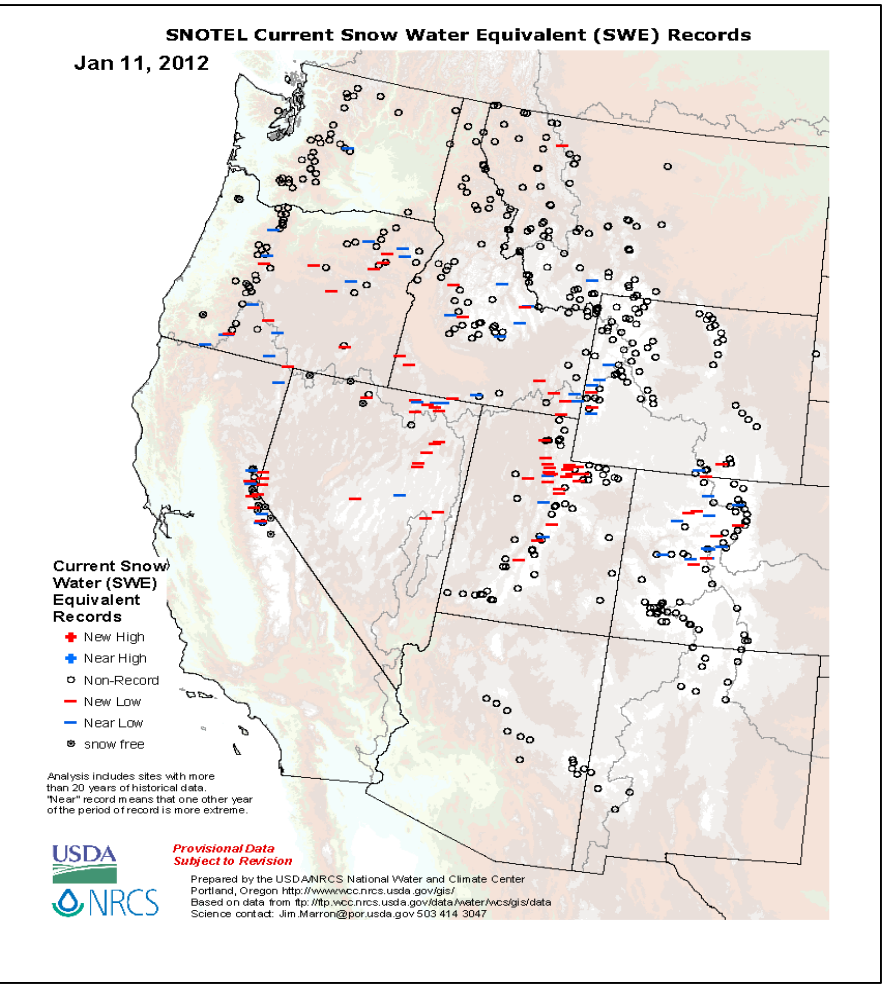
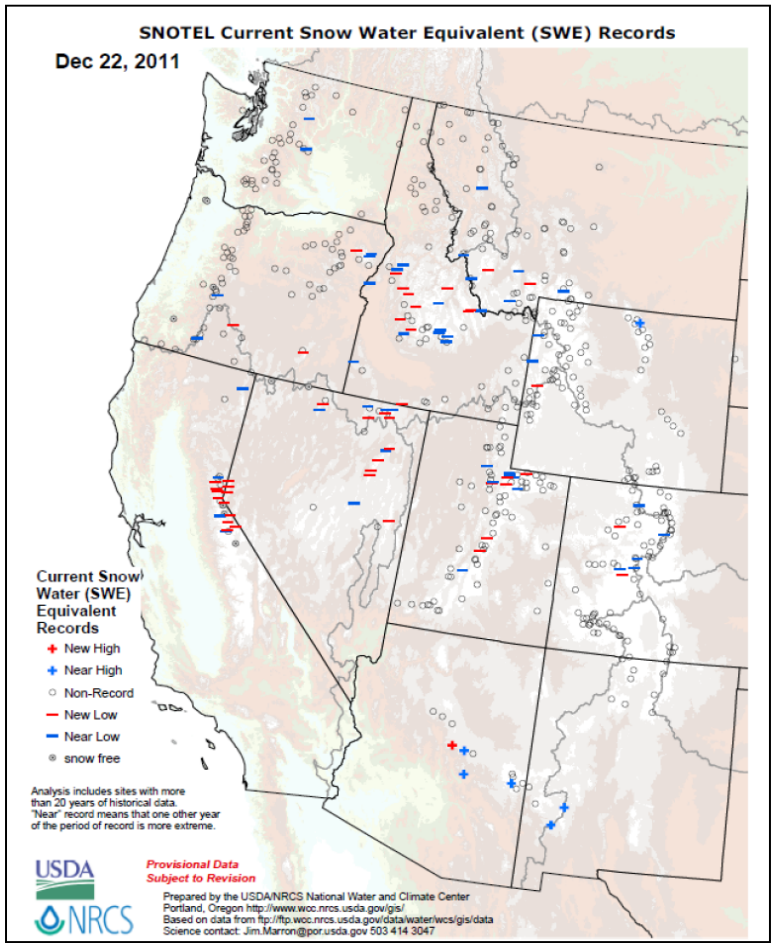
# Idaho Water Supply Outlook

## IDWR State Water Supply Meeting Jan 12, 2012

NRCS
United States Department of Agriculture
Natural Resources Conservation Service

# Idaho Water Supply Outlook Report January 1, 2012

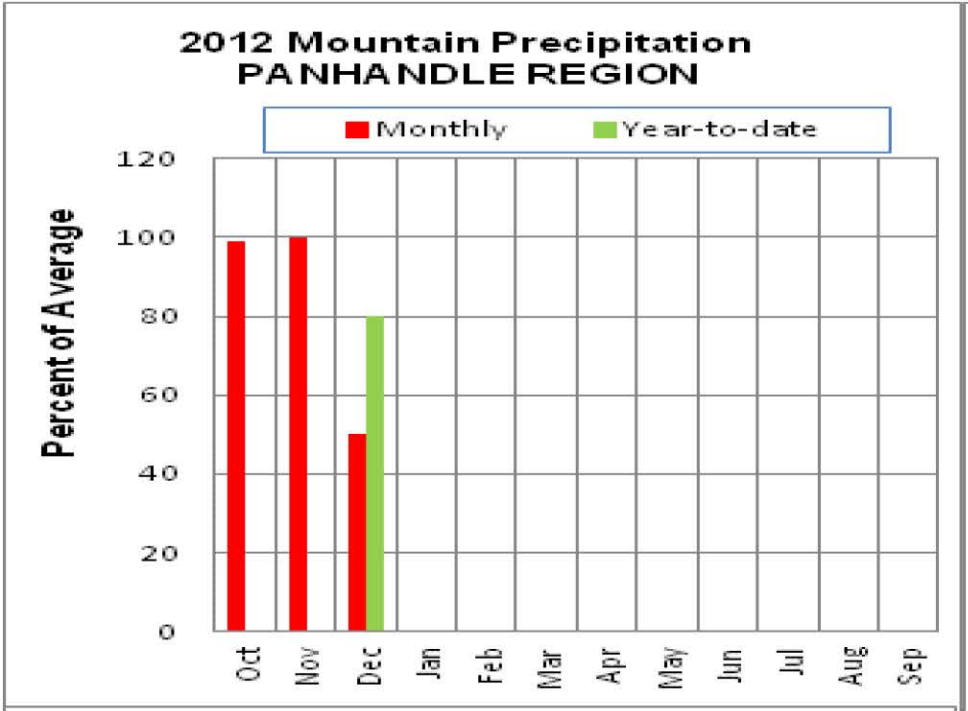


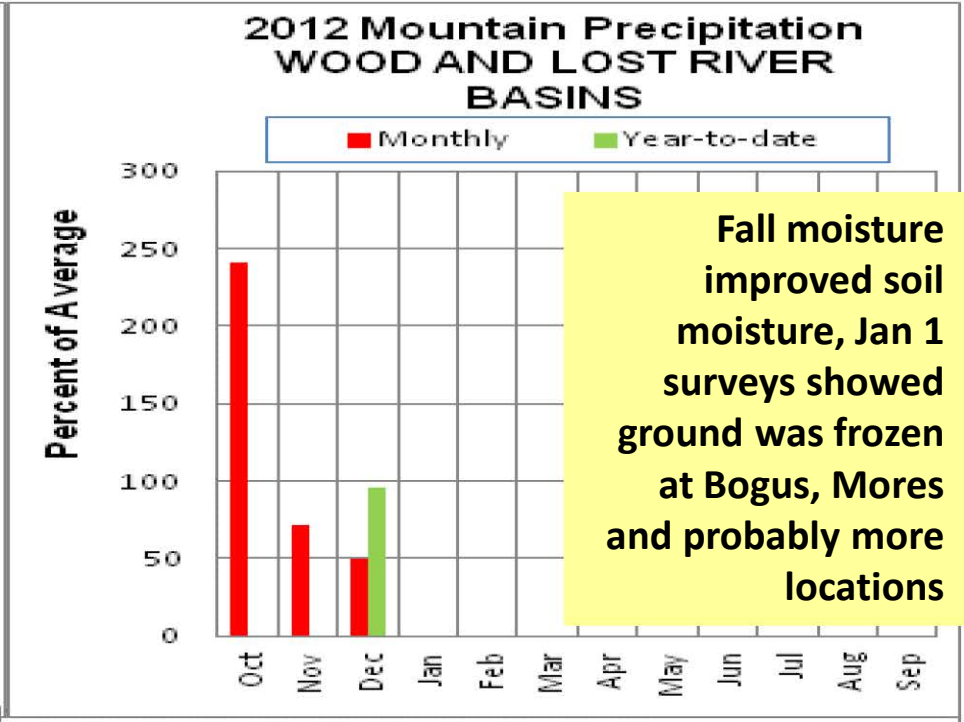




USDA United States Department of Agriculture

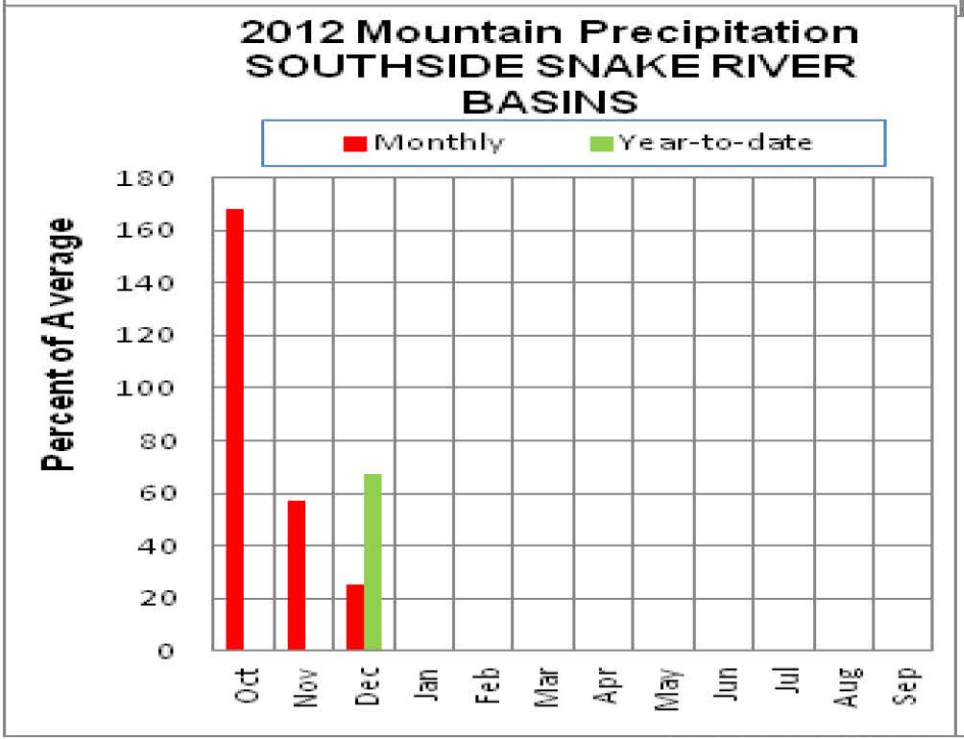
NRCS Natural Resources Conservation Service

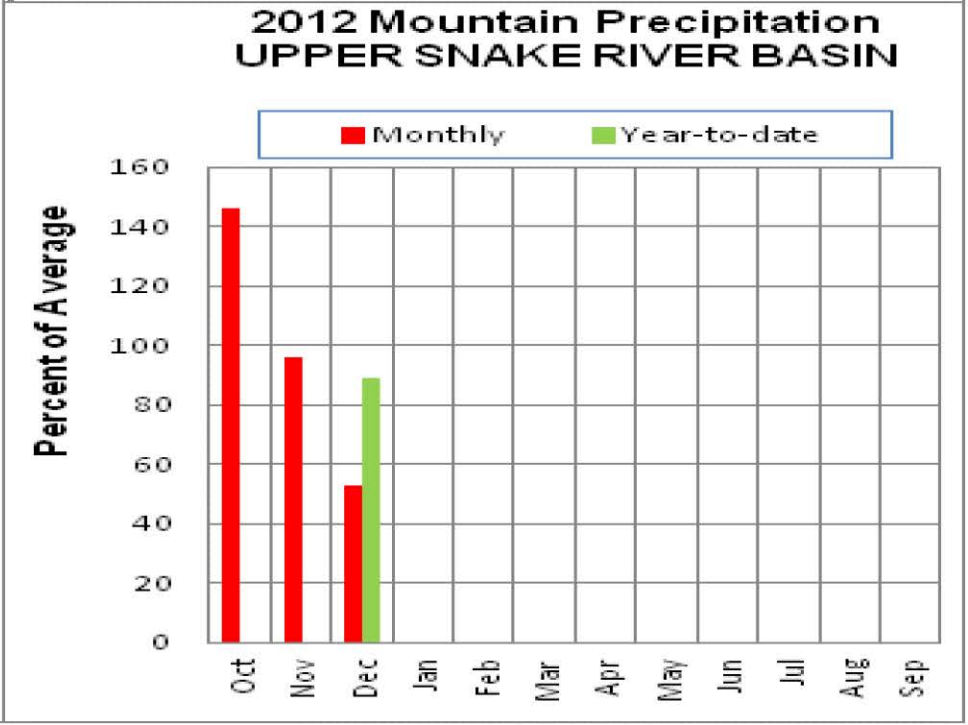
**The minus signs on this map represent the record or near record low snowpacks at many SNOTEL sites across Idaho and the West. These dry conditions may be surprising since cold ocean temperatures, that signal a La Nina, have been measured in the Pacific Ocean ever since last winter. La Nina conditions are often touted as producing cold and stormy winters in the Pacific Northwest. Last winter was a textbook example. While this year's La Nina is not as strong as last year, climate models are still predicting an above average winter. At this point our best advice is to be patient; snow is on its way (we hope).**




**Fall moisture improved soil moisture, Jan 1 surveys showed ground was frozen at Bogus, Mores and probably more locations**



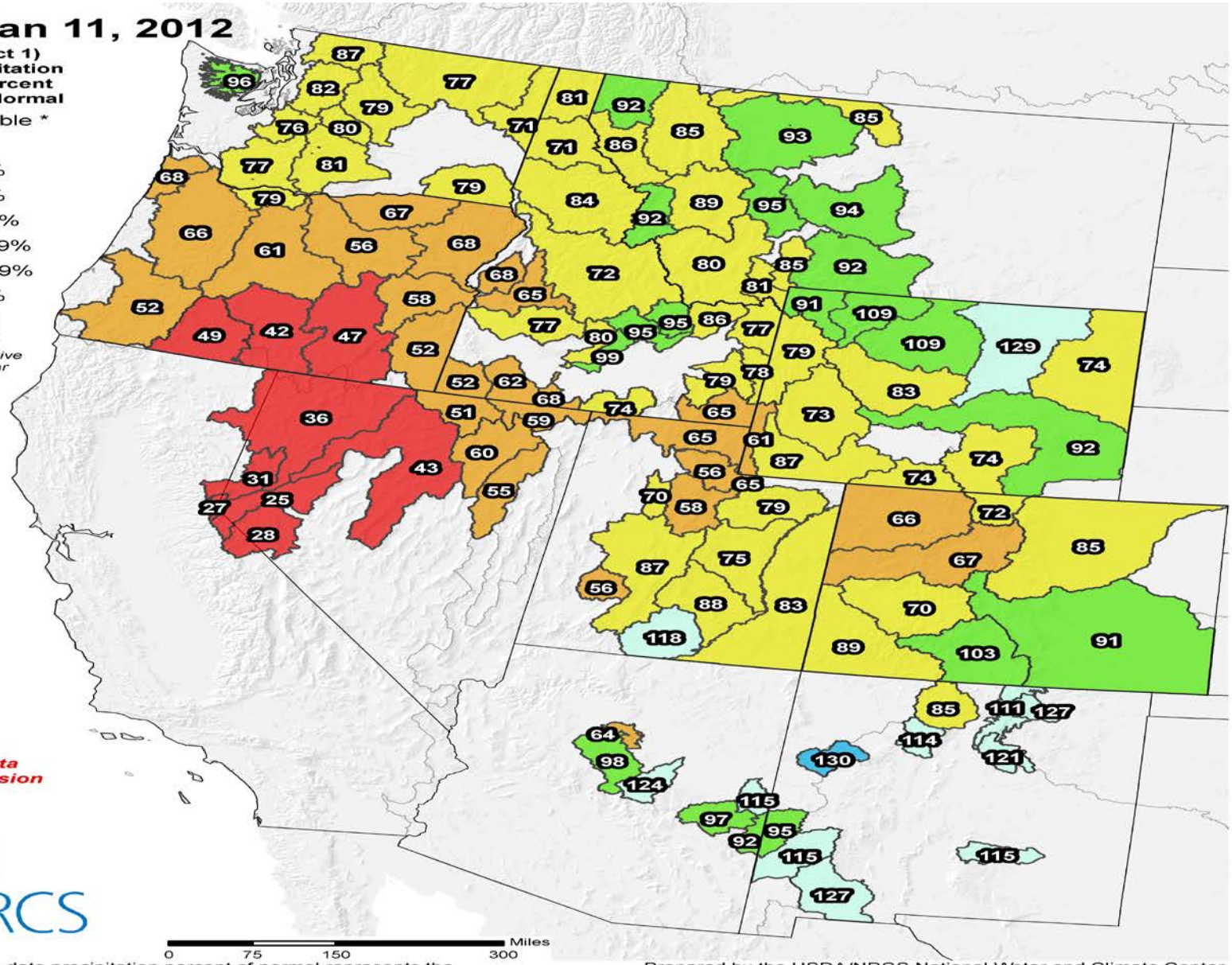
# Westwide SNOTEL Water Year (Oct 1) to Date Precipitation % of Normal

