

CBRFC
April 2012
Water Supply Webinar

10am April 6, 2012

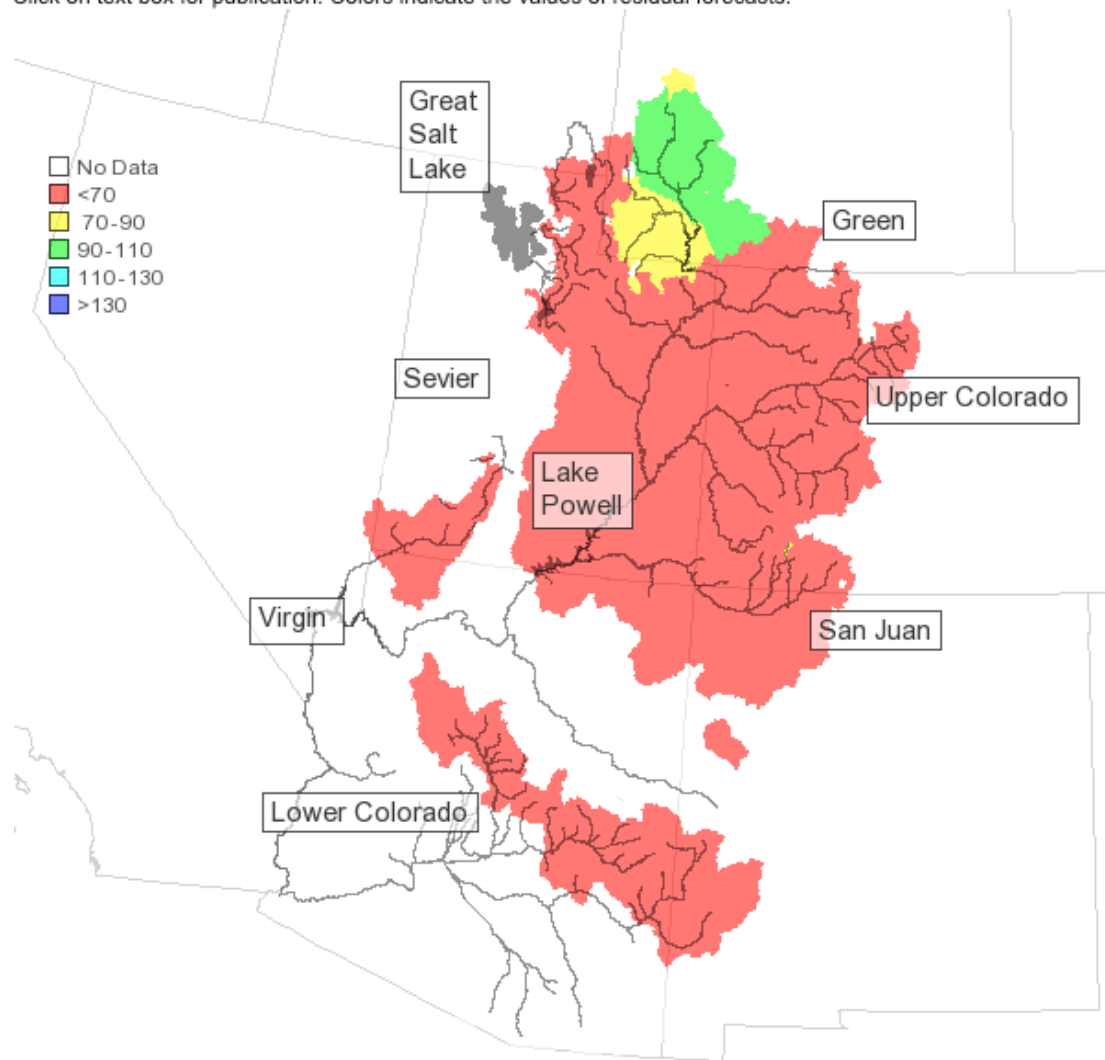
Kevin Werner

New 1981-2010 Averages being used this year.

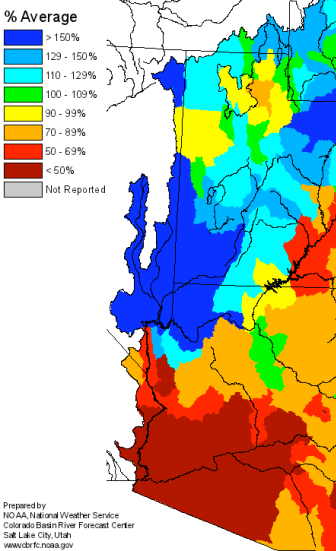
Click on text box for publication. Colors indicate the values of residual forecasts.

Outline

- Recent Weather
- Snow States
- Future Weather/
Climate
- Water Supply
Forecasts
- Peak Flow
Forecasts

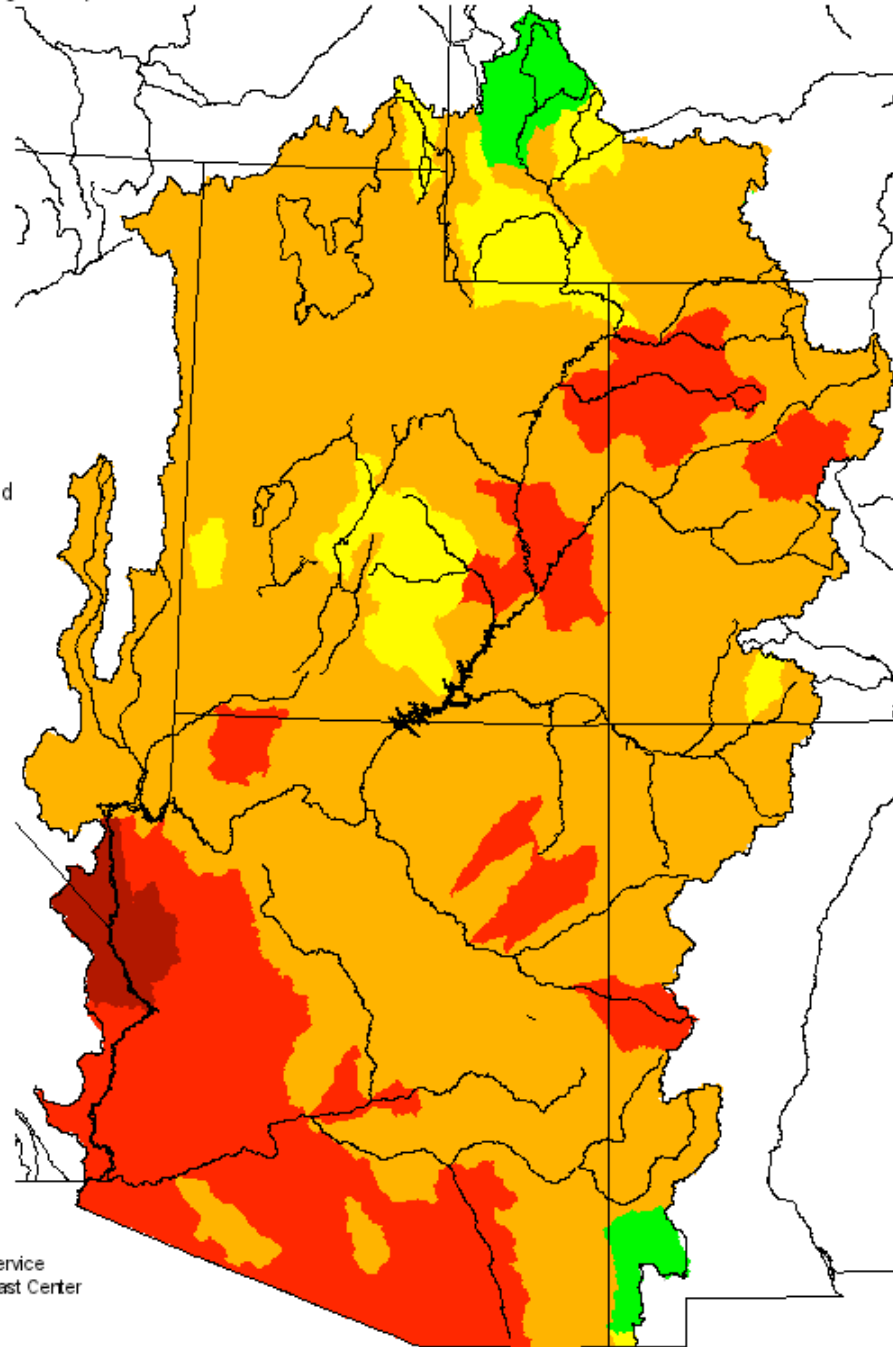
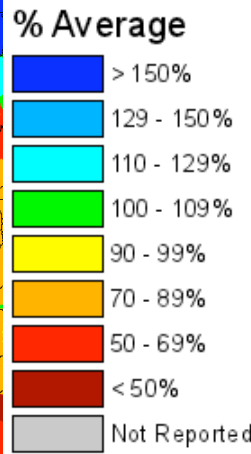


Monthly Precipitation for October 2011
(Averaged by Hydrologic Unit)



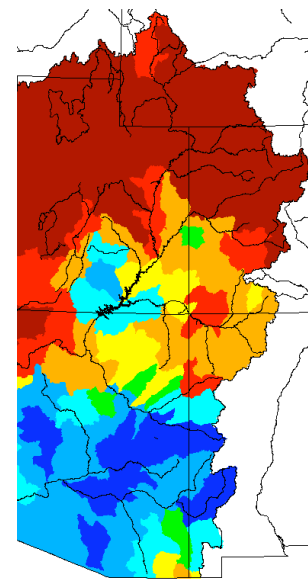
Seasonal Precipitation, October 2011 - March 2012

(Averaged by Hydrologic Unit)

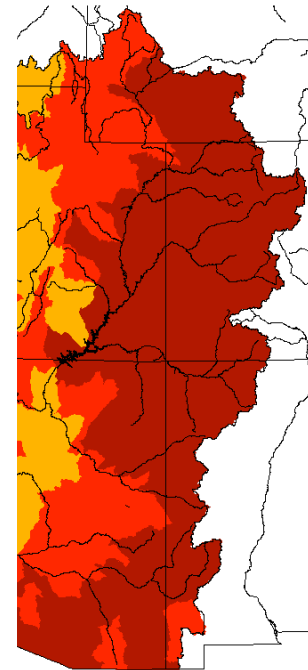


Prepared by
NOAA, National Weather Service
Colorado Basin River Forecast Center
Salt Lake City, Utah
www.cbrfc.noaa.gov

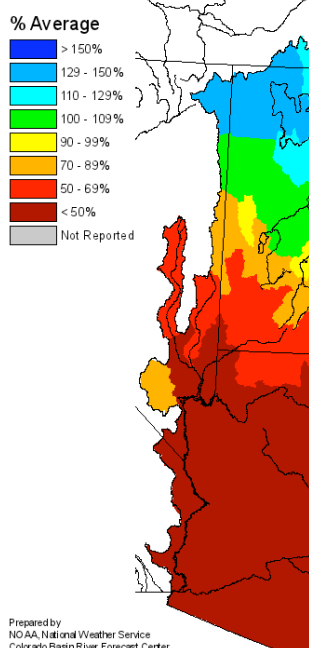
Monthly Precipitation for December 2011



March 2012

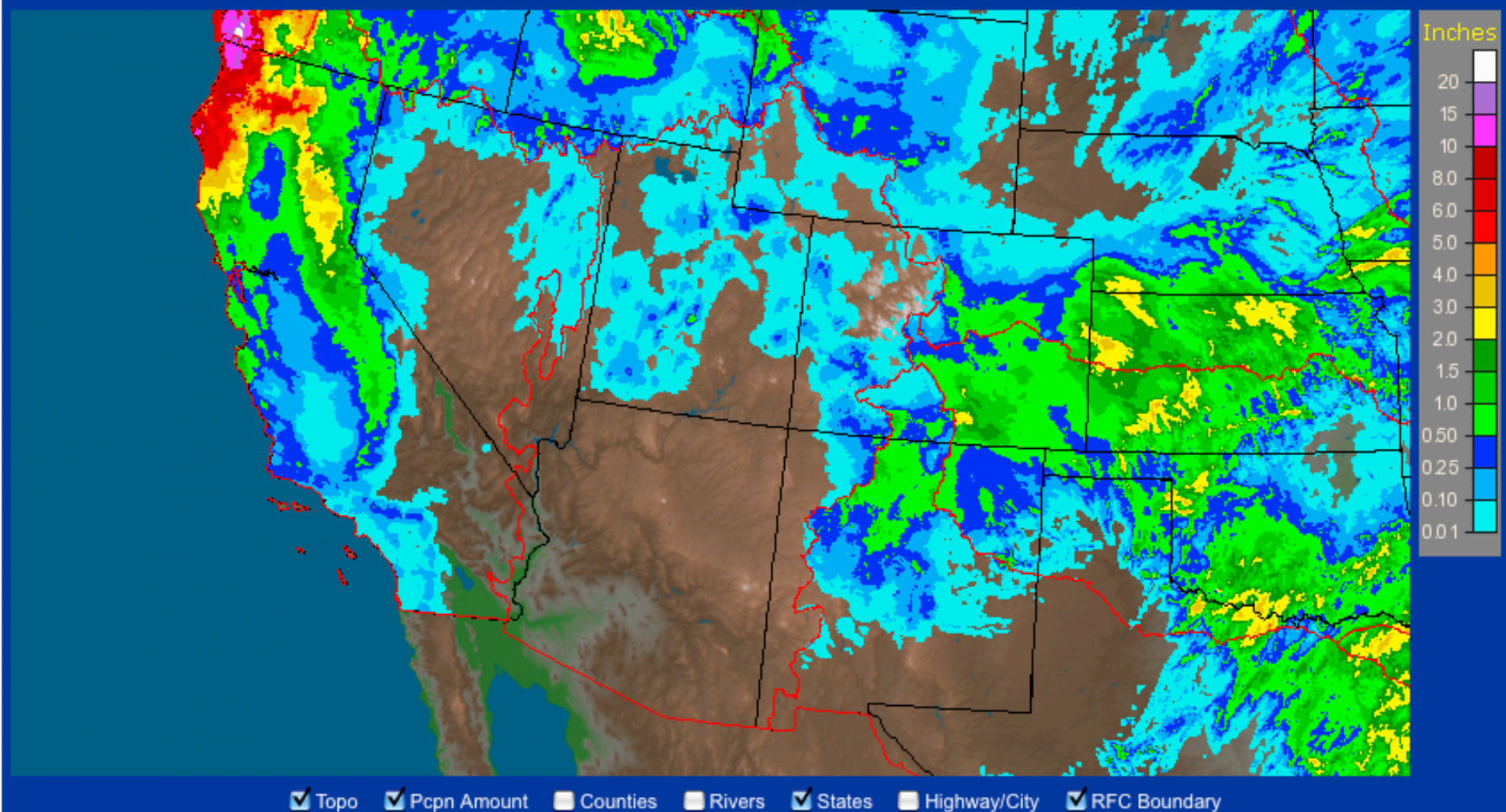


Monthly Precipitation for January 2012
(Averaged by Hydrologic Unit)



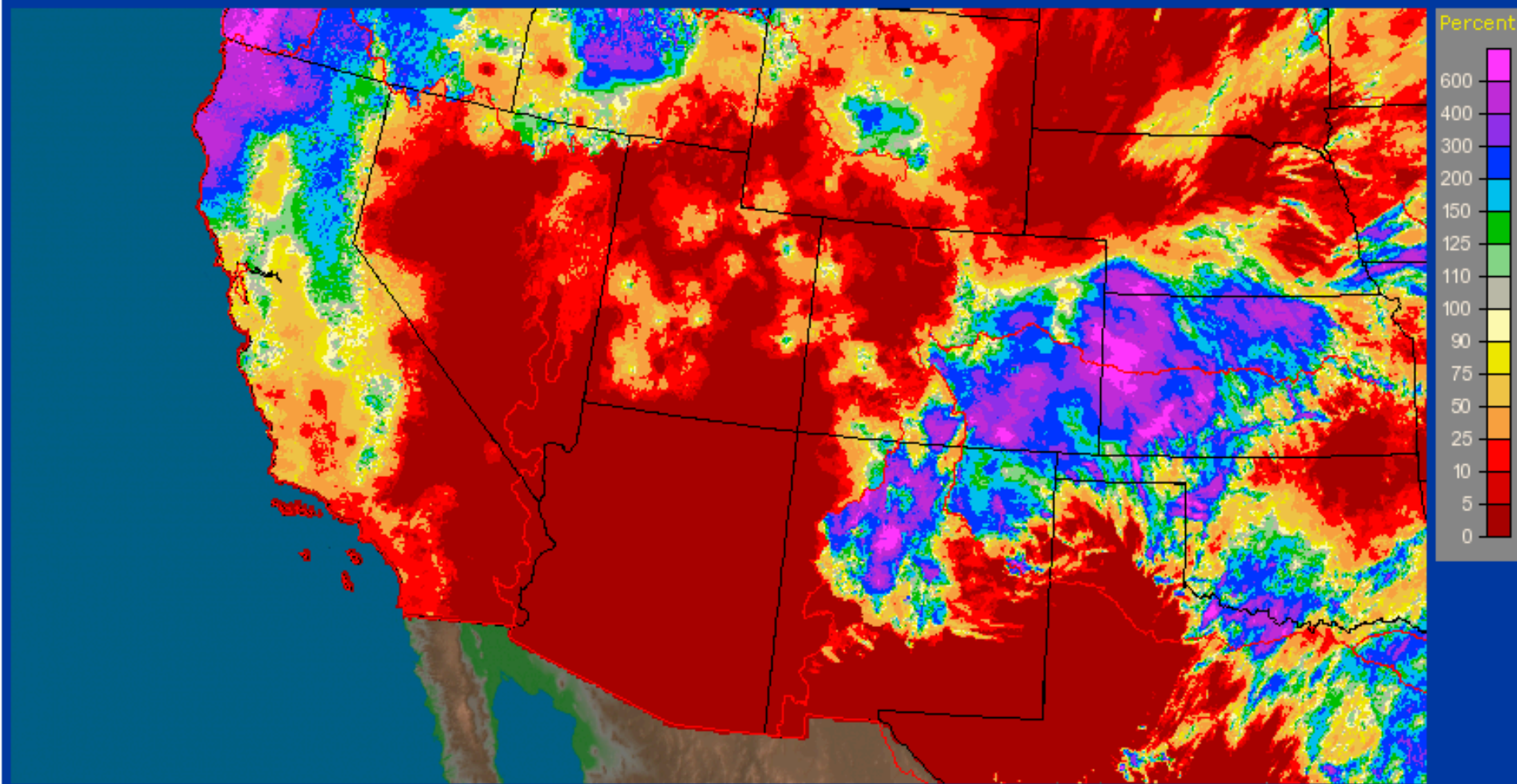
Prepared by
NOAA, National Weather Service
Colorado Basin River Forecast Center
Salt Lake City, Utah
www.cbrfc.noaa.gov

Colorado Basin RFC Salt Lake City, UT: Current 7-Day Observed Precipitation
Valid at 4/5/2012 1200 UTC - Created 4/5/12 19:55 UTC



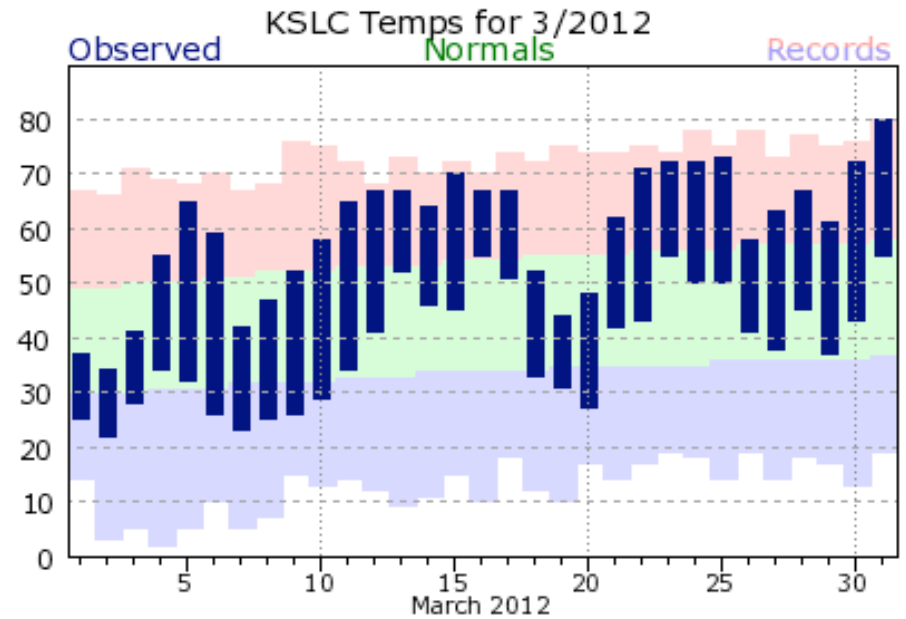
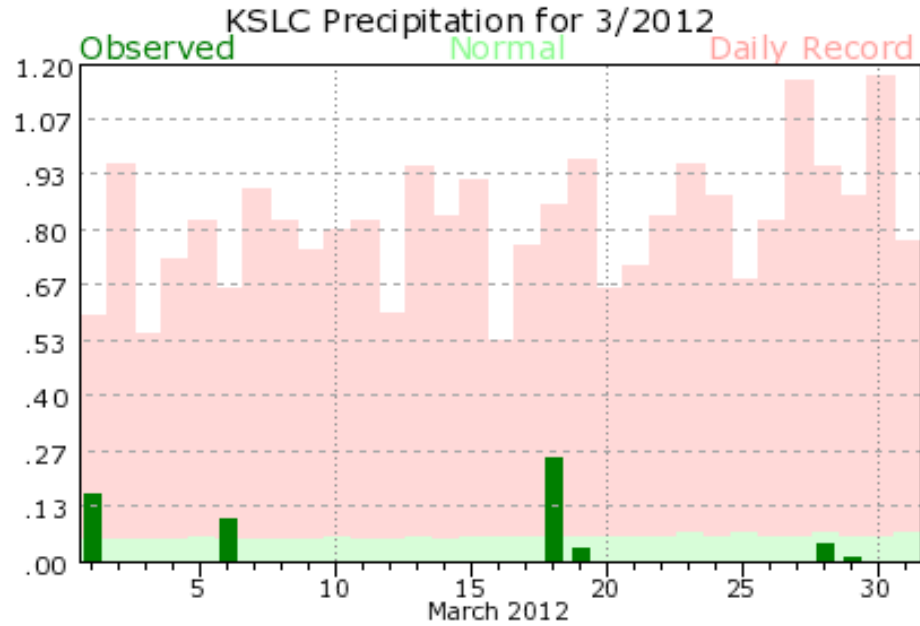
Web Reference: water.weather.gov/precip

Colorado Basin RFC Salt Lake City, UT: Current 7-Day Percent of Normal Precipitation
Valid at 4/5/2012 1200 UTC - Created 4/5/12 19:59 UTC

