COLORADO WATER SUPPLY CONDITIONS UPDATE

FROM THE OFFICE OF THE STATE ENGINEER: COLORADO DIVISION OF WATER RESOURCES ROOM 818, 1313 SHERMAN ST., DENVER, CO 80203 303-866-3581; <u>www.water.state.co.us</u>

November 1, 2017

The Surface Water Supply Index (SWSI) is used as an indicator of water supply conditions in the seven major river basins of the state and in each of the 41 smaller watersheds, or HUCs. The Colorado Water Conservation Board (CWCB) completed a major revision to the Colorado Drought Plan in 2010. At that time, Colorado adopted a revised SWSI analysis based on the components shown below, which vary depending on the time of year. The revised SWSI is based on a ranking of total volume in a HUC or major river basin ranked against similar volumes in historical years. For instance, in January, the total volume in a HUC is based on the forecasted runoff at specific locations plus the volume in storage in specific reservoirs, all within the HUC. That total volume is ranked against similar total volumes that occurred each January between 1970 and 2010.

Time Period	SWSI Components
January 1 - June 1	Forecasted Runoff + Reservoir Storage
July 1 - September 1	Previous Month's Streamflow + Reservoir Storage
October 1 - December 1	Reservoir Storage

In 2015, CWCB and the Division of Water Resources (DWR) (both Divisions of the Colorado Department of Natural Resources) completed a software project to implement an automated calculation of the SWSI and to document the underlying hydrologic data. July 1, 2015 was the first month that the automated DNR SWSI was published. The results of each month's analysis are summarized within this report and additional information, maps & data are available at: <u>http://water.state.co.us/DWRDocs/Reports/Pages/SWSIReport.aspx</u>. This report also contains updates about current regional conditions and water matters prepared by each DWR Division Office.

The SWSI calculation for the fall season (October 1 to December 1) is based solely on reservoir storage at the end of last month, in this case October 31. The following SWSI values were computed for each of the seven major basins for November 1, 2017. Water supply conditions, as represented by water in storage, are above normal for November 1, 2017 statewide, with the exception of the Colorado River Basin. The lower value for the Colorado River Basin is based on storage below normal for both Ruedi and Green Mountain reservoirs.

Basin	November 1 SWSI	Change from Previous Month	Change from Previous Year
Arkansas	3.0	0.1	1.0
Colorado	-0.2	-0.9	-0.2
Gunnison	2.4	-0.5	3.4
Rio Grande	3.1	0.0	1.1
San Juan-Dolores	1.7	-0.4	-0.8
South Platte	3.2	0.0	1.1
Yampa-White	3.8	0.3	-0.1

				SWSI Scale				
-4	-3	-2	-1	0	1	2	3	4
Severe		Moderate		Near Normal		Above Normal	Ab	undant
Drought		Drought		Supply		Supply		Supply



