COLORADO
WATER SUPPLY CONDITIONS UPDATE

FROM THE OFFICE OF THE STATE ENGINEER: COLORADO DIVISION OF WATER RESOURCES
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December 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: http://water.state.co.us/DWRDocs/Reports/Pages/SWSIReport.aspx. This report also contains updates about current regional conditions and water matters prepared by each DWR Division Office.

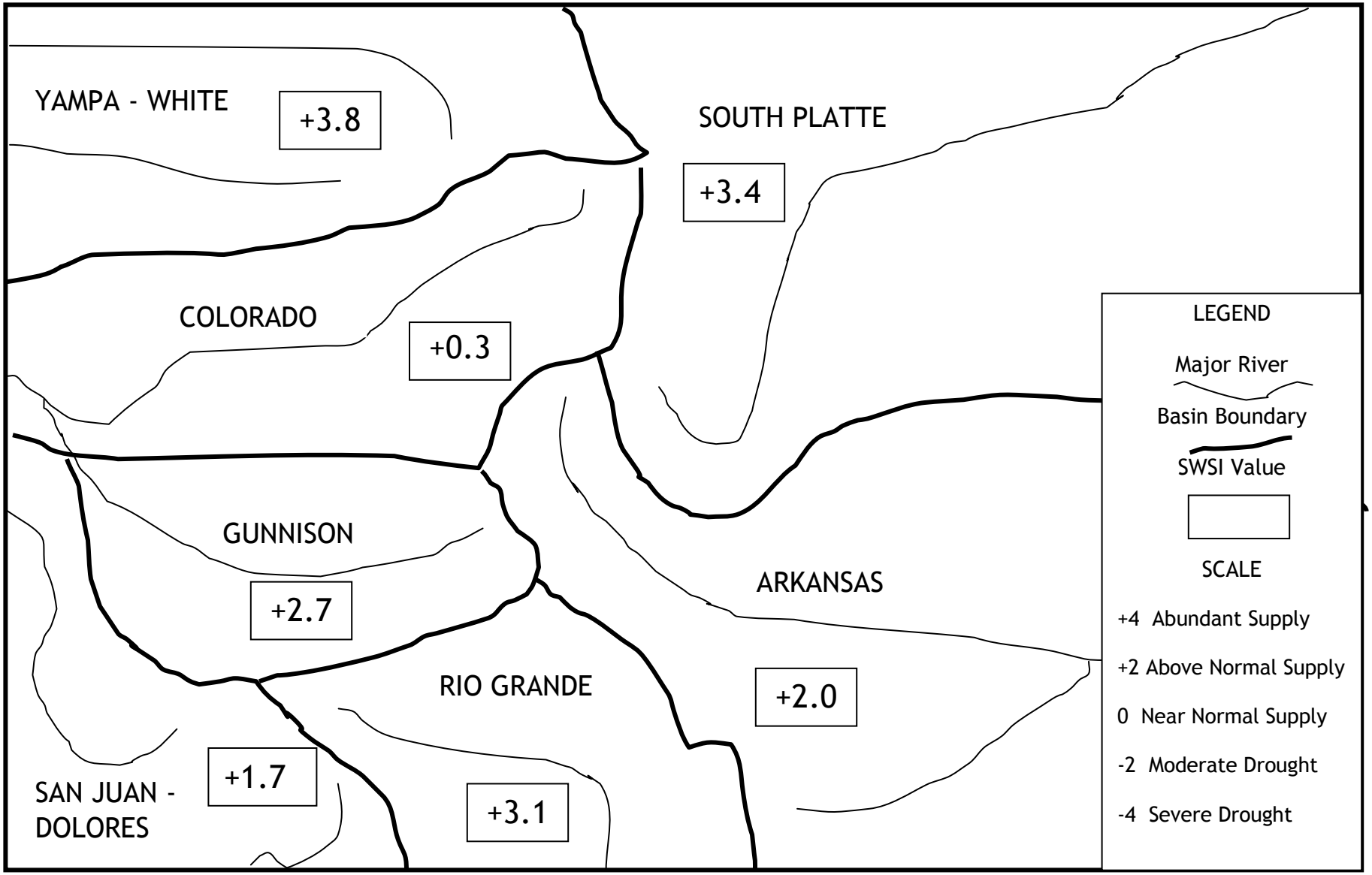
The SWSI calculation for the fall season (October 1 to December 1) is based solely on reservoir storage at the end of last month, in this case November 30. The following SWSI values were computed for each of the seven major basins for December 1, 2017. Water supply conditions, as represented by water in storage, are above normal for December 1, 2017 statewide.

Basin	December 1 SWSI	Change from Previous Month	Change from Previous Year
Arkansas	2.9	-0.1	0.9
Colorado	0.3	0.5	-0.2
Gunnison	2.7	0.3	3.0
Rio Grande	3.1	0.0	1.1
San Juan-Dolores	1.7	0.0	-1.1
South Platte	3.4	0.3	1.8
Yampa-White	3.8	0.0	-0.1

SWSI Scale

-4	-3	-2	-1	0	1	2	3	4
Severe Drought		Moderate Drought		Near Normal Supply		Above Normal Supply		Abundant Supply

SURFACE WATER SUPPLY INDEX FOR COLORADO BY MAJOR RIVER BASIN

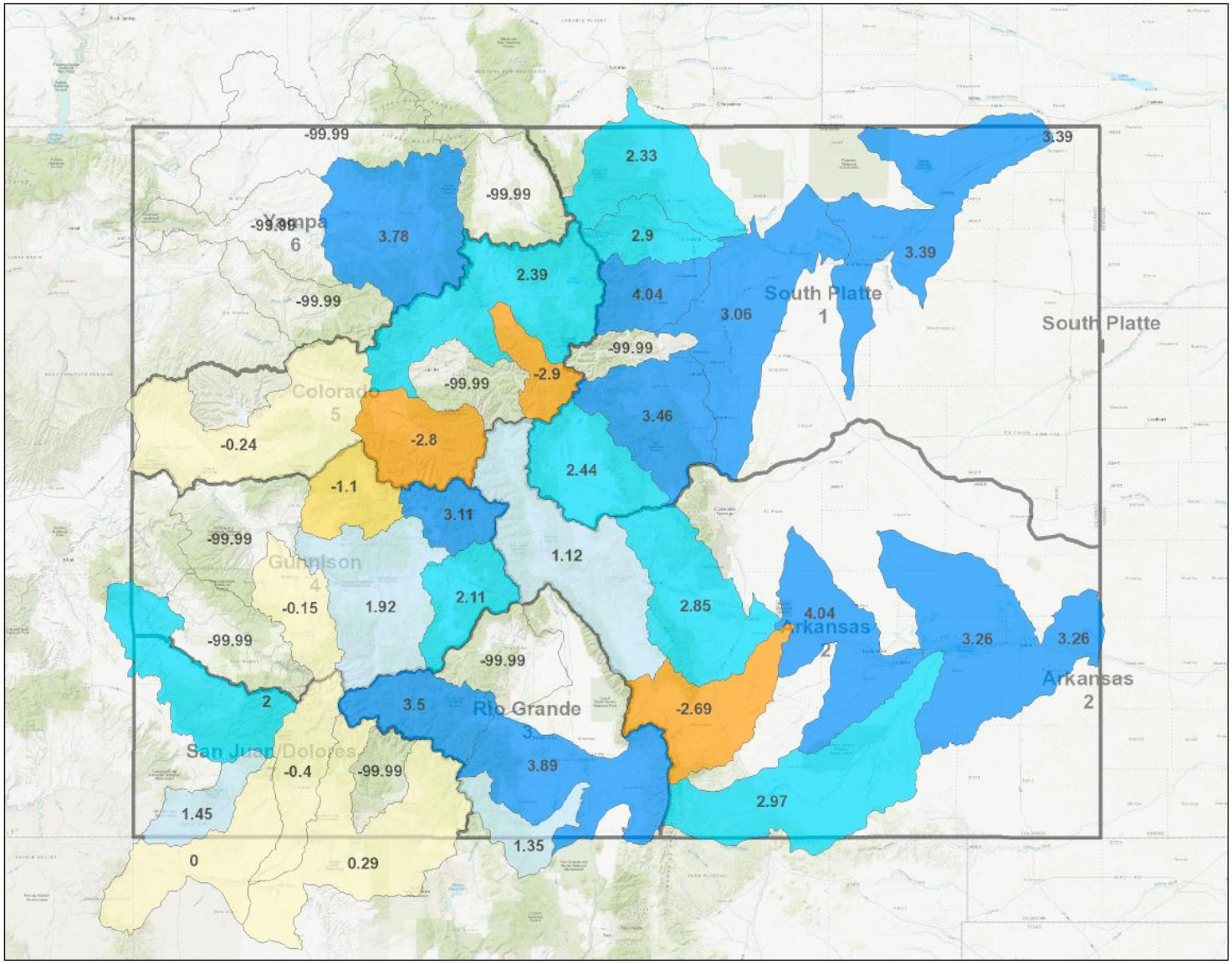


December 1, 2017

SURFACE WATER SUPPLY INDEX FOR COLORADO BY HUC

CDSS
Colorado's Decision Support Systems

SWSI December 1, 2017



Legend

SWSI - Current Report

- SWSI Not Applicable (-99.99)
- Extremely Dry (-3.0 - -4.2)
- Moderately Dry (-2.0 to -2.9)
- Slightly Dry (-1.0 to -1.9)
- Near Average (-0.9 to 0.9)
- Slightly Wet (1.0 to 1.9)
- Moderately Wet (2.0 to 2.9)
- Extremely Wet (3.0 to 4.2)

