



CBRFC Operations

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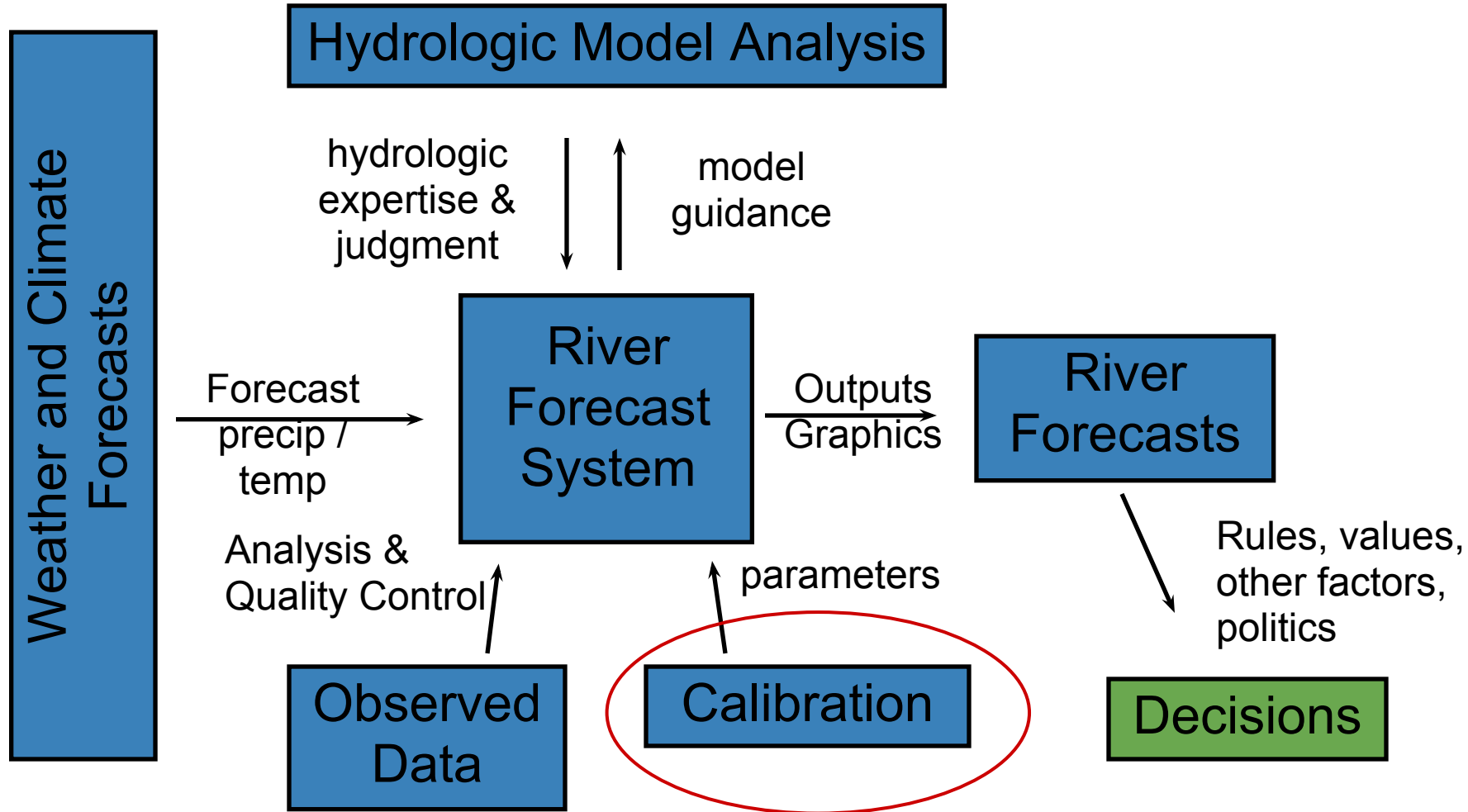


Presentation Outline

- Forecasting Process
 - Daily Operations
 - Models/Calibration
 - Data
 - Products
 - Water Supply Operations
 - Ensemble Streamflow Prediction (ESP)
 - Products
 - New daily guidance
 - Future
- McPhee - Current Forecast
- Website demo



Forecast Process



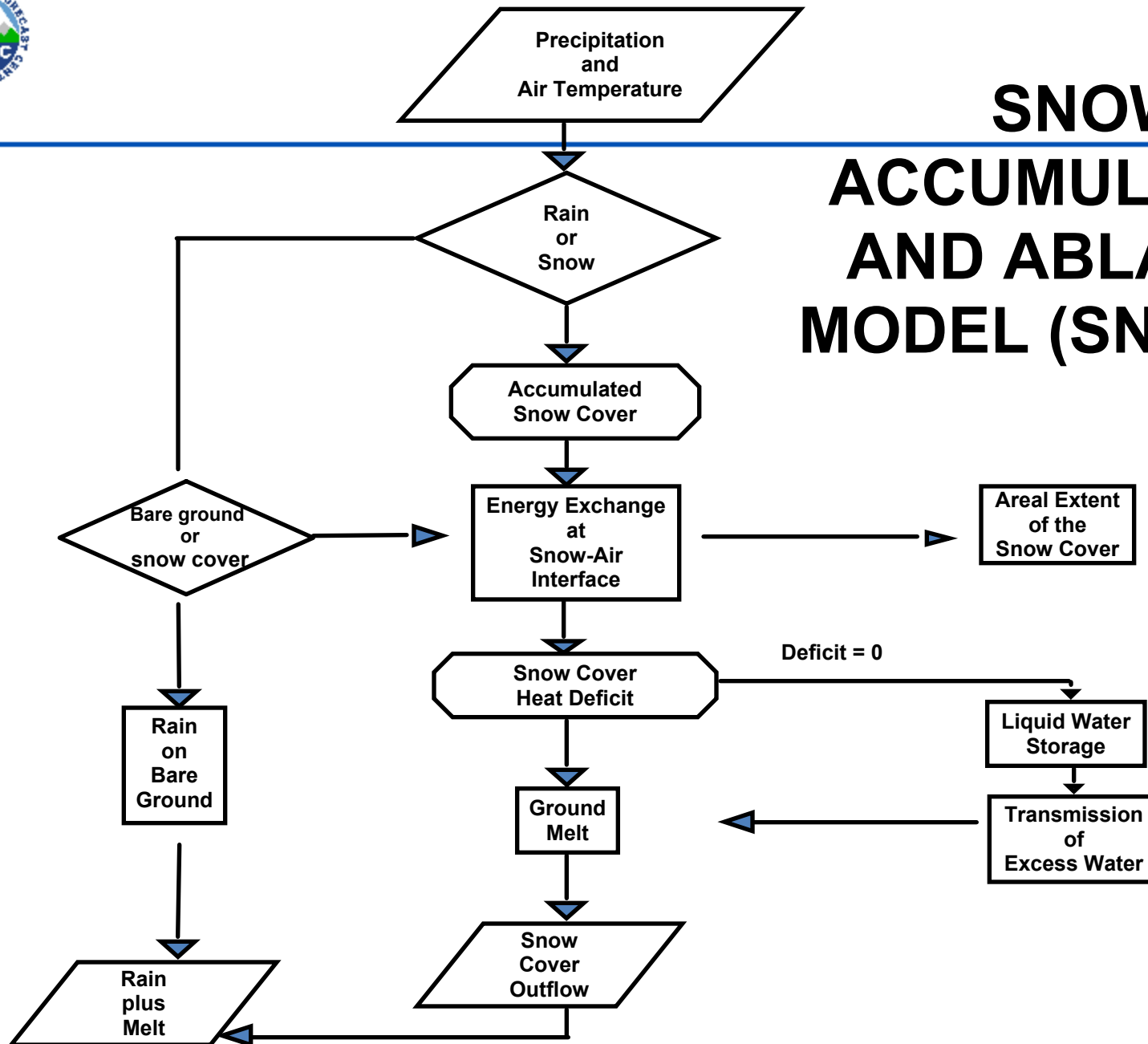


Models



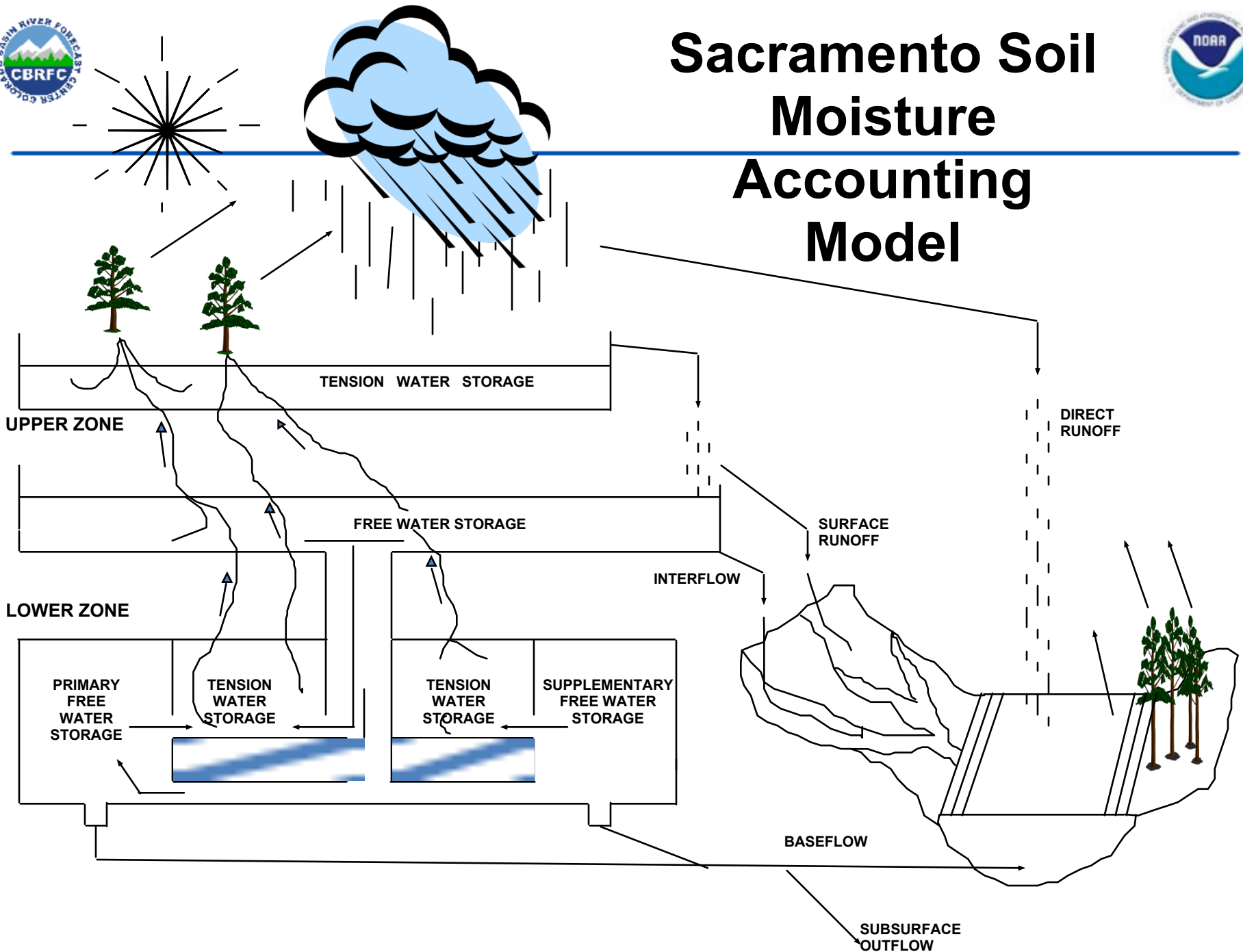
- A snow model is first run for each area in the basin accumulates/ablates snow
- A soil moisture model is then run for each area
 - Controls amount of water from the snow model retained in the soil
 - evaporates or
 - ends up in the stream

SNOW ACCUMULATION AND ABLATION MODEL (SNOW-17)





Sacramento Soil Moisture Accounting Model



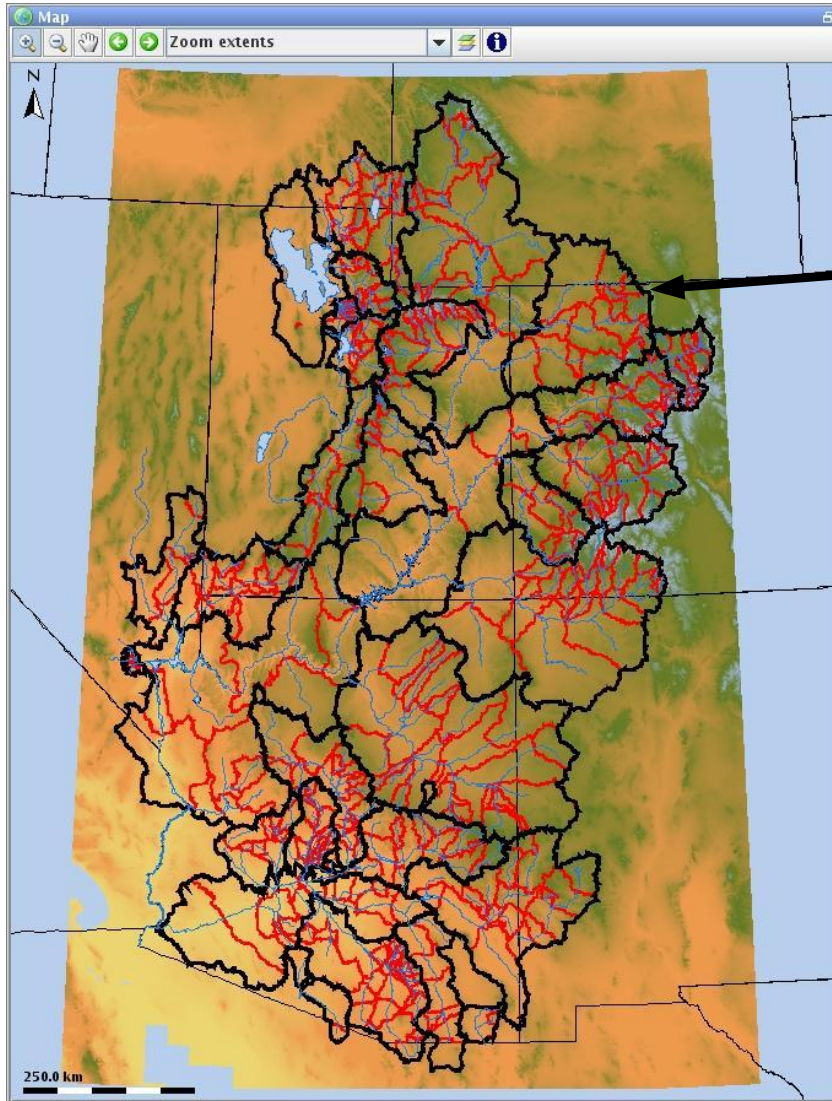


Calibrations - Inputs



- Precipitation and temperature are calculated every six hours at each area within the basin
- 30 year historical record calculation
- Used to calibrate hydrologic models
- Operationally done in a similar way
- Ensures our forecasts will have similar quality/characteristics to calibration

Calibration Example

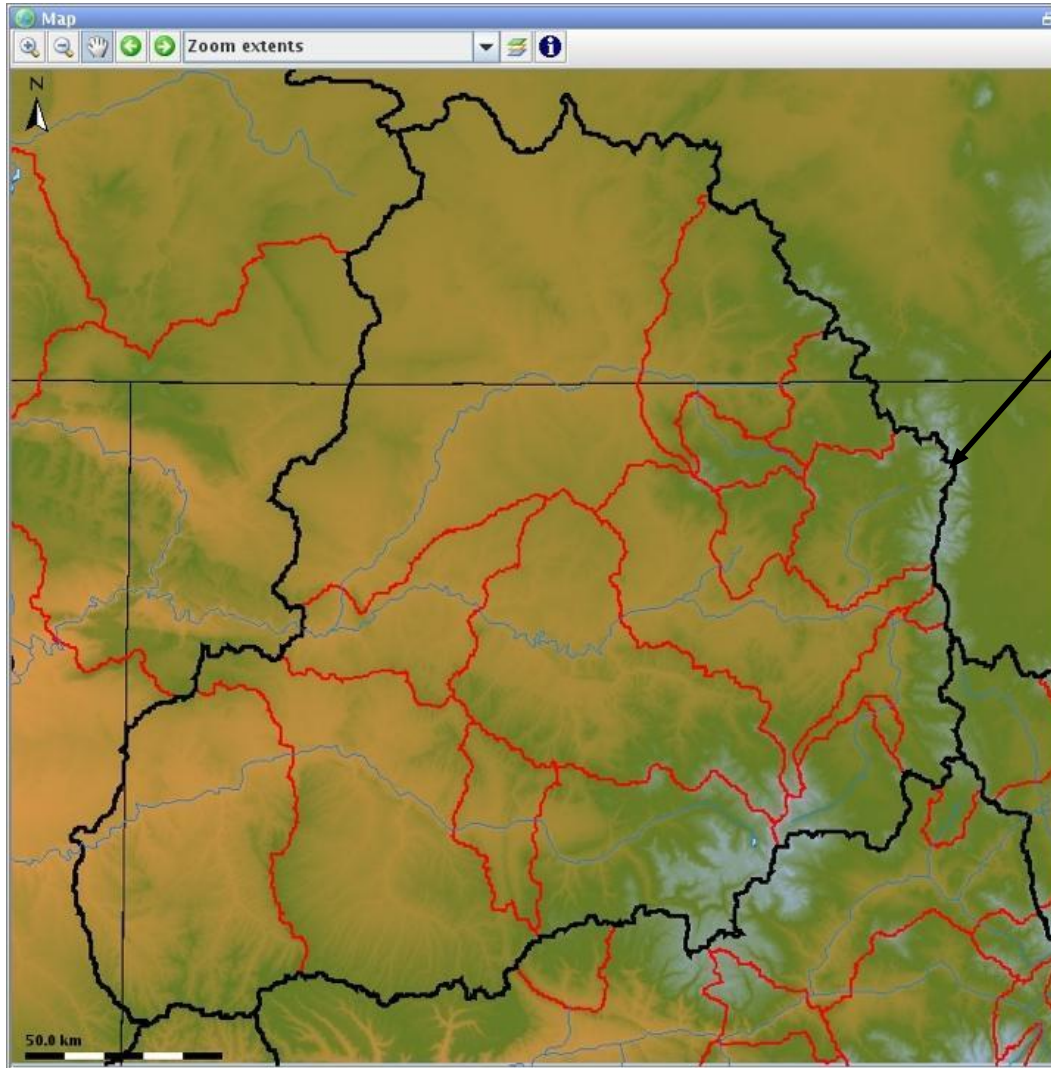


CBRFC area is broken into 30 forecast Groups

This example is from the White - Yampa Group



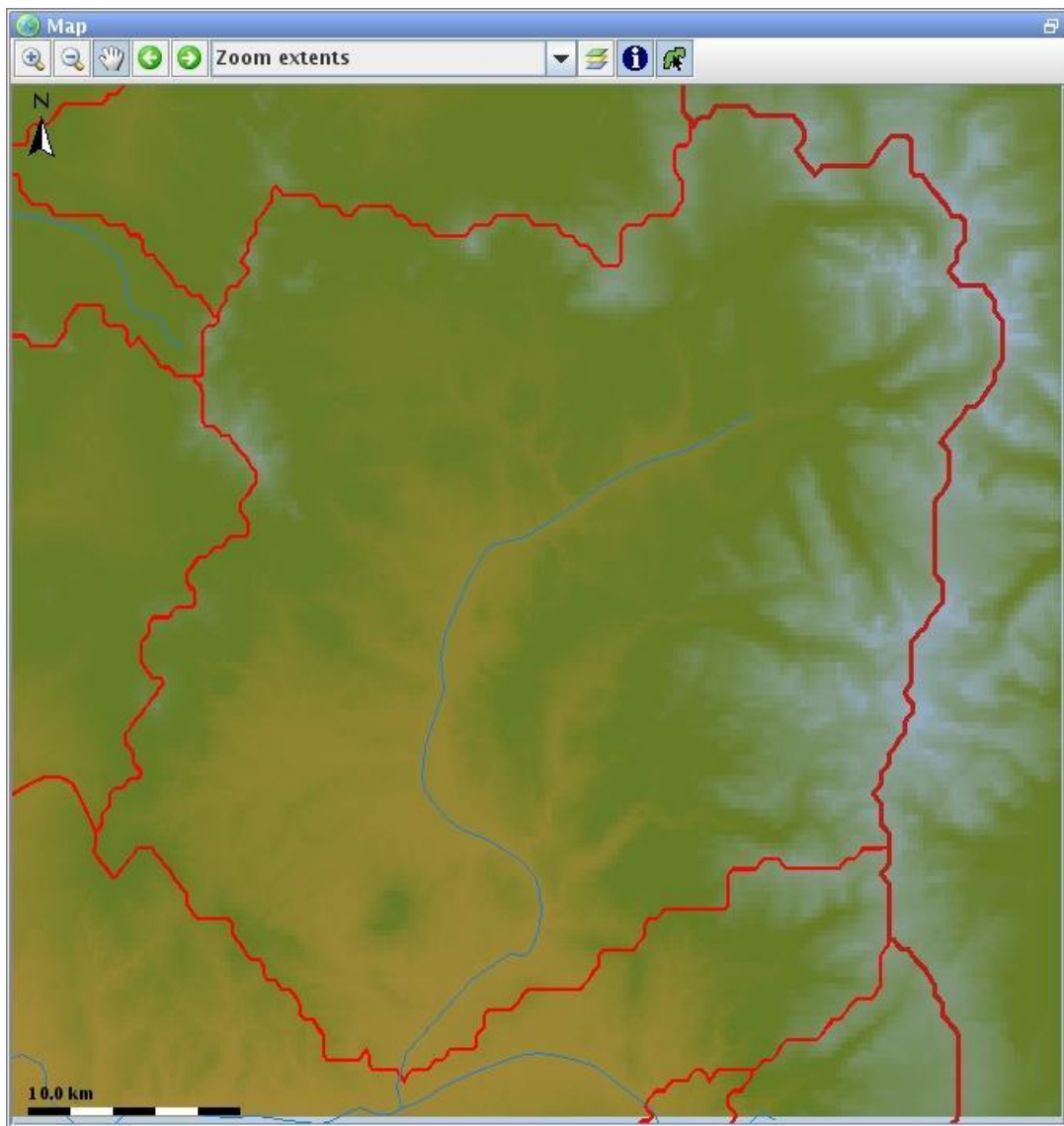
White Yampa Basin



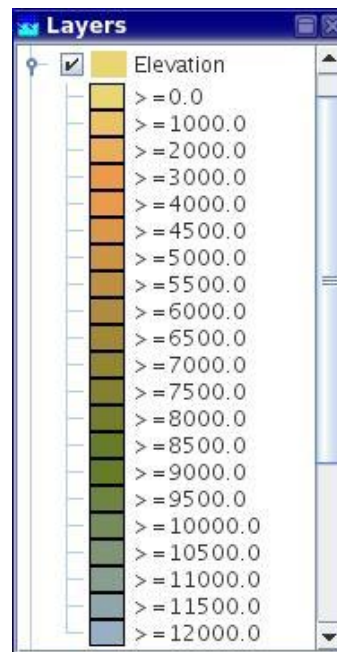
We will look at the
Elk River near Milner

