NRCS – Snow Survey & Water Supply Forecasting

Water Availability Task Force Meeting
March 21st, 2013

Mage Hultstrand

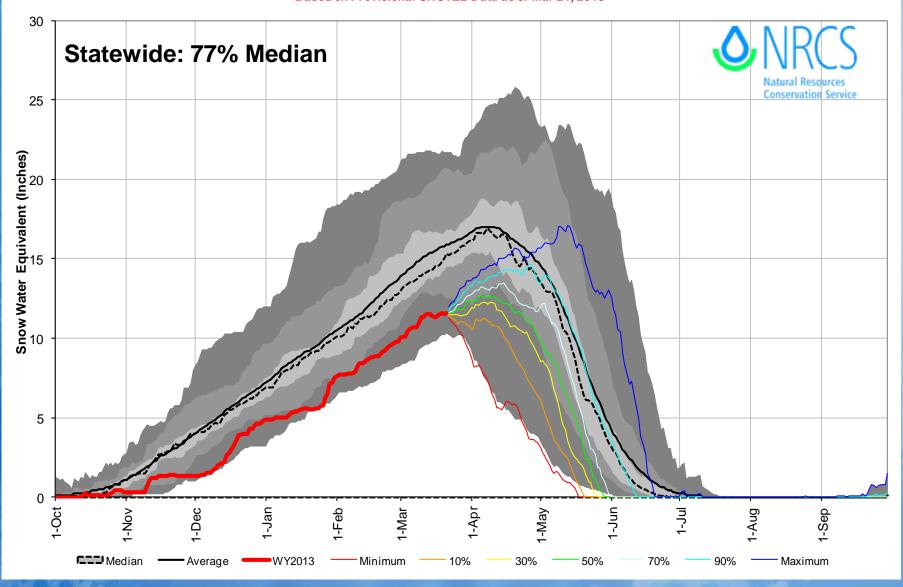
Assistant Snow Survey Supervisor 720-544-2855

mage.hultstrand@co.usda.gov

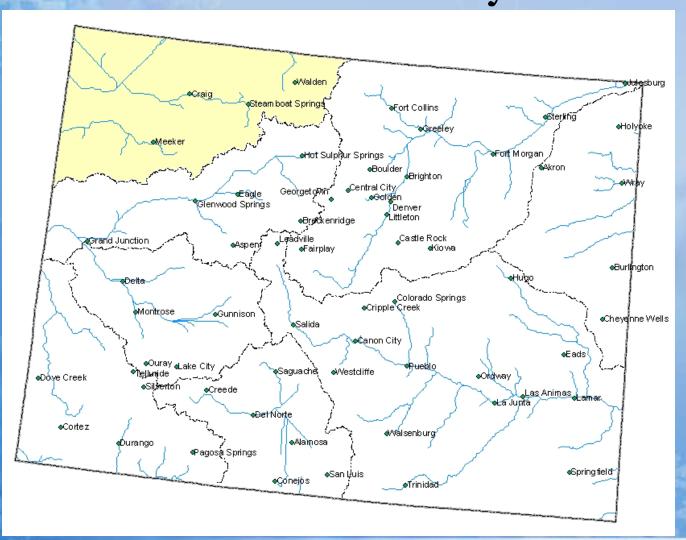
http://www.co.nrcs.usda.gov/snow/

Colorado State-Wide with Non-Exceedence Projections

Based on Provisional SNOTEL Data as of Mar 21, 2013

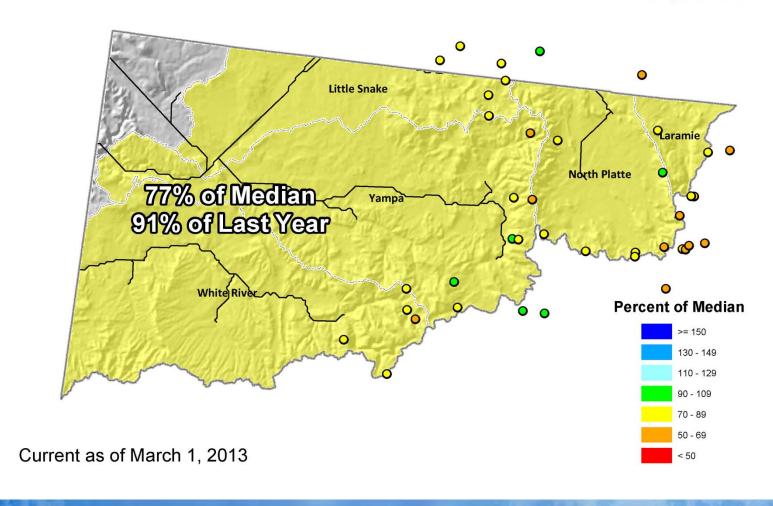


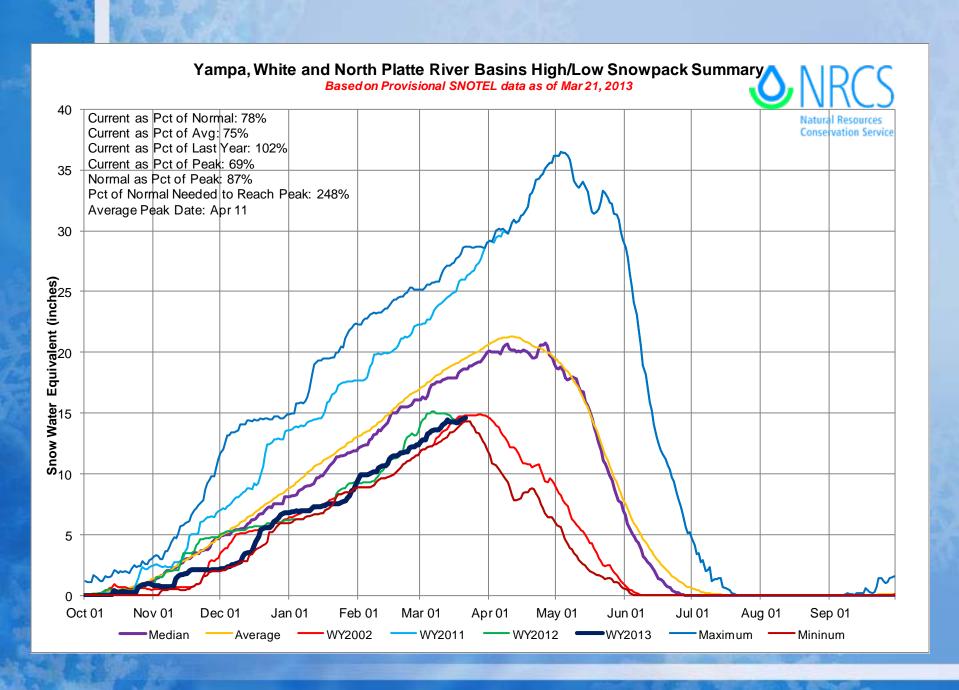
Yampa, White & North Platte River Basins Summary



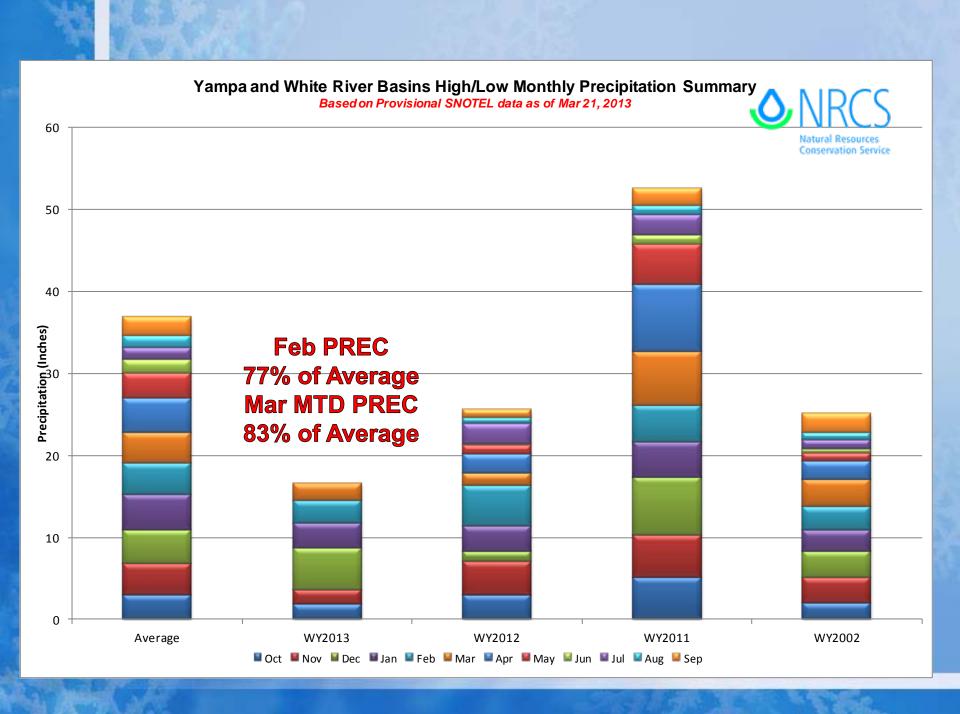
Yampa, White and North Platte River Basins Snowpack Map

Provisional Data Subject to Revision



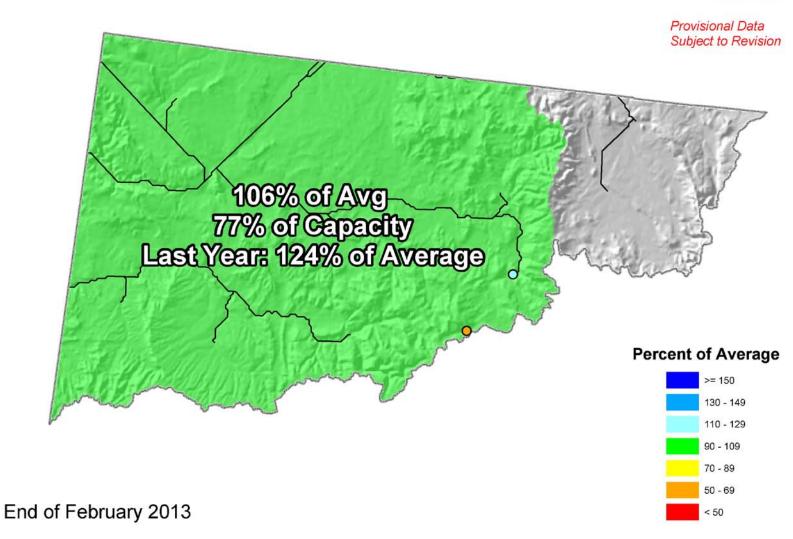


Yampa and White River Basins High/Low Year-to-Date Precipitation Summary Based on Provisional SNOTEL data as of Mar 21, 2013 Current as Pct of Average: 77% Conservation Service Current as Pct of Last Year: 94% Current as Pct of Average Annnual Total: 45% Average as Pct of Average Annual Total: 58% Pct of Avg Needed to Reach Avg Annual Total: 131% 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