SURFACE WATER SUPPLY INDEX FOR COLORADO BY MAJOR RIVER BASIN

November 1, 2017

SURFACE WATER SUPPLY INDEX FOR COLORADO BY HUC



Basin	HUC ID	HUC Name	SWSI	Reservoir Storage NEP	Total Vol (AF)
	11020001	Arkansas Headwaters	1.9	73	212,152
44 Yanga Sanga San		Upper Arkansas	2.7	83	207,900
		Upper Arkansas-Lake Meredith	4.0	99	52,109
		Huerfano River	-2.4	21	0
A	11020009	Upper Arkansas-John Martin Reservoir	3.2	88	285,800
	11020010	Purgatoire River	2.9	85	32,730
	14010001	Colorado Headwaters	2.3	78	123,460
ор	14010002	Blue River	-2.7	18	73,800
Colorado	14010003	Eagle River		#N/A	
20	14010004	Roaring Fork	-2.6	18	76,680
	14010005	Colorado Headwaters-Plateau	-0.2	48	9,038
	14020001	East-Taylor	2.7	82	78,012
	14020002	Upper Gunnison	1.0	62	784,796
uo	14020003	Tomichi Creek	1.8	72	490
Gunnison	14020004	North Fork Gunnison	-2.5	20	986
Gui	14020005	Lower Gunnison		#N/A	
	14020006	Uncompahgre River	-0.2	48	58,500
	14030003	San Miguel		#N/A	
	13010001	Rio Grande Headwaters	3.5	92	50,512
Rio Grande	13010002	Alamosa-Trinchera	3.3	90	11,901
Grai	13010004	Saguache Creek		#N/A	
U	13010005	Conejos River	1.3	65	26,004
	14030002	Upper Dolores	2.0	74	305,514
÷	14080101	Upper San Juan	0.2	53	60,547
San Juan- Dolores	14080102	Piedra River		#N/A	
l nu Dolo	14080104	Animas River	-0.3	47	19,346
Sa	14080105	Middle San Juan	0.0	50	1,038
	14080107	Mancos	1.8	71	5,332
	10190001	South Platte Headwaters	1.5	67	155,100
	10190002	Upper South Platte	3.2	88	313,303
tte	10190003	Middle South Platte-Cherry Creek	3.7	94	86,700
South Platte	10190004	Clear Creek		#N/A	
Ith	10190005	St. Vrain River	3.7	95	67,358
Sol	10190006	Big Thompson River	2.7	82	552,177
	10190007	Cache La Poudre	2.5	80	130,427
	10190012	Middle South Platte-Sterling	2.3	78	93,700
	10180001	North Platte Headwaters		#N/A	
e å	14050001	Upper Yampa	3.8	95	39,505
Yampa- White	14050002	Lower Yampa		#N/A	
אַ 14050003		Little Snake		#N/A	
	14050005	Upper White		#N/A	

November 1, 2017 SWSI Values by HUC and Non Exceedance Probabilities (NEP)

NEP is non exceedance percentage for total reservoir storage in HUC. Some HUCs do not have any reservoirs considered in the SWSI and are shown as "N/A". Total Vol is the volume of reservoir storage in the HUC. NEP is calculated compared to the volume of actual active storage historically occurring this month during the period 1970-2010. The following table lists each component considered in each HUC.

SWSI Color Scale:	-4.0 (Severe Drought)	0 (Normal)	4.0 (Abundant Supply)

	Novembe	r 1, 2017 SWSI Component Information By		
HUC ID	HUC Name	Component Name	Component Volume (AF)	Component NEP for Month
		CLEAR CREEK RESERVOIR	5,834	56
11020001	Arkansas Headwaters	TURQUOISE LAKE	112,989	58
11020001	Arkansas neduwalers	TWIN LAKES RESERVOIR	52,032	64
		HOMESTAKE RESERVOIR	41,297	74
11020002	Upper Arkansas	PUEBLO RESERVOIR	207,900	83
11020005	Upper Arkansas-Lake	MEREDITH RESERVOIR	42,740	99
11020005	Meredith	LAKE HENRY	9,369	99
11020006	Huerfano River	CUCHARAS RESERVOIR*	0	21
11020000	Upper Arkansas-John	ADOBE CREEK RESERVOIR	41,940	90
11020009	Martin Reservoir	JOHN MARTIN RESERVOIR	243,860	87
11020010	Purgatoire River	TRINIDAD LAKE	32,730	85
1 401 0001	Coloro do Llos duratoro	WILLIAMS FORK RESERVOIR	67,300	38
14010001	Colorado Headwaters	WOLFORD MOUNTAIN RESERVOIR	56,160	99
14010002	Blue River	GREEN MOUNTAIN RESERVOIR	73,800	18
14010004	Roaring Fork	RUEDI RESERVOIR	76,680	18
14010005	Colorado Headwaters- Plateau	VEGA RESERVOIR	9,038	48
14020001	East-Taylor	TAYLOR PARK RESERVOIR	78,012	82
		BLUE MESA RESERVOIR	666,615	69
		MORROW POINT RESERVOIR	111,527	34
14020002	Upper Gunnison	FRUITLAND RESERVOIR	200	42
		CRAWFORD RESERVOIR	3,840	27
		SILVER JACK RESERVOIR	2,614	15
14020003	Tomichi Creek	VOUGA RESERVOIR NEAR DOYLEVILLE	490	72
14020004	North Fork Gunnison	PAONIA RESERVOIR	986	20
14020006	Uncompahgre River	RIDGEWAY RESERVOIR	58,500	48
		RIO GRANDE RESERVOIR	22,267	87
13010001	Rio Grande Headwaters	SANTA MARIA RESERVOIR	18,725	90
		CONTINENTAL RESERVOIR	9,520	96
13010002	Alamosa-Trinchera	TERRACE RESERVOIR	5,043	70
		MOUNTAIN HOME	6,858	98
13010005	Conejos River	PLATORO RESERVOIR	26,004	65
14030002	Upper Deleres	GROUNDHOG RESERVOIR	12,202	46
14030002	Upper Dolores	MCPHEE RESERVOIR	293,312	75
14080101	Upper San Juan	VALLECITO RESERVOIR	60,547	53
14080104	Animas River	LEMON RESERVOIR	19,346	47
14080105	Middle San Juan	LONG HOLLOW RESERVOIR	1,038	50
14080107	Mancos	JACKSON GULCH RESERVOIR	5,332	71
		ANTERO RESERVOIR	20,700	96
		ELEVENMILE CANYON RESERVOIR	99,400	71
10190001	South Platte Headwaters	SPINNEY MOUNTAIN RESERVOIR	35,000	64
		CHEESMAN LAKE	73,703	80

