Colorado Basin Outlook

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NWS Colorado Basin River Forecast Center

NOAA/NWS Arizona La Nina Briefing
December 6, 2013

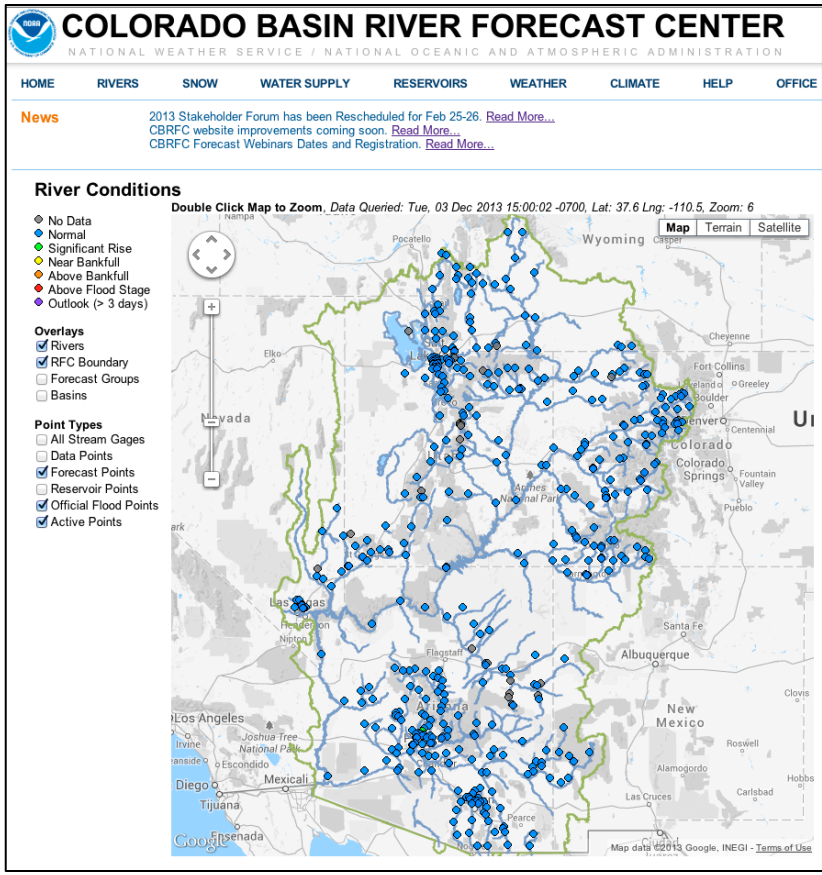
Outline

- River Forecast Center overview
- Arizona's water supply
- 2013 runoff review
  - Colorado River
  - Salt/Verde Rivers
- 2014 Look Ahead
  - Antecedent conditions
  - Climate and Weather impacts on Streamflow

Colorado Basin River Forecast Center

The Colorado Basin River Forecast Center (CBRFC) generates streamflow forecasts across the Colorado and Utah. The latest forecasts, data, and more are available online:

- **Daily streamflow forecasts**
- **Long lead peak flow forecasts**
- **Water supply forecasts**
- **Webinar briefings**
- **Email updates**
- **And More….**

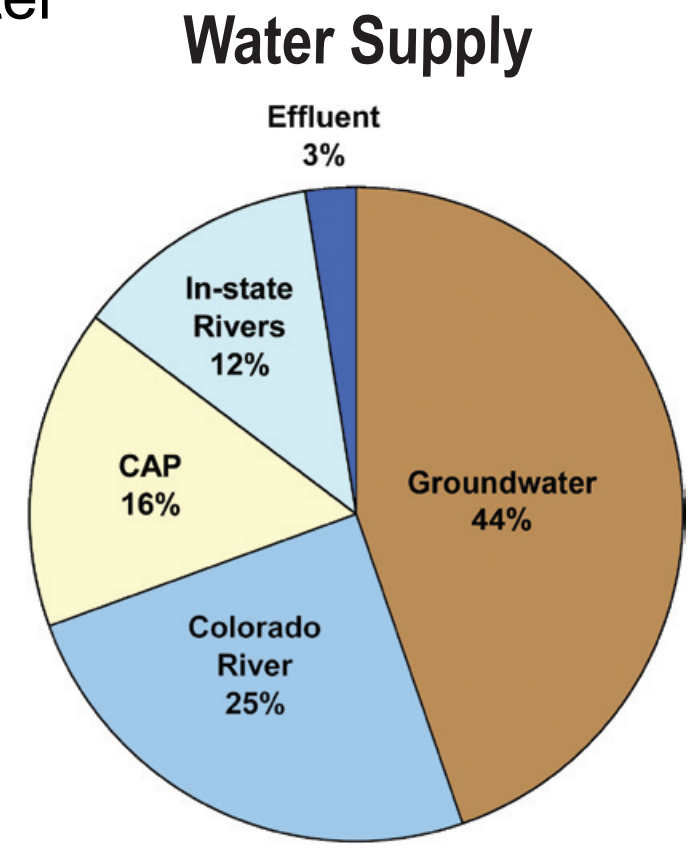


www.cbrfc.noaa.gov

Arizona Water Supply

Arizona's surface water surface water supply:

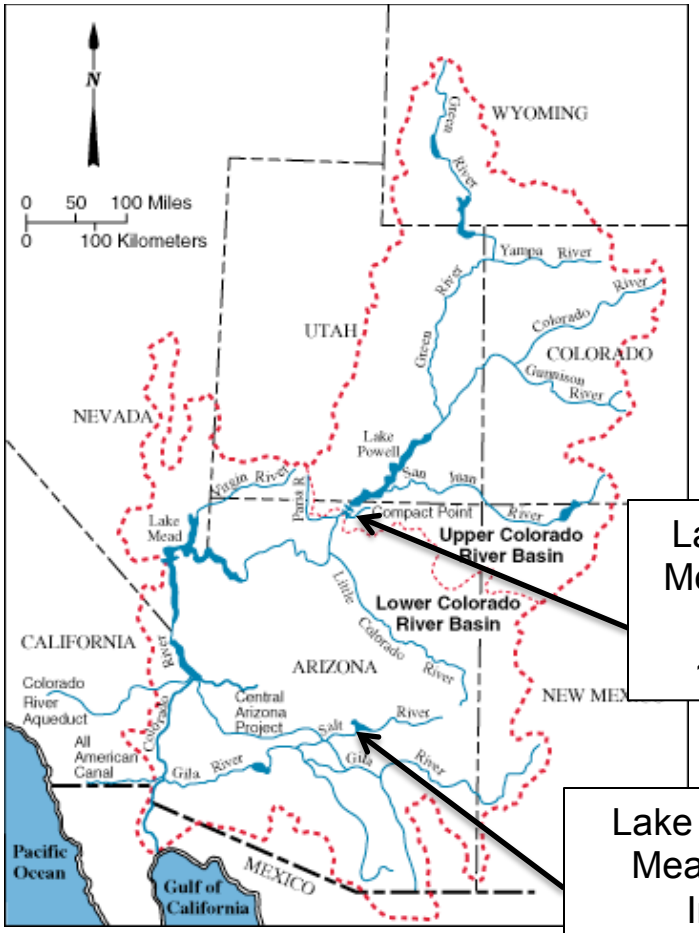
- 2.8 MAF/year from Colorado R
- ~0.8 MAF/year from Salt Verde
- ~0.25 MAF/year from other rivers



Colorado River Basin

Key Characteristics:

- Mostly semi-arid with average annual precipitation ranging from 3” to 75”
- Runoff dominated by snowmelt from mountains: 85% of runoff comes from elevations above 9000 feet
- Reservoir storage capacity (~60 MAF) is ~4 times mean annual flow (~15 MAF)
- Average annual water demand approximately equal to supply



