NRCS
Natural Resources Conservation Service

Utah Climate and Water Report

December, 2011

View of Uinta Mountains from Buck Pasture Aerial Marker, Utah

Photo by Shane Miller, USDA-NRCS

Utah Climate and Water Report

The purpose of the Climate and Water Report is to provide a snapshot of current and immediate past climatic conditions and other information useful to agricultural and water user interests in Utah. The report utilizes data from several sources that represent specific parameters (streamflow data from the United States Geological Survey, reservoir data from the Bureau of Reclamation, and other sources), geography including high elevation United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) Snowpack Telemetry (SNOTEL) data, and agriculturally important data from the USDA-NRCS Soil Climate Analysis Network (SCAN). Data on precipitation, soil moisture, soil temperature, reservoir storage, and streamflow are analyzed and presented. These data analyses can be used to increase irrigation efficiency and agricultural production. As with all data and analyses, there are limitations due to data quality, quantity, and spatial application.

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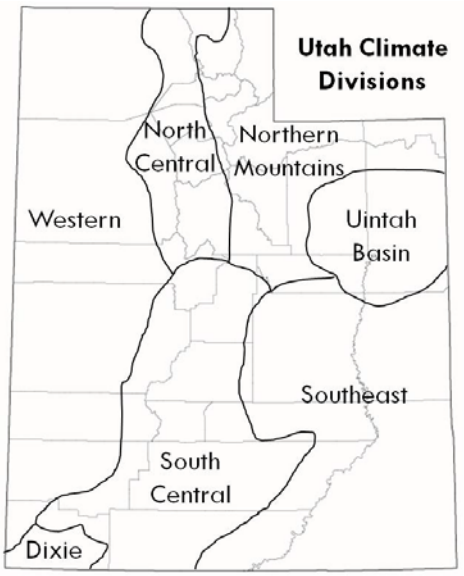
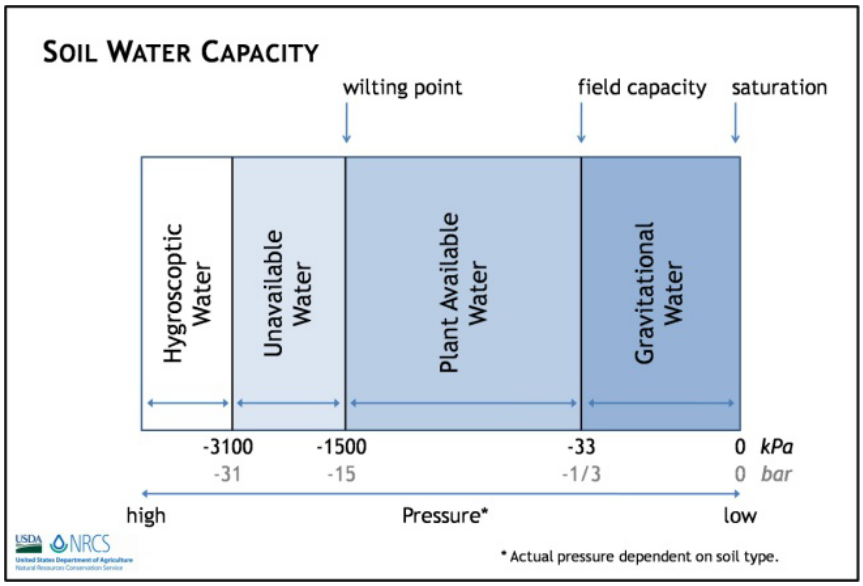
Climate and Water Information

Soil Climate Analysis Network

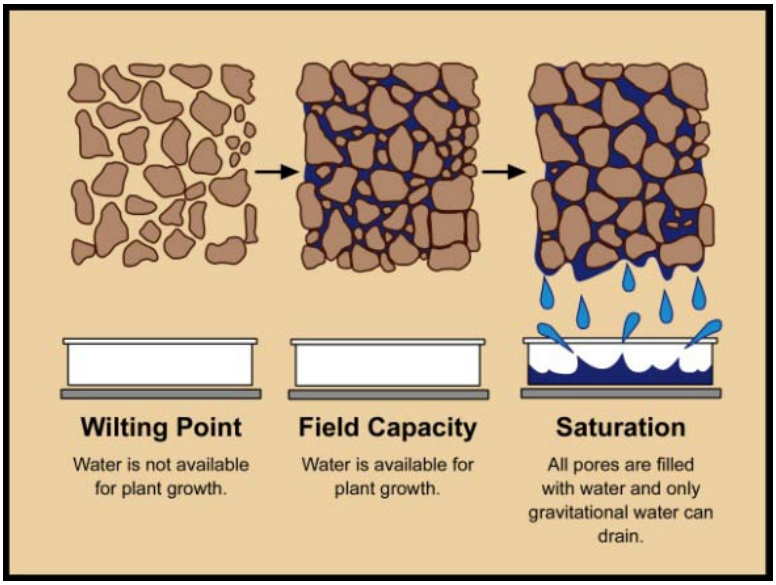
Soil Climate Analysis Network (SCAN) stations are primarily located on low- to mid-elevation, agriculturally important landscapes that maintain representative soils. Elevations range from 3,000 to 7,000 ft. The SCAN network provides real-time soil moisture and temperature data coupled with additional climate information for use in natural resource planning, drought assessment, water resource management, and resource inventory. Stations are situated on non-irrigated, native soils, are remotely located, and collect hourly atmospheric and soils data that are available to the public online.

In order to summarize SCAN data, the 35 sites in Utah are grouped by climate divisions (North Central, Northern Mountains, Uintah Basin, Southeast, South Central, Dixie, and Western).





Explanation of soil water capacity definitions. Field capacity (FC) and wilting point (WP) are calculated in the laboratory for each soil horizon. The amount of water held between field capacity and wilting point is plant available.



Visual explanation of soil water capacity definitions.

http://www.wcc.nrcs.usda.gov/scan/Utah/utah.html

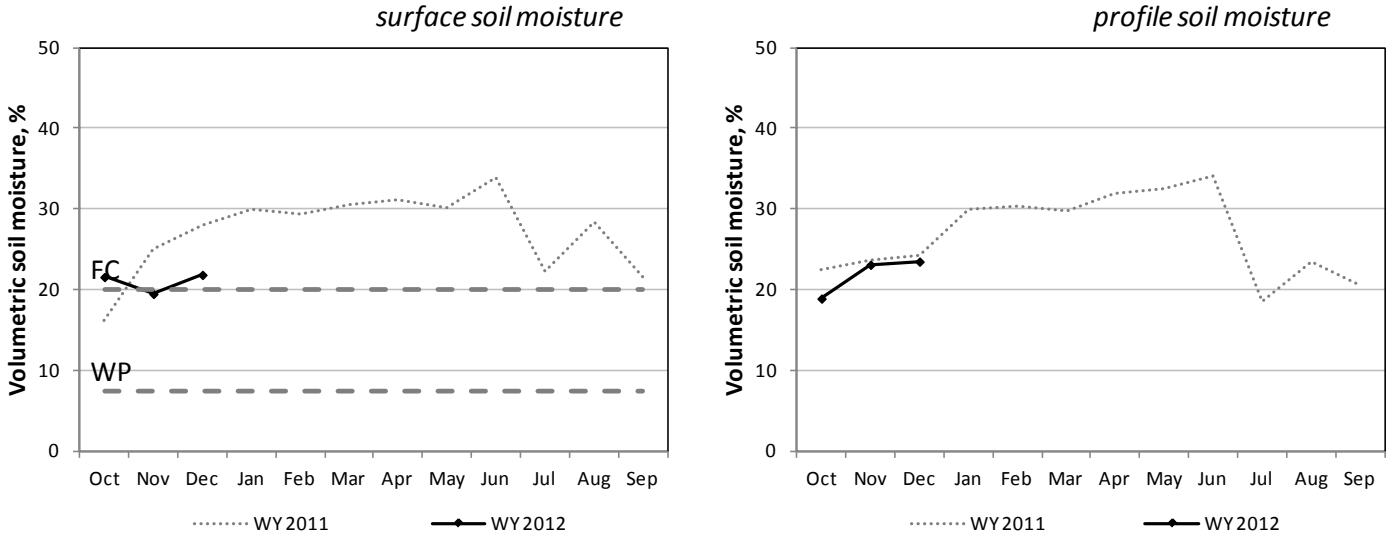
North Central

Soil Climate Analysis Network (SCAN)

Site name	County	Precip to Date*	Monthly Precip	Avg Air Temp	Soil Moisture					Soil Temperature				
					2"	4"	8"	20"	40"	2"	4"	8"	20"	40"
		in.	*in.*	*°F*	*volume %*					*°F*				
NORTH CENTRAL														
Blue Creek	*Box Elder*	2.6	0.3	33	27	24	22	22	20	32	34	35	39	45
Cache Junction	*Cache*	3.5	1.8	31	27	33	25	23	27	32	34	35	40	45
Grantsville	*Tooele*	2.2	1.2	34	10	3	21	27	26	37	39	42	49	56

*since October 1, 2011. Monthly Precip is the amount of precipitation accumulated in the past month and Avg Air Temp is the average air temperature measured at the SCAN station. Soil moisture and temperature values reflect conditions measured on the first of the month.

North Central



Surface soil moisture is the weighted mean of the water content measured at depths of 2, 4, and 8 inches. **FC** is the mean field capacity, **WP** is the mean permanent wilting point for the soil surface (0 to 12 inches) at SCAN sites within the region, and **WY** is the water year lasting October through September. *Profile soil moisture* is the weighted mean of water content measured at depths of 2, 4, 8, 20, and 40 inches.

Additional data available at the SCAN website, including: hourly air temperature, relative humidity, wind speed, wind direction, barometric pressure, precipitation, solar radiation, soil temperature, and soil moisture.

http://www.wcc.nrcs.usda.gov/scan/Utah/utah.html

Northern Mountains

Soil Climate Analysis Network (SCAN)

Site name	County	Precip to Date*	Monthly Precip	Avg Air Temp	Soil Moisture					Soil Temperature				
					2"	4"	8"	20"	40"	2"	4"	8"	20"	40"
		in.	*in.*	*°F*	*volume %*					*°F*				
NORTHERN MOUNTAINS														
Chicken Ridge	*Morgan*	2.1	0.9	-22	6	9	11	6	11	39	37	38	33	33
Buffalo Jump	*Rich*	1.4	0.8	29	8	9	11	7	-	32	32	33	38	-
Morgan	*Morgan*	2.8	2.0	30	22	20	22	13	7	35	35	36	38	40

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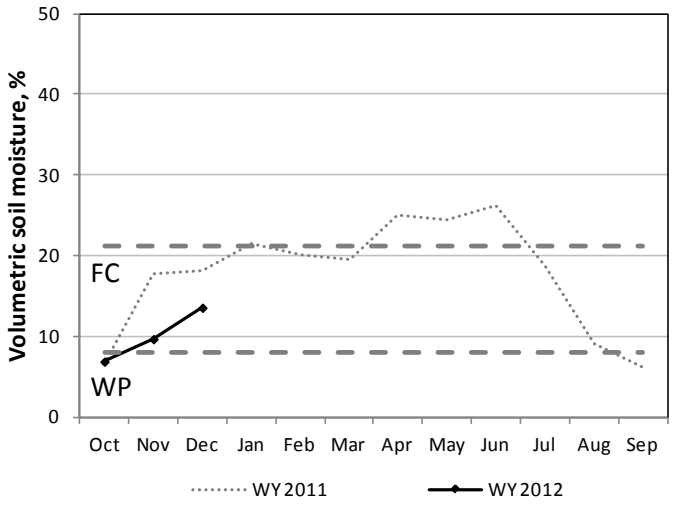
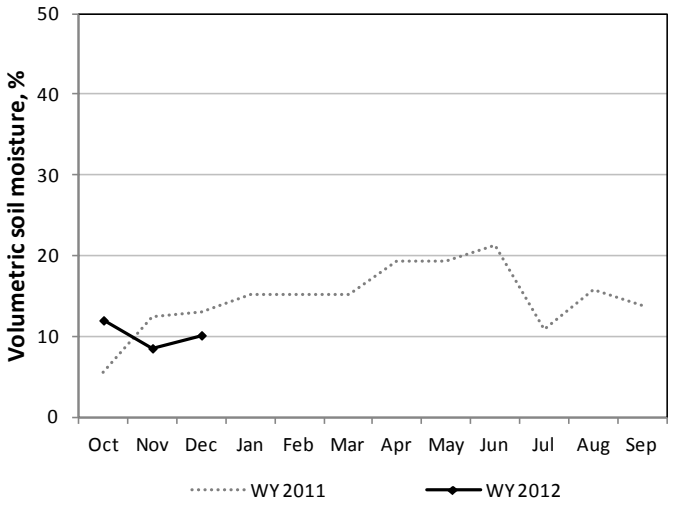
Northern Mountains

surface soil moisture



profile soil moisture



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Additional data available at the SCAN website, including: hourly air temperature, relative humidity, wind speed, wind direction, barometric pressure, precipitation, solar radiation, soil temperature, and soil moisture.

http://www.wcc.nrcs.usda.gov/scan/Utah/utah.html

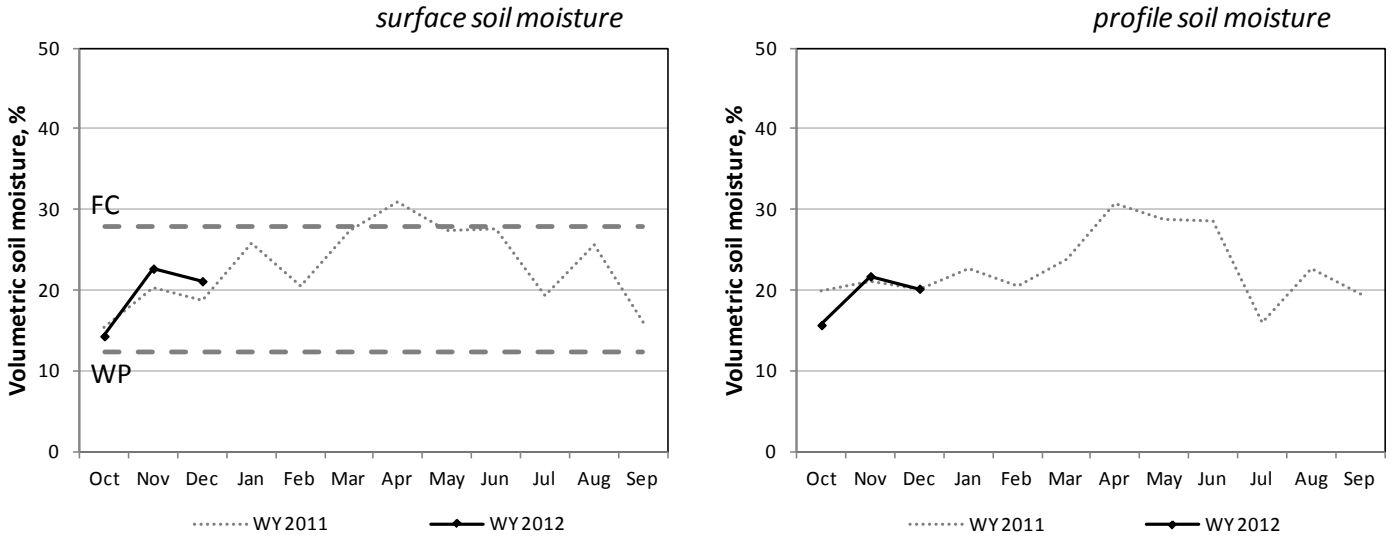
Uintah Basin

Soil Climate Analysis Network (SCAN)

Site name	County	Precip to Date*	Monthly Precip	Avg Air Temp	Soil Moisture					Soil Temperature				
					2"	4"	8"	20"	40"	2"	4"	8"	20"	40"
		in.	*in.*	*°F*	*volume %*					*°F*				
UINTAH BASIN														
Mountain Home	*Duchesne*	2.4	0.4	32	25	32	26	18	11	32	33	34	37	41
Little Red Fox	*Duchesne*	1.7	0.2	31	4	23	27	31	38	34	34	35	38	43
Split Mountain	*Uintah*	2.0	0.6	32	11	21	16	10	11	31	32	33	39	45

*since October 1, 2011. Monthly Precip is the amount of precipitation accumulated in the past month and Avg Air Temp is the average air temperature measured at the SCAN station. Soil moisture and temperature values reflect conditions measured on the first of the month.