## Jan 11, 2012

**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*

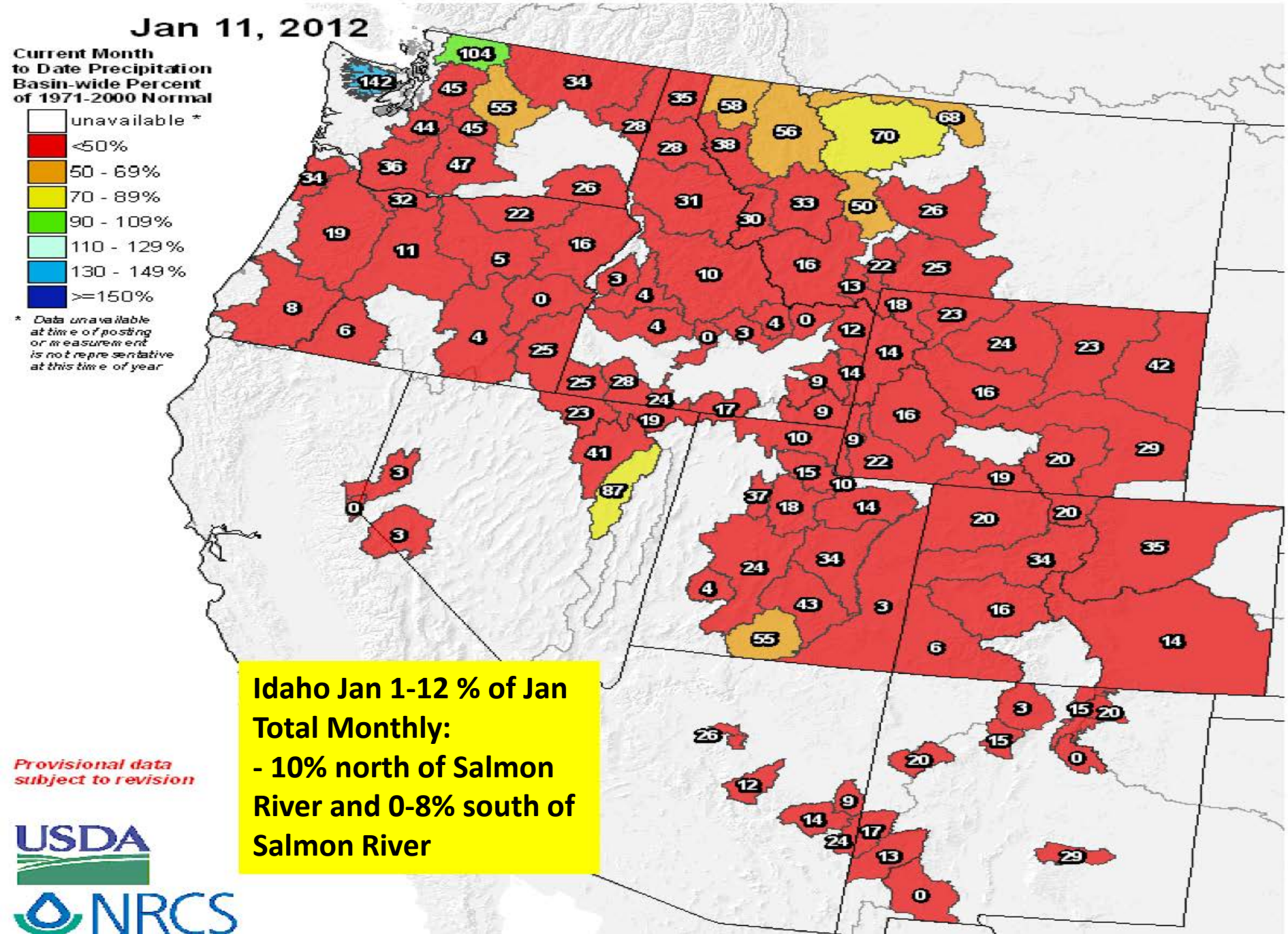



***Provisional data subject to revision***

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).

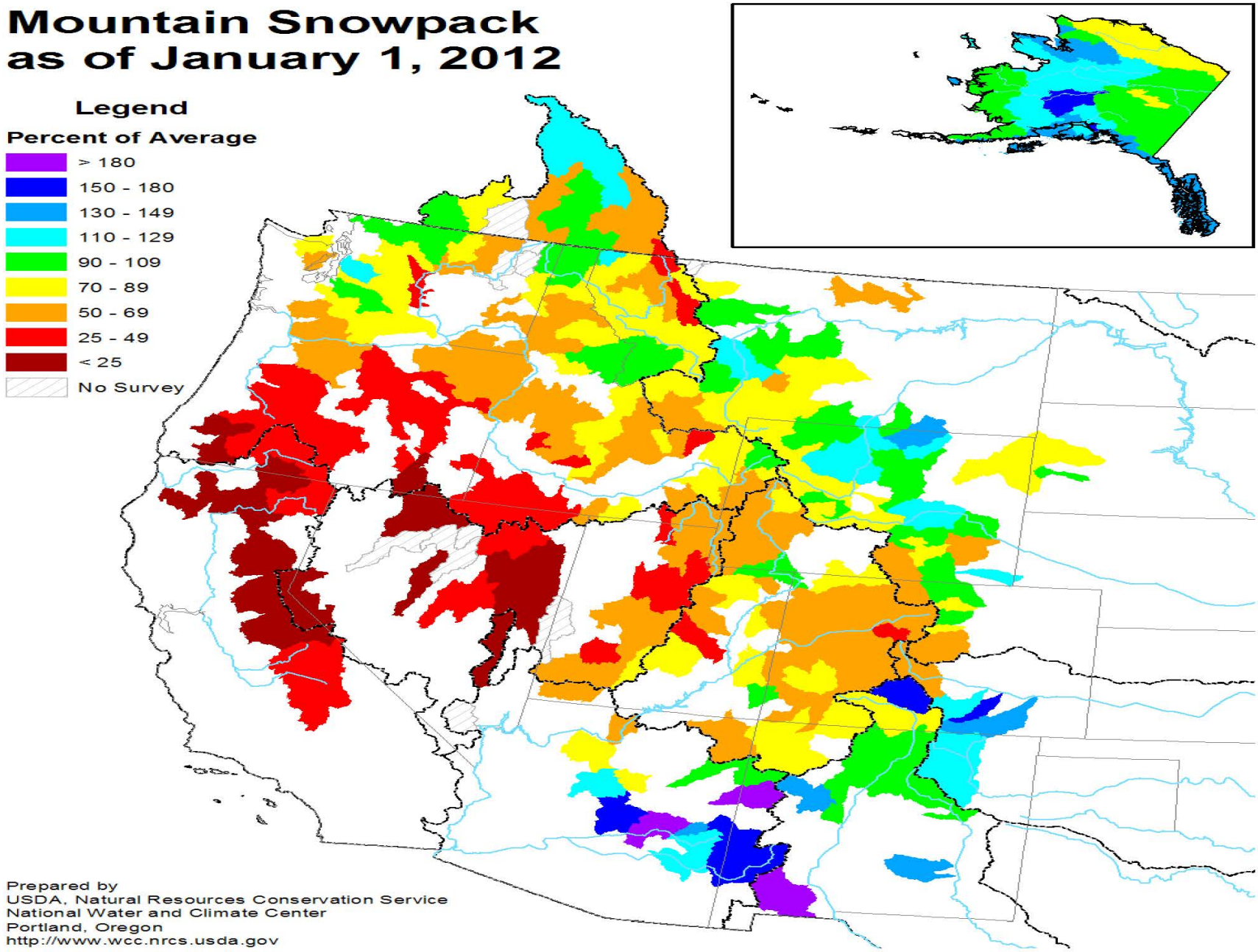
Prepared by the USDA/NRCS National Water and Climate Center
Portland, Oregon http://www.wcc.nrcs.usda.gov/gis/
Based on data from http://www.wcc.nrcs.usda.gov/reports/
Science contact: Jim.Marron@por.usda.gov 503 414 3047

# Westwide SNOTEL Current Month to Date Precipitation % of Normal

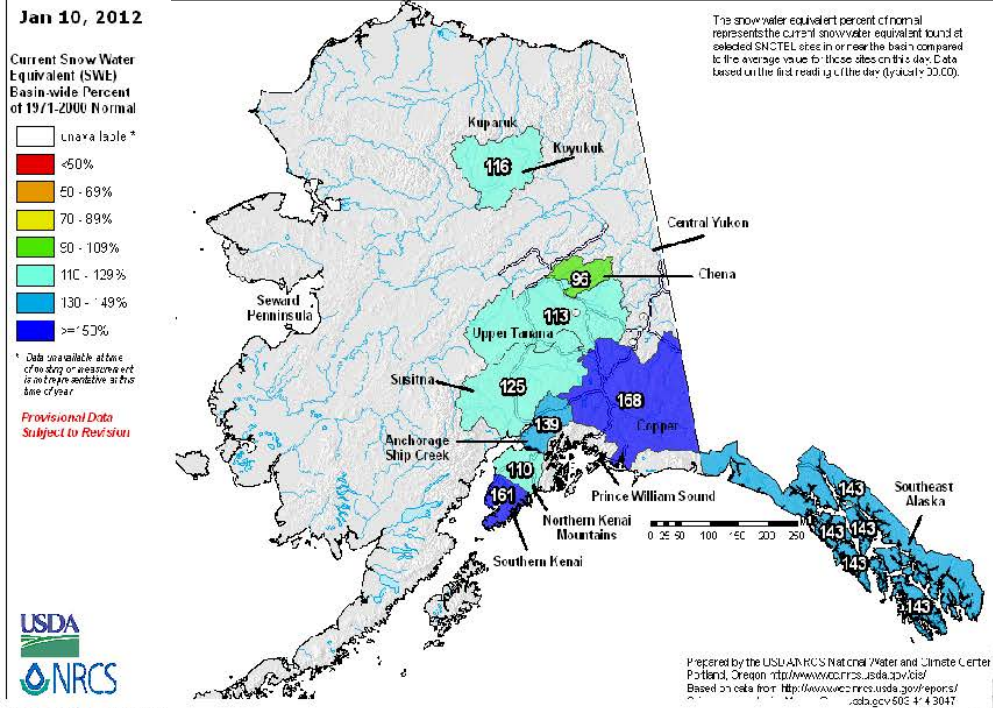



**Idaho Jan 1-12 % of Jan Total Monthly:**
**- 10% north of Salmon River and 0-8% south of Salmon River**

# Mountain Snowpack as of January 1, 2012




Prepared by
USDA, Natural Resources Conservation Service
National Water and Climate Center
Portland, Oregon
http://www.wcc.nrcs.usda.gov



Photos provided by the Alaska Division of Homeland Security

By one count, nearly 15 feet of snow has fallen in Cordova, a town of 2,000, in the past few weeks. Above, workers try to clear snow from the roof of the town's volunteer fire department building.

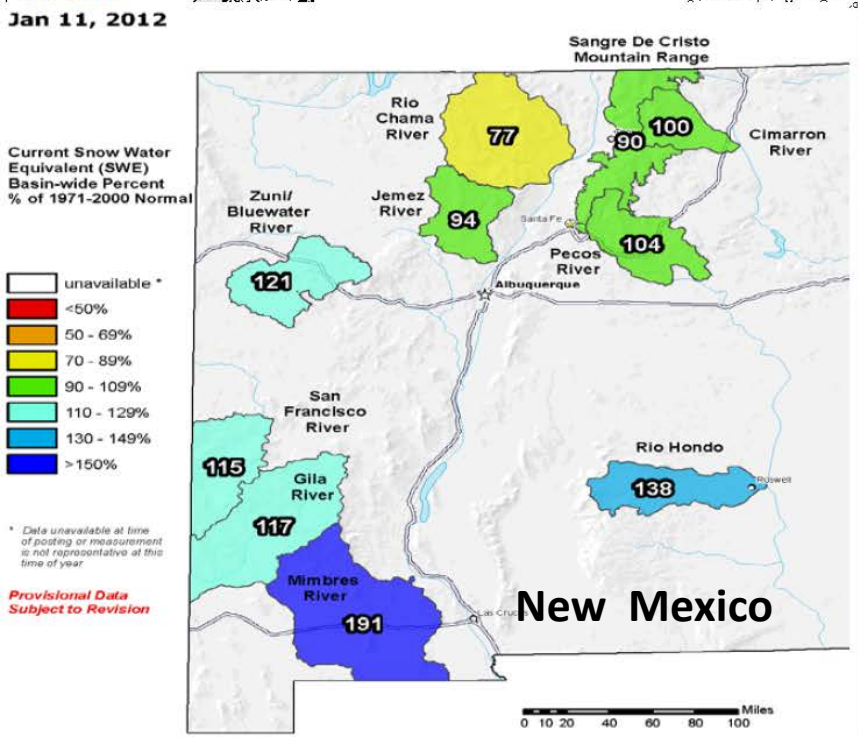
# Alaska winter meaner than usual this year

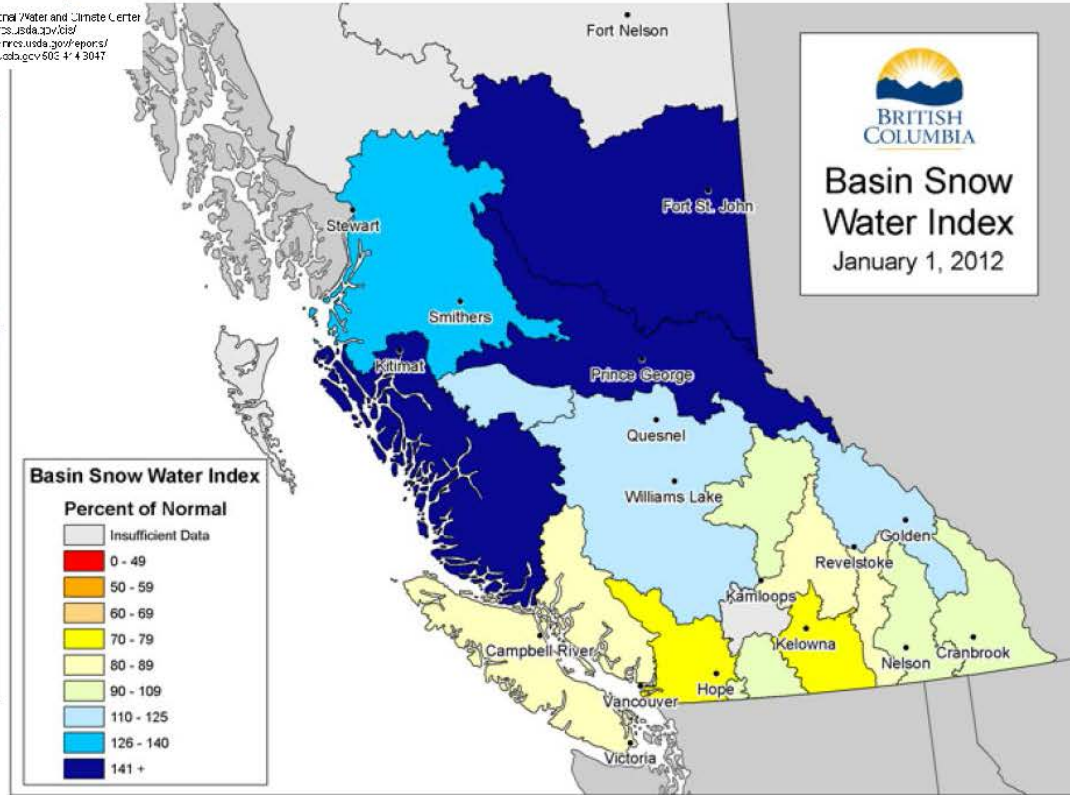
One town is buried in snow. Another is iced in. Now, residents are looking for help.