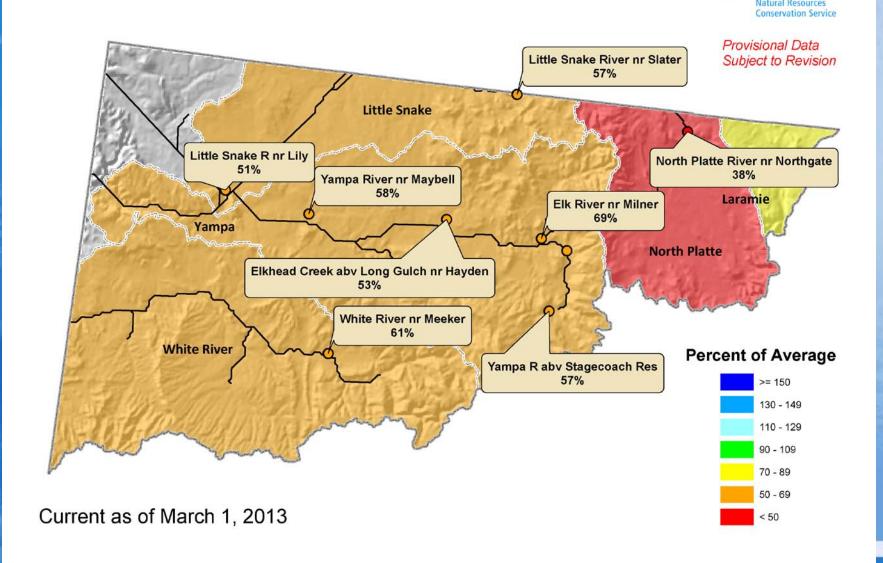


Yampa & White River Basins Reservoir Storage Map





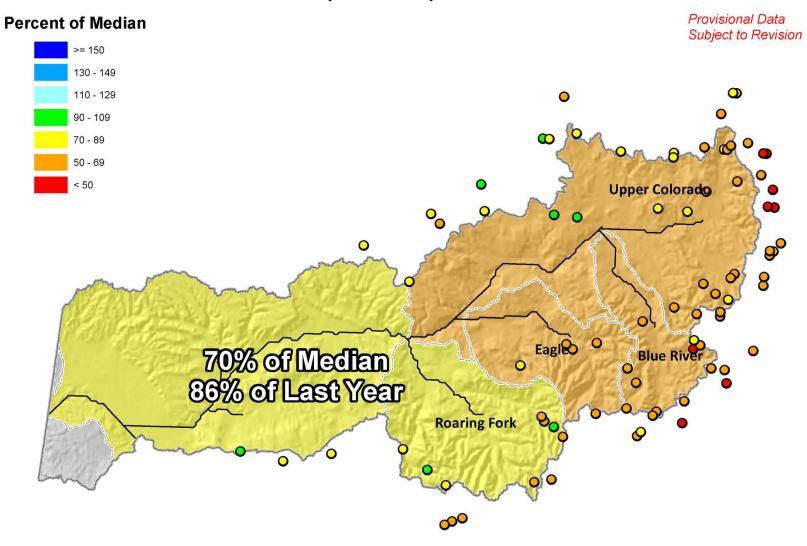
Yampa, White and North Platte River Basins Streamflow Map



Colorado River Basin Summary



Colorado River Basin Snowpack Map



Current as of March 1, 2013

Upper Colorado River Basin High/Low Snowpack Summary Based on Provisional SNOTEL data as of Mar 21, 2013 30 Current as Pct of Normal: 72% Current as Pct of Avg: 71% Conservation Service Current as Pct of Last Year: 101% Current as Pct of Peak: 65% Normal as Pct of Peak: 90% Pct of Normal Needed to Reach Peak: 356% 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

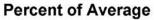
Upper Colorado River Basin High/Low Year-to-Date Precipitation Summary

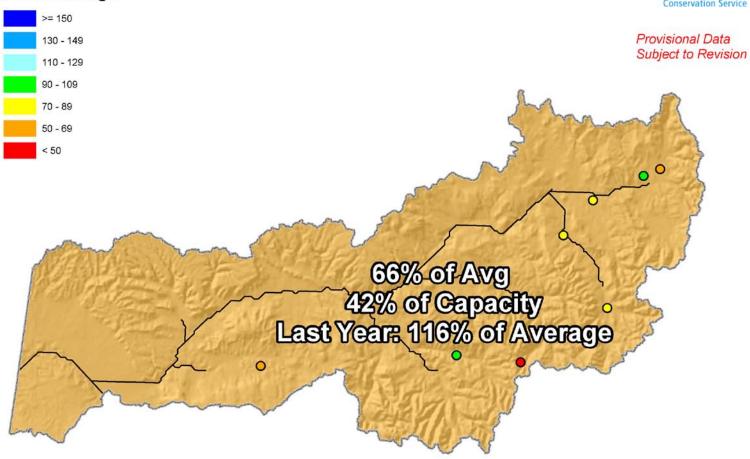
Based on Provisional SNOTEL data as of Mar 21, 2013 Current as Pct of Average: 74% Conservation Service Current as Pct of Last Year: 94% Current as Pct of Average Annnual Total: 38% Average as Pct of Average Annual Total: 52%
Pct of Avg Needed to Reach Avg Annual Total: 129% 35 Year-to-Date Precipitation (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 Mar 21, 2013 45 Conservation Service 40 35 30 Feb PREC Precipitation (Inches) 74% of Average **Mar MTD PREC** 80% 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