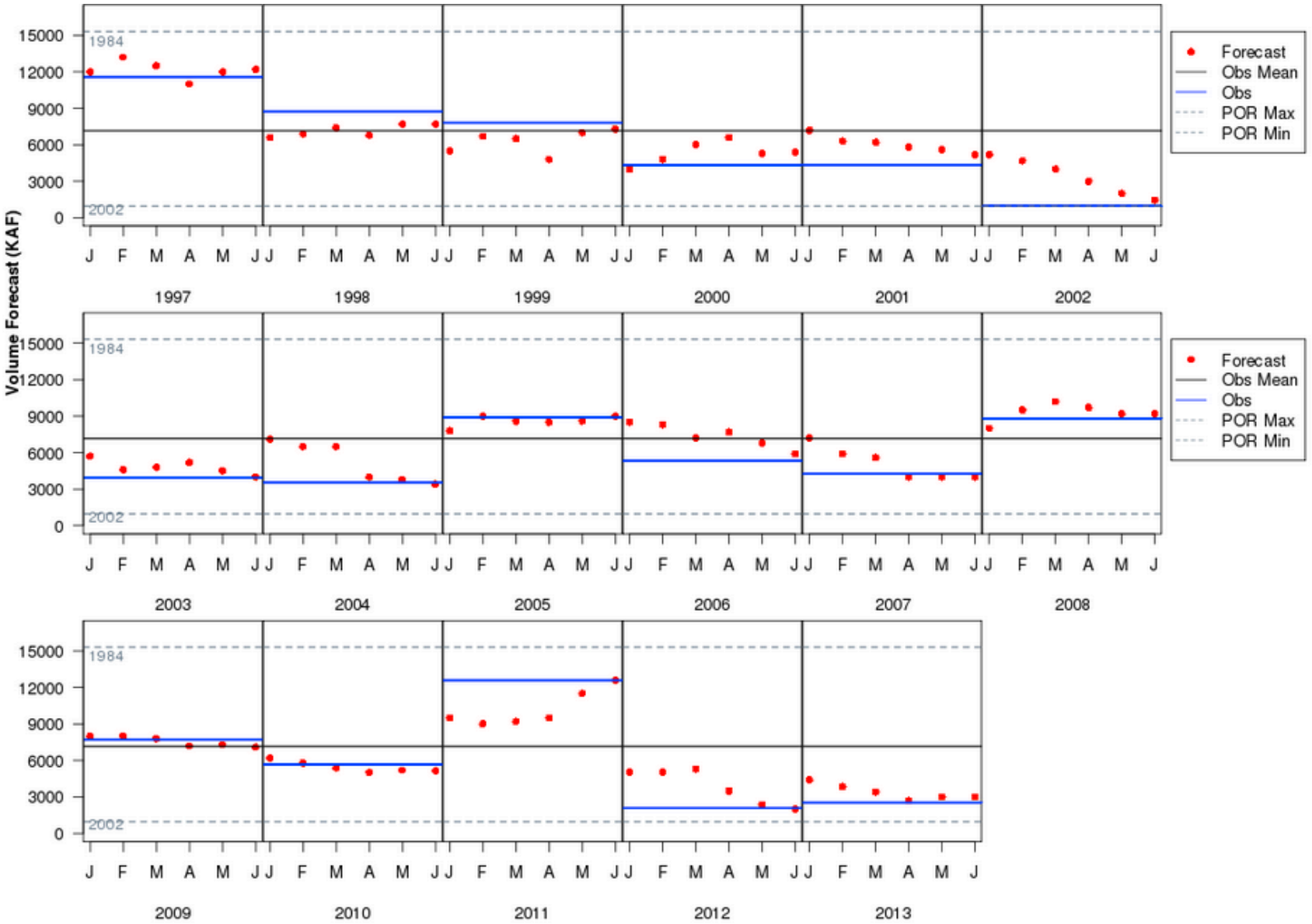
Lake Powell Mean Annual Inflow: ~12 MAF

Lake Roosevelt Mean Annual Inflow: ~0.7 MAF

Recent History

- **Upper Colorado** - 2012 and 2013 were the two driest consecutive years on record and two of the four driest individual years on record for Lake Powell inflow
- **Salt/Verde –** Roosevelt inflow was 2011 (9th driest), 2012 (21st driest), and 2013 (34th driest) were all much below historical average and median
- Summer 2013 was very wet – providing good antecedent conditions for winter season

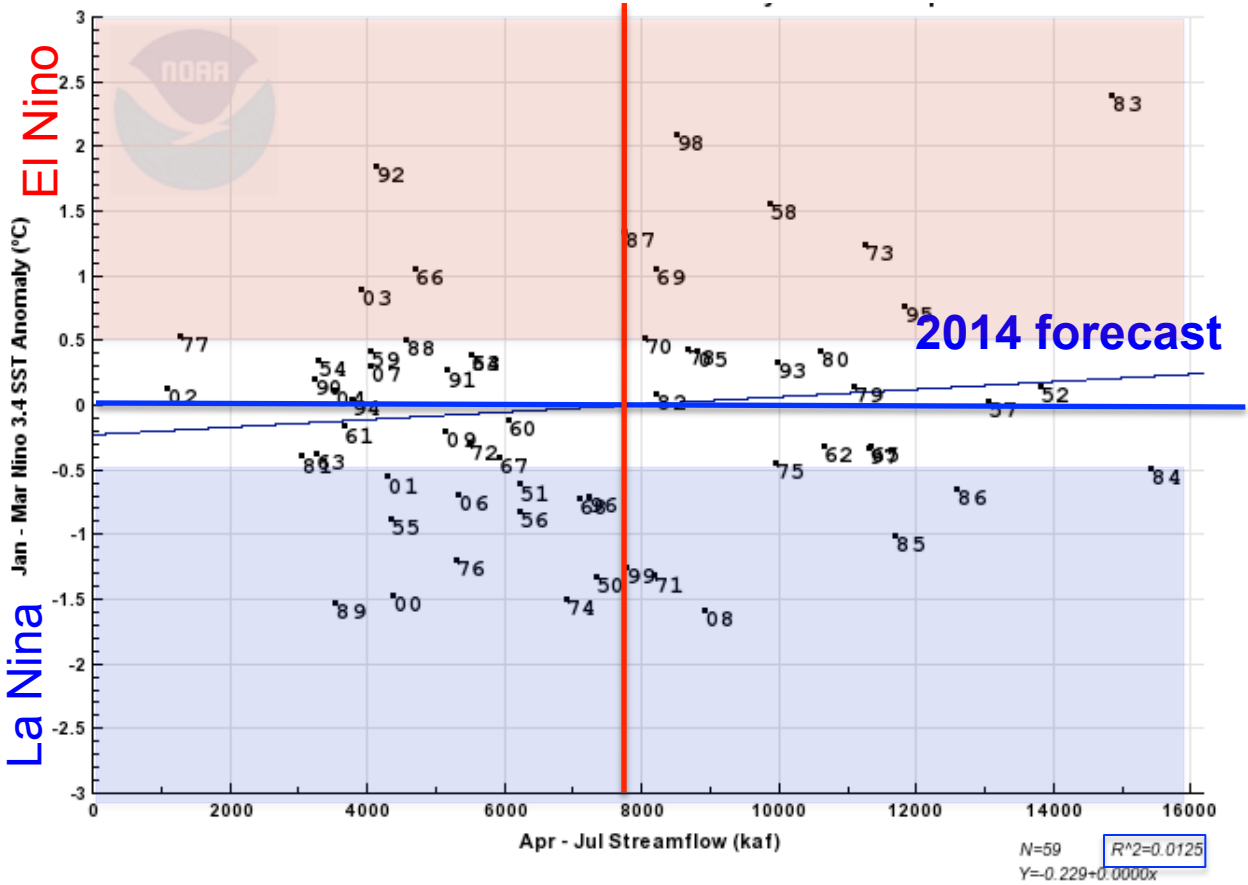
Lake Powell Inflow



La Nina and CO River Streamflow

- Very low correlations in most of upper basin (right: Lake Powell)
- La Nina correlated with low streamflow in lower basin at around 0.2 – 0.3
- Weaker correlations for San Juan Basin with low streamflow and Upper Green with high streamflow

