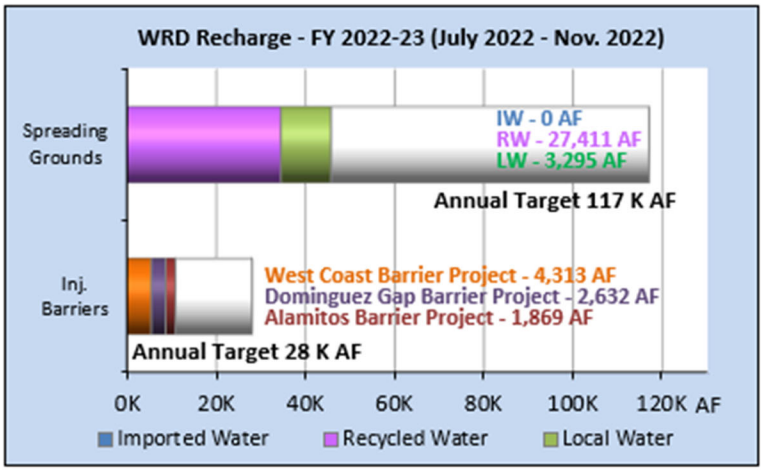
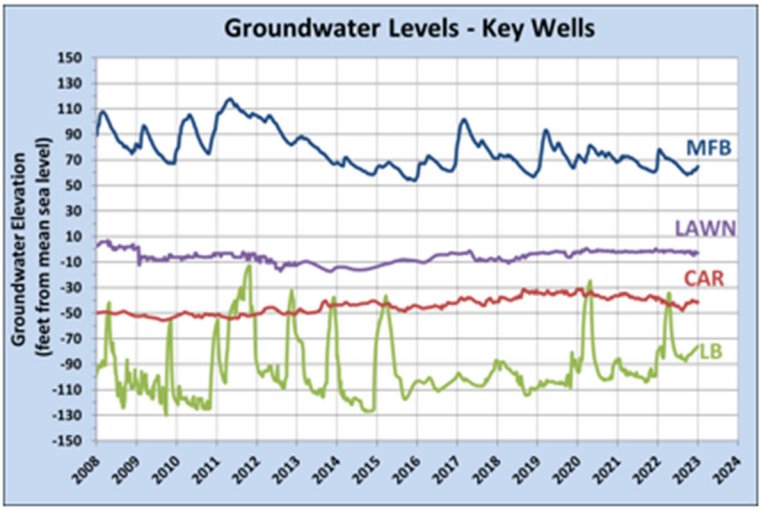
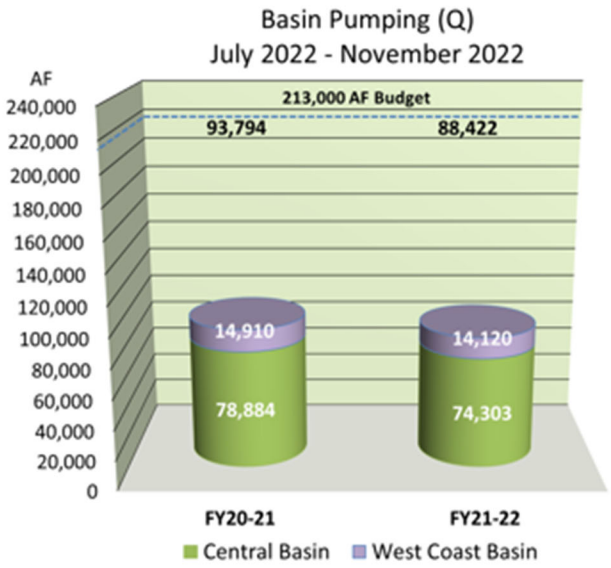
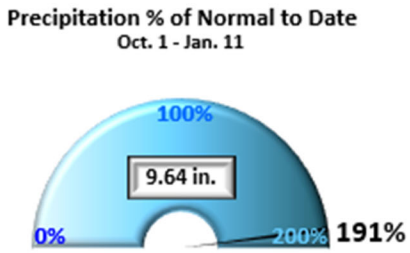
GROUNDWATER BASIN UPDATE
FOR JANUARY 2023

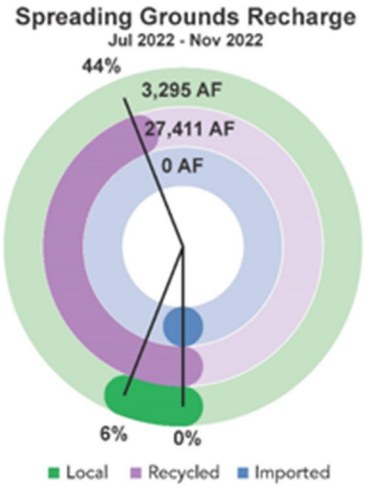
GROUNDWATER BASINS *AT A GLANCE**

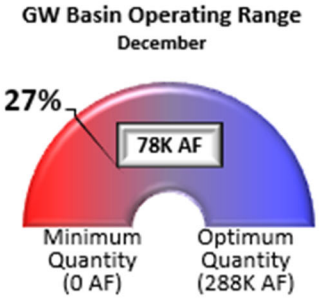


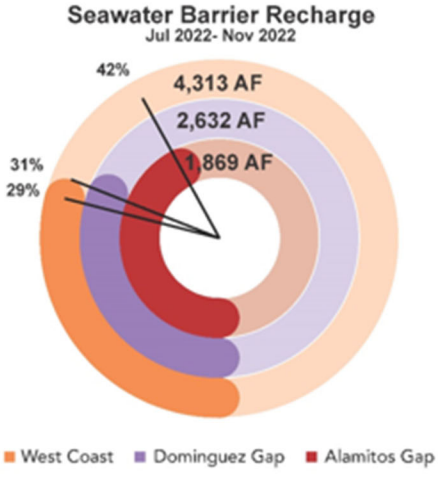












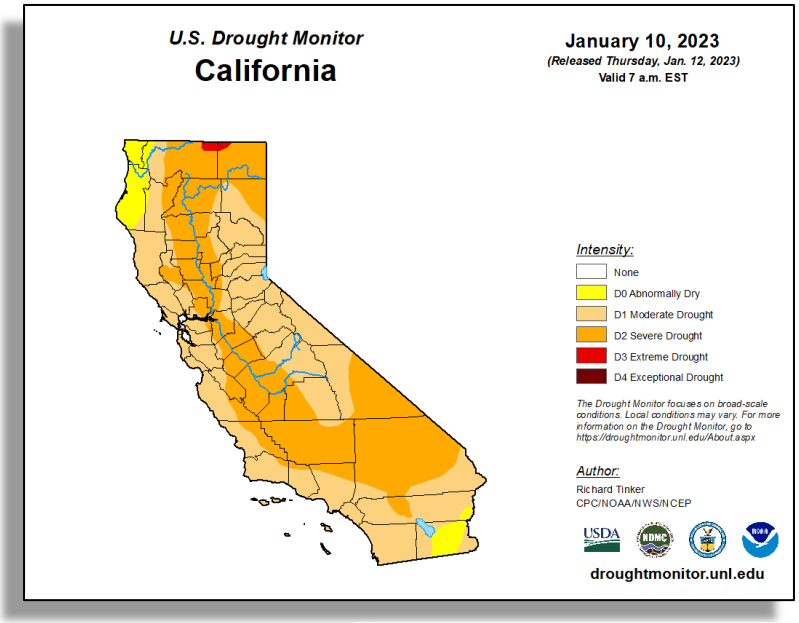
* - Preliminary numbers, subject to change.