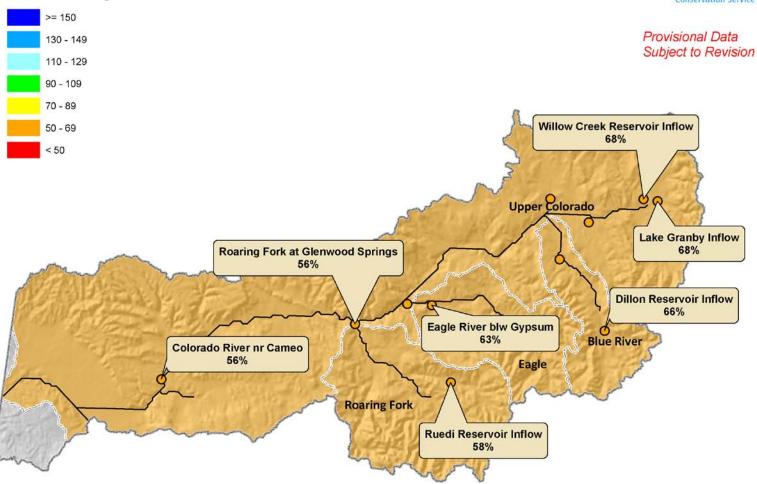


End of February 2013

Colorado River Basin Streamflow Forecast Map

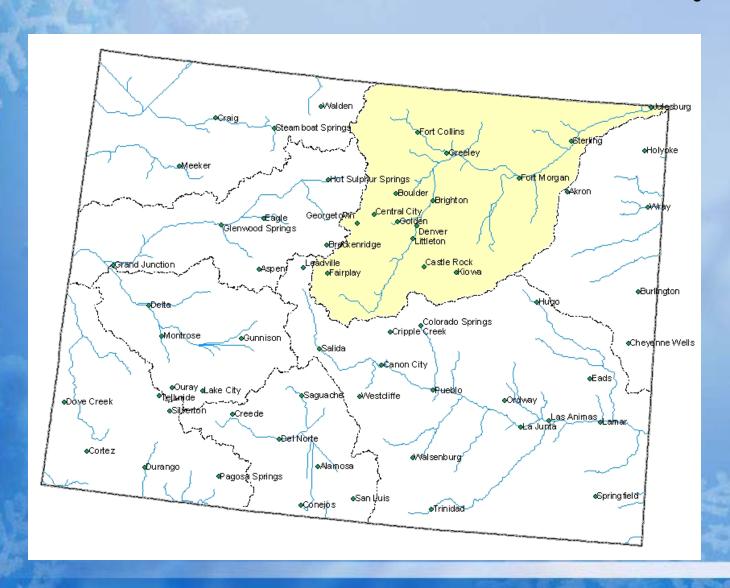
Natural Resources Conservation Service

Percent of Average

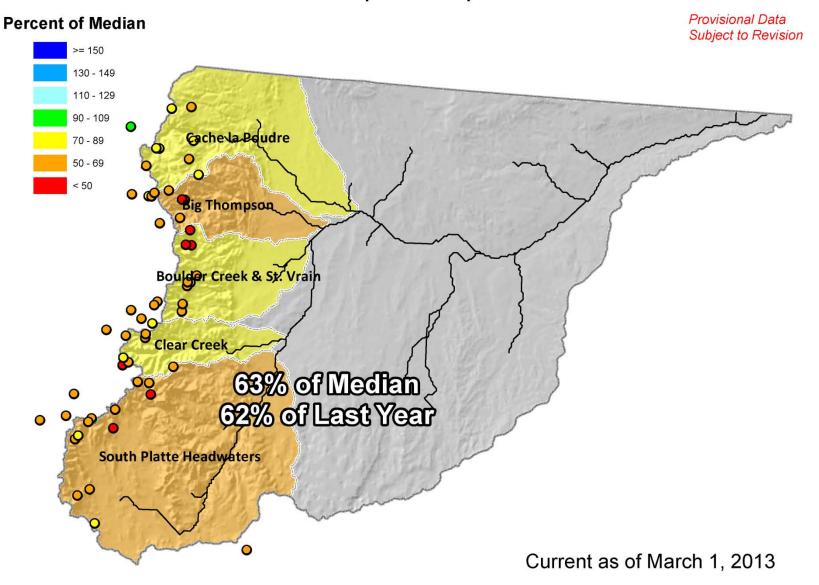


Current as of March 1, 2013

South Platte River Basin Summary



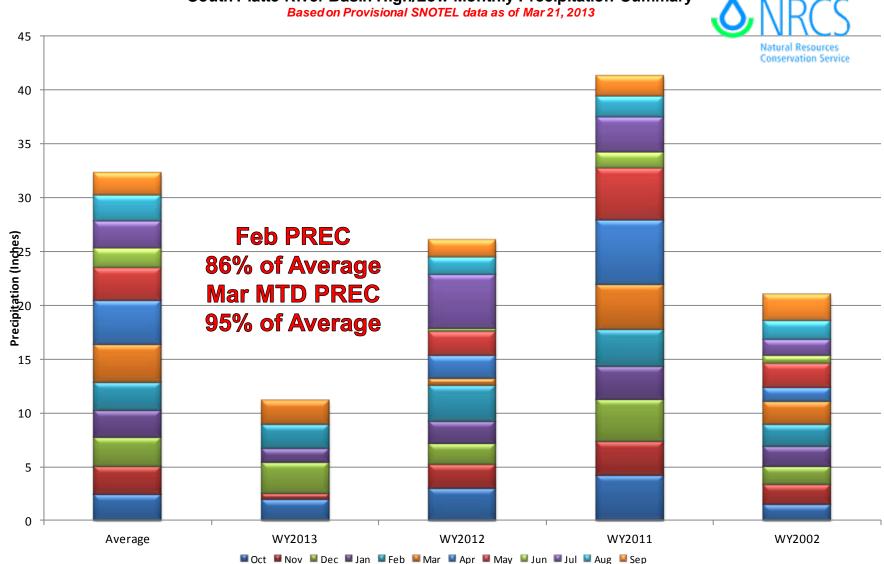
South Platte River Basin Snowpack Map



South Platte River Basin High/Low Snowpack Summary Based on Provisional SNOTEL data as of Mar 21, 2013 35 Current as Pct of Normal: 69% Current as Pct of Avg: 67% Conservation Service Current as Pct of Last Year: 85% Current as Pct of Peak: 58% Normal as Pct of Peak: 84% Pct of Normal Needed to Reach Peak: 269% 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

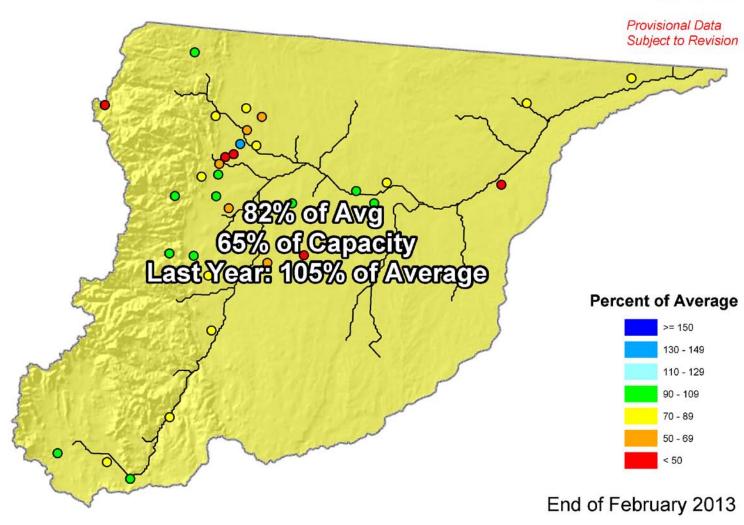
South Platte River Basin High/Low Year-to-Date Precipitation Summary Based on Provisional SNOTEL data as of Mar 21, 2013 Current as Pct of Average: 73% Current as Pct of Last Year: 84% Current as Pct of Average Annnual Total: 34% Average as Pct of Average Annual Total: 47% Pct of Avg Needed to Reach Avg Annual Total: 123% 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 WY2002 WY2011 WY2012 Mininum Average **W**Y2013 Median Maximum

South Platte River Basin High/Low Monthly Precipitation Summary



South Platte River Basin Reservoir Storage Map

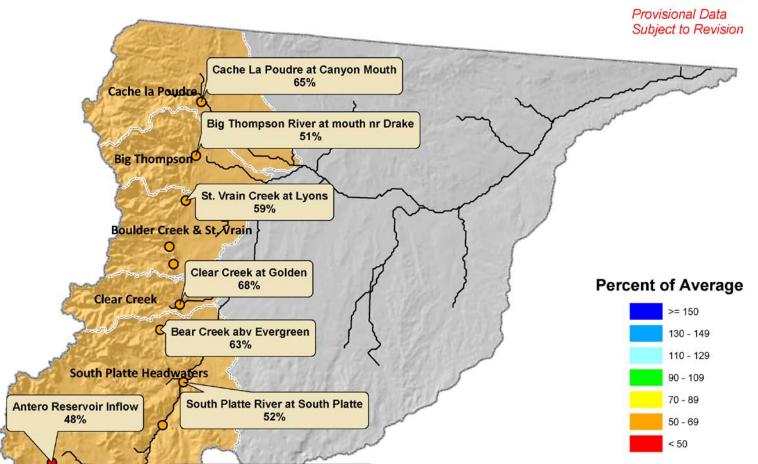




South Platte River Basin Streamflow Forecast Map

Elevenmile Canyon Reservoir Inflow 56%



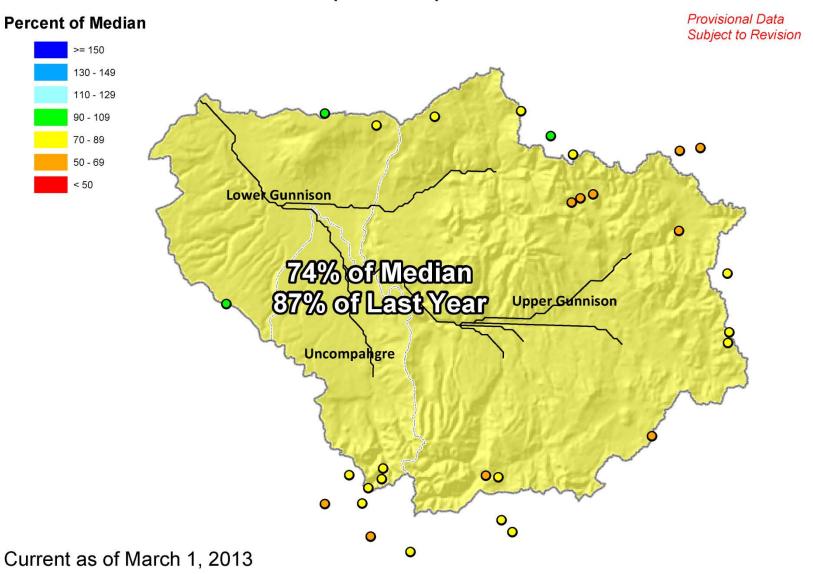


Current as of March 1, 2013

Gunnison River Basin Summary



Gunnison River Basin Snowpack Map



Gunnison River Basin High/Low Snowpack Summary Based on Provisional SNOTEL data as of Mar 21, 2013 35 Current as Pct of Normal: 75% Current as Pct of Avg: 72% Conservation Service Current as Pct of Last Year: 92% Current as Pct of Peak: 66% Normal as Pct of Peak: 88% Pct of Normal Needed to Reach Peak: 293% Average Peak Date: Apr 10 25 Equivalent (inches) Snow Water 0 5 Oct 01 Dec 01 Jan 01 Feb 01 Mar 01 Apr 01 May 01 Jun 01 Jul 01 Aug 01 Sep 01 Nov 01 WY2002 WY2013 Mininum Median Average WY2011 WY2012 - Maximum

Gunnison River Basin High/Low Year-to-Date Precipitation Summary Based on Provisional SNOTEL data as of Mar 21, 2013 Current as Pct of Average: 71% Current as Pct of Last Year: 83% Current as Pct of Average Annual Total: 39% Average as Pct of Average Annual Total: 55% Pct of Avg Needed to Reach Avg Annual Total: 135%

50

40

35

Year-to-Date Precipitation (inches)

