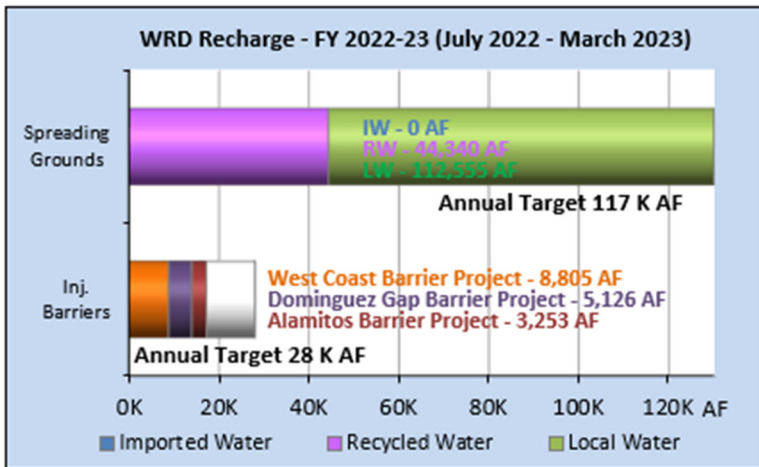
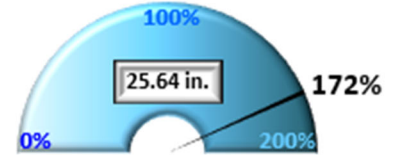


GROUNDWATER BASIN UPDATE FOR MAY 2023

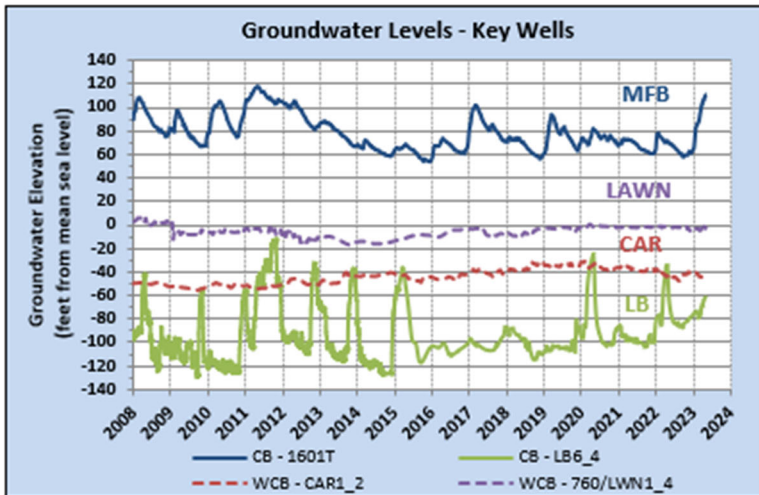
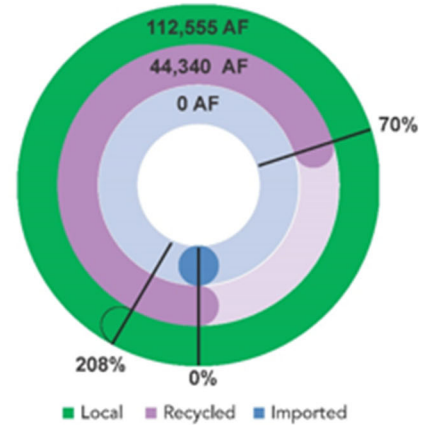
GROUNDWATER BASINS AT A GLANCE*



Precipitation % of Normal to Date
Oct. 1, 2022 - May 5, 2023



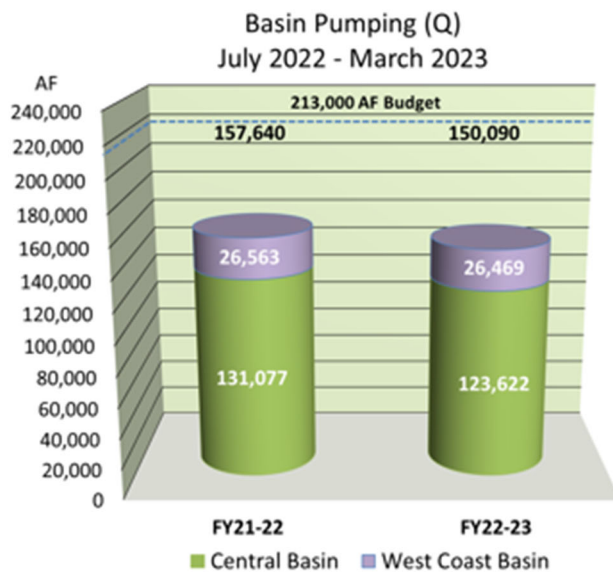
Spreading Grounds Recharge
Jul 2022 - Mar 2023



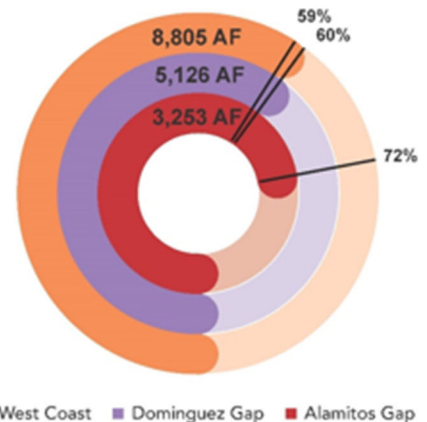
GW Basin Operating Range
May 4, 2023



Minimum Quantity (0 AF) Optimum Quantity (288K AF)



Seawater Barrier Recharge
Jul 2022 - Mar 2023



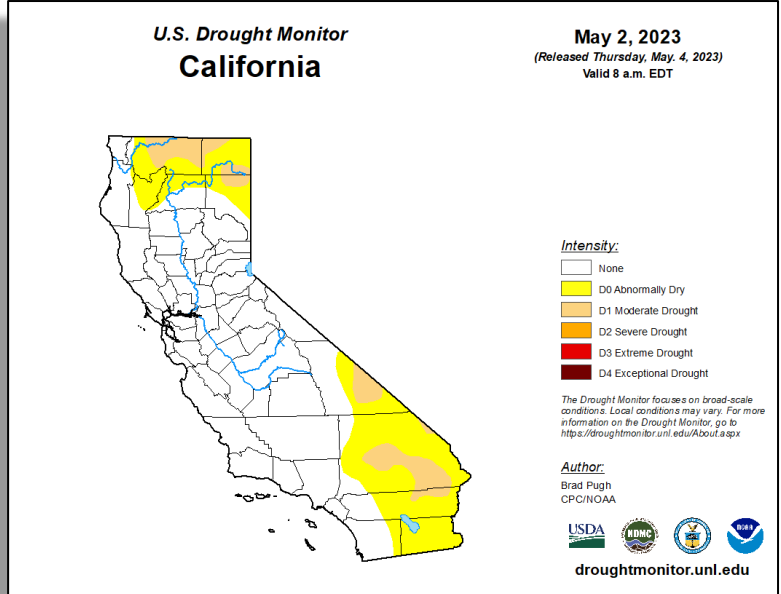
* - Preliminary numbers, subject to change.

SUMMARY

Staff monitors groundwater conditions in the District’s service area throughout the year. A summary of the latest information is presented below.