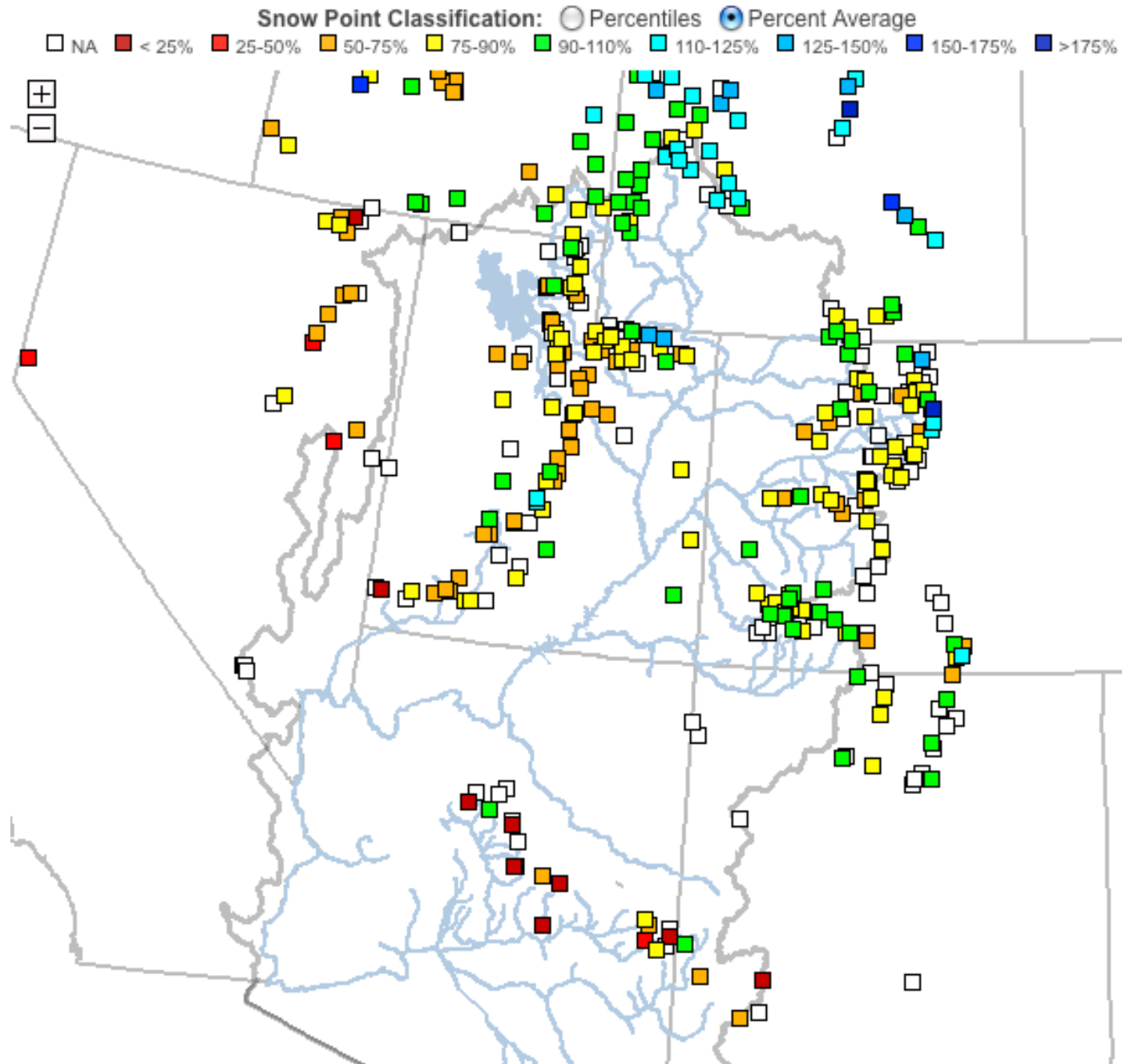


- Topo
- Pcpn Amount
- Counties
- Rivers
- States
- Highway/City
- RFC Boundary

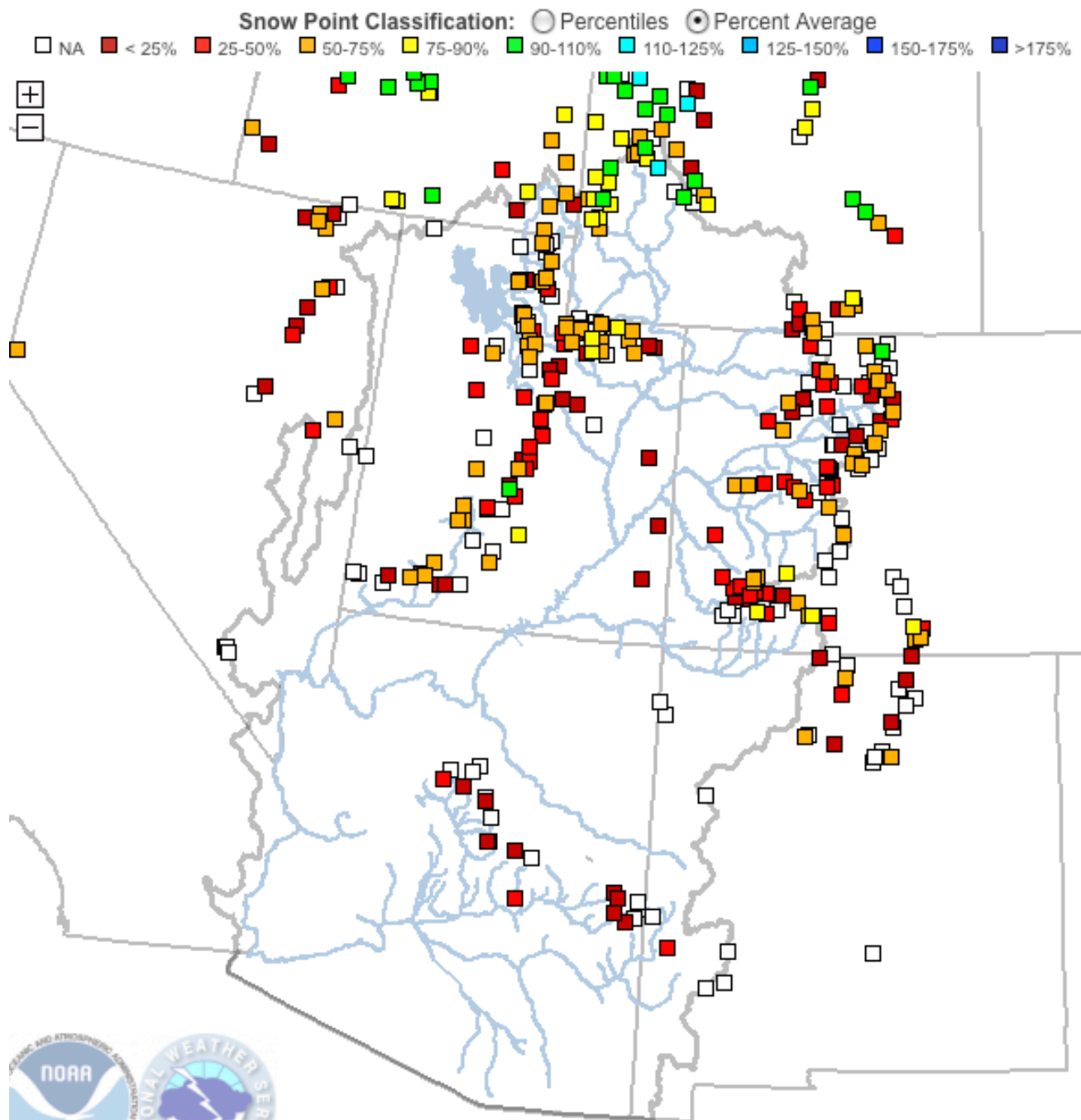
March 2012



Snow



Snow

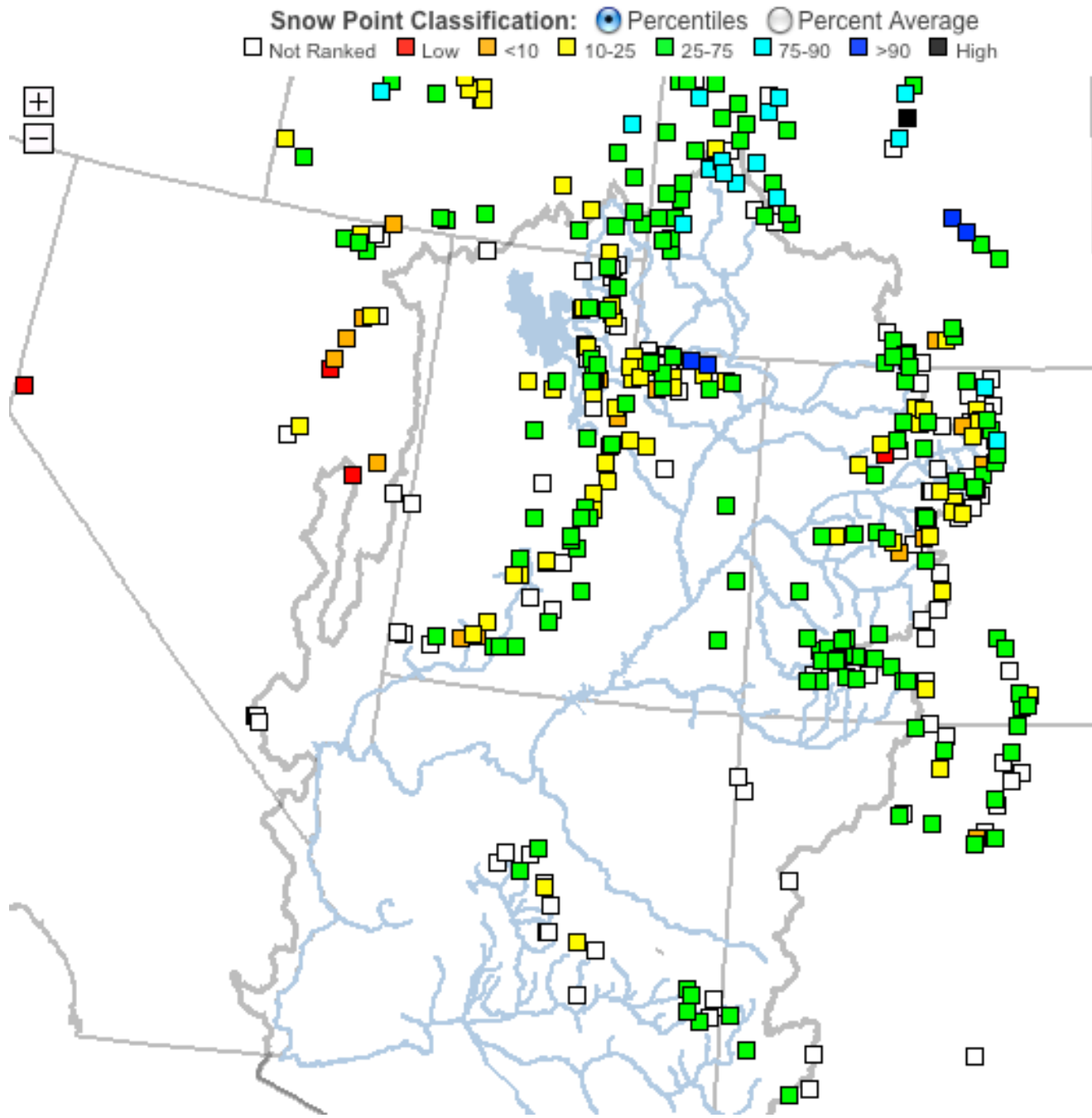


Created: April 5, 2012, 14:15

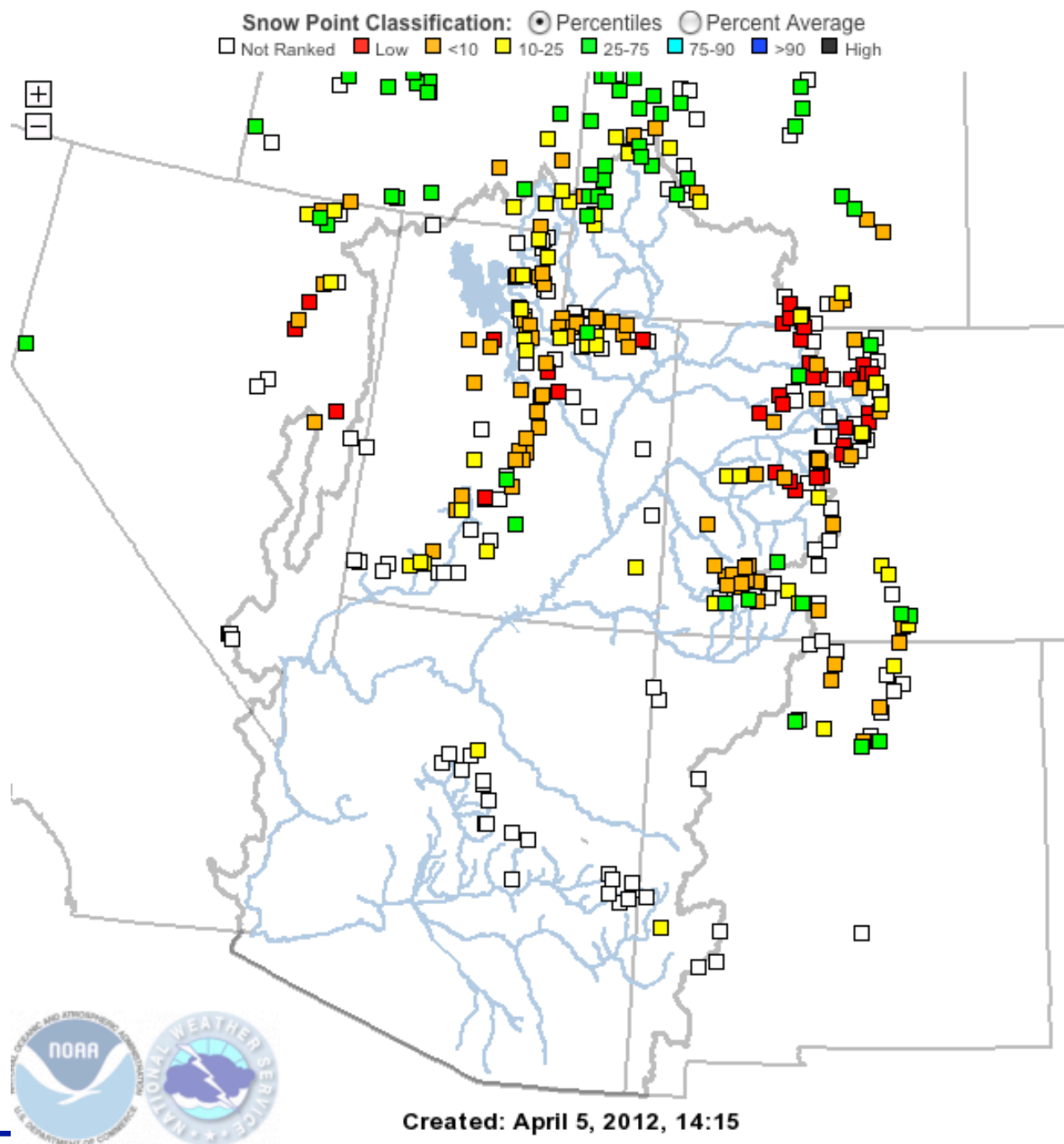
Web Reference

SNOW

March 5, 2012

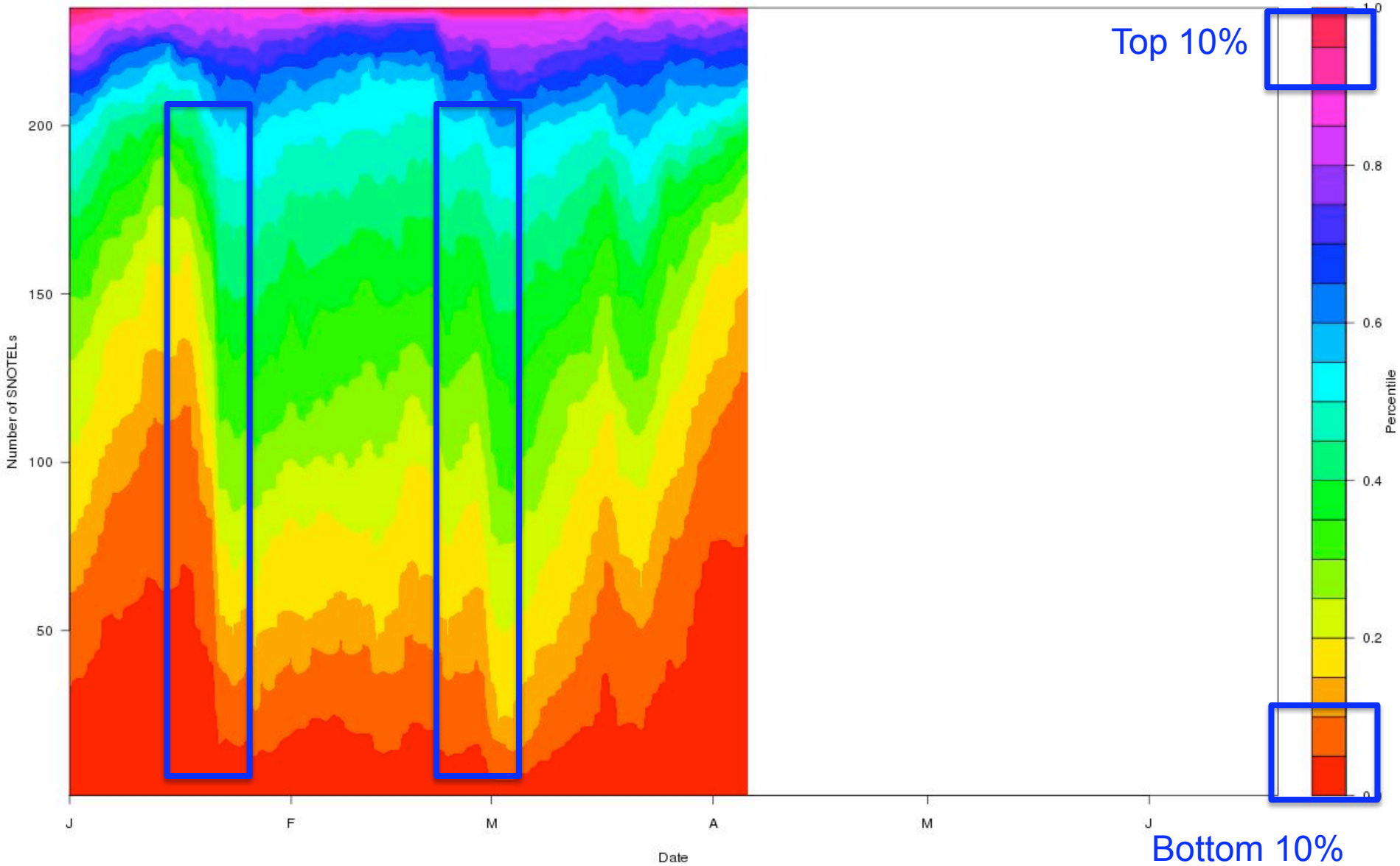


Snow

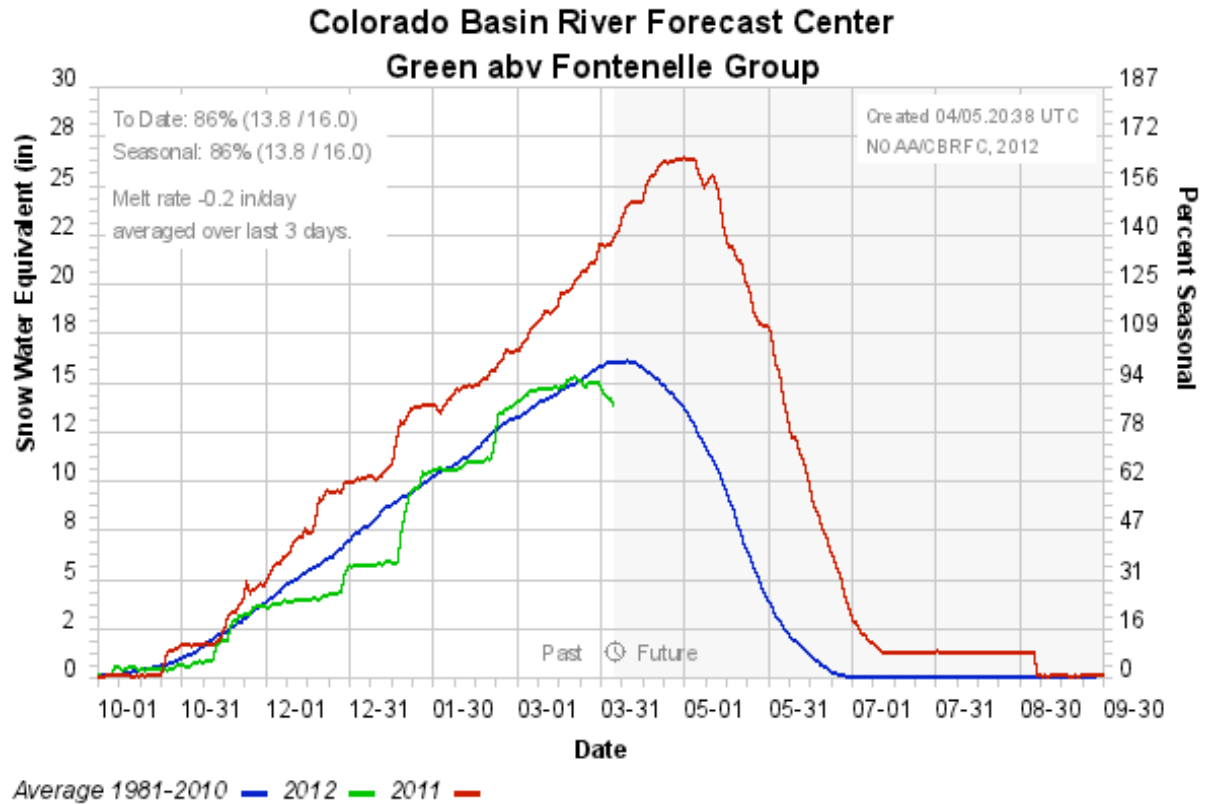
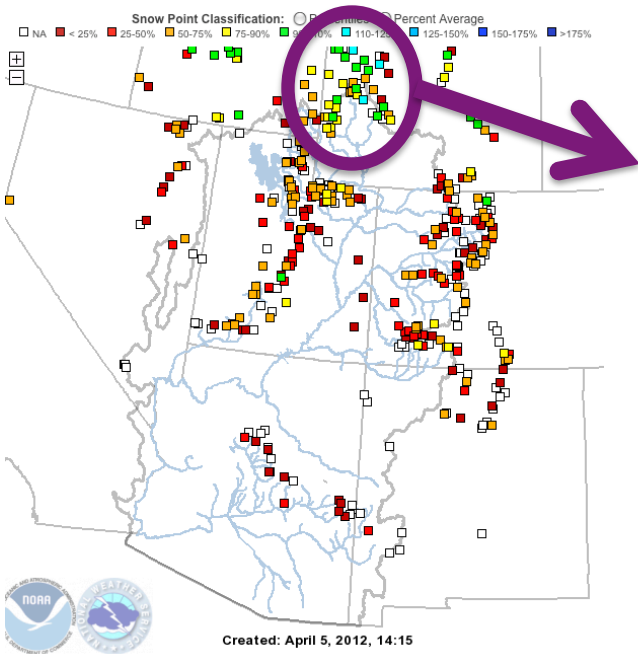


Storms

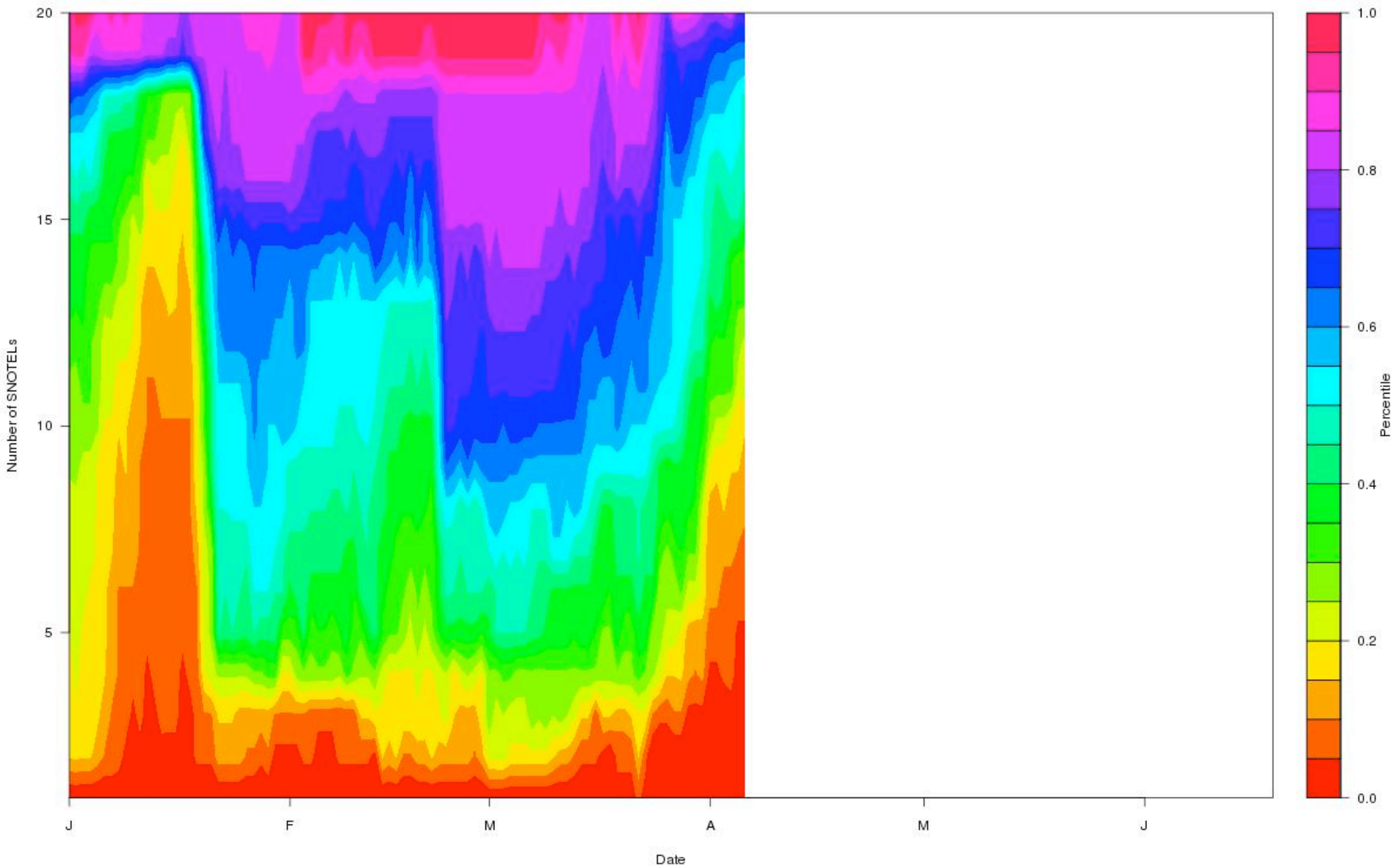
SNOTEL percentile rankings for 2012 for all



Snow: Upper Green Basin (Fontelle)

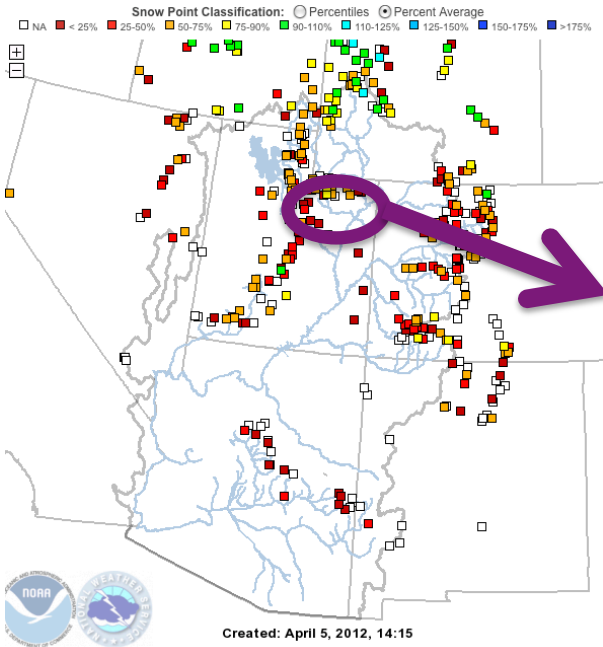


SNOTEL percentile rankings for 2012 for UpGreen

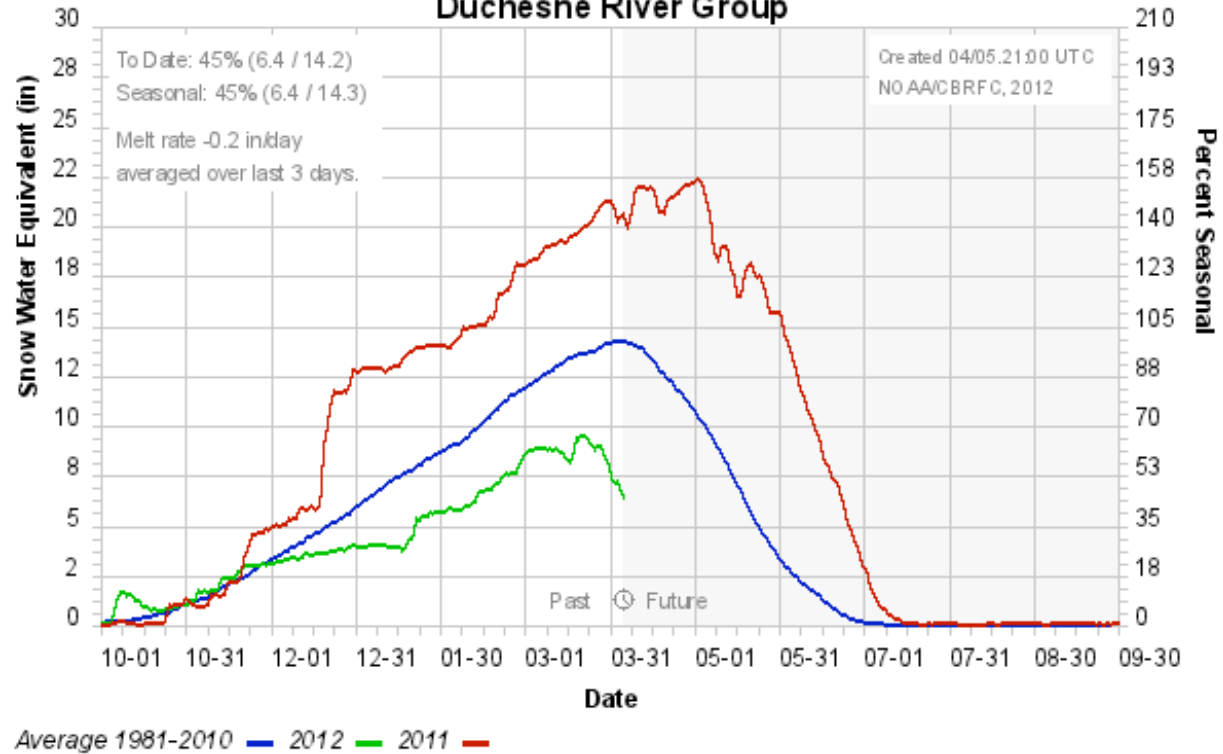


Web Reference: <http://www.cbrfc.noaa.gov/snow/raster/>

Snow: Duchesne Basin

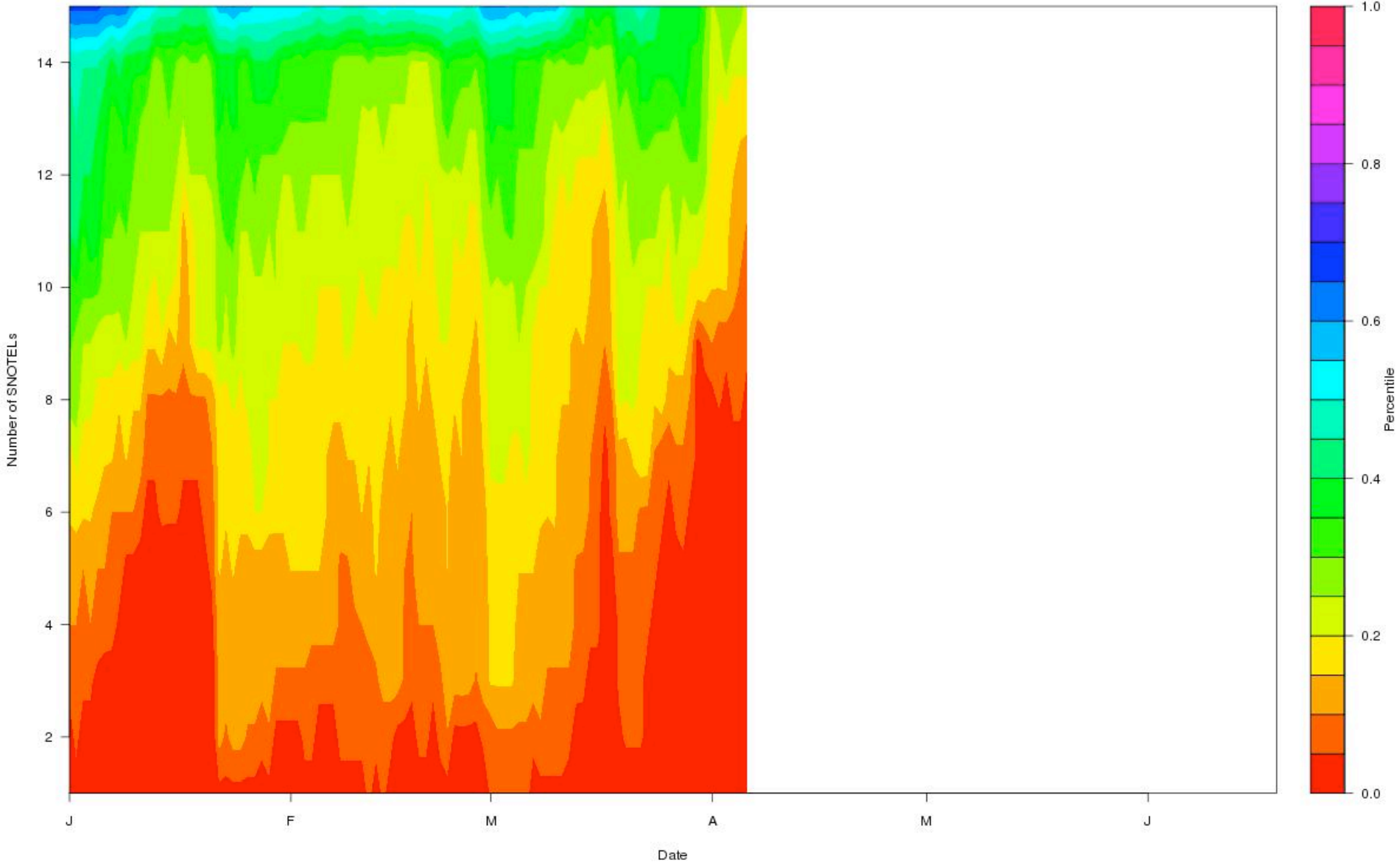


Colorado Basin River Forecast Center
Duchesne River Group



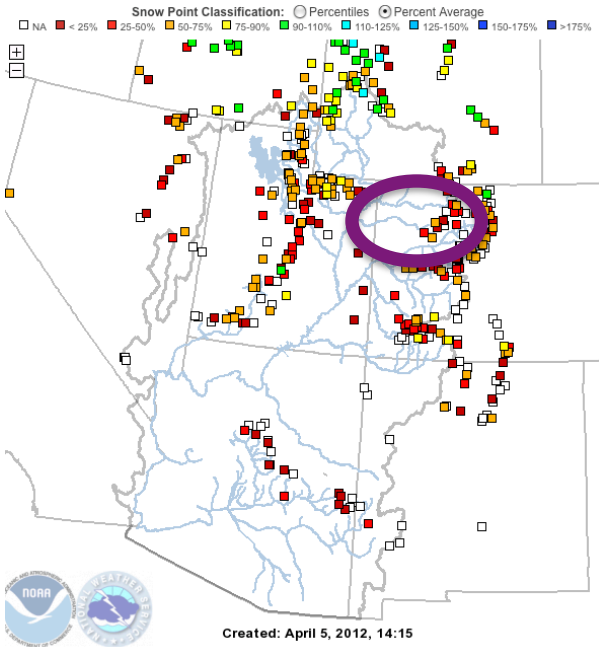
Web Reference: <http://www.cbrfc.noaa.gov/station/sweplo/plot/sweplo.cgi???open>

SNOTEL percentile rankings for 2012 for Duchesne

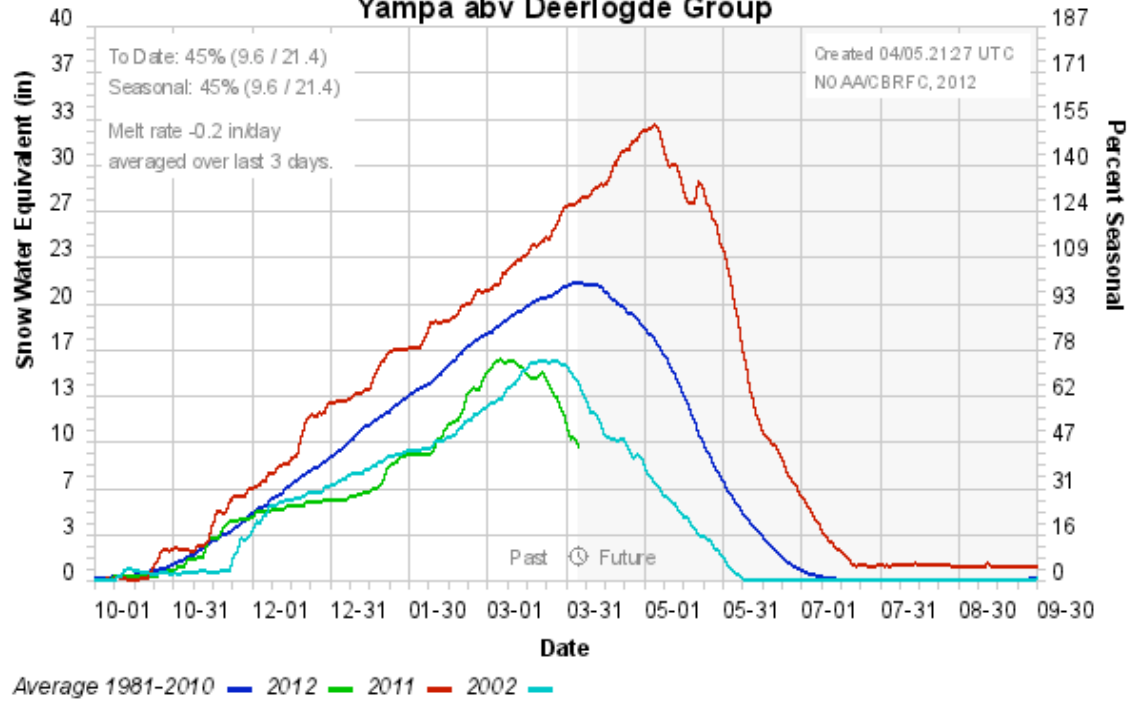


Web Reference: <http://www.cbrfc.noaa.gov/snow/raster/>

Snow: Yampa Basin



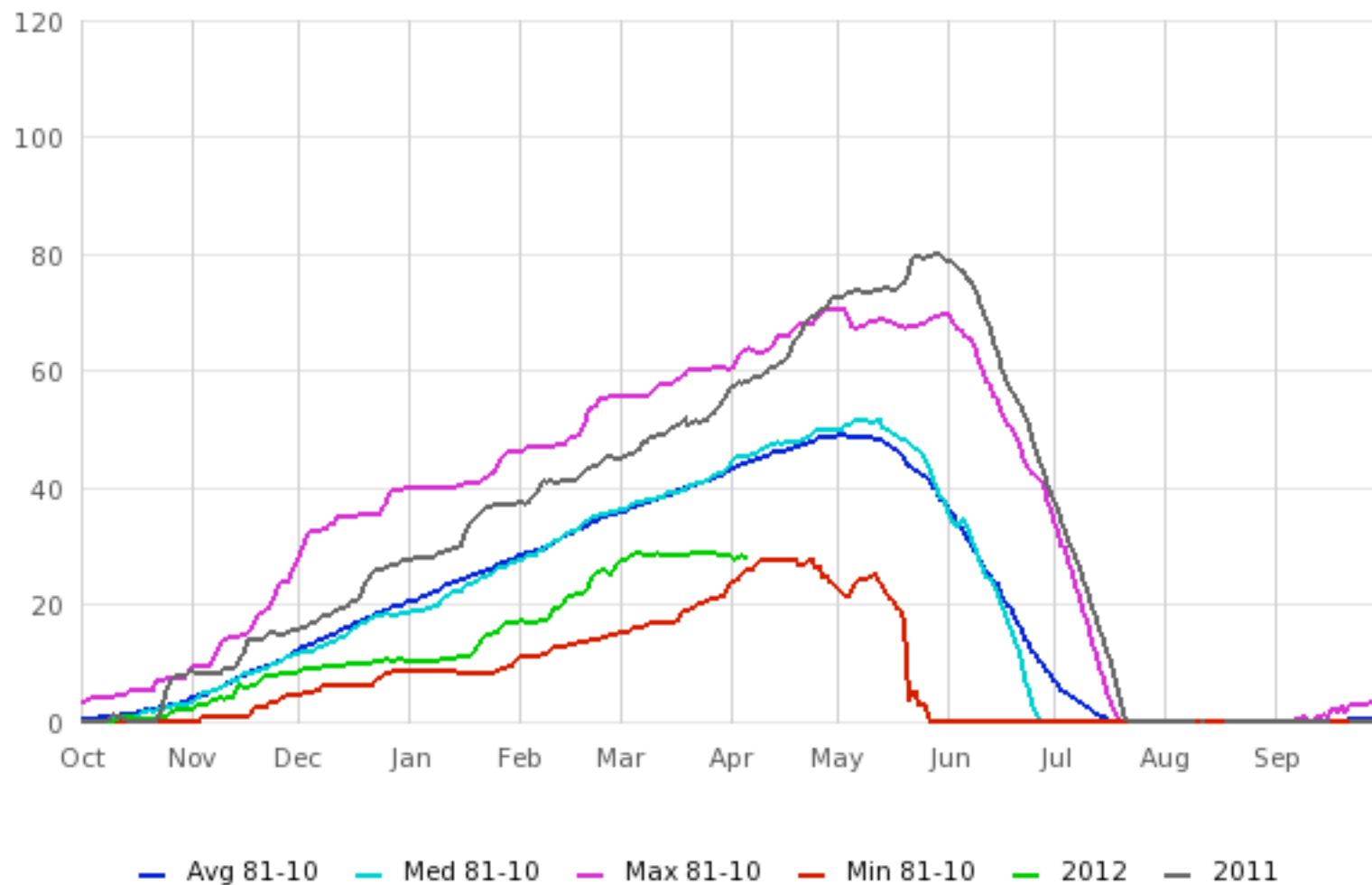
Colorado Basin River Forecast Center
Yampa abv Deerlogde Group



