

Staff Workshop on Updated Water Unavailability Methodology and Draft Emergency Regulation for the Delta Watershed

May 12, 2022



Division of Water Rights

Workshop Logistics and Housekeeping

- Recording will be posted on the Delta Drought webpage – waterboards.ca.gov/drought/delta/
- If you wish to view the workshop only – view the webcast at: <https://video.calepa.ca.gov> (closed captioning available)
- If you wish to participate and provide oral comments or ask clarifying questions during the workshop – Fill out virtual speaker card using online form provided in workshop notice
- If you have questions or wish to submit written comments – email Bay-Delta@waterboards.ca.gov. Comments are due by **5:00 PM on May 19**

Timeline of Water Rights Drought Response Actions in the Delta Watershed To Date (1 of 2)

Governor's
Emergency Drought
Proclamation & Draft
Water Unavailability
Methodology
(methodology)
released; Staff
workshop held

Updated methodology,
released draft
emergency
regulation, and
issued notices of
water unavailability to
senior water rights;
Staff workshop held

Released updated
methodology

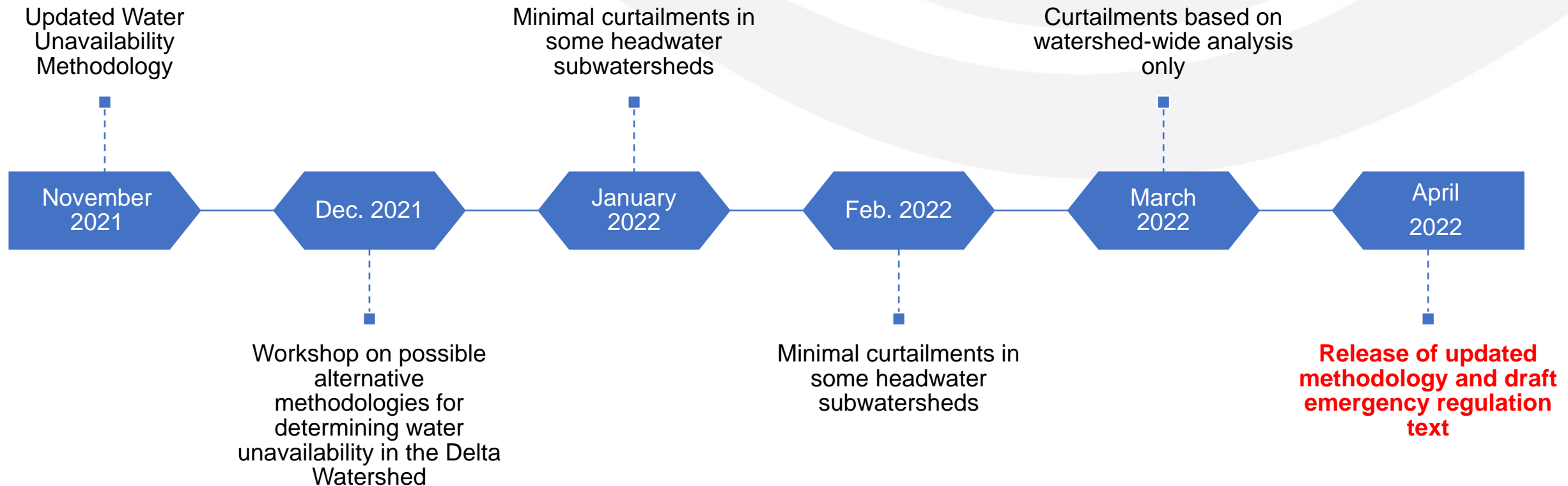


Updated methodology
and issued notices of
water unavailability to
post-1914s

**Board adopted and OAL
approved emergency
curtailment regulation,
released updated
methodology, and Board
issued curtailments to
water right holders**

Staff workshop on
potential adjustments
to methodology

Timeline of Water Rights Drought Response Actions in the Delta Watershed To Date (2 of 2)



Tentative Schedule for Emergency Regulation

**Notice of
Proposed
Rulemaking**
June 27

- Includes updated regulation text, finding of emergency, informative digest, and fiscal analysis, and possible updates to methodology
- **Begins written comment period – ends at noon on July 8**

Board Meeting
July 19

- Staff presentation on overview of regulation
- Public comments
- Board consideration of proposed emergency regulation

**Submittal to
OAL**
July 20-25

- OAL notices for a five-calendar day comment period
- OAL reviews package within 10 calendar days of submittal
- Upon approval, OAL submits to Secretary of State

**Regulation
Effective**
August 1-5

- **Existing curtailment orders, including reporting requirements, are still in effect**
- Continue outreach and messaging

OAL – Office of Administrative Law

Overview of Discussion Topics

- Water supply data considerations
- Water demand data sources
- Return flow considerations
- Curtailment methods where a portion of supply is unavailable, including correlative shortages for riparian claims
- Subwatershed curtailment implementation
- Delta supply sources
- Direct diversion demand and storage demand accounting
- Other relevant curtailment issues

Overview of Updates to Methodology

Water supply outlook variables

Curtailment decision adjustments

Legal Delta supply considerations

Demand data refinements

Overview of Updates to Emergency Regulation

Expansion of the data sources to be considered in assessing water right demand

De-ranking of supply forecast data sources

Elimination of deadlines for certain responses to curtailment

Clarifying language for jointly developed alternative water sharing agreements

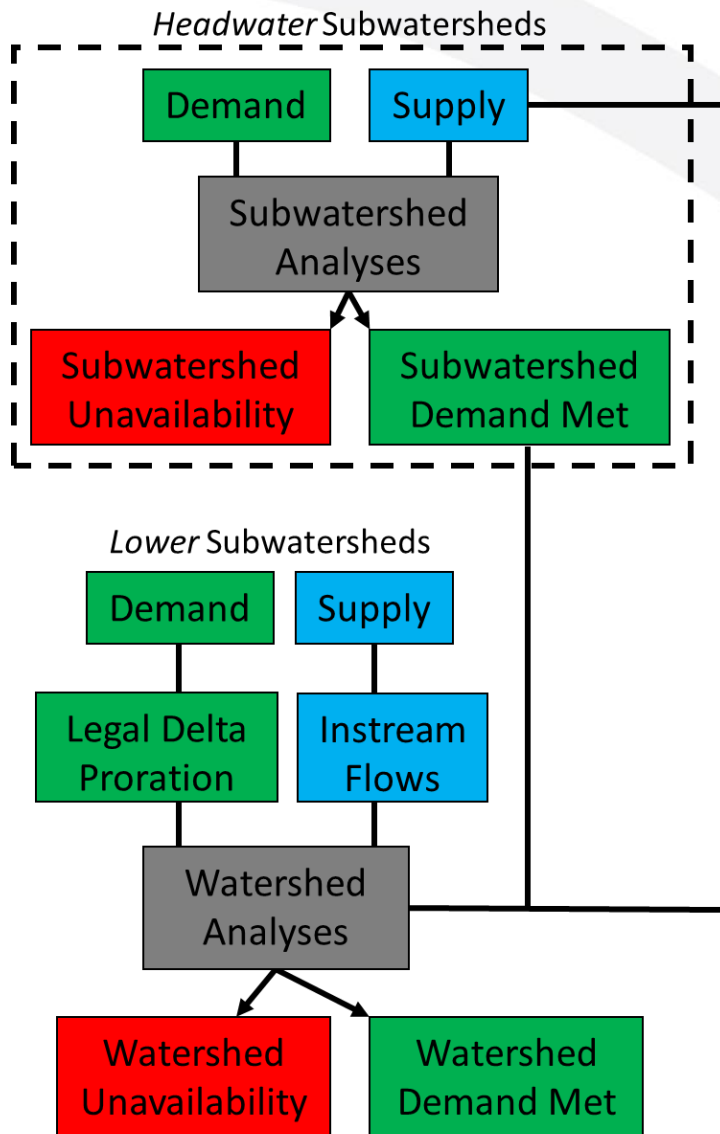
Updates to outdated references and dates