DILLON RESERVOIR

239,600

HUC ID	HUC Name	Component Name	Component Volume (AF)	Component NEP for Month
10190003		BARR LAKE	28,200	99
	Middle South Platte-Cherry	MILTON RESERVOIR	19,700	99
	Creek	STANDLEY RESERVOIR	38,800	87
		HORSECREEK RESERVOIR	0	1
		GROSS RESERVOIR	30,766	99
		MARSHALL RESERVOIR	5,400	80
10190005	St. Vrain River	BUTTONROCK (RALPH PRICE) RESERVOIR	16,192	90
		TERRY RESERVOIR	2,400	4
		UNION RESERVOIR	12,600	93
		BOYD LAKE	31,300	57
		CARTER LAKE	55,667	59
		LAKE LOVELAND RESERVOIR	6,000	23
10190006	Big Thompson River	LONE TREE RESERVOIR	6,800	85
		MARIANO RESERVOIR	1,500	29
		LAKE GRANBY	446,210	92
		WILLOW CREEK RESERVOIR	4,700	2
	Cache La Poudre	BLACK HOLLOW RESERVOIR	3,500	95
		CACHE LA POUDRE	9,200	99
		CHAMBERS LAKE	7,200	95
10190007		COBB LAKE	19,400	78
10190007		FOSSIL CREEK RESERVOIR	9,300	99
		HALLIGAN RESERVOIR	2,900	85
		HORSETOOTH RESERVOIR	70,927	60
		WINDSOR RESERVOIR	8,000	47
	Middle South Platte- Sterling	EMPIRE RESERVOIR	22,500	94
		JACKSON LAKE RESERVOIR	19,200	86
10190012		JULESBURG RESERVOIR	16,300	70
		POINT OF ROCKS RESERVOIR	14,600	45
		PREWITT RESERVOIR	8,200	21
		RIVERSIDE RESERVOIR	12,900	51
14050001	Upper Vempe	STAGECOACH RESERVOIR NR OAK CREEK	33,600	99
14030001	Upper Yampa	YAMCOLO RESERVOIR	5,905	72
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NEP is non exceedance percentage (percentile) for volume of the component compared to this month during the historical period 1970-2010.

*Empty, filling restriction

 Water Volume NEP Color Scale:
 0 (Well Below Normal)
 50 (Normal)
 100 (Well Above Normal)

The SWSI value for the month was +3.2. During October 2017 both temperature and precipitation over northeast Colorado were generally near normal. Temperatures were generally near to slightly below normal. The major exception was an area of warmer than normal temperatures more-or-less centered on Morgan County. October precipitation, though near normal as a whole, actually had two distinct areas. Basically about the western half of the area had near to above normal precipitation while about the eastern half of the area had below normal precipitation.

There was literally no change in the USDA Drought Monitor rating during October in northeastern Colorado. The same relatively small area in Logan and Sedgwick Counties that had a D0 "Abnormally Dry" rating at the end of September still had a D0 rating at the end of October.