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 – January 11, 2023)

The WRD precipitation index reports that for the 2022-23 Water Year, there has been above average rainfall (9.64 inches) through January 11, 2023. The normal rainfall for this time period is 5.05 inches, so the District is 191% of normal. As of January 10, 2023, the U.S. Drought Monitor is reporting 100% of the State is abnormally dry, 95% under moderate (-4%), 46% under severe (-39%), <1% under extreme (-40%), and 0% exceptional (-13%) drought conditions.



Snowpack (Snow Water Content [SWE] as of January 12, 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: 12-Jan-2023	
Number of Stations Reporting	33
Average snow water equivalent	24.4"
Percent of April 1 Average	86%
Percent of normal for this date	192%

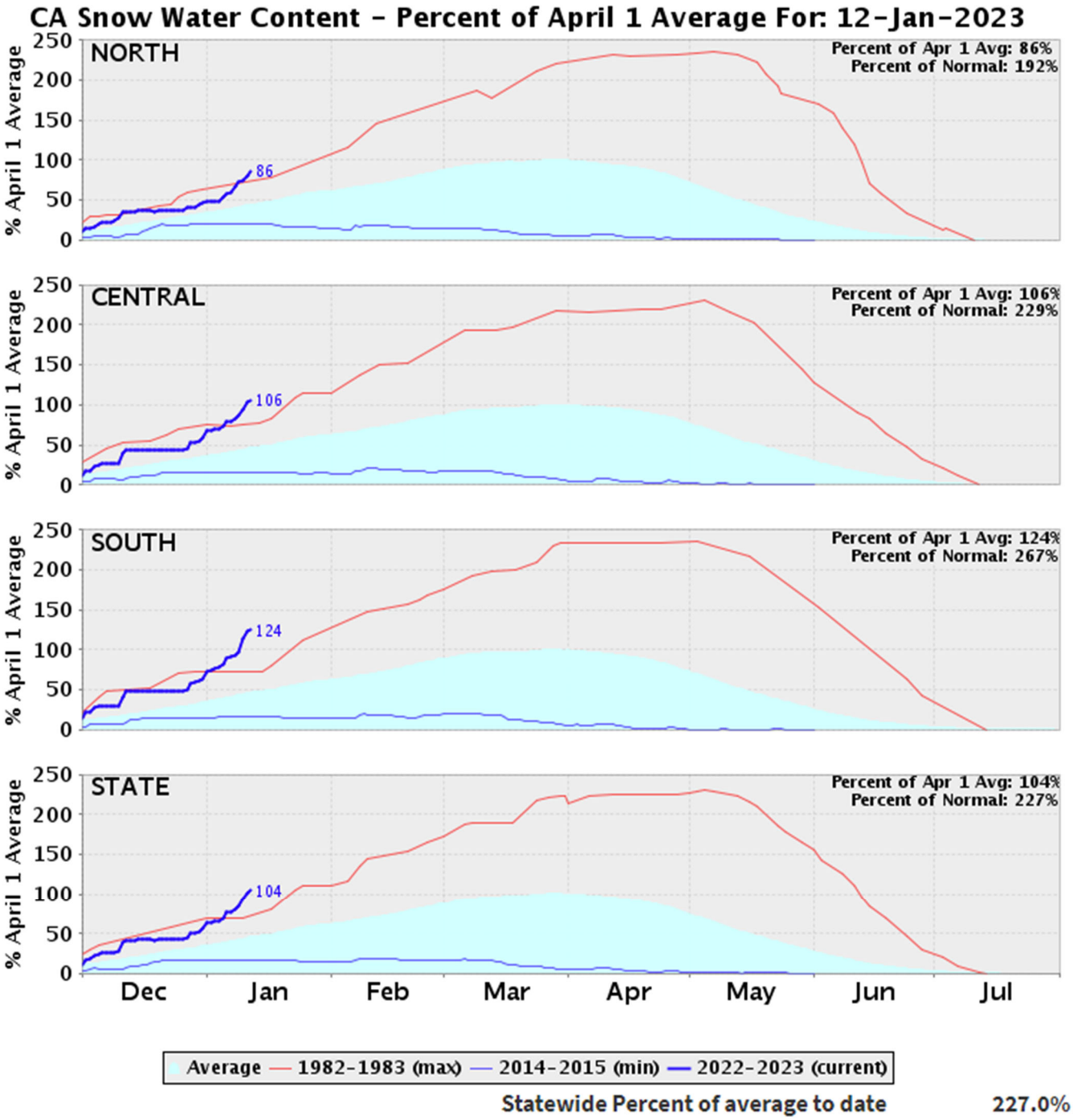
CENTRAL	
Data For: 12-Jan-2023	
Number of Stations Reporting	51
Average snow water equivalent	28.9"
Percent of April 1 Average	106%
Percent of normal for this date	229%