Updates to the Water Unavailability Methodology

Jesse Jankowski, WRCE



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Methodology Overview

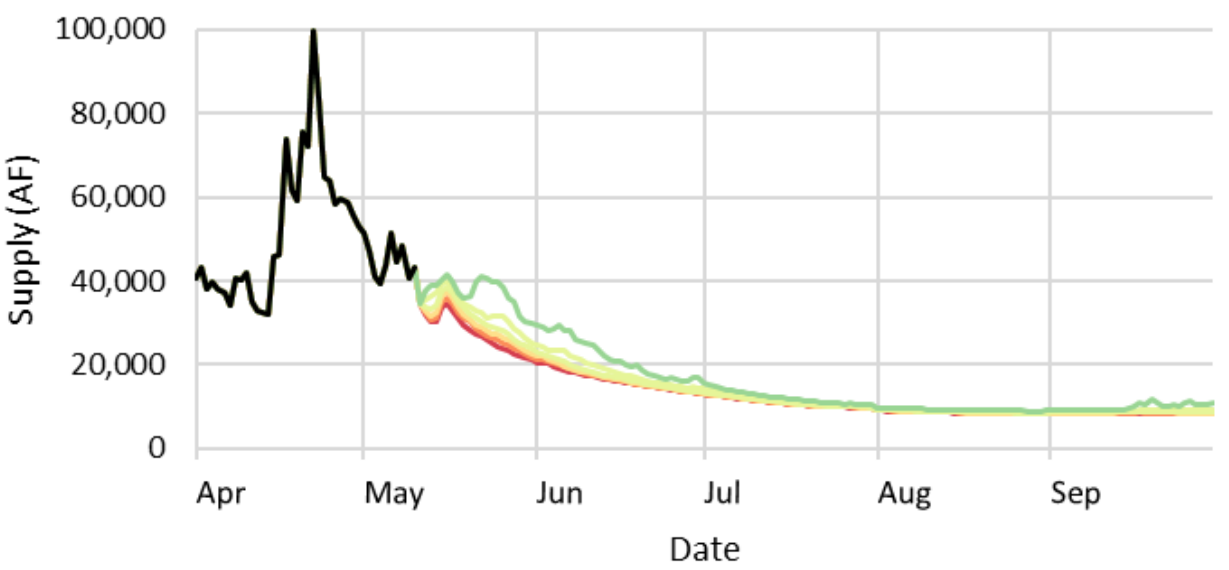
- Compares water supply & demand to evaluate unavailability to ~17,000 water rights in the Delta watershed, including the Legal Delta
- Does not apply to previously stored water, contracts, transfers, groundwater, or other water right terms & conditions
- Removes demand not met by available supply on headwater tributaries, considers watershed-wide availability by priority
- Addresses natural flows, abandoned instream flows, return flows, & other factors

Water Supply Forecast Variables

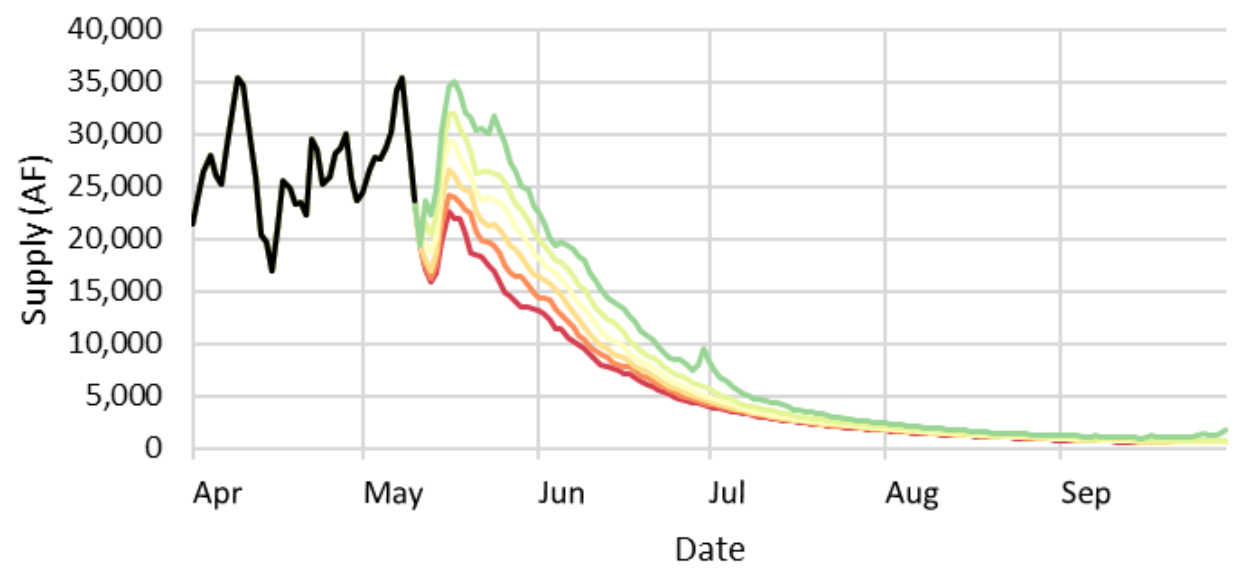
- Forecast Exceedance
 - Acknowledges uncertainty in the prediction of future conditions
 - Wider spread of potential supply values when precipitation anticipated
 - A single supply value is required to make curtailment decisions
 - 90% Bulletin 120 used in late summer 2021, 50% California Nevada River Forecast Center has been used since
- Analysis Period
 - Affects forecasted supply, blends demand data from multiple months
 - 7 or 14-day window is meteorology-driven, conditions further out are largely climate-driven (based on historical data)
 - Discrete monthly in late summer 2021, rolling future window in winter, shift back to 31-day outlook in late winter 2022