Continuing the pattern started in August, the flows at the Kersey index gage were above the long term mean flow while the flows at the Julesburg index gage were below the long term mean flow. The Kersey gage flows were heavily influenced by two precipitation induced flow "spikes" during the first half of October and then very near the historic mean for the last half of the month. The overall October mean flow at the Kersey gage was 835 cfs or about 125% of the long term mean flow of 667 cfs. Though the Julesburg gage did see some small precipitation

induced flow "spikes" in October, flows were below the historic mean flow for the entire month. The overall September mean flow at the Julesburg gage was 133 cfs. This represents a flow of about 44% of the long term mean flow of 299 cfs.

As perhaps could be expected from the variable precipitation and flow patterns for October, water rights calls were quite varied over northeast Colorado. The mainstem call from metro Denver and upstream was not unusual. However, going to free river on the mainstem below metro Denver on October 3rd and remaining there for the rest of the month, especially with the low flows and precipitation was unusual. This was mainly due to many of the major plains reservoirs not being able to take water because of maintenance/repair work on the inlet ditches or dams. The calls on the major South Platte tributaries were also varied with some, like Clear Creek and St. Vrain Creek being fairly normal while the other major tributaries were more junior than normal.

Probably at least partially due to the near to above normal upstream precipitation in October, storage was not heavily used and storage volumes over northeast Colorado ended October with better-thanaverage storage volumes. This provides a good base to build on at the beginning of Irrigation Year 2018 on November 1. The overall end of October storage was about 65% of capacity. This compares to the long term average end of October storage of about 54% of capacity.





South Platte-DataComposite-SWSI



The SWSI value for the month was +3.0.

<u>Outlook</u>

The river call during October ranged from the 3/1/1887 Fort Lyon Canal call to the 6/9/1890 Colorado Canal call.

A meeting of the Winter Water Board of Directors was held on October 20, 2017. Planning for the upcoming storage season which runs from November 15, 2017 through March 14, 2018 was the topic at this meeting. Another significant topic that was discussed at this meeting was a potential change in policy by the Southeastern Colorado Water Conservancy District related to allocation of project water and use by ditch companies under which there are significant ineligible acres per the Reclamation Reform Act.

Winter Compact storage in John Martin Reservoir began at midnight on October 31, 2017. Storage in Trinidad Reservoir began on October 16, 2017.

Administrative/Management Concerns

An abundance of precipitation during both 2016 and 2017 left reservoir levels at very high levels entering the winter storage season. In order to make room for storage in upper basin reservoirs for transmountain imports in 2018, the Bureau of Reclamation plans to move a significant amount of Fryingpan-Arkansas Project water down to Pueblo Reservoir. It is projected that this storage, along with storage under the Pueblo Winter Water Storage Program, will push storage levels into the flood pool. Storage can invade the flood pool in Pueblo Reservoir during the November through March period, however storage levels must be reduced to meet specific targets beginning on April 1st of 2018. This will force a potential spill of water from Pueblo Reservoir. Well Associations in Division 2 are scrambling to move some water to recharge to avoid losing dominion and control during an April spill event.









The SWSI value for the month was +3.1. Flow at the gaging station Rio Grande near Del Norte averaged 520 cfs (108% of normal). The Conejos River near Mogote had a mean flow of 280 cfs (207% of normal). Streamflow in the majority of the upper Rio Grande basin was above average during October due to the mid - late September rainfall throughout the basin. It took some time for that rainfall to reach all the streams, so the first half of October had well above normal streamflow. Most gauging stations in the San Luis Valley indicated the flow had dropped to near average levels by October 17.

October itself was fairly dry. Only 0.06 inch fell in Alamosa during the month, 0.62 inch below average. However, the annual precipitation total in Alamosa will finish above the yearly average due to the very wet January, July, and September months.

Reservoir storage in the basin is near historic levels. Storage season begins in November.

<u>Outlook</u>

Recently-released National Weather Service 90-day precipitation and temperature outlooks call for above average temperatures and near average precipitation this winter. In a typical scenario, the NWS map shows dry

conditions south of Colorado and wet conditions in northern Colorado and the states to the north. Southern Colorado water supply officials hope the north wins the battle this winter.

