensure Delta outflows are not diminished significantly over time during critical winter/spring period



Sacramento/Delta Update Background

- 2012: Supplemental Notice of Preparation
- 2012-2016: Workshops and public meetings to inform Sacramento/Delta updates to the Bay-Delta Plan and draft Scientific Basis Report development
- 2017: Peer-reviewed Scientific Basis Report completed
 - Evaluates Sacramento and Delta tributary (Mokelumne, Cosumnes, and Calaveras) inflows and cold-water habitat, Delta outflows, and interior Delta flows
- 2018: Framework for possible Sacramento/Delta updates to the Bay-Delta Plan

Proposed Plan Amendments

- Possible Sacramento/Delta changes to Bay-Delta Plan identified in 2018 Framework referred to as “proposed Plan amendments”
 - Year-round inflows of 55% of unimpaired inflows with an adaptive range from 45-65% that would apply to Sacramento River and Delta (Mokelumne, Cosumnes, Calaveras) salmon bearing tributaries
 - Narrative cold water habitat objective and implementation measures
 - Year-round inflow-based Delta outflows that would provide for required inflows as outflows
 - Interior Delta flows to avoid export related impacts
 - Science, monitoring, evaluating, reporting and other provisions
- Board has not decided on changes to the Bay-Delta Plan, which will be informed by public comments and other information

Recent Sacramento/Delta Update Activities

- 2022: Proposed Voluntary Agreements (VAs)
 - Proposed by water users, the Secretaries of the CA Natural Resources Agency and Environmental Protection Agency, and U.S. Bureau of Reclamation
 - Propose flow and habitat restoration actions
 - Proposed strategic planning, governance, science, and adaptive management programs
- 2023: Draft Scientific Basis Report Supplement for proposed Sacramento/Delta VAs
 - Documents science supporting Sacramento/Delta provisions of proposed VAs
 - Supplements 2017 Scientific Basis Report
 - Revised based on public input and included as appendix to draft Staff Report and submitted for independent scientific peer review
- September 2023: Draft Staff Report in support of Sacramento/Delta updates to the Bay-Delta Plan

Proposed VAs

- Propose flow, habitat restoration, and other actions on Sacramento, Feather, American, Yuba, and Mokelumne Rivers, Putah Creek, and in Delta
- Propose: (1) a new narrative objective to achieve viability of native fish populations, and (2) to provide participating parties' share to contribute to achieving the existing narrative objective to double salmon populations by 2050
- Initial 8-year term proposed, following which VAs could be extended or modified, or regulatory pathway could apply if proposed VAs are not found to be effective
- Draft Staff Report identifies proposed regulatory pathway consistent with the inflow, outflow, and cold water habitat provisions of 2018 Framework, assumes pathway applies to non-VA regions, and applies if VAs not continued after initial implementation

Draft Staff Report

- Evaluates potential benefits and environmental/economic impacts of possible alternatives for updating the Sacramento/Delta components of the Bay-Delta Plan
- Assesses a range of alternatives, including proposed Plan amendments, proposed VAs, and others
- Identifies proposed incorporation of tribal and subsistence fishing beneficial uses to the Plan
- Complies with California Environmental Quality Act, Water Code, and other laws
- Public's opportunity to review and comment on analyses
- Public input will inform the State Water Board's planning process and eventual consideration of adoption of Sacramento/Delta updates

California Environmental Quality Act (CEQA)

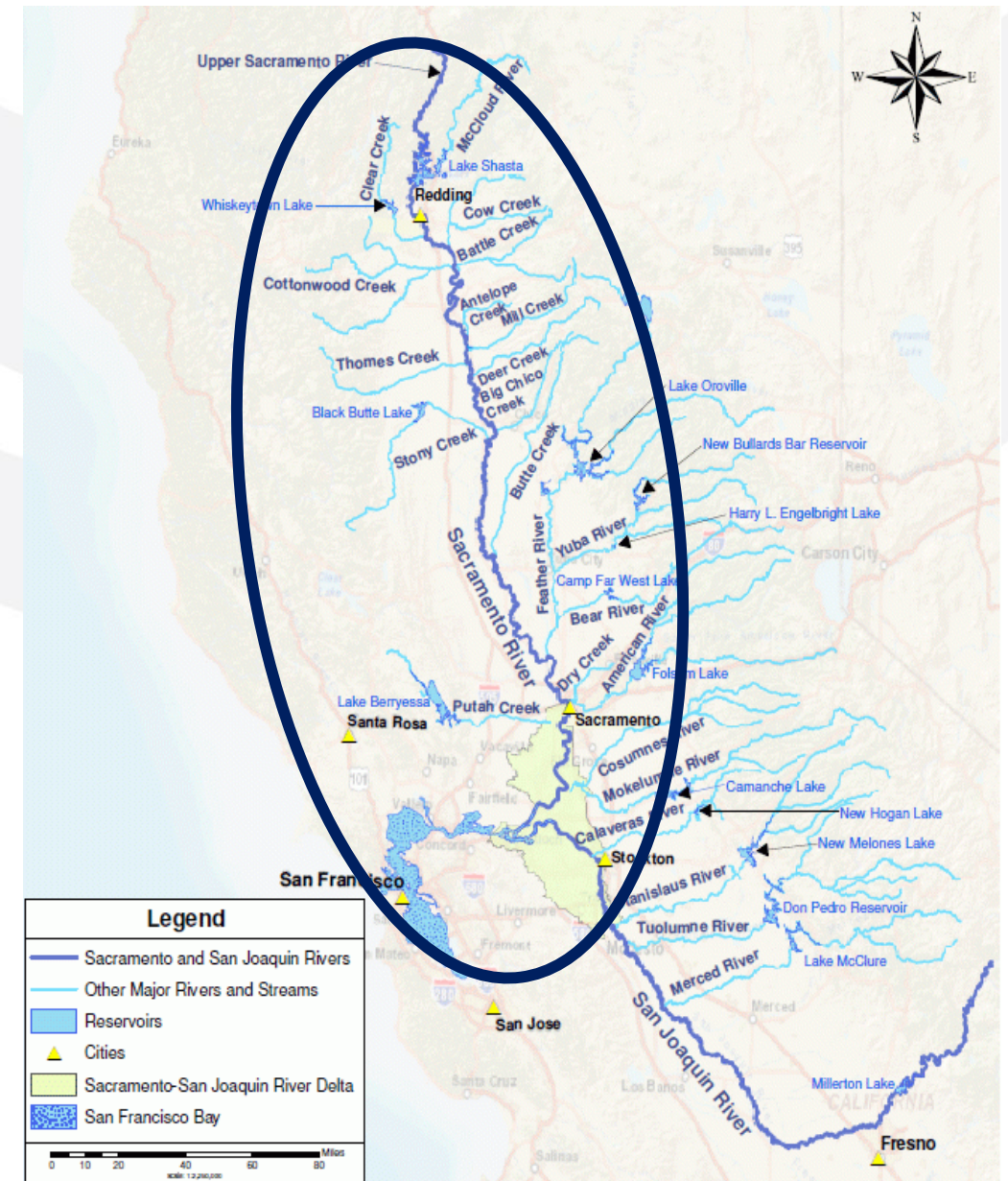
- CEQA's basic purposes:
 - Inform governmental decision makers and the public about potential significant environmental effects of proposed activities
 - Prevent significant, avoidable damage to the environment by requiring changes in projects through alternatives or mitigation measures
- Staff Report fulfills the requirements of CEQA and the State Water Board's CEQA regulations, as well as other applicable requirements

Water Quality Planning Factors

- Certain factors must be considered when establishing water quality objectives:
 - Past, present, and probable future beneficial uses of water
 - Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto
 - Water quality conditions that could reasonably be achieved through the coordinated control of all factors that affect water quality in the area
 - Economic considerations
 - The need for developing housing within the region
 - The need to develop and use recycled water
- Climate change is a relevant factor that also merits consideration

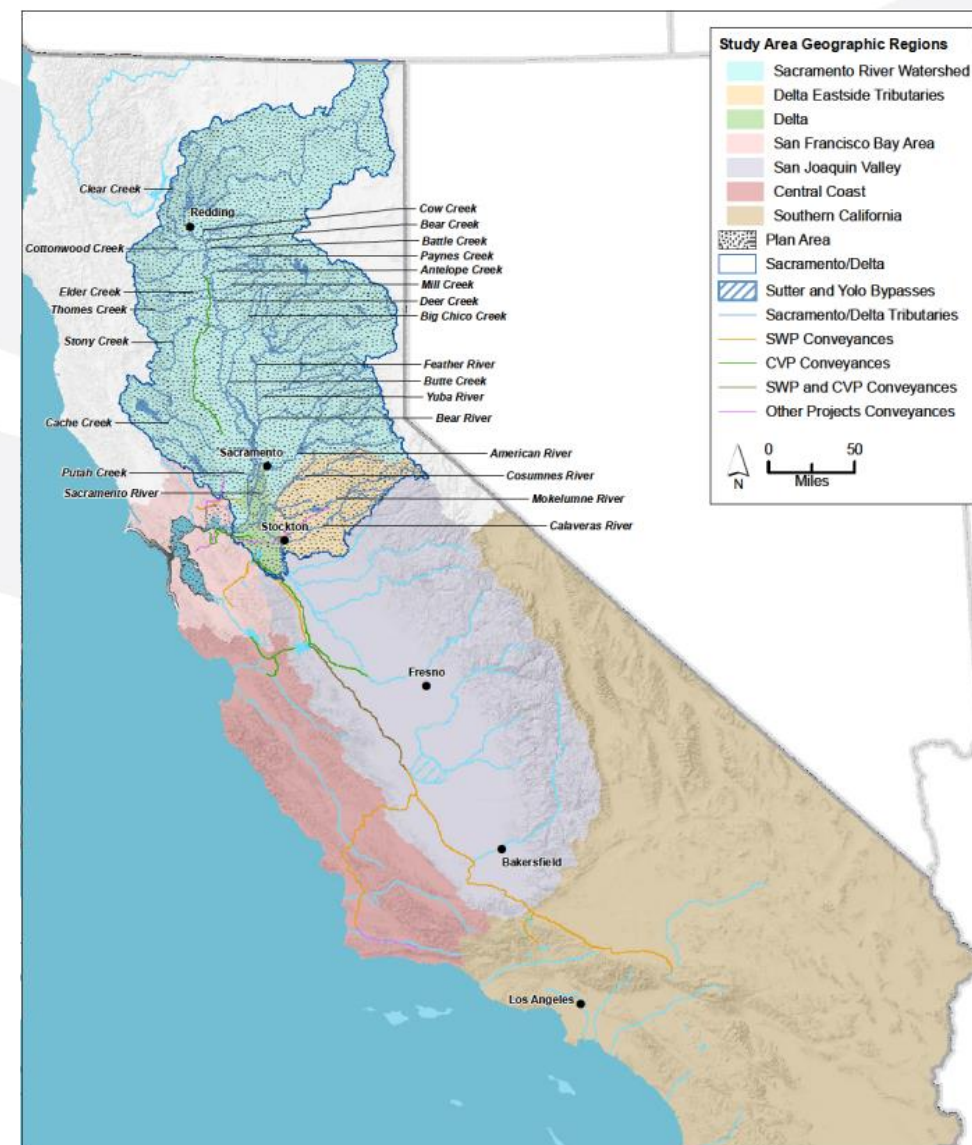
Staff Report Plan Area

- Includes Sacramento/Delta and continues west through Delta, downstream through Suisun Marsh and adjoining bays, out to Pacific Ocean
- Encompasses areas where Sacramento/Delta Plan amendments may apply and the ecosystem that the Plan is intended to protect