Division
Citations

Location

Notes

-99.99 indicates no SWSI for a HUC because there are no indicator reservoirs

113.64 0 56.82 113.64 Miles

1: 3,600,000

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

Date Prepared: 12/22/2017 7:20:42 AM

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

Basin	HUC ID	HUC Name	SWSI	Reservoir Storage NEP	Total Vol (AF)
Arkansas	11020001	Arkansas Headwaters	1.1	63	196,183
	11020002	Upper Arkansas	2.9	84	226,400
	11020005	Upper Arkansas-Lake Meredith	4.0	99	49,327
	11020006	Huerfano River	-2.7	18	0
	11020009	Upper Arkansas-John Martin Reservoir	3.3	89	305,931
	11020010	Purgatoire River	3.0	86	35,960
Colorado	14010001	Colorado Headwaters	2.4	79	121,490
	14010002	Blue River	-2.9	15	68,800
	14010003	Eagle River	N/A		
	14010004	Roaring Fork	-2.8	16	74,731
	14010005	Colorado Headwaters-Plateau	-0.2	47	9,417
Gunnison	14020001	East-Taylor	3.1	87	78,285
	14020002	Upper Gunnison	1.9	73	776,546
	14020003	Tomichi Creek	2.1	75	594
	14020004	North Fork Gunnison	-1.1	37	1,883
	14020005	Lower Gunnison	N/A		
	14020006	Uncompahgre River	-0.2	48	60,000
	14030003	San Miguel	N/A		
Rio Grande	13010001	Rio Grande Headwaters	3.5	92	53,506
	13010002	Alamosa-Trinchera	3.9	97	14,887
	13010004	Saguache Creek	N/A		
	13010005	Conejos River	1.4	66	24,551
San Juan-Dolores	14030002	Upper Dolores	2.0	74	301,519
	14080101	Upper San Juan	0.3	54	63,201
	14080102	Piedra River	N/A		
	14080104	Animas River	-0.4	45	18,878
	14080105	Middle San Juan	0.0	50	1,248
	14080107	Mancos	1.5	67	5,281
South Platte	10190001	South Platte Headwaters	2.4	79	156,600
	10190002	Upper South Platte	3.5	92	312,203
	10190003	Middle South Platte-Cherry Creek	3.1	87	88,500
	10190004	Clear Creek	N/A		
	10190005	St. Vrain River	4.0	99	71,498
	10190006	Big Thompson River	2.9	85	553,650
	10190007	Cache La Poudre	2.3	78	132,336
	10190012	Middle South Platte-Sterling	3.4	91	155,600
Yampa-White	10180001	North Platte Headwaters	N/A		
	14050001	Upper Yampa	3.8	95	40,060
	14050002	Lower Yampa	N/A		
	14050003	Little Snake	N/A		
	14050005	Upper White	N/A		

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)

December 1, 2017 SWSI Component Information By HUC

HUC ID	HUC Name	Component Name	Component Volume (AF)	Component NEP for Month
11020001	Arkansas Headwaters	CLEAR CREEK RESERVOIR	6,367	60
		TURQUOISE LAKE	97,249	42
		TWIN LAKES RESERVOIR	51,379	65
		HOMESTAKE RESERVOIR	41,188	73
11020002	Upper Arkansas	PUEBLO RESERVOIR	226,400	84
11020005	Upper Arkansas-Lake Meredith	MEREDITH RESERVOIR	40,121	99
		LAKE HENRY	9,206	99
11020006	Huerfano River	CUCHARAS RESERVOIR*	0	18
11020009	Upper Arkansas-John Martin Reservoir	ADOBE CREEK RESERVOIR	46,880	93
		JOHN MARTIN RESERVOIR	259,051	86
11020010	Purgatoire River	TRINIDAD LAKE	35,960	86
14010001	Colorado Headwaters	WILLIAMS FORK RESERVOIR	65,900	46
		WOLFORD MOUNTAIN RESERVOIR	55,590	99
14010002	Blue River	GREEN MOUNTAIN RESERVOIR	68,800	15
14010004	Roaring Fork	RUEDI RESERVOIR	74,731	16
14010005	Colorado Headwaters-Plateau	VEGA RESERVOIR	9,417	47
14020001	East-Taylor	TAYLOR PARK RESERVOIR	78,285	87
14020002	Upper Gunnison	BLUE MESA RESERVOIR	658,717	81
		MORROW POINT RESERVOIR	110,991	31
		FRUITLAND RESERVOIR	400	43
		CRAWFORD RESERVOIR	4,191	24
		SILVER JACK RESERVOIR	2,247	10
14020003	Tomichi Creek	VOUGA RESERVOIR NEAR DOYLEVILLE	594	75
14020004	North Fork Gunnison	PAONIA RESERVOIR	1,883	37
14020006	Uncompahgre River	RIDGEWAY RESERVOIR	60,000	48
13010001	Rio Grande Headwaters	RIO GRANDE RESERVOIR	24,403	87
		SANTA MARIA RESERVOIR	18,879	90
		CONTINENTAL RESERVOIR	10,224	99
13010002	Alamosa-Trinchera	TERRACE RESERVOIR	6,378	74
		MOUNTAIN HOME	8,509	99
13010005	Conejos River	PLATORO RESERVOIR	24,551	66
14030002	Upper Dolores	GROUNDHOG RESERVOIR	12,183	46
		MCPHEE RESERVOIR	289,336	75
14080101	Upper San Juan	VALLECITO RESERVOIR	63,201	54
14080104	Animas River	LEMON RESERVOIR	18,878	45
14080105	Middle San Juan	LONG HOLLOW RESERVOIR	1,248	50
14080107	Mancos	JACKSON GULCH RESERVOIR	5,281	67
10190001	South Platte Headwaters	ANTERO RESERVOIR	20,500	96
		ELEVENMILE CANYON RESERVOIR	99,800	87
		SPINNEY MOUNTAIN RESERVOIR	36,300	71
10190002	Upper South Platte	CHEESMAN LAKE	74,103	80
		DILLON RESERVOIR	238,100	94

HUC ID	HUC Name	Component Name	Component Volume (AF)	Component NEP for Month
10190003	Middle South Platte-Cherry Creek	BARR LAKE	27,900	98
		MILTON RESERVOIR	19,400	96
		STANDLEY RESERVOIR	41,200	99
		HORSECREEK RESERVOIR	0	1
10190005	St. Vrain River	GROSS RESERVOIR	32,089	99
		MARSHALL RESERVOIR	6,100	86
		BUTTONROCK (RALPH PRICE) RESERVOIR	16,200	97
		TERRY RESERVOIR	5,900	78
		UNION RESERVOIR	11,209	63
10190006	Big Thompson River	BOYD LAKE	31,200	59
		CARTER LAKE	52,537	33
		LAKE LOVELAND RESERVOIR	6,800	30
		LONE TREE RESERVOIR	7,000	81
		MARIANO RESERVOIR	3,900	68
		LAKE GRANBY	446,713	96
		WILLOW CREEK RESERVOIR	5,500	10
10190007	Cache La Poudre	BLACK HOLLOW RESERVOIR	3,400	85
		CACHE LA POUDRE	9,000	99
		CHAMBERS LAKE	6,800	94
		COBB LAKE	19,200	78
		FOSSIL CREEK RESERVOIR	9,300	99
		HALLIGAN RESERVOIR	5,100	94
		HORSETOOTH RESERVOIR	70,736	54
		WINDSOR RESERVOIR	8,800	41
10190012	Middle South Platte-Sterling	EMPIRE RESERVOIR	25,800	82
		JACKSON LAKE RESERVOIR	24,200	84
		JULESBURG RESERVOIR	16,500	51
		POINT OF ROCKS RESERVOIR	34,900	59
		PREWITT RESERVOIR	12,400	40
		RIVERSIDE RESERVOIR	41,800	98
14050001	Upper Yampa	STAGECOACH RESERVOIR NR OAK CREEK	33,500	99
		YAMCOLO RESERVOIR	6,560	65