Uintah Basin



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Additional data available at the SCAN website, including: hourly air temperature, relative humidity, wind speed, wind direction, barometric pressure, precipitation, solar radiation, soil temperature, and soil moisture.

http://www.wcc.nrcs.usda.gov/scan/Utah/utah.html

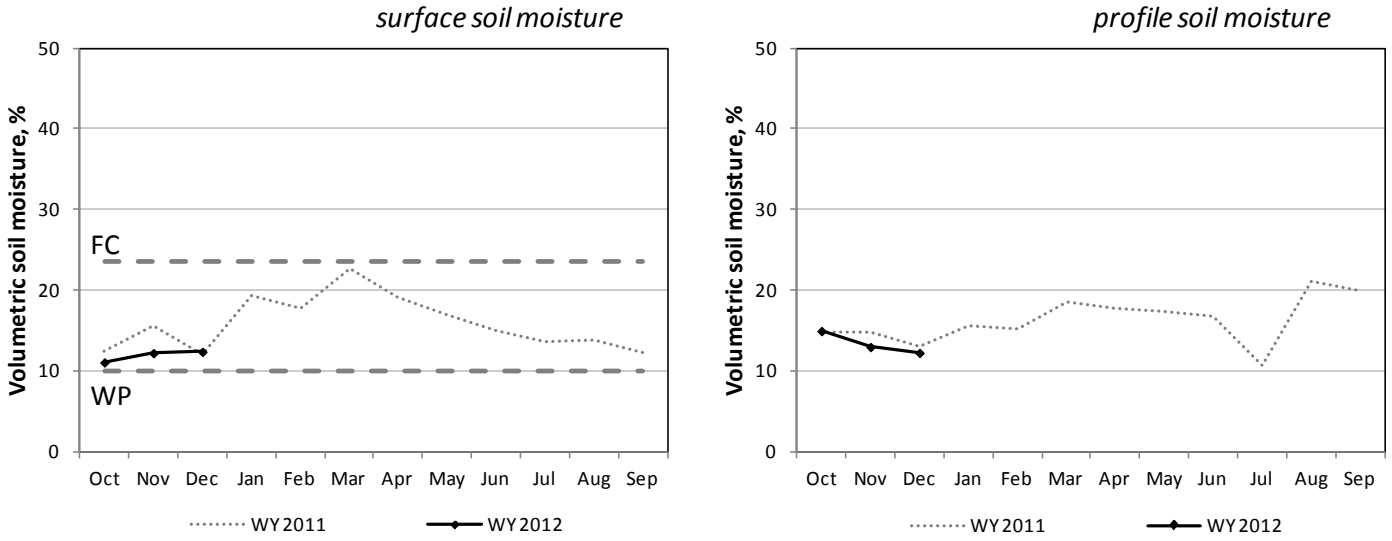
Southeast

Soil Climate Analysis Network (SCAN)

Site name	County	Precip to Date*	Monthly Precip	Avg Air Temp	Soil Moisture					Soil Temperature				
					2"	4"	8"	20"	40"	2"	4"	8"	20"	40"
		in.	*in.*	*^{o}F*	*volume %*					*^{o}F*				
SOUTHEAST														
Price	*Carbon*	1.7	0.1	36	1	14	17	14	17	37	39	39	41	46
Green River	*Emery*	1.2	0.2	35	9	10	8	3	7	39	38	38	41	48
Harm's Way	*San Juan*	0.0	0.7	38	8	3	12	13	6	37	34	38	40	45
West Summit	*San Juan*	1.6	0.9	36	14	18	17	14	17	31	31	34	37	42
Eastland	*San Juan*	2.7	1.2	37	21	19	16	21	20	34	35	36	40	44
Alkali Mesa	*San Juan*	2.5	1.0	40	10	13	14	17	12	35	33	38	42	46
McCracken Mesa	*San Juan*	1.6	0.6	40	14	17	14	14	12	38	41	41	46	52

*since October 1, 2011. Monthly Precip is the amount of precipitation accumulated in the past month and Avg Air Temp is the average air temperature measured at the SCAN station. Soil moisture and temperature values reflect conditions measured on the first of the month.

Southeast



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http://www.wcc.nrcs.usda.gov/scan/Utah/utah.html

South Central

Soil Climate Analysis Network (SCAN)

Site name	County	Precip to Date*	Monthly Precip	Avg Air Temp	Soil Moisture					Soil Temperature				
					2"	4"	8"	20"	40"	2"	4"	8"	20"	40"
		in.	*in.*	*°F*	*volume %*					*°F*				
SOUTH CENTRAL														
Nephi	*Juab*	2.9	1.1	35	22	24	19	7	0	37	37	38	42	47
Ephraim	*Sanpete*	1.2	0.3	32	10	13	16	15	33	35	37	38	41	47
Holden	*Millard*	1.8	0.4	35	4	7	5	13	13	37	38	38	42	49
Milford	*Beaver*	1.4	0.2	36	17	21	14	26	16	37	39	40	44	50
Manderfield	*Beaver*	2.4	0.5	36	3	15	11	10	5	32	36	38	40	44
Circleville	*Piute*	1.2	0.2	35	22	9	9	8	7	34	33	35	41	-148
Panguitch	*Garfield*	1.5	0.3	29	7	16	12	19	35	29	30	31	37	44
Cave Valley	*Washington*	3.3	1.1	37	1	6	6	5	6	34	36	38	40	42
Vermillion	*Kane*	1.7	0.4	41	0	2	2	3	8	32	31	34	38	44
Spooky	*Kane*	1.7	0.8	42	4	7	3	12	2	40	40	41	44	48

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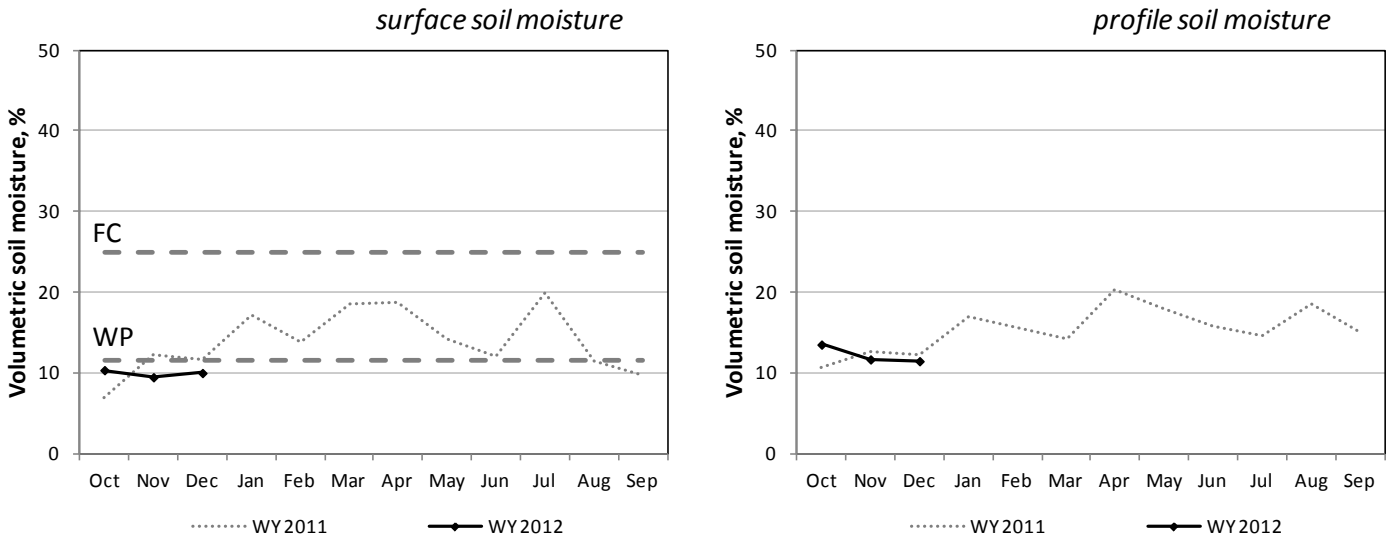
South Central



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http://www.wcc.nrcs.usda.gov/scan/Utah/utah.html

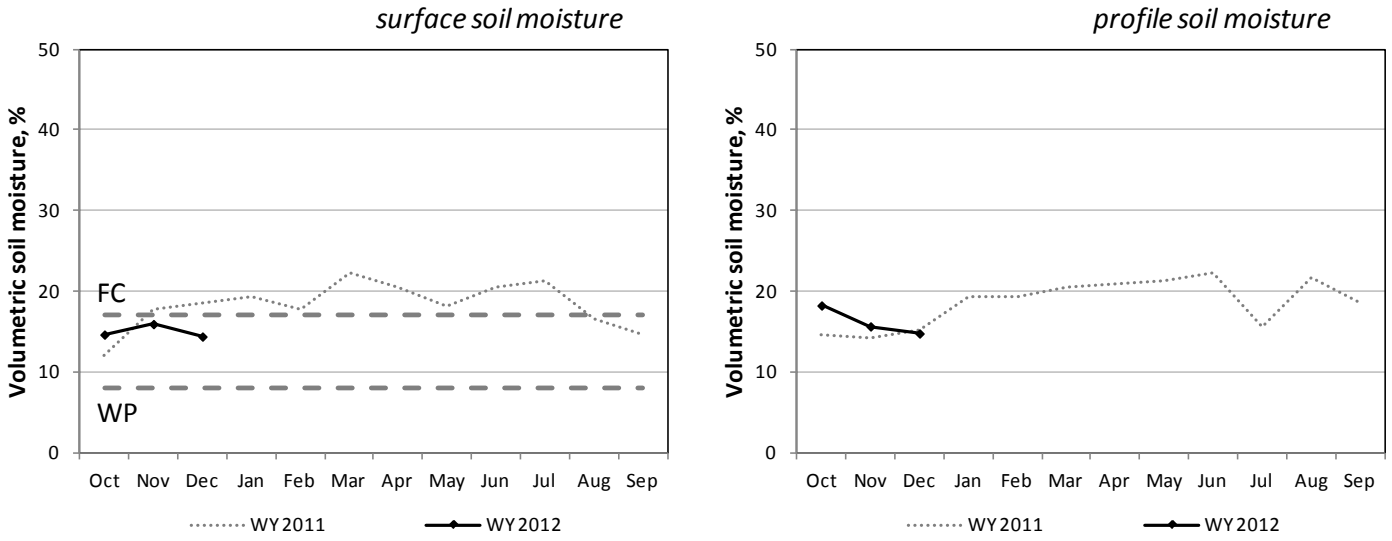
Western and Dixie

Soil Climate Analysis Network (SCAN)

Site name	County	Precip to Date*	Monthly Precip	Avg Air Temp	Soil Moisture					Soil Temperature				
					2"	4"	8"	20"	40"	2"	4"	8"	20"	40"
		in.	*in.*	*°F*	*volume %*					*°F*				
WESTERN														
Grouse Creek	*Box Elder*	2.2	0.6	29	2	13	11	15	16	29	33	36	39	44
Park Valley	*Box Elder*	4.0	2.9	33	1	6	11	24	25	32	35	38	42	48
Goshute	*Tooele*	0.8	0.3	31	9	18	36	30	30	31	34	37	39	46
Dugway	*Tooele*	1.2	0.6	34	17	26	31	nd	12	34	36	37	43	46
Tule Valley	*Millard*	1.4	0.6	34	20	18	25	18	9	36	38	41	43	49
Hal's Canyon	*Millard*	1.7	0.2	35	0	8	11	9	8	36	37	38	43	49
Enterprise	*Washington*	2.0	0.7	40	7	21	19	13	15	38	41	41	43	50
DIXIE														
Sand Hollow	*Washington*	1.7	0.4	47	2	4	0	1	0	42	45	46	47	54

*since October 1, 2011, (nd) no data. Monthly Precip is the amount of precipitation accumulated in the past month and Avg Air Temp is the average air temperature measured at the SCAN station. Soil moisture and temperature values reflect conditions measured on the first of the month.

Western & Dixie



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http://www.wcc.nrcs.usda.gov/scan/Utah/utah.html

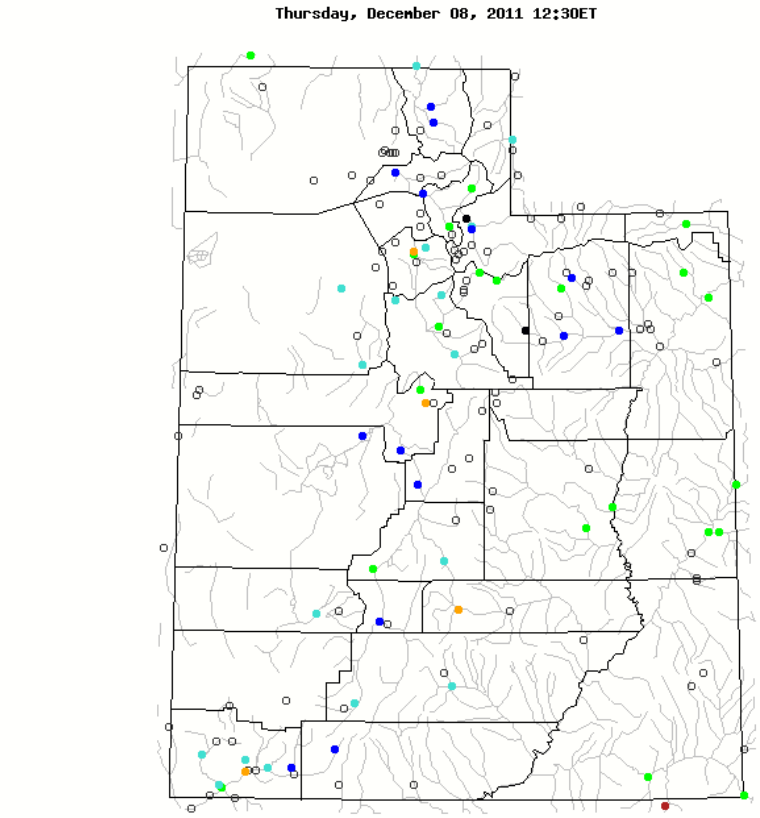
Utah Hydrologic Summary

December 1, 2011

Current Conditions

Soil moisture is below average in northern Utah, above average in the south and much lower than the record high values seen last year. Precipitation in northern Utah ranged from below to near normal (81%-94%) and was below normal in southern Utah (64%-84%) for November. Snowpack's across the state are currently below normal. Reservoir storage is exceptionally high (84% of capacity compared to 63% last year) across the state with many reservoirs capable of filling prior to next year's snowmelt runoff. Current streamflow is average to well above average across the state. The climate outlook for this winter given the existing La Nina is for average to above snowpack's in northern Utah and likely much dryer conditions in southern Utah. All things considered – good soil moisture and excellent reservoir storage – the water supply outlook across the state is very good.

