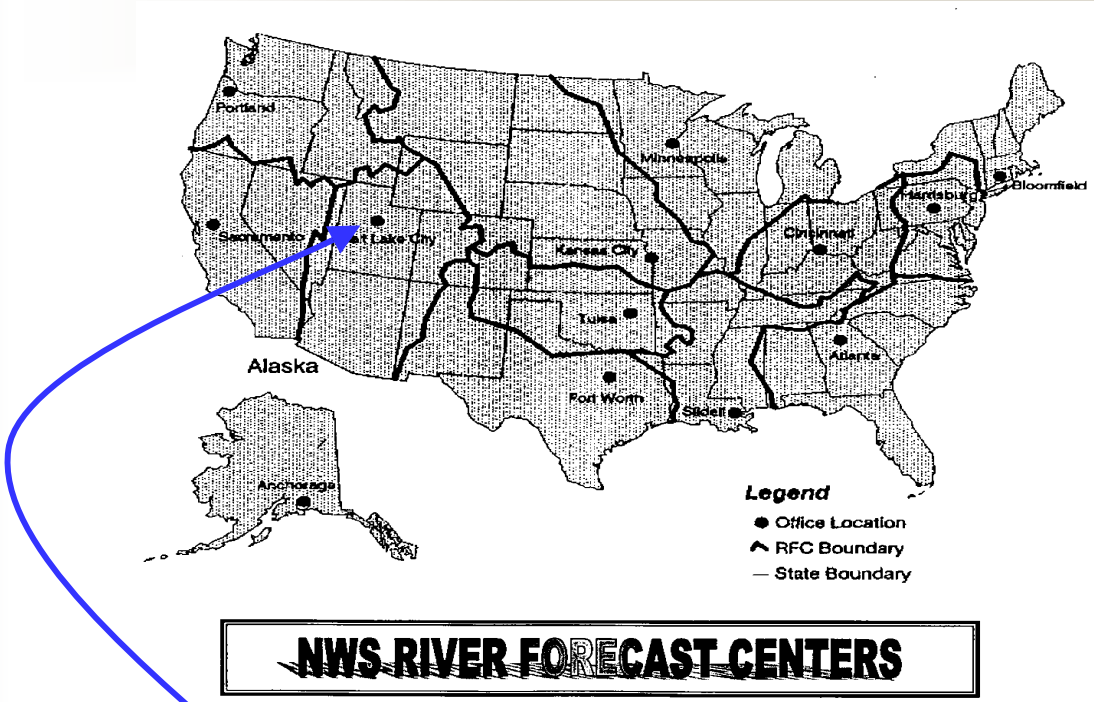
Colorado Basin
River Forecast Center

USBR-NWS Liaison

Previous: Bob Adams, Roland Springer,

Current: **Chris Cutler**



NWS RIVER FORECAST CENTERS

CBRFC AREAL STATISTICS

AREA	=	**303,450 SM (RANK 5TH)**
COUNTIES	=	**558**
STATES	=	**7**
NEXRADS	=	**16**

Two Basic Models Are Used to Forecast Streamflow

(1) Statistical Regression Models

Relates input variables such as snowpack, precipitation, climate indices to an output variable, volumetric streamflow

(2) Ensemble Streamflow Prediction

Uses historical traces of precipitation and temperature and conditions these based on current soil moisture conditions…traces can be weighted