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)

Basinwide Conditions Assessment

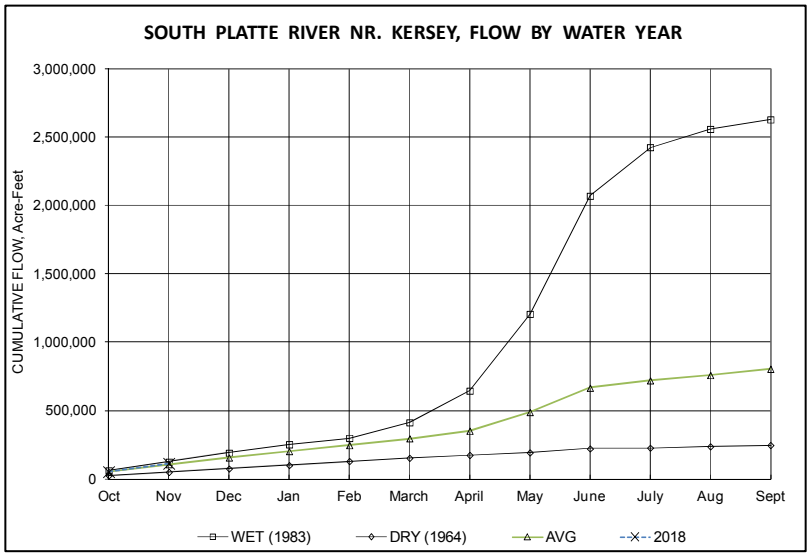
The SWSI value for the month was +3.4. November 2017 was a warm and dry month in almost all of northeast Colorado. Temperatures were uniformly above or well above average for the entire month. Precipitation was significantly below average over most of the area. The exceptions were the mountainous areas of Larimer County and southern South Park where precipitation was near normal.

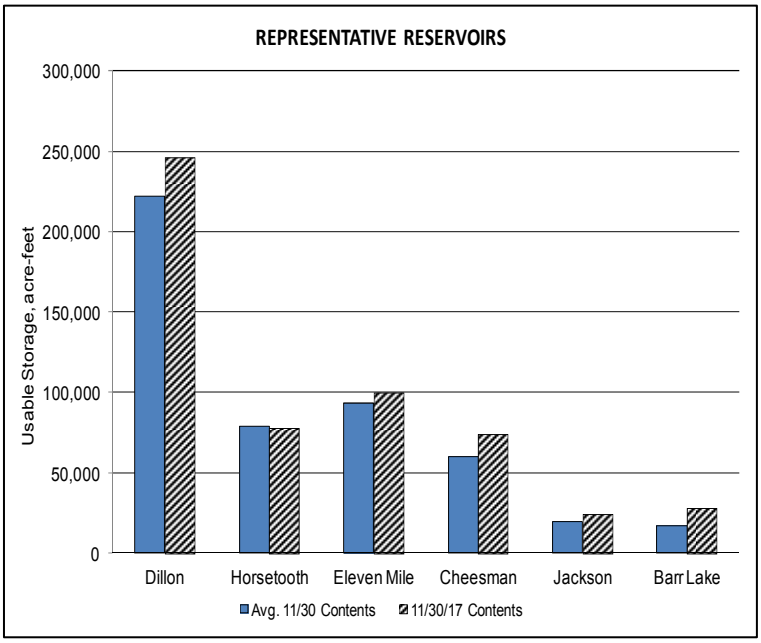
Despite the generally warm and dry conditions, again there was literally no change in the USDA Drought Monitor rating during November in northeastern Colorado. This marks the second month in a row that the same relatively small area was rated D0 "Abnormally Dry". This area located mostly in northern Logan County did not change between the October 3 and December 5 Drought Monitor maps.

For the fourth month in a row (since 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 overall November mean flow at the Kersey gage was 1040 cfs or about 139% of the long term mean flow of 747 cfs. The overall November mean flow at the Julesburg gage was 201 cfs. This represents a flow of about 60% of the long term mean flow of 335 cfs.

Calls on the South Platte mainstem began November as more junior than normal, but by the last 1/3 of the month had shifted to fairly normal priorities. The calls on the major South Platte tributaries were pretty normal for November.

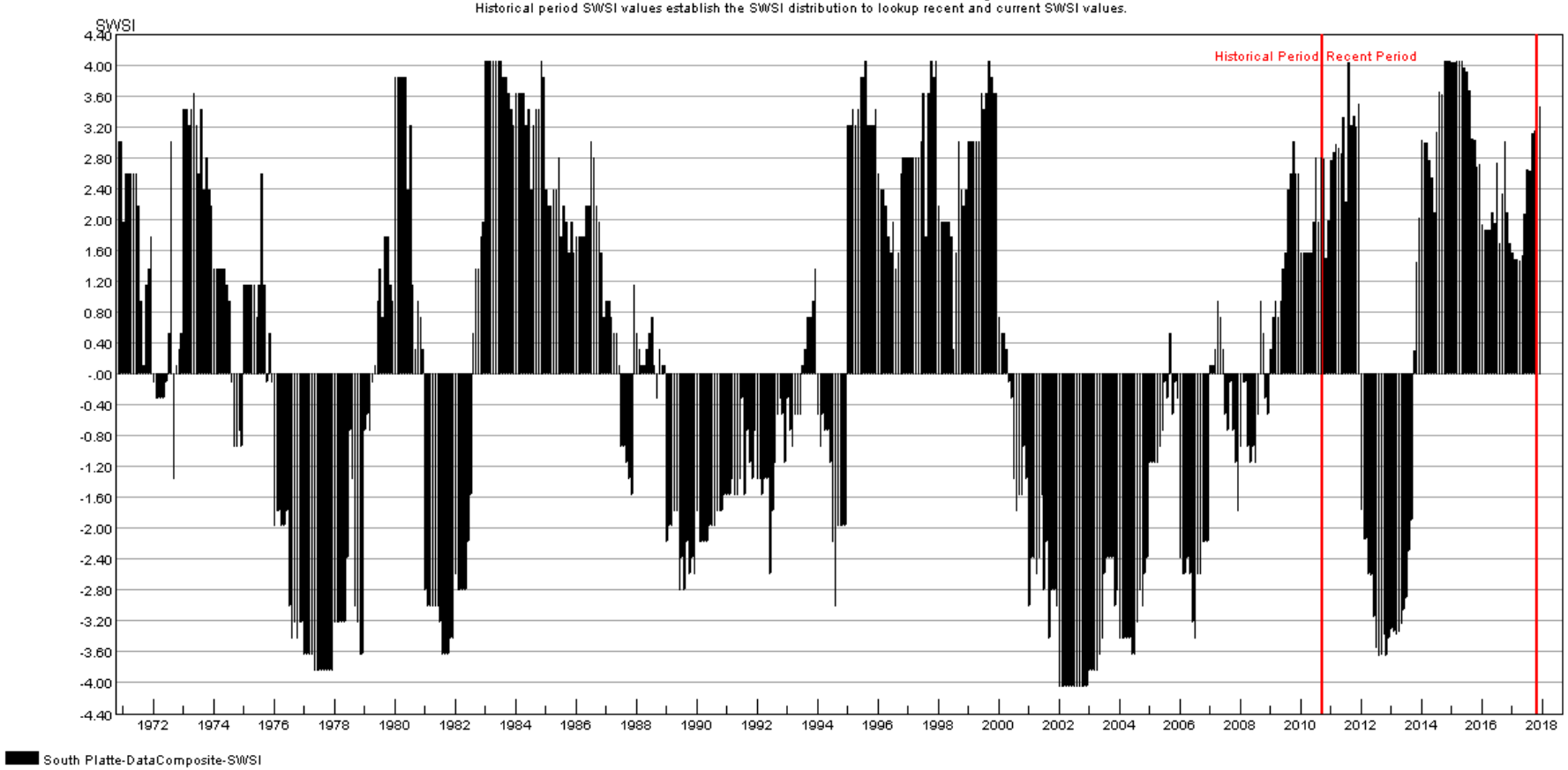
Thanks in part to the warm weather preventing any inflow ditch icing problems, the 2018 Irrigation Year in northeast Colorado got off to a good start. Storage volumes started off the year in better than average shape on November 1 and continued to improve throughout the month. The overall end of November storage was about 72% of capacity. This compares to the long term average end of November storage of about 61% of capacity.





South Platte Basin SWSI History

Historical period SWSI values establish the SWSI distribution to lookup recent and current SWSI values.



