

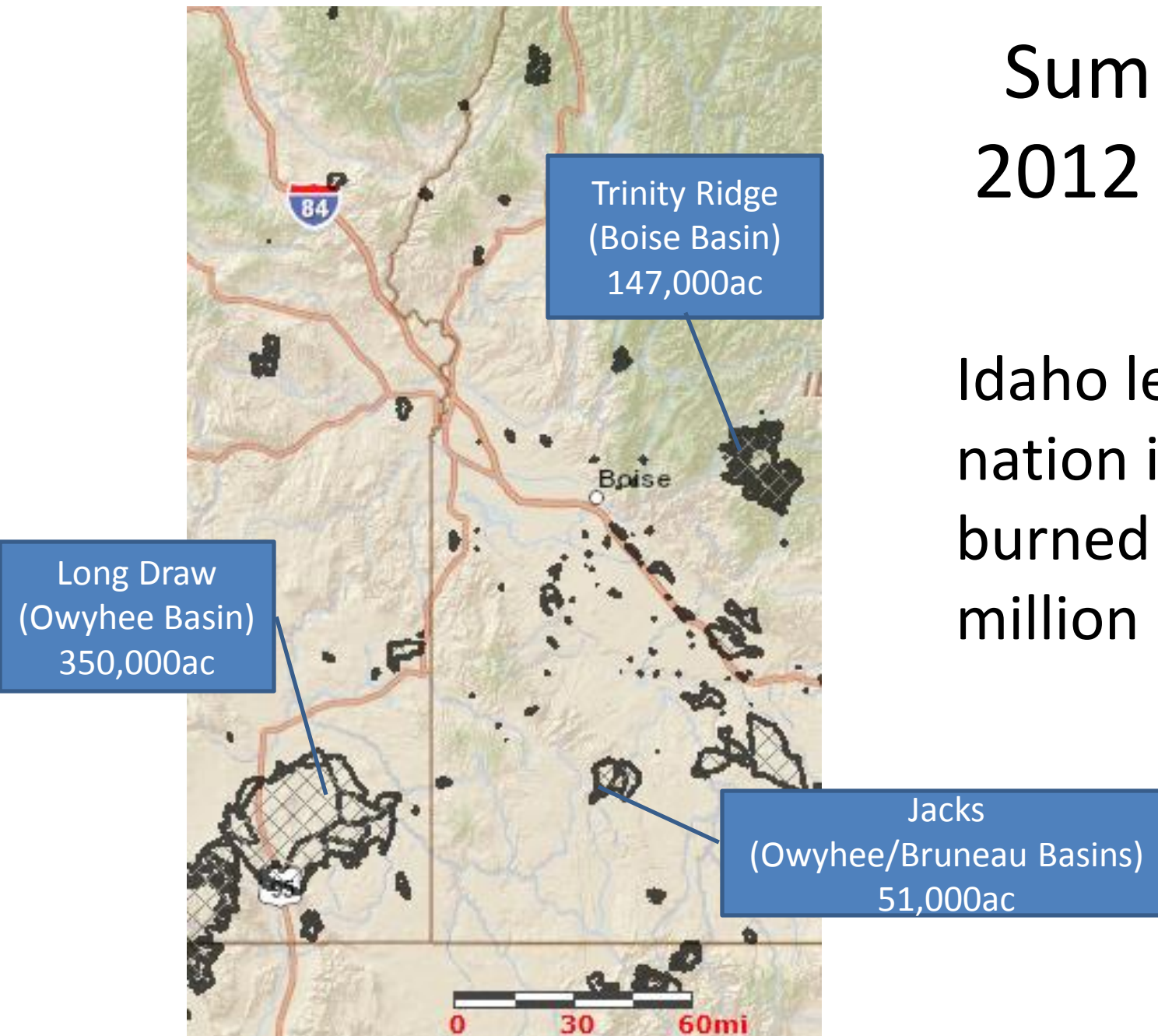
# **Snow Survey Update and Water Supply Conditions**

**Treasure Valley Irrigation Conference  
December 6, 2012**

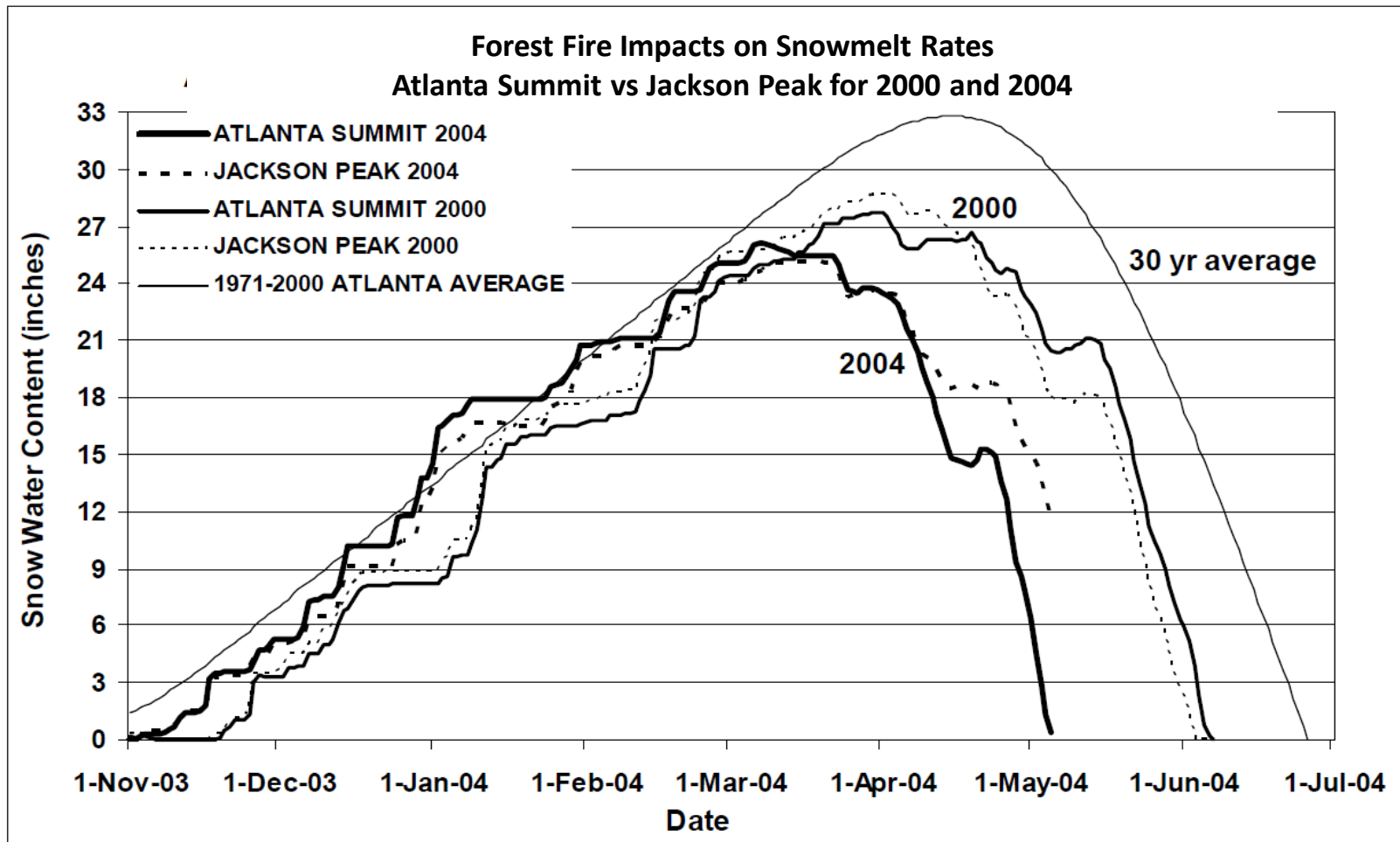
**Jeff Anderson  
Hydrologist  
NRCS Snow Survey**

# Summer 2012 Fires

Idaho led the  
nation in acres  
burned with 1.7  
million acres.



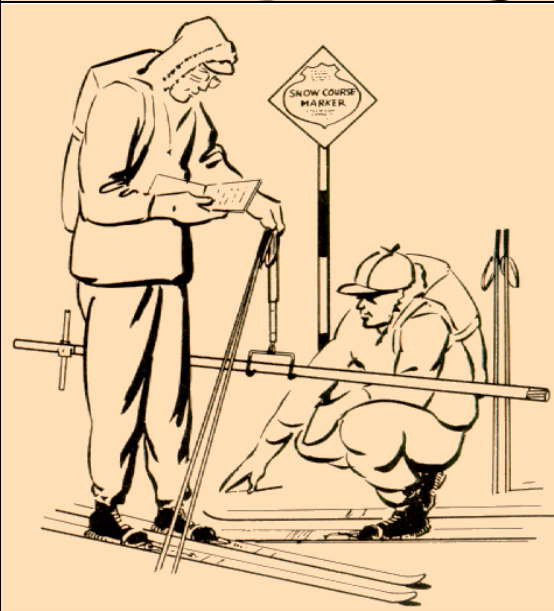
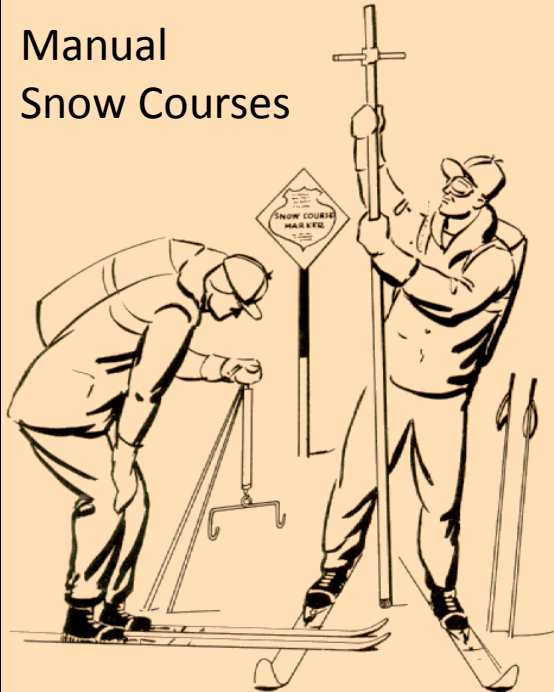
# Hydrologic Fire Effects: Earlier snowmelt / runoff