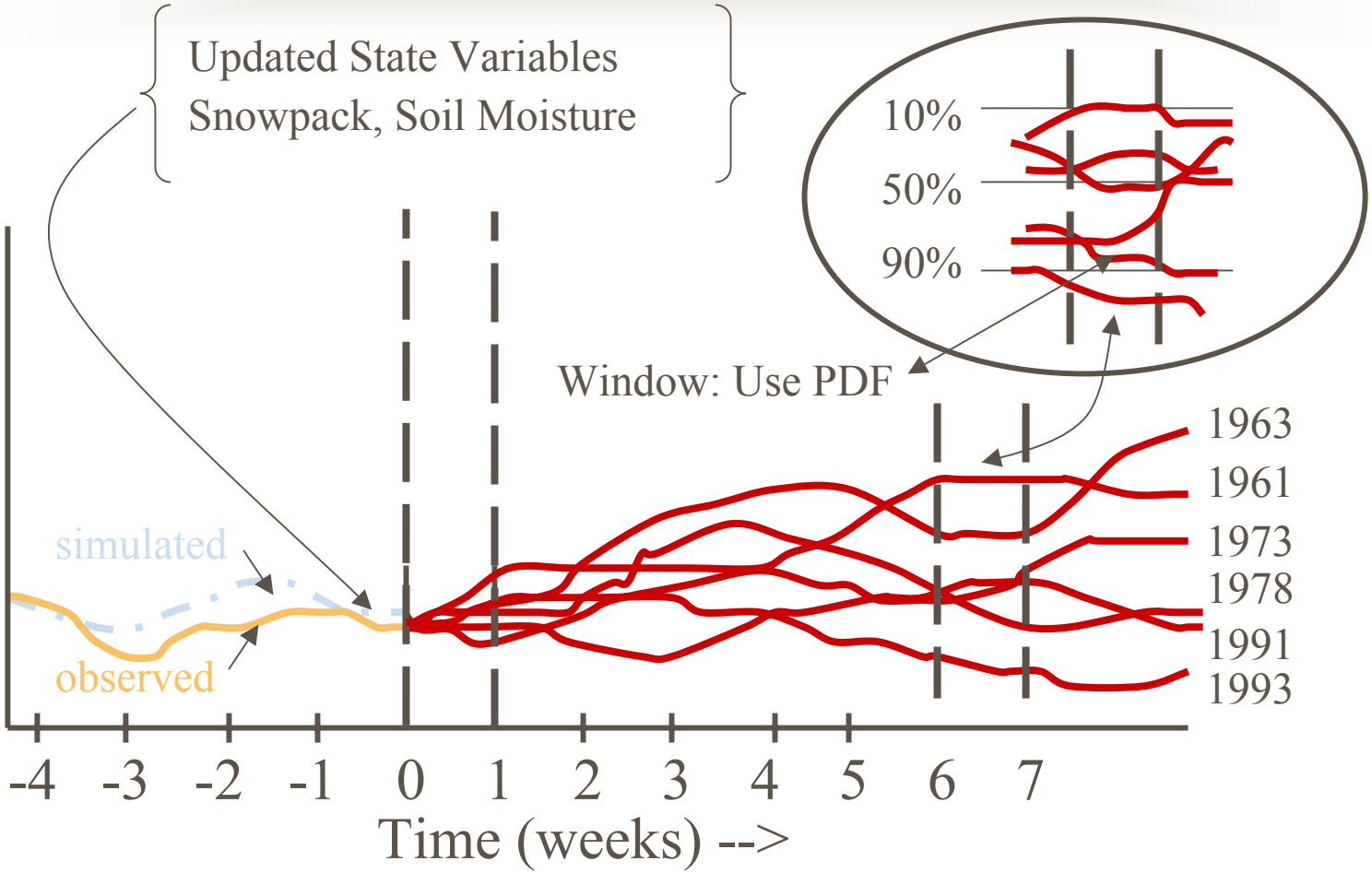
Statistical Regression

Used since late 40's
Simple Model-Easy to Implement
Good at predicting a single variable
Breaks down in extreme years
Non-Linear capabilities
    Neural Networks
    Power Functions
    Nearest Neighbor Analogs

