CBRFC
March 2013
Water Supply Webinar

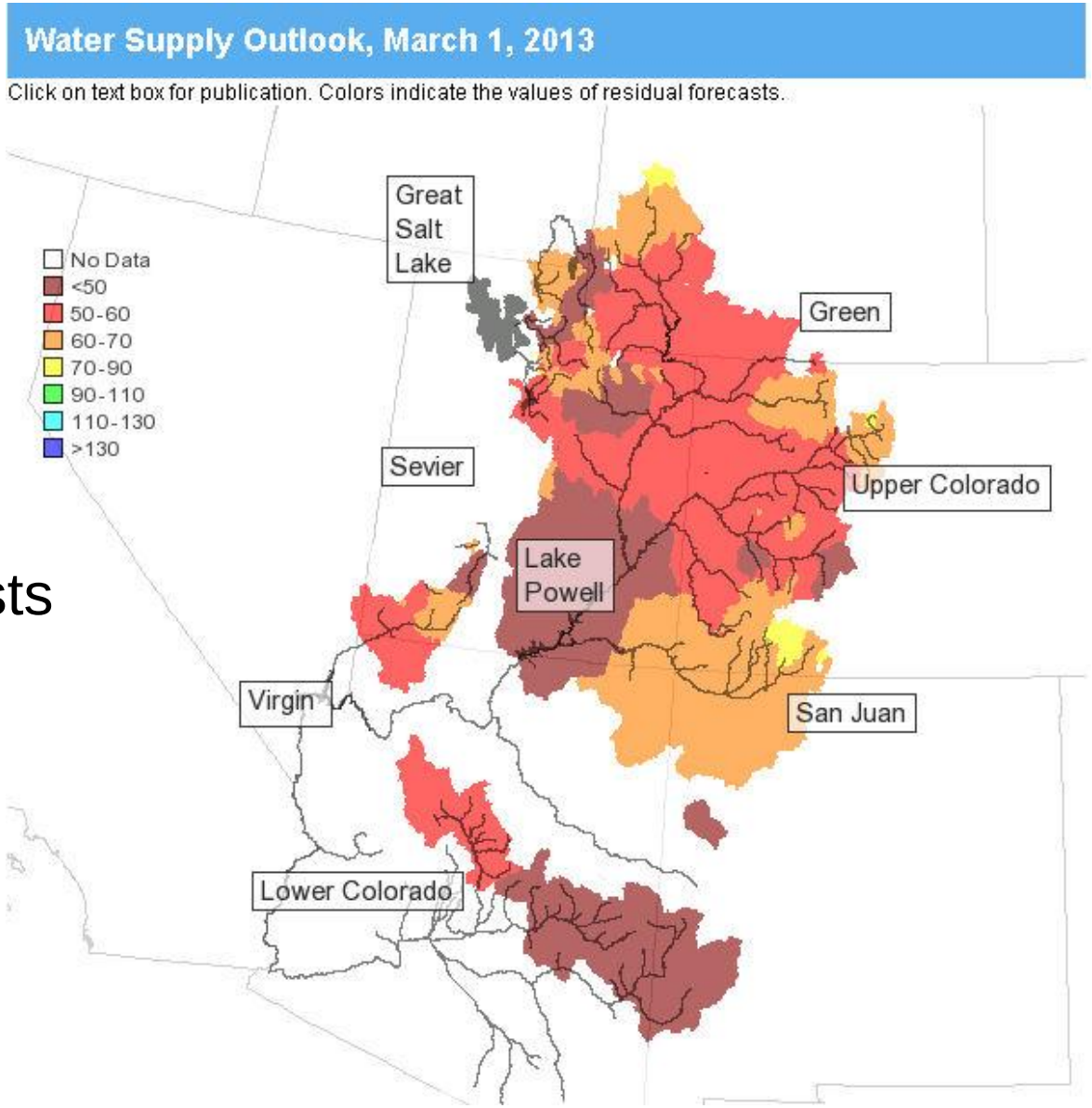
March 6, 2013

Greg Smith

These slides: www.cbrfc.noaa.gov/present/present.php

Outline

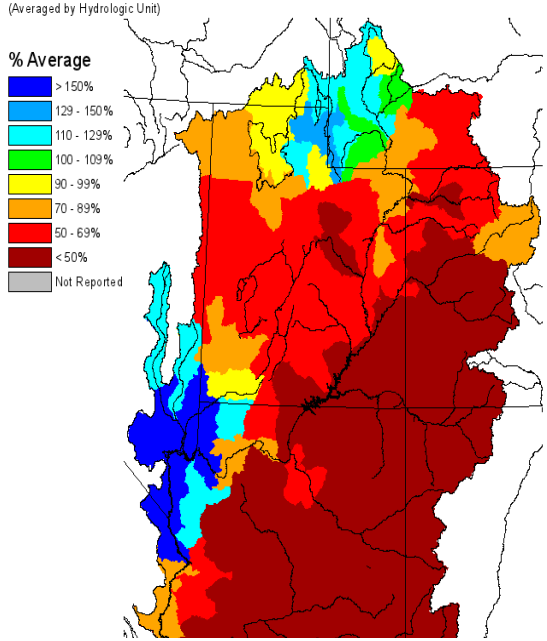
- Weather Review
- Current Snow States
- Water Supply Forecasts
- Peak Flows
- Future Weather



Web Reference: http://www.cbrfc.noaa.gov/wsup/pub2/map/html/cpub.php

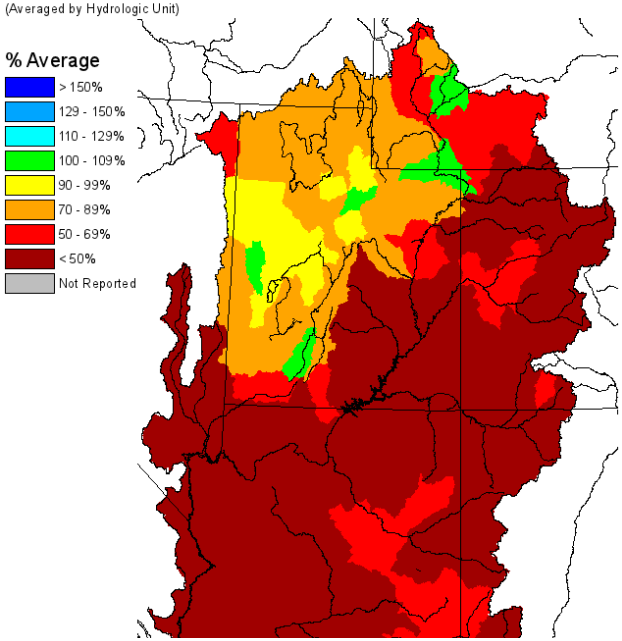
Monthly Precipitation for October 2012

(Averaged by Hydrologic Unit)



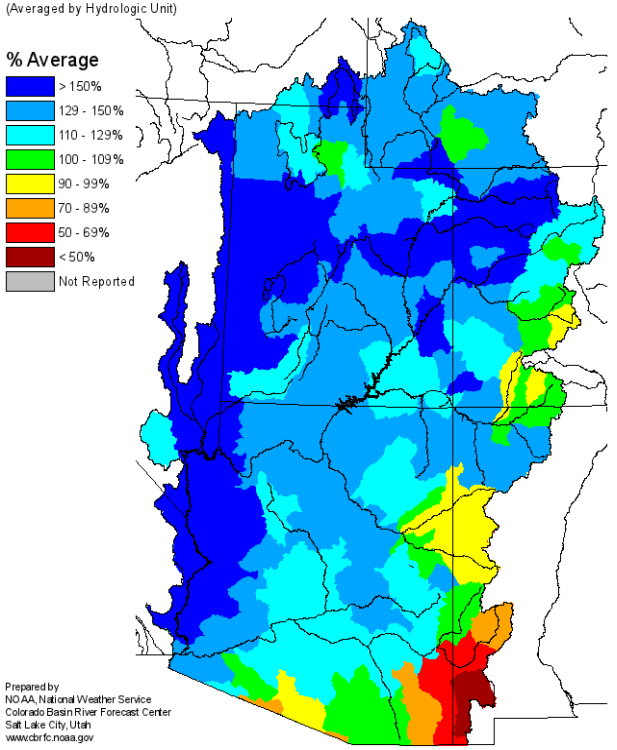
Monthly Precipitation for November 2012

(Averaged by Hydrologic Unit)



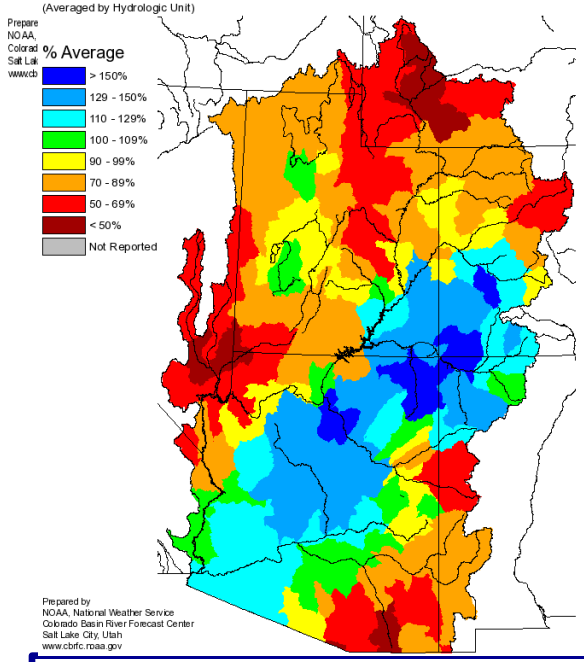
Monthly Precipitation for December 2012

(Averaged by Hydrologic Unit)



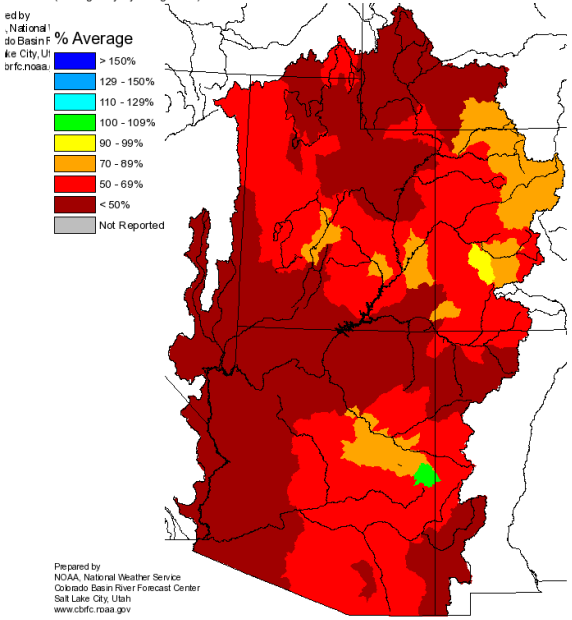
Monthly Precipitation for January 2013

(Averaged by Hydrologic Unit)



Monthly Precipitation for February 2013

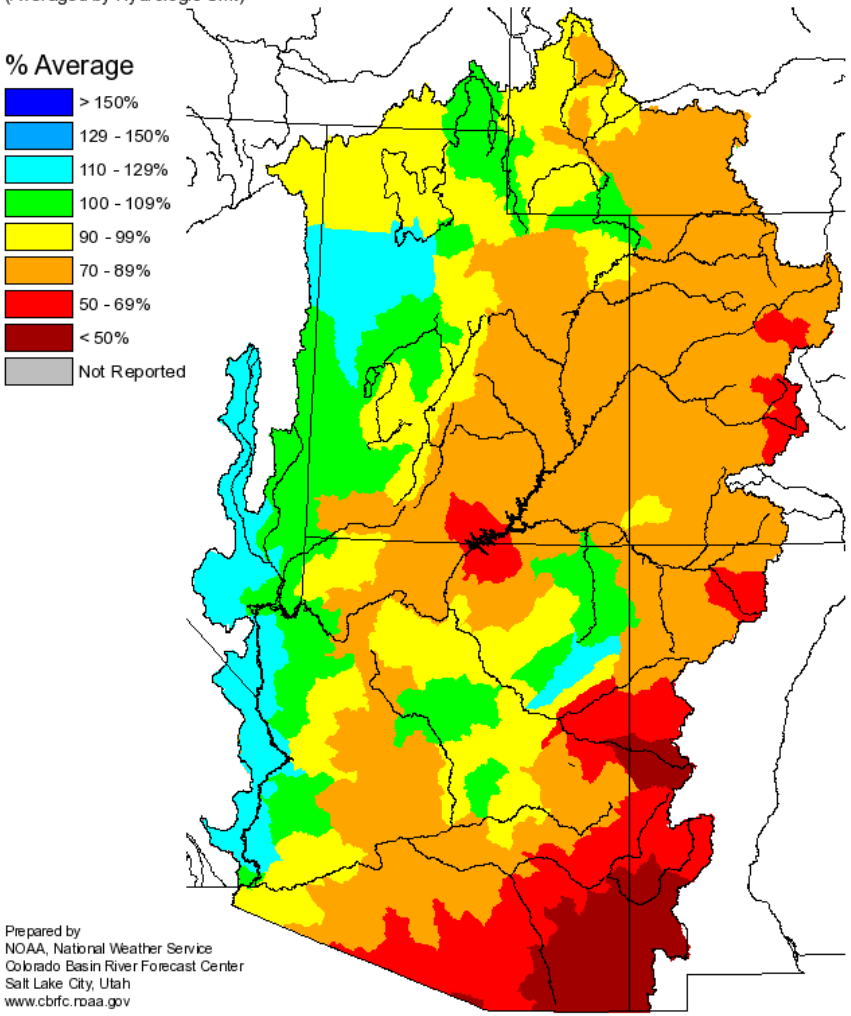
(Averaged by Hydrologic Unit)



Web Reference: http://www.cbrfc.noaa.gov

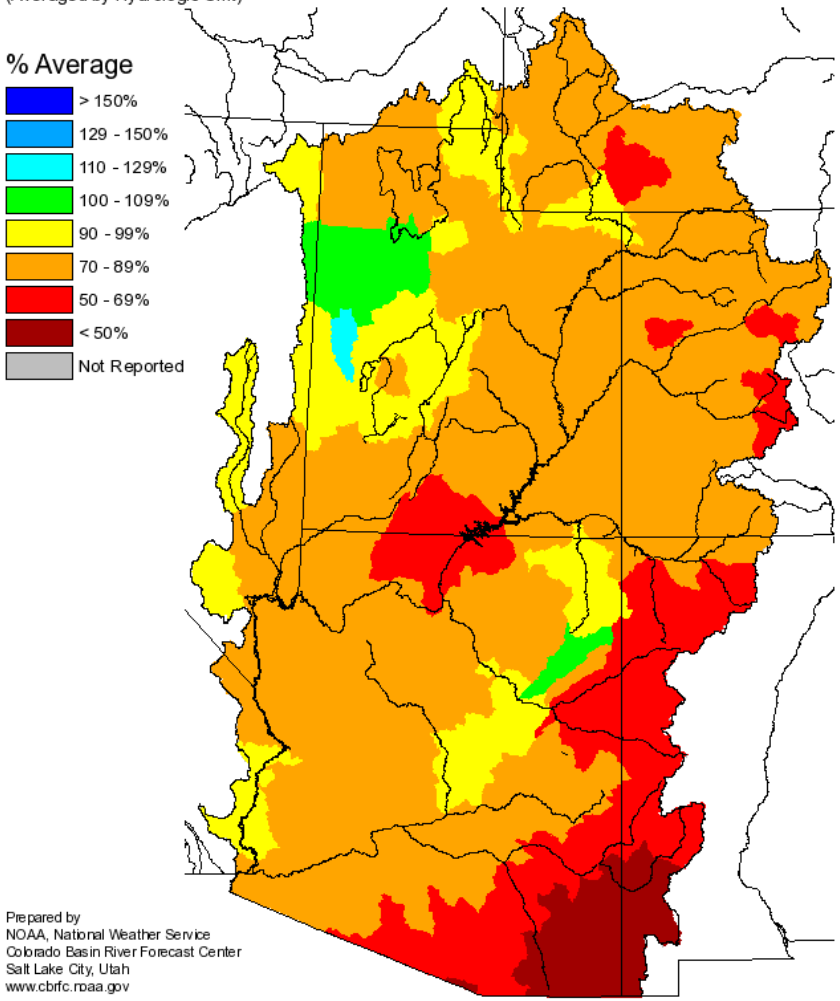
Seasonal Precipitation, October 2012 - January 2013

(Averaged by Hydrologic Unit)



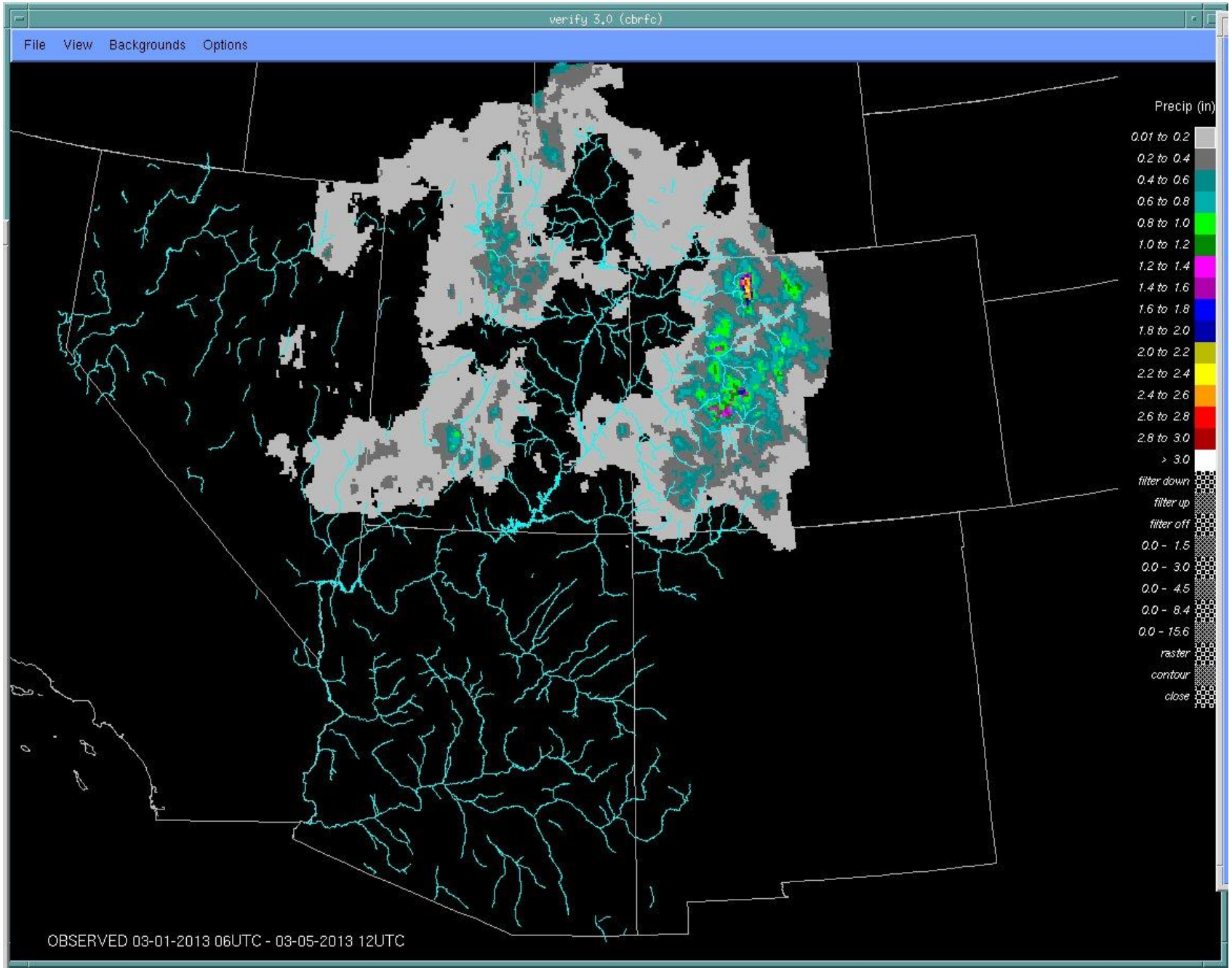
Seasonal Precipitation, October 2012 - February 2013

(Averaged by Hydrologic Unit)