Lake Powell Inflow vs El Nino / La Nina

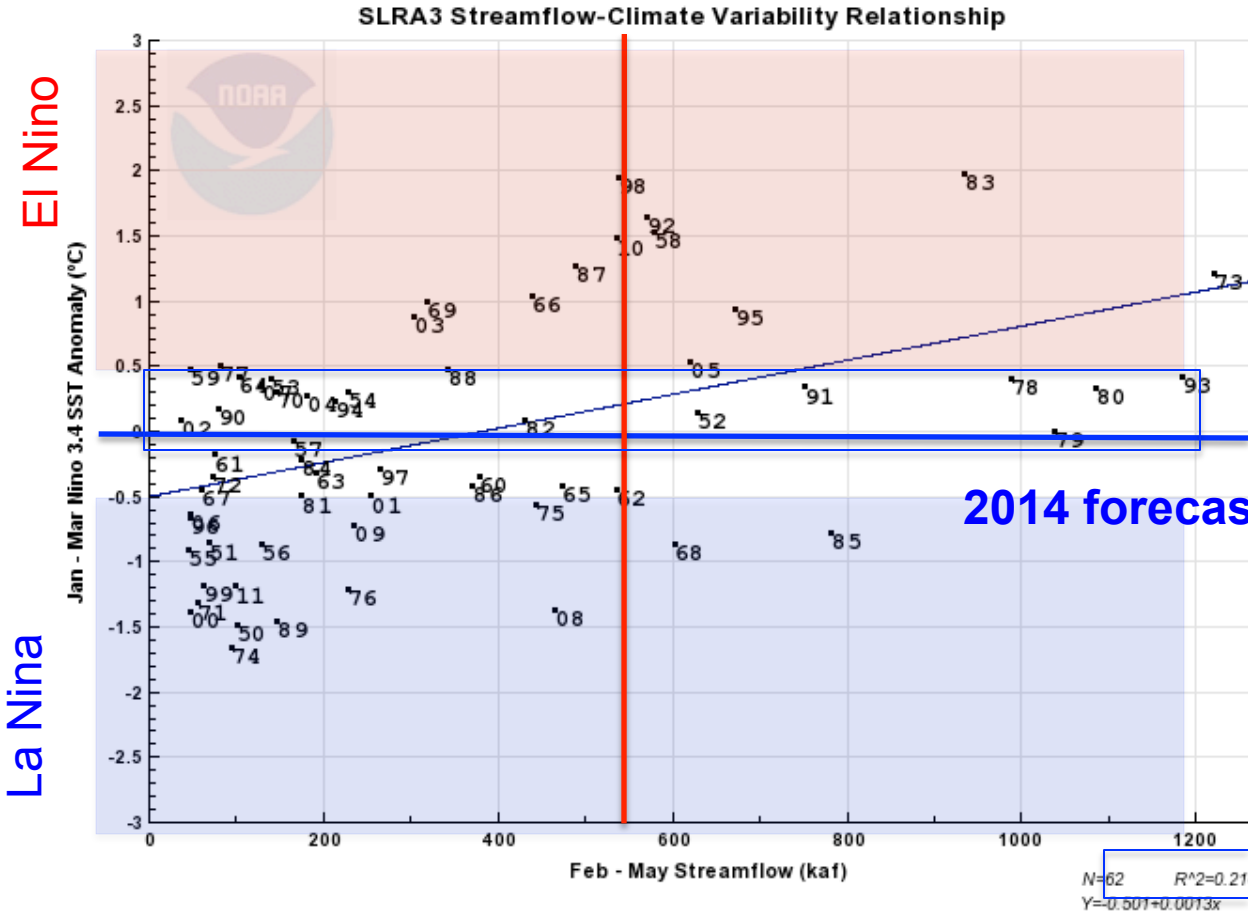


Average = 7.9 maf

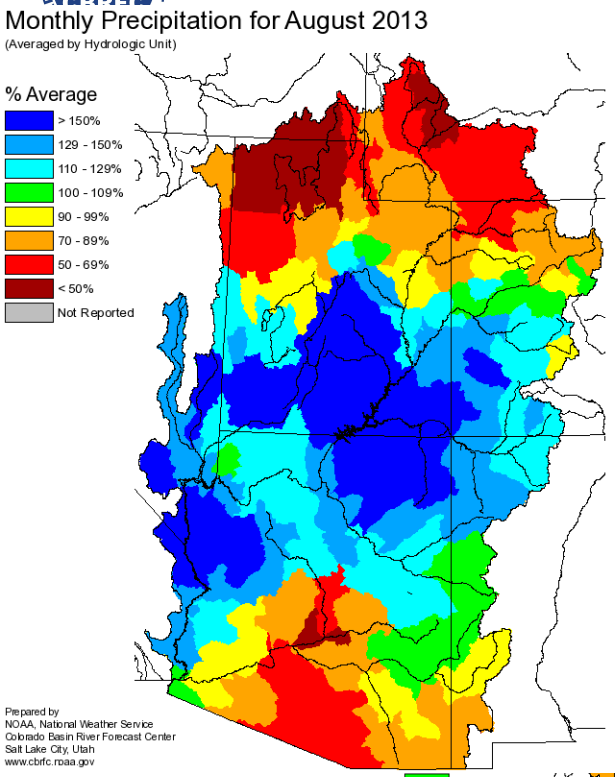
El Nino/La Nina and Arizona Rivers

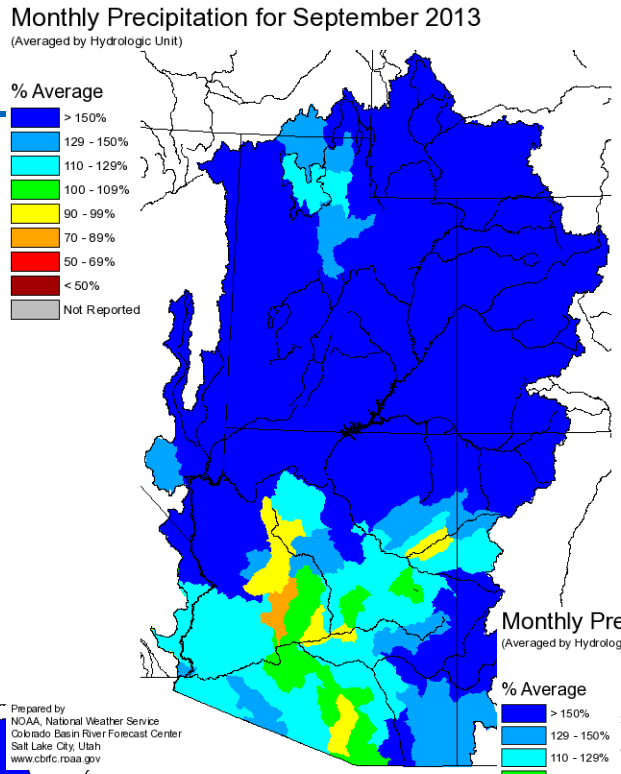
- Salt River shown
- Significant correlations (0.15-0.3) for low streamflow during La Nina years
- Relationship especially strong with strong La Nina years (like 2011)

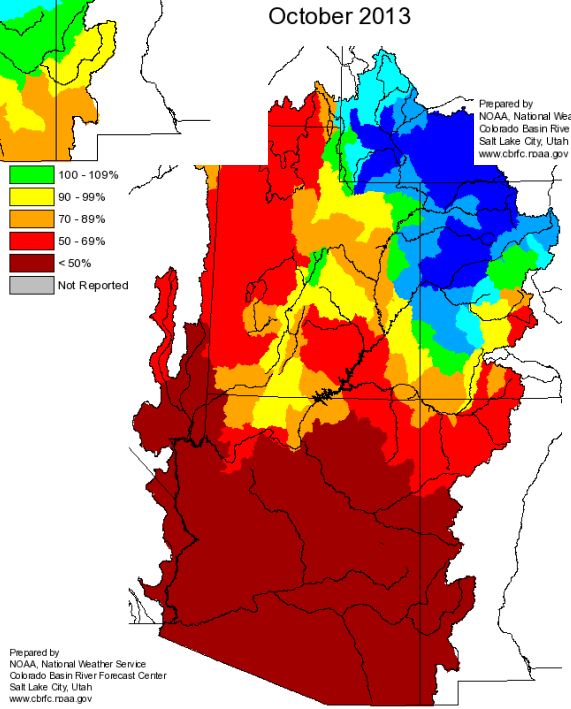
Lake Roosevelt Inflow vs El Nino / La Nina

