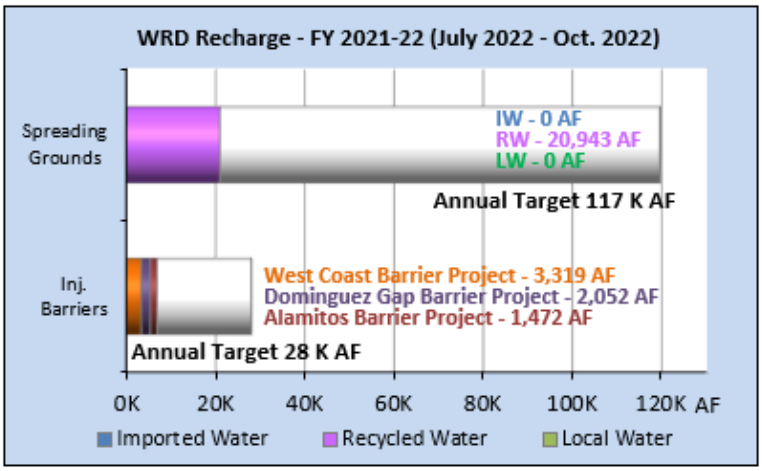
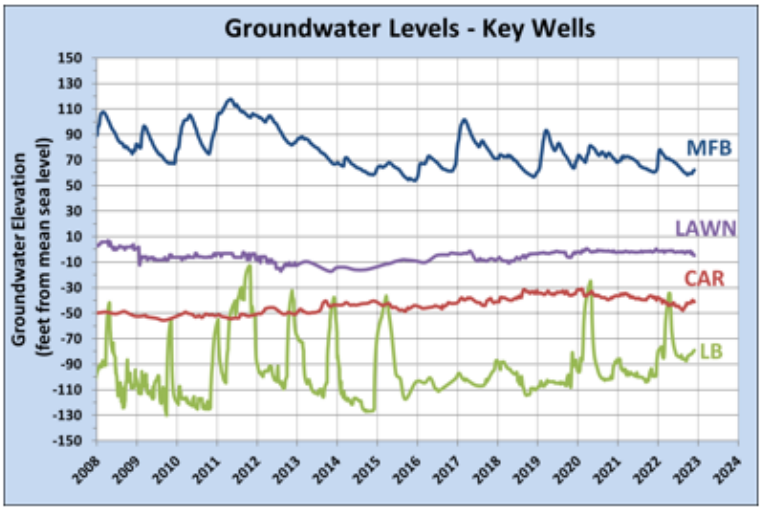
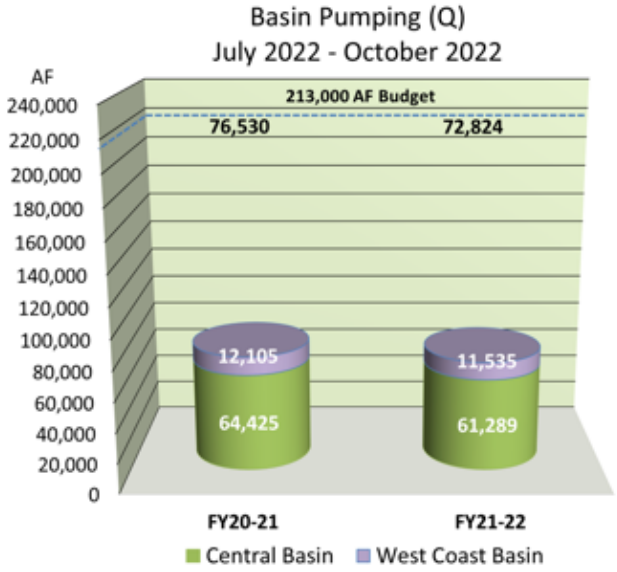
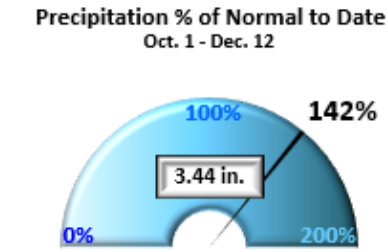
GROUNDWATER BASIN UPDATE
FOR DECEMBER 2022

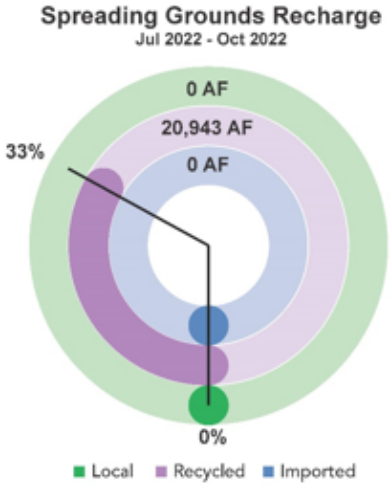
GROUNDWATER BASINS *AT A GLANCE**

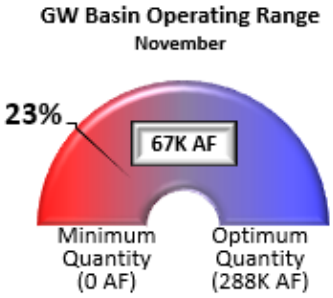


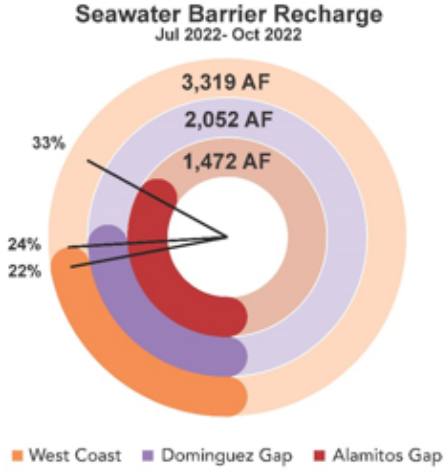












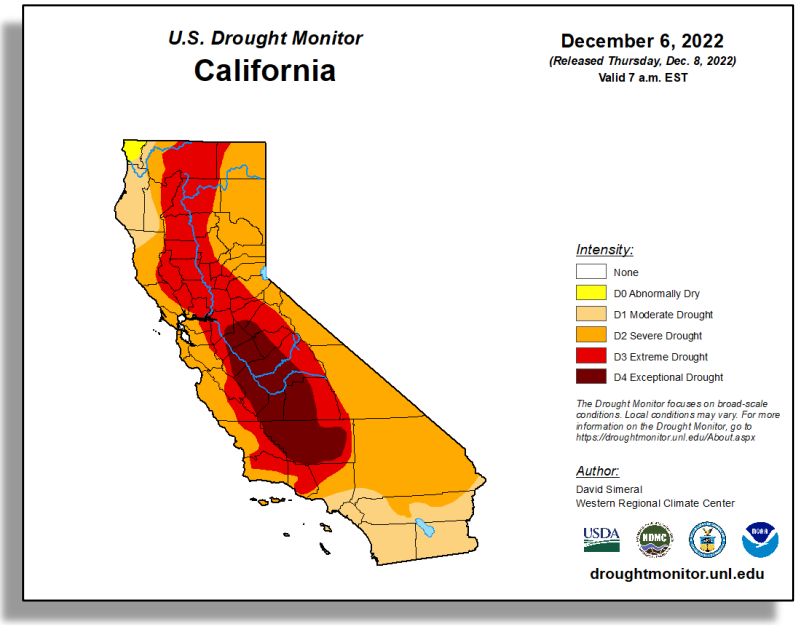
* - Preliminary numbers, subject to change.