Precipitation (October 1, 2022 – May 5, 2023)

The WRD precipitation index reports that for the 2022-23 Water Year, there has been above average rainfall (25.64 inches) through May 5, 2023. The normal rainfall for this time period is 14.89 inches, so the District is 172% of normal. As of May 4, 2023, the U.S. Drought Monitor is reporting 32% of the State is abnormally dry (-2%), 8% under moderate (-1%), 0% under severe (same), 0% under extreme (same), and 0% exceptional (same) drought conditions.



Snowpack (Snow Water Content [SWE] as of May 10, 2023)

In 1929, the State established the California Cooperative Snow Surveys Program with the California Department of Water Resources as the coordinator. Today, over 50 state, national, and private agencies collaborate in collecting snow data from over 300 snow courses with more than 60 of the courses being the original courses established in the early 1900’s. The average snow course is 1,000 feet long and consist of about 10 sample points. Anywhere from two to six courses are measured per day depending on weather and access method.

The snow survey is completed using a snow sampling tube equipped with a cutter on the end that is driven through the snow measuring the depth and obtaining a snow core. The snow core is then weighed and the snow water content (or snow water equivalent) calculated. The surveys are completed throughout the winter by returning to the same sample points throughout the season to observe the changing conditions. From February through May the data is used by the State to forecast snow melt runoff. Many snow courses are only measured on or around April 1st, and since it is presumed that the snow accumulates up to April 1st and melts thereafter, April 1st is the benchmark for historic data comparisons.

NORTH	
Data For: 10-May-2023	
Number of Stations Reporting	24
Average snow water equivalent	45.6"
Percent of April 1 Average	153%
Percent of normal for this date	273%

CENTRAL	
Data For: 10-May-2023	
Number of Stations Reporting	41
Average snow water equivalent	49.3"
Percent of April 1 Average	193%
Percent of normal for this date	309%

SOUTH	
Data For: 10-May-2023	
Number of Stations Reporting	22
Average snow water equivalent	49.3"
Percent of April 1 Average	239%
Percent of normal for this date	415%

STATEWIDE SUMMARY	
Data For: 10-May-2023	
Number of Stations Reporting	87
Average snow water equivalent	48.3"
Percent of April 1 Average	190%
Percent of normal for this date	318%

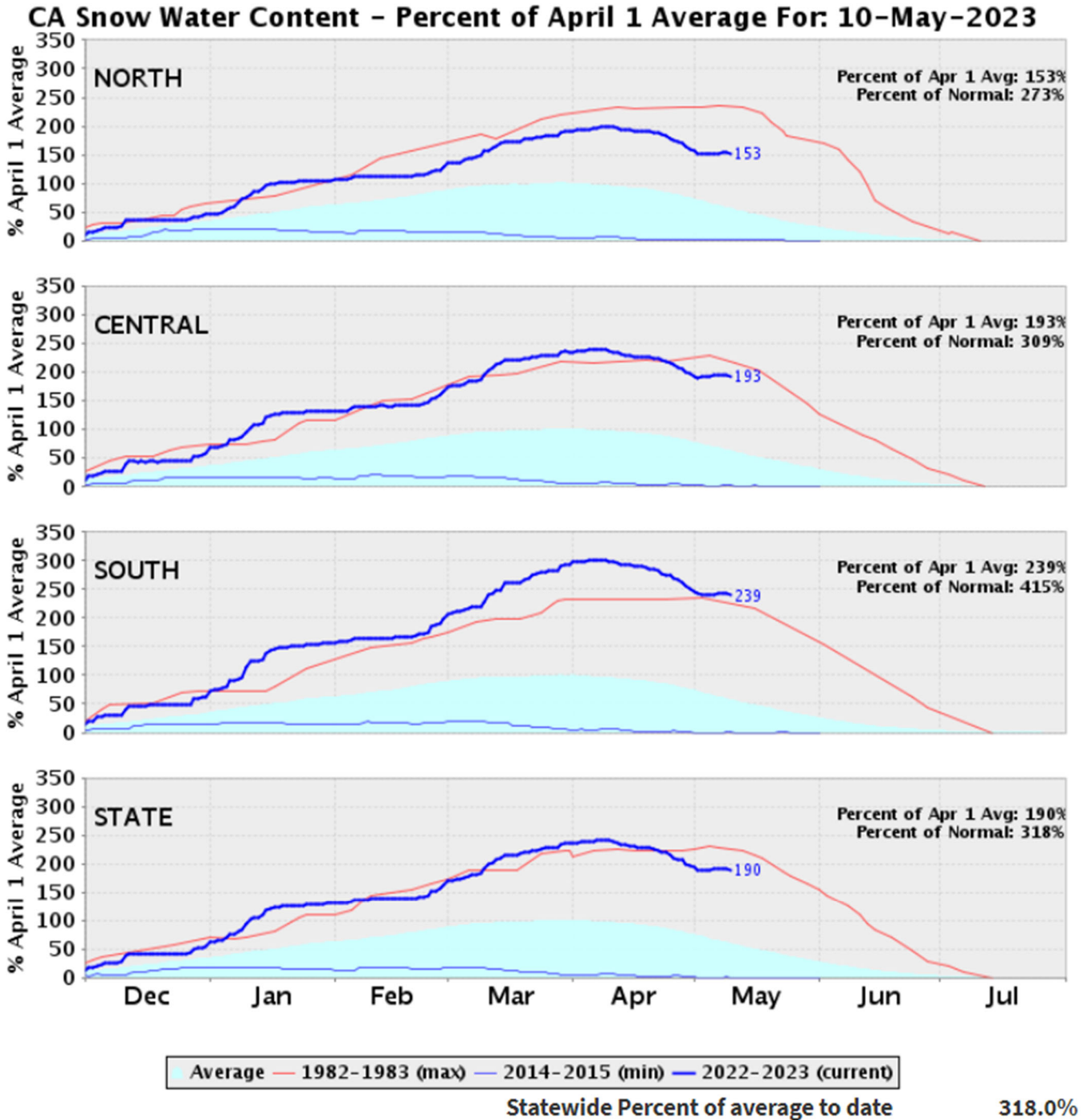
Snow Water Equivalent (SWE):

Northern Sierra Nevada – 45.6 in., 153% of April 1st average and 273% of normal to date