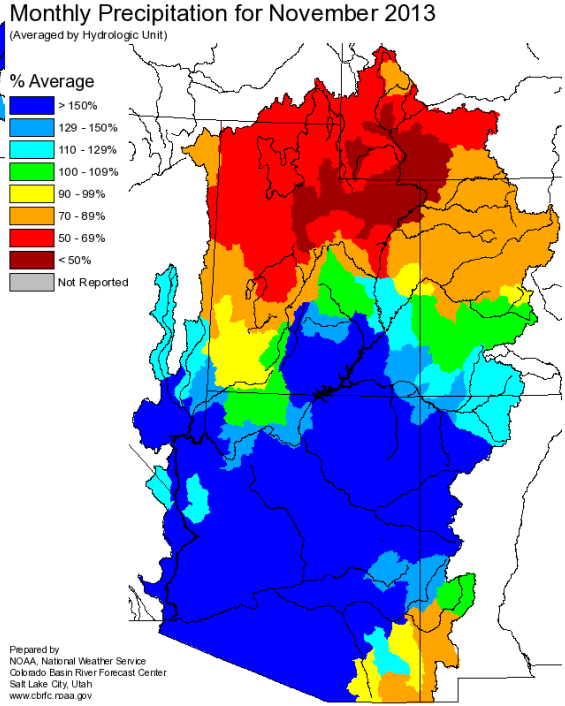


Summer/Fall Precipitation

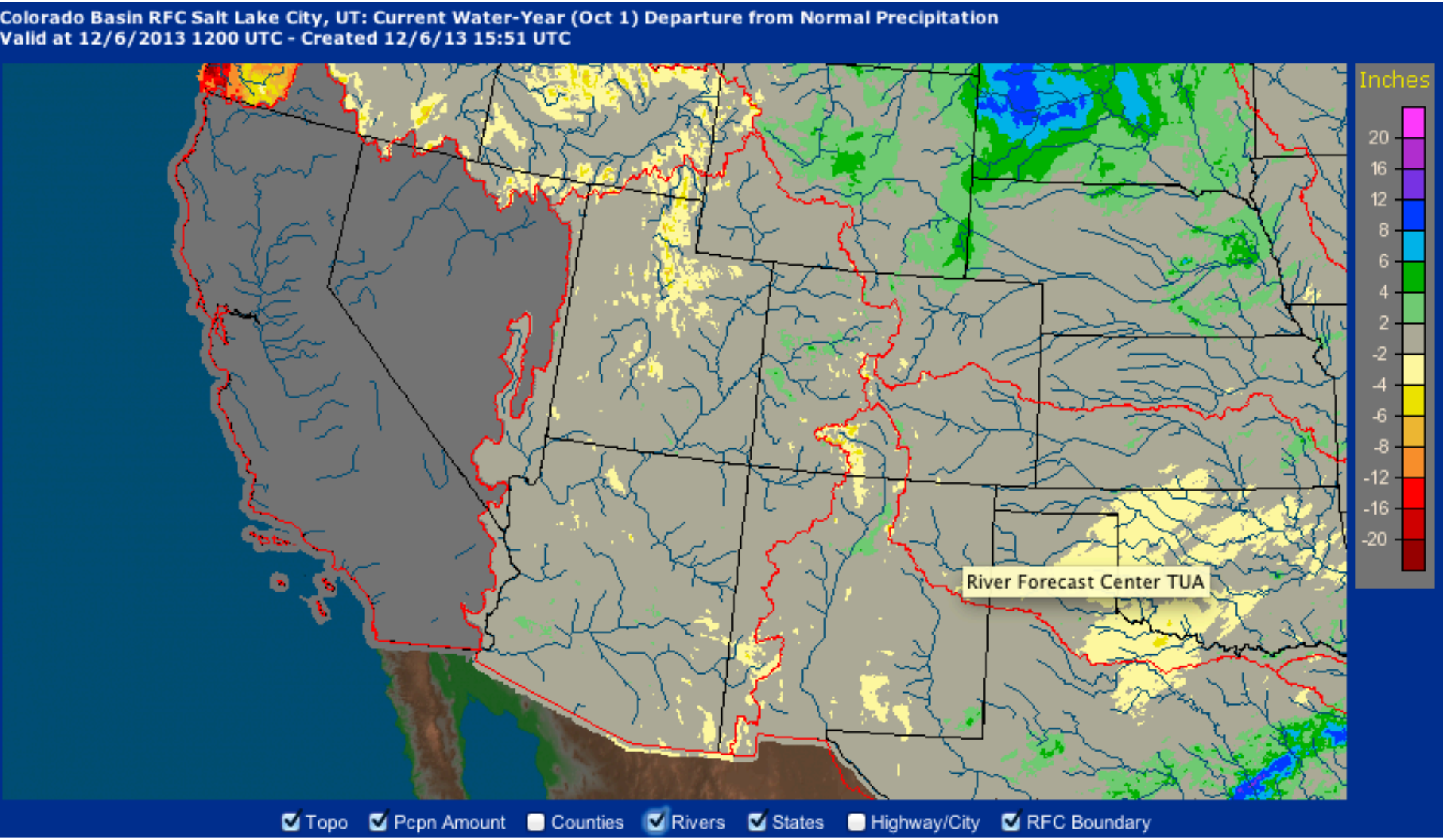




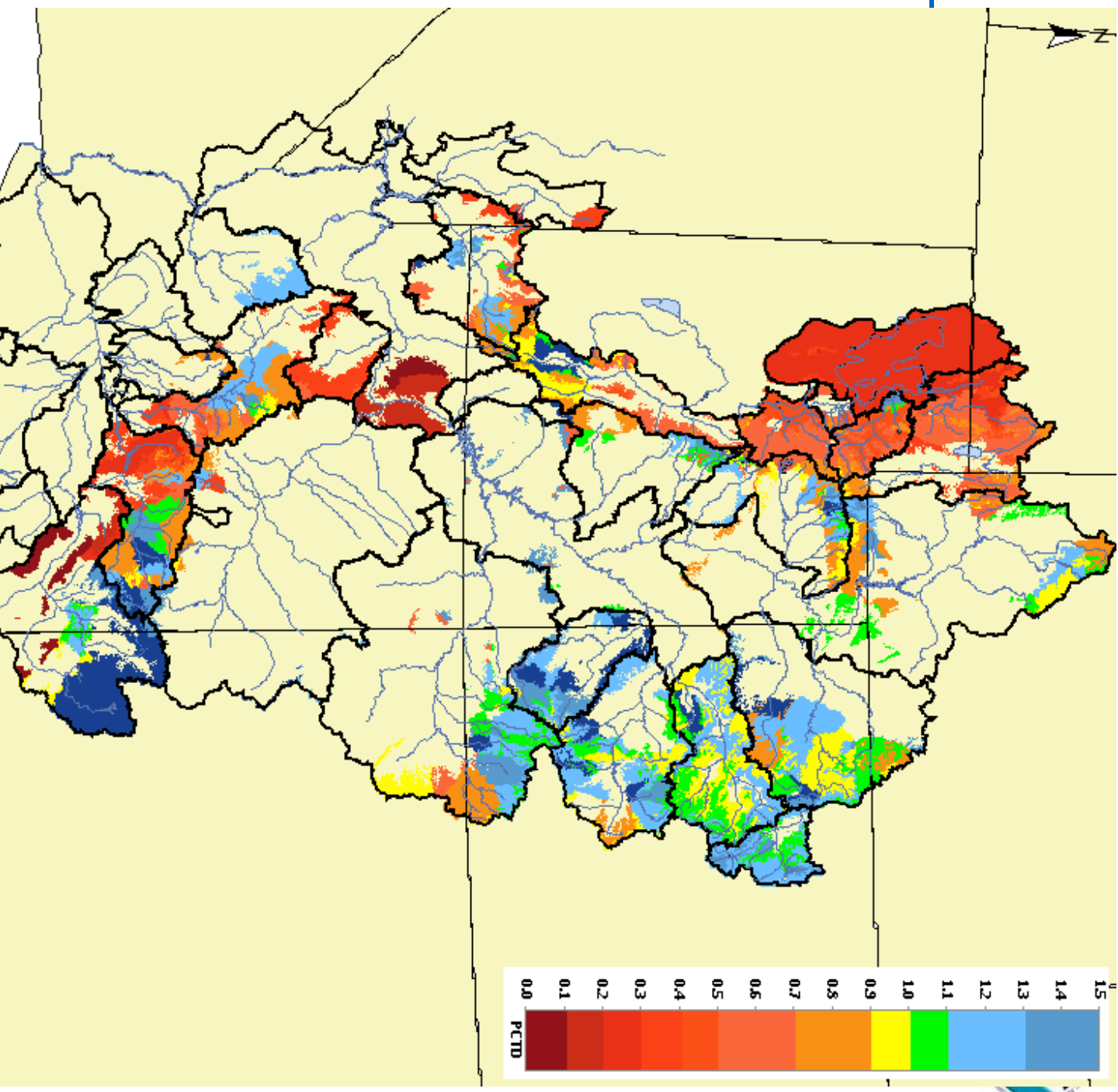




Water Year Departure from Normal

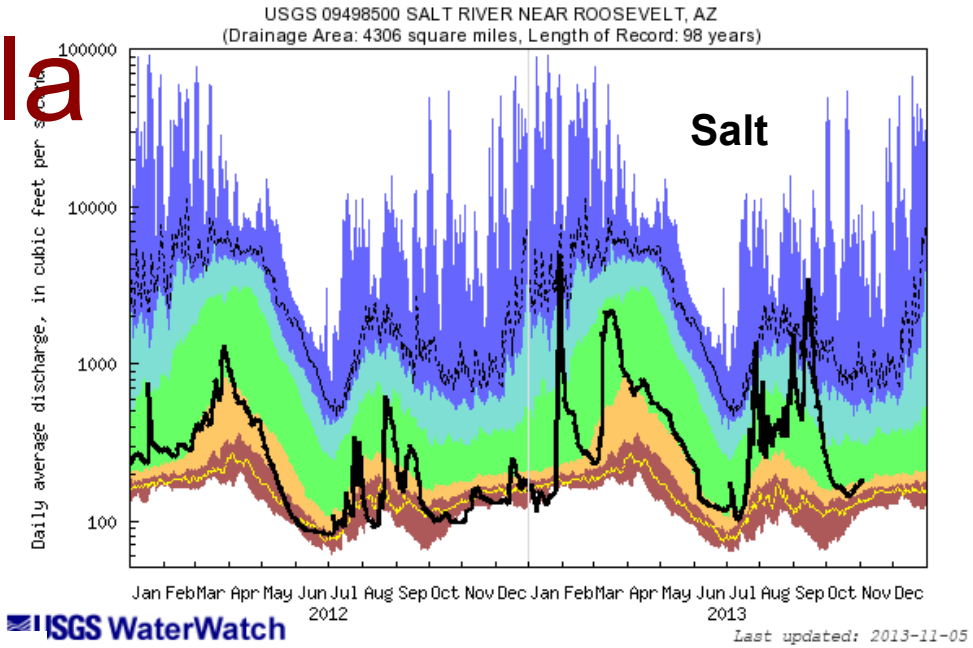


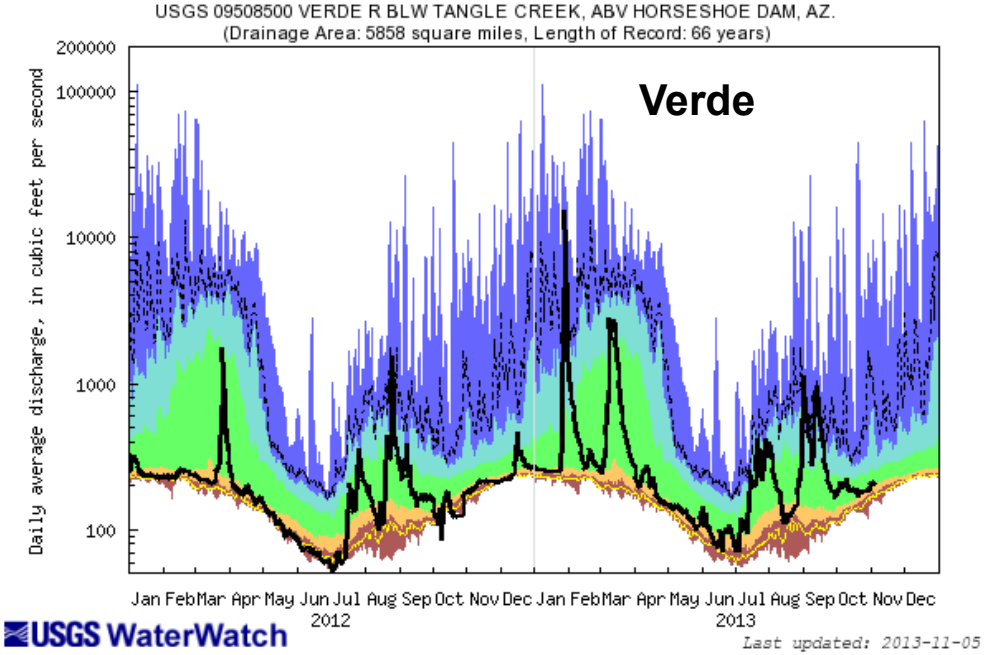
CBRFC Model Soil Moisture 11/1/2013