ENMC2

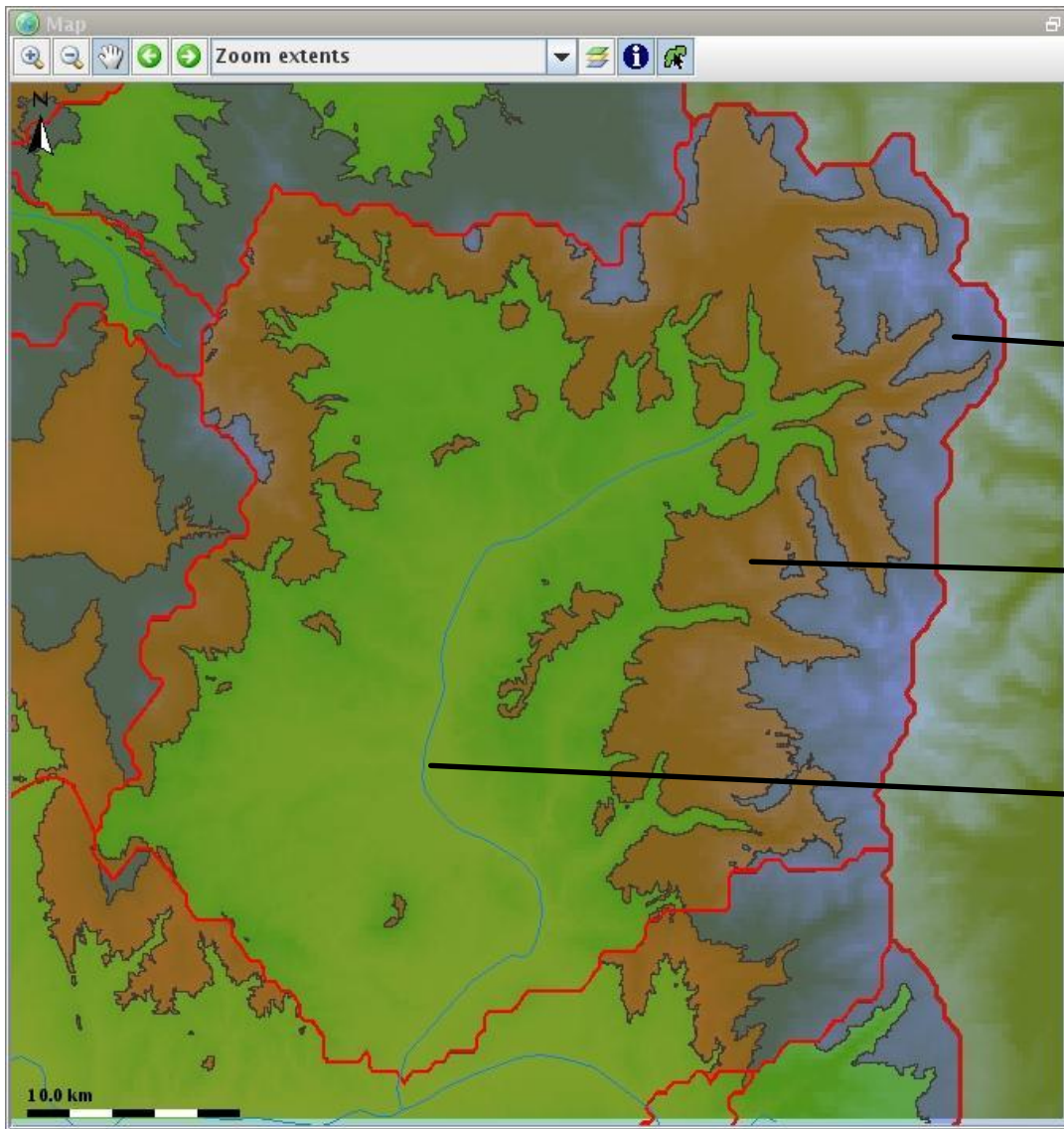
Elk near Milner (ENMC2)



The basin is first broken into elevation zones



Elk near Milner (ENMC2)



Upper (10000-11970)

Middle (8500-10000)

Lower (7205-8500)



Calibrations - Inputs

In reality the 3 areas (upper, middle and lower) are represented (simulated) by only 3 points (Lumped Model)

The inputs our model needs for calibrations and operations (at these 3 points) are:

- precipitation
- temperature
- freezing level



Calibrations - Precipitation



Each area (upper, middle and lower) MAP is built using precipitation stations that (hopefully) have similar characteristics to that area

For the ENMC2

- Upper area – DRLC2 .46, ELKC2.46
- Middle area - DRLC2 .46, ELKC2.46
- Lower area - DRLC2 .46, ELKC2.46

These weights were chosen to guarantee water balance in each area. The water balance in each area was calculated using the PRISM sets

ENMC2-Precipitation Gages





Calibrations/Simulations - Temperature



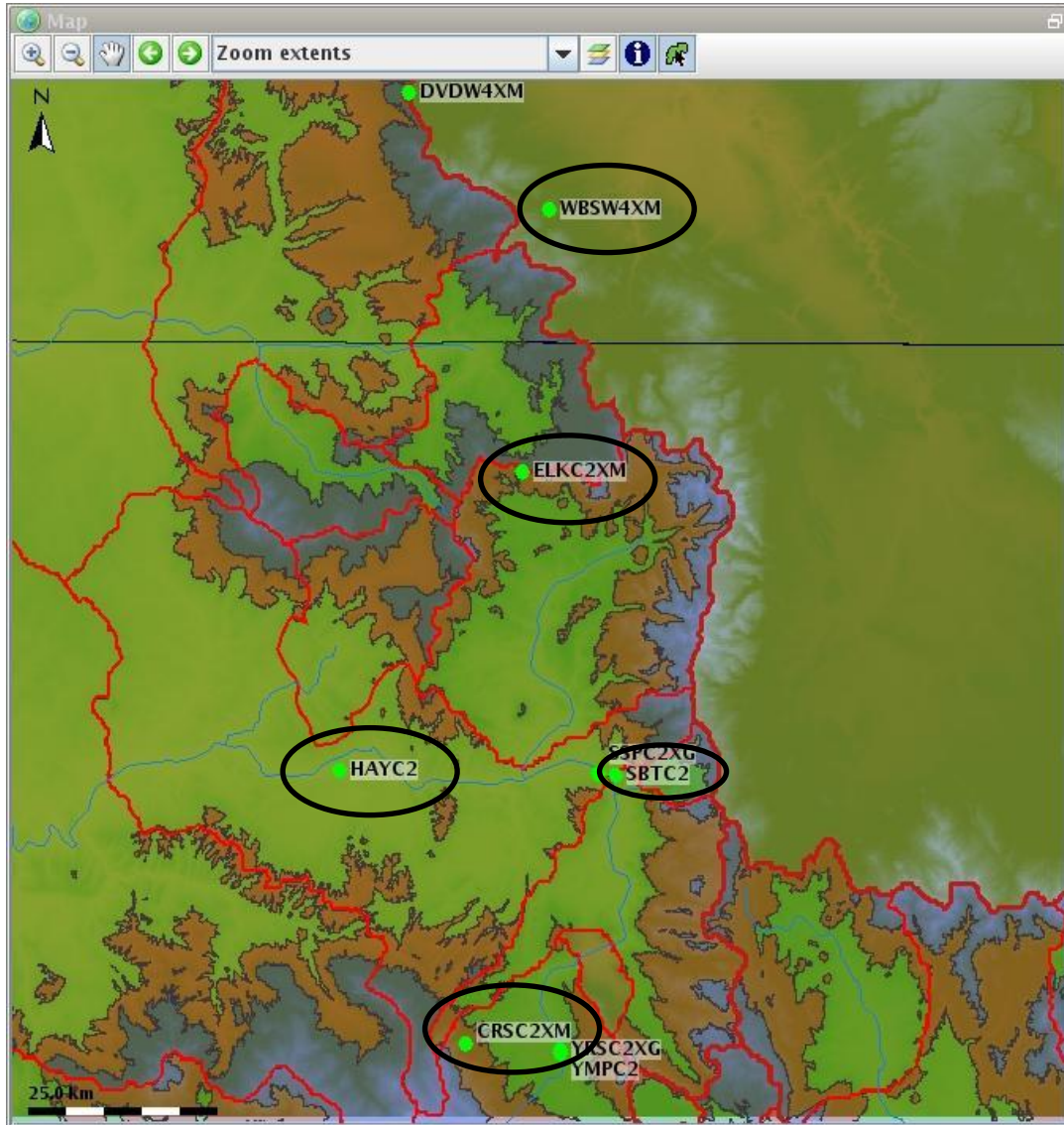
Nearby stations (whose climatology is known) area used to calculate the temperature at the mid-point elevation of the area (whose climatologies are calculated using the climatology of the nearby stations)

Temperature is calculated by using the difference in station and area climatology

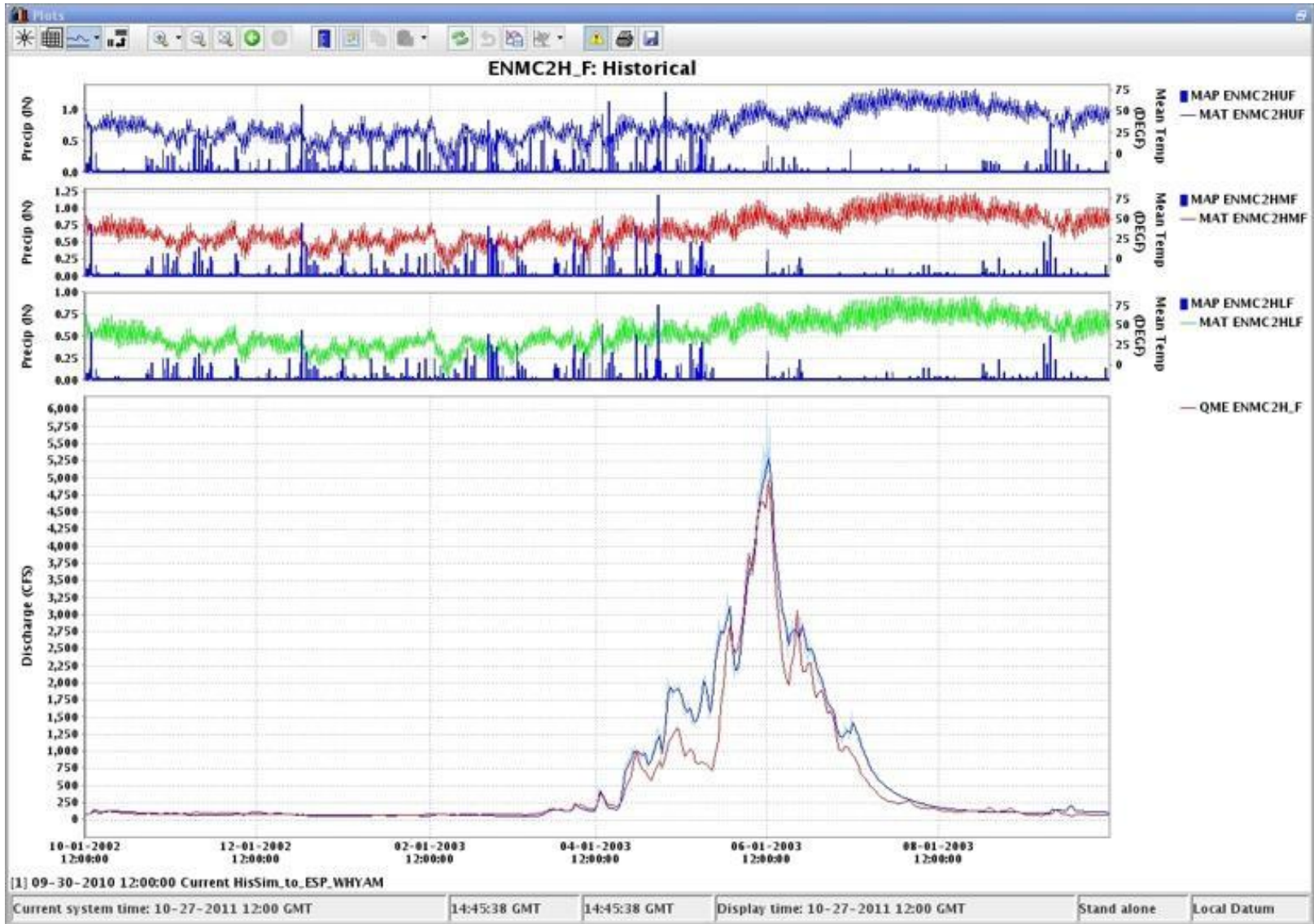
For the ENMC2

- Upper area – CRSC2 0.009, ELKC2 0.011
- Middle area - SBTC2 0.009, CRSC2 0.013, ELKC2 0.045
- Lower area - WBSW4 0.009, SBTC2 .02, HAYC2 0.013, ELKC2 0.019

ENMC2- Temperature Gages



Calibrations - Results





Calibrations - Reservoirs

Reservoir modeling is difficult as they are not physically based. However, we calibrate the reservoir models assuming two different modes:

- Irrigation (use average releases)
- Spillway/passflow

Operationally we can do the following:

- Assume the current release
- Input a schedule
- Allow the spill/passflow rules



Adjustments to Flow

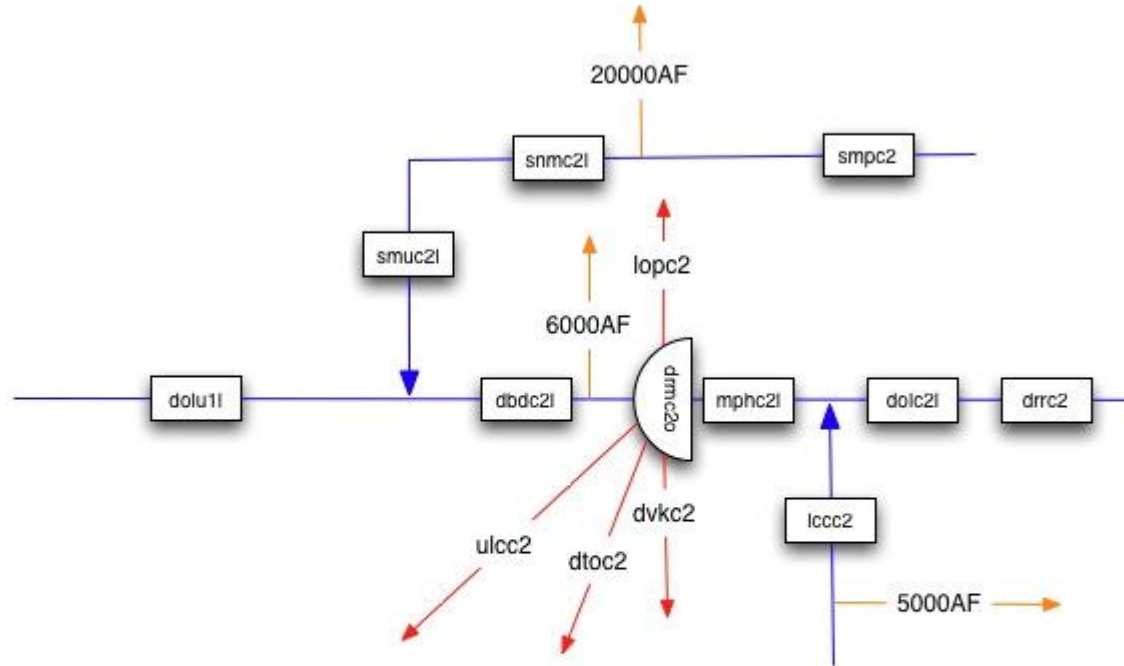
- $\text{Unregulated flow} = \text{Observed flow} + \text{Diversions (measured)} + \text{Storage}$
- $\text{Natural flow} = \text{Unregulated flow} + \text{Consumptive Use}$
- Consumptive use (in basin irrigation) can only be estimated
 - In our simulations, we simulate natural flow but subtract out the consumptive use so the output is always unregulated flow

So:



- We simulate “natural flow”
- We remove the in-basin irrigation (consumptive use)
- This is the simulated unregulated flow. It simulates the actual flow plus the measured diversions (adjusted flow)
- Operational considerations
 - $\text{Observed flow} = \text{Unregulated flow} - \text{Diversions} - \text{Storage}$

Dolores Adjustments to Flow

Dolores River

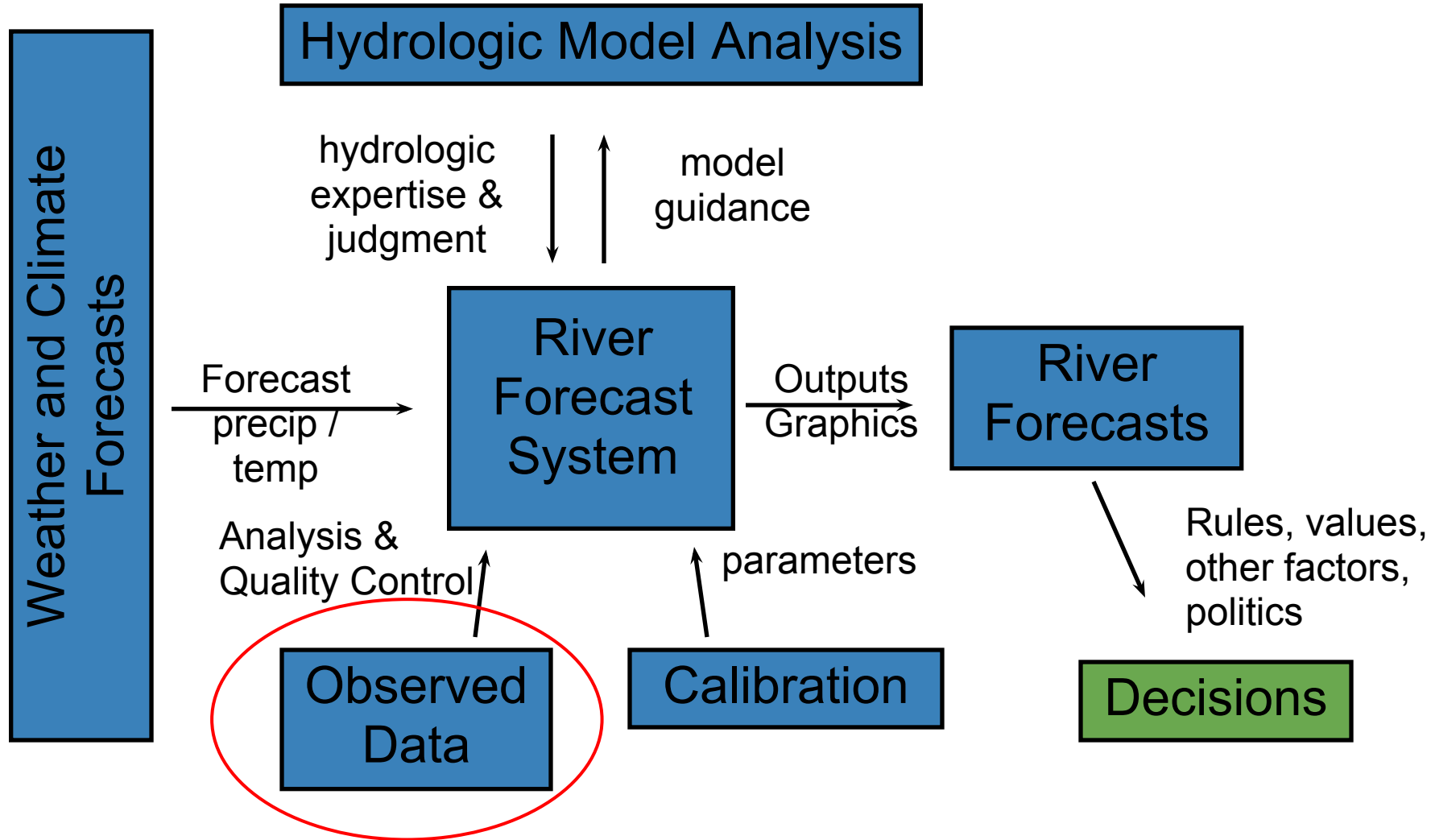


- river
- diversion
- consumptive use
- import

-  river segment
-  reservoir segment



Forecast Process





Key Observing Systems

NRCS SNOTEL

USGS Stream Gauging

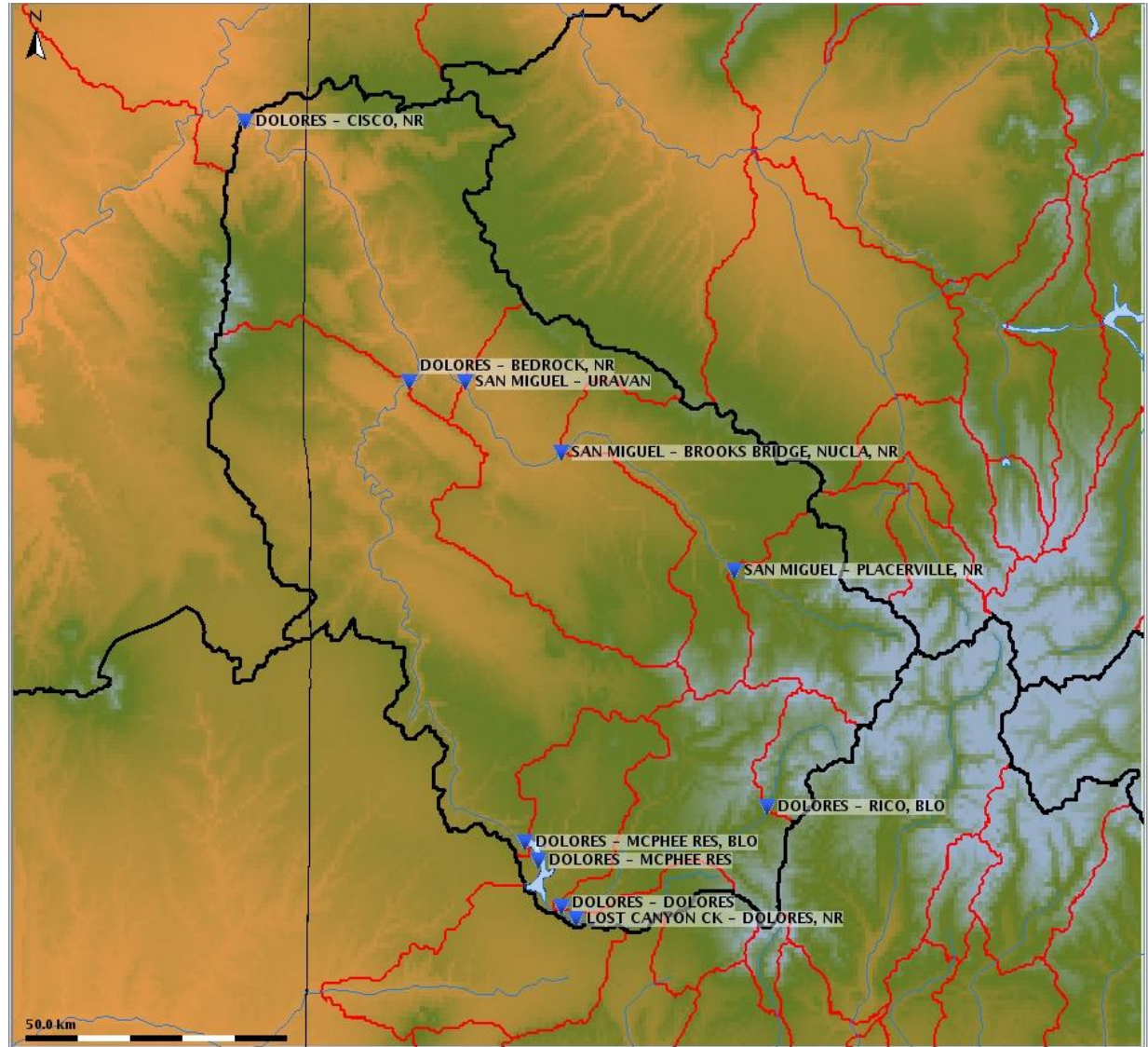
NWS COOP, Radar, etc

Data Used in CBRFC Daily Ops:

- ~260 precipitation
- ~330 temperature
- ~875 flows including river, reservoir, and diversion
- ~95 storage

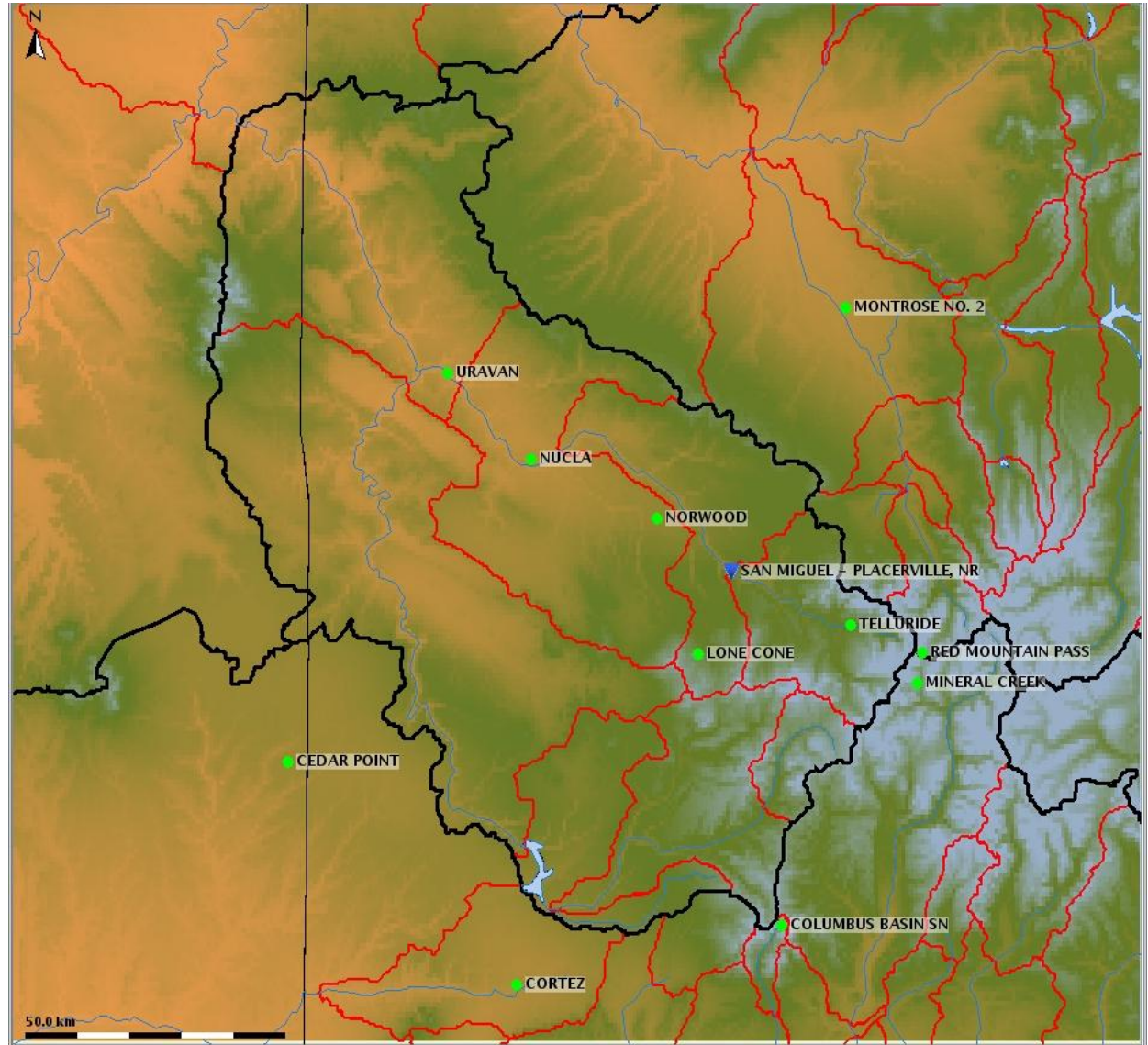
Dolores Forecast Locations

10 Forecast Locations in the Dolores, 4 above McPhee



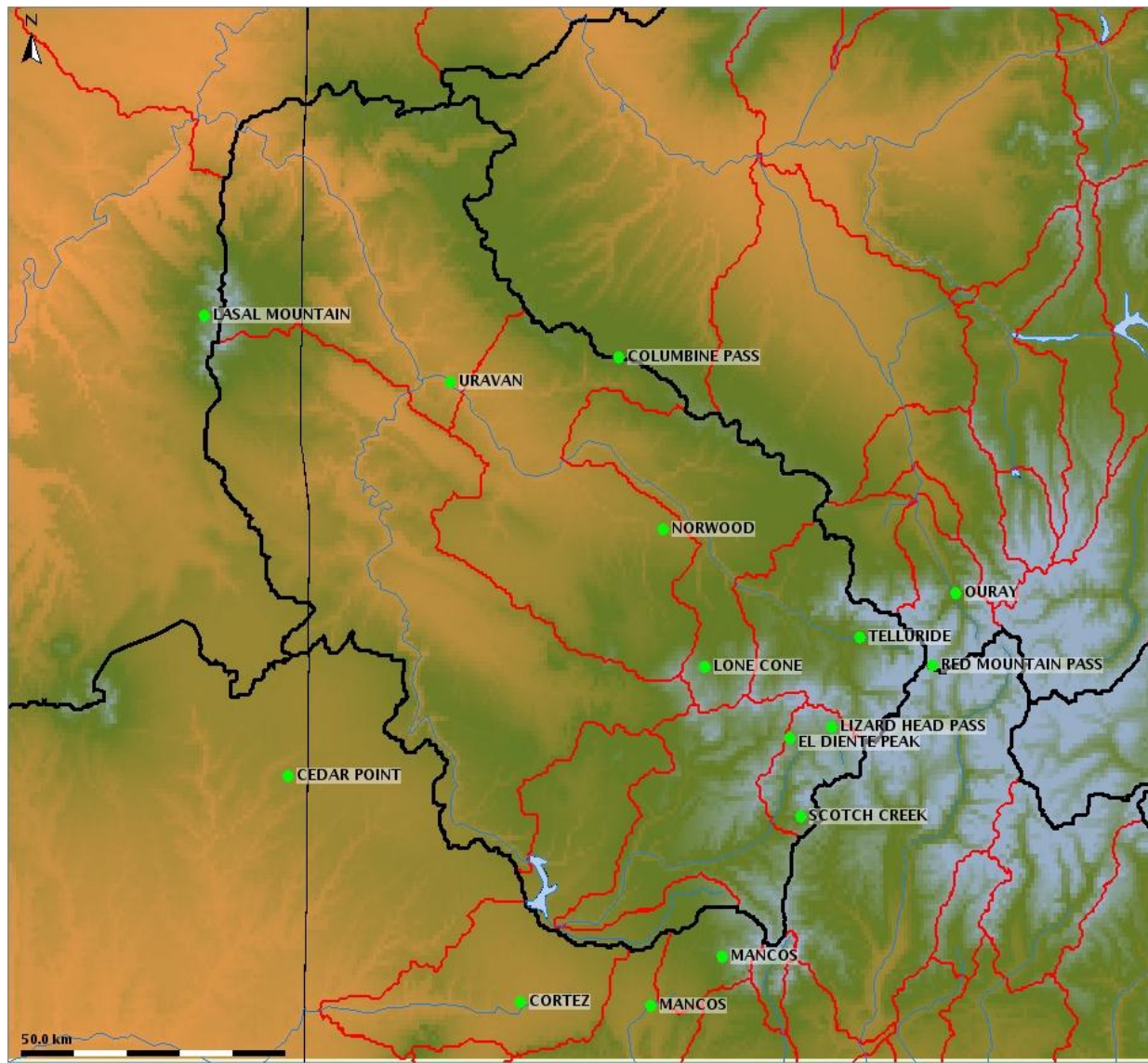
Dolores Temperature Stations

3 GOES
4 SNOTEL
5 COOP

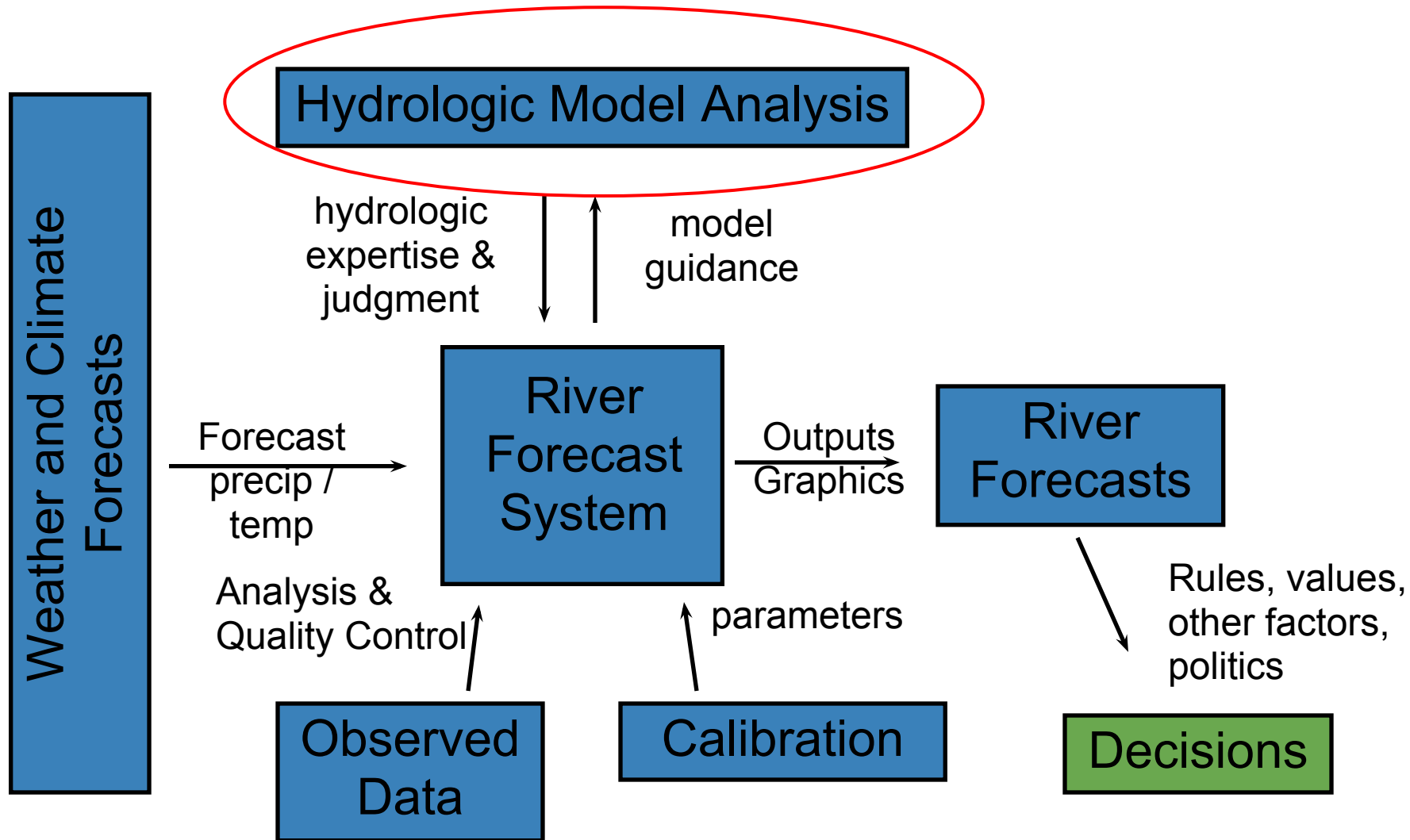


Dolores Precipitation Stations

8 SNOTEL
7 COOP

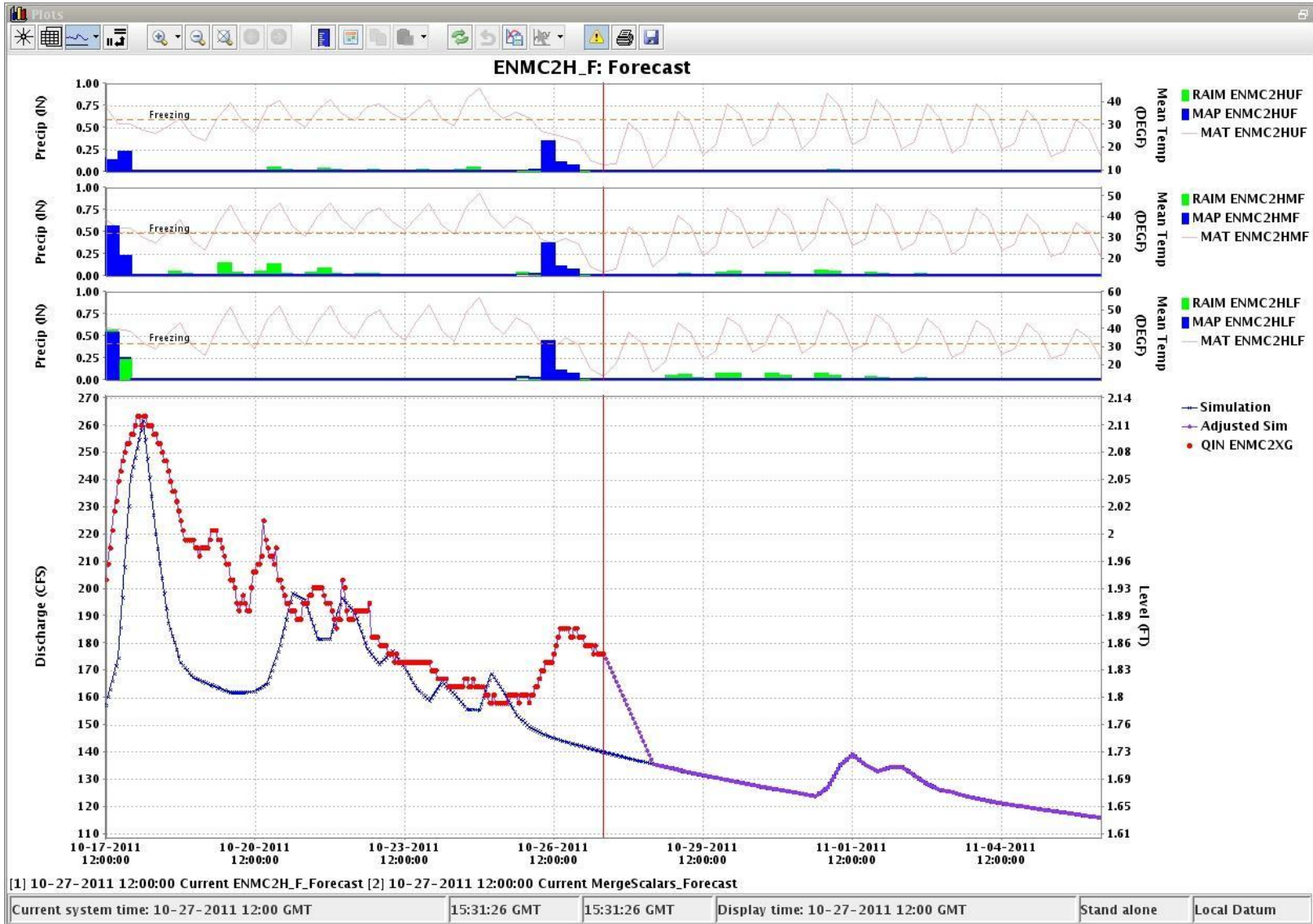


Forecast Process





Simulations - Real Time (no mods)





Simulations - Results (with mods)

Modifiers

Mod type	Name	Summary	Start	End	Valid Time	User	Creation time	Acti...	Del...	Copy
CHGBLEND	ADJUSTQ_ENMC2H_F...	100	--	--	--	jdl	10-31-2011 15:...	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SACCO 6hr	SACCO_6HR_ENMC2HLF		10-25-2011 18:...	10-25-2011 18:...	--	jdl	10-31-2011 15:...	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
RAINSNOW	RAINSNOW_ENMC2HLF	rain	10-25-2011 18:...	10-27-2011 06:...	--	jdl	10-31-2011 15:...	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Create mod CHGBLEND TSHNG Forcings MFC CONSUSE SETQ Re-run

Modifier Properties

Type: sacco_6hr
Name: SACCO_6HR_ENMC2HLF
Start time: 10-25-2011 18:00:00 End time: 10-25-2011 18:00:00 Valid time: 01-01-3000 00:00:00

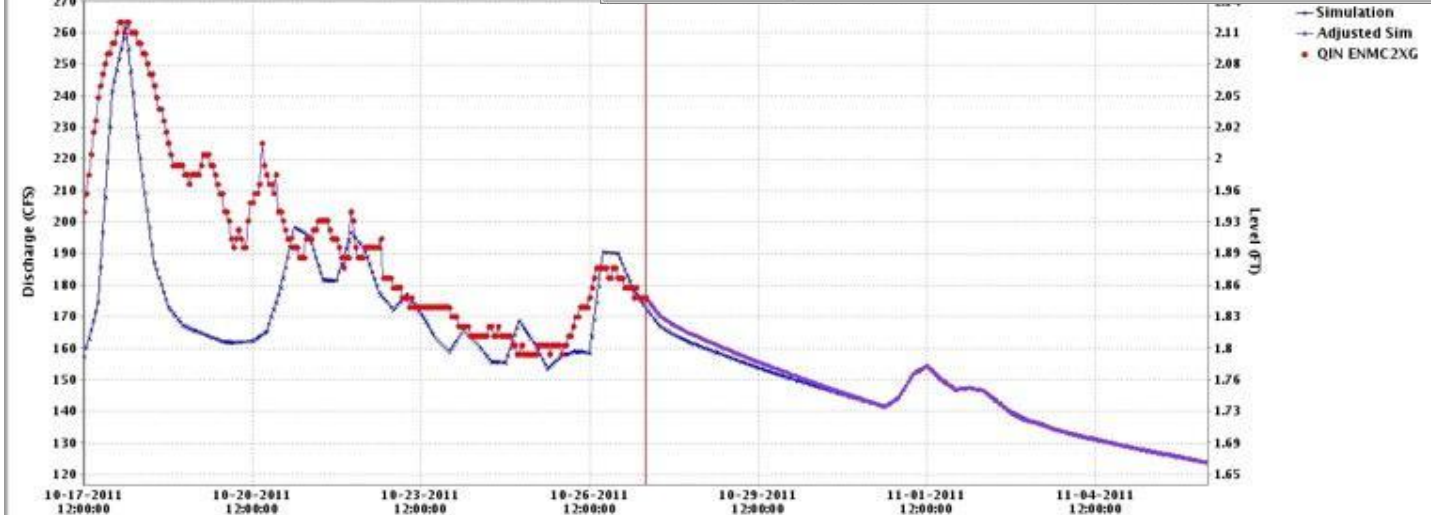
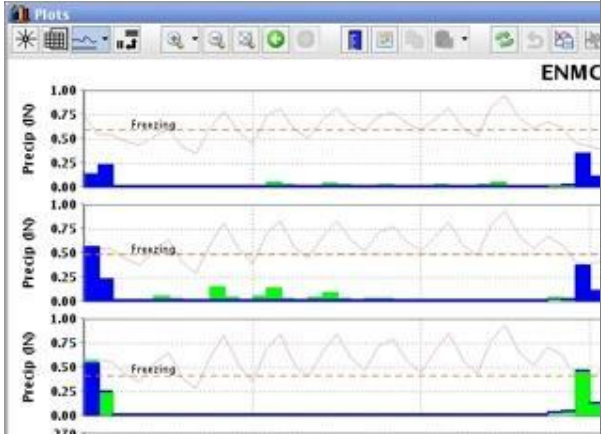
Apply Apply To

Locations

- ENMC2HLF
- ENMC2HMF
- ENMC2HUF

Location	UZTWC (IN)	UZFWC (IN)	LZTWC (IN)	LZFWC (IN)	LZFC (IN)	ADIMC (IN)
ENMC2HLF	-0.78	-1.57	-8.86	-3.54	-6.69	-9.64
ENMC2HMF	-0.59	-1.18	-6.64	-2.65	-5.02	-7.23
ENMC2HUF	-0.2	-0.79	-4.43	-1.77	-3.35	-4.82
	0.28	0	1.82	0.03	4.23	1.66
	0.41	0.18				