Staff Report Study Area

- Larger study area is also defined to ensure that environmental and economic impacts are evaluated in all areas where impacts may occur
- Divided into 7 regions based on geography and water supply
 - Sacramento River watershed, Delta eastside tributaries, Delta, San Francisco Bay, San Joaquin Valley, Central Coast, and Southern California



Organization of Draft Staff Report

- Chapter 1: Executive Summary
- Chapter 2: Hydrology and Water Supply
- Chapter 3: Scientific Knowledge to Inform Fish and Wildlife Flow Recommendations
- Chapter 4: Other Aquatic Ecosystem Stressors
- Chapter 5: Proposed Changes to the Bay-Delta Plan for the Sacramento/Delta
- Chapter 6: Changes in Hydrology and Water Supply
- Chapter 7: Environmental Analysis
- Chapter 8: Economic Analysis and Other Considerations
- Chapter 9: Proposed Voluntary Agreements
- Chapter 10: Economically Disadvantaged Communities
- Chapter 11: Tribal Engagement
- Chapter 12: Public Participation
- Appendices (Modeling results, Scientific Basis Report, VA Scientific Basis Report Supplement, VA MOU and other draft VA components)

Draft Staff Report Alternatives

- See Section 7.2, *Alternatives Description*
- Stand-Alone Alternatives:
 - Proposed Plan Amendments (based on 2018 Framework)
 - Low Flow Alternative – same as Proposed Plan Amendments but inflows of 35-45%
 - High Flow Alternative – same as Proposed Plan Amendments but inflows of 65-75%
 - Collectively Proposed Plan Amendments, Low, and High Flow Alternatives referred to as “Flow Alternatives”
 - Proposed VAs (based on VA MOU)
 - No Project Alternative
- Modular Alternatives:
 - Interior Delta Flow and Fall Delta Outflow Variations
 - Drought Alternatives
 - Protection of VA Flows Alternative
- State Water Board has not yet made any decisions on how to move forward, and all alternatives are available for consideration

Organization of the Environmental Analyses

- Changes in hydrology
 - Magnitude and timing of tributary flows, Delta inflows, and Delta outflows; reservoir levels; interior Delta flows
- Changes in water supply
 - Sacramento/Delta supplies
 - Agricultural, municipal, and wildlife refuge supplies
 - Groundwater
 - Other water management actions
 - Groundwater storage and recovery, water transfers, water recycling, and water conservation measures
- Habitat restoration and other ecosystem projects
- New or modified facilities

Environmental Resource Categories

- See Chapter 7 and Chapter 9
- Analysis identifies potential impacts and mitigation measures that may result from changes in hydrology or water supply resulting from each alternative
 - Aesthetics
 - Agriculture and Forest Resources
 - Air Quality
 - Biological Resources
 - Cultural Resources
 - Energy
 - Geology and Soils
 - Greenhouse Gas Emissions
 - Hazards and Hazardous Materials
 - Hydrology and Water Quality
 - Land Use and Planning
 - Mineral Resources
 - Noise
 - Population and Housing
 - Public Services
 - Recreation
 - Transportation/Traffic
 - Utilities and Service Systems

Impact Conclusions Overview

- Identifies potentially significant impacts, less-than-significant impacts, and beneficial environmental effects from project alternatives (Tables 1-1, 1-2, 7.21-1, 7.22-1, and Appendix F)
- Conservative (worst-case) approach for evaluating potentially significant impacts
 - Some impacts are inversely proportional, and it is not possible for a worst-case scenario to occur for every environmental resource area (e.g., agriculture/groundwater)
- Potentially significant adverse impacts should be viewed in context of an already highly altered and impaired ecosystem
 - While many potentially significant impacts are identified under the conservative analysis, including some impacts to fish and wildlife at certain times and locations, the project would be expected to improve conditions for native fish and wildlife over time

Mitigation Measures Overview

- Chapters 7 and 9 identify mitigation measures that could avoid or reduce any potentially significant impacts on the environment
- Mitigation measures are likely to reduce many potential impacts to less-than-significant levels
- State Water Board has authority to ensure mitigation is implemented for some actions
- Other mitigation measures are largely within the jurisdiction and control of other agencies
- Many impact conclusions that remain potentially significant can and will likely be mitigated to less than significant under State Water Board and other agencies' authorities

Modeling Tools to Support Environmental Analysis

- Several modeling tools used:
 - Sacramento Water Allocation Model (SacWAM), Delta Simulation Model 2 (DSM2), Statewide Agricultural Production Model (SWAP), and others
- SacWAM
 - Hydrologic and system operations model
 - Used to assess potential changes in flows, reservoir levels, and water supply under the proposed Plan amendments and proposed VAs
 - SacWAM results are used as input to other models in the draft Staff Report
- Model results are used in a comparative manner to assess possible incremental effects of scenarios compared to a base scenario
- Model results are not intended to be used in a predictive manner
- Modeling workshop Nov. 2, 2023, including video recording

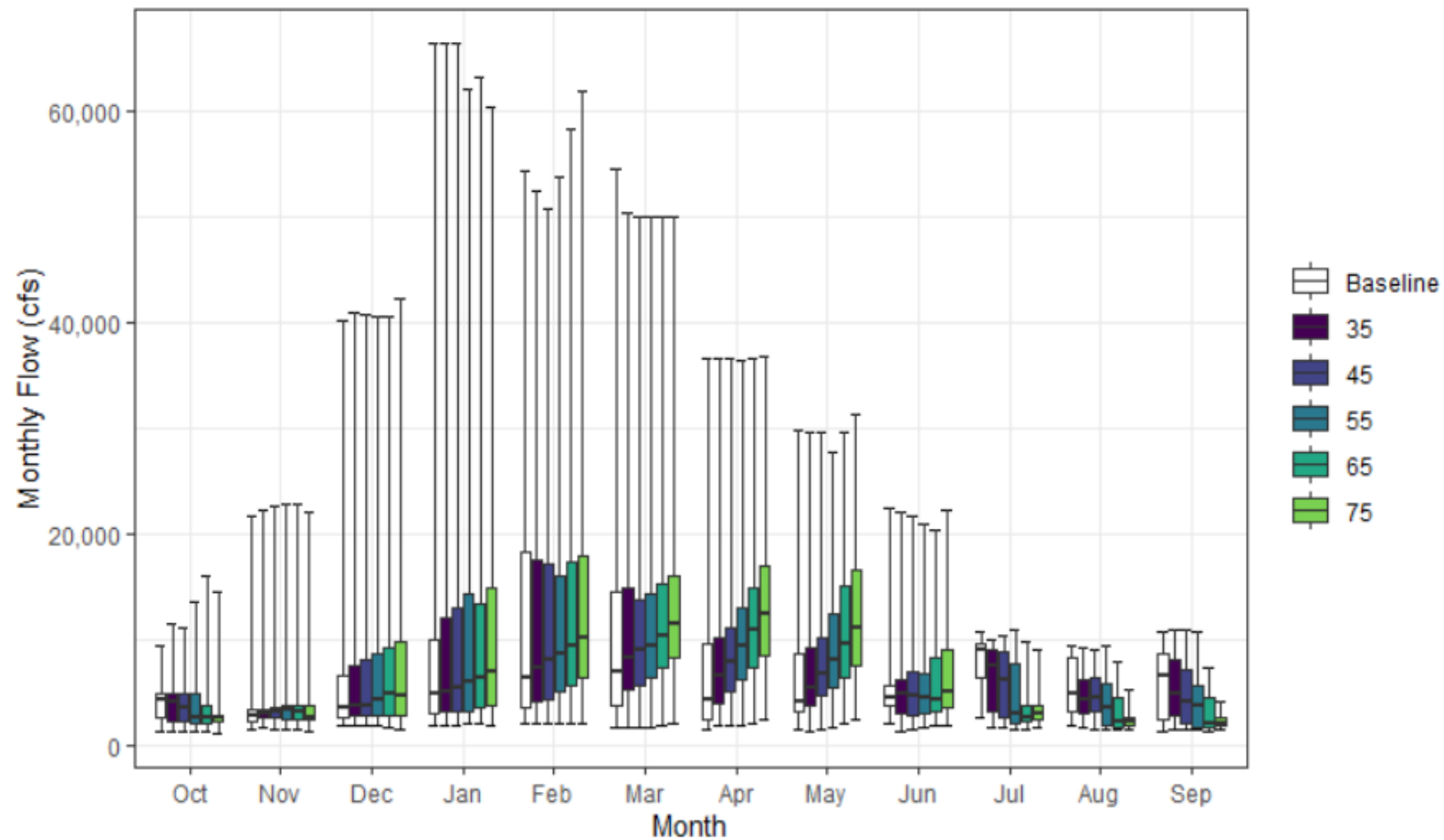
Draft Staff Report Baseline

- Draft Staff Report baseline reflective of existing conditions pursuant to CEQA
 - Represents existing reservoir operations, streamflows, and Delta operations, including current regulatory requirements, including recent court orders
 - Project baseline is described in more detail in Chapter 6, *Changes in Hydrology and Water Supply*

