# NRCS – Snow Survey & Water Supply Forecasting

# Water Availability Task Force Meeting January 23<sup>rd</sup>, 2013

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## "New" 30 Year Normals

- •Use base period 1981 2010
- Are still a work in progress in Colorado
  - All unconditional (>20 years) are complete
  - Sites with <5 years will not have normals computed
- •All PREC, SWE, & Streamflow products have been updated
  - PREC uses Average
  - SWE uses Median
  - Streamflow uses Average (with some exceptions)
- •End of December Reservoir products still use 1971 2000 Averages.

## Use caution when comparing percentage data from year to year

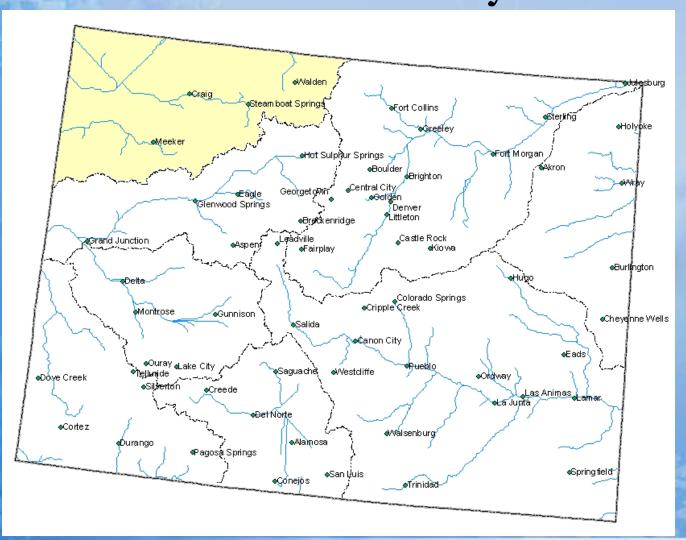
Station Id	Station Name	Snow Water Equivalent (in)	Normal Snow Water Equivalent (1981-2010) (in)	Snow Water Equivalent % of Normal (1981-2010)	Normal Snow Water Equivalent (1971-2000) (in)	Snow Water Equivalent % of Normal (1971-2000)
485	FREMONT PASS	5.2	8.6	60%	9.5	55%
551	JOE WRIGHT	5.9	12.1	49%	12.5	47%
713	RED MOUNTAIN PASS	7.4	12.4	60%	13.1	56%
825	TOWER	13.7	24.6	56%	27	51%
842	VAIL MOUNTAIN	4.8	10	48%	12.2	39%
874	WOLF CREEK SUMMIT	10.5	19.4	54%	18.1	58%

For more information:

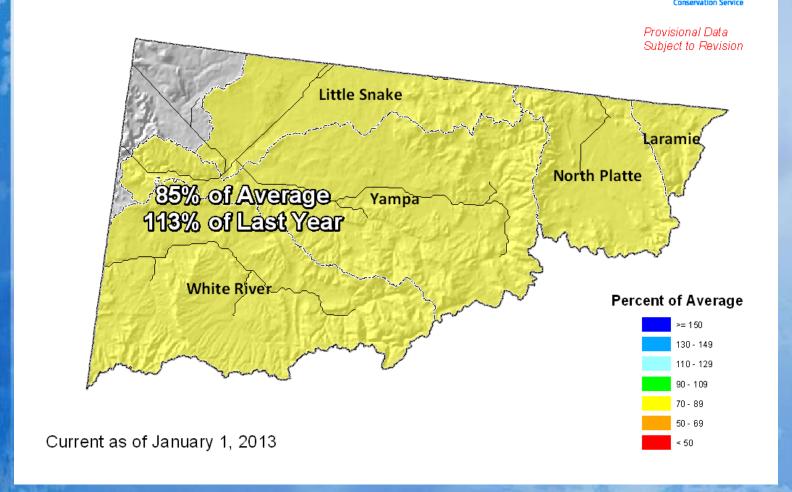
<a href="http://www.wcc.nrcs.usda.gov/normals/30year\_normals\_data.htm">http://www.wcc.nrcs.usda.gov/normals/30year\_normals\_data.htm</a>
And on why the change to median:

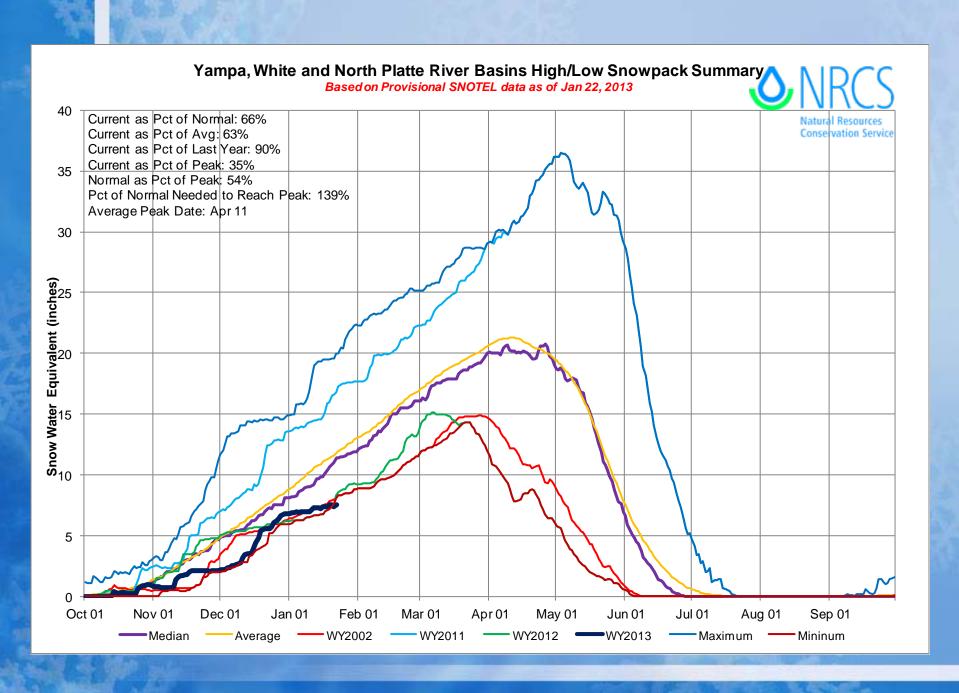
http://www.wcc.nrcs.usda.gov/normals/median\_average.htm

## Yampa, White & North Platte River Basins Summary

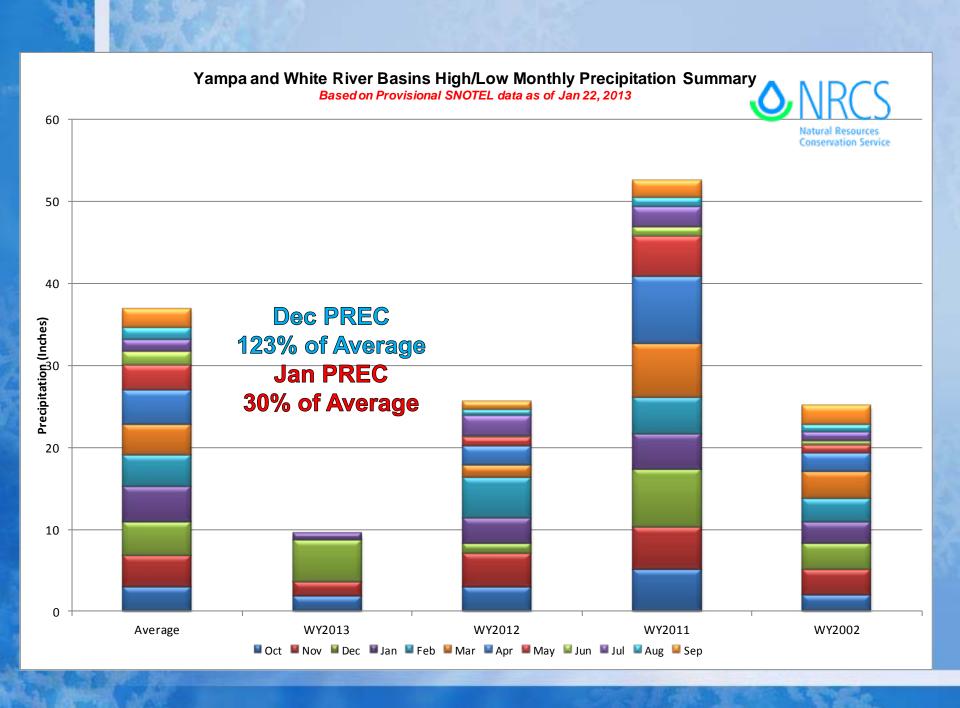


#### Yampa, White and North Platte River Basins Snowpack Map



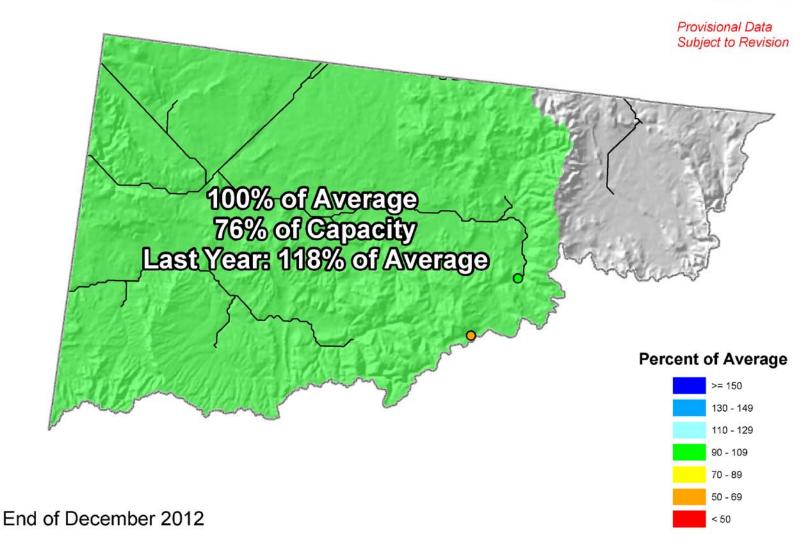


Yampa and White River Basins High/Low Year-to-Date Precipitation Summary Based on Provisional SNOTEL data as of Jan 22, 2013 Current as Pct of Average: 68% Conservation Service Current as Pct of Last Year: 91% Current as Pct of Average Annnual Total: 26% Average as Pct of Average Annual Total: 38% Pct of Avg Needed to Reach Avg Annual Total: 119% 50 Year-to-Date Precipitation (inches) 10 Oct 01 Nov 01 Dec 01 Jan 01 Feb 01 Mar 01 Apr 01 May 01 Jun 01 Jul 01 Aug 01 Sep 01 Average WY2002 WY2011 WY2012 **─**WY2013 Median Maximum Mininum