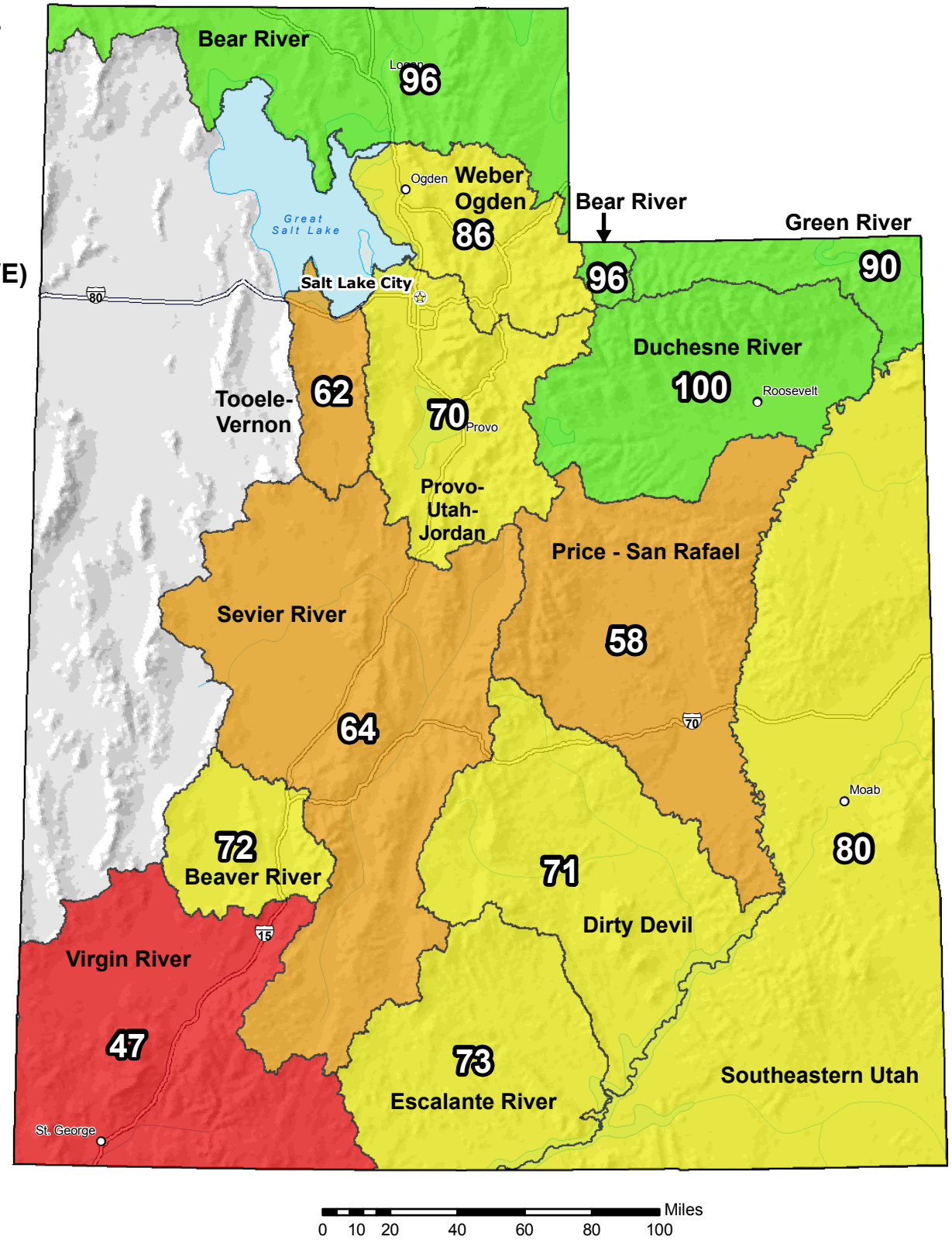
Current Utah Streamflow - Courtesy US Geological Survey



Explanation - Percentile classes							
Low	<10 Much below normal	10-24 Below normal	25-75 Normal	76-90 Above normal	>90 Much above normal	High	Not ranked

Utah
SNOTEL Current Snow Water Equivalent (SWE)
% of Normal

Dec 01, 2011



Snow Water Equivalent (SWE) Basin-wide Percent of 1971-2000 Normal

- 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

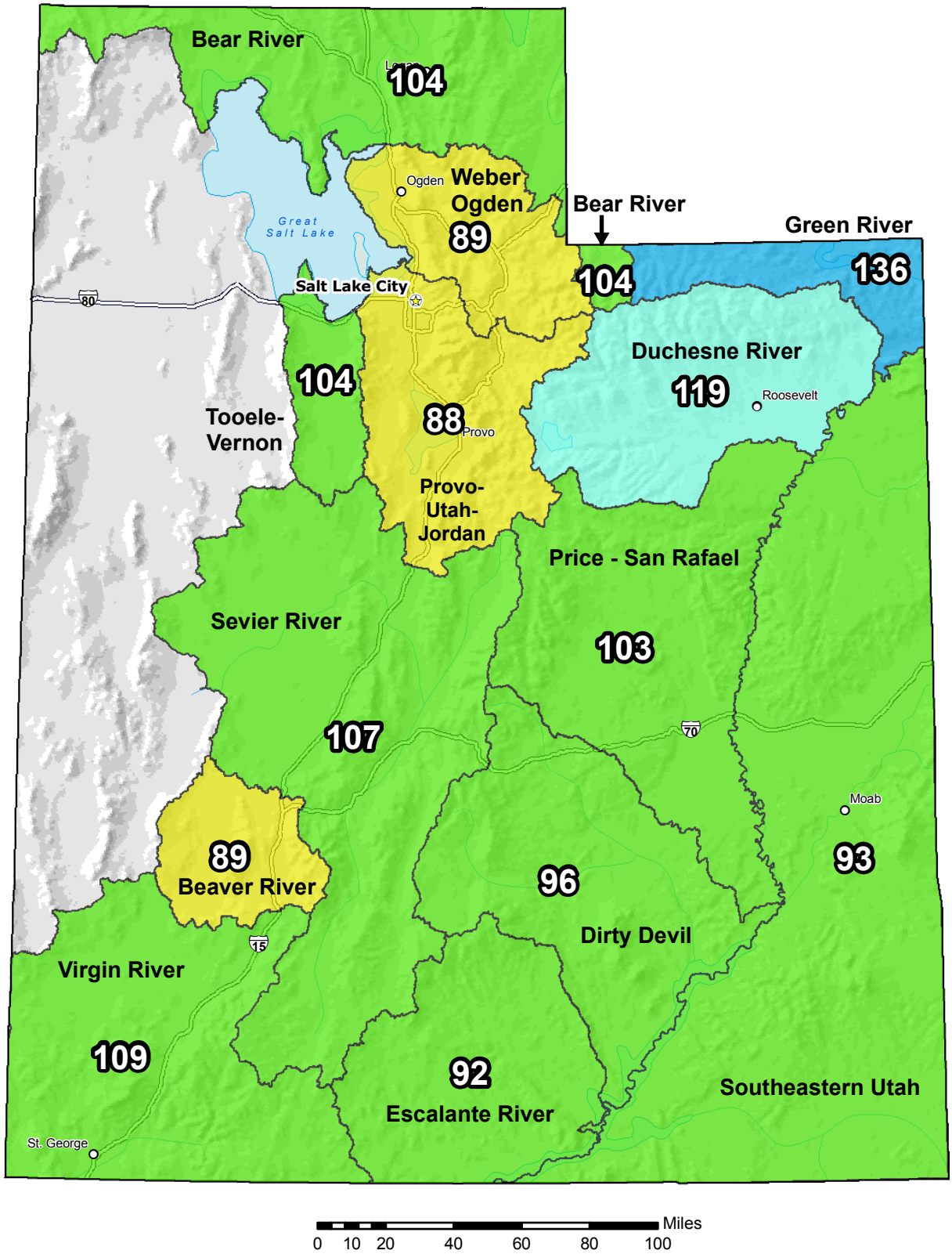
USDA NRCS

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 the USDA/NRCS National Water and Climate Center
Portland, Oregon http://www.wcc.nrcs.usda.gov/gis/
Based on data from http://www.wcc.nrcs.usda.gov/reports/
Science contact: Jim.Marron@por.usda.gov 503 414 3047

Utah
SNOTEL Water Year (Oct 1) to Date Precipitation
% of Normal

Dec 01, 2011



Water Year (Oct 1) to Date Precipitation Basin-wide Percent of 1971-2000 Normal

- 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

USDA NRCS

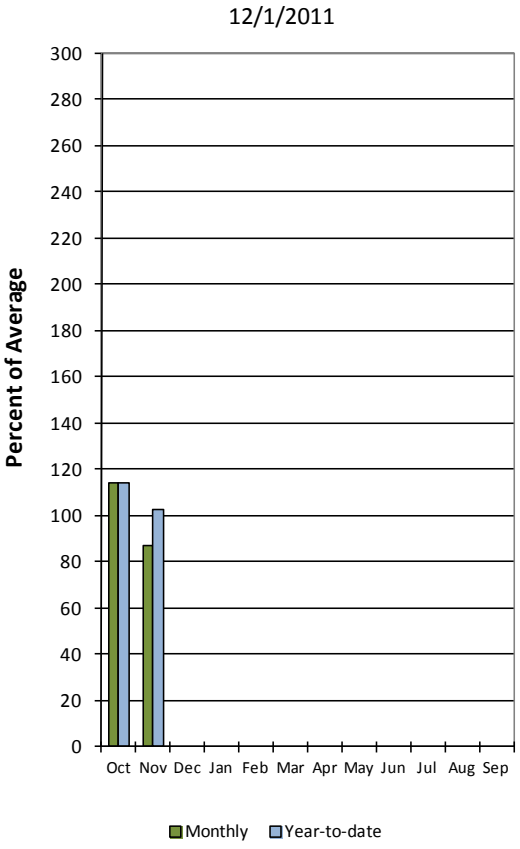
The water year to date precipitation percent of normal represents the accumulated precipitation found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 00:00).

Prepared by the USDA/NRCS National Water and Climate Center
Portland, Oregon http://www.wcc.nrcs.usda.gov/gis/
Based on data from http://www.wcc.nrcs.usda.gov/reports/
Science contact: Jim.Marron@por.usda.gov 503 414 3047

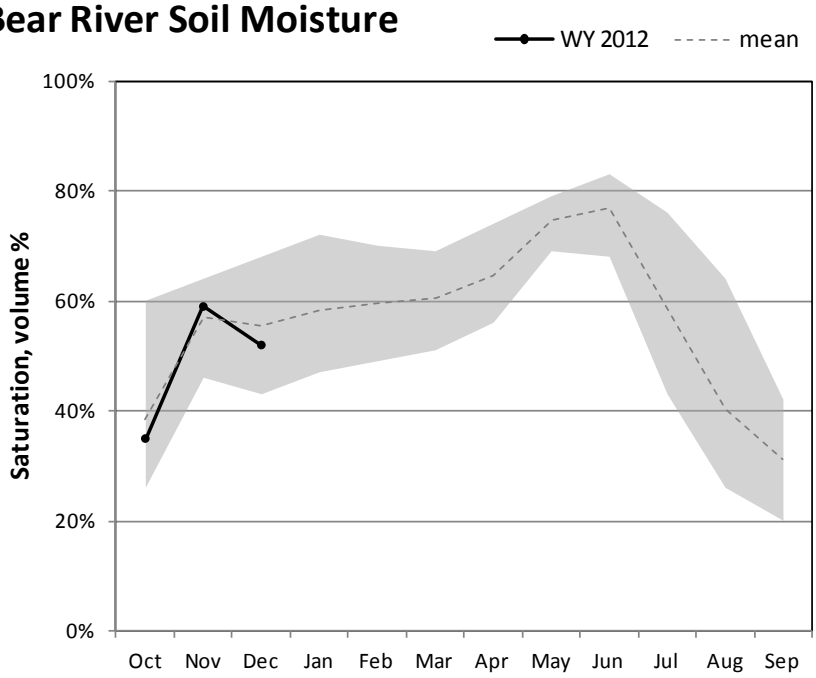
Bear River Basin
December 1, 2011

Precipitation in November was below average at 87%. Reservoir storage is near average at 76% of capacity, which is 43% higher than this time last year. Soil moisture is at 52% compared to 66% last year.

Bear River Precipitation

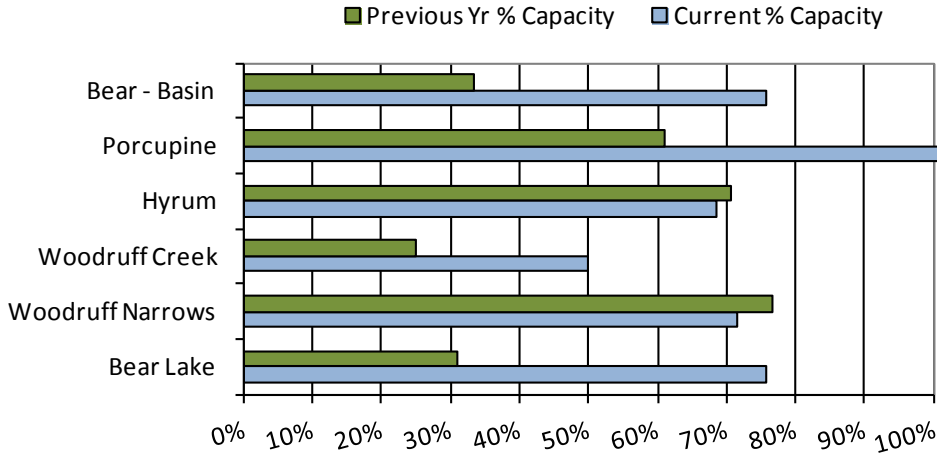


Bear River Soil Moisture



Percent saturation is calculated using the weighted average of volumetric soil moisture content at 2, 8, and 20-inch depths. Saturation is estimated as 40% volumetric water content. The gray area represents the range in saturation values since 2005.

December Bear River Reservoir Storage

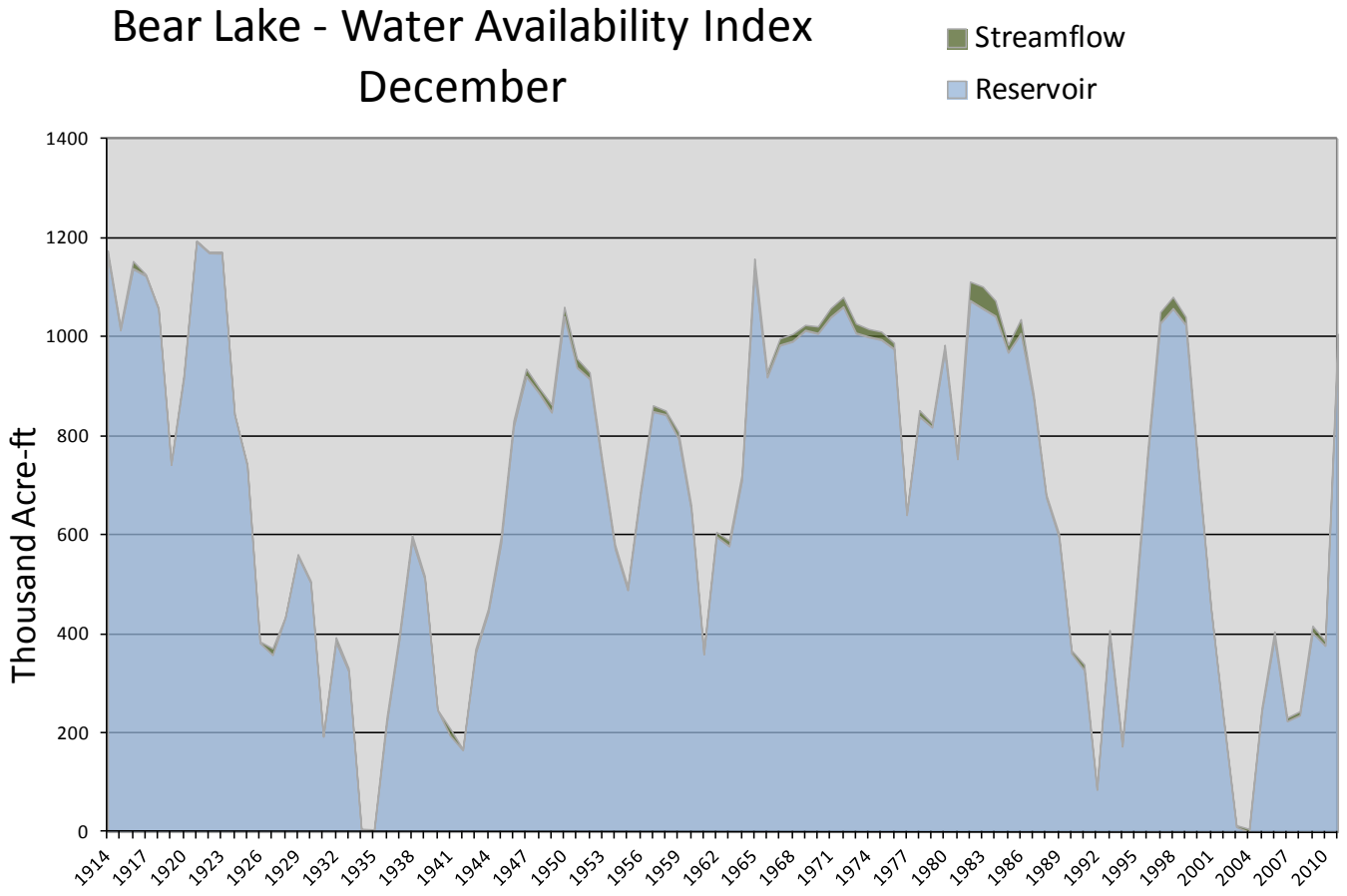


December 1, 2011

Water Availability Index

Basin or Region	November EOM* Bear Lake	November accumulated inflow to Bear Lake (*observed*)	Reservoir + Streamflow	WAI#	Percentile	Years with similar WAI
	*KAF^*	*KAF*	*KAF*		*%*	
Bear River	**985**	**20.5**	**1006**	**2.06**	**75**	**67, 68, 75, 74**