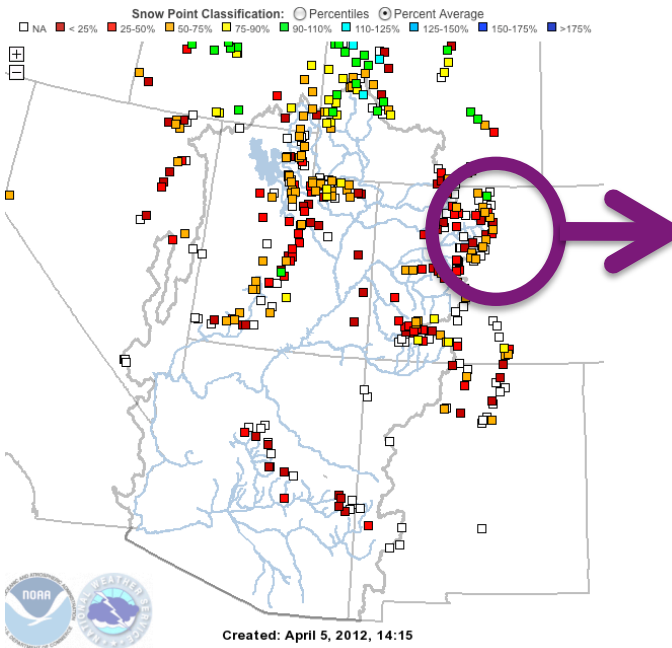
TOWER (towc2)

Inches of Snow Water Equivalent (SWE)

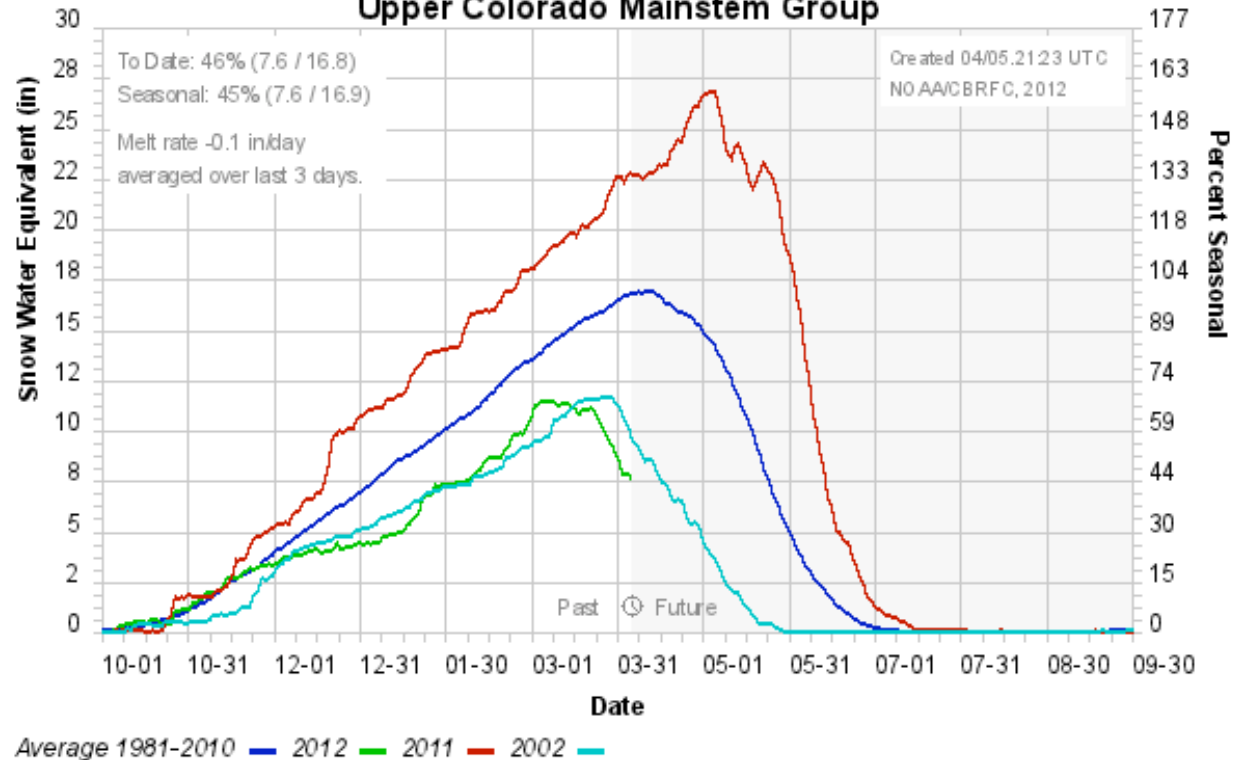
Plot Created April 5, 15:26 MDT by the Colorado Basin River Forecast Center (NWS/NOAA)



Snow: Colorado Mainstem (above Cameo)



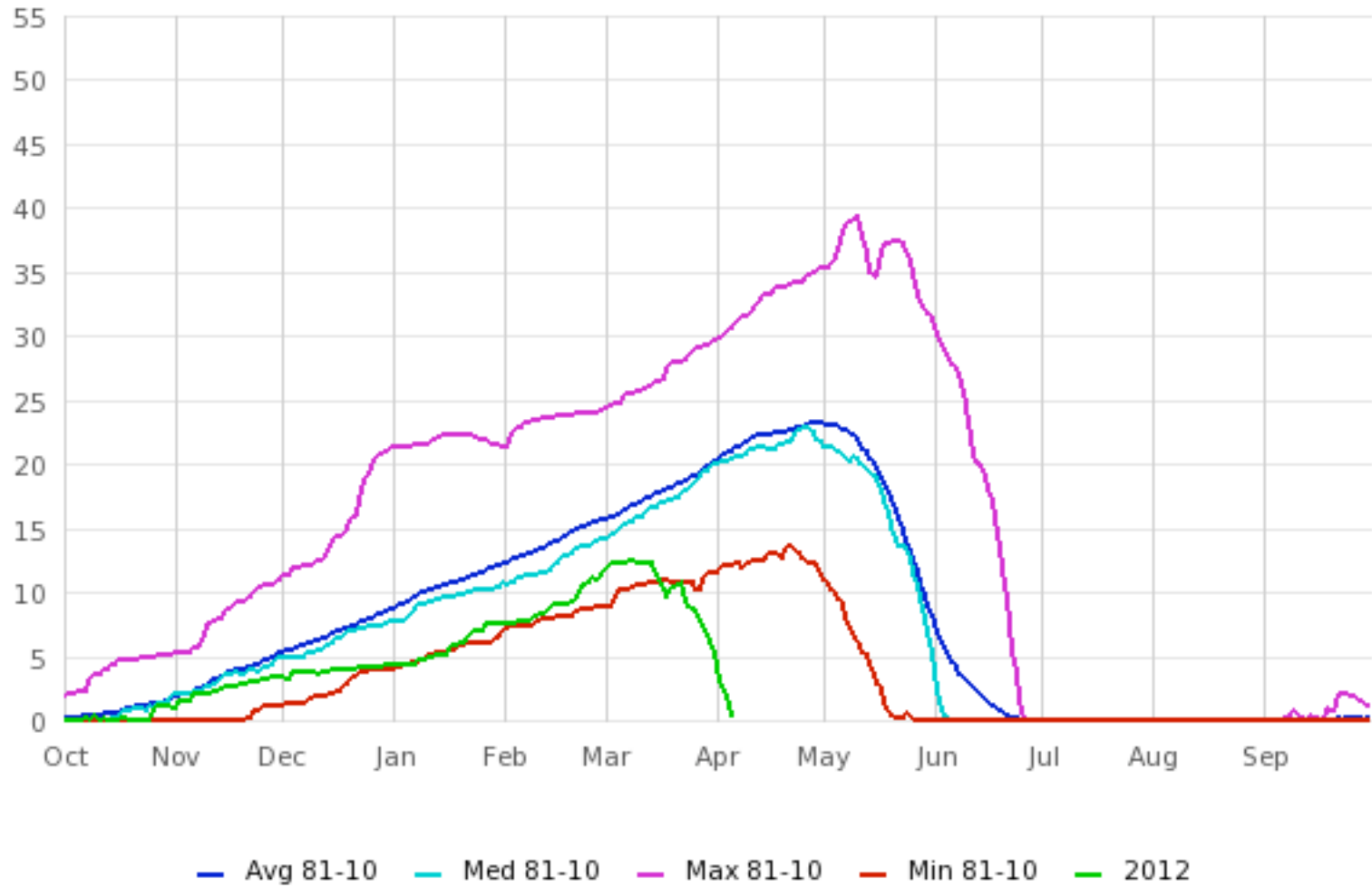
Colorado Basin River Forecast Center
Upper Colorado Mainstem Group



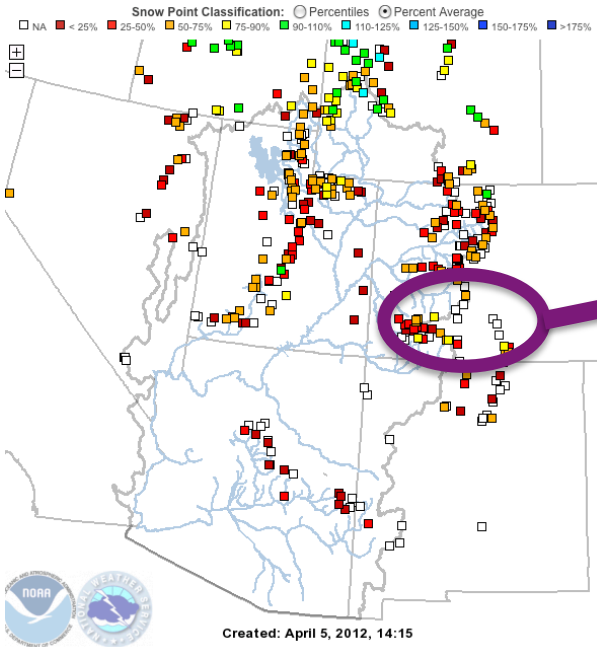
VAIL MOUNTAIN (vlmc2)

Inches of Snow Water Equivalent (SWE)

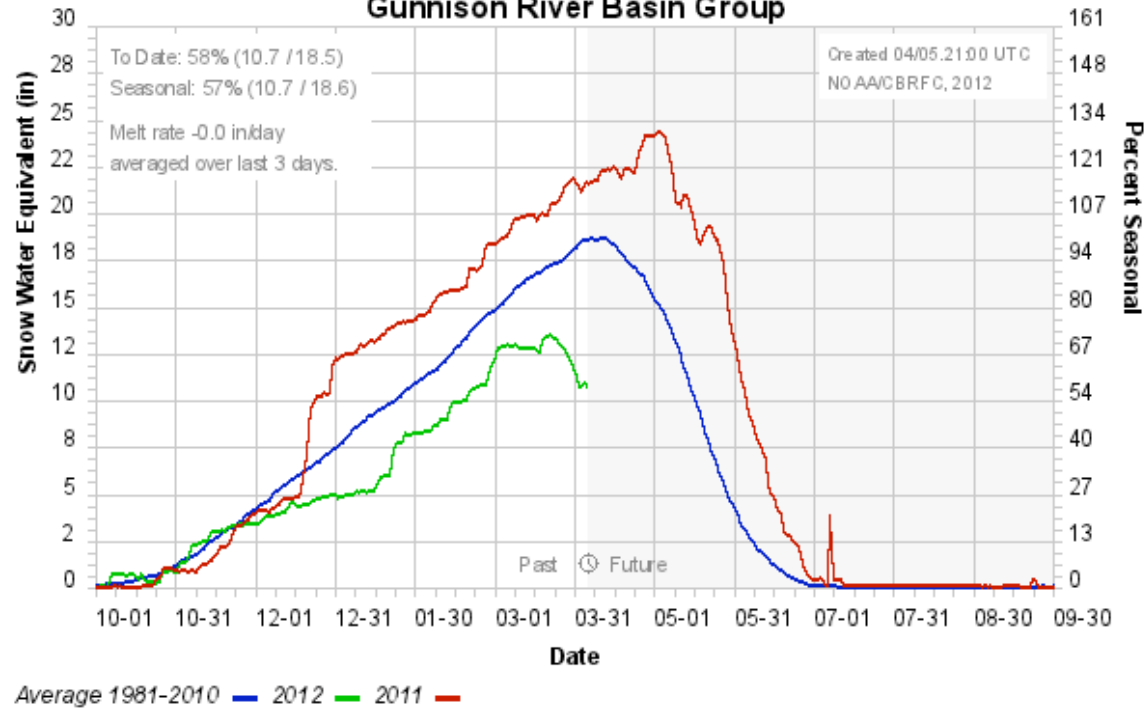
Plot Created April 5, 15:25 MDT by the Colorado Basin River Forecast Center (NWS/NOAA)



Snow: Gunnison Basin

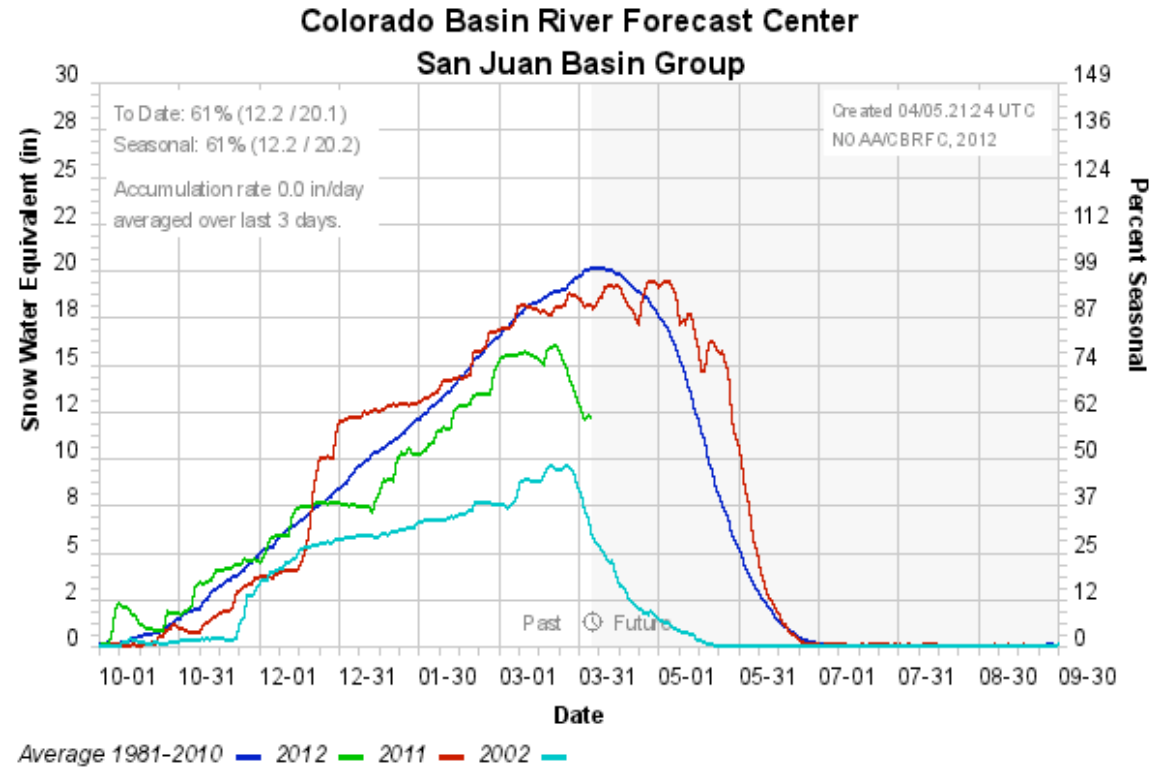
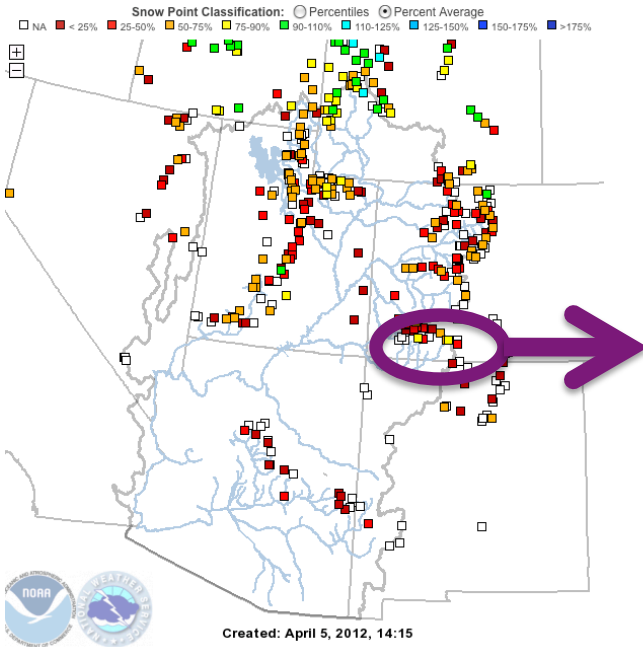


Colorado Basin River Forecast Center
Gunnison River Basin Group



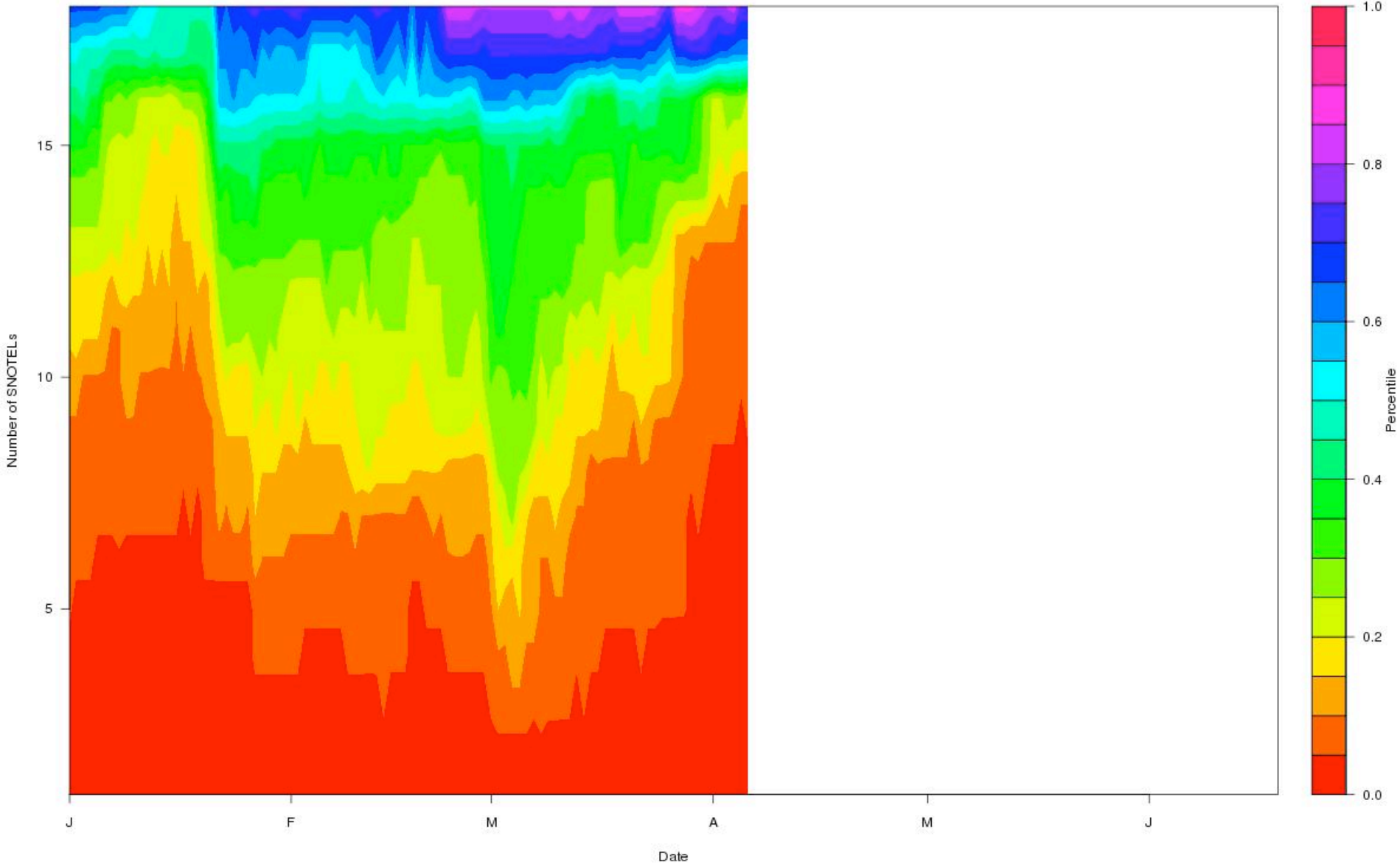
Web Reference: <http://www.cbrfc.noaa.gov/station/swep/plot/swep/plot.cgi???open>

Snow: San Juan Basin



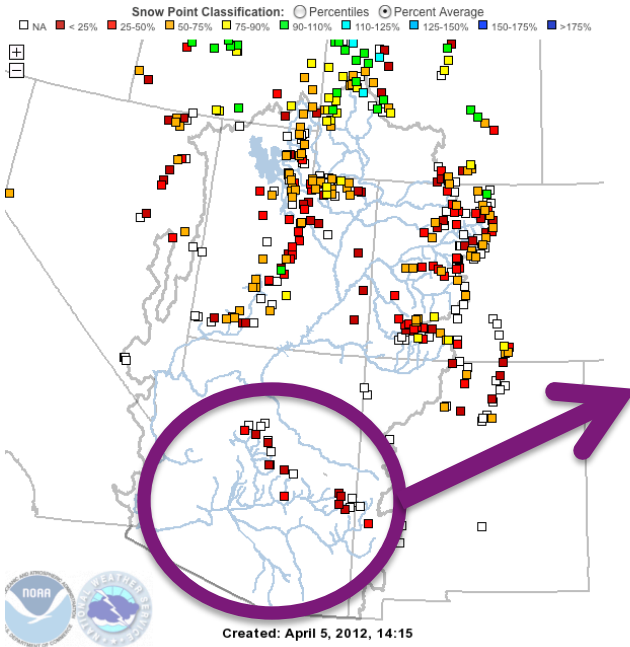
Web Reference: <http://www.cbrfc.noaa.gov/station/swep/plot/swep/plot.cgi???open>

SNOTEL percentile rankings for 2012 for Powell

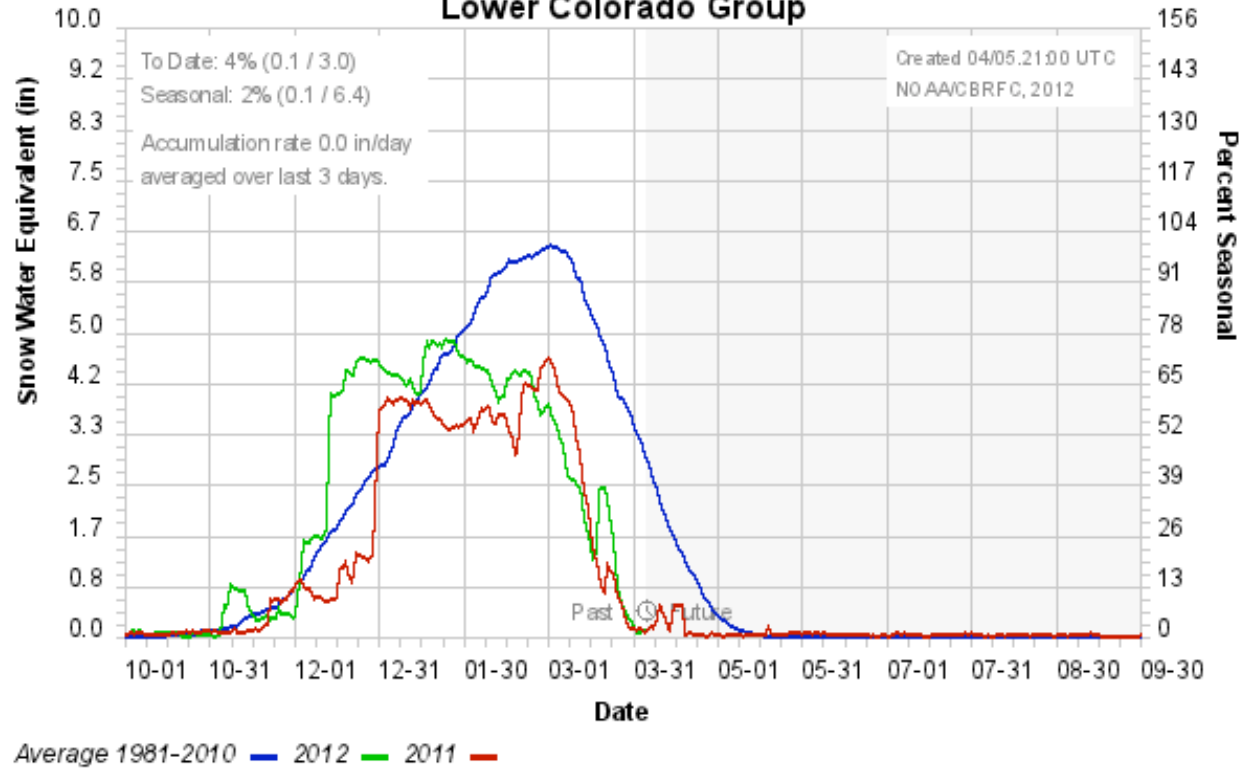


Web Reference: <http://www.cbrfc.noaa.gov/snow/raster/>

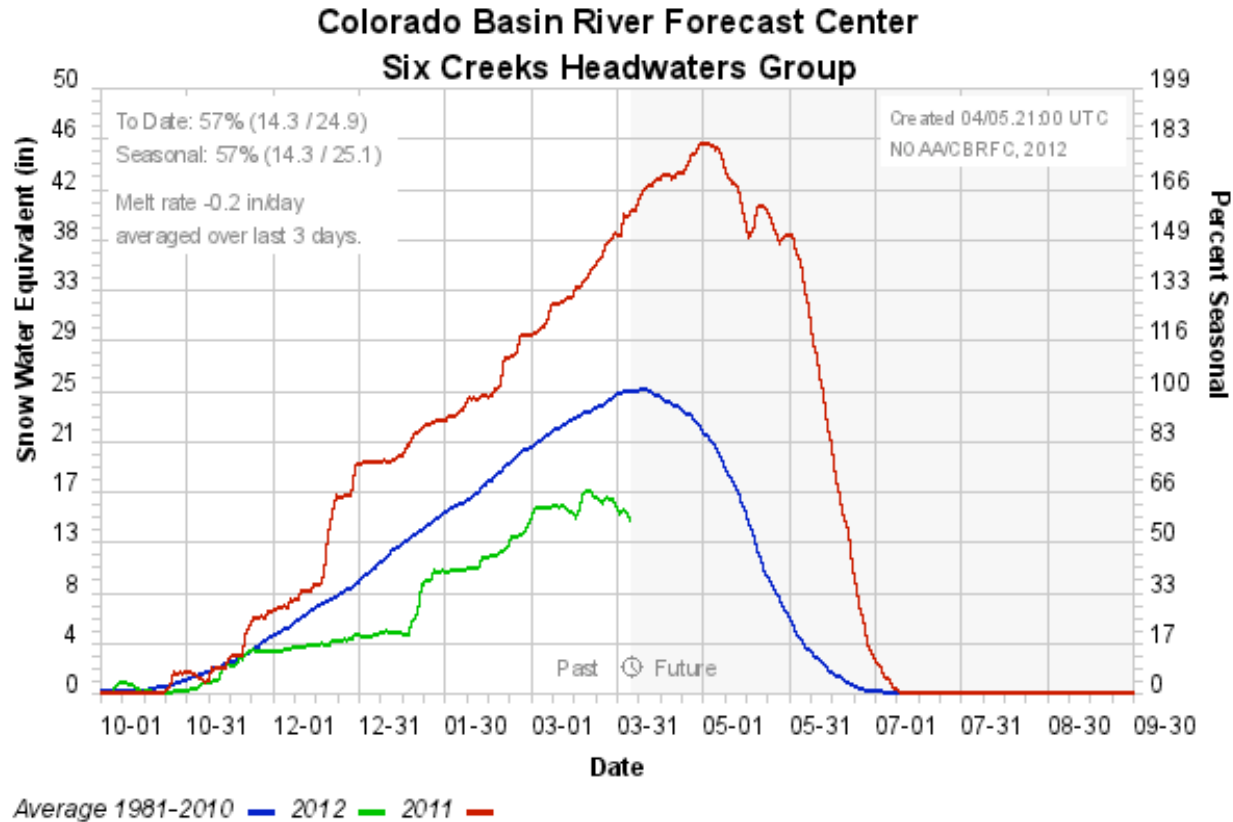
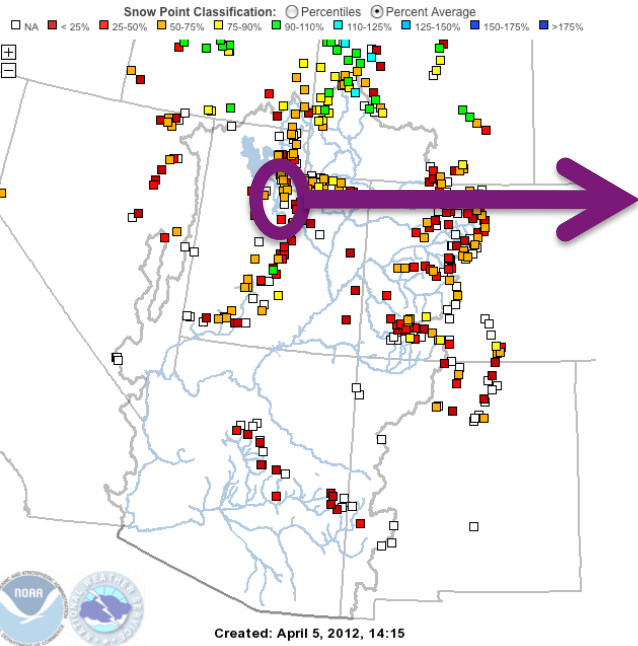
Snow: Lower Colorado