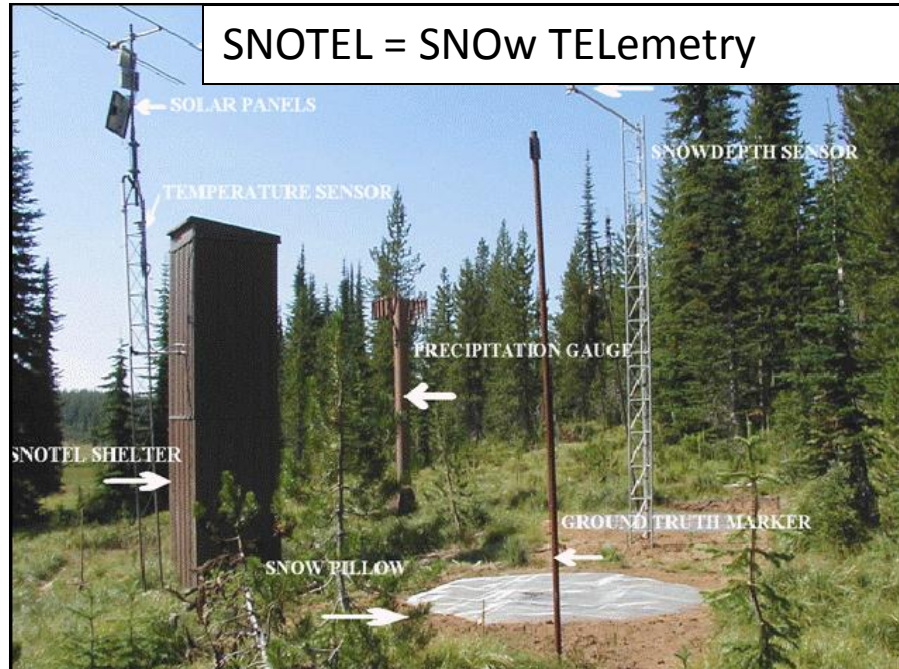


# NRCS Snow Measurement Techniques

Manual  
Snow Courses



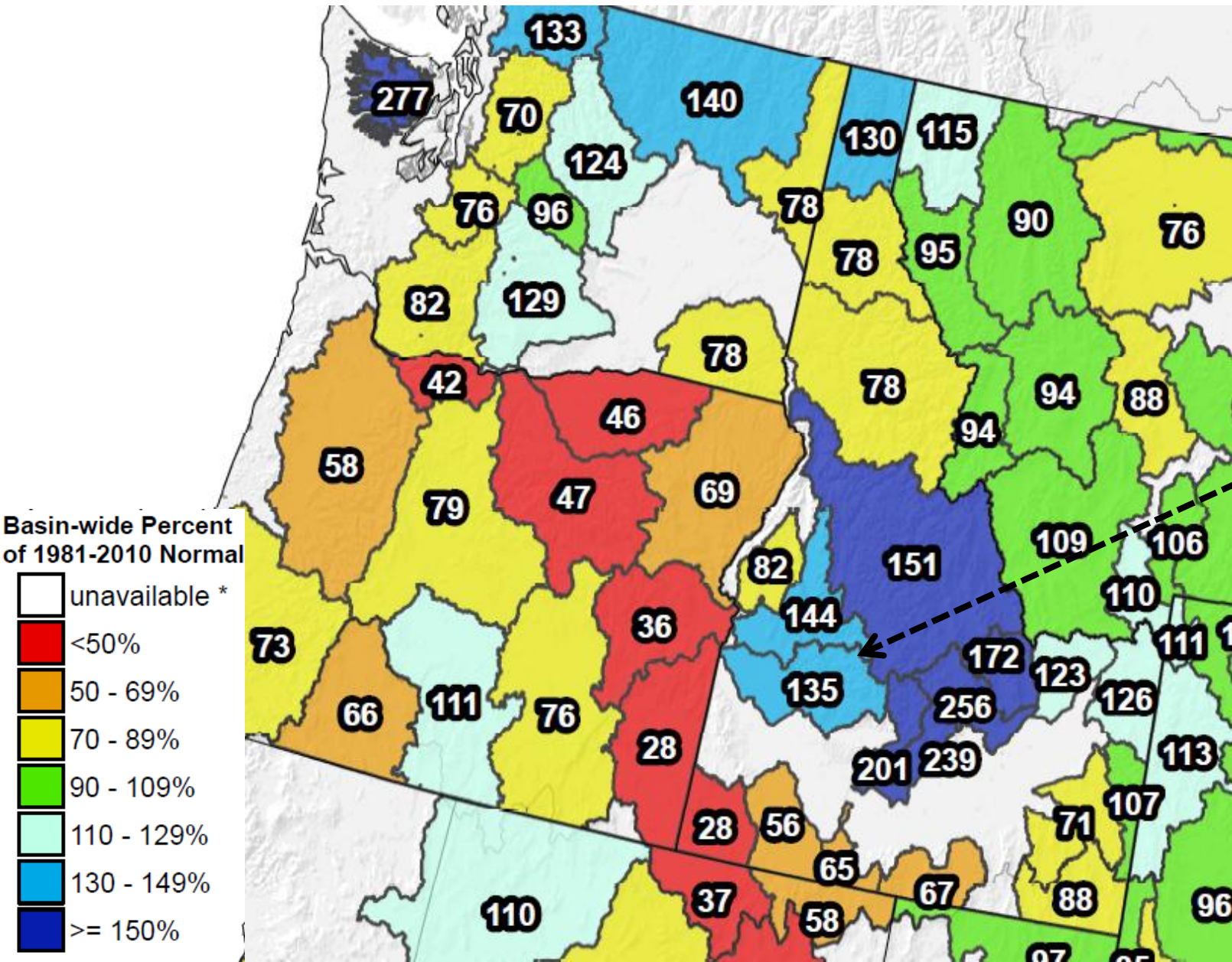
SNOTEL = SNOW TELelemetry



Aerial Snow Course Markers



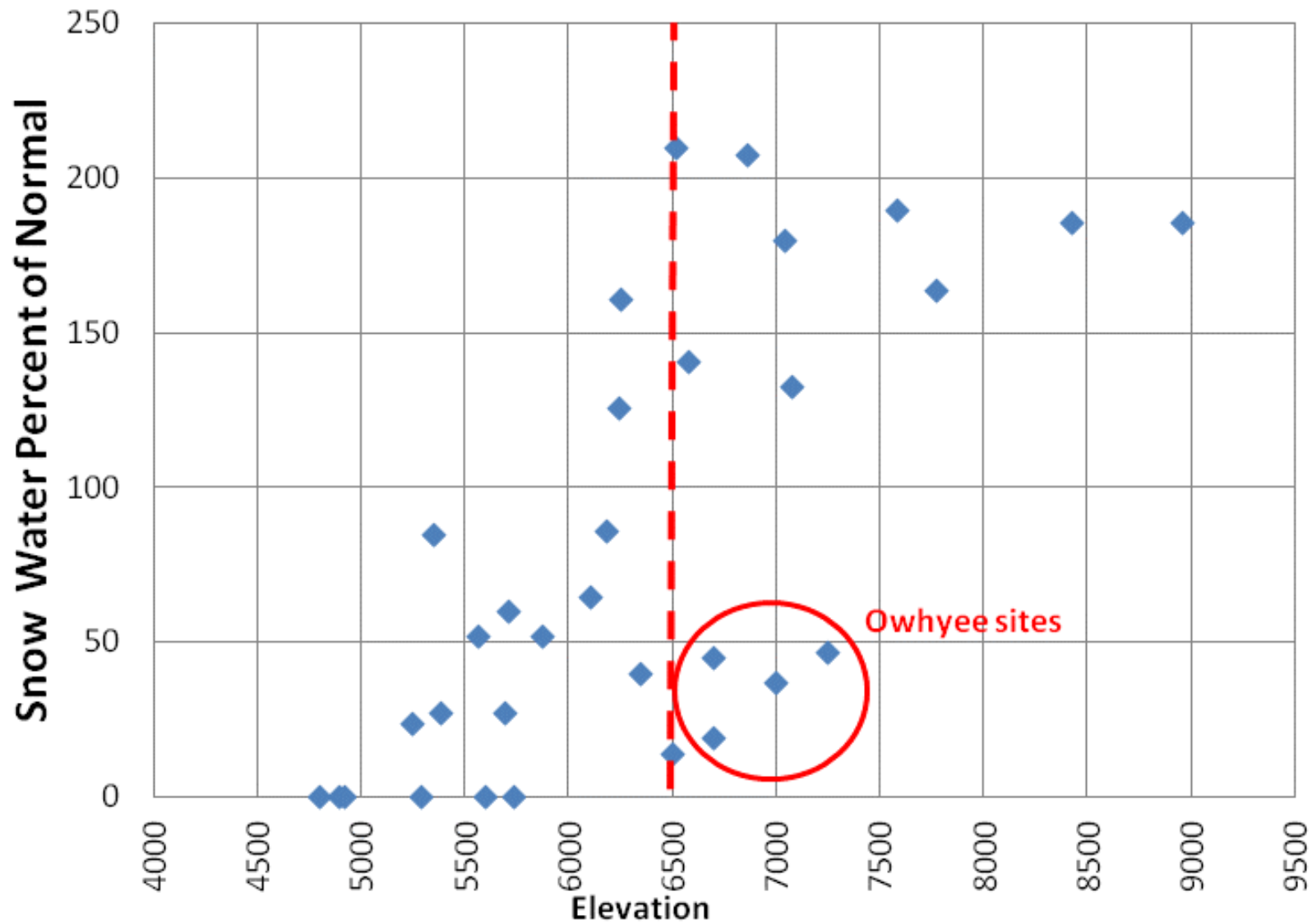
# Snow Water % of Normal as of Dec 5<sup>th</sup>



Boise and Payette  
snowpack  
increased  
60% since  
11/30



**Snow Water Percent of Normal  
Southwest Idaho and Southeast Oregon  
December 5, 2012**



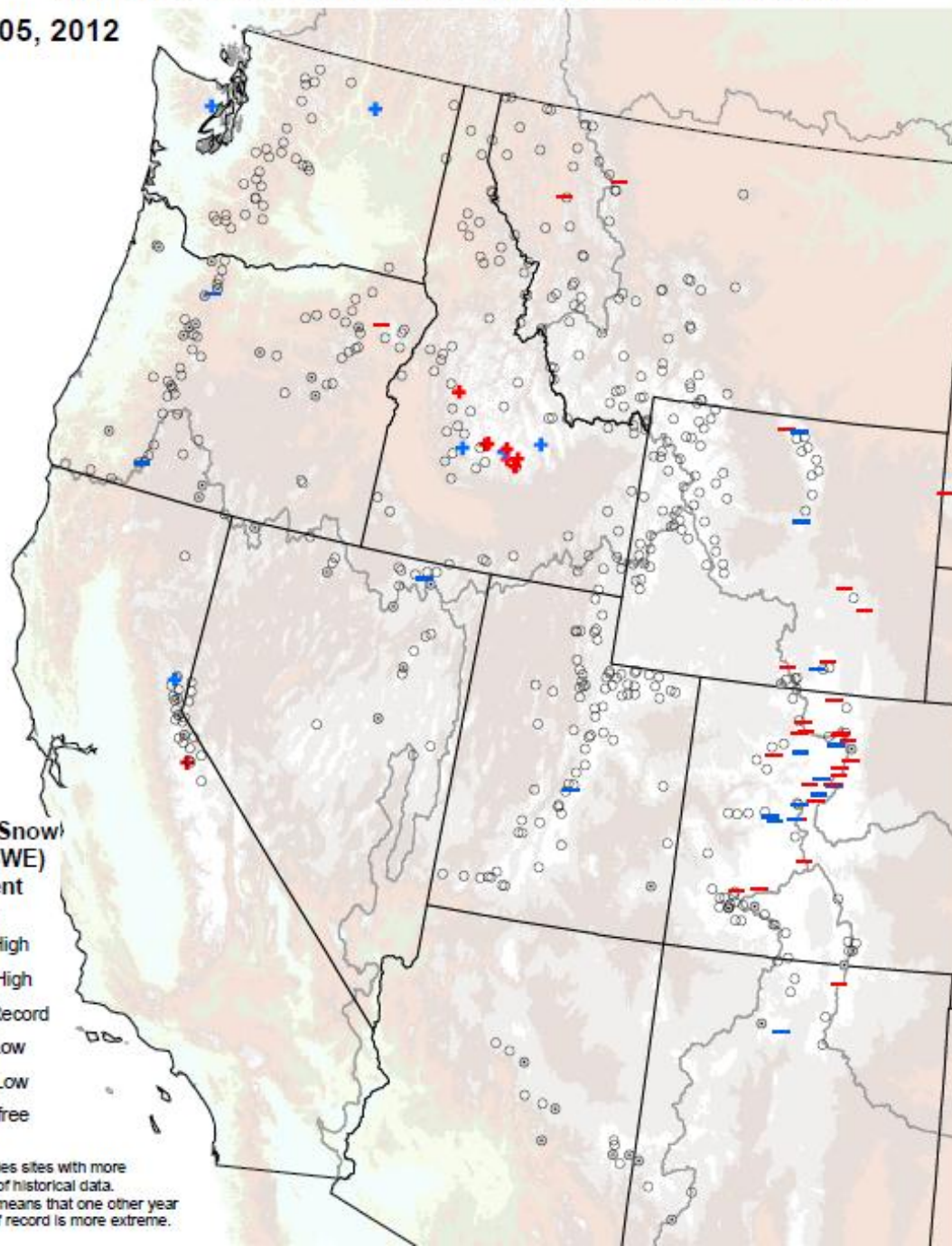
# SNOTEL Current Snow Water Equivalent (SWE) Records

