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, 2015

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 new SWSI analysis based on the components shown below, which vary depending on the time of year. The new 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. 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

Recently, 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 new DNR SWSI was published. The results are summarized within this monthly report and additional information, maps & data are available at: <u>http://water.state.co.us/DWRDocs/Reports/Pages/SWSIReport.aspx</u>. This document also contains reports about regional conditions prepared by each DWR Division Office.

The SWSI calculation for the fall season is based only on reservoir storage. For some HUCs, there is not a reservoir that is considered in the SWSI, and those HUCs do not have a SWSI calculated in the fall. The statewide SWSI values for October (November 1) range from -0.2 in the Colorado River Basin to 4.0 in the Yampa-White River Basin. The following SWSI values were computed for each of the seven major basins for November 1, 2015.

Basin	November 1 SWSI	Change from Previous Month	Change from Previous Year
Arkansas	2.3	-0.5	1.5
Colorado	-0.2	-1.3	-1.6
Gunnison	1.7	-1.1	2.0
Rio Grande	1.7	0.1	1.7
San Juan-Dolores	1.3	-0.3	0.9
South Platte	2.4	-0.6	-1.7
Yampa-White	4.0	0.0	0.0

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



SURFACE WATER SUPPLY INDEX FOR COLORADO BY MAJOR RIVER BASIN

November 1, 2015



SURFACE WATER SUPPLY INDEX FOR COLORADO BY HUC

November 1, 2015

		HUC Name	swsi	Res Storage	
	11020001	Arkansas Headwaters	1 1	6/	21/ 100
	11020001	Inner Arkansas	2.0	74	180,000
sas	11020002	Upper Arkansas-Lake Meredith	1.0	73	31 600
्र भू 110200	11020005	Huerfano	-2 /	21	0*
Ar	11020000	Inner Arkansas- John Martin Reservoir	2.4	80	2/15 300
	11020007		2.5	78	243,300
	1/010001	Colorado Headwaters	2.5	82	128,100
0	14010001	Blue	-2.0	15	71 700
Irad	14010002	Fagle	-2.5	Lo reservoirs considered	no SWSL calculated
Colo	14010003	Poaring Fork	-3.4		
Ŭ	14010004	Colorado Headwaterr Plateau	-0.2	/8	8 900
	14010003	Fast Taylor	-0.2	48	71 000
	14020001		-0.4	43	71,000
ç	14020002	Tomichi	2.0	39	779,700
osir	14020003	North Fork Cuppison	2.0	24	1 500
nnr	14020004		-1.5	54	UUC,I
6	14020005				
	14020000		-0.2	40	000,000
14030003		San Miguel	2.2		
Rio	13010001	Alemana Trinchara	3.2	88	41,000
	13010002	Alamosa-Trinchera	-0.2	48 48	4,8/1
פֿ	13010004	Saguacile	1 5		
	1 40 2000 2		-1.5	52	261,400
ores	14030002	Upper Dotores	0.0	37	201,400
Dolo	14000101	Diedro	5.4	91	0,800
l-ne	14000102	Animos			
Jua	14080104	Animas Middle See Juan	-0.2	47	19,700
San	14080105	Madde San Juan	0.0	50	147
	14000107	MailCos	1.5	08	5,200
	10190001	South Platte	-0.5	44 62	140,000
υ	10190002	Upper South Platte Charmy Creek	1.1	05	510,400
latt	10190003	Clear	-1.5	55	50,700
h Pl	10190004	Clear Cte Virein			
out	10190005	St. Vrain	-0.9	39	500,458 500,000
Ň	10190006	Big I nompson	1.2	64	508,600
	1019000/	Viddle South Platte Starling	2.9	85	136,400
	10190012	Middle South Platte-Sterling	3.3	90	110,100
nite		North Platte HeadWaters		io reservoirs considered	, no swsi calculated
- A	14050001	Upper Yampa	4.0	99	42,300
·pa	14050002	Lower Yampa		io reservoirs considered	, no SWSI calculated
Yan	14050003			io reservoirs considered	, no SWSI calculated
	14050005	LUpper White	1 N	In reservoirs considered	no SWSI calculated