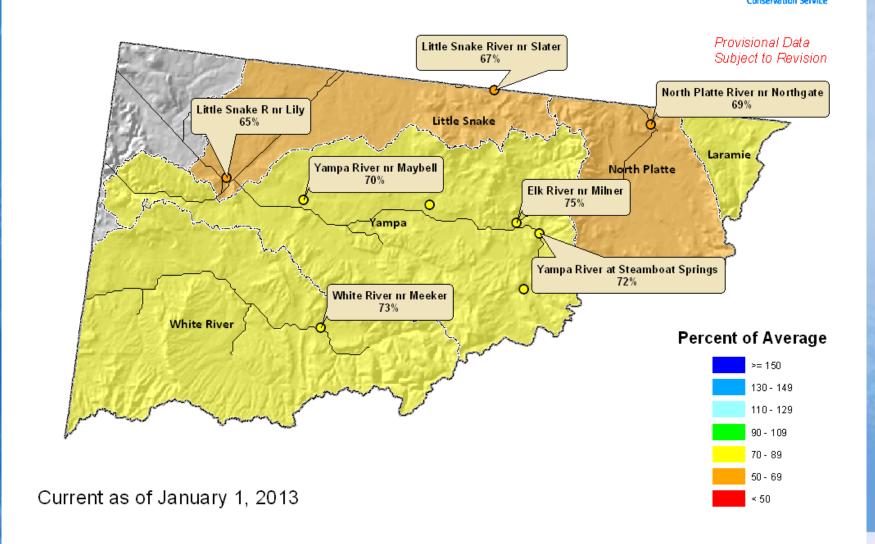


#### Yampa & White River Basins Reservoir Storage Map





#### Yampa, White and North Platte River Basins Streamflow Map



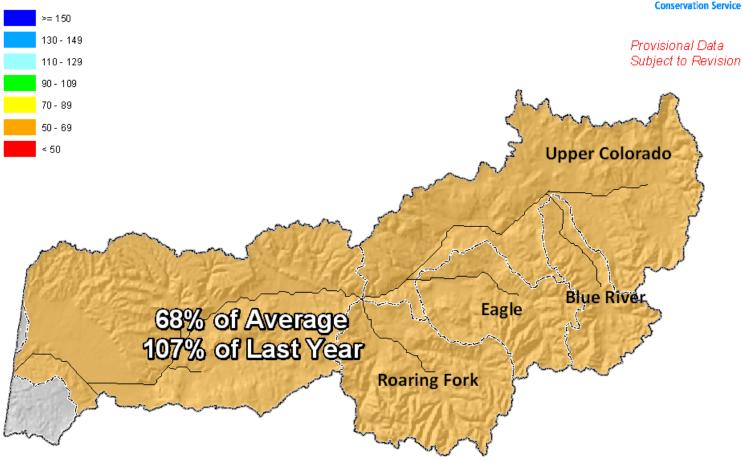
### Colorado River Basin Summary



#### Colorado River Basin Snowpack Map



#### Percent of Average



Current as of January 1, 2013

#### Upper Colorado River Basin High/Low Snowpack Summary Based on Provisional SNOTEL data as of Jan 22, 2013 30 Current as Pct of Normal: 63% Current as Pct of Avg: 58% Conservation Service Current as Pct of Last Year: 80% Current as Pct of Peak: 31% Normal as Pct of Peak: 49% Pct of Normal Needed to Reach Peak: 136% Average Peak Date: Apr 10 Snow Water Equivalent (inches) 5 Oct 01 Nov 01 Dec 01 Jan 01 Feb 01 Mar 01 Apr 01 May 01 Jun 01 Jul 01 Aug 01 Sep 01 WY2002 WY2011 WY2012 WY2013 Maximum Mininum Average Median

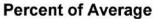
Upper Colorado River Basin High/Low Year-to-Date Precipitation Summary

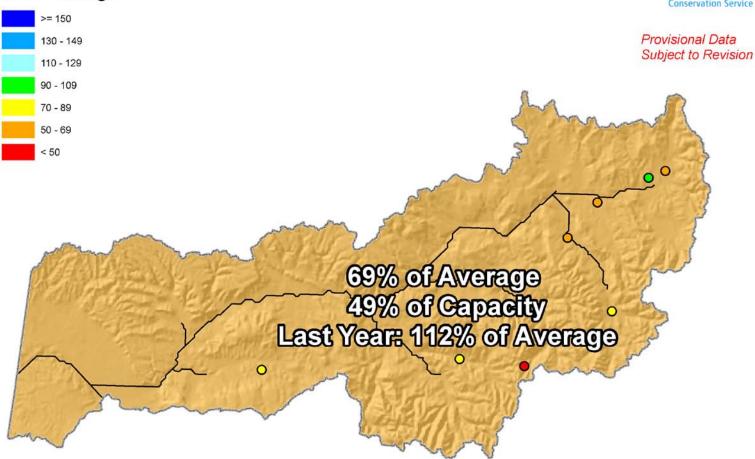
Based on Provisional SNOTEL data as of Jan 22, 2013 Current as Pct of Average: 63% Conservation Service Current as Pct of Last Year: 81% Current as Pct of Average Annnual Total: 21% Average as Pct of Average Annual Total: 33%
Pct of Avg Needed to Reach Avg Annual Total: 118% 35 Year-to-Date Precipitation (inches) 10 5 Oct 01 Nov 01 Dec 01 Jan 01 Feb 01 Mar 01 Apr 01 May 01 Jun 01 Jul 01 Aug 01 Sep 01 Average WY2002 WY2011 WY2012 **■**WY2013 Median Maximum Mininum

#### Upper Colorado River Basin High/Low Monthly Precipitation Summary Based on Provisional SNOTEL data as of Jan 22, 2013 45 Conservation Service 40 35 30 Dec PREC Precipitation (Inches) 111% of Average **Jan PREC 30% of Average** 15 10 5 0 Average WY2013 WY2012 WY2011 WY2002 ■ Oct ■ Nov ■ Dec ■ Jan ■ Feb ■ Mar ■ Apr ■ May ■ Jun ■ Jul ■ Aug ■ Sep

#### Colorado River Basin Reservoir Storage Map

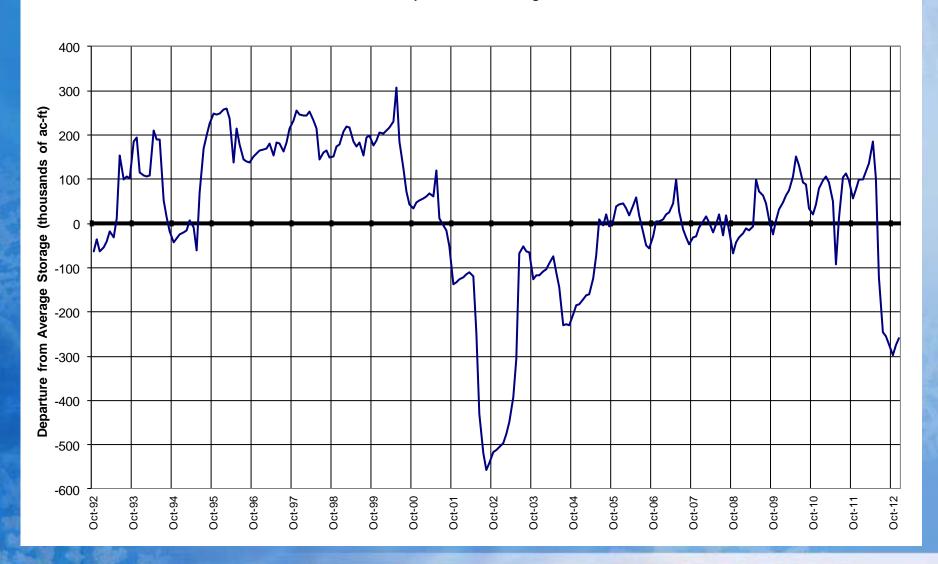






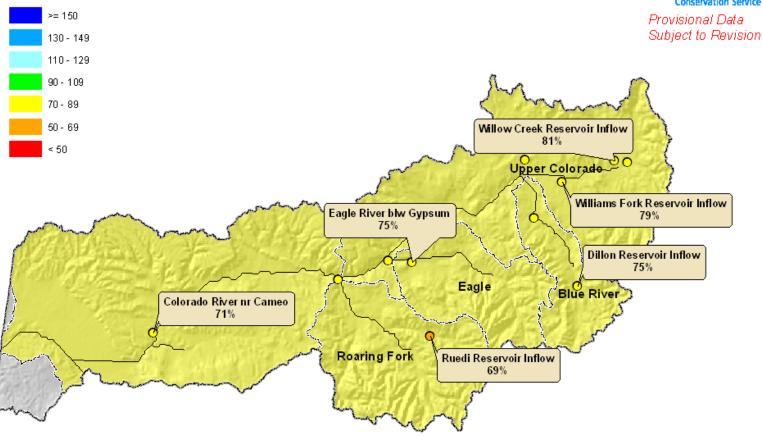
End of December 2012

#### COLORADO RIVER BASIN Reservoir Storage Departure from Average



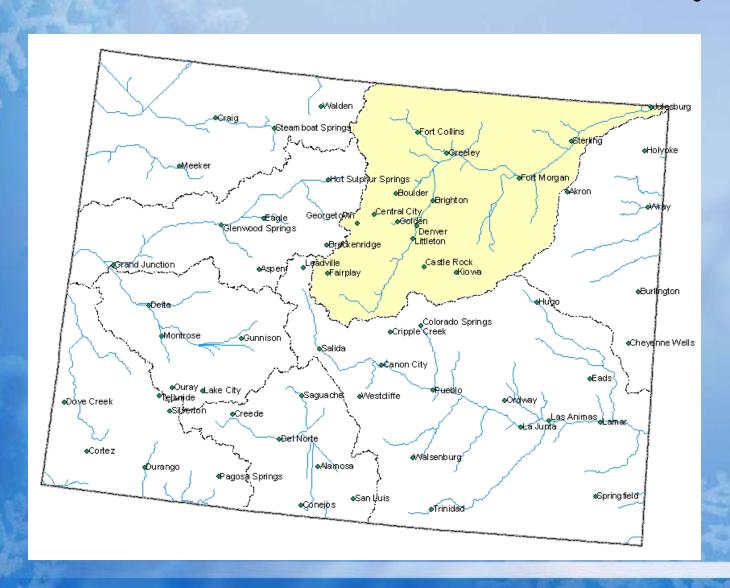
#### Colorado River Basin Streamflow Forecast Map