Dec 05, 2012

## Current Snow Water (SWE) Equivalent Records

- + New High
- + Near High
- Non-Record
- New Low
- Near Low
- ⊙ snow free

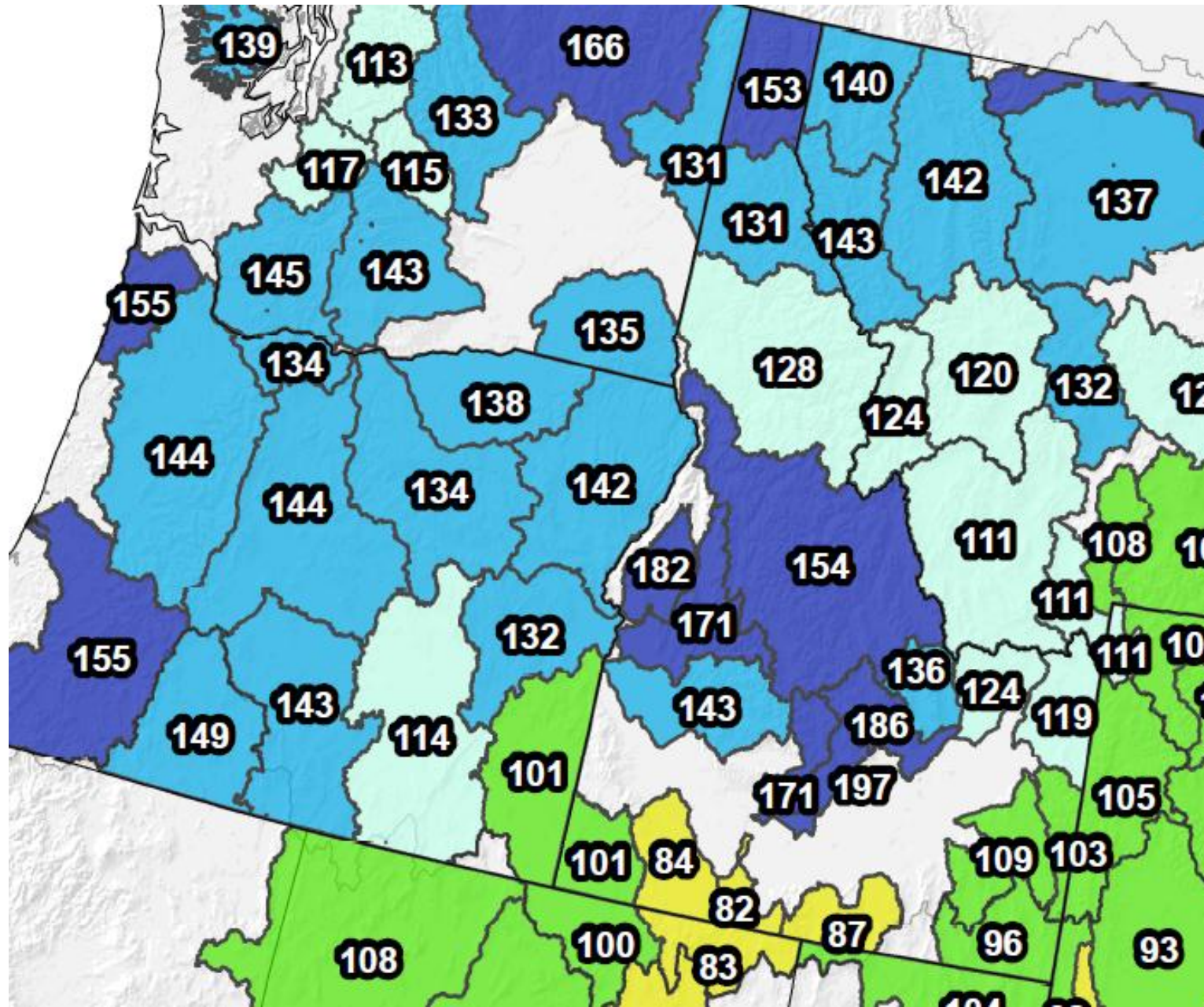
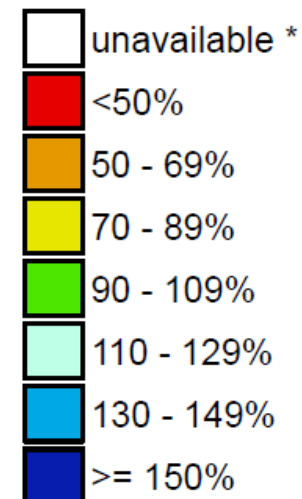
Analysis includes sites with more than 20 years of historical data. "Near" record means that one other year of the period of record is more extreme.





# Water Year Precipitation since Oct 1 as of Dec 5<sup>th</sup>

Basin-wide Percent  
of 1981-2010 Normal





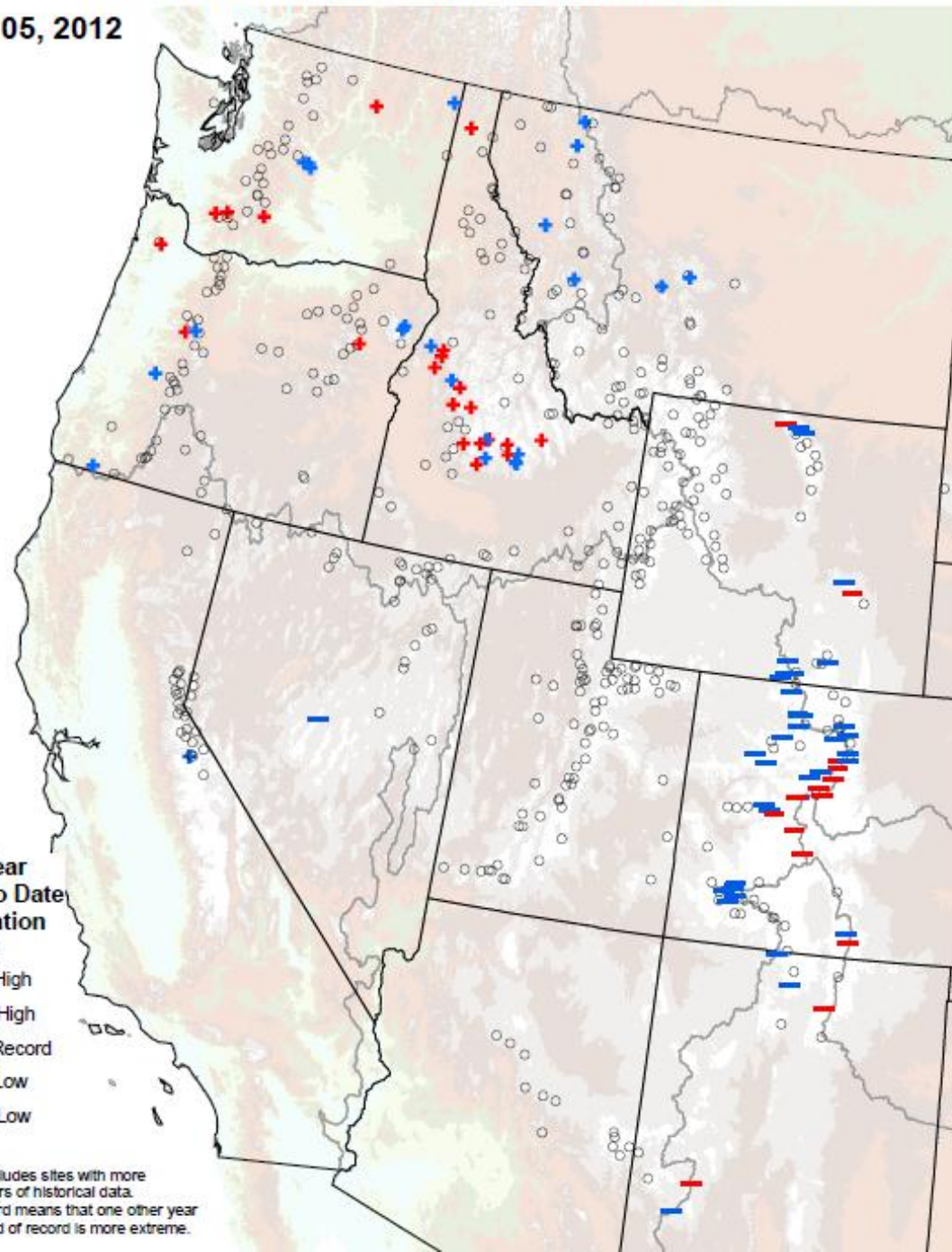
# SNOTEL Water Year (Oct 1) to Date Precipitation Records