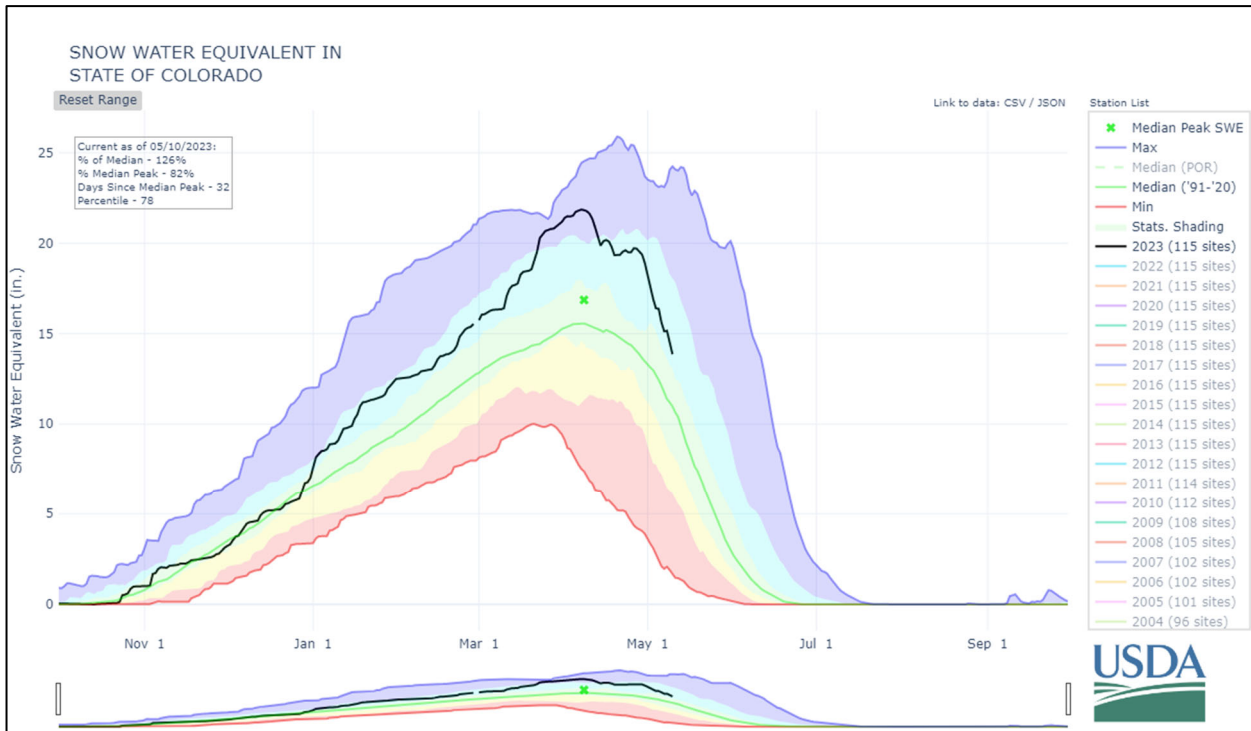
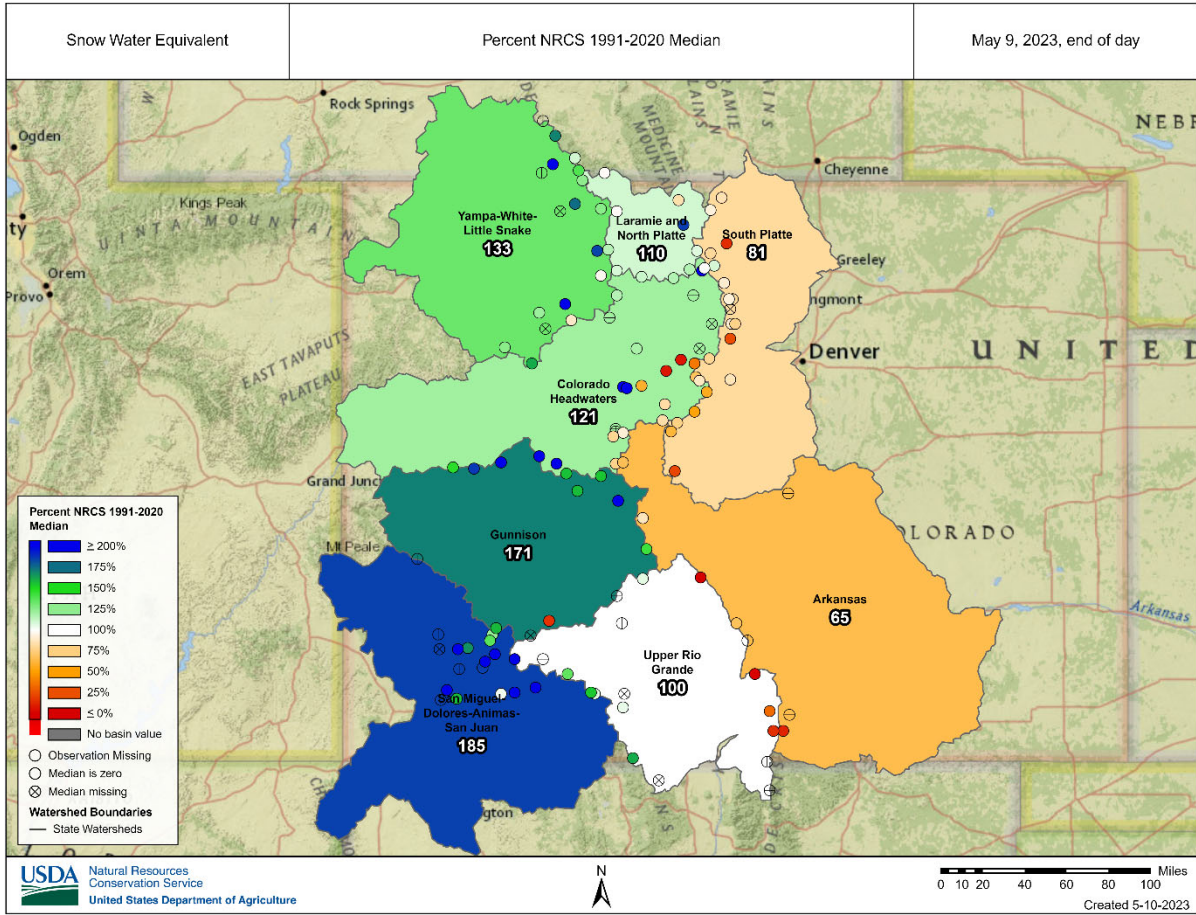
Central Sierra Nevada – 49.3 in., 193% of April 1st average and 309% of normal to date

Southern Sierra Nevada – 49.3 in., 239% of April 1st average and 415% of normal to date

Statewide Summary – 48.3 in., 190% of April 1st average and 318% of normal to date

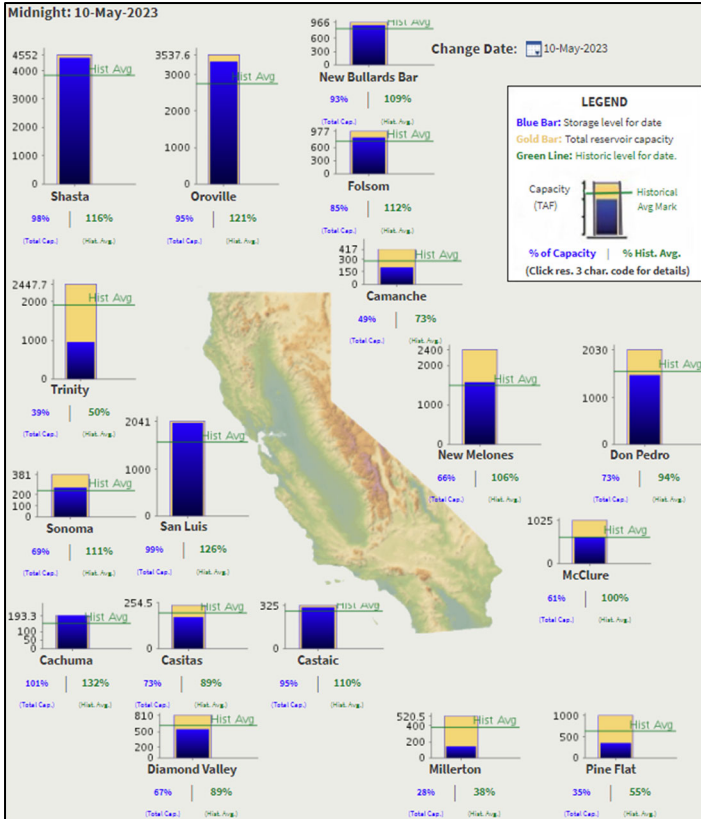


Colorado Snowpack Data



Reservoirs (as of May 10, 2023)

For the 21 reservoirs reported monthly to the committee, water levels have increased in 12 of 21 reservoirs. The largest increase occurred at Lake Powell (0.59 million acre feet, MAF). The smallest increase occurred at Cachuma and Perris Lakes (0.01 MAF). The largest decrease (-0.63 MAF) occurred at Lake Silverwood. The smallest decrease (<-0.01 MAF) occurred at Sonoma and Castaic Lakes.