BY MARY PEMBERTON AND RACHEL D'ORO
THE ASSOCIATED PRESS

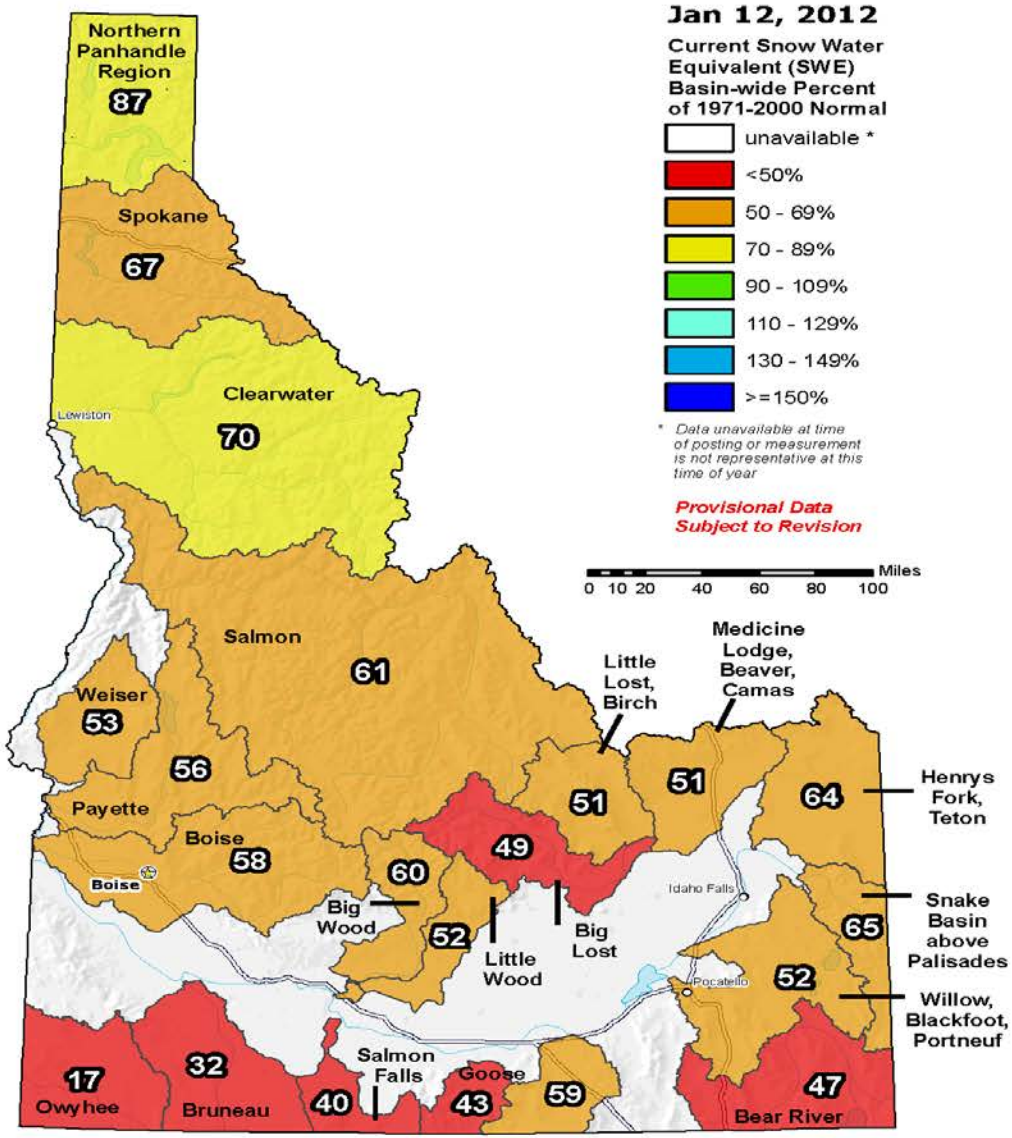
ANCHORAGE, Alaska — Dozens of National Guard members are helping the fishing town of Cordova dig out from mountains of snow that collapsed roofs, triggered avalanches and trapped some people in homes.

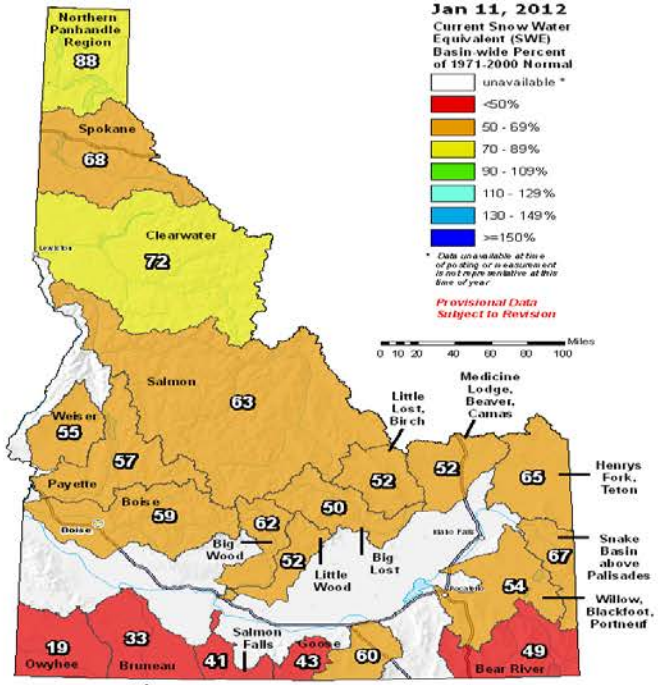
With high winds, more snow and possibly rain in the forecast, responders and local volunteers were trying



# Idaho SNOTEL Current Snow Water Equivalent (SWE) % of Normal

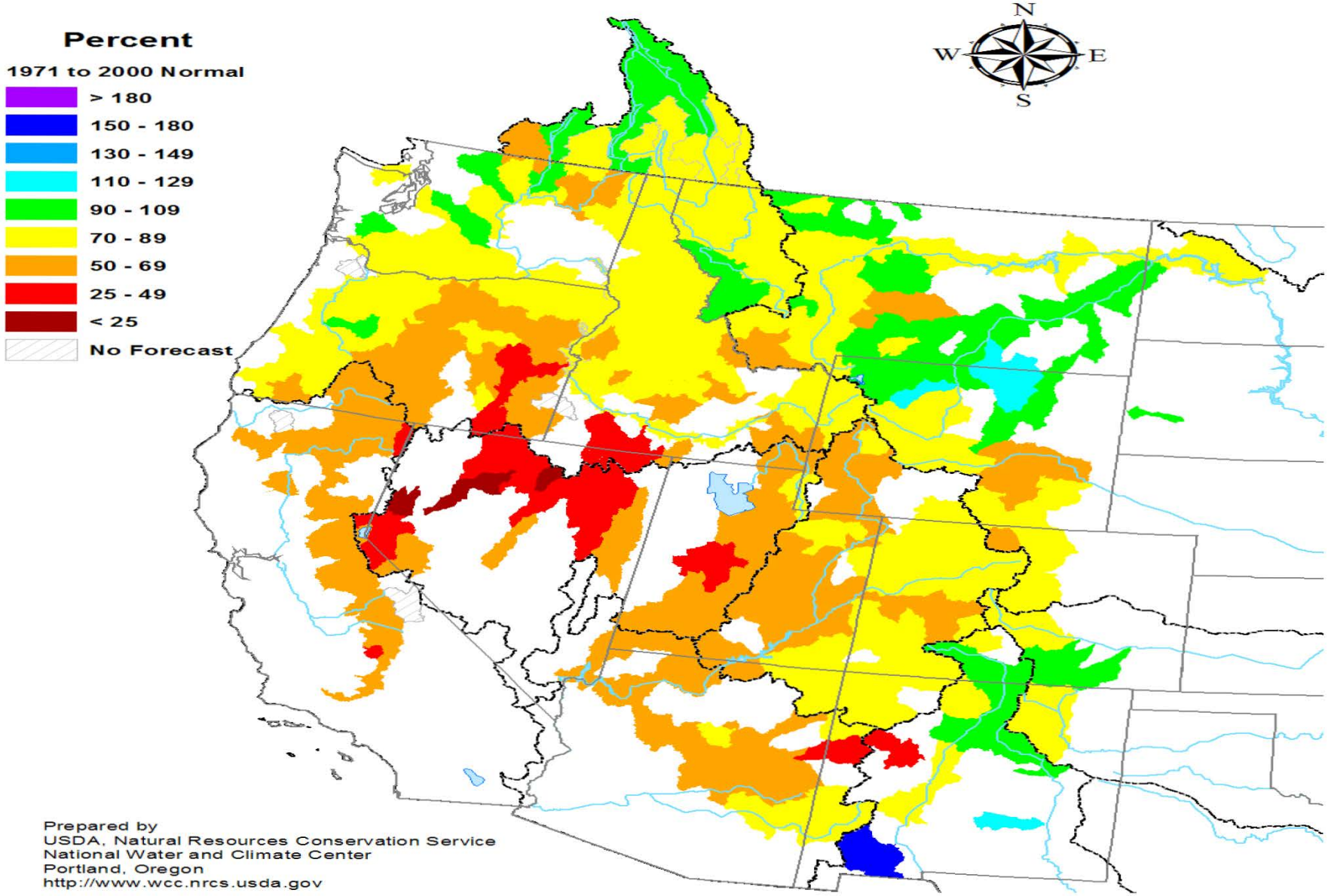


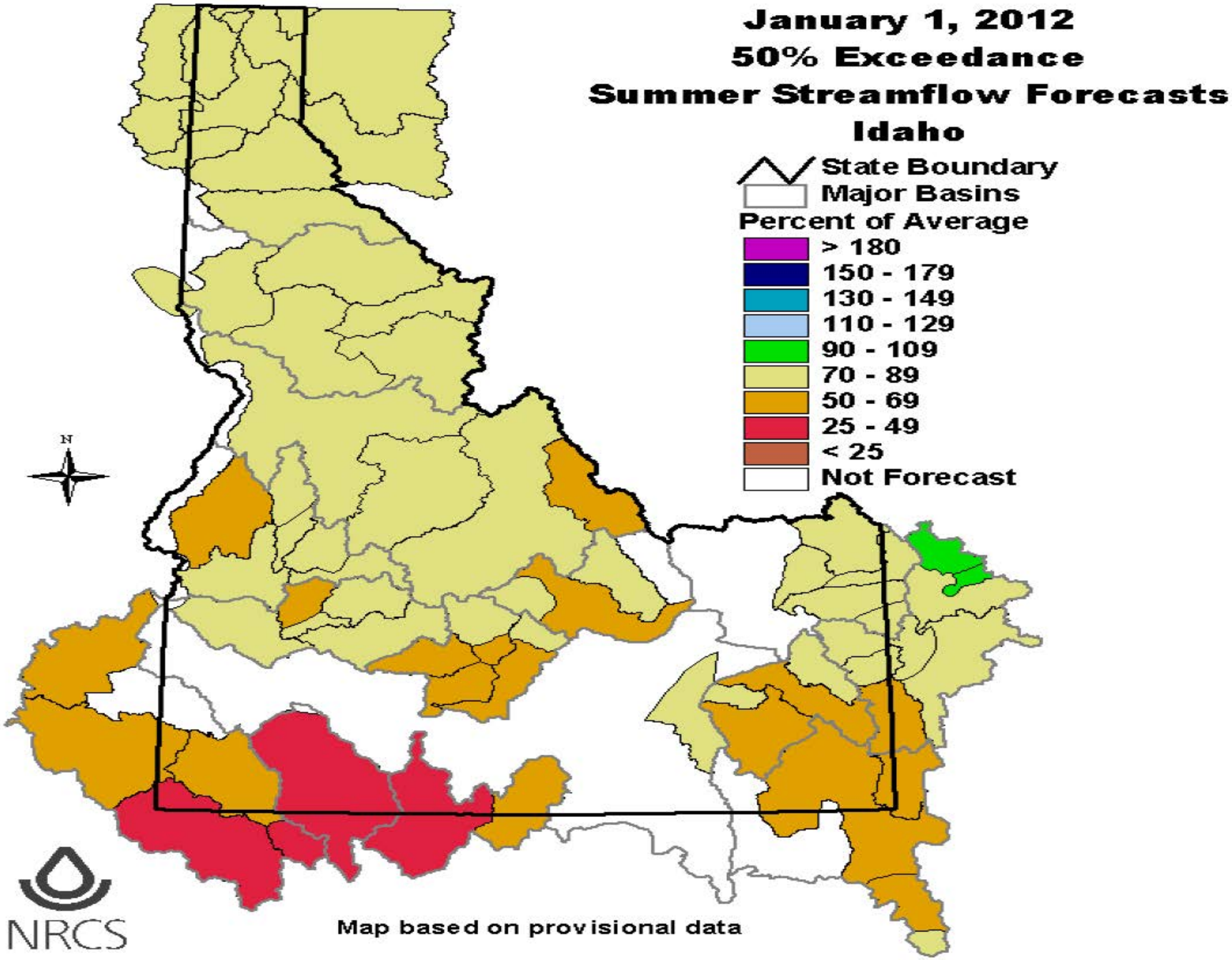

The snow water equivalent percent of normal represents the current snow water equivalent found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 00:00).

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

# Spring and Summer Streamflow Forecasts as of January 1, 2012



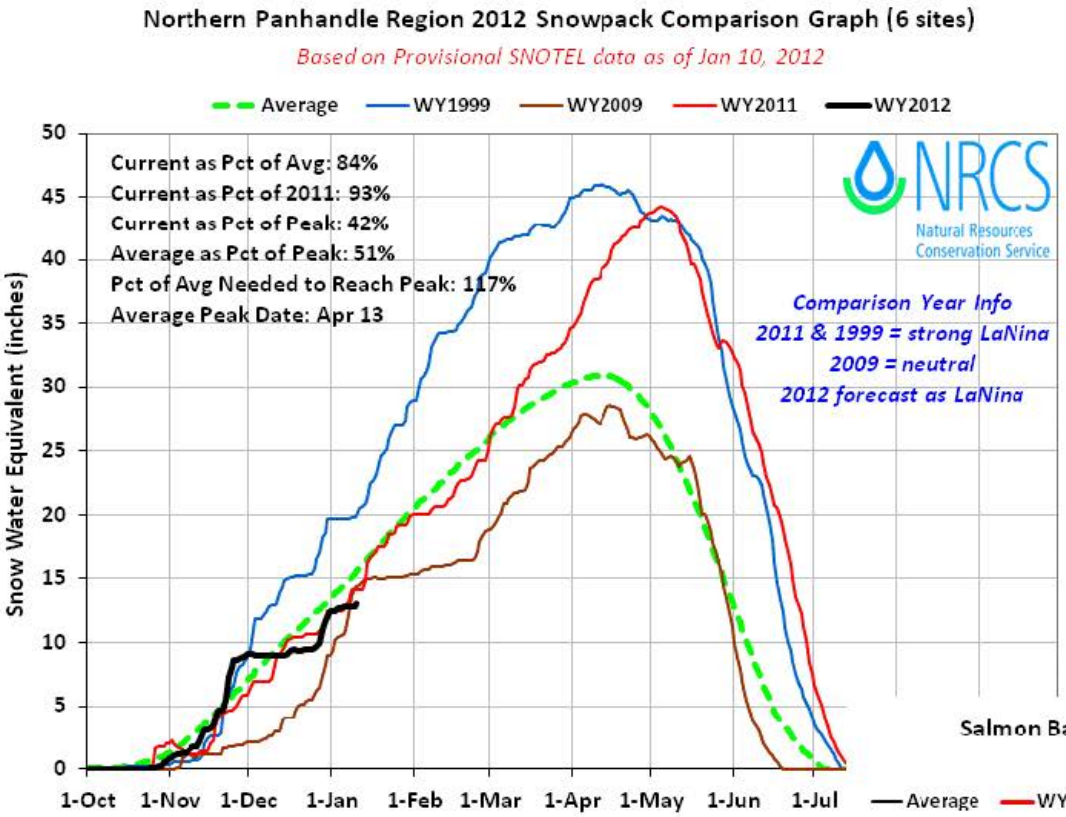

Prepared by
USDA, Natural Resources Conservation Service
National Water and Climate Center
Portland, Oregon
http://www.wcc.nrcs.usda.gov