Dec 05, 2012

## Water Year (Oct 1) to Date Precipitation Records

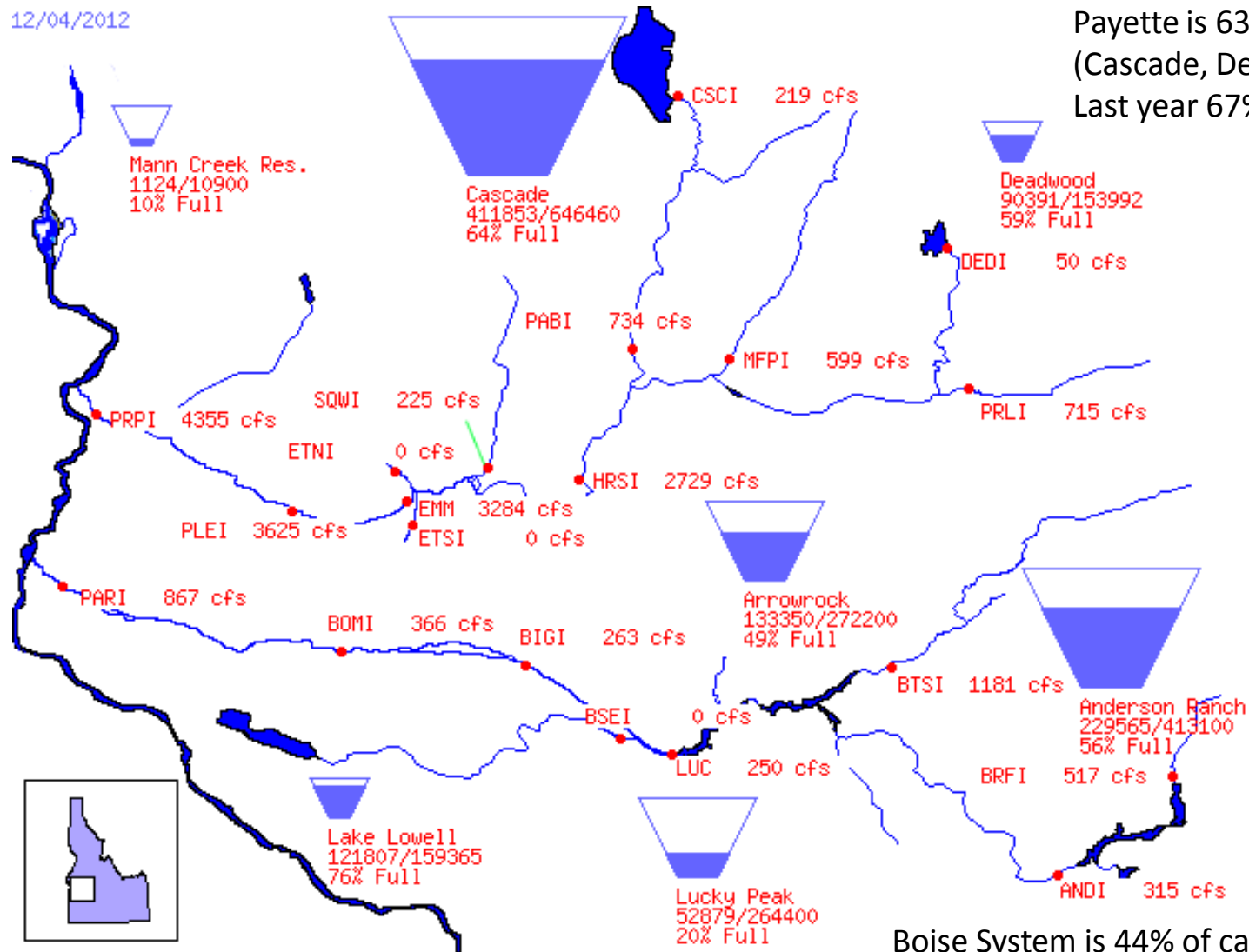
- + New High
- + Near High
- Non-Record
- New Low
- Near Low

Analysis includes sites with more than 20 years of historical data.  
"Near" record means that one other year of the period of record is more extreme.



# Boise / Payette Reservoir System

12/04/2012



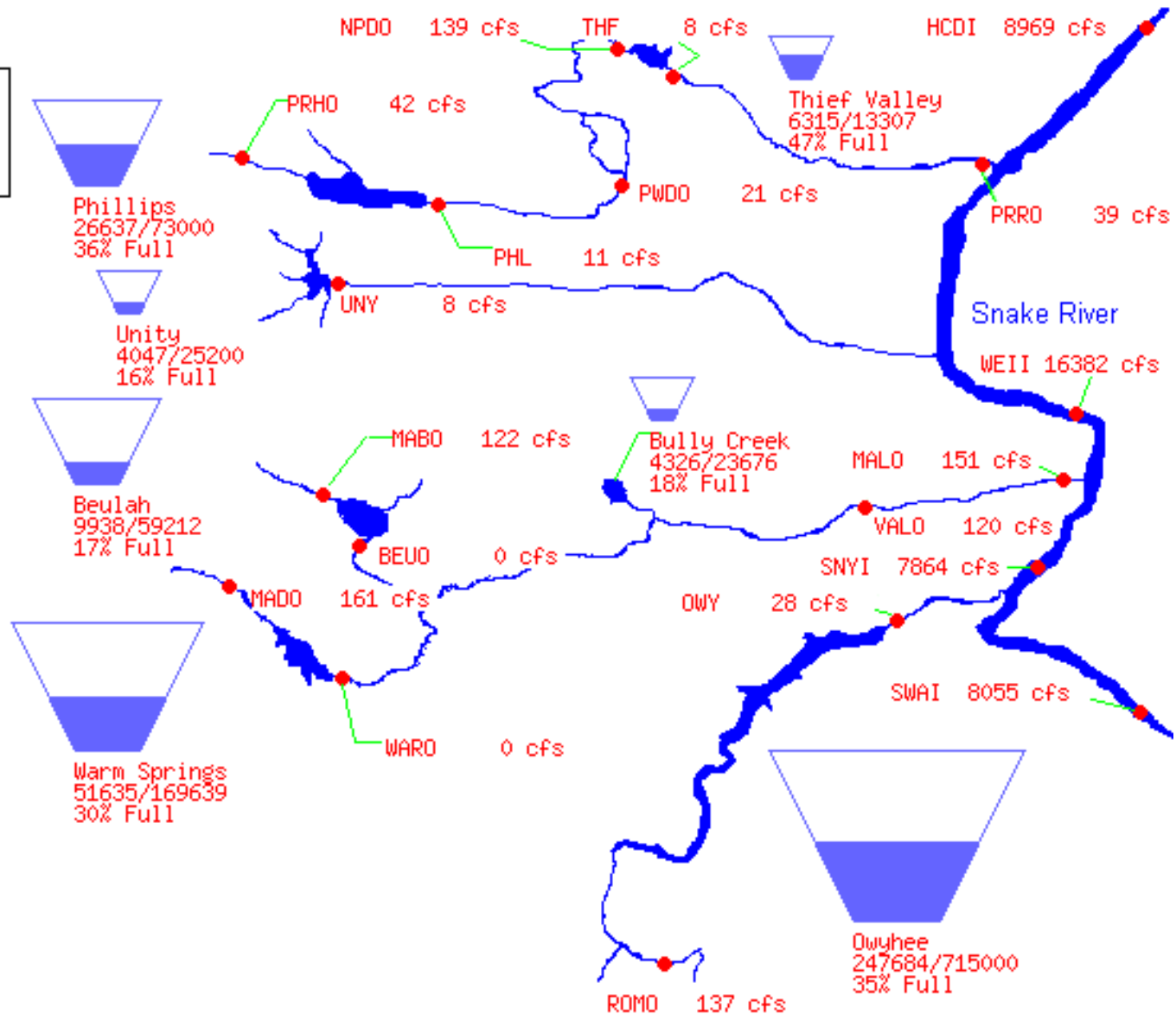
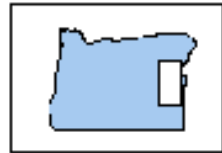
Payette is 63% of capacity.  
(Cascade, Deadwood)  
Last year 67%

Boise System is 44% of capacity.  
(Anderson Ranch, Arrowrock, Lucky Peak)  
Last year 61%



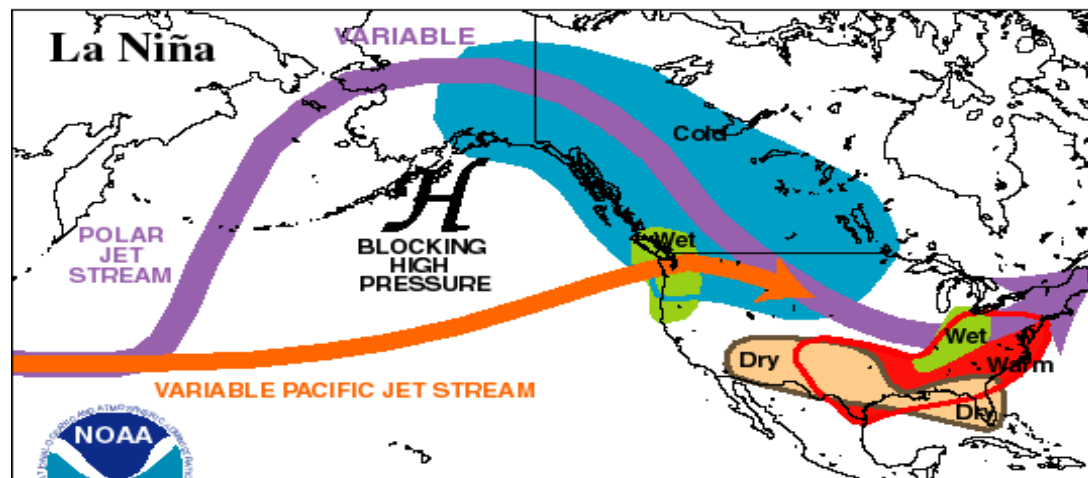
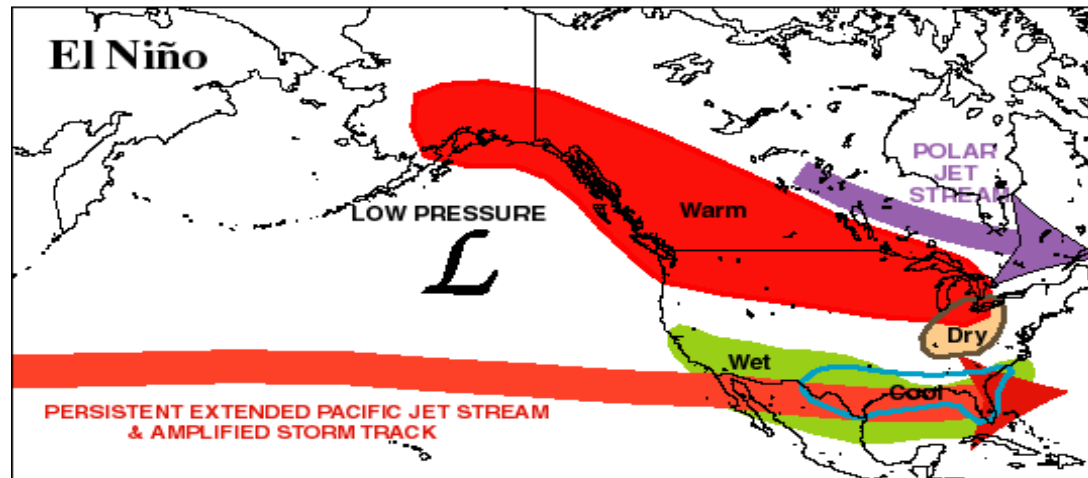
# SE Oregon Reservoir System