Colorado Basin River Forecast Center
Lower Colorado Group



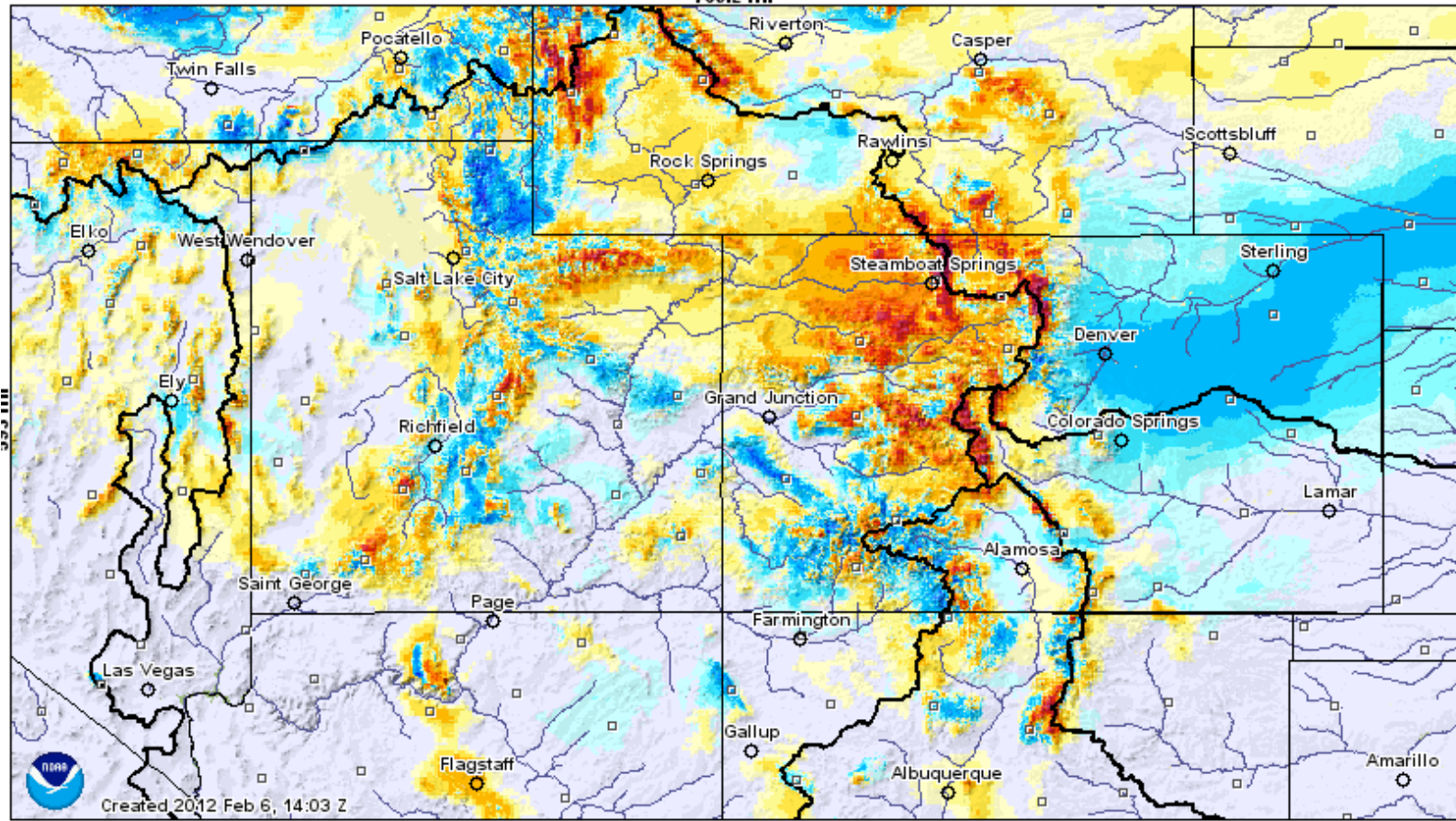
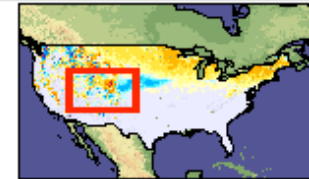
Snow: Six Creeks in Salt Lake County



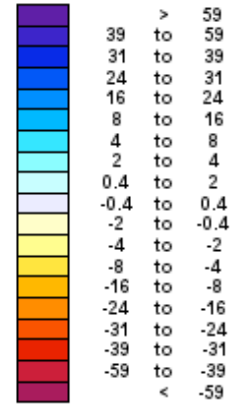
Web Reference: <http://www.cbrfc.noaa.gov/station/swep/plot/swep/plot.cgi???open>

Snow Maps

Modeled Snow Depth Departure from Normal (Daily) for 2012 February 6, 6:00 Z



Inches of depth



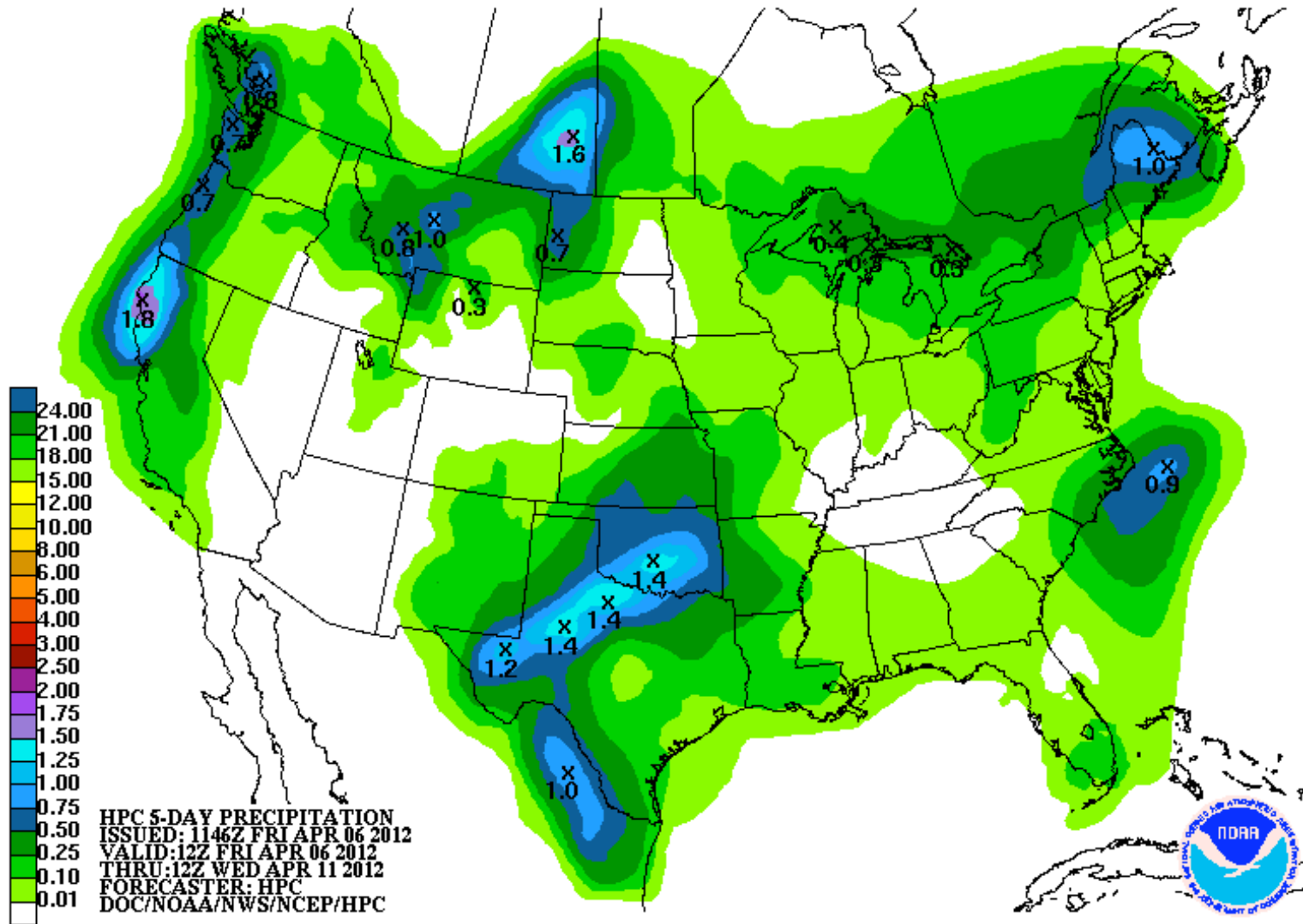
Not Estimated

Elevation in feet



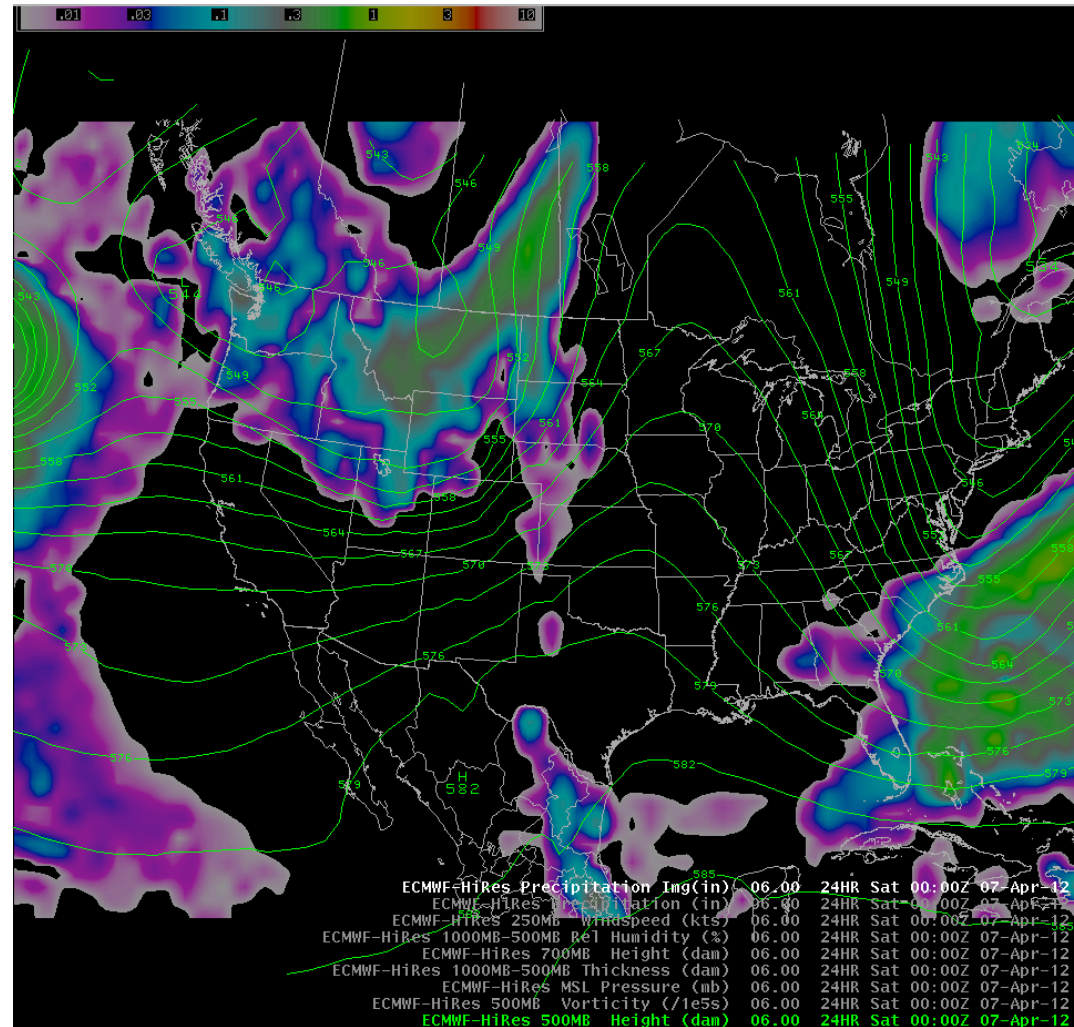
Web Reference: <http://www.nohrsc.nws.gov>

Forecast Precipitation



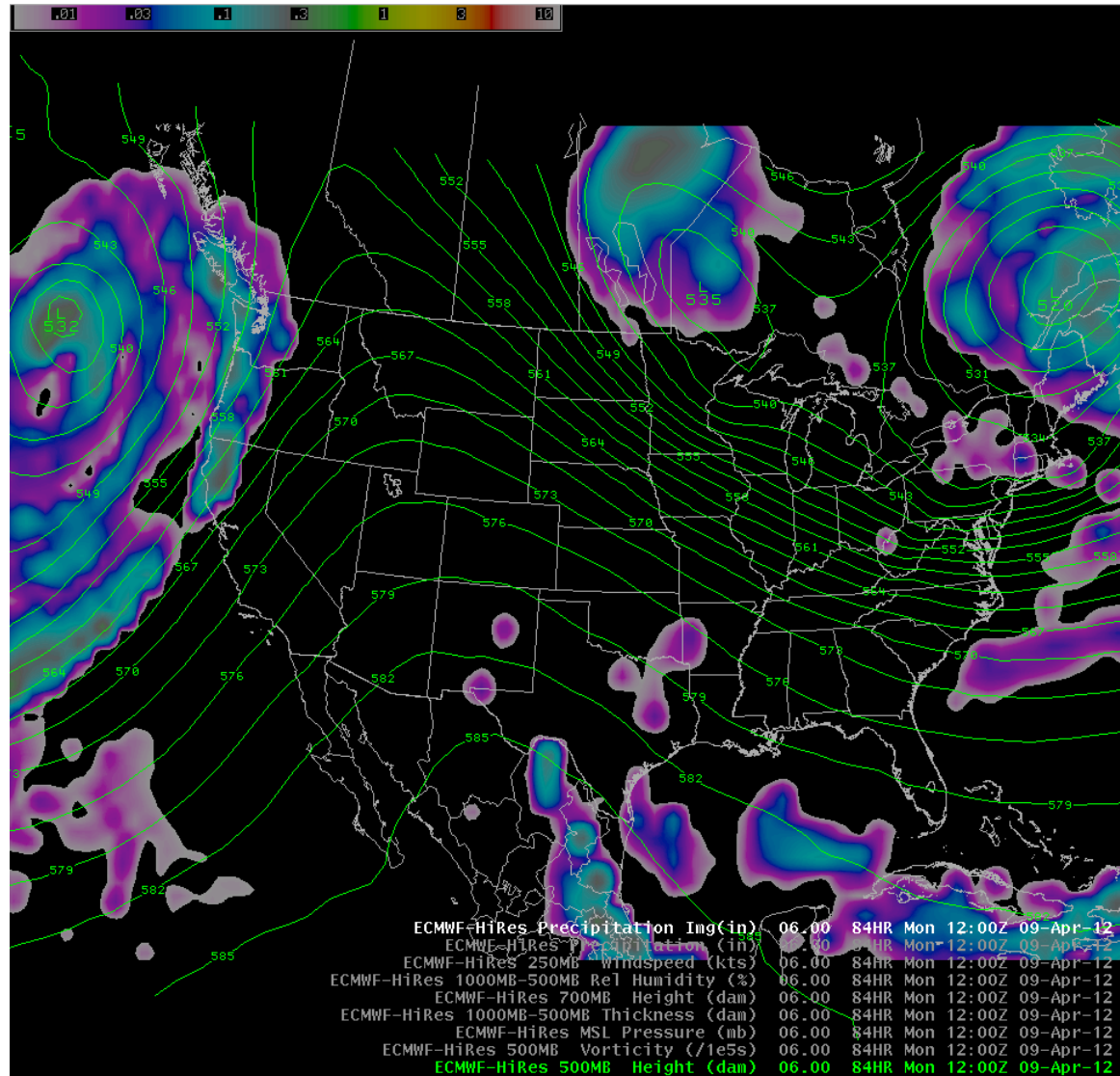
Weather Forecast

- **Active Pacific storm track forecast**
- Storm #1 (right) impacting northern today. Minor accumulations less than 1".



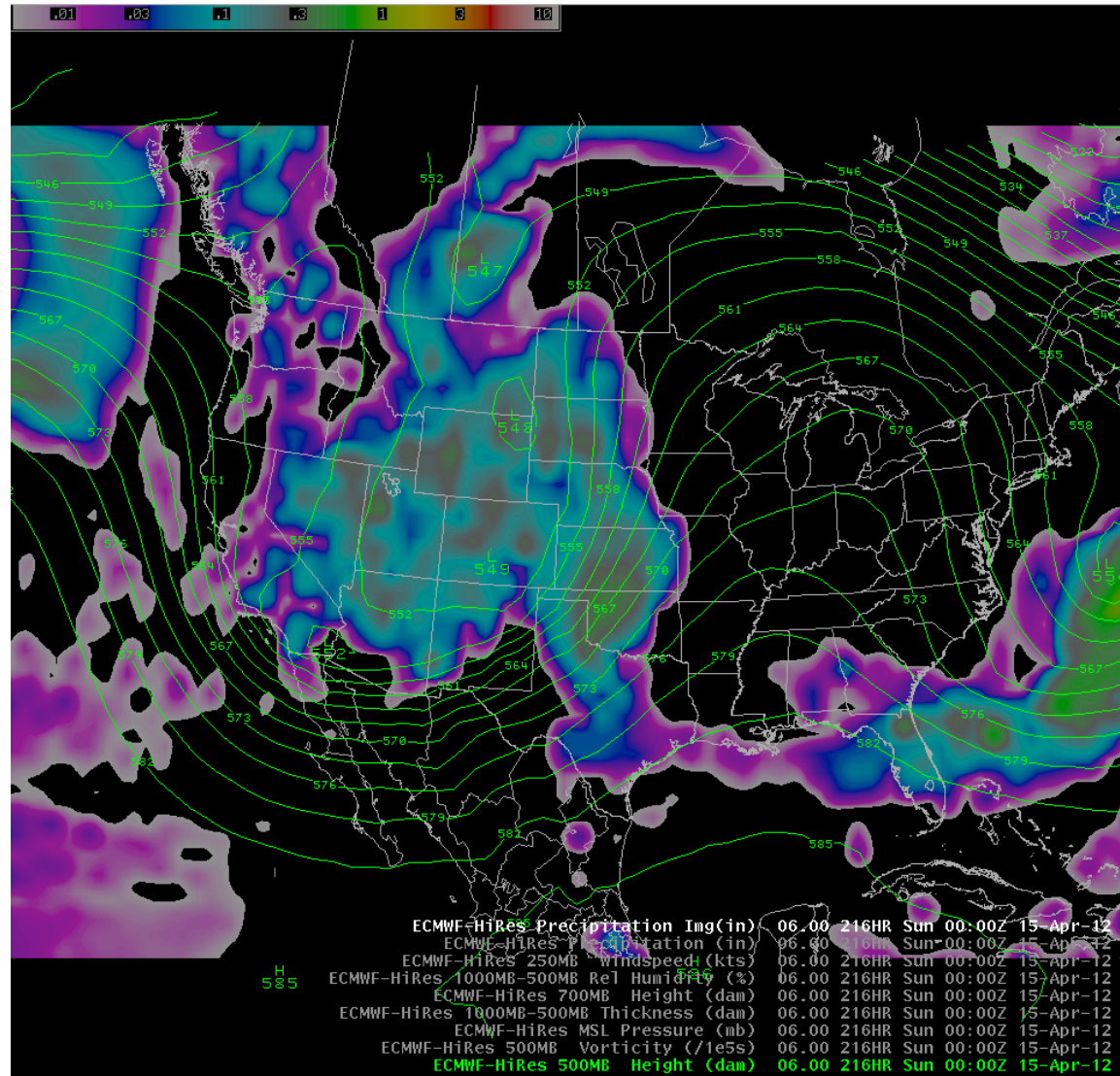
Weather Forecast

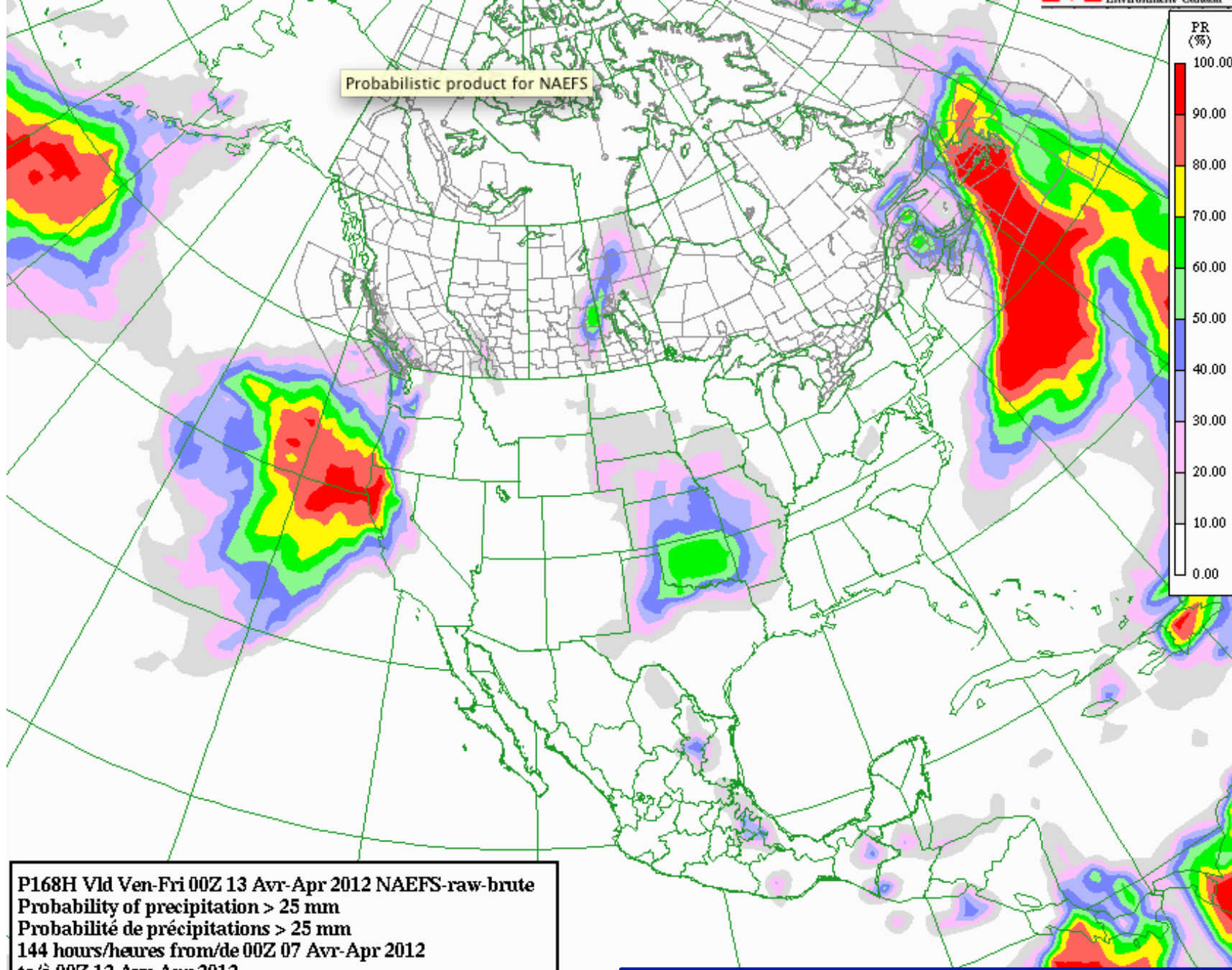
- **Active Pacific storm track forecast**
- Storm #1 impacting northern today. Minor accumulations less than 1”.
- Atmospheric ridging builds over weekend and early next week. This period will be warm and dry.
- Storm #2 arrives middle/late next week bringing minor snow accumulation to mountains.



Weather Forecast

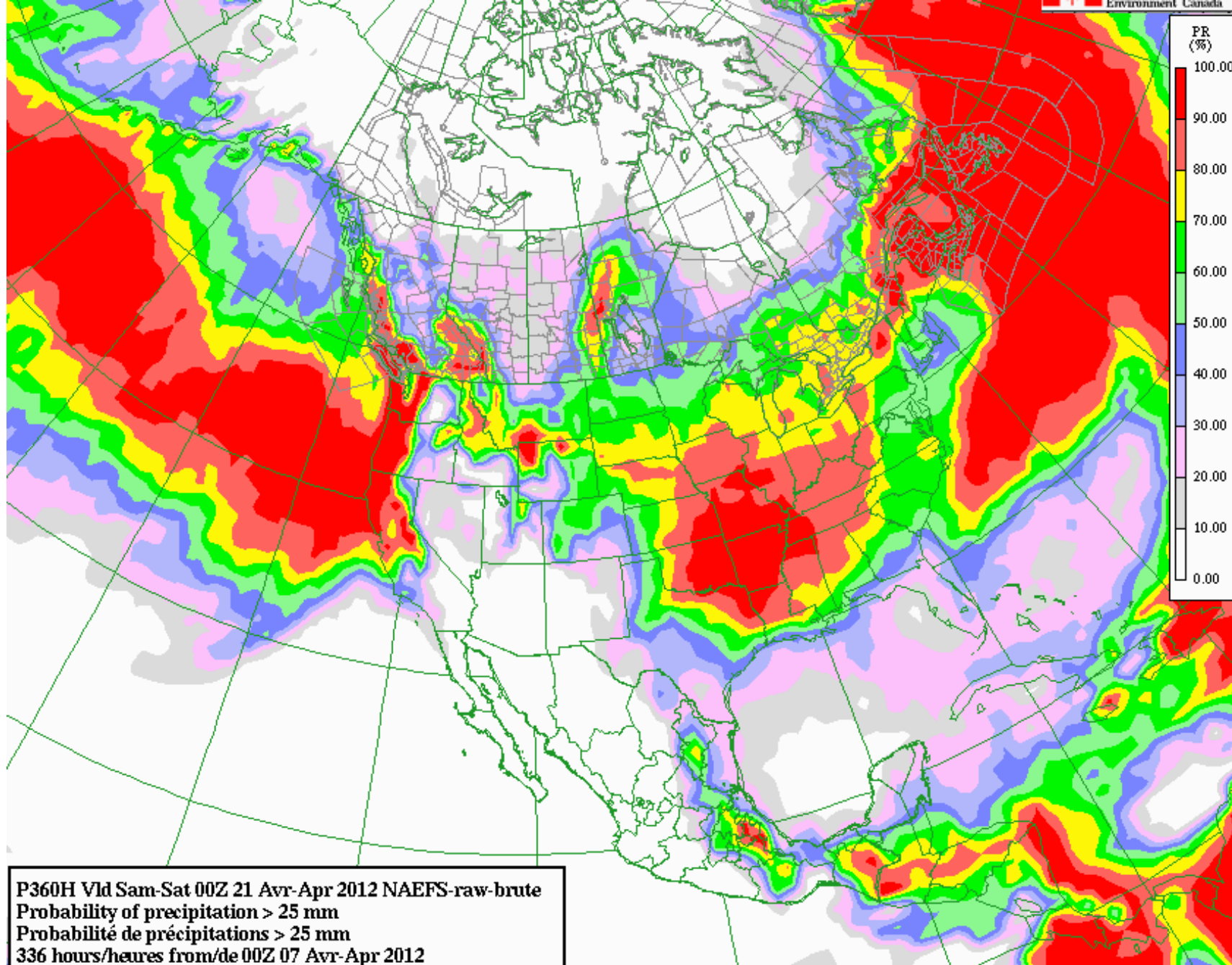
- **Active Pacific storm track forecast**
- Storm #1 impacting northern today. Minor accumulations less than 1”.
- Atmospheric ridging builds over weekend and early next week. This period will be warm and dry.
- Storm #2 arrives middle/late next week bringing minor snow accumulation to mountains.
- Storm #3 arrives April 14/15/16 with potential for more widespread and significant snow accumulation. However, uncertainty with this storm remains large.