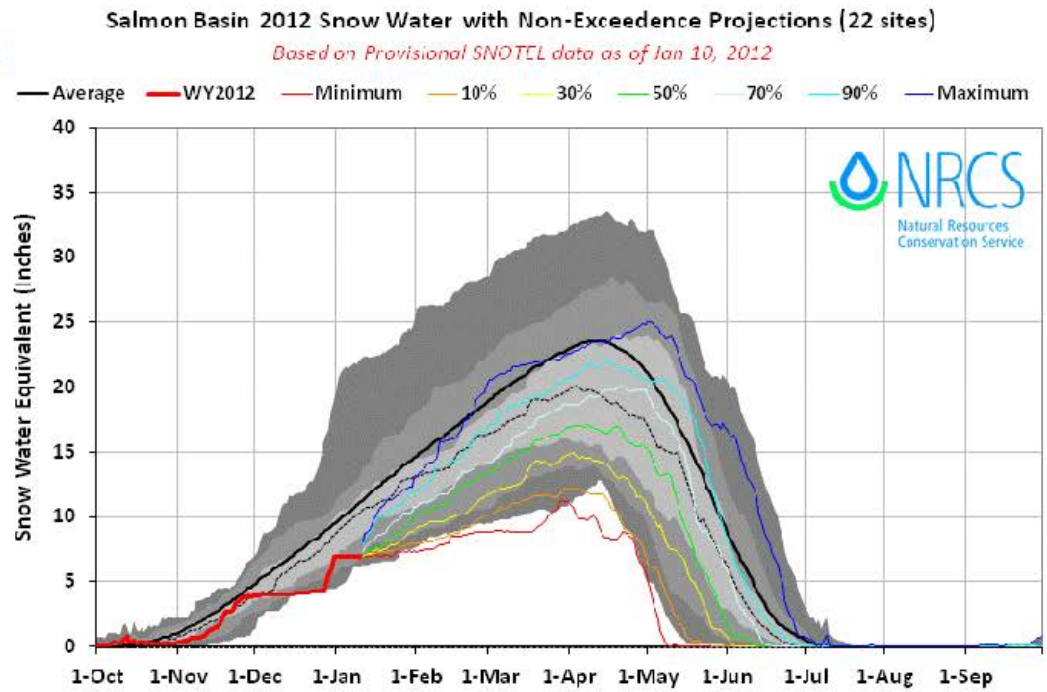

January 1, 2012
50% Exceedance
Summer Streamflow Forecasts
Idaho
State Boundary
Major Basins
Percent of Average
> 180
150 - 179
130 - 149
110 - 129
90 - 109
70 - 89
50 - 69
25 - 49
< 25
Not Forecast
N
NRCS
Map based on provisional data

# January 1, 2012 Idaho Surface Water Supply Index (SWSI)

| Basin or Region | January SWSI Value | Similar Year | Surface Agricultural Water Supply Shortages Occur when SWSI is Less Than |
|---|---|---|---|
| Northern Panhandle | -0.4 | 1995 | NA |
| Spokane | -0.7 | 2010 | NA |
| Clearwater | -1.7 | 2010 | NA |
| Salmon | -1.4 | 2004 | NA |
| Weiser | -1.7 | 2004 | NA |
| Payette | -1.4 | 2004 | NA |
| Boise | 0.7 | 2007 | -1.3 to -1.6 |
| Big Wood | 0.6 | 2011 | 0.5 to 0.7 |
| Little Wood | 0.7 | 2005 | -1.3 to -1.6 |
| Big Lost | -0.4 | 2010 | 0.3 to 0.5 |
| Little Lost | -1.2 | 2008 | 1.0 to 1.3 |
| Teton | -0.9 | 2005 | -3.7 to -3.9 |
| Henrys Fork | -0.8 | 2010 | -3.4 to -3.6 |
| Snake (Heise) | 0.9 | 2008 | -1.3 to -1.6 |
| Oakley | 1.4 | 2000 | 0.3 to 0.5 |
| Salmon Falls | 0.1 | 2010 | -0.4 to -0.8 |
| Bruneau | -2.4 | 2003 | NA |
| Owyhee | 0.4 | 2005 | -3.0 to -3.5 |
| Bear River | 2.0 | 2011 | -2.3 to -2.6 |

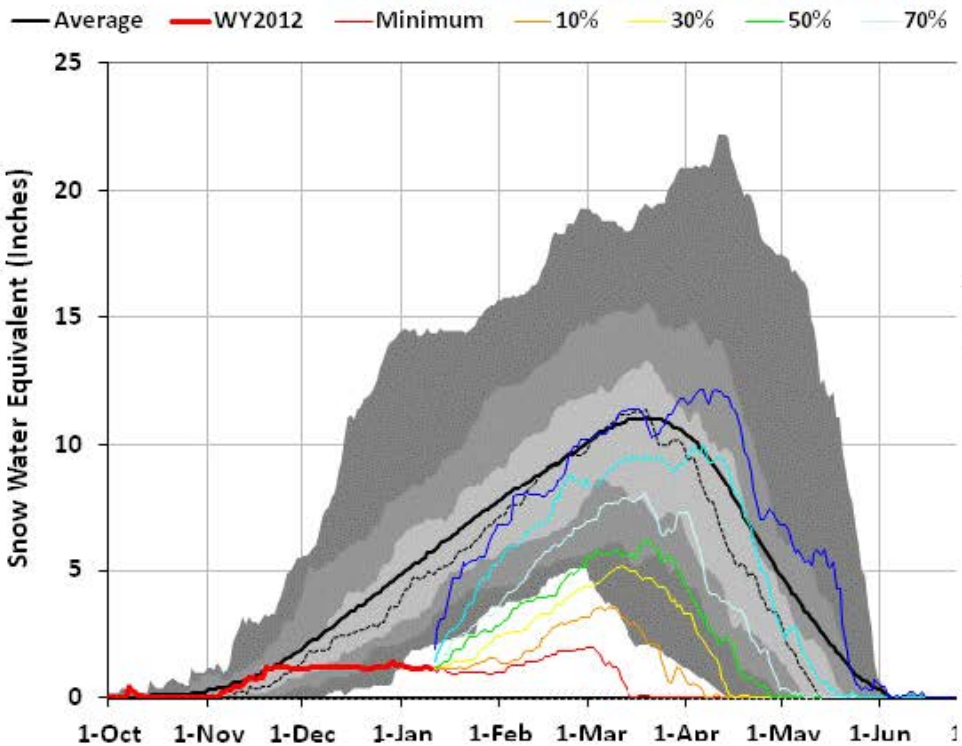
SWSI period is based on the 1981 to 2011 period


Northern Panhandle Region 2012 Snowpack Comparison Graph (6 sites)
Based on Provisional SNOTEL data as of Jan 10, 2012
Average
WY1999
WY2009
WY2011
WY2012
Current as Pct of Avg: 84%
Current as Pct of 2011: 93%
Current as Pct of Peak: 42%
Average as Pct of Peak: 51%
Pct of Avg Needed to Reach Peak: 117%
Average Peak Date: Apr 13
NRCS
Natural Resources Conservation Service
Comparison Year Info
2011 & 1999 = strong LaNina
2009 = neutral
2012 forecast as LaNina
Snow Water Equivalent (inches)
0
5
10
15
20
25
30
35
40
45
50
1-Oct
1-Nov
1-Dec
1-Jan
1-Feb
1-Mar
1-Apr
1-May
1-Jun
1-Jul


Salmon Basin 2012 Snow Water with Non-Exceedence Projections (22 sites)
Based on Provisional SNOTEL data as of Jan 10, 2012
Average
WY2012
Minimum
10%
30%
50%
70%
90%
Maximum
NRCS
Natural Resources Conservation Service
Snow Water Equivalent (inches)
0
5
10
15
20
25
30
35
40
1-Oct
1-Nov
1-Dec
1-Jan
1-Feb
1-Mar
1-Apr
1-May
1-Jun
1-Jul
1-Aug
1-Sep

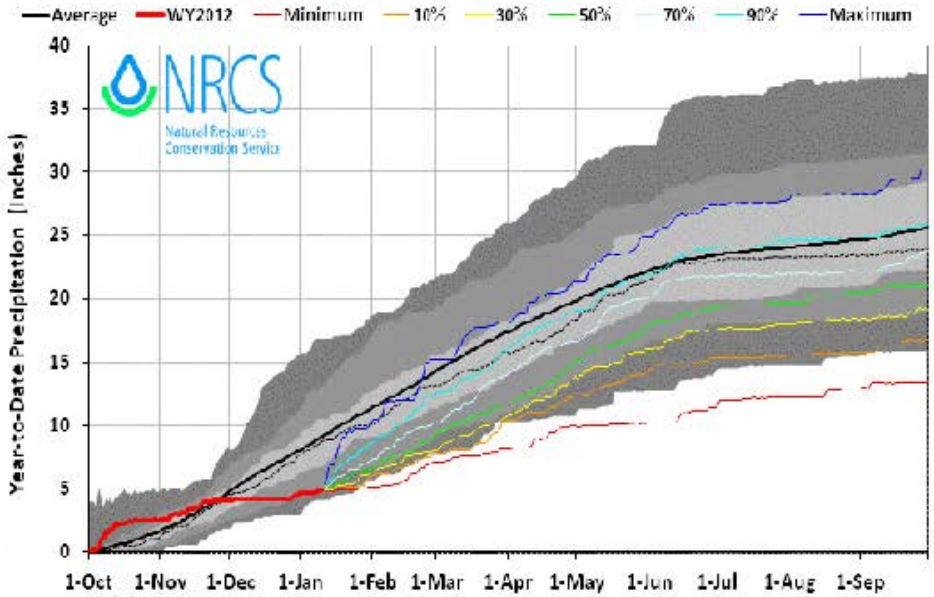
## Owyhee Basin 2012 Snow Water with Non-Exceedence Projections (7 sites)

*Based on Provisional SNOTEL data as of Jan 10, 2012*



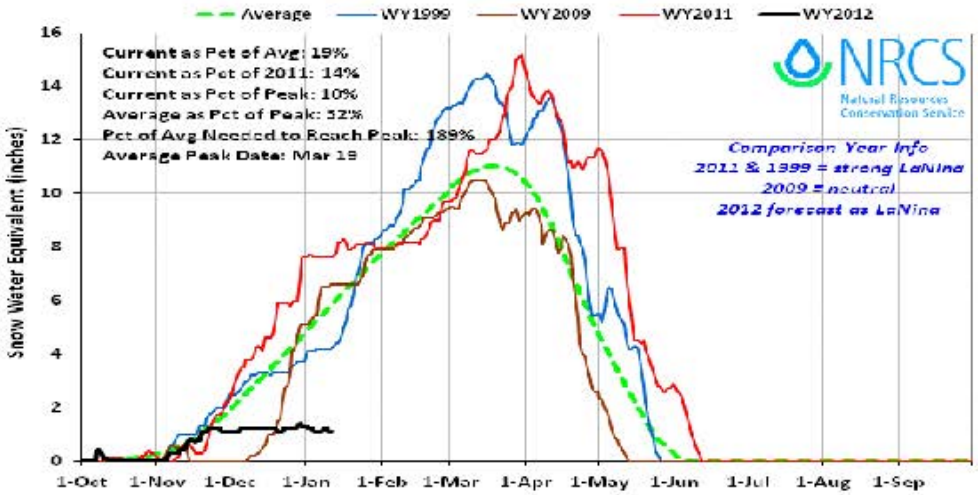

## Owyhee Basin 2012 Precipitation with Non-Exceedence Projections (7 sites)

*Based on Provisional SNOTEL data as of Jan 10, 2012*




## Owyhee Basin 2012 Snowpack Comparison Graph (7 sites)

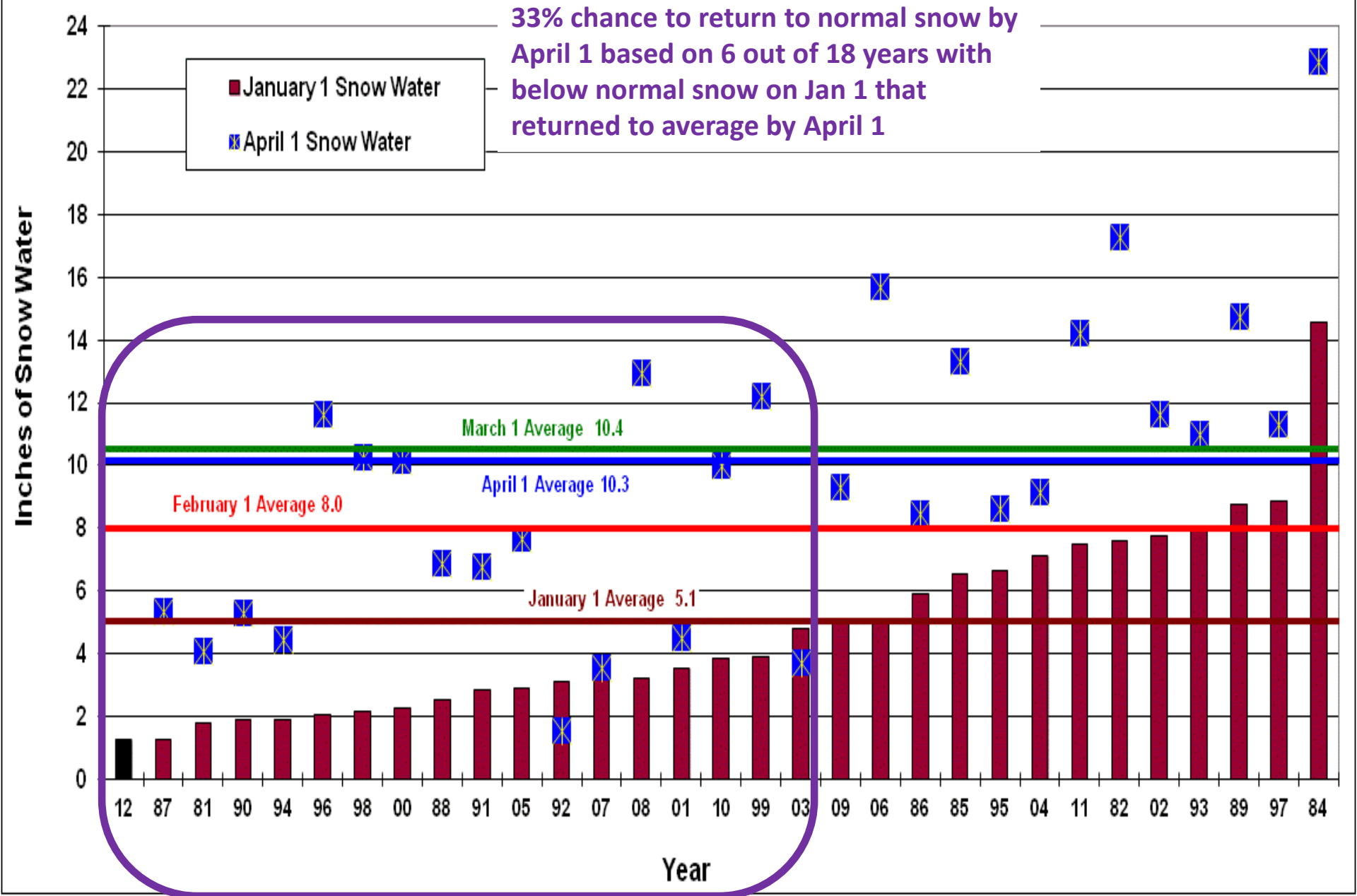
*Based on Provisional SNOTEL data as of Jan 11, 2012*

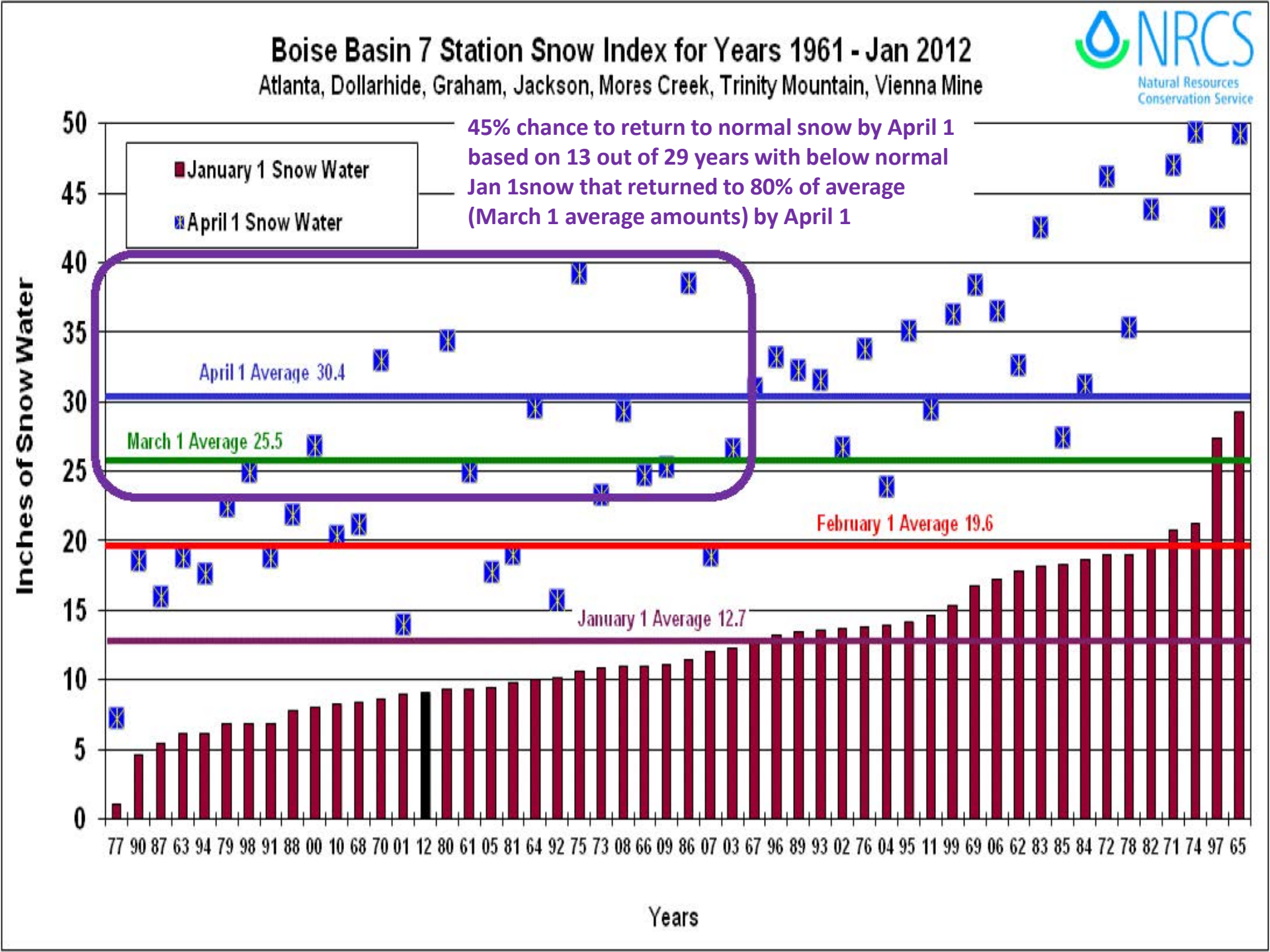


# Snow Index for the Owyhee River, ID 1987- Jan 2012

Big Bend, Jack Creek Upper, Laurel Draw, Mud Flat, South Mtn, and Taylor Canyon SNOTEL Sites