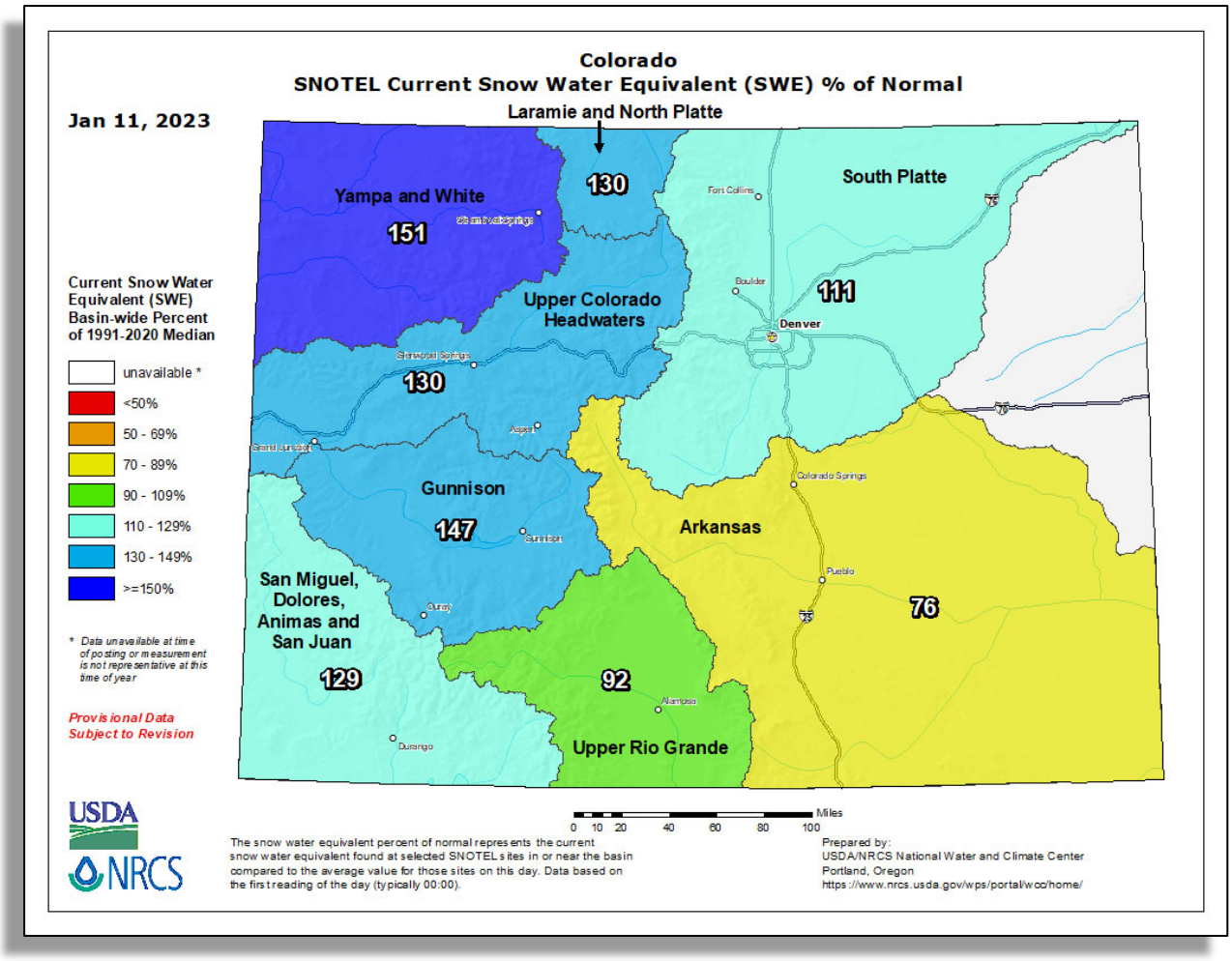
SOUTH	
Data For: 12-Jan-2023	
Number of Stations Reporting	32
Average snow water equivalent	28.0"
Percent of April 1 Average	124%
Percent of normal for this date	267%

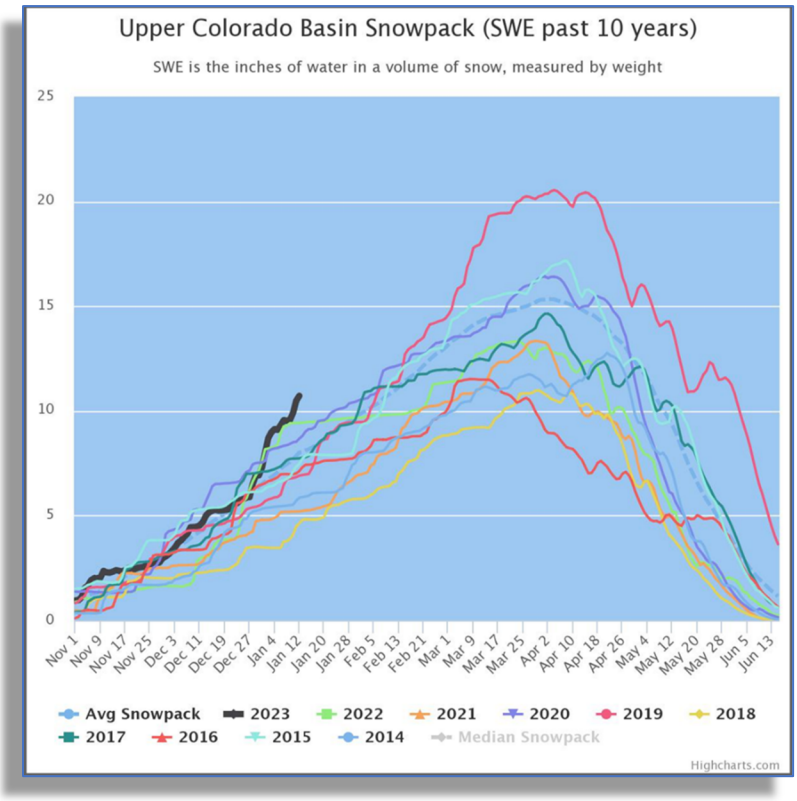
STATEWIDE SUMMARY	
Data For: 12-Jan-2023	
Number of Stations Reporting	116
Average snow water equivalent	27.4"
Percent of April 1 Average	104%
Percent of normal for this date	227%

Snow Water Equivalent (SWE):

Northern Sierra Nevada – 24.4 in., 86% of April 1st average and 192% of normal to date
Central Sierra Nevada – 28.9 in., 106% of April 1st average and 229% of normal to date
Southern Sierra Nevada – 28.0 in., 124% of April 1st average and 267% of normal to date
Statewide Summary *– 27.4 in., 104% of April 1st average and 227% of normal to date*

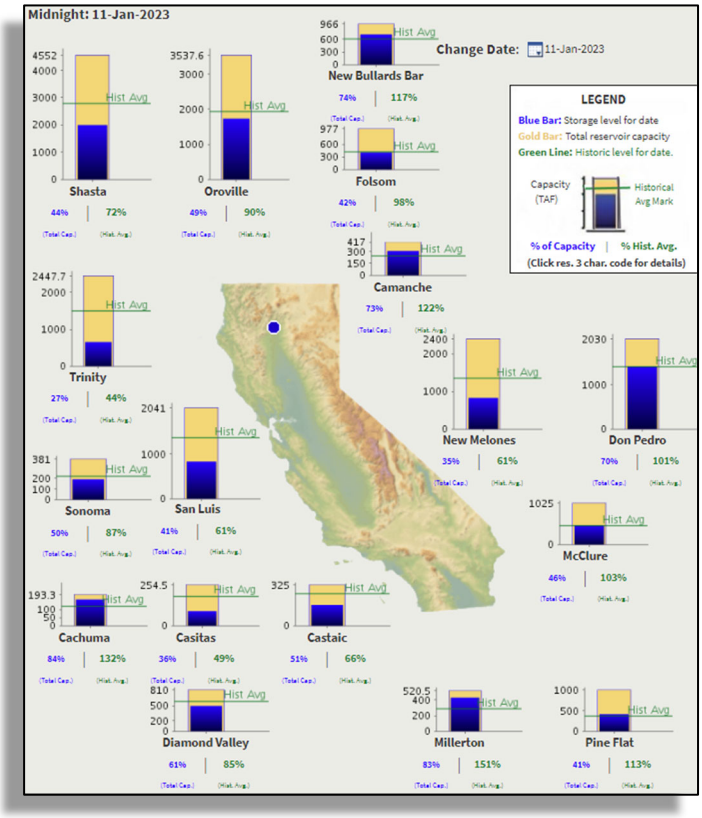



Colorado
SNOTEL Current Snow Water Equivalent (SWE) % of Normal
Jan 11, 2023
Laramie and North Platte
130
Yampa and White
151
South Platte
111
Upper Colorado Headwaters
130
Gunnison
147
Arkansas
76
San Miguel, Dolores, Animas and San Juan
129
92
Upper Rio Grande
Current Snow Water Equivalent (SWE) Basin-wide 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 10 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
2016
2015
2014
Median Snowpack
Highcharts.com