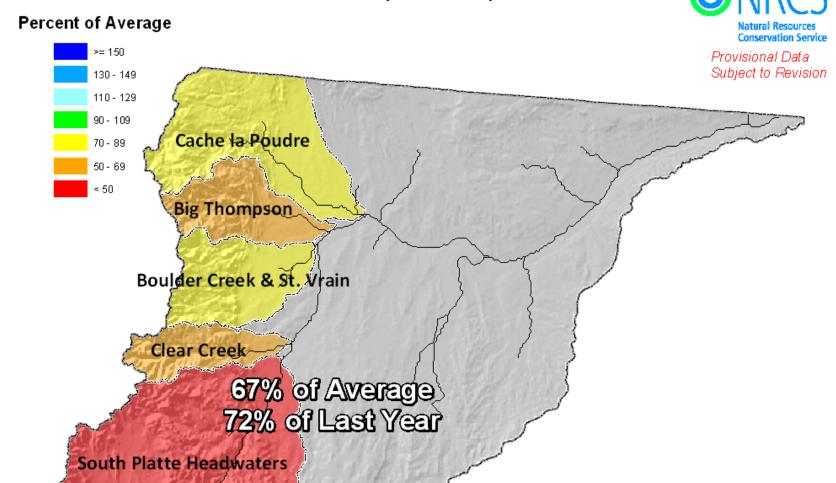


Current as of January 1, YYYY

## South Platte River Basin Summary



#### South Platte River Basin Snowpack Map

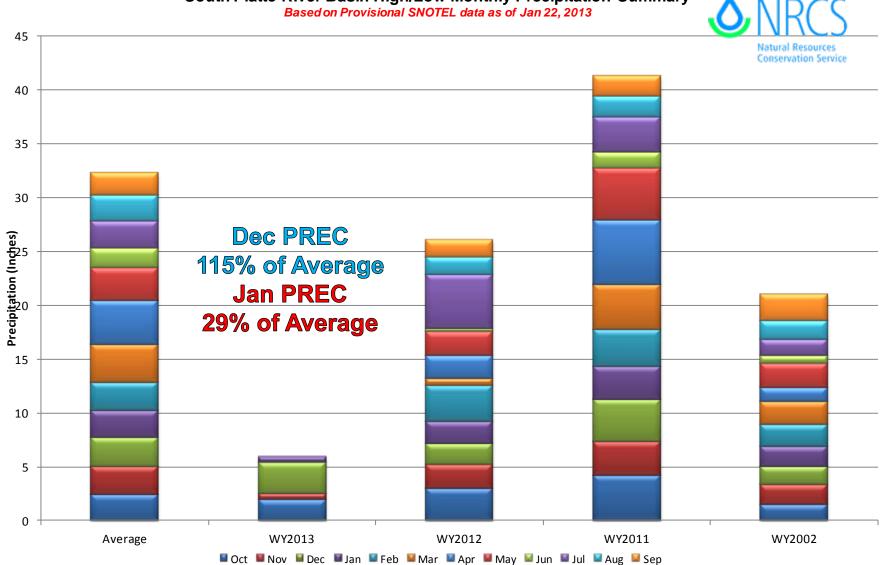


Current as of January 1, 2013

#### South Platte River Basin High/Low Snowpack Summary Based on Provisional SNOTEL data as of Jan 22, 2013 35 Current as Pct of Normal: 56% Current as Pct of Avg: 55% Conservation Service Current as Pct of Last Year: 60% Current as Pct of Peak: 28% Normal as Pct of Peak: 51% Pct of Normal Needed to Reach Peak: 146% Average Peak Date: Apr 28 25 Equivalent (inches) Snow Water 0 5 Oct 01 Nov 01 Dec 01 Jan 01 Feb 01 Mar 01 Apr 01 May 01 Jun 01 Jul 01 Aug 01 Sep 01 WY2002 WY2011 WY2012 WY2013 Maximum Mininum Average Median

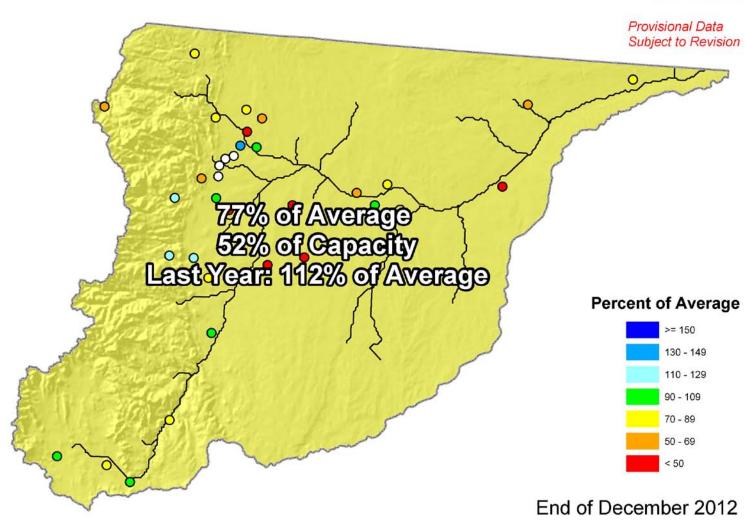
South Platte River Basin High/Low Year-to-Date Precipitation Summary Based on Provisional SNOTEL data as of Jan 22, 2013 Current as Pct of Average: 63% Conservation Service Current as Pct of Last Year: 68% Current as Pct of Average Annnual Total: 18% Average as Pct of Average Annual Total: 29% Pct of Avg Needed to Reach Avg Annual Total: 115% 35 Year-to-Date Precipitation (inches) 10 5 Oct 01 Nov 01 Dec 01 Jan 01 Feb 01 Mar 01 Apr 01 May 01 Jun 01 Jul 01 Aug 01 Sep 01 Average WY2002 WY2011 WY2012 **W**Y2013 Median Maximum Mininum

#### South Platte River Basin High/Low Monthly Precipitation Summary

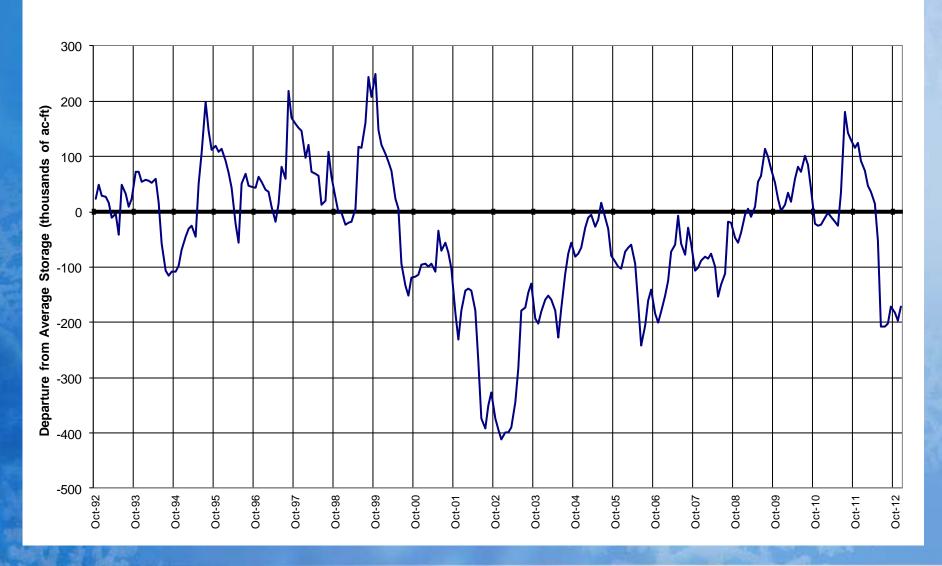


#### South Platte River Basin Reservoir Storage Map



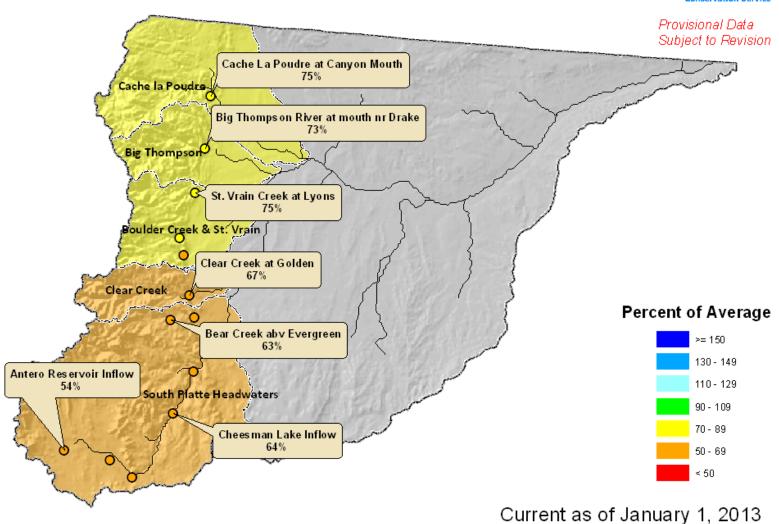


## SOUTH PLATTE RIVER BASIN Reservoir Storage Departure from Average



#### South Platte River Basin Streamflow Forecast Map





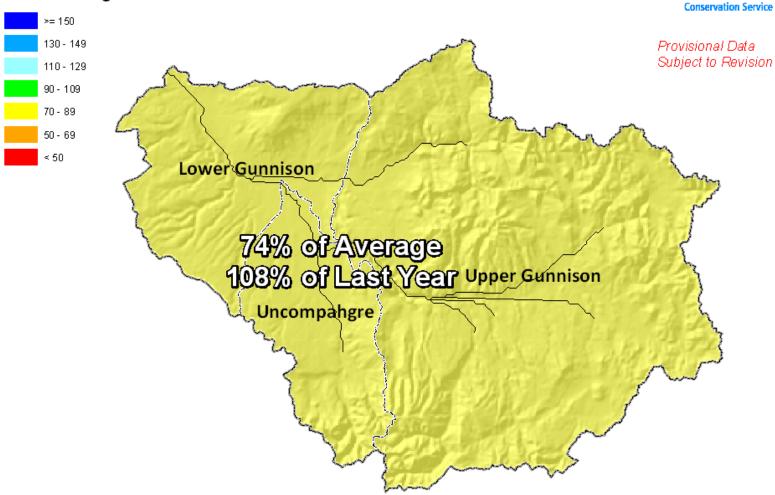
## Gunnison River Basin Summary



#### Gunnison River Basin Snowpack Map

## Natural Resources Conservation Service

#### Percent of Average



Current as of January 1, 2013

#### **Gunnison River Basin High/Low Snowpack Summary** Based on Provisional SNOTEL data as of Jan 22, 2013 35 Current as Pct of Normal: 63% Current as Pct of Avg: 60% Conservation Service Current as Pct of Last Year: 82% Current as Pct of Peak: 32% Normal as Pct of Peak: 50% Pct of Normal Needed to Reach Peak: 137% Average Peak Date: Apr 10 25 Equivalent (inches) Snow Water 0 5 Oct 01 Nov 01 Dec 01 Jan 01 Feb 01 Mar 01 Apr 01 May 01 Jun 01 Jul 01 Aug 01 Sep 01 WY2002 WY2011 WY2012 **WY2013** Maximum Mininum Average Median

## Gunnison River Basin High/Low Year-to-Date Precipitation Summary Based on Provisional SNOTEL data as of Jan 22, 2013 Current as Pct of Average: 60% Current as Pct of Last Year: 74% Current as Pct of Average Annnual Total: 21% Average as Pct of Average Annual Total: 34% Pct of Avg Needed to Reach Avg Annual Total: 121%

Mar 01

WY2012

Apr 01

**WY2013** 

May 01

Jun 01

Median

Jul 01

Maximum

Aug 01

Mininum

Sep 01

Feb 01

WY2011

50

40

35

Year-to-Date Precipitation (inches)