Water Supply Forecast Variables

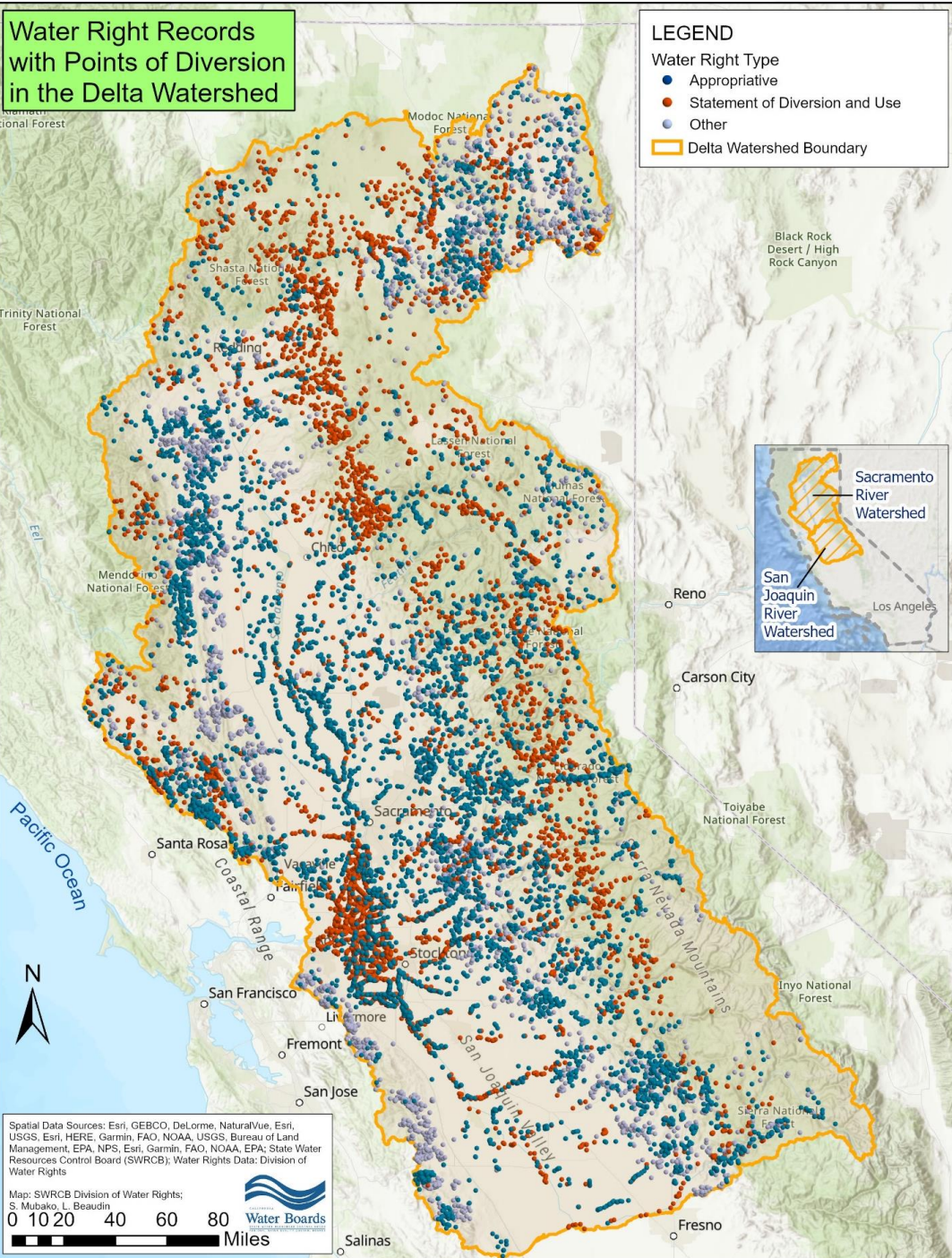
Sacramento River Watershed



San Joaquin River Watershed



Water Right Records with Points of Diversion in the Delta Watershed



Demand Adjustments

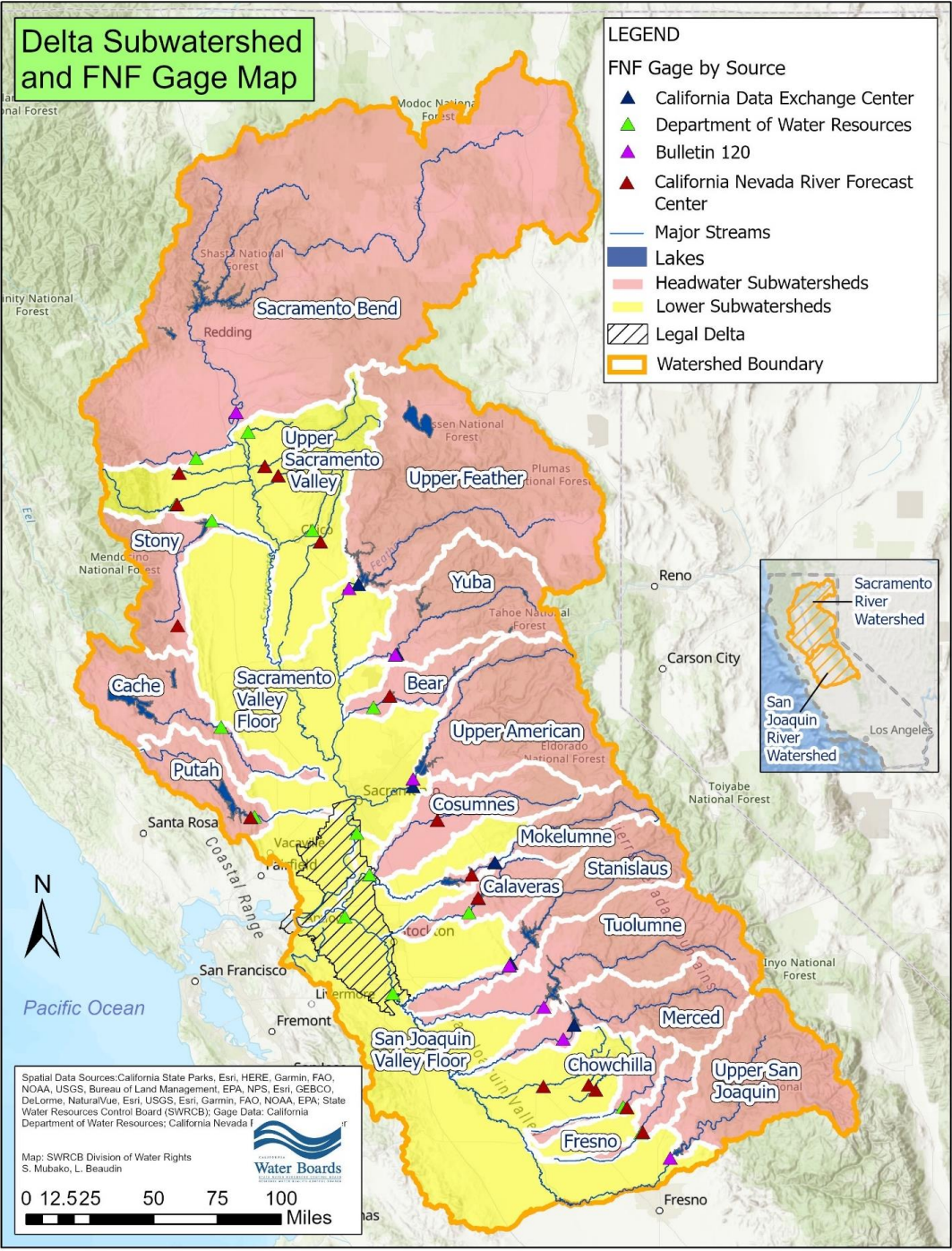
- Disaggregated demands for direct diversion & storage
 - Assigned based on POD type
 - Return flows are not applied to storage
 - Points of Rediversion do not factor into curtailment decisions
- Modified boundaries for Mokelumne, Calaveras, Fresno, & Chowchilla
- Specific demand adjustments for certain rights & claims

Delta Subwatershed and FNF Gage Map

LEGEND

FNF Gage by Source

- ▲ California Data Exchange Center
- ▲ Department of Water Resources
- ▲ Bulletin 120
- ▲ California Nevada River Forecast Center
- Major Streams
- Lakes
- Headwater Subwatersheds
- Lower Subwatersheds
- ▨ Legal Delta
- ▭ Watershed Boundary



Curtailment Decision Changes

- A right or claim is only curtailed if zero supply is available to meet demand
 - Implemented February 18
- Subwatershed-level curtailments
 - Temporarily suspended on March 1 to allow storage of remaining snowmelt
 - Reimposition under consideration as early as June 2022
- Abandoned instream flows are not allocated to Riparian-only claims
 - Implemented April 19

Legal Delta Water Supply

- Water unavailability evaluated on the same timestep as the rest of the watershed (no lag or extended availability assumed)
- Legal Delta curtailments based only on >30-day analysis
- Non-Riparian rights & claims are assumed to have access to both Sacramento & San Joaquin River supply, are only curtailed if water is unavailable from both sources
- Riparian claims are only curtailed if zero supply is forecasted

Demand Data and Enhanced Reporting

Robert McCarthy, Env'tl Scientist
Lauren Adams, WRCE



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Demand Data

- The Water Unavailability Methodology evaluates demands for natural and abandoned flows by basis of water right
- To date, the analysis has relied on reported water diversion data from the State Water Board's Electronic Water Rights Information Management System (eWRIMS) database
- Currently, the Water Unavailability Methodology estimates water demand based on the total monthly diversion amount reported for each consumptive use water right record in 2018, including direct diversions and diversions to storage