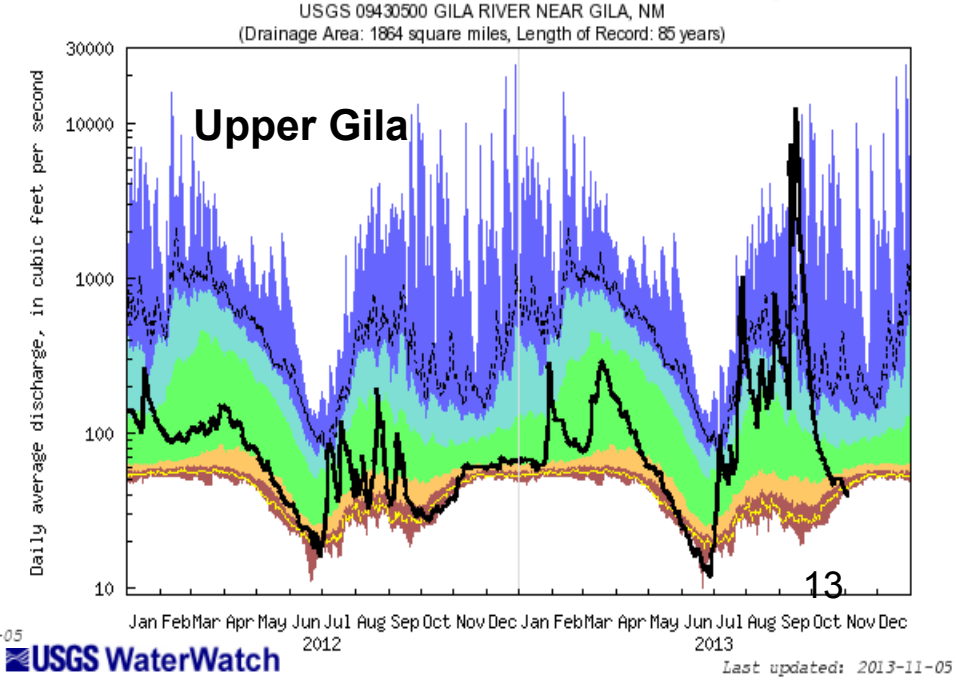


Base Flow: Salt, Verde, and Gila

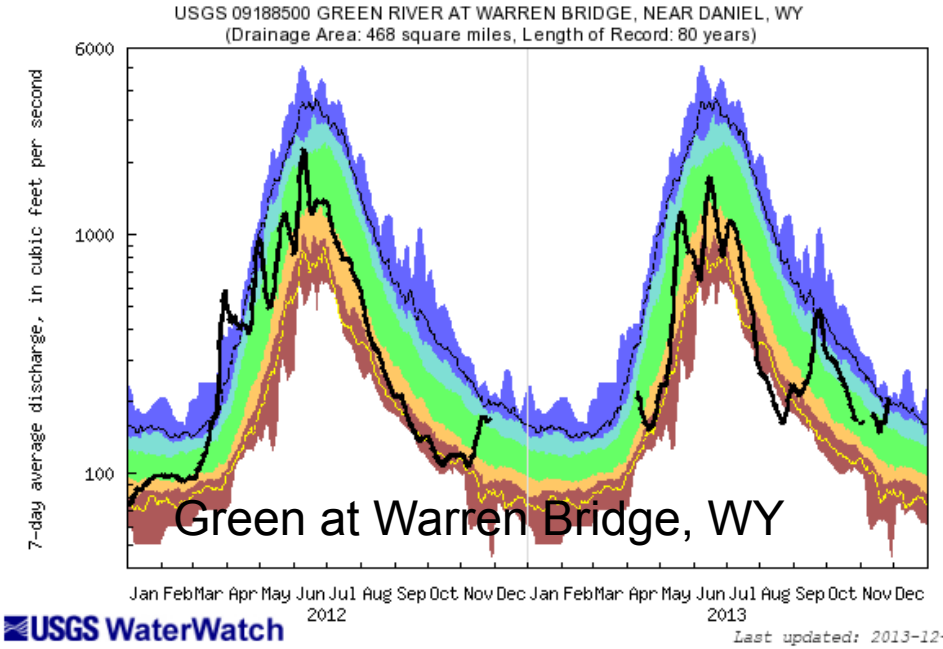
- Dry conditions throughout AZ
- Being so dry from last year definitely factored into this year's forecast
- Conditions improved this summer for next year's WS