Administrative/Management Concerns

The State Engineer's policy no. 2010-01 dealing with the irrigation season within Water Division No. 3 is in effect. Water users in the Conejos River system, the Alamosa / La Jara Creek drainages, the northern drainages, and the Fort Garland area creeks were required to discontinue all diversion of water from ditches, reservoirs and wells at the end-of-day November 1. The Rio Grande and its tributaries and the La Garita area had a November 4th at midnight shut-off. The Culebra drainage irrigation season remains open.

Administrative/Management Concerns

Sometimes you just wonder if the wind is howling more than normal. Yes, the fall weather patterns have been unseasonably windy this year in the San Luis Valley. September and October 2017 were the windiest like months in over two decades. In fact, an all-time high in recorded history for October average wind speed was set this past month at the Great Sand Dunes Natl. Park.









The SWSI value for the month was +2.4. Conditions were extremely dry in the Gunnison basin during October, in fact, western parts of the basin only received 0-30% of the 30 year average. Conditions were slightly better in eastern areas, where up to 70% of the average fell. Temperatures during October were near average in the lower elevations and slightly above average in the high country (1-3 degrees above average).

<u>Outlook</u>

The most recent NWS forecast for October through December includes a forecast for La Nina conditions to persist through the winter season. This would usually result in the Gunnison basin being between higher than average precipitation to the north and lower than average to the south, which is reflected in the official NWS forecast.

Administrative/Management Concerns

The Uncompany Valley Water Users Association (UVWUA) reduced diversions into the Gunnison Tunnel from 1,000 cfs to 850 cfs at the end of October and fully shut down the Tunnel on November 1st. Diversions at the Gunnison Tunnel were greater than inflows to the Aspinall Unit for all but four days during October.

This resulted in the use of over 9,000 acre-feet of storage from the second fill account in Taylor Park Reservoir.

The North Fork Gunnison River went back on call for a short period of time during October following successful completion of the Paonia Reservoir outlet and bulkhead repair.

The Slate River Minimum Instream Flow water right remained on call for much of October and as such, the water commissioner in Water District 59 spent time ensuring that replacement water required for the numerous augmentation plans in the Slate River drainage was released. Releases for the basin wide augmentation plan that uses Meridian Lake as the replacement source actually released water for all of its active contractees to replace November depletions as well, which is required to be made in October by decree due to freezing conditions in November.

Public Use Impacts

The UVWUA reduced releases from Taylor Park Reservoir from 300 cfs to 100 cfs on October 10th, which still produces good fishing conditions below the dam.









Gunnison Basin SWSI History Historical period SWSI values establish the SWSI distribution to lookup recent and current SWSI values. Basinwide Conditions Assessment The SWSI value for the month was -0.2.

<u>Outlook</u>

Colorado River flows continue to fall to around average with tributary flows running around or just below average throughout November. Below average precipitation with above average temperature is forecast for western Colorado through November.

Administrative/Management Concerns

As of October 28, the call on the Colorado River main stem is the Shoshone Hydro Power Right for 1250 cfs. Grand Valley Irrigation diversions (Government Highline/Orchard Mesa Irrigation, Grand Valley Irrigation canals) have discontinued irrigating for the season. The Orchard Mesa Irrigation District above Palisade (ORCHIDCO) gage will start diverting for the Grand Valley Power Plant by the end of the month for the duration of the winter. Green Mountain is releasing to pass inflows, release contract water, CB-T replacement water and HUP water. The HUP Surplus water is no longer being released.

Public Use Impacts

Ski areas are gearing up to open for the 2017-18 ski season, with a couple already open. As the weather cools down, most, if not all of the ski areas will be making snow and will continue through November.





Colorado-DataComposite-SWSI



The SWSI value for the month was +3.8.

October precipitation was slightly below average in the Yampa, White, and North Platte River basins. Precipitation for the month, as measured at the SNOTEL sites operated by NRCS, was reported at 93% of average for the Yampa, White, and North Platte River basins. Total precipitation for the water year as a percent of average to date in the combined basins at the end of October was 93%.

All Division 6 seasonal stream gages are closed. The gages on the Yampa and Williams Fork remain open through the winter.