10

5

Oct 01

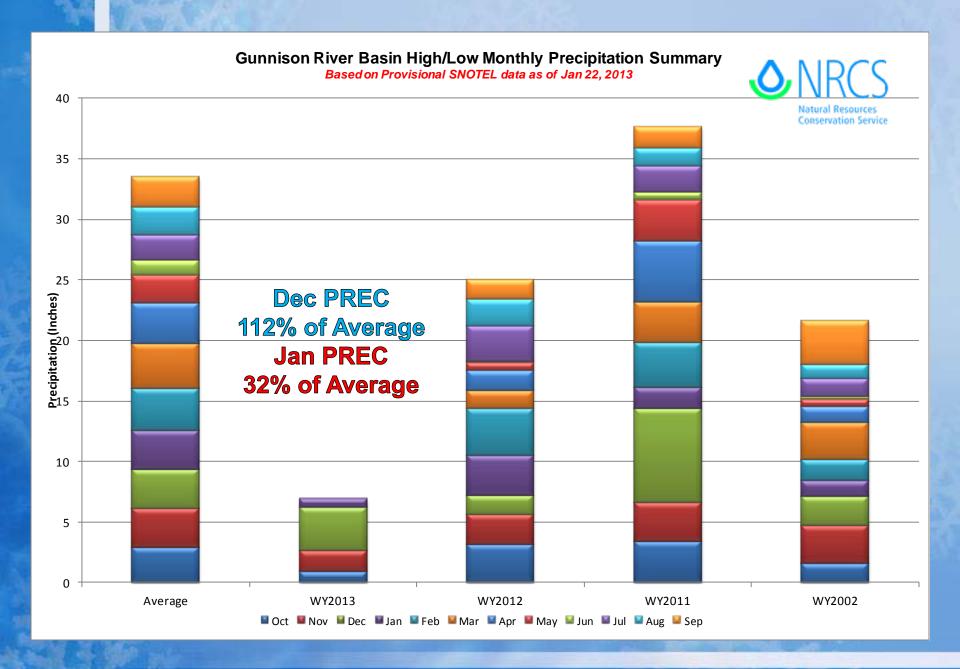
Nov 01

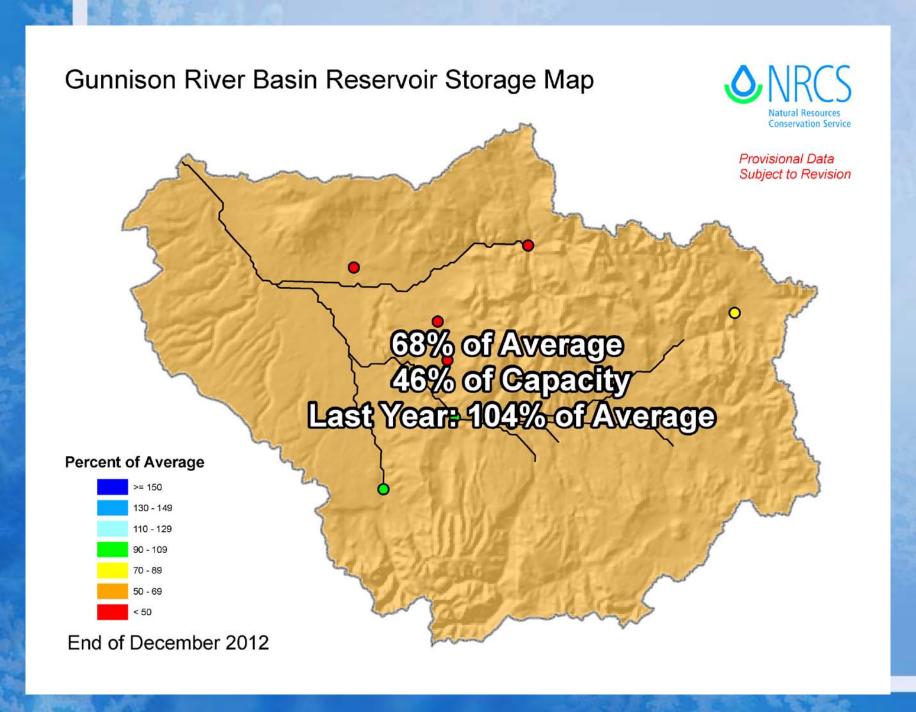
Dec 01

Average

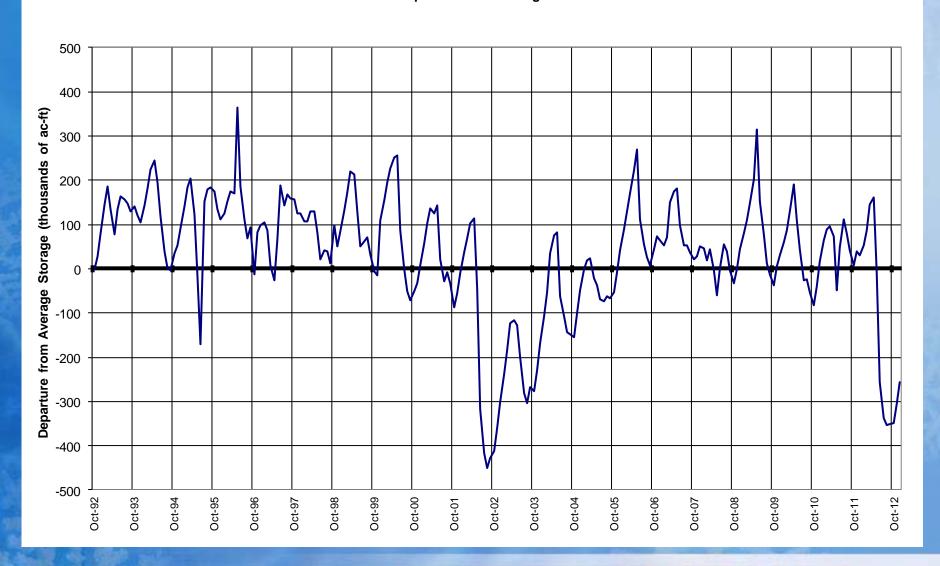
Jan 01

WY2002



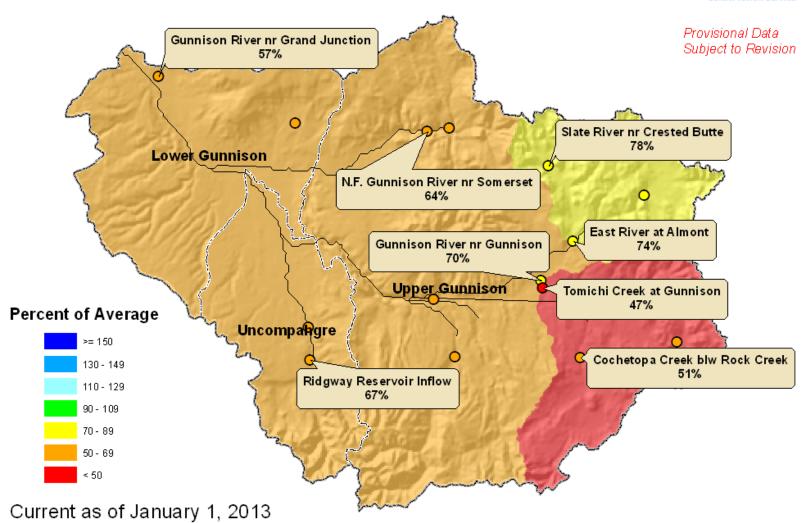


#### GUNNISON RIVER BASIN Reservoir Storage Departure from Average

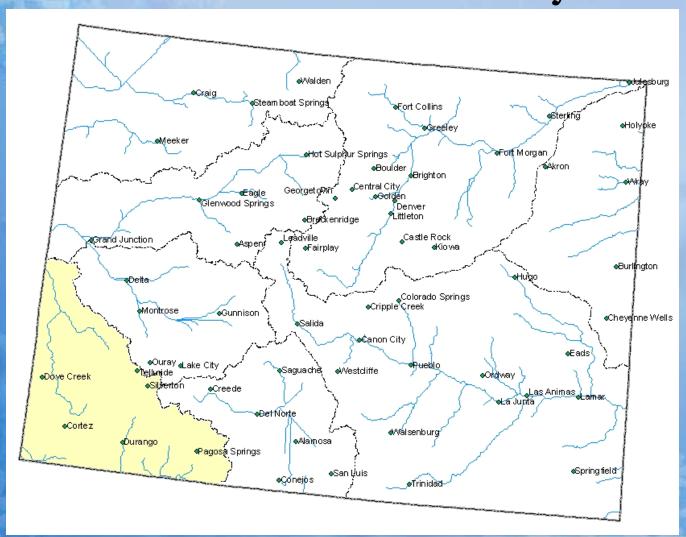


#### Gunnison River Basin Streamflow Forecast Map



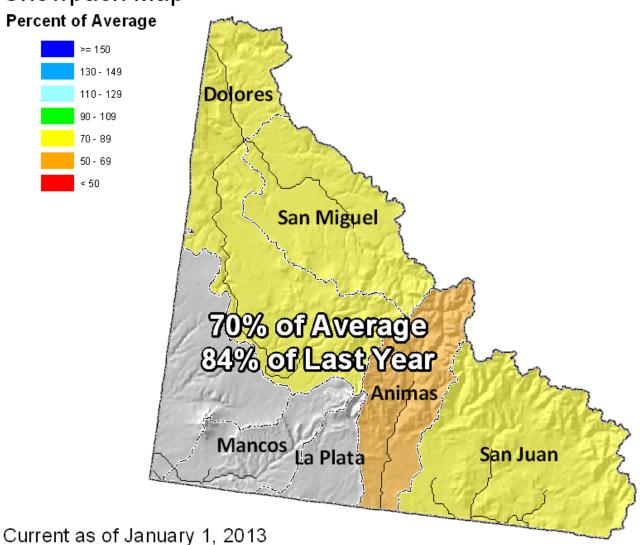


## San Miguel, Dolores, Animas & San Juan River Basins Summary

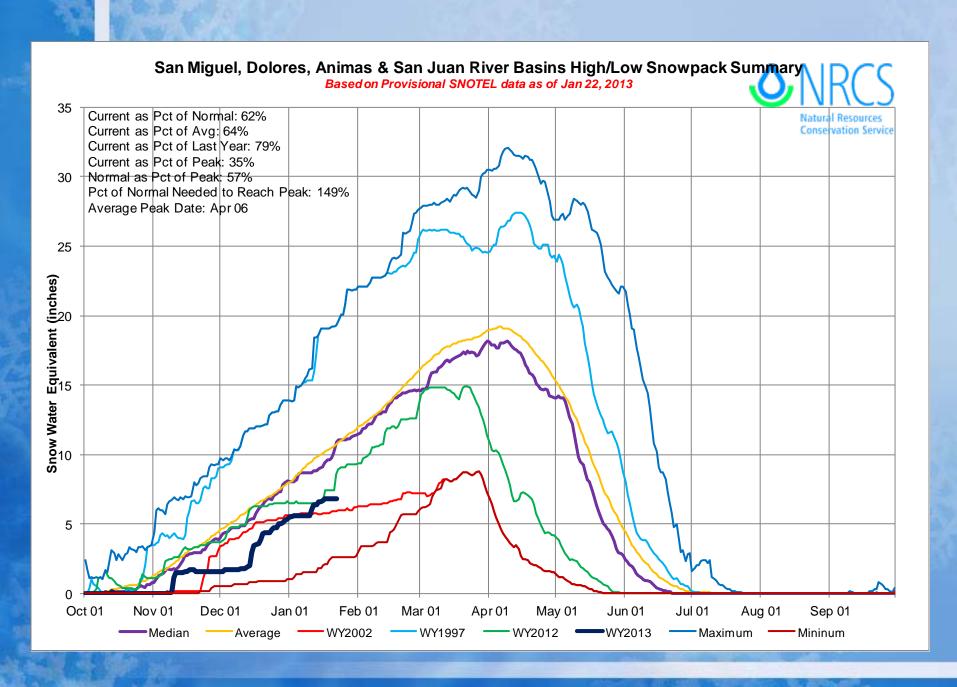


San Miguel, Dolores, Animas and San Juan River Basins

Snowpack Map

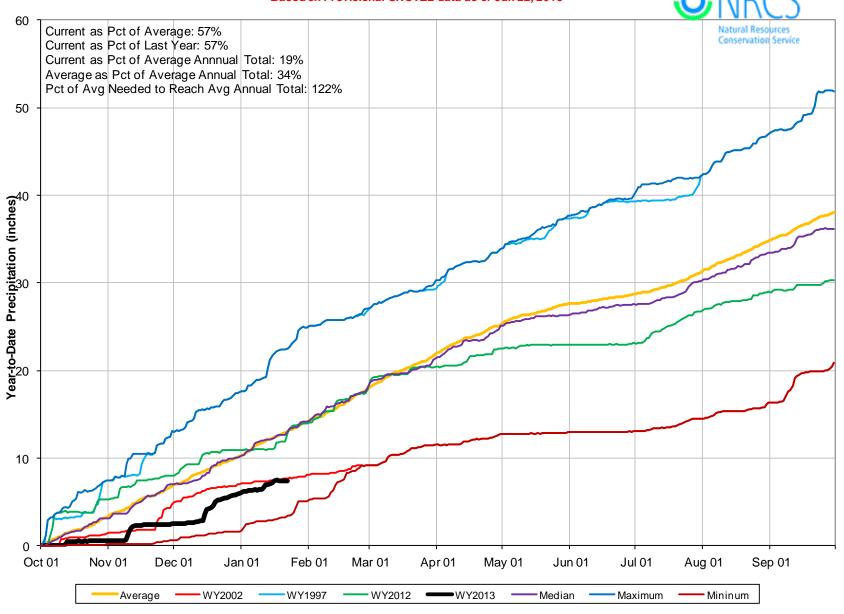


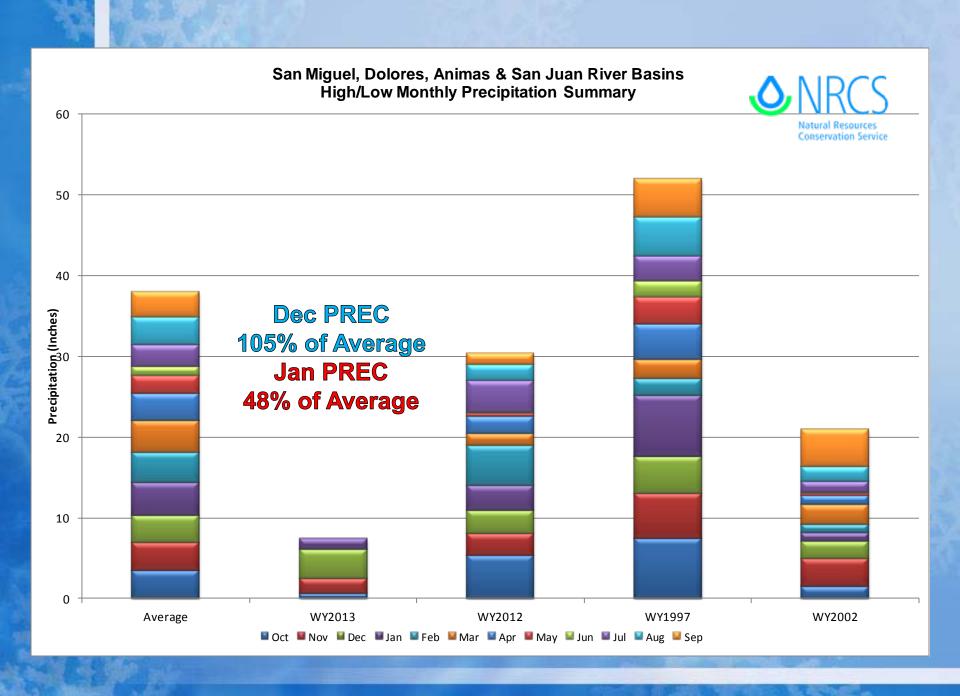
Provisional Data Subject to Revision



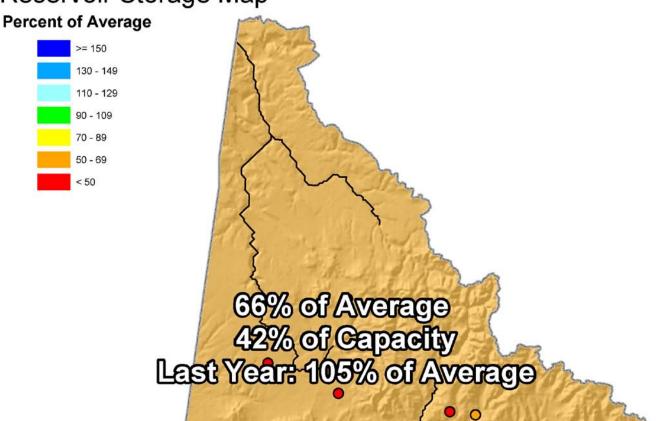
San Miguel, Dolores, Animas & San Juan River Basins **High/Low Year-to-Date Precipitation Summary** 







San Miguel, Dolores, Animas and San Juan River Basins Reservoir Storage Map

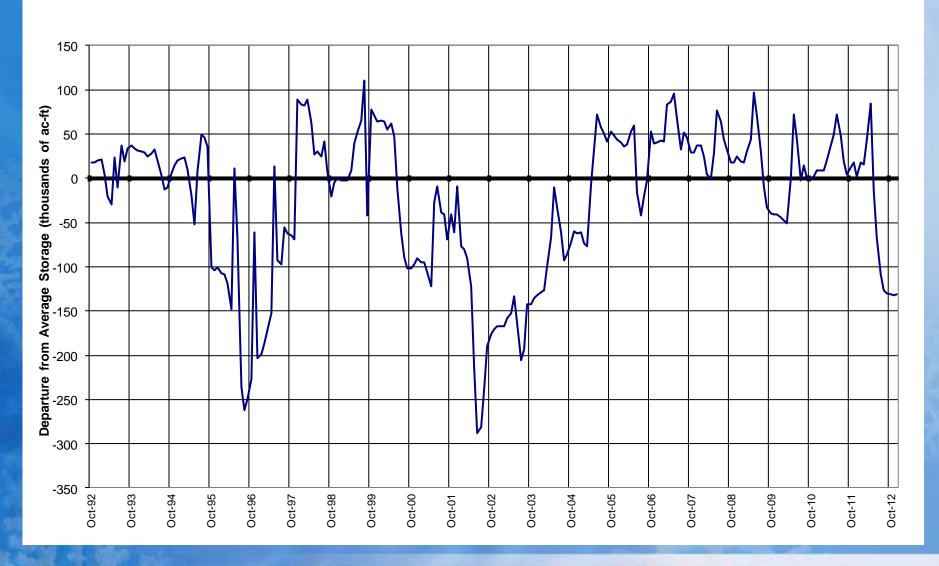


Natural Resources
Conservation Service

Provisional Data Subject to Revision

End of December 2012

# SAN MIGUEL, DOLORES, ANIMAS AND SAN JUAN RIVER BASINS Reservoir Storage Departure from Average

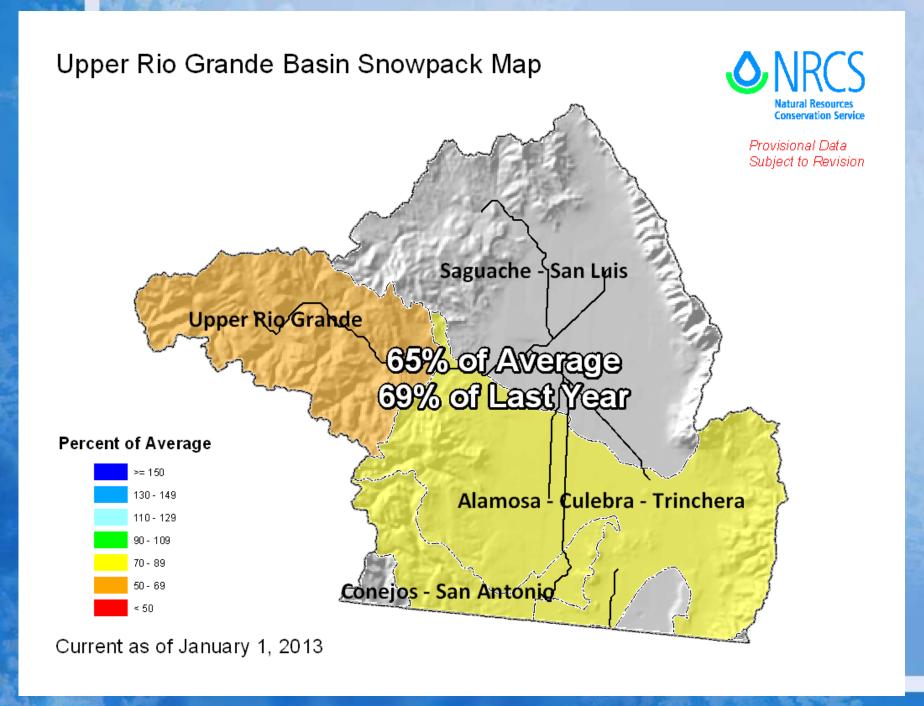