P168H Vld Ven-Fri 00Z 13 Avr-Apr 2012 NAEFS-raw-brute
Probability of precipitation > 25 mm
Probabilité de précipitations > 25 mm
144 hours/heures from/de 00Z 07 Avr-Apr 2012
to/à 00Z 13 Avr-Apr 2012
Issued/Émise 2012040600Z
Counting members/Comptage de membres

Web Reference: www.weatheroffice.gc.ca

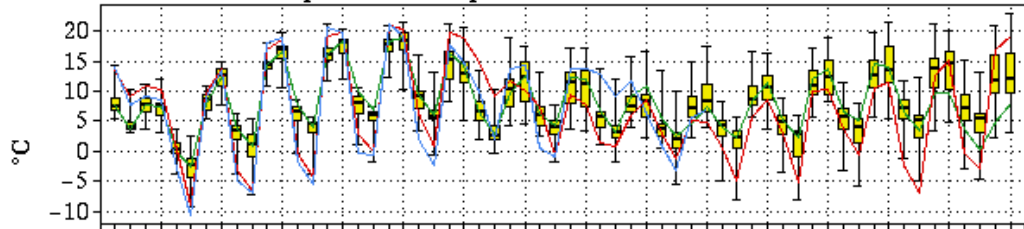


P360H Vld Sam-Sat 00Z 21 Avr-Apr 2012 NAEFS-raw-brute
Probability of precipitation > 25 mm
Probabilité de précipitations > 25 mm
336 hours/heures from/de 00Z 07 Avr-Apr 2012
to/à 00Z 21 Avr-Apr 2012
Issued/Émise 2012040600Z
Counting members/Comptage de membres

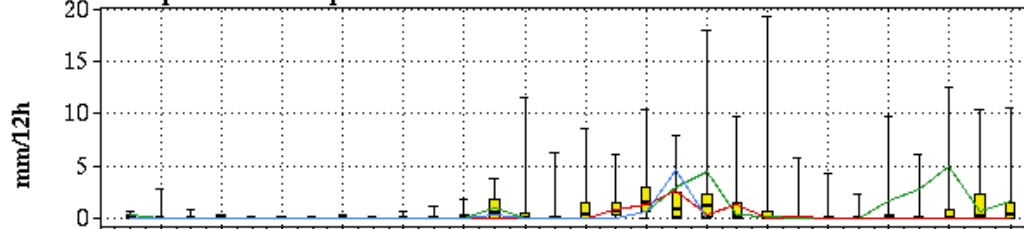
Web Reference: www.weatheroffice.gc.ca

Ensemble and Deterministic Forecasts issued 6 April 2012 00 UTC
 Prévision d'ensemble et déterministe émises le 6 Avril 2012 00 UTC
 for/pour **GRAND JUNCTION (GJT) 39.12 N 108.53 W/O** NAEFS / SPENA

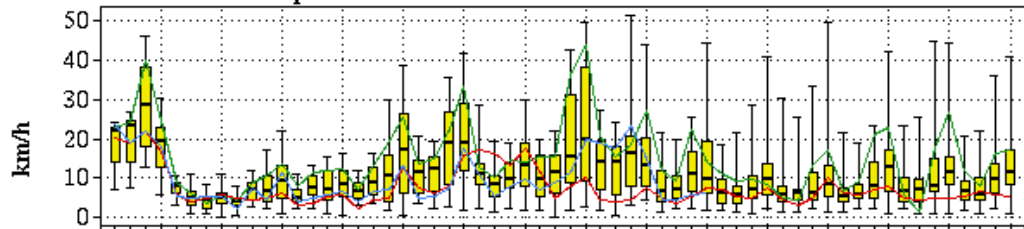
Surface Air Temperature/Température de l'air à la surface



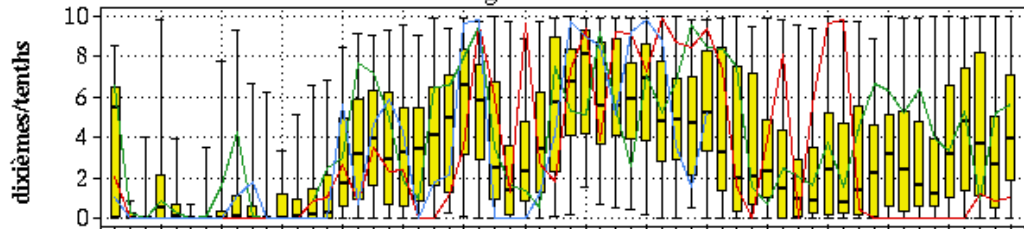
Precipitation/Précipitations



Surface Wind Speed/Vitesse du vent à la surface



Total Cloud Cover/Couvert nuageux total

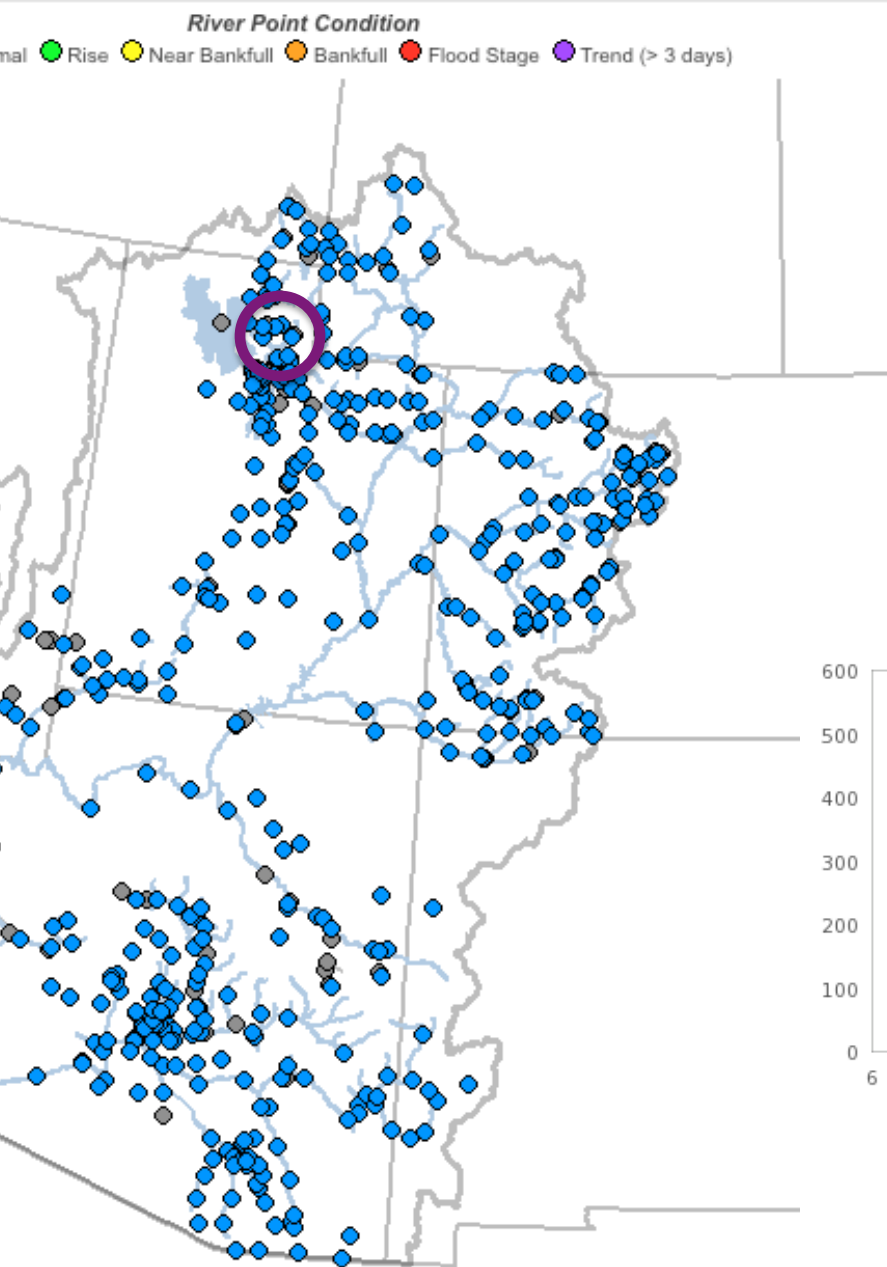


06 07 08 09 10 11 12 13 14 15 16 17 18 19 20
April/Avril 2012

max
 75%
 median/médiane
 25%
 min

— Global Model / Modèle global CMC
 — Control Member / Membre contrôle CMC
 — Control Member / Membre contrôle NCEP

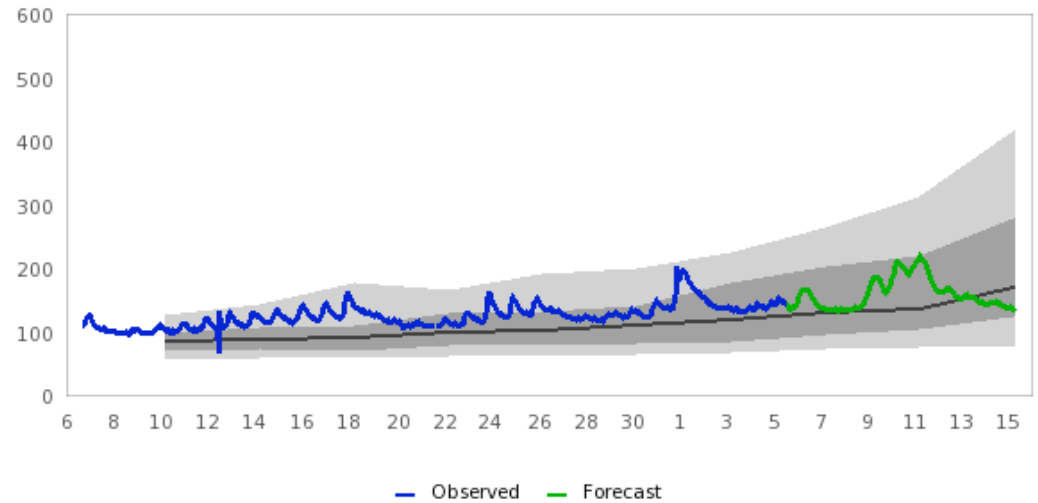
Above Average March Runoff



BLACKSMITH FORK - HYRUM, NR, UPNL DAM, ABV (hrmu1)

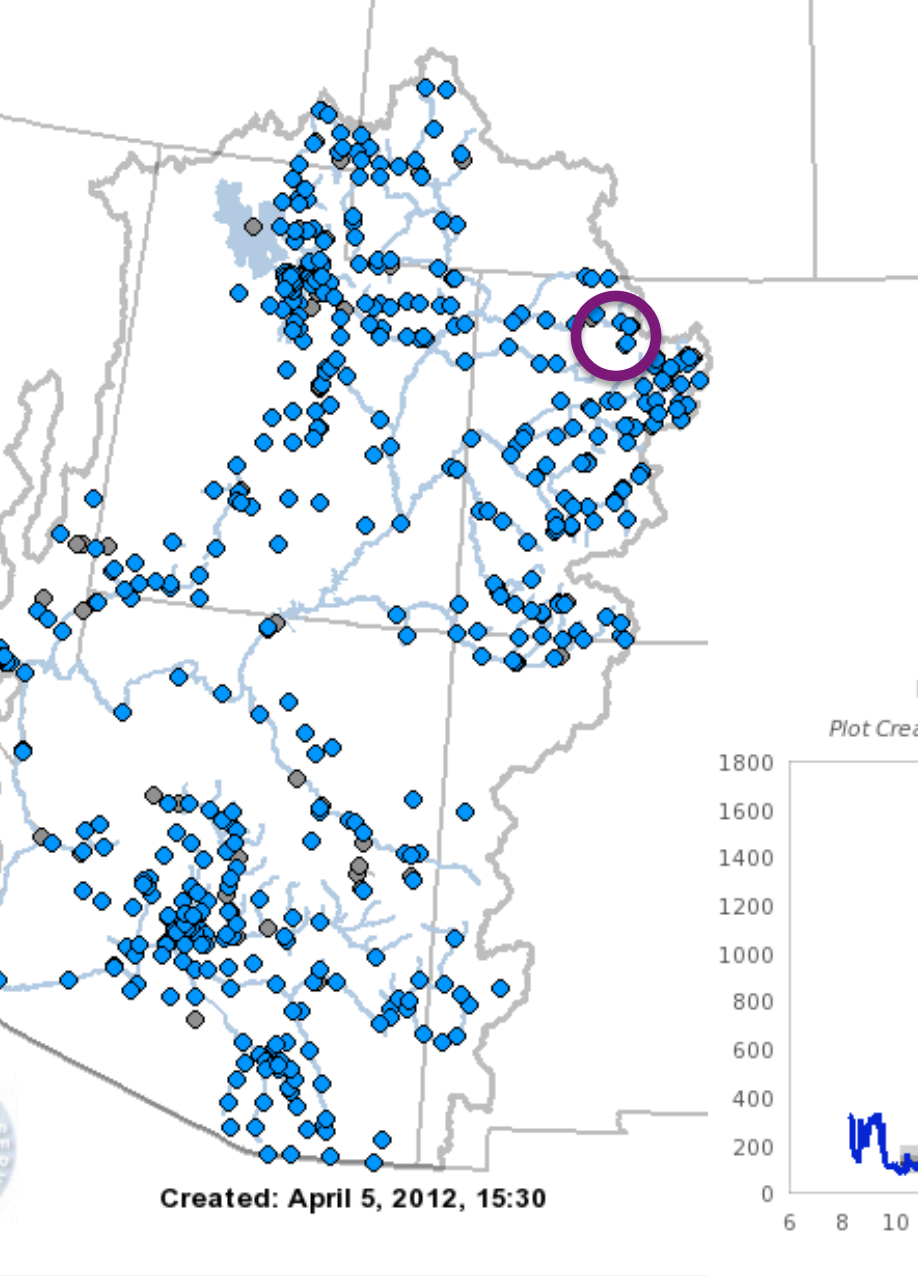
Flow (cfs) for past 30 Days, Forecast run 2012-04-05 14:00 GMT

Plot Created April 5, 15:34 MDT by the Colorado Basin River Forecast Center (NWS/NOAA)



Created: April 5, 2012, 15:30

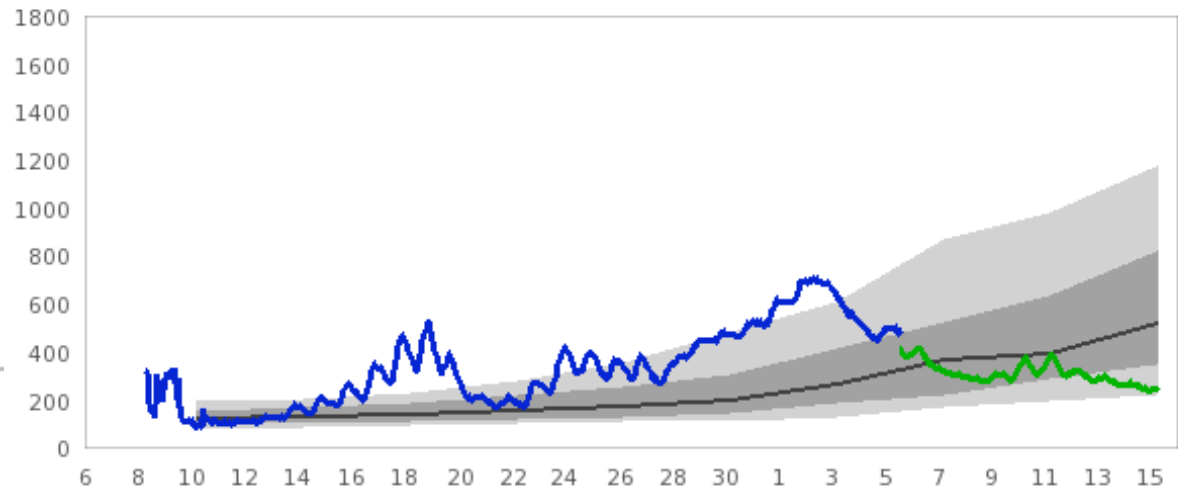
Above Average March Runoff



YAMPA - STEAMBOAT SPRINGS (stmc2)

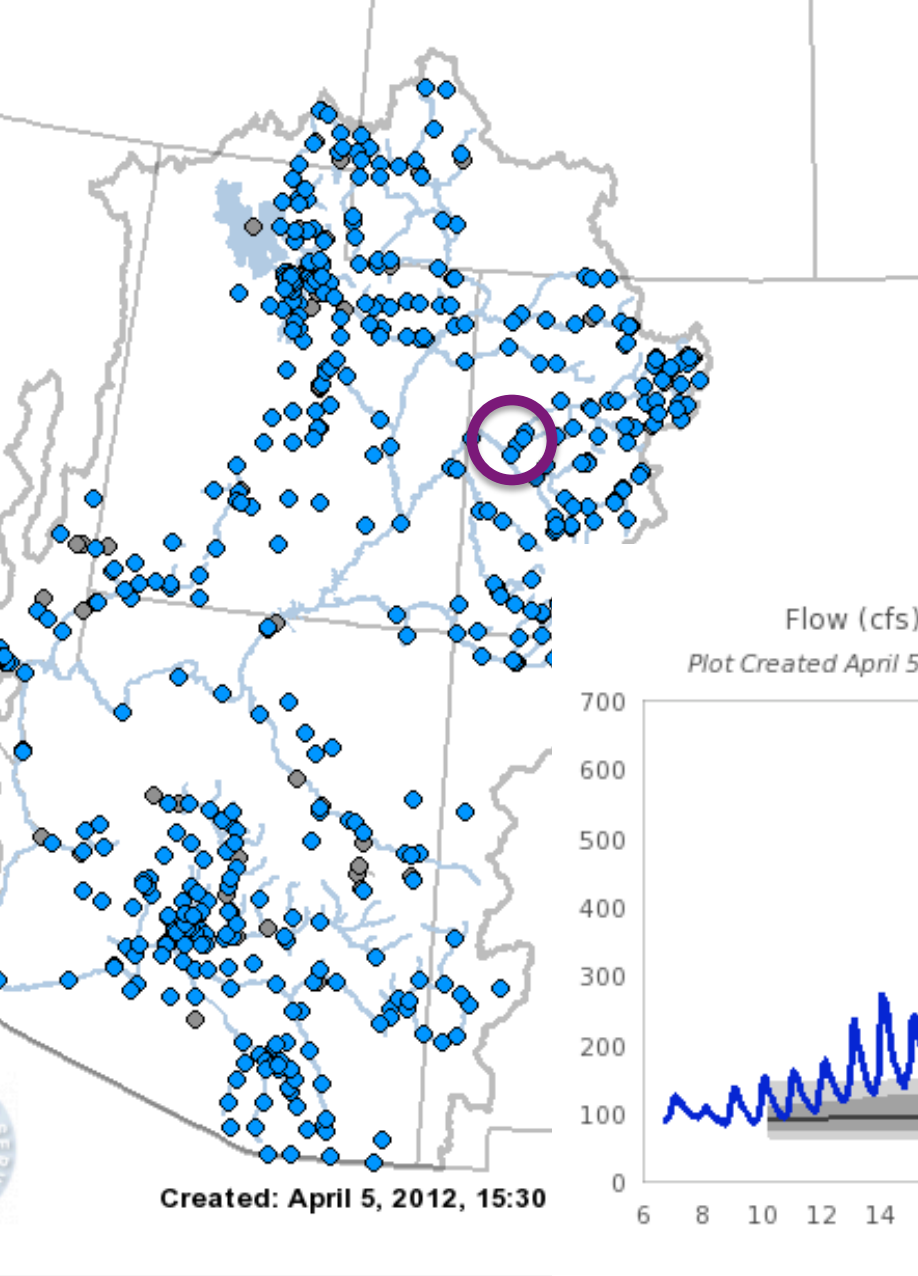
Flow (cfs) for past 30 Days, Forecast run 2012-04-05 14:00 GMT

Plot Created April 5, 15:39 MDT by the Colorado Basin River Forecast Center (NWS/NOAA)



— Observed — Forecast

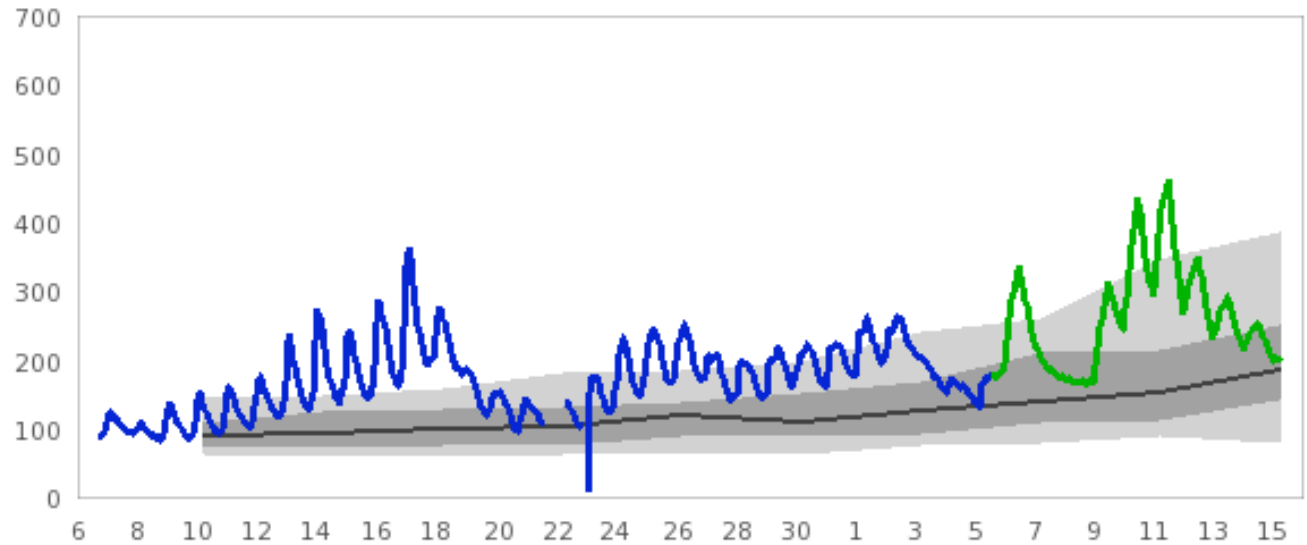
Above Average March Runoff



PLATEAU CK - CAMEO, NR (pccc2)

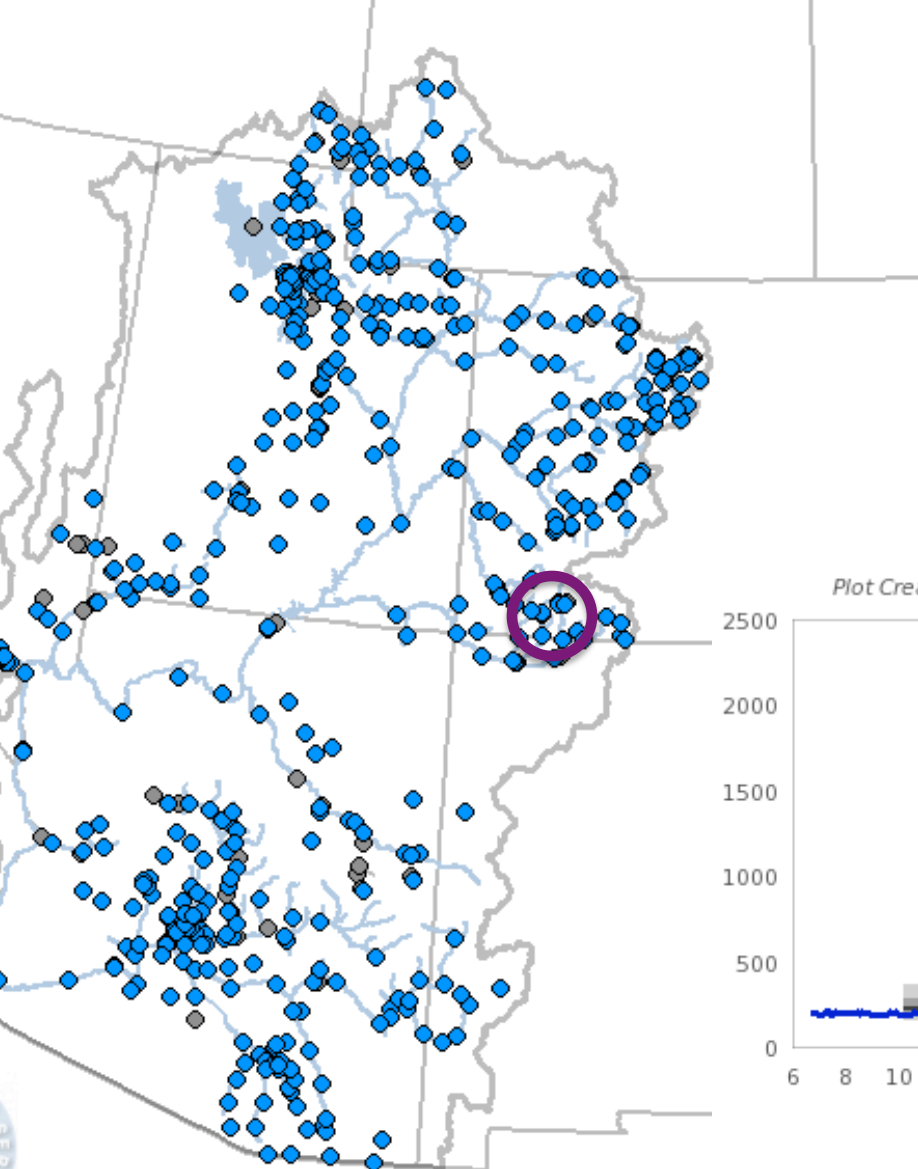
Flow (cfs) for past 30 Days, Forecast run 2012-04-05 14:00 GMT

Plot Created April 5, 15:39 MDT by the Colorado Basin River Forecast Center (NWS/NOAA)



— Observed — Forecast

Above Average March Runoff

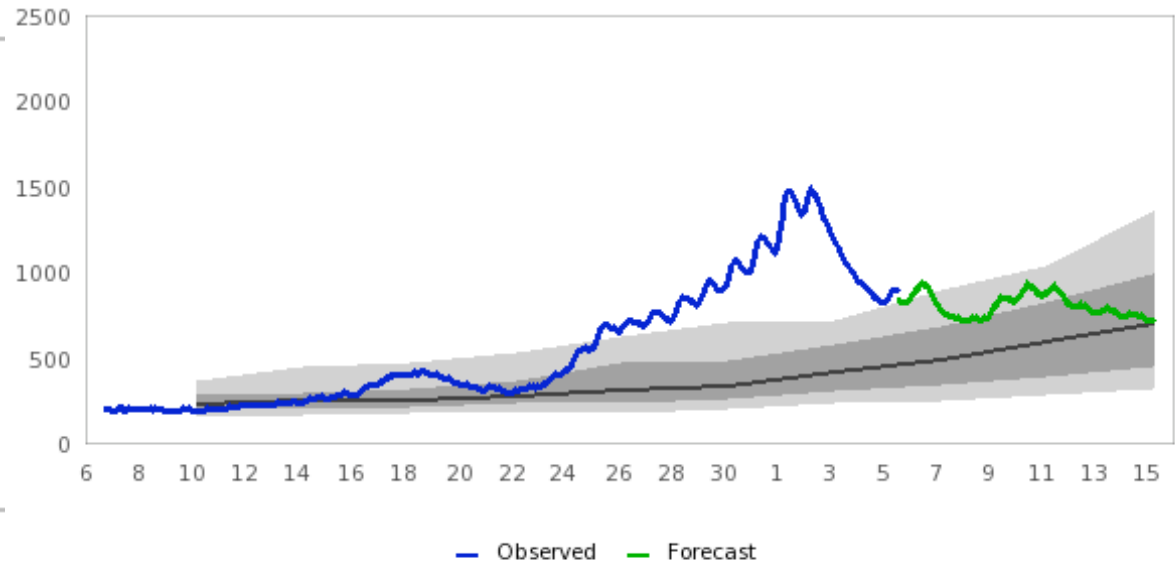


Created: April 5, 2012, 15:30

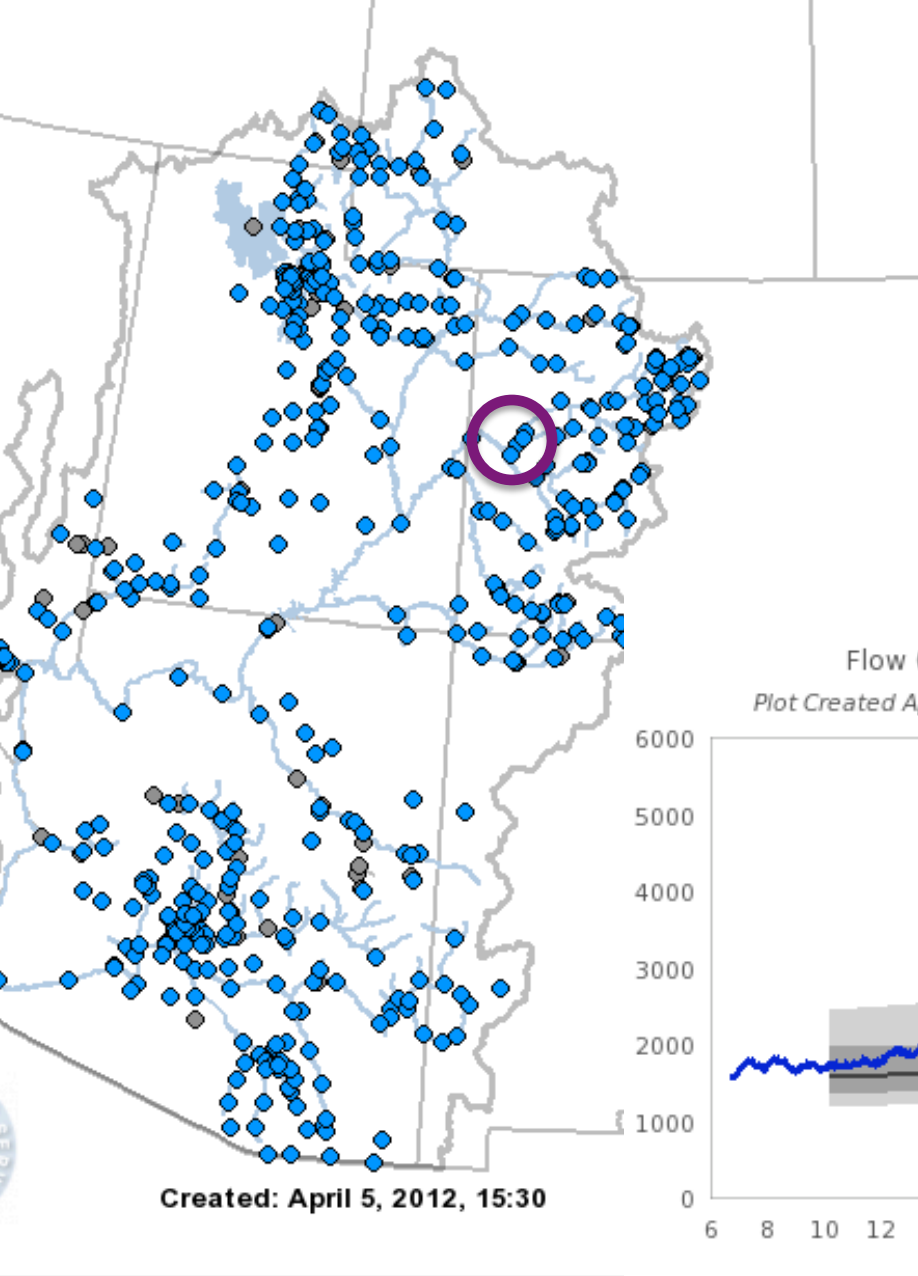
ANIMAS - DURANGO (drgc2)

Flow (cfs) for past 30 Days, Forecast run 2012-04-05 14:00 GMT

Plot Created April 5, 15:40 MDT by the Colorado Basin River Forecast Center (NWS/NOAA)



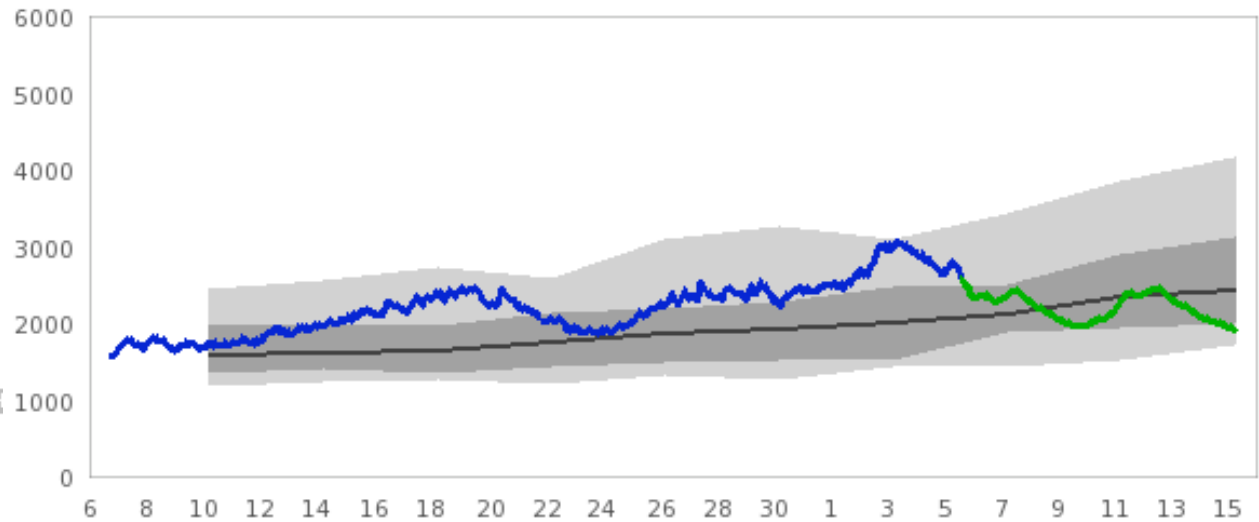
Above Average March Runoff



COLORADO - CAMEO, NR (camc2)