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 – December 12, 2022)

The WRD precipitation index reports that for the 2022-23 Water Year, there has been above average rainfall (3.44 inches) through December 12, 2022. The normal rainfall for this time period is 2.42 inches, so the District is 142% of normal. As of December 6, 2022, the U.S. Drought Monitor is reporting 100% of the State is abnormally dry, 99% under moderate (-1%), 85% under severe (-7%), 40% under extreme (-3%), and 13% exceptional (-4%) drought conditions.



Snowpack (Snow Water Content [SWE] as of December 14, 2022)

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: 14-Dec-2022	
Number of Stations Reporting	32
Average snow water equivalent	10.3"
Percent of April 1 Average	36%
Percent of normal for this date	184%

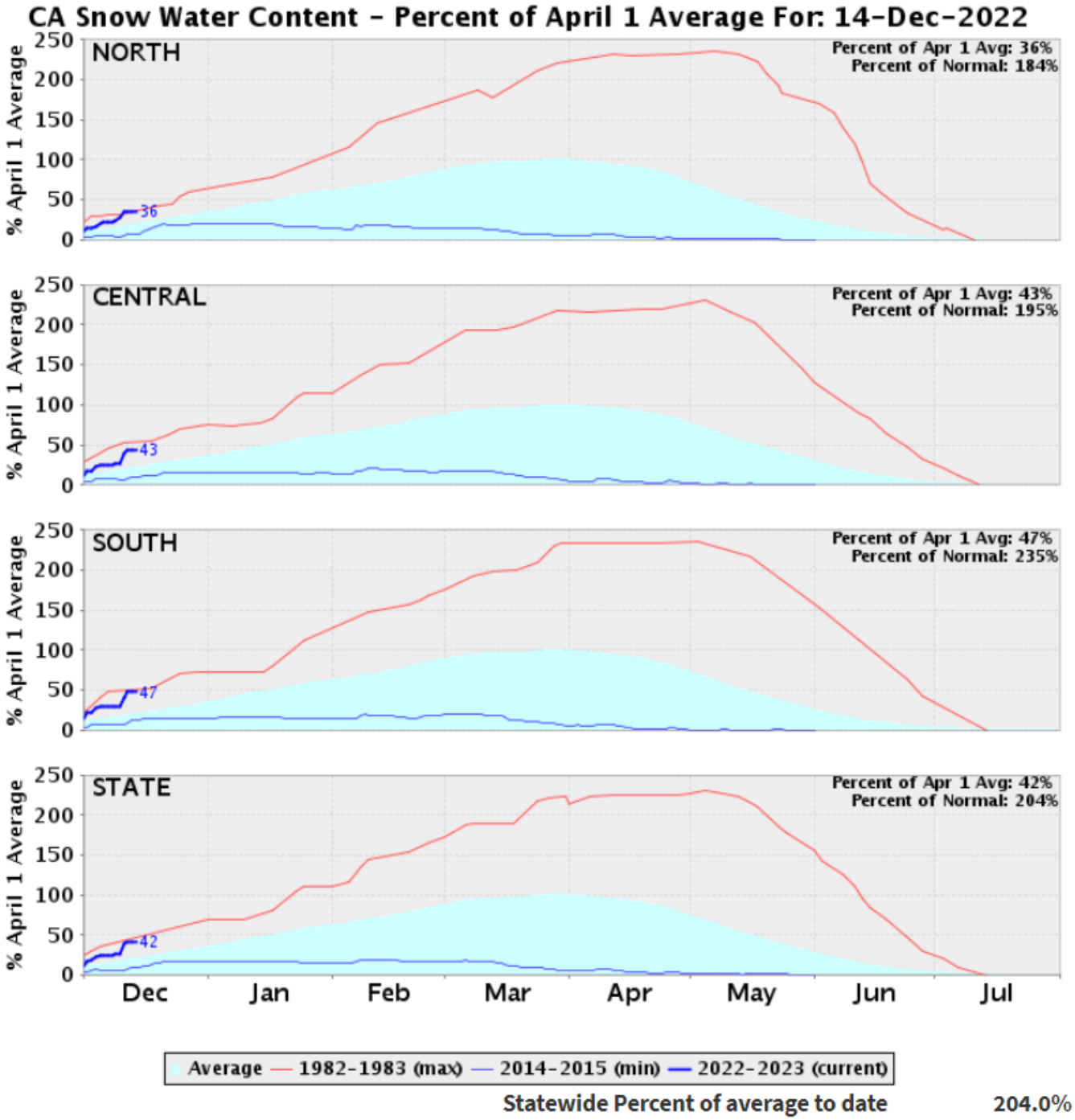
CENTRAL	
Data For: 14-Dec-2022	
Number of Stations Reporting	54
Average snow water equivalent	12.0"
Percent of April 1 Average	43%
Percent of normal for this date	195%

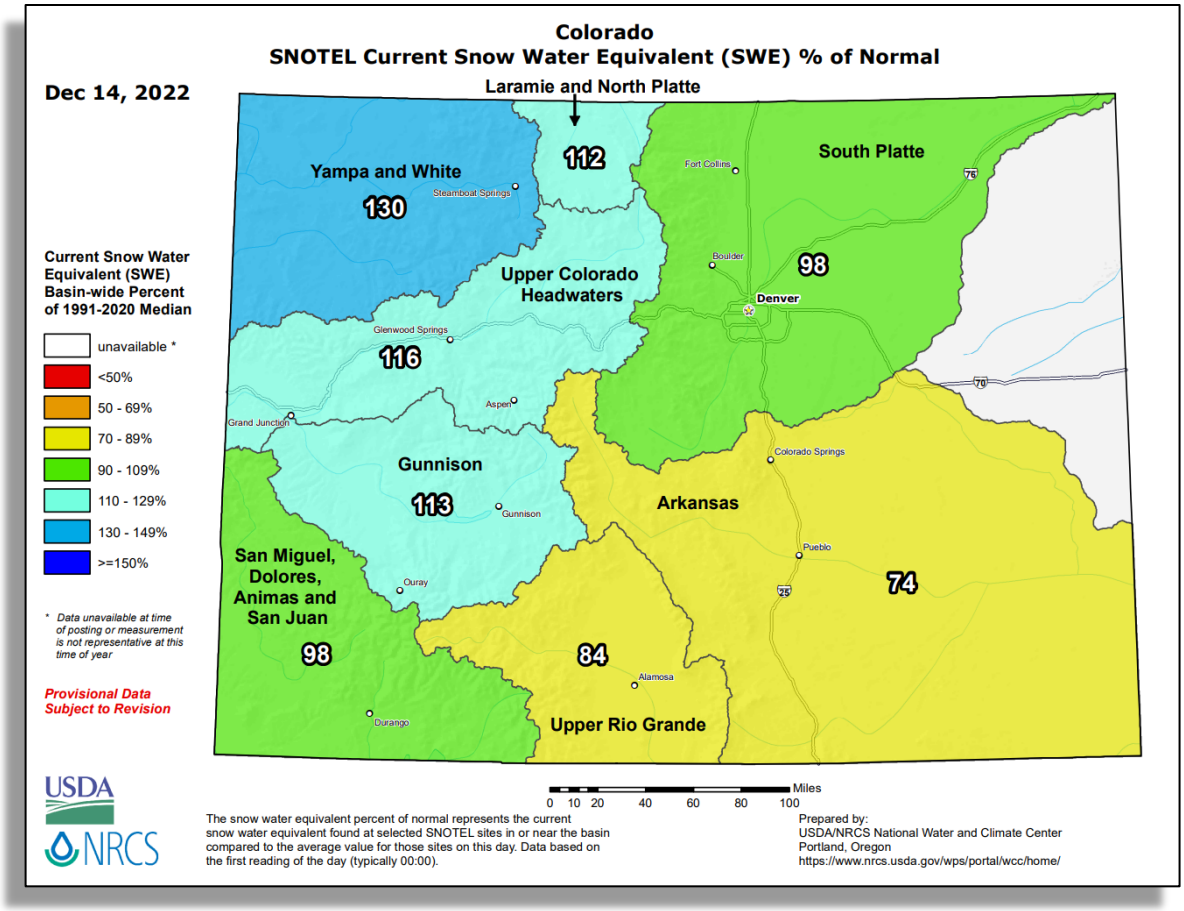
SOUTH	
Data For: 14-Dec-2022	
Number of Stations Reporting	33
Average snow water equivalent	10.7"
Percent of April 1 Average	47%
Percent of normal for this date	235%