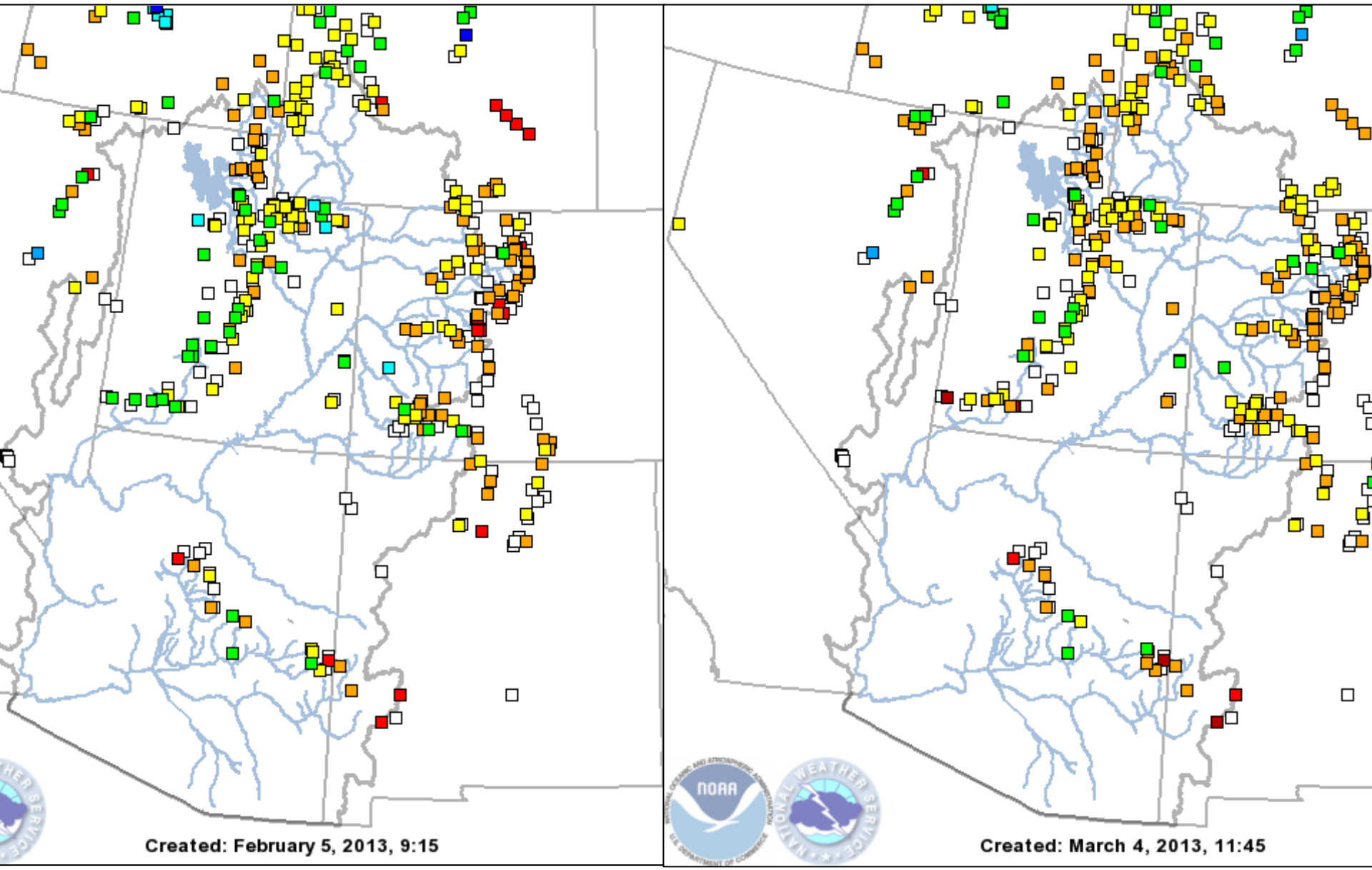


Web Reference: http://www.cbrfc.noaa.gov

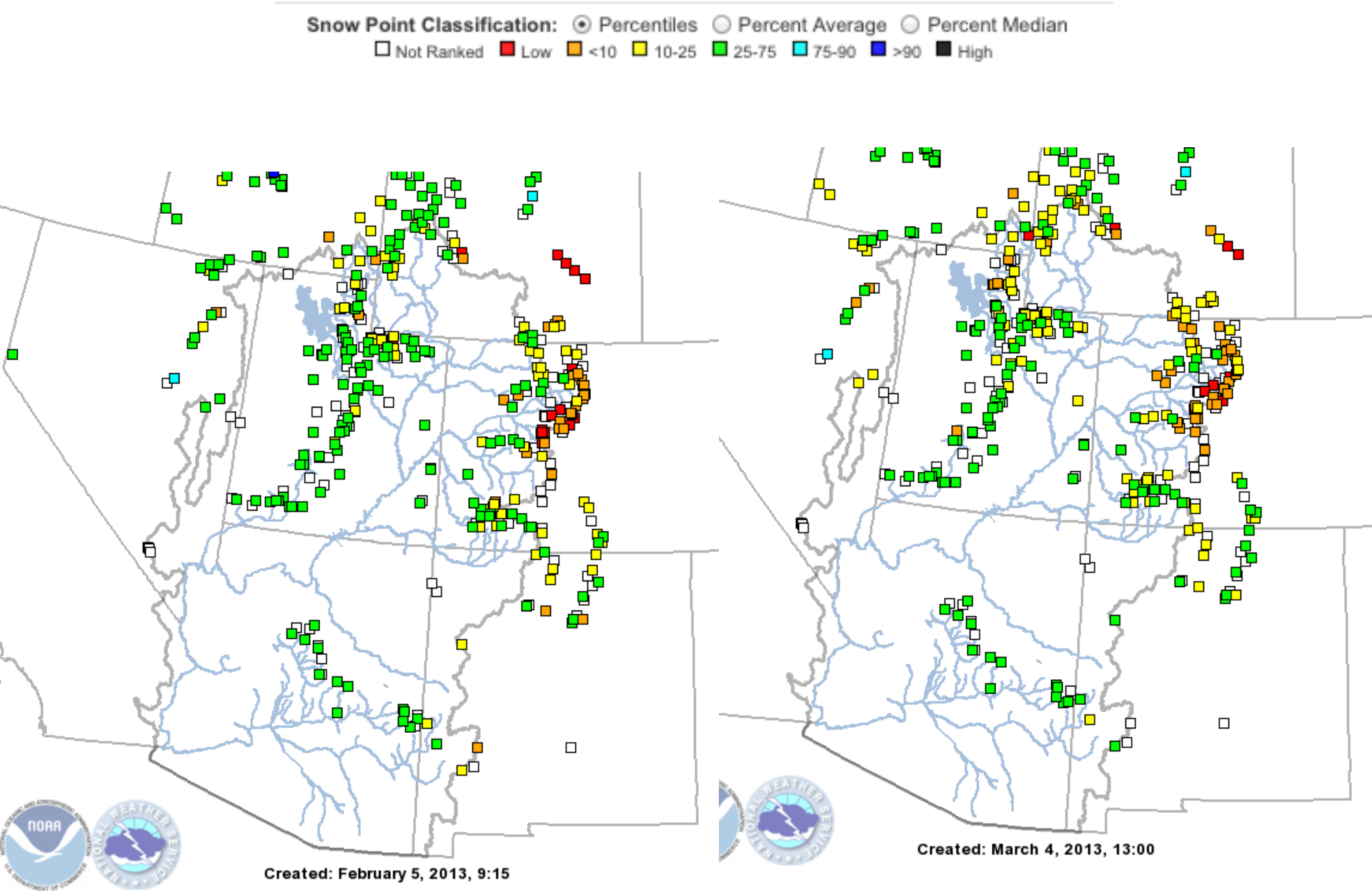
March 1-5 Precipitation in the CBRFC area



Snow



Web Reference: http://www.cbrfc.noaa.gov/gmap/cmap2.php?con=snow



Web Reference: http://www.cbrfc.noaa.gov/gmap/cmap2.php?con=snow

Snow List

Click point type or enter search to change points displayed. Click column heading to sort by that data. Click ID to show plot for point.
Download pipe-delimited file of displayed points.

SEARCH POINTS

Area: CBRFC Upper Colorado Green San Jaun Great Basin Sevier Virgin Lower Colorado
Sub-Area: Colorado Headwaters Gunnison Dolores
Plots: Auto Off On

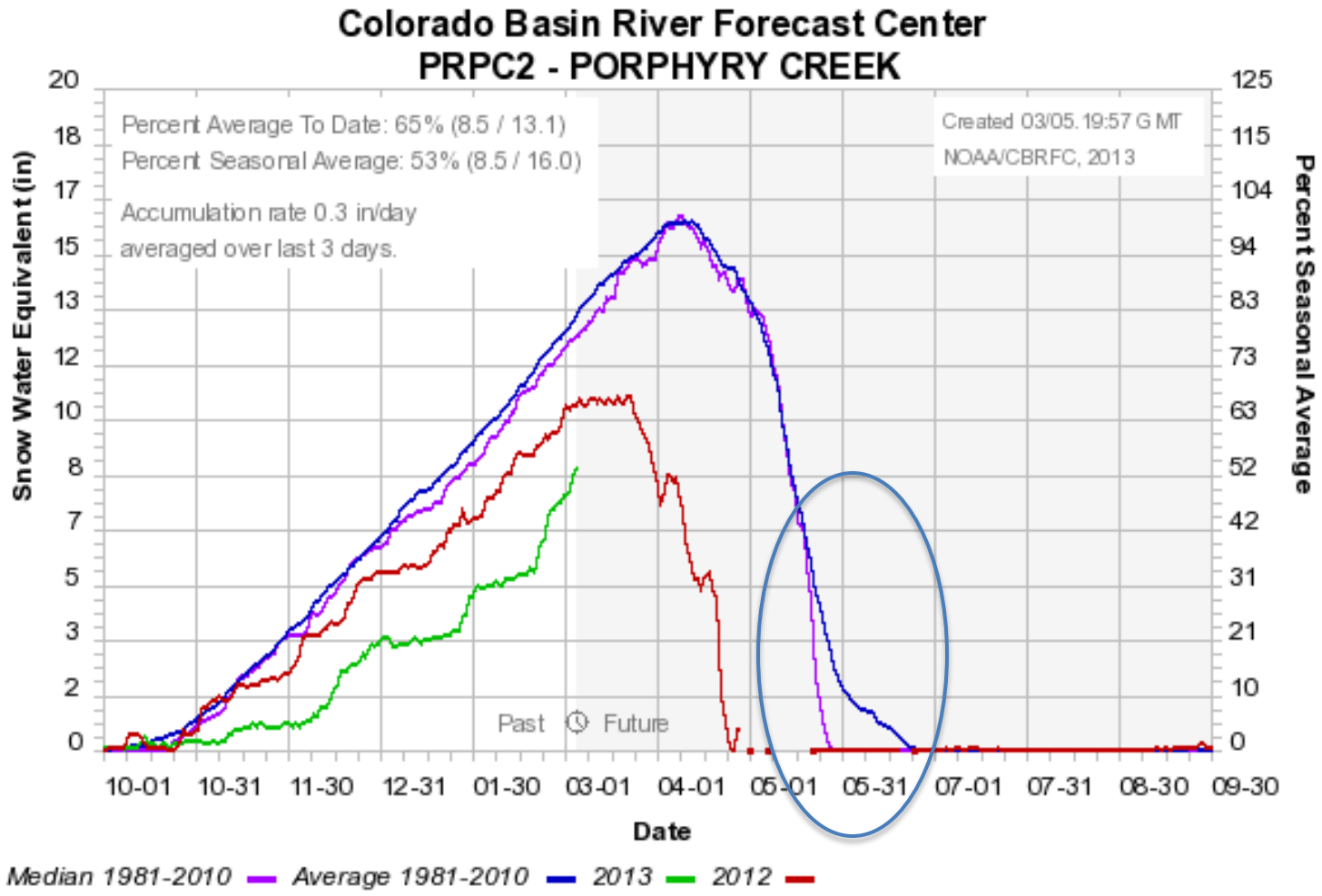
Percent Average
NA | < 25% | 25-50% | 50-75% | 75-90% | 90-110% | 110-125% | 125-150% | 150-175% | >175%

Percentile
Not Ranked | Low | <10 | 10-25 | 25-75 | 75-90 | >90 | High

	NWS ID	Location	Percent Average	Percent Median	Percentile	Observed Date (Day)	SWE (in)	Average	%Average	Median	%Median	Wet Rank	Dry Rank	Total Years	Percentile	Day Rate	Week Rate	HUC	Elevation	State	HSA
1	ARPC2	Arapaho Ridge				4	14							11		0.4	0.1	14010001	8900	UT	SLC
2	AROC2	Arrow				4	5.8	11.5	50	11.3	51	34	1	34	0	0.1	-0.1	14010001	10000	CO	PUB
3	BCVC2	Beaver Ck Village				4	7.3							10		0.3	0.1	14010003	9360	WY	RIW
4	BTSC2	Berthoud Summit				4	11.1	14.4	77	14.4	77	32	4	35	8	0.3	0.1	14010001	10600	CO	PUB
5	BLSC2	Bison Lake				4	15.7	22	72	19.3	81	27	2	28	3	0.3	0.1	14010001	7440	WY	CYS
6	BUFC2	Buffalo Park				3	10.2					13	6	18	27	0	0	14010001	9160	CO	BOU
7	BUTC2	Butte				4	7.1	12.6	57	11.2	63	31	2	32	3	0.7	0.1	14020001	5650	NV	LKN
8	HAPC2	Chapman Tunnel				4	6.8							6		0.3	0.1	14010004	10040	CO	PUB
9	CPSC2	Columbine Pass				4	16.2	15.8	103	15.6	104	13	15	27	51	0	0.1	14020005	8100	NV	LKN
10	CPMC2	Copper Mountain				4	6.9	11.4	61	11.3	61	33	3	35	5	0.4	0.1	14010002	8037	UT	SLC
11	EDSC2	El Diente Peak				4	10.8	12.8	85	11.7	92	15	13	27	44	0.3	0.1	14030002	11100	CO	BOU
12	ELRC2	Elliot Ridge				4	12							4		0.1	0.1	14010002	9212	UT	SLC
13	FCVC2	Fool Creek				4	10.9							1		0.3	0	14010001	9145	UT	GJT
14	FMTC2	Fremont Pass				4	9.2	13.2	70	12	77	32	2	33	3	0.4	0.1	14010002	7787	UT	SLC
15	GZPC2	Grizzly Peak				4	9.2	13.4	69	13.4	69	30	4	33	9	0.4	0.1	14010002	10966	UT	SLC
16	HOOC2	Hoosier Pass				4	7.4	11.8	63	11.1	67	31	3	33	6	0.4	0.1	14010002	6544	UT	SLC
17	IDRC2	Idarado				4	8.5	11.2	76	10.4	82	27	7	33	18	0.2	0.1	14020006	8960	UT	SLC
18	IDPC2	Independence Pass				4	8	13.3	60	12.9	62	32	2	33	3	0.5	0.2	14010004	7760	WY	RIW
19	IVHC2	Ivanhoe				4	9.8					17	6	22	22	0.4	0.1	14010004	10000	CO	GJT
20	JNPC2	Jones Pass				4	8.4							14		0.2	0.1	14010001	8800	ID	PIH

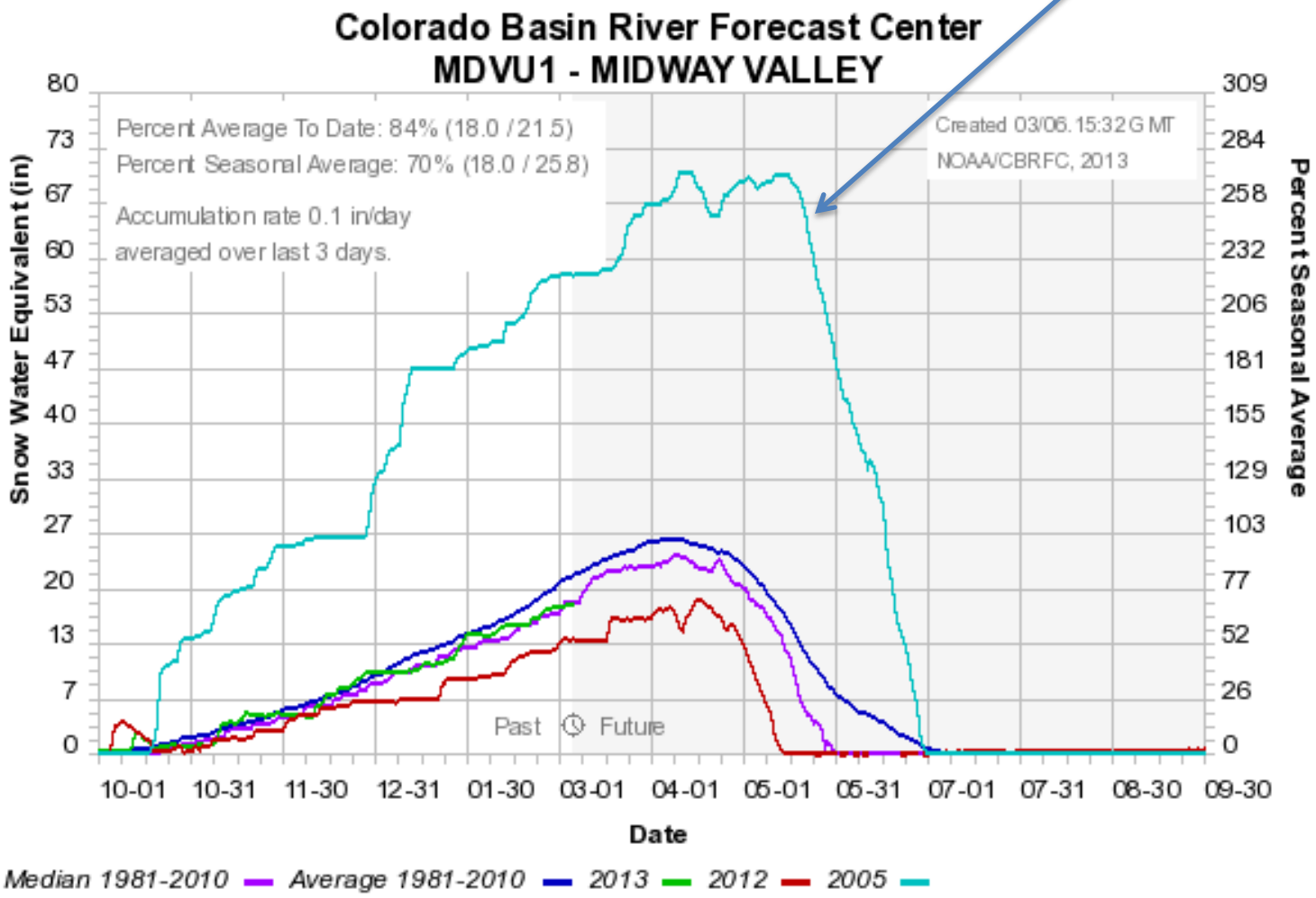
| | NWS ID | Location | Percent Average | Percent Median | Percentile | Observed Date (Day) | SWE (in) | Average | %Average | Median | %Median | Wet Rank | Dry Rank | Total Years | Percentile | Day Rate | Week Rate | HUC | Elevation | State | HSA |

SNOW: Historical Median vs Average

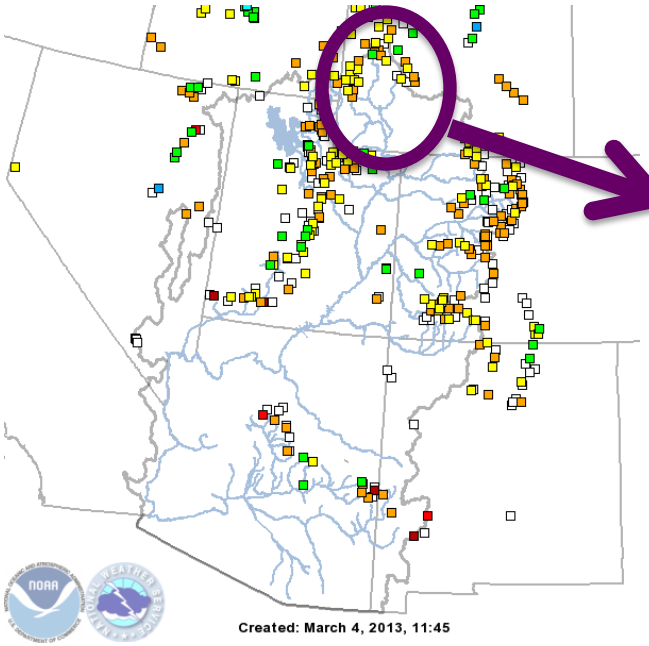


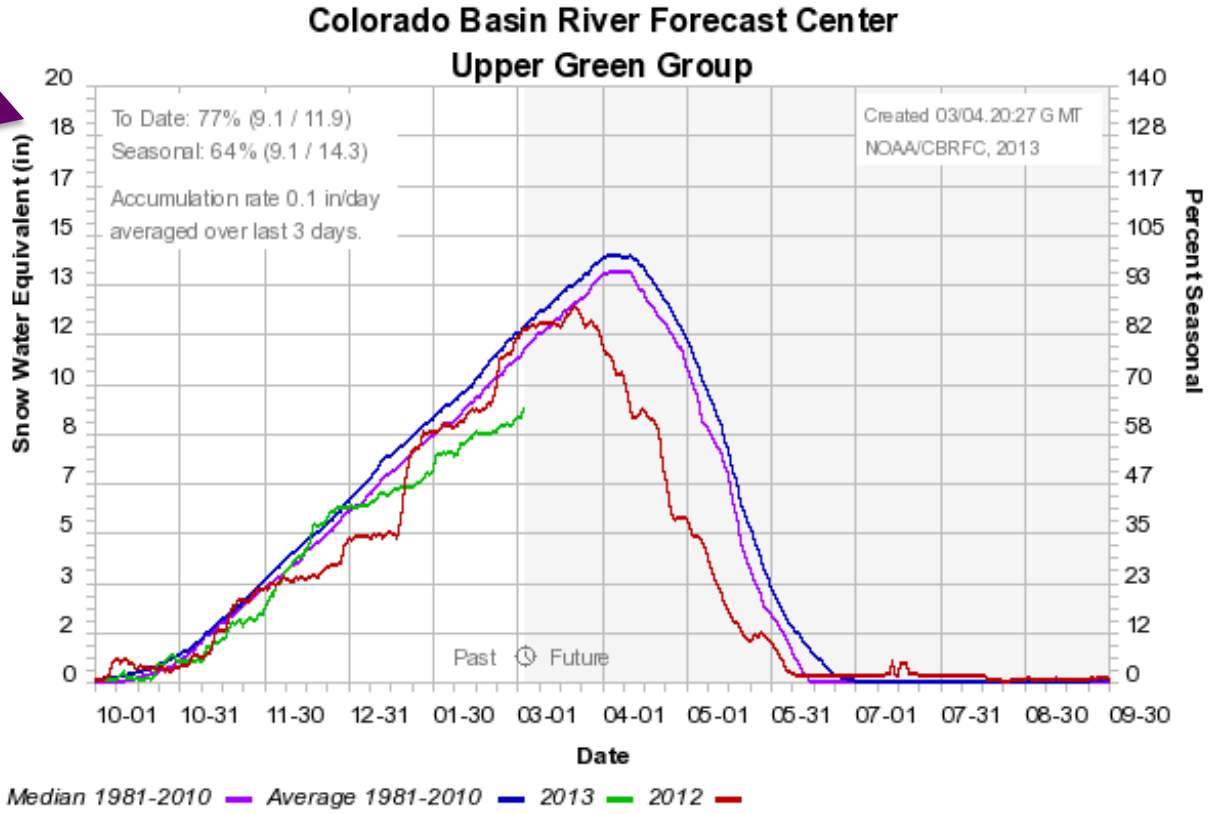
SNOW: Historical Median vs Average

Very large years like 2005 can skew the historical average



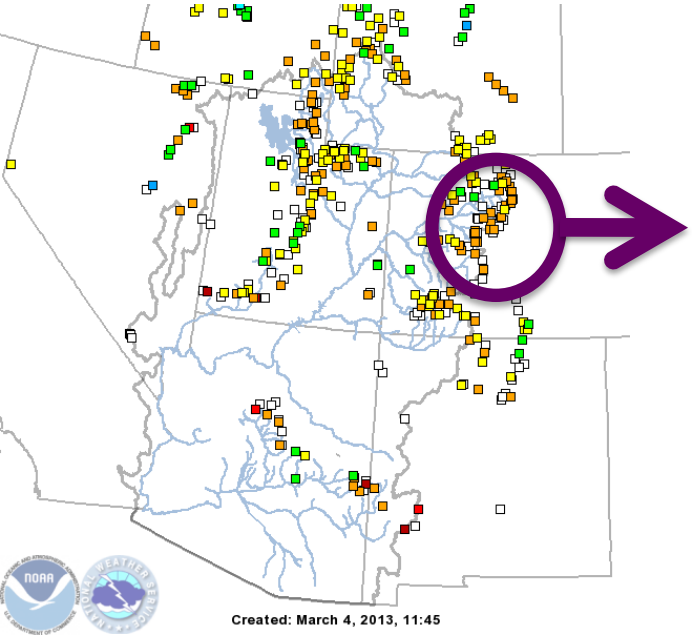
Snow: Upper Green Basin (above Flaming Gorge)

