

Water Right Curtailments & Water Unavailability Methodology for the Sacramento-San Joaquin Delta Watershed

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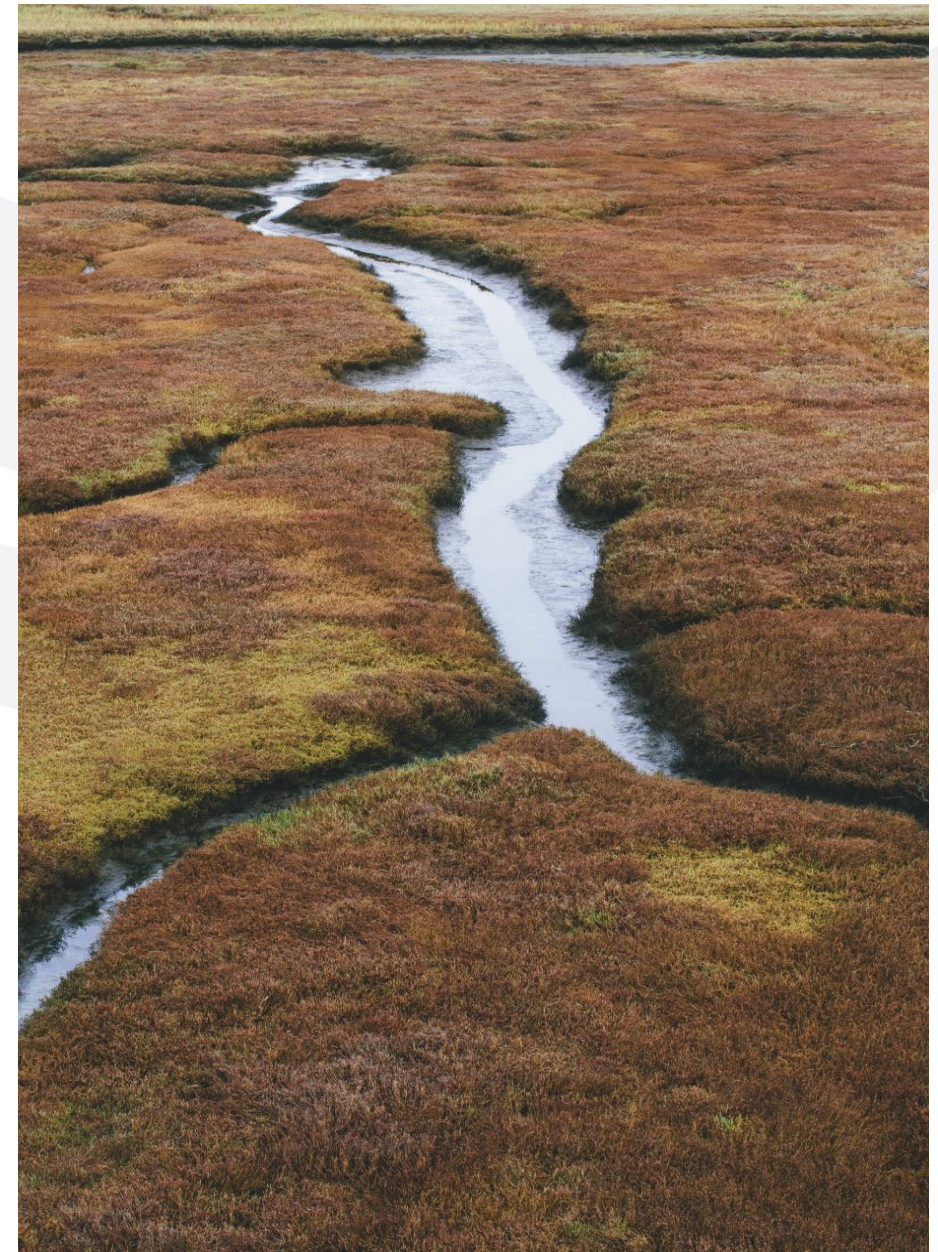


CWEMF Annual Meeting

April 6, 2022

Agenda

- Background & Emergency Regulation
- Water Supply Forecasts & Demand
- Methodology & Visualizations
- Curtailments to Date
- Future Outlook