San Miguel, Dolores, Animas and San Juan River Basins Streamflow Forecast Map Percent of Average >= 150 Provisional Data 130 - 149 Subject to Revision 110 - 129 90 - 109 70 - 89 50 - 69 Lilylands Reservoir Inlet < 50 78% San Miguel Dolores McPhee Reservoir Inflow 62% Vallecito Reservoir Inflow Mancos River nr Mancos 71% 63% Dolores River at Dolores Navajo River at Oso Diversion 70% 🖊 Animas 🔾 Mancos La Plata 72% San Juan Animas River at Durango 66%

Current as of January 1, 2013

### Upper Rio Grande Basin Summary





### **Upper Rio Grande Basin High/Low Snowpack Summary** Based on Provisional SNOTEL data as of Jan 22, 2013 30 Current as Pct of Normal: 61% Current as Pct of Avg: 62% Conservation Service Current as Pct of Last Year: 69% Current as Pct of Peak: 34% Normal as Pct of Peak: 56% Pct of Normal Needed to Reach Peak: 150% Average Peak Date: Apr 06 Snow Water Equivalent (inches) 5 Oct 01 Nov 01 Dec 01 Jan 01 Feb 01 Mar 01 Apr 01 May 01 Jun 01 Jul 01 Aug 01 Sep 01 Median WY2002 WY1997 WY2012 WY2013 Maximum Mininum Average

Upper Rio Grande Basin High/Low Year-to-Date Precipitation Summary Based on Provisional SNOTEL data as of Jan 22, 2013 50 Current as Pct of Average: 60% Conservation Service Current as Pct of Last Year: 56% Current as Pct of Average Annnual Total: 20% Average as Pct of Average Annual Total: 33% Pct of Avg Needed to Reach Avg Annual Total: 120% 40 35 Year-to-Date Precipitation (inches) 10 5 Oct 01 Nov 01 Dec 01 Jan 01 Feb 01 Mar 01 Apr 01 May 01 Jun 01 Jul 01 Aug 01 Sep 01