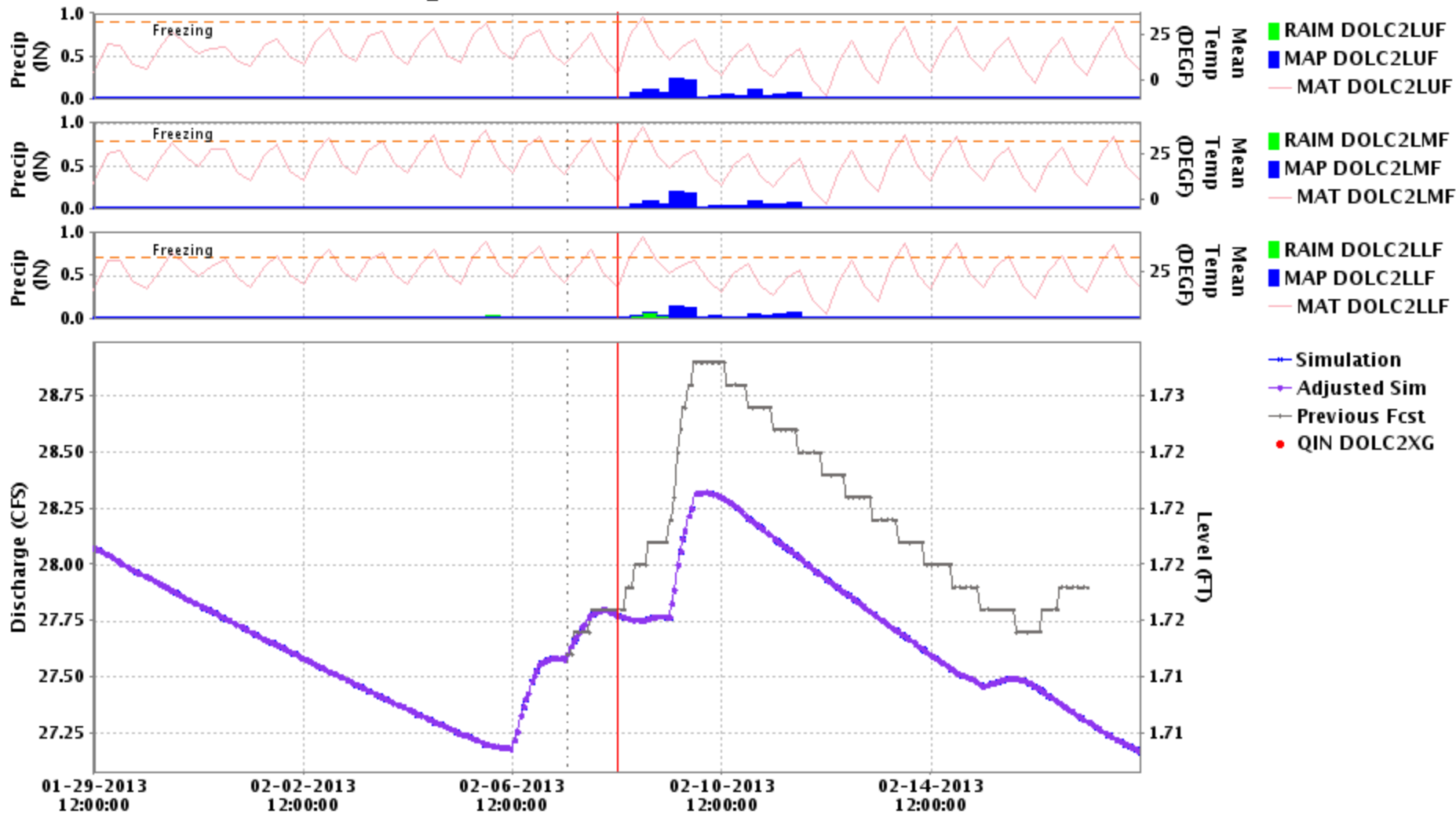
Reset Climatology





Dolores - Dolores Forecast

DOLC2L_F: DOLORES - DOLORES - Forecast



none: [3] 02-07-2013 13:00:00 External

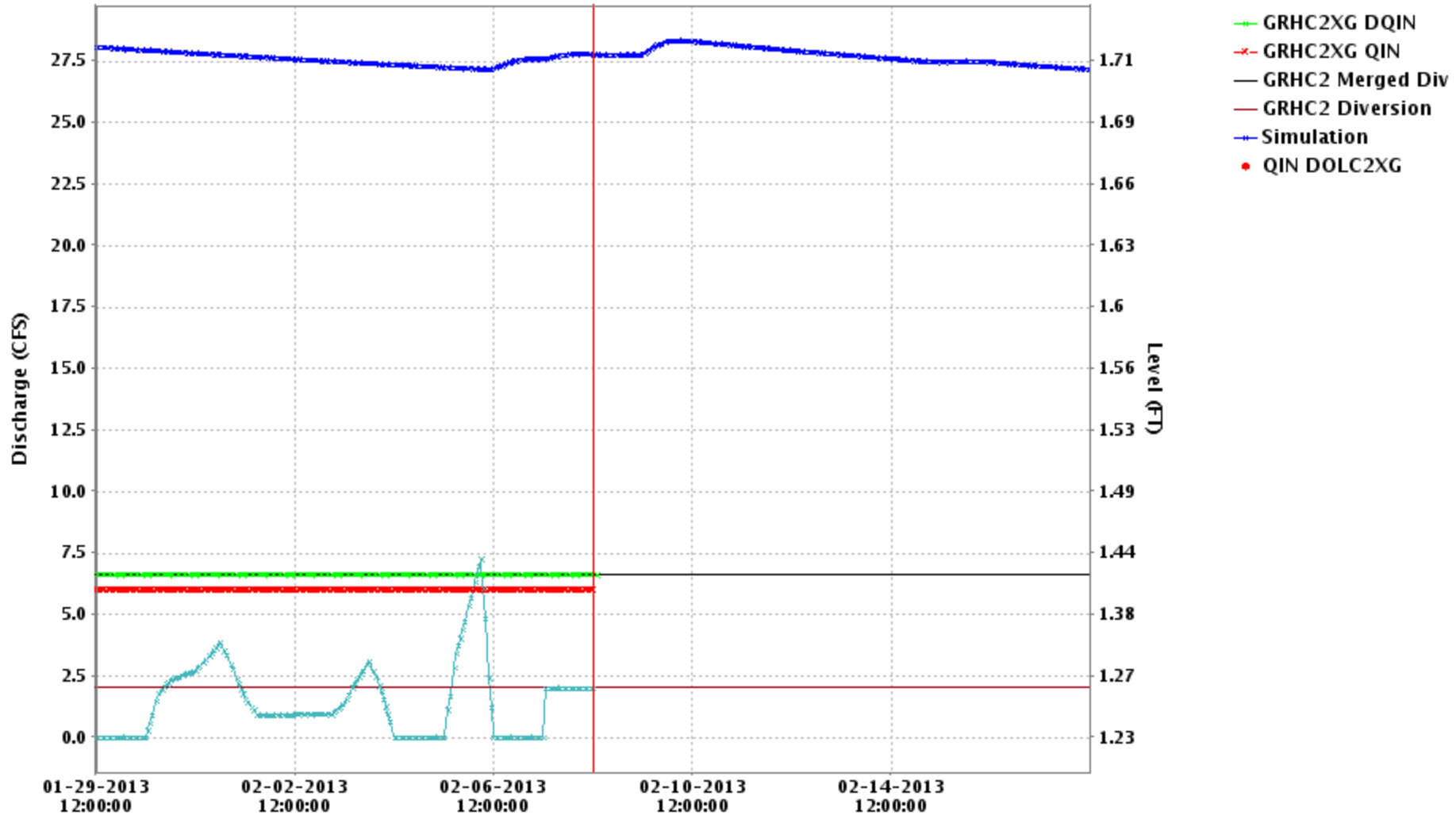
MergeScalars_Forecast: [2] 02-08-2013 12:00:00 Current

DOLC2L F Forecast: [1] 02-08-2013 12:00:00 Current



Dolores - Groundhog

DOLC2L_F: Diversions

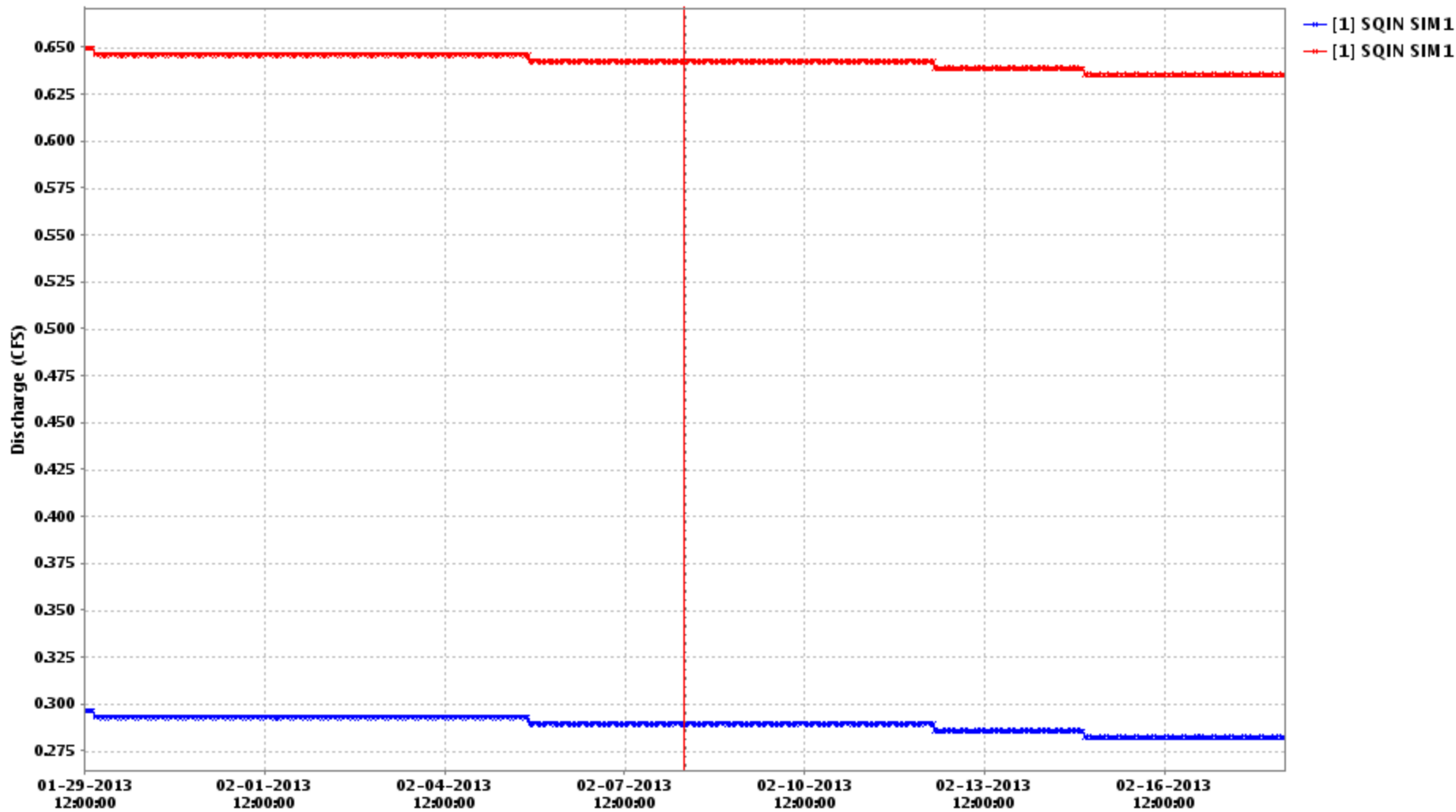


DOLC2L_F_Forecast: [1] 02-08-2013 12:00:00 Current



Lost Canyon - Summit Reservoir

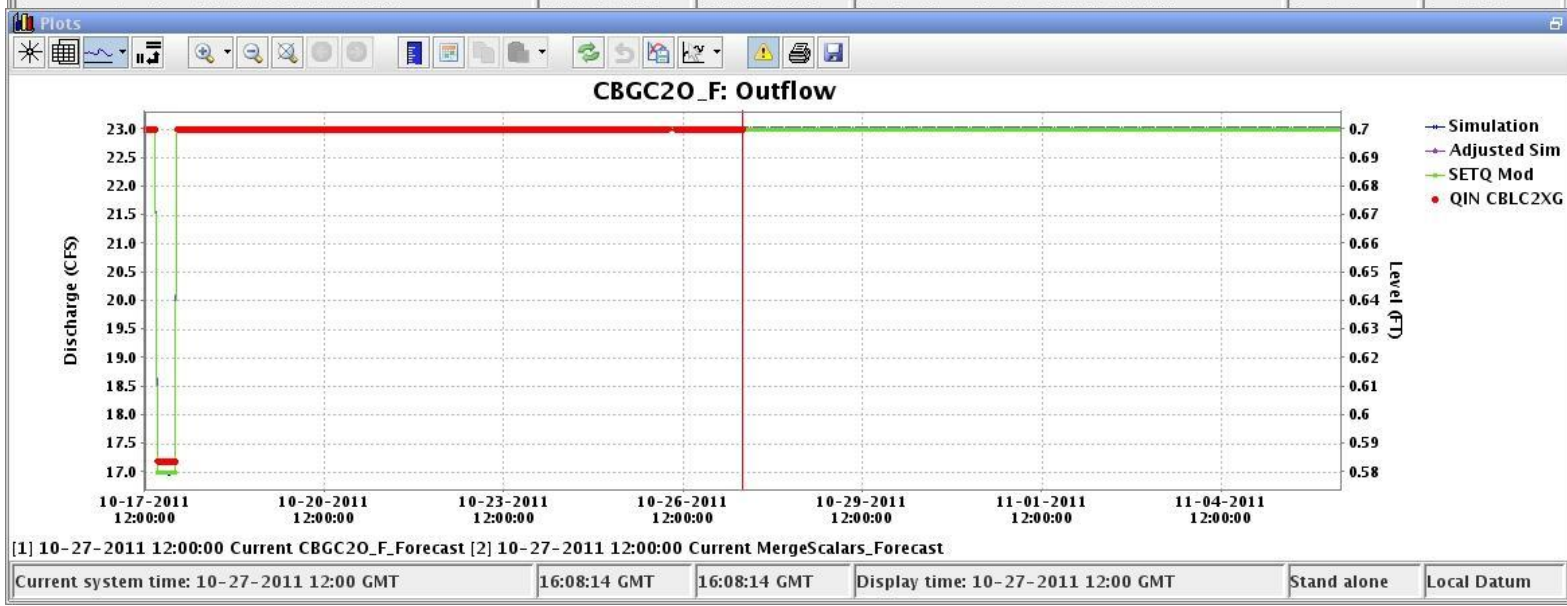
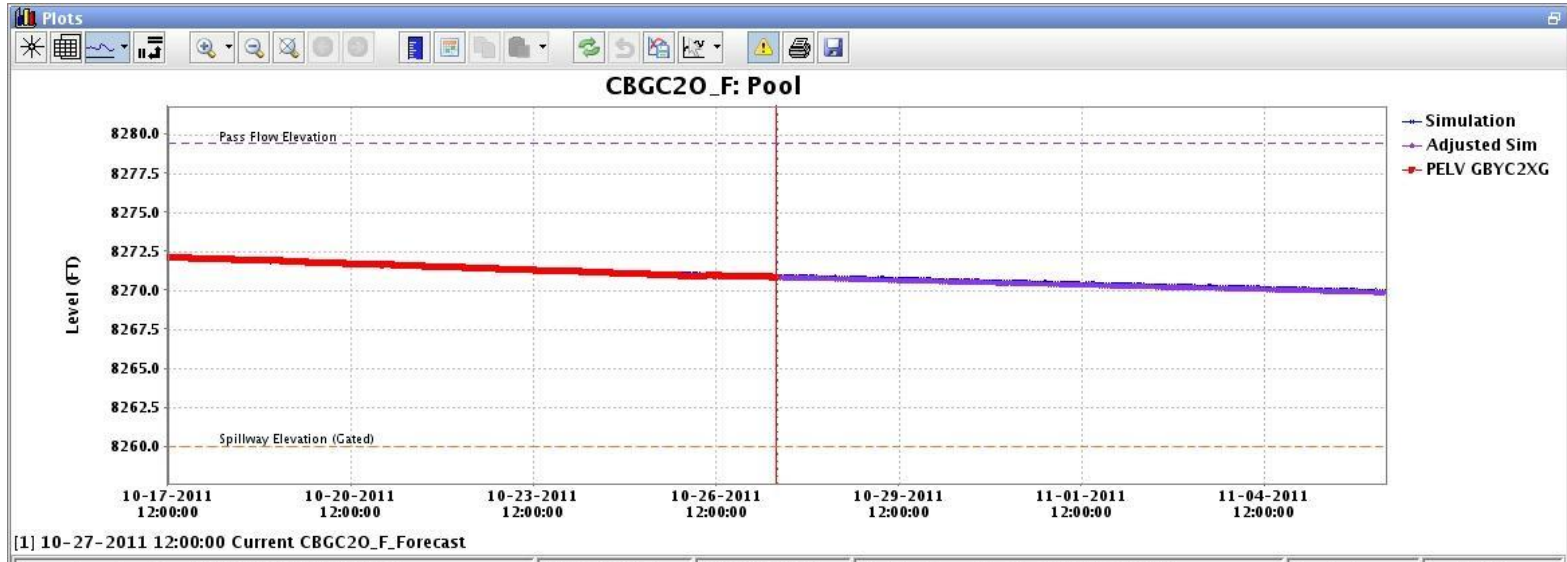
LOST CANYON CK - DOLORES, NR



LCCC2H_F_Forecast: [1] 02-08-2013 12:00:00 Current

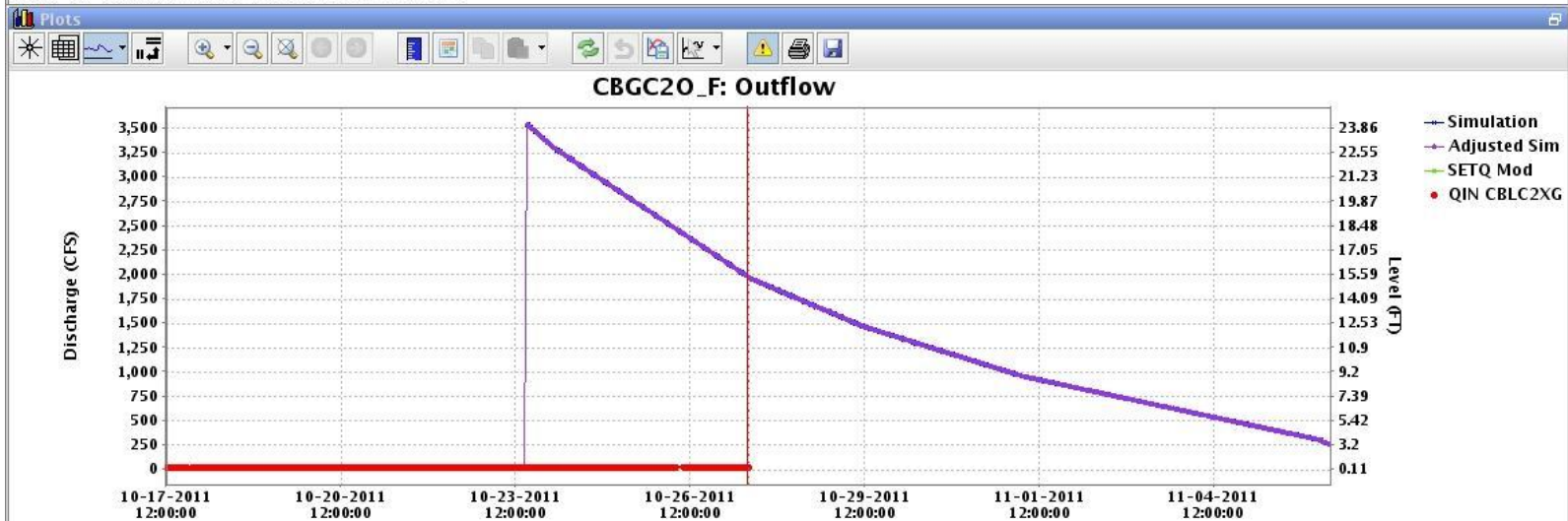
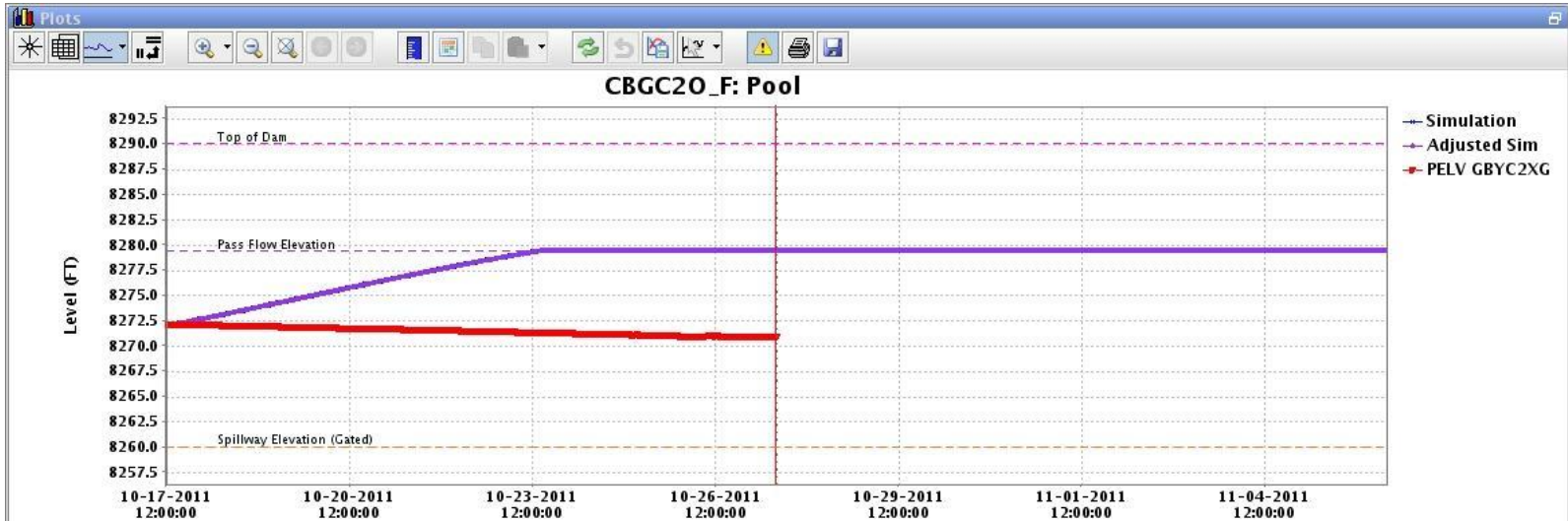