10

5

Oct 01

Dec 01

Average

Jan 01

WY2002

Feb 01

WY2011

Mar 01

WY2012

Apr 01

−WY2013

May 01

Jun 01

Median

Jul 01

Maximum

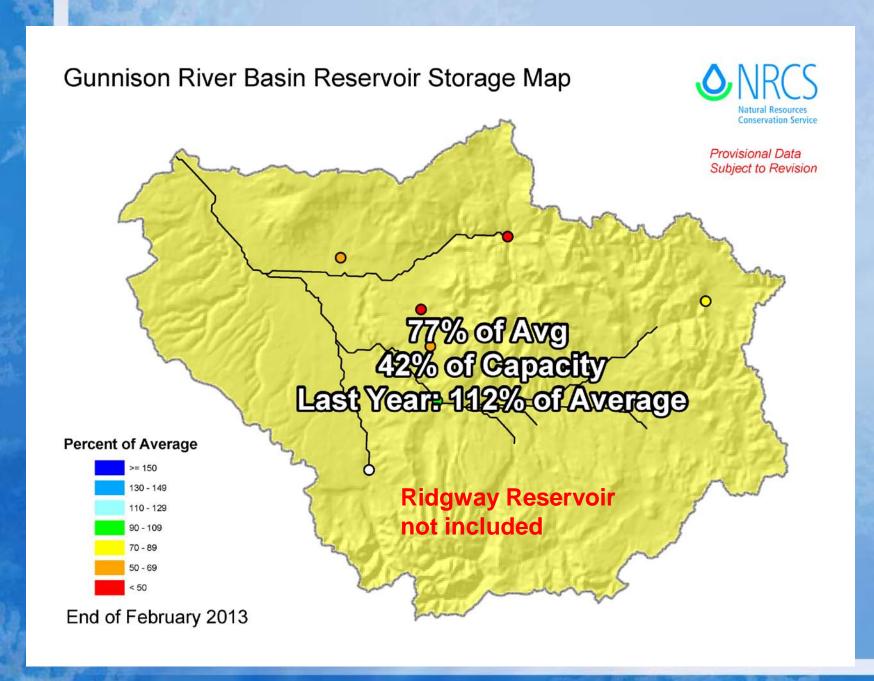
Aug 01

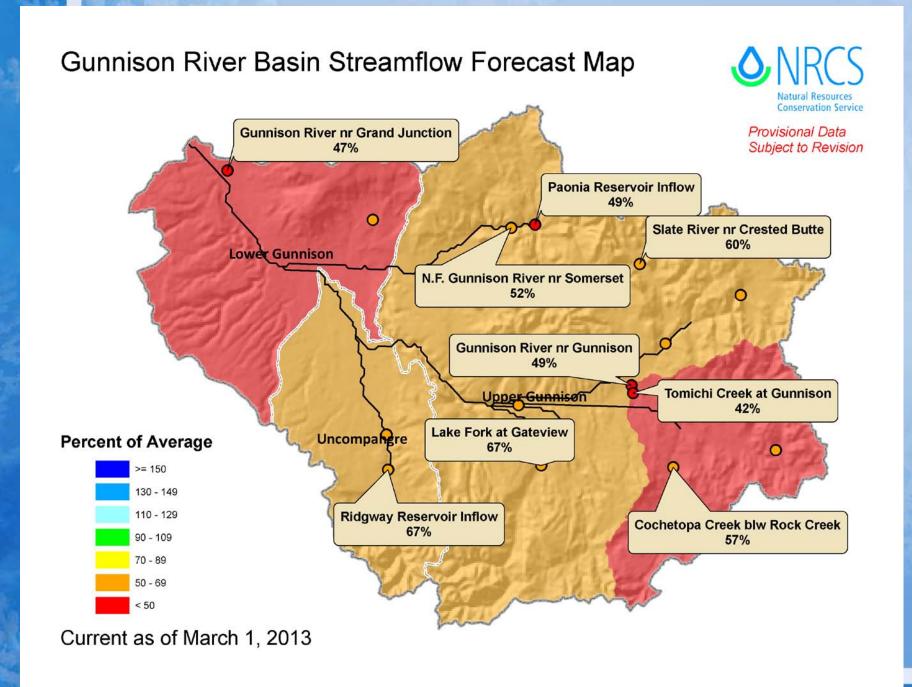
Mininum

Sep 01

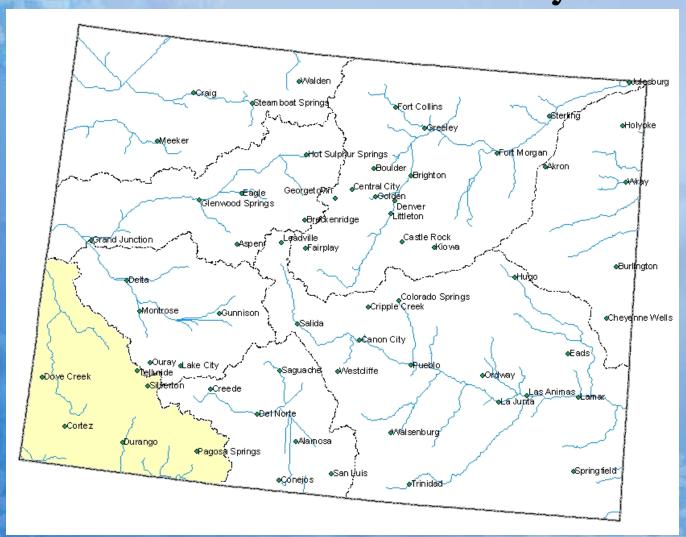
Nov 01

Gunnison River Basin High/Low Monthly Precipitation Summary Based on Provisional SNOTEL data as of Mar 21, 2013 40 Conservation Service 35 30 25 **Feb PREC** Precipitation (Inches) **66% of Average Mar MTD PREC 59% of Average** 10 5 0 Average WY2013 WY2012 WY2011 WY2002 ■ Oct ■ Nov ■ Dec ■ Jan ■ Feb ■ Mar ■ Apr ■ May ■ Jun ■ Jul ■ Aug ■ Sep

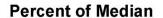




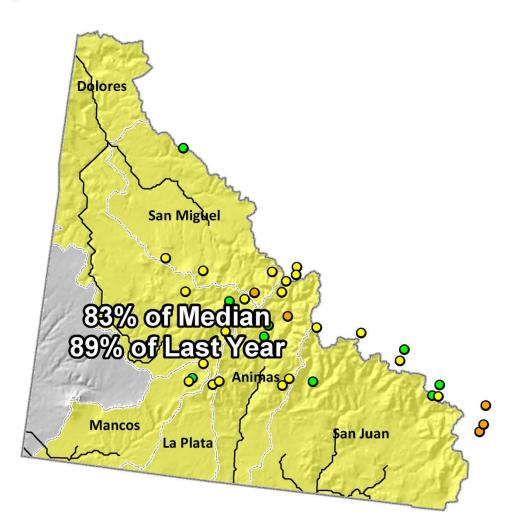
San Miguel, Dolores, Animas & San Juan River Basins Summary



San Miguel, Dolores, Animas and San Juan River Basins Snowpack Map

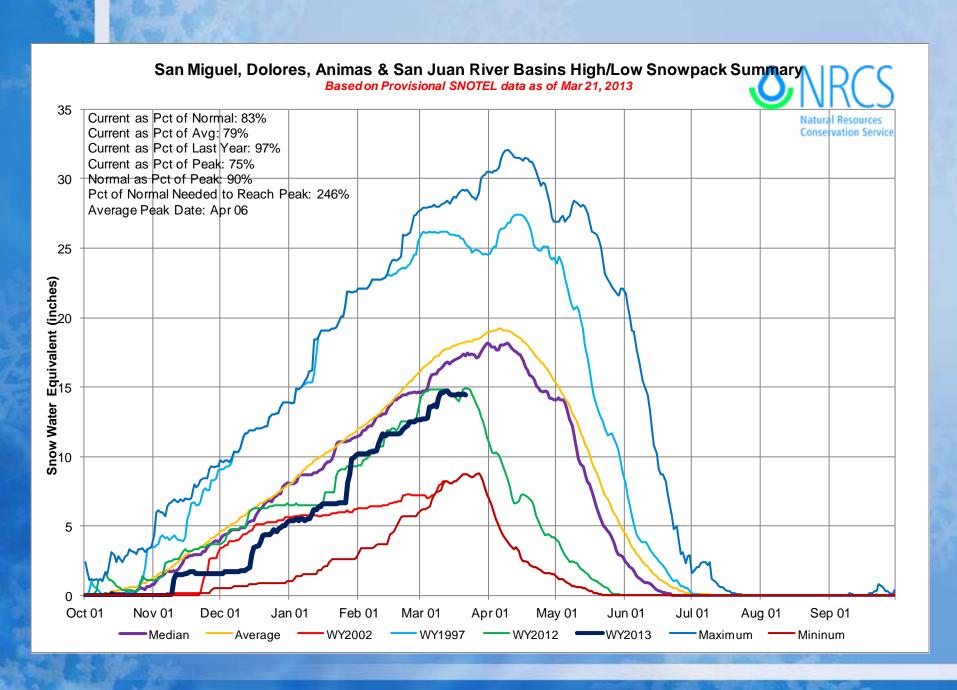






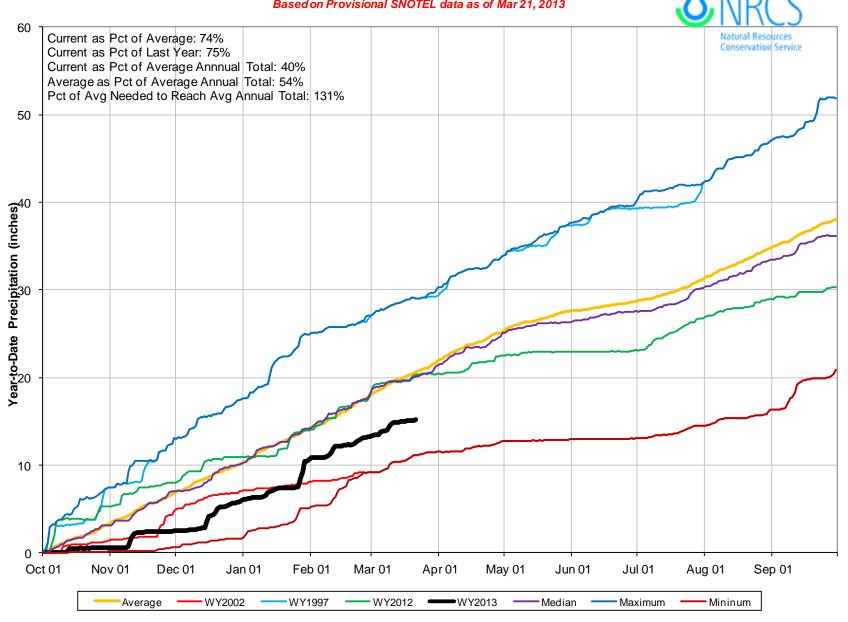
Provisional Data Subject to Revision

Current as of March 1, 2013



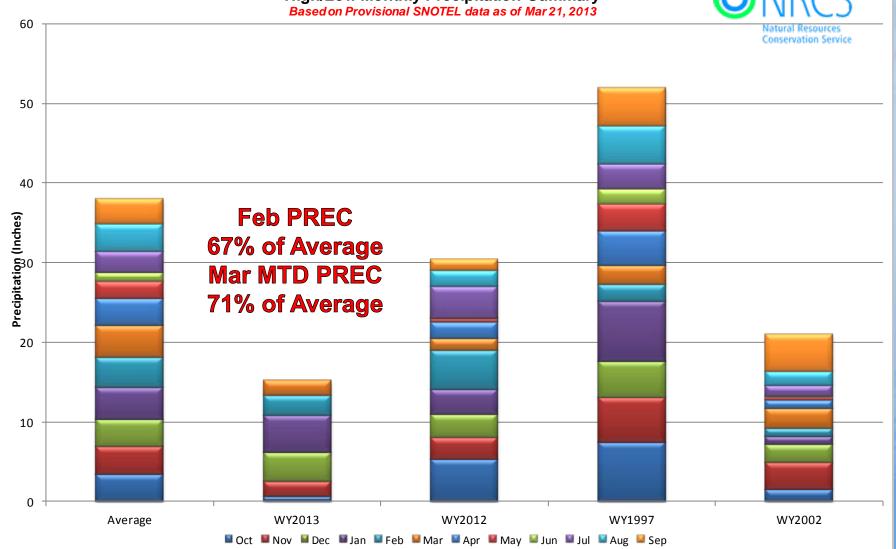
San Miguel, Dolores, Animas & San Juan River Basins **High/Low Year-to-Date Precipitation Summary**



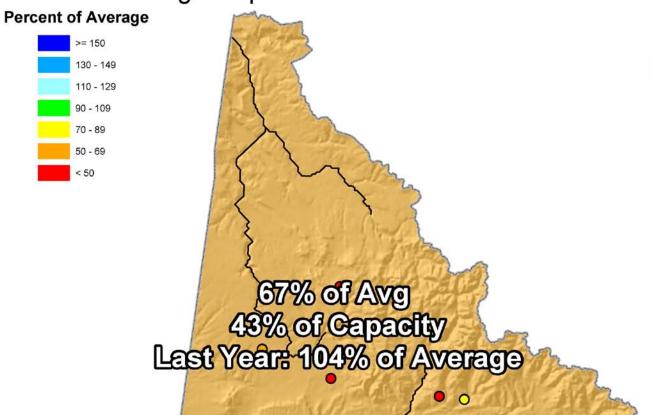


San Miguel, Dolores, Animas & San Juan River Basins **High/Low Monthly Precipitation Summary**