Average

WY2002

WY1997

WY2012

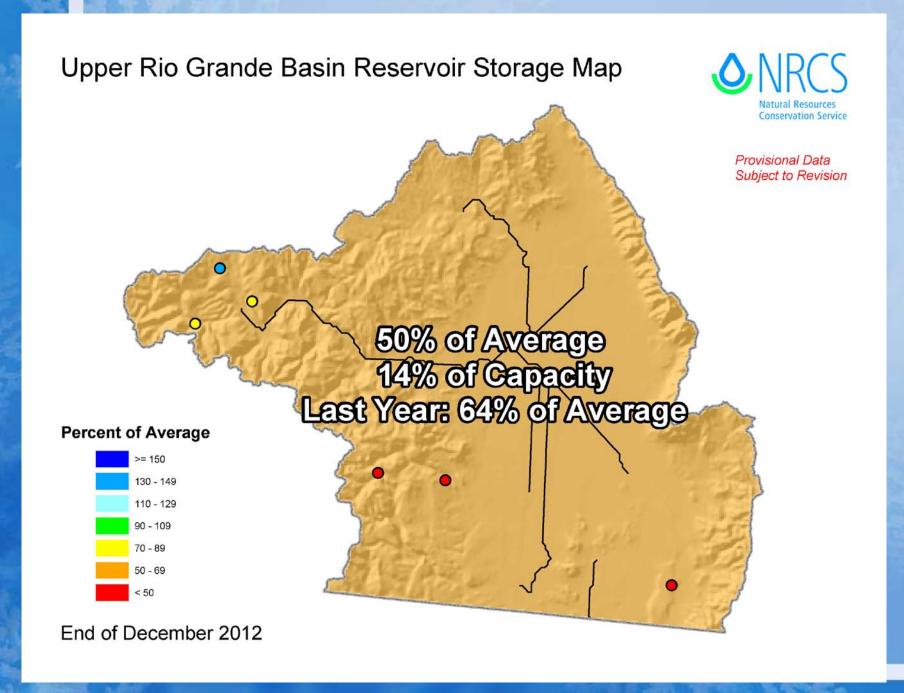
**WY2013** 

Median

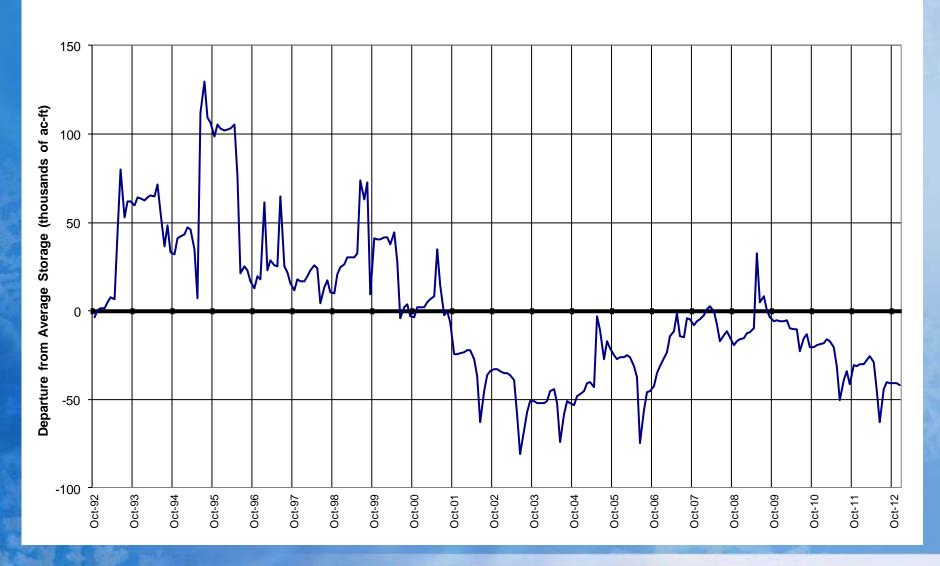
Maximum

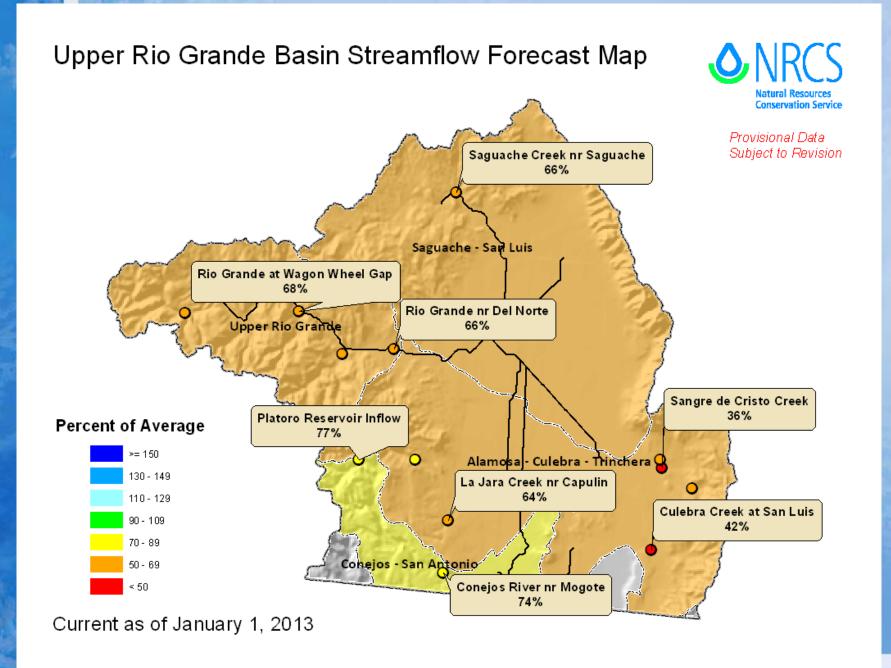
Mininum

### **Upper Rio Grande Basin High/Low Monthly Precipitation Summary** Based on Provisional SNOTEL data as of Jan 22, 2013 45 Conservation Service 40 35 30 Dec PREC Precipitation (Inches) 105% of Average **Jan PREC 43% of Average** 15 10 5 0 Average WY2013 WY2012 WY1997 WY2002 ■ Oct ■ Nov ■ Dec ■ Jan ■ Feb ■ Mar ■ Apr ■ May ■ Jun ■ Jul ■ Aug ■ Sep



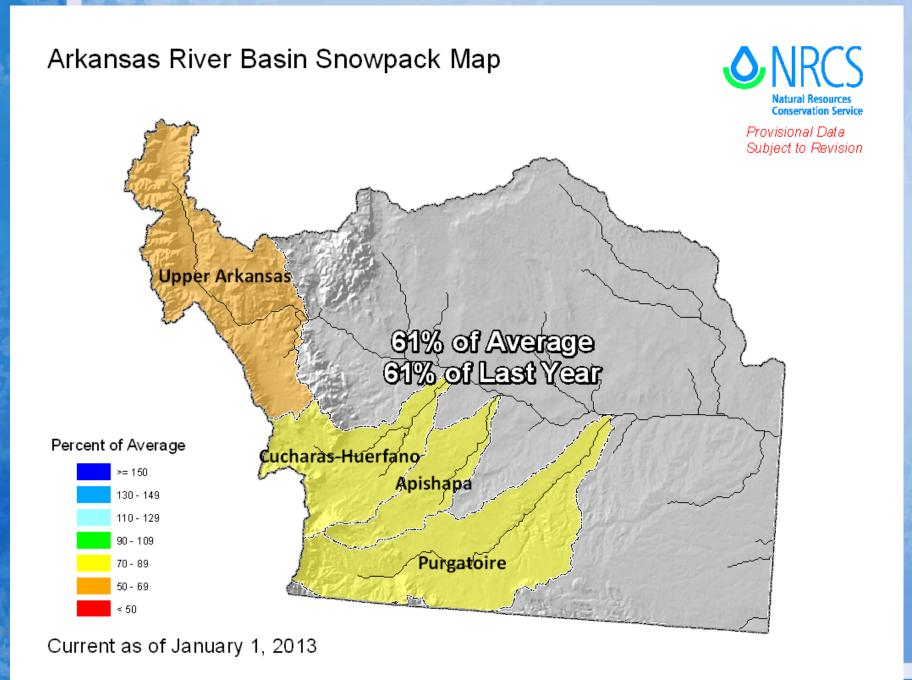
#### UPPER RIO GRANDE BASIN Reservoir Storage Departure from Average





### Arkansas River Basin Summary

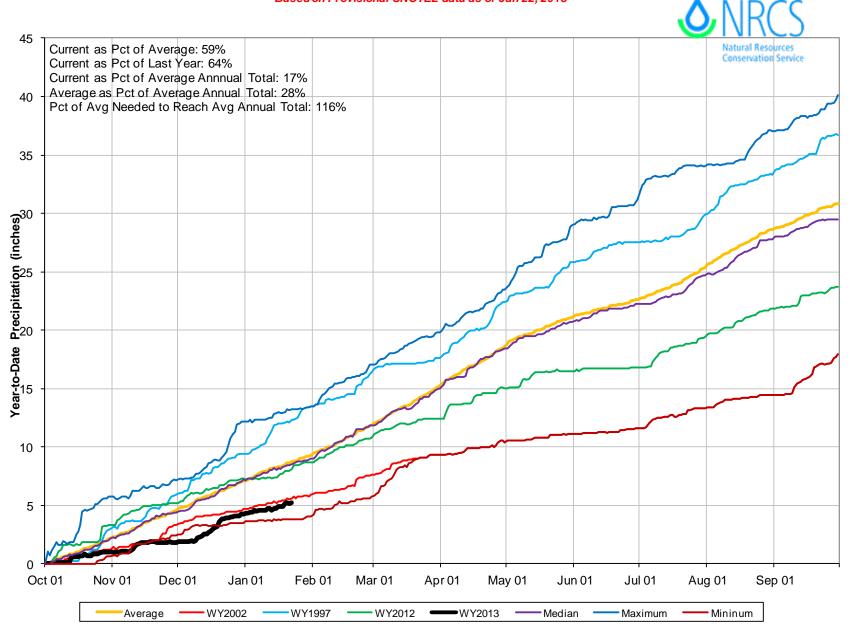




### **Arkansas River Basin High/Low Snowpack Summary** Based on Provisional SNOTEL data as of Jan 23, 2013 35 Conservation Service Current as Pct of Avg: 51% Current as Pct of Last Year: 59% Current as Pct of Peak: 28% 30 Normal as Pct of Peak: 79% Pct of Normal Needed to Reach Peak: 344% Average Peak Date: Apr 10 25 Snow Water Equivalent (inches) 5 Dec 01 Oct 01 Nov 01 Jan 01 Feb 01 Mar 01 Apr 01 May 01 Jun 01 Jul 01 Aug 01 Sep 01 **W**Y2002 -WY1997 ---- Maximum WY2012 **WY2013** -Mininum