Demand Data QAQC Summary

- eWRIMS diversion data not systematically verified
- Approx. 17,000 records in Bay-Delta Watershed
- Quality Control Effort Focused on diversions ≥ 5 thousand acre-feet (AF)
 - ~ 600 records
 - Represented approximately 90% of diverted water
- Resulted in demand reduction of nearly 50 million AF

Demand Data Adjustments and Refinements

- Dataset adjustments in addition to QAQC
 - Exclusions of disconnected systems
 - Elimination of duplicate demands
 - Disaggregation of demand type (direct and storage)
 - Identification of non-consumptive demand types
 - Diverter submitted demand corrections
- Enhanced Reporting
 - Section 879(d) required the largest diverters to provide monthly reporting information regarding actual diversion volumes and demand projections

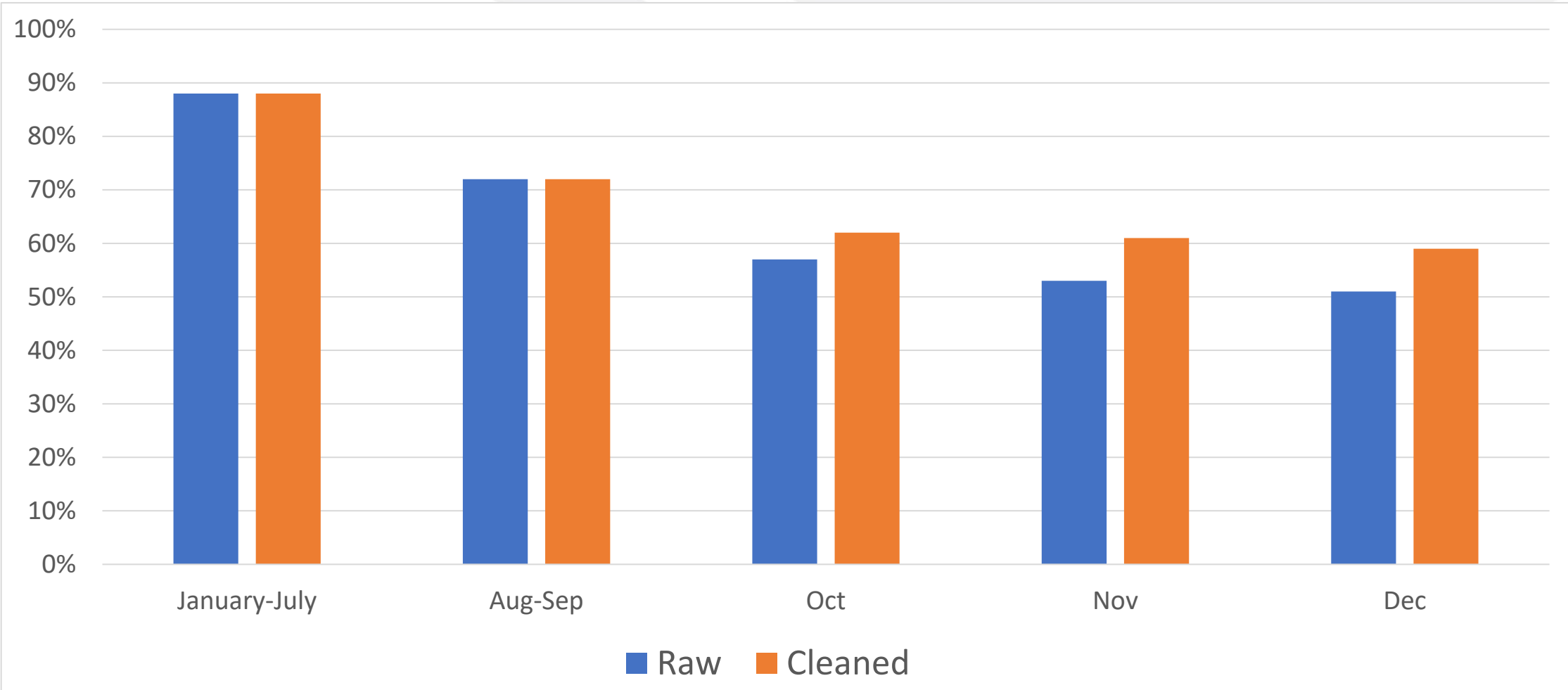
Enhanced Reporting

- Delta Watershed Emergency Regulation Section 879(d)
- Currently required for water rights and claims with a face value or recent annual diversion amount of 5,000 AF or larger
- Accurate up-to-date diversion and demand data helps to inform curtailment decisions
 - Watershed comparisons of projected demands and 2018 diversion data to avoid over-curtailment
 - Comparisons of prior diversions and other reporting

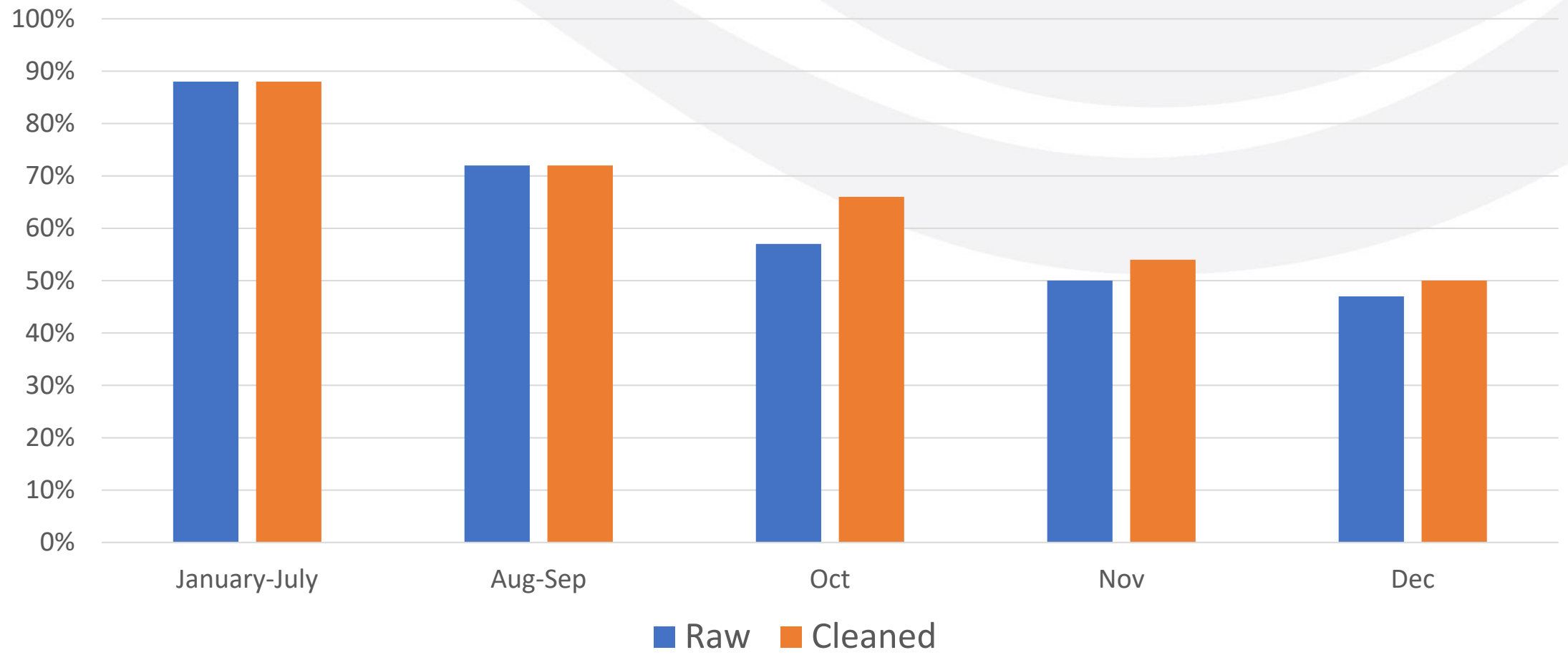
Enhanced Reporting

- Finer resolution details
- Spatially-explicit situations
- Flow movement along a river, including through reservoirs
- Contractual diversions and diversions under water right/claim
- Currently used to confirm demand estimates are not inflated, address specific curtailment questions, as a means of compliance evaluations
- Possible future replacement of prior demands in water unavailability analysis