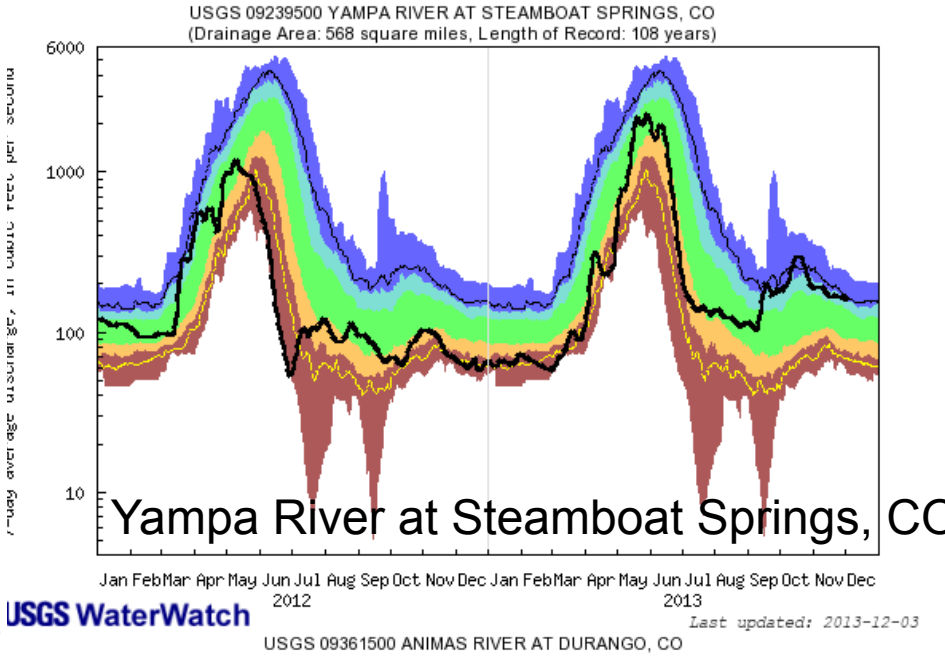


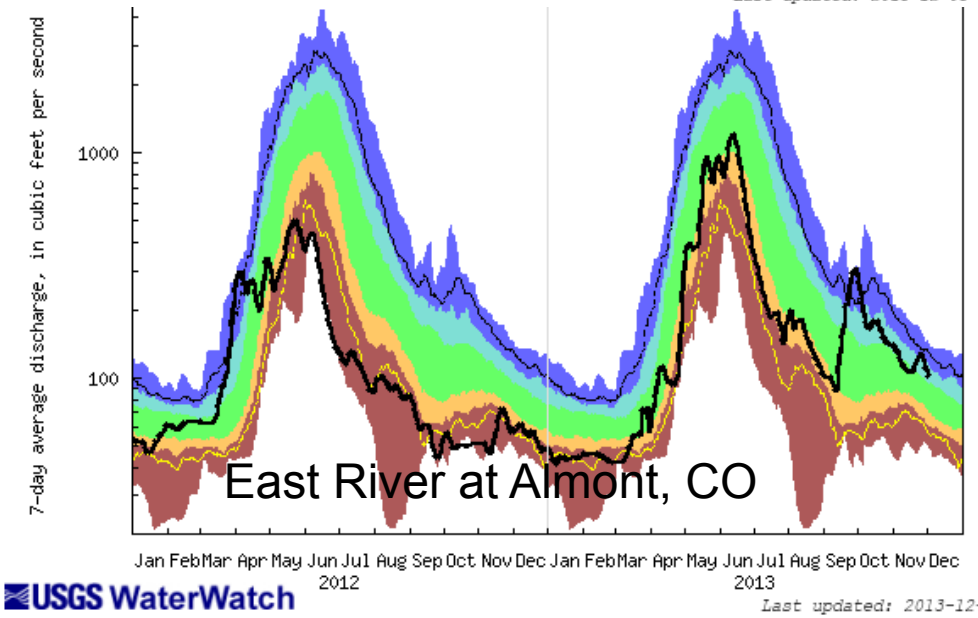


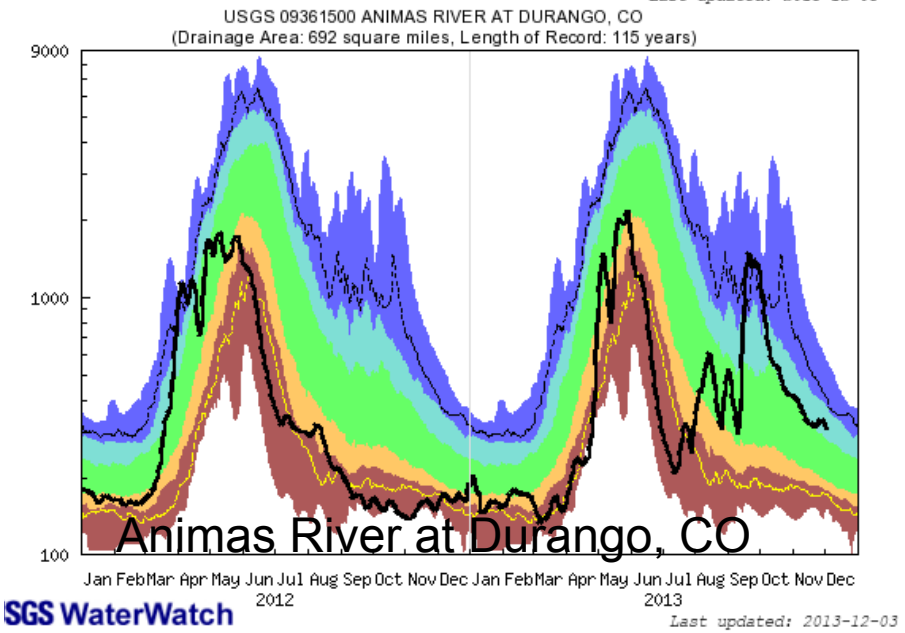


Base flows: Upper Colorado

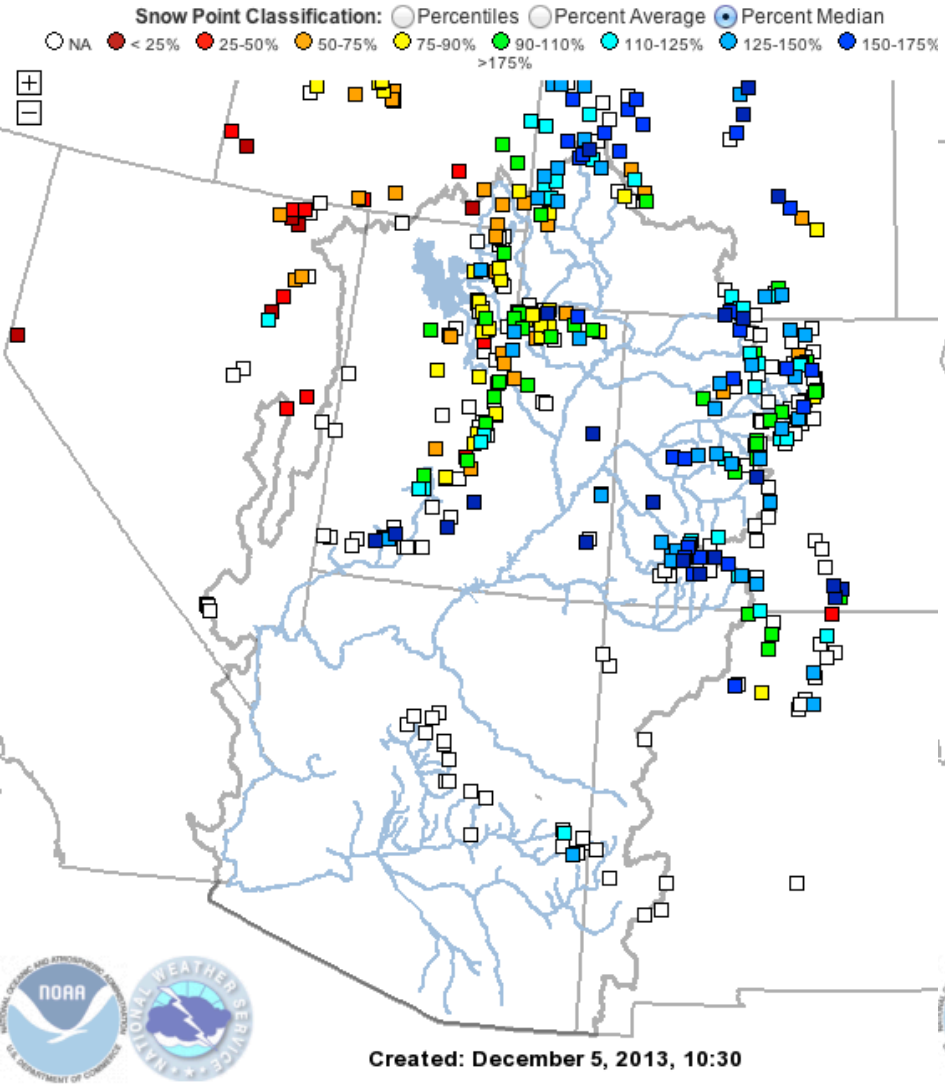


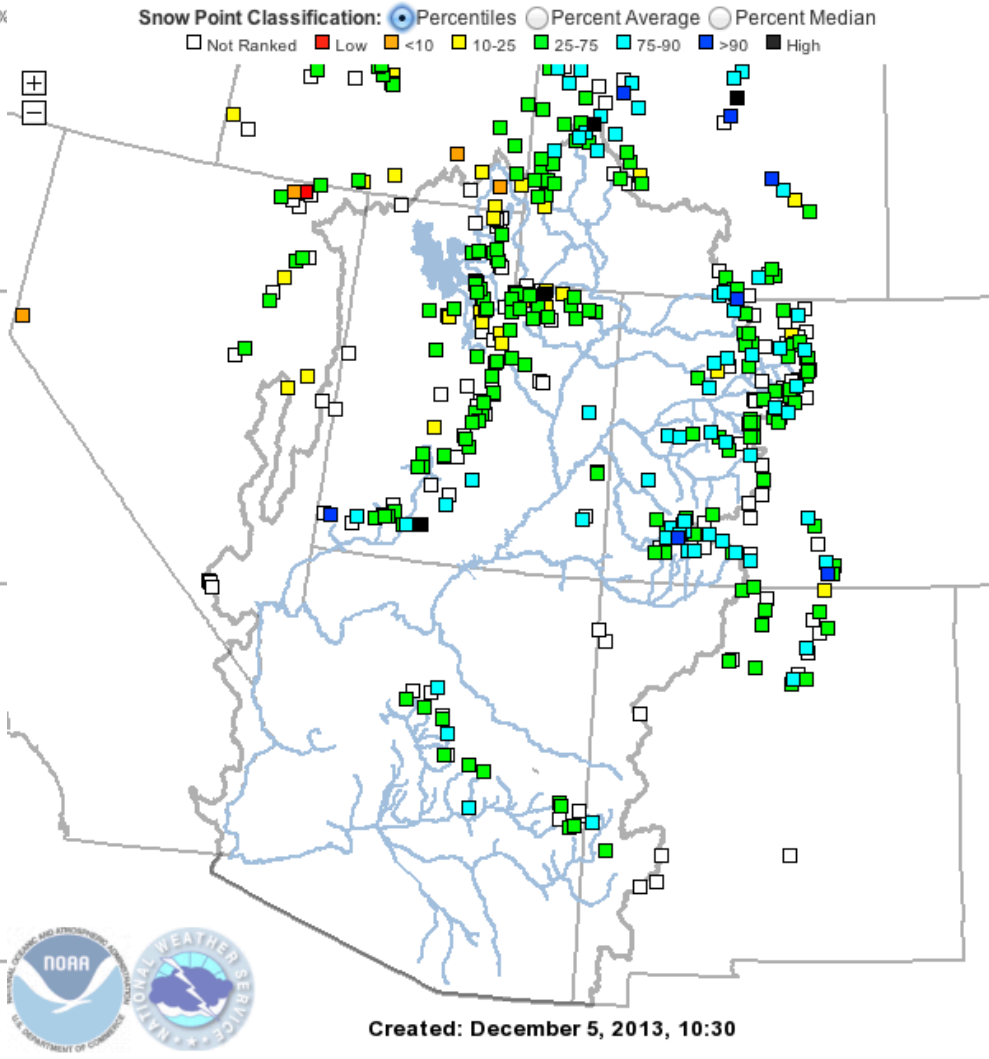


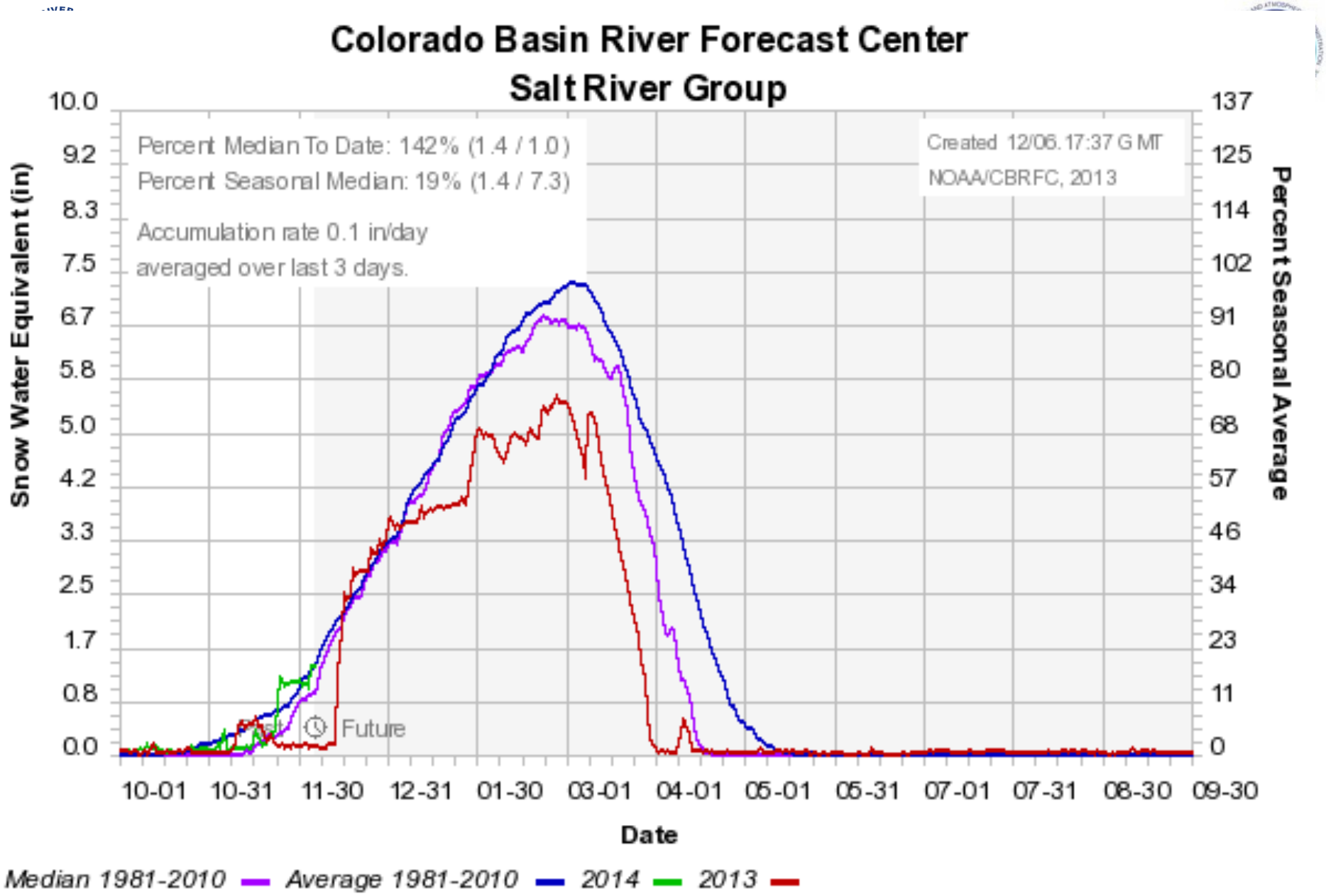




Snow so far (Dec 5)

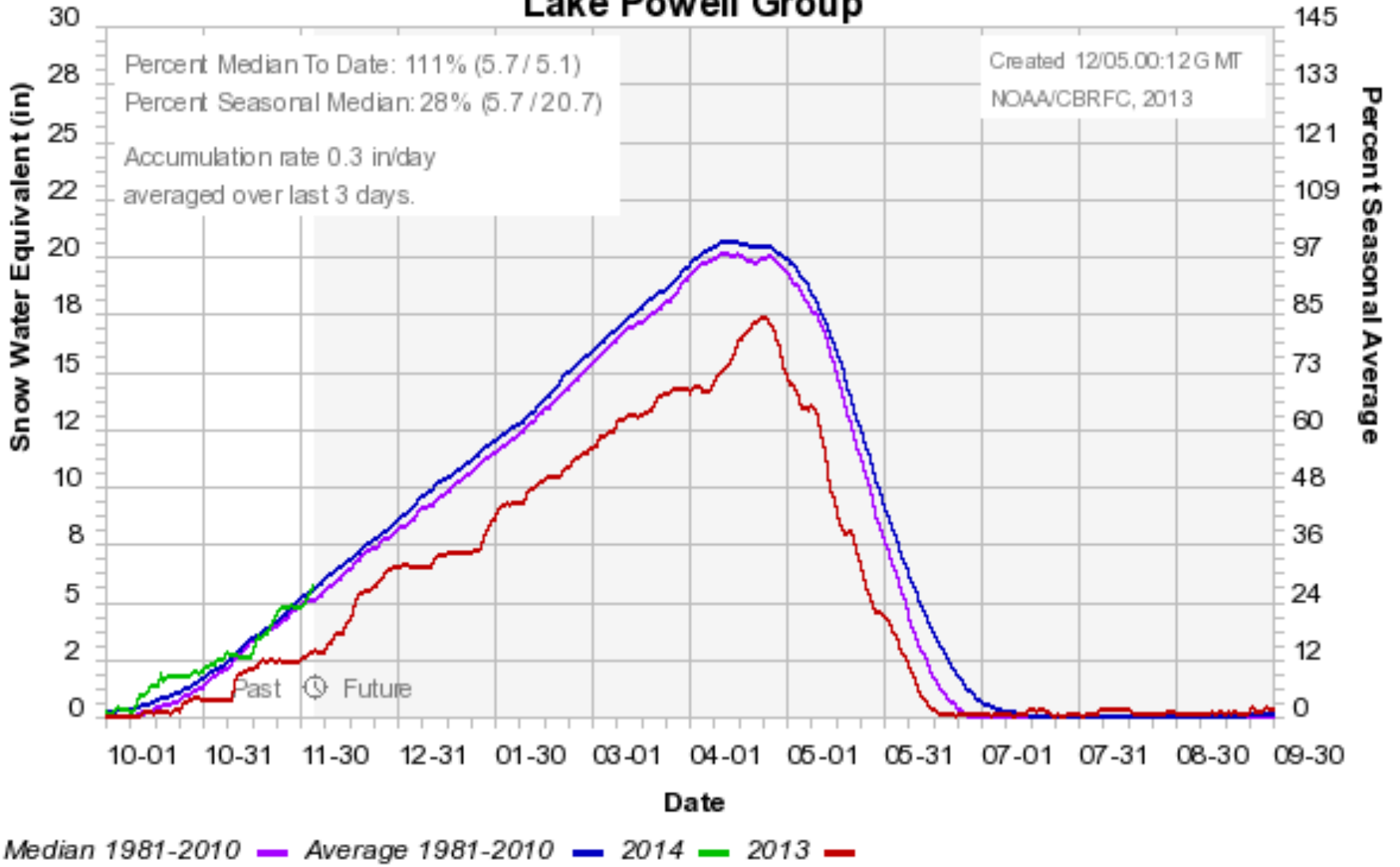





Colorado Basin River Forecast Center
Salt River Group
Percent Median To Date: 142% (1.4 / 1.0)
Percent Seasonal Median: 19% (1.4 / 7.3)
Accumulation rate 0.1 in/day
averaged over last 3 days.
Created 12/06.17:37 G MT
NOAA/CBRFC, 2013
Snow Water Equivalent (in)
Percent Seasonal Average
10.0
9.2
8.3
7.5
6.7
5.8
5.0
4.2
3.3
2.5
1.7
0.8
0.0
137
125
114
102
91
80
68
57
46
34
23
11
0
Future
10-01
10-31
11-30
12-31
01-30
03-01
04-01
05-01
05-31
07-01
07-31
08-30
09-30
Date
Median 1981-2010
Average 1981-2010
2014
2013