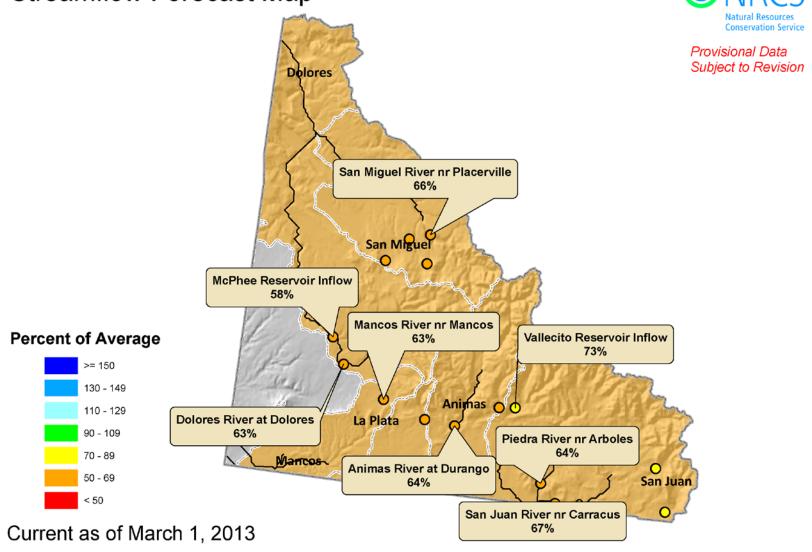
San Miguel, Dolores, Animas and San Juan River Basins Reservoir Storage Map



End of February 2013



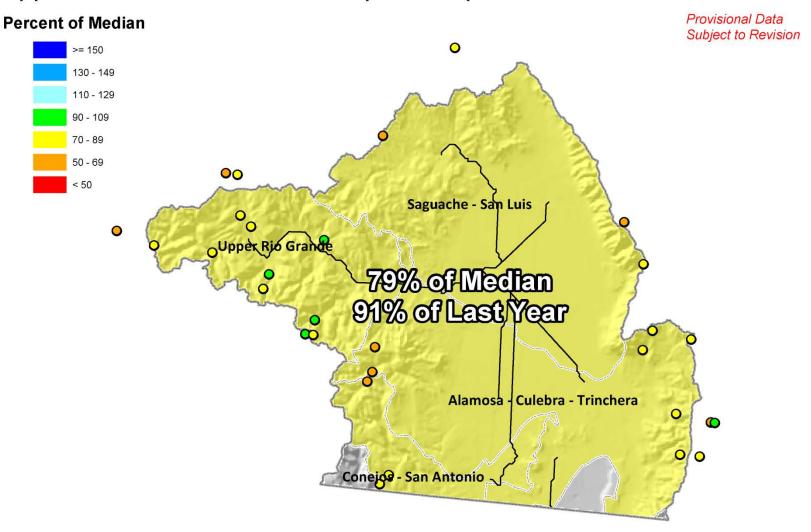
Provisional Data Subject to Revision San Miguel, Dolores, Animas and San Juan River Basins Streamflow Forecast Map



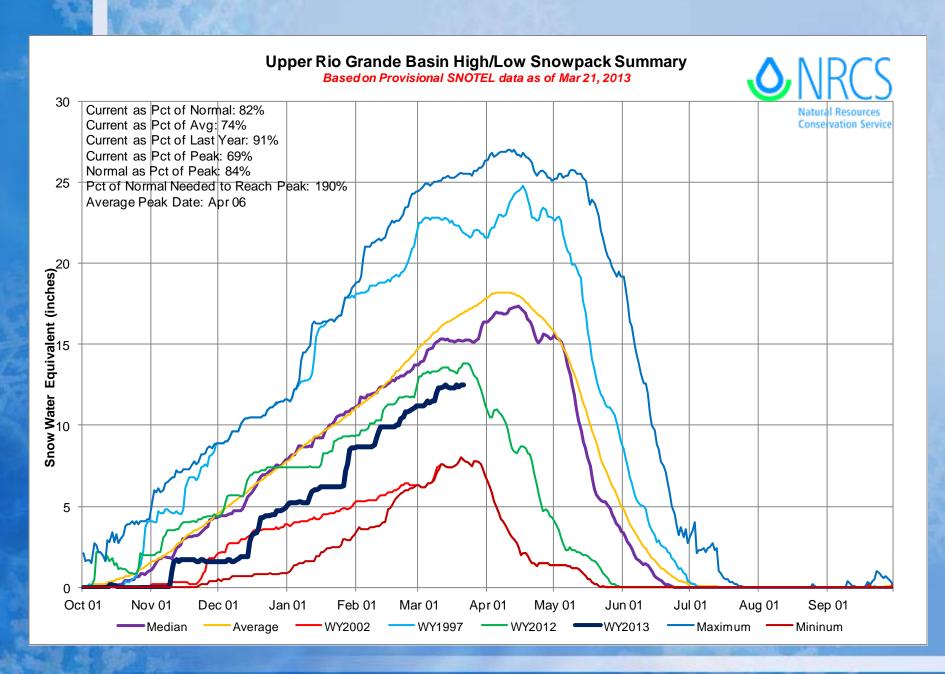
Upper Rio Grande Basin Summary



Upper Rio Grande Basin Snowpack Map



Current as of March 1, 2013



Upper Rio Grande Basin High/Low Year-to-Date Precipitation Summary Based on Provisional SNOTEL data as of Mar 21, 2013 50 Current as Pct of Average: 72% Conservation Service Current as Pct of Last Year: 73% Current as Pct of Average Annnual Total: 38% Average as Pct of Average Annual Total: 52% Pct of Avg Needed to Reach Avg Annual Total: 131% 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