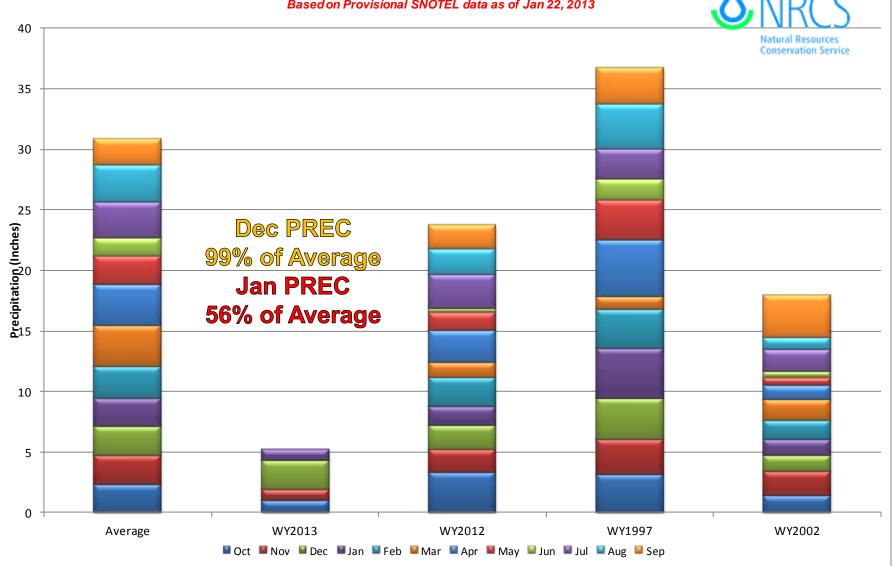
#### Arkansas River Basin High/Low Year-to-Date Precipitation Summary

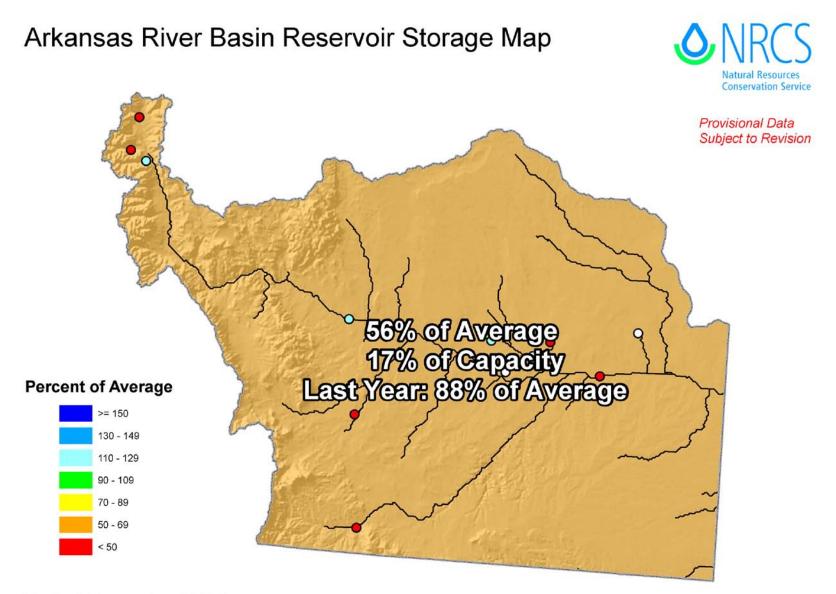
Based on Provisional SNOTEL data as of Jan 22, 2013



### Arkansas River Basin High/Low Monthly Precipitation Summary

Based on Provisional SNOTEL data as of Jan 22, 2013

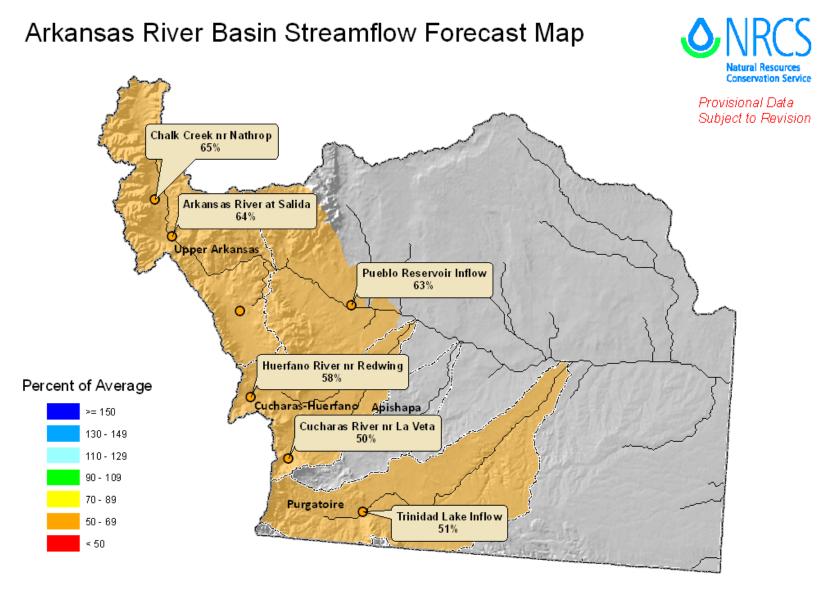




End of December 2012

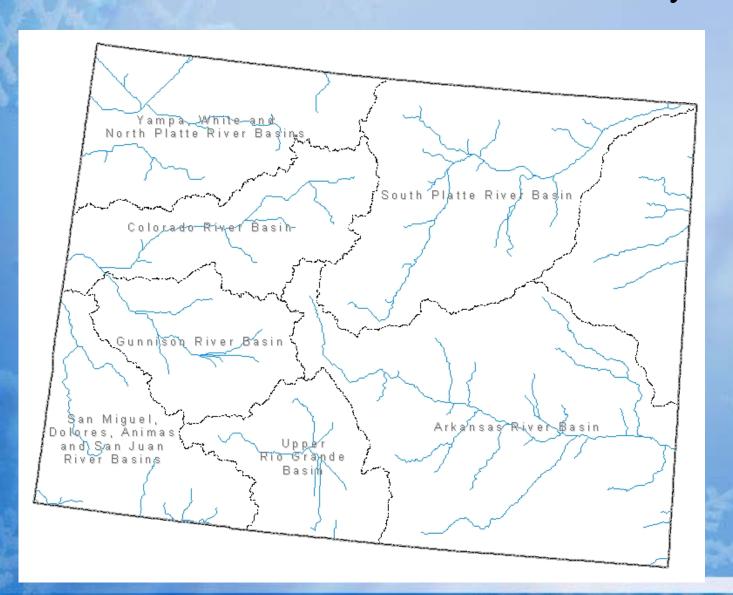
#### ARKANSAS RIVER BASIN Reservoir Storage Departure from Average





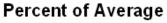
Current as of January 1, 2013

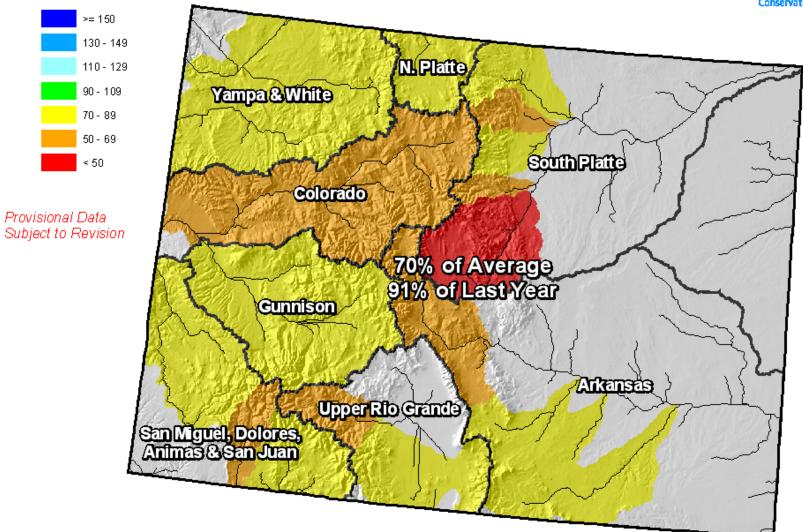
# Colorado Statewide Summary



### Colorado Snowpack Map



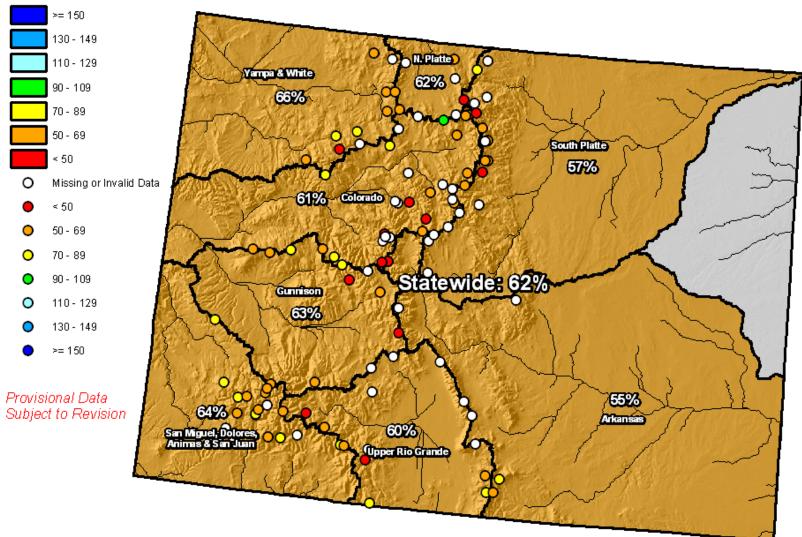




Current as of January 1, 2013

### Colorado SNOTEL Snowpack Update Map with Site Data

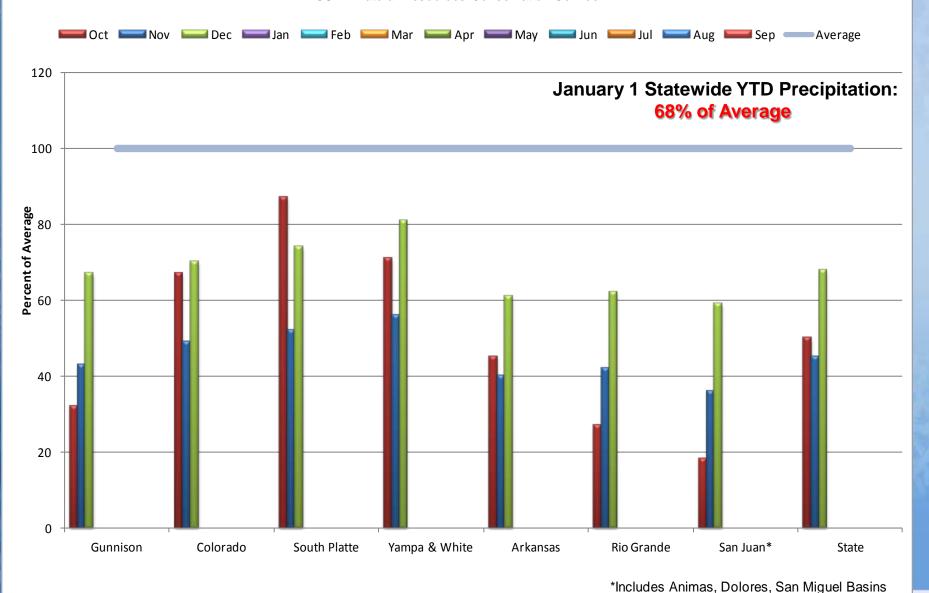




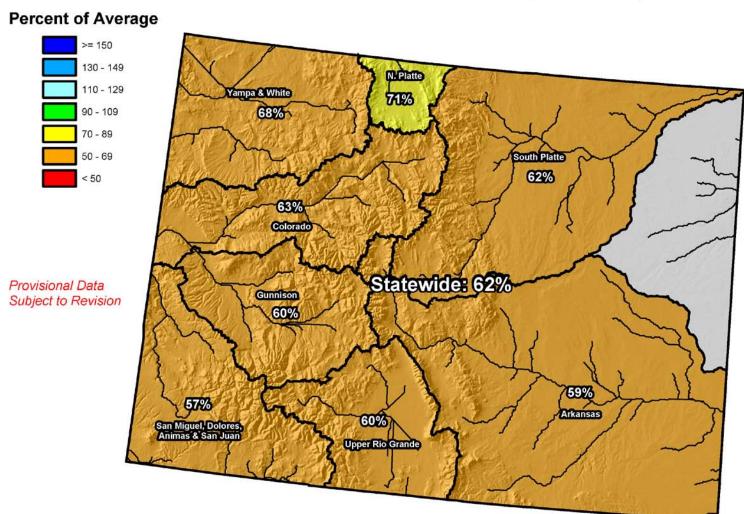
### Colorado State-Wide High/Low Snowpack Summary Based on Provisional SNOTEL data as of Jan 22, 2013 30 Current as Pct of Normal: 64% Current as Pct of Avg: 60% Conservation Service Current as Pct of Last Year: 79% Current as Pct of Peak: 34% Normal as Pct of Peak: 53% Pct of Normal Needed to Reach Peak: 140% Average Peak Date: Apr 08 Snow Water Equivalent (inches) 5 Oct 01 Nov 01 Dec 01 Jan 01 Feb 01 Mar 01 Apr 01 May 01 Jun 01 Jul 01 Aug 01 Sep 01 WY2002 WY2011 WY2012 WY2013 Maximum Mininum Median Average