MWD Reservoirs (SWP) Storage in Million Acre Feet

Reservoir	Capacity	Storage	% Full	Change
Trinity Lake (CLE)	2.45	0.95	39%	0.03
Lake Shasta (SHA)	4.55	4.45	98%	0.37
Lake Oroville (ORO)	3.54	3.36	95%	0.31
New Bullards Bar (BUL)	0.97	0.90	93%	0.09
Folsom Lake (FOL)	0.98	0.83	85%	0.14
Camanche Lake (CMN)	0.42	0.20	49%	-0.07
New Melones L. (NML)	2.40	1.58	66%	0.15
Don Pedro Res (DNP)	2.03	1.49	73%	-0.17
Lake McClure (EXC)	1.02	0.62	61%	-0.06
Lake Sonoma (WRS)	0.38	0.26	69%	0.00
San Luis Res (SNL)	2.04	2.01	99%	-0.01
Millerton Lake (MIL)	0.52	0.14	28%	-0.06
Pine Flat Res. (PNF)	1.00	0.35	35%	-0.24
Cachuma Lake (CCH)	0.19	0.20	101%	0.01
Castaic Lake (CAS)	0.33	0.31	95%	0.00
Casitas Lake (CSI)	0.25	0.19	73%	0.02
Perris Lake (PRR)	0.13	0.12	93%	0.01
L. Silverwood (SLW)	0.08	0.07	89%	-0.63

MWD Reservoirs (CRA) Storage in Million Acre Feet

Reservoir	Capacity	Storage	% Full	Change
Lake Powell	24.32	5.88	24%	0.59
Lake Mead	26.12	7.72	30%	0.32
Diamond Valley L (DVL)	0.81	0.55	67%	0.04

Black Text - Decrease or no change in storage since the last report.
Green Text - Increase in storage since the last report.

These 21 reservoirs are at 43% capacity (32.19 MAF) which is up 0.8 MAF from the prior month (-0.14 MAF State Water Project [SWP] and +0.95 MAF Colorado River Aqueduct [CRA]).

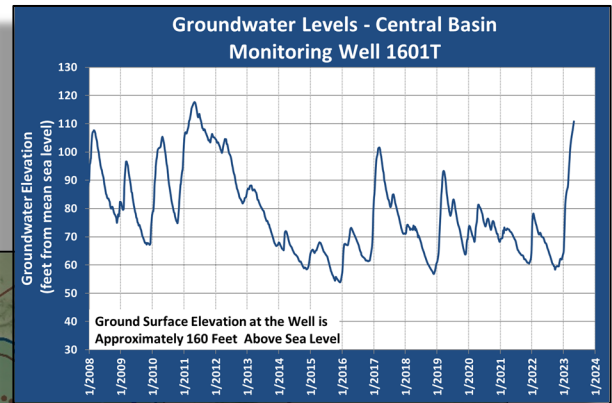
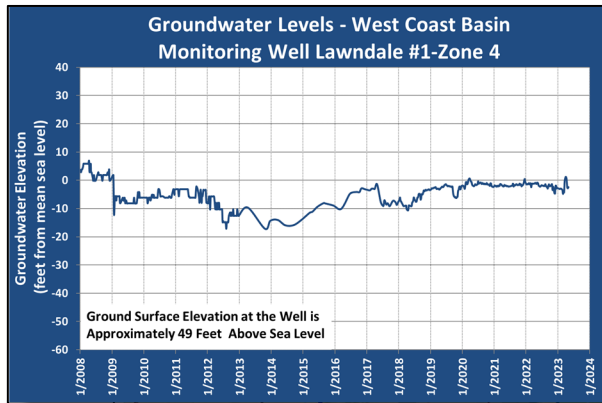


Did you know?

The state's dams provide multiple benefits in addition to storing water for cities and farms. Dams generate 15% of California's electricity supply on average.

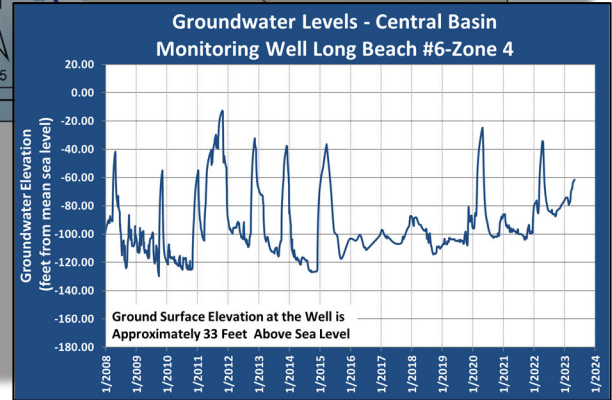
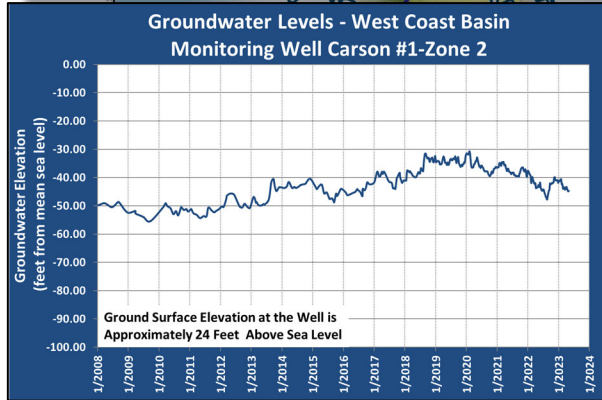
Groundwater Levels (through May 4, 2023)

Groundwater levels in key monitoring wells are shown in the hydrographs below.



Central Basin Key Well Long Beach #6 and West Coast Basin Key Wells Lawndale #1 & Carson #1 are in a confined aquifer and do not respond readily to rainfall but instead to changes in pumping patterns and barrier recharge.

Central Basin Key Well 1601T is between the two spreading grounds and rises rapidly with rainfall and replenishment but falls sharply during dry spells and lack of replenishment.