November 1, 2015 SWSI Values by HUC and Component Non Exceedance Probabilities (NEP)

NEP is non exceedance probability for total reservoir storage in HUC (if there is more than one of each type of component, their volumes are added together). Total Vol is the volume of reservoir storage in HUC combined. NEP is calculated compared to active storage data for the period 1970-2010. *Cucharas Reservoir is empty due to Division Engineer filling restriction

**Long Hollow Reservoir is newly constructed and therefore does not have a history of storage for comparison

November 1,	2015	SWSI	Component	Information	By	HUC
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HUC ID	HUC Name	Component Name	Component Volume (AF)	Component NEP for Month
11020001	Arkansas	CLEAR CREEK RESERVOIR	6,100	59
		TURQUOISE LAKE	117,000	74
	Headwaters	TWIN LAKES RESERVOIR	49,300	37
		HOMESTAKE RESERVOIR	41,700	77
11020002	Upper Arkansas	PUEBLO RESERVOIR	180,000	74
11020005	Upper Arkansas-	MEREDITH RESERVOIR	24,400	70
11020003	Lake Meredith	LAKE HENRY	7,200	99
11020006	Huerfano	CUCHARAS RESERVOIR	0*	21
11020000	Upper Arkansas-	ADOBE CREEK RESERVOIR	39,000	88
11020007	Reservoir	JOHN MARTIN RESERVOIR	206,300	79
11020010	Purgatoire	TRINIDAD LAKE	22,100	78
14010001	Colorado	WILLIAMS FORK RESERVOIR	83,200	80
14010001	Headwaters	WOLFORD MOUNTAIN RESERVOIR	45,000	75
14010002	Blue	GREEN MOUNTAIN RESERVOIR	71,700	15
14010004	Roaring Fork	RUEDI RESERVOIR	74,000	9
14010005	Colorado Headwaters-Plateau	VEGA RESERVOIR	8,900	48
14020001	East-Taylor	TAYLOR PARK RESERVOIR	71,000	45
	Upper Gunnison	BLUE MESA RESERVOIR	672,800	69
		MORROW POINT RESERVOIR	98,500**	3
14020002		FRUITLAND RESERVOIR	300	45
		CRAWFORD RESERVOIR	4,800	49
		SILVER JACK RESERVOIR	3,300	37
14020003	Tomichi	VOUGA RESERVOIR NEAR DOYLEVILLE	700	84
14020004	North Fork Gunnison	PAONIA RESERVOIR	1,500	34
14020006	Uncompahgre	RIDGEWAY RESERVOIR	58,800	48
	Rio Grande Headwaters	RIO GRANDE RESERVOIR	21,800	87
13010001		SANTA MARIA RESERVOIR	19,000	90
		CONTINENTAL RESERVOIR	800	24
13010002	Alamosa-Trinchera	TERRACE RESERVOIR	2,400	45
		MOUNTAIN HOME	2,471	59
13010005	Conejos	PLATORO RESERVOIR	14,600	32
14030002	Upper Dolores	GROUNDHOG RESERVOIR	18,600	99
		MCPHEE RESERVOIR	242,800	55
14080101	Upper San Juan	VALLECITO RESERVOIR	76,800	91
14080104	Animas	LEMON RESERVOIR	19,700	47
14080105	Middle San Juan	LONG HOLLOW RESERVOIR	147	50
14080107	Mancos	JACKSON GULCH RESERVOIR	5,200	68
	South Platte	ANTERO RESERVOIR	0**	4
10190001	Headwater	ELEVENMILE CANYON RESERVOIR	99,200	64
		SPINNEY MOUNTAIN RESERVOIR	41,400	82