Basinwide Conditions Assessment

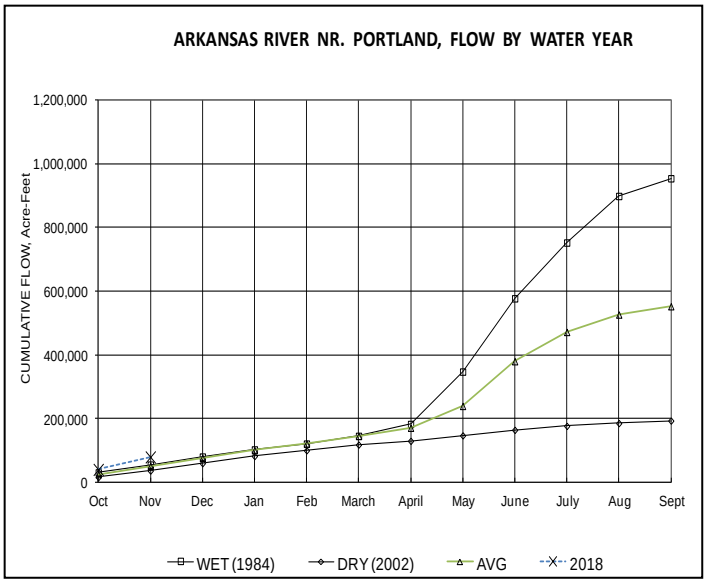
The SWSI value for the month was +2.9.

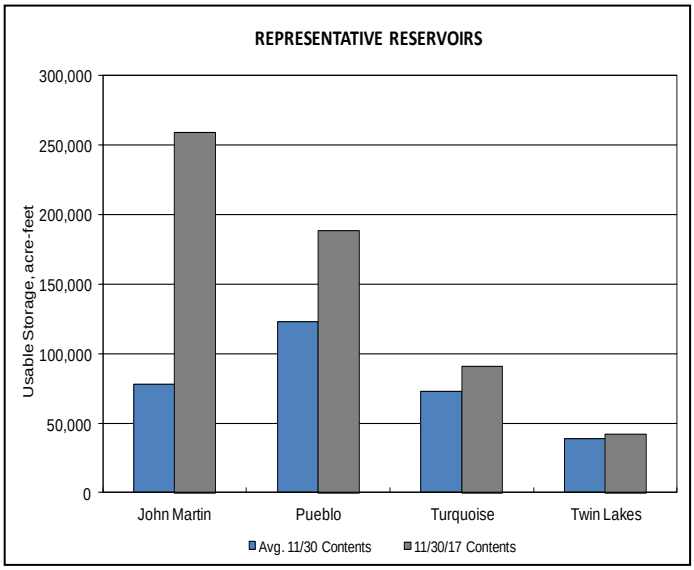
Outlook

Winter Compact storage began in John Martin Reservoir on November 1, 2017. The Pueblo Winter Water Program began operation on November 15, 2017 with storage taking place initially in Pueblo and John Martin Reservoirs and under the Fort Lyon Canal system in Adobe Reservoir. Storage in John Martin Reservoir during November totaled approximately 8,699 acre-feet for Conservation Storage and 2,915 acre-feet for Winter Water participants. Storage overall under the Pueblo Winter Water Program in November totaled approximately 31,075 acre-feet in all storage locations. These storage levels are significantly higher than 2016.

Administrative/Management Concerns

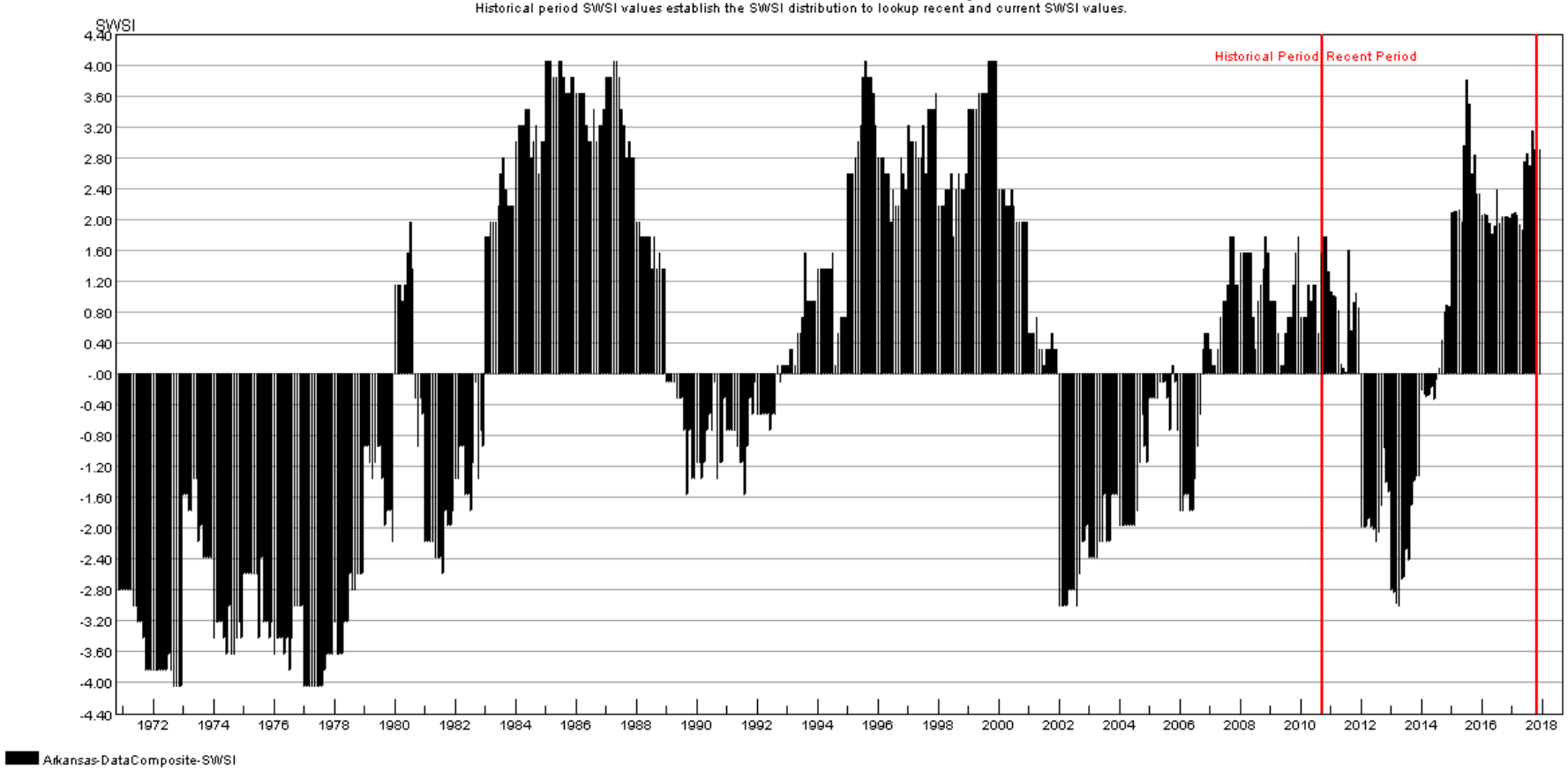
Despite a protracted lack of precipitation in November river flows remain high and storage reservoirs are relatively full. It is anticipated that Trinidad Reservoir will fill the Purgatoire River Water Conservancy District's transferred Model storage right (20,000 acre-feet) by mid-January and will have to pass water downstream thereafter. Pueblo Reservoir is also expected to fill above the conservation pool into the flood space as allowed for winter operations, however this will likely force a spill of some account water beginning in April 2018.





Arkansas 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 +3.1. Flow at the gaging station Rio Grande near Del Norte averaged 269 cfs (98% of normal). The Conejos River near Mogote had a mean flow of 136 cfs (151% of normal). The higher flows on the Conejos are due to releases from Platoro Reservoir for Compact delivery requirements. Streamflow levels in most drainages of the upper Rio Grande basin were near normal during November.

Precipitation during November in Alamosa was only 0.05 inches, 0.37 inches below normal. It was a very dry month in the San Luis Valley, evidenced by little snowpack seen on the local mountains.