Groundwater Level Changes in Key Wells

Well Name	Since Last Report	Since Same Time the Previous Year
Central Basin Key Well 1601T	Increased 4.5 feet	Increased 40.95 feet
Central Basin Key Well Long Beach #6 4	Increased 2.6 feet	Decreased 1.8 feet
West Coast Basin Key Well Lawndale #1 4	Decreased 2.9 feet	Decreased 1.3 feet
West Coast Basin Key Well Carson #1 2	Decreased 0.9 foot	Decreased 2.1 feet

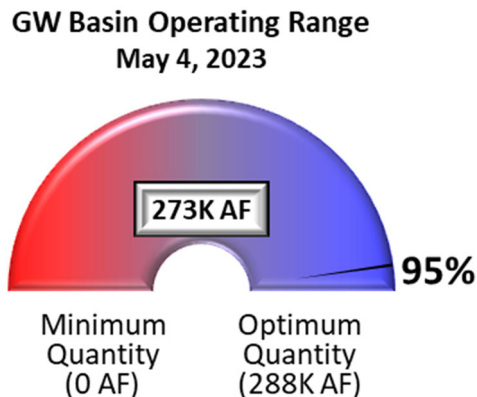
Bold indicates a change in direction (decreasing or increasing) since the last report.

Optimum and Minimum Groundwater Quantity (May 4, 2023)

In response to a 2002 State audit of the District's activities, the Board of Directors adopted an Optimum and Minimum Quantity for groundwater in the District to define an appropriate operating range that would sustain adjudicated pumping rights, leave room for future storage projects, and identify a lower limit. The amounts are based on the accumulated overdraft concept, which the District tracks year by year based on changes in groundwater storage.

After an extensive review of over 70 years of water level fluctuations and discussions with the Board and pumping community, Water Year 1999/2000 was recognized as a representative year for the Optimum Quantity, which equated to an accumulated overdraft of approximately 612,000 acre feet. The Minimum Quantity was defined as an accumulated overdraft of 900,000 acre feet, which allowed an operating range from 0 acre feet (minimum) to 288,000 acre feet (optimum). The Board also adopted a policy to make-up the groundwater deficit should the accumulated overdraft fall too far below the Optimum Quantity.

The Accumulated Overdraft as of May 4, 2023, has been estimated at 626,598 acre feet (subject to change), which is 273,402 acre feet above the Minimum Quantity and 14,598 acre feet below the Optimum Quantity. The Basin is at 95% of Optimum Quantity which is 6% higher than what was reported last month (~17,000 AF higher).



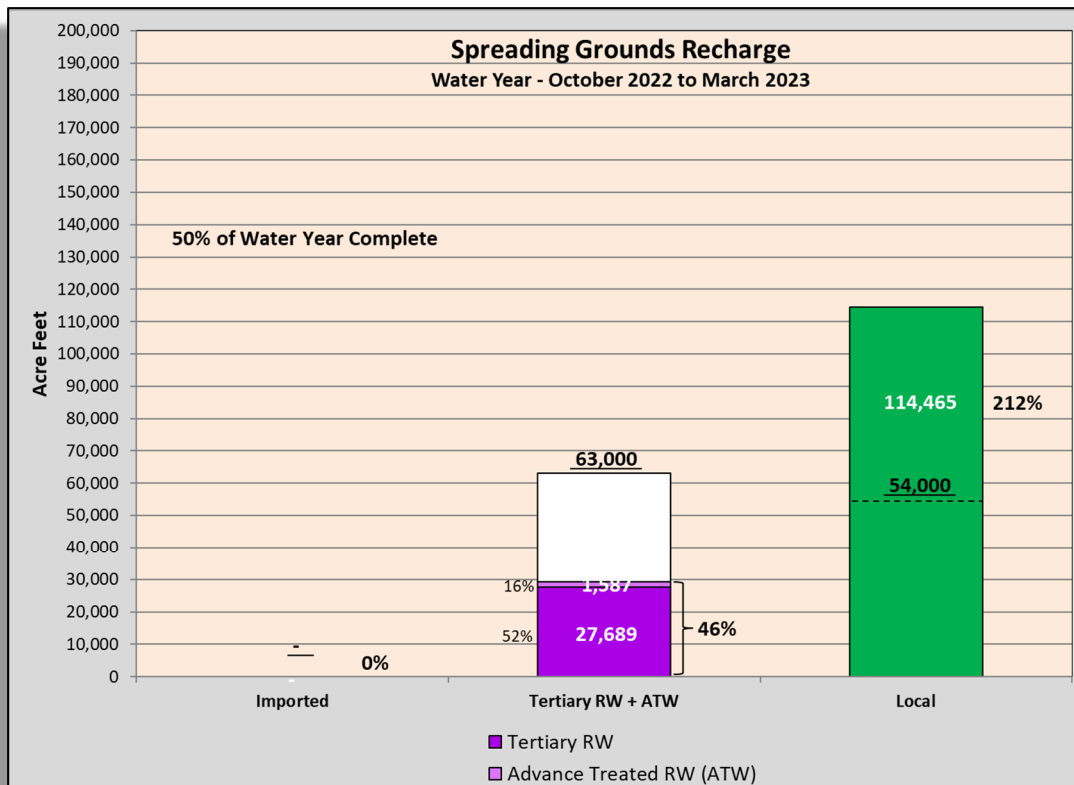
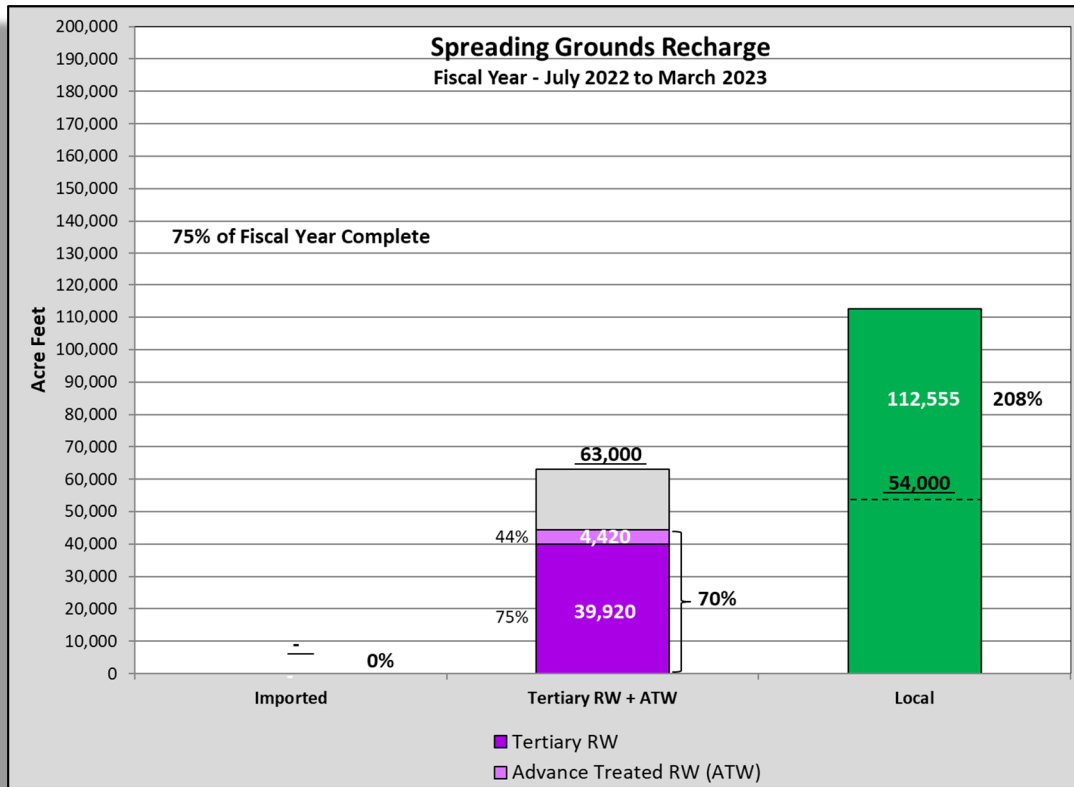
FACT:

About 90 percent of our freshwater supplies lie underground, but less than 27 percent of the water Americans use comes from underground sources, which illustrates the under-utilization of groundwater.