Flow (cfs) for past 30 Days, Forecast run 2012-04-05 14:00 GMT

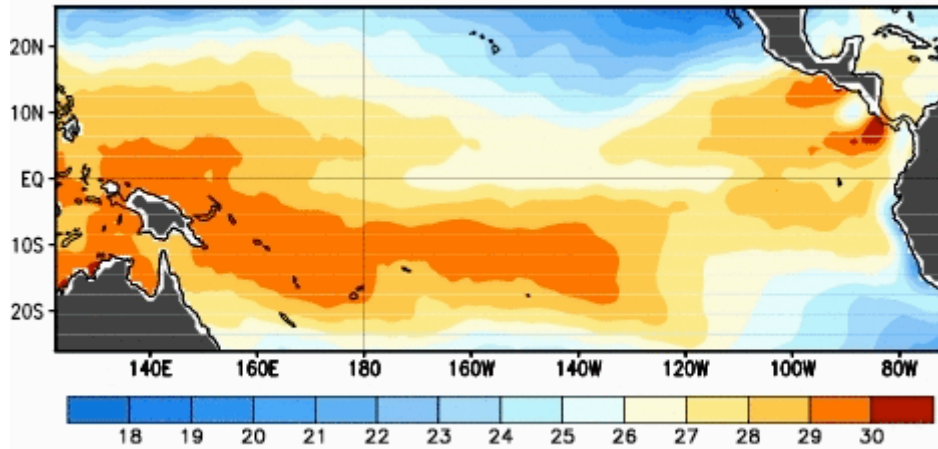
Plot Created April 5, 15:40 MDT by the Colorado Basin River Forecast Center (NWS/NOAA)



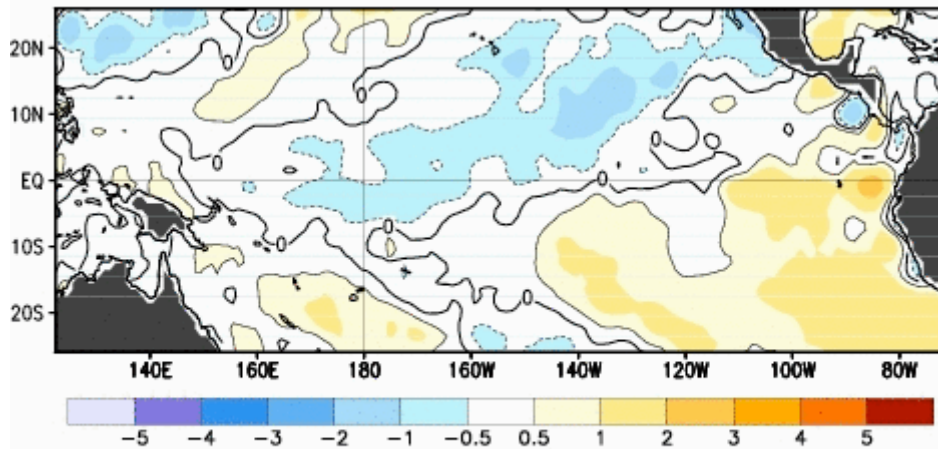
— Observed — Forecast

La Nina Update

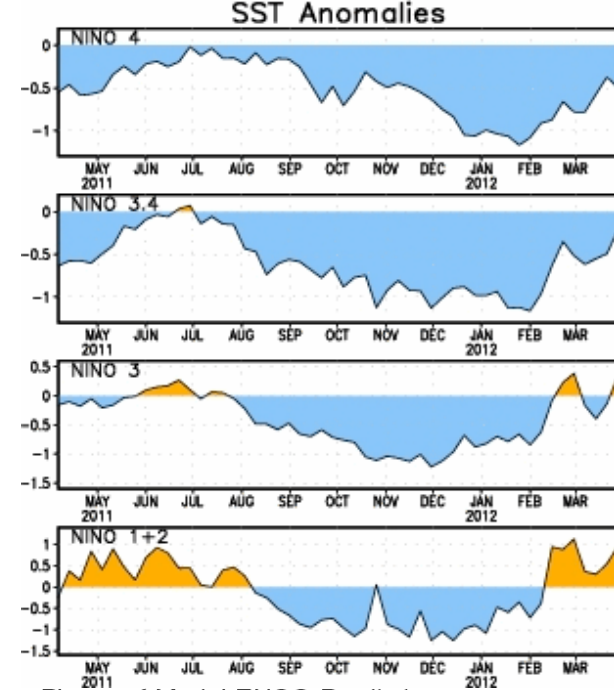
Observed Sea Surface Temperature (°C)



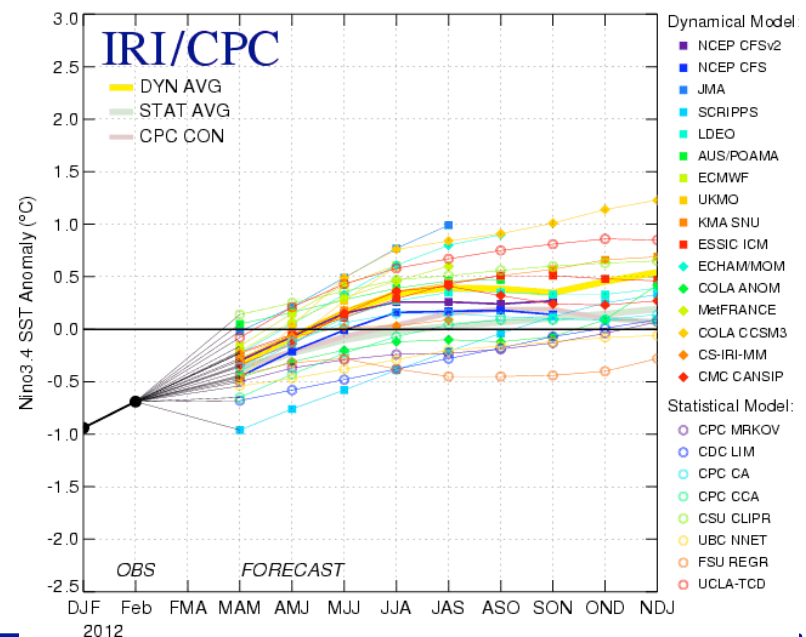
Observed Sea Surface Temperature Anomalies (°C)



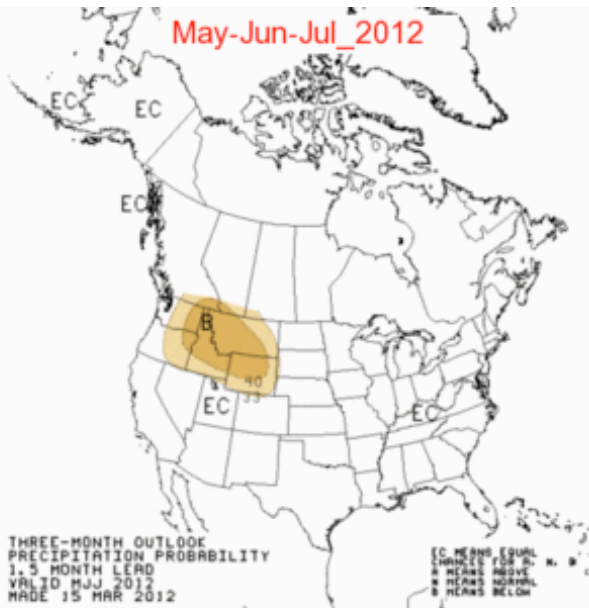
7-day Average Centered on 28 March 2012



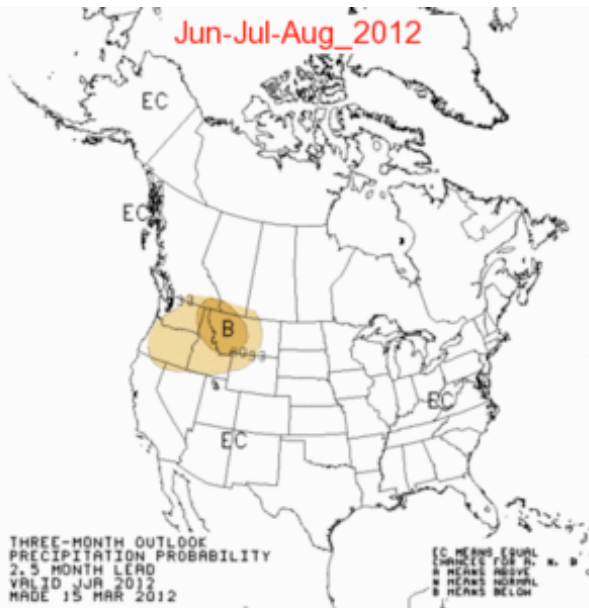
Mid-Mar 2012 Plume of Model ENSO Predictions



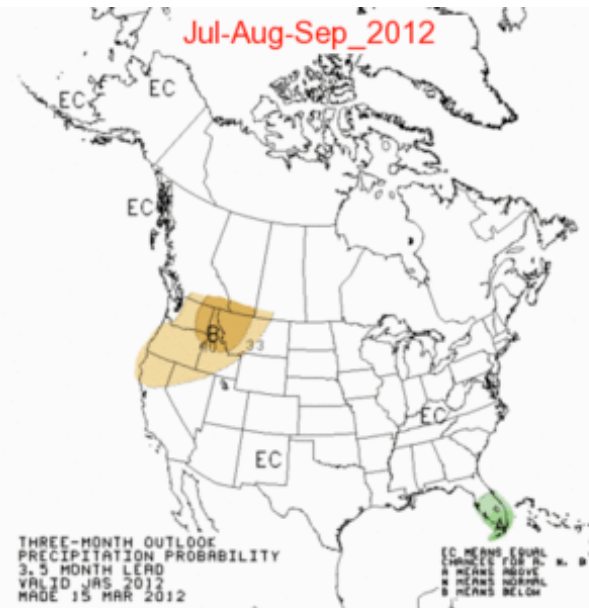
May-Jun-Jul_2012



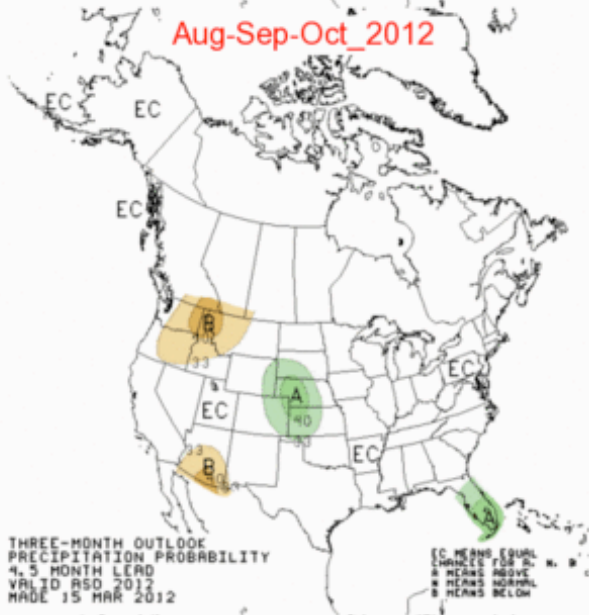
Jun-Jul-Aug_2012



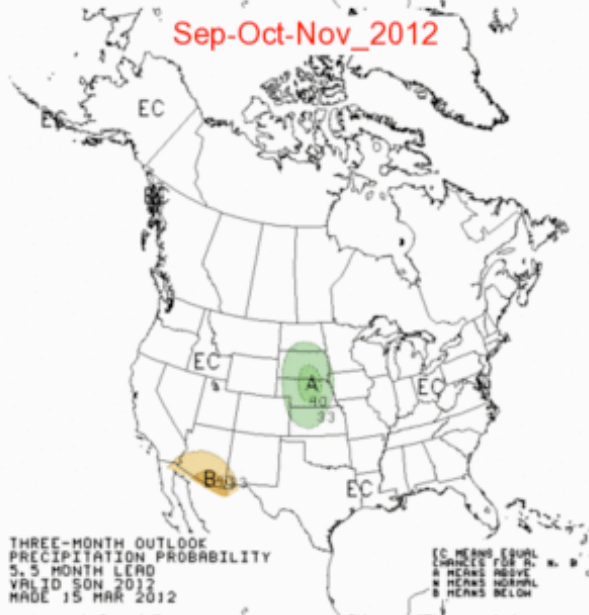
Jul-Aug-Sep_2012



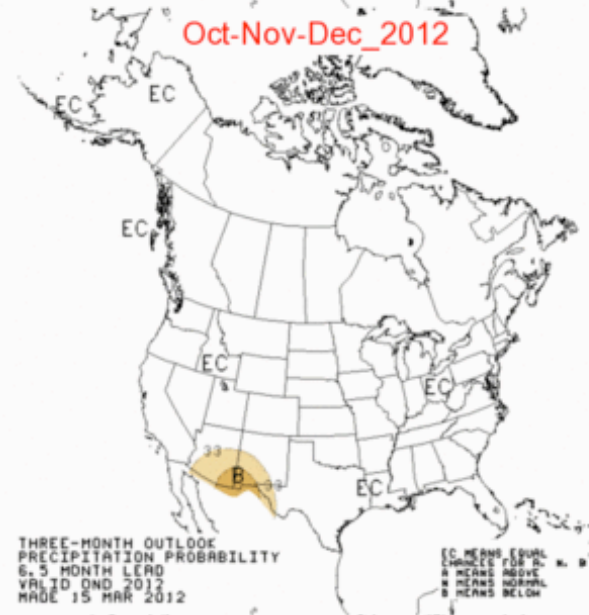
Aug-Sep-Oct_2012

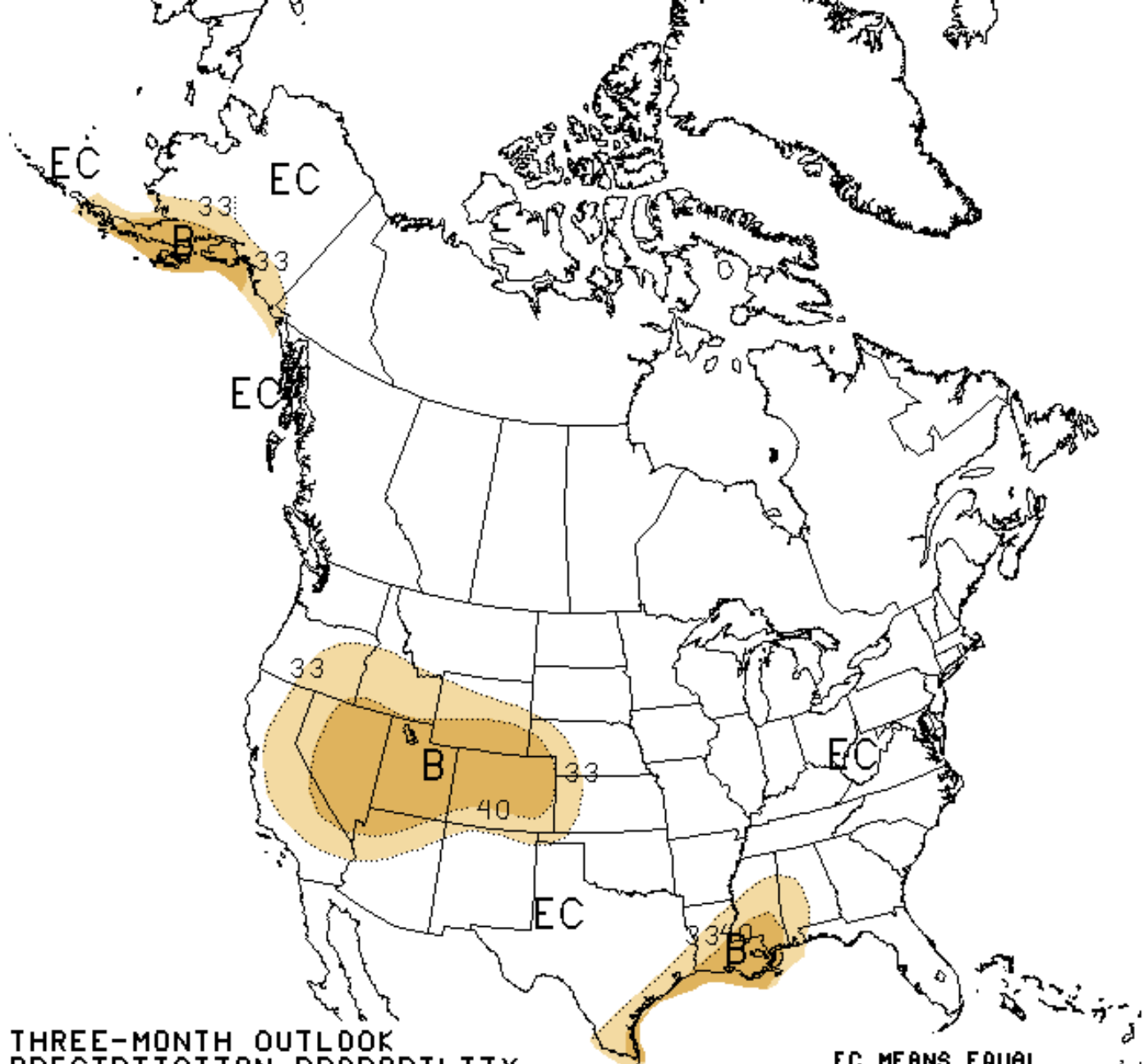


Sep-Oct-Nov_2012



Oct-Nov-Dec_2012



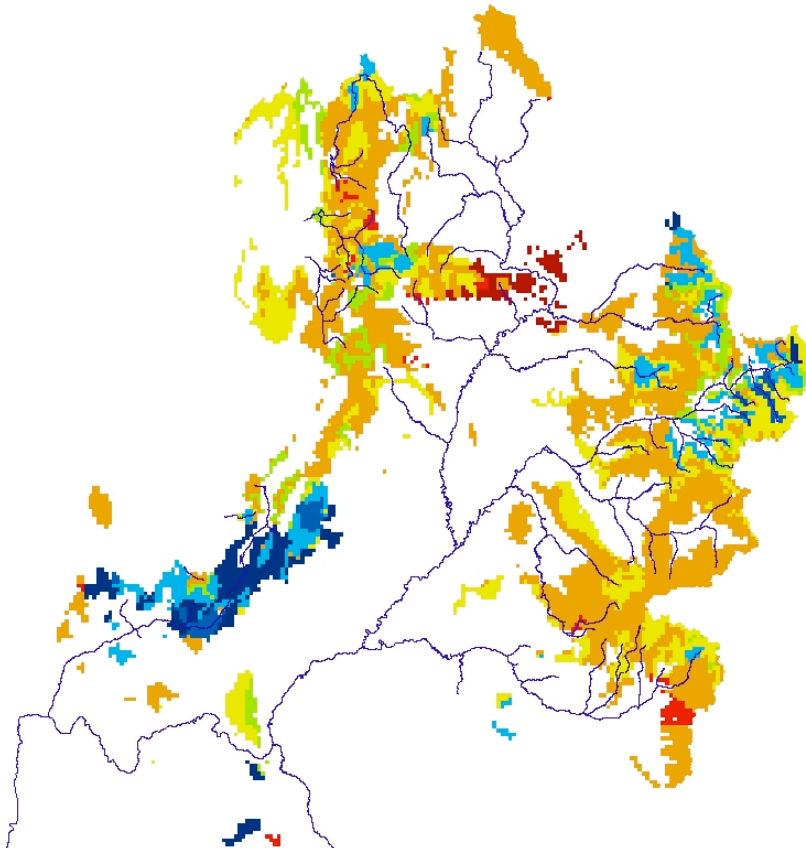


THREE-MONTH OUTLOOK
 PRECIPITATION PROBABILITY
 0.5 MONTH LEAD
 VALID AMJ 2012
 MADE 15 MAR 2012

EC MEANS EQUAL
 CHANCES FOR A, N, B
 A MEANS ABOVE
 N MEANS NORMAL
 B MEANS BELOW

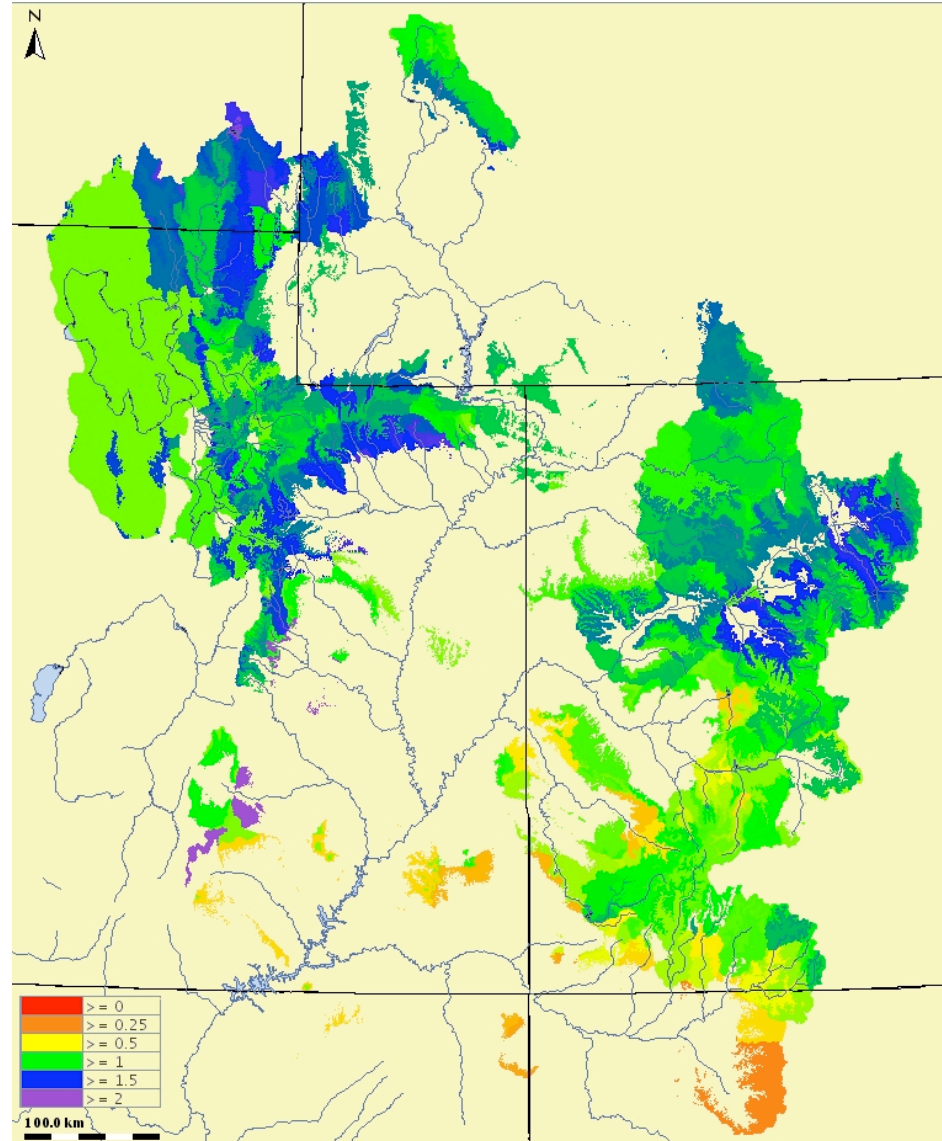
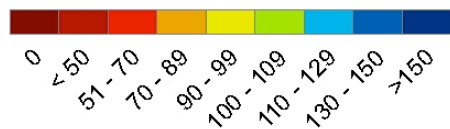
Soil Moisture

Upper Colorado
NWSRFS Modeled Lower Zone Soil Moisture



Percent Average (> 1.0 inch) November 1, 2010

VALUE



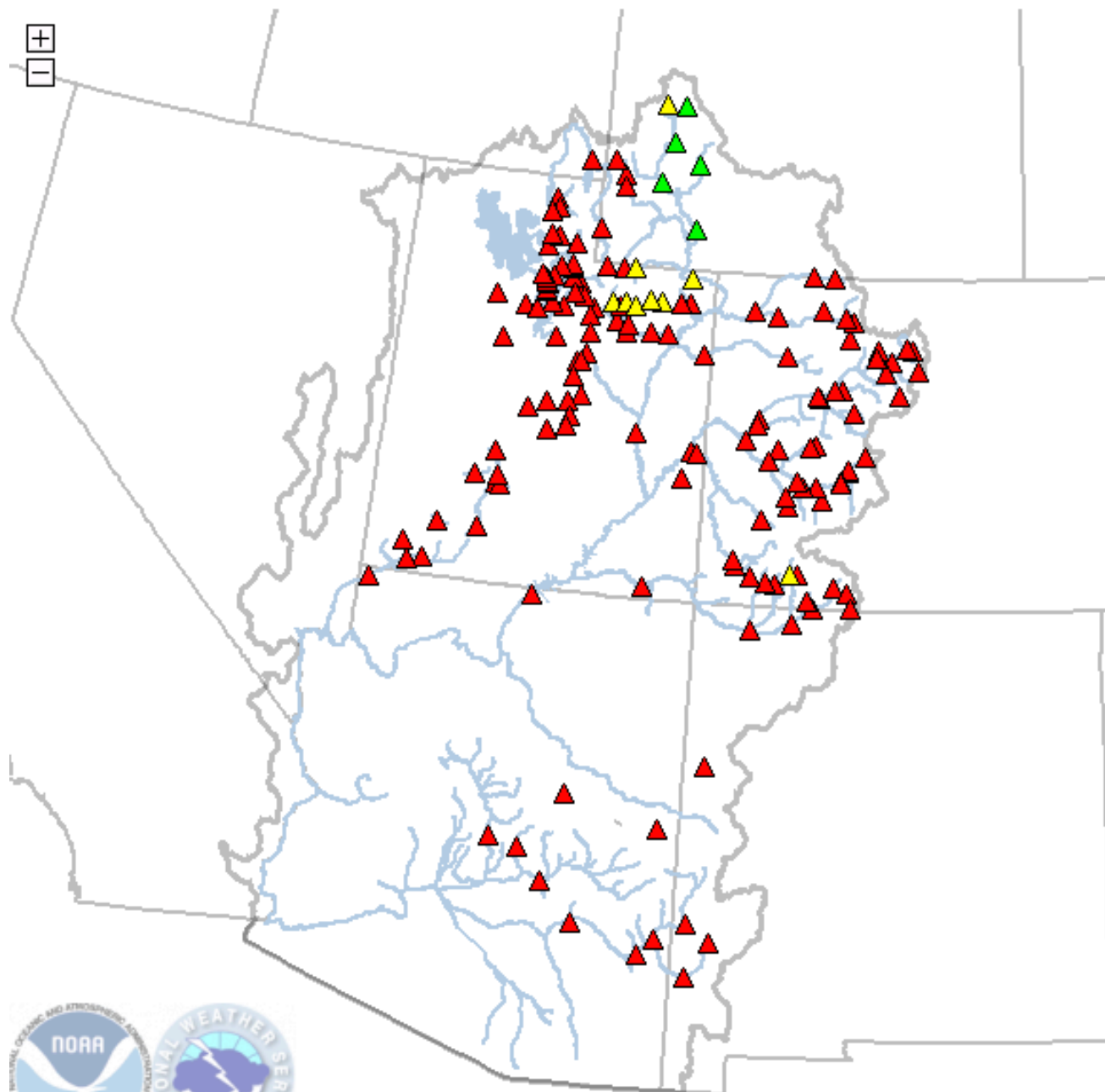
100.0 km

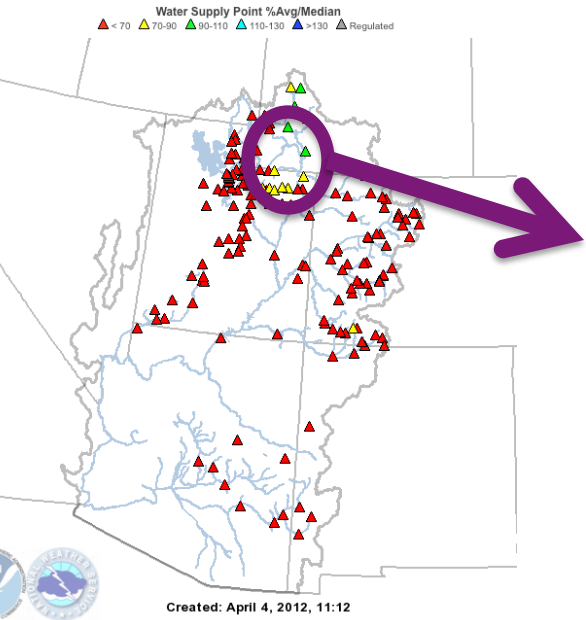
April 2012 Water Supply Forecasts

Water Supply Point %Avg/Median
▲ < 70 ▲ 70-90 ▲ 90-110 ▲ 110-130 ▲ >130 ▲ Regulated

Highlights:

- Major reductions from March 1 forecasts in many areas including:
 - Yampa
 - Upper Colorado mainstem
 - Gunnison
 - San Juan
 - Lower Basin
- Less change in:
 - Upper Green
 - Duchesne





810 kaf
50% Exceedence (Official Forecast)

97%
of Historical Median

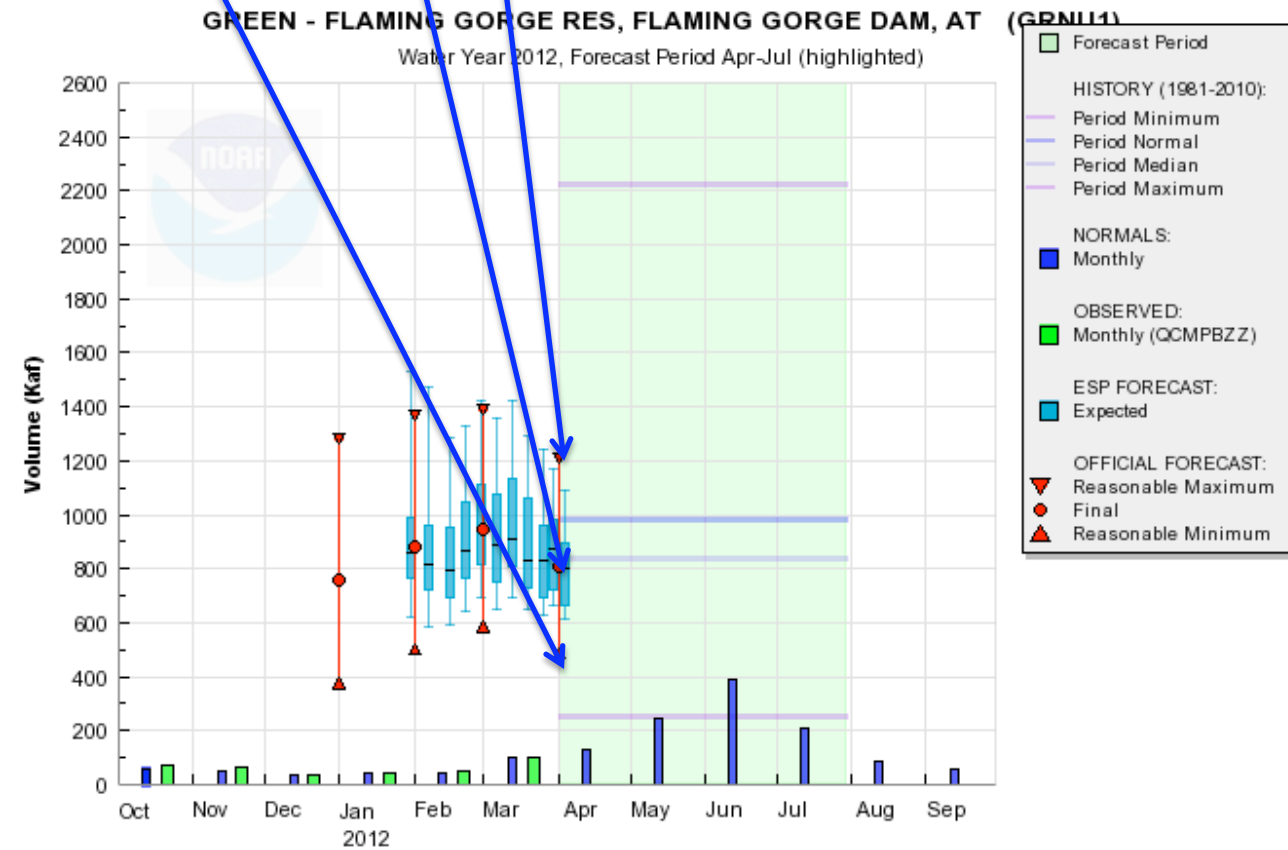
83%
of Historical Mean

490 kaf
90% Exceedence

1210 kaf
10% Exceedence

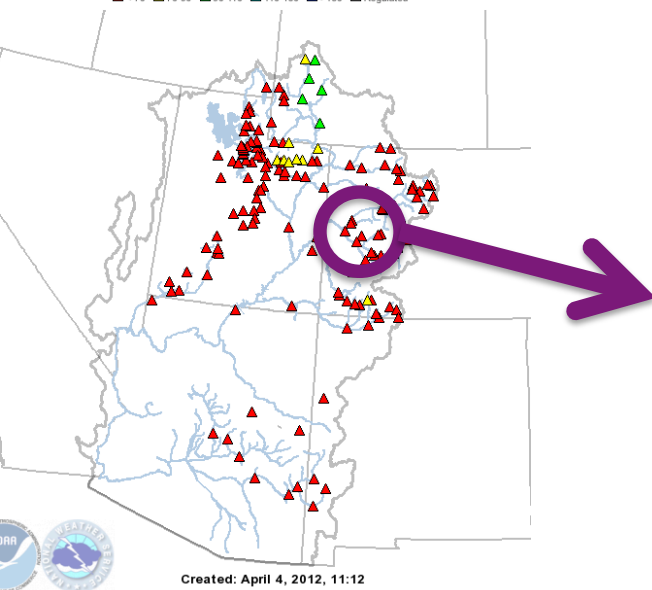
51st of 72
Official Historical Flows

Forecast Issued: Apr 1 2012 [View Water Supply Forecast Plot](#)