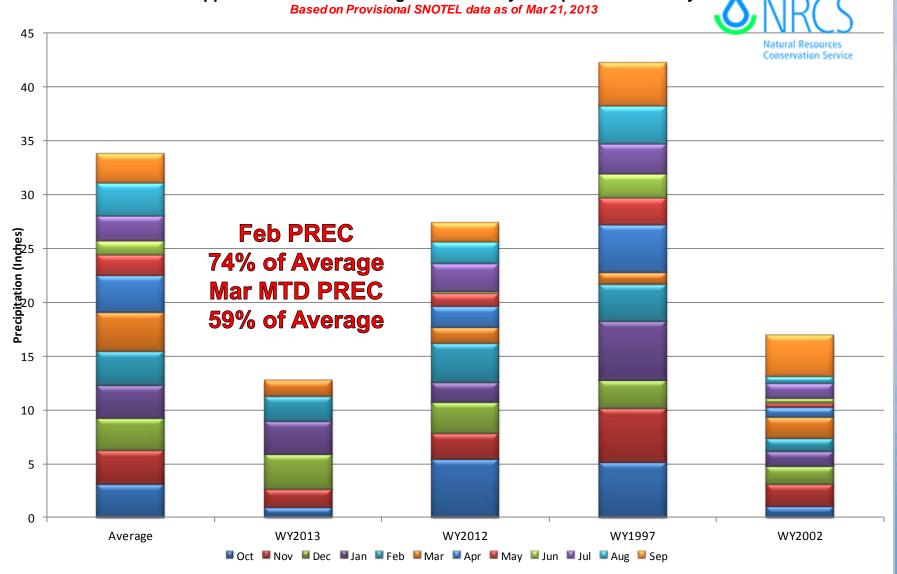
WY2013

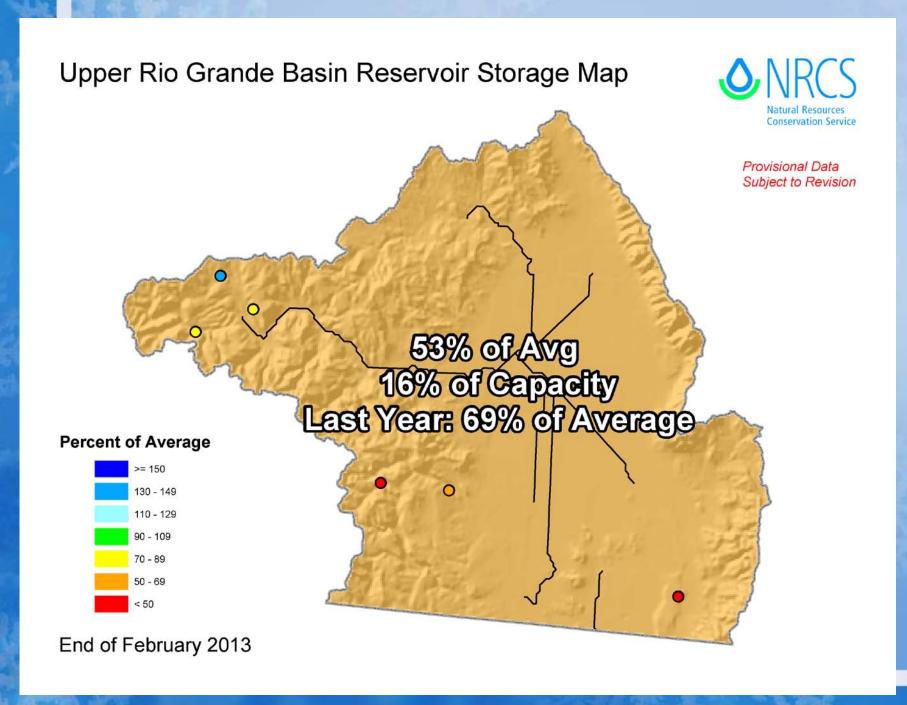
Median

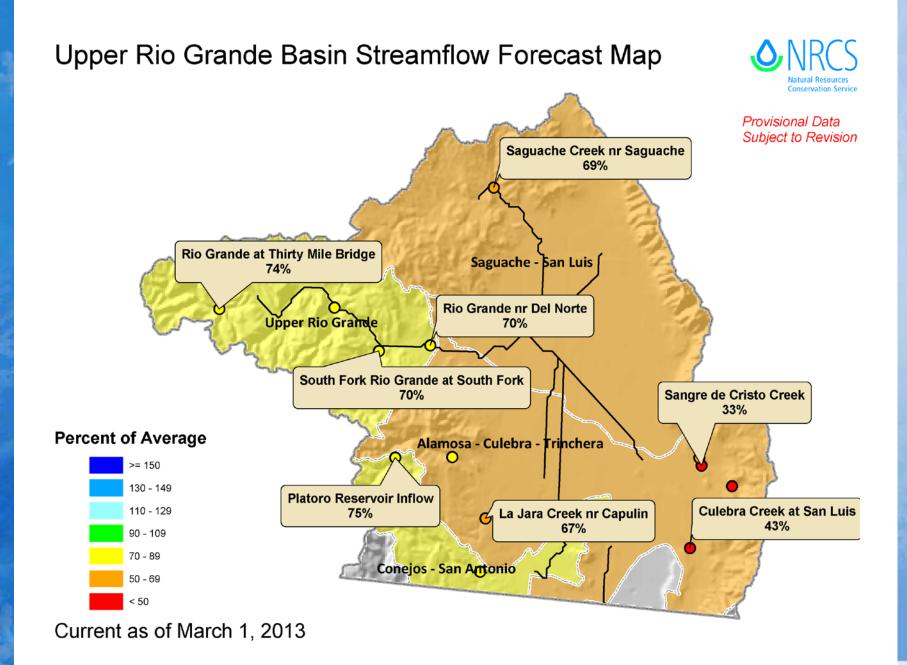
Maximum

Mininum

Upper Rio Grande Basin High/Low Monthly Precipitation Summary

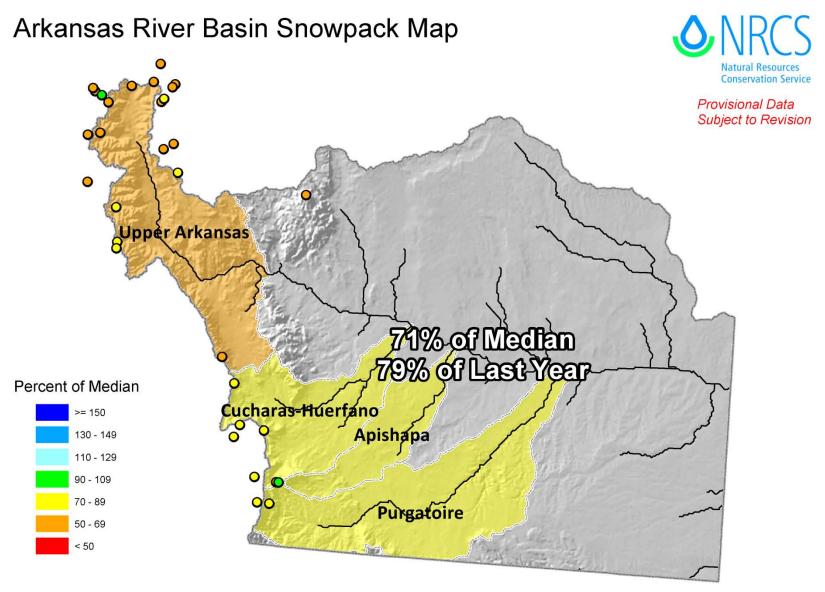






Arkansas River Basin Summary





Current as of March 1, 2013

Arkansas River Basin High/Low Snowpack Summary Based on Provisional SNOTEL data as of Mar 21, 2013 Current as Pct of Normal: 75% Conservation Service Current as Pct of Avg: 73% Current as Pct of Last Year: 90% Current as Pct of Peak: 69% Normal as Pct of Peak: 92% Pct of Normal Needed to Reach Peak: 389% 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

WY1997

WY2012

WY2013

- Maximum

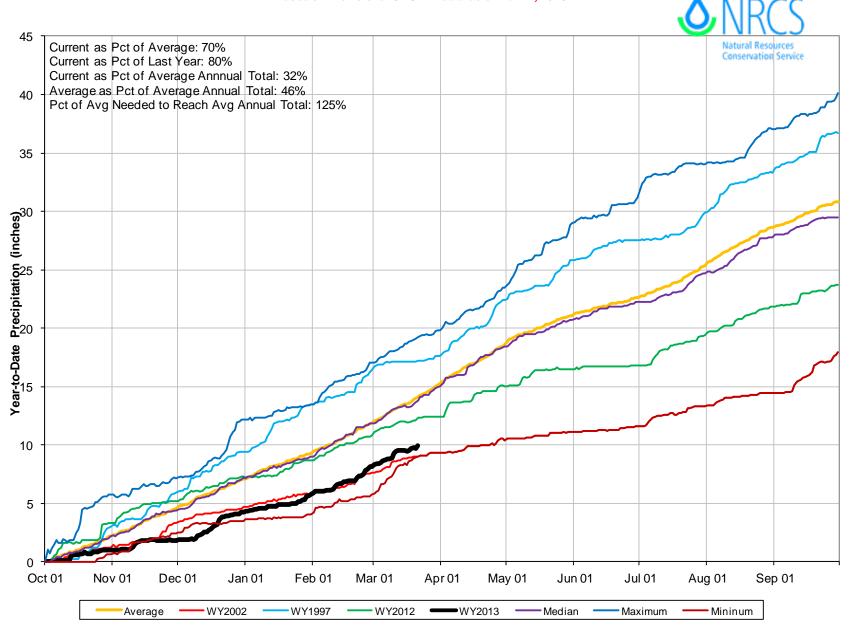
Mininum

Median

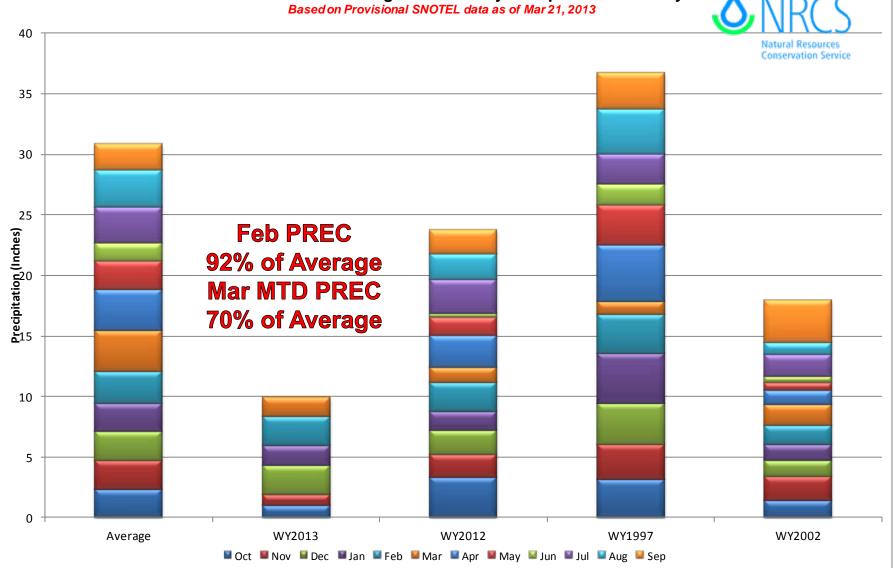
Average

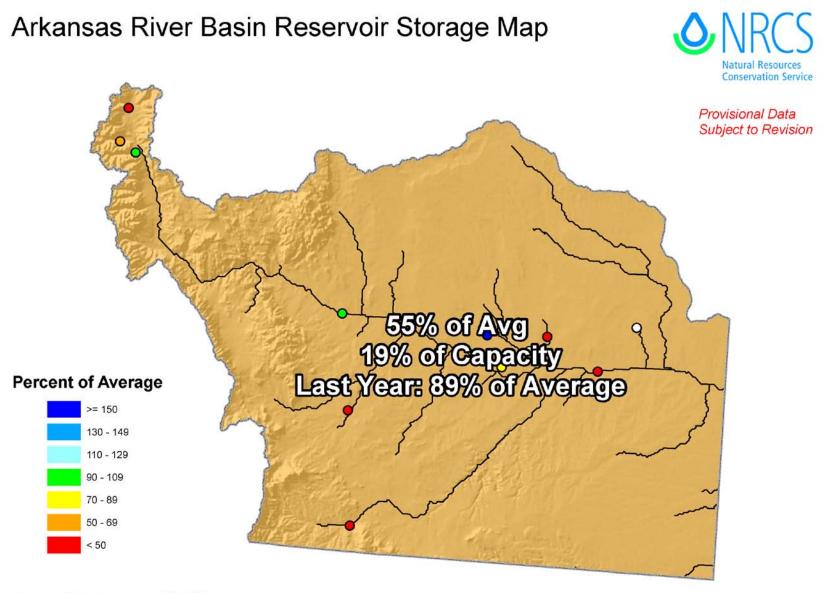
Arkansas River Basin High/Low Year-to-Date Precipitation Summary