NRCS Natural Resources Conservation Service

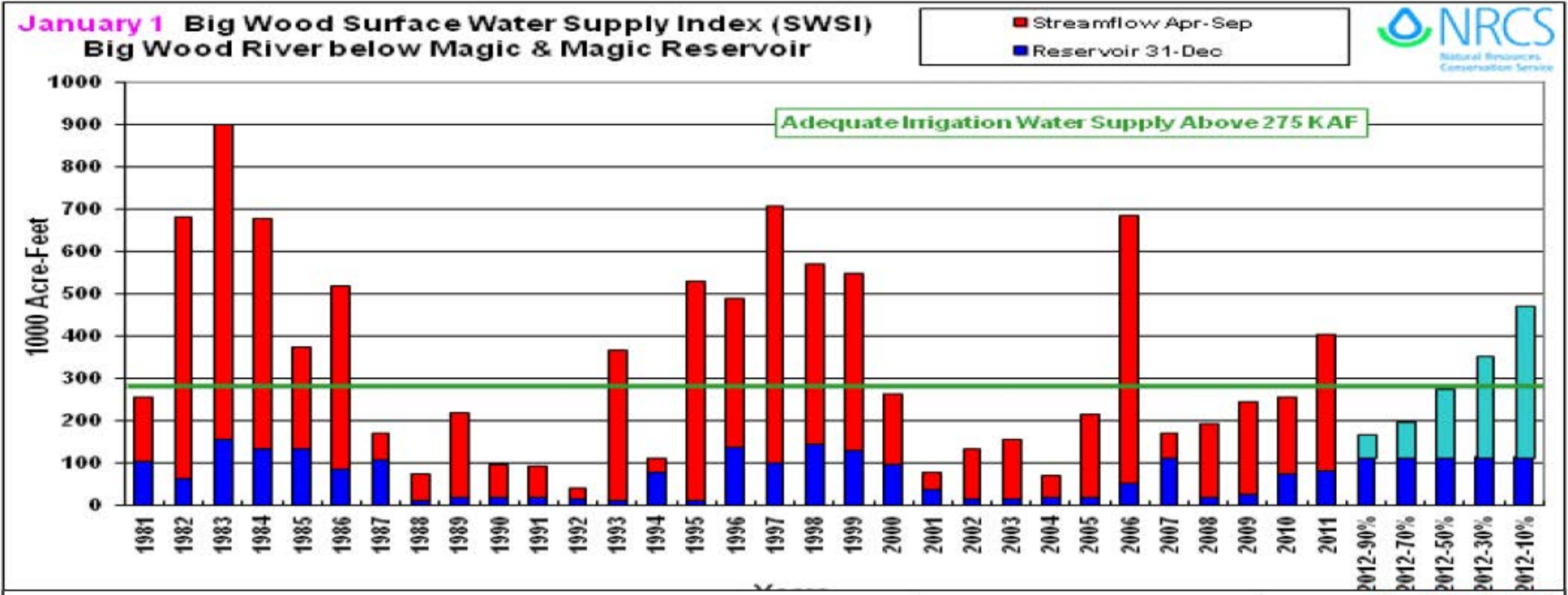


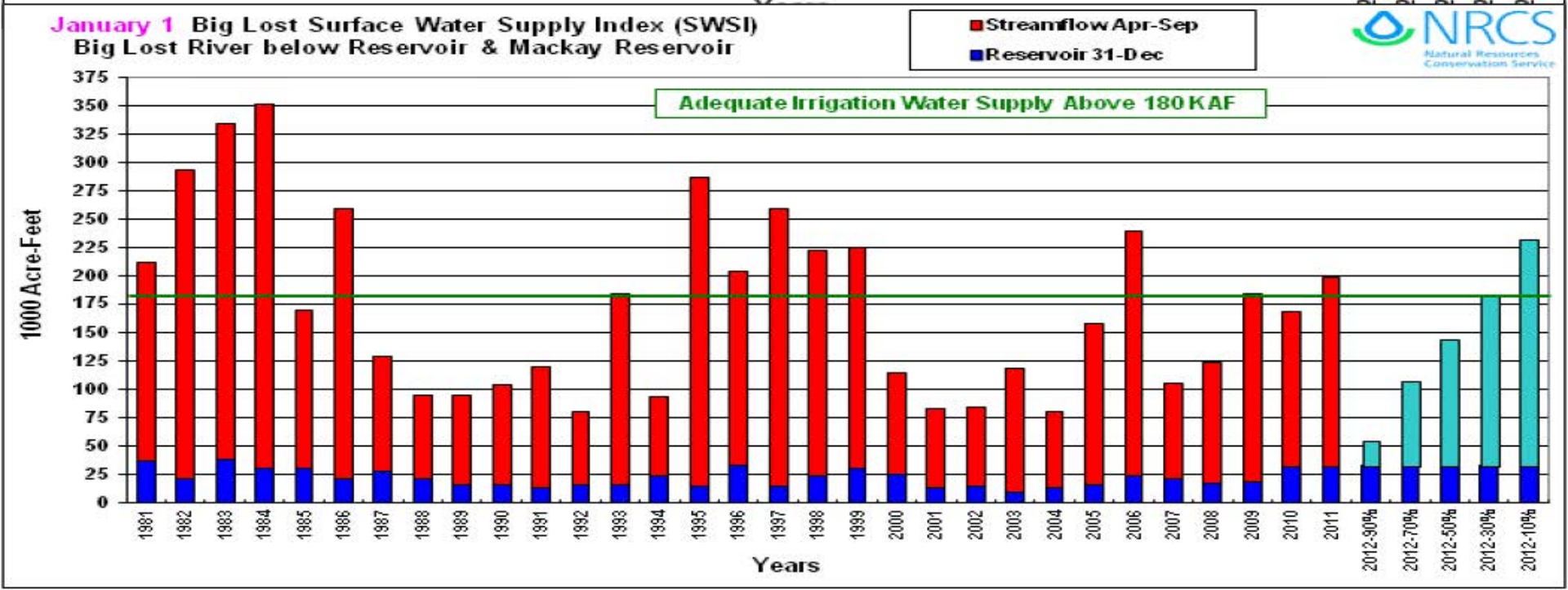

Boise Basin 7 Station Snow Index for Years 1961 - Jan 2012
Atlanta, Dollarhide, Graham, Jackson, Mores Creek, Trinity Mountain, Vienna Mine
NRCS
Natural Resources Conservation Service
45% chance to return to normal snow by April 1 based on 13 out of 29 years with below normal Jan 1snow that returned to 80% of average (March 1 average amounts) by April 1
January 1 Snow Water
April 1 Snow Water
April 1 Average 30.4
March 1 Average 25.5
February 1 Average 19.6
January 1 Average 12.7
Inches of Snow Water
0
5
10
15
20
25
30
35
40
45
50
77 90 87 63 94 79 98 91 88 00 10 68 70 01 12 80 61 05 81 64 92 75 73 08 66 09 86 07 03 67 96 89 93 02 76 04 95 11 99 69 06 62 83 85 84 72 78 82 71 74 97 65
Years

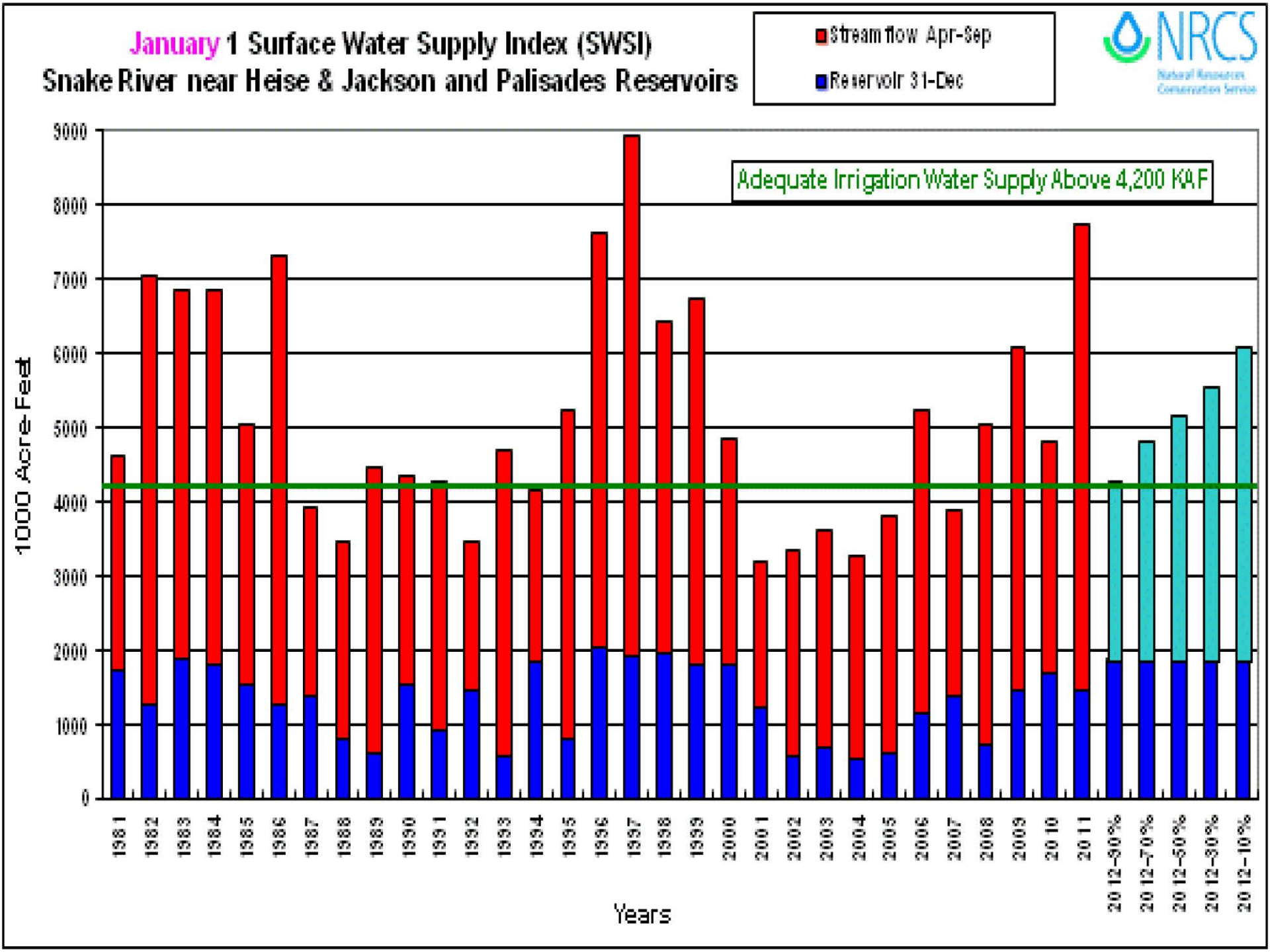
# Snow Riders Drought

Soldier Mountain Resort February 201 0

Northern Idaho March 1, 2011


January 1 Big Wood Surface Water Supply Index (SWSI)
Big Wood River below Magic & Magic Reservoir
Streamflow Apr-Sep
Reservoir 31-Dec
NRCS
Natural Resources Conservation Service
Adequate Irrigation Water Supply Above 275 KAF
1000 Acre-Feet
0
100
200
300
400
500
600
700
800
900
1000
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012-90%
2012-70%
2012-50%
2012-30%
2012-10%

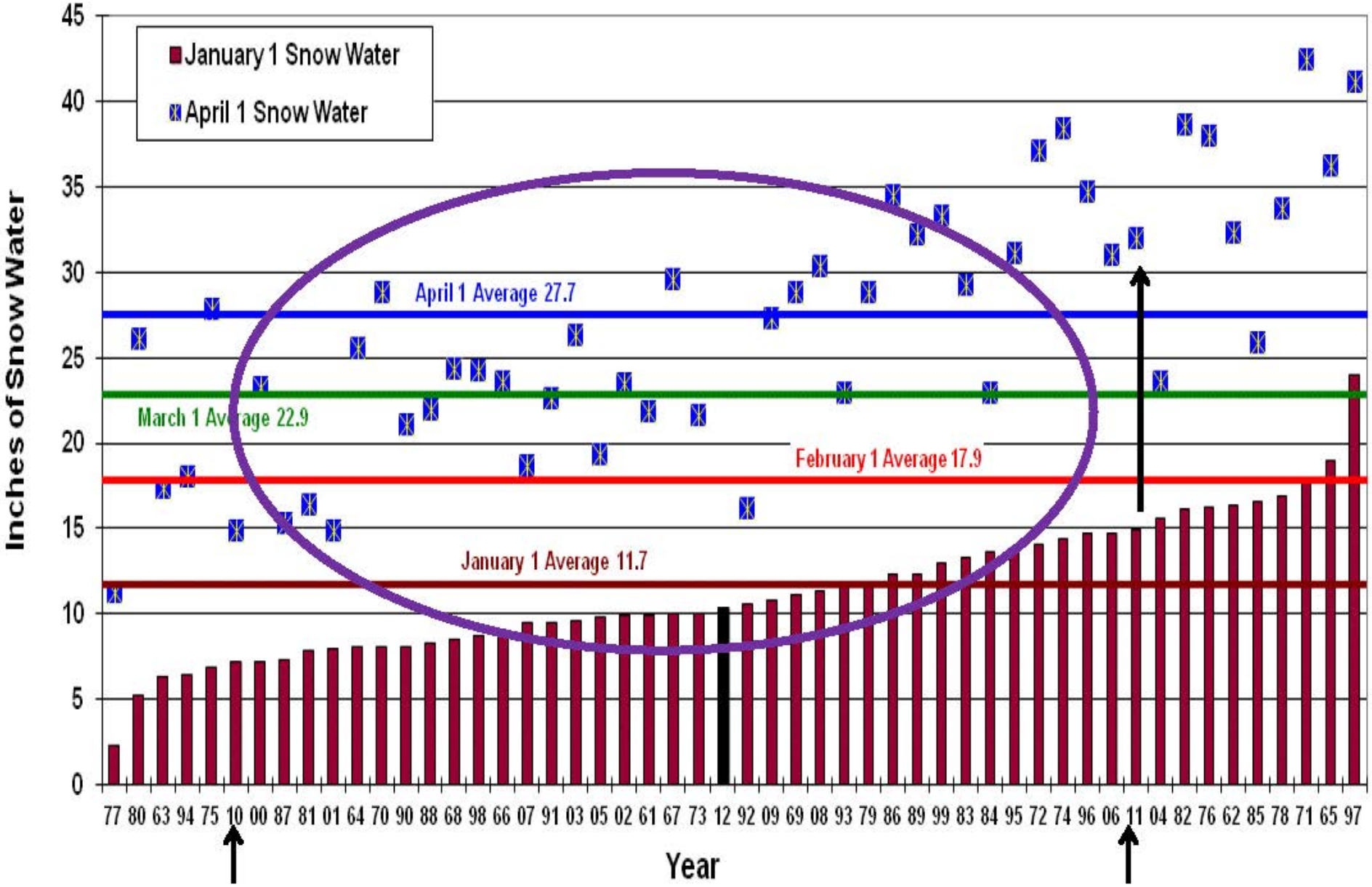

January 1 Big Lost Surface Water Supply Index (SWSI)
Big Lost River below Reservoir & Mackay Reservoir
Streamflow Apr-Sep
Reservoir 31-Dec
NRCS
Natural Resources Conservation Service
Adequate Irrigation Water Supply Above 180 KAF
1000 Acre-Feet
0
25
50
75
100
125
150
175
200
225
250
275
300
325
350
375
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012-90%
2012-70%
2012-50%
2012-30%
2012-10%
Years