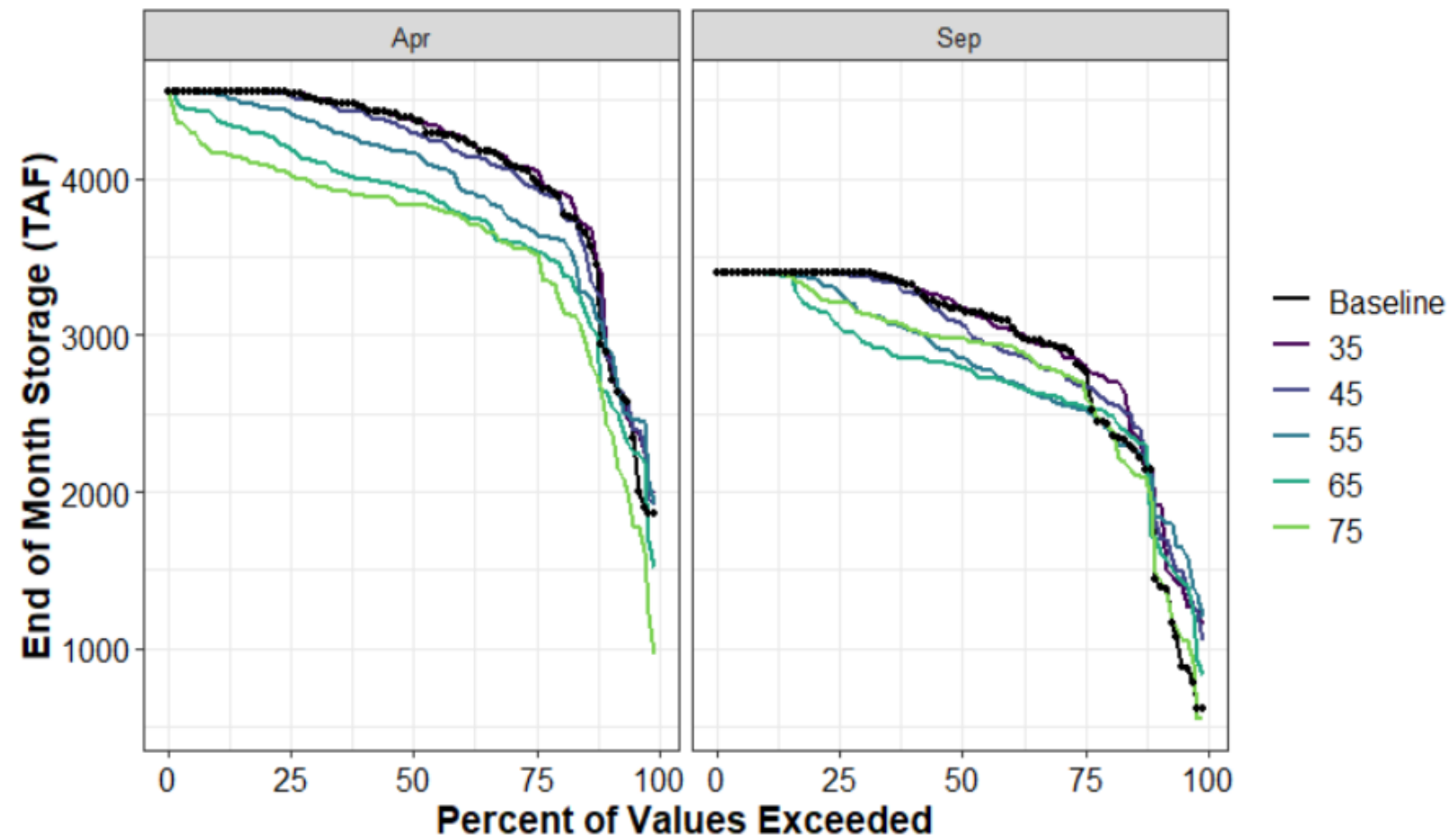
Changes in Hydrology Summary: Flow Alternatives

- Chapter 6, *Changes in Hydrology and Water Supply*, summarizes changes in hydrology under the proposed Plan amendments, Low Flow Alternative, and High Flow Alternative (35-75% unimpaired flow scenarios)
- Flows increase at times in some locations (e.g., spring months on regulated tributaries)
- Flows decrease at times in some locations (e.g., summer and fall on regulated tributaries)
- Changes in reservoir levels including decreased reservoir levels at times
- Delta inflows generally increase during January through June, and decrease in July through October, but generally higher on an annual basis
- Delta outflow generally increases during all months

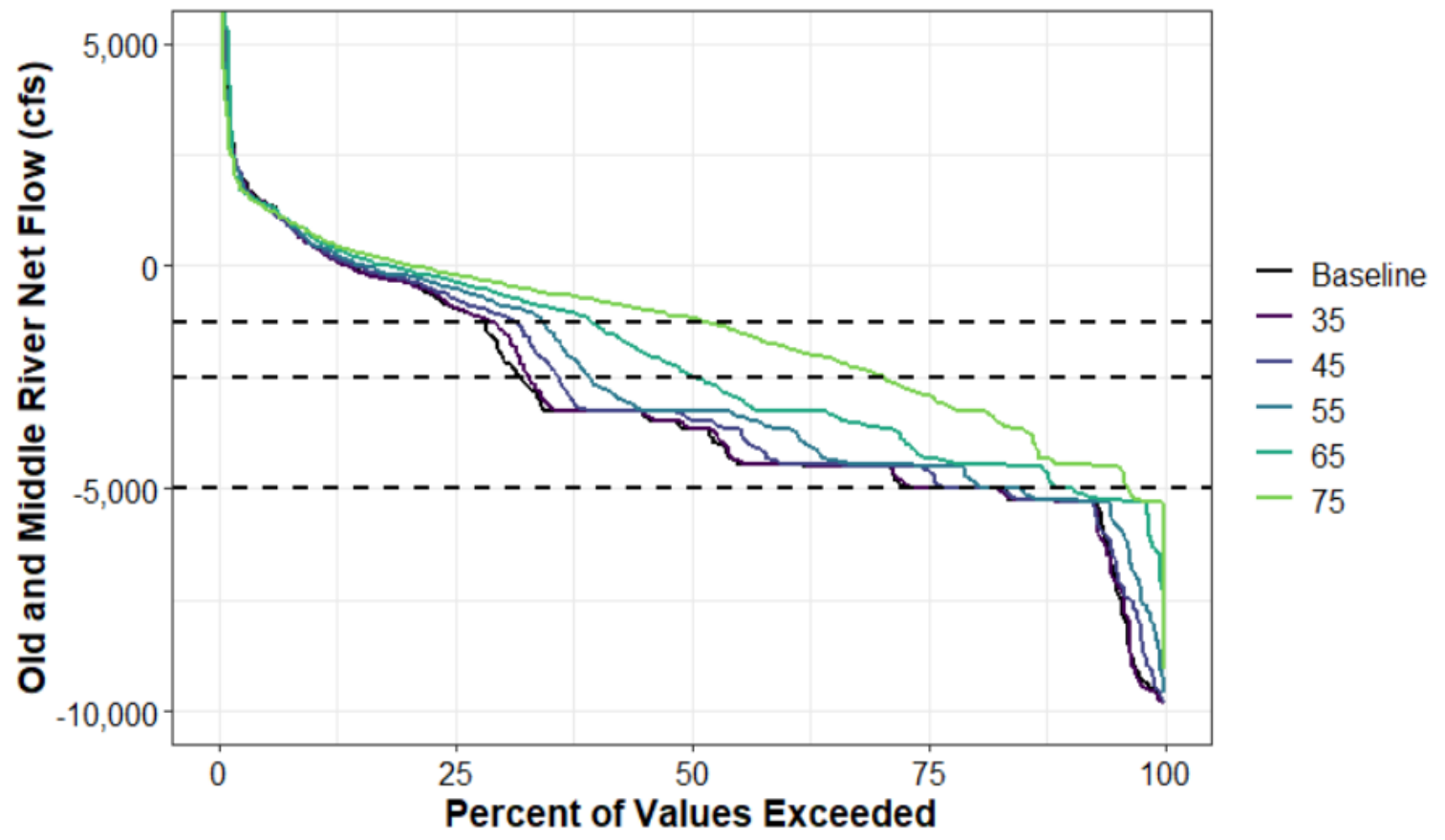
Changes in Hydrology Example: Feather River Above the Sacramento River



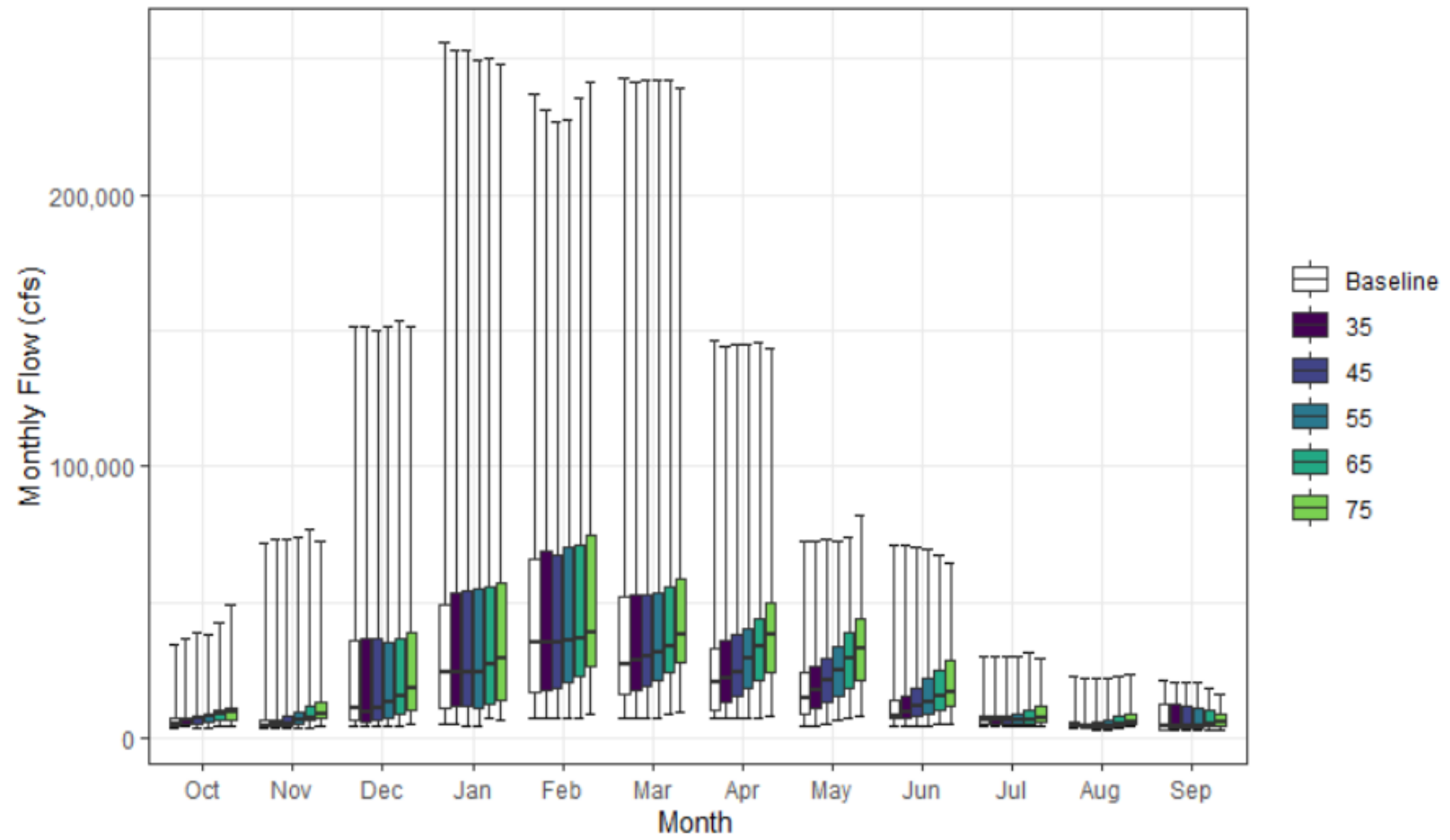
Changes in Hydrology Example: Shasta Reservoir (Sacramento River)



Monthly Exceedance Frequency Distribution of Old and Middle River Net Flow for December through June