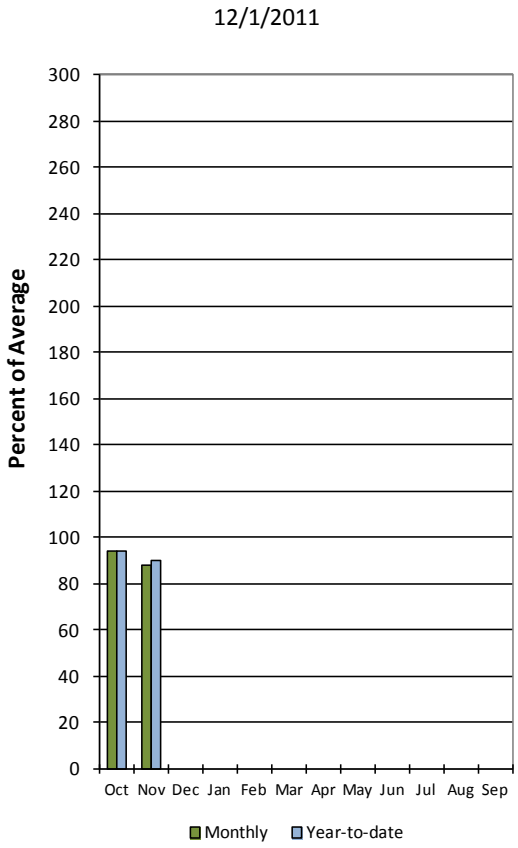
**EOM, end of month; # WAI, water availability index; ^KAF, thousand acre-feet.*



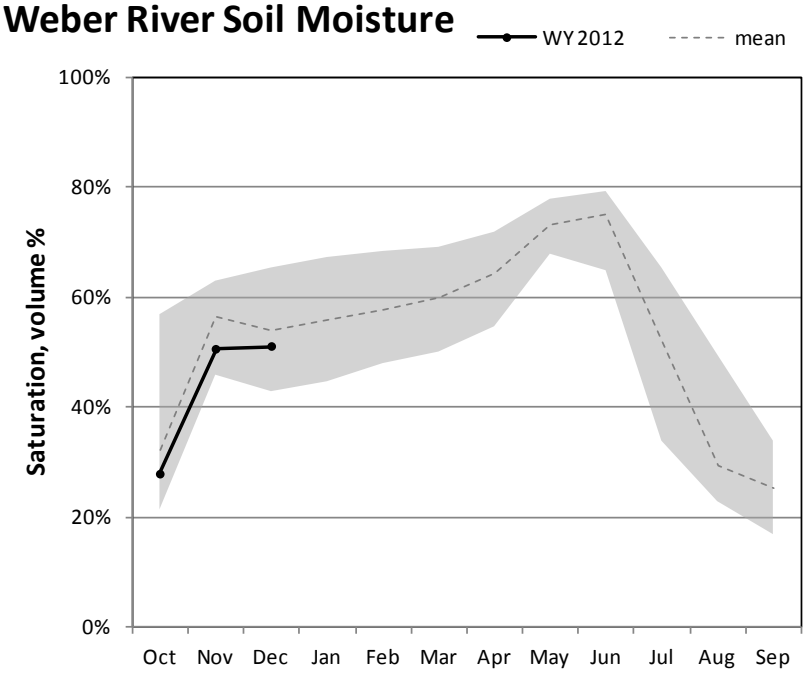
Weber and Ogden River Basin
December 1, 2011

Precipitation in November was below average at 88%. Reservoir storage is at 80% of capacity, which is 10% higher than this time last year. Soil moisture is at 51% compared to 66% last year.

Weber River Precipitation



Weber River Soil Moisture



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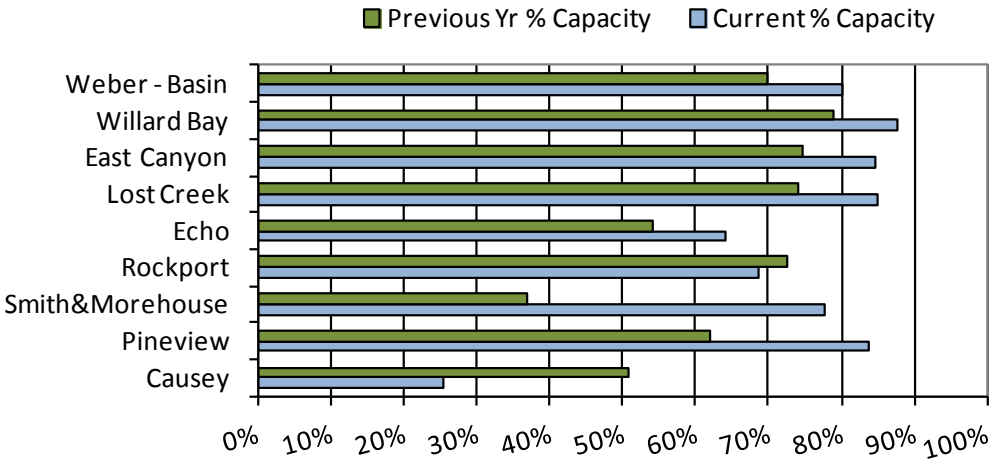
December Weber Basin Reservoir Storage

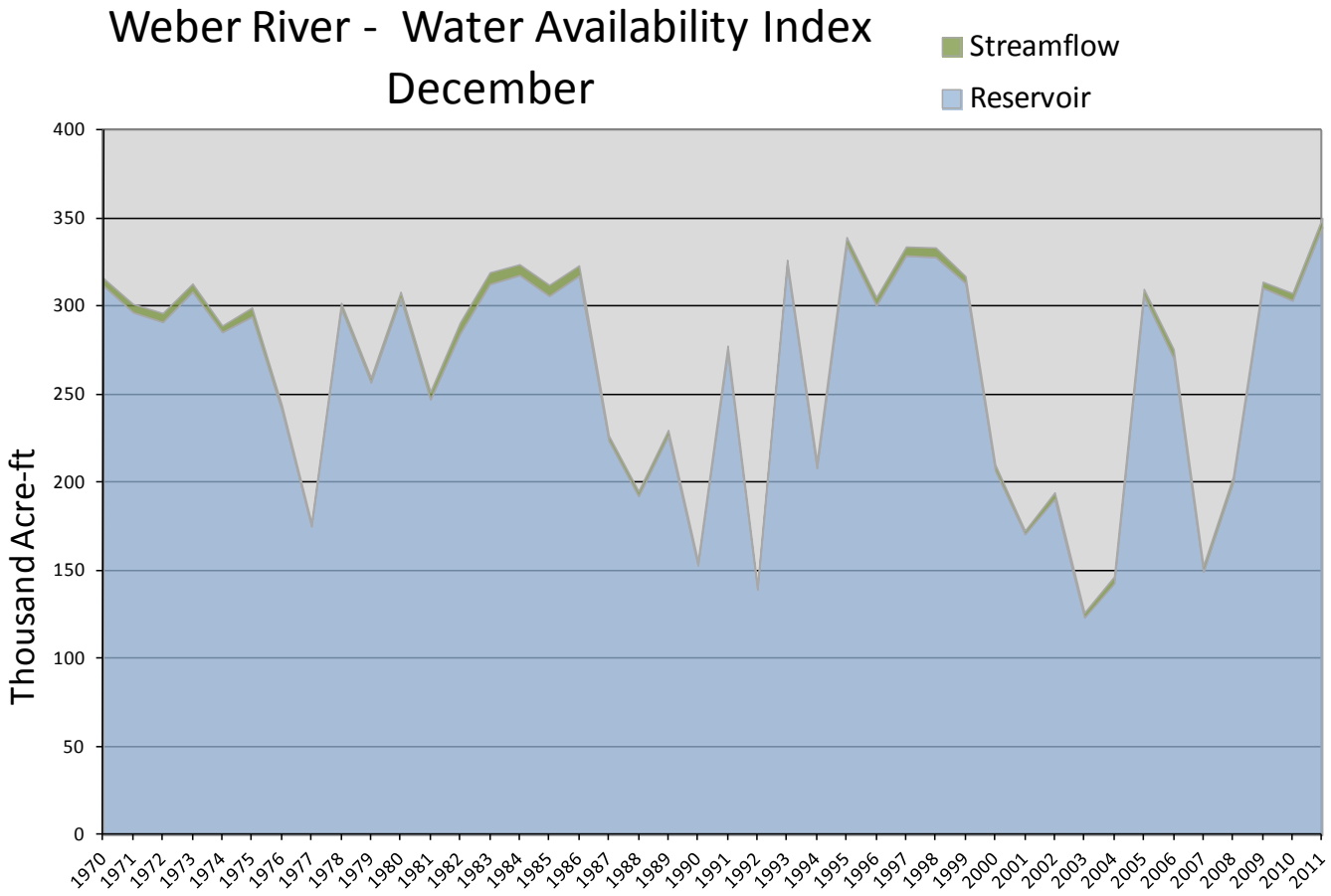


December 1, 2011

Water Availability Index

Basin or Region	November EOM* Reservoirs	November accumulated flow at Weber near Oakley (*observed*)	Reservoirs + Streamflow	WAI[#]	Percentile	Years with similar WAI
	*KAF^*	*KAF*	*KAF*		*%*	
Weber River	**345**	**5**	**350**	**3.97**	**98**	**93, 98, 97, 95**

**EOM, end of month; [#] WAI, water availability index; ^KAF, thousand acre-feet.*

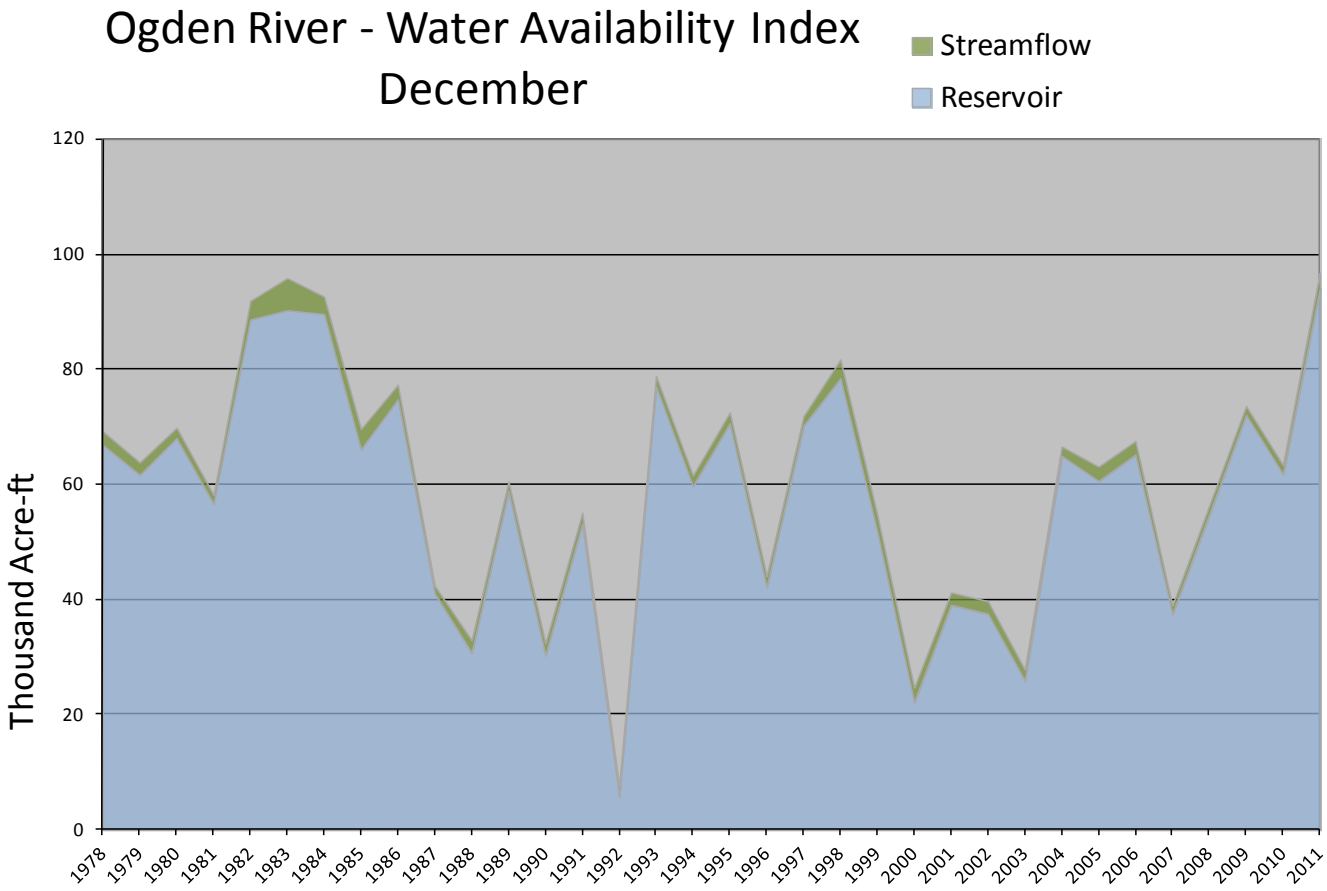


December 1, 2011

Water Availability Index

Basin or Region	November EOM* Pine View & Causey	November accumulated flow at South Fork Ogden (*observed*)	Reservoir + Streamflow	WAI#	Percentile	Years with similar WAI
	*KAF^*	*KAF*	*KAF*		*%*	
Ogden River	**94.0**	**2.7**	**96.7**	**3.93**	**97**	**98, 82, 84, 83**

**EOM, end of month; # WAI, water availability index; ^KAF, thousand acre-feet.*

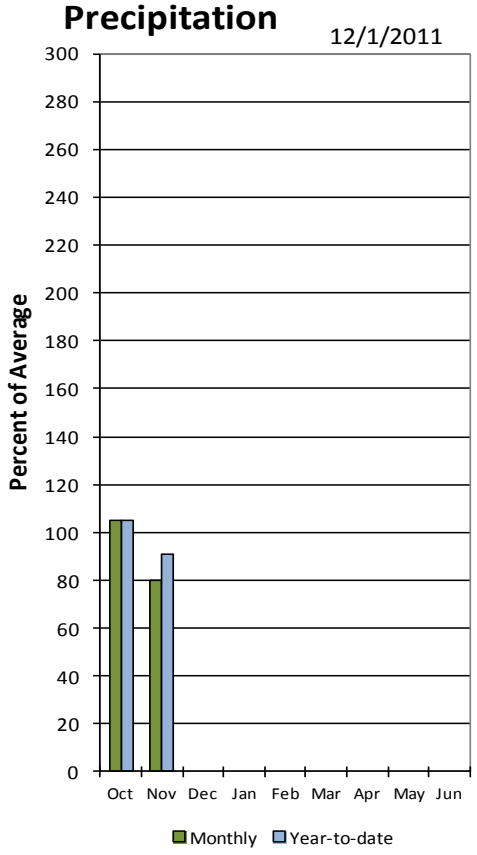


Utah Lake, Jordan River, & Tooele Valley Basins

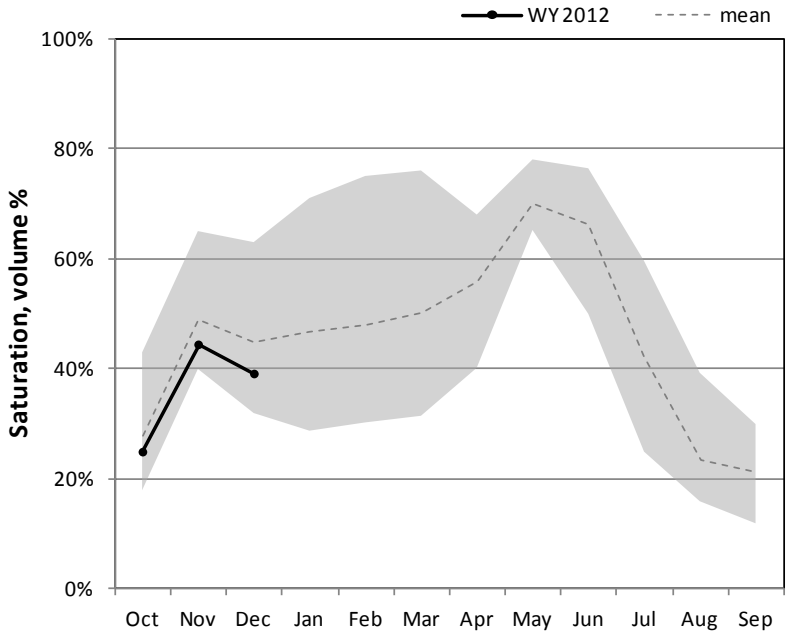
December 1, 2011

Precipitation in November was below average at 81%. Reservoir storage is at 92% of capacity, which is 6% more than this time last year. Soil moisture is at 39% compared to 53% last year at this time.