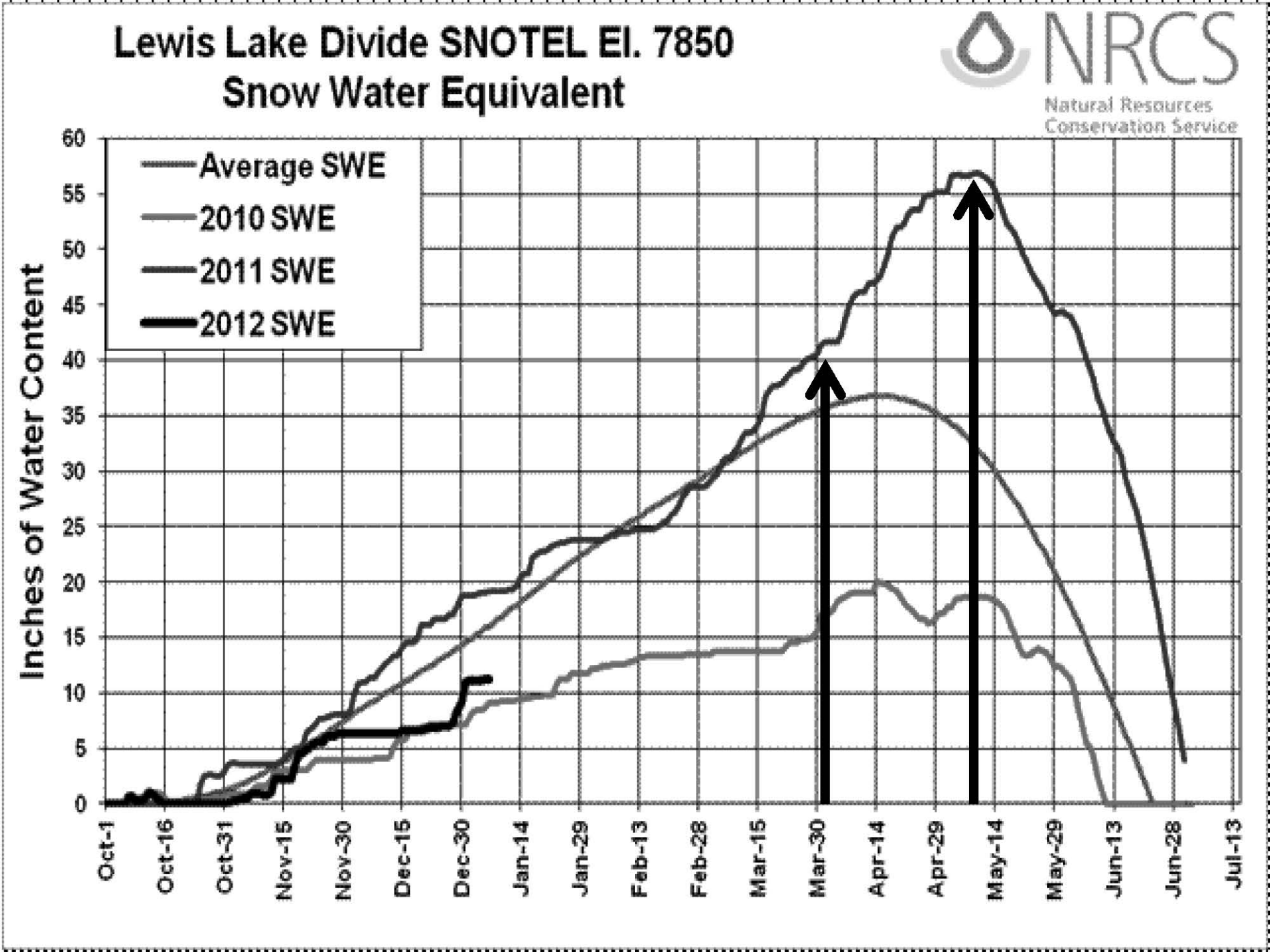

January 1 Surface Water Supply Index (SWSI)
Snake River near Heise & Jackson and Palisades Reservoirs
Streamflow Apr-Sep
Reservoir 31-Dec
NRCS
Natural Resources Conservation Service
Adequate Irrigation Water Supply Above 4,200 KAF
1000 Acre-Feet
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012-90%
2012-70%
2012-50%
2012-30%
2012-10%
Years

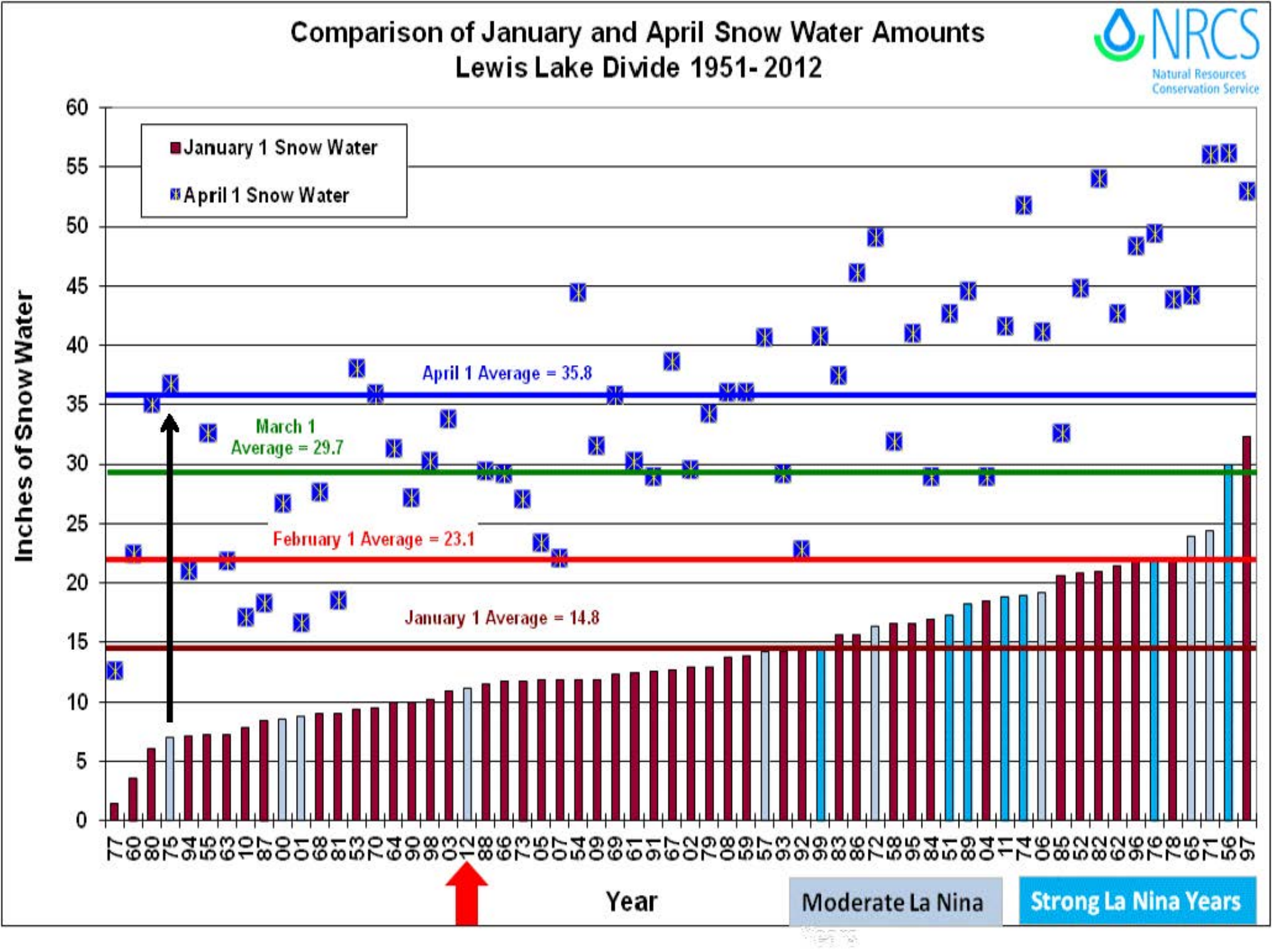
# Snake River Basin above Jackson Lake Station Snow Index for Years 1961 - Jan 2012

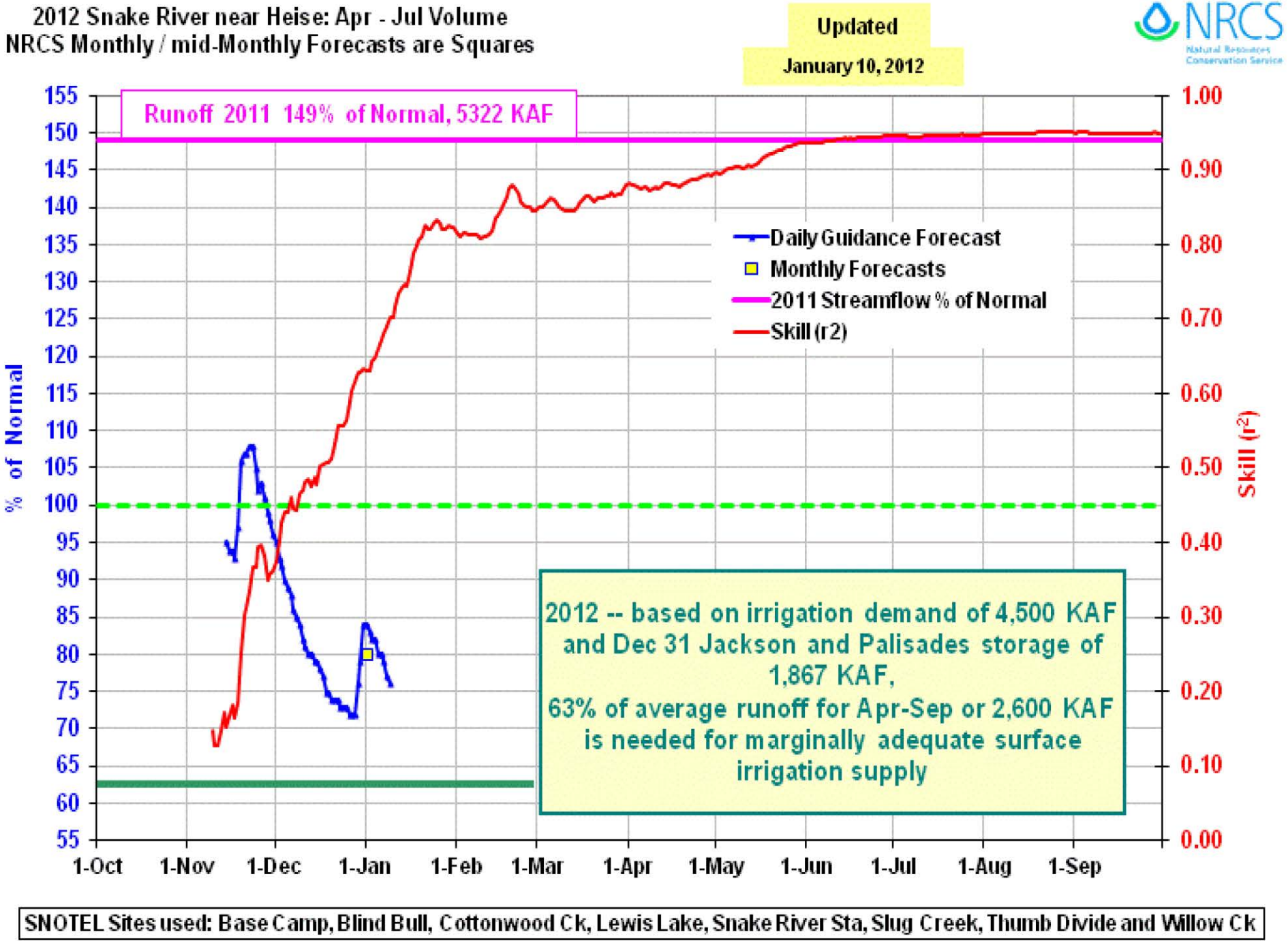
Grassy Lake, Lewis Lake, Snake River Station, Thumb Divide, and Two Ocean SNOTEL Sites

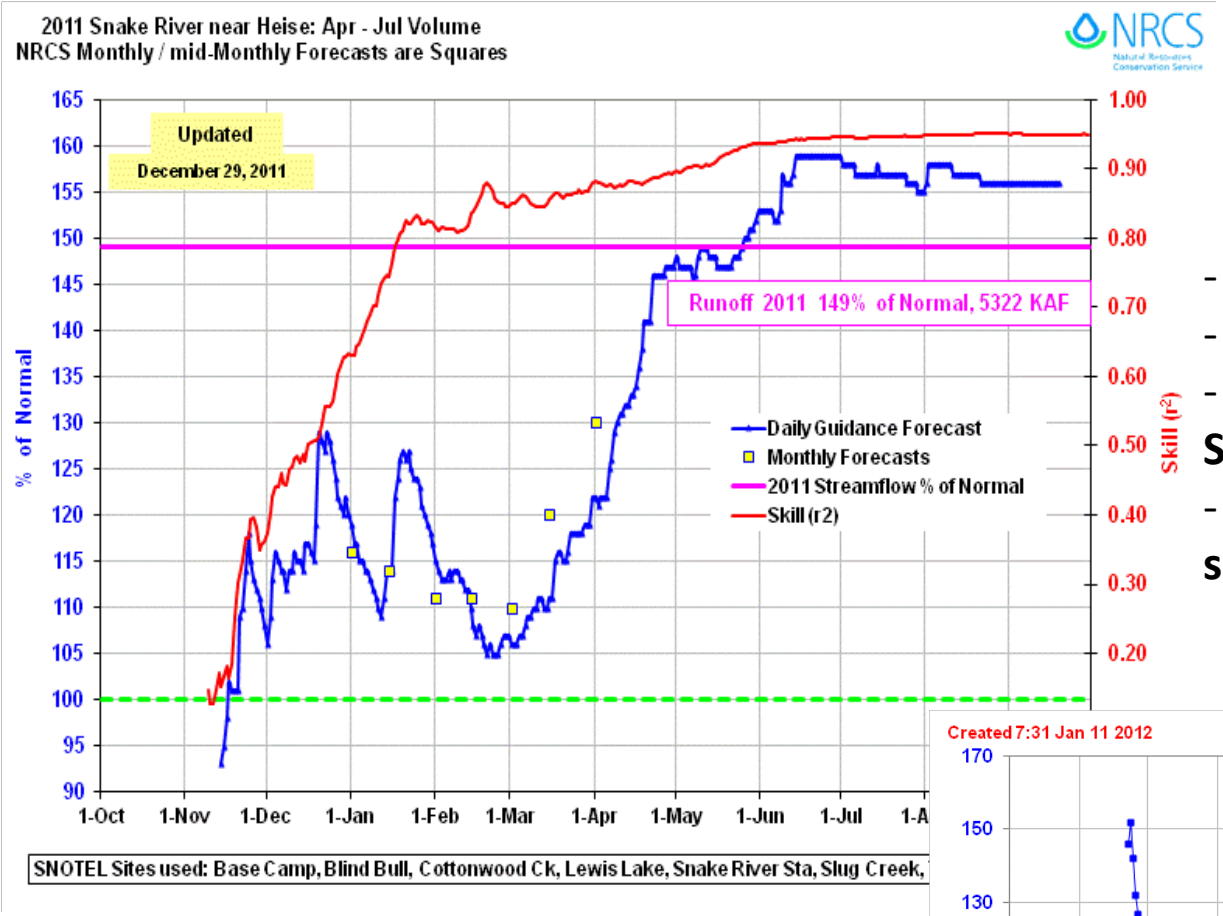
NRCS
Natural Resources Conservation Service




Lewis Lake Divide SNOTEL El. 7850
Snow Water Equivalent
NRCS
Natural Resources
Conservation Service
Average SWE
2010 SWE
2011 SWE
2012 SWE
Inches of Water Content
0
5
10
15
20
25
30
35
40
45
50
55
60
Oct-1
Oct-16
Oct-31
Nov-15
Nov-30
Dec-15
Dec-30
Jan-14
Jan-29
Feb-13
Feb-28
Mar-15
Mar-30
Apr-14
Apr-29
May-14
May-29
Jun-13
Jun-28
Jul-13