Changes in Delta Outflow Across the Flow Scenarios

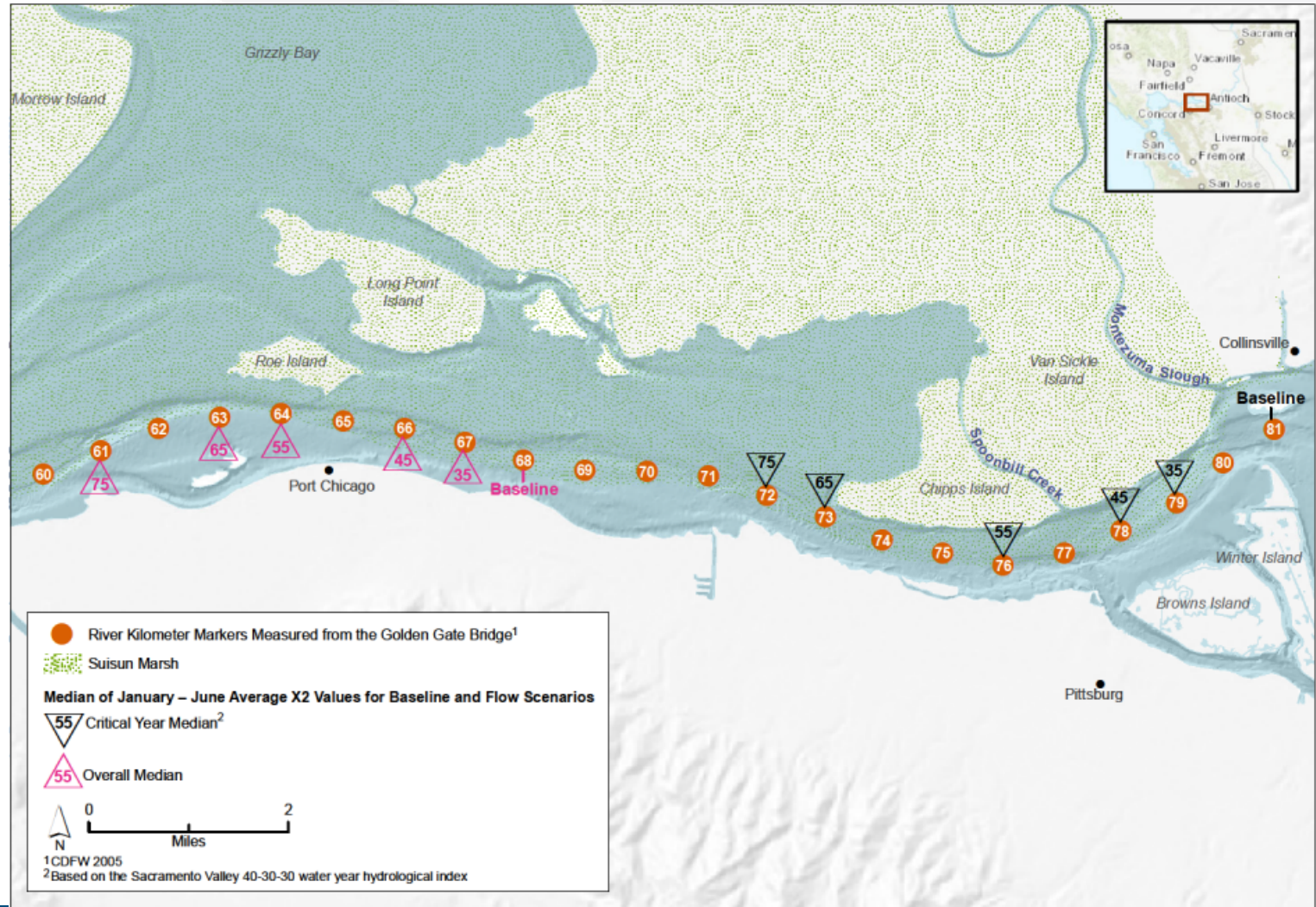


Change in Annual Total Delta Outflow by Water Year Type (TAF)

Change from Baseline

Water Year Type	Baseline	35	45	55	65	75
C	5,535	183	555	1,060	1,844	2,695
D	7,439	600	1,124	2,006	3,266	4,671
BN	10,657	649	1,196	2,078	3,348	4,911
AN	18,005	391	843	1,803	2,990	4,722
W	28,714	-3	219	763	1,967	3,200
All	15,489	333	737	1,466	2,625	3,960

Median of January-June Average X2 Position for Baseline and Flow Scenarios



Proposed VA Assets

- Additional description of proposed VAs is provided in Chapter 9, *Proposed Voluntary Agreements*

Location	Flows (thousand acre-feet) by Water Year Type					Physical Habitat Restoration (acres)		
	C	D	BN	AN	W	Spawning	Instream Rearing	Floodplain
Sacramento		100	100	100		113.5	137.5	20,000
American ¹	30	40	10	10		25	75	
Yuba		50	50	50			50	100
Feather		60	60	60		15	5.25	1,655
Putah ²	7	6	6	6		1.4		
Mokelumne (by Mokelumne Water Year Type) ³		5	5	7			1	25
Delta		125*	125*	175*				5,227.5**
PWA Fixed Price Purchases	3	63.5	84.5	99.5	27			
PWA Market Price Purchases		50	60	83				
Permanent State Water purchases	65	108	9	52	123			
Friant (by San Joaquin Water Year Type) ⁴		0-50	0-50	0-50				
Tuolumne (by San Joaquin Water Year Type)	37	62	78	27				

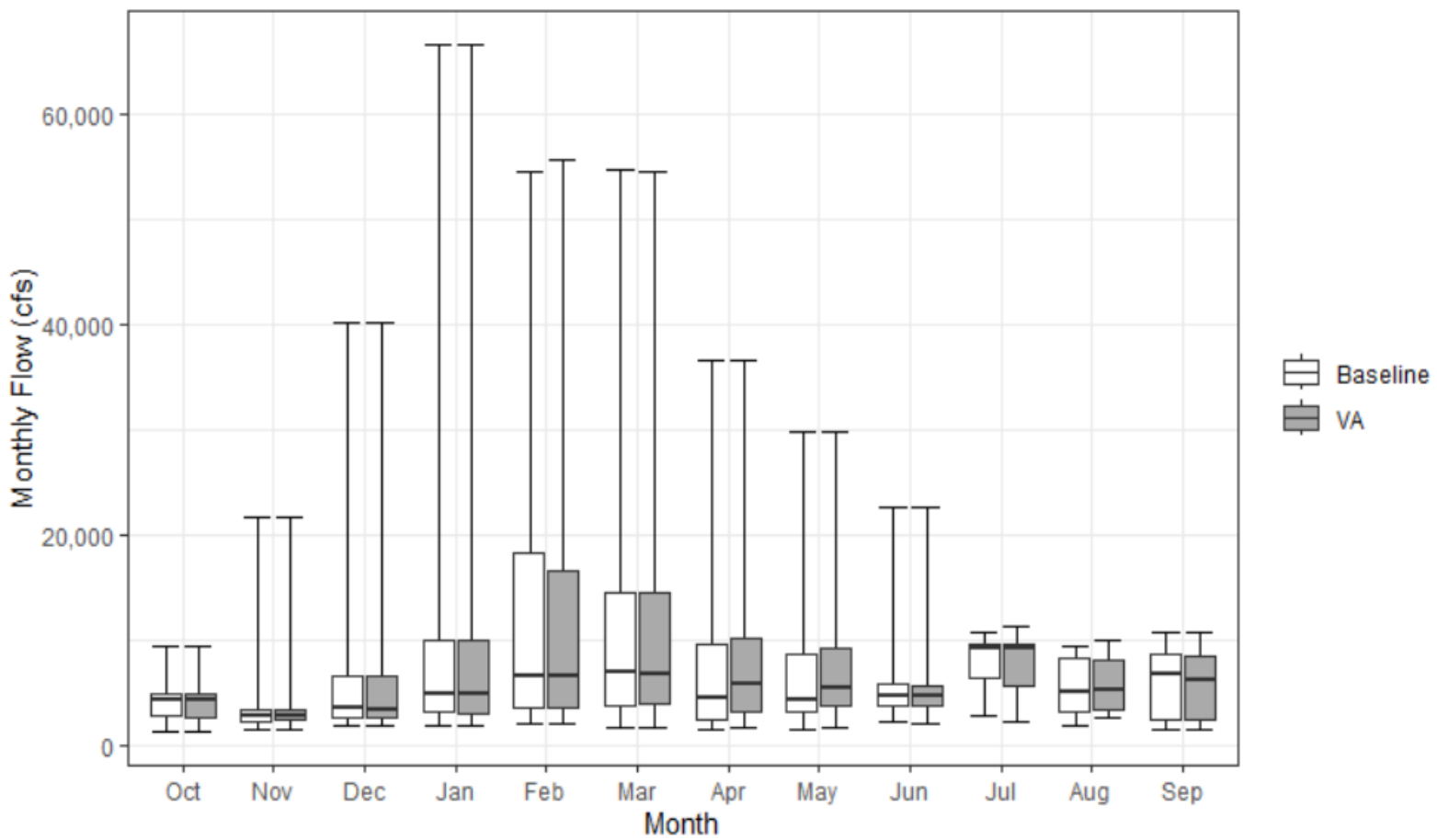
Proposed VAs: Water Purchase Programs

- Proposed VAs include flow assets through water purchases, including Permanent State Water Purchase Program, Public Water Agency (PWA) Water Purchase Fixed Price Program, and PWA Water Purchase Market Price Program
- The sources of flow assets for the PWA Water Purchase Market Price Program and Permanent State Water Purchases are not known at this time and are termed *unspecified water purchases*
 - Because sources of unspecified water purchases not known, two different scenarios are evaluated assuming these flows are derived from inflows or from Delta export reductions
 - Both methods would have the same effect on Delta outflows