Jordan/Provo River Precipitation

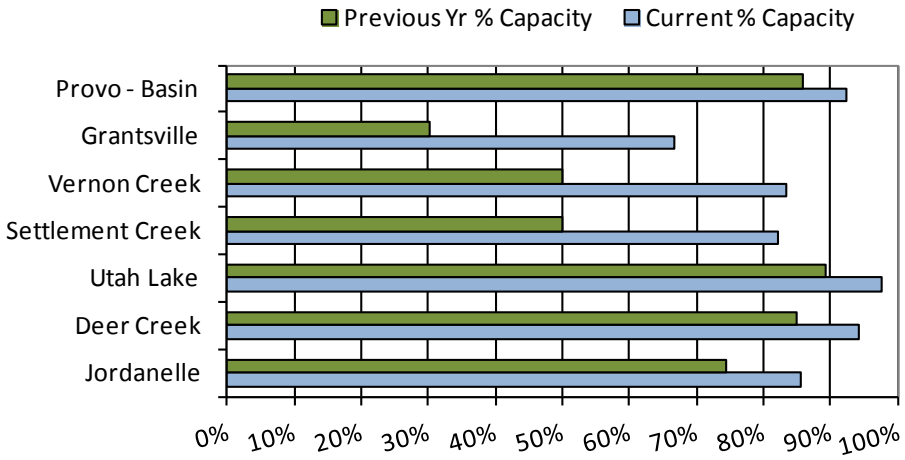


Jordan / Provo River Soil Moisture



Percent saturation is calculated using the weighted average of volumetric soil moisture content at 2, 8, and 20-inch depths. Saturation is estimated as 40% volumetric water content. The gray area represents the range in saturation values since 2005.

December Provo River Reservoir Storage

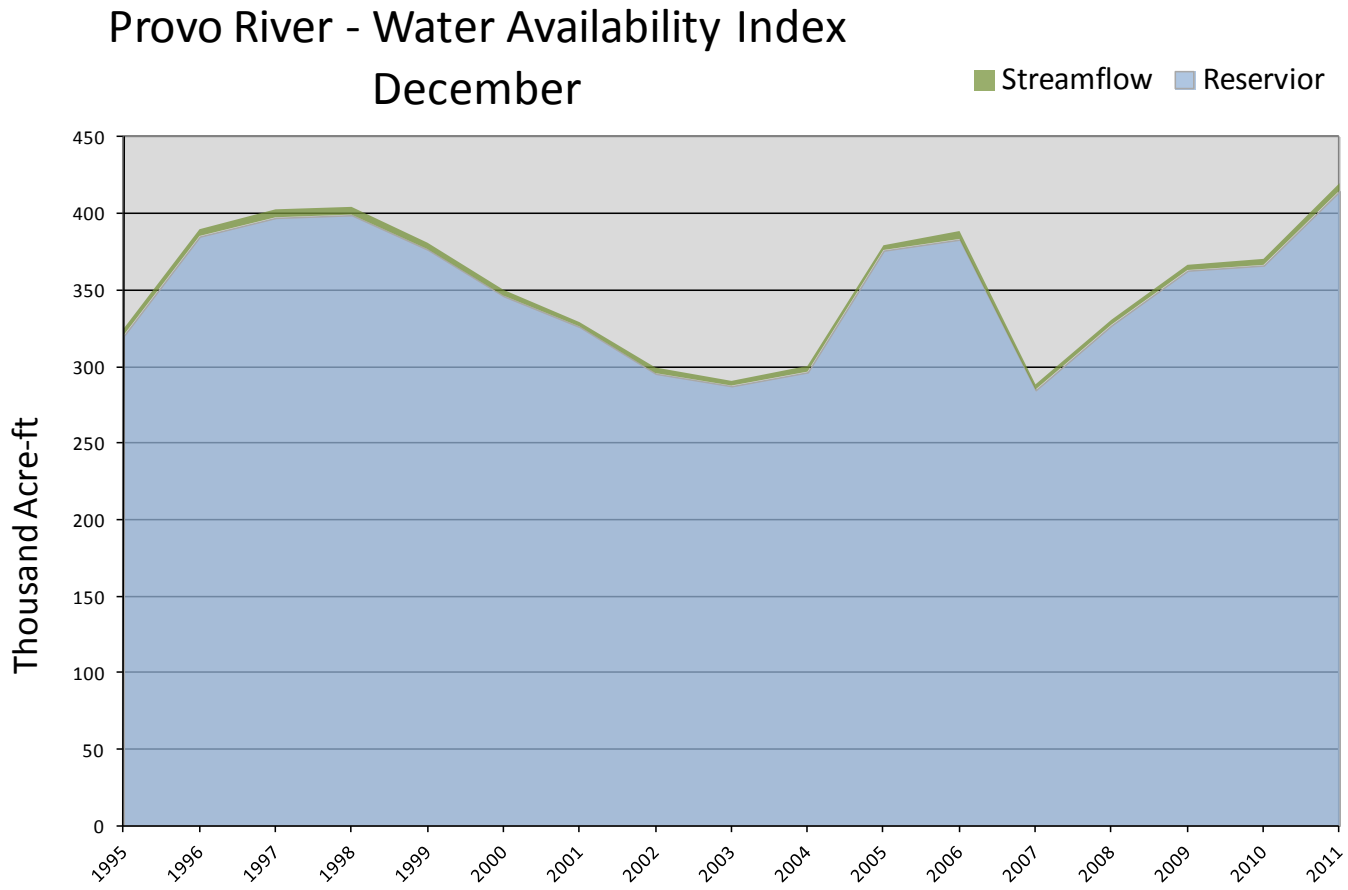


December 1, 2011

Water Availability Index

Basin or Region	November EOM* Deer Creek, Jordanelle	November accumulated flow Provo River at Woodland (*observed*)	Reservoir + Streamflow	WAI[#]	Percentile	Years with similar WAI
	*KAF^*	*KAF*	*KAF*		*%*	
Provo	**415**	**4.8**	**420**	**3.70**	**94**	**98, 97, 96, 06**

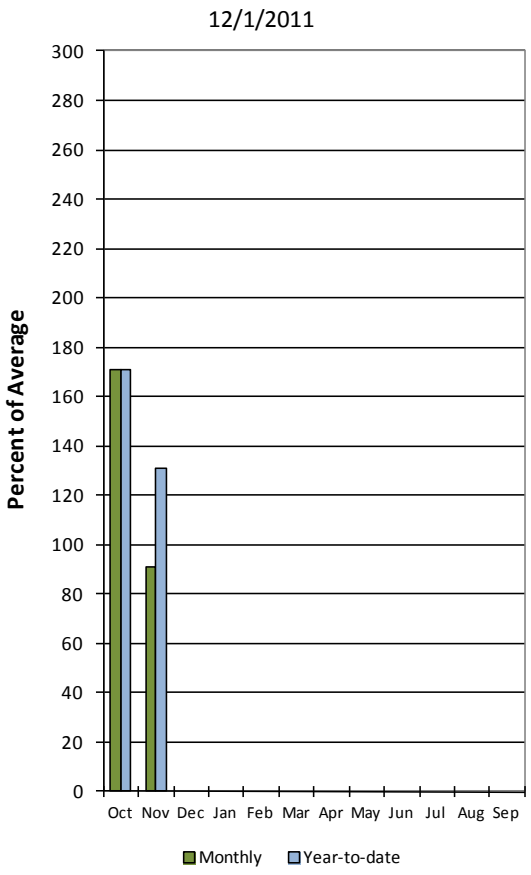
**EOM, end of month; [#] WAI, water availability index; ^KAF, thousand acre-feet.*



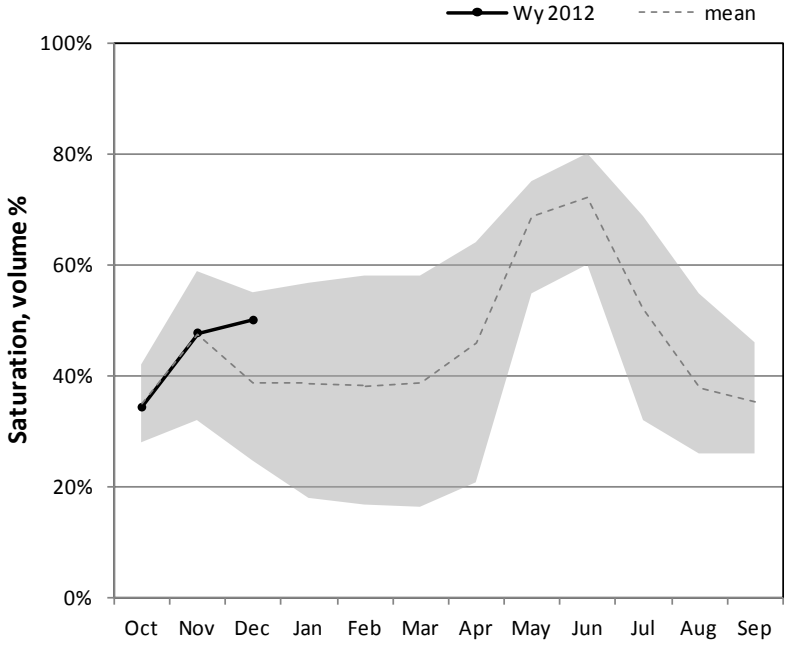
Uintah Basin and Dagget SCDs
December 1, 2011

Precipitation in November was average at 94%. Reservoir storage is at 86% of capacity, 3% higher than this time last year. Soil moisture is at 50% compared to 55% last year.

Uintah Precipitation

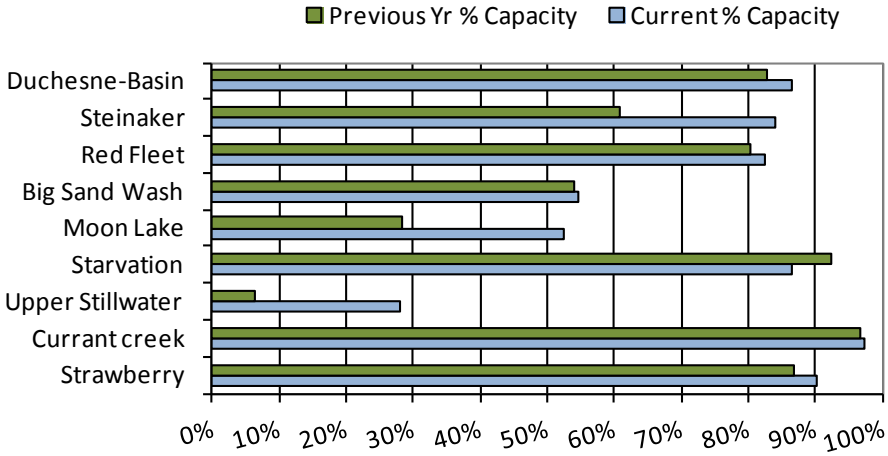


Uintah Basin Soil Moisture



Percent saturation is calculated using the weighted average of volumetric soil moisture content at 2, 8, and 20-inch depths. Saturation is estimated as 40% volumetric water content. The gray area represents the range in saturation values since 2005.

December Uintah Basin Reservoir Storage

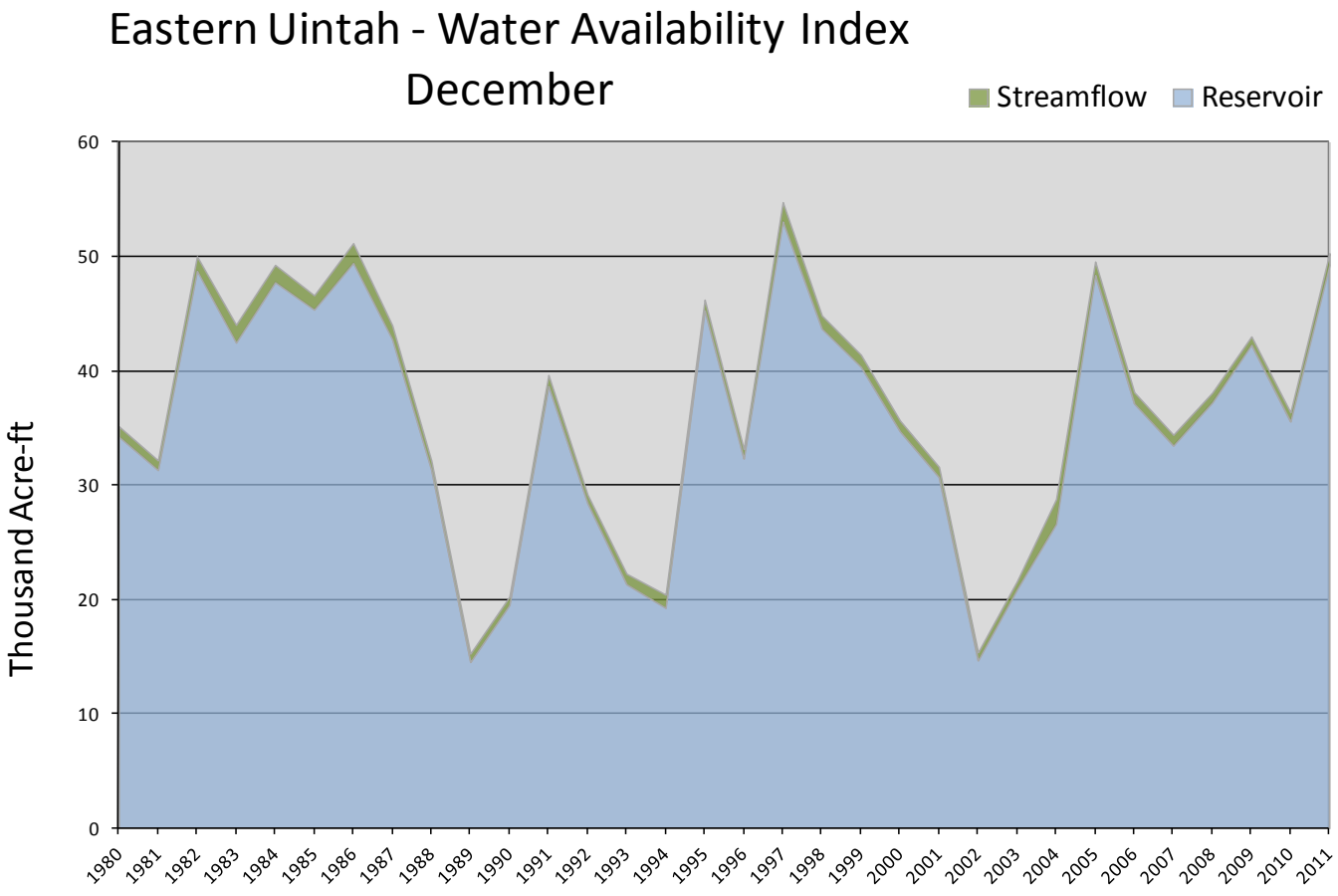


December 1, 2011

Water Availability Index

Basin or Region	November EOM* Red Fleet and Steinaker	November accumulated flow Big Brush Creek (*observed*)	Reservoir + Streamflow	WAI#	Percentile	Years with similar WAI
	*KAF^*	*KAF*	*KAF*		*%*	
Eastern Uintah	**49.3**	**1.0**	**50.3**	**3.41**	**91**	**05, 82, 86, 97**