Reservoirs (as of January 11, 2023)

For the 21 reservoirs reported monthly to the committee, water levels have increased in 19 of 21 reservoirs. The largest increase occurred at Lake Oroville (0.71 million acre feet, MAF). The smallest increase occurred at Lakes Perris and Silverwood (<0.01 MAF). The largest decrease (-0.14 MAF) occurred at Lake Powell. The smallest decrease (<0.0 MAF) occurred at Diamond Valley Lake.



MWD Reservoirs (SWP)
Storage in Million Acre Feet

Reservoir	Capacity	Storage	% Full	Change
Trinity Lake (CLE)	2.45	0.65	27%	0.13
Lake Shasta (SHA)	4.55	2.00	44%	0.56
Lake Oroville (ORO)	3.54	1.73	49%	0.71
New Bullards Bar (BUL)	0.97	0.72	74%	0.14
Folsom Lake (FOL)	0.98	0.41	42%	0.13
Camanche Lake (CMN)	0.42	0.31	73%	0.08
New Melones L. (NML)	2.40	0.83	35%	0.22
Don Pedro Res (DNP)	2.03	1.41	70%	0.36
Lake McClure (EXC)	1.02	0.47	46%	0.27
Lake Sonoma (WRS)	0.38	0.19	50%	0.09
San Luis Res (SNL)	2.04	0.83	41%	0.30
Millerton Lake (MIL)	0.52	0.43	83%	0.12
Pine Flat Res. (PNF)	1.00	0.40	40%	0.20
Cachuma Lake (CCH)	0.19	0.14	71%	0.07
Castaic Lake (CAS)	0.33	0.17	51%	0.05
Casitas Lake (CSI)	0.25	0.09	37%	0.02
Perris Lake (PRR)	0.13	0.09	70%	0.00
L. Silverwood (SLW)	0.08	0.07	88%	0.00

MWD Reservoirs (CRA)
Storage in Million Acre Feet

Reservoir	Capacity	Storage	% Full	Change
Lake Powell	24.32	5.52	23%	-0.14
Lake Mead	26.12	7.33	28%	0.11
Diamond Valley L (DVL)	0.81	0.49	61%	0.00

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

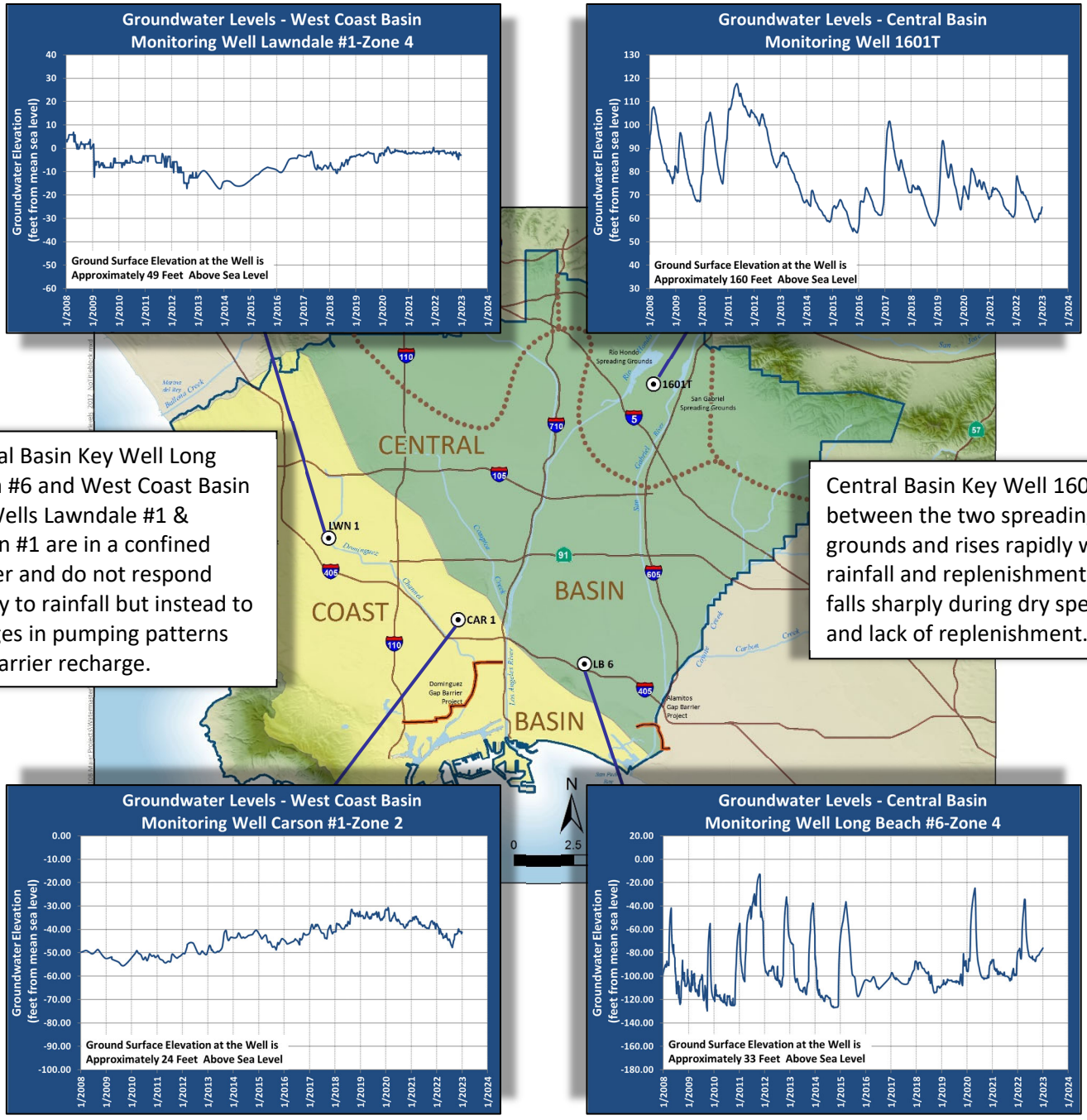
These 21 reservoirs are at 33% capacity (24.28 MAF) which is up 3.44 MAF from the prior month (+3.46 MAF State Water Project [SWP] and -0.02 MAF Colorado River Aqueduct [CRA]).