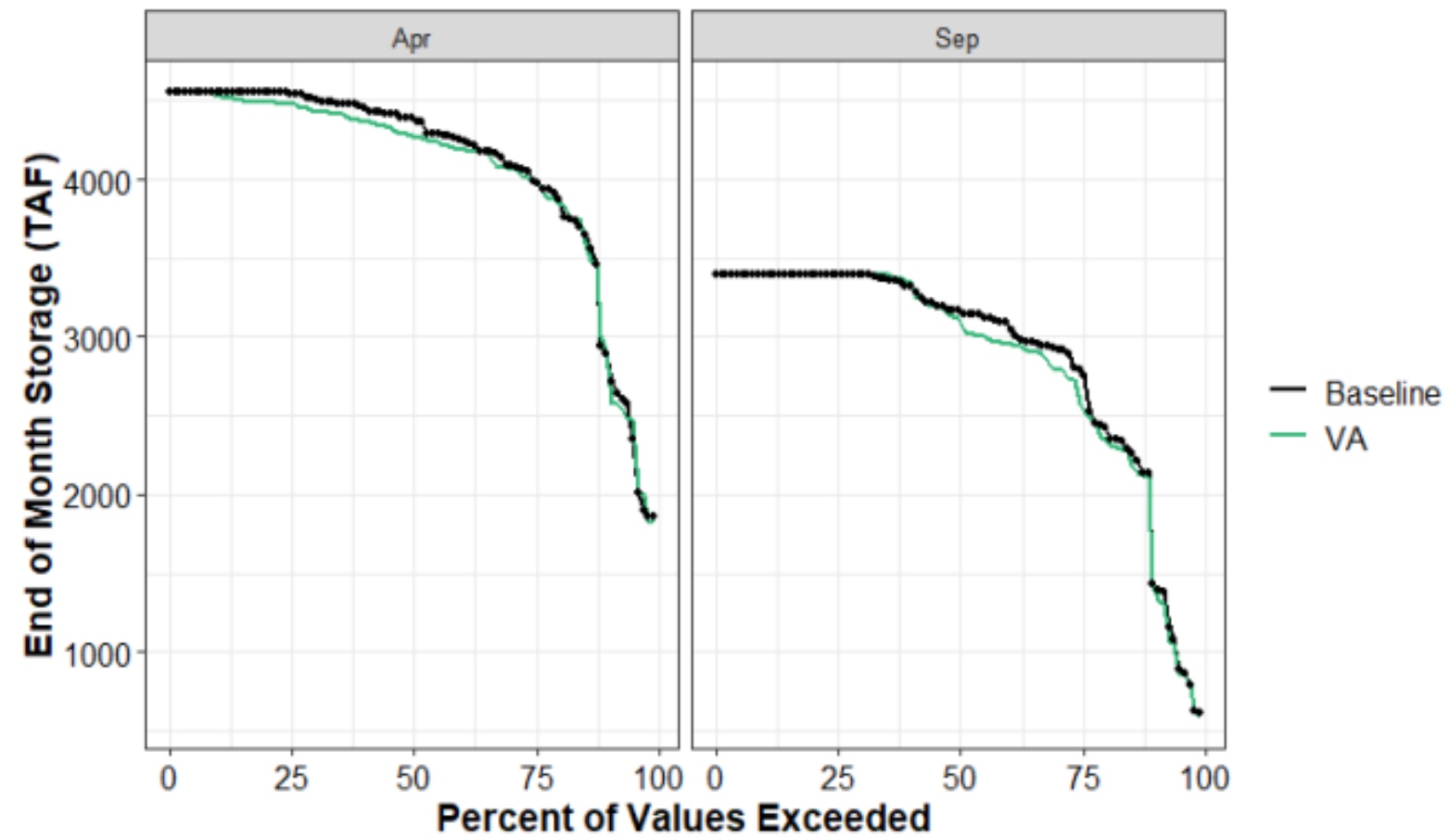
Analysis of Proposed VAs

- VA Accounting Base: theoretical assumed starting point for VA accounting purposes based on 2019 Biological Opinions, does not include current Incidental Take Permit or recent court orders
- Points of comparison for VAs
 - Impacts analyzed compared to baseline
 - Benefits analyzed compared to 2008-2009 BiOps conditions (which is similar to baseline), consistent with 2017 Scientific Basis Report
- Range of VA Evaluations
 - Unspecified water purchases analyzed as resulting from export reductions or additional Sacramento/Delta inflows
 - Analysis with/without Tuolumne River and Friant MOU contributions
 - Analysis of additional benefits to outflows during winter/spring of assumed Merced/ Stanislaus contributions in VAs and 2018 Bay-Delta Plan 40% of unimpaired flow requirement

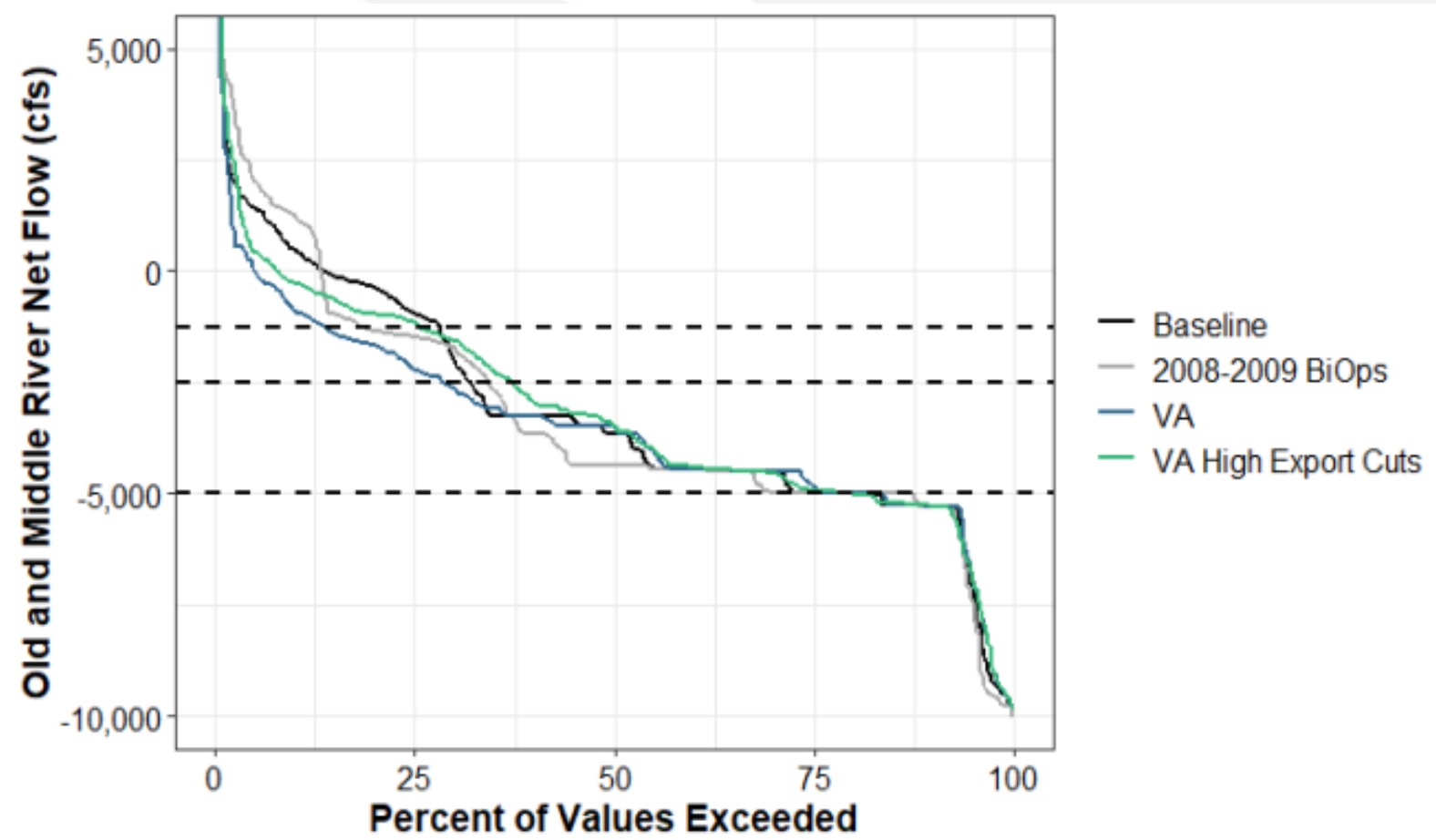
Changes in Hydrology Example: Feather River Above the Sacramento River



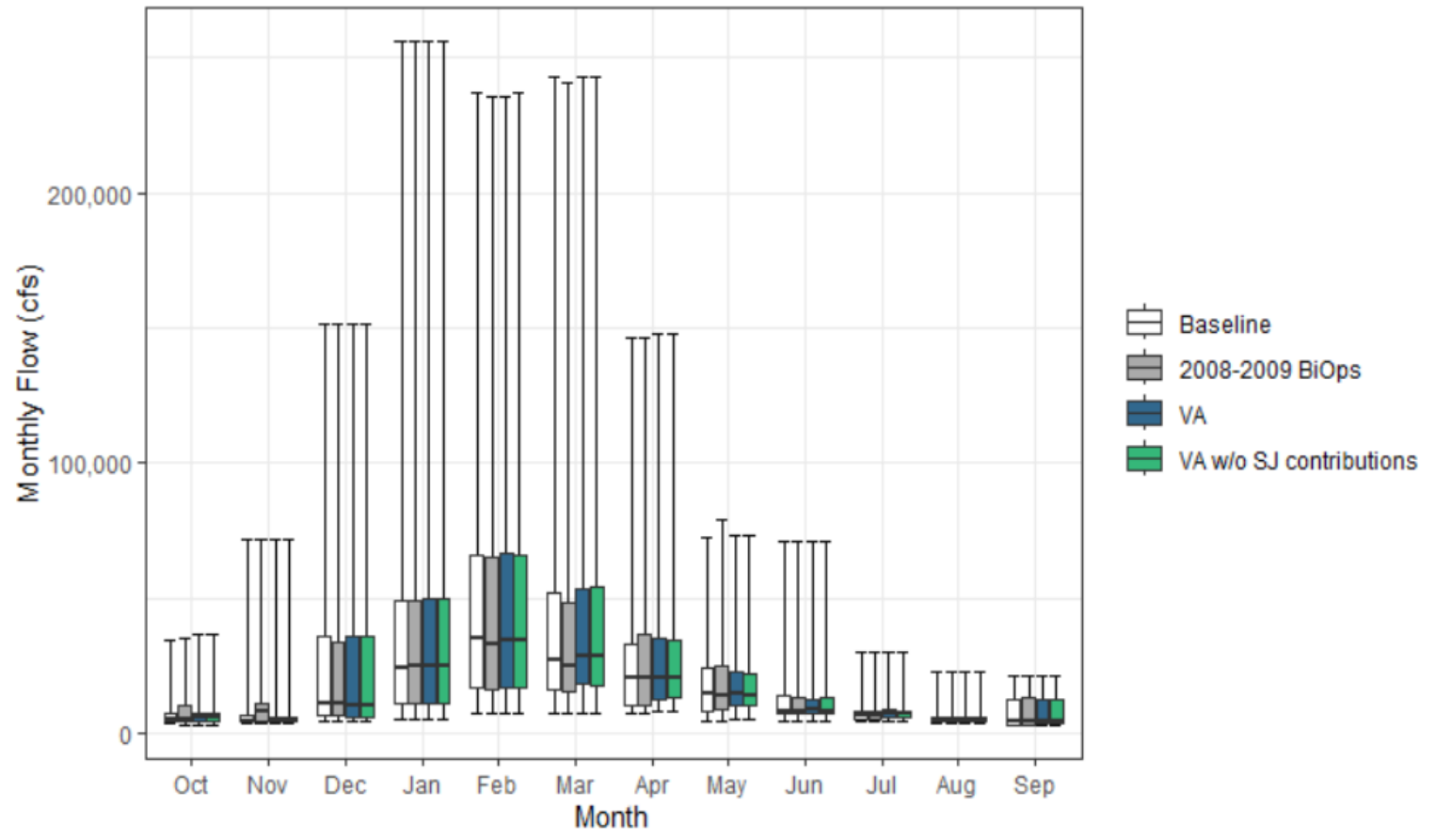
Changes in Hydrology Example: Shasta Reservoir (Sacramento River)



Monthly Exceedance Frequency Distribution of Old and Middle River Net Flow for December-June under Baseline, 2008-2009 BiOps Condition, VA, and VA High Export Cuts Scenarios



Delta Outflows: Proposed VAs



Change in January-June Total Delta Outflow by Water Year Type (TAF)