HUC ID	HUC Name	Component Name	Component Volume (AF)	Component NEP for Month
10100002	Lipper South Platte	CHEESMAN LAKE	71,600	77
TO 190002 Opper South Platte		DILLON RESERVOIR	238,800	40
		BARR LAKE	13,400	50
10100003	Middle South Platte-	MILTON RESERVOIR	2,600**	13
10170005	Cherry Creek	STANDLEY RESERVOIR	36,500	74
		HORSECREEK RESERVOIR	4,200	53
		GROSS RESERVOIR	30,500	55
		MARSHALL RESERVOIR	5,800	84
10190005	St. Vrain	BUTTONROCK (RALPH PRICE) RESERVOIR	6,400	1
		TERRY RESERVOIR	6,100	81
		UNION RESERVOIR	11,658	68
		BOYD LAKE	31,600	57
		CARTER LAKE	46,400	35
		LAKE LOVELAND RESERVOIR	4,000	17
10190006	Big Thompson	LONE TREE RESERVOIR	2,800	30
		MARIANO RESERVOIR	1,300	28
		LAKE GRANBY	414,400	66
		WILLOW CREEK RESERVOIR	8,100	59
	Cache La Poudre	BLACK HOLLOW RESERVOIR	3,000	54
		CACHE LA POUDRE	5,500	68
		CHAMBERS LAKE	4,100	74
10190007		COBB LAKE	18,800	75
10170007		FOSSIL CREEK RESERVOIR	7,200	94
		HALLIGAN RESERVOIR	3,300	87
		HORSETOOTH RESERVOIR	86,800	76
		WINDSOR RESERVOIR	7,700	78
		EMPIRE RESERVOIR	17,000	80
10190012		JACKSON LAKE RESERVOIR	19,200	86
	Middle South Platte-	JULESBURG RESERVOIR	14,900	65
	Sterling	POINT OF ROCKS RESERVOIR	17,600	57
		PREWITT RESERVOIR	15,800	64
		RIVERSIDE RESERVOIR	25,600	90
14050001	lloper Vampa	STAGECOACH RESERVOIR NR OAK CREEK	35,500	99
14030001		YAMCOLO RESERVOIR	6,800	90

*Cucharas Reservoir is empty due to Division Engineer filling restriction **Water level low for maintenance The SWSI value for the month was 2.4. October is normally a month of change in the South Platte basin and October 2015 was no different. October started with the very warm and dry conditions that marked September, but shifted to more "normal" conditions by the last 10 days of the month. The very warm start to October and milder conditions throughout the month led to an average monthly temperature several degrees Fahrenheit above normal for the entire basin. Precipitation over almost the entire basin was near to above normal, primarily due to a significant precipitation event over the October 21-23 period, especially along the Front Range.

The winter of 2015-16 is predicted to have a "monster" El Nino - the biggest since 1997. Interestingly, over the October 23-25, 1997 period northeast Colorado experienced a very large snow event with over 18" of snow in some areas of the Front Range. In 2015, the large precipitation event was rain due to warmer temperatures, but the almost identical dates for a large precipitation event in northeast Colorado do make one wonder what the rest of the winter holds for northeast Colorado.

The results of the end of October precipitation are also shown by the slightly above the historic mean stream flows at the Julesburg and Kersey gages. The October Julesburg mean gage flow was 336 cfs or 112%

of the long term October mean flow of 299 cfs. The overall October Kersey gage mean flow was 734 cfs or 110% of the long term October mean flow of 667 cfs.

The call regime on the South Platte during October was reflective of the mixed conditions. There was no call on the mainstem of the South Platte for the entire month. There were calls on many of the major Front Range tributaries for some or all of the month. These calls were generally relatively junior, except on Clear Creek where they tended to be more senior.

Reservoir storage in northeast Colorado continues to be good, even with the lower flows throughout the late summer and early fall. The end of October overall storage was at approximately 61% of capacity. This compares to an overall average end of October storage of approximately 55% of capacity.







South Platte-DataComposite-SWSI

The SWSI value for the month was 2.3. The river call during October ranged from the 12/3/1884 Catlin Canal call at the beginning of the month with gradually more junior calls towards the end of the month where the final call was set at 9/25/1889 Holbrook Canal.

A meeting of the Winter Water Board of Directors was held on October 16, 2015. Planning for the upcoming storage season which runs from November 15, 2015 through March 14, 2016 was the topic at this meeting. A separate meeting was conducted earlier in the week of October 12th with entities with off-channel storage to attempt to plan better for the storage season. Winter storage is expected to be strong and a number of reservoirs are nearly full.