Delta Watershed Location

LEGEND

- Rivers
- Lakes
- Legal Delta
- Delta Watershed Boundary

Delta Watershed Emergency Regulation

- **March-June 2021** – Early drought warning actions
- **May 10, 2021** – Governor's Drought Emergency Proclamation included the Delta Watershed
- **May-August 2021** – Public workshops & outreach
- **August 19, 2021** – Emergency Regulation approved
- **August 20, 2021** – Curtailment Orders mailed to ~17,000 water right holders in the watershed
- **August 2021-Present** – Curtailments continue to be suspended or re-imposed as appropriate

Spatial Data Sources: Esri, GEBCO, DeLorme, NaturalVue, Esri, USGS, Esri, HERE, Garmin, FAO, NOAA, USGS, Bureau of Land Management, EPA, NPS, Esri, Garmin, FAO, NOAA, EPA; State Water Resources Control Board (SWRCB); Water Rights Data: Division of Water Rights

Map: SWRCB Division of Water Rights
S. Mubako, L. Beaudin

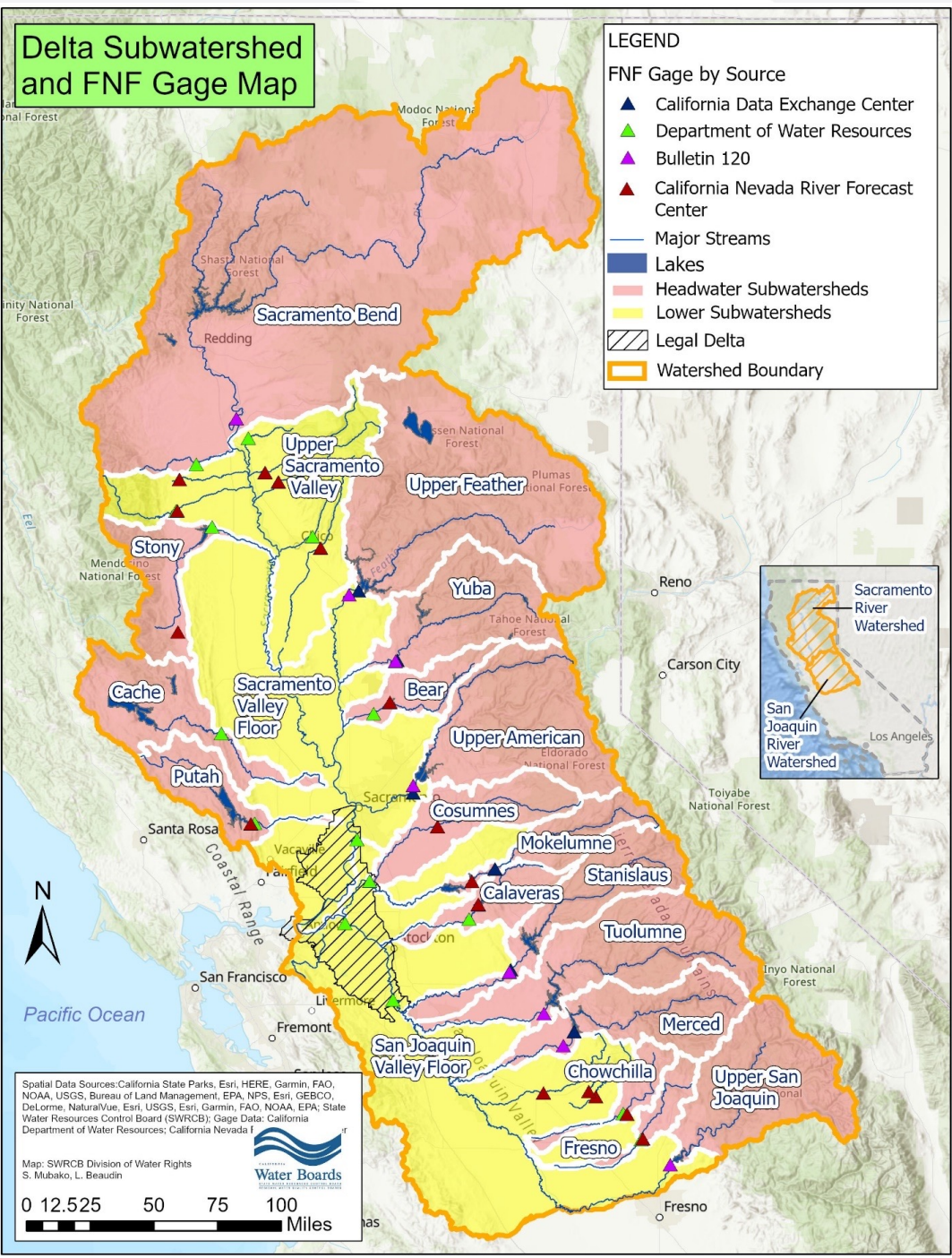


0 12.525 50 75 100
Miles

Delta Watershed Emergency Regulation