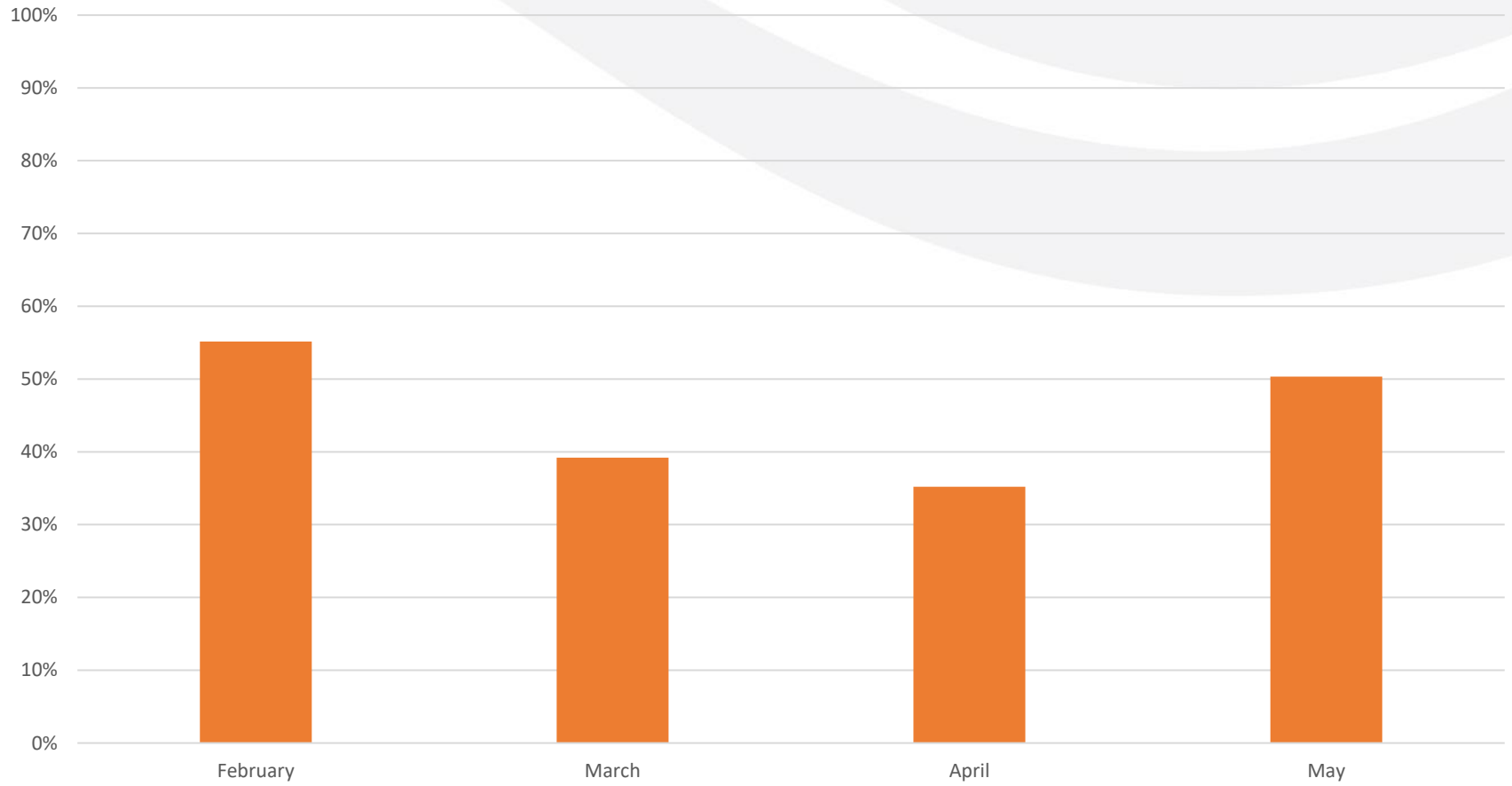
Enhanced Reporting Submission Rates of 2021 Prior Activity, by Water Right ID



Enhanced Reporting Submission Rates of 2021 Prior Activity, by POD ID



Enhanced Reporting Submission Rates of Projected Demands (Feb-May)



Demand Dataset and Enhanced Reporting Challenges and Benefits

2018, 2019, 2020, and 2021 Annual Reports	Enhanced Reporting	Annual Reports and Enhanced Reporting
Best available data	Best available data	Best available data
Historical record	Historical Record	Historical Record
Ungaged	Ungaged	Ungaged
Reporting unauthorized diversions	Reporting unauthorized diversions	Reporting unauthorized diversions
Weather dependent	Weather dependent	Weather dependent
No spatial reference	Spatially-explicit	
Full Bay-Delta	Only for large diverters	
Does not include releases	Includes releases	
Does not include scheduled activity	Includes scheduled activity	

Possible Demand Estimates

- Continue use of the 2018-based demand dataset with adjustments where appropriate based on projected demands and other relevant information
- Direct use of projected demands- compliance rate is low, data needs further QAQC for direct use
- Use Annual Reports and Supplemental Statements of Diversion and Use for other years with low precipitation, e.g. 2020 or 2021 - both years have different weather and demand patterns, both require QAQC, and 2021 included curtailments
- Replace the demand dataset with underlying rights and claims – would likely over estimate demands because permits as unperfected rights may inflate demands, license represent maximum use years, and Statements of Diversion and Use are unverified claims that have not been QAQCed generally
- Develop more refined modeling tools with spatially-resolute land-based/SB88, weather, streamflow, demand, diversion, and/or other information and/or complex systems operations and hydrologic routing- this is planned but will take time
- Possible curtailment method based on water calls for available supplies (unimpaired flows)