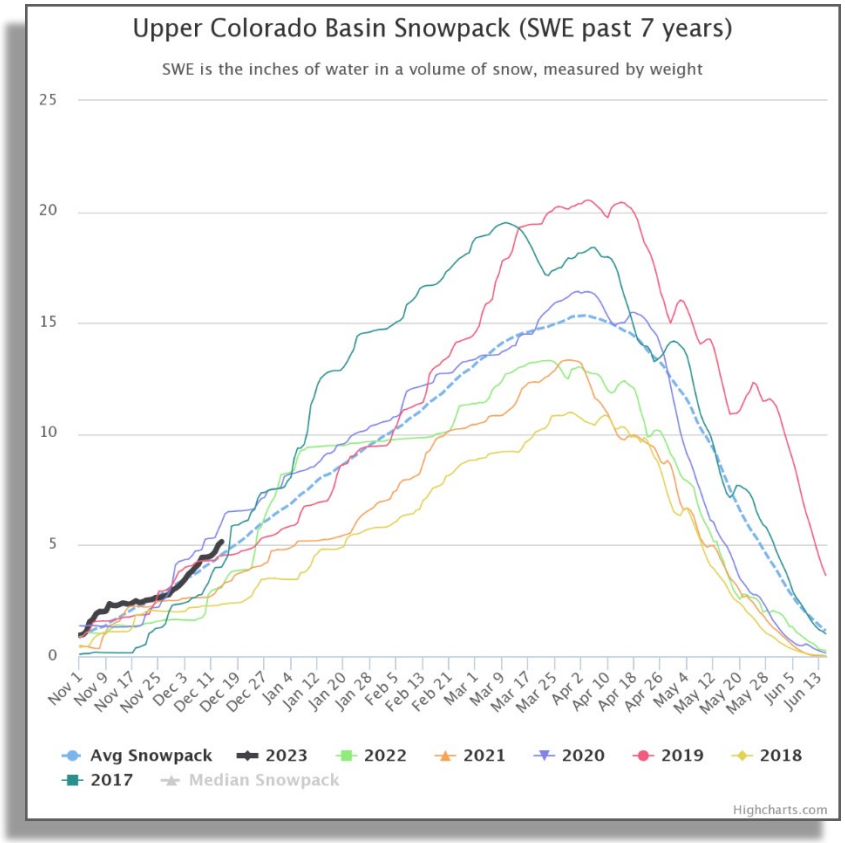
STATEWIDE SUMMARY	
Data For: 14-Dec-2022	
Number of Stations Reporting	119
Average snow water equivalent	11.2"
Percent of April 1 Average	42%
Percent of normal for this date	204%

Snow Water Equivalent (SWE):

Northern Sierra Nevada – 10.3 in., 36% of April 1st average and 184% of normal to date
Central Sierra Nevada – 12.0 in., 43% of April 1st average and 195% of normal to date
Southern Sierra Nevada – 10.7 in., 47% of April 1st average and 235% of normal to date
Statewide Summary *– 11.2 in., 42% of April 1st average and 204% of normal to date*

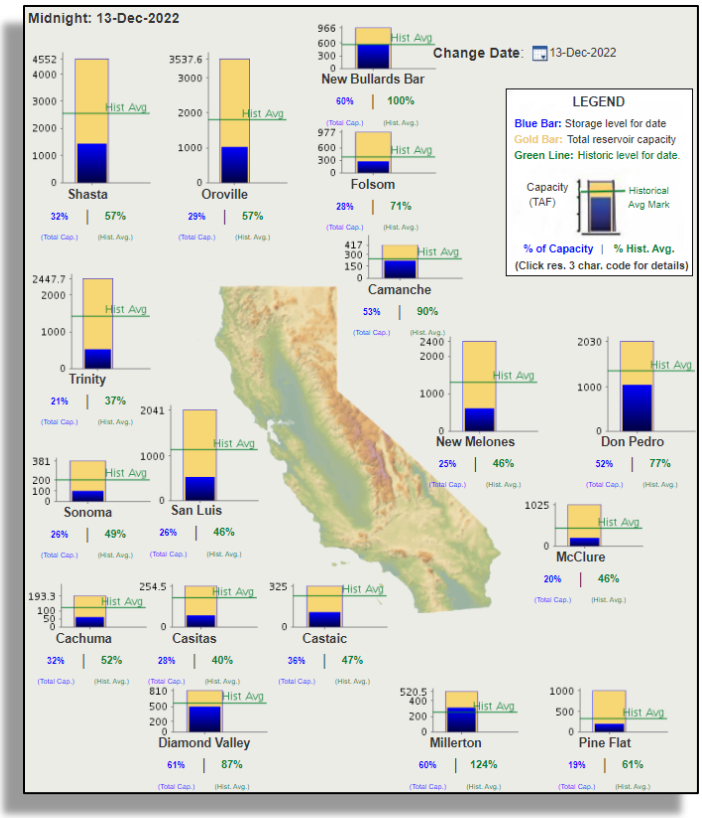



Colorado
SNOTEL Current Snow Water Equivalent (SWE) % of Normal
Dec 14, 2022
Laramie and North Platte
112
South Platte
98
Yampa and White
130
Steamboat Springs
Fort Collins
Boulder
Denver
Upper Colorado Headwaters
116
Glenwood Springs
Aspen
Grand Junction
Gunnison
113
Gunnison
Arkansas
Colorado Springs
Pueblo
74
San Miguel, Dolores, Animas and San Juan
98
Ouray
84
Alamosa
Durango
Upper Rio Grande
Current Snow Water Equivalent (SWE) Basin-wide Percent of 1991-2020 Median
unavailable *
<50%
50 - 69%
70 - 89%
90 - 109%
110 - 129%
130 - 149%
>=150%
* Data unavailable at time of posting or measurement is not representative at this time of year
Provisional Data Subject to Revision
Miles
0 10 20 40 60 80 100
The snow water equivalent percent of normal represents the current snow water equivalent found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 00:00).
Prepared by:
USDA/NRCS National Water and Climate Center
Portland, Oregon
https://www.nrcs.usda.gov/wps/portal/wcc/home/


Upper Colorado Basin Snowpack (SWE past 7 years)
SWE is the inches of water in a volume of snow, measured by weight
25
20
15
10
5
0
Nov 1
Nov 9
Nov 17
Nov 25
Dec 3
Dec 11
Dec 19
Dec 27
Jan 4
Jan 12
Jan 20
Jan 28
Feb 5
Feb 13
Feb 21
Mar 1
Mar 9
Mar 17
Mar 25
Apr 2
Apr 10
Apr 18
Apr 26
May 4
May 12
May 20
May 28
Jun 5
Jun 13
Avg Snowpack
2023
2022
2021
2020
2019
2018
2017
Median Snowpack
Highcharts.com

Reservoirs (as of December 12, 2022)

For the 21 reservoirs reported monthly to the committee, water levels have increased in 10 of 21 reservoirs. The largest increase occurred at Lake Shasta, Don Pedro, San Luis, and Pine Flat Reservoirs (0.04 million acre feet, MAF). The smallest increase occurred at Lakes Casitas and Silverwood (<0.01 MAF). The largest decrease (-0.16 MAF) occurred at Lake Powell. The smallest decrease (<0.0 MAF) occurred at Folsom, Sonoma, Cachuma, Perris, and Diamond Valley Lakes.