Montebello Forebay Spreading Grounds (July 2022 – March 2023)

The following Charts shows the preliminary spreading grounds replenishment water for the current Fiscal Year (2022-23; 9 months) and Water Year (2022-23; 6 months):



No imported water purchases are planned for Fiscal Year 2022-23.

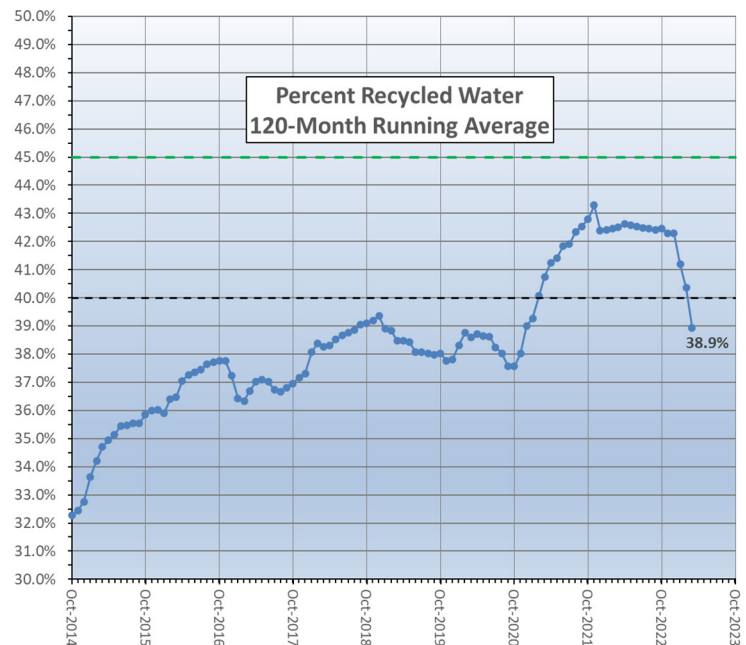
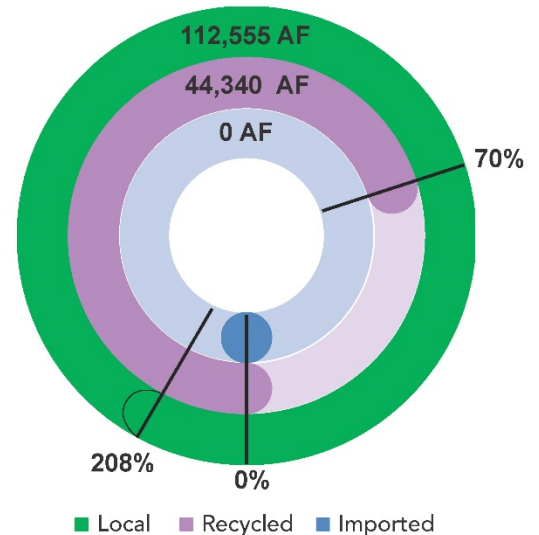
Local water (stormwater plus dry weather urban runoff) is captured by the Los Angeles County Department of Public Works (LACPW) at the spreading grounds for recharge. Local water amounts are determined as the sum of the total waters conserved at the spreading grounds less the imported and recycled water deliveries. For the 2022-23 Fiscal Year, 112,555 acre feet of local water capture has been reported by the LACPW.

Preliminary numbers for the 2022-23 Fiscal Year show that approximately 44,340 acre feet of recycled water has been recharged with 4,420 acre feet consisting of advanced treat water from the ARC AWWTF and 39,920 acre feet of tertiary recycled water. Presuming the advanced treated water as “Null Water”, the 120-month running average of the recycled water contribution in the Montebello Forebay is 38.9% and the regulatory maximum is 45%, with additional monitoring being required once 40% is reached. WRD and LACSD submitted the additional monitoring plan on May 26, 2021. The plan is still awaiting acceptance by the RWQCB; however, there is no need to implement the plan at this time.

Tertiary Recycle Water Permit Update

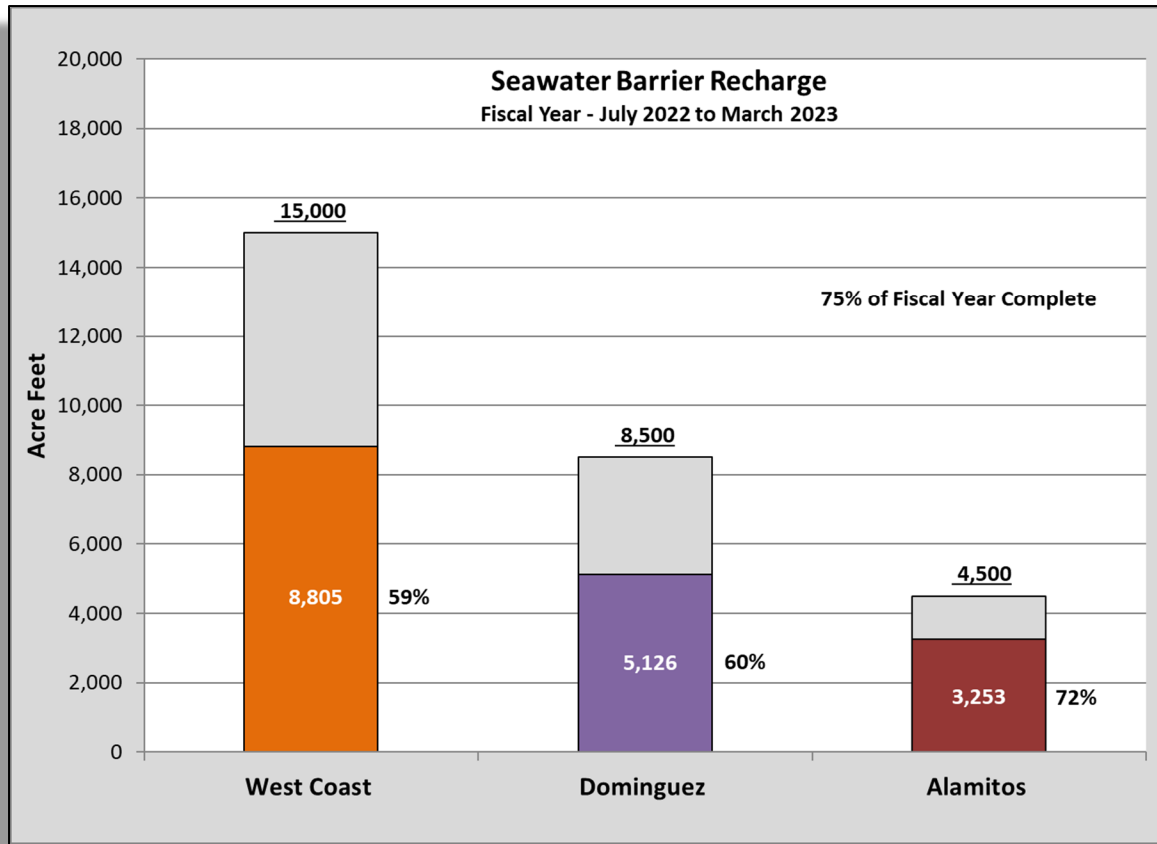
The permit is continuing to progress with LACSD and WRD staff working to update pertinent sections of the new Title 22 Engineering Report. Due to the continued mega drought and recent emergency drought proclamation by Governor Newsom, LACSD and WRD submitted a request to modify the recycled water contribution percentage to 50% and the advanced treated water classification to diluent in a letter to the LARWQCB and CA-DDW dated July 8, 2022. LACSD and WRD staff are targeting the end of 2023 to have the new Title 22 Engineering Report submitted, including the requests the increase the recycled water contribution percentage to 50% and reclassify the advanced treated water as diluent.