Return Flows and Further Technical Considerations

Matt Holland, Program Manager



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Return Flow Assumptions

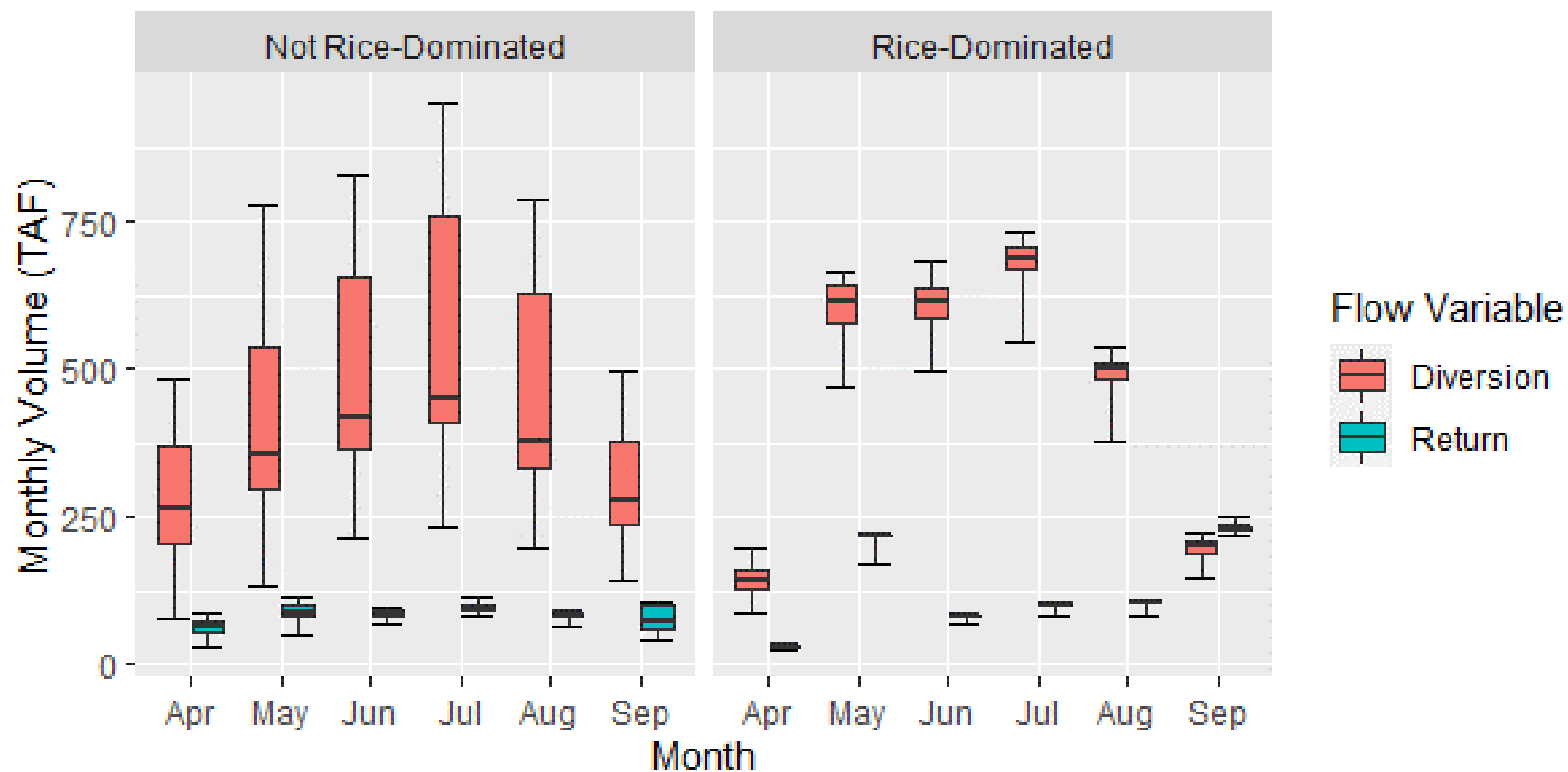
- Demands in four subwatersheds scaled by demand factor
- Demand factors derived from ratio of modeled monthly return flows from all supply sources to modeled surface water deliveries (CalSim 3.0, valley floor demand units)
 - Demand factor = $1 - \text{Returns/Diversions}$
 - Calculated at watershed scale (Sacramento, San Joaquin)
- Demand for diversion to storage not scaled by demand factor (enabled by demand data set disaggregation discussed previously)



Return Flow Challenges and Analysis

- Most return flows unengaged, distributed throughout watershed
- Likely changes to land use and other practices in the Sacramento Valley
 - Reduced rice acreage by Sacramento River Settlement Contractors
 - Potential for conservation and recapture of return flows
- Following slides focus on Sacramento Valley return flows

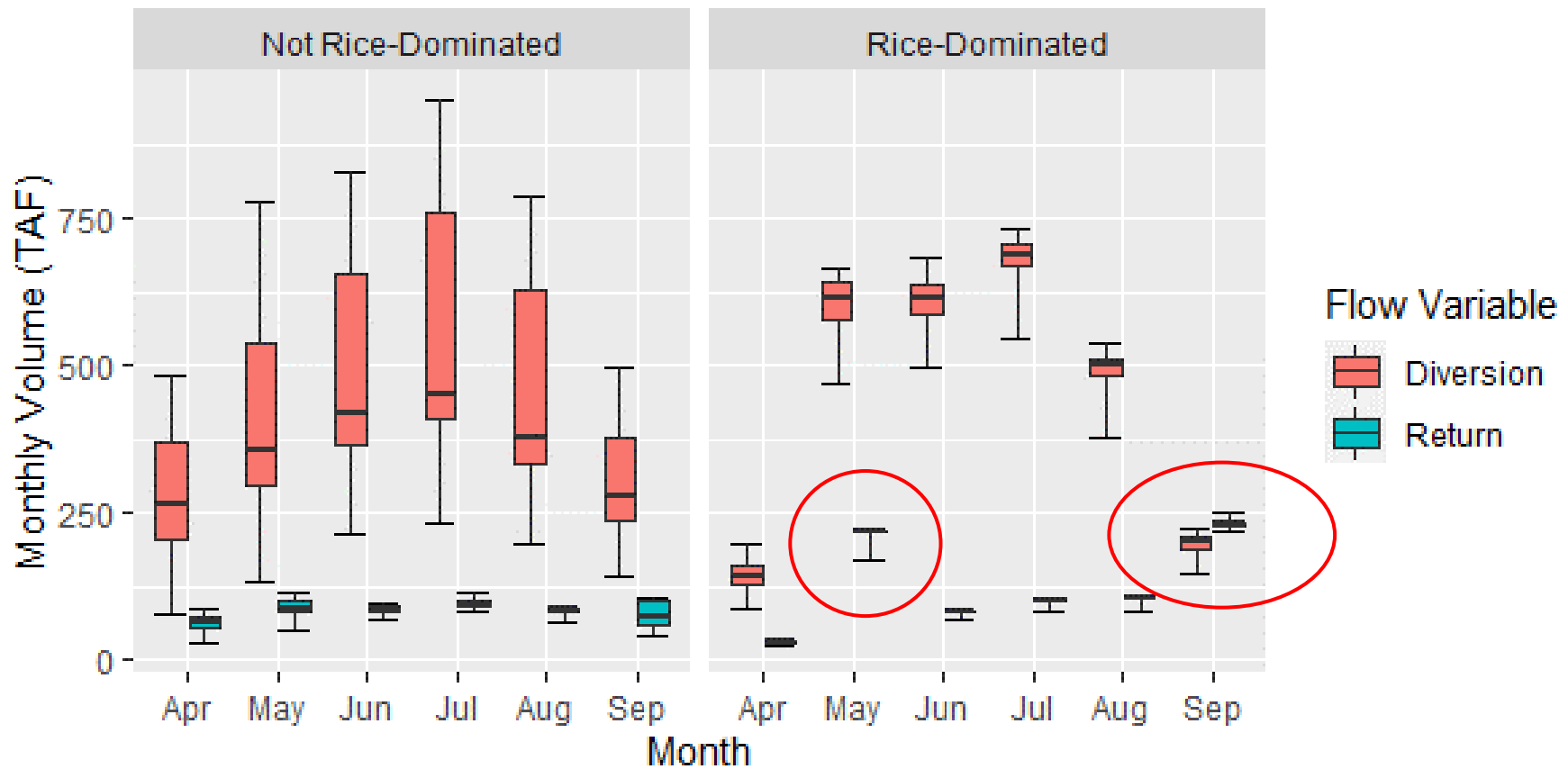
Diversions and Return Flows by Land Use



- **Rice-Dominated:** greater than half of applied water demand for rice (Table 11-12, DWR 2017)
- **Not Rice-Dominated:** everything else, including urban
- Monthly patterns for diversion and return flow differ substantially

Data source: CalSim 3.0 Public Release 2020 LOD and CalSim 3.0 Draft Report, DWR 2017