1. Applies to all water rights in the Sacramento & San Joaquin River watersheds, including the Legal Delta.
2. Does not affect use of previously stored water, contracts, transfers, groundwater pumping, or other terms/conditions of water rights.
3. Authorizes curtailment orders & sets a methodology used to determine who is curtailed & when.
4. Largest users must submit prior & projected demand data monthly.
5. Provides various options for users to apply for exemption from curtailment.
6. Separate emergency regulations (and methodologies) for the Russian River, Scott/Shasta Rivers, & Mill/Deer Creeks.

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

Spatial Data Sources: California State Parks, Esri, HERE, Garmin, FAO, NOAA, USGS, Bureau of Land Management, EPA, NPS, Esri, GEBCO, DeLorme, NaturalVue, Esri, USGS, Esri, Garmin, FAO, NOAA, EPA, State Water Resources Control Board (SWRCB); Gage Data: California Department of Water Resources; California Nevada I

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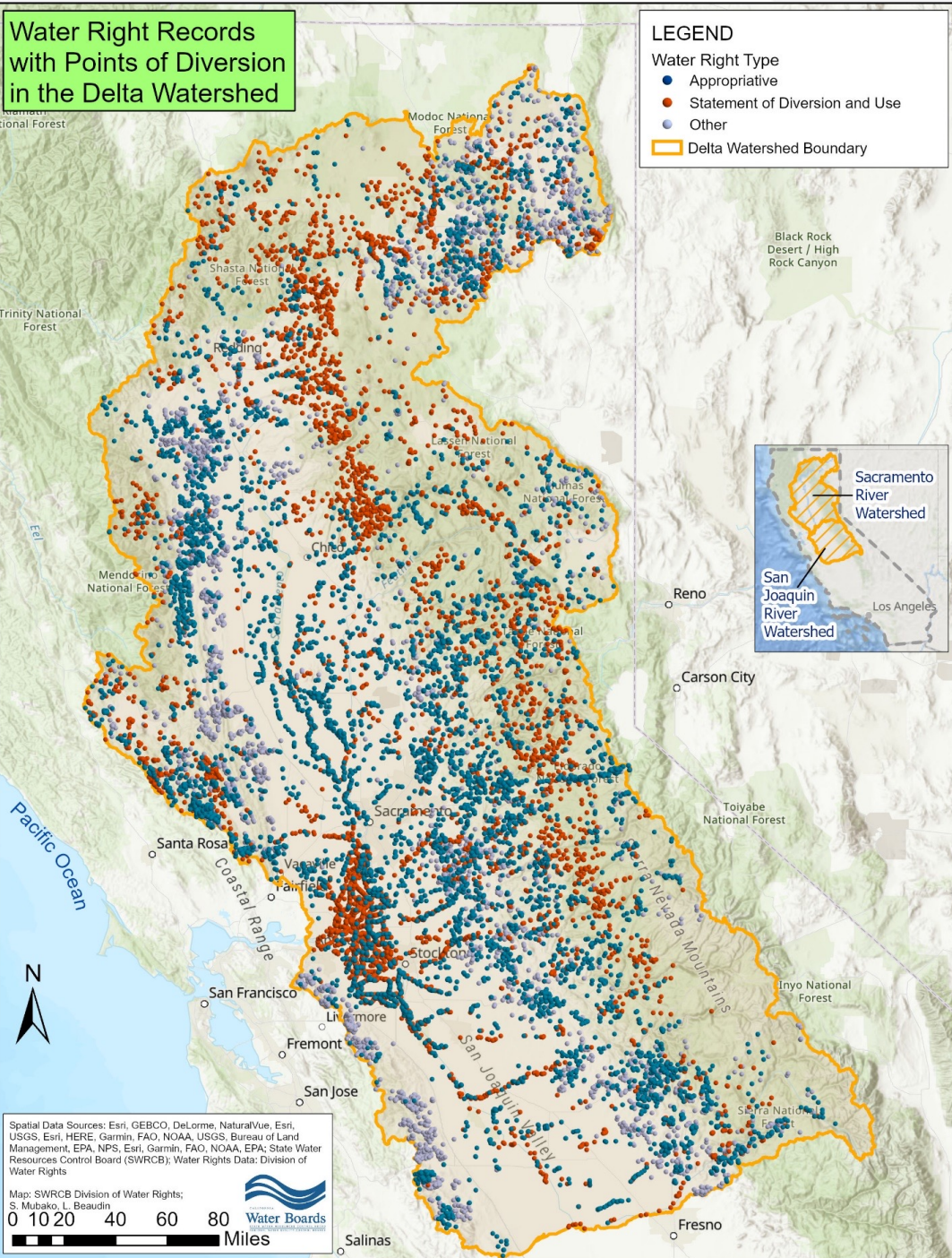
Water Boards