Spreading Grounds Recharge
Jul 2022 - Mar 2023

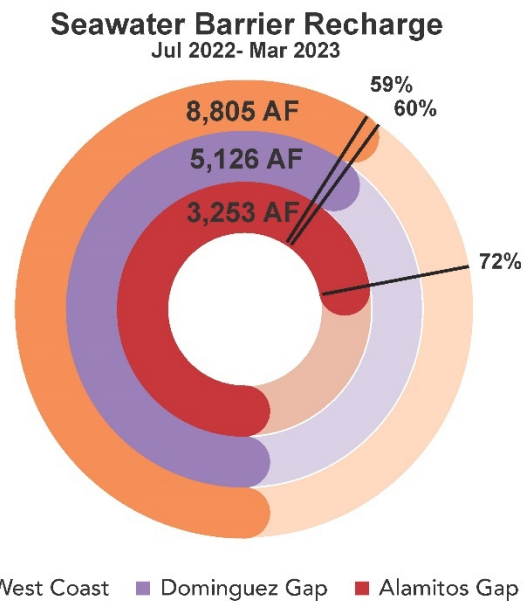


Seawater Barrier Well Injection and Replenishment (July 2022 – March 2023)

The following Chart shows the barrier water injection:

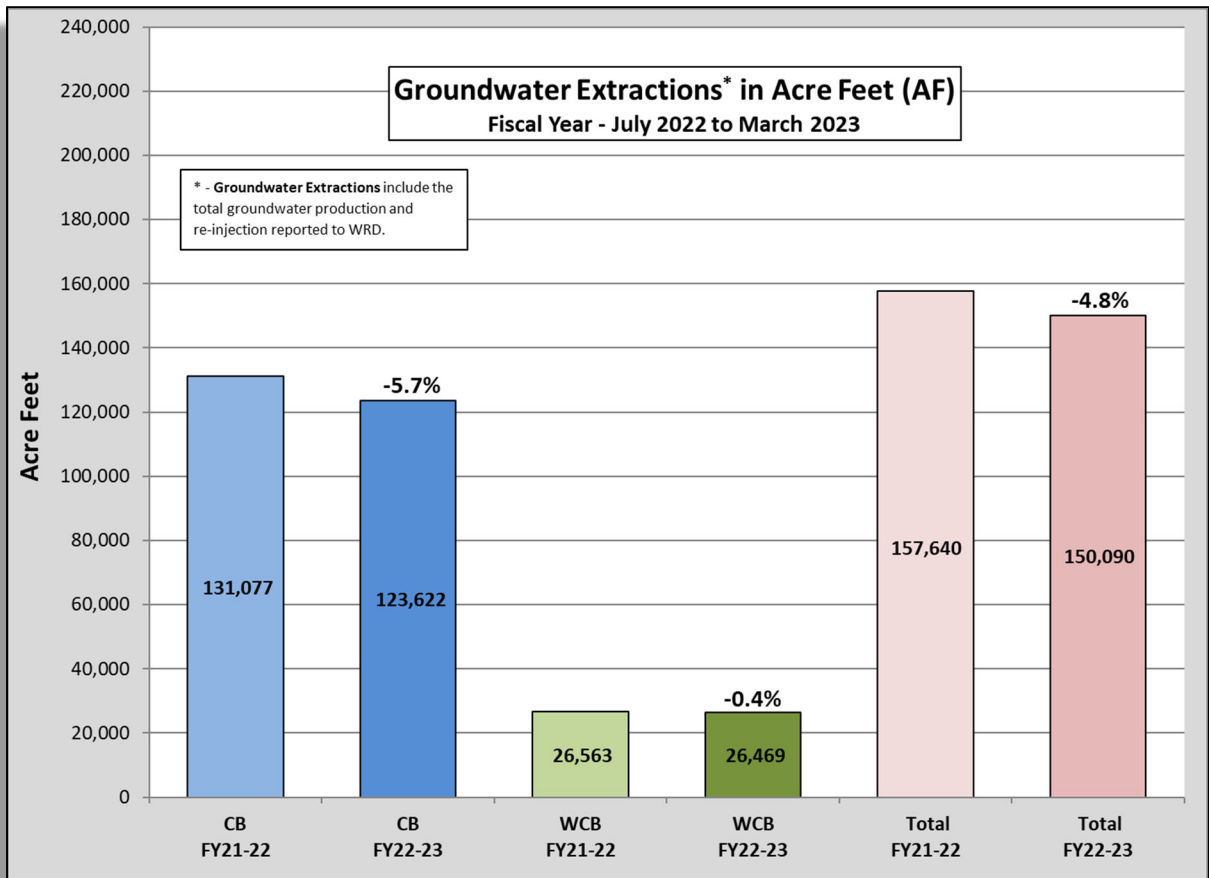


Preliminary numbers for the 2022-23 Fiscal Year show that the West Coast Barrier has used 8,805 acre feet of the total 15,000 acre feet planned for injection, 59% of total for the Fiscal Year. The Dominguez Gap Barrier used 5,126 acre feet of the total 8,500 acre feet planned for injection, 60% of the total for the Fiscal Year. The Alamitos Barrier, on the WRD side, used 3,253 acre feet of the total 4,500 acre feet planned for injection, 72% of the total for the Fiscal Year.