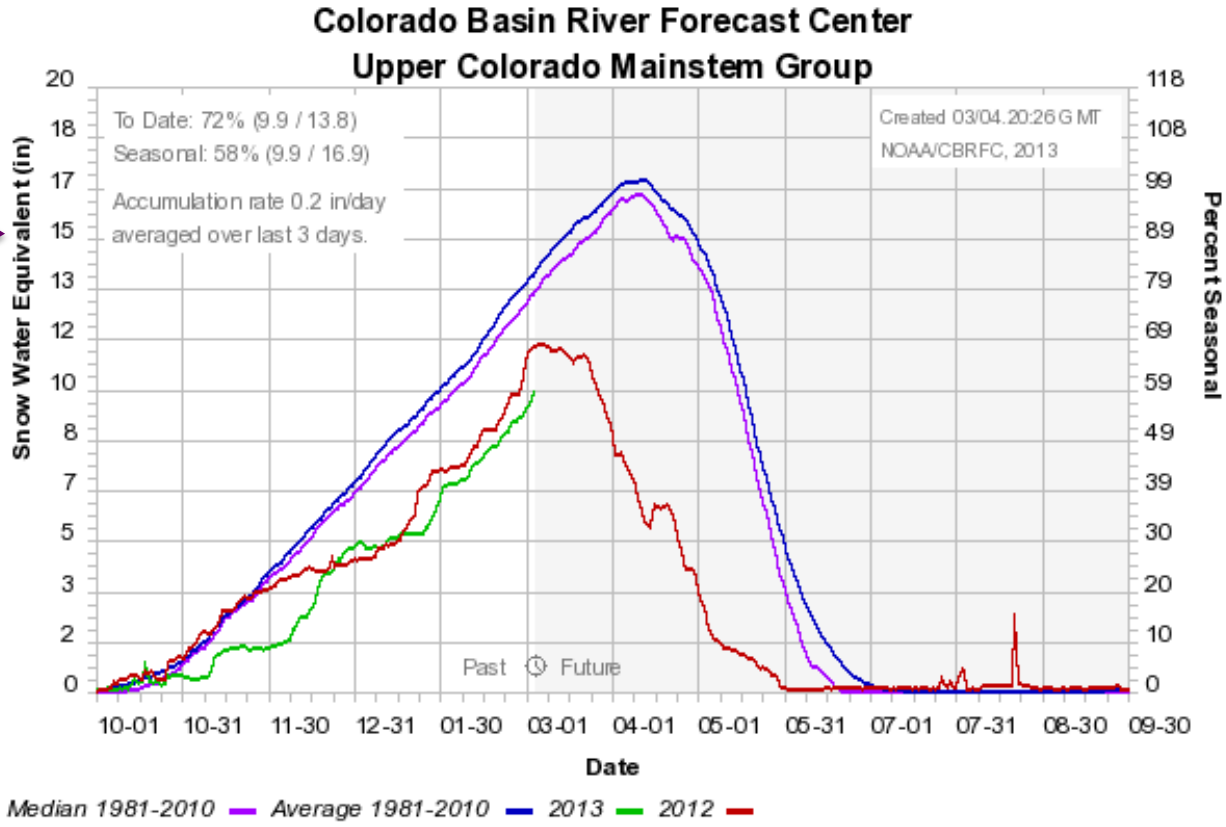




Web Reference: http://www.cbrfc.noaa.gov/station/sweplot/snowgroup.php

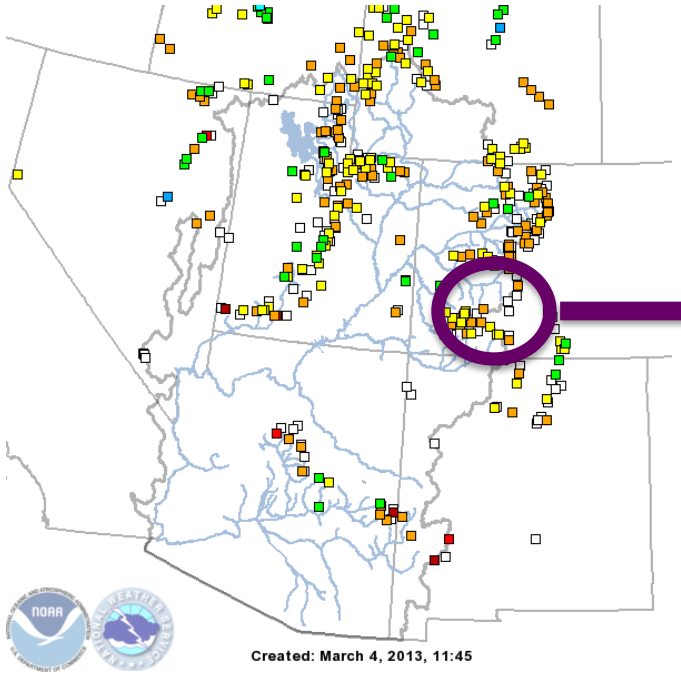
Snow:
Colorado Mainstem (above Cameo)