0 12.525 50 75 100 Miles

Water Supply Forecasts

- Subwatersheds delineated based on available supply locations, primarily using HUC8 boundaries
- Unimpaired or “Full Natural” Flow (FNF)
- Gap filling to estimate supply from small streams
- Historical FNF data from CDEC stations
- Forecasts with exceedance probabilities:
 - California Nevada River Forecast Center (CNRFC)
 - Dept. of Water Resources (DWR) Bulletin 120
- Instream flow releases in excess of FNF (only downstream of intended reach)
- No adjustments for tides or seawater in the Delta

Water Right Records with Points of Diversion in the Delta Watershed



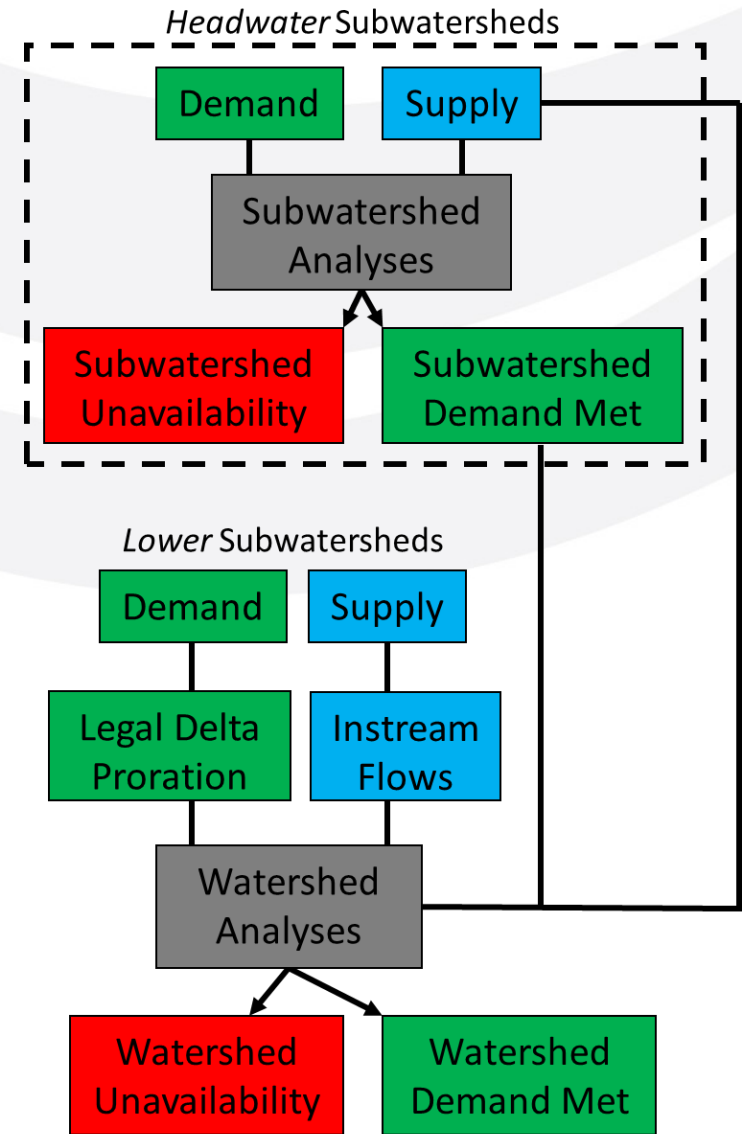
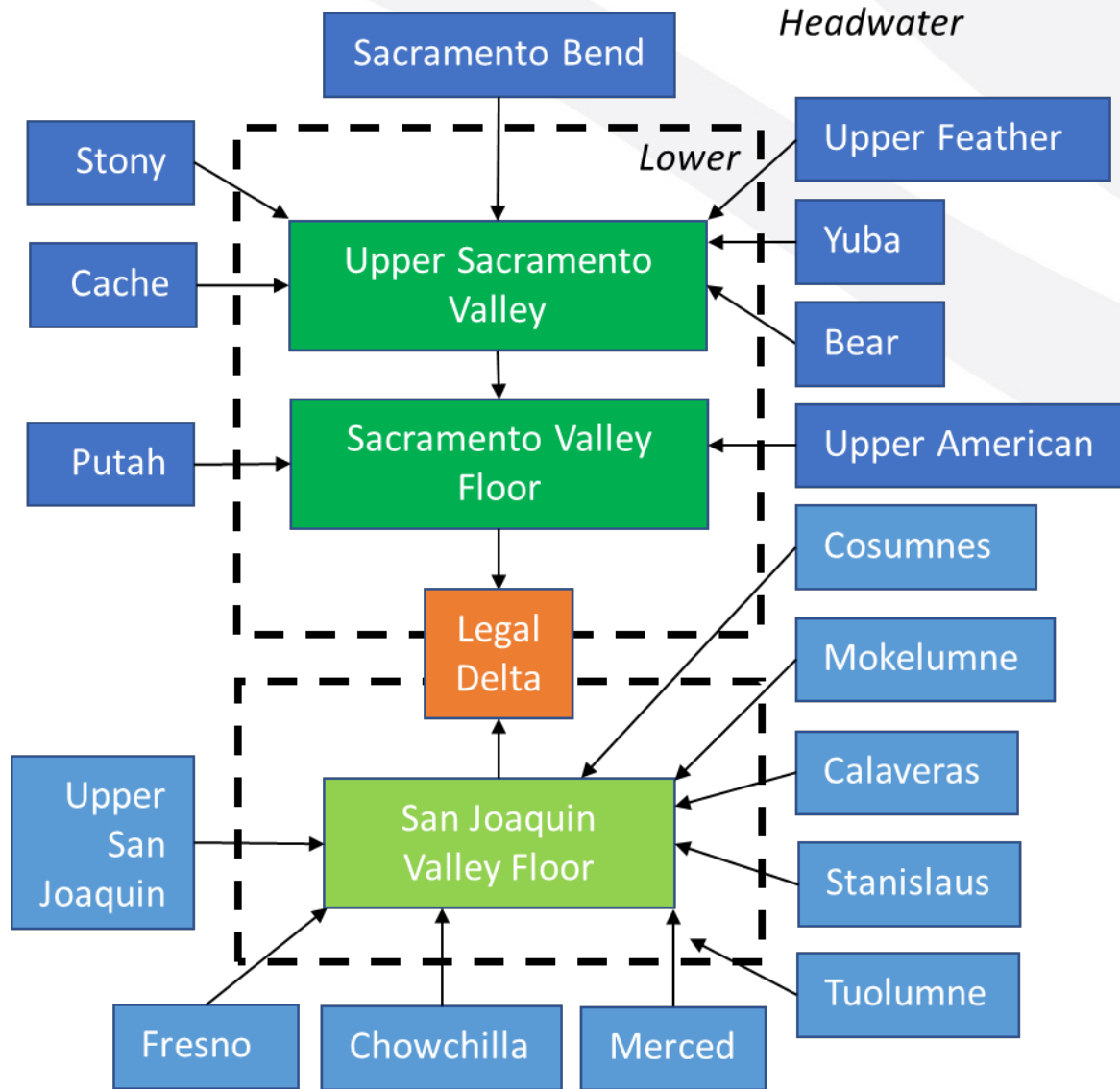
Water Demand Data