MWD Reservoirs (SWP)
Storage in Million Acre Feet

Reservoir	Capacity	Storage	% Full	Change
Trinity Lake (CLE)	2.45	0.52	21%	-0.01
Lake Shasta (SHA)	4.55	1.44	32%	0.04
Lake Oroville (ORO)	3.54	1.02	29%	-0.04
New Bullards Bar (BUL)	0.97	0.58	60%	-0.01
Folsom Lake (FOL)	0.98	0.28	28%	0.00
Camanche Lake (CMN)	0.42	0.22	53%	0.01
New Melones L. (NML)	2.40	0.61	25%	0.02
Don Pedro Res (DNP)	2.03	1.05	52%	0.04
Lake McClure (EXC)	1.02	0.20	20%	0.02
Lake Sonoma (WRS)	0.38	0.10	26%	0.00
San Luis Res (SNL)	2.04	0.53	26%	0.04
Millerton Lake (MIL)	0.52	0.31	60%	-0.01
Pine Flat Res. (PNF)	1.00	0.19	19%	0.04
Cachuma Lake (CCH)	0.19	0.06	32%	0.00
Castaic Lake (CAS)	0.33	0.12	36%	0.01
Casitas Lake (CSI)	0.25	0.07	28%	0.00
Perris Lake (PRR)	0.13	0.09	70%	0.00
L. Silverwood (SLW)	0.08	0.07	84%	0.00

MWD Reservoirs (CRA)
Storage in Million Acre Feet

Reservoir	Capacity	Storage	% Full	Change
Lake Powell	24.32	5.66	23%	-0.16
Lake Mead	26.12	7.23	28%	-0.12
Diamond Valley L (DVL)	0.81	0.50	61%	0.00

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

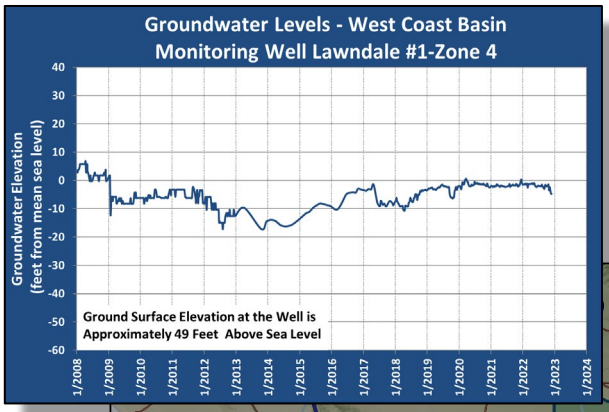
These 21 reservoirs are at 28% capacity (20.85 MAF) which is down 0.14 MAF from the prior month (+0.15 MAF State Water Project [SWP] and -0.29 MAF Colorado River Aqueduct [CRA]).

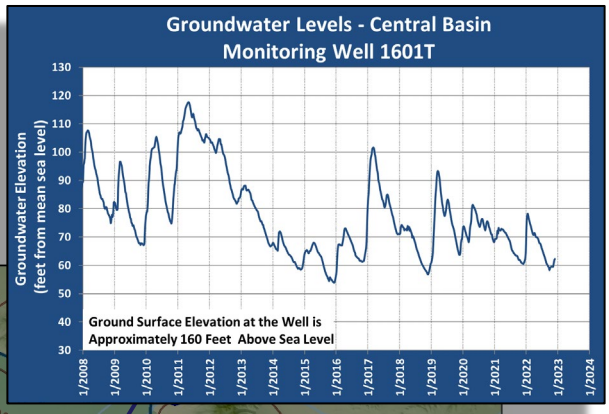
Did you know?

A person can live about a month without food, but only about a week without water.

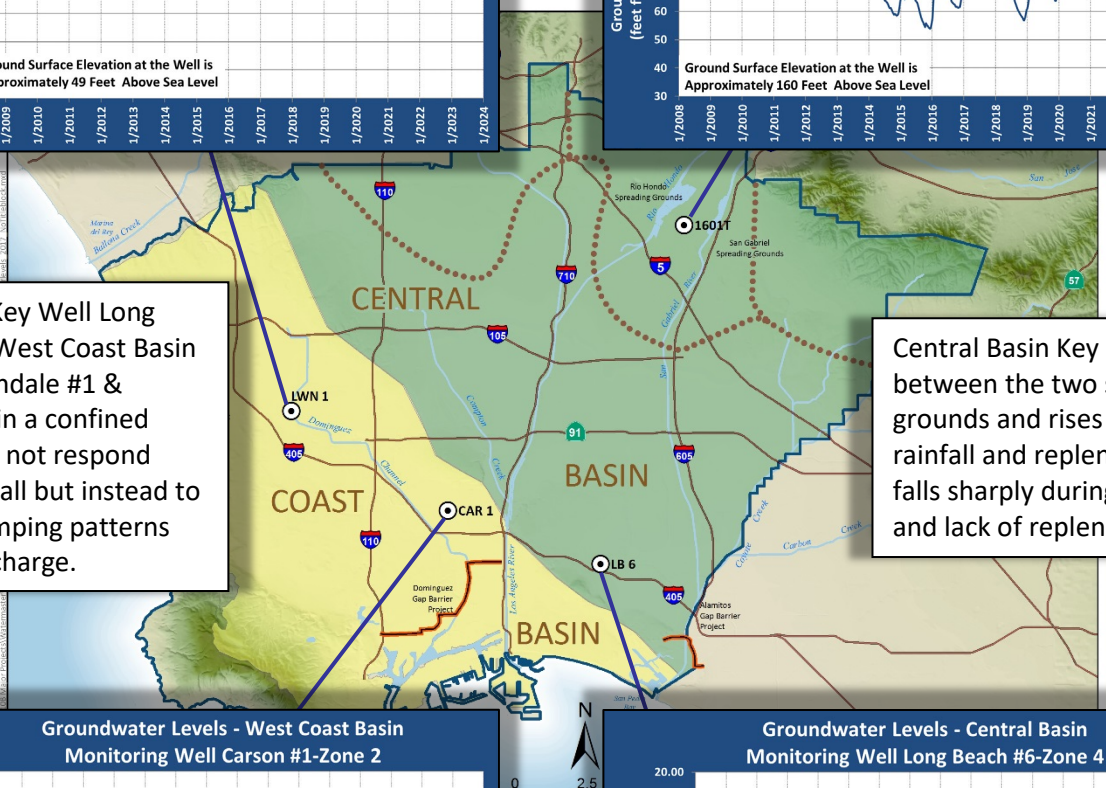
Groundwater Levels (through December 1, 2022)