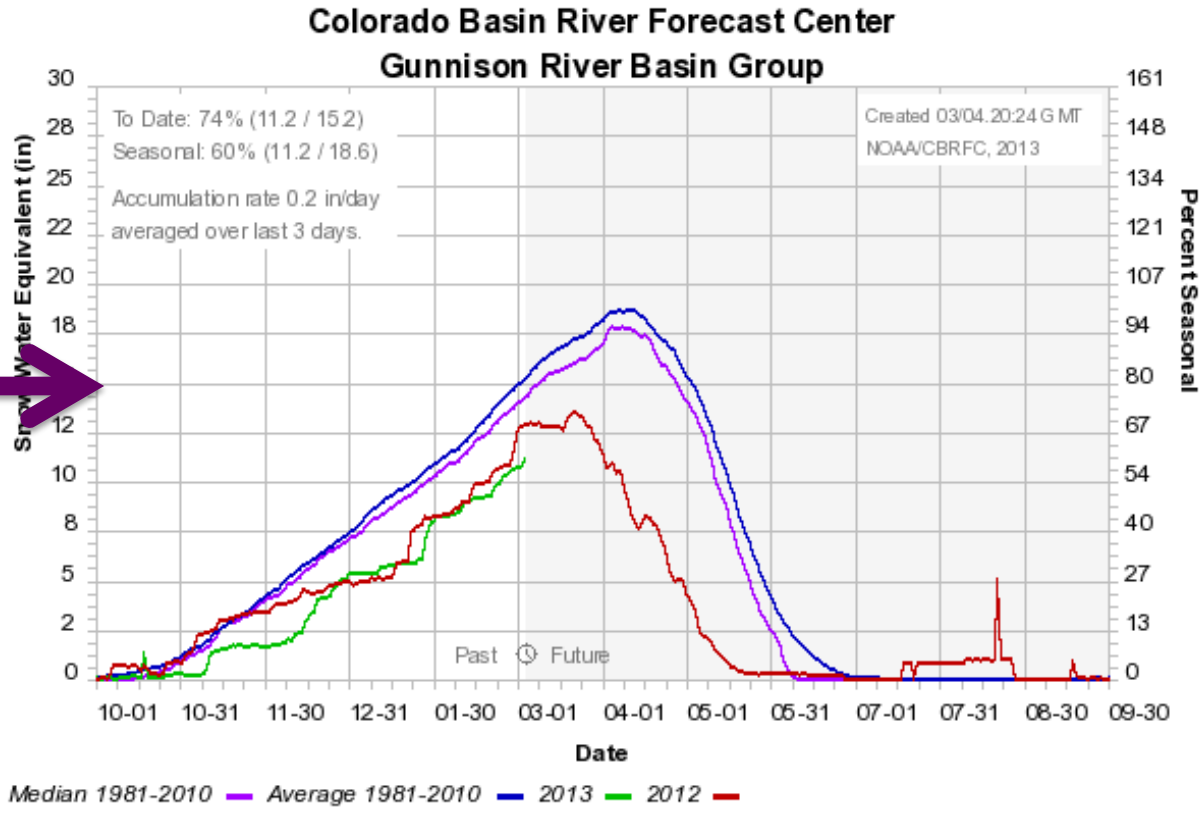




Web Reference: http://www.cbrfc.noaa.gov/station/sweplot/snowgroup.php

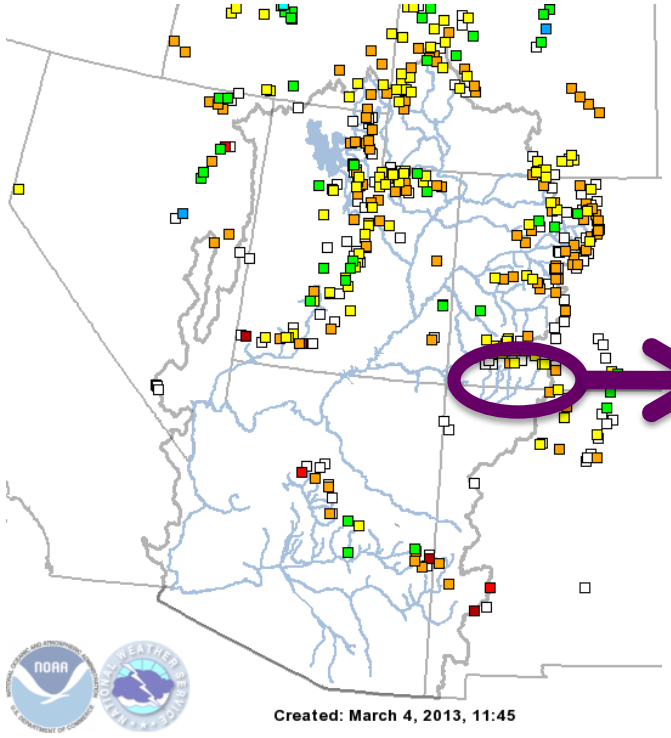
Snow:
Gunnison Basin

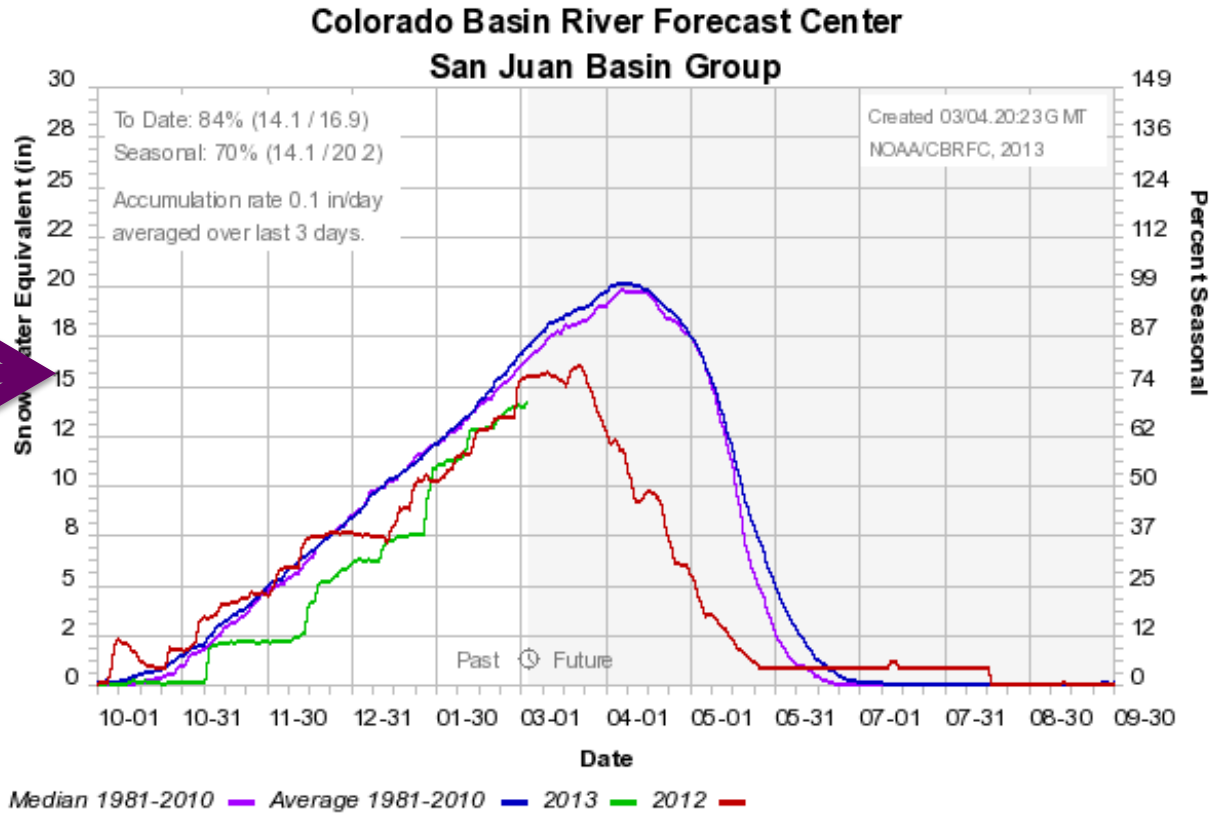




Web Reference: http://www.cbrfc.noaa.gov/station/sweplot/snowgroup.php

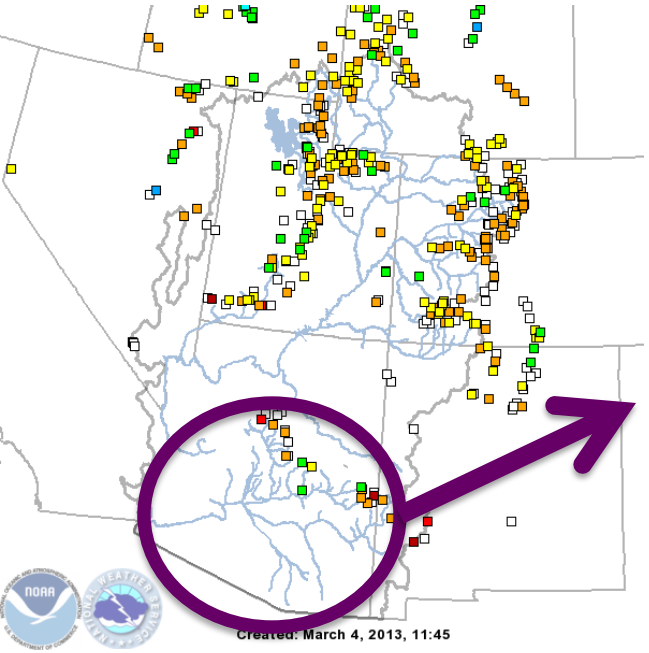
Snow:
San Juan Basin

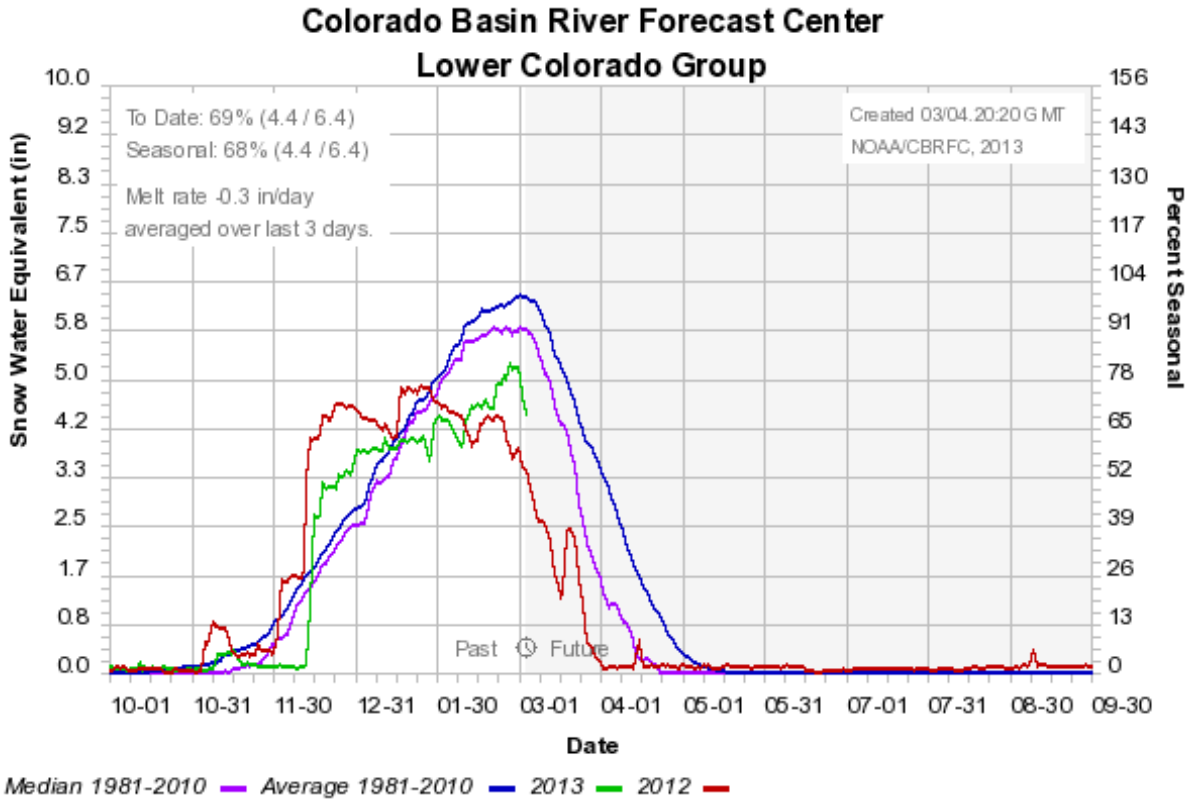




Web Reference: http://www.cbrfc.noaa.gov/station/sweplot/snowgroup.php

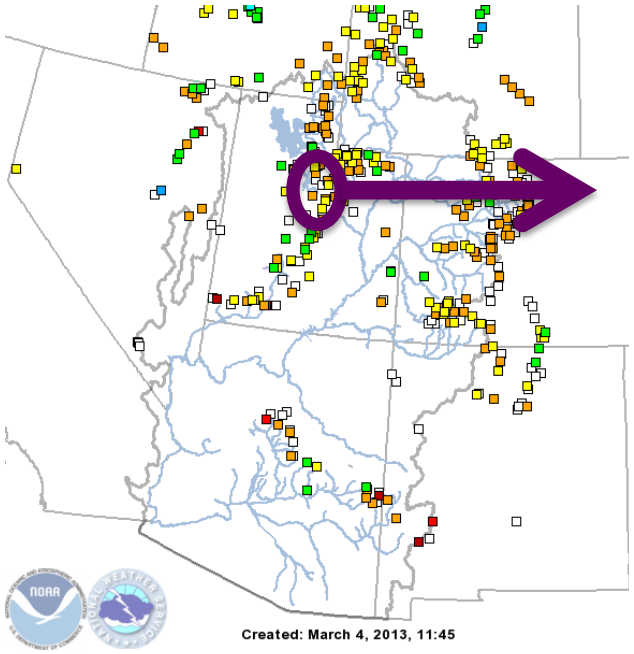
Snow:
Lower Colorado

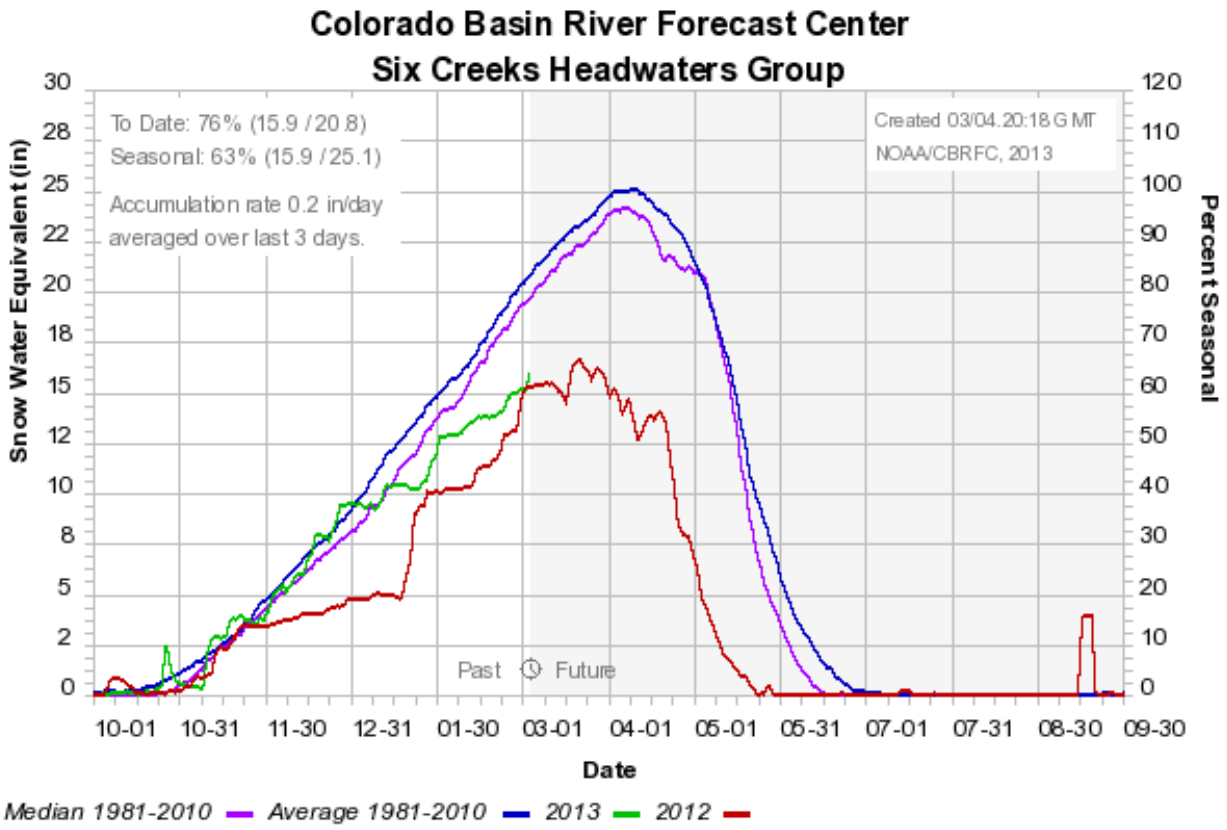




Web Reference: http://www.cbrfc.noaa.gov/station/sweplot/snowgroup.php

Snow:
Six Creeks in Salt Lake County

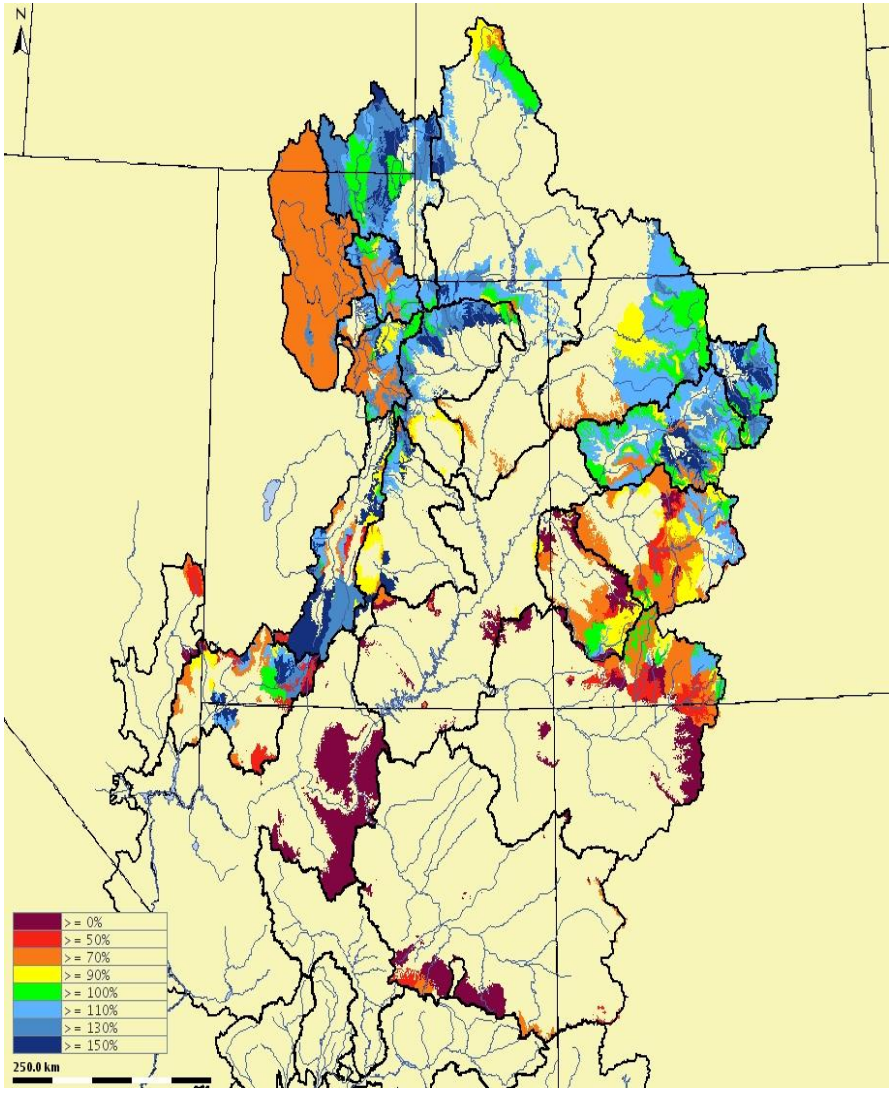




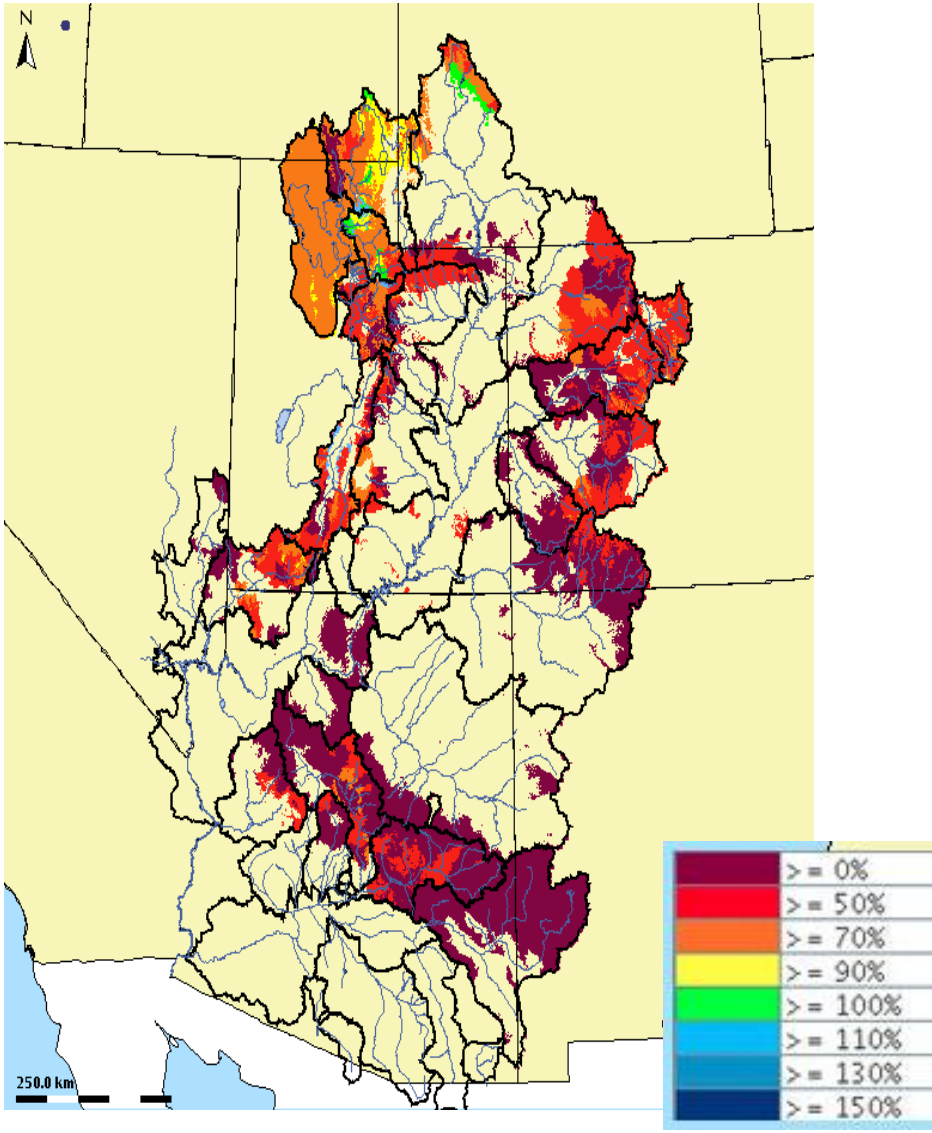
Web Reference: http://www.cbrfc.noaa.gov/station/sweplot/snowgroup.php

Modeled Soil Moisture

December 2011



December 2012



March 1, 2013
Water Supply Forecasts

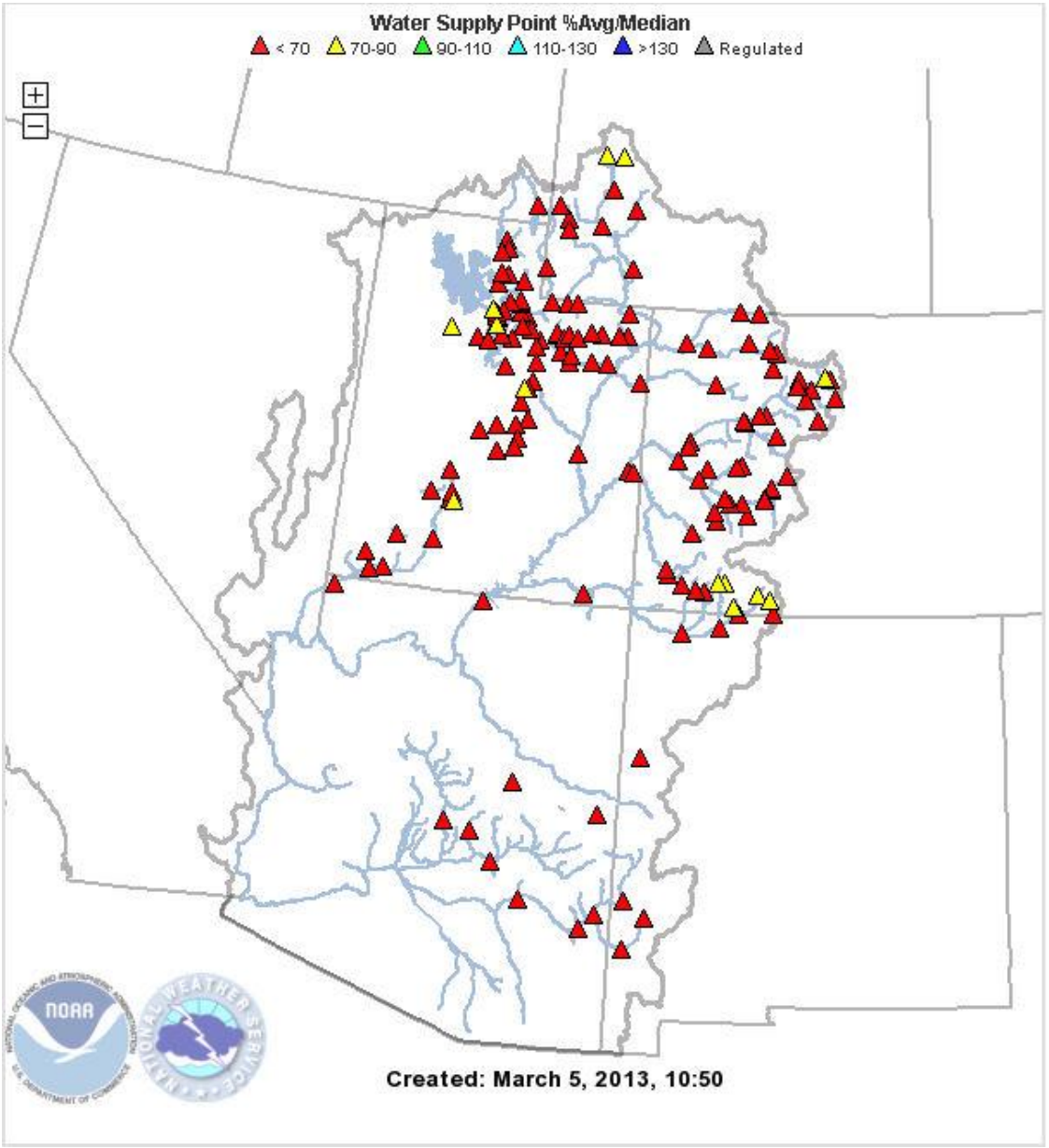
Highlights:
• Below average/median forecasts everywhere

• Major factors:
  • Dry antecedent soil moisture conditions

  •Dry fall (Oct – Nov)

  • Below average snow is widespread

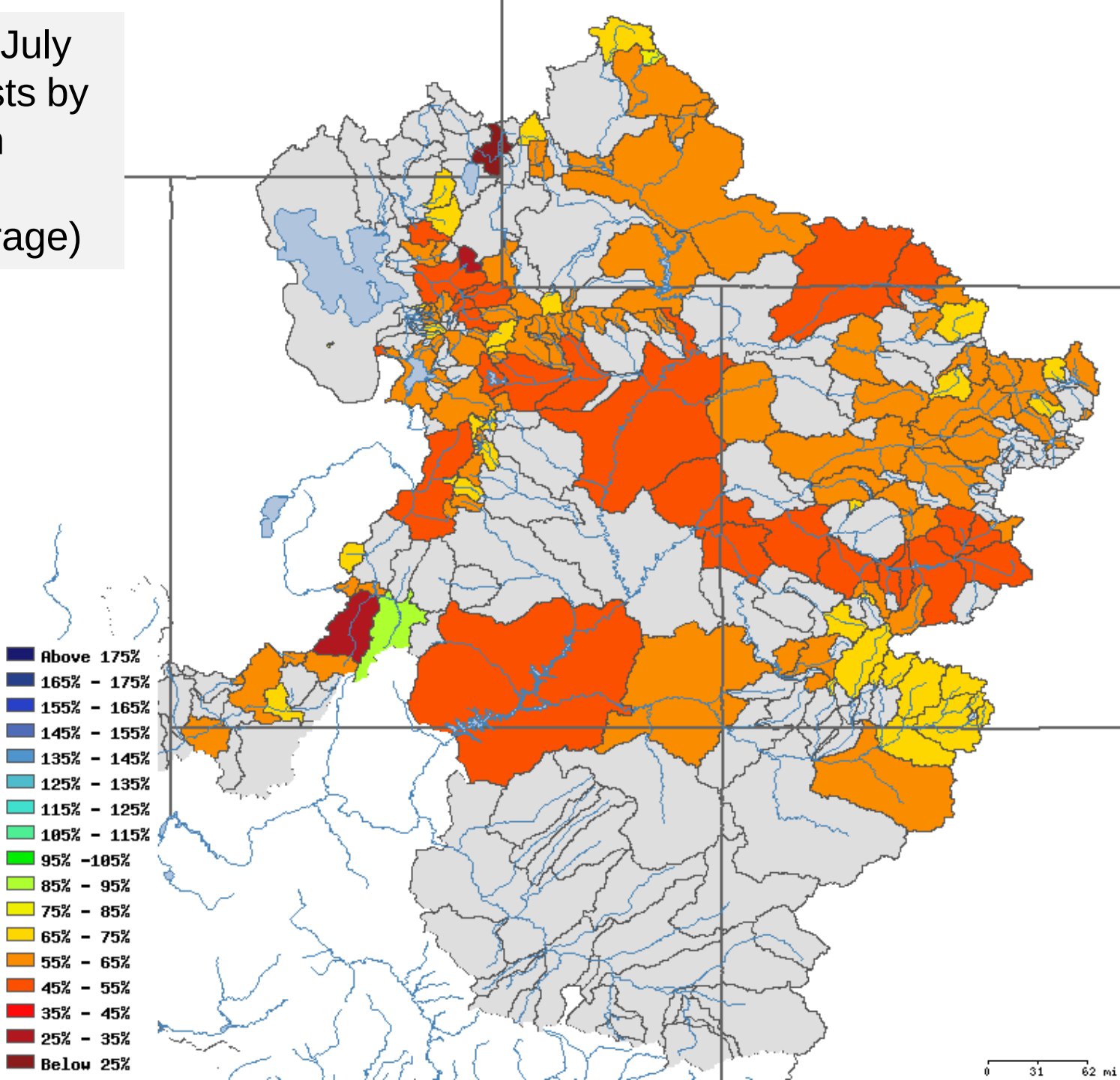
  • General decrease in forecasts since Feb 1st



Web Reference: http://www.cbrfc.noaa.gov/gmap/cmap2.php?con=wsup

March 1st April-July Volume Forecasts by River Basin

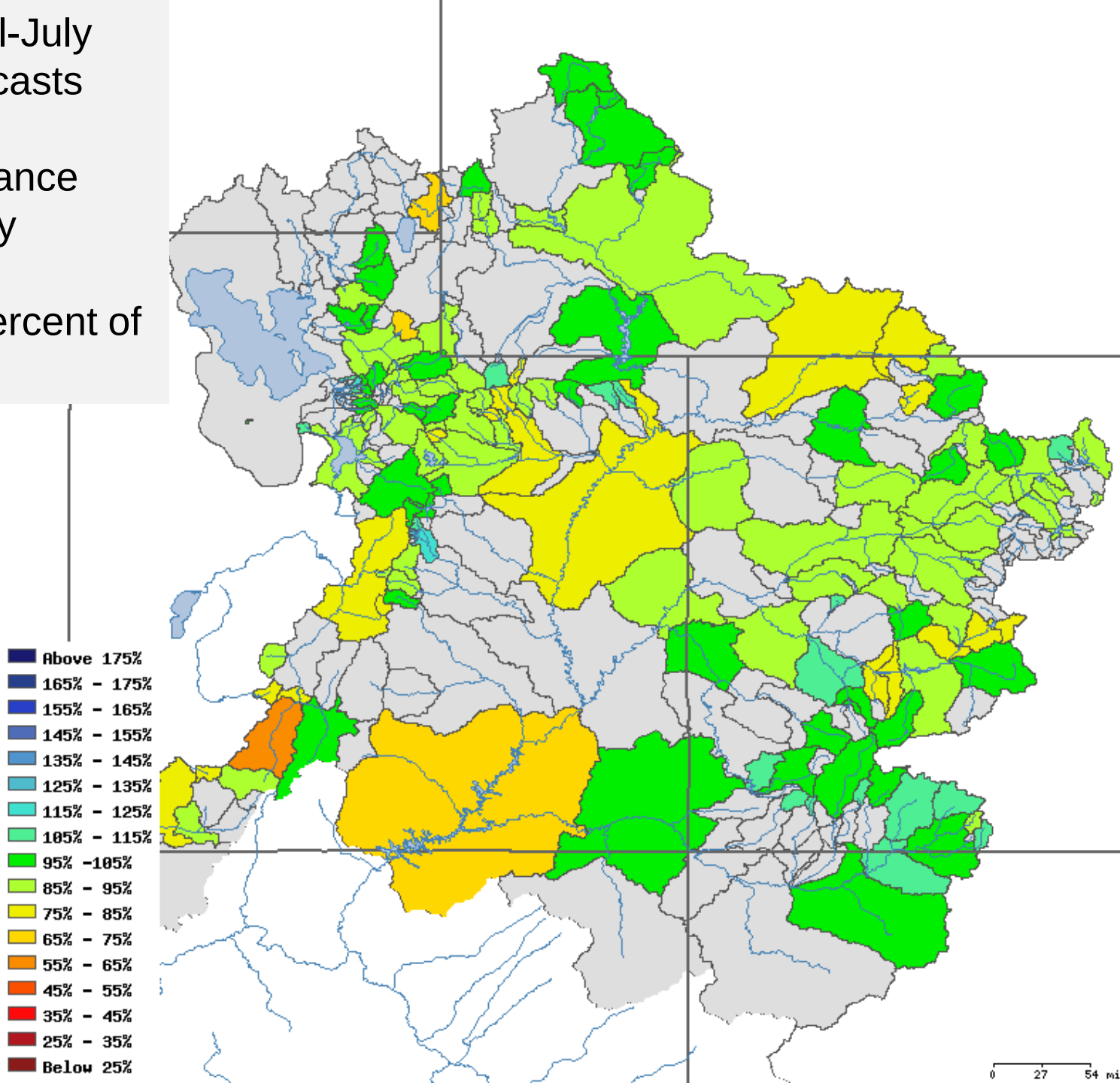
(percent of average)



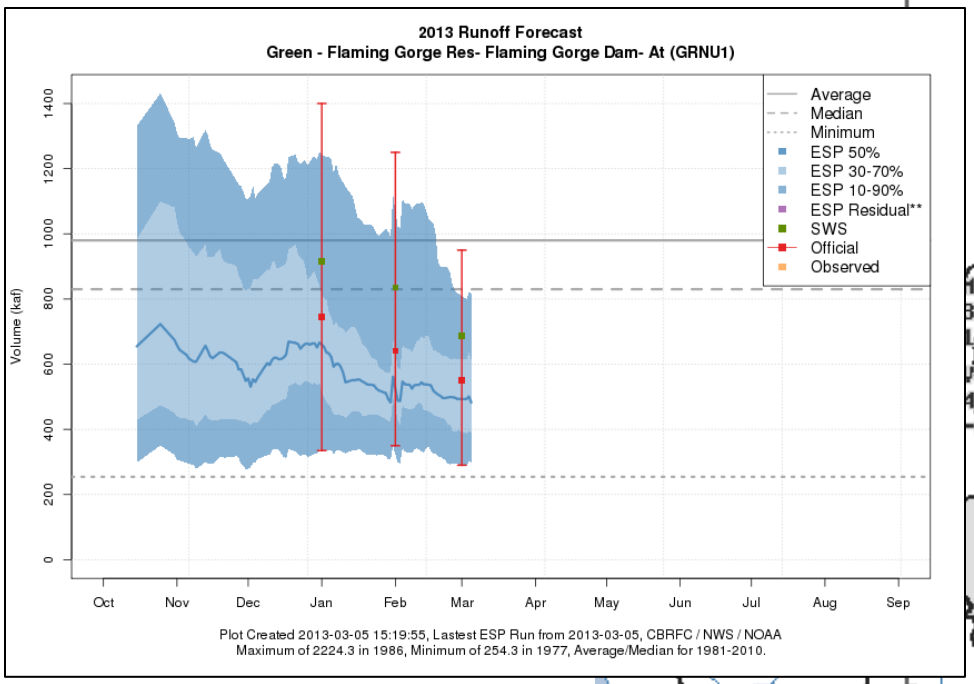
March 1st April-July Volume Forecasts

10% Exceedance Probability

(volumes as a percent of average)