**EOM, end of month; # WAI, water availability index; ^KAF, thousand acre-feet.*

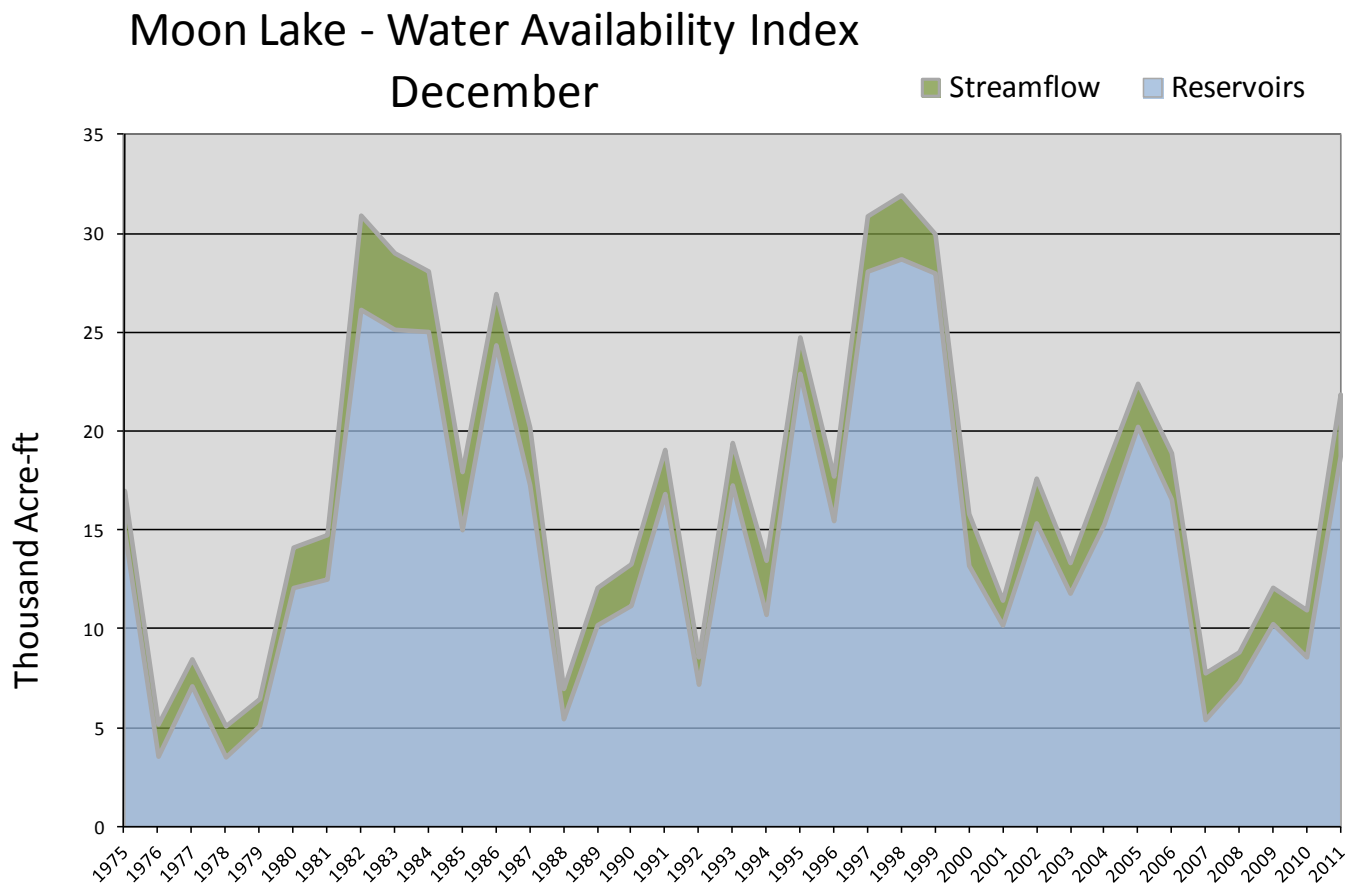


December 1, 2011

Water Availability Index

Basin or Region	November EOM* Moon Lake	November accumulated flow Lake Fork Creek above Moon Lake (*observed*)	Reservoir + Streamflow	WAI#	Percentile	Years with similar WAI
	*KAF^*	*KAF*	*KAF*		*%*	
Moon Lake	**18.8**	**3.1**	**21.9**	**1.97**	**74**	**93, 87, 05, 95**

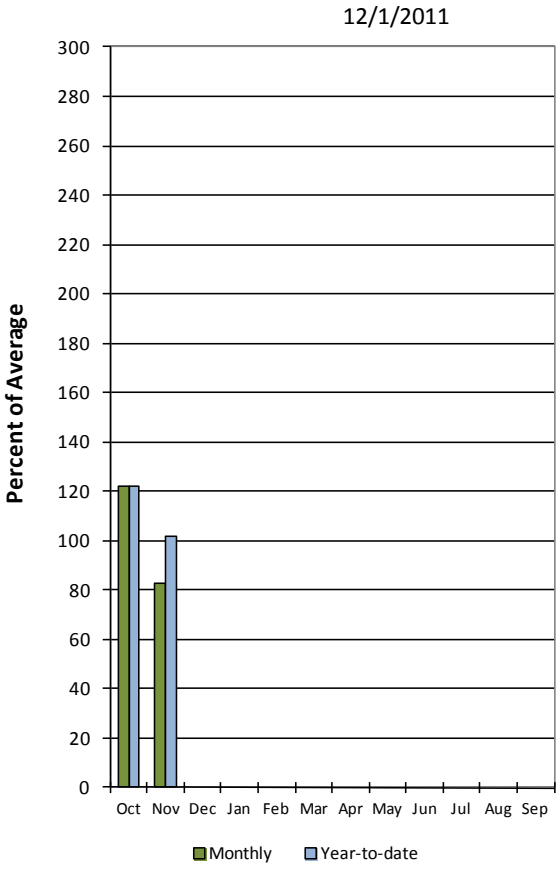
**EOM, end of month; # WAI, water availability index; ^KAF, thousand acre-feet.*



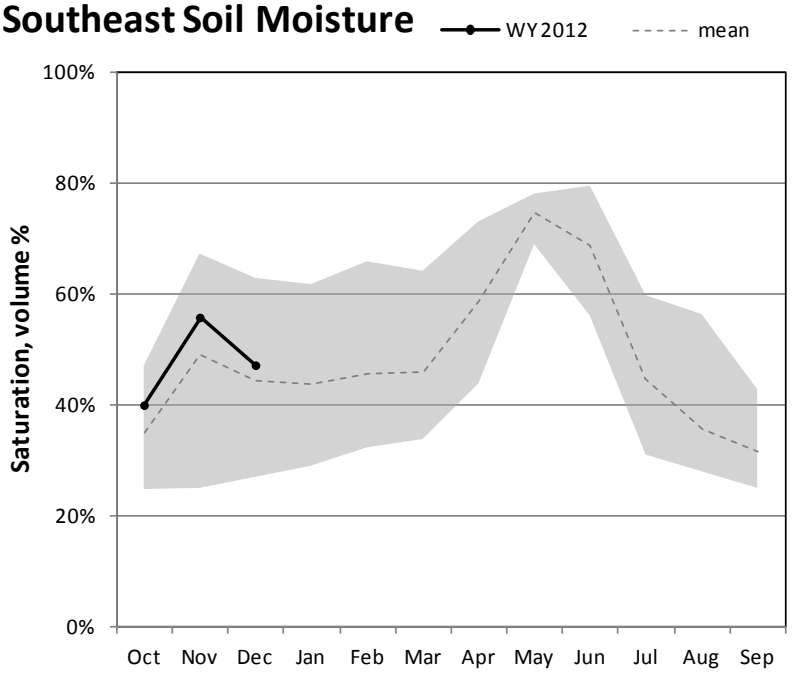
Southeast – Carbon, Emery, Wayne, Grand, and San Juan Counties
December 1, 2011

Precipitation in November was below average at 84%. Reservoir storage is at 74% of capacity, which is 23% higher at this time last year. Soil moisture is at 47% compared to 63% last year.

Southeast Utah Precipitation

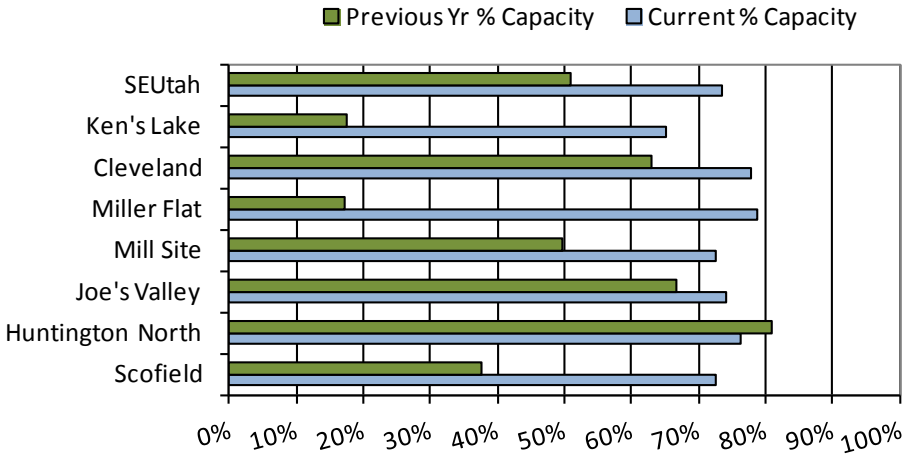


Southeast Soil Moisture



Percent saturation is calculated using the weighted average of volumetric soil moisture content at 2, 8, and 20-inch depths. Saturation is estimated as 40% volumetric water content. The gray area represents the range in saturation values since 2005.

December Southeast Utah Reservoir Storage

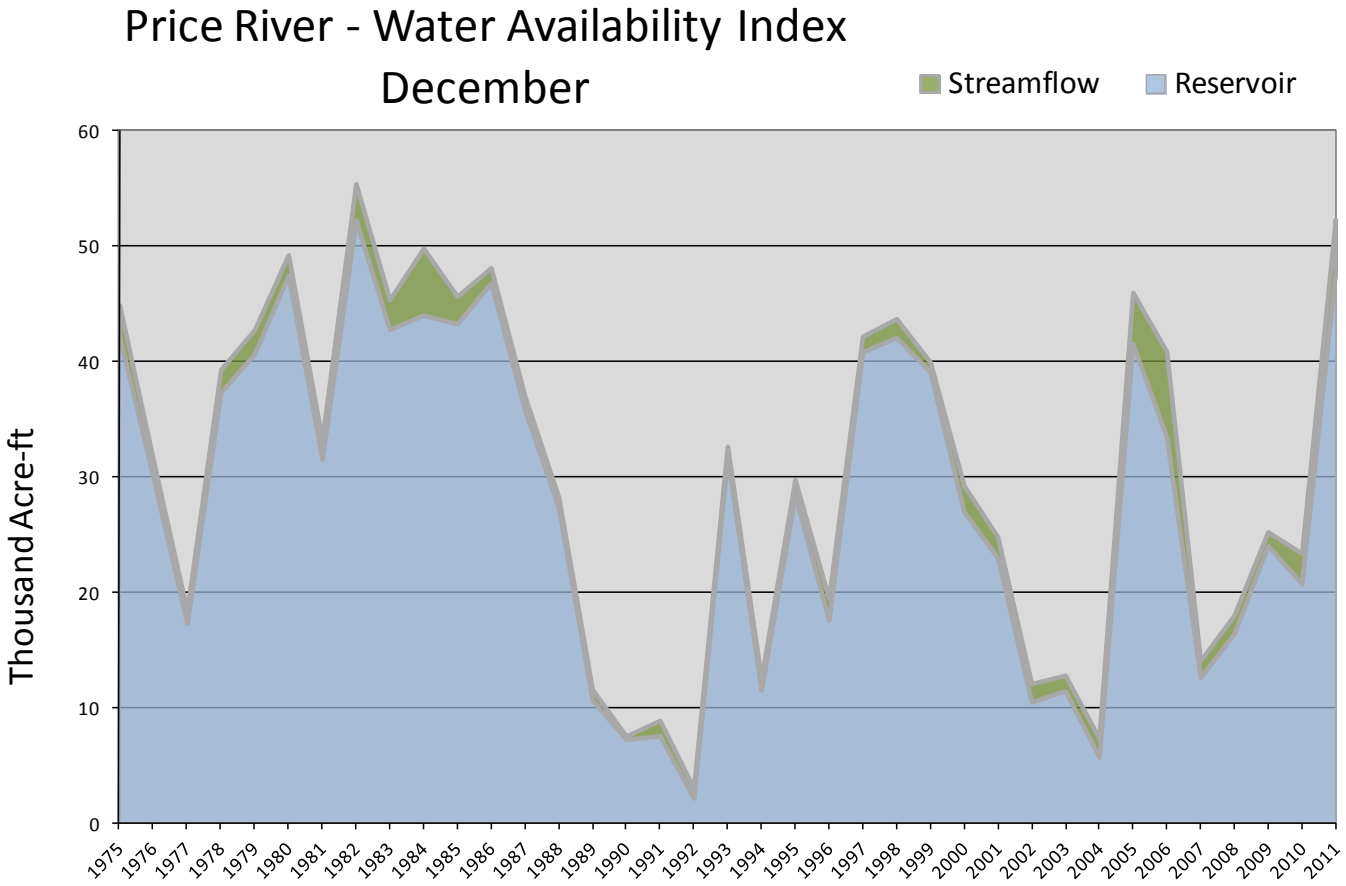


December 1, 2011

Water Availability Index

Basin or Region	November EOM* Scofield	November accumulated inflow to Scofield (*calculated*)	Reservoir + Streamflow	WAI#	Percentile	Years with similar WAI
	*KAF^*	*KAF*	*KAF*		*%*	
Price River	**47.8**	**4.6**	**52.4**	**3.73**	**95**	**86 ,80, 84, 82**

**EOM, end of month; # WAI, water availability index; ^KAF, thousand acre-feet.*

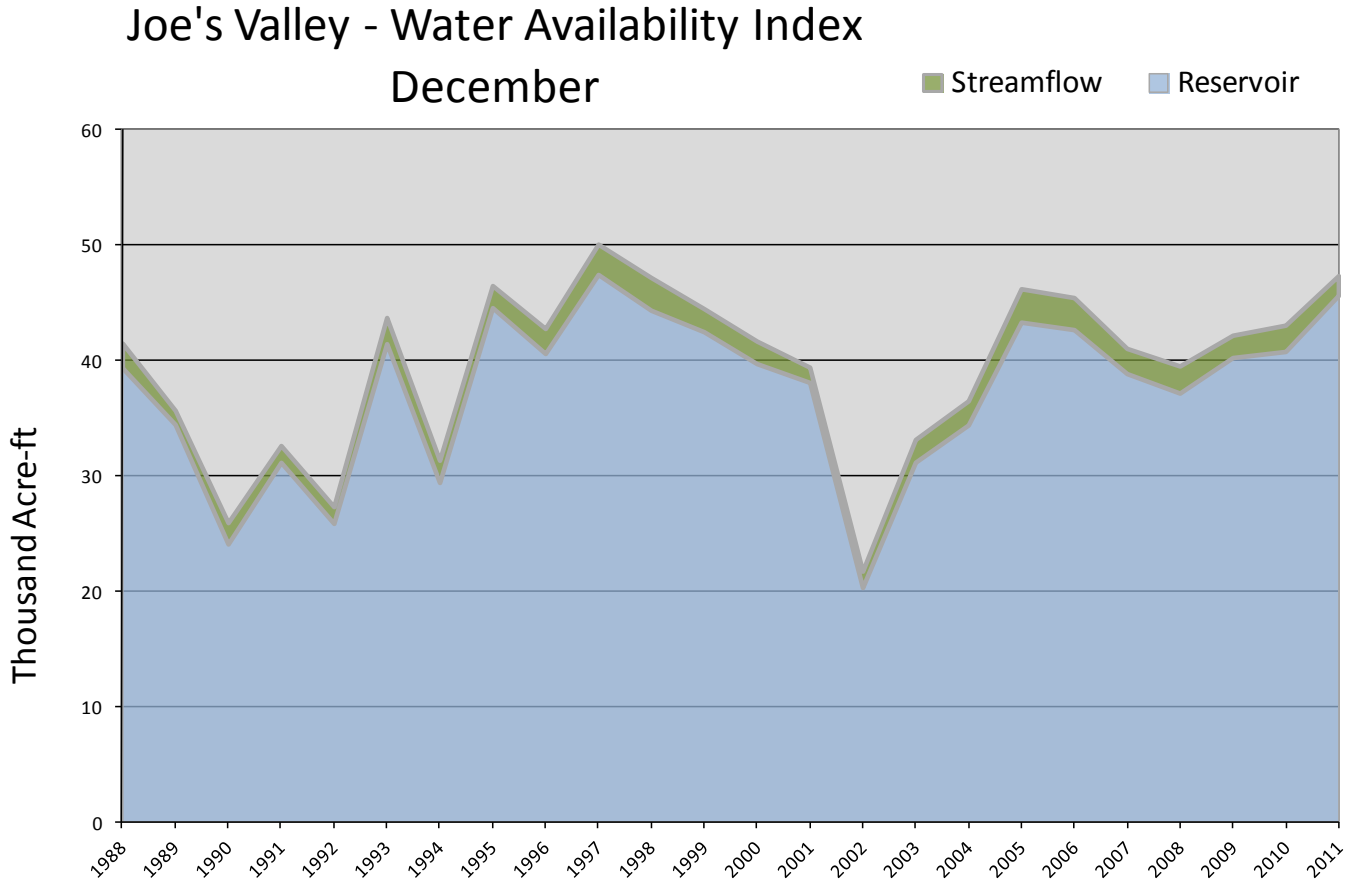


December 1, 2011

Water Availability Index

Basin or Region	November EOM* Joe's Valley	November accumulated inflow to Joe's Valley (*calculated*)	Reservoir + Streamflow	WAI[#]	Percentile	Years with similar WAI
	*KAF^*	*KAF*	*KAF*		*%*	
Joe's Valley	**45.7**	**1.7**	**47.4**	**3.50**	**92**	**05, 95, 98, 97**