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

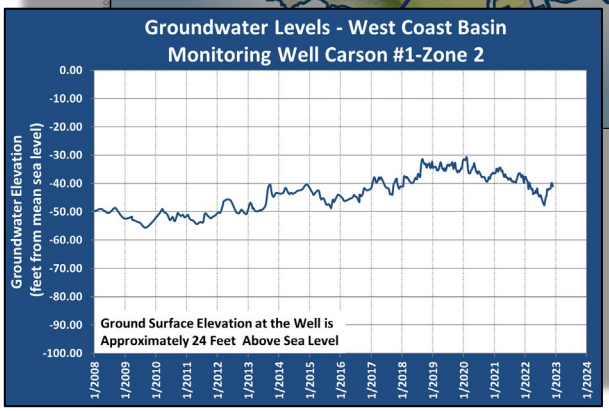


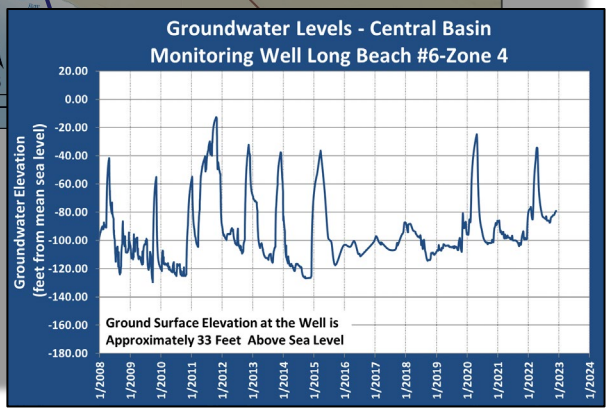


Central Basin Key Well Long Beach #6 and West Coast Basin Key Wells Lawndale #1 & Carson #1 are in a confined aquifer and do not respond readily to rainfall but instead to changes in pumping patterns and barrier recharge.



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 2.7 feet	**Increased 1.7 feet**
Central Basin Key Well Long Beach #6_4	Increased 3.0 feet	Increased 20.3 feet
West Coast Basin Key Well Lawndale #1_4	Decreased 1.2 feet	Decreased 3.4 feet
West Coast Basin Key Well Carson #1_2	Increased 0.7 foot	Decreased 4.0 feet

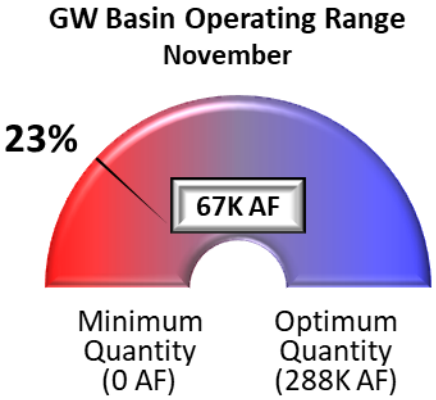
Bold indicates a change in direction (decreasing or increasing) since the last report.

Optimum and Minimum Groundwater Quantity (December 1, 2022)

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 December 1, 2022, has been estimated at 833,242 acre feet (subject to change), which is 66,758 acre feet above the Minimum Quantity and 221,242 acre feet below the Optimum Quantity. The Basin is at 23% of Optimum Quantity which is 3% higher than what was reported last month (~11,000 AF higher).