CBRFC/NWS/NOAA 04/05/12 22:03:42 UTC

Web Reference: www.cbrfc.noaa.gov/gmap/gmapm.php?wcon=checked



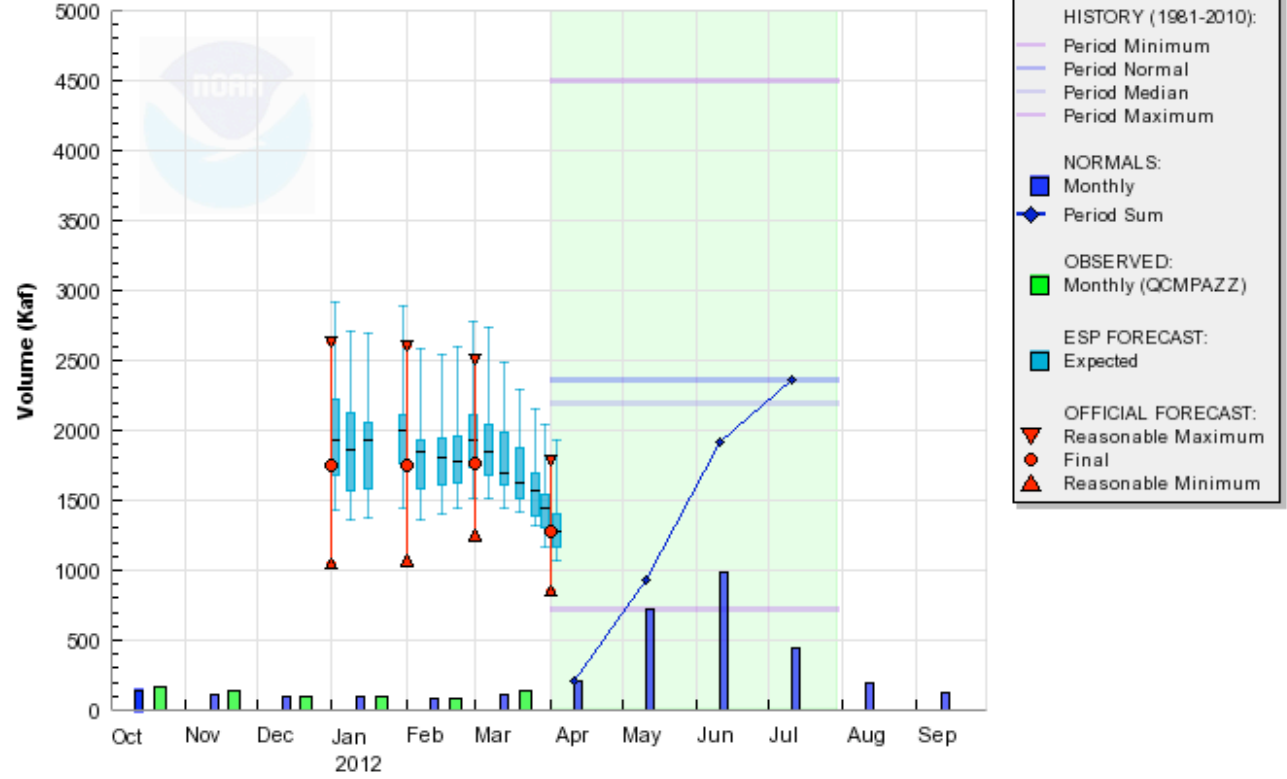
Seasonal Water Supply Forecast ?

Forecast Period: Apr-Jul

1280 kaf 50% Exceedence (Official Forecast)		58% of Historical Median	54% of Historical Mean
855 kaf 90% Exceedence	1790 kaf 10% Exceedence	71st of 79 Official Historical Flows	
Forecast Issued: Apr 1 2012		View Water Supply Forecast Plot	

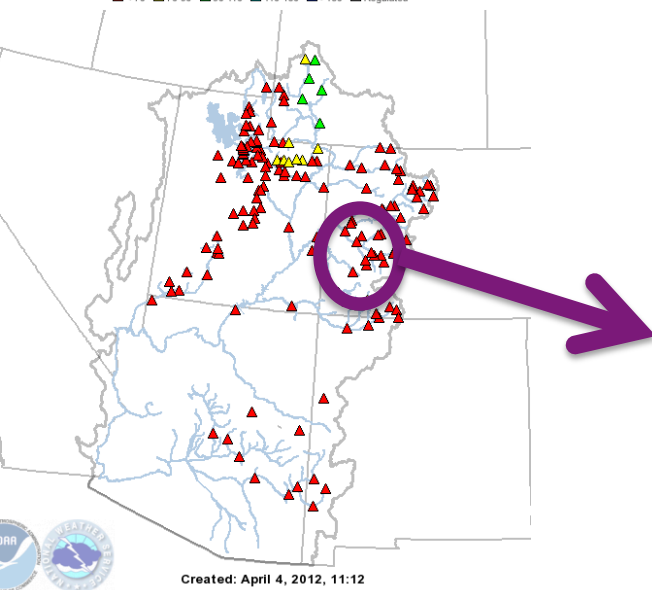
Created: April 4, 2012, 11:12

COLORADO - CAMEO, NR (CAMC2) Water Year 2012, Forecast Period Apr-Jul (highlighted)



CBRFC/NWS/NOAA 04/06/12 18:33:30 UTC

Web Reference: www.cbrfc.noaa.gov/gmap/gmapm.php?wcon=checked



Seasonal Water Supply Forecast ?

Forecast Period: Apr-Jul

330 kaf 50% Exceedence (Official Forecast)		57% of Historical Median	49% of Historical Mean
225 kaf 90% Exceedence	455 kaf 10% Exceedence	39th of 42 Official Historical Flows	
Forecast Issued: Apr 1 2012		View Water Supply Forecast Plot	

Created: April 4, 2012, 11:12

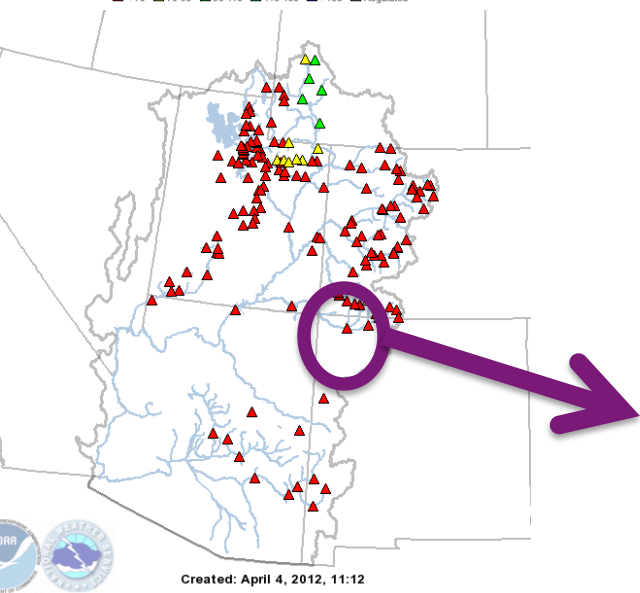
GUNNISON - BLUE MESA RES (BMDC2)

Water Year 2012, Forecast Period Apr-Jul (highlighted)



CBRFC/NWS/NOAA 04/05/12 22:05:25 UTC

Web Reference: www.cbrfc.noaa.gov/gmap/gmapm.php?wcon=checked



Created: April 4, 2012, 11:12

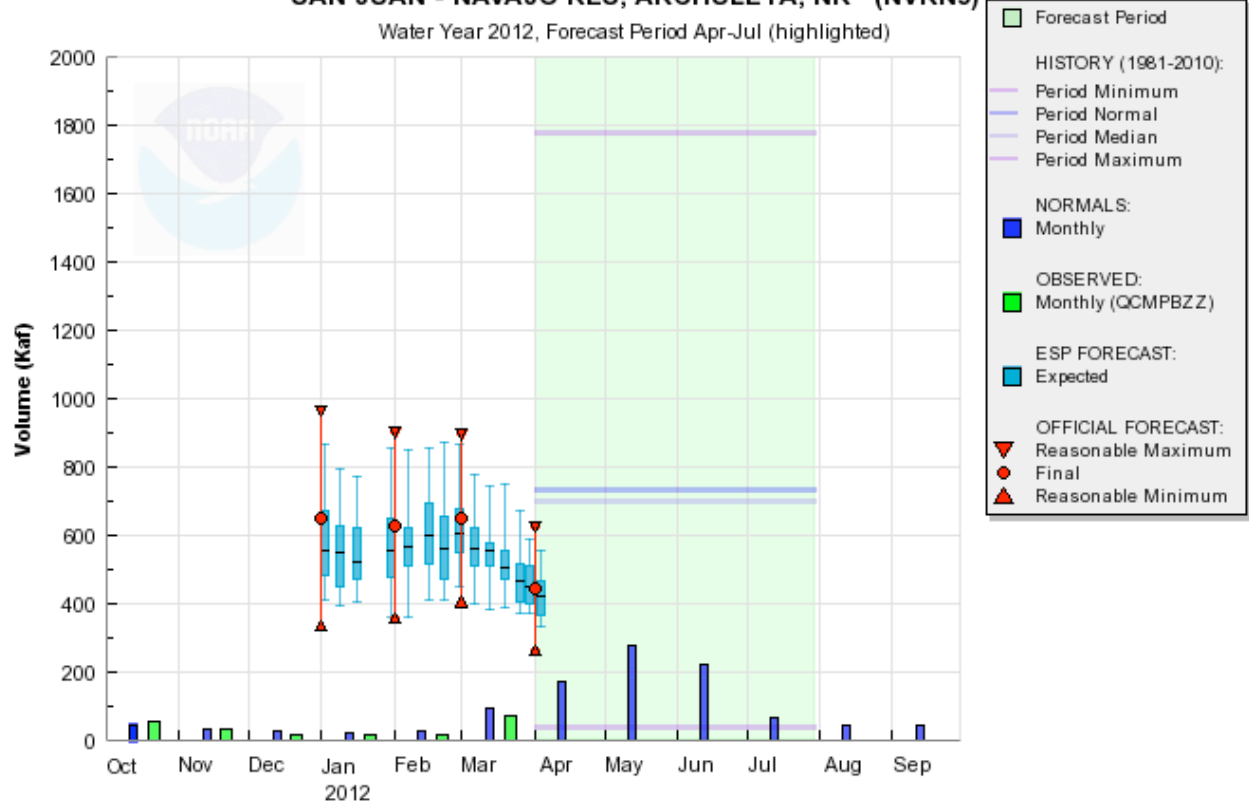
Seasonal Water Supply Forecast

Forecast Period: Apr-Jul

445 kaf 50% Exceedence (Official Forecast)		64% of Historical Median	61% of Historical Mean
265 kaf 90% Exceedence	625 kaf 10% Exceedence	46th of 65 Official Historical Flows	
Forecast Issued: Apr 1 2012		View Water Supply Forecast Plot	

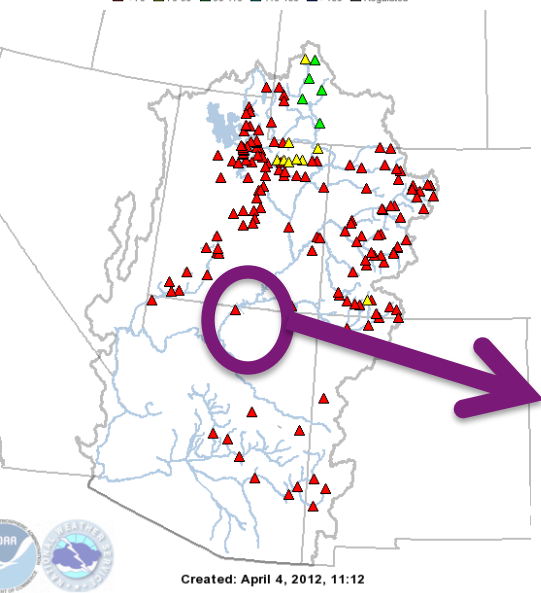
SAN JUAN - NAVAJO RES, ARCHULETA, NR (NVRN5)

Water Year 2012, Forecast Period Apr-Jul (highlighted)



CBRFC/NWS/NOAA 04/05/12 22:06:21 UTC

Web Reference: www.cbrfc.noaa.gov/gmap/gmapm.php?wcon=checked



Created: April 4, 2012, 11:12

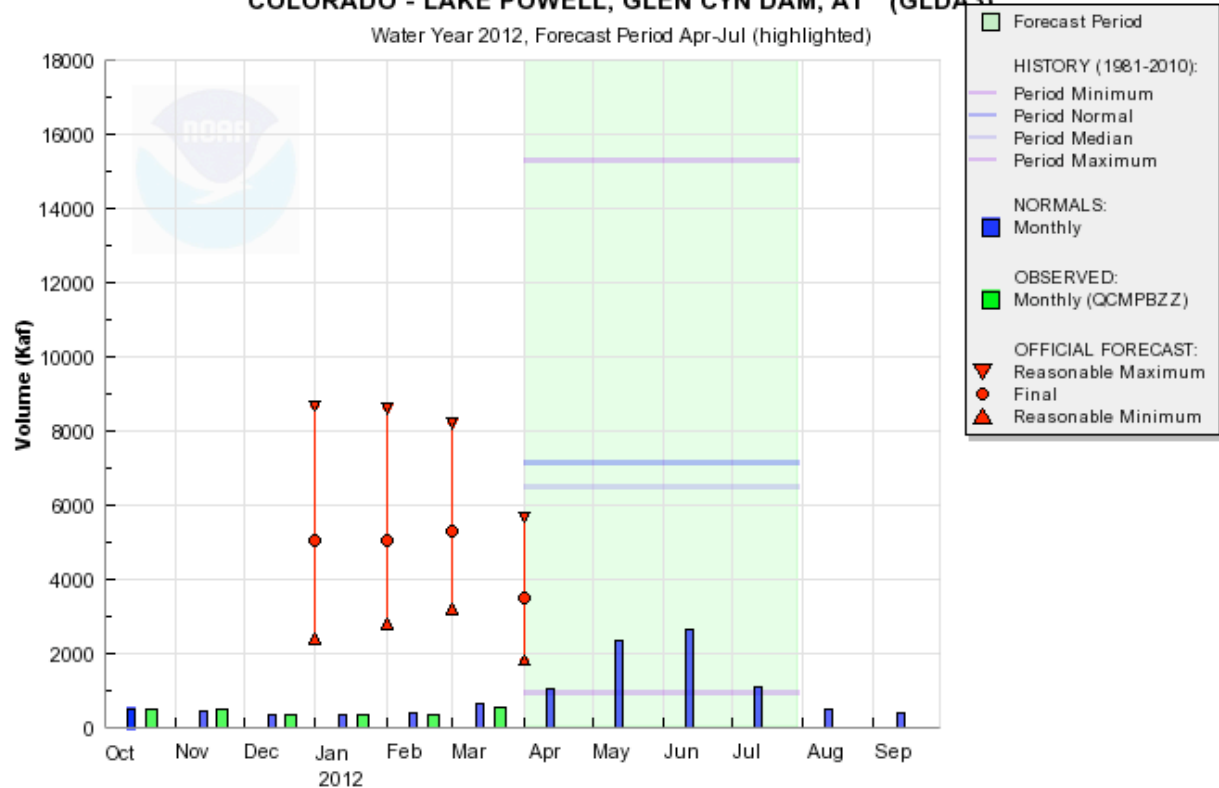
Seasonal Water Supply Forecast

Forecast Period: Apr-Jul

<p>3500 kaf 50% Exceedence (Official Forecast)</p>		<p>54% of Historical Median</p>	<p>49% of Historical Mean</p>
<p>1840 kaf 90% Exceedence</p>	<p>5690 kaf 10% Exceedence</p>	<p>95th of 103 Official Historical Flows</p>	
<p>Forecast Issued: Apr 1 2012</p>		<p>View Water Supply Forecast Plot</p>	

COLORADO - LAKE POWELL, GLEN CYN DAM, AT (GLDA3)

Water Year 2012, Forecast Period Apr-Jul (highlighted)

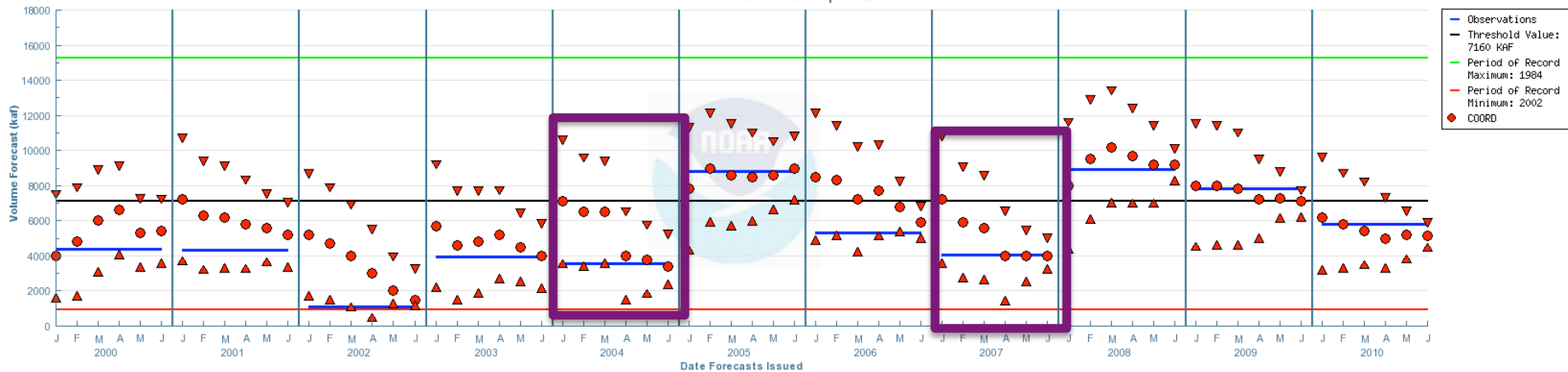


CBRFC/NWS/NOAA 04/05/12 22:07:18 UTC

Web Reference: www.cbrfc.noaa.gov/gmap/gmapm.php?wcon=checked

Have we seen major drops in the forecast from March to April before?

Historical - COLORADO - LAKE POWELL, GLEN CYN DAM, AT (GLDA3)
Forecast Period: Apr - Jul



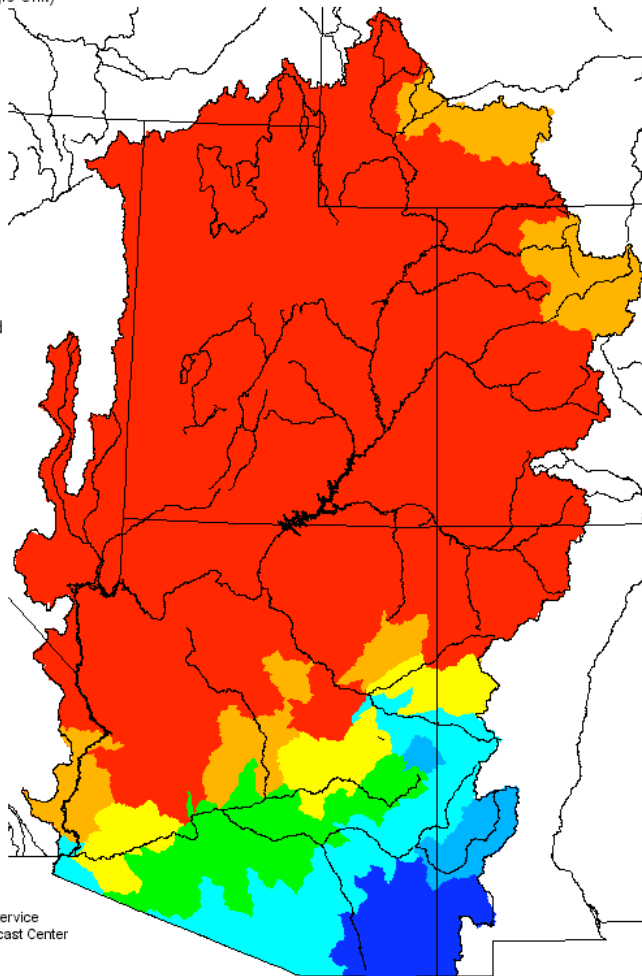
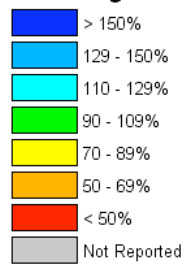
Yes: 2004 (forecast dropped 6.5 MAF to 4.0 MAF) and
2007 (forecast dropped 5.6 MAF to 4.0 MAF)

2012 forecast went 5.3 MAF to 3.5 MAF

Monthly Precipitation for March 2004

(Averaged by Hydrologic Unit)

% Average

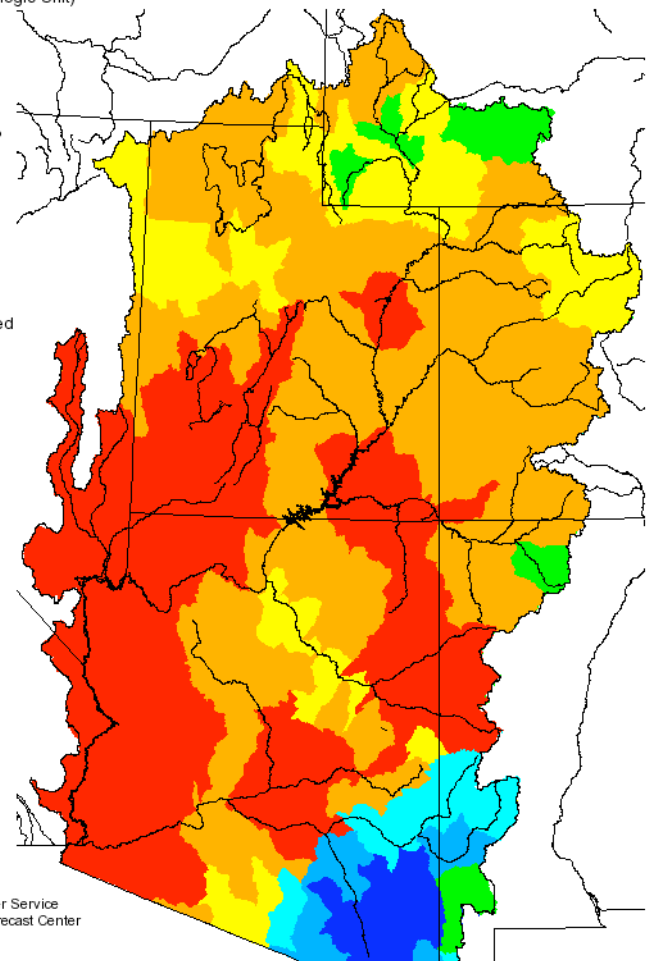
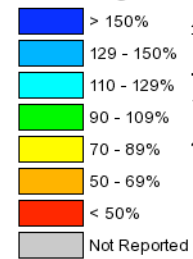


Prepared by
NOAA, National Weather Service
Colorado Basin River Forecast Center
Salt Lake City, Utah
www.cbrfc.noaa.gov

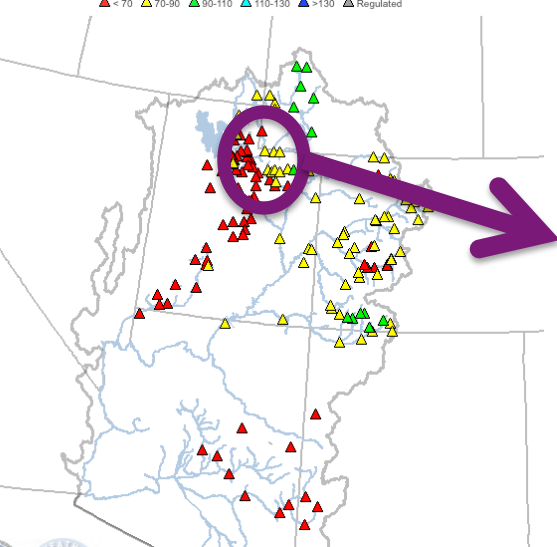
Monthly Precipitation for March 2007

(Averaged by Hydrologic Unit)

% Average



Prepared by
NOAA, National Weather Service
Colorado Basin River Forecast Center
Salt Lake City, Utah
www.cbrfc.noaa.gov

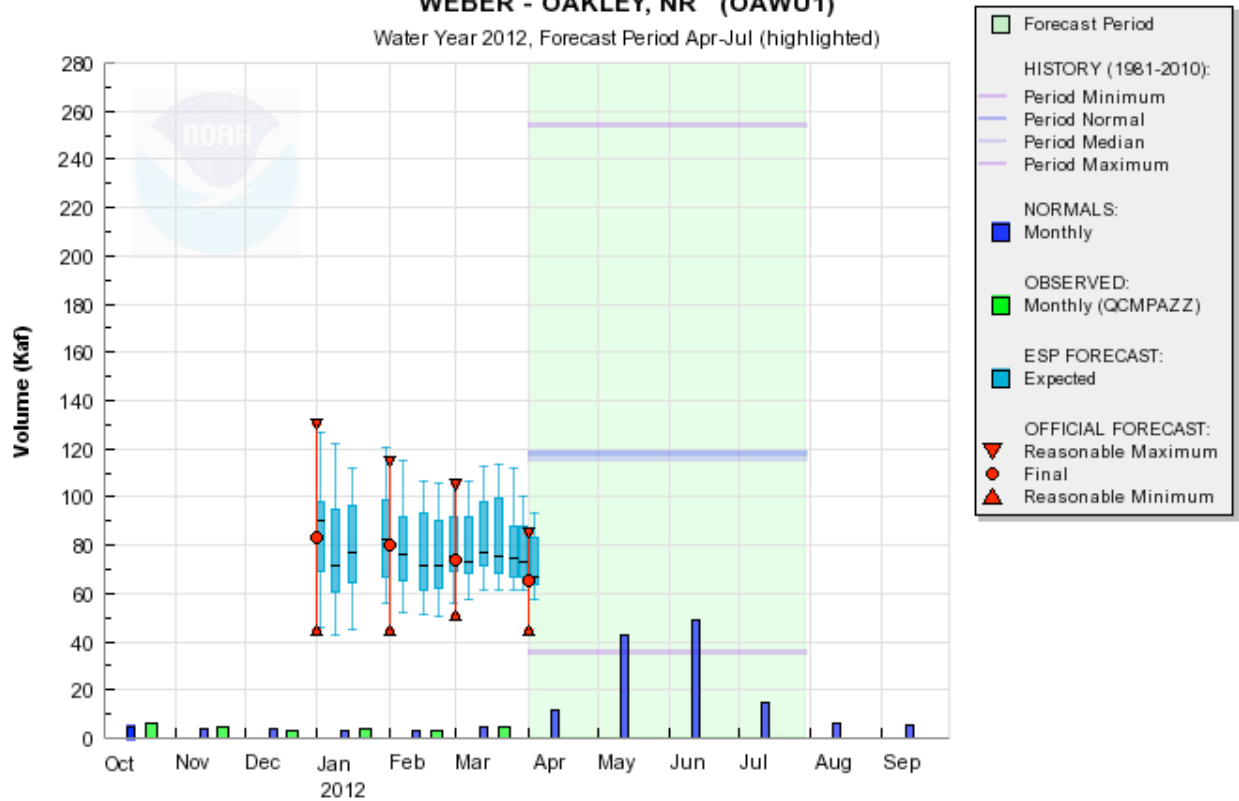


Seasonal Water Supply Forecast ?