**EOM, end of month; [#] WAI, water availability index; ^KAF, thousand acre-feet.*

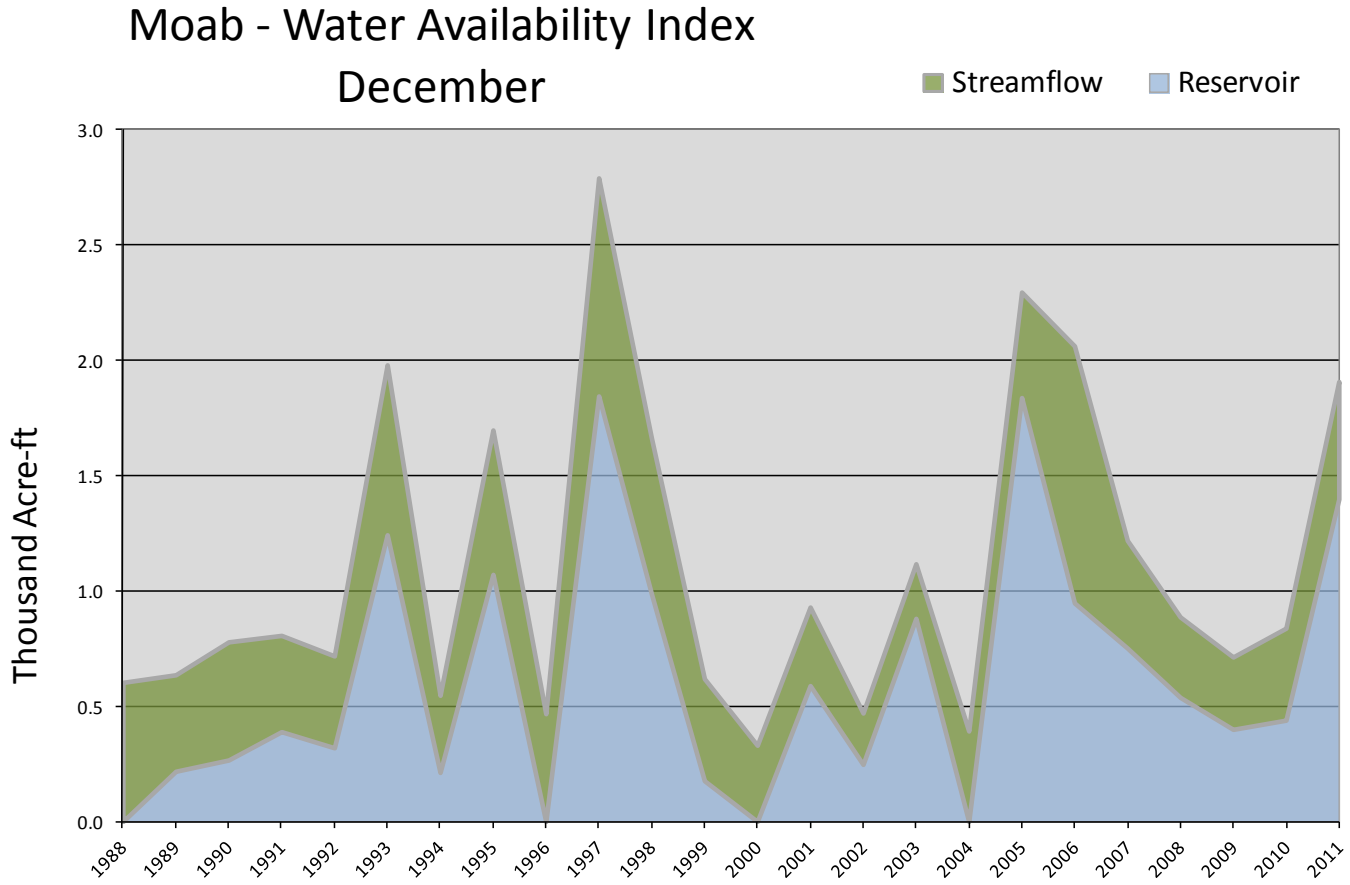


December 1, 2011

Water Availability Index

Basin or Region	November EOM* Ken's Lake Reservoir	November accumulated flow Mill Creek at Sheley (*observed*)	Reservoir + Streamflow	WAI[#]	Percentile	Years with similar WAI
	*KAF^*	*KAF*	*KAF*		*%*	
Moab	**1.5**	**0.4**	**1.9**	**2.17**	**76**	**07, 98, 95, 93**

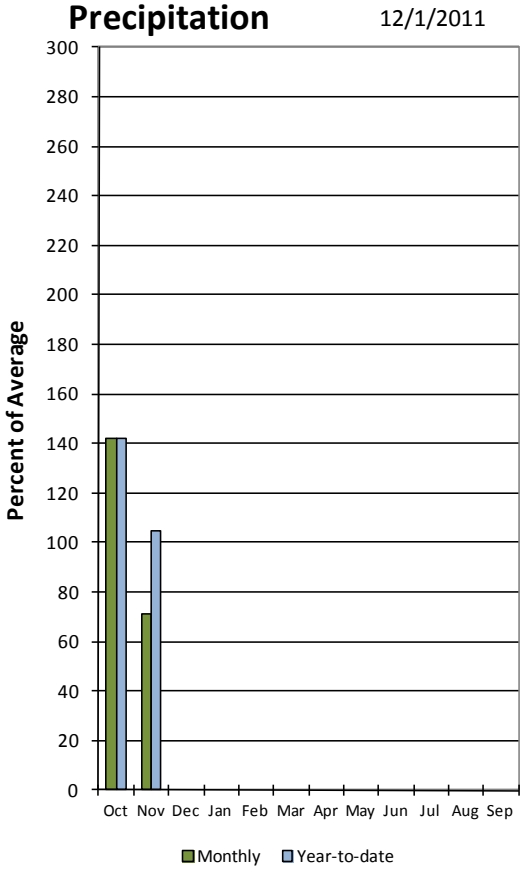
**EOM, end of month; [#] WAI, water availability index; ^KAF, thousand acre-feet.*



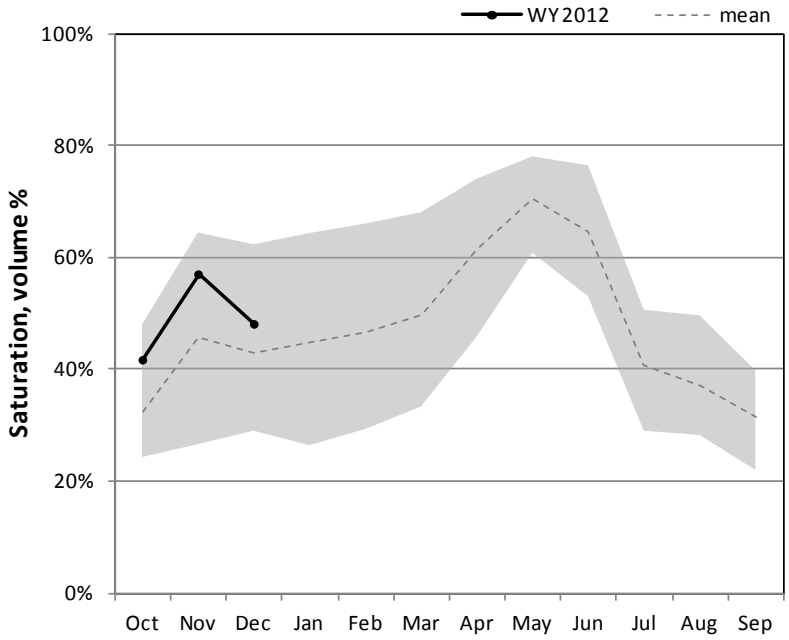
Sevier and Beaver River Basins
December 1, 2011

Precipitation in November was below average at 71%. Reservoir storage is high at 81% of capacity, compared to 23% of capacity last year. Soil moisture is at 48% of saturation compared to 62% last year. Water Availability Indexes for the Sevier/Beaver are extremely high – 80% to 96%.

Sevier /Beaver River Precipitation

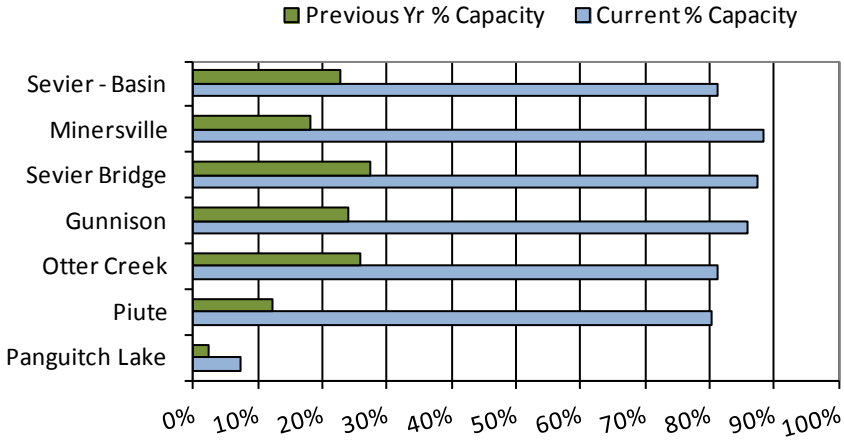


Sevier / Beaver River Soil Moisture



Percent saturation is calculated using the weighted average of volumetric soil moisture content at 2, 8, and 20-inch depths. Saturation is estimated as 40% volumetric water content. The gray area represents the range in saturation values since 2005.

December Sevier River Reservoir Storage

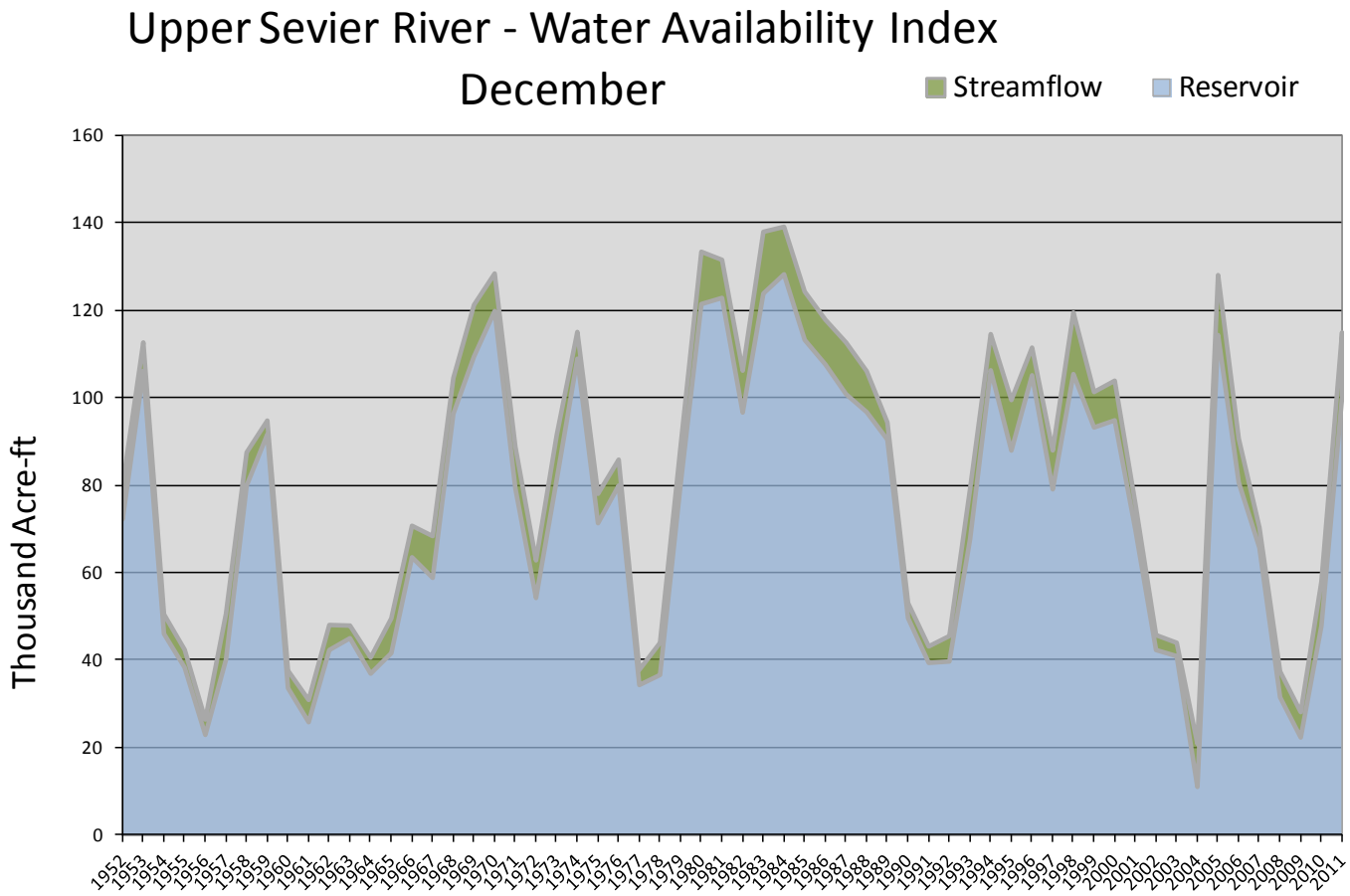


December 1, 2011

Water Availability Index

Basin or Region	November EOM* Otter Creek and Piute	November accumulated flow at Kingston (*observed*)	Reservoir + Streamflow	WAI#	Percentile	Years with similar WAI
	*KAF^*	*KAF*	*KAF*		*%*	
Upper Sevier River	**100**	**14.8**	**115**	**2.53**	**80**	**87, 94, 74, 86**