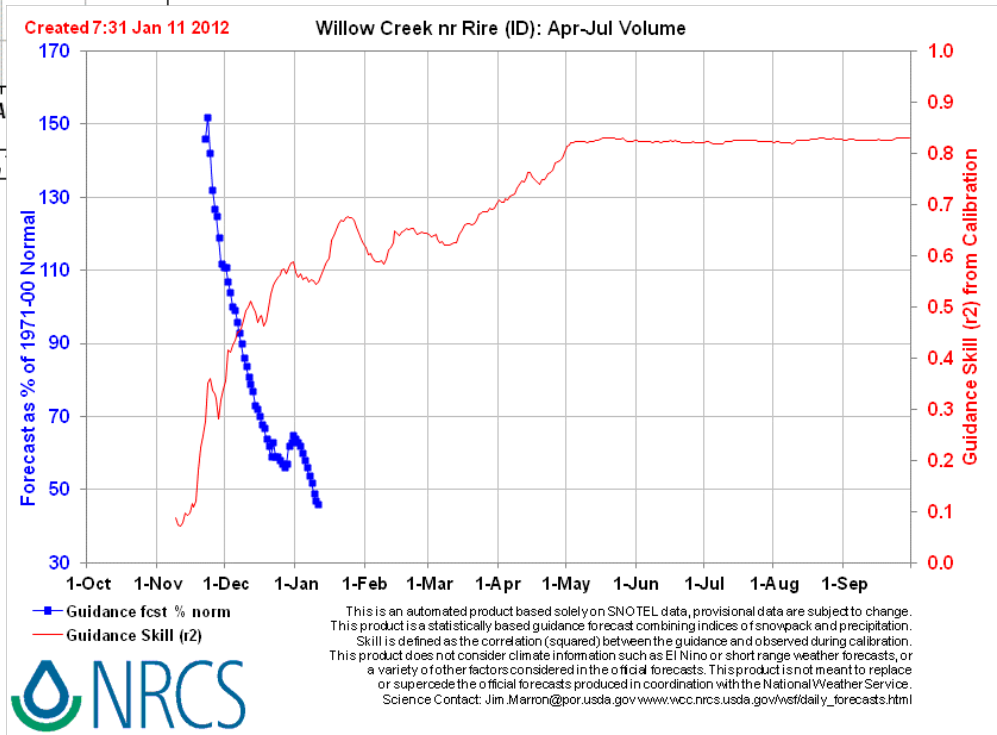

Comparison of January and April Snow Water Amounts
Lewis Lake Divide 1951- 2012
NRCS
Natural Resources Conservation Service
January 1 Snow Water
April 1 Snow Water
April 1 Average = 35.8
March 1 Average = 29.7
February 1 Average = 23.1
January 1 Average = 14.8
Inches of Snow Water
0
5
10
15
20
25
30
35
40
45
50
55
60
77 60 80 75 94 55 63 10 87 00 01 68 81 53 70 64 90 98 03 12 88 66 73 05 07 54 09 69 61 91 67 02 79 08 59 57 93 92 99 83 86 72 58 95 84 51 89 04 11 74 06 85 52 82 62 96 76 78 65 71 56 97
Year
Moderate La Nina
Strong La Nina Years

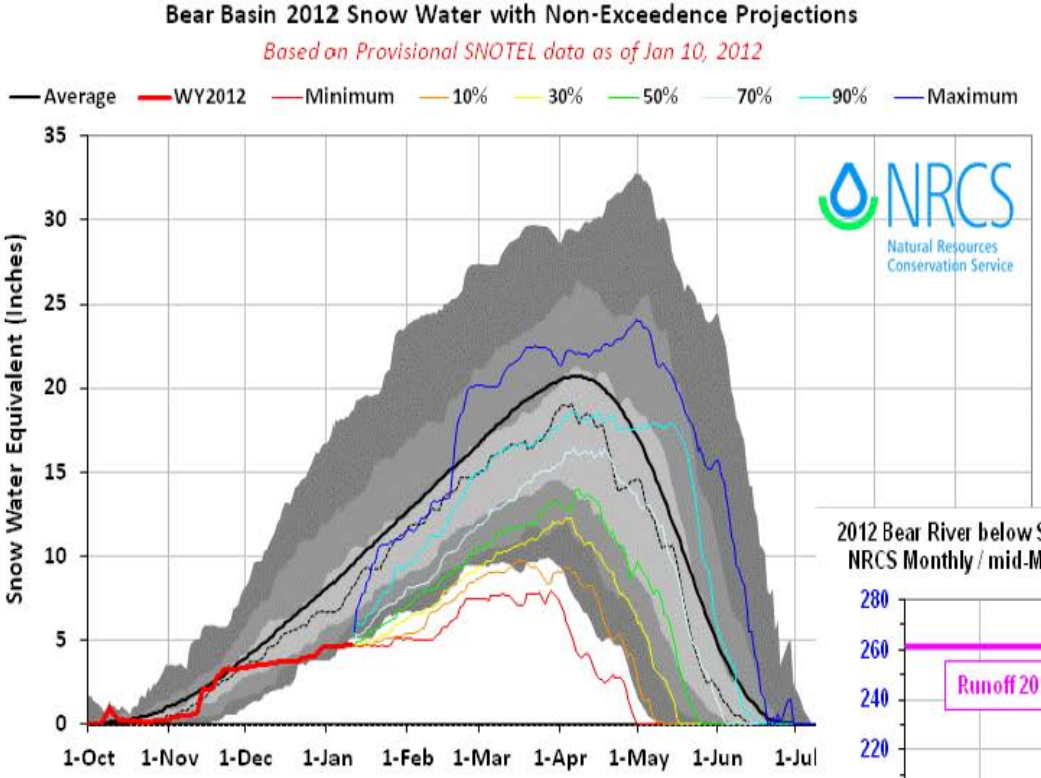

2012 Snake River near Heise: Apr - Jul Volume
NRCS Monthly / mid-Monthly Forecasts are Squares
Updated
January 10, 2012
NRCS
Natural Resources Conservation Service
Runoff 2011 149% of Normal, 5322 KAF
Daily Guidance Forecast
Monthly Forecasts
2011 Streamflow % of Normal
Skill (r2)
% of Normal
Skill (r²)
155
150
145
140
135
130
125
120
115
110
105
100
95
90
85
80
75
70
65
60
55
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
1-Oct
1-Nov
1-Dec
1-Jan
1-Feb
1-Mar
1-Apr
1-May
1-Jun
1-Jul
1-Aug
1-Sep
2012 -- based on irrigation demand of 4,500 KAF and Dec 31 Jackson and Palisades storage of 1,867 KAF,
63% of average runoff for Apr-Sep or 2,600 KAF is needed for marginally adequate surface irrigation supply
SNOTEL Sites used: Base Camp, Blind Bull, Cottonwood Ck, Lewis Lake, Snake River Sta, Slug Creek, Thumb Divide and Willow Ck

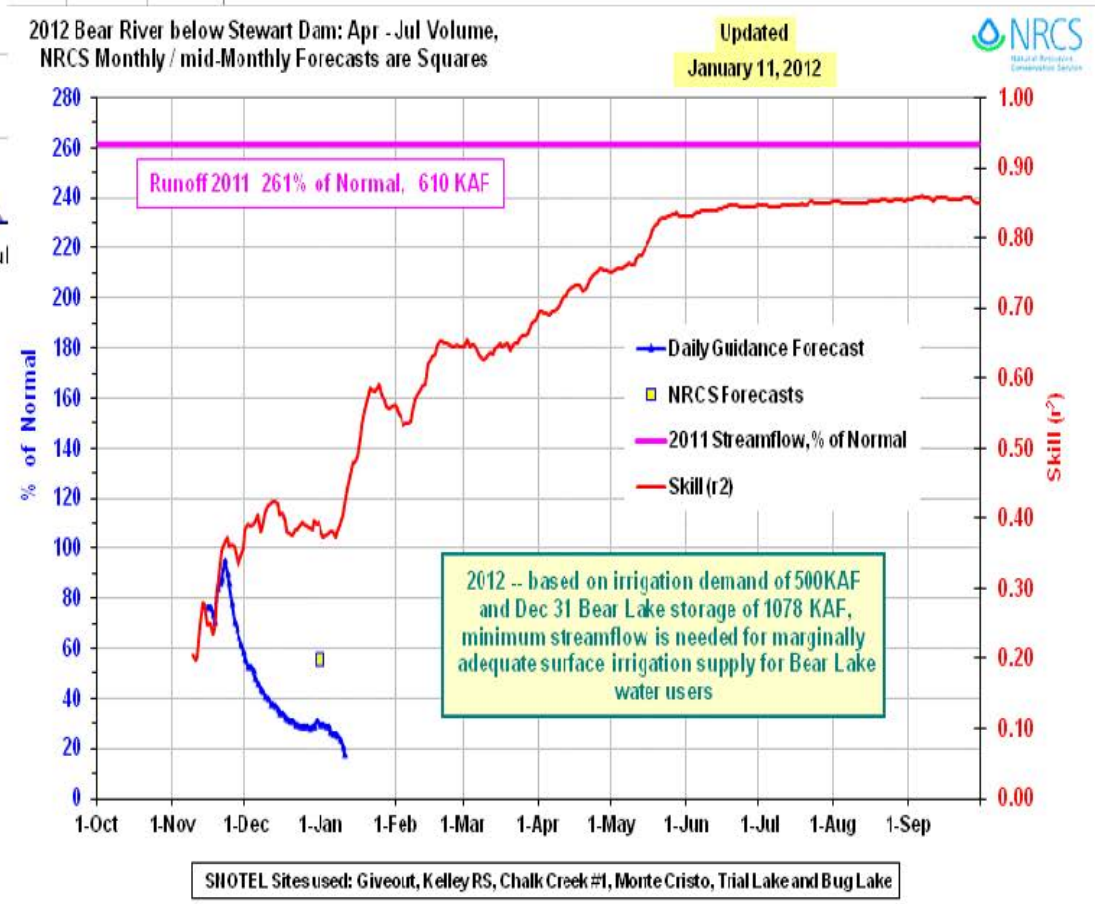


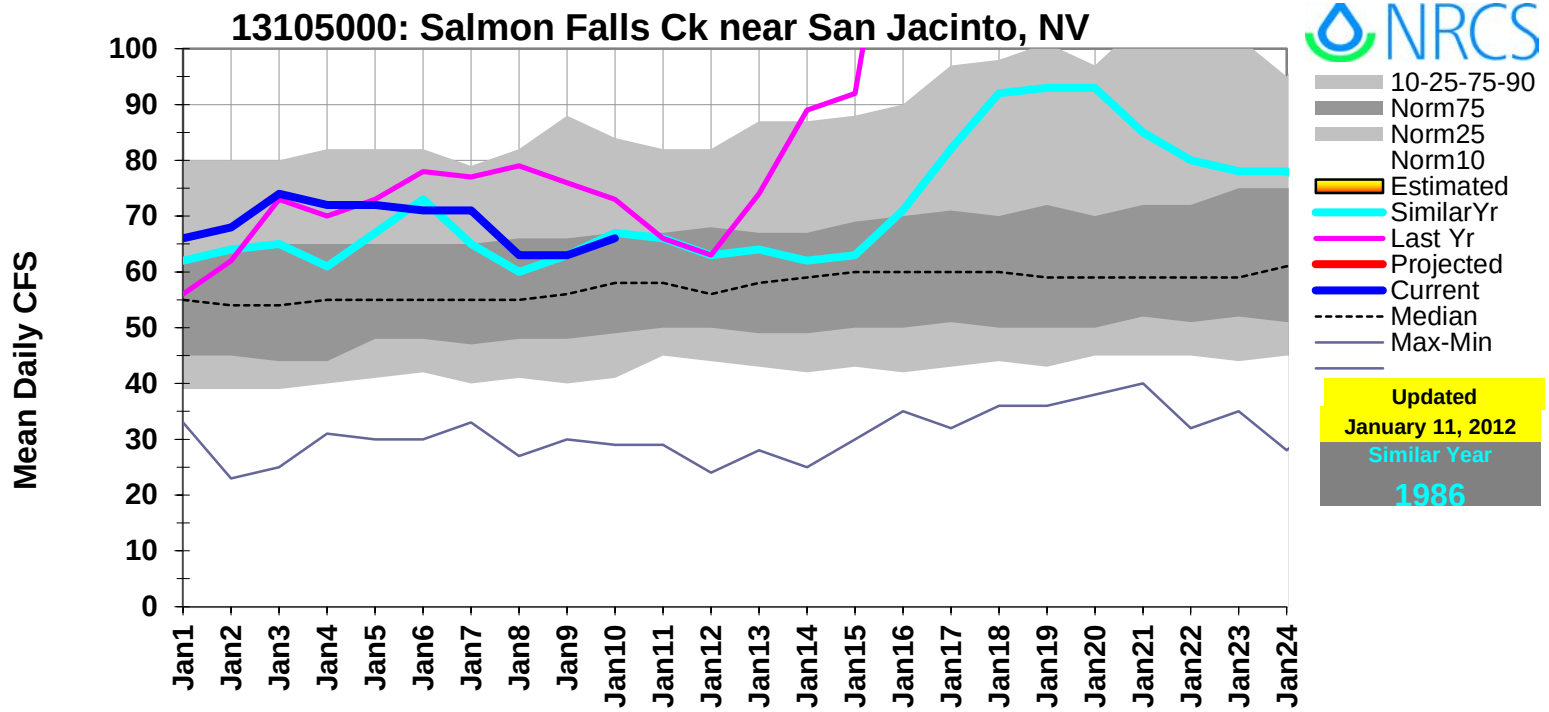

# Mid-months forecasts and use of them?

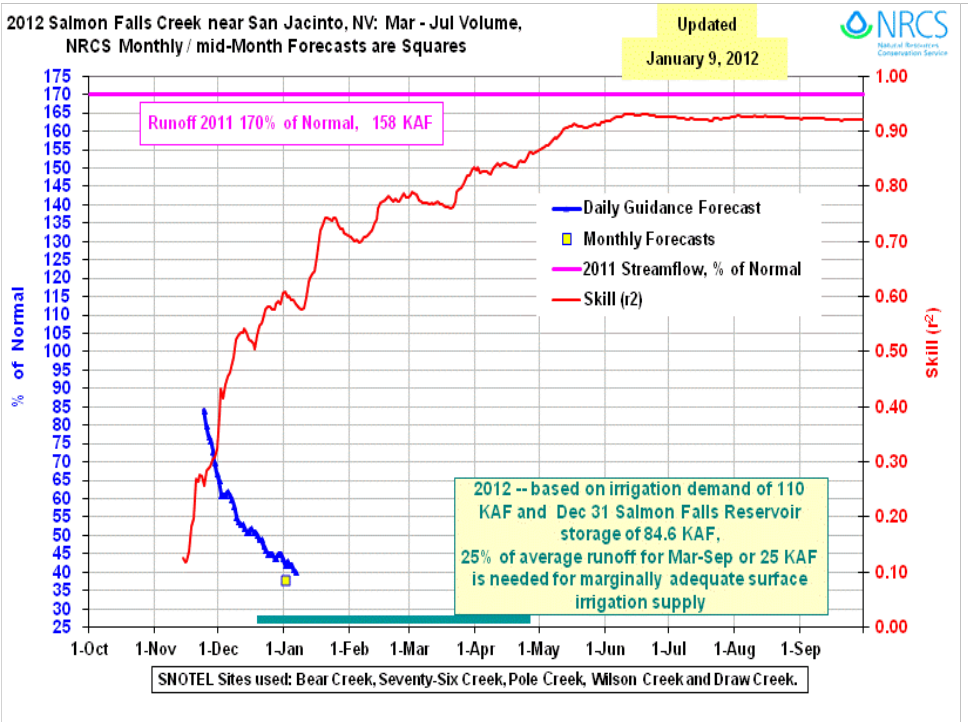
- Started as requests from users,
- Then forecast most points,
- Today, we have Daily Water Supply Forecasts
- Added more forecasts this summer, now 27 run daily

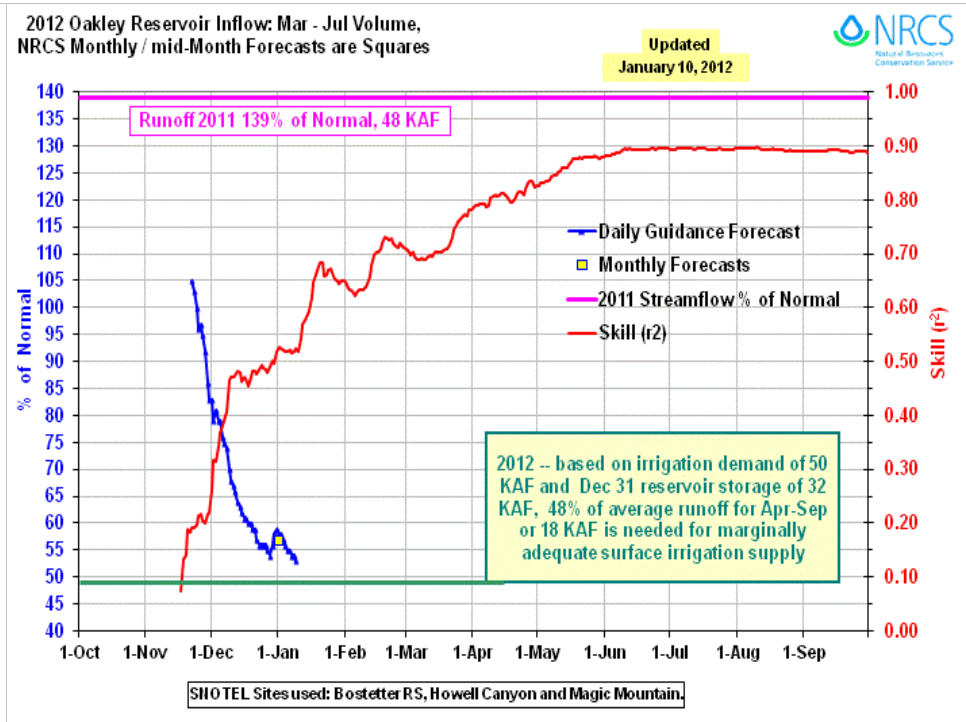



Bear Basin 2012 Snow Water with Non-Exceedence Projections
Based on Provisional SNOTEL data as of Jan 10, 2012
Average
WY2012
Minimum
10%
30%
50%
70%
90%
Maximum
Snow Water Equivalent (Inches)
35
30
25
20
15
10
5
0
1-Oct
1-Nov
1-Dec
1-Jan
1-Feb
1-Mar
1-Apr
1-May
1-Jun
1-Jul
NRCS
Natural Resources Conservation Service