Change from Baseline

Water Year Type	Baseline	VA	VA w/o SJ contributions
C	3,659	142	92
D	5,127	488	400
BN	8,014	206	122
AN	14,128	218	180
W	22,106	-98	-91
All	11,691	169	123

Change from 2008-2009 BiOps

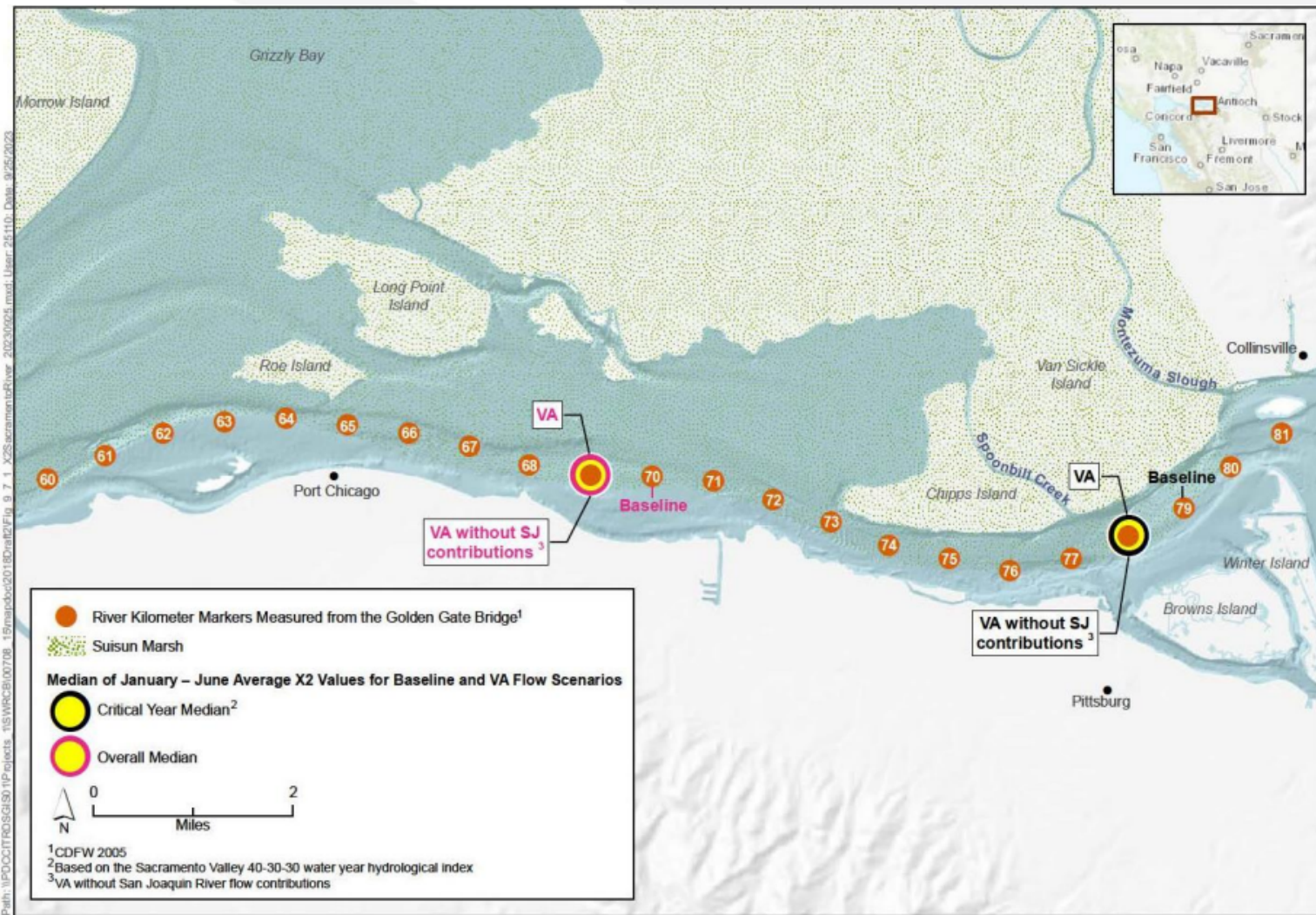
Water Year Type	2008-2009 BiOps	VA	VA w/o SJ contributions
C	3,636	165	116
D	5,058	556	469
BN	7,881	340	256
AN	13,907	439	402
W	22,337	-330	-323
All	11,689	172	126

Delta Outflows VA Benefits Bookends: Change in January-June Total Delta Outflow by Water Year Type (TAF)

Change from 2008-2009 BiOps

Water Year Type	2008-2009 BiOps	VA	VA w/o SJ contributions	VA w/ Bias Correction and LSJR Placeholder	VA w/ Bias Correction and 40% UF Merced & Stanislaus
C	3,636	165	116	76	195
D	5,058	556	469	535	680
BN	7,881	340	256	599	735
AN	13,907	439	402	631	829
W	22,337	-330	-323	-96	70

X2 Position for Baseline and the VA Flow Scenarios Presented as Median of the January-June Average Values



Changes in Hydrology

- Expected benefits from increased inflow and Delta outflow
- Possible impacts from reduced flows and reservoir levels
- Possible impacts from reduced reservoir levels and increased fluctuations
- With increases in instream flow levels, there are larger effects (magnitude, frequency, geographic scope)

Water Temperature

- Elevated water temperatures are an existing concern, particularly downstream of rim reservoirs that are now upper extent of habitat for anadromous fish
- Existing temperature protections are in place for some stream reaches and reservoirs, but legal requirements are applied unevenly and, in some cases, not at all
- Changes in flow and reservoir storage could affect stream temperatures
 - Higher spring flows would be expected to provide temperature benefits to native salmonids and other native species, but could result in a reduction in reservoir storage at the end of spring and a somewhat smaller cold water pool volume in the summer and fall months depending on specific implementation
 - Lower flows on regulated tributaries in summer and fall could affect water temperatures

Water Temperature (Cont.)

- Draft Staff Report identifies mitigation measures that could be implemented to reduce or avoid temperature-related impacts
- Proposed Plan amendments include cold water habitat objective and flexibility provided in the inflow requirements that would be expected to mitigate potential impacts and improve water temperature conditions for native cold water fish and reduce impacts
- Non-flow actions to address temperature evaluated in Section 7.21
- Changes in streamflows and reservoir levels would be less under the proposed VAs than the proposed Plan amendments
- Proposed VAs include flexibility in the timing of flow assets, which could reduce or avoid possible temperature-related impacts

Contaminants

- Changes in hydrology (increased flows) could affect the movement of contaminants, such as pathogens, trace metals and metalloids, current-use pesticides, legacy contaminants, contaminants of emerging concern (CECs), and mercury and methylmercury
- Long-term water quality impacts on movement and deposition of sediment and adhered contaminants would generally be minimal
- While higher flows may cause more sediment to enter the water column, higher flows can also help move sediment and contaminants out of the system
- Reductions in flow could concentrate dissolved contaminants, and could affect water quality
- See Sections 7.12.1 and 9.7.12.1

Mercury and Methylmercury

- Mercury is a statewide problem under existing conditions
- Many waterbodies throughout California are on 303(d) list as impaired by mercury levels that affect beneficial uses associated with human and wildlife consumption of fish
- Increased flows and floodplain inundation could result in increased input of mercury and methylmercury production in bypasses and other areas
- Increased water fluctuation in some reservoirs could incrementally increase ongoing bioaccumulation of methylmercury
- Draft Staff Report identifies mitigation measures that could reduce or avoid mercury and methylmercury related impacts from floodplain inundation

Harmful Algal Blooms and Invasive Aquatic Vegetation

- Harmful algal blooms (HABs) reported at multiple locations within Sacramento/Delta watershed under existing conditions, including in multiple lakes and reservoirs, canals, and riverine locations, as well as within the Delta
- Increased flows in spring could lead to reduced HAB formation and invasive aquatic vegetation in large portions of the Delta
- Reduced Delta inflows in summer and fall could result in increased production of HABs and invasive aquatic vegetation in some Delta channels at some times
- Lower reservoir levels could lead to shallower, warmer, more stable water column conditions in some reservoirs, which could increase the production of HABs
- Changes in hydrology would be less under the proposed VAs than the proposed Plan amendments, so HAB related impacts of the proposed VAs would likely be more similar to baseline
- Draft Staff Report identifies several mitigation measures that could be implemented to reduce or avoid HAB-related water quality impacts

Delta HABs Actions

- Uncertainty in the specific drivers of HABs in the Delta result in uncertainty in the potential impacts or benefits of the proposed Plan amendments or the proposed VAs
- Need better information on the drivers of HABs, including the effects of flow and water project operations
- Program of implementation proposed to include commitments by Board to work with other agencies and stakeholders to better understand HABs to inform actionable control mechanisms
- Board has started on these efforts by funding research into HABs drivers and development of a HABs monitoring design
- Delta HABs monitoring strategy will be available for public review early next year

Changes in Water Supply Summary: Flow Scenarios

- Reduced Sacramento/Delta supply to agricultural, municipal, and wildlife refuge uses
- Sacramento/Delta water supply reduction to each geographic region in the study areas (Sacramento River watershed, Delta eastside tributaries, Delta, San Joaquin Valley, Central Coast, San Francisco Bay Area, Southern California)
- Sacramento/Delta surface water supplies comprise only a portion of each geographic region's total water supply
- Increased groundwater pumping
- Other water management actions: groundwater storage and recovery water transfers, recycled water, and water conservation
- Additional information provided in Chapter 6, *Changes in Hydrology and Water Supply*