Did you know?

Water is composed of two elements, Hydrogen and Oxygen. 2 Hydrogen + 1 Oxygen = H_2O.

Groundwater Levels (through January 5, 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 2.6 feet	**Decreased 8.8 feet**
Central Basin Key Well Long Beach #6_4	Increased 3.1 feet	Increased 3.3 feet
West Coast Basin Key Well Lawndale #1_4	**Increased 1.9 feet**	Decreased 1.4 feet
West Coast Basin Key Well Carson #1_2	**Decreased 0.2 foot**	Decreased 3.6 feet

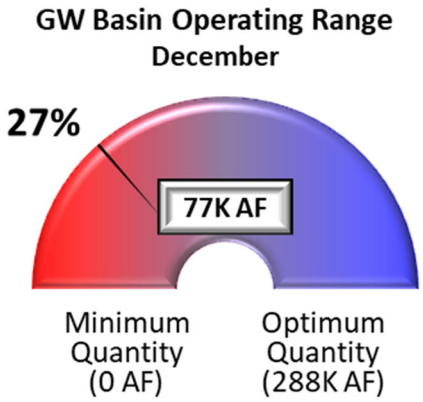
Bold indicates a change in direction (decreasing or increasing) since the last report.

Optimum and Minimum Groundwater Quantity (January 5, 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 January 5, 2023, has been estimated at 823,142 acre feet (subject to change), which is 76,858 acre feet above the Minimum Quantity and 211,142 acre feet below the Optimum Quantity. The Basin is at 27% of Optimum Quantity which is 4% higher than what was reported last month (~10,000 AF higher).

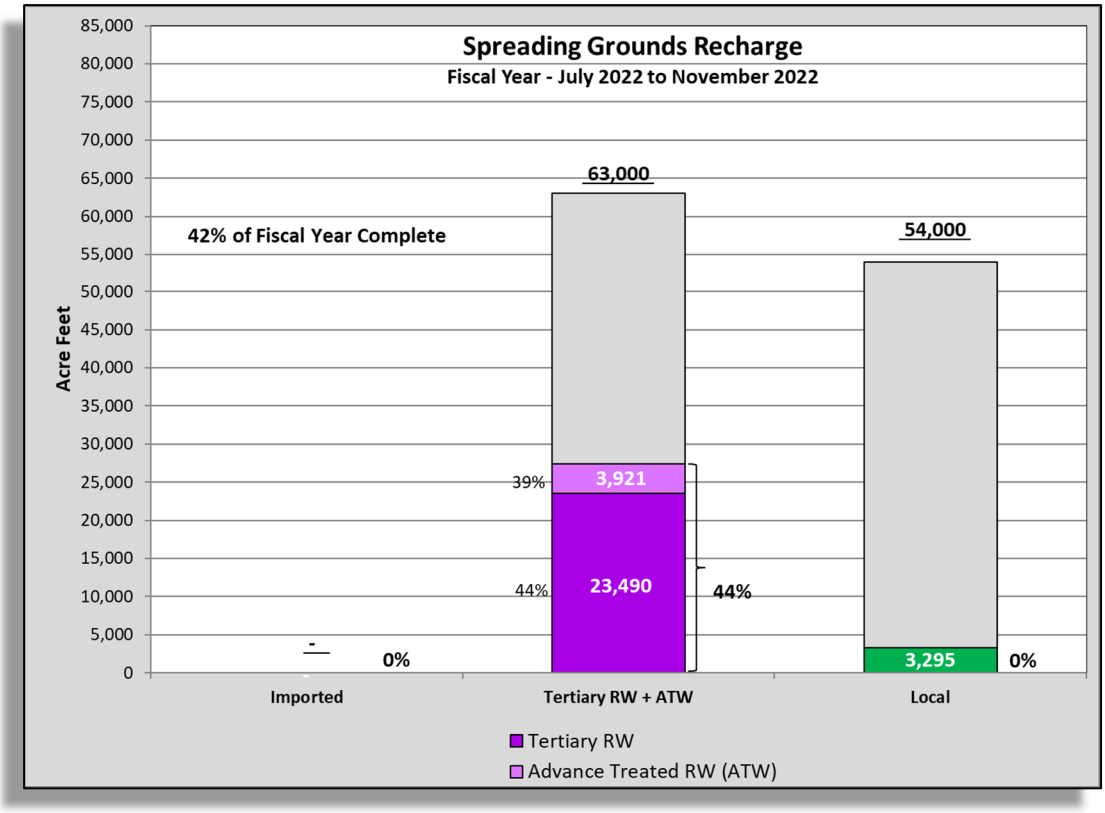


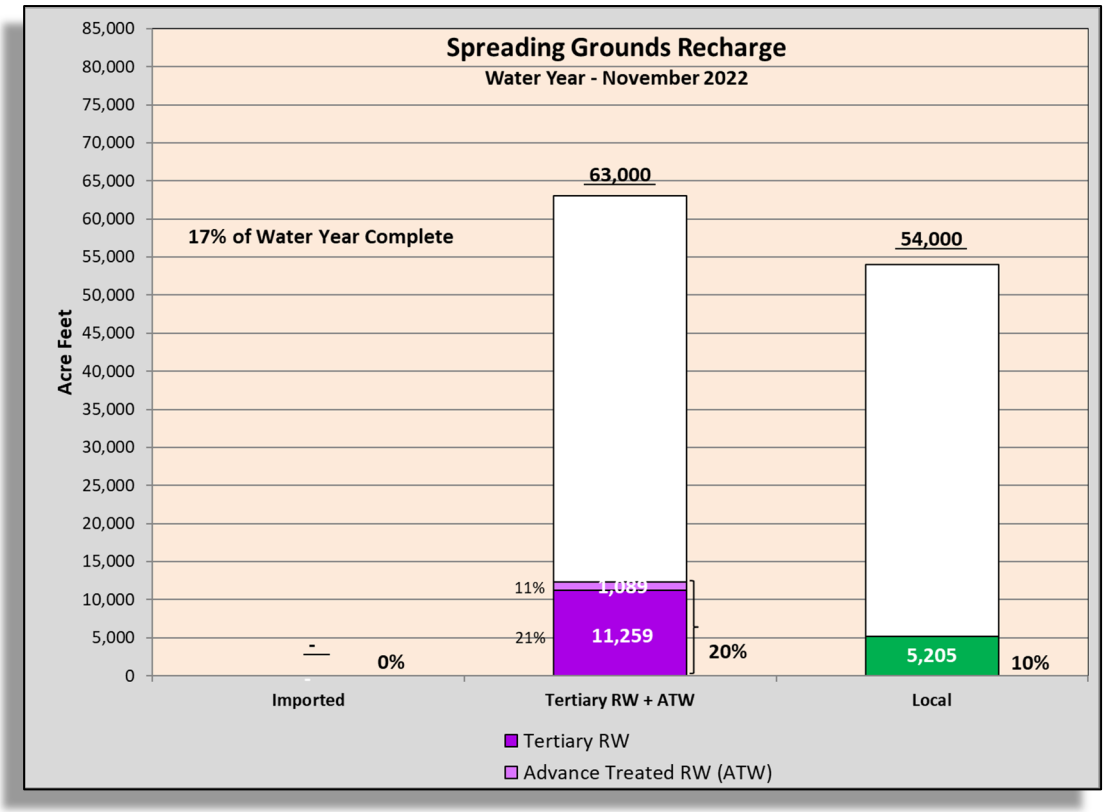
FACT:

Water regulates the Earth's temperature. It also regulates the temperature of the human body, carries nutrients and oxygen to cells, cushions joints, protects organs and tissues, and removes wastes.