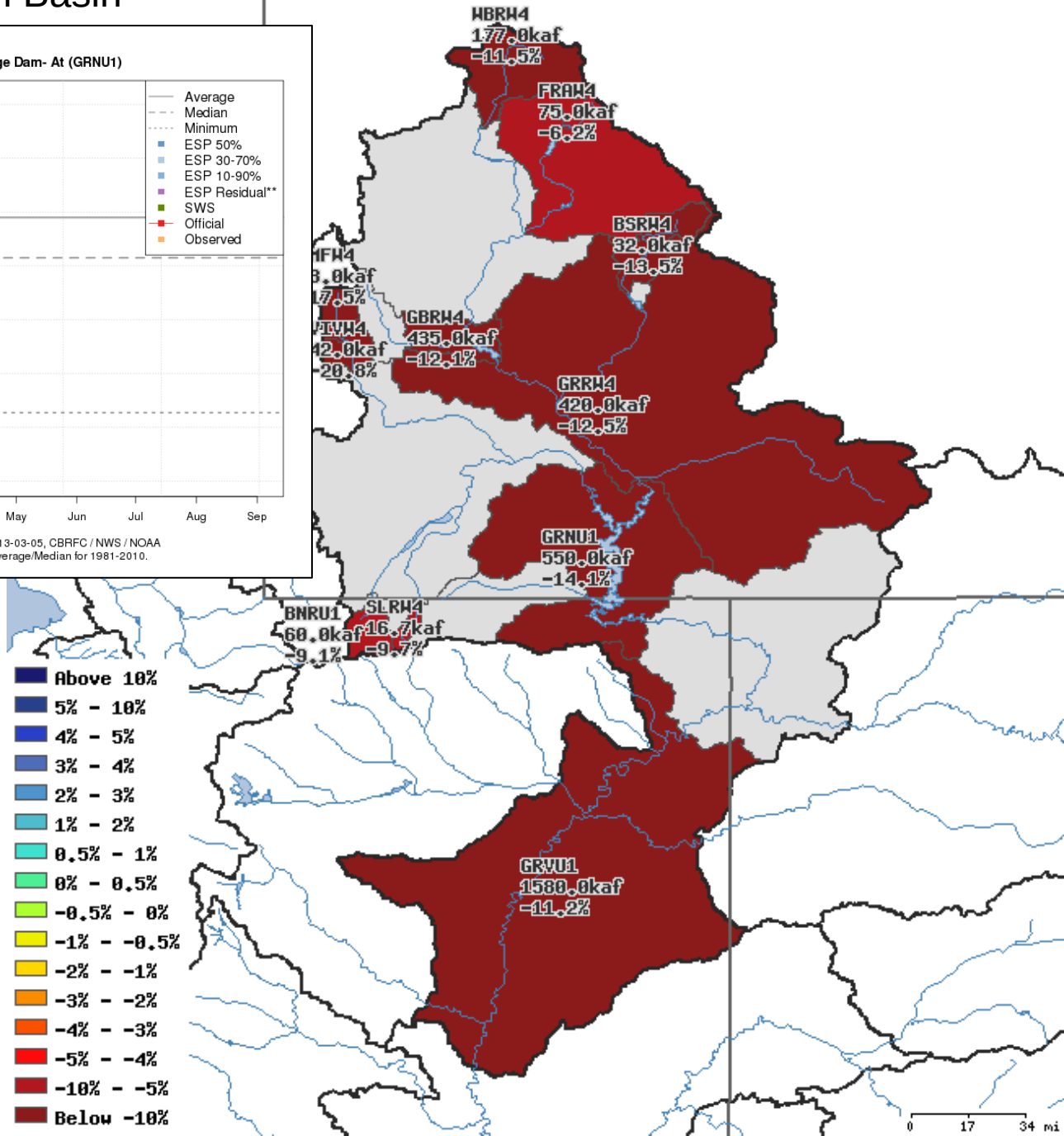


Forecast Trend: Upper Green Basin

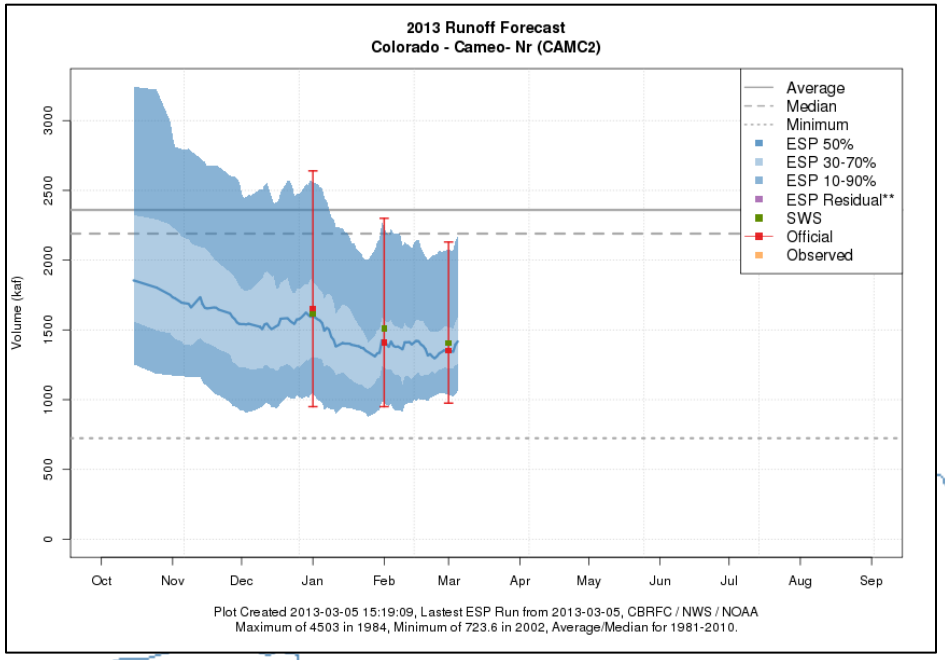


Flaming Gorge:

MIN (90%)	**290 KAF**
MP (50%)	**550 KAF 56% avg**
MAX (10%)	**905 KAF**

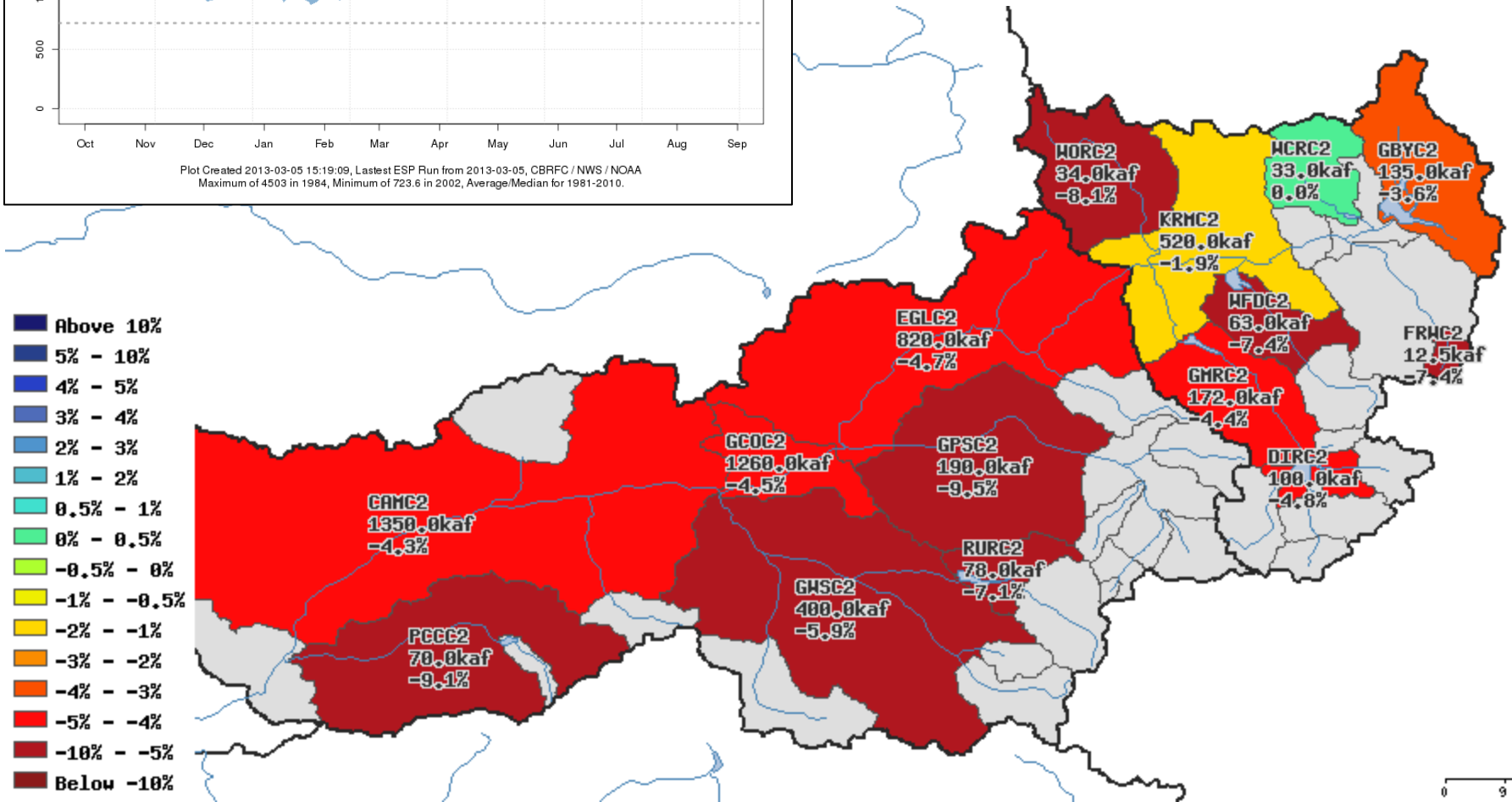


Forecast Trend: Colorado Mainstem



Colorado - Cameo:

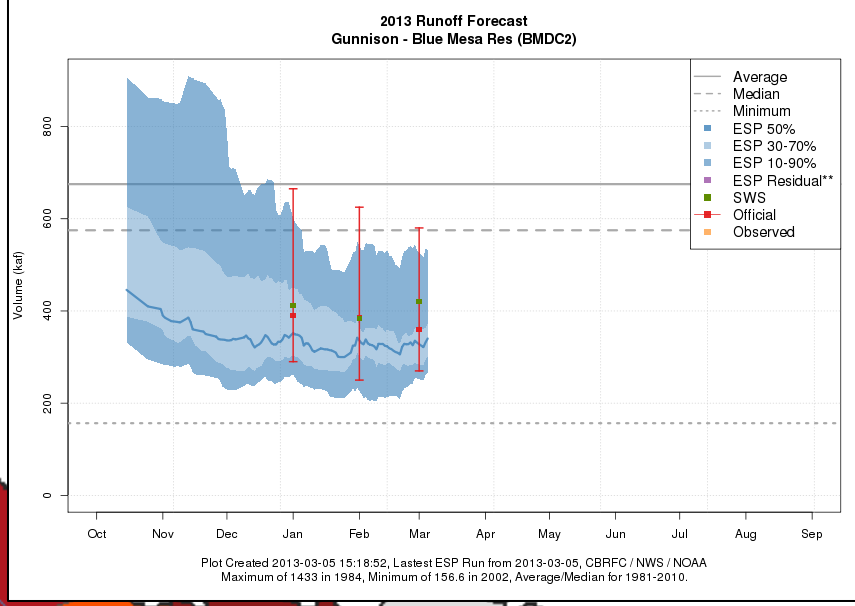
MIN (90%) 975 KAF
MP (50%) 1350 KAF 57% avg
MAX (10%) 2130 KAF

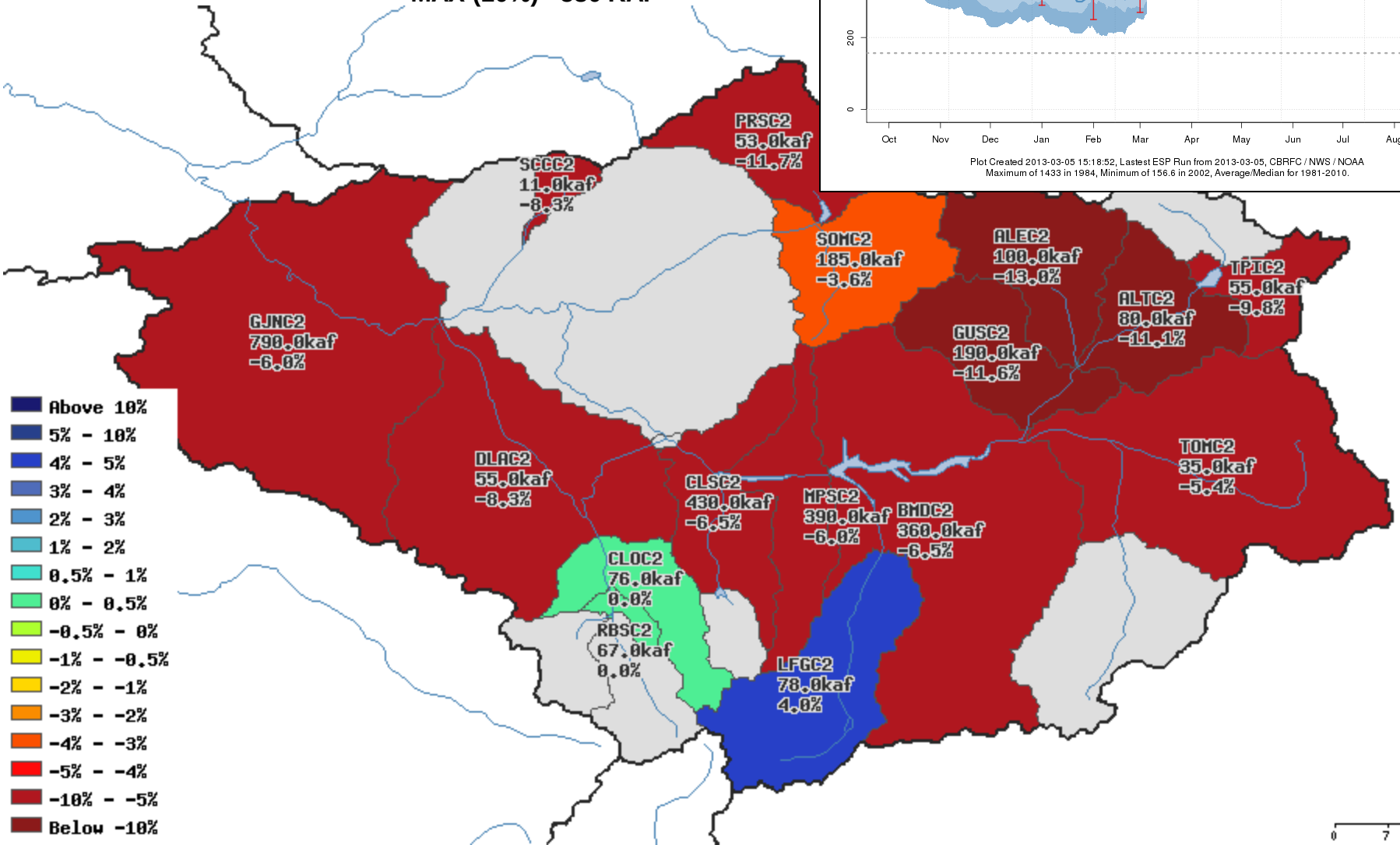


Forecast Trend: Gunnison Basin

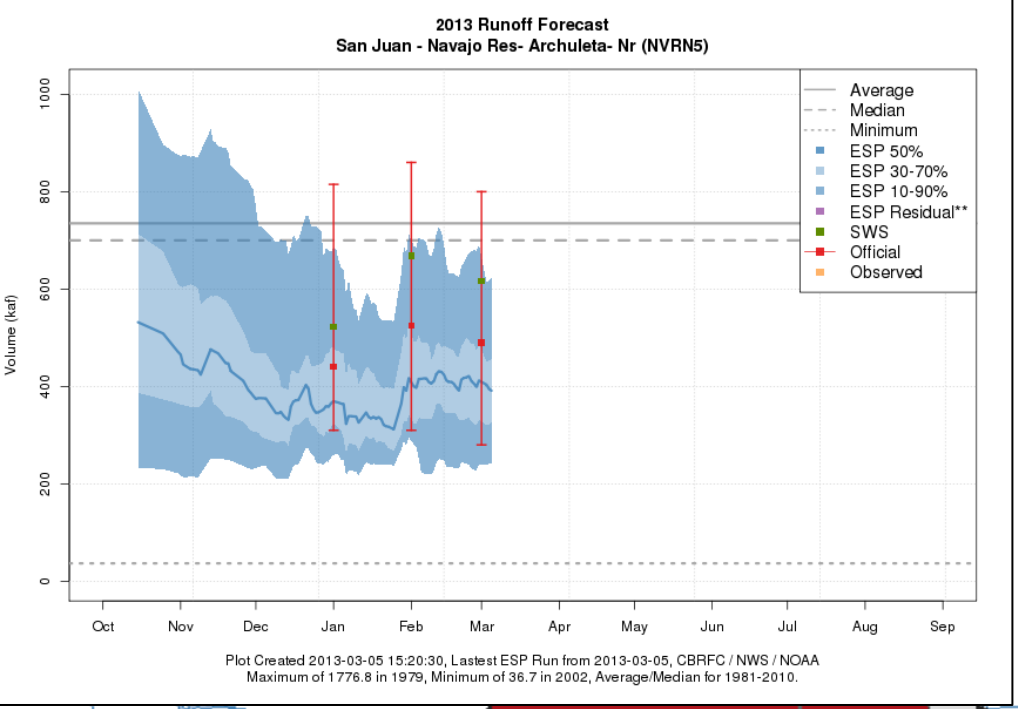
Gunnison – Blue Mesa:

MIN (90%) 270 KAF
MP (50%) 360 KAF 50% avg
MAX (10%) 580 KAF



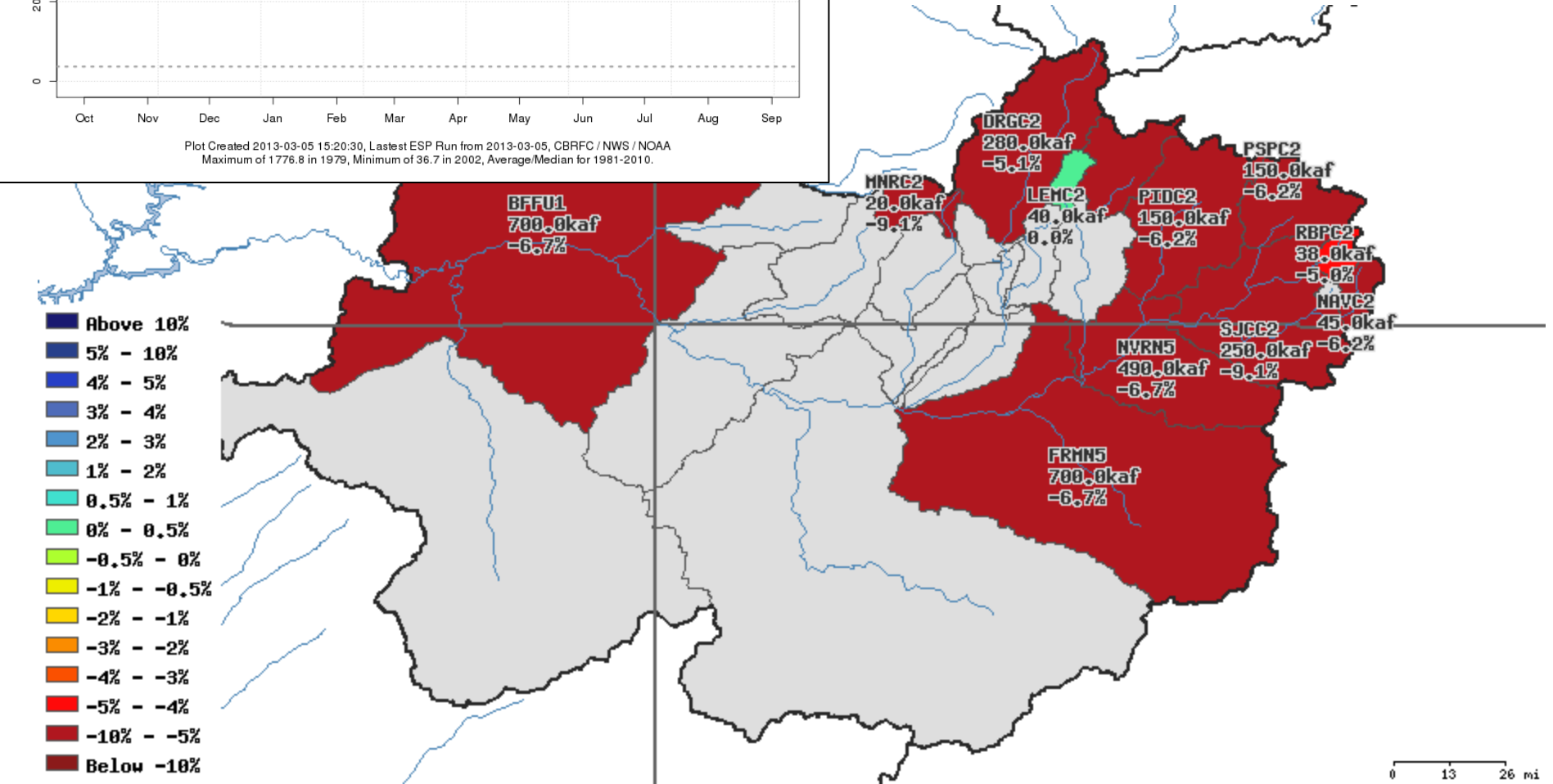


Forecast Trend: San Juan Basin



Navajo Reservoir:

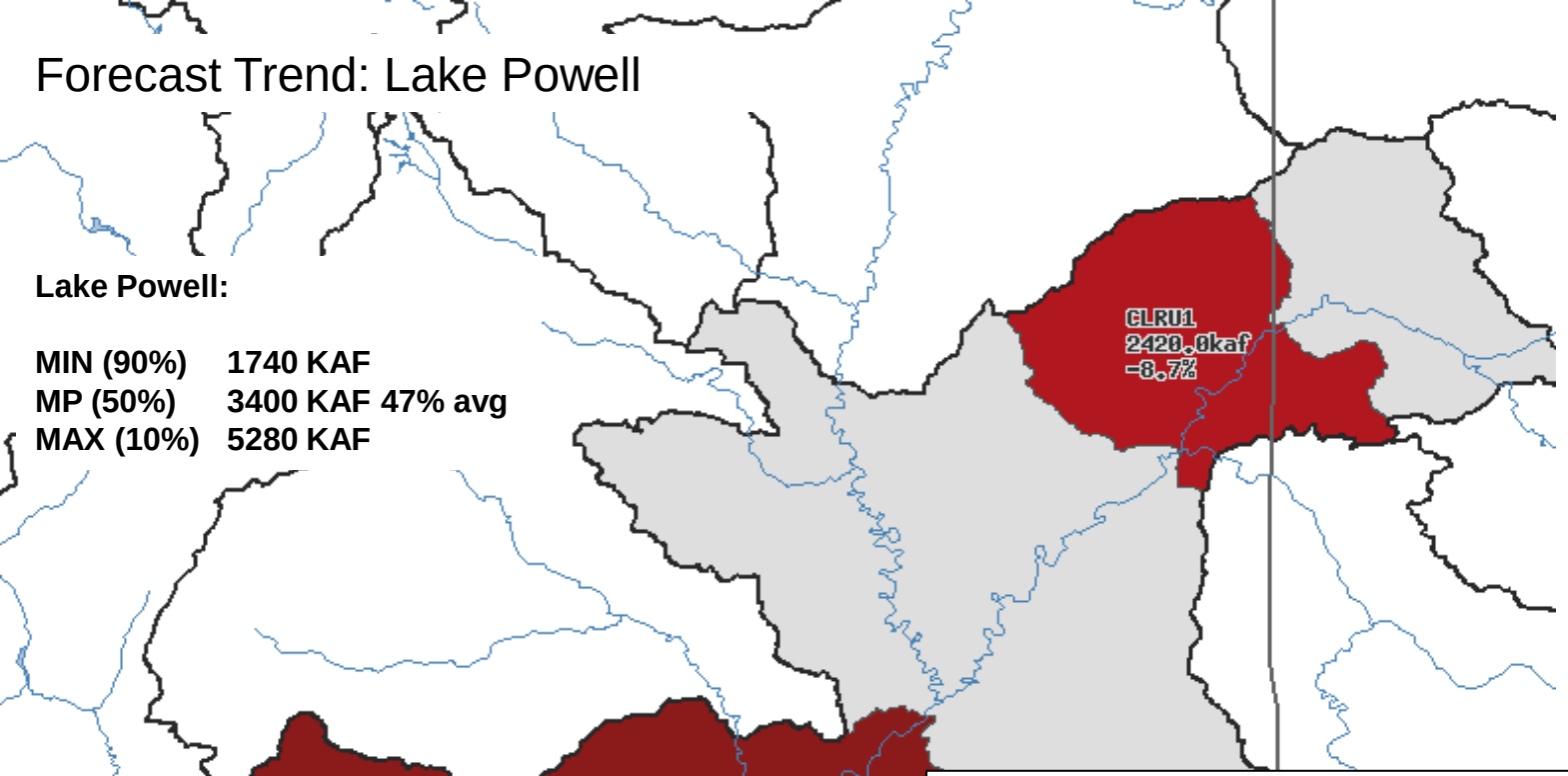
MIN (90%)	**280 KAF**
MP (50%)	**490 KAF 56% avg**
MAX (10%)	**800 KAF**

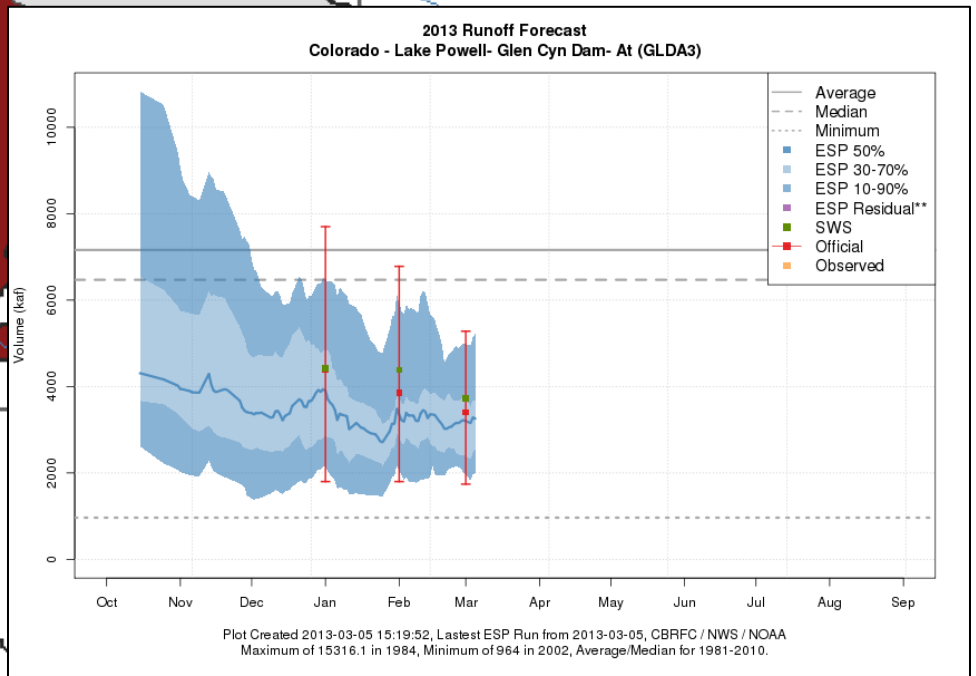


Forecast Trend: Lake Powell

Lake Powell:

MIN (90%)	**1740 KAF**	
MP (50%)	**3400 KAF**	**47% avg**
MAX (10%)	**5280 KAF**	

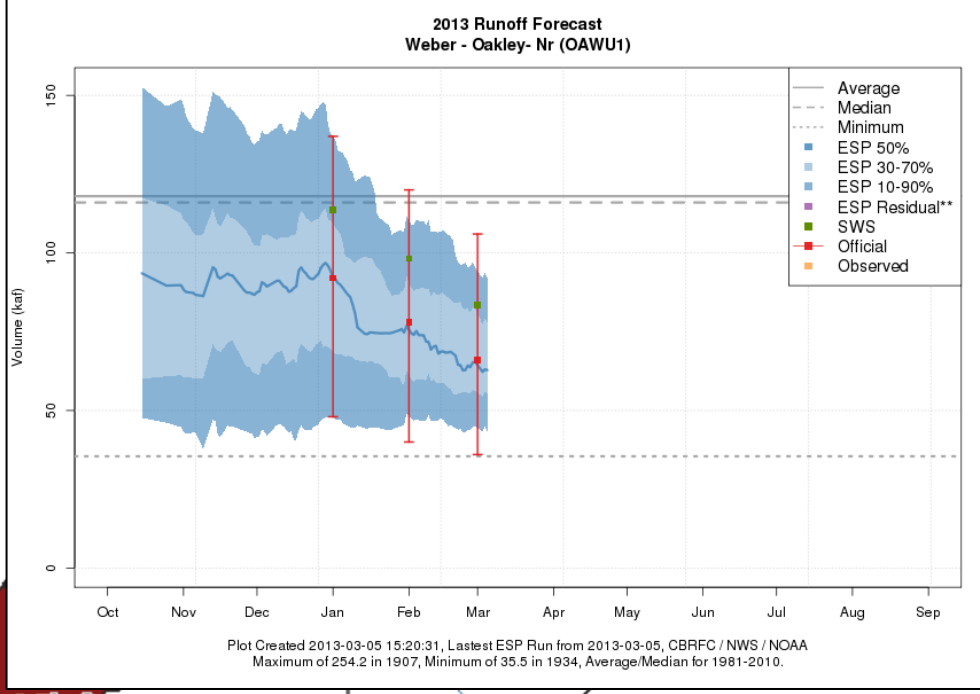


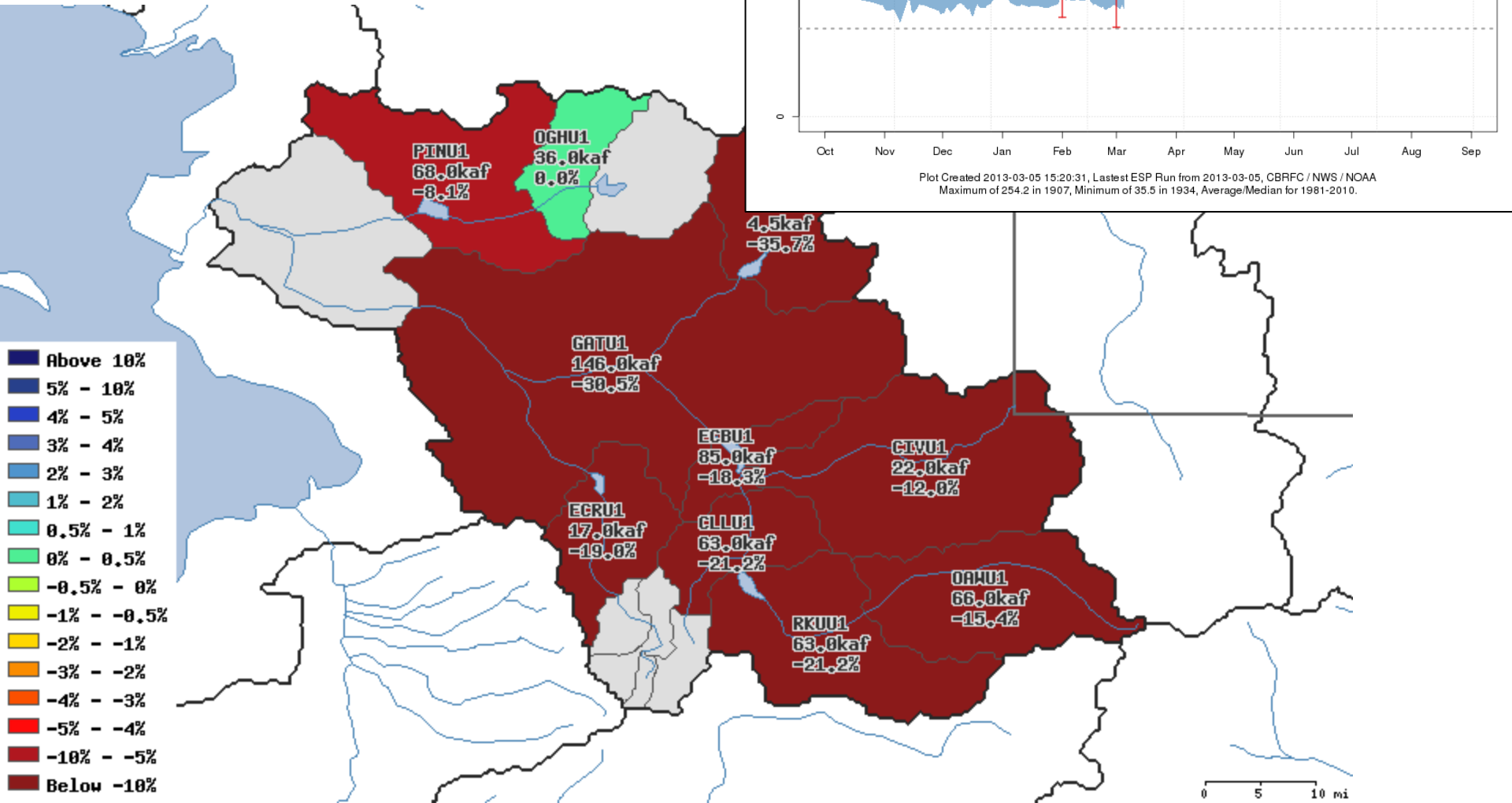


Forecast Trend: Weber Basin

Weber - Oakley:

MIN (90%) 36 KAF
MP (50%) 66 KAF 56% avg
MAX (10%) 106 KAF

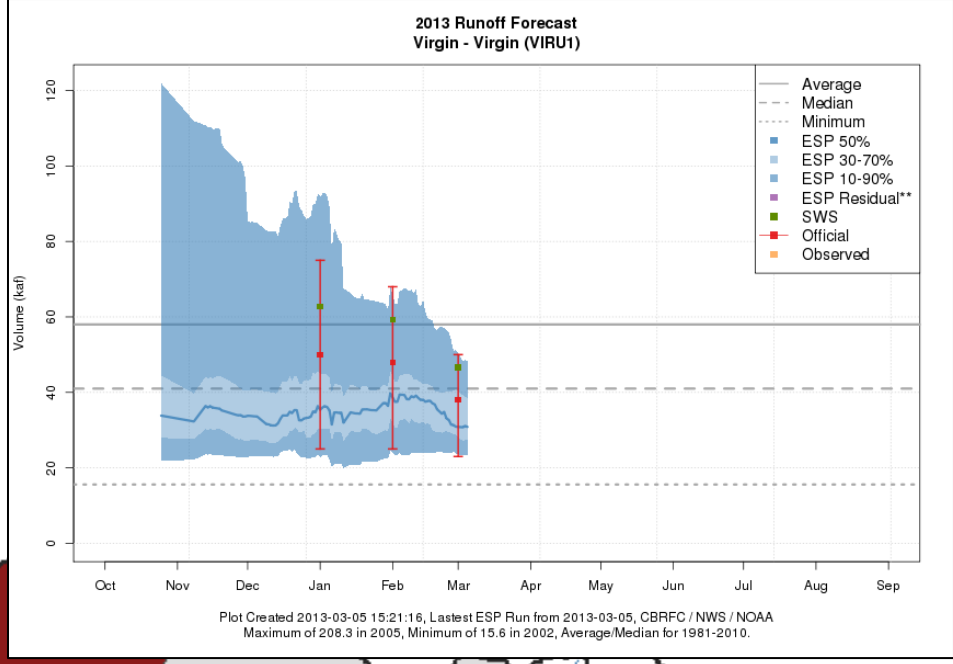


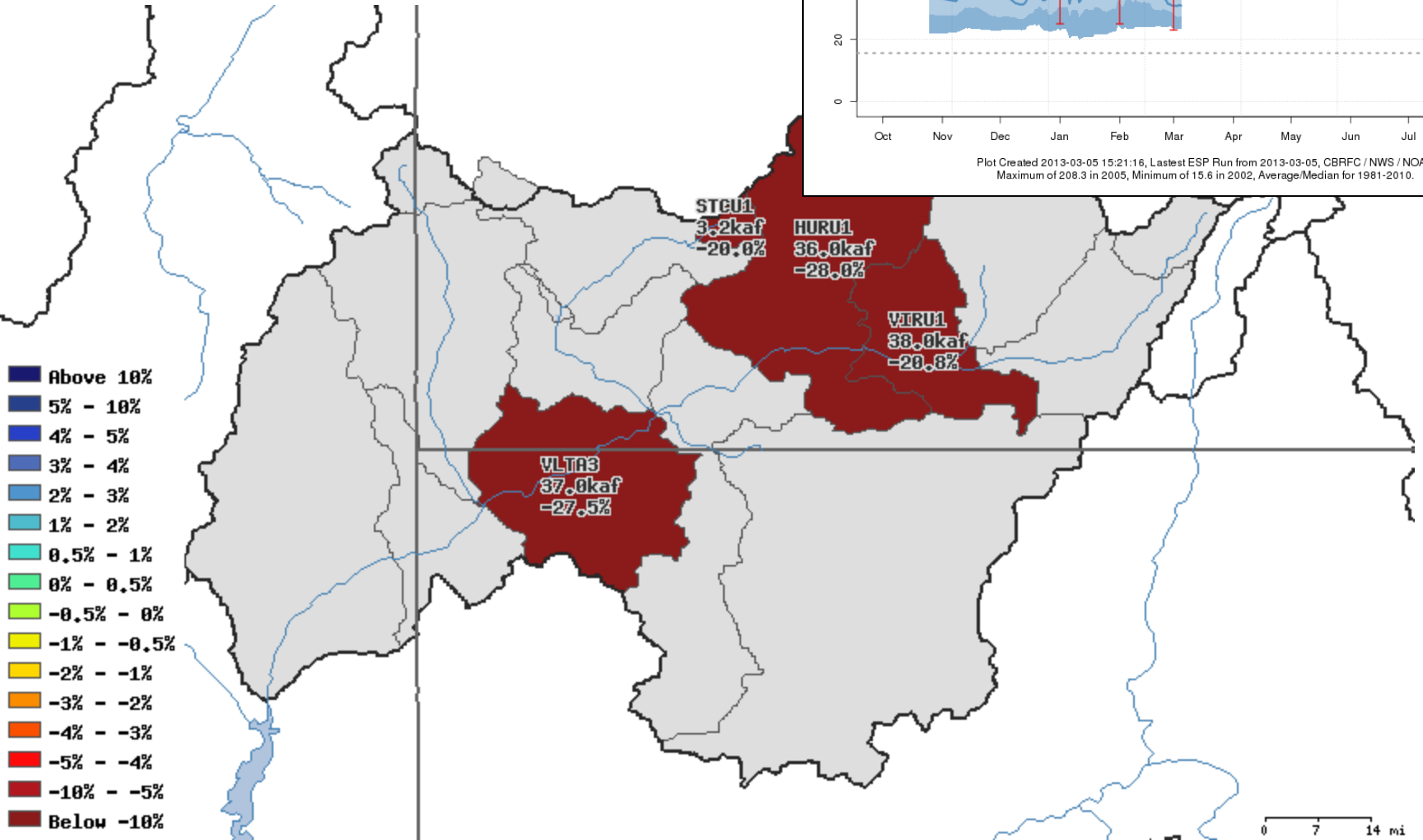


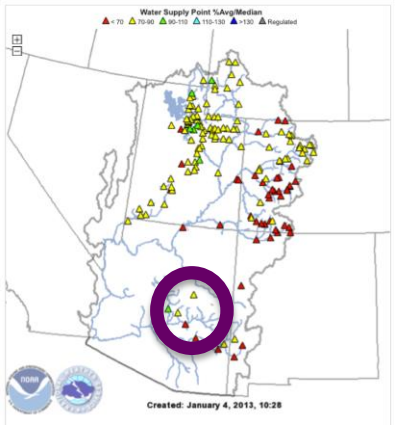
Forecast Trend: Virgin River Basin

Virgin - Virgin:

MIN (90%)	**23 KAF**
MP (50%)	**38 KAF 66% avg**
MAX (10%)	**50 KAF**



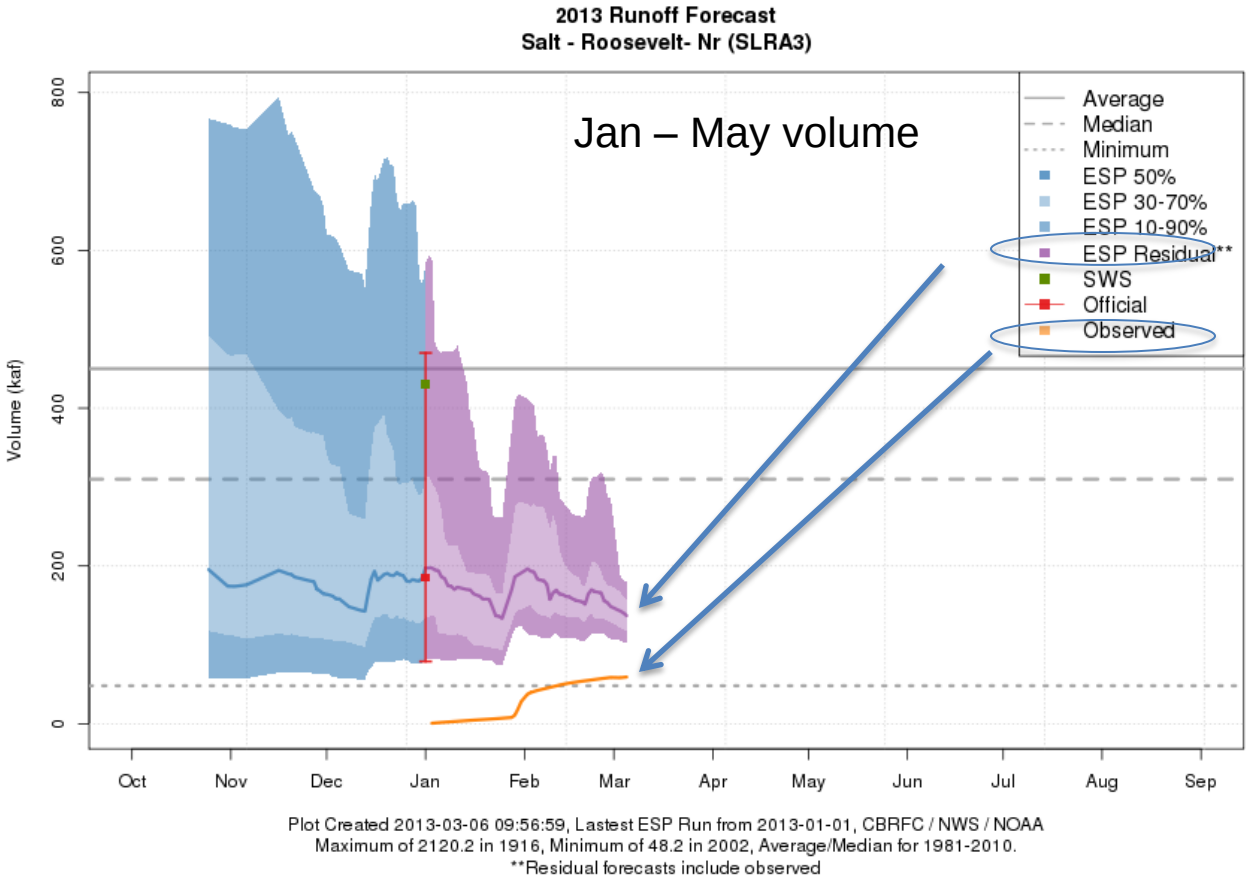




Mar – May volume

Salt - Roosevelt Nr
SLRA3

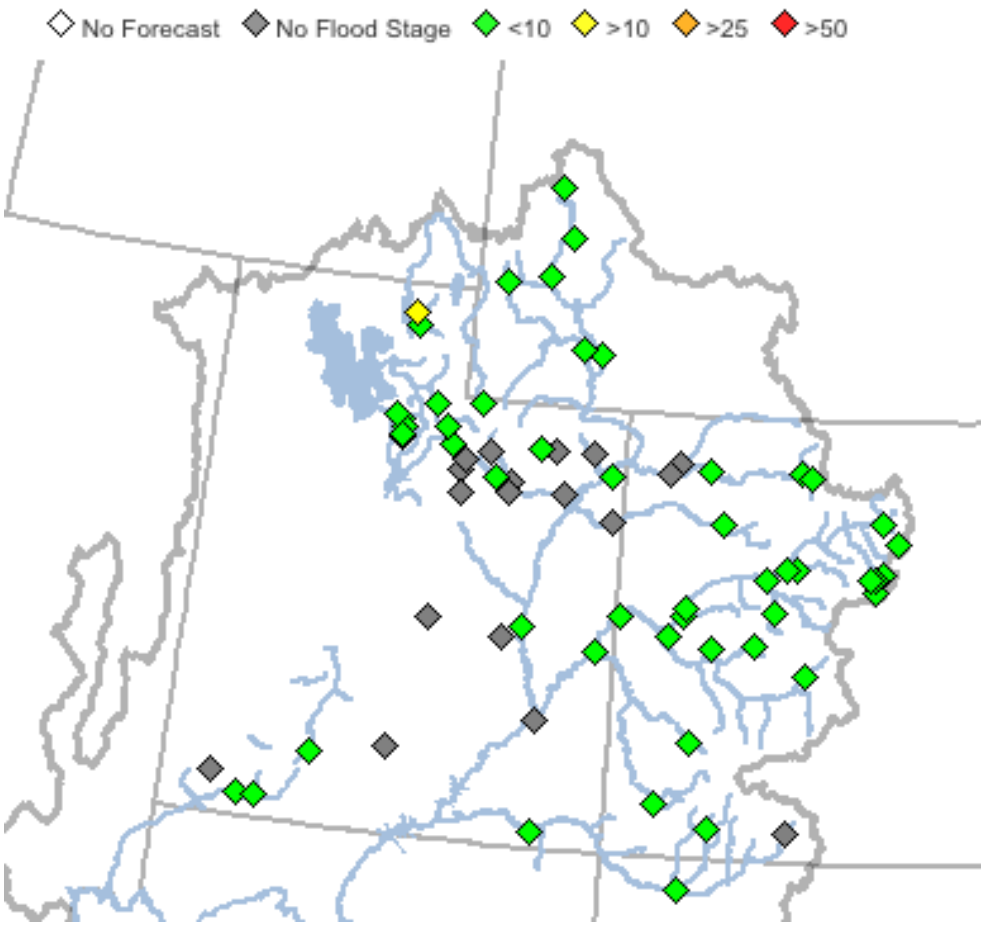
Official Forecast Date:	2013-03-01
Official Min (90%):	43 kaf
Official MP (50%):	80 kaf
Official Max (10%):	120 kaf
Official Percent Avg:	33%
Official Percent Med:	26%
Average:	240 kaf
Median:	310 kaf
ESP Min (90%):	44 kaf
ESP Min (70%):	59 kaf
ESP MP (50%):	78 kaf
ESP Min (30%):	98 kaf
ESP Max (10%):	121 kaf
ESP Percent Average:	17%
ESP Percent Median:	25%
ESP Date:	2013-03-05