12/04/2012



# Climate Outlook

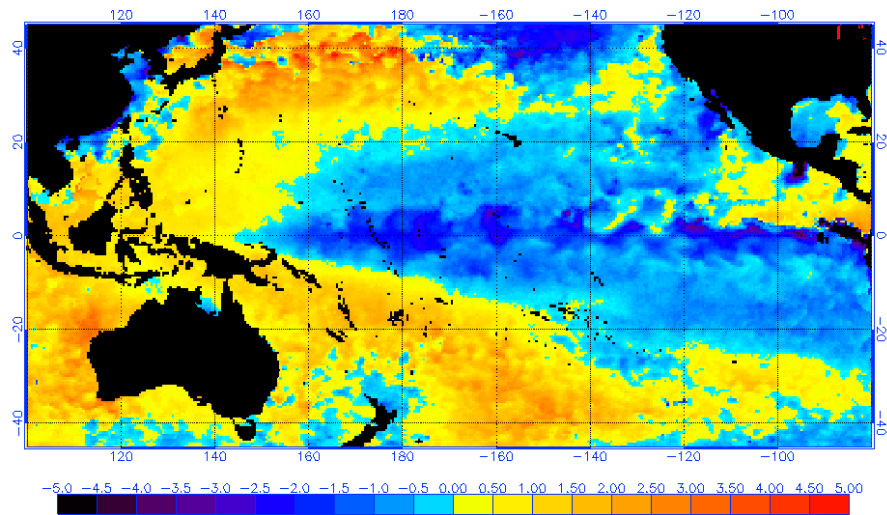
**TYPICAL JANUARY-MARCH WEATHER ANOMALIES  
AND ATMOSPHERIC CIRCULATION  
DURING MODERATE TO STRONG  
EL NIÑO & LA NIÑA**