Reservoir Simulations – Assume Constant Outflow





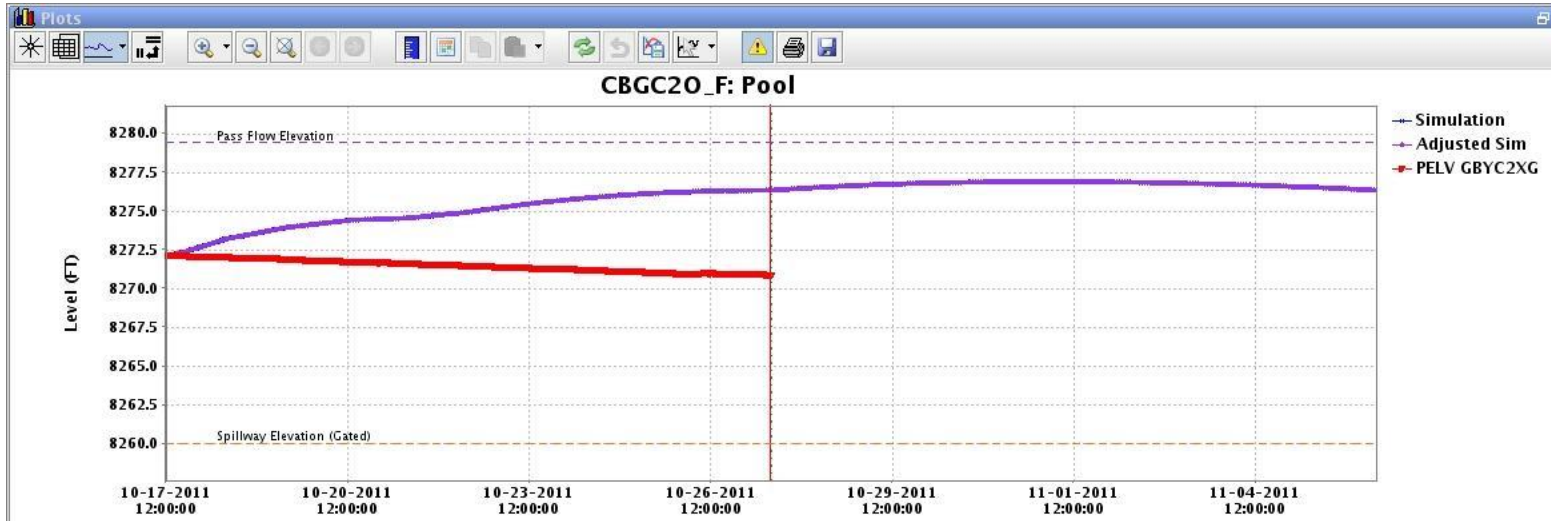
Reservoir Simulations – Use Rules



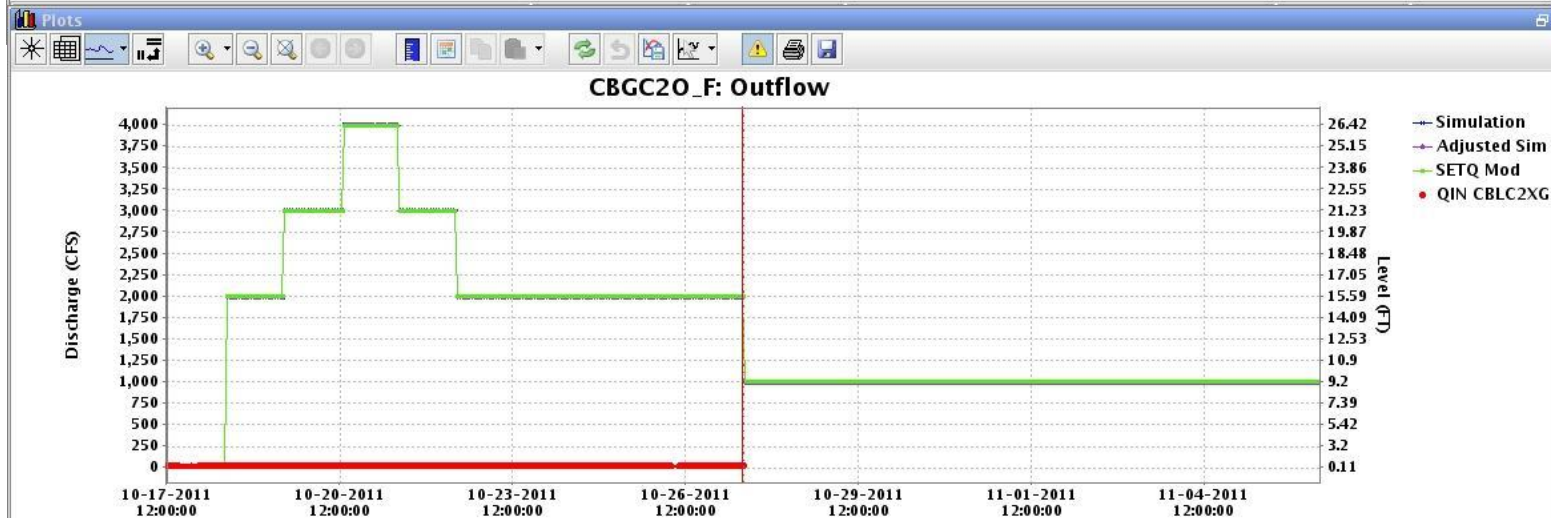
[1] 10-27-2011 12:00:00 Current CBGC20_F.Forecast [2] 10-27-2011 12:00:00 Current MergeScalars.Forecast



Reservoir Simulations – Release Schedule

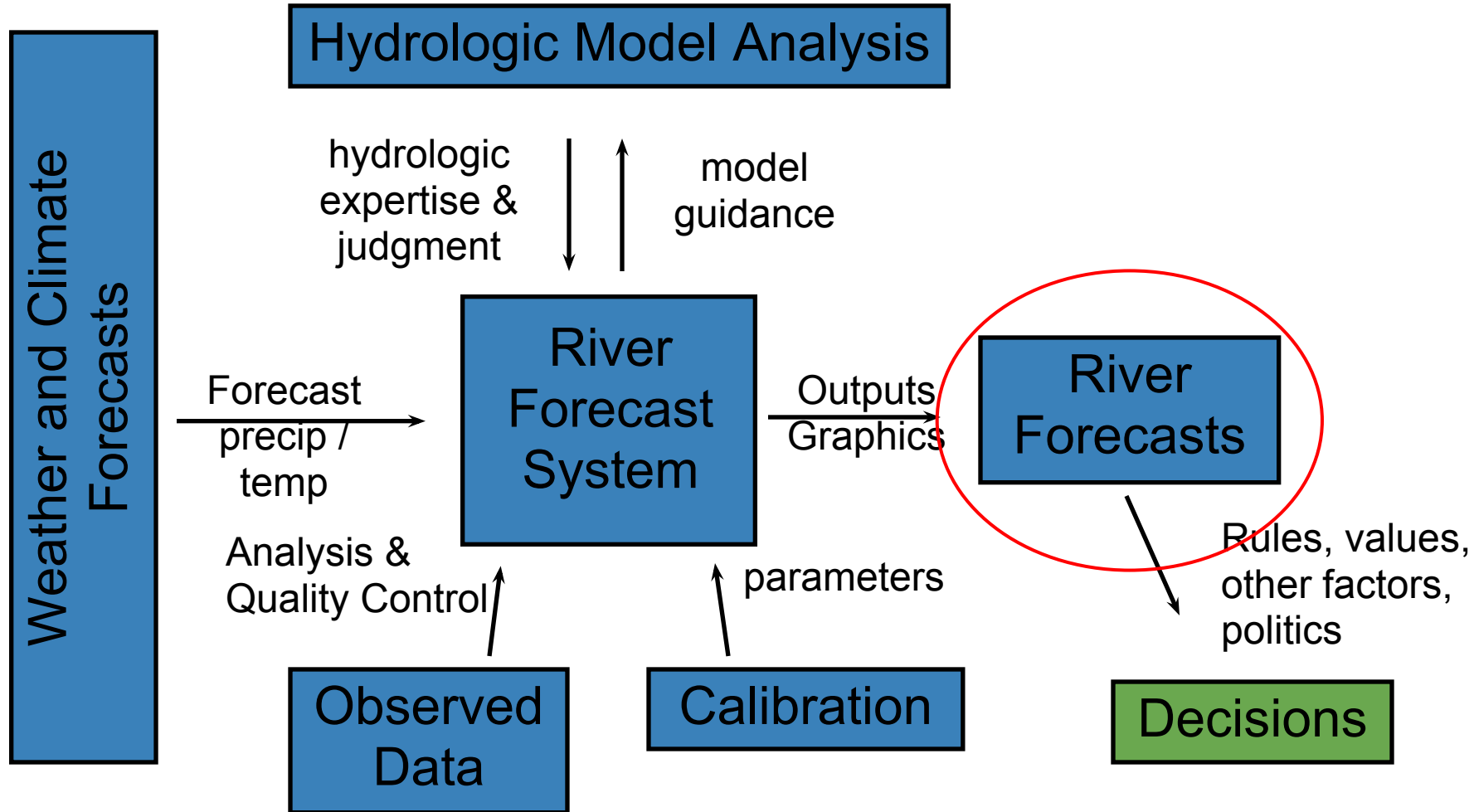


[1] 10-27-2011 12:00:00 Current CBGC20_F.Forecast



[1] 10-27-2011 12:00:00 Current CBGC20_F.Forecast [2] 10-27-2011 12:00:00 Current MergeScalars.Forecast

Forecast Process





Products



Web Graphics

Text Products

Recreation Report

Finished forecasting by 10am

- Update throughout day as needed



Water Supply Operations

Start January 1st

End June 1st

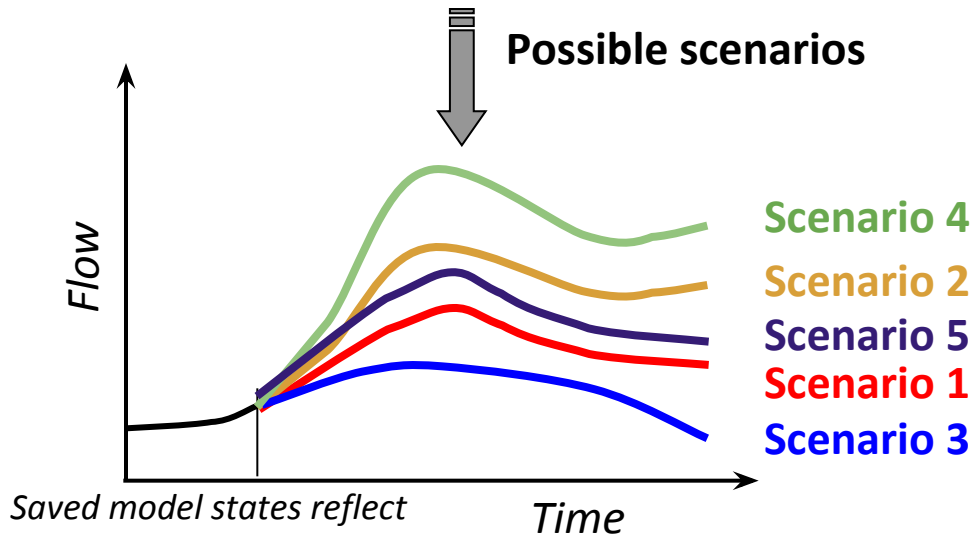
Forecasts at the beginning and middle of each month

Based on Ensemble Streamflow Prediction (ESP) and Statistical Water Supply equations

New for the year is Daily ESP Guidance

ESP Technique

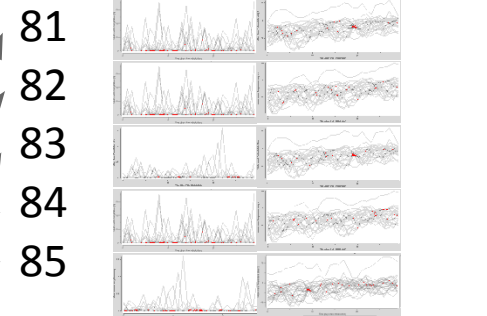
Multiple streamflow scenarios with historic meteorological or forecast weather/climatic data



Saved model states reflect current conditions (snow, soil moisture, current river/reservoir levels)

Results used in statistical analysis to produce forecasts with probabilistic values

Historical time series of precipitation and temperature



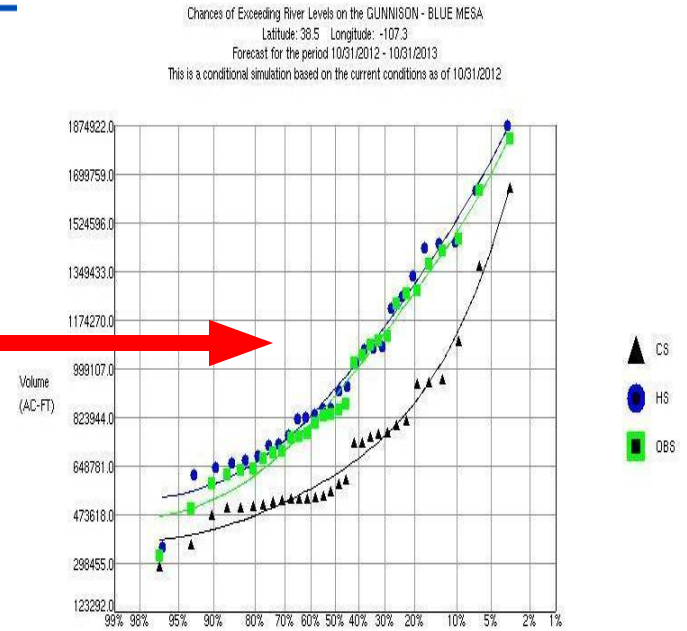
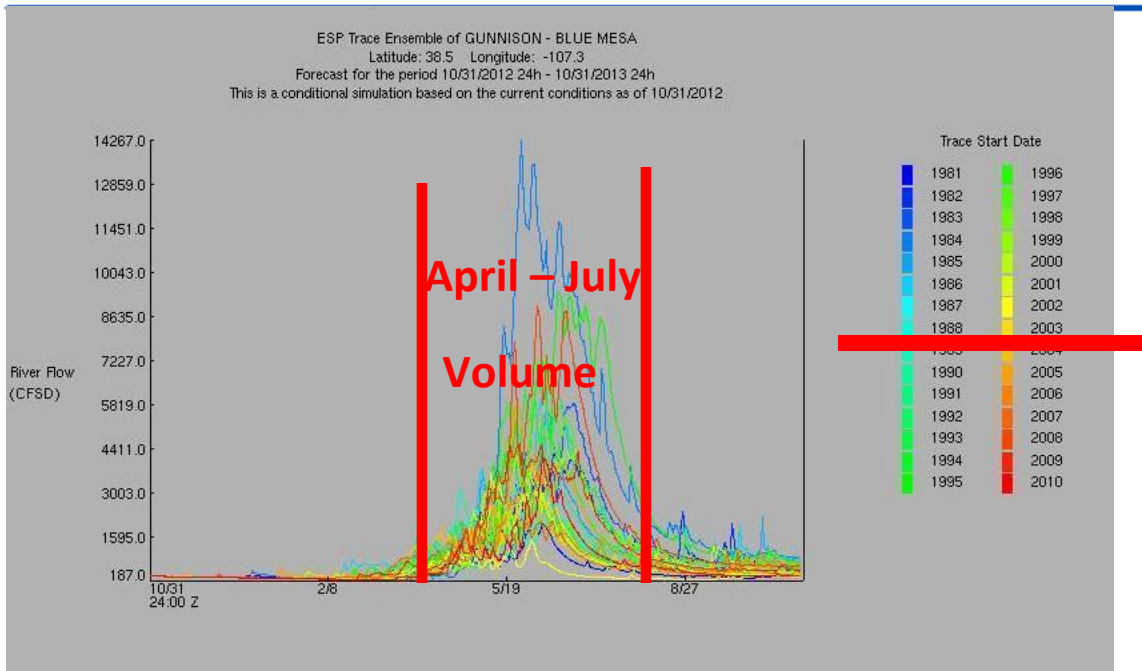
CBRFC: Currently using water years 1981-2010

Can also include forecast precipitation and temperature.

CBRFC:

- Use 10 days of forecast max/min temperatures.
- Two runs –
 - 5 days of forecast precipitation
 - 0 days of forecast precipitation

Ensemble Streamflow Prediction (ESP)



1. Select a forecast window
2. Select a forecast variable
3. Model derives a distribution function
4. 50% exceedance value = most probable forecast
5. Also use 10%/90% levels

# Exceedance Probabilities	Conditional Simulation	Historical Simulation	Historical Observed
0.900	417330,156	581462,500	525460,000
0.750	493856,750	699928,938	659224,812
0.700	517683,500	741569,312	705094,750
0.600	565268,875	829048,438	799524,375
0.500	616216,625	923809,188	898919,562
0.400	676330,375	1029094,688	1006031,062
0.300	755745,938	1151067,250	1126296,500
0.250	808794,500	1222083,250	1194804,500
0.100	1123002,375	1534576,375	1490881,125



ESP 'Modes'



UNREGULATED

(Water Supply Volume Forecasts)

- Not what will be observed in the rivers.
- No diversions (for places we have historical/real time measurements).
 - Trans-basin diversions.
- No water held by reservoirs (passes through).
- Consumptive Use operation still in effect.

REGULATED

(Peak Flow Forecasts)

- Observed mean daily peak.
- Historical diversion data used in calculation of each year's hydrograph.
- Reservoirs operated based on a set of 'rules'.
 - Time of year or elevation.
- Similar to daily forecast methodology.



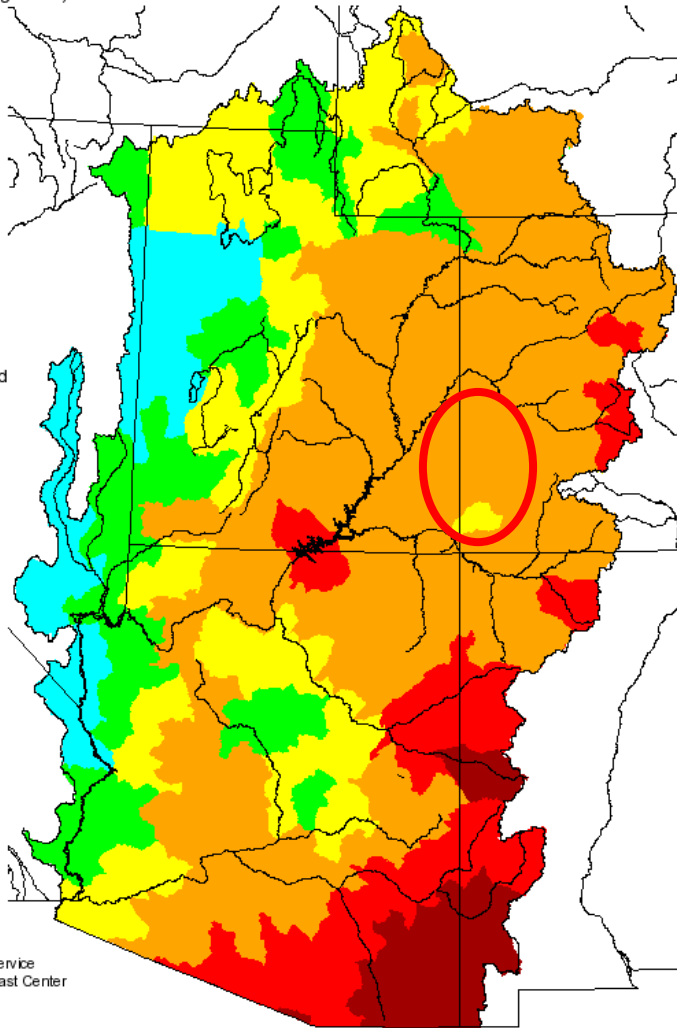
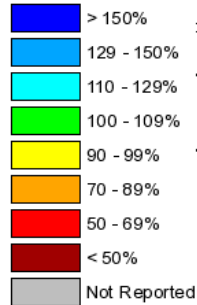
Current McPhee April - July Volume Forecast

Precipitation

Seasonal Precipitation, October 2012 - January 2013

(Averaged by Hydrologic Unit)

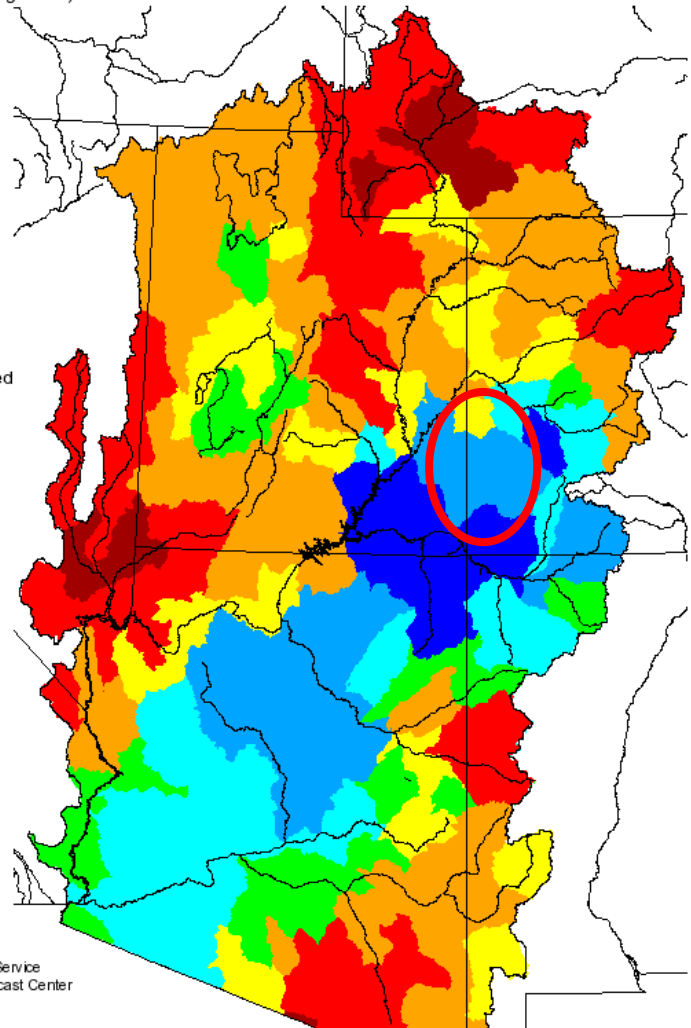
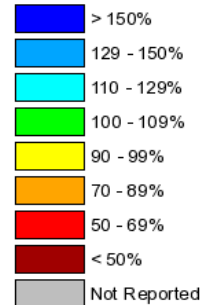
% Average



Monthly Precipitation for January 2013

(Averaged by Hydrologic Unit)