Web Reference: http://www.cbrfc.noaa.gov/gmap/cmap2.php?con=wsup

Peak Flow Forecast Synopsis

- All 50% forecasts (much) below flood stages
- Many Sites have only a 10% chance of reaching historical average peaks.
- Forecasts should be available later today or tomorrow at the latest



Example of 2012 Map

Peak Flow – Spring Weather Is Important

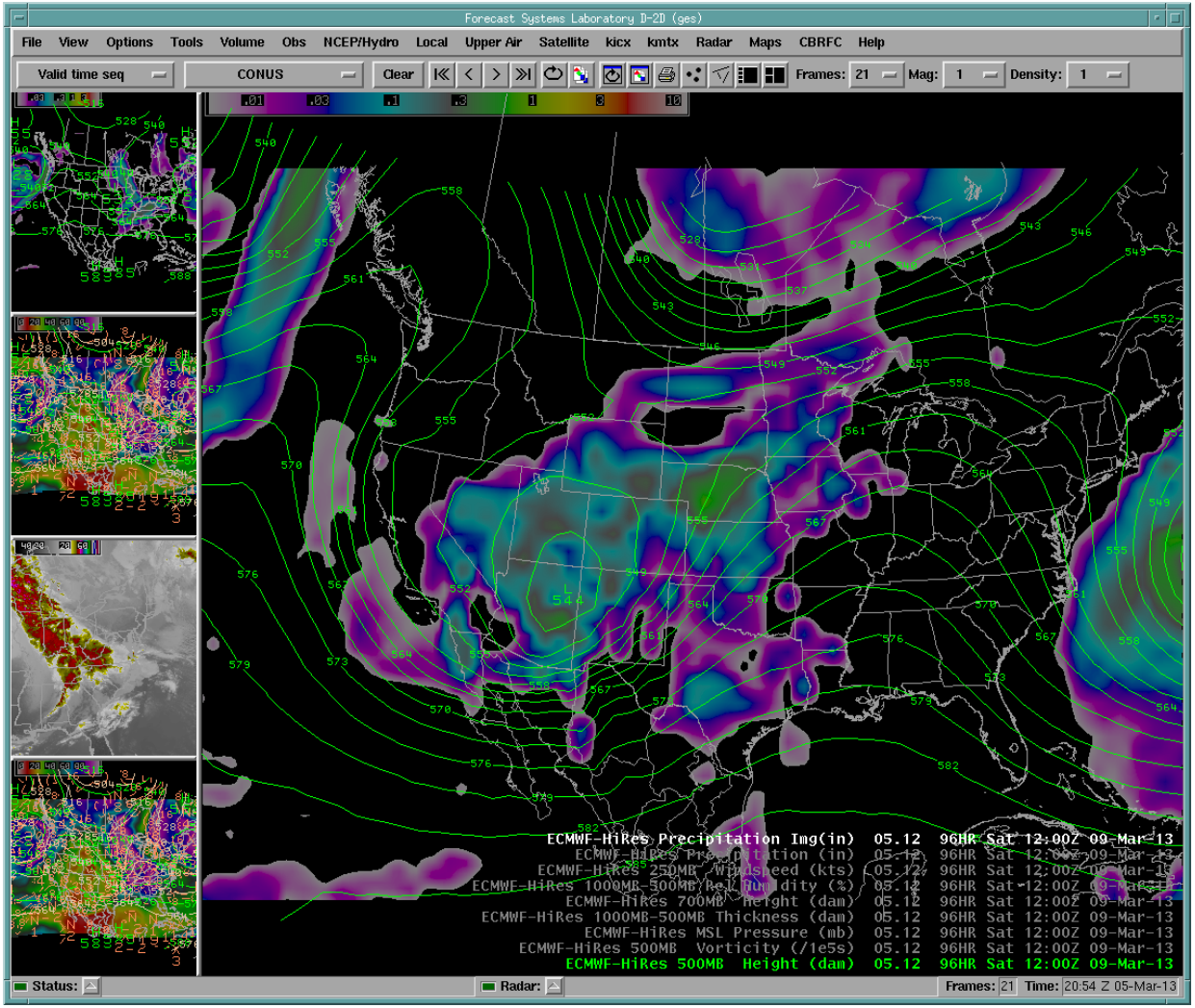
- Runoff characteristics are largely determined by the day-to-day spring weather.
  - While large snow pack years increase chances for flooding, it is not an inevitability
  - Small snow pack years can flood with the right sequence of spring temperatures
  - Rain during peak melt is a wildcard

Upcoming Weather – Short Term

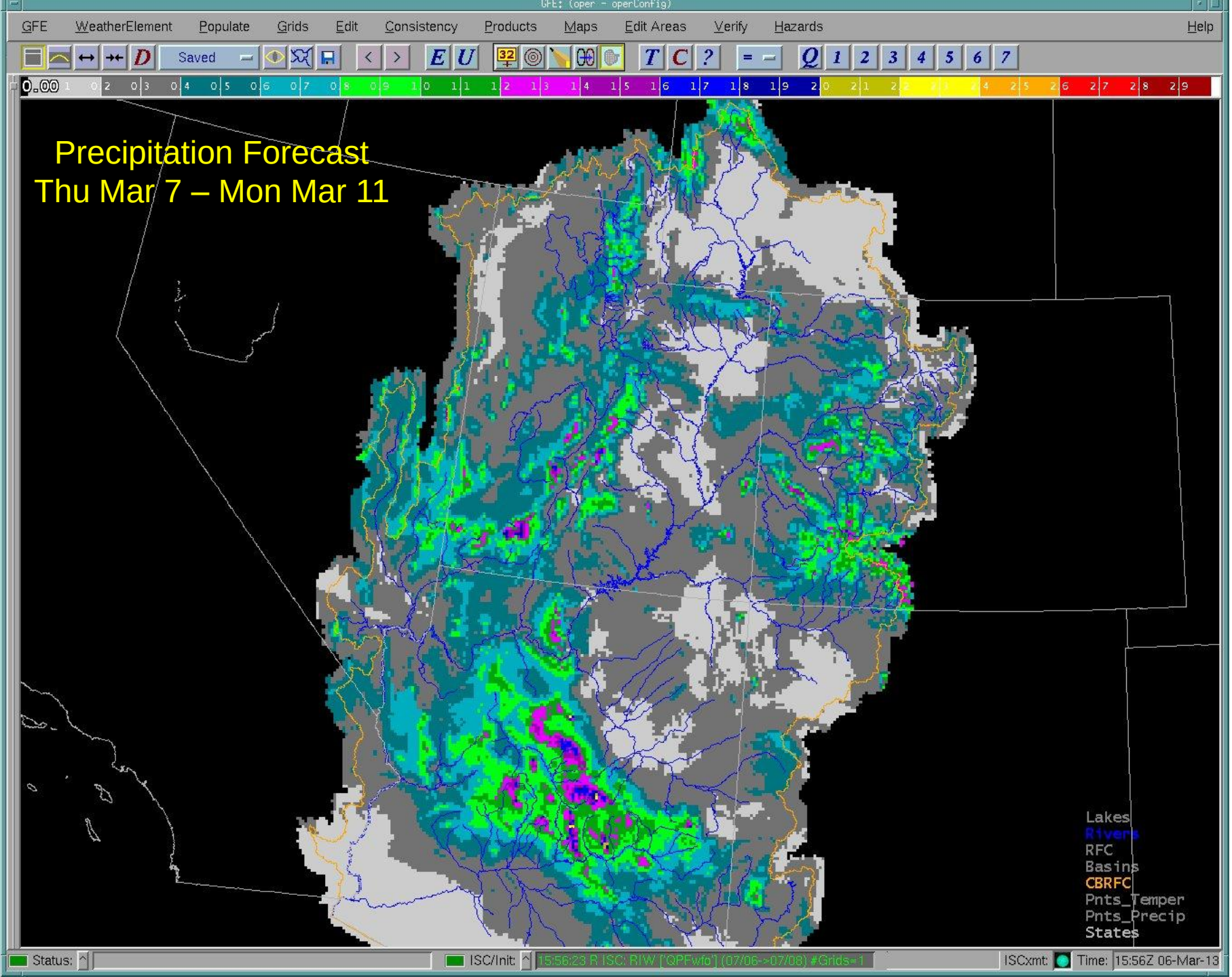
- Large low pressure system moves across the area during the Thu-Mon time frame.

- Widespread precipitation likely during this period. Some areas may see significant precipitation.

- Favored areas for precipitation at this time appear to be Southern Utah, Arizona, and southwest Colorado.



Web Reference: www.hpc.noaa.gov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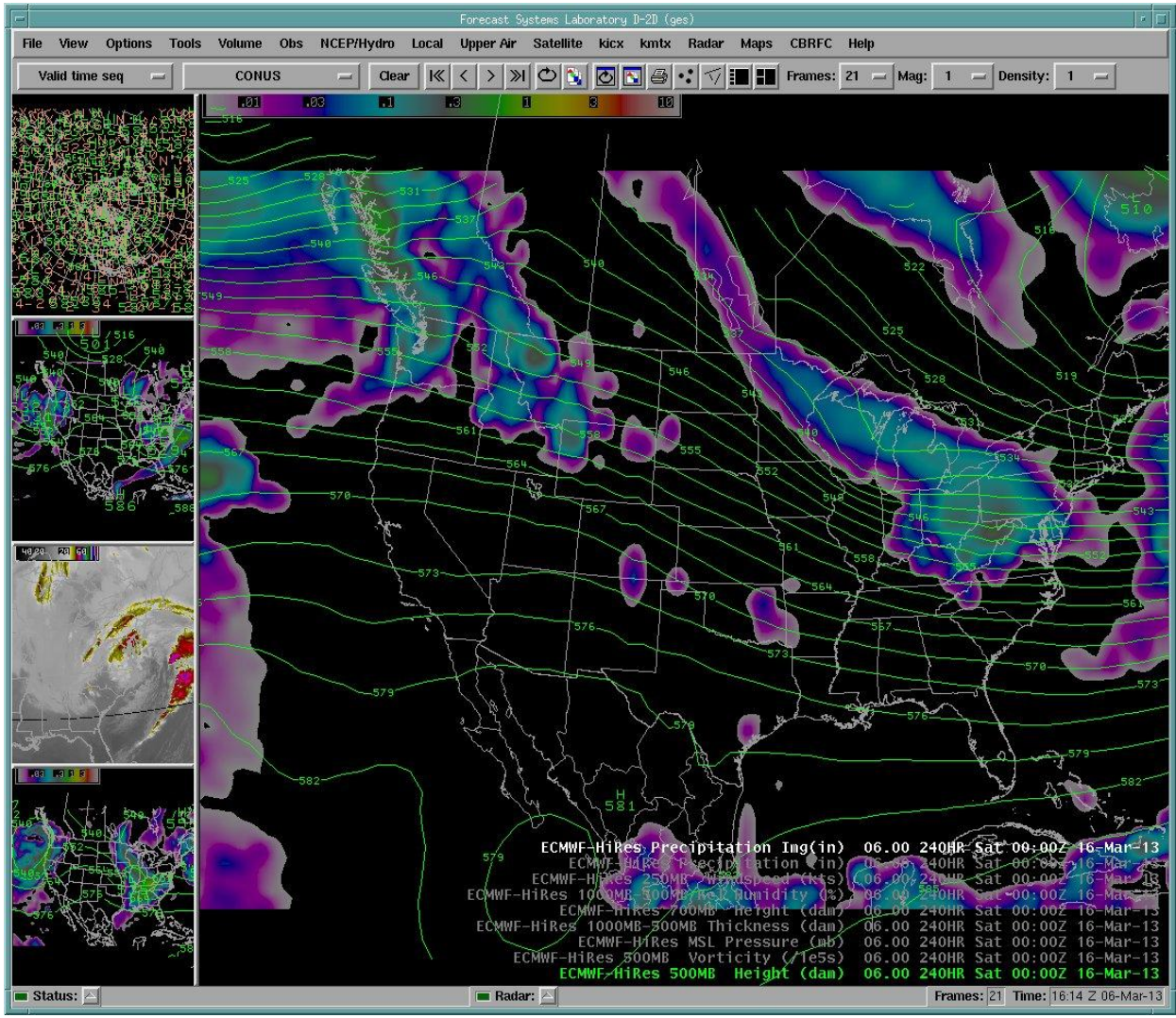
GFE
WeatherElement
Populate
Grids
Edit
Consistency
Products
Maps
Edit Areas
Verify
Hazards
Help
Saved
0.00
Precipitation Forecast
Thu Mar 7 – Mon Mar 11
Lakes
Rivers
RFC
Basins
CBRFC
Pnts_Temper
Pnts_Precip
States
Status:
ISC/Init:
ISCxmt:
Time: 15:56Z 06-Mar-13

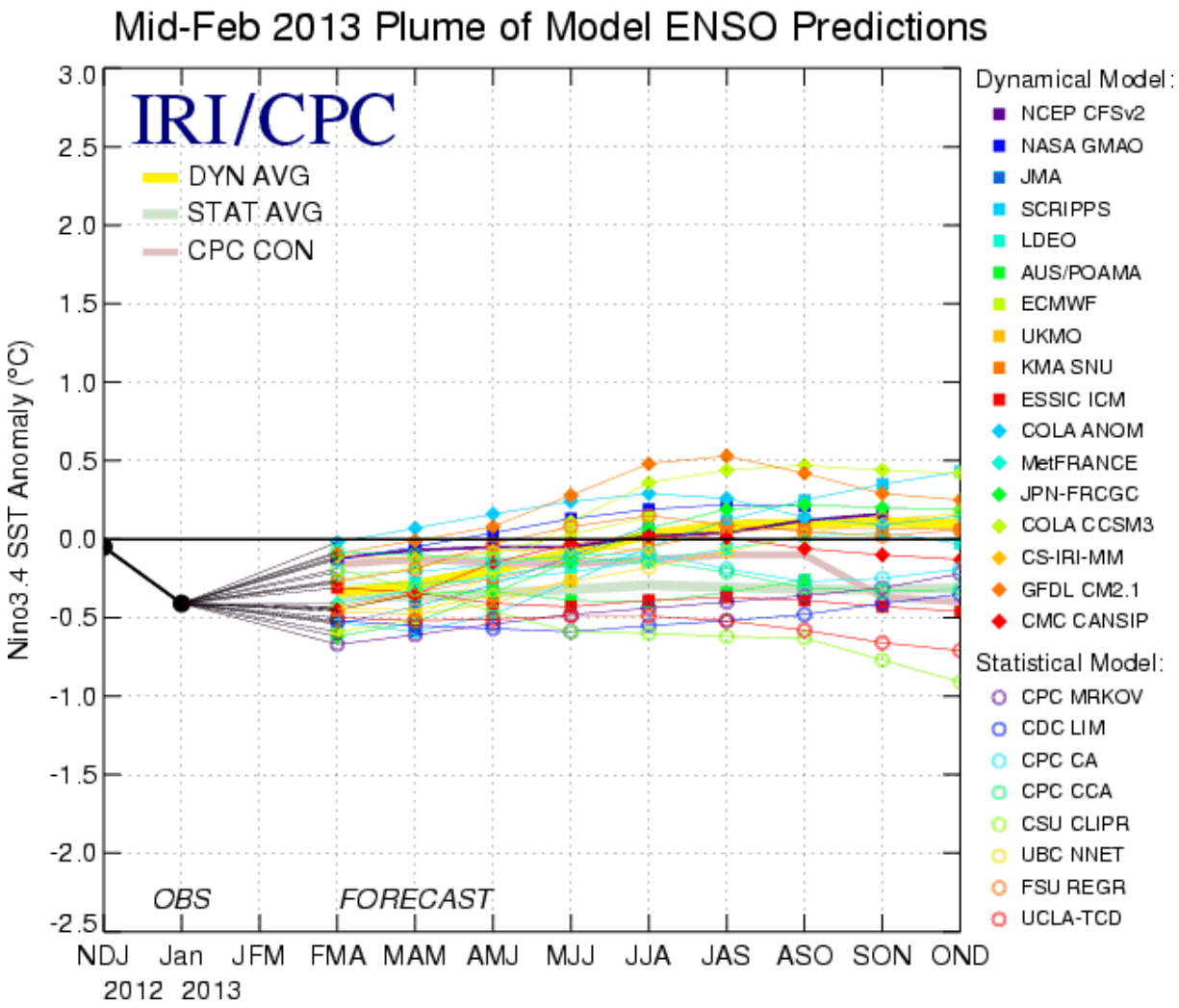
Upcoming Weather – Extended

- A period of dry and warmer weather next week as temporary high pressure builds into the area.
- The upper air pattern becomes more westerly by the middle of March.
- Light precipitation over the far northern areas at best in this pattern