Total Pumping (Fiscal Year 2022-23, July 2022 – March 2023)

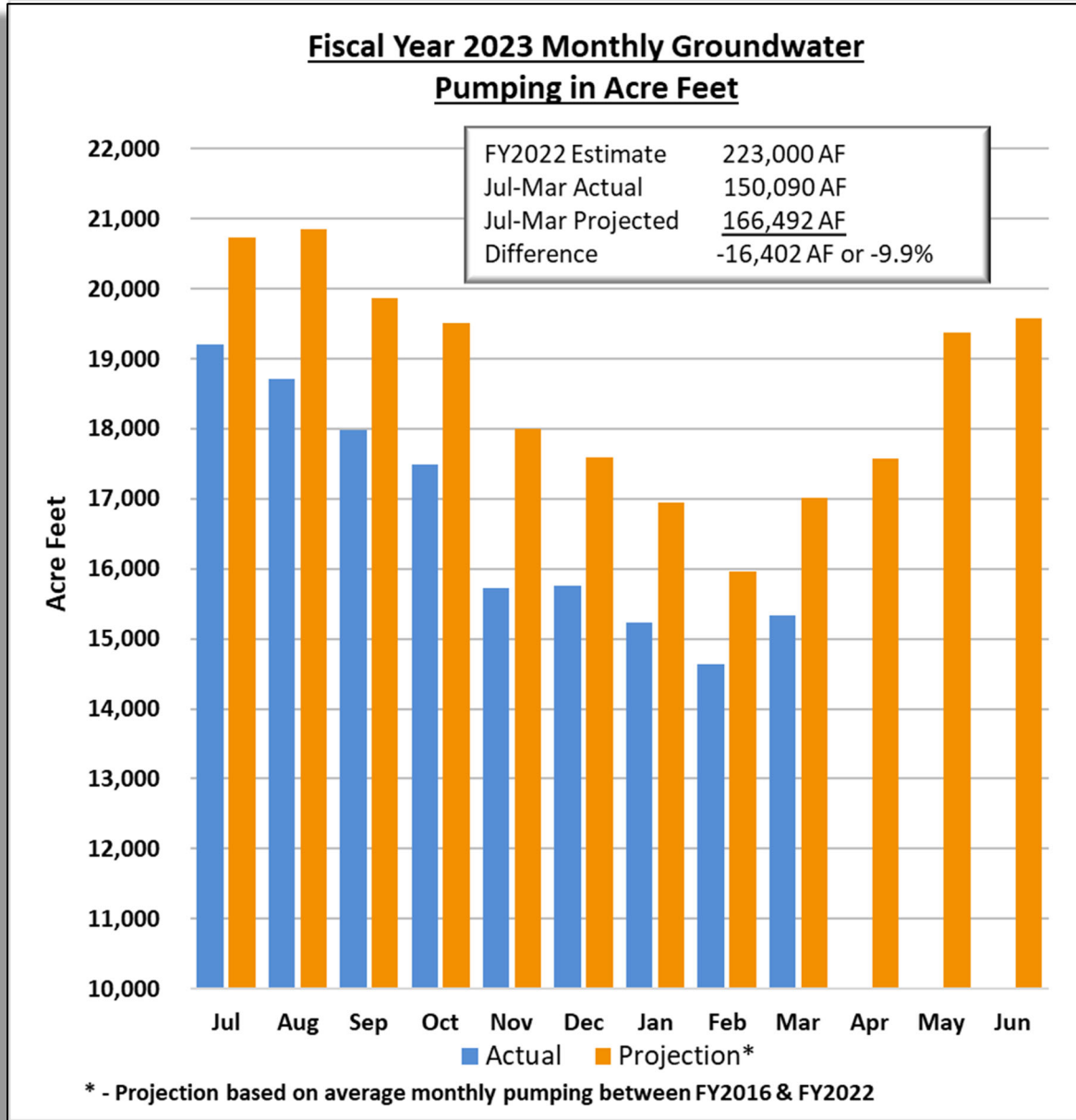
Preliminary numbers for groundwater production in the District for the Fiscal Year 2022-23 (July-March) indicate total pumping in the Central Basin was down 7,455 acre feet from the same time of the previous fiscal year (-5.7%) and the West Coast Basin total pumping was 94 acre feet lower than the previous fiscal year (-0.4%). The total pumping is 150,090 acre feet compared to 157,640 acre feet during the same time the previous year for a decrease of 7,550 acre feet, or -4.8%. The current pumping data do not include seven (7) Central Basin pumpers and one (1) West Coast Basin pumper who have not yet reported for an estimated 6 additional acre feet.



Interesting...

Of the total 349 billion gallons of freshwater the United States withdraws each day, groundwater is estimated to be 79.6 billion gallons, or 26 percent.

Preliminary numbers indicate 150,090 acre feet have been pumped this fiscal year and is 9.9% below the projected fiscal year to date goal of 166,492 acre feet (or -16,402 acre feet). Monthly actual production versus the 7-year average monthly production projections (FY 2016 through 2022) are included in the chart below.



“Water is the driving force of all nature.”
 - Leonardo da Vinci



For the Fiscal Year 2022-23 (July 2022 - March 2023), staff has tracked the production trends of the top five (5) producing pumpers and the bottom five (5) producing pumpers in each basin. These pumpers are identified in the following tables and are based on the change in volume (in acre feet) compared to the same time period for the previous Fiscal Year.

Production Trends - Central Basin				
Top 5 Producing by Volume (AF)	Jul 2021- Mar 2021	Jul 2022- Mar 2022	Difference	% Change
Long Beach, City - CB	20,953.64	21,955.07	1001.43	4.56
Cal. Water Service Co. (East LA)	7,761.41	8,005.16	243.75	3.04
Los Angeles, City - CB	3,063.79	3,294.02	230.23	6.99
Golden State Water Co. - CB	13,555.64	13,670.37	114.73	0.84
Boeing, Compton Site	0.00	36.30	36.30	100.00
Bottom 5 Producing by Volume (AF)	Jul 2021- Mar 2021	Jul 2022- Mar 2022	Difference	% Change
Downey, City	10,783.69	9,921.34	-862.35	-8.69
Santa Fe Springs, City	1,786.16	961.76	-824.40	-85.72
Whittier, City	4,419.09	3,687.05	-732.04	-19.85
Vernon, City	4,886.44	4,284.96	-601.48	-14.04
Lakewood - City	5,267.37	4,752.63	-514.74	-10.83

Production Trends – West Coast Basin				
Top 5 Producing by Volume (AF)	Jul 2021- Mar 2021	Jul 2022- Mar 2022	Difference	% Change
Cal. Water Service Co. Dominguez - WB	1,581.94	2,559.71	977.77	38.20
Tesoro Refining	7,152.37	7,945.50	793.13	9.98
Golden State Water Co. - WB	3,642.27	4,203.59	561.32	13.35
Cal. Water Service Co./Hawthorne Lease	15.21	233.11	217.90	93.48
Manhattan Beach, City	163.01	343.71	180.70	52.57
Bottom 5 Producing by Volume (AF)	Jul 2021- Mar 2021	Jul 2022- Mar 2022	Difference	% Change
Phillips 66 Co. - Alpha 7093	4,764.22	3,897.35	-866.87	-22.24
Cal. Water Service Co. Alpha 7050	1,036.00	627.13	-408.87	-65.20
Torrance, City	1,364.27	956.64	-407.63	-42.61
Inglewood, City	1,558.62	1,406.94	-151.68	-10.78
Roman Catholic Archbishop - WB	199.76	113.17	-86.59	-76.51

Water Replenishment District (WRD) publishes the Groundwater Basin Update (GWBU) monthly. All information contained herein is preliminary and is meant to be a snapshot the status of the basins at the time of publication and should not constitute an official WRD report. All the information presented in the GWBU utilizes the best available data at the time of publication. Data provided herein is a compilation of WRD data and publicly available information from several of our partners including, by not limited to, the Los Angeles County Department of Public Works - Stormwater Engineering Division, Metropolitan Water District of Southern California, California Department of Water Resources, US Bureau of Reclamation, University of Nebraska - Lincoln, and the US Department of Agriculture - Natural Resources Conservation Service. The GWBU is prepared by Senior Hydrogeologist, Everett Ferguson, who can be contacted directly with questions at eferguson@wrd.org.