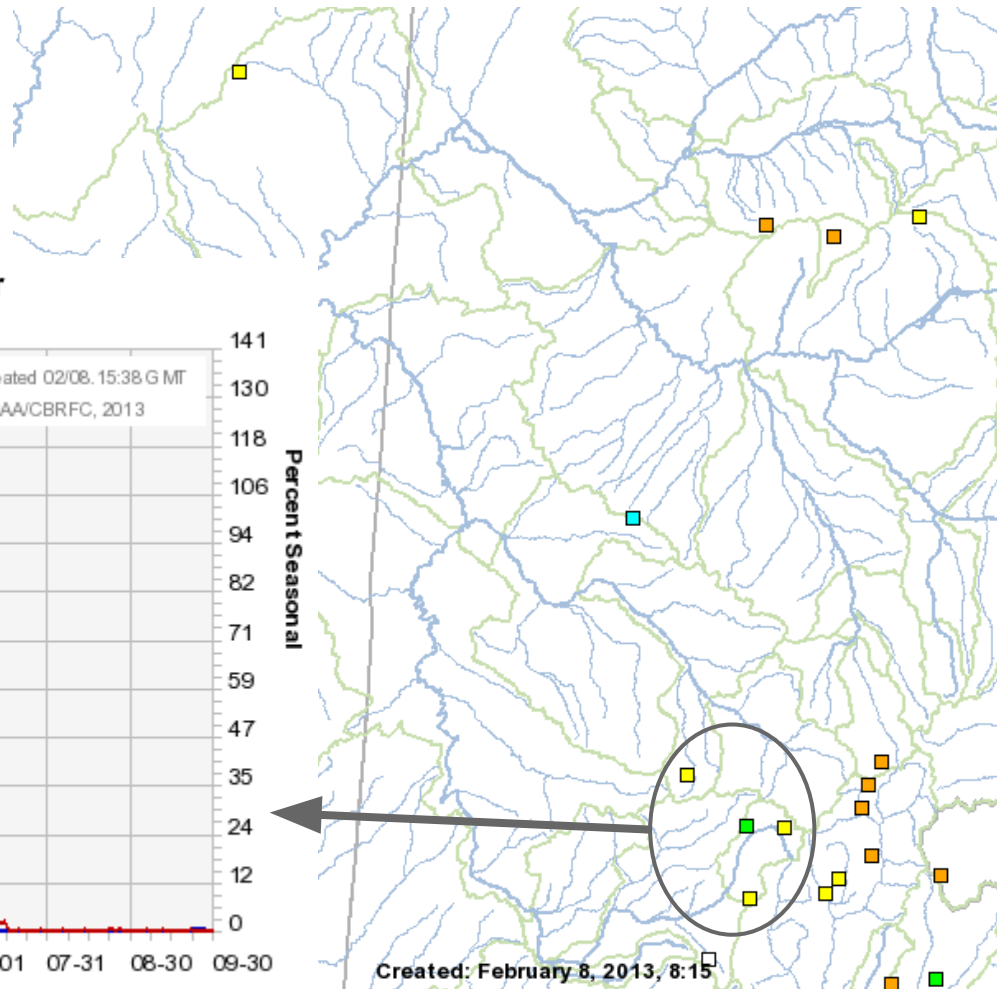
% Average



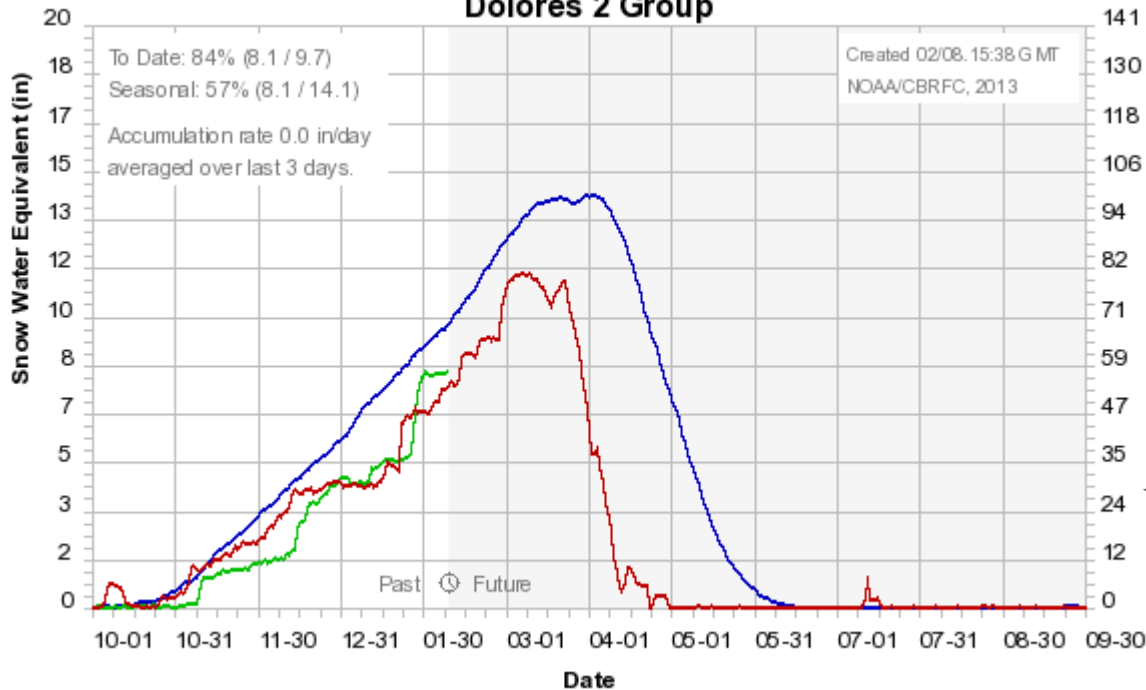


Current Snow Conditions

Snow Point Classification: ○ Percentiles ● Percent Average
□ NA ■ < 25% ■ 25-50% ■ 50-75% ■ 75-90% ■ 90-110% ■ 110-125% ■ 125-150% ■ 150-175% ■ >175%



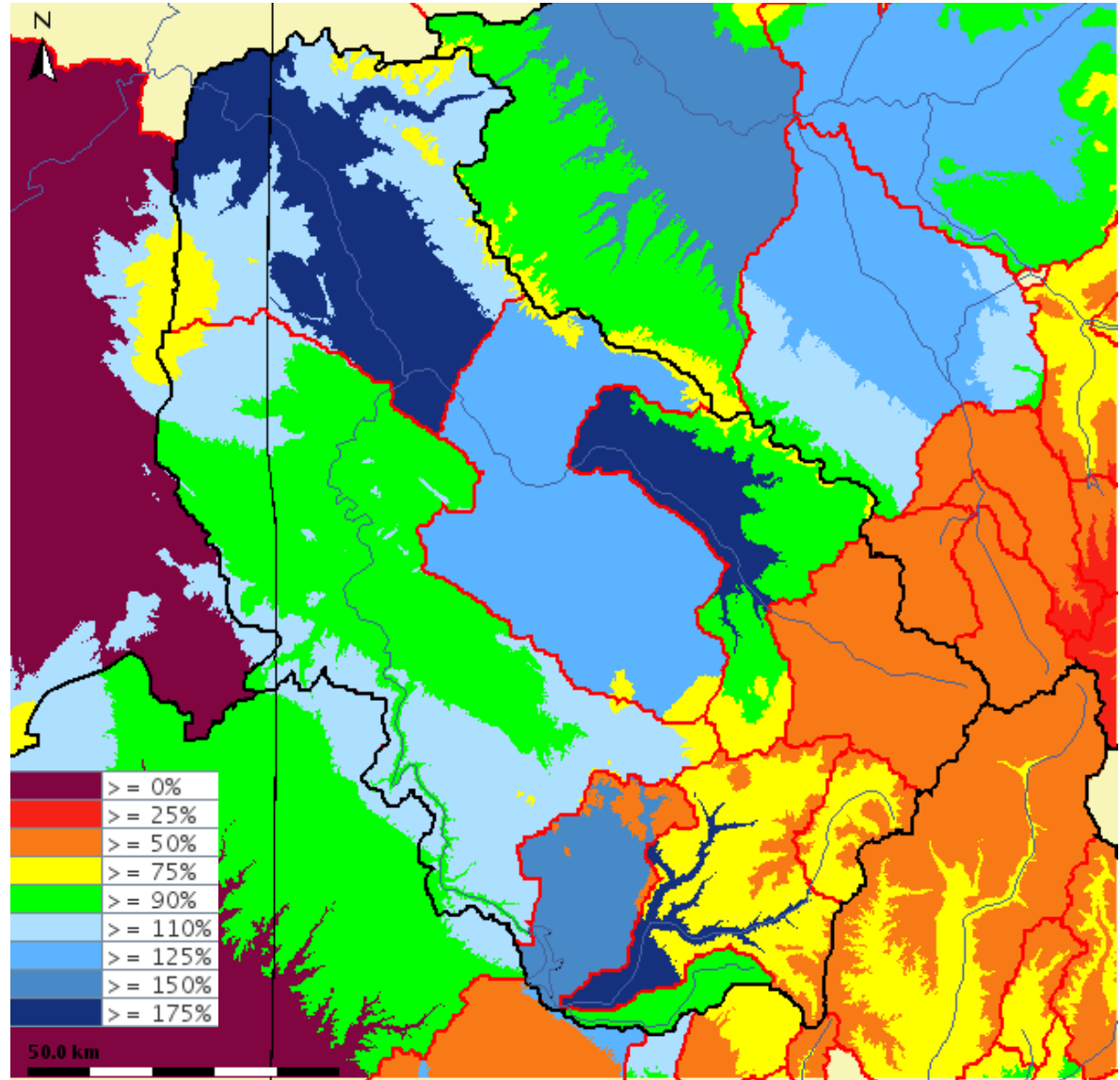
Colorado Basin River Forecast Center
Dolores 2 Group



Created: February 8, 2013, 8:15

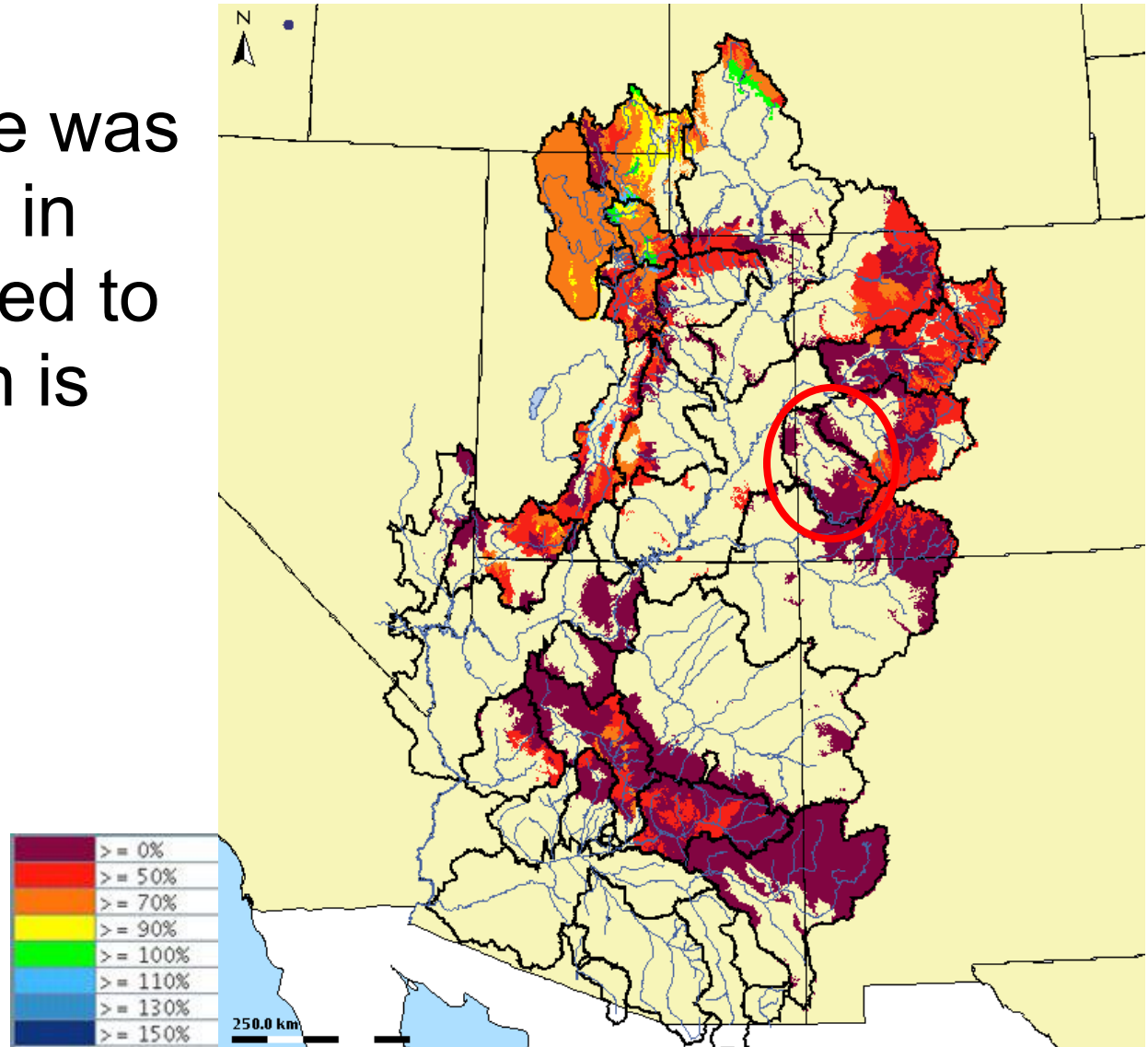
Feb 8th Model Snow % of Avg

Cooler lower elevation temperatures causing higher % averages in lower zones.



2012 December Soil Moisture

Above McPhee was about average in 2011, Compared to this year which is well below.

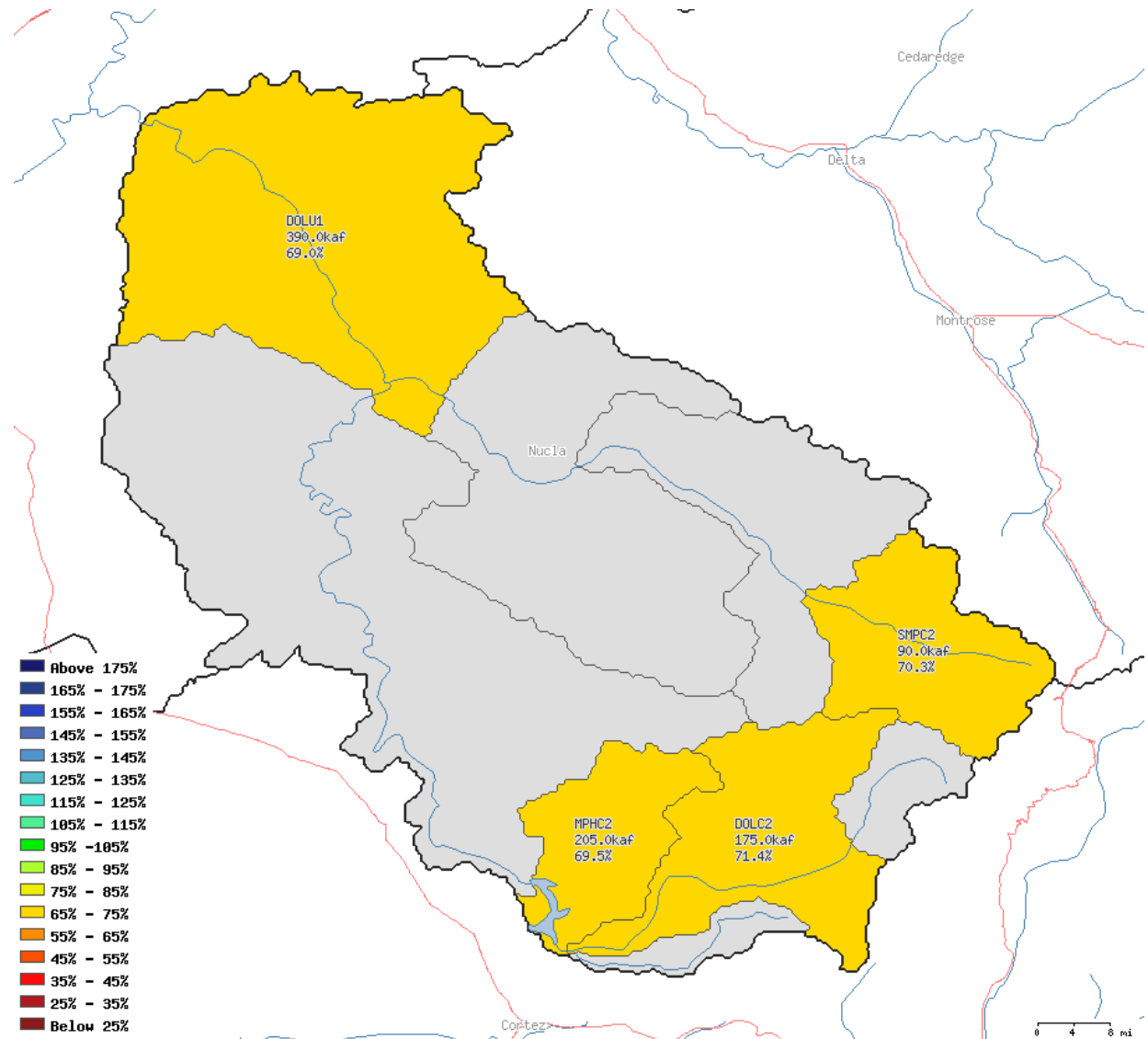




April - July Volume Forecast

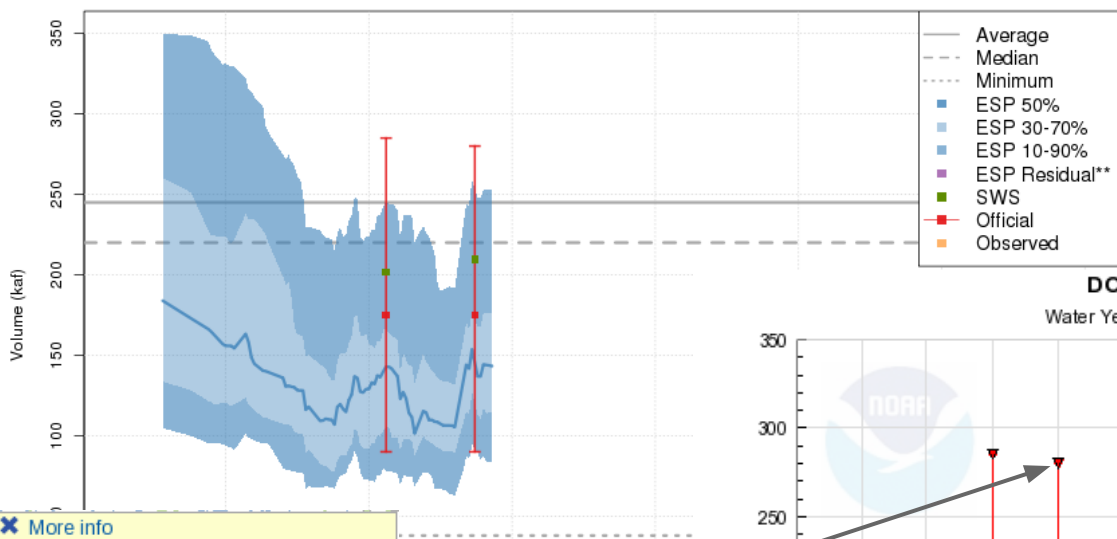
Dolores -
175 kaf
71.4%

McPhee -
205 kaf
69.5%

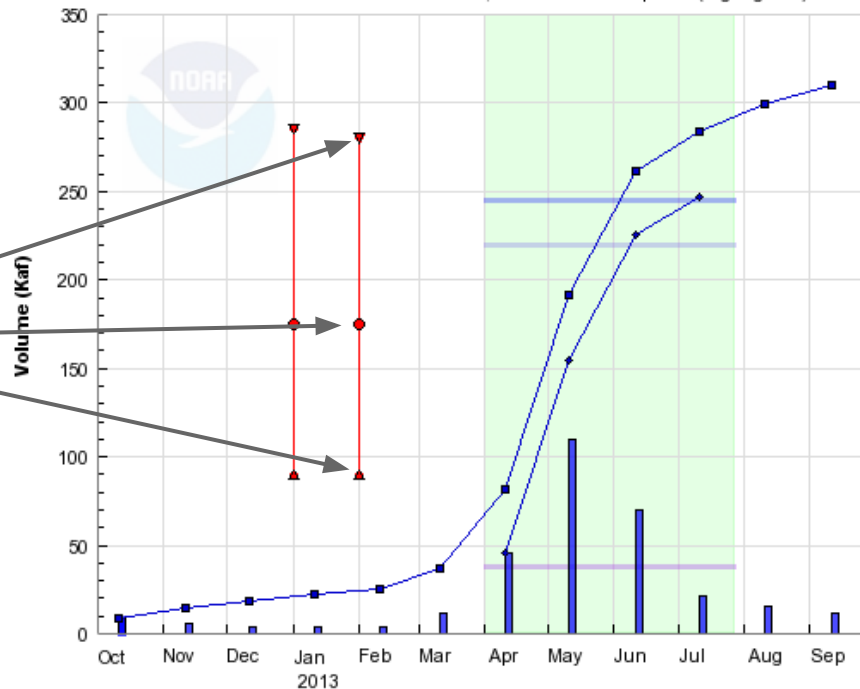


Dolores April-July Evolution Plot

2013 Runoff Forecast
Dolores - Dolores (DOLC2)



DOLORS - DOLORS (DOLC2)
Water Year 2013, Forecast Period Apr-Jul (highlighted)



More info
Dolores - Dolores
DOLC2

Official Forecast Date: 2013-02-01
 Official Min (90%): 90 kaf
 Official MP (50%): **175 kaf**
 Official Max (10%): 280 kaf
 Official Percent Avg: **71%**
 Official Percent Med: **80%**

Average: 245 kaf
 Median: 220 kaf

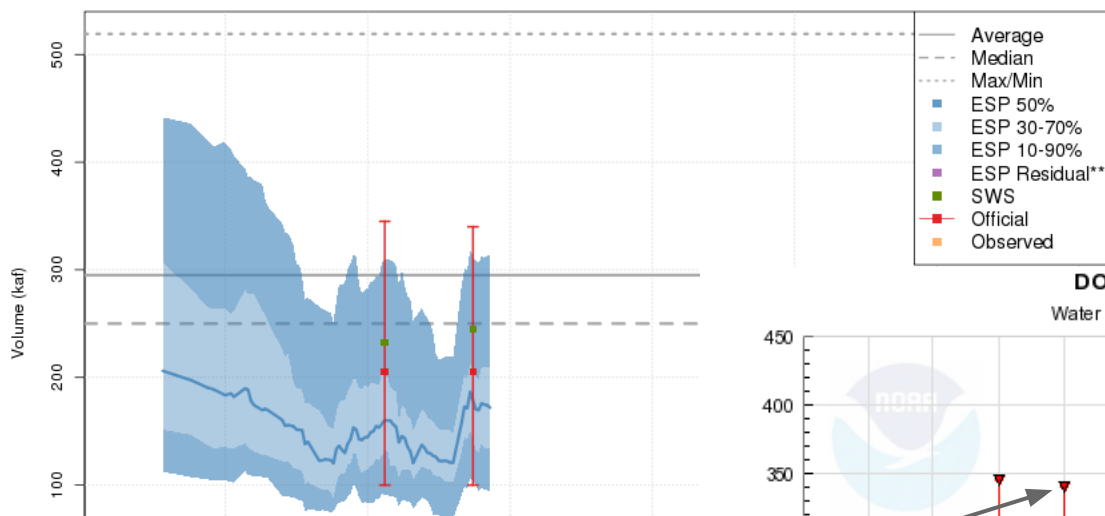
ESP Min (90%): 83 kaf
 ESP Min (70%): 114 kaf
 ESP MP (50%): **143 kaf**
 ESP Min (30%): 176 kaf
 ESP Max (10%): 253 kaf