- Water rights or claims & associated priority dates, CY 2018-2019 reported direct & storage diversions.
 - Riparians most senior priority, Projects most junior.
- ~700 records QA/QC'd to remove:
 - Rediversions of storage, non-consumptive direct diversions.
 - Duplicate reporting under multiple rights, unit errors.
- Water rights with multiple points of diversion (PODs) have demands split between active direct PODs.
- Non-Riparian demands in the Legal Delta are prorated between watersheds based on supply.
- Return flows applied to reduce valley floor demands.
- Monthly data prorated to shorter timesteps.

Water Unavailability Methodology

1. Comparison of water supply & demand at subwatershed & watershed scales.
2. Removes demand unmet by local supplies in headwater subwatersheds, supply & demand if disconnected (Riparian demand > supply).
3. User-specified inputs:
 - a) Analysis period start & end dates (from 10/1 of current WY to one year in the future)
 - b) Supply forecast source (CNRFC or DWR Bulletin 120)
 - c) Forecast exceedances for each subwatershed or custom volumes
 - d) Demand data year & components (direct diversion &/or diversion to storage)
4. Determines curtailment status of each water right in Delta watershed based on either local or watershed-wide unavailability.

Water Unavailability Methodology



Methodology Visualizations

- Curtailment Status List
- Compliance Tracker

< Curtailment List | Curtailment Summary >

Search by Water Right ID

Search by Owner Name

Filter by Water Right Type

Filter by Subwatershed

Filter by Legal Delta

(Updated 3/22/2022 - Curtailments Effective 3/23/2022)
 Curtailment status should not be construed as a validation of a water right claim or an authorization to divert.

WR ID	Primary Owner	Claimed Priority Year	Status
A000018	GLENN-COLUSA IRRIGATION DISTRICT	1915	Not Curtailed
A000023	U.S. BUREAU OF RECLAMATION	Project	Not Curtailed
A000026	JAMES S PHELPS, TRUSTEE	1915	Not Curtailed
A000027	RECLAMATION DISTRICT #1004	1915	Not Curtailed
A000065	FRANK KIMP	1915	Not Curtailed

% of Compliance Certification Filed by Subwatershed

Green regions indicate higher compliance certification rates
 Red regions indicate lower compliance certification rates