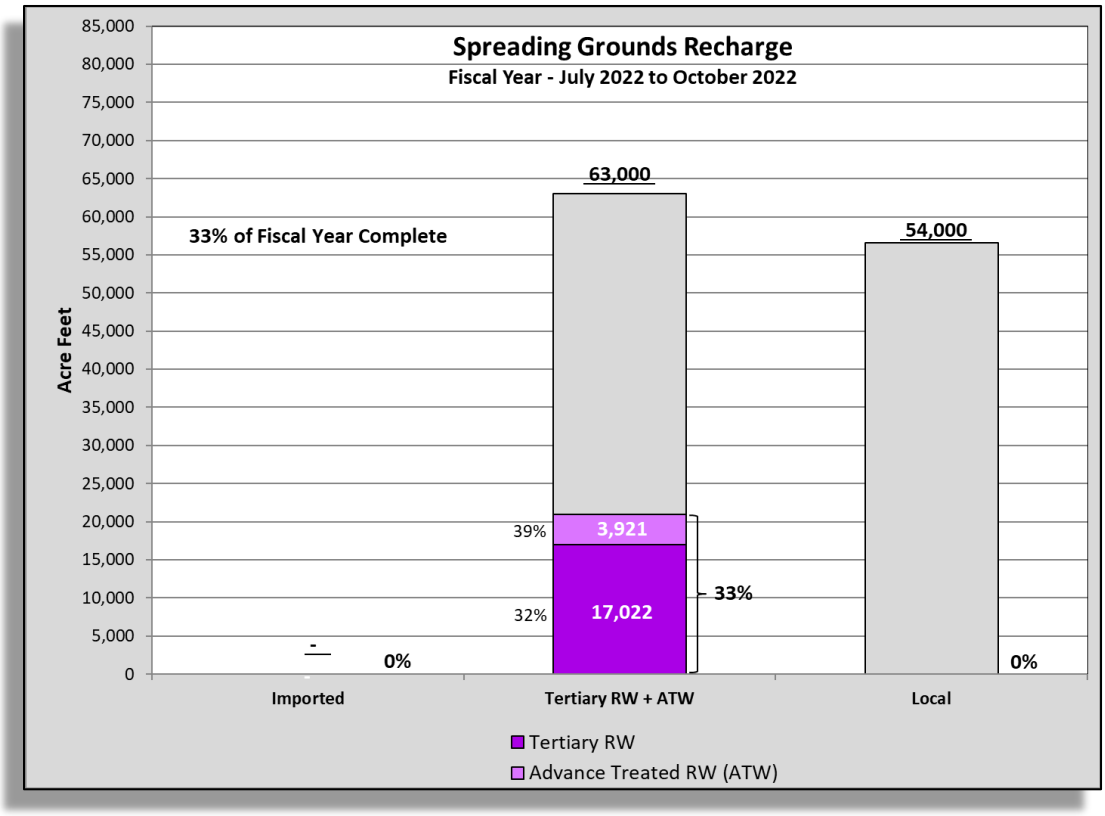


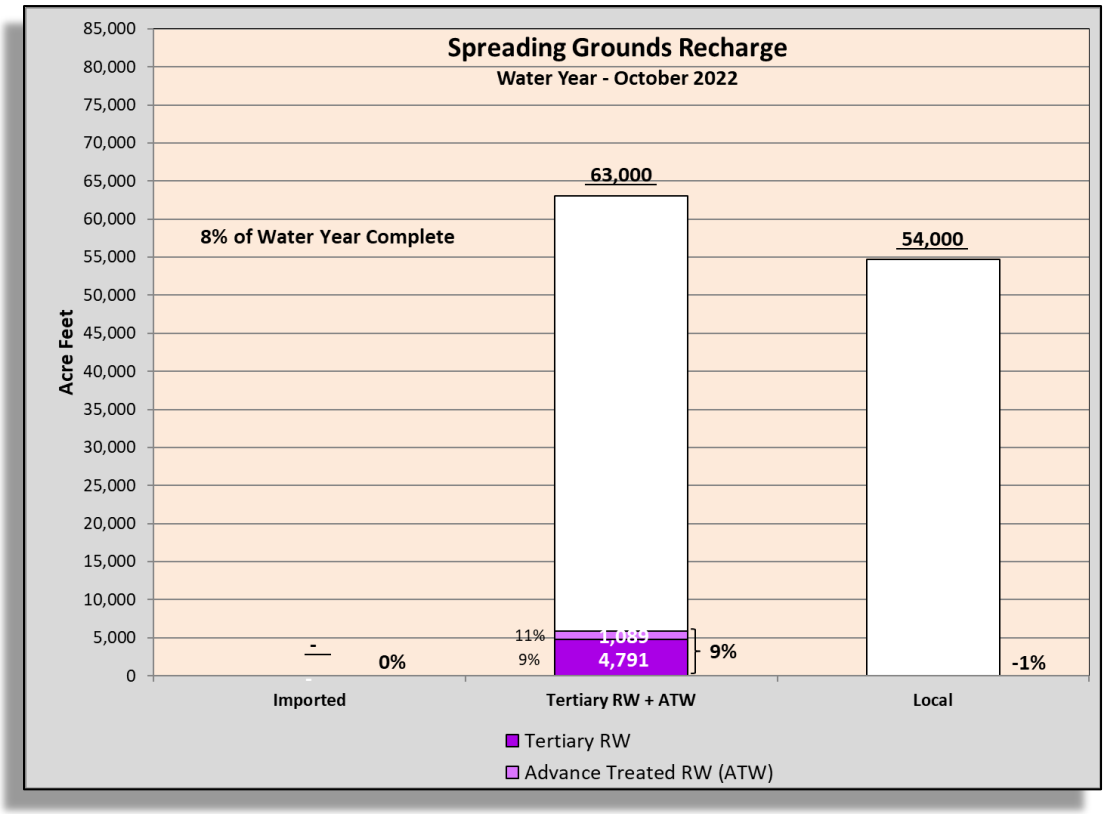
FACT:

The U.S. is the third largest irrigator in the world, after China and India.

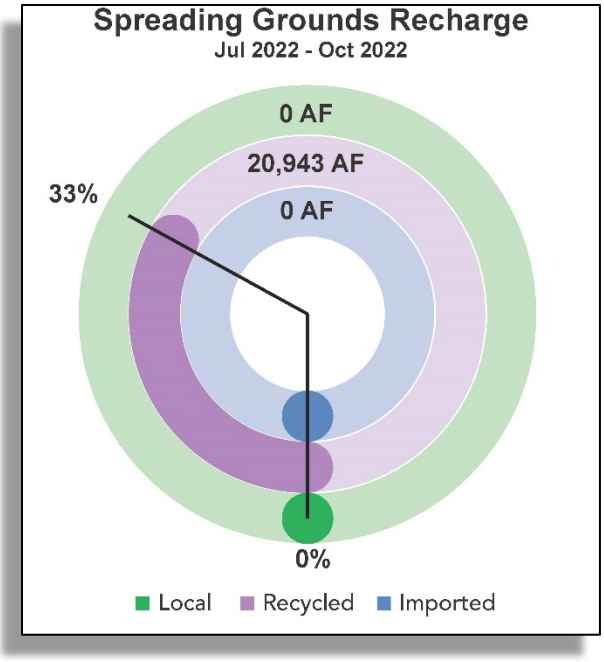
Montebello Forebay Spreading Grounds (July 2022 – October 2022)

The following Charts shows the preliminary spreading grounds replenishment water for the current Fiscal Year (2022-23; 4 months) and Water Year (2022-23; 1 month):



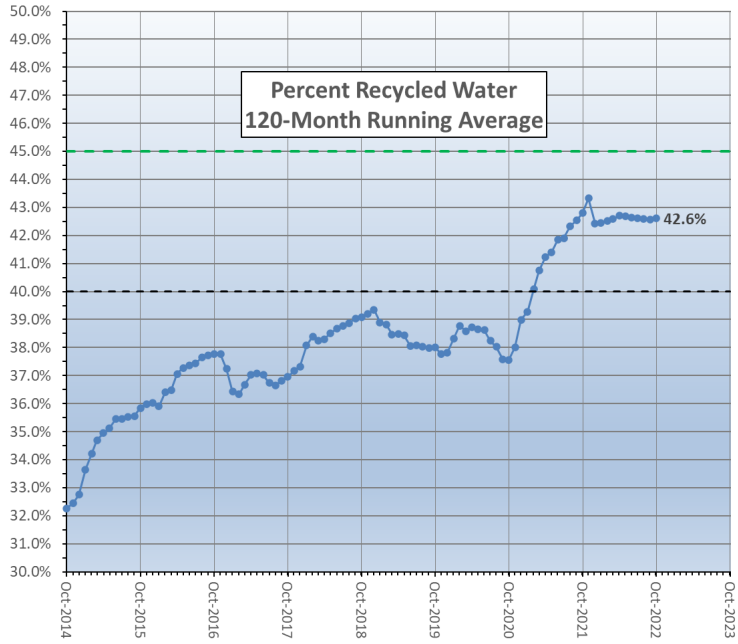


No imported water purchases are planned for Fiscal Year 2022-23.



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, no local water capture has been reported by the LACPW.

Preliminary numbers for the 2022-23 Fiscal Year show that approximately 20,943 acre feet of recycled water has been recharged with 3,921 acre feet consisting of advanced treat water from the ARC AWTF and 17,022 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 42.6% 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. Implementation of the plan will commence upon acceptance by the RWQCB.



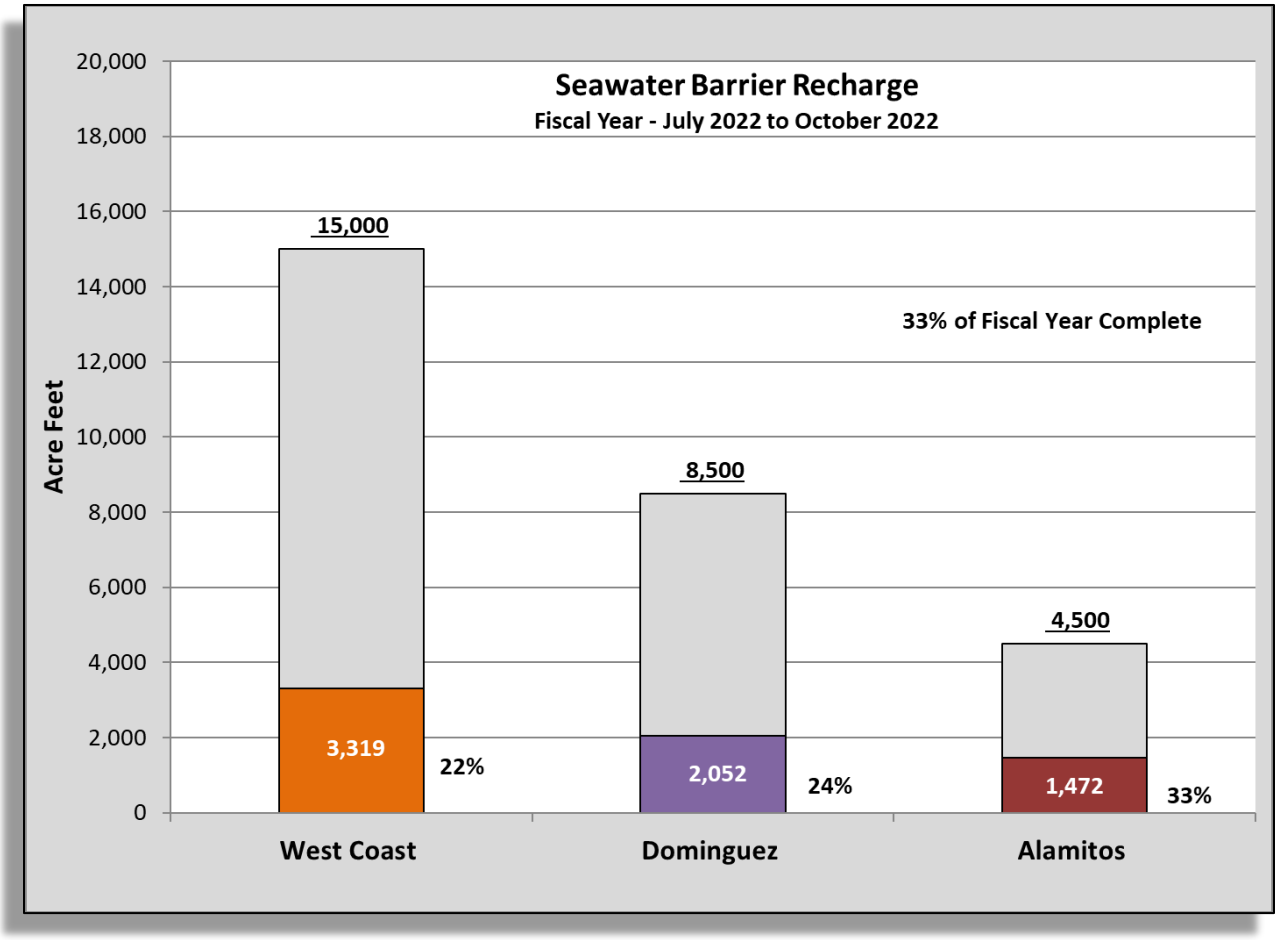
<u>Tertiary Recycle Water Permit Update</u>