Colorado Basin River Forecast Center

Lake Powell Group



Early WY14 River Outlook…

Excellent antecedent conditions

- Aug/Sept precipitation
- Soil moisture (less so in UT)
- Streamflow

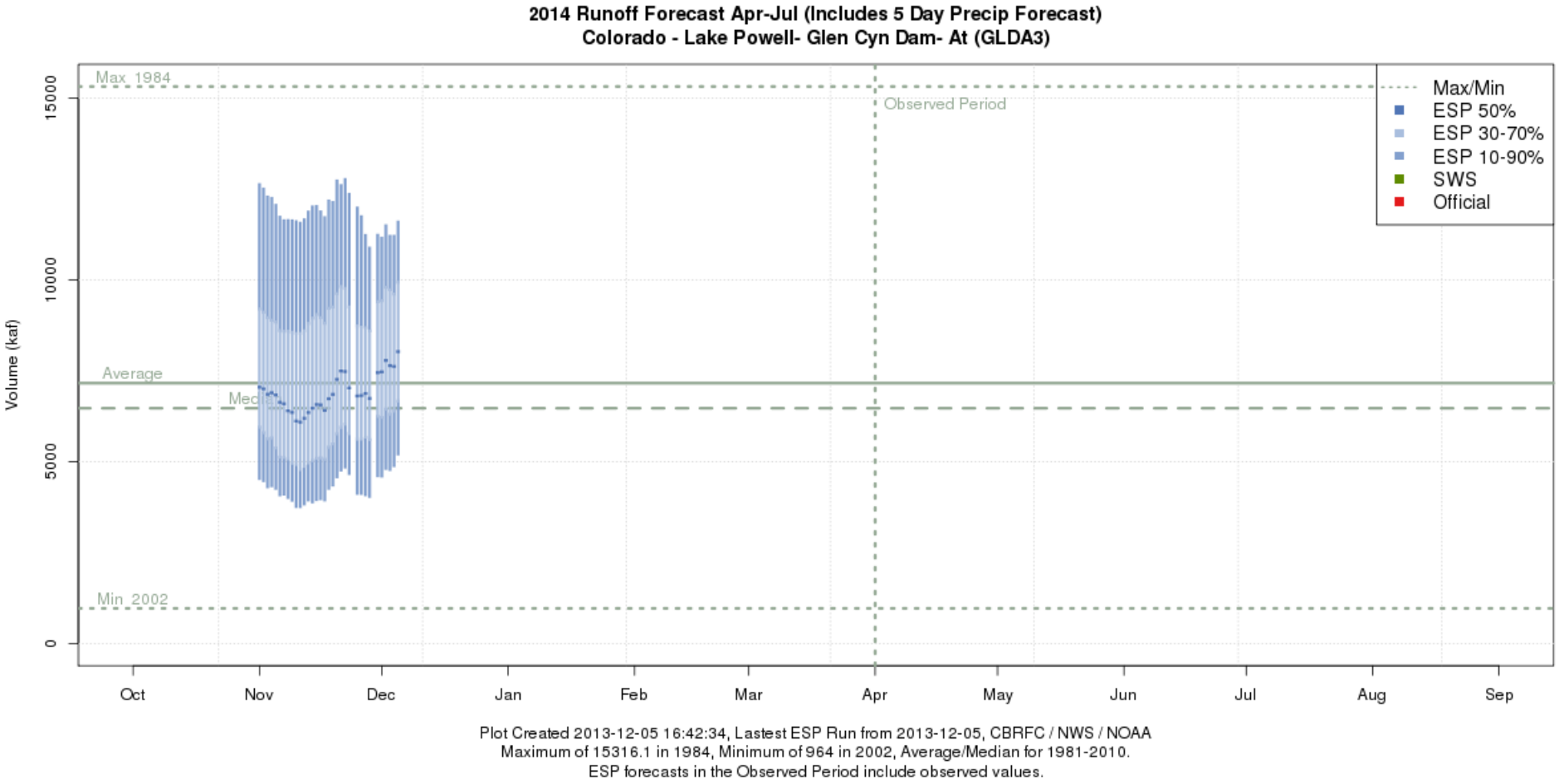
Climate predictions

- Dry for AZ, NM
- No help for upper basin

Weather

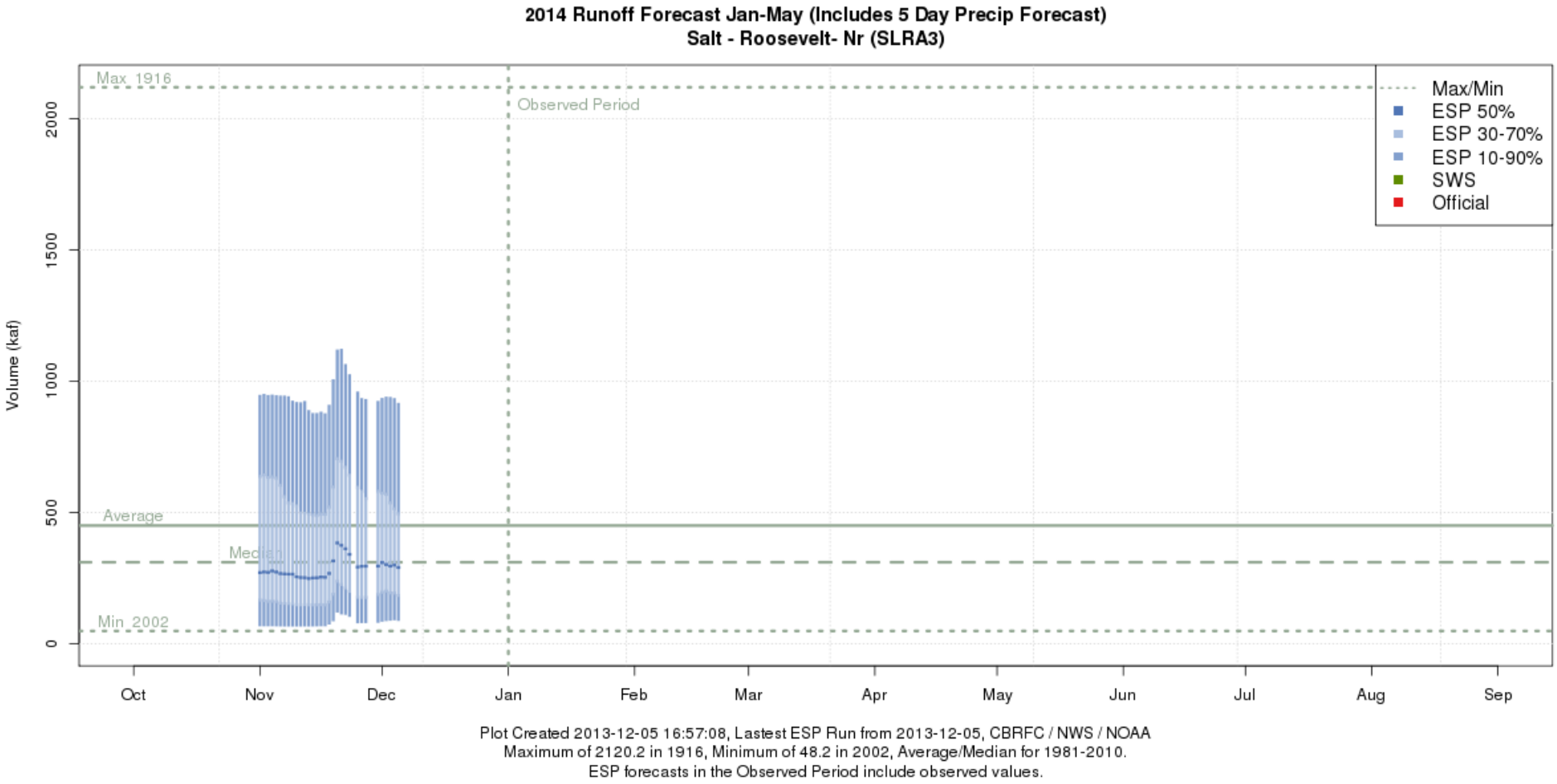
- Active period

Early WY14 River Outlook: Lake Powell



Bottom line: Off to a promising start but long ways to go

Early WY14 River Outlook: Lake Roosevelt



Bottom line: Off to a promising start but long ways to go

Summary

- Poor runoff last 2-3 years
- Great antecedent conditions
- ENSO neutral -> “anything goes”
- Snow season off to a good start but still very early and lots can happen.

Feedback, Questions, Concerns always welcome….

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