Based on Provisional SNOTEL data as of Mar 21, 2013



Arkansas River Basin High/Low Monthly Precipitation Summary

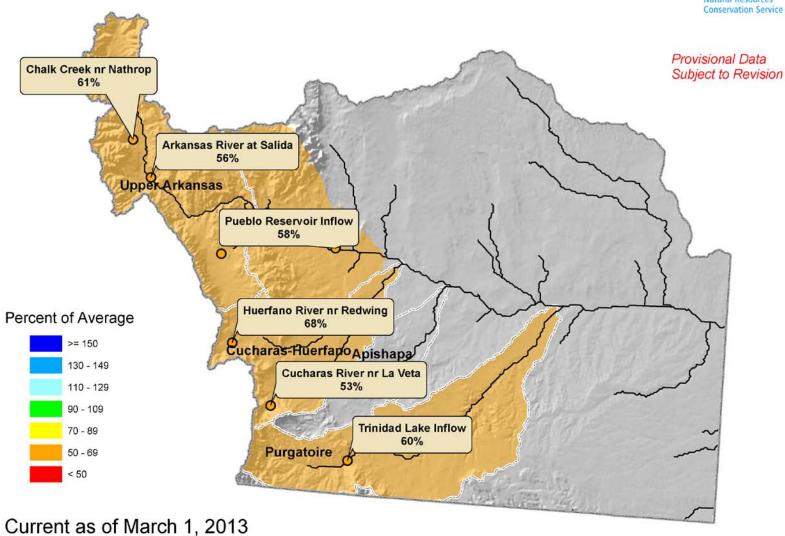




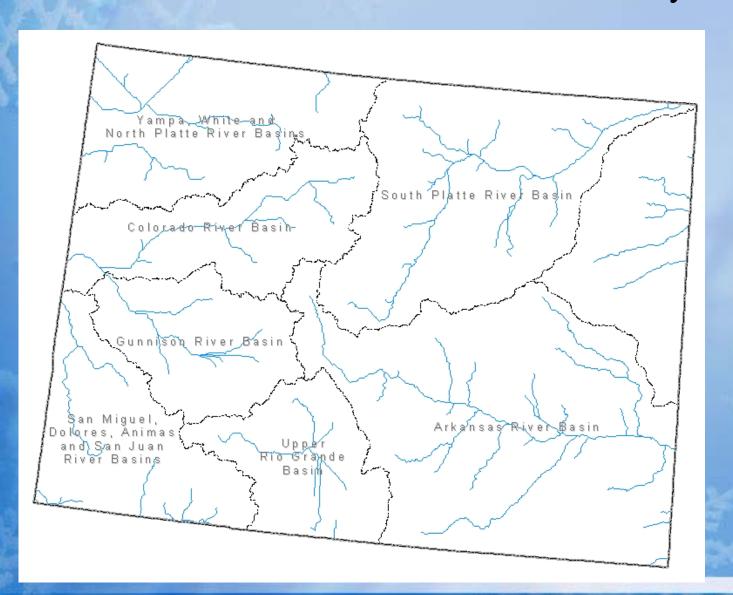
End of February 2013

Arkansas River Basin Streamflow Forecast Map



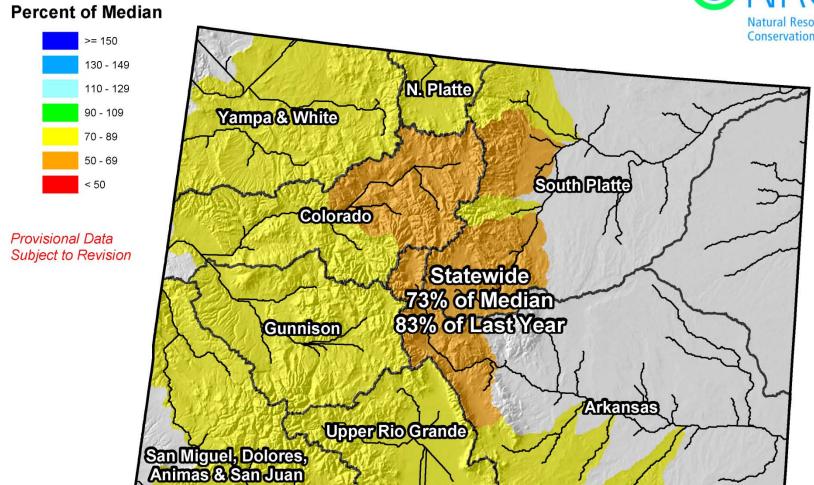


Colorado Statewide Summary



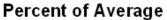
Colorado Snowpack Map

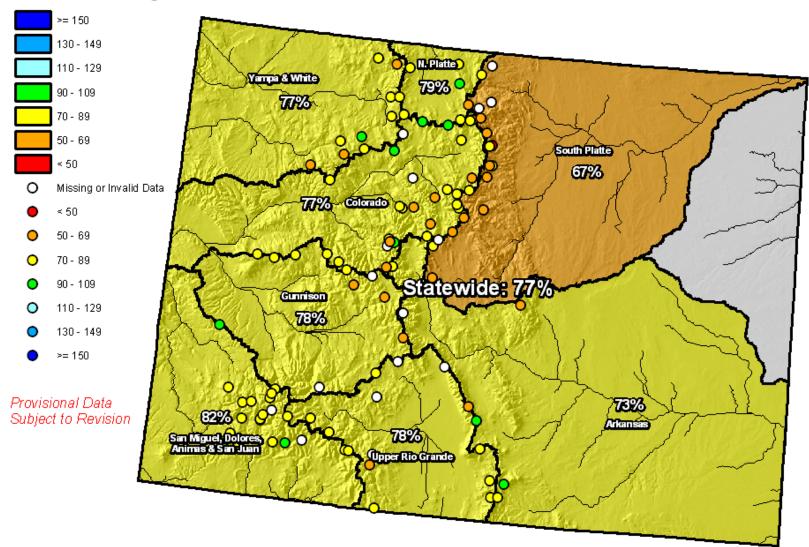




Current as of March 1, 2013

Colorado SNOTEL Snowpack Update Map with Site Data

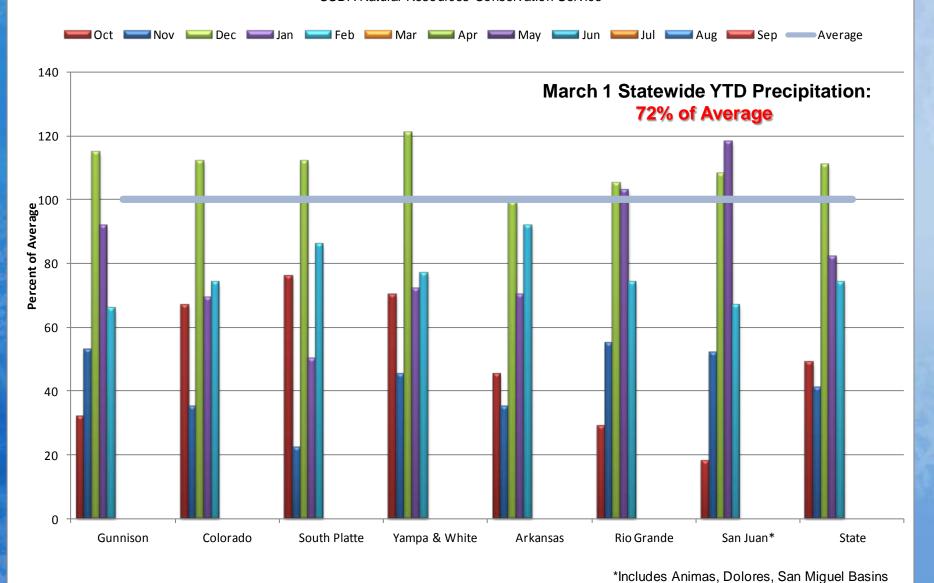




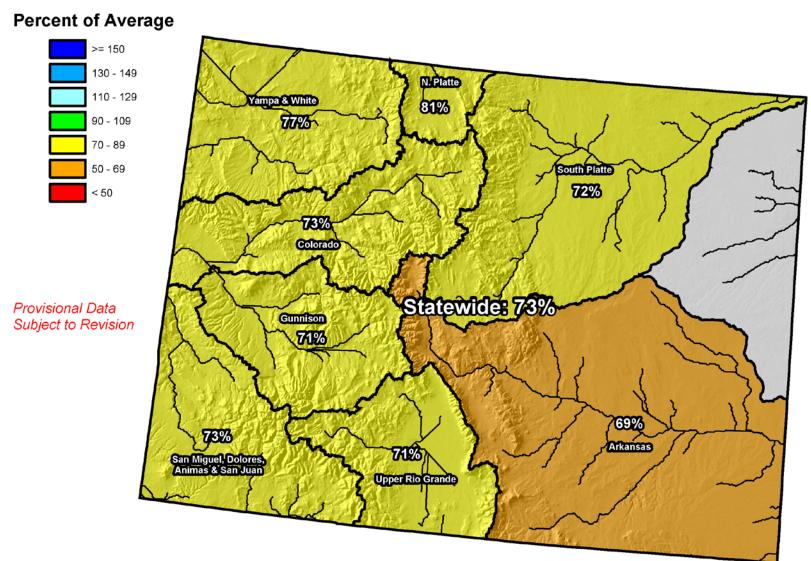
Colorado State-Wide High/Low Snowpack Summary Based on Provisional SNOTEL data as of Mar 21, 2013 30 Current as Pct of Normal: 77% Conservation Service Current as Pct of Avg: 73% Current as Pct of Last Year: 97% Current as Pct of Peak: 68% Normal as Pct of Peak: 88% Pct of Normal Needed to Reach Peak: 275% 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 Monthly Precipitation Summary for WY2013

USDA Natural Resources Conservation Service



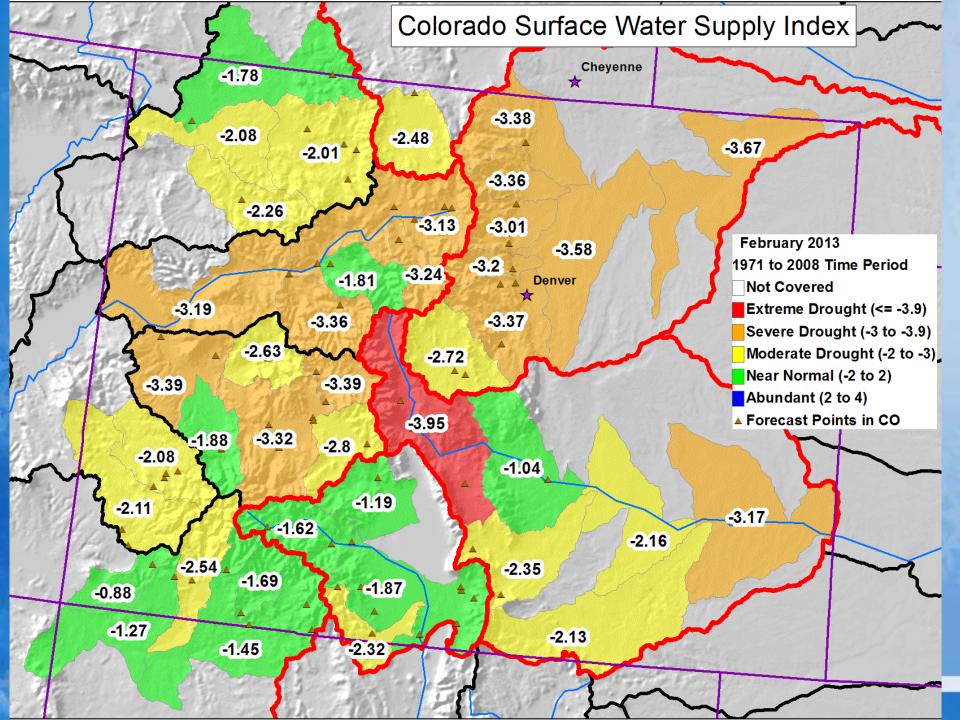
Colorado SNOTEL Water Year-to-Date Precipitation Update Map