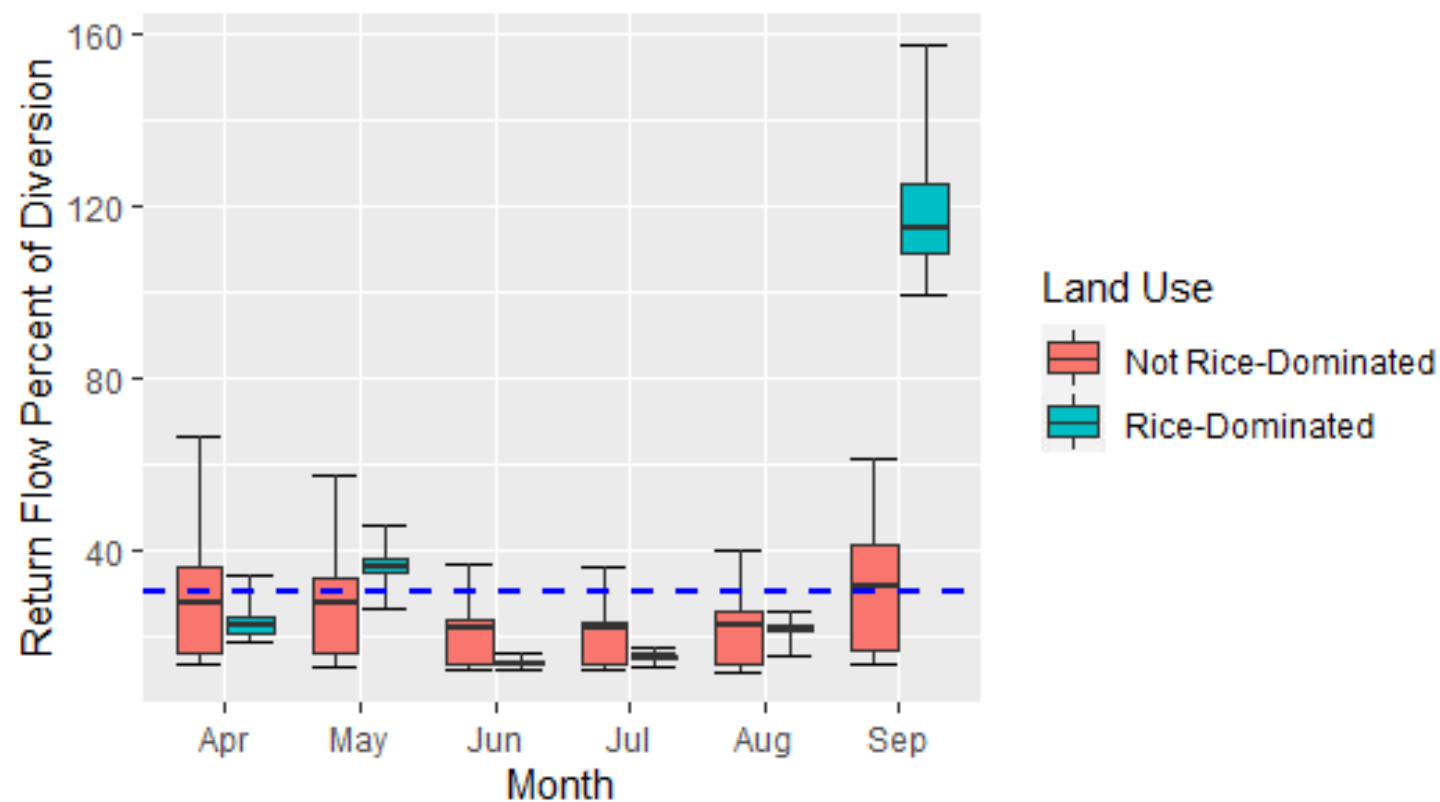
Diversions and Return Flows by Land Use



- **Non rice areas:** surface water diversions exceed return flows
- **Rice areas:** return flows exceed diversions in September (approx. double Jun-Aug), dominate total return flows. Early return flow peak in May
- Total returns approx 200 TAF/mo June-July

Data source: CalSim 3.0 Public Release 2020 LOD and CalSim 3.0 Draft Report, DWR 2017

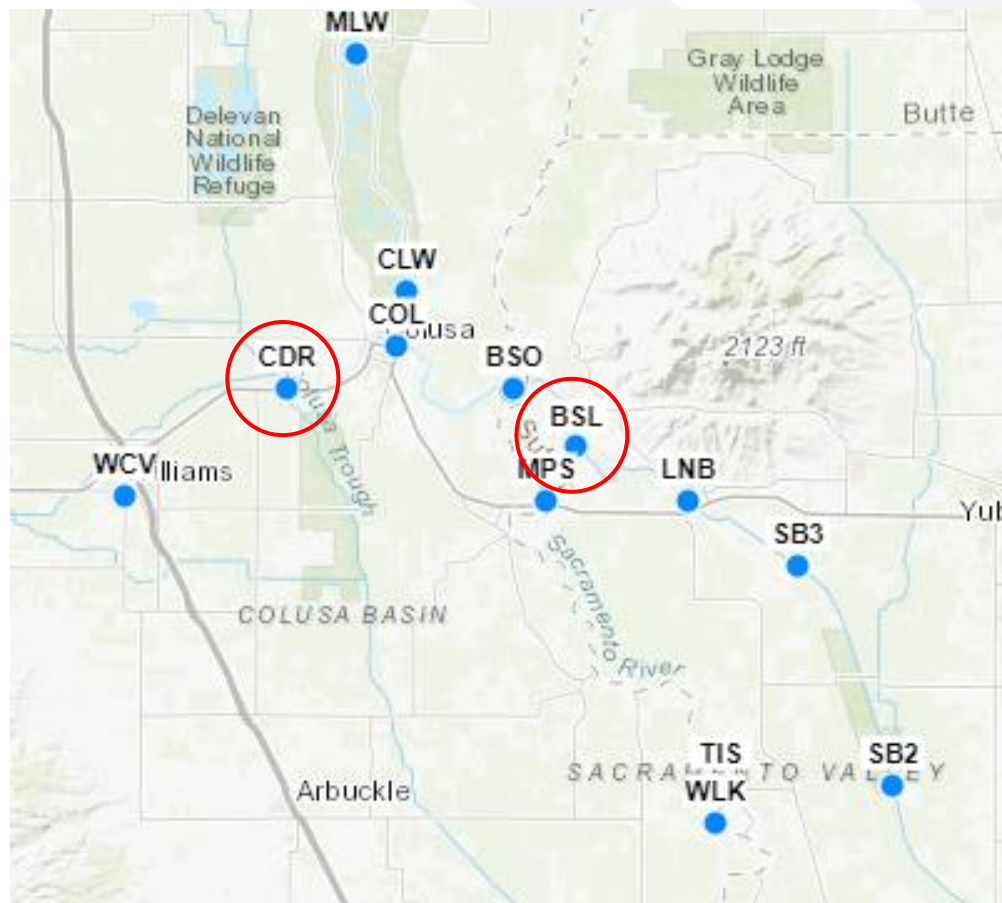
Return Flow as Percent of Diversion



- As modeled, rice/non-rice difference most pronounced in September
- Return flows 20-30% during most of irrigation season

Data source: CalSim 3.0 Public Release 2020 LOD and CalSim 3.0 Draft Report, DWR 2017