2012 Bear River below Stewart Dam: Apr - Jul Volume,
NRCS Monthly / mid-Monthly Forecasts are Squares
Updated
January 11, 2012
NRCS
Runoff 2011 261% of Normal, 610 KAF
Daily Guidance Forecast
NRCS Forecasts
2011 Streamflow, % of Normal
Skill (r2)
2012 -- based on irrigation demand of 500KAF and Dec 31 Bear Lake storage of 1078 KAF, minimum streamflow is needed for marginally adequate surface irrigation supply for Bear Lake water users
% of Normal
Skill (r²)
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
1-Oct
1-Nov
1-Dec
1-Jan
1-Feb
1-Mar
1-Apr
1-May
1-Jun
1-Jul
1-Aug
1-Sep
SNOTEL Sites used: Giveout, Kelley RS, Chalk Creek #1, Monte Cristo, Trial Lake and Bug Lake

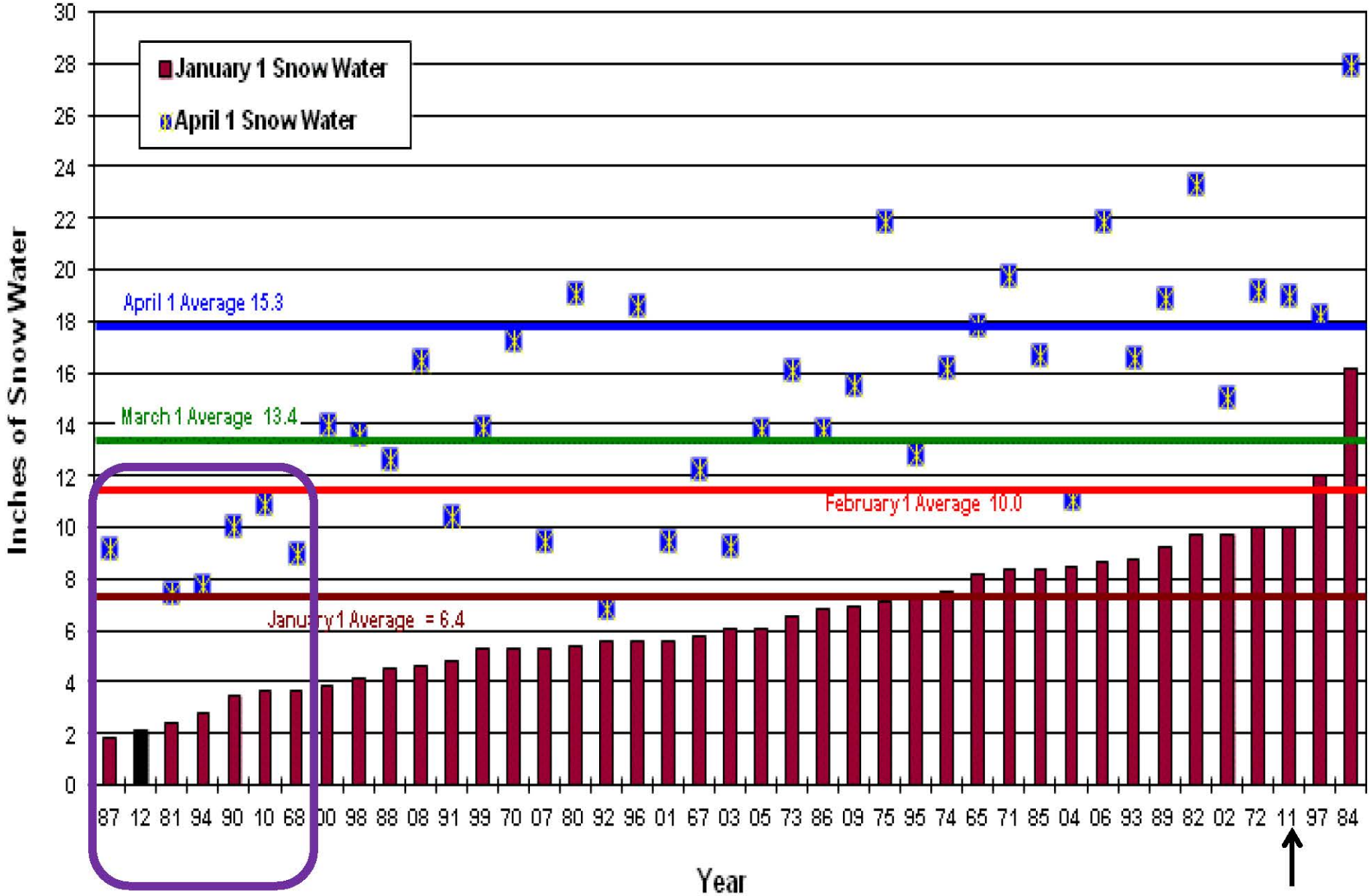

13105000: Salmon Falls Ck near San Jacinto, NV
Mean Daily CFS
100
90
80
70
60
50
40
30
20
10
0
Jan1
Jan2
Jan3
Jan4
Jan5
Jan6
Jan7
Jan8
Jan9
Jan10
Jan11
Jan12
Jan13
Jan14
Jan15
Jan16
Jan17
Jan18
Jan19
Jan20
Jan21
Jan22
Jan23
Jan24
NRCS
10-25-75-90
Norm75
Norm25
Norm10
Estimated
SimilarYr
Last Yr
Projected
Current
Median
Max-Min
Updated
January 11, 2012
Similar Year
1986


2012 Salmon Falls Creek near San Jacinto, NV: Mar - Jul Volume,
NRCS Monthly / mid-Month Forecasts are Squares
Updated
January 9, 2012
NRCS
Runoff 2011 170% of Normal, 158 KAF
Daily Guidance Forecast
Monthly Forecasts
2011 Streamflow, % of Normal
Skill (r2)
% of Normal
Skill (r²)
2012 -- based on irrigation demand of 110 KAF and Dec 31 Salmon Falls Reservoir storage of 84.6 KAF, 25% of average runoff for Mar-Sep or 25 KAF is needed for marginally adequate surface irrigation supply
1-Oct
1-Nov
1-Dec
1-Jan
1-Feb
1-Mar
1-Apr
1-May
1-Jun
1-Jul
1-Aug
1-Sep
SNOTEL Sites used: Bear Creek, Seventy-Six Creek, Pole Creek, Wilson Creek and Draw Creek.


2012 Oakley Reservoir Inflow: Mar - Jul Volume,
NRCS Monthly / mid-Month Forecasts are Squares
Updated
January 10, 2012
NRCS
Runoff 2011 139% of Normal, 48 KAF
Daily Guidance Forecast
Monthly Forecasts
2011 Streamflow % of Normal
Skill (r2)
% of Normal
Skill (r²)
2012 -- based on irrigation demand of 50 KAF and Dec 31 reservoir storage of 32 KAF, 48% of average runoff for Apr-Sep or 18 KAF is needed for marginally adequate surface irrigation supply
1-Oct
1-Nov
1-Dec
1-Jan
1-Feb
1-Mar
1-Apr
1-May
1-Jun
1-Jul
1-Aug
1-Sep
SNOTEL Sites used: Bostetter RS, Howell Canyon and Magic Mountain.

# Bruneau River Basin 4 Station Snow Index 1984 - Jan 2012

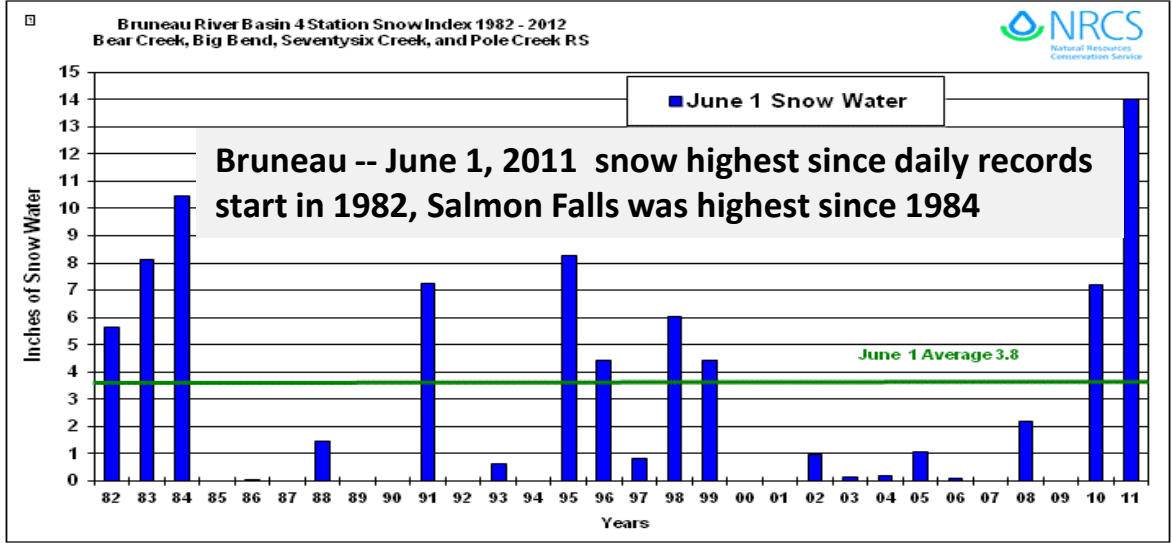
## Bear Creek, Big Bend, Pole Creek RS and Seventysix Creek

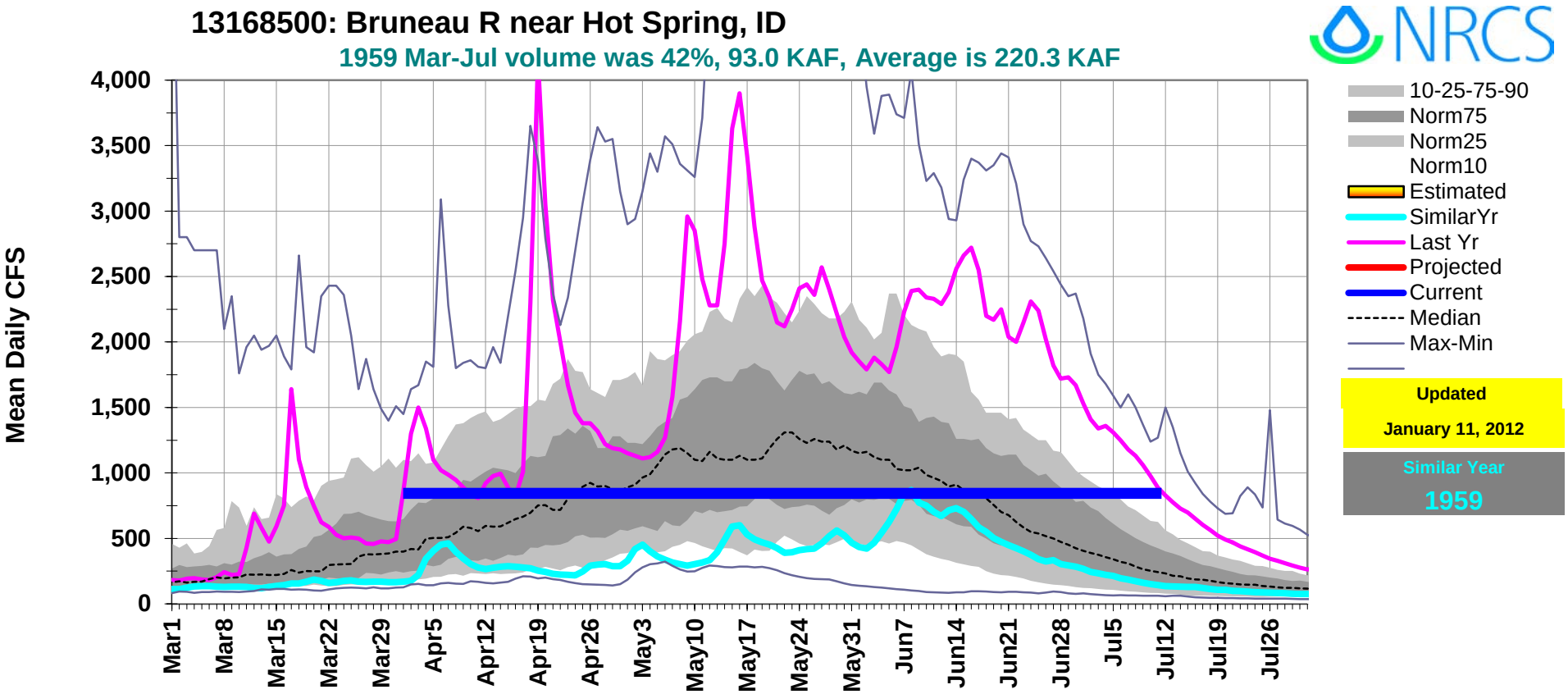


-2011 had over 3 months with flows over 800 cfs for river running

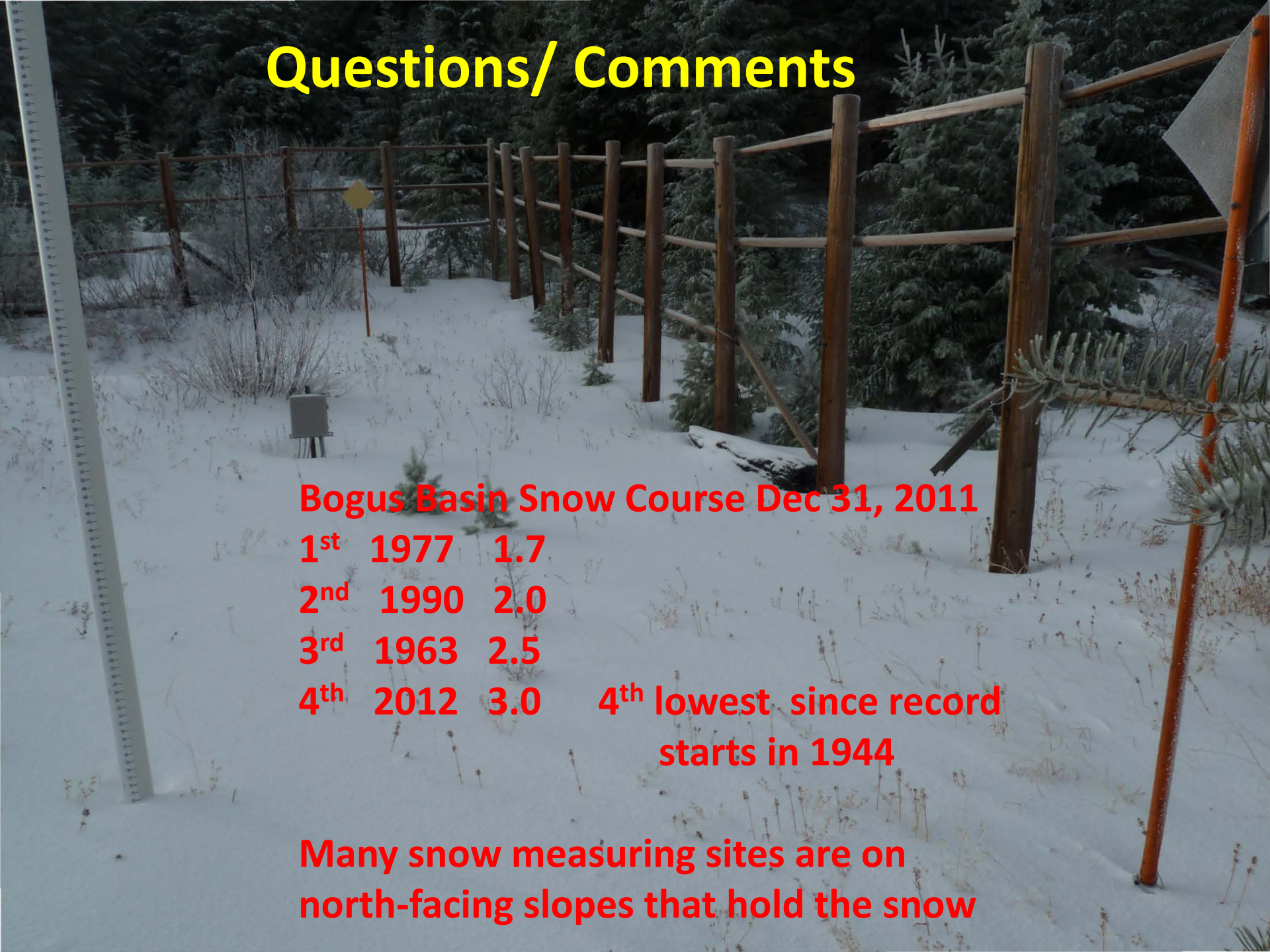
- Jan 2012 forecast Mar – Jul for 47% of average

- 1959 flow was 42%



# Questions/ Comments



**Bogus Basin Snow Course Dec 31, 2011**

| | | |
|---|---|---|
| 1st | 1977 | 1.7 |
| 2nd | 1990 | 2.0 |
| 3rd | 1963 | 2.5 |
| 4th | 2012 | 3.0 |

4th lowest since record starts in 1944

**Many snow measuring sites are on north-facing slopes that hold the snow**