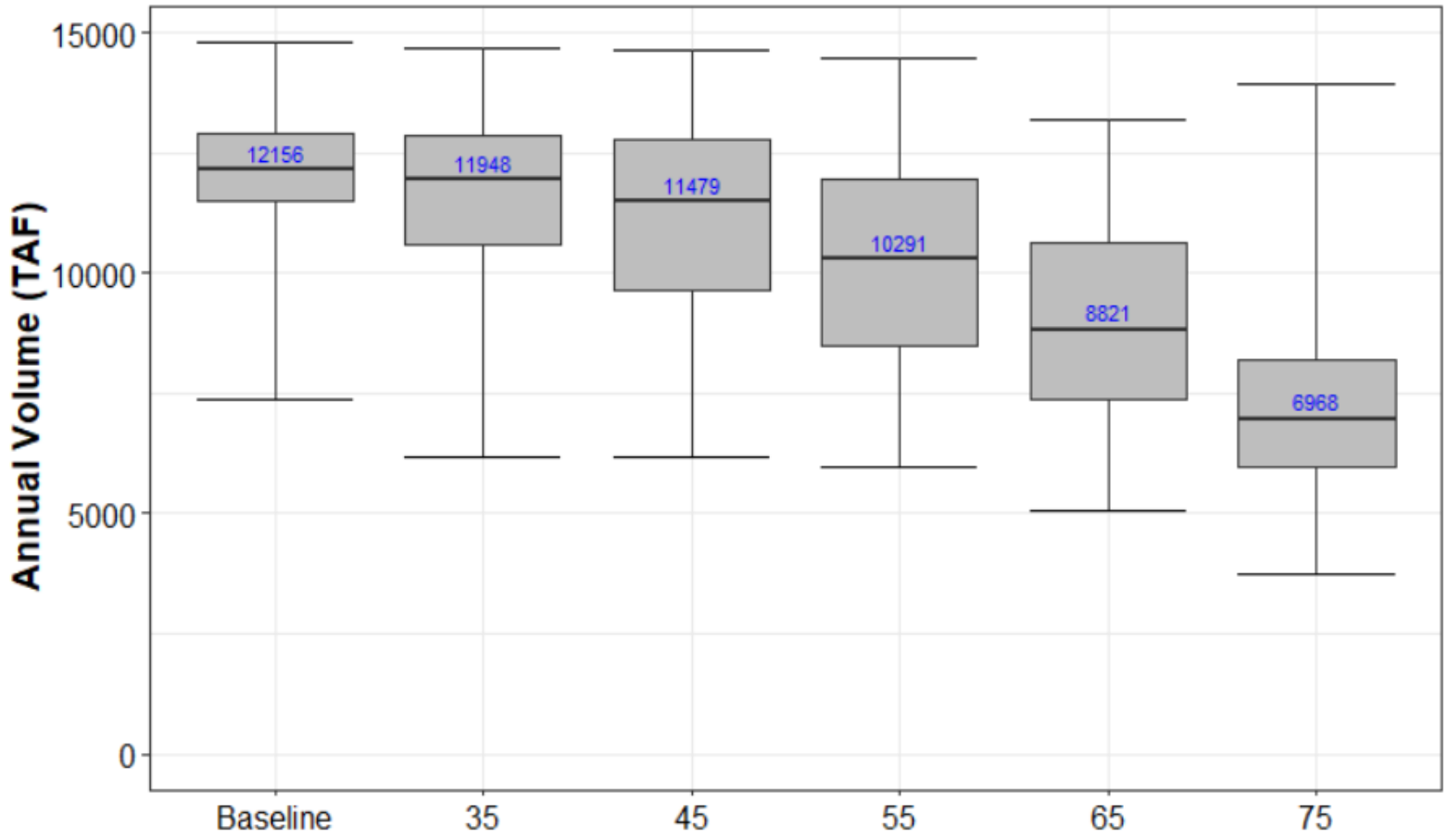
Total Sacramento/Delta change from baseline Annual volume

		Sacramento River Watershed	Delta Eastside Tributaries	Delta	San Francisco Bay Area	Central Coast	San Joaquin Valley	Southern California	Study Area Total
Historical Water Deliveries Data	Total	8,050	986	1,368	1,251	1,334	18,437	9,449	40,875
	Agriculture	6,773	824	1,185	137	1,055	16,803	4,863	31,640
	Municipal	826	154	136	1,089	279	1,053	4,518	8,055
	Wetland	451	8	48	26	0	581	68	1,182
Baseline	Sac/Delta	5,320	205	1,154	698	86	2,819	1,675	11,957
	Agriculture	4,641	124	1,136	27	37	2,422	14	8,401
	Municipal	480	81	18	670	49	99	1,661	3,058
	Refuge	199	0	0	0	0	298	0	497
35	Sac/Delta	5,110 (-4%) [-3%]	185 (-10%) [-2%]	1,154 (0%) [0%]	632 (-9%) [-5%]	83 (-3%) [0%]	2,781 (-1%) [0%]	1,583 (-5%) [-1%]	11,528 (-4%) [-1%]
	Agriculture	4,467	111	1,136	21	36	2,387	14	8,172
	Municipal	464	74	18	611	47	95	1,569	2,878
	Refuge	179	0	0	0	0	298	0	477
45	Sac/Delta	4,986 (-6%) [-4%]	177 (-14%) [-3%]	1,153 (0%) [0%]	583 (-16%) [-9%]	78 (-9%) [-1%]	2,673 (-5%) [-1%]	1,435 (-14%) [-3%]	11,085 (-7%) [-2%]
	Agriculture	4,363	107	1,135	18	34	2,288	12	7,957
	Municipal	450	70	19	565	43	88	1,422	2,657
	Refuge	174	0	0	0	0	298	0	472
55	Sac/Delta	4,714 (-11%) [-8%]	161 (-21%) [-4%]	1,150 (0%) [0%]	518 (-26%) [-14%]	67 (-22%) [-1%]	2,440 (-13%) [-2%]	1,225 (-27%) [-5%]	10,275 (-14%) [-4%]
	Agriculture	4,131	96	1,132	13	30	2,069	11	7,482
	Municipal	427	66	18	504	38	77	1,214	2,344
	Refuge	156	0	0	0	0	294	0	450
65	Sac/Delta	4,234 (-20%) [-13%]	142 (-31%) [-6%]	1,140 (-1%) [-1%]	442 (-37%) [-20%]	48 (-44%) [-3%]	1,950 (-31%) [-5%]	1,019 (-39%) [-7%]	8,975 (-25%) [-7%]
	Agriculture	3,705	83	1,124	10	17	1,611	9	6,559
	Municipal	397	59	16	432	32	64	1,010	2,010
	Refuge	133	0	0	0	0	275	0	408
75	Sac/Delta	3,478 (-35%) [-23%]	127 (-38%) [-8%]	1,134 (-2%) [-1%]	381 (-45%) [-25%]	37 (-57%) [-4%]	1,504 (-47%) [-7%]	757 (-55%) [-10%]	7,418 (-38%) [-11%]
	Agriculture	3,039	74	1,120	6	13	1,212	7	5,471
	Municipal	372	53	14	375	24	49	750	1,637
	Refuge	67	0	0	0	0	242	0	309

Total Sacramento/Delta change from baseline Annual volume

		Sacramento River Watershed	Delta Eastside Tributaries	Delta	San Francisco Bay Area	Central Coast	San Joaquin Valley	Southern California	Study Area Total
Historical Water Deliveries Data	Total	8,050	986	1,368	1,251	1,334	18,437	9,449	40,875
	Agriculture	6,773	824	1,185	137	1,055	16,803	4,863	31,640
	Municipal	826	154	136	1,089	279	1,053	4,518	8,055
	Wetland	451	8	48	26	0	581	68	1,182
Baseline	Sac/Delta	5,320	205	1,154	698	86	2,819	1,675	11,957
	Agriculture	4,641	124	1,136	27	37	2,422	14	8,401
	Municipal	480	81	18	670	49	99	1,661	3,058
	Refuge	199	0	0	0	0	298	0	497
35	Sac/Delta	5,110 (-4%) [-3%]	185 (-10%) [-2%]	1,154 (0%) [0%]	632 (-9%) [-5%]	83 (-3%) [0%]	2,781 (-1%) [0%]	1,583 (-5%) [-1%]	11,528 (-4%) [-1%]
	Agriculture	4,467	111	1,136	21	36	2,387	14	8,172
	Municipal	464	74	18	611	47	95	1,569	2,878
	Refuge	179	0	0	0	0	298	0	477
45	Sac/Delta	4,986 (-6%) [-4%]	177 (-14%) [-3%]	1,153 (0%) [0%]	583 (-16%) [-9%]	78 (-9%) [-1%]	2,673 (-5%) [-1%]	1,435 (-14%) [-3%]	11,085 (-7%) [-2%]
	Agriculture	4,363	107	1,135	18	34	2,288	12	7,957
	Municipal	450	70	19	565	43	88	1,422	2,657
	Refuge	174	0	0	0	0	298	0	472
55	Sac/Delta	4,714 (-11%) [-8%]	161 (-21%) [-4%]	1,150 (0%) [0%]	518 (-26%) [-14%]	67 (-22%) [-1%]	2,440 (-13%) [-2%]	1,225 (-27%) [-5%]	10,275 (-14%) [-4%]
	Agriculture	4,131	96	1,132	13	30	2,069	11	7,482
	Municipal	427	66	18	504	38	77	1,214	2,344
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65	Sac/Delta	4,234 (-20%) [-13%]	142 (-31%) [-6%]	1,140 (-1%) [-1%]	442 (-37%) [-20%]	48 (-44%) [-3%]	1,950 (-31%) [-5%]	1,019 (-39%) [-7%]	8,975 (-25%) [-7%]
	Agriculture	3,705	83	1,124	10	17	1,611	9	6,559
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	Municipal	372	53	14	375	24	49	750	1,637
	Refuge	67	0	0	0	0	242	0	309

Annual Sacramento/Delta Supply: Flow Alternatives



TAF = thousand acre-feet

Changes in Water Supply: Proposed VAs

- Proposed VAs could result in changes in Sacramento/Delta surface water supply, both within and outside of the Sacramento/Delta watershed
 - Agriculture: VA following actions
 - Municipal: Generally small
 - Water purchases likely from agricultural supply
- Some VA flow assets could be provided through groundwater substitution
- Other Water Management Actions
 - Similar to flow scenarios but fewer impacts

Changes in Water Supply: Proposed VAs

Annual Total Sacramento/Delta Supply under baseline and Proposed VAs (TAF/yr)

Water Year Type	Baseline	Proposed VA: Change from Baseline
C	9,305	-81
D	11,563	-306
BN	12,149	-132
AN	12,334	-184
W	13,394	22
All	11,957	-123