Forecast Period: Apr-Jul

65 kaf 50% Exceedence (Official Forecast)		56% of Historical Median	55% of Historical Mean
45 kaf 90% Exceedence	85 kaf 10% Exceedence	102nd of 108 Official Historical Flows	
Forecast Issued: Apr 1 2012		View Water Supply Forecast Plot	

WEBER - OAKLEY, NR (OAWU1)
Water Year 2012, Forecast Period Apr-Jul (highlighted)



CBRFC/NWS/NOAA 04/05/12 22:07:45 UTC

Web Reference: www.cbrfc.noaa.gov/gmap/gmapm.php?wcon=checked

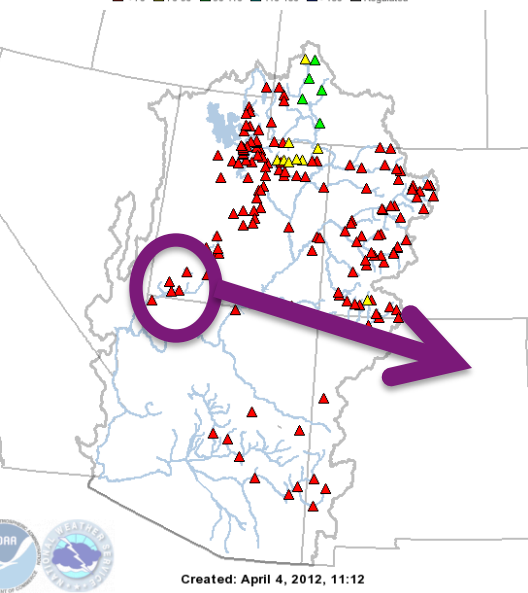
Seasonal Water Supply Forecast

Forecast Period: Apr-Jul

28 kaf 50% Exceedence (Official Forecast)	68% of Historical Median	48% of Historical Mean
18.4 kaf 90% Exceedence	40 kaf 10% Exceedence	84th of 104 Official Historical Flows

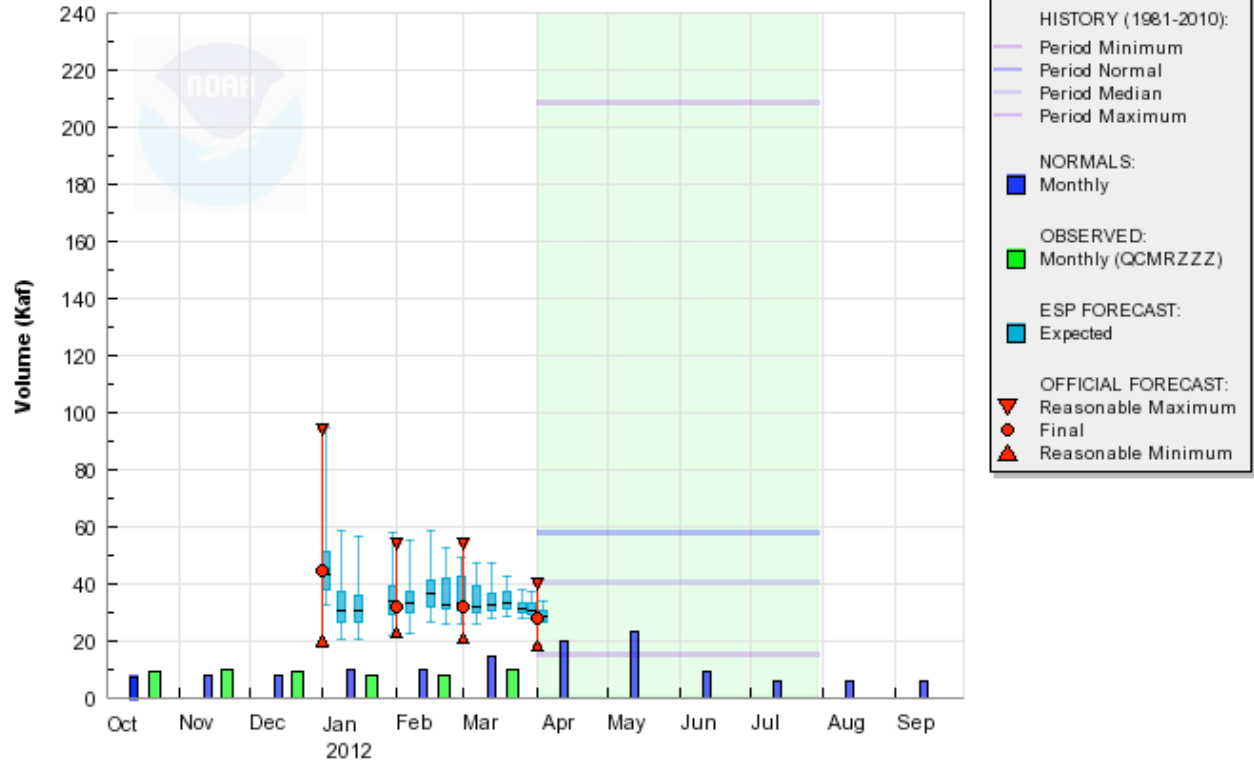
Forecast Issued: Apr 1 2012

[View Water Supply Forecast Plot](#)



Created: April 4, 2012, 11:12

VIRGIN - VIRGIN (VIRU1)
Water Year 2012, Forecast Period Apr-Jul (highlighted)



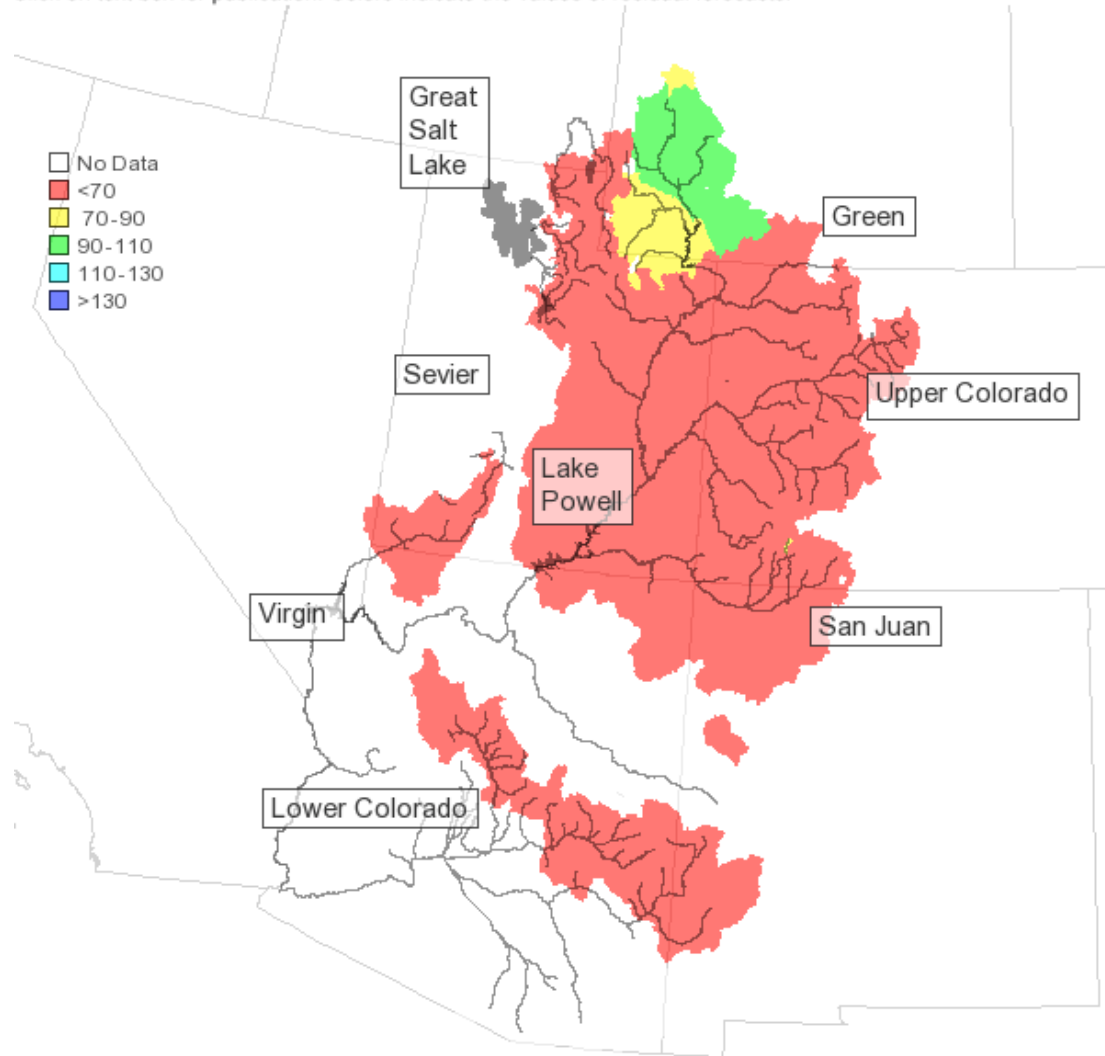
CBRFC/NWS/NOAA 04/05/12 22:08:38 UTC

Web Reference: www.cbrfc.noaa.gov/gmap/gmapm.php?wcon=checked

Online Publication

New 1981-2010 Averages being used this year.

Click on text box for publication. Colors indicate the values of residual forecasts.



Upper Colorado Water Supply Outlook, January 1, 2011

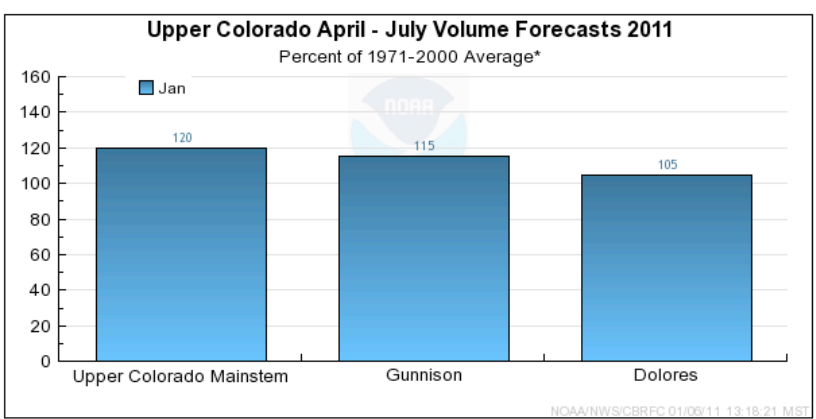


Prepared by Brenda Alcorn, Tracy Cox
 NOAA, National Weather Service
 Colorado Basin River Forecast Center
 Salt Lake City, Utah
www.cbrfc.noaa.gov

Contents

- Upper Colorado Summary
- Upper Colorado Mainstem Basin Conditions
- Gunnison Basin Conditions
- Dolores Basin Conditions
- Upper Colorado Mainstem Specific Site Forecasts
- Gunnison Specific Site Forecasts
- Dolores Specific Site Forecasts
- Reservoir Monthly Inflow Forecasts
- Reservoir Contents
- Monthly Streamflows
- Precipitation Maps
- Definitions
- Additional Information
- Questions or Comments

Upper Colorado Summary



*Median of forecasts within each basin.

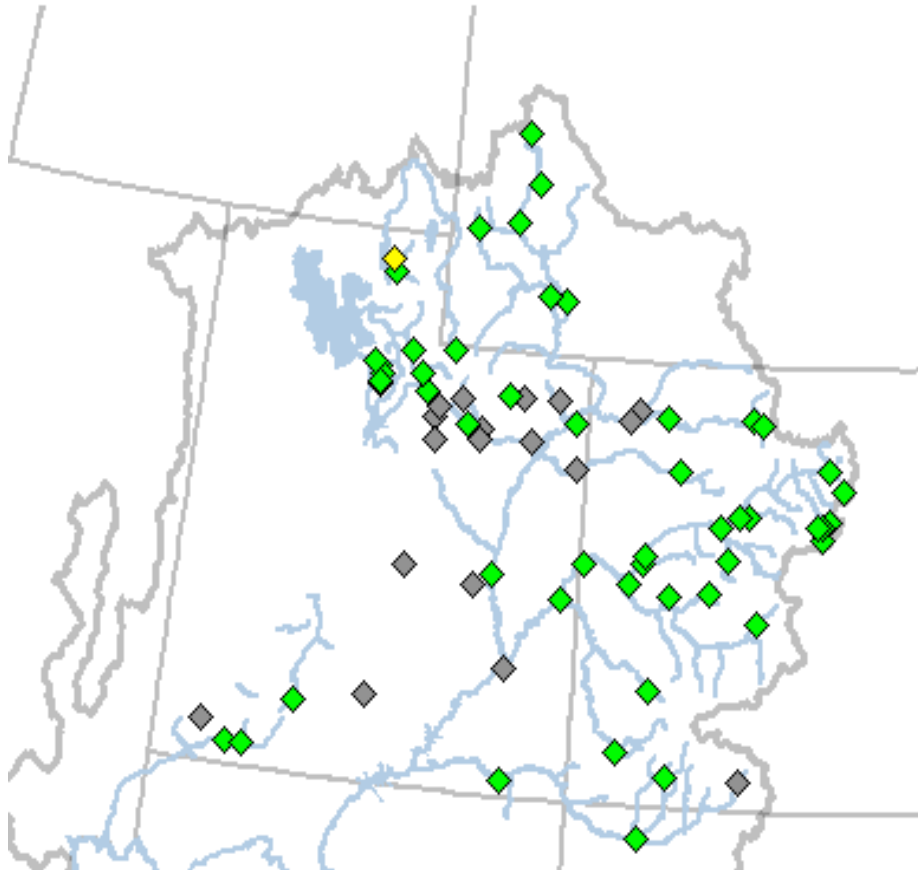
Click site name for graph.

	Forecast Period	90% Exceedance Volume	50% Exceedance Volume	Percent Average	10% Exceedance Volume
Colorado					
Lake Granby, Granby, Nr	April-July	200	280	124	370
Willow Ck					
Willow Ck Res, Granby, Nr	April-July	44	70	137	102
Fraser					
Winter Park	April-July	15	23	115	29
Williams Fork					
Williams Fork Res, Parshall, Nr	April-July	76	110	116	150
Muddy Ck					
Wolford Mtn Res, Blo	April-July	46	76	127	114
Blue					
Dillon Res	April-July	134	200	120	280
Green Mtn Res	April-July	225	335	120	465
Colorado					
Kremmling, Nr	April-July	725	1070	123	1450
Eagle					
Gypsum, Blo	April-July	250	380	113	535
Colorado					
Dotsero, Nr	April-July	1140	1720	119	2410
Frying Pan					
Ruedi Res, Basalt, Nr	April-July	112	160	113	215
Roaring Fork					
Glenwood Springs	April-July	570	840	118	1160
Colorado					
Glenwood Springs, Blo	April-July	1700	2560	119	3600
Cameo, Nr	April-July	1980	2910	120	4020
Plateau Ck					
Cameo, Nr	April-July	100	160	139	250
Colorado					
Cisco, Nr	April-July	3640	5620	121	8020
Mill Ck					
Moab, Nr, Sheley Tun, At	April-July	2.9	6	120	10.8
Colorado					
Lake Powell, Glen Cyn Dam, At	April-July	5860	9500	120	14000

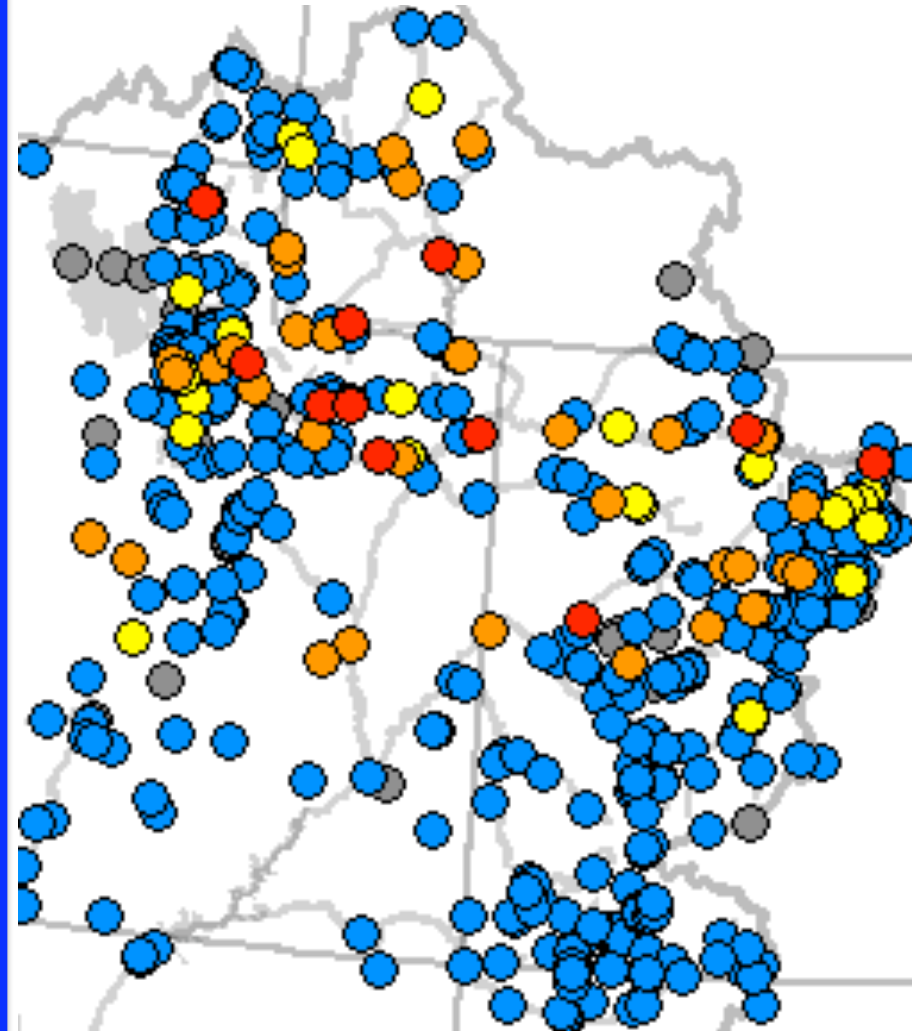
Peak Flow Forecasts

Long Lead Peak Flow Forecasts

◇ No Forecast ◆ No Flood Stage ◆ <10 ◆ >10 ◆ >25 ◆ >50



Daily Forecasts

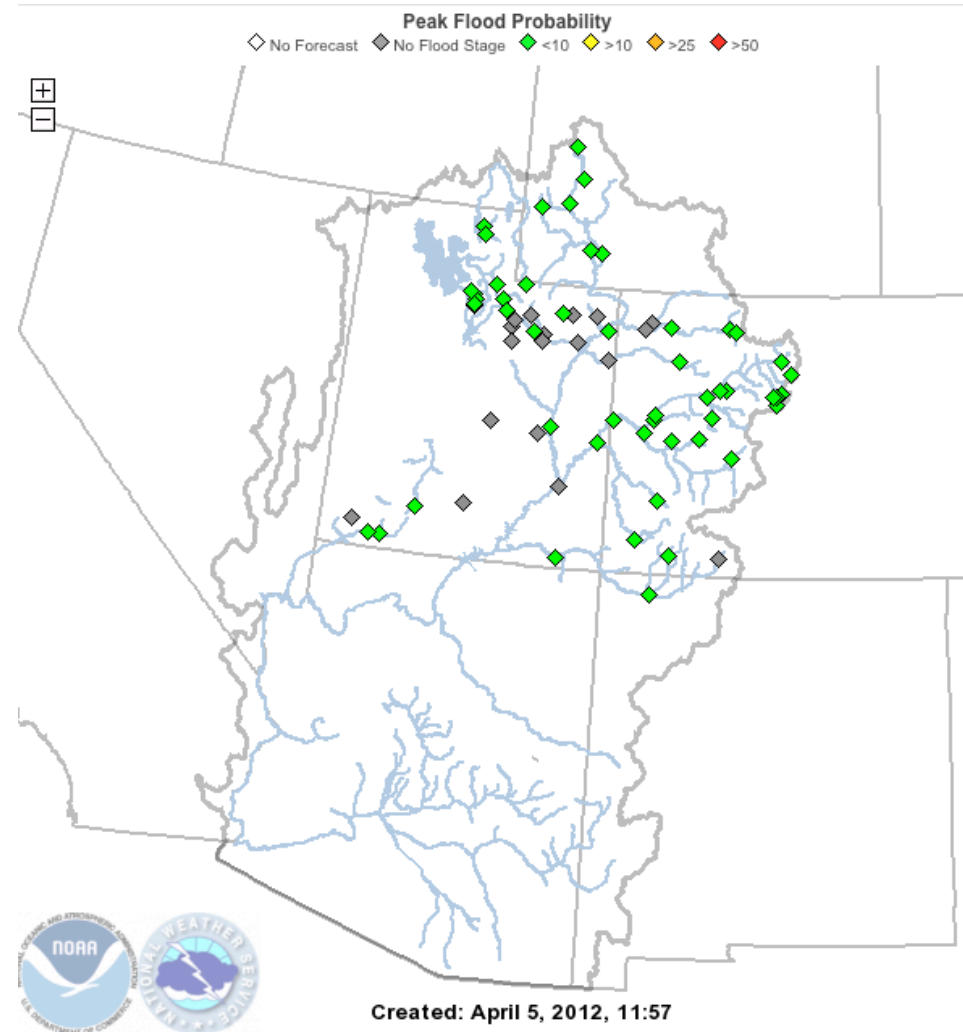


Spring Weather Really Matters

- 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 (like 2010) can flood with the right sequence of spring temperatures

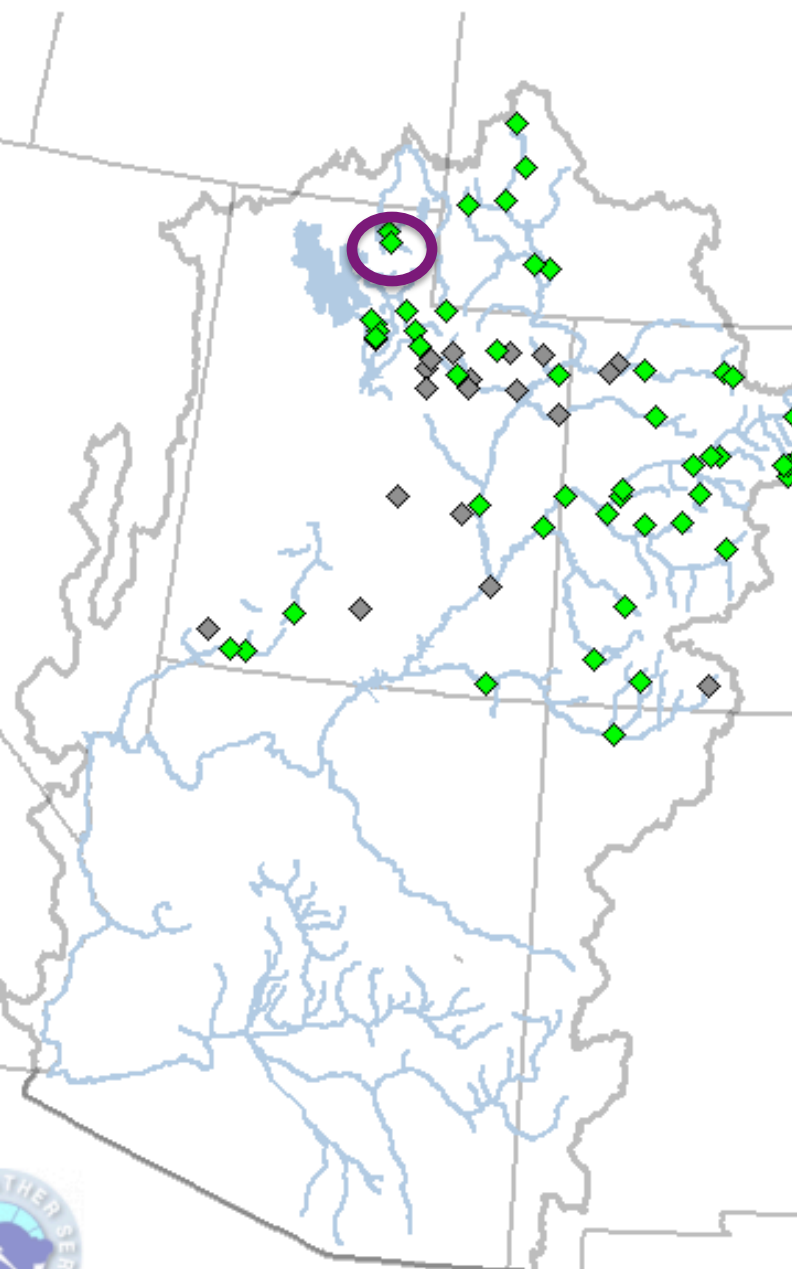
Peak Flow Forecast Synopsis

- All 50% forecasts (much) below flood stages
- All 10% forecasts below flood stage
- Upper Green has somewhat higher chances of river flows near bankfull reflecting near average snow pack in that drainage



Peak Flood Probability

◇ No Forecast ◇ No Flood Stage ◇ <10 ◇ >10 ◇ >25 ◇ >50



Blacksmith Fork - Hyrum Nr Upnl Dam Abv

[Plot](#) [Maps](#) [Verification](#) [Gage](#)

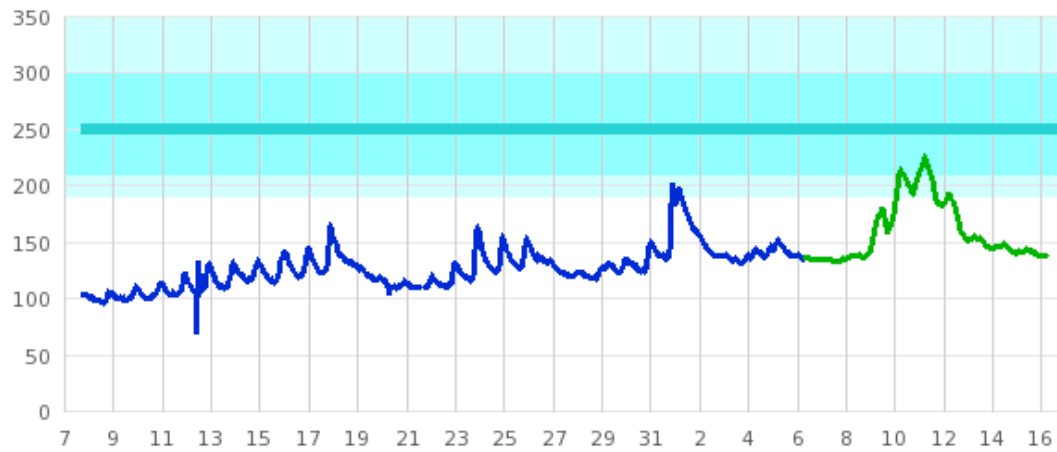
Past 30 days

- Stage
 - Simulated
 - Flood
 - Statistics
 - Forecast Peak
 - Historical Peak
 - Yearly Peaks
 - Stage vs Flow
- 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97
 98 99 00 01 02 03 04 05 06 07 08 09 10 11

BLACKSMITH FORK - HYRUM, NR, UPNL DAM, ABV (hrmu1)

Flow (cfs) for past 30 Days, Forecast run 2012-04-06 14:00 GMT

Plot Created April 6, 08:41 MDT by the Colorado Basin River Forecast Center (NWS/NOAA)



— Forecast Peak — Observed — Forecast

Forecast Peaks are Mean Daily. Historical and Yearly Peaks are Instantaneous.

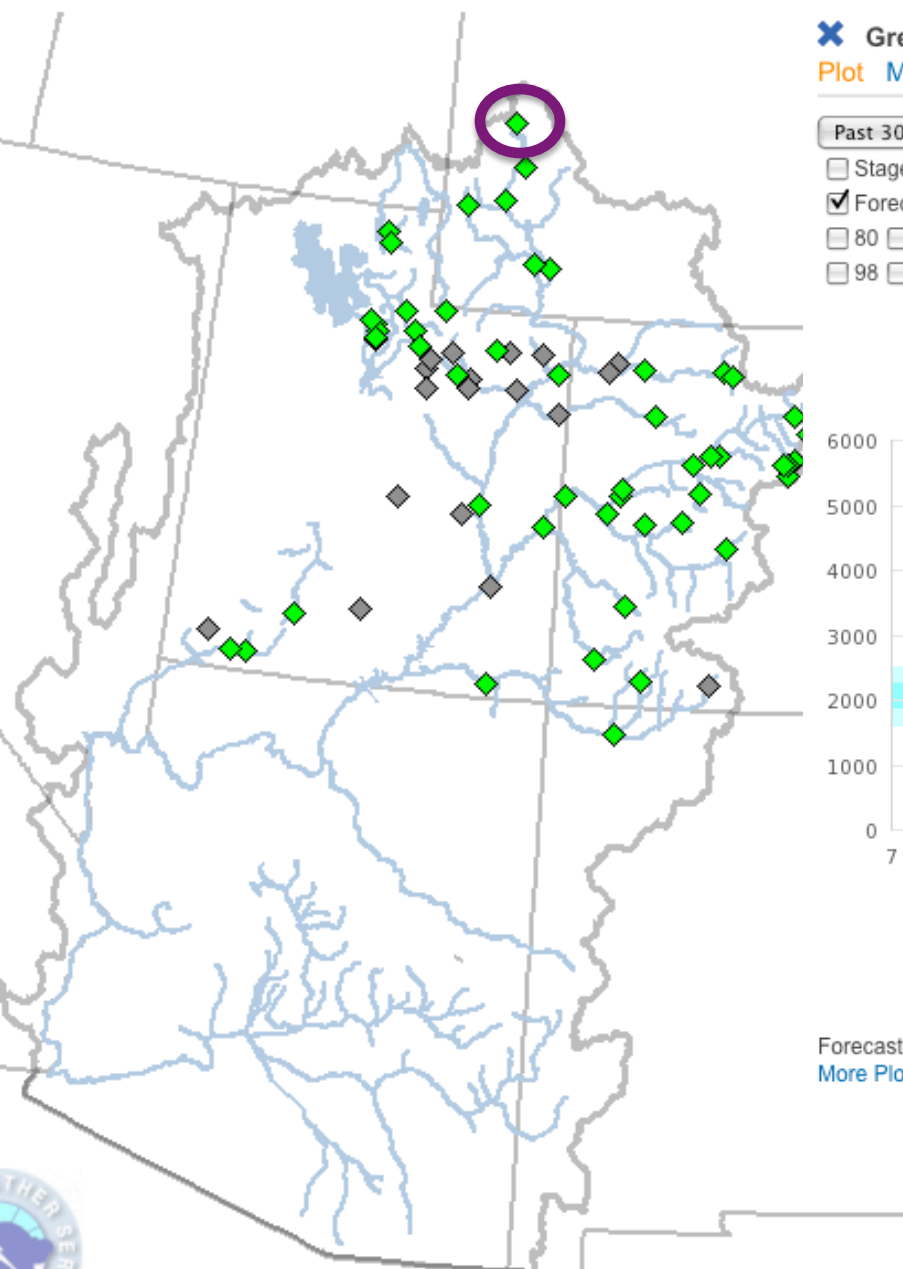
[More Plot Options](#)



Created: April 5, 2012, 11:57

Peak Flood Probability

◇ No Forecast ◇ No Flood Stage ◇ <10 ◇ >10 ◇ >25 ◇ >50



Green - Daniel Nr Warren Bridge At

[Plot](#) [Maps](#) [Verification](#) [Gage](#)

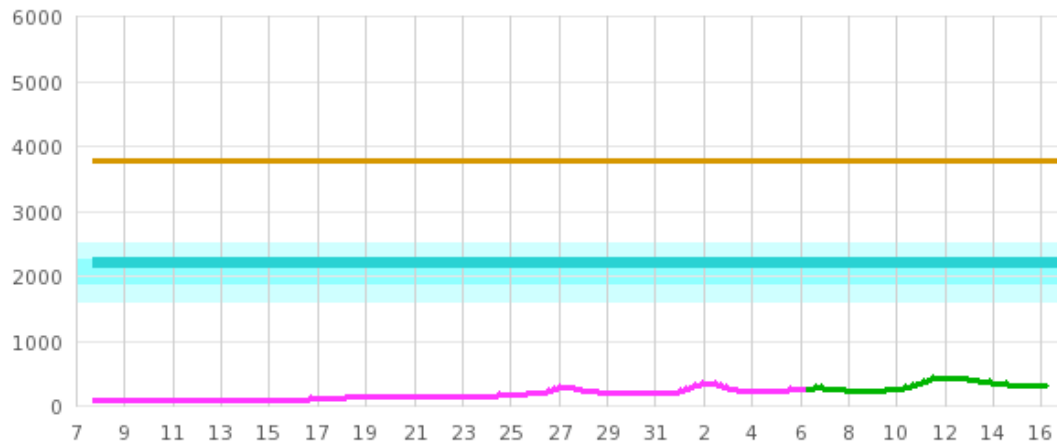
Past 30 days

- Stage
 - Simulated
 - Flood
 - Statistics
 - Forecast Peak
 - Historical Peak
 - Yearly Peaks
 - Stage vs Flow
- 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97
 98 99 00 01 02 03 04 05 06 07 08 09 10 11

GREEN - DANIEL, NR, WARREN BRIDGE, AT (wbrw4)

Flow (cfs) for past 30 Days, Forecast run 2012-04-06 14:00 GMT

Plot Created April 6, 08:45 MDT by the Colorado Basin River Forecast Center (NWS/NOAA)



— Forecast Peak — Observed — Simulated — Forecast — Bankfull

Forecast Peaks are Mean Daily. Historical and Yearly Peaks are Instantaneous.

[More Plot Options](#)



Created: April 5, 2012, 11:57

CBRFC News

- Basin Focal Points (Available to discuss forecasts: 801.524.5130)
 - Upper Colorado: Brenda Alcorn / John Lhotak
 - Green: Ashley Nielson
 - San Juan / Gunnison: Greg Smith
 - Great Basin: Brent Bernard
 - Sevier / Virgin: Stacie Bender
 - Lower Colorado (below Lake Powell): Tracy Cox
- Misc:
 - New CBRFC webpage (www.cbrfc.noaa.gov) - “How to use the webpage” webinar recording available
 - Lake Powell forecast page development
 - Future webinar dates announced:
 - May 4 at 1pm MT
 - June 6 at 1pm MT
 - **Mid-month peak flow webinars:**
 - April 18 at 1pm
 - May 17 at 1pm
 - Weekly ESP model guidance
 - mail product updates via govdelivery
 - Blog

More Resources

- www.cbrfc.noaa.gov
- Wateroutlook.nwrfc.noaa.gov
- Tentative February webinar: 10am Mar 7

Feedback, Questions, Concerns always welcome....



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