The permit is progressing with LACSD and WRD staff working with both LARWQCB and CA-DDW regulators to respond the questions and update pertinent sections of the new Title 22 Engineering Report. LACSD continues to work on two major studies needed for the new Title 22 Engineering Report – Biodegradable Dissolve Organic Carbon (BDOC) Study and Virus Logarithmic Reduction Value (LRV) Study.

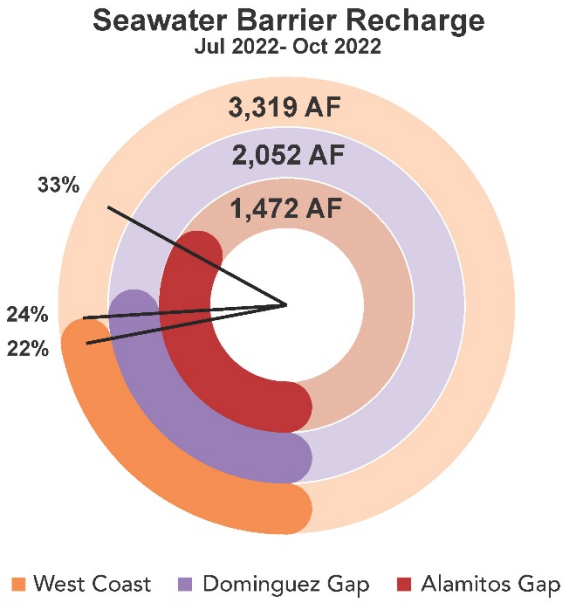
Due to the continued mega drought and recent emergency drought proclamation by Governor Newsom, LACSD and WRD submitted a request to modify the recycled water contribution percentage to 50% and the advanced treated water classification to diluent in a letter to the LARWQCB and CA-DDW dated July 8, 2022.

Seawater Barrier Well Injection and Replenishment (July 2022 – October 2022)

The following Chart shows the barrier water injection:

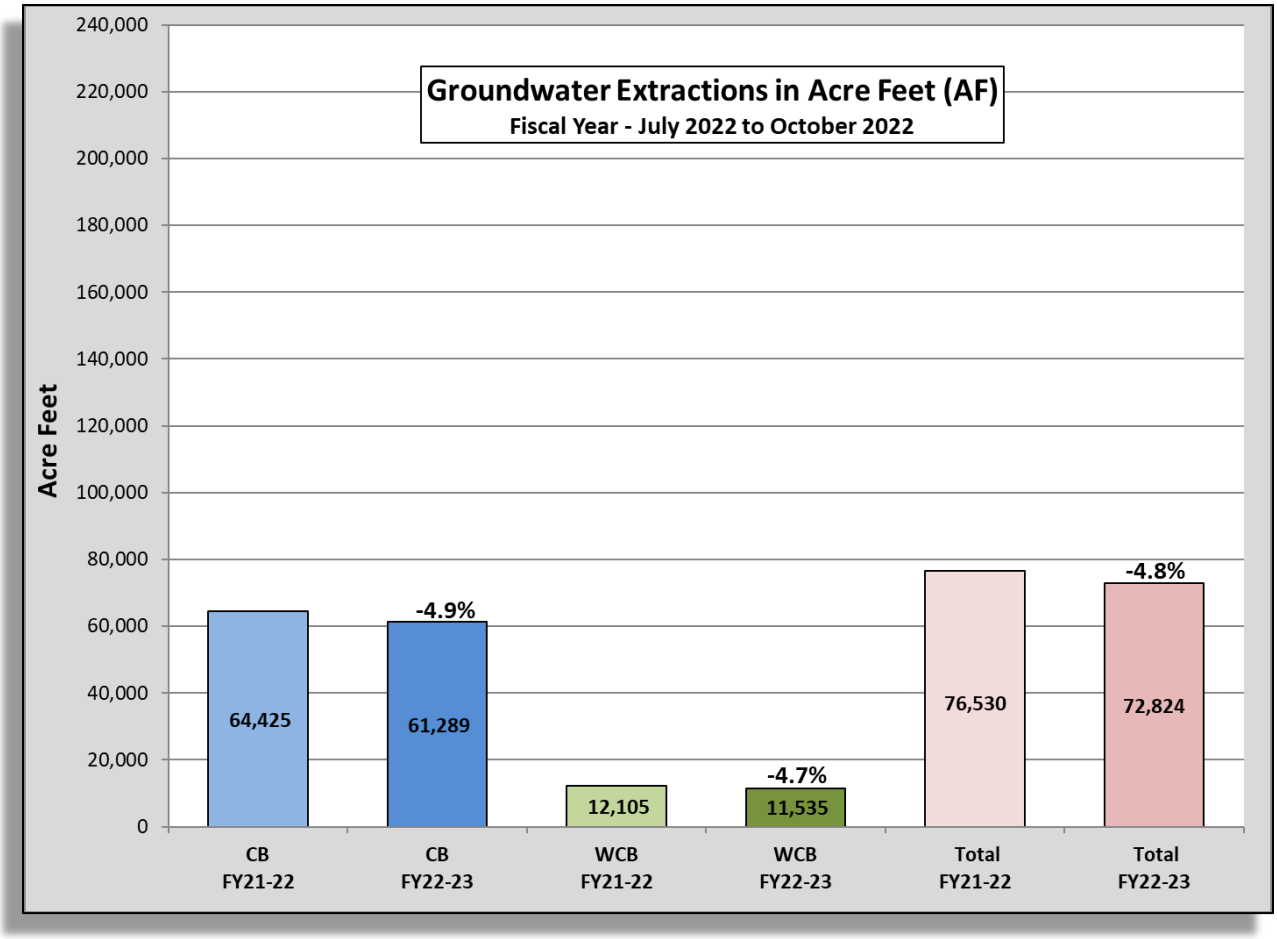


Preliminary numbers for the 2022-23 Fiscal Year show that the West Coast Barrier has used 3,319 acre feet of the total 15,000 acre feet planned for injection, 22% of total for the Fiscal Year. The Dominguez Gap Barrier used 2,052 acre feet of the total 8,500 acre feet planned for injection, 24% of the total for the Fiscal Year. The Alamitos Barrier, on the WRD side, used 1,472 acre feet of the total 4,500 acre feet planned for injection, 33% of the total for the Fiscal Year.