Outlook

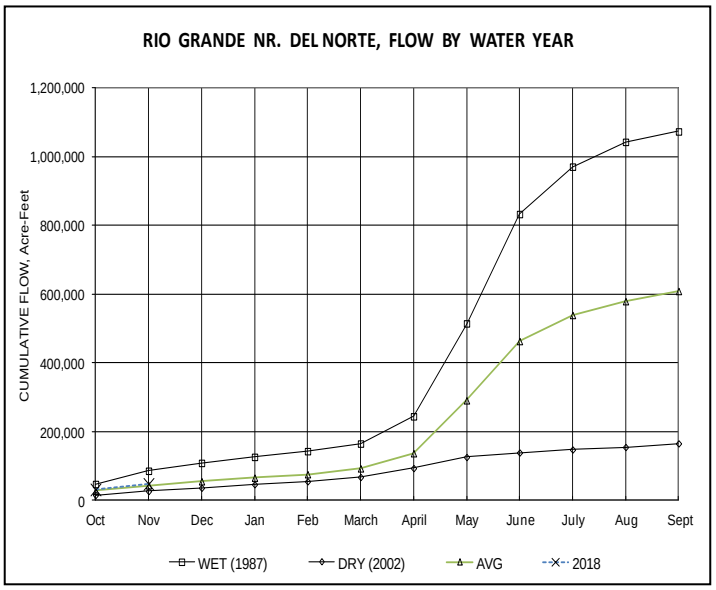
Weather conditions have been generally very pleasant with sunny days and mild temperatures this autumn. A glance at the snowpack conditions during the first week of December indicates most of the upper Rio Grande basin is lagging well behind average.

Weather forecasts continue to predict above normal temperatures and below normal precipitation the next several months.

Administrative/Management Concerns

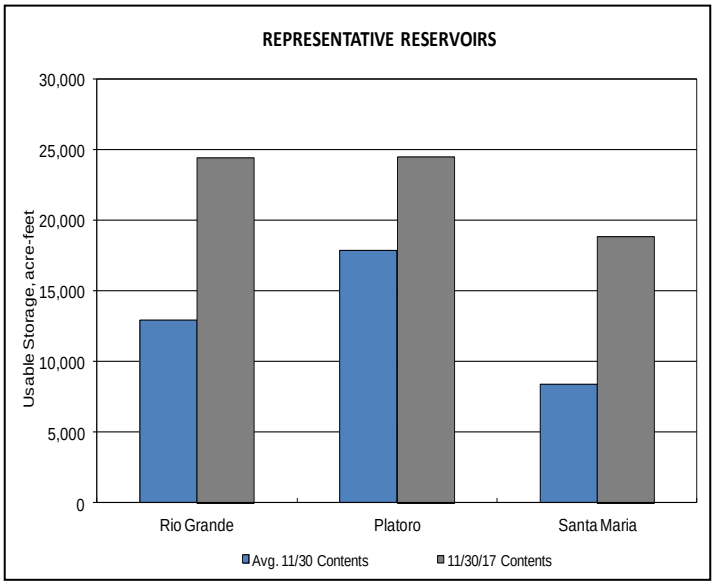
Colorado will slightly over-deliver on the amount required to meet the Rio Grande Compact delivery requirement to New Mexico and Texas during 2017. Individually, the Conejos basin is very close to their delivery requirement, while the Rio Grande pared down its over-delivery via decreed diversions for recharge purposes from November 2 through 14.

December 1st was the deadline for annual submittal of meter readings on irrigation wells in Water Division 3. Compliance has been generally good, with a few stragglers still working out data submittal issues with the staff. The Division Engineer has been working with the Office of the Attorney General to bring tardy well users into metering and reporting compliance.



Administrative/Management Concerns

Mild weather conditions hampered the success of hunters this fall and slowed the open of ski season. The snowless hillsides are making the natives restless.



Rio Grande Basin SWSI History

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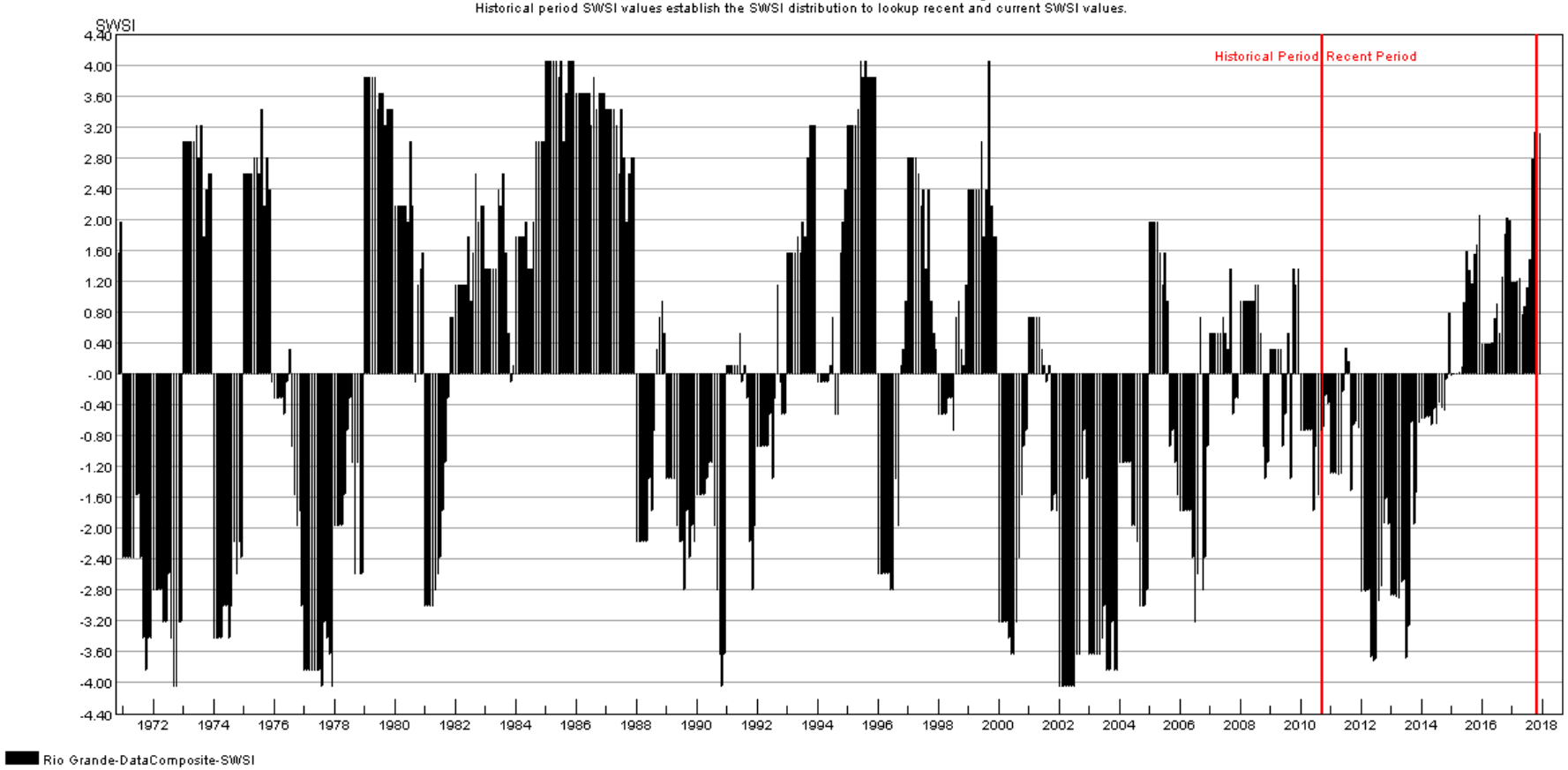


Basinwide Conditions Assessment

The SWSI value for the month was +2.7. Areas of the Gunnison basin west of Blue Mesa Reservoir only received 0-30% of the 30 year average for the second month in a row in November. Areas east of Blue Mesa fared slightly better, generally receiving precipitation between 30-70% of the average. While snowpack conditions this early in the season rarely equal end of season conditions, it is cause for concern that Gunnison basin snowpack, calculated as an average of NRCS Snotel sites in the basin, sat at 45% of the 30-year median on December 1st, which is the second lowest level for the date in the 37-year period from 1981-2018. Only in 2000 did the basin have lower snowpack to begin December. The good news is that in 2000, Gunnison snowpack recovered and ended at 95% of the median peak. Temperatures during November were routinely near record highs, which resulted in values between 5 and 9 degrees above average basin-wide. As a result, high country soil moisture values modeled on November 16th range from 50-70% of average on the Uncompahgre Plateau and 70-90% elsewhere.