Current as of Mar 20, 2013

Colorado SNOTEL Month-to-Date Precipitation

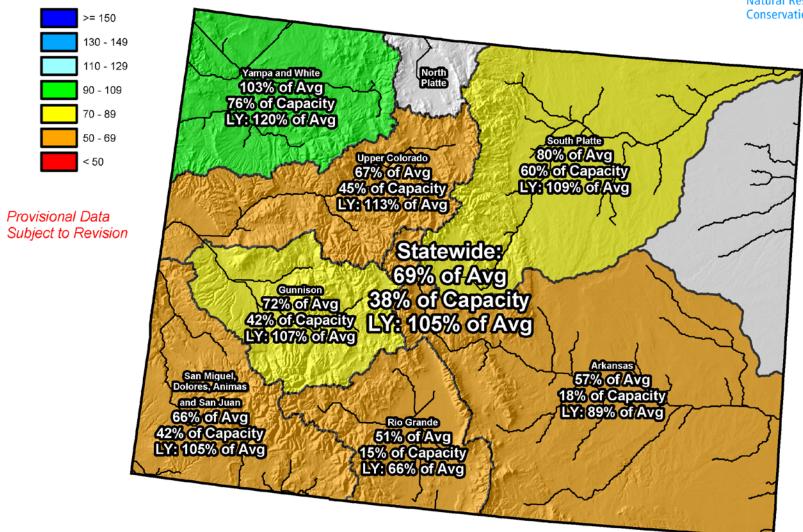
Percent of Average Missing or Invalid Data < 50 50 - 69 70 - 89 90 - 109 110 - 129 130 - 149 >= 150 Provisional Data Subject to Revision



Colorado Reservoir Storage Map

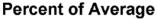


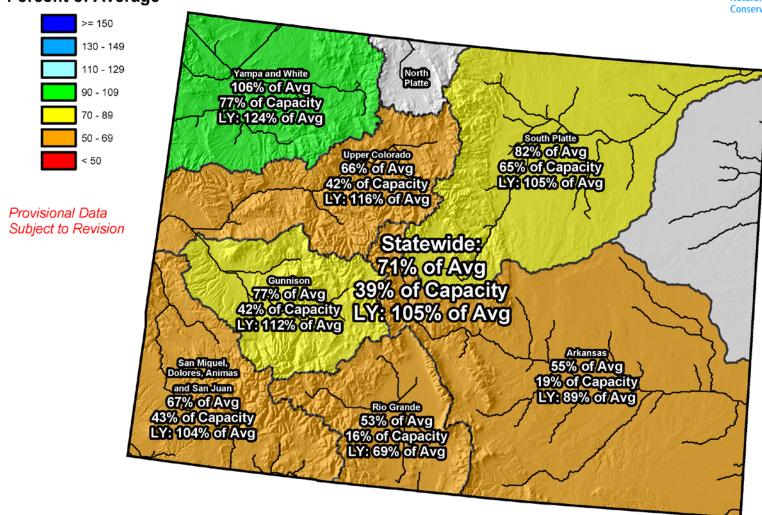
Percent of Average



Colorado Reservoir Storage Map



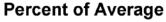


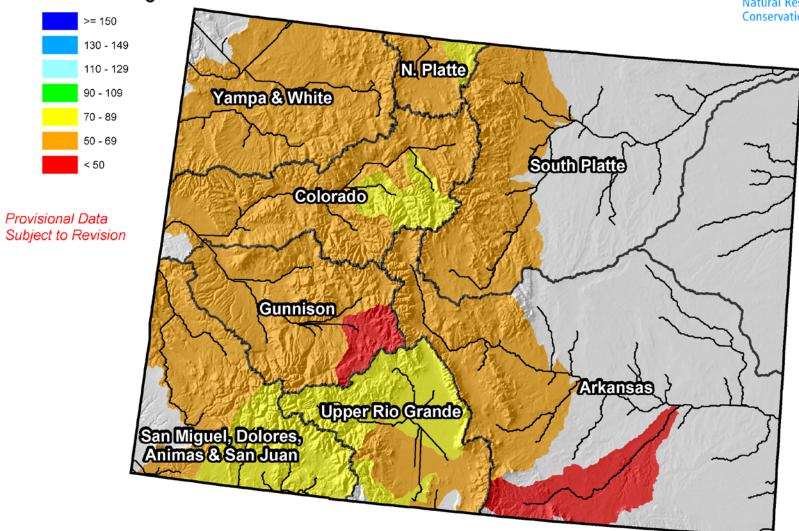


End of February 2013

Colorado Streamflow Forecast Map



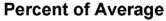


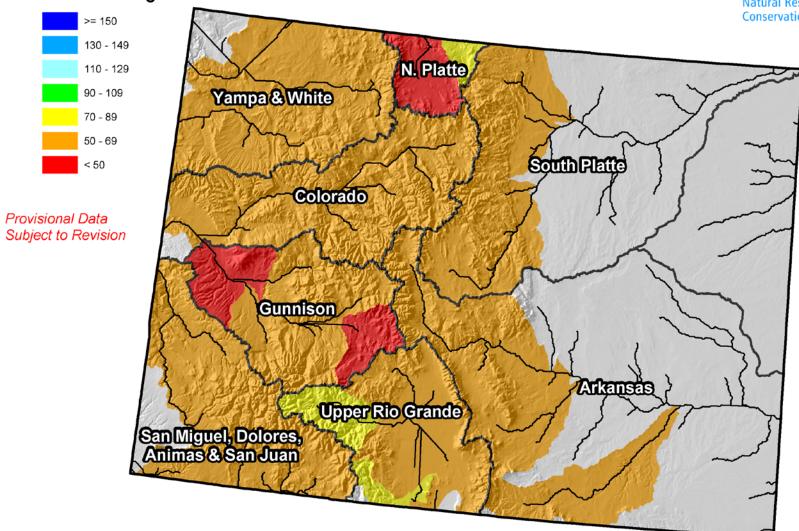


Current as of February 1, 2013

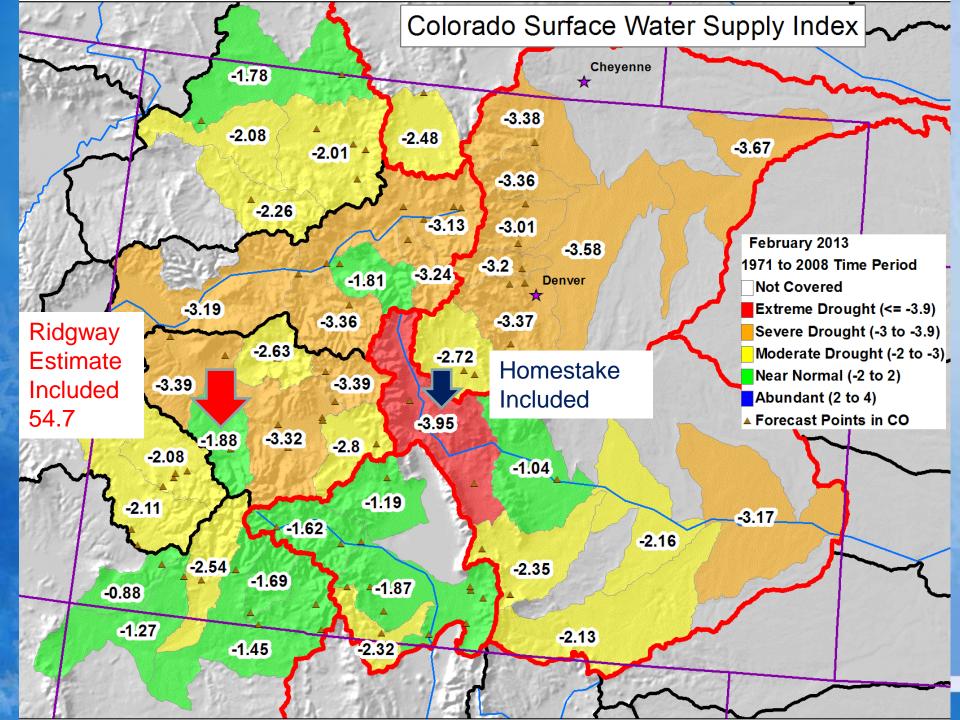
Colorado Streamflow Forecast Map

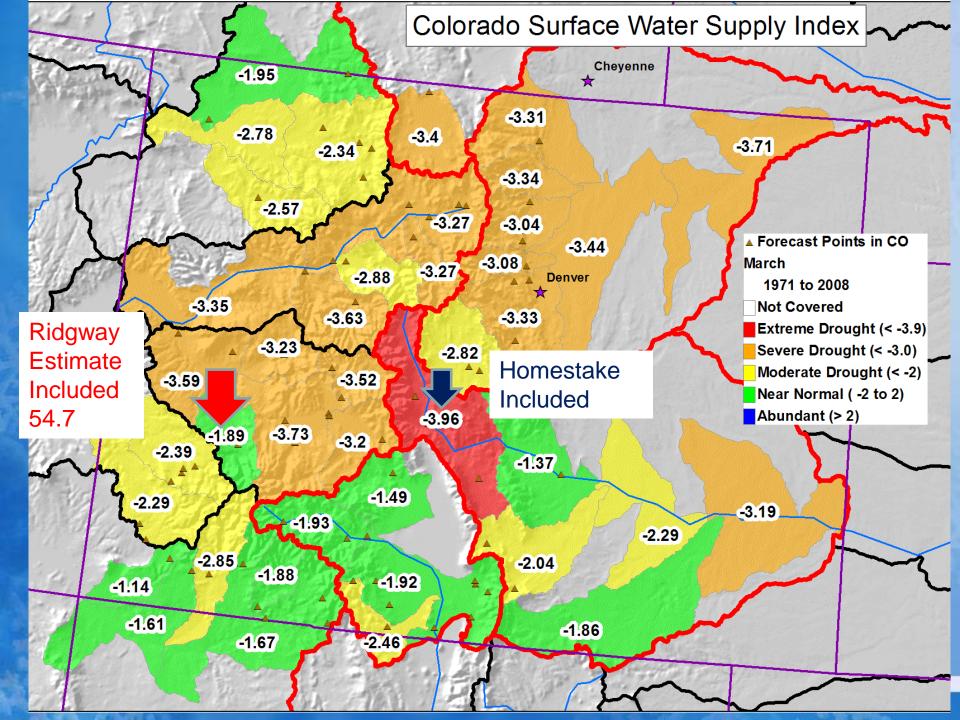






Current as of March 1, 2013





Notes on the March SWSI

- •SWSI inputs switch in January from reservoir storage and observed streamflow to reservoir storage and streamflow forecasts.
 - "More of a future component"
- •Many 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 negative 3.95 is reporting reservoir storage at the lowest end of the historical probability distribution (Homestake).
- •March SWSI values have not changed much from February's. Most HUC's are more negative.

WY2013 Summary

- •OCT: Began WY with below normal mountain precipitation and SWE.
- •NOV: Overall Nov ended up being drier, compared to normal, than Oct.
- •DEC: SNOW! Finally. Storms in mid to late Dec boosted snowpack but it was not enough to reach normal conditions.
- •JAN: Overall very little snow or prec. End of January storm increased snowpack mostly in the Southwest basins.
- •FEB: Prec below average for the month in all basins. What snow we did receive was just enough to keep percentages from further declining.
- •MAR: Storms have helped maintained snowpack but not boosted it. Below normal prec and swe so far...