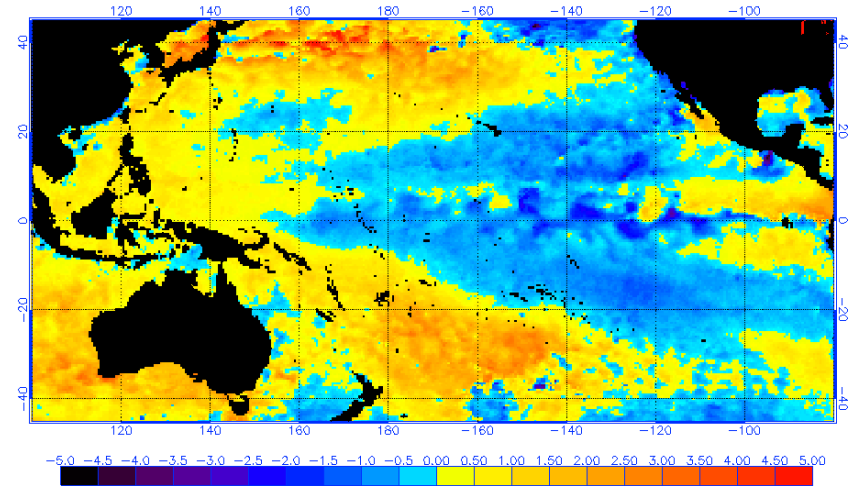
## Nov 2010 – Strong La Nina

NOAA/NESDIS SST Anomaly (degrees C), 11/8/2010



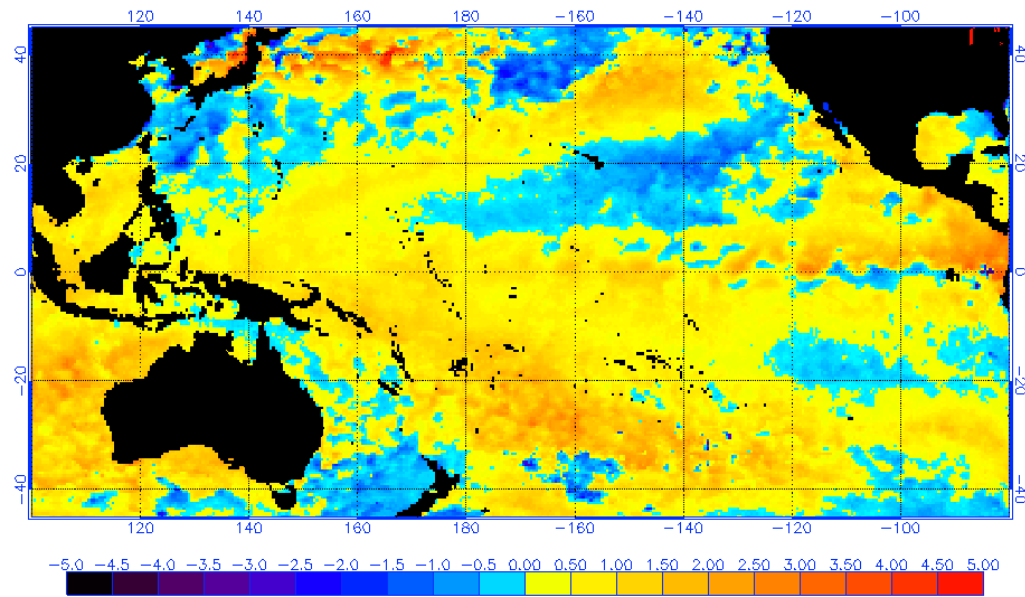
## Nov 2011 – Weak La Nina

NOAA/NESDIS SST Anomaly (degrees C), 11/7/2011



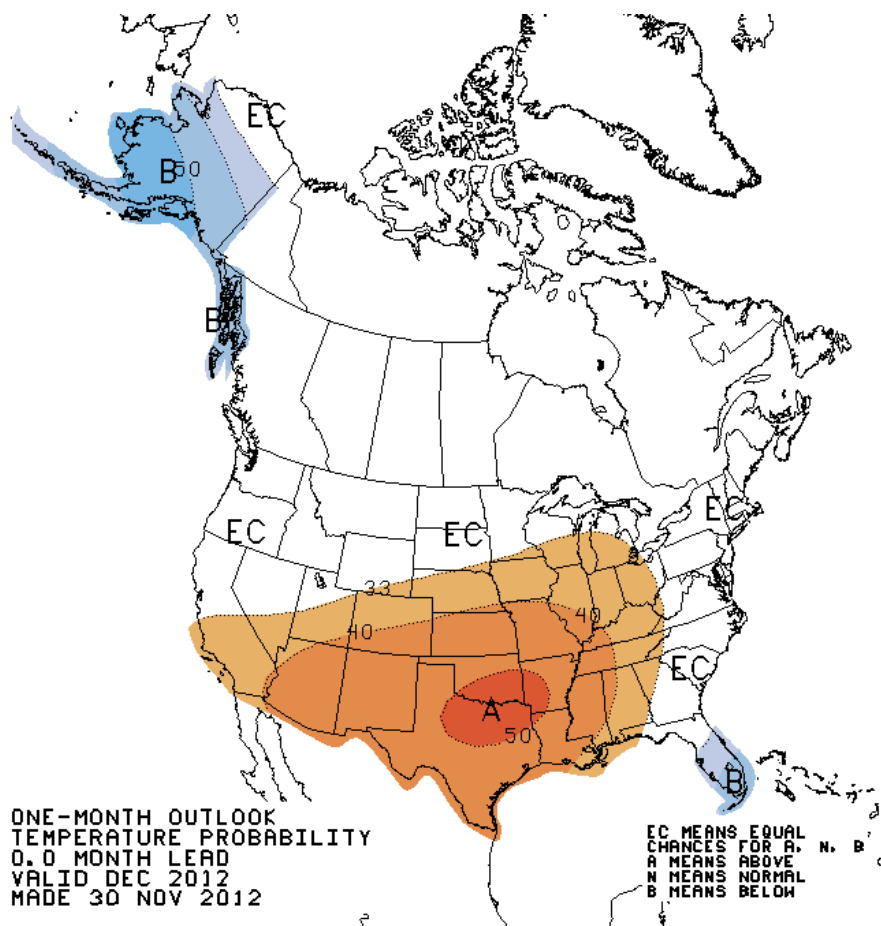
## November 2012 - Neutral

NOAA/NESDIS SST Anomaly (degrees C), 11/5/2012

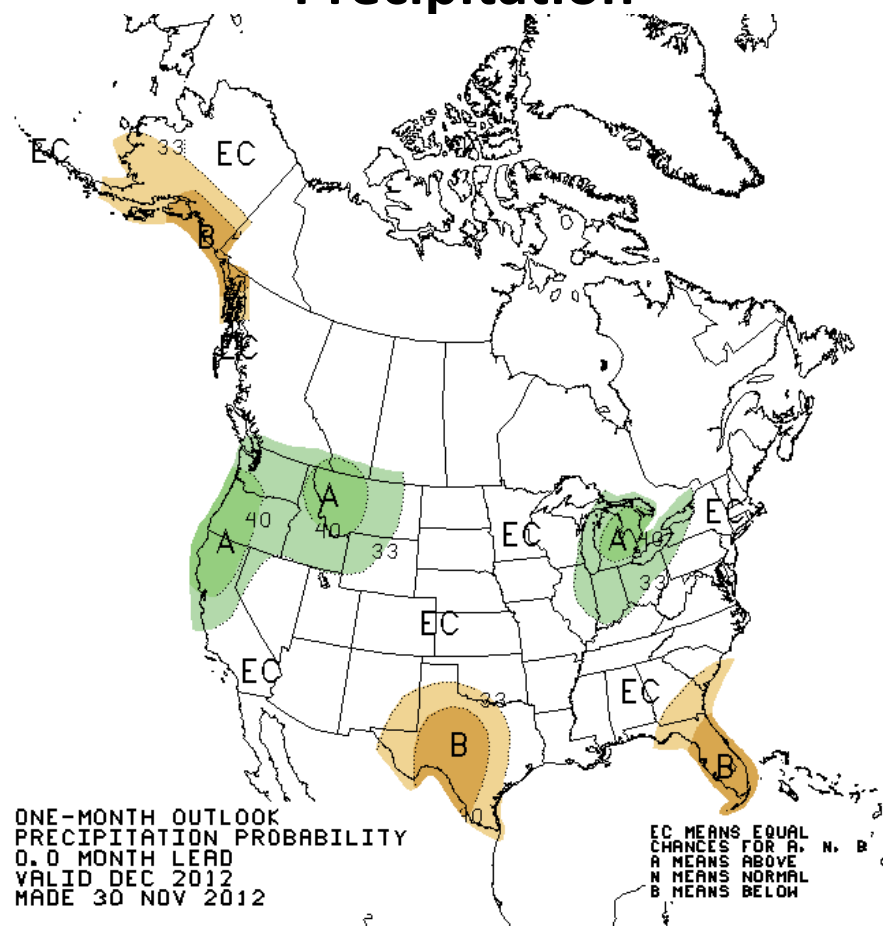


# December 1 Month Outlook

## Temperature



## Precipitation

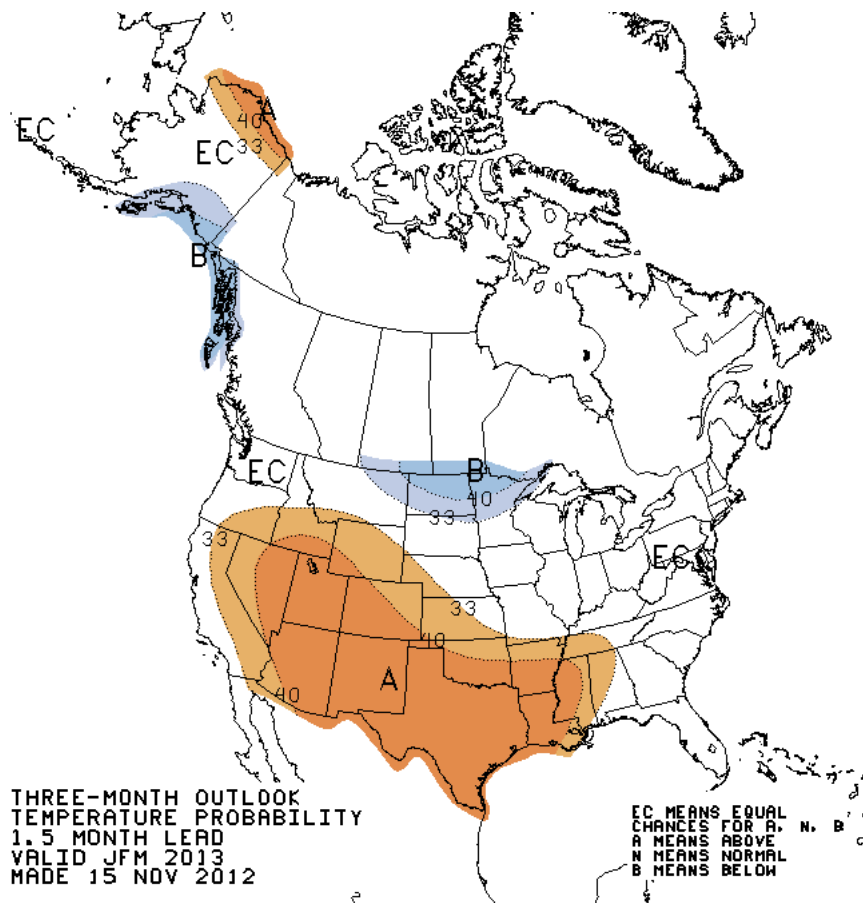




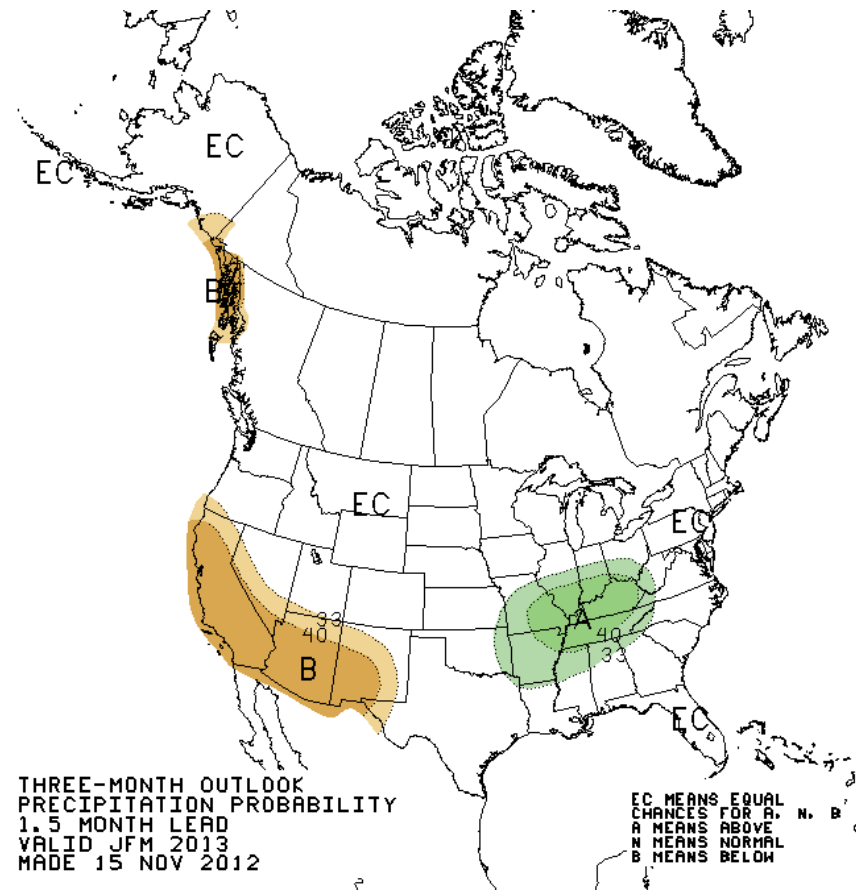
# Seasonal Outlook

## January – March 2013

### Temperature



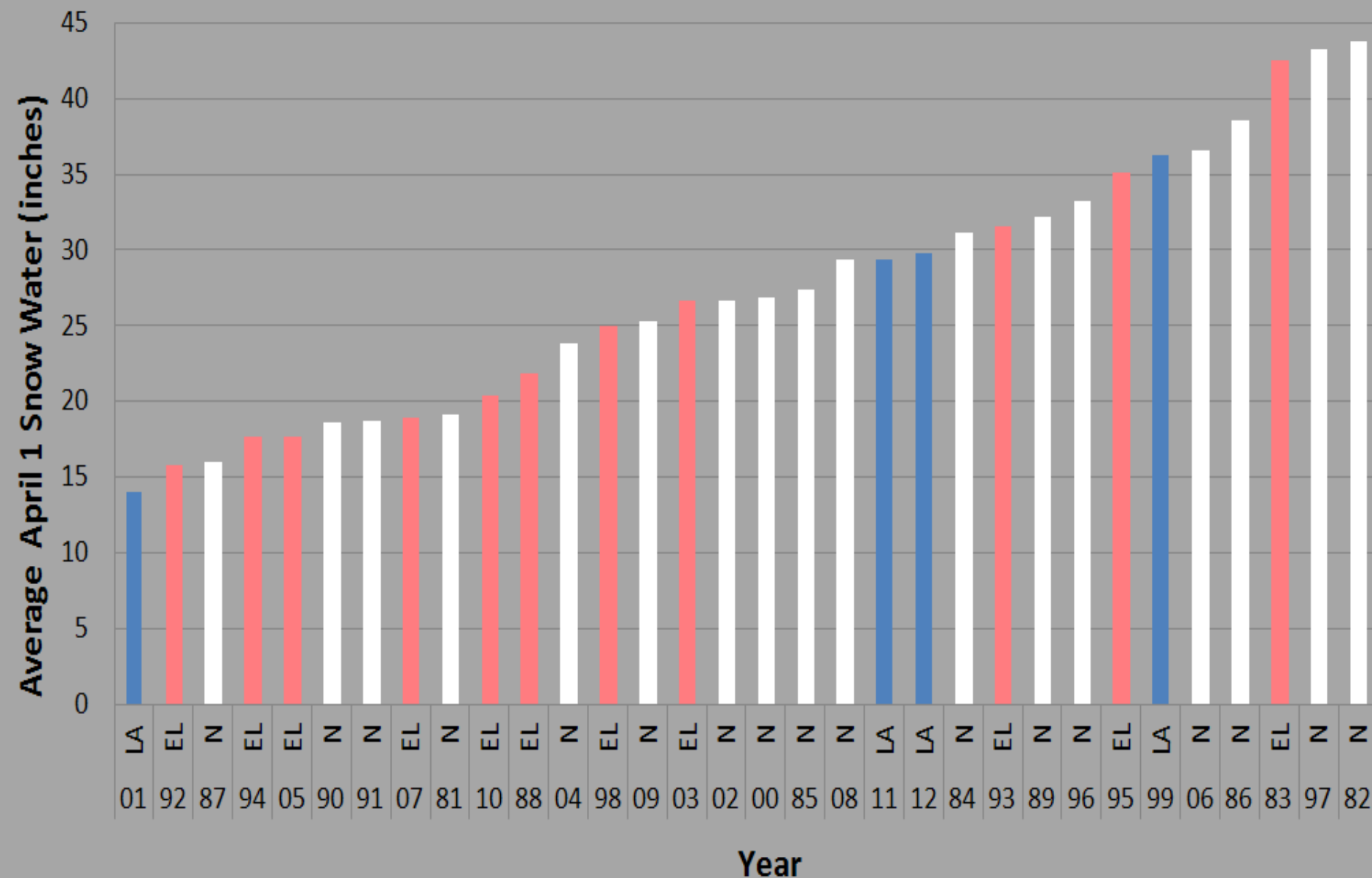
### Precipitation



# Boise Basin April 1 Snow Water and ENSO Classification

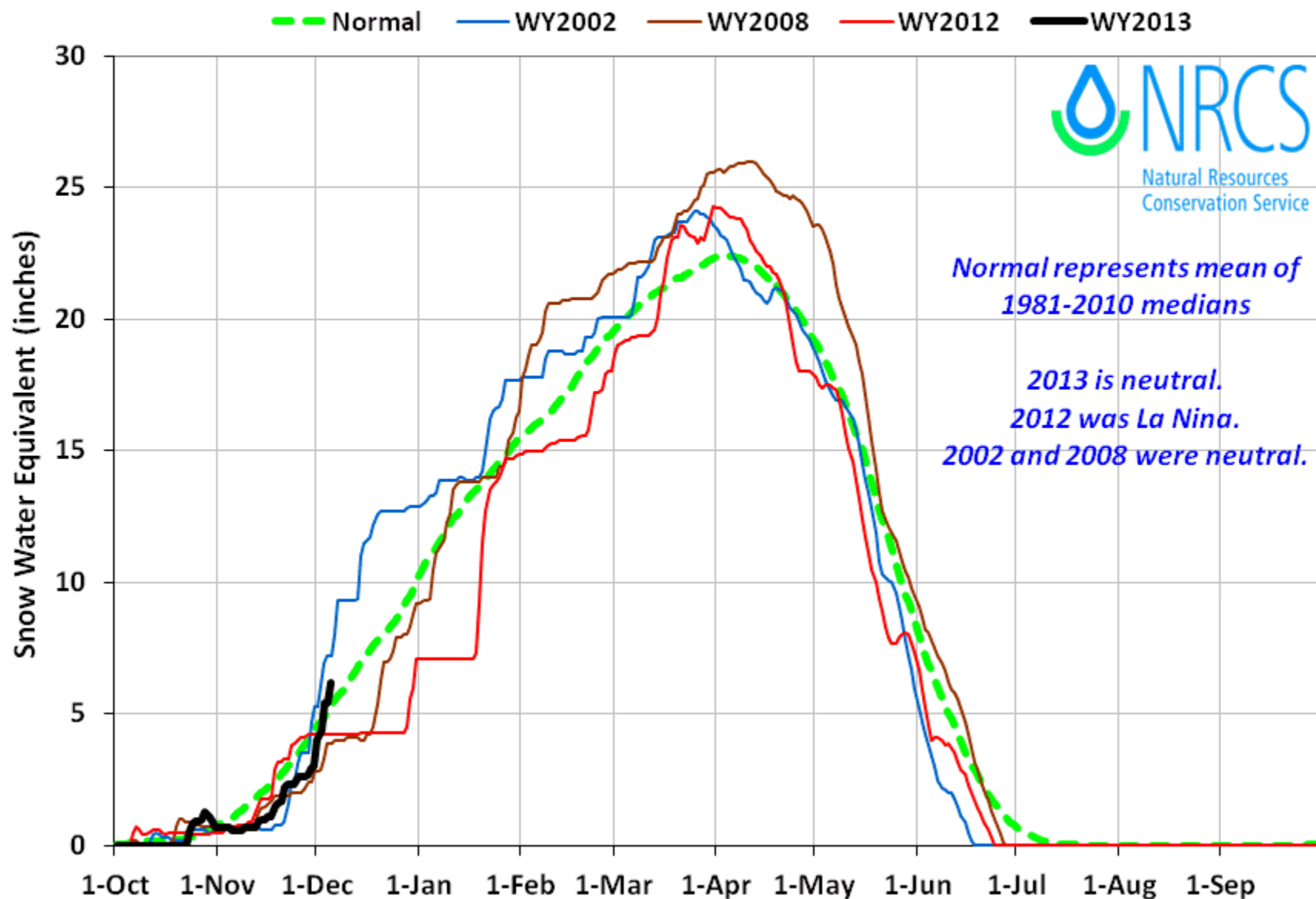
(Average of 7 SNOTEL Sites)