ESP Percent Average: **58%**
 ESP Percent Median: **65%**
 ESP Date: 2013-02-07

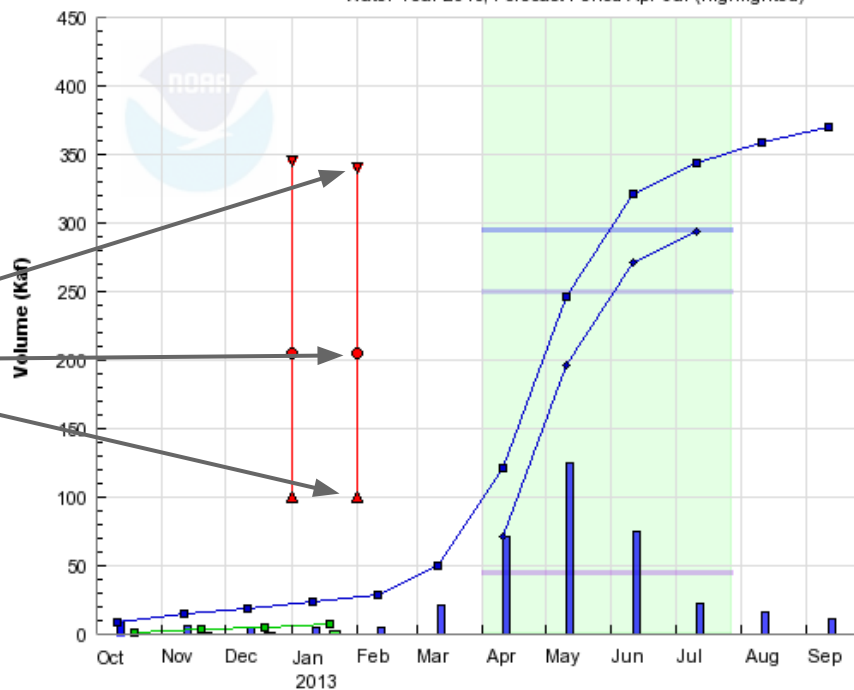
02-07 13:35:58, Latest ESP Run from 272.5 in 1926, Minimum of 38 in 1977. Av

McPhee April-July Evolution Plot

2013 Runoff Forecast
Dolores - Mcphee Res (MPHC2)



DOLORES - MCPHEE RES (MPHC2)
Water Year 2013, Forecast Period Apr-Jul (highlighted)



- Forecast Period
- HISTORY (1981-2010):
 - Period Minimum
 - Period Normal
 - Period Median
- NORMALS:
 - Monthly
 - Period Sum
 - Water Year Sum
- OBSERVED:
 - Monthly (QCMRZZZ)
 - Water Year Sum
- OFFICIAL FORECAST:
 - Reasonable Maximum
 - Final
 - Reasonable Minimum

More info
Dolores - Mcphee Res
MPHC2

Official Forecast Date: 2013-02-01
 Official Min (90%): 100 kaf
 Official MP (50%): **205 kaf**
 Official Max (10%): 340 kaf
 Official Percent Avg: **69%**
 Official Percent Med: **82%**

Average: 295 kaf
 Median: 250 kaf

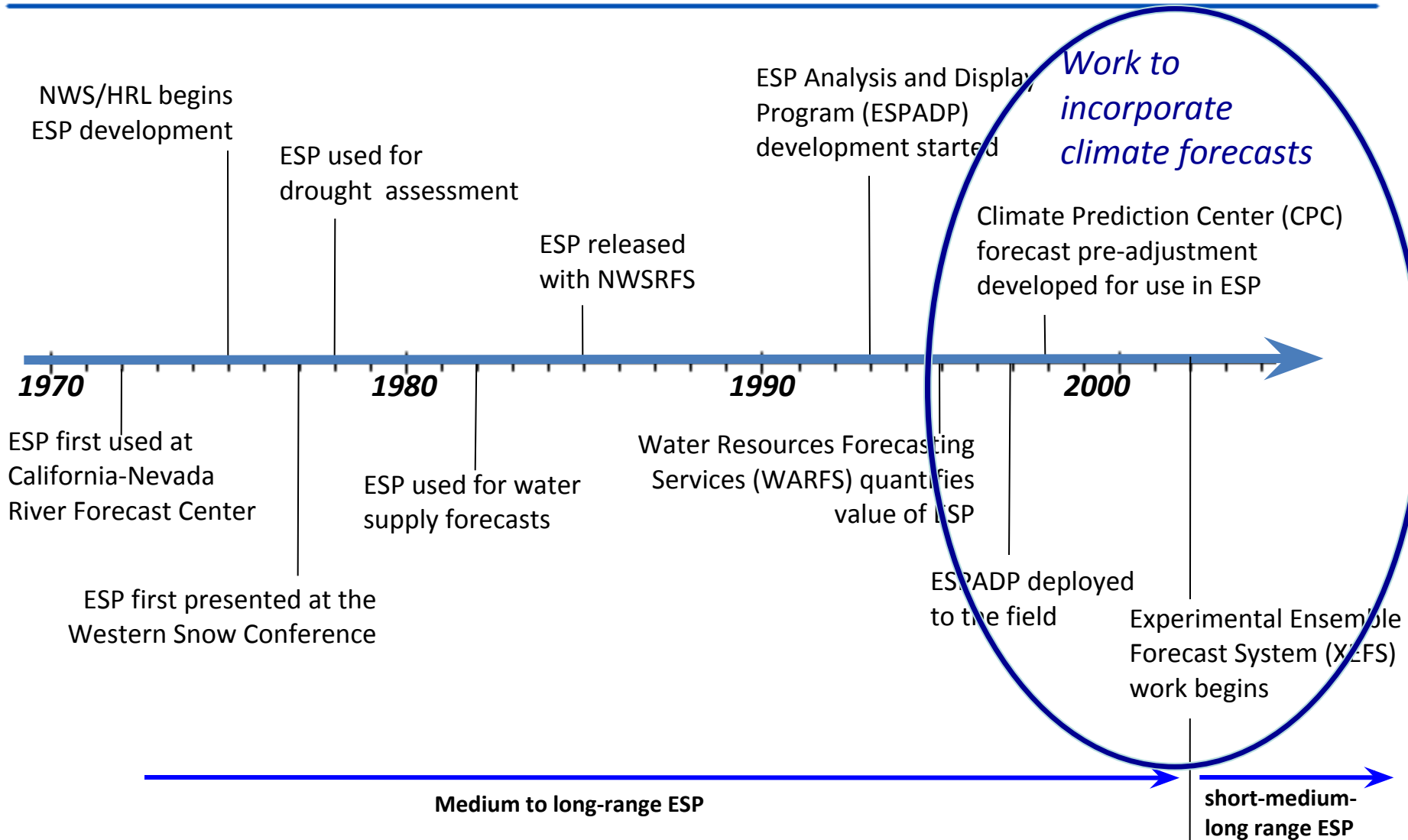
ESP Min (90%): 95 kaf
 ESP Min (70%): 134 kaf
 ESP MP (50%): **172 kaf**
 ESP Min (30%): 209 kaf
 ESP Max (10%): 314 kaf

ESP Percent Average: **58%**
 ESP Percent Median: **69%**
 ESP Date: 2013-02-07

0.2507 13.3028 Latest ESP Run from 20
9.1 in 1993, Minimum of 45.2 in 2002, Ave



Historic development of ESP





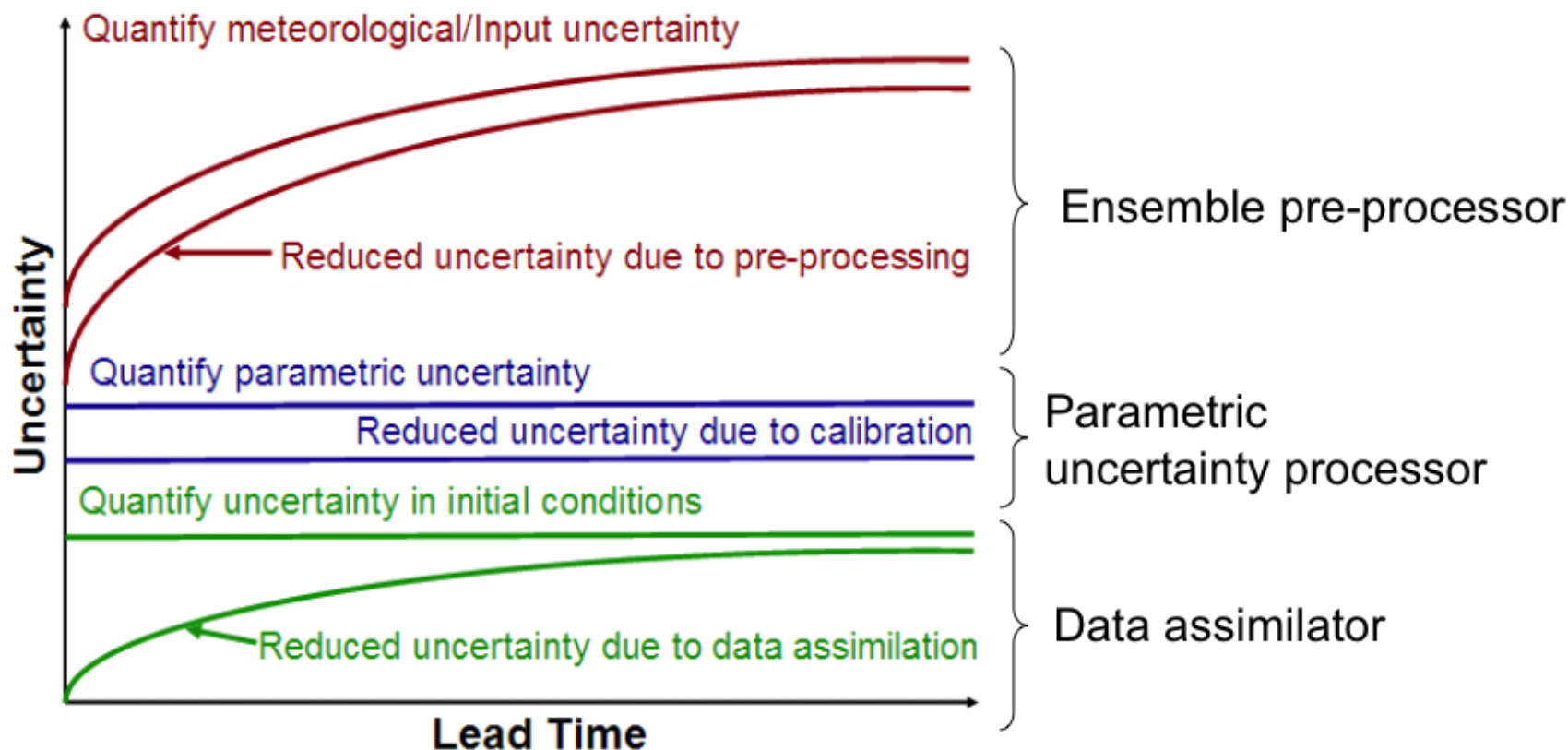
Hydrologic Ensemble Forecast System (HEFS)



- Motivations:
 - Quantify and reduce uncertainties in ESP due to:
 - Future weather and climate
 - Calibration
 - Initial conditions
 - Provide unbiased and skillful forecast ensembles to stakeholders and NWS hydrologic forecast products
 - Generate reforecast dataset consistent with real time forecasts



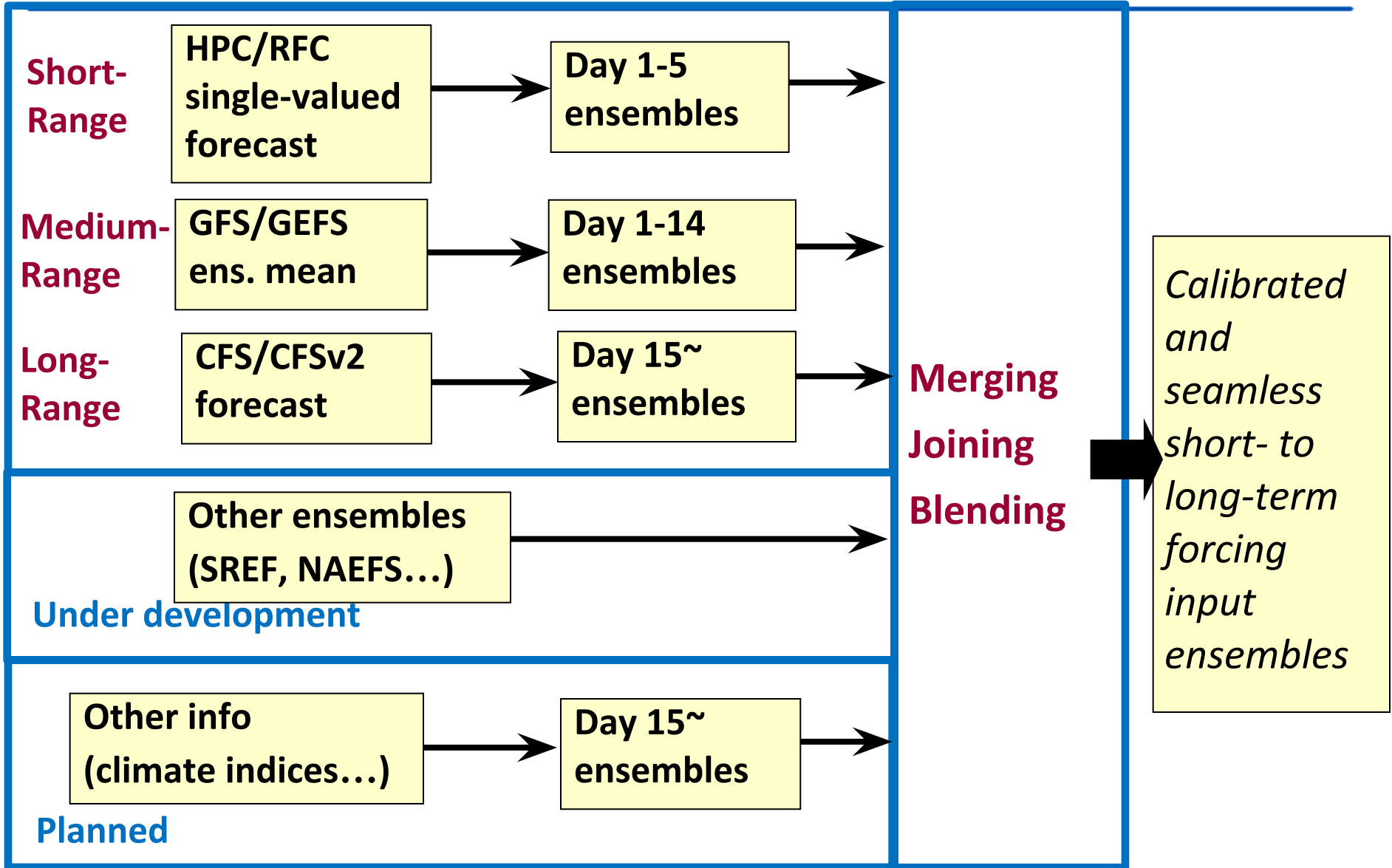
Uncertainties in Hydrologic Forecast



Flow regulations: A large challenge

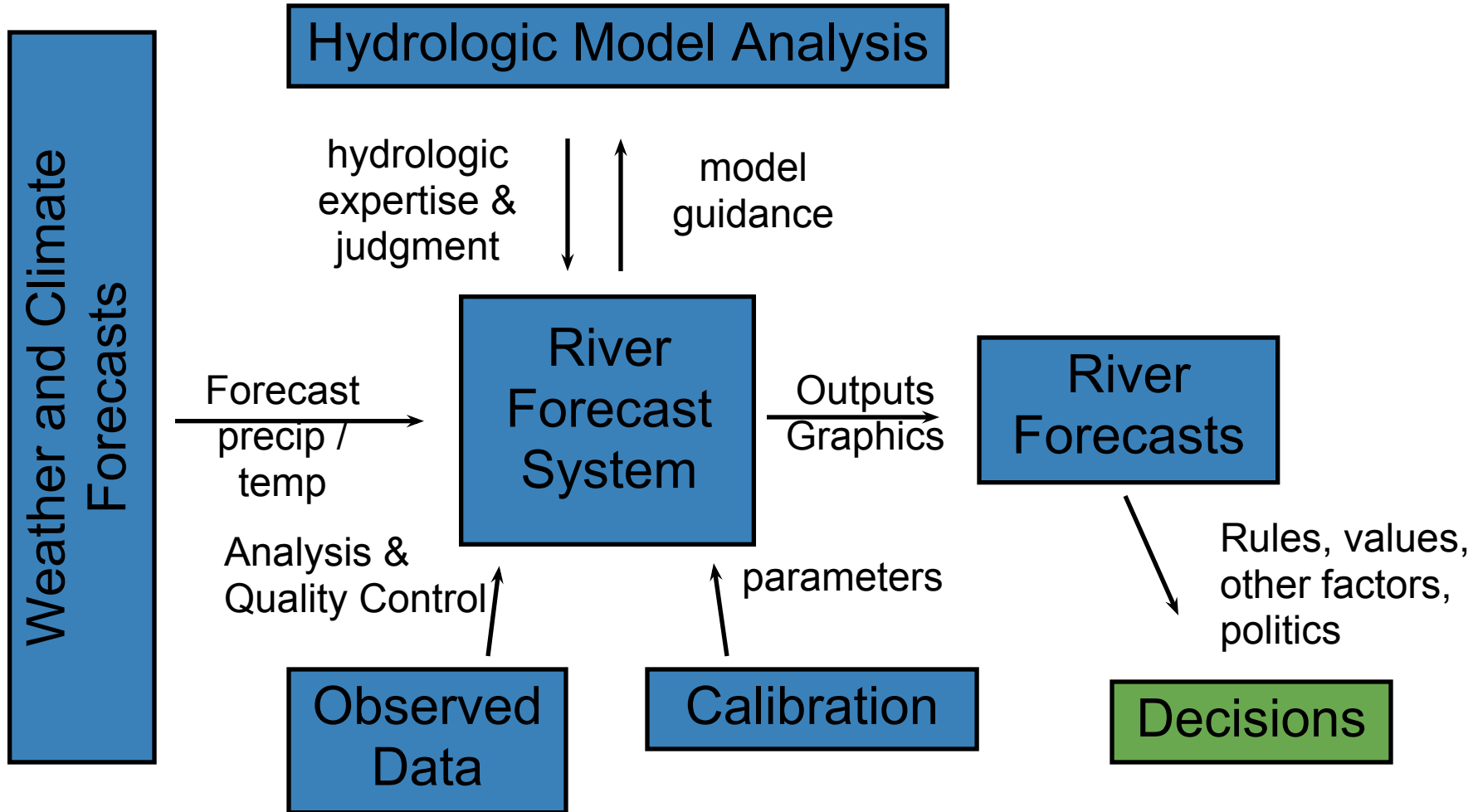


Atmospheric Ensemble Processor: current & new forecast sources

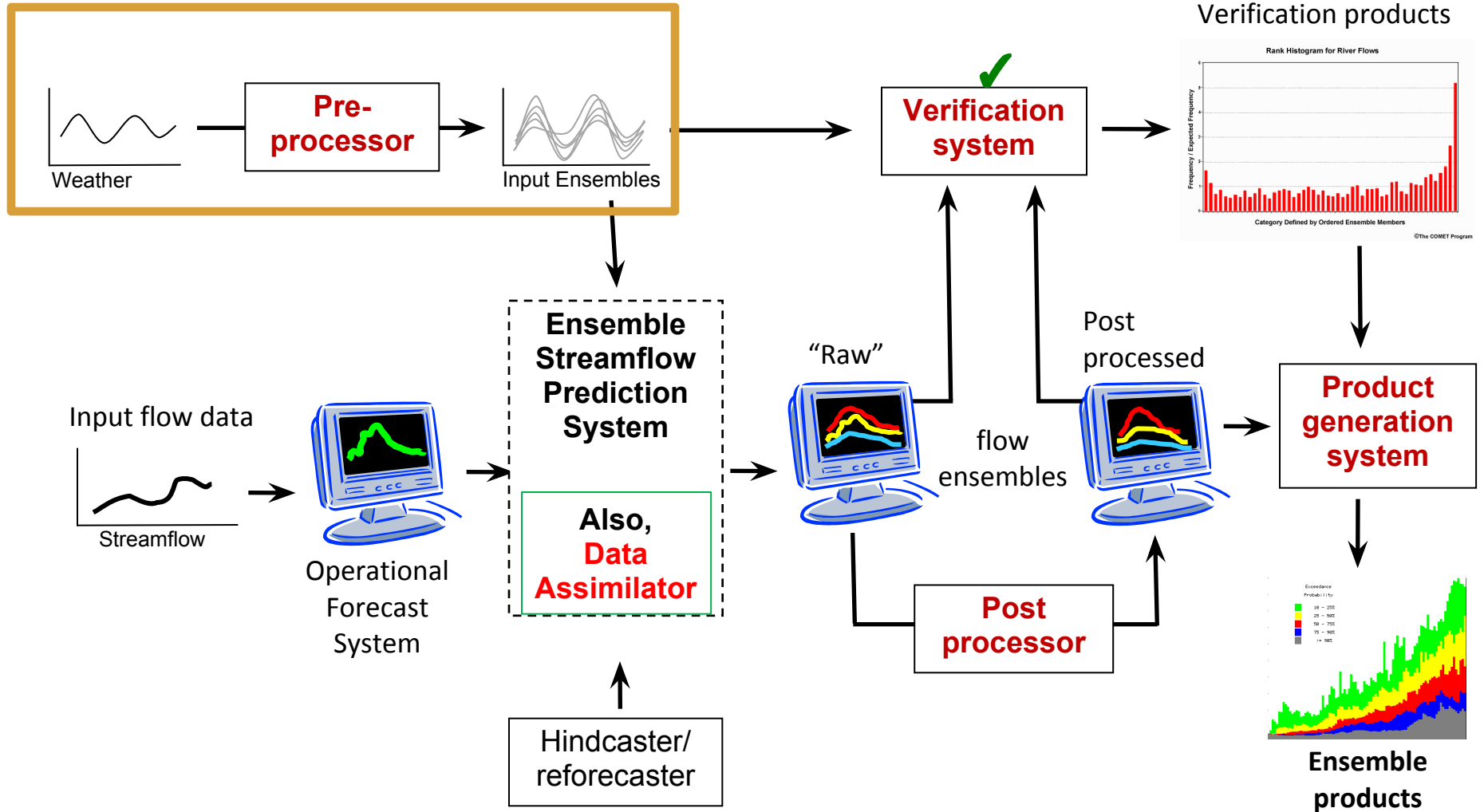




Forecast Process



Upgrade Forecast - ESP Process





Web Site Overview

CBRFC Home Page

<http://www.cbrfc.noaa.gov/>

Firefox > CBRFC Conditions Map <@lajolla>

www.cbrfc.noaa.gov

COLORADO BASIN RIVER FORECAST CENTER
NATIONAL WEATHER SERVICE / NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

News: [Forecast Webinar, Wednesday, February 6, 11 AM MST](#)

[RIVERS](#) [SNOW](#) [WATER SUPPLY](#) [RESERVOIRS](#) [WEATHER](#)

[Conditions Map](#) [List](#) [Peak Map](#) [Peak List](#) [Peak Pub](#) [Recreational Forecasts](#)

Areas: [CBRFC](#) [Upper Colorado](#) [Green](#) [San Juan](#) [Great](#) [Sevier](#) [Virgin](#) [Lower Colorado](#)

SEARCH POINTS

****Changes:** Click Point for Name then Choose Option for Details, Click Map to Zoom.
Hover has been removed for touch screen compatibility.