Montebello Forebay Spreading Grounds (July 2022 – November 2022)

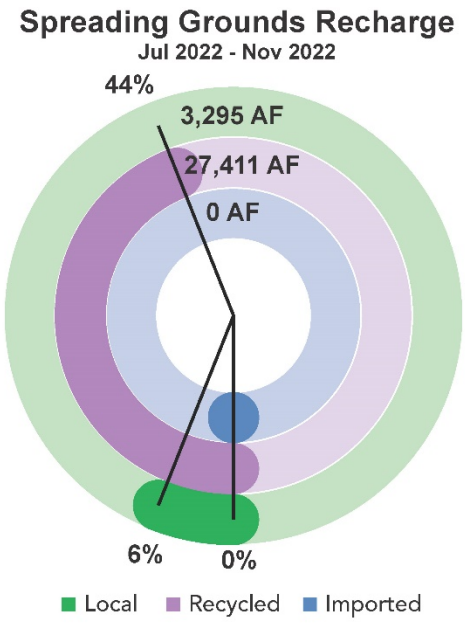
The following Charts shows the preliminary spreading grounds replenishment water for the current Fiscal Year (2022-23; 5 months) and Water Year (2022-23; 2 month):



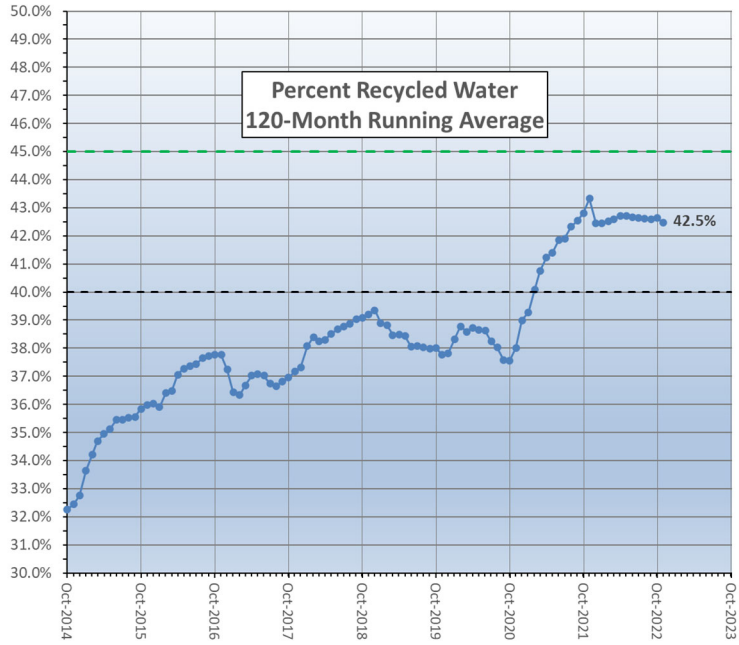


No imported water purchases are planned for Fiscal Year 2022-23.

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, 3,295 acre feet of local water capture has been reported by the LACPW.



Preliminary numbers for the 2022-23 Fiscal Year show that approximately 27,411 acre feet of recycled water has been recharged with 3,921 acre feet consisting of advanced treat water from the ARC AWTF and 23,490 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 42.5% 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.



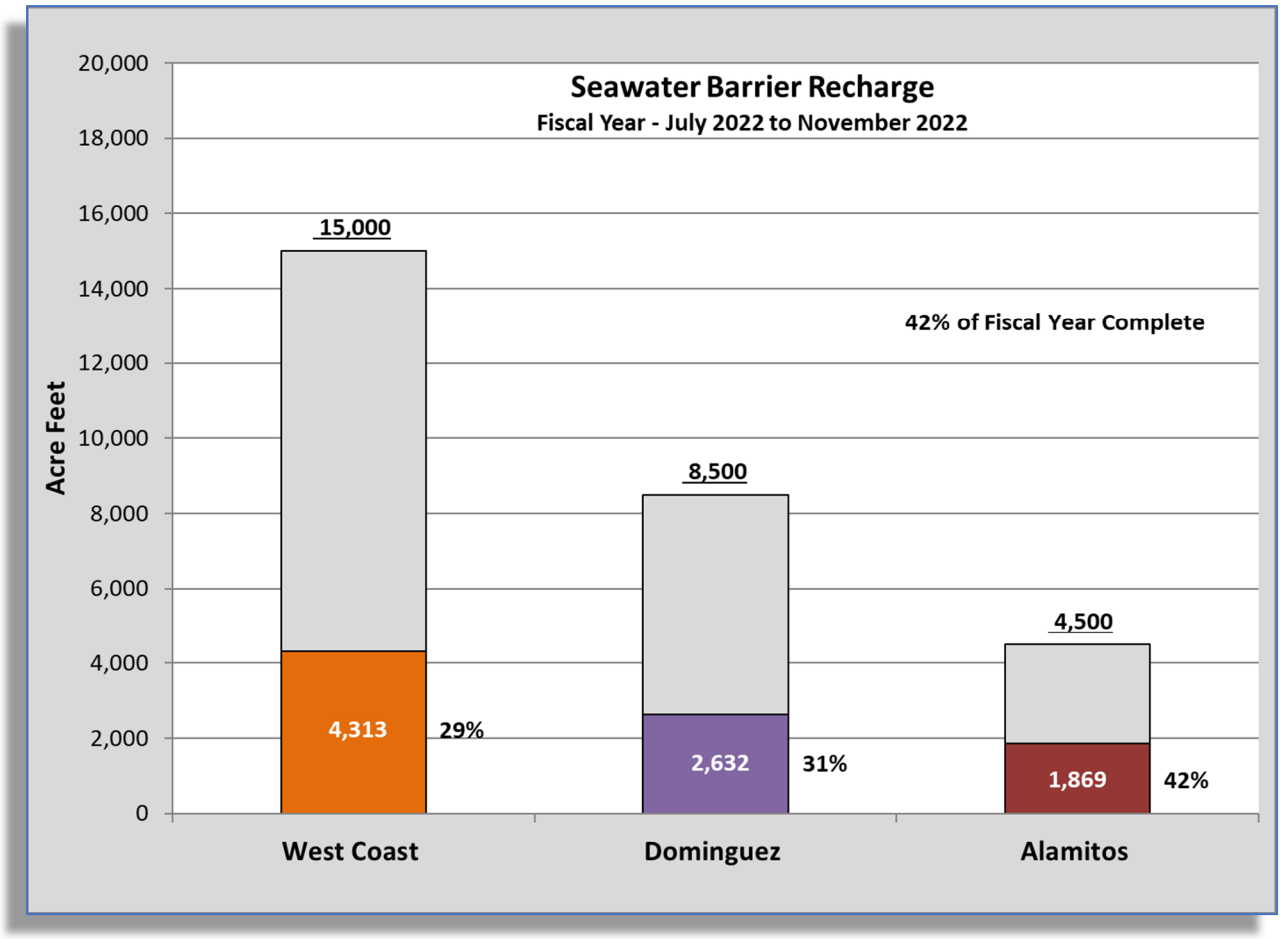
<u>Tertiary Recycle Water Permit Update</u>

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.