Outlook

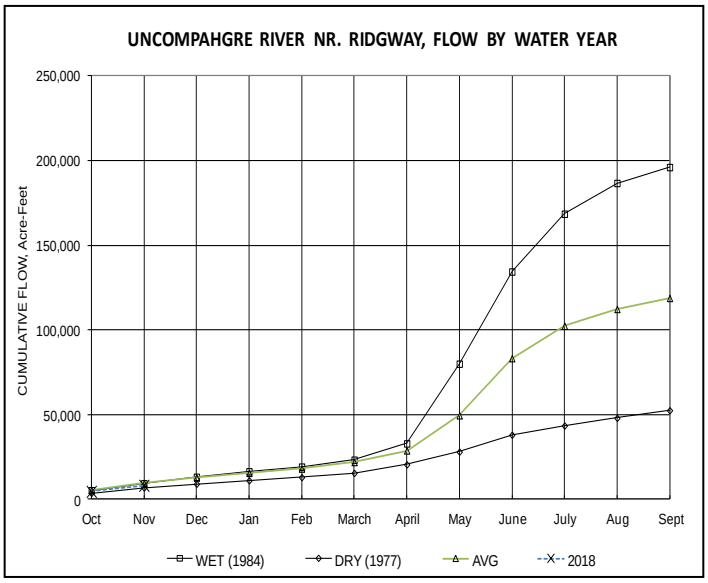
The most recent NWS forecast for December through February sandwiches the Gunnison basin between areas expected to receive higher than average precipitation to the north and lower than average to the south. Temperatures during the same period are expected to be above average.

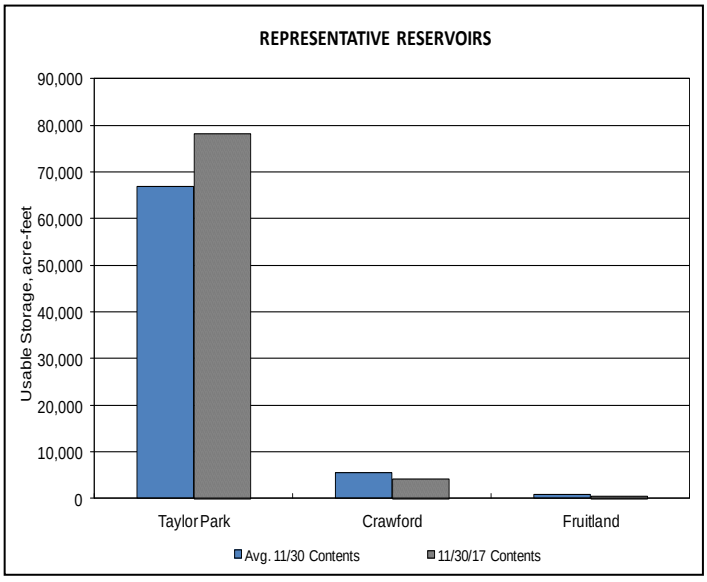
Administrative/Management Concerns

Although daily Gunnison Tunnel diversions by the Uncompahgre Valley Water Users Association (UVWUA) ceased on November 1st, 50-70 cfs was diverted at the Gunnison Tunnel to fill Fairview Reservoir on November 14th and 15th and November 28th and 29th. Fairview Reservoir stores water for treatment by the Project 7 Water Authority for delivery to 7 water providers in the lower Uncompahgre Valley including the City of Montrose and Delta. These diversions will continue to occur every two to three weeks through the winter months.

Releases from the Aspinall Unit at Crystal Dam were increased from 750 cfs to over 1,600 cfs on December 2nd in an effort to reduce the water level in Blue Mesa Reservoir to the target of 7,490 feet. The icing target is intended to prevent ice buildup that could impact areas along the Gunnison River between the Town of Gunnison and the Reservoir and Blue Mesa sat at 7499.62 feet, almost ten feet above the target on December 1st.

Carryover reservoir storage in the over 90 reservoirs in the Grand Mesa Water Users Association system on November 1st was 29%, which is lower than the typical 35% due to increased use during the dry fall period.



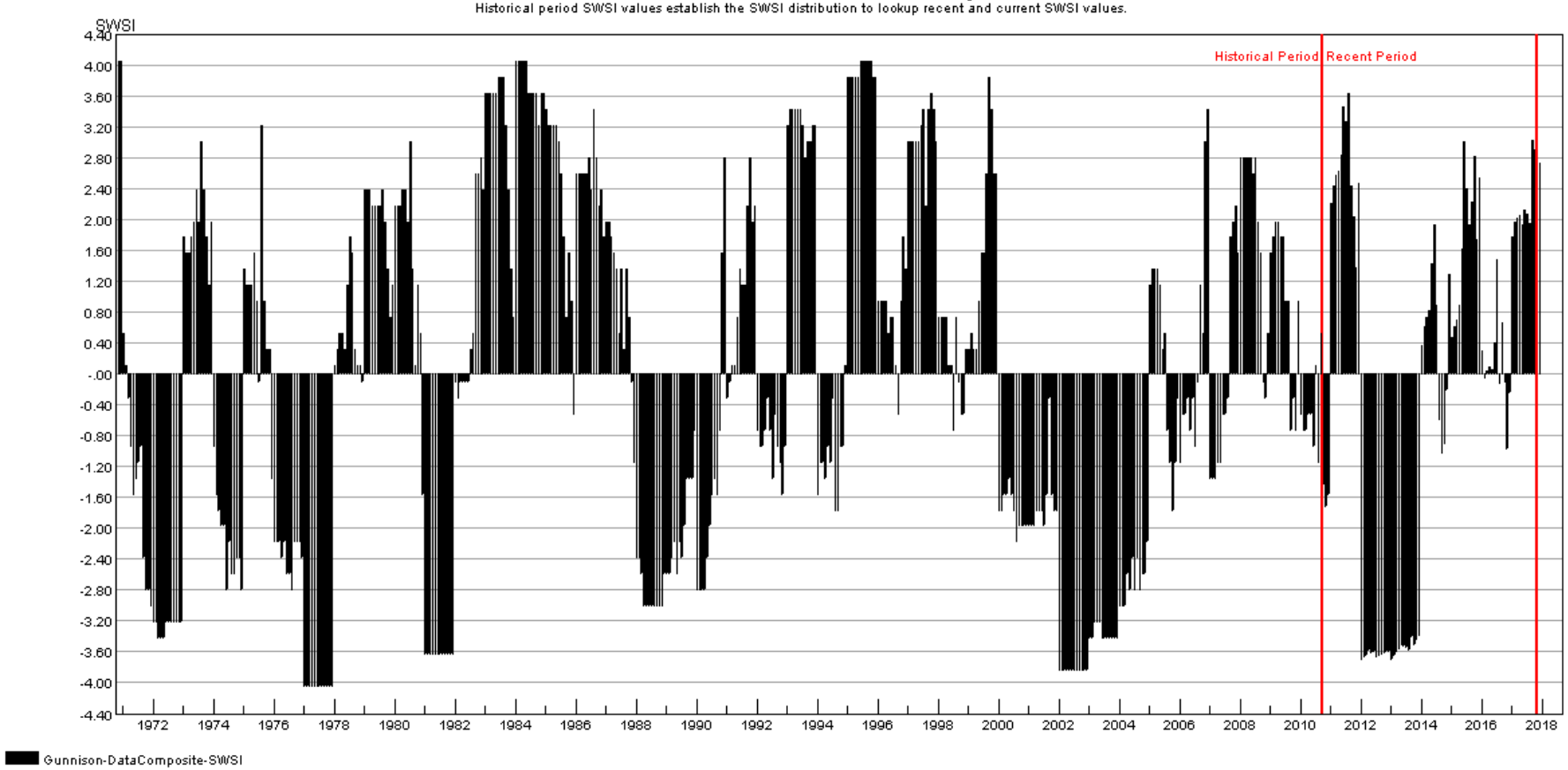


Public Use Impacts

Discharge in the Gunnison Gorge is well above the average for this time of year due to the 1,600 cfs releases from Crystal Dam. Basin ski resorts, Telluride and Crested Butte, are currently open, but had to postpone their opening day multiple times because in addition to the lack of natural snow, the weather didn't get consistently cold enough to make snow until the last week of November.

Gunnison Basin SWSI History

Historical period SWSI values establish the SWSI distribution to lookup recent and current SWSI values.