River Point Condition

- NA
- Normal
- Rise
- Near Bankfull
- Bankfull
- Flood Stage
- Trend (> 3 days)

Created: February 8, 2013, 9:45

NARR
NATIONAL WEATHER SERVICE



Web Site Overview

Choosing the Area and Sub-Area will drill the map to the selection

The screenshot shows the CBRFC Conditions Map website in a Mozilla Firefox browser. The page title is "CBRFC Conditions Map" and the URL is "www.cbrfc.noaa.gov". The header includes the NOAA logo and the text "COLORADO BASIN RIVER FORECAST CENTER NATIONAL WEATHER SERVICE / NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION".

Navigation links include: News: Forecast Webinar, Wednesday, February 6, 11 AM MST; RIVERS SNOW WATER SUPPLY RESERVOIRS WEATHER; Conditions Map List Peak Map Peak List Peak Pub Recreational Forecasts; Areas: CBRFC Upper Colorado Green San Juan Great Sevier Virgin Lower Colorado; Sub-Areas: Upper Colorado Malnstem Gunnison Dolores White-Yampa Lake Powell.

A search box labeled "SEARCH POINTS" is present. Below it, a note states: "**Changes:** Click Point for Name then Choose Option for Details, Click Map to Zoom. Hover has been removed for touch screen compatibility."

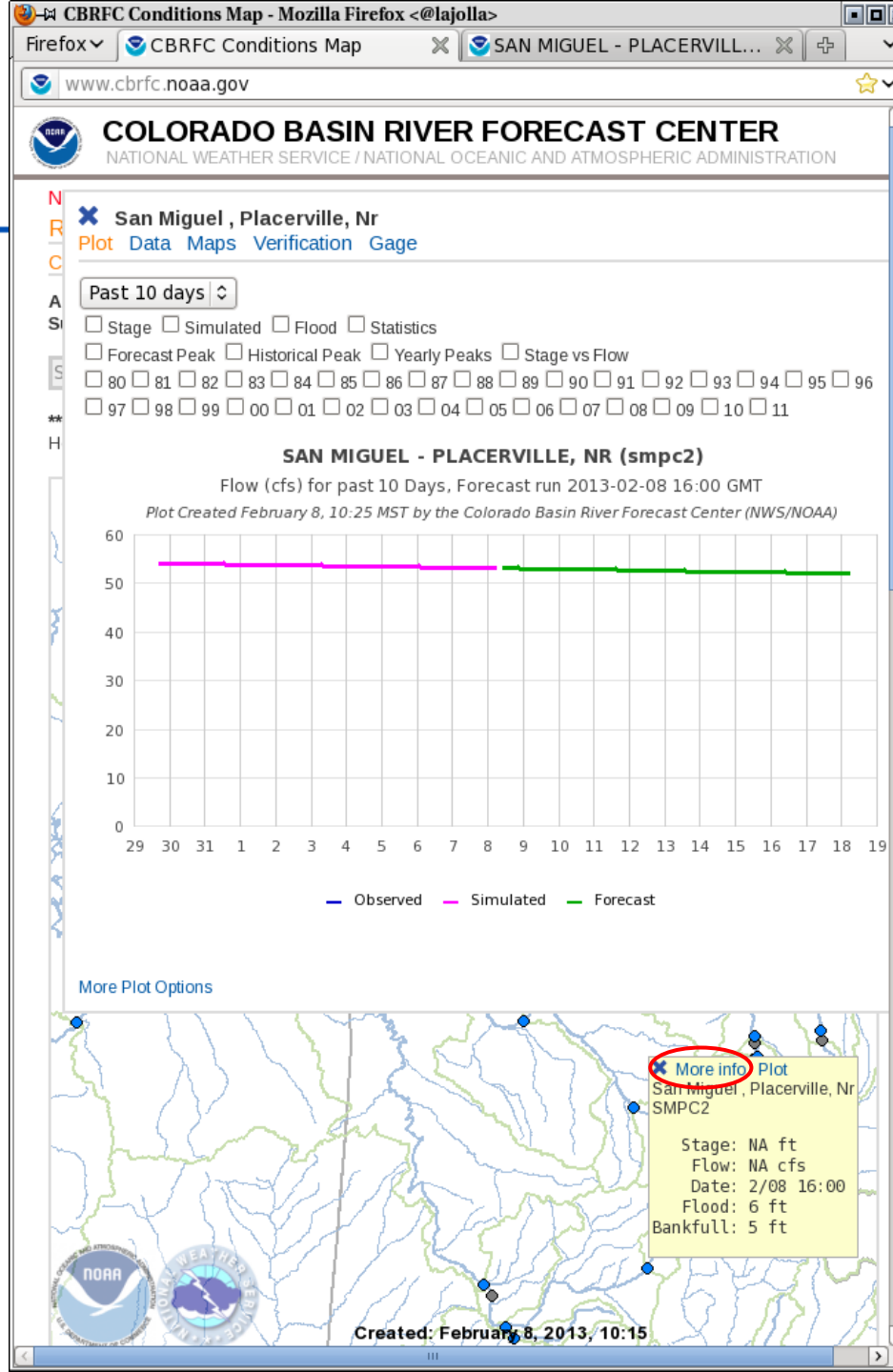
The main content is a map titled "River Point Condition" showing a network of rivers. A legend indicates the following conditions: NA (grey dot), Normal (blue dot), Rise (green dot), Near Bankfull (yellow dot), Bankfull (orange dot), Flood Stage (red dot), and Trend (> 3 days) (purple dot). The map shows several blue dots (Normal) and green dots (Rise) scattered across the river network. The map includes zoom controls in the top left and NOAA logos in the bottom left. The creation date is "Created: February 8, 2013, 10:00".



Web Site Overview

Clicking a River Icon will pop up an information box with the current stage and flow if available.

Clicking *More info* will pop up a plot on the page while Clicking *Plot* will open a new tab with the station plot





Web Site Overview

River Plot page.
Many options to
display different data

Firefox ▾ CBRFC Conditions Map × SAN MIGUEL - PLACERVILLE... ×

SAN MIGUEL - PLACERVILLE, NR (SMPC2)

Forecasts are guidance only. [Click here](#) for official warnings and forecasts.
View station on [Conditions Map](#) or [Download KML](#)

Colorado Basin River Forecast Center SAN MIGUEL - PLACERVILLE, NR - Hydrograph

Latest: M, Flood Stage: 6.00, Bankfull: 5.00
Created 02/08, 17:19 GMT
NOAA/CBRFC, 2013

ft

month/day (MST)

Observed — Simulated — Forecast (02/08 16:00) — Outlook (increasing uncertainty) - - -

Historical Exceedance Probability (USGS): 90-75% 75-50% 50-25% 25-10%

Observed=QRIRGZZ, Simulated=QRIPAZZ, Forecast=QRIFEZZ F (02/08.16:00)
resoutid=

Hydrograph Options

<input type="checkbox"/> Critical	Years	Date
Stages	1911	02/08/2013
<input type="checkbox"/> Simulated	1912	Past Days
<input type="checkbox"/> Raw Data	1913	10
<input type="checkbox"/> Linear Flow	1914	Future Days
<input type="checkbox"/> Mean Daily	1915	10
Values	1916	ESP
<input type="checkbox"/> Forecast	1917	Off
Peak	1918	Analog Years
<input type="checkbox"/> Historical	1919	Off
Peak		Analog Years Period
<input type="checkbox"/> Yearly		Off
Peaks		
<input type="checkbox"/> Daily		
Maxima		
<input checked="" type="checkbox"/> Statistics		
<input type="checkbox"/> Contingency		
<input type="checkbox"/> Adjust		
<input type="checkbox"/> Requery		
<input type="checkbox"/> Forecasts		

Graphs

<input type="checkbox"/> Precipitation
<input type="checkbox"/> Temperature
<input type="checkbox"/> Freezing
<input type="checkbox"/> Level
<input type="checkbox"/> Snow
<input type="checkbox"/> Soil
<input type="checkbox"/> Moisture
<input type="checkbox"/> Rating
<input checked="" type="checkbox"/> Table
<input type="checkbox"/> Hydrograph

Tabular Data

<input type="checkbox"/> Precipitation
<input type="checkbox"/> Temperature
<input type="checkbox"/> Freezing
<input type="checkbox"/> Level
<input type="checkbox"/> Snow
<input type="checkbox"/> Soil
<input type="checkbox"/> Moisture
<input type="checkbox"/> Rating
<input type="checkbox"/> Table
<input type="checkbox"/> Critical
<input type="checkbox"/> Stages
<input type="checkbox"/> Peaks
<input type="checkbox"/> Flows

Information

<input type="checkbox"/> Gage Info
<input type="checkbox"/> Basin/Location
Maps
<input type="checkbox"/> Aerial/Topo
16 mpp
<input type="checkbox"/> Photos

Apply and Redisplay



Web Site Overview

Snow, Water Supply
and Reservoir Map
work the same way.

<http://www.cbrfc.noaa.gov/gmap/cmap2.php?con=snow>

A screenshot of a web browser displaying the "CBRFC Conditions Map" page. The browser's address bar shows the URL "www.cbrfc.noaa.gov/gmap/cmap2.php?con=snow". The page header includes the NOAA logo and the text "COLORADO BASIN RIVER FORECAST CENTER NATIONAL WEATHER SERVICE / NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION". Below the header, there are navigation links for "News: Water Supply Forecast Publications for February", "RIVERS SNOW WATER SUPPLY RESERVOIRS WEATHER", and "Conditions Map Conditions List Snow Groups". A search bar labeled "SEARCH POINTS" is present. The main content area features a map of the Colorado Basin with numerous colored squares representing snow points. A legend titled "Snow Point Classification" is located at the top of the map, showing color-coded boxes for various percentile ranges: NA (white), < 25% (red), 25-50% (orange), 50-75% (yellow), 75-90% (light green), 90-110% (green), 110-125% (light blue), 125-150% (blue), 150-175% (dark blue), and >175% (dark purple). The legend also includes options for "Percentiles" (open circles) and "Percent Average" (filled circles). At the bottom of the map, there are logos for NOAA and the National Weather Service, along with the text "Created: February 8, 2013, 10:30".



Web Site Overview

River, Snow, Water Supply and Reservoirs can also be displayed as a list.

Example here is a Dolores Snow List

<http://www.cbrfc.noaa.gov/gmap/list/list.php?search=&point=all&plot=&sort=sweids&type=snow&basin=1&subbasin=2&espqpf=0&espdist=empirical>

The screenshot shows the NOAA website interface for the Colorado Basin River Forecast Center. The page title is "Snow List" and the URL is www.cbrfc.noaa.gov/gmap/list/list.php?search=&point=all&plot=&sort=sweids&type=snow. The page header includes the CBRFC logo and the text "COLORADO BASIN RIVER FORECAST CENTER NATIONAL WEATHER SERVICE / NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION".

Navigation links include: News: Water Supply Forecast Publications for February, RIVERS, SNOW, WATER SUPPLY, RESERVOIRS, WEATHER.

The "Snow List" section includes instructions: "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." Below this is a "SEARCH POINTS" input field.

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 legend: NA, < 25%, 25-50%, 50-75%, 75-90%, 90-110%, 110-125%, 125-150%, 150-175%, >175%
Percentile legend: Not Ranked, Low, <10, 10-25, 25-75, 75-90, >90, High

	NWS ID	Location	Percent Average	Percentile	Observed Date (Day)	SWE (in)	Average	%Average	Wet Rank	Dry Rank	Year
1	EDSC2	El Diente Peak	■	■	8	9	9.5	95	13	15	
2	LIZC2	Lizard Head Pass	■	■	8	7.4	9.7	76	27	7	
3	LMU1	Lasal Mountain-lower	□	□	8	6.7					
4	LNCC2	Lone Cone	■	■	8	9.7	11.4	86	23	11	
5	LSMU1	Lasal Mountain	■	■	8	8.6	8.2	105	16	17	
6	SHSC2	Scotch Creek	■	■	8	6.3	8.1	77	20	8	
7	SKZC2	Sharkstooth	□	□	8	10.6					
8	WPRC2	Willow Park	■	■	8	4.9	10.9	45	32	2	

Footer navigation links:

- RIVERS: Conditions Map, Conditions List, Peak Flow Map, Peak Flow List, Peak Flow Publication, Recreational Forecasts, Text Products, 5 Day Flood Outlook, Hydro Data, AHPS
- WATER SUPPLY: Internal Tools, Forecast Map, Forecast List, Discussion, Publication, Publication Archive, Daily ESP, Text Outlooks, Documentation, Western LIS
- RESERVOIRS: Conditions Map, Conditions List, Damcrit, Webcat, DamBreak
- WEATHER: Observed, Forecast, Radar

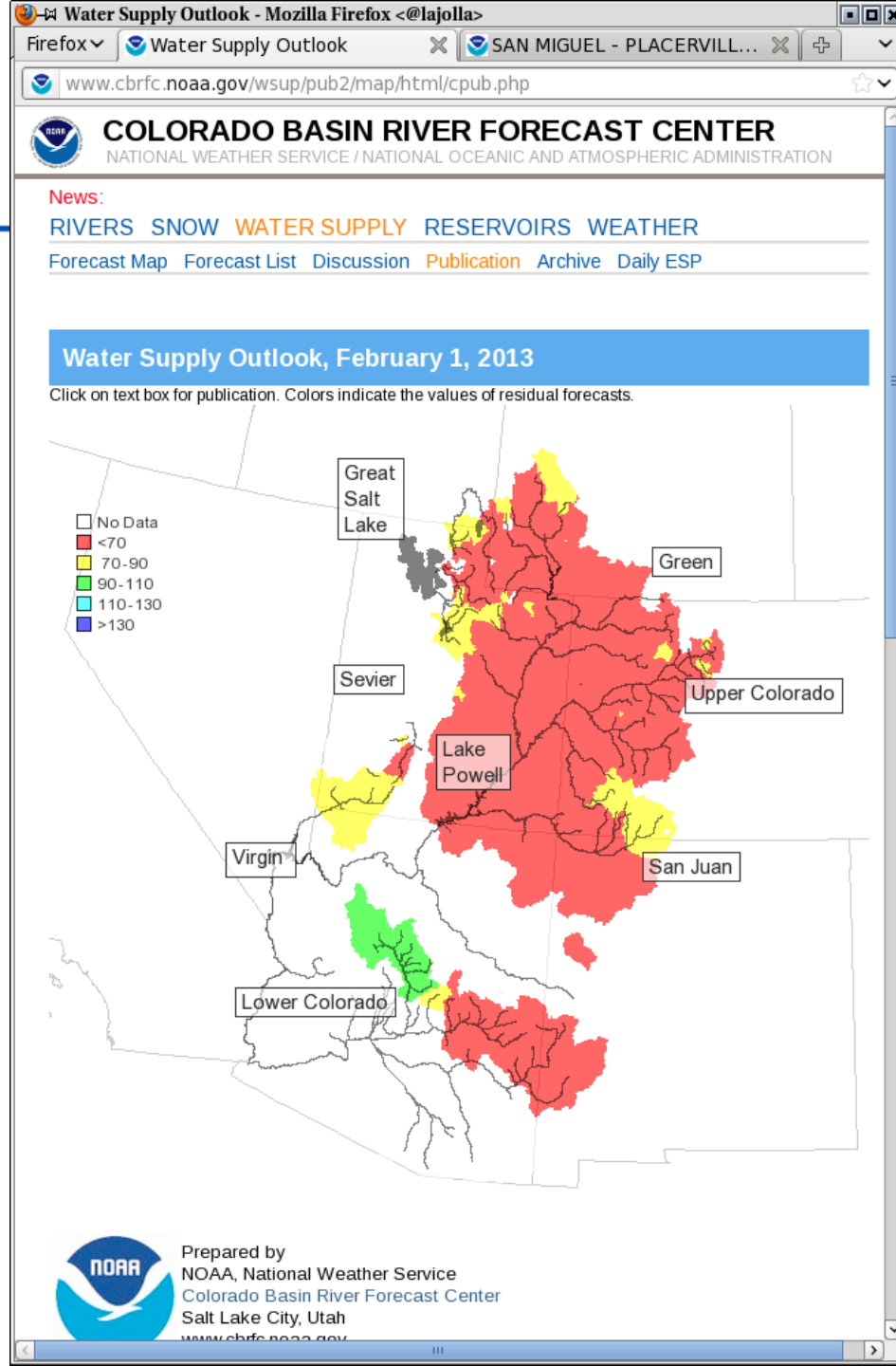


Web Site Overview

Water Supply Publication provides an overview of the current outlook.

The Dolores in part of the Upper Colorado

<http://www.cbrfc.noaa.gov/wsup/pub2/map/html/cpub.php>





Web Site Overview

New for this year is the Water Supply Forecast Discussion. Gives a synopsis of the conditions used to make the current Water Supply Forecast.

<http://www.cbrfc.noaa.gov/wsup/pub2/discussion/cbrfc.2013.2.php>

The screenshot shows a web browser window with the URL www.cbrfc.noaa.gov/wsup/pub2/discussion/cbrfc.2013.2.php. The page header includes the CBRFC logo and the text "COLORADO BASIN RIVER FORECAST CENTER NATIONAL WEATHER SERVICE / NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION".

News:
[RIVERS](#) [SNOW](#) [WATER SUPPLY](#) [RESERVOIRS](#) [WEATHER](#)
[Forecast Map](#) [Forecast List](#) [Discussion](#) [Publication](#) [Archive](#) [Daily ESP](#)

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

[Click here for specific site water supply forecasts](#)

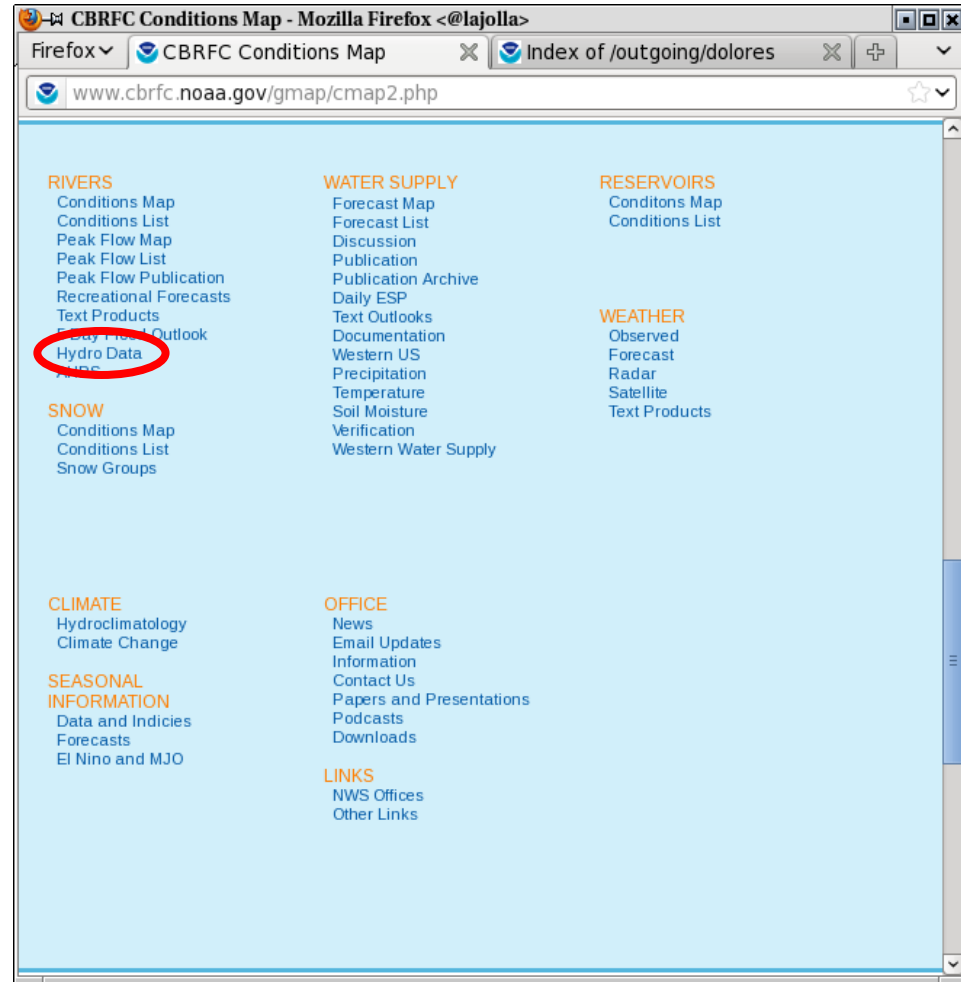
Water Supply Discussion



Web Site Overview

Getting to Dolores ESP Traces

At the bottom of the
main home page click
Hydro Data





Web Site Overview

Getting to Dolores
ESP Traces continued

Under ESP Traces
select *Dolores ESP*
Traces and the page
to download the files
will open in a new tab

Firefox > Hydro Data - Mozilla Firefox <@lajolla> | Index of /outgoing/dolores

www.cbrfc.noaa.gov/data/datalinks.php

COLORADO BASIN RIVER FORECAST CENTER
NATIONAL WEATHER SERVICE / NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

News:
RIVERS SNOW WATER SUPPLY RESERVOIRS WEATHER

Hydro Data

General
CBRFC Station Data
Long Park Dam
CBRFC Current Radar Biases

ESP Traces
Denver Water Board ESP Traces
PacifiCorp ESP Traces
Gunnison ESP Traces
San Juan ESP Traces
Dolores ESP Traces
Lower Reclamation ESP Traces
Reclamation ECAO ESP Traces
Reclamation SLC ESP Traces
Reclamation 32 month ESP Traces

NRCS
Water Supply Obs

Basin Maps

Firefox > Hydro Data | Index of /outgoing/dolores

www.cbrfc.noaa.gov/outgoing/dolores/

Index of /outgoing/dolores

	Name	Last modified	Size	Description
📁	Parent Directory		-	
📄	dol-dol.out	04-Feb-2013 12:43	159K	
📄	dol-dol.spreadout	04-Feb-2013 12:43	103K	
📄	dol-rico.out	04-Feb-2013 12:43	159K	
📄	dol-rico.spreadout	04-Feb-2013 12:43	103K	
📄	lostcnyn.out	04-Feb-2013 12:43	159K	
📄	lostcnyn.spreadout	04-Feb-2013 12:43	103K	
📄	mcphee.out	04-Feb-2013 12:43	159K	
📄	mcphee.spreadout	04-Feb-2013 12:43	103K	



Questions?