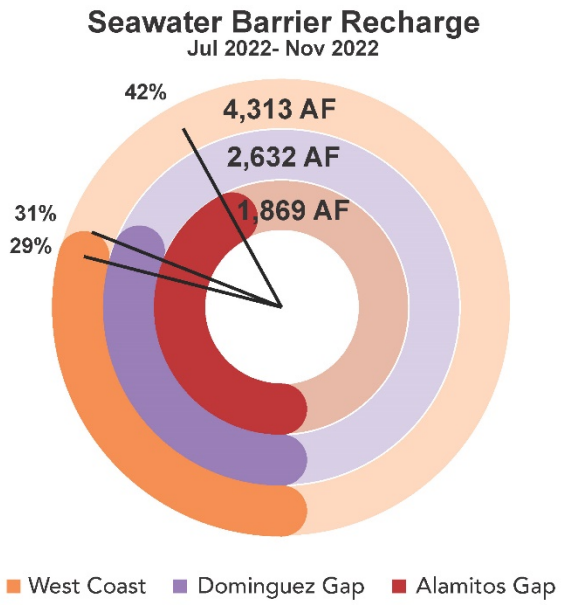
Due to the continued mega drought and recent emergency drought proclamation by Governor Newsom, LACSD and WRD submitted a request to modify the recycled water contribution percentage to 50% and the advanced treated water classification to diluent in a letter to the LARWQCB and CA-DDW dated July 8, 2022.

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

The following Chart shows the barrier water injection:

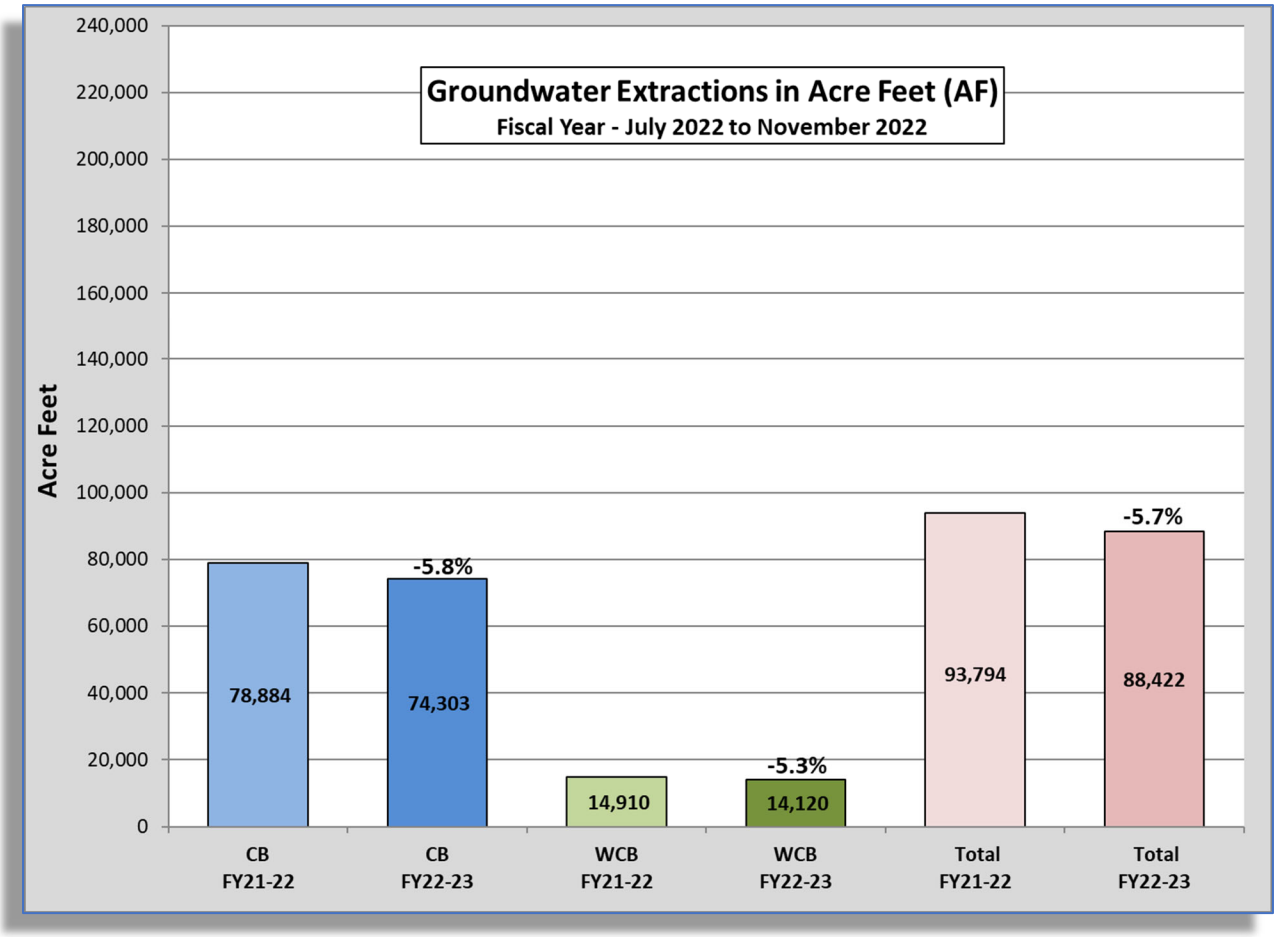


Preliminary numbers for the 2022-23 Fiscal Year show that the West Coast Barrier has used 4,313 acre feet of the total 15,000 acre feet planned for injection, 29% of total for the Fiscal Year. The Dominguez Gap Barrier used 2,632 acre feet of the total 8,500 acre feet planned for injection, 31% of the total for the Fiscal Year. The Alamitos Barrier, on the WRD side, used 1,869 acre feet of the total 4,500 acre feet planned for injection, 42% of the total for the Fiscal Year.