Compliance Certification Filed

12.6K

out of 16.7k required

No 24.73% | Yes 75.27%

Water Rights/Claims Filed
Health and Safety Exceptions

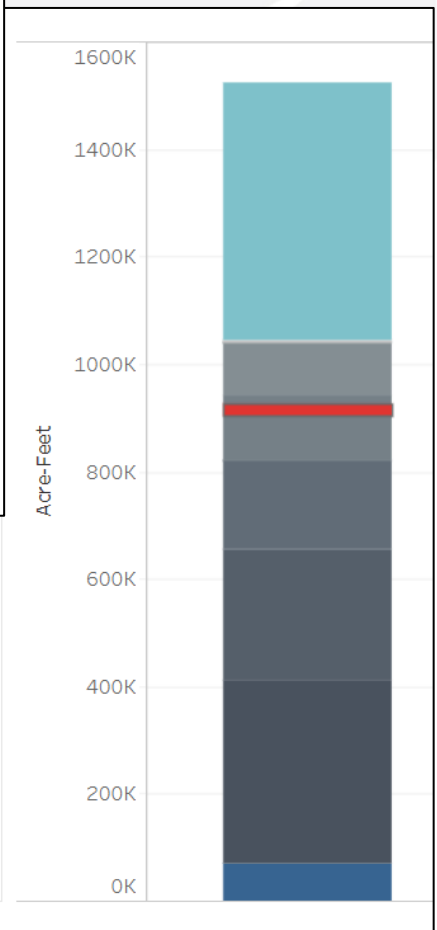
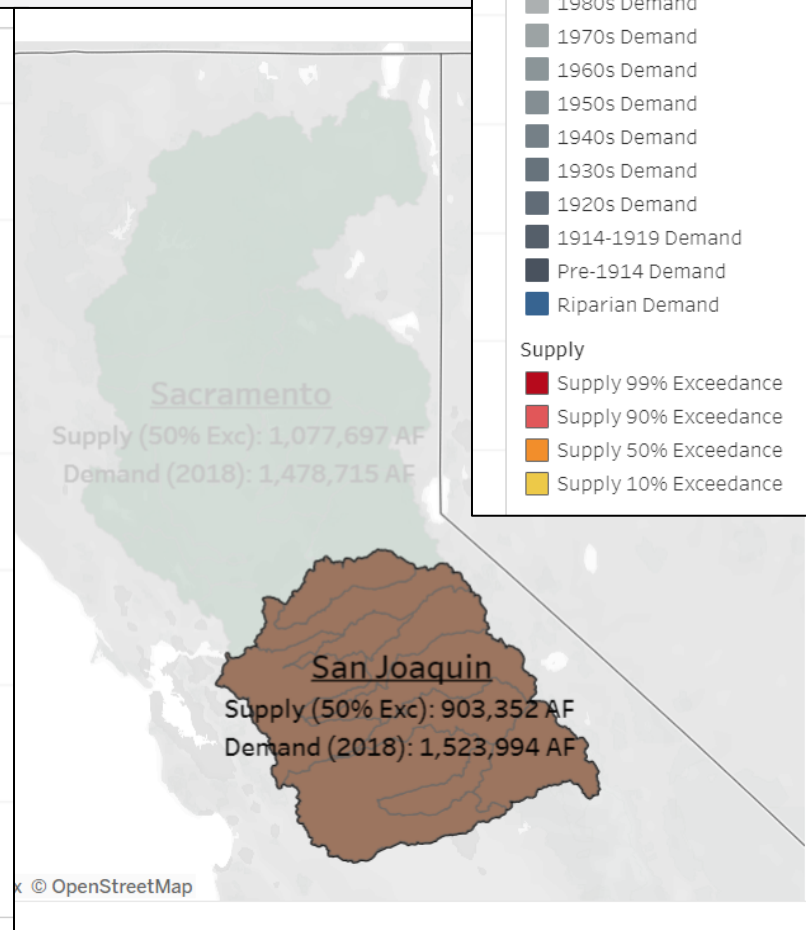
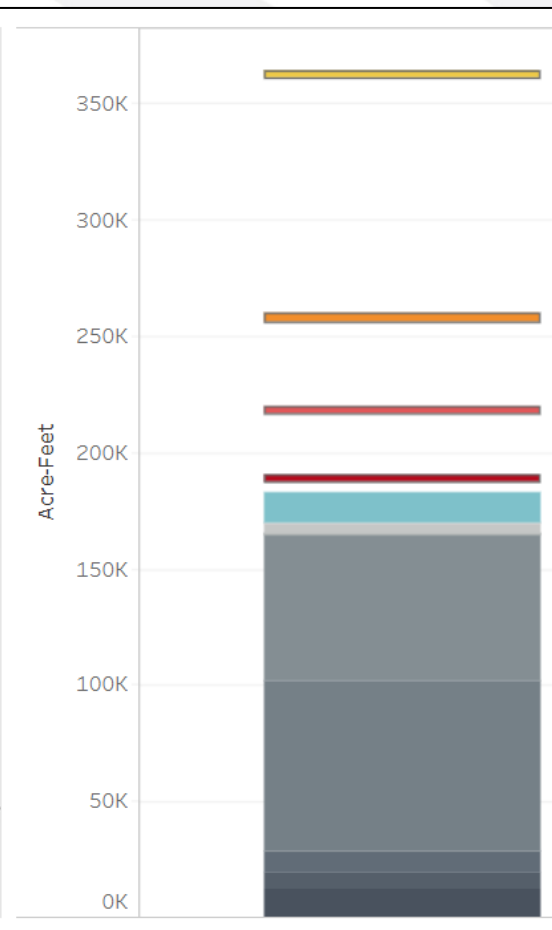
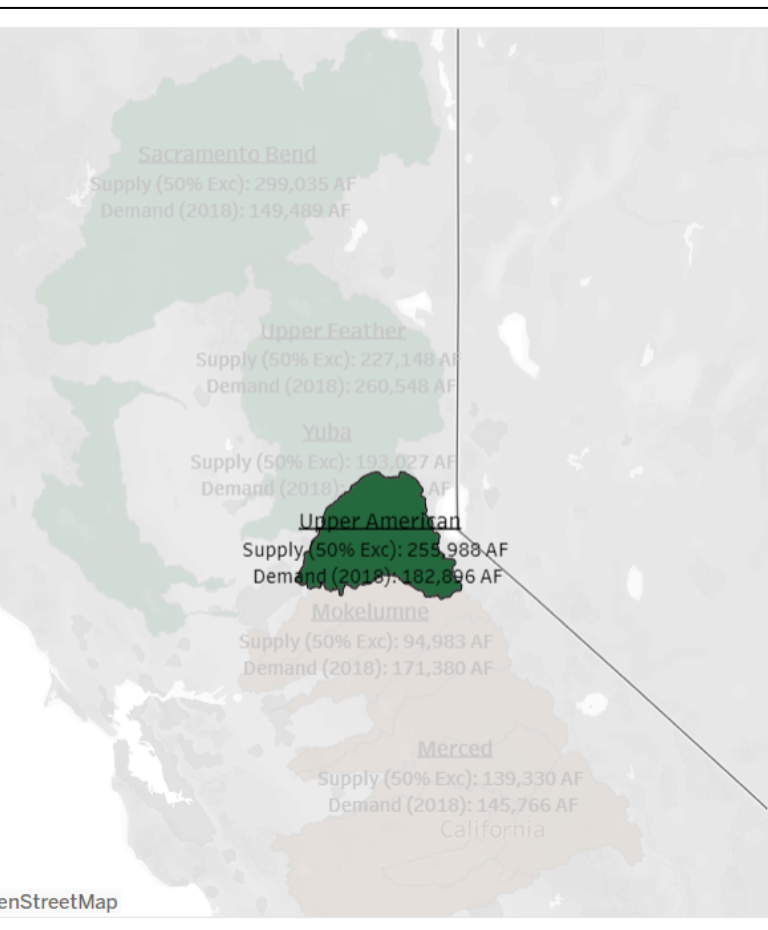
795