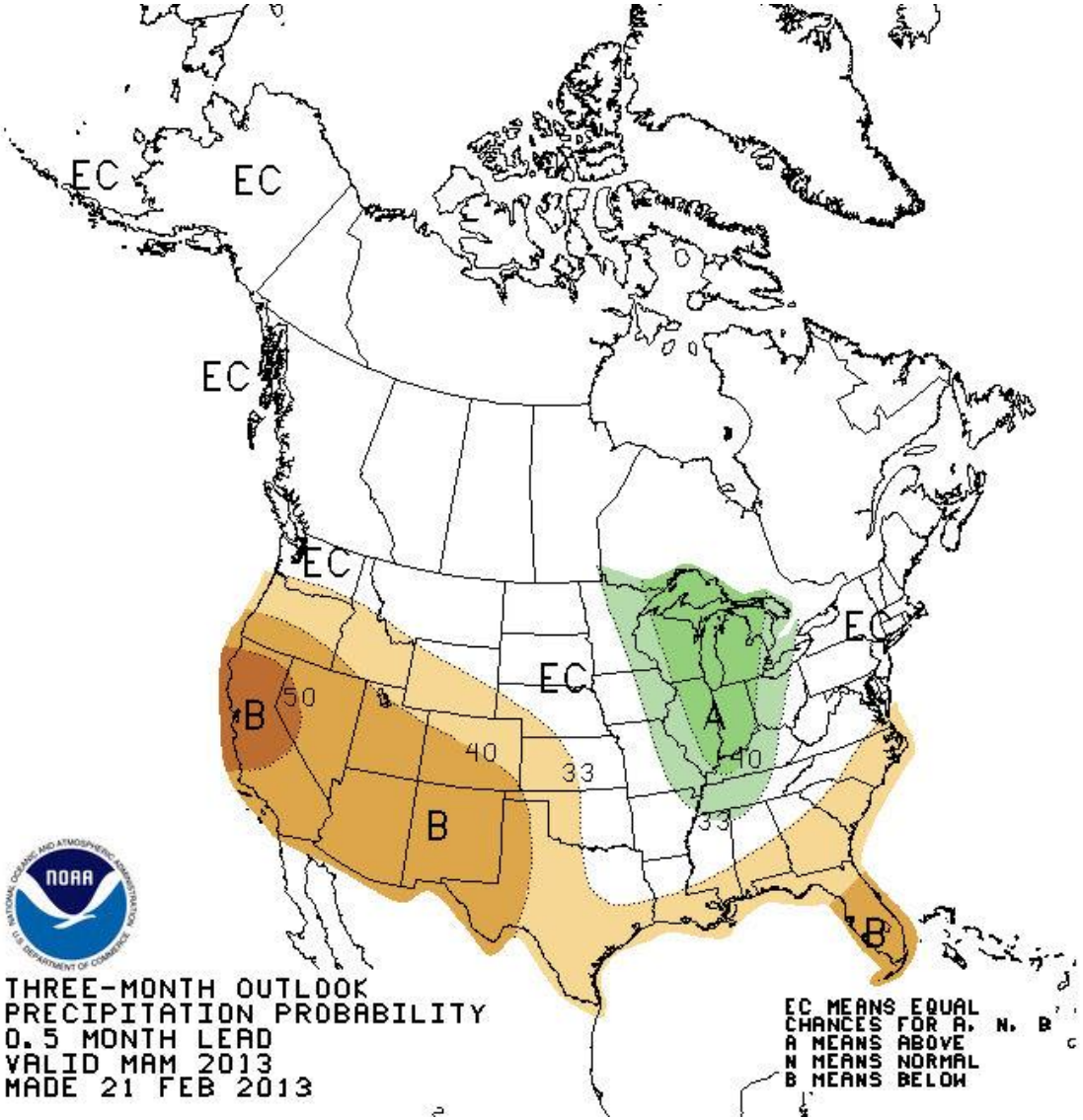
Web Reference: www.hpc.noaa.gov

ENSO Update: Neutral Conditions through summer

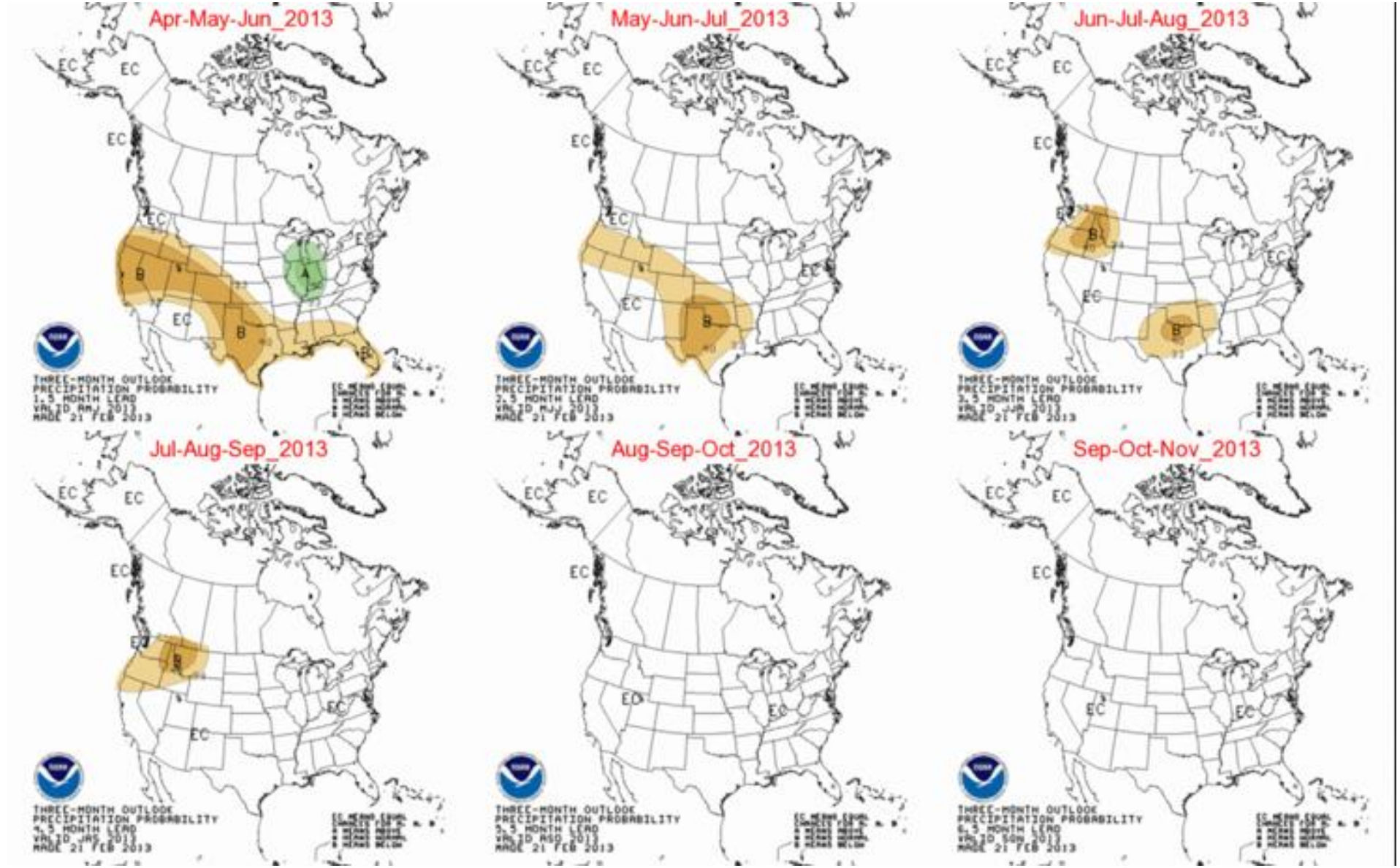


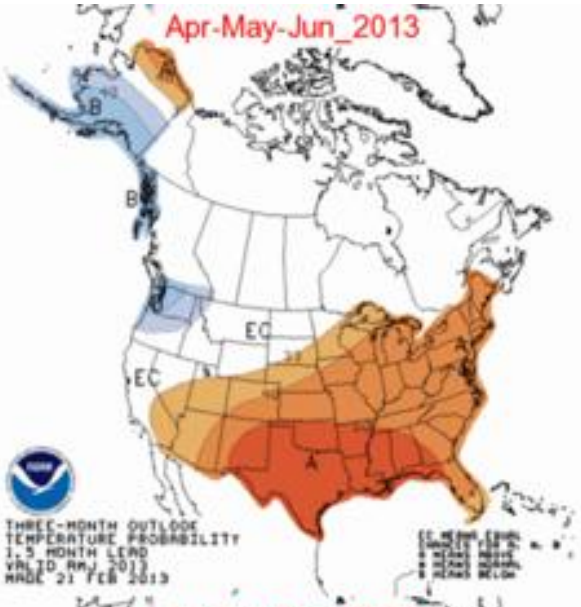
Web Reference: http://www.cpc.noaa.gov and iri.columbia.edu/climate/ENSO

Seasonal Outlook: March – May 2013



Web Reference: www.cpc.ncep.noaa.gov


Apr-May-Jun_2013
May-Jun-Jul_2013
Jun-Jul-Aug_2013
Jul-Aug-Sep_2013
Aug-Sep-Oct_2013
Sep-Oct-Nov_2013
EC
A
B
THREE-MONTH OUTLOOK
PRECIPITATION PROBABILITY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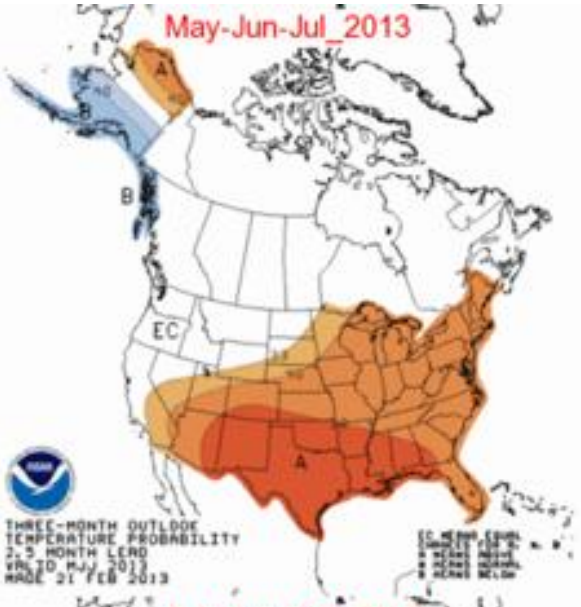
THREE-MONTH OUTLOOK
TEMPERATURE PROBABILITY
1.5 MONTH LEAD
VALID MAY 2013
MADE 21 FEB 2013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TEMPERATURE PROBABILITY
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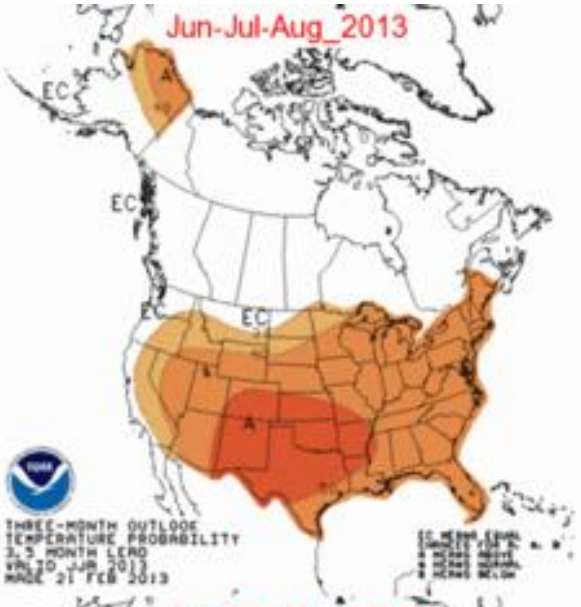
VALID MAY 2013
MADE 21 FEB 2013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TEMPERATURE PROBABILITY
3.5 MONTH LEAD
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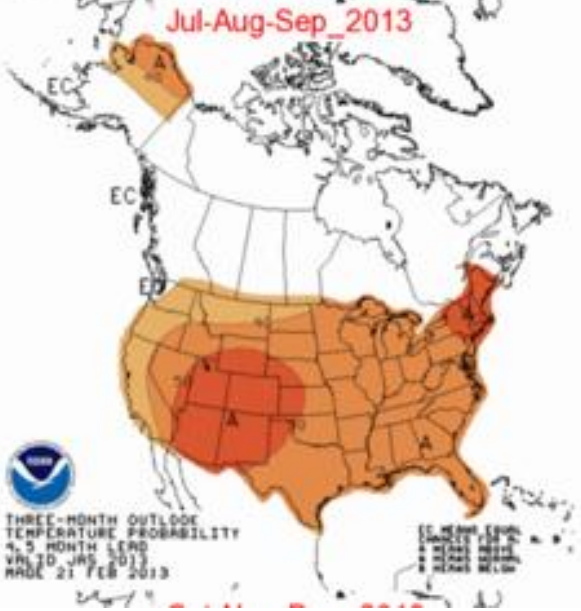
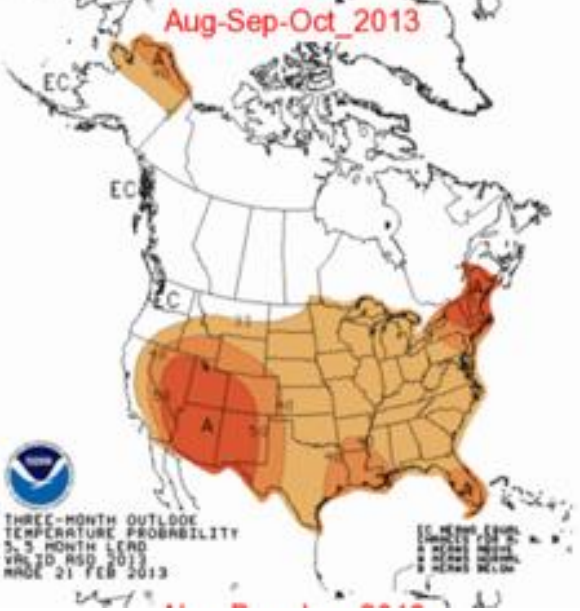
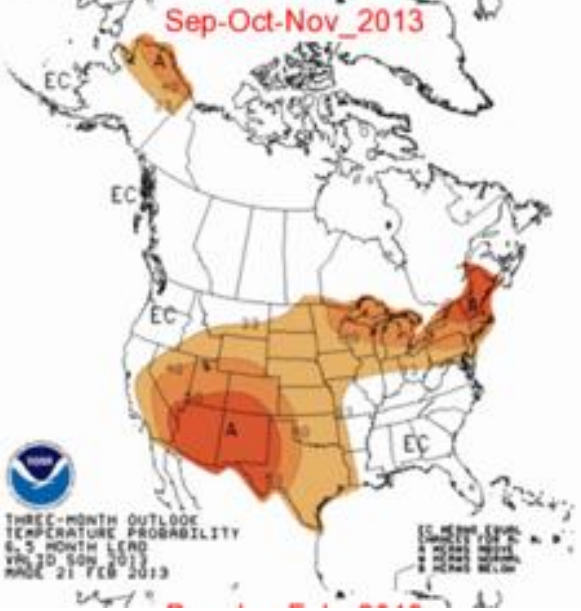

Jul-Aug-Sep_2013
THREE-MONTH OUTLOOK
TEMPERATURE PROBABILITY
4.5 MONTH LEAD
VALID JUL 2013
MADE 21 FEB 2013


Aug-Sep-Oct_2013
THREE-MONTH OUTLOOK
TEMPERATURE PROBABILITY
5.5 MONTH LEAD
VALID AUG 2013
MADE 21 FEB 2013


Sep-Oct-Nov_2013
THREE-MONTH OUTLOOK
TEMPERATURE PROBABILITY
6.5 MONTH LEAD
VALID SEP 2013
MADE 21 FEB 2013

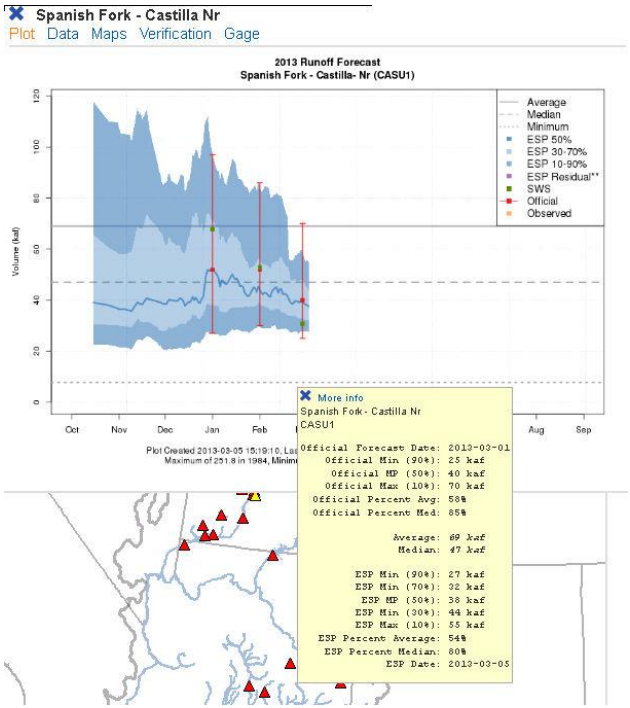
Water Supply - Online

Click on WATER SUPPLY

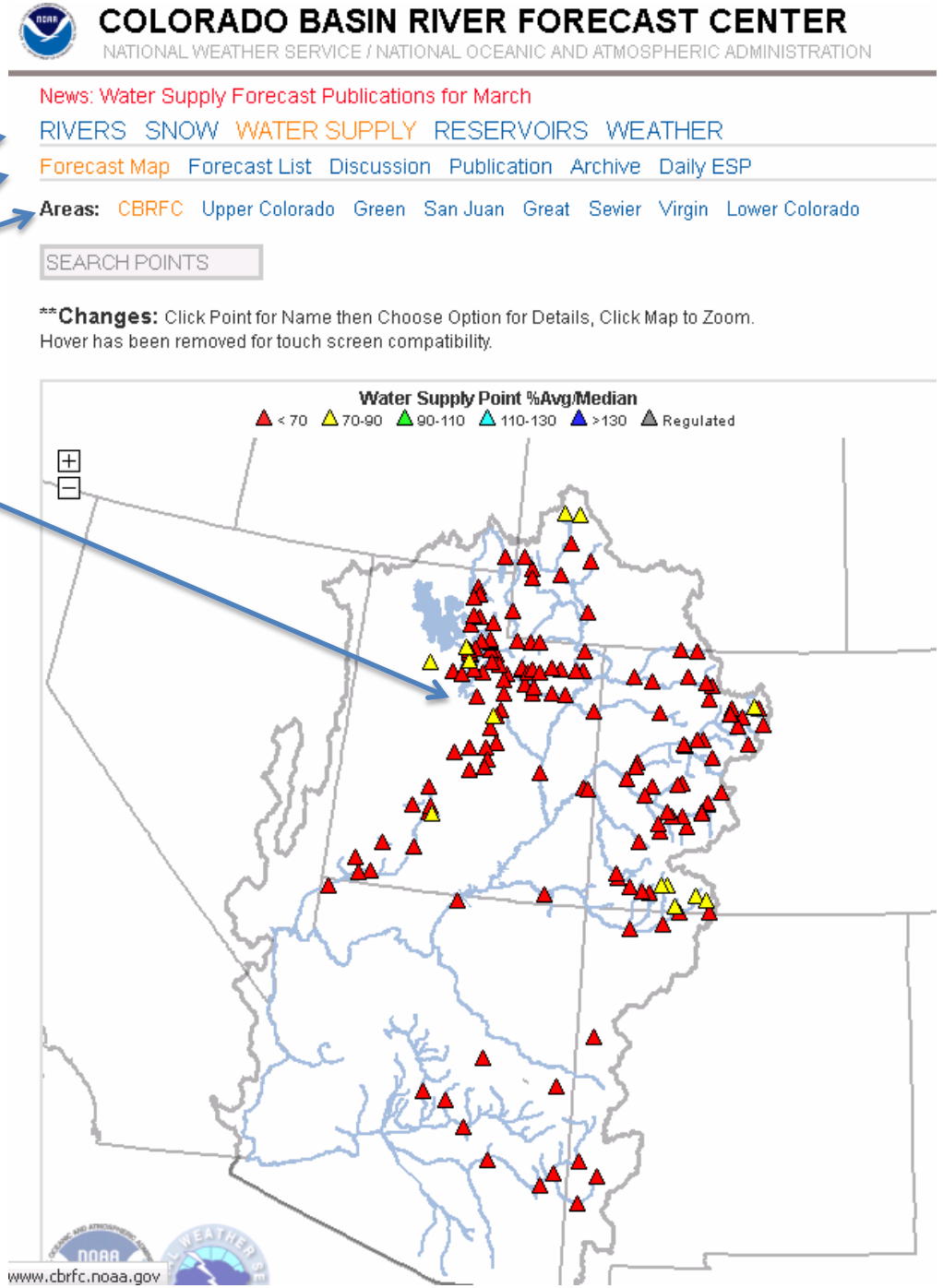
Select feature of interest

Select area of interest

Forecast points are clickable



www.cbrfc.noaa.gov

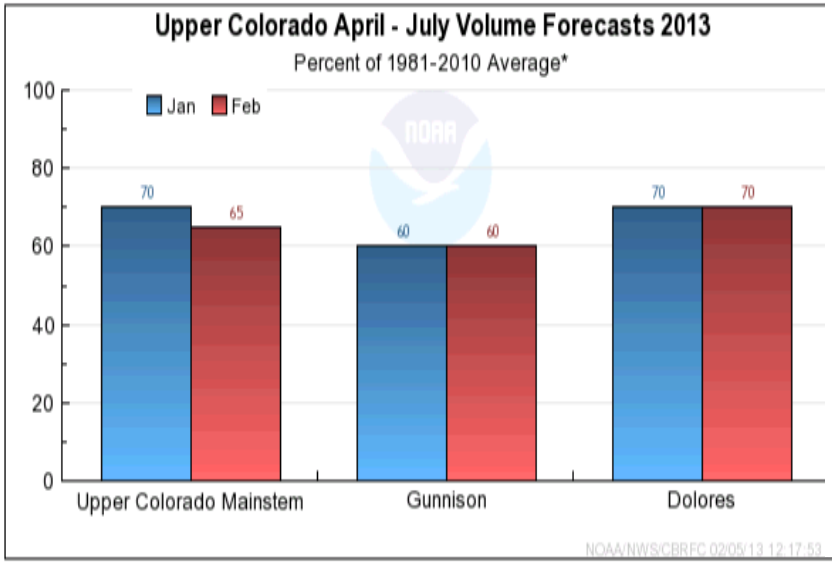


Contents

Water Supply Forecast Discussion

CLICK HERE For a narrative describing last months weather conditions, current hydrologic conditions, a

Upper Colorado Summary



*Median of forecasts within each basin.

February 1, 2013 Water Supply Forecast Discussion

The CBRFC geographic forecast area includes the Upper Colorado River Basin, Lower Colorado River Basin, and Eastern Great Basin.

Seasonal Water Supply Forecasts:

Quick Summary: Some Improvement in the San Juan,Uncompahgre and Salt Rivers
Elsewhere Forecasts Generally Lower

Below average spring and summer April-July streamflow volumes are forecast throughout the Upper Colorado River Basin and Great Basin. Near median to below median February-May volumes are expected in the Lower Colorado River Basin.

The highest runoff volumes relative to average are expected in the Great Basin of northern Utah and Green River Basin of southeast Utah. Lowest volumes relative to average are forecast for the Blue, Eagle and Roaring Fork Rivers. In the Lower Colorado River Basin highest volumes relative to median are expected in the Verde Basin with lowest volumes in the Gila Basin

Water Supply Discussion
Weather Synopsis:
The weather pattern during January was dominated by a mostly dry northwest flow over the CBRFC area. There was a brief but significant event that took place towards the end of January. A moist, warm southwest flow became established for a few days over the Southern portions of the CBRFC including most of Arizona, New Mexico and portions of Southern Colorado. This event brought several inches of precipitation to these areas and resulted in a large increase in snow over the San Juan mountains and a significant rain event over Arizona.

Snowpack:
Snow conditions in early February deteriorated over the northern Great Basin and upper Green Basin, with some improvement over the San Juan basin and southern portions of the Gunnison basin. In general, as of February 1st, most SNOTEL sites in the CBRFC area are at or below average.

Snow in the the Roaring Fork, Blue,and Eagle River Basins continue to record some of the lowest values for their respective periods of record (red sites on the map below). Several other sites are in the bottom 10 percent of record (orange on the map). Most SNOTEL sites in this area have periods of record around 30 to 35 years so they rank near the 2nd or 3rd lowest for this time of year.

Web Reference: www.cbrfc.noaa.gov Select **WATER SUPPLY (publication & discussion)**

CBRFC News

- Basin Focal Points (Available to discuss forecasts: 801.524.5130 or email)
  - Upper Colorado: Brenda Alcorn (brenda.alcorn@noaa.gov)
  - Green: Ashley Nielson (ashley.nielson@noaa.gov)
  - San Juan / Gunnison: Greg Smith (greg.smith@noaa.gov)
  - Dolores: John Lhotak (john.lhotak@noaa.gov)
  - Great Basin: Brent Bernard (brent.bernard@noaa.gov)
  - Sevier / Virgin: Stacie Bender (stacie.bender@noaa.gov)
  - Lower Colorado (below Lake Powell): Tracy Cox (tracy.cox@noaa.gov)
- Misc:
  - Sign up for next webinar Apr 4, 2013 11am MDT
    - www.cbrfc.noaa.gov/news/wswebinar2013.html
  - New water supply email notification list – are you on it ??
    - Send a request to greg.smith@noaa.gov
  - Stakeholder forum this summer at the CBRFC

Feedback, Questions, Concerns always welcome….

Greg Smith

CBRFC Senior Hydrologist
Phone: 801.524.5130
Email: greg.smith@noaa.gov