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

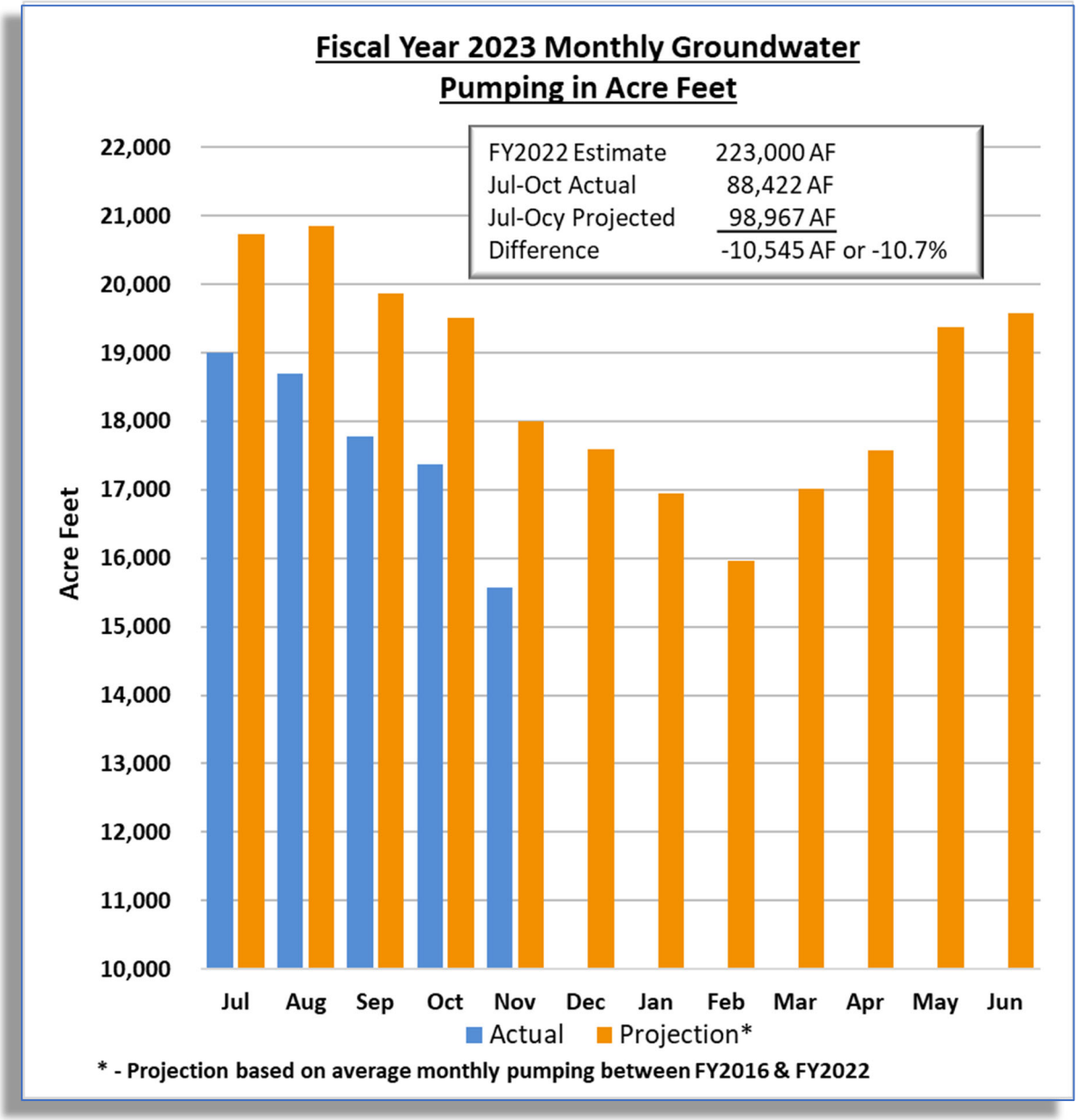
Preliminary numbers for groundwater production in the District for the Fiscal Year 2022-23 (July-November) indicate total pumping in the Central Basin was down 4,582 acre feet from the same time of the previous fiscal year (-5.8%) and the West Coast Basin total pumping was 790 acre feet lower than the previous fiscal year (-5.3%). The total pumping is 88,422 acre feet compared to 93,794 acre feet during the same time the previous year for a decrease of 5,372 acre feet, or -5.7%. The current pumping data do not include seven (7) Central Basin pumpers and three (3) West Coast Basin pumpers who have not yet reported for an estimated 110 additional acre feet.



Interesting…

Water expands by 9% when it freezes. Frozen water (ice) is lighter than water, which is why ice floats in water.

Preliminary numbers indicate 88,422 acre feet have been pumped this fiscal year and is 10.7% below the projected goal of 98,967 acre feet (or -10,545 acre feet). Monthly actual production versus the 7-year average monthly production projections (FY 2016 through 2022) are included in the chart below.



"The cure for anything is salt water: sweat, tears, or the sea." - *Isak Dinesen*

For the Fiscal Year 2022-23 (July 2022 - November 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-Nov 2021	Jul 2022-Nov 2022	Difference	% Change
Los Angeles, City - CB	1,367.45	2,610.66	1243.21	47.62
Cal. Water Service Co. (East LA)	4,069.38	4,373.80	304.42	6.96
South Gate, City	3,584.92	3,670.39	85.47	2.33
Signal Hill, City	333.23	369.58	36.35	9.84
Virginia Country Club	197.09	209.97	12.88	6.13
Bottom 5 Producing by Volume (AF)	Jul 2021-Nov 2021	Jul 2022-Nov 2022	Difference	% Change
Long Beach, City - CB	13,561.90	12,500.83	-1061.07	-8.49
Whittier, City	2,538.70	2,105.84	-432.86	-20.56
Santa Fe Springs, City	1,019.24	599.68	-419.56	-69.96
Cerritos, City	3,574.71	3,220.81	-353.90	-10.99
Lynwood, City	2,253.11	1,922.50	-330.61	-17.20

Production Trends – West Coast Basin				
Top 5 Producing by Volume (AF)	Jul 2021-Nov 2021	Jul 2022-Nov 2022	Difference	% Change
Tesoro Refining	3,820.40	4,367.11	546.71	12.52
Cal. Water Service Co./Hawthorne Lease	14.61	233.11	218.50	93.73
Manhattan Beach, City	76.49	227.52	151.03	66.38
Hillside Memorial Park	54.34	70.66	16.32	23.10
L.A. County Depart. of Parks & Rec - WB	174.47	184.07	9.60	5.22
Bottom 5 Producing by Volume (AF)	Jul 2021-Nov 2021	Jul 2022-Nov 2022	Difference	% Change
Phillips 66 Co. - Alpha 7093	2,625.81	2,186.14	-439.67	-20.11
Cal. Water Service Co. Alpha 7050	720.55	303.27	-417.28	-137.59
Inglewood, City	932.49	753.97	-178.52	-23.68
Cal. Water Service Co. Dominguez - WB	822.67	741.84	-80.83	-10.90
Golden State Water Co. - WB	1,992.85	1,936.85	-56.00	-2.89

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.