**EOM, end of month; # WAI, water availability index; ^KAF, thousand acre-feet.*

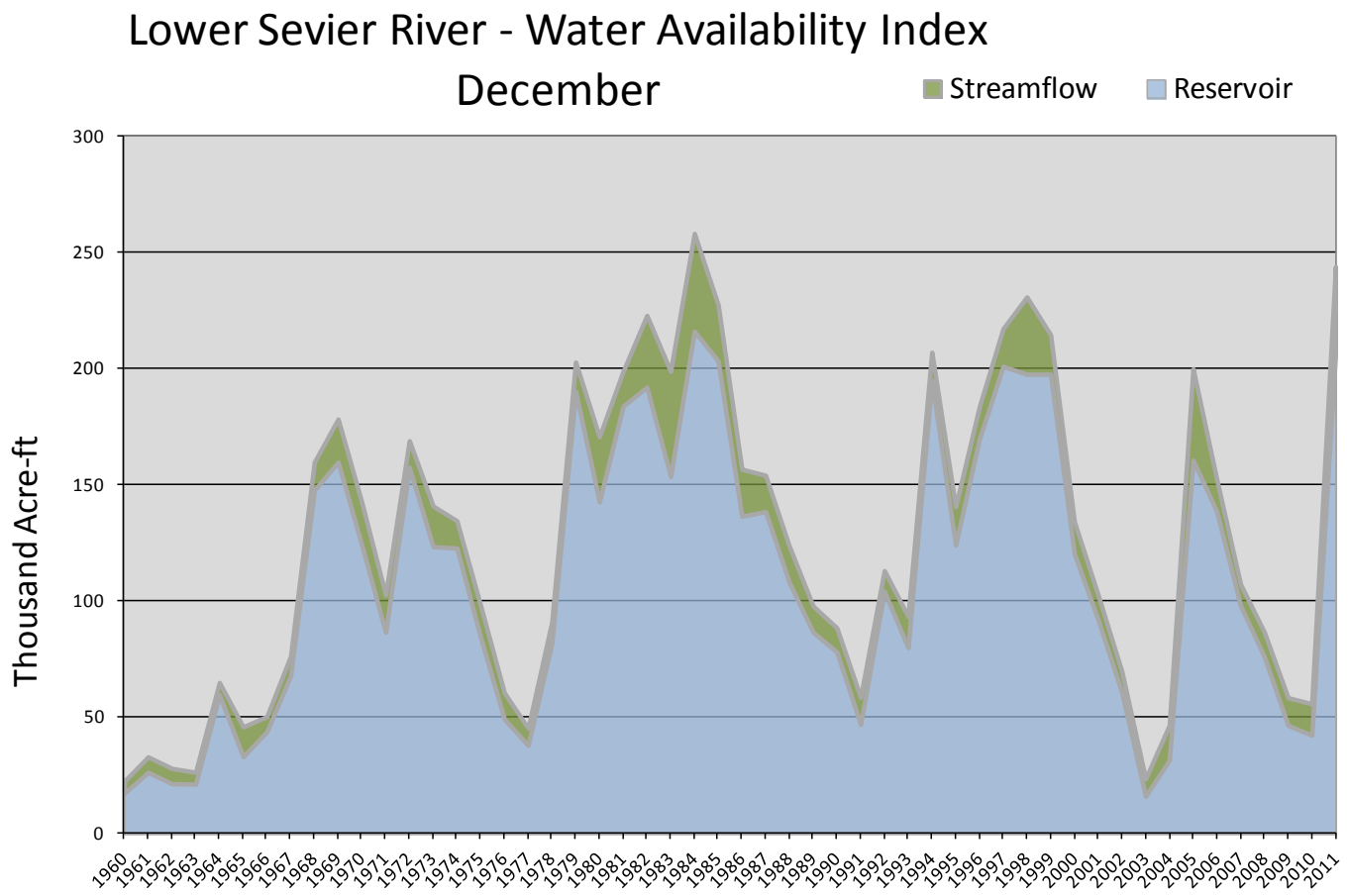


December 1, 2011

Water Availability Index

Basin or Region	November EOM* Sevier Bridge	November accumulated flow Sevier at Gunnsion (*observed*)	Reservoir + Streamflow	WAI[#]	Percentile	Years with similar WAI
	*KAF^*	*KAF*	*KAF*		*%*	
Lower Sevier River	**207**	**37.4**	**244**	**3.85**	**96**	**82 ,85, 98, 84**

**EOM, end of month; [#] WAI, water availability index; ^KAF, thousand acre-feet.*

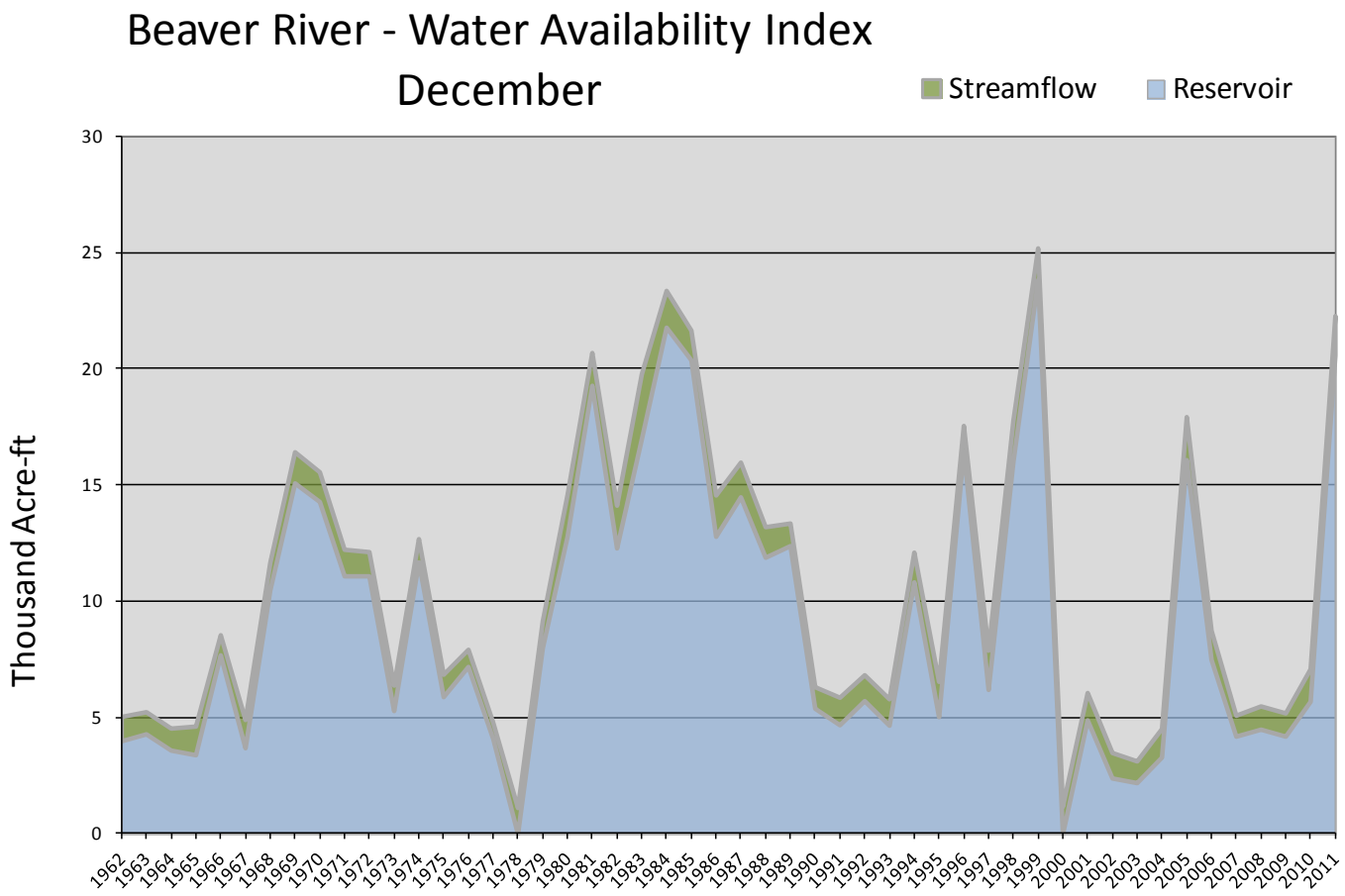


December 1, 2011

Water Availability Index

Basin or Region	November EOM* Minersville Reservoir	November accumulated flow Beaver River at Beaver (*observed*)	Reservoir + Streamflow	WAI[#]	Percentile	Years with similar WAI
	*KAF^*	*KAF*	*KAF*		*%*	
Beaver	**20.6**	**1.7**	**22.3**	**3.68**	**94**	**81, 84, 85, 99**

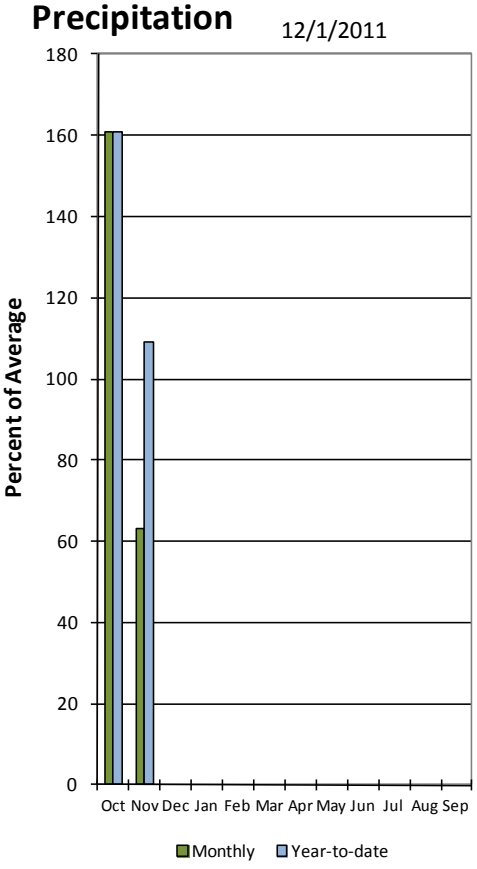
**EOM, end of month; [#] WAI, water availability index; ^KAF, thousand acre-feet.*



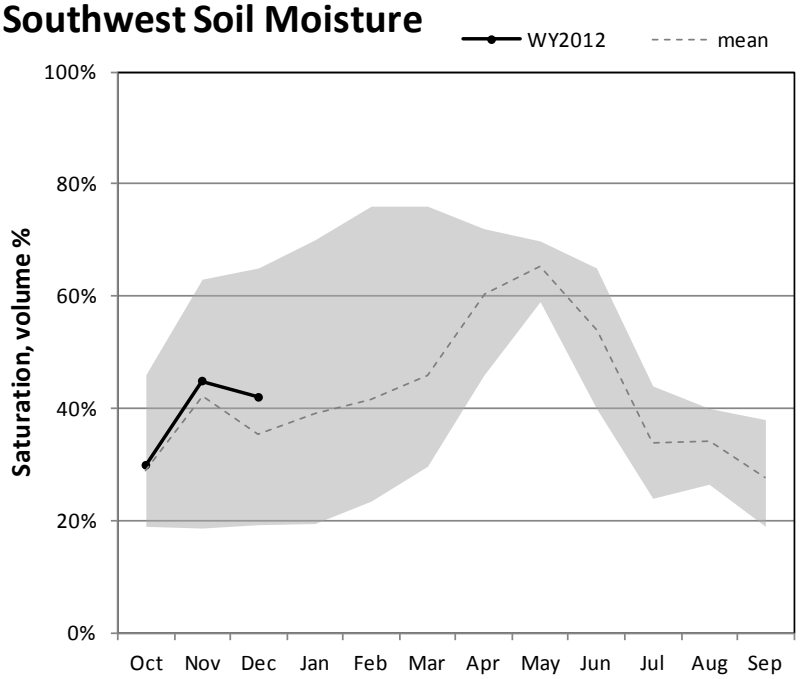
Southwest – E. Garfield, Kane, Washington, & Iron Counties
December 1, 2011

Precipitation in November was below average at 64%. Reservoir storage is low at 73% of capacity, 21% higher than last year at this time. Soil moisture is at 42% compared to 53% at this time last year.

Southwest Utah Precipitation

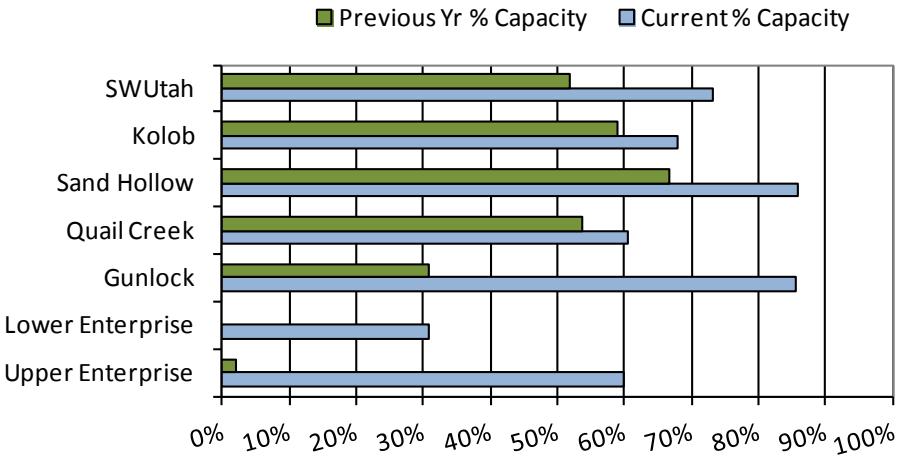


Southwest Soil Moisture



Percent saturation is calculated using the weighted average of volumetric soil moisture content at 2, 8, and 20-inch depths. Saturation is estimated as 40% volumetric water content. The gray area represents the range in saturation values since 2005.

Dec. Southwest Utah Reservoir Storage

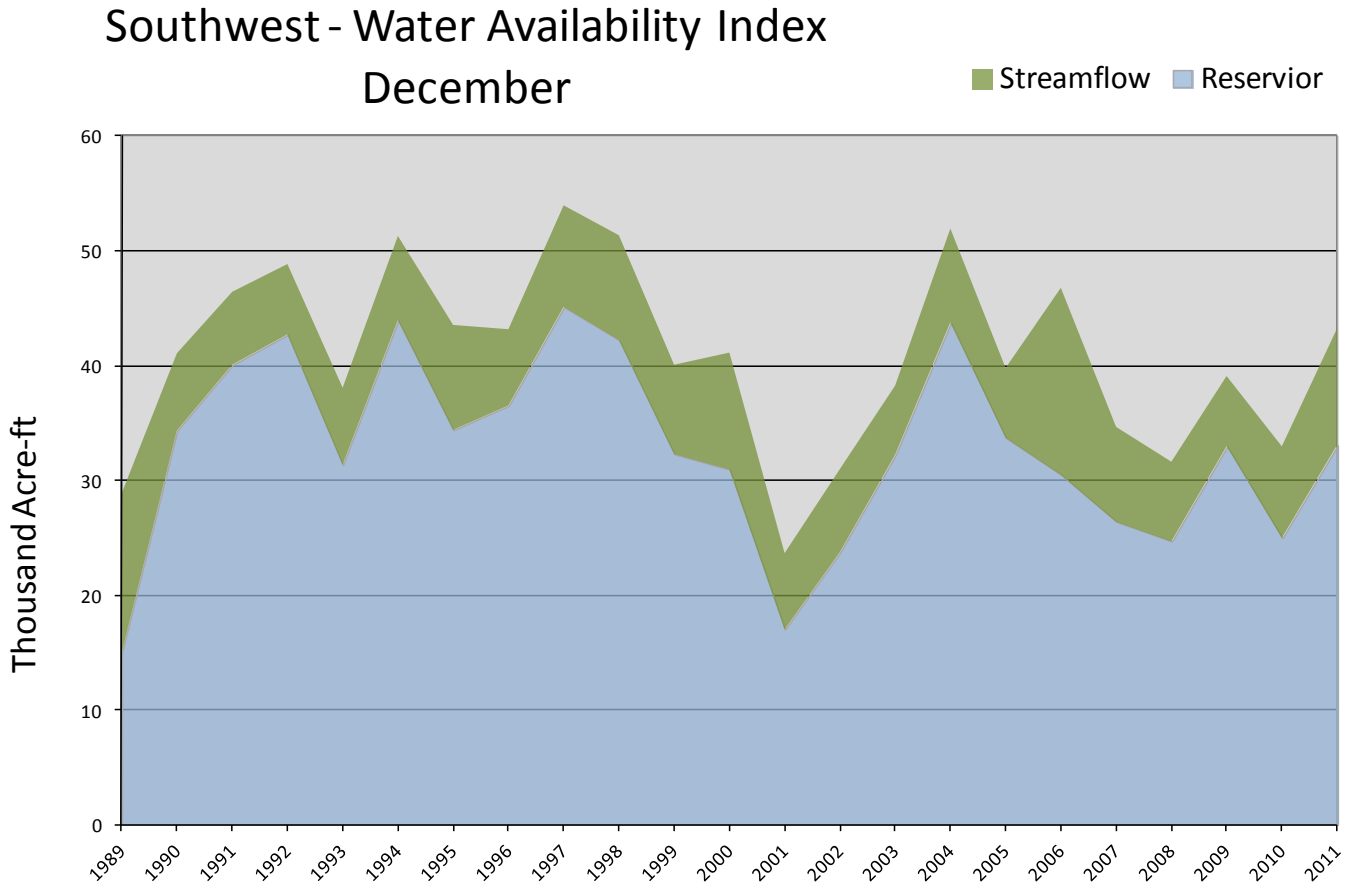


December 1, 2011

Water Availability Index

Basin or Region	November EOM* Reservoir	November accumulated flow Virgin and Santa Clara Rivers (*observed*)	Reservoir + Streamflow	WAI[#]	Percentile	Years with similar WAI
	*KAF^*	*KAF*	*KAF*		*%*	
Southwest	**33.1**	**10.2**	**43.3**	**1.04**	**63**	**91, 95, 96, 00**

**EOM, end of month; [#] WAI, water availability index; ^KAF, thousand acre-feet.*



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Utah Climate and Water Report

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