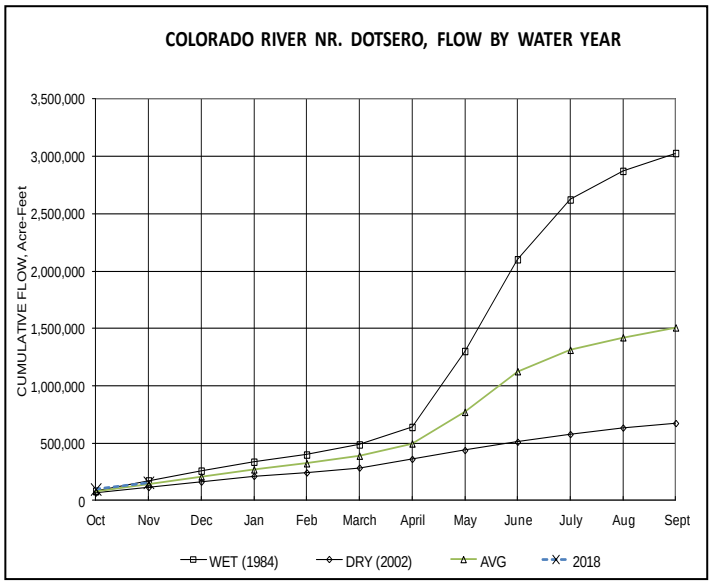


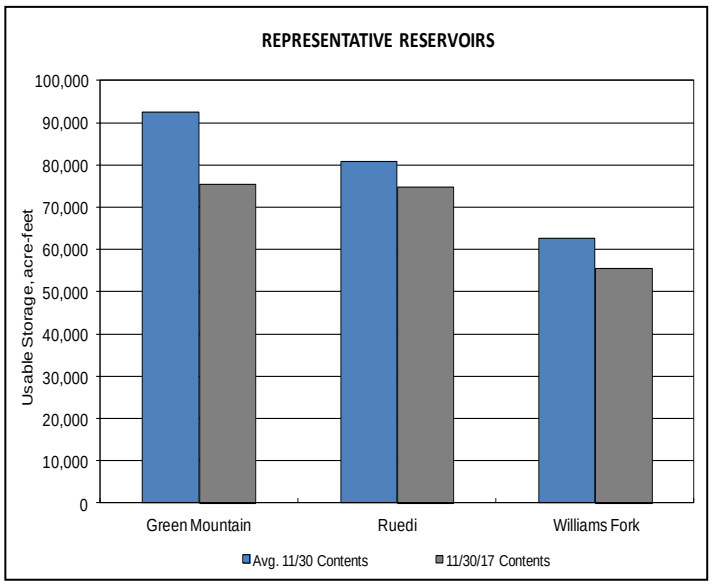
Basinwide Conditions Assessment
The SWSI value for the month was +0.3.

Outlook
Colorado River flows are running below average with tributary flows running near or slightly below average throughout December. As of December 14, the Upper Colorado River Basin snowpack was 56 percent of median snow water equivalent and 56 percent of average precipitation. Forecasts call for above average precipitation with above normal temperatures for western Colorado through December.

Administrative/Management Concerns
Since October 18, the call on the Colorado River main stem has been the Shoshone Hydro Power Right for 1250 cfs. Green Mountain is releasing to pass inflows, release contract water, CB-T replacement water and HUP water.

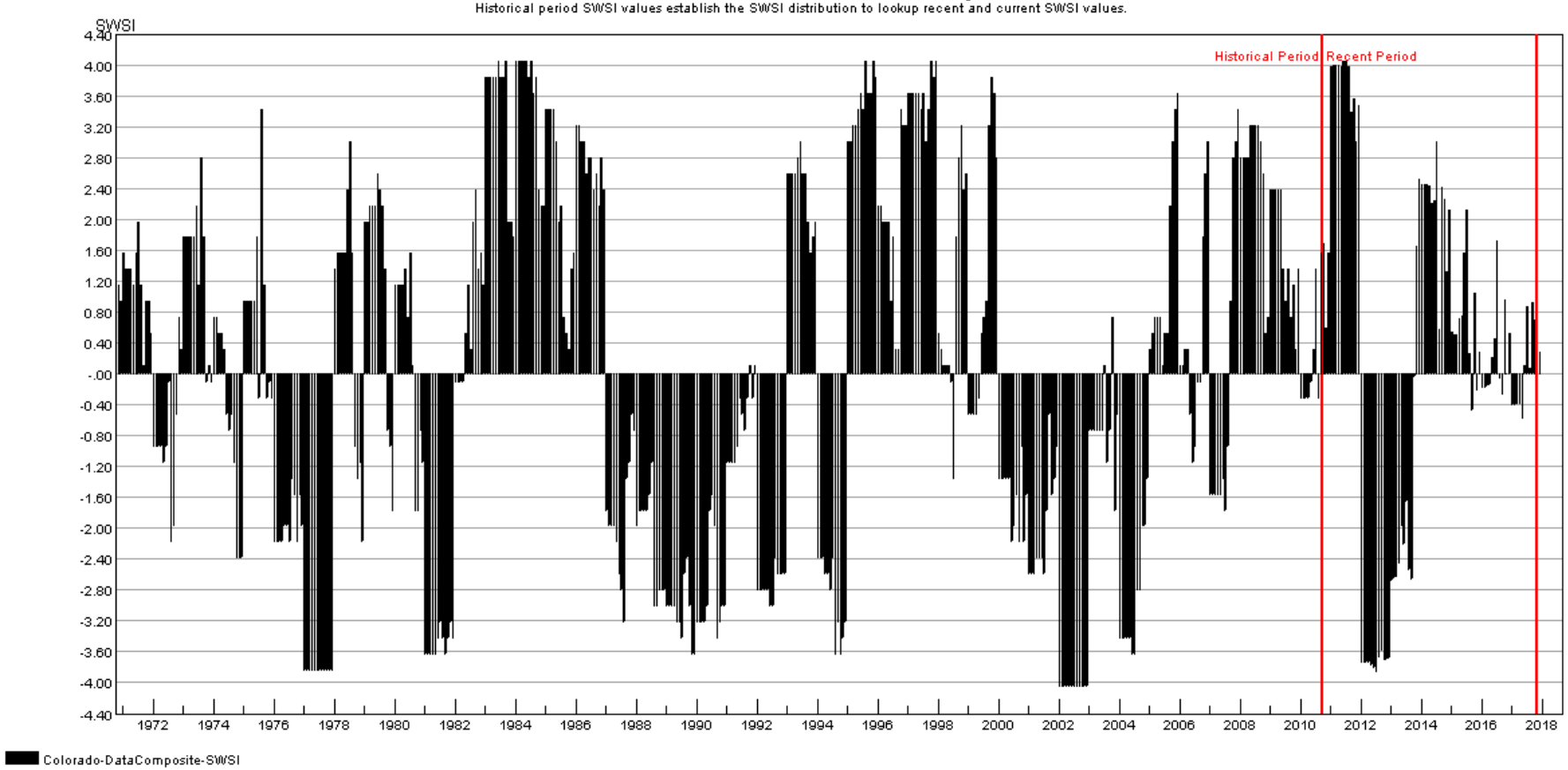
Public Use Impacts
Numerous ski areas have postponed their opening day due to lack of snowfall and average temperatures too high to make adequate snow. Cooler temperatures recently have enabled ski areas to make more snow in preparation for the busy holidays, although the open acreage is well below normal.





Colorado 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 +3.8.

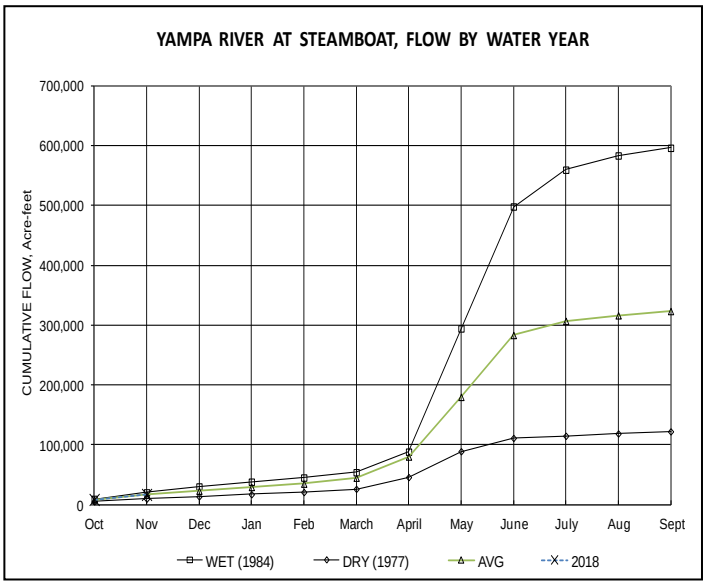
November precipitation was well below average in the Yampa, White, and North Platte River basins. Precipitation for the month, as measured at the SNOTEL sites operated by NRCS, was reported at 78% of average for the Yampa, White, and North Platte River basins. Total precipitation for the water year as a percent of average to date in the combined basins at the end of November was 83%.

Snowpack in the Yampa, White, and North Platte River basins was also below average at 82%.

All Division 6 seasonal stream gages are closed. The gages on the Yampa and Williams Fork remain open through the winter. The radar gage on the Williams Fork River is not accurately recording data as there is ice and snow below the radar unit.