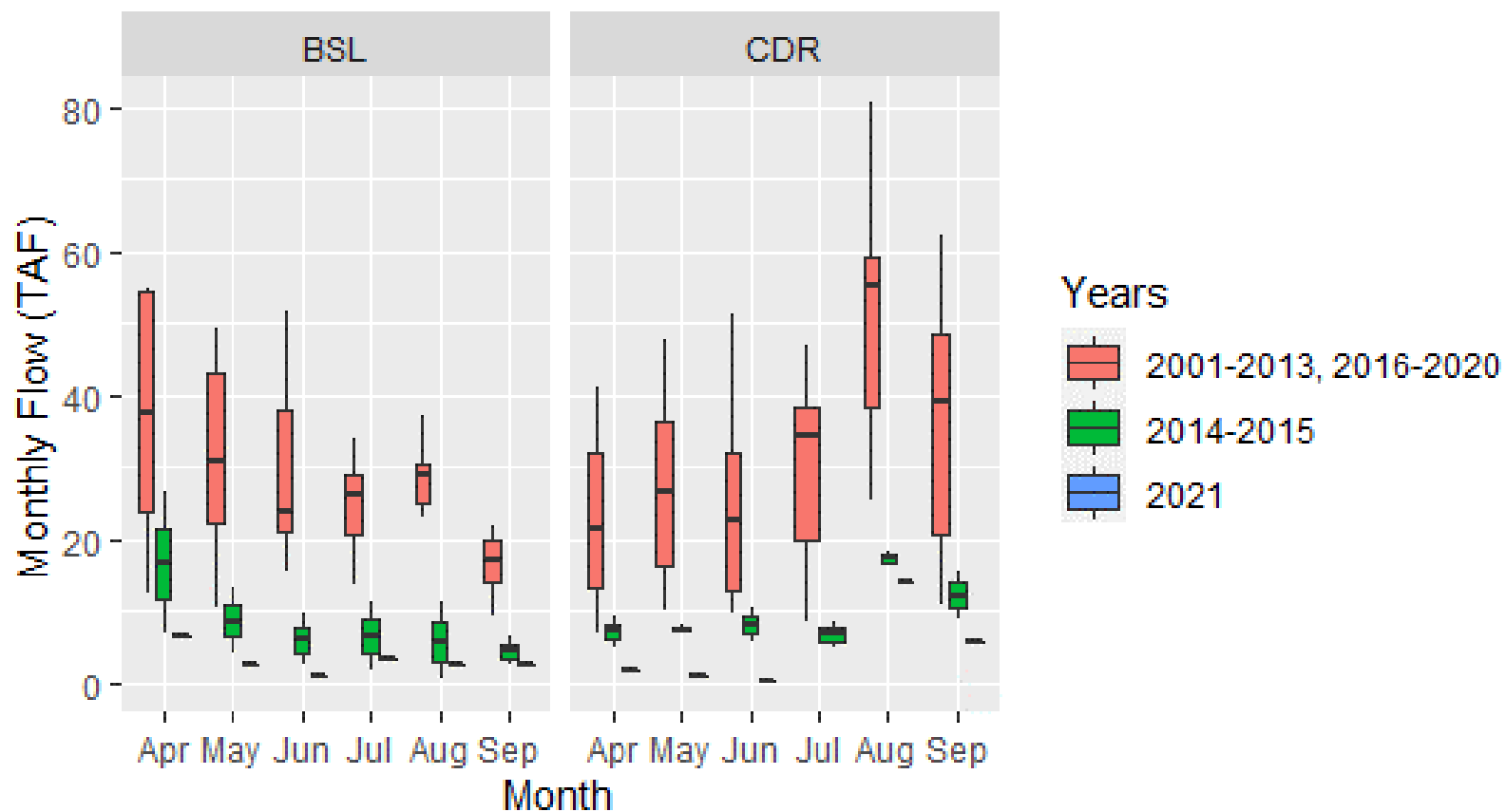
Historical Flows at Index Locations



- Long-term gage data for return flow dominated locations limited
- CDEC stations CDR (Colusa Basin Drain near Highway 20) and BSL (Butte Slough near Meridian)
- These locations should be generally rice-dominated, but they also convey rainfall runoff during wet season
- Substantial return flows occur downstream of these locations

Data source: CDEC, <https://cdec.water.ca.gov/>

Historical Flows at Index Locations



- Historical data support earlier rice peak, starting in August
- Peak flows approximately double June-July at CDR
- Severe drought year flows substantially lower than other years in record
- 2021 flows generally lower than 2014-2015
- CDR + BSL June-July flows approx. 50 TAF/month (20-25% of modeled return flows)

Data source: CDEC, <https://cdec.water.ca.gov/>

Return Flow Analysis Summary

- CalSim-derived Sacramento Valley return flow factors
 - Dominated by rice in September
 - Likely too high in light of historical data and 2022 Sacramento River Settlement Contractor supplies and land use
- Potential modifications:
 - Spread September return flow peak August-September
 - Scale modeled late-season return flows to account for land use changes (e.g., weighted average of Sacramento and Feather basin land use)
 - Modification of factors informed by enhanced monitoring of actual return flows in key locations
- Input on these options or other modeling tools and analyses invited

Delta Water Supply

- No new analysis to present at this time related to Delta Water Supply or Appendix D to the Report
- Delta curtailments continue to be determined on a monthly time scale, consistent with the latest revision of the Report
- Staff are performing additional technical analyses to assess whether any changes to the current approach should be adopted later in the irrigation season or next year, should drought conditions persist
- Staff remain receptive to constructive technical input

Proposed Readoption of Emergency Curtailment and Reporting Regulation

Riley Nolan, WRCE



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Phased Renewal Process

Readoption of Russian River Emergency Regulation

- Readopted sections specific to Russian River
- Readopted sections affecting multiple watersheds, including Delta

Preliminary Release of Delta-Specific Regulation Sections

- April 19 to May 19 – Draft regulation text for Delta-specific sections released for comment

Future Release of Proposed Emergency Curtailment and Reporting Regulation for the Delta Watershed

- Late June - Complete proposed emergency regulation with any changes based on public comments in May released for additional comment in advance of Board consideration

Readoption of Emergency Curtailment and Reporting Regulation for the Delta Watershed

- July 19 - Board consideration of adoption of complete emergency regulation

Readoption Process

- Emergency Curtailment and Reporting Regulation (California Code of Regulations, title 23, sections 876.1, 877.1, 878-878.2, and 879-879.2)
 - Sections 876.1 and 878.2 are **specific to the Delta Watershed**
 - Other sections apply to multiple watersheds in California and have been amended and readopted by the Board on May 10
 - The readopted regulation sections are subject to final approval from the Office of Administrative Law (OAL)
 - Interested parties will have an additional opportunity to submit comments on regulation sections affecting multiple watersheds in advance of the July 19 Board Meeting

Draft Changes to Delta-Specific Reg Sections

- Other minor changes to streamline administration of the emergency regulation and water unavailability methodology
- Expand water right demand sources to include annual water right reports from 2020, 2021, and demands reported in annual watermaster reports
- Eliminate ranking of supply data sources (B120 vs Daily CNRFC FNF)*
- Eliminate deadline for the submission of priority date corrections and proposals that curtailment is inappropriate
- Clarifying language for the submission of jointly developed alternative water sharing agreements
- Updated references to global regulation sections

*B120 – [Department of Water Resources Bulletin 120](#)

*CNRFC – [California Nevada River Forecast Center](#)

*FNF – Full Natural Flow

Tentative Timeline - Emergency Regulation Renewal

- Ongoing/Future Opportunities for public comment:
 - April 19 – May 19 (5:00 PM) written comment period on regulation sections specific to the Delta watershed
 - June 27 – July 8 written comment period on Delta-specific regulation sections and sections affecting multiple watersheds
 - July 19 Board Meeting

Public Comments & Clarifying Questions



Resources – Contact the State Water Board

Email: Bay-Delta@waterboards.ca.gov

Delta Drought Phone Line:

Call (916) 319-0960 and leave a message and staff will return your call as soon as possible

Webpages:

Delta Drought Webpage:
waterboards.ca.gov/drought/delta/

Water Unavailability Methodology Webpage:
waterboards.ca.gov/drought/drought_tools_methods/delta_method.html

Delta Drought Email Subscription List:
waterboards.ca.gov/resources/email_subscriptions/

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