### **Colorado Year-to-Date Precipitation Summary for WY2013**

USDA Natural Resources Conservation Service

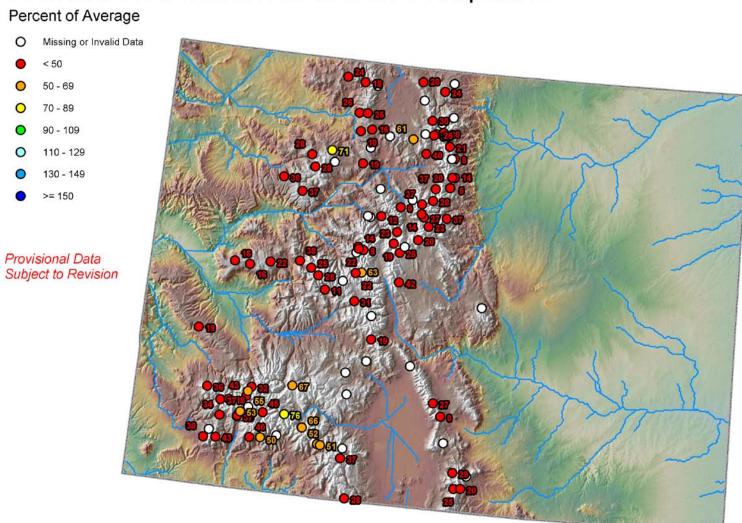


### Colorado SNOTEL Water Year-to-Date Precipitation Update Map



Current as of Jan 22, 2013

### Colorado SNOTEL Month-to-Date Precipitation

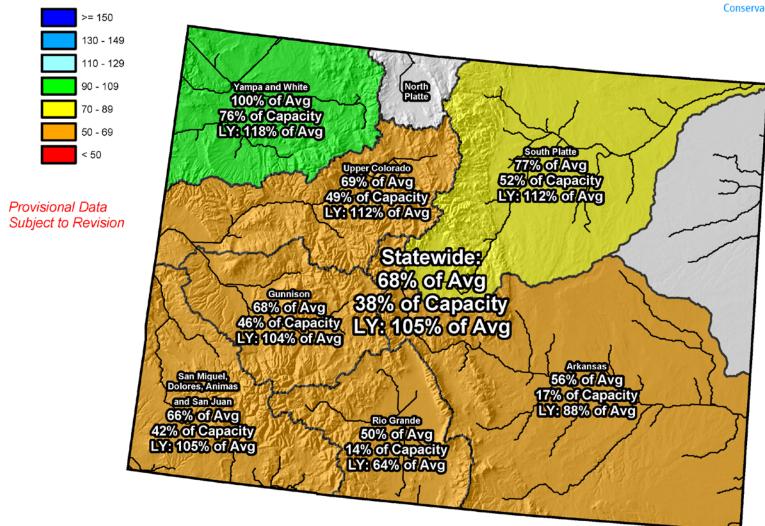


Current as of Jan 22, 2013

### Colorado Reservoir Storage Map

# Natural Resources Conservation Service

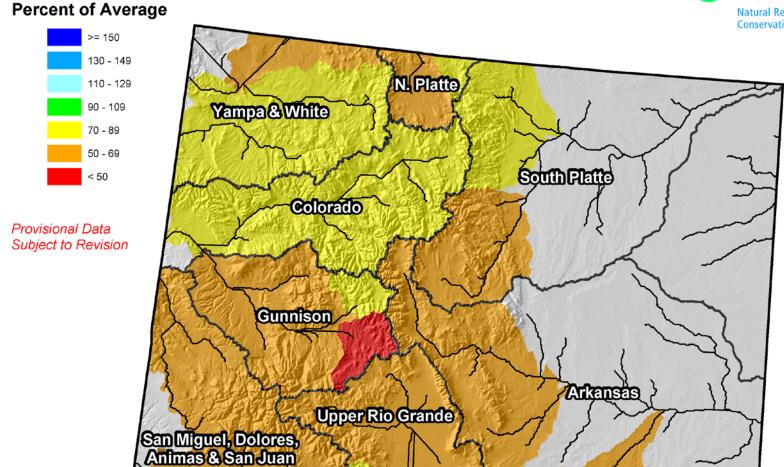
### **Percent of Average**



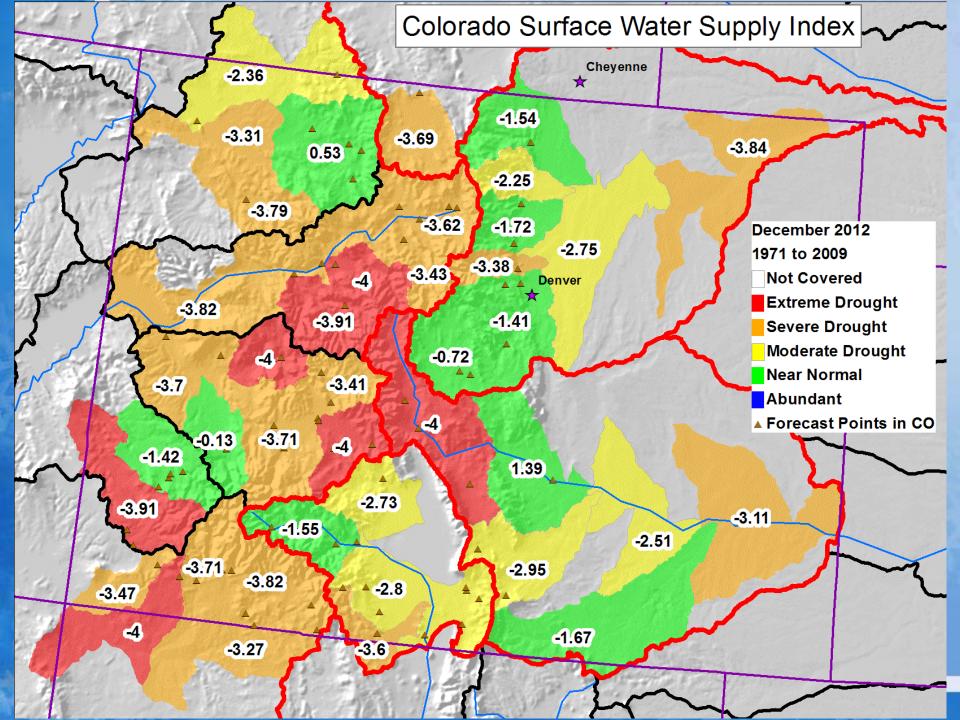
End of December 2012

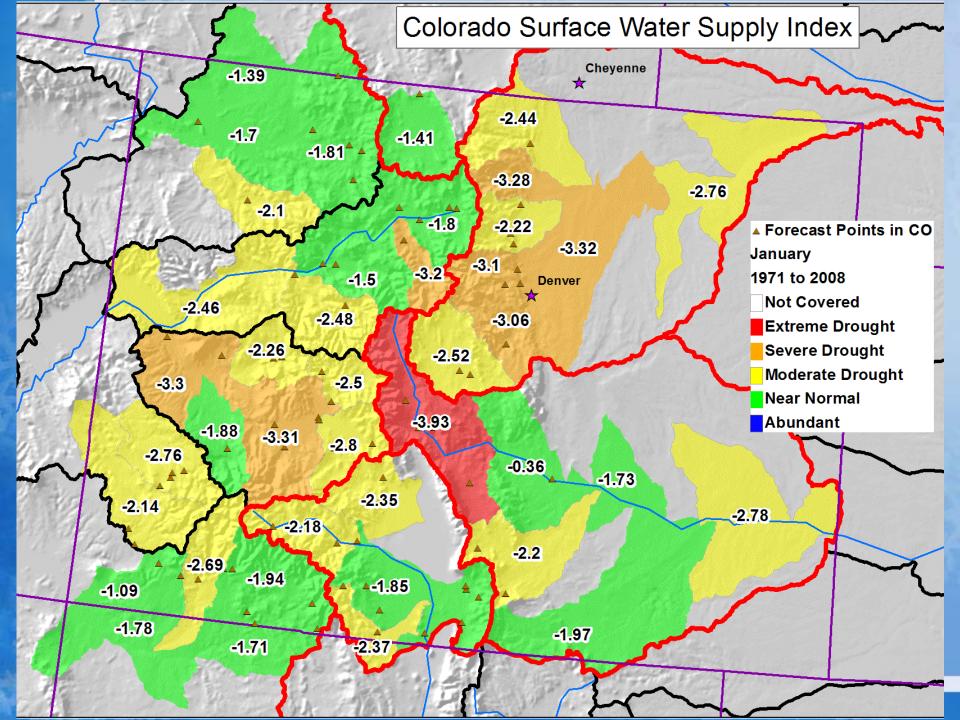
### Colorado Streamflow Forecast Map





Current as of January 1, 2013





# Notes on the January SWSI

- •SWSI inputs switch in January from reservoir storage and observed streamflow to reservoir storage and streamflow forecasts.
- •Most of the HUC's in the Near Normal category are negative and on the boundary of the next lower classification.
- •The Arkansas Headwaters HUC that is nearly negative 4 is reporting reservoir storage at the lowest end of the historical probability distribution (it includes Homestake).
- •All HUC's will most likely become more negative in the Feb 1 SWSI as forecasts will reflect dry conditions in January.

# WY2013 Summary

- •OCT: Began WY with below normal mountain precipitation and SWE. Statewide SWE was only 28% of normal on November 1.
- •NOV: Overall Nov ended up being drier, compared to normal, than Oct. Going into Dec all basins had VERY low snowpack's. Statewide SWE on Dec 1 was just 34% of normal!
- •DEC: SNOW! Finally. Storms in mid to late Dec boosted snowpack but it was not enough to reach normal conditions. By January 1 snowpack was 70% of normal.
- •JAN: Very little snow or prec. Southern basins have the highest PREC percentages so far. All basins snowpack's percentages have dropped since Jan 1.