La Nino ■  
Neutral ■  
El Nino ■



## Boise Basin 2013 Snowpack Comparison Graph (10 sites)

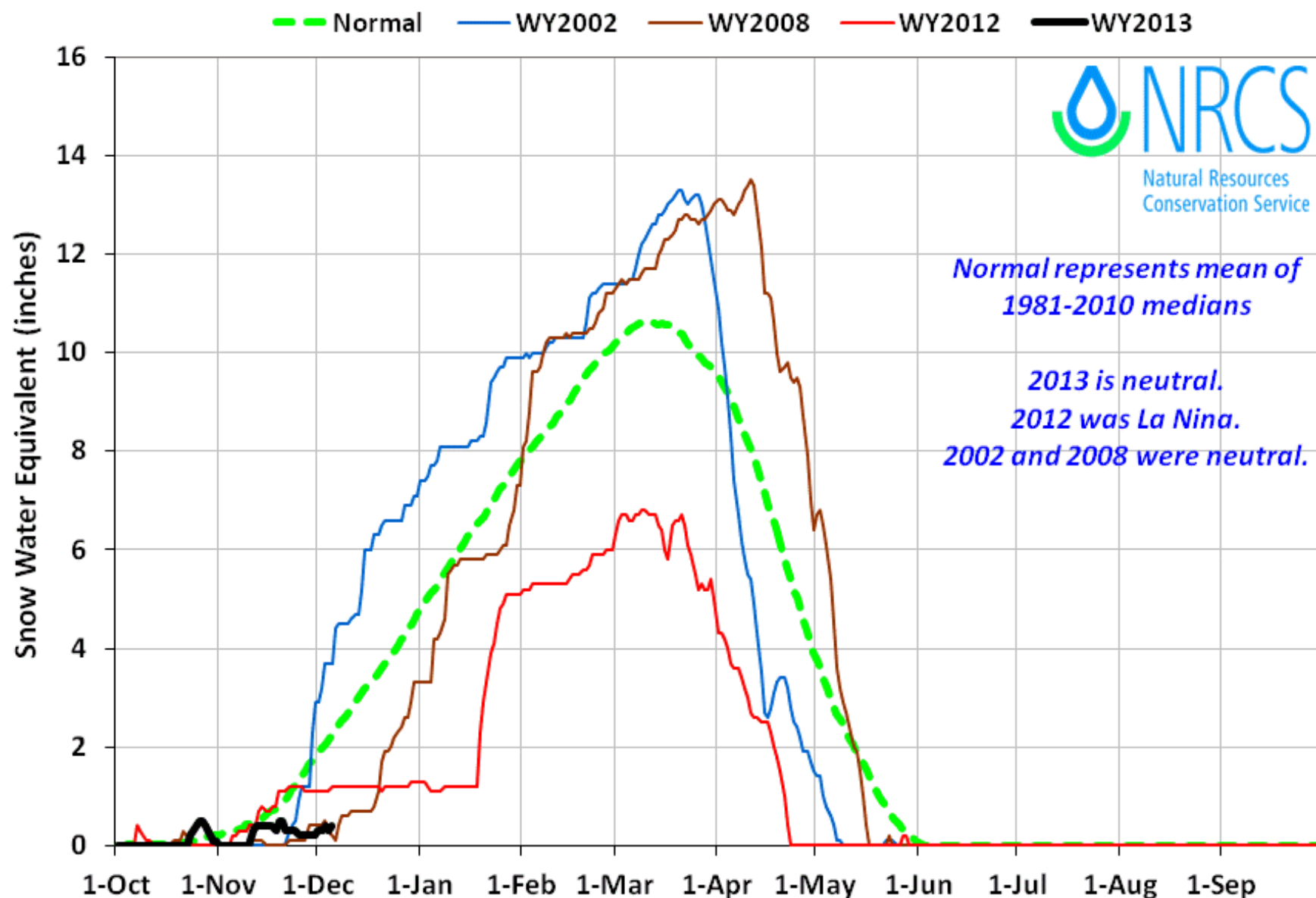
*Based on Provisional SNOTEL data as of Dec 05, 2012*





## Owyhee Basin 2013 Snowpack Comparison Graph (7 sites)

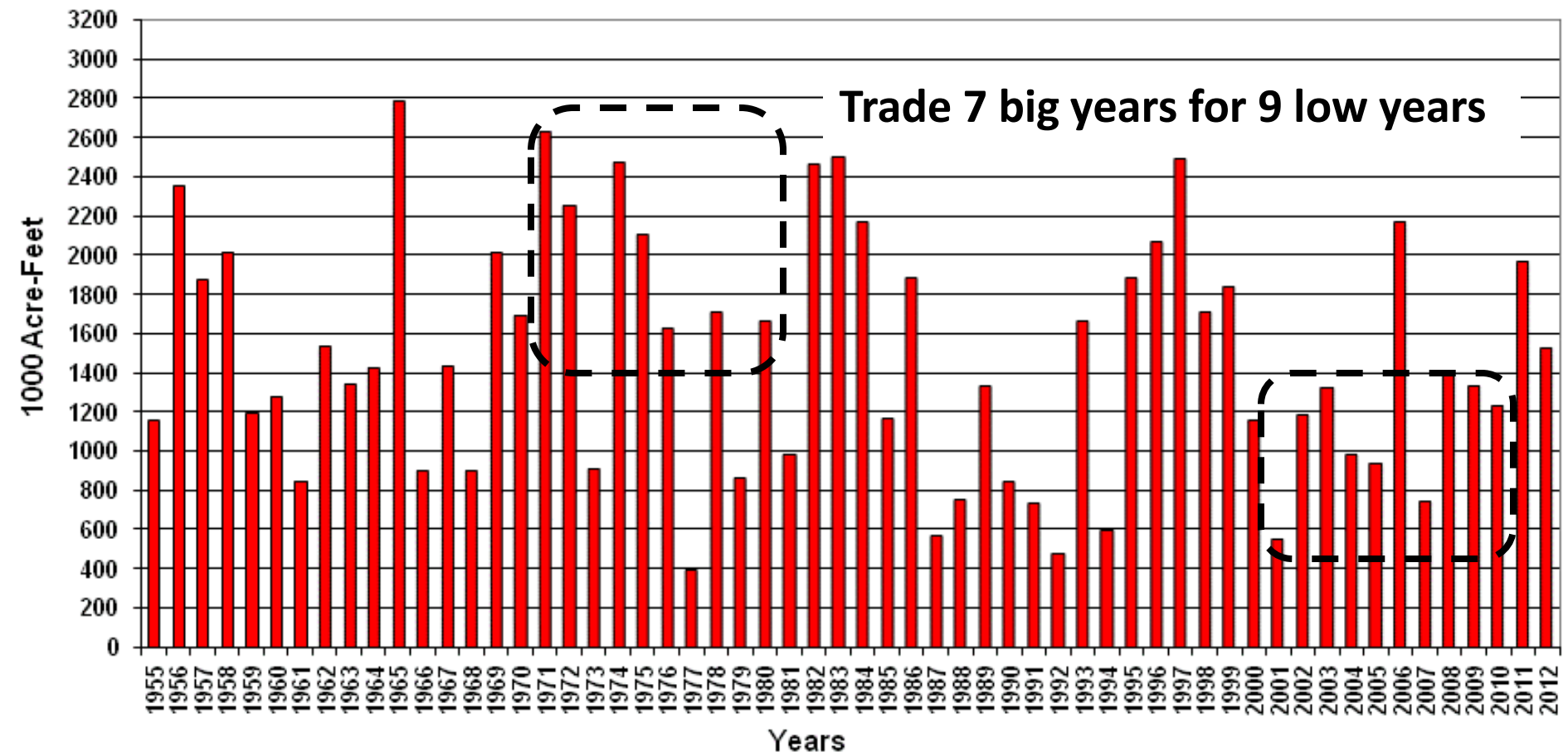
*Based on Provisional SNOTEL data as of Dec 05, 2012*



# New Normals this Year

- Every decade the 30 year normals change periods.
- This year we go from the 1971-2000 period to the 1981-2010 period
- The change is to meant to keep pace with climate variability
- Why don't we update the every year instead?
- Most data types will be calculated as a straight average except Snow Water Equivalent which will be the “median” or “middle value”