Water Rights/Claims Filed
Non-Consumptive Use Exceptions

805

Methodology Visualizations

- Water Unavailability Graphs



Demand Year
2018

Demand Type

- Project Demand
- 2010s Demand
- 2000s Demand
- 1990s Demand
- 1980s Demand
- 1970s Demand
- 1960s Demand
- 1950s Demand
- 1940s Demand
- 1930s Demand
- 1920s Demand
- 1914-1919 Demand
- Pre-1914 Demand
- Riparian Demand

Supply

- Supply 99% Exceedance
- Supply 90% Exceedance
- Supply 50% Exceedance
- Supply 10% Exceedance

Curtailments to Date

- **Aug 2021** – All Pre-1914 appropriative rights in San Joaquin watershed, Pre-1914 rights junior to 1882 in Sacramento watershed, Riparians on some tributaries curtailed.
- **Sep 2021** – Most Sacramento curtailments suspended due to rice field drainage return flows.
- **Oct 2021 & Dec-Jan 2022** – All curtailments temporarily suspended due to precipitation events.
- **Feb 2022** – Some curtailments reimposed as dry conditions persisted.
- **Currently** – Curtailments based only on watershed-wide unavailability, 9 Project rights curtailed.



Future Outlook

- Increased curtailments likely across the watershed as a dry summer approaches, regular updates will continue weekly.
- Enhanced Reporting data under evaluation to potentially refine demand assumptions.
- Additional public workshop on the Methodology in the coming months.
- Delta watershed emergency regulation expires in August 2022, renewal being considered.
- Decision assessment, improved visualizations.



Thank you!

Co-Authors: Lisa Hong, Mara Irby, Riley Nolan, Alyssa Campbell, Jeff Laird, Andrew Hill, Robert McCarthy, Scott Ligare, Nicole Williamson, Matt Holland, Conny Mitterhofer, Diane Riddle, attorneys, & many others at the State Water Resources Control Board

<https://www.waterboards.ca.gov/drought/delta/>

https://www.waterboards.ca.gov/drought/drought_tools_methods/delta_method.html

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