Winter Compact storage in John Martin Reservoir began at midnight on October 31, 2015. Storage in Trinidad Reservoir began on October 15, 2015.





Arkansas-DataComposite-SWSI

Basinwide Conditions Assessment

The SWSI value for the month was 1.7. Flow at the gaging station Rio Grande near Del Norte averaged 426 cfs (91% of normal). The Conejos River near Mogote had a mean flow of 89 cfs (66% of normal). Streamflow in the majority of the upper Rio Grande basin has been below average from July through October. The Alamosa River, LaJara Creek, and Conejos River drainages continue to languish with below average precipitation and streamflow. The southern part of the San Luis Valley experienced generally poor runoff in 2015 while most of the other drainages (i.e. the Rio Grande) have had near-average or even above average (i.e. Saguache Creek) runoffs.

The past three months of dry conditions on the mountains and plains have erased some of the pleasantly green hue from healthy vegetation seen back in June and July.

Reservoir storage in the basin has been depleted to help meet irrigation demand. A few reservoirs have gained a slight amount of storage in the past month.

<u>Outlook</u>

The recently-released National Weather Service 90-day precipitation and temperature outlooks call for a very welcome forecast of above average precipitation for December through May for this region.

Administrative/Management Concerns

The State Engineer's policy no. 2010-01 dealing with the irrigation season within Water Division No. 3 is in effect. The Rio Grande, the Conejos, and their tributaries, had a November 1st shut-off date to effect Compact delivery requirement compliance. Water users in other areas of the Valley were also required to discontinue all diversion of water from ditches, reservoirs and wells on November 1. The order went into effect at midnight November 1st.

The sole remaining open creek is La Jara Creek where the effects of the lingering drought were most strongly felt this runoff season. A few more days of irrigation season could benefit this watershed.

Public Use Impact

The autumn weather patterns have been very comfortable and have had little or no effect on crop harvest. It has been a slow start to the 2015 - 16 snowpack so far. Residents did awaken to snow covered peaks around the Valley on October 22. As of the end of the month, no snow has fallen on the Valley floor.









GUNNISON BASIN

Basinwide Conditions Assessment

The SWSI value for the month was 1.7. October precipitation in the Gunnison basin varied depending on location, with areas west of the Uncompahyre River generally receiving greater than average and areas east of the Uncompahyre receiving slightly less than average. The very warm fall continued with temperatures between 3 to 5 degrees above average basin wide. Streamflows recovered from the lower than average conditions in late September and early October thanks to the late month rain and snow. While snowpack this early in the season is rarely an indicator of how we will end the year, the Gunnison basin is beginning the year in good shape with 112% of average snow water equivalent on November 12th.

<u>Outlook</u>

The Gunnison basin is within an area expected to receive El Nino enhanced precipitation during the next three months. The current El Nino is one of the strongest on record for this time of year and is expected to continue. Water users are hoping that the early season snow is a preview of what is to come!

Administrative/Management Concerns

The Gunnison Tunnel shut down on October 30th and releases from Crystal Dam were correspondingly reduced to keep flows in the Black Canyon at around 600 cfs. Demand at the Tunnel exceeded inflows into the Aspinall Unit until October 22nd, but only by small amounts, resulting in the use of only 1,300 acre-feet of storage. Taylor Park ended the irrigation season at their target of over 70,000 acre-feet in storage. The Taylor Park first fill account started the

season full at 106,230 acre-feet, with over 35,000 acre-feet stored in the Aspinall Unit per the conditions in the 86CW203 decree.

Reservoir water use decreased in October and most reservoirs contained greater than average carryover storage on November 1st. For example, the 90 plus reservoirs on the Grand Mesa carried over a better than average 42% of capacity.

Division of Water Resources, Water Division 4 (DWR) staff are working with a few water users in the North Fork and Uncompany River basins to get their continuous recorders on the DWR streamflow website, which will make managing the water more efficient for the ditch companies and administration more efficient for DWR.