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

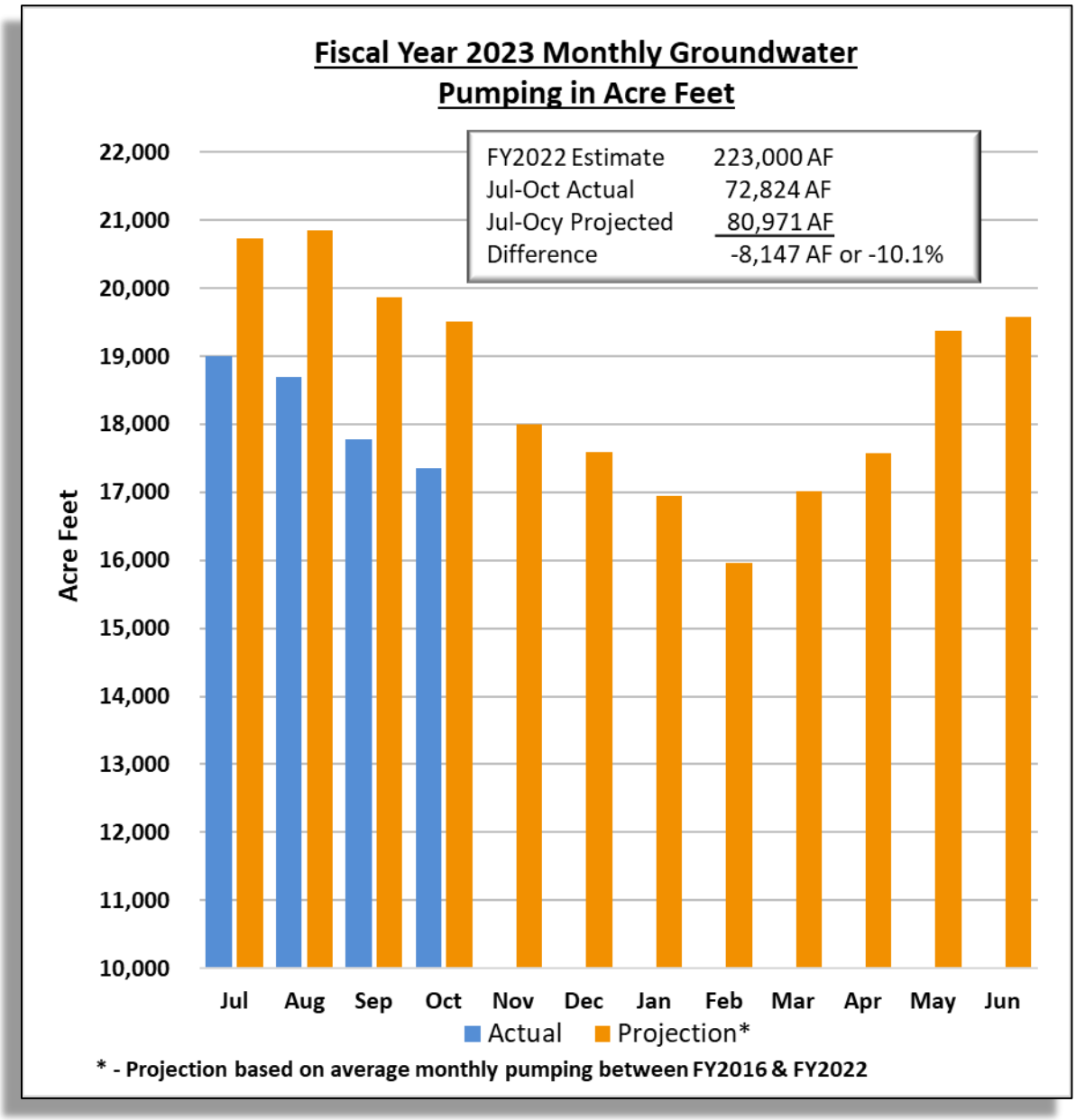
Preliminary numbers for groundwater production in the District for the Fiscal Year 2022-23 (July-October) indicate total pumping in the Central Basin was down 3,136 acre feet from the same time of the previous fiscal year (-4.9%) and the West Coast Basin total pumping was 570 acre feet lower than the previous fiscal year (-4.7%). The total pumping is 72,824 acre feet compared to 76,530 acre feet during the same time the previous year for a decrease of 3,706 acre feet, or -4.8%. The current pumping data do not include three (3) Central Basin pumpers and four (4) West Coast Basin pumpers who have not yet reported for an estimated 10 additional acre feet.



Interesting…

The average total home water use for each person in the U.S. is about 50 gallons a day.

Preliminary numbers indicate 72,824 acre feet have been pumped this fiscal year and is 10.1% below the projected goal of 80,971 acre feet (or -8,147 acre feet). Monthly actual production versus the 7-year average monthly production projections (FY 2016 through 2022) are included in the chart below.



"Anyone who can solve the problems of water will be worthy of two Nobel prizes - one for peace and one for science."- *John F. Kennedy*

For the Fiscal Year 2022-23 (July 2022 - October 2022), 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-Oct 2021	Jul 2022-Oct 2022	Difference	% Change
Los Angeles, City - CB	895.55	2,307.78	1412.23	61.19
Cal. Water Service Co. (East LA)	3,198.86	3,467.47	268.61	7.75
Signal Hill, City	259.84	345.41	85.57	24.77
American Text. M.	0.00	17.59	17.59	100.00
Virginia Country Club	178.27	191.57	13.30	6.94
Bottom 5 Producing by Volume (AF)	Jul 2021-Oct 2021	Jul 2022-Oct 2022	Difference	% Change
Long Beach, City - CB	10,949.86	10,108.01	-841.85	-8.33
Whittier, City	2,159.36	1,795.86	-363.50	-20.24
Lynwood, City	1,878.01	1,555.45	-322.56	-20.74
Cerritos, City	2,941.47	2,652.51	-288.96	-10.89
Santa Fe Springs, City	825.95	545.64	-280.31	-51.37

Production Trends – West Coast Basin				
Top 5 Producing by Volume (AF)	Jul 2021-Oct 2021	Jul 2022-Oct 2022	Difference	% Change
Tesoro Refining	3,124.07	3,470.23	346.16	9.98
Cal. Water Service Co./Hawthorne Lease	14.02	226.79	212.77	93.82
Manhattan Beach, City	63.36	226.25	162.89	72.00
Cal. Water Service Co. Dominguez - WB	644.19	673.48	29.29	4.35
Torrance Refining & Marketing Co.	315.01	333.20	18.19	5.46
Bottom 5 Producing by Volume (AF)	Jul 2021-Oct 2021	Jul 2022-Oct 2022	Difference	% Change
Cal. Water Service Co. Alpha 7050	637.75	298.05	-339.70	-113.97
Phillips 66 Co. - Alpha 7093	2,112.05	1,808.13	-303.92	-16.81
Golden State Water Co. - WB	1,606.34	1,414.95	-191.39	-13.53
Inglewood, City	760.52	584.64	-175.88	-30.08
Eco Services Operations	122.71	102.54	-20.17	-19.67

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.