<u>Outlook</u>

As of October 31st Fish Creek Reservoir was storing approximately 3,515 AF, 84% of capacity. The capacity of Fish Creek Reservoir is 4,167 AF. Yamcolo Reservoir was storing 5,900 AF, 68% of capacity at the end of October 2017. The capacity of Yamcolo Reservoir is 8,700 AF. The G3 web server is not functioning currently for Elkhead Creek Reservoir. The contact for the Colorado River

District will let me know when the site is available. The capacity of Elkhead Creek Reservoir is 24,778 AF. On October 31, 2017, Stagecoach Reservoir was storing 33,900 AF, 92% of capacity.

Water stored in Fish Creek Reservoir is used primarily for municipal purposes, Yamcolo Reservoir for irrigation purposes, and Elkhead Creek Reservoir for municipal. industrial, recreational. fish and recovery releases. Stagecoach Reservoir is primarily used for recreation though a significant amount of stored water is allocated for municipal, industrial, irrigation and augmentation uses.



Public Use Impacts

Boat ramps at Stagecoach Reservoir State Park are closed, however hand launched vessels are allowed. Limited winter camping is available on a first come - first serve basis. Water and dump station are not available during the winter. The swim beach is closed.

Please check the Stagecoach Reservoir State Park website for a detailed fishing report or call 970-879-6552 for the latest fishing conditions. There has been update recently to the park's fishing conditions.

Steamboat Lake campgrounds and swim beach are closed. Boat ramps are closed however hand launched vessels are still allowed. The Steamboat Lake Dam will be undergoing a year-long project to complete required maintenance and repairs. Sage Flats day use area and all access to the dam will be closed for the year. All other Park facilities and activities will be open and available with the exception of the activities listed above. No update on fishing conditions provided this month.

Yampa-White-DataComposite-SWSI



SAN JUAN-DOLORES BASIN

The SWSI value for the month was +1.7. Flow at the Animas River at Durango averaged 353 cfs (85% of average). The flow at the Dolores River at Dolores averaged 87 cfs (65% of average). The La Plata River at Hesperus averaged 6.6 cfs (41% of average). Precipitation in Durango was 0.20 inches for the month, 11% of the 30-year average of 1.89 inches. Precipitation was the 110th highest amount recorded in October, in Durango, out of 123 years of record. Precipitation to date in Durango, for the water year, is 0.20 inches, 11% of the 30-year average of 1.89 inches. End of last month precipitation to date, for the water year was 100% of average. The average high and low temperatures for the month of October in Durango were 700 and 330. In comparison, the 30-year average high and low for the month is 660 and 340. At the end of the month Vallecito Reservoir contained 61,382 acre-feet compared to its average content of 53,179 acre-feet (115% of average). McPhee Reservoir was up to 293,460 acre-feet compared to its average content of 261,675 (112% of average), while Lemon Reservoir was up to 19,690 acre-feet as compared to its average content of 19,258 acre-feet (102% of average).

<u>Outlook</u>

Precipitation (0.20 inches) was well below average for October in Durango. There were 110 years out of 123 years of record where there was more precipitation than this year. The flows in the rivers within the basin remained below average for this time of year. There was only 84 out of 107 years of record where the total flow past the Animas River at Durango stream gauge was more than this year. There were 76 out of 109 years of record where the total flow past the Dolores stream gauge was more than this year and 77 out of 101 years of record where the total flow past the La Plata River at Hesperus gauge was more than this year.









San Juan-Dolores Basin SWSI History
Historical period SWSI values establish the SWSI distribution to lookup recent and current SWSI values.









HUC 14080107 (Mancos) SWSI Values - NOV Historical period SWSI values establish the SWSI distribution to lookup recent and current SWSI values.





= HUC:14080107-NOV-PrevMoStreamflow-SWSI = HUC:14080107-NOV-ForeoastedRunoff-SWSI = HUC:14080107-NOV-ReservoirStorage-SWSI = HUC:14080107-NOV-DataComposite-SWSI







HUC:13010001-NOV-DataComposite-SWSI







HUC:10190003-NOV-Reservoirstorage-SWS


























HUC:10190001-NOV-Reservoirstorage-SWS











HUC 14020003 (Tomichi) Surface Water Supply - NOV

= HUC:14020003-NOV-PrevMoStreamflow-SWSI = HUC:14020003-NOV-ForeoastedRunoff-SWSI = HUC:14020003-NOV-ReservoirStorage-SWSI = HUC:14020003-NOV-DataComposite-SWSI

0.00 -1.00 -2.00