# Boise River near Boise Streamflow April - Sept



1971-2000 average = 1,526 KAF

1981-2010 average = 1,363 KAF

Compare 2012 runoff of 1,520 KAF

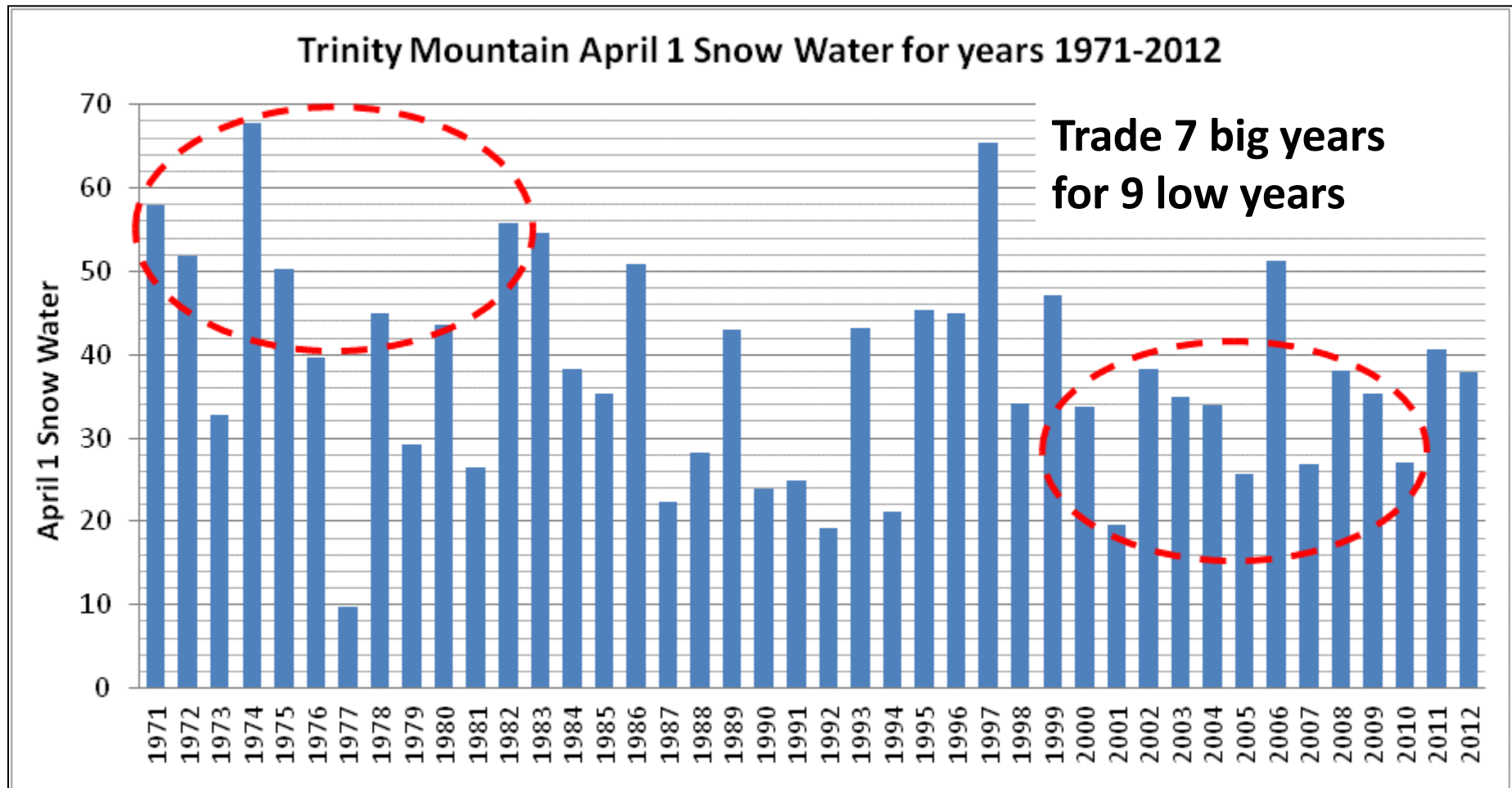
100% of 1971-2000 average

112% of 1981-2010 average

**+12%**



# Old 1971-2000 vs New 1981-2010 Normals



1971-2000 average = 39.5"

1981-2010 median = 35.3"

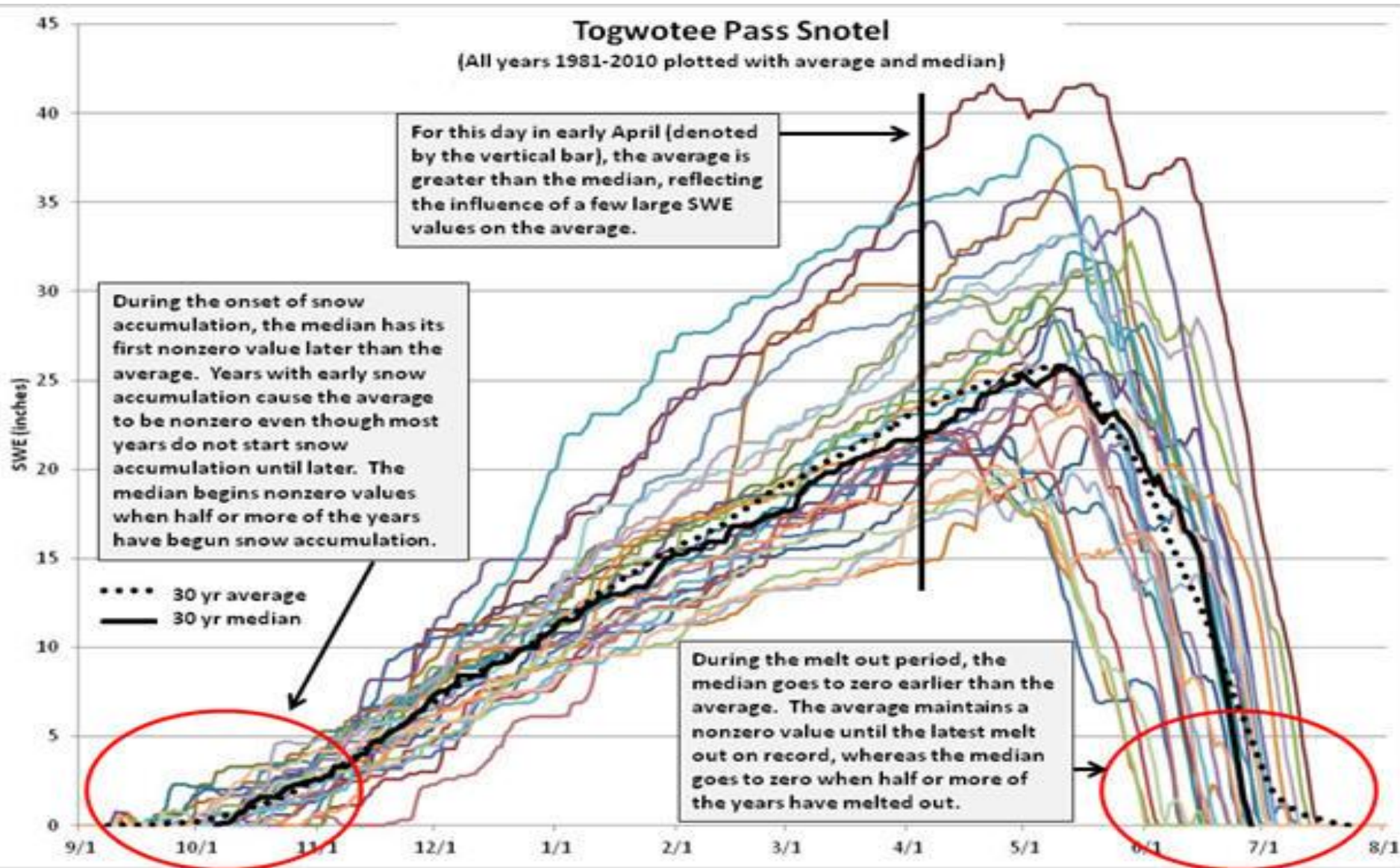
Compare 2012 snowpack of 37.9"

95% of 1971-2000 average

107% of 1981-2010 average

+12%

# Why will SWE use a median?



# Meeting the Boise's Demand in 2013

To estimate amount needed for next year:		KAF
Current Year Sep 30 end of month storage		476
Projected Storage Change Sep 30 to Mar 31	+199	(based on last 3 years)
Projected Mar 31 storage		675
Adequate Irrigation Needs		1500
Minus projected storage	- 675	
Apr-Sep Streamflow to meet irrigation demand		825

This equates to...

54% of the average 1971-2000 Apr-Sep streamflow

61% of the average 1981-2010 Apr-Sep streamflow

Mel Kunkel from BSU forecasts 1,867 KAF based on multiple climate indices or...

88% of 1971-2000 average

98% of 1981-2010 average



# Meeting the Owyhee's Demand in 2013

To estimate amount needed for next year:		KAF
Current Year Sep 30 end of month storage		230
<u>Storage Change Sep 30 to Feb 28</u>	+ 142	(based on last year )
Projected Mar 31 storage		372
 Adequate Irrigation Needs		450
<u>Minus projected storage</u>	- 372	
Apr-Sep Streamflow to meet irrigation demand		78

This equates to...

18% of the average 1971-2000 Apr-Sep streamflow 427 KAF

19% of the average 1981-2010 Apr-Sep streamflow 405KAF

55% of 2012 Apr-Sep streamflow of 139.5

REPORT  
CARD

ENGLISH....	D	/	C
MATH.....	C-	/	B-
HISTORY....	D+	/	C+
SPANISH....	F	/	D
SOCIALST...	C	/	B
PHYS.ED....	B	/	A

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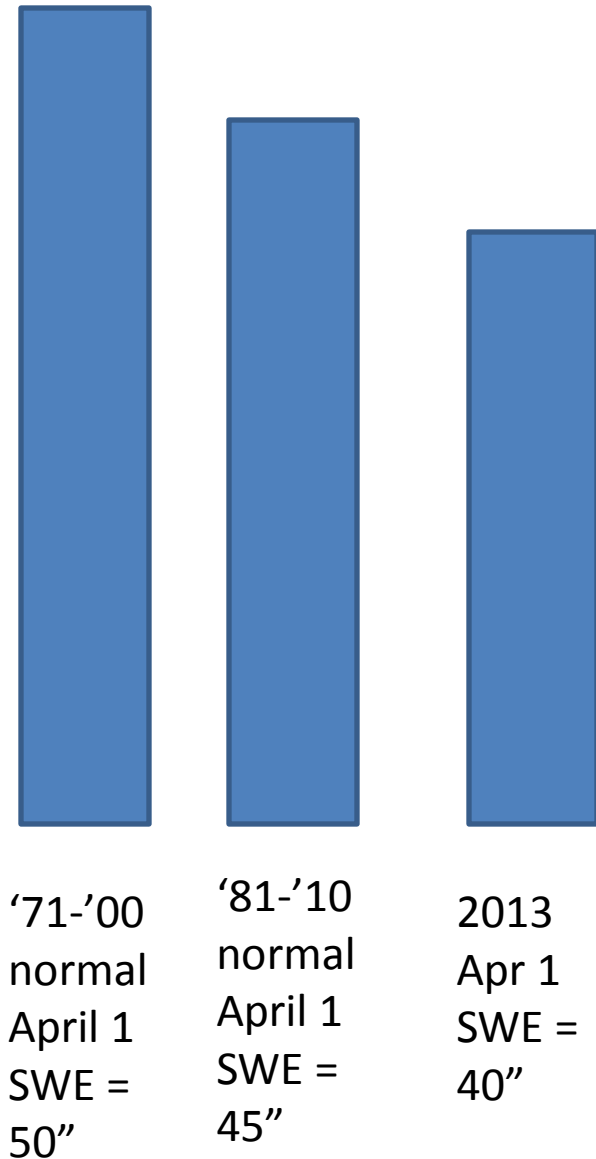
*Mr. C. C. C.*

## What does this mean?

I see the new normals as the hydrologic equivalent of “No child left behind”

Thanks to the new, lower averages...

For the same work a winter can now earn a grade of “B” when in the past it would have been a “C”



% of normal =  $\text{SWE} / \text{normal}$

$40'' / 50'' = 80\%$  ('71-00)

$40'' / 45'' = 88\%$  ('81-10)

This year we all need to re-calibrate our idea of what a good snowpack is.

In the past you might have been happy with a 80% of normal snowpack, but now you'll want need a 90% of average snow to obtain the same runoff



# Summary

- Expect earlier runoff where large fires occurred.
- This year's snowpack is above average, even record setting, at high elevations (>6500 ft). Not true in Owyhee and Malheur basins.
- Neutral ENSO conditions add uncertainty to winter precipitation forecast.
- The new averages are lower, causing % of normal to be higher. Adjust your expectations upward.
- Water supply in Boise and Owyhee basins should be adequate in 2013 even if the snowpack is mediocre.