Effects of Changes in Water Supply

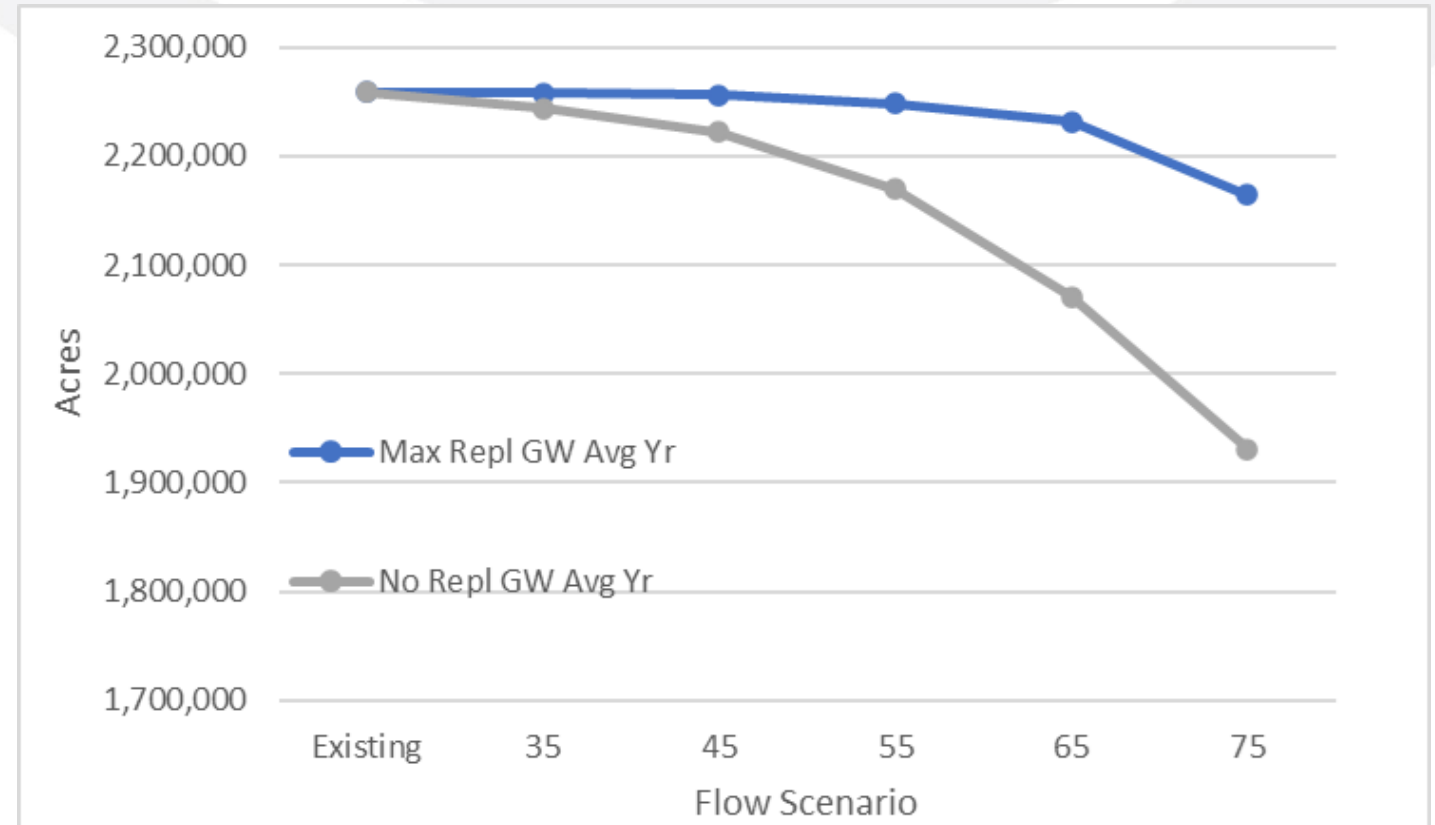
- Conservative analysis finds changes in water supply could result in potentially significant impacts to multiple environmental resource areas
- For each resource area, the analysis assumes the worst-case scenario, but some impacts are inversely proportional (e.g., impacts to groundwater levels and impacts to agricultural resources)
- Increased groundwater pumping and other water management actions are response actions that may mitigate impacts, but may also result in additional environmental impacts
- Mitigation measures could reduce potentially significant impacts; however, many conclusions acknowledge the potential for significant impacts that cannot be mitigated to less-than-significant levels

Agricultural Resources: Approach to Analysis

- Draft Staff Report uses conservative threshold of significance related to land conversion (i.e., assumes any reduction in irrigated crop acreage would result in permanent conversion of important farmland to nonagricultural use resulting in a potentially significant impact)
- In response to reductions in Sacramento/Delta supply, individual water users may choose to increase groundwater pumping, where available and not locally restricted, or choose to plant lower water use crops, engage in deficit irrigation, or fallow land
- Draft Staff Report identifies mitigation measures that could be implemented to reduce or avoid impacts to agriculture

Agricultural Resources: Flow Scenarios – Range of Potential Change in Crop Acreage in the Sacramento/Delta

- Results discussed in Section 7.4, *Agriculture and Forest Resources*
- Reduction in irrigated crop acreage would be largest under 75% unimpaired flow scenario, and smallest under 35% unimpaired flow
- Results presented for maximum replacement groundwater pumping and no replacement groundwater pumping conditions



Agricultural Resources: Proposed VAs

- SWAP results for proposed VAs presented in Chapter 9, *Proposed Voluntary Agreements*
- Modeling results suggest changes in crop acreage would be less under the proposed VAs than the proposed Plan amendments
- Actual effects on agricultural resources could differ from those indicated by SWAP modeling results
 - Equating reductions in irrigated acreage to cropland conversions likely overestimates potential acreage reductions
 - Unspecified water purchases would be provided from willing sellers that choose to participate in the water purchase program, and actual effects could differ from those indicated by the SWAP model results
 - Analysis for the proposed VAs quantifies estimated changes in crop acreage assuming groundwater is not used to replace lost surface water supply

Municipal Use

- Evaluated in Section 7.20 and 9.7.20
- Reduced Sacramento/Delta water supply could affect municipal water supplies, including disadvantaged communities
 - Reductions under the proposed VAs would be smaller compared to the proposed Plan amendments
- Reduced groundwater levels could affect water supplies for communities that rely on groundwater as their primary municipal water source, including disadvantaged communities
- Reduced water levels at some locations could affect the ability of existing diversion intakes to divert water, which could affect municipal water supplies
- Changes in water supply could affect water quality of wastewater treatment plant (WWTP) influent and effluent
- Draft Staff Report identifies several mitigation measures that could be implemented to reduce or avoid impacts on municipal water supplies

Groundwater

- Evaluated in Section 7.12.2 and Section 9.7.12.2
- Lower groundwater levels – Impact Mechanisms
 - In response to reductions in Sacramento/Delta surface water supply, individual water users may choose to increase groundwater pumping, where available and not restricted
 - Reduced incidental groundwater recharge from applied irrigation
 - Reduced Sac/Delta supply for groundwater banks/recharge
 - Agricultural conservation measures
- Lower groundwater levels have potential secondary impacts
 - For example, increase in frequency and severity of critical shortages or dry wells occurring in some areas for communities that rely on groundwater
- Draft Staff Report identifies mitigation measures that could reduce or avoid groundwater related impacts

Other Water Management Actions

- Changes in water supply also includes other water management actions that do not involve construction: groundwater storage and recovery, water transfers, recycled water, and water conservation
- May mitigate impacts from reduced Sacramento/Delta supply
- Other water management actions may have environmental impacts that are also evaluated in draft Staff Report
- While the project is not considered the driving impetus for sustainable management and water supply diversification efforts, it may accelerate and increase these efforts

Physical Habitat Restoration and Other Ecosystem Projects

- Section 7.21, *Habitat Restoration and Other Ecosystem Projects*, evaluates potential environmental impacts of physical habitat restoration and other complementary ecosystem projects that may be taken to improve conditions for fish and wildlife in the Sacramento/Delta watershed
- Project types include: physical habitat restoration, fish passage improvements, predatory fish control, and invasive aquatic vegetation control
- Proposed VAs include physical habitat restoration on a portion of the Sacramento/Delta tributaries and in the Delta
- Table 7.22-1 summarizes potentially significant impacts, less-than-significant impacts, and beneficial environmental effects of physical habitat restoration and other ecosystem projects

New and Modified Facilities

- Section 7.22, *New and Modified Facilities*, addresses actions entities may take that would involve construction to modify or build new facilities and infrastructure to supplement or conserve water supplies
- Project types: new or modified reservoirs and points of diversion, groundwater wells and groundwater storage and recovery projects, new or modified drinking water treatment plants (including desalination plants and WWTPs), and other construction projects that may result from implementation of the project (e.g., boat ramps, stream gages, canal lining)
- Operational impacts from increased groundwater storage and recovery, water transfers, water recycling, and water conservation are addressed in resource sections (Sections 7.3 through 7.20)
- Construction impacts consolidated to avoid redundancy
- Table 7.22-1 identifies potentially significant impacts and less-than-significant impacts of new and modified facilities

Economic Effects

- State Water Board is required to consider several factors, including economic considerations, when establishing water quality objectives for the reasonable protection of beneficial uses
- Economic effects for the proposed Plan amendments are evaluated in Chapter 8, and economic effects for the proposed VAs are evaluated in Chapter 9
- Economic effects associated with changes in water supply to agriculture and municipal water providers
- Regional economic effects on output (sales), income, and employment due to changes in agricultural production
- Economic benefits, including effects on fisheries and recreation

Tribal Engagement and Feedback

- Tribal outreach and engagement activities, including listening sessions, meetings, and individual discussions
 - March and May 2023 Tribal Listening Sessions
 - June 2023 Tribal and Subsistence Fishing Beneficial Uses of Water (TBUs) Informational Item
- Letters offering formal consultation on Bay-Delta planning processes
 - Tribal representatives may contact Rob McCarthy at Robert.McCarthy@waterboards.ca.gov
- Draft Staff Report identifies proposed incorporation of TBUs into the Bay-Delta Plan
- Draft Staff Report Documents traditional ecological knowledge (TEK)
- See Draft Staff Report Chapter 11, *Tribal Engagement*

Public Participation

- State Water Board has provided several previous opportunities for interested parties to provide input on the Sacramento/Delta updates to the Bay-Delta Plan
 - CEQA scoping meetings, informational workshops, informational items, workshops and comment periods on Scientific Basis Report and Scientific Basis Report Supplement, listening sessions, meetings
- State Water Board has received valuable input that has informed the Sacramento/Delta updates to the Bay-Delta Plan and will be further considered through the planning process
- See Draft Staff Report Chapter 12, *Public Participation*
- Additional public input is encouraged and will continue to inform the Sacramento/Delta update processes

Upcoming Public Participation and Tribal Engagement Opportunities

- **October 19, 2023:** Public Workshop – Draft Staff Report
- **November 2, 2023:** Public Workshop – Modeling Workshop
- **November 2023:** Tribal Workshop (tribal representatives only)
- **November 17, 2023:** Board Hearing Day 1 (9:30 am)
- **December 1, 2023:** Board Hearing Day 2 (9:30 am)
- **December 11, 2023:** Board Hearing Day 3 (4:00 pm)
- **December 15, 2023:** Written comments due

Anticipated Timeline

- **Fall 2023:** VA Scientific Basis Report Supplement Report submitted for independent scientific peer review
- **Late 2023:** VA parties submit additional draft components of VA proposal (flow accounting, various agreements, governance charter) to the Board and for public review
- **Early to Mid 2024:** Release specific draft changes to Bay-Delta Plan, including program of implementation language, for public review and comment, and hold public meeting
- **Late 2024:** Develop responses to public comments on draft Staff Report and any needed changes to Staff Report and proposed changes to the Bay-Delta Plan for Board consideration
- **Late 2024:** Board meeting to consider adoption of Sacramento/Delta updates to Bay-Delta Plan and final Staff Report

Resources and Contact Information

Submit written comments:

SacDeltaComments@waterboards.ca.gov

Webpage:

Bay-Delta Watershed:

www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/

Sacramento/Delta Updates:

www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/comp_review.html

Bay-Delta Notices

Email Subscription List:

www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/



Email Subscription List

Subscribe to the Bay Delta Notices email topic to receive notifications and the latest updates.

*Email Address

Submit

Remarks from California Department of Water Resources (DWR) and California Department of Fish and Wildlife (DFW)



Question and Answer Session

- **To ask questions:** must be on Zoom platform
 - Zoom: submit questions using Q&A function or raise your hand to ask question verbally
 - Phone: press *9 to raise and lower your hand
- Email SacDeltaComments@waterboards.ca.gov for assistance

Upcoming Events + More Information

- **November 2, 2023:** Public Workshop – Modeling Workshop
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Bay-Delta website: waterboards.ca.gov/bay_delta

Sacramento/Delta updates website: bit.ly/sac-delta-update