Outlook

As of November 30th Fish Creek Reservoir was storing approximately 3,562 AF, 86% of capacity. The capacity of Fish Creek Reservoir is 4,167 AF. Yamcolo Reservoir was storing 6,600 AF, 75% of capacity at the end of November 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 November 31, 2017, Stagecoach Reservoir was storing 33,500 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, and fish 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.

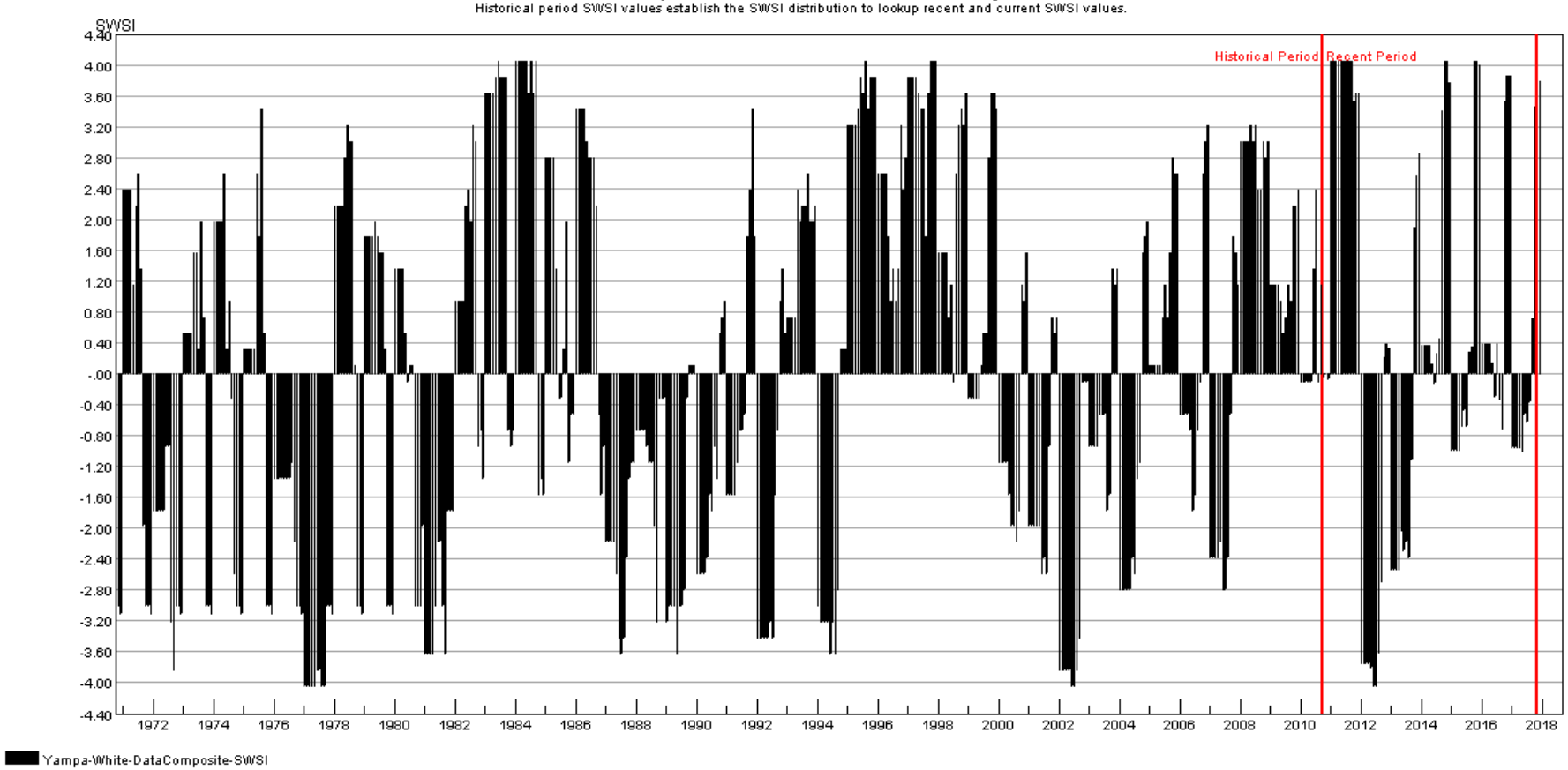
Public Use Impacts

The reservoir is currently ice-free. 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. Please check the Stagecoach Reservoir State Park website for a detailed fishing report or call 970-879-6552 for the latest fishing conditions. There was an update on November 7th on the park's fishing conditions.

At Steamboat Lake ice is forming in the coves, and shore fishing is coming to an end. Ice is thin on most of the lake. 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.

Yampa-White Basin SWSI History

Historical period SWSI values establish the SWSI distribution to lookup recent and current SWSI values.

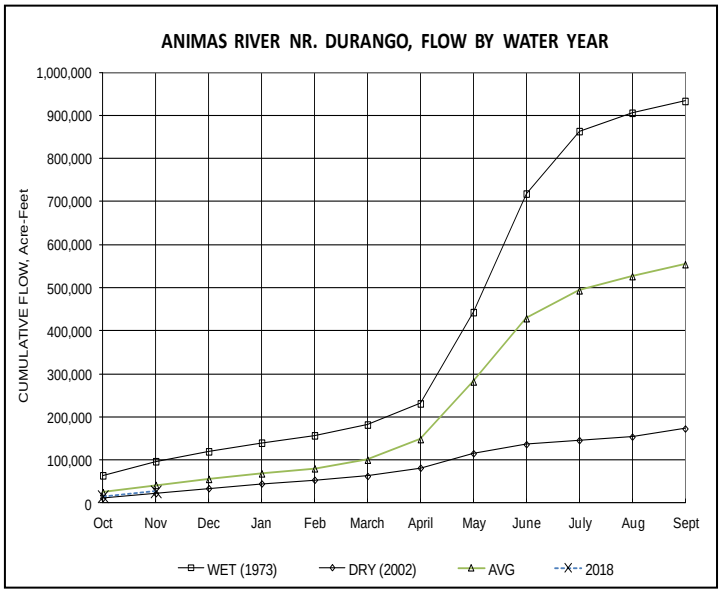


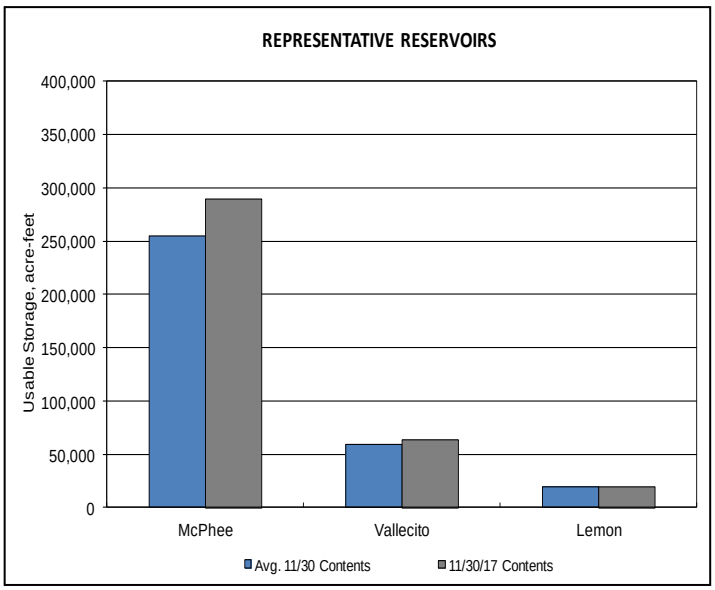
Basinwide Conditions Assessment

The SWSI value for the month was +1.7. Flow at the Animas River at Durango averaged 189 cfs (66% of average). The flow at the Dolores River at Dolores averaged 50 cfs (60% of average). The La Plata River at Hesperus averaged 5.3 cfs (51% of average). Precipitation in Durango was 0.14 inches for the month, 8.4% of the 30-year average of 1.66 inches. Precipitation was the 110th highest amount recorded in November, in Durango, out of 123 years of record. Precipitation to date in Durango, for the water year, is 0.34 inches, 10% of the 30-year average of 3.34 inches. End of last month precipitation to date, for the water year was 10% of average. The average high and low temperatures for the month of November in Durango were 61o and 28o. In comparison, the 30-year average high and low for the month is 52o and 24o. At the end of the month Vallecito Reservoir contained 64,010 acre-feet compared to its average content of 54,339 acre-feet (118% of average). McPhee Reservoir was up to 289,297 acre-feet compared to its average content of 259,411 (112% of average), while Lemon Reservoir was up to 19,220 acre-feet as compared to its average content of 19,499 acre-feet (99% of average).

Outlook

Precipitation (0.14 inches) was well below average for November 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 93 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 63 out of 108 years of record where the total flow past the Dolores stream gauge was more than this year and 85 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.