Public Use Impacts

Blue Mesa Reservoir ended the irrigation season above the icing target of 7,490 feet in elevation. As a result, the USBR will begin releasing excess water from the Aspinall Unit on November 16th to reach that level by the end of December. This will result in Gunnison Gorge and Black Canyon flows in excess of 1,100 cfs instead of 600 cfs.

Early snow and cooler weather during the end of October and beginning of November allowed area ski resorts, such as Crested Butte, to fully utilize their snowmaking water rights. Skiers and resort operators are hoping that the early snow is a sign of a good ski season to come!











<u>Basinwide Conditions Assessment</u> The SWSI value for the month was -0.2.

<u>Outlook</u>

Colorado River flows continue to fall to slightly below average with tributary flows running near or below average throughout November. Slightly above average precipitation with average to below average temperature is forecast for western Colorado through November.

Administrative/Management Concerns

As of October 26, the call on the Colorado River main stem at Shoshone is the senior Shoshone Hydro Power right for 1250 cfs and there is no call on the Colorado main stem at Cameo due to the end of the irrigation season. Accordingly, Green Mountain Reservoir is releasing to pass inflows, provide replacement water and HUP obligations and make C-BT replacements. Wolford Reservoir is bypassing inflows and releasing for contracts.

Public Use Impacts

Ski areas are gearing up to open for the 2015-16 ski season, with a few already open. Most, if not all, ski areas are making snow and will continue through November.







Colorado-DataComposite-SWSI

Basinwide Conditions Assessment

The SWSI value for the month was 4.0. October precipitation was well 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 63% of average for the combined 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 also 63% as this was the first month of the water year.

<u>Outlook</u>

As of October 31st Fish Creek Reservoir was storing approximately 2,848 AF, 68% of capacity. The capacity of Fish Creek Reservoir is 4,167 AF. Yamcolo Reservoir was storing 6,800 AF at the end of October 2015. The capacity of Yamcolo Reservoir is 8,700 AF. On October 31tst, 2015; Stagecoach Reservoir was storing 35,500 AF which is 107% of capacity.

Water stored in Fish Creek Reservoir is used primarily for municipal purposes, Yamcolo Reservoir is used for irrigation purposes. 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

At Stagecoach State Park the boat ramps are now closed. Fishing from shore has steadily increased due to cooler weather and water temperatures dropping. Anglers are still catching a fair amount of fish. Many anglers at the headwaters have been catching Rainbow Trout. Fly fishing at the Tail Waters has been steady with anglers catching lots of trout

At Steamboat Lake State Park the boat ramps are now closed. Fishing is good on the lake considering the cooler water.







SAN JUAN-DOLORES BASIN

Basinwide Conditions Assessment

The SWSI value for the month was 1.3. Flow at the Animas River at Durango averaged 352 cfs (84% of average). The flow at the Dolores River at Dolores averaged 108 cfs (80% of average). The La Plata River at Hesperus averaged 15.7 cfs (100% of average). Precipitation in Durango was 3.88 inches for the month, 204% of the 30-year average of 1.90 inches. Precipitation was the 17 highest amount recorded in October, in Durango, out of 121 years of record. Precipitation to date in Durango, for the water year, is 3.88 inches, 204% of the 30-year average of 1.90 inches. End of last month precipitation to date, for the water year was 108% of average. The average high and low temperatures for the month of October in Durango were 690 and 390. 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 76,290 acre-feet compared to its average content of 77,565 acre-feet (148% of average). McPhee Reservoir was up to 242,810 acre-feet compared to its average content of 261,191 (93% of average), while Lemon Reservoir was up to 20,060 acre-feet as compared to its average content of 19,231 acre-feet (104% of average).

Outlook

Precipitation (3.88 inches) was well above average for October in Durango. There were 17 years out of 121 years of record where there was more precipitation than this year. Flows in the rivers within the basin remained below average for the month. There were 42 out of 105 years of record where the total flow past

the Animas River at Durango stream gauge was more than this year. There were 43 out of 107 years of record where the total flow past the Dolores stream gauge was more than this year and 31 out of 99 years of record where the total flow past the La Plata River at Hesperus gauge was more than this year.









































