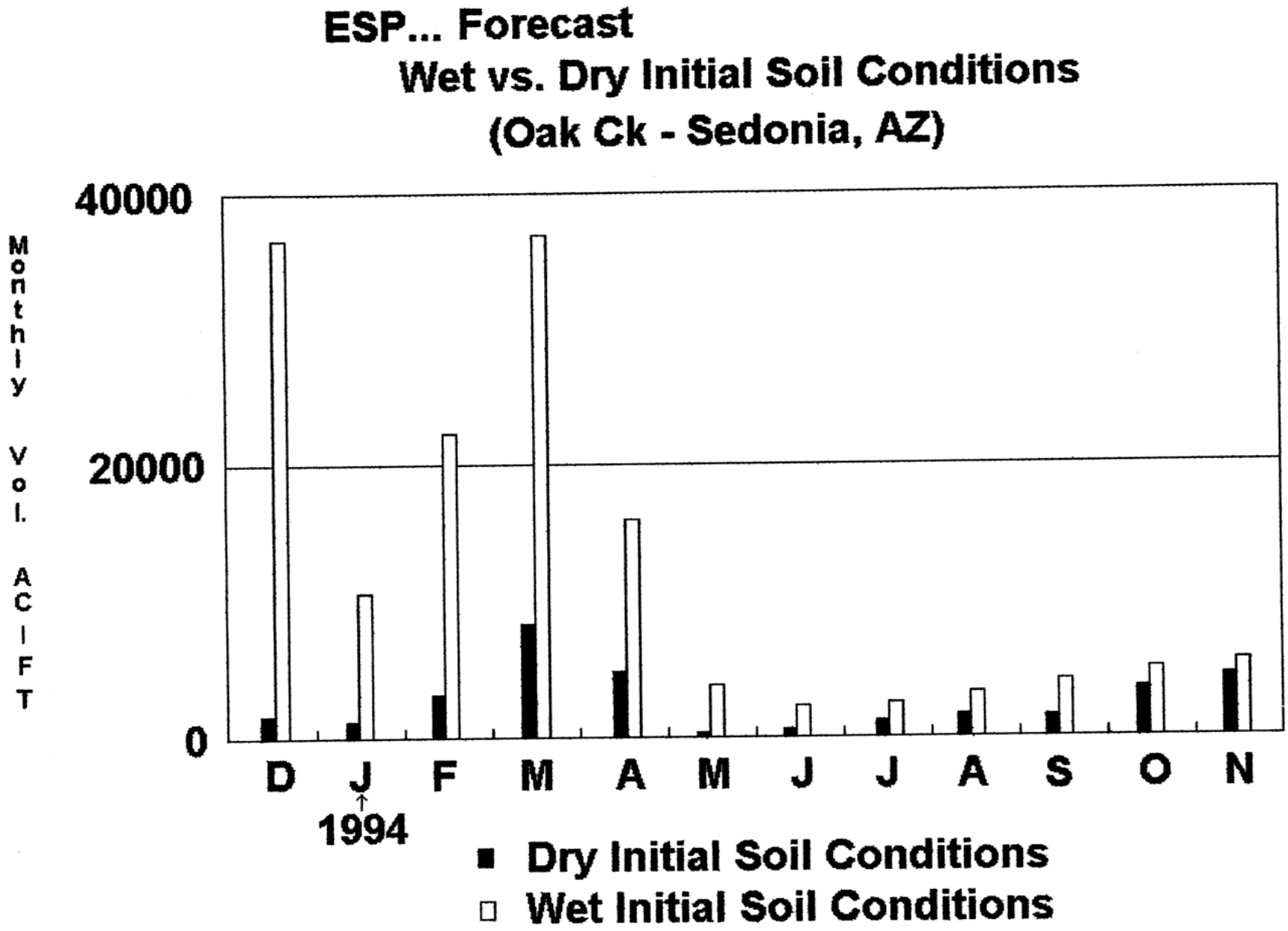
ESP: A conditional forecast simulation based on:

1. Current watershed conditions and model states, snow, soil moisture, flow

2. Known historical precipitation, Temperature and streamflow (can be weighted)



Model Input	Observations TA, PP, QC	QPF QTF	Yearly Historical Time Series PP & TA based on Weighting Schemes


ESP... Forecast
Wet vs. Dry Initial Soil Conditions
(Oak Ck - Sedonia, AZ)
Monthly Vol. AC IFT
40000
20000
0
D
J
F
M
A
M
J
J
A
S
O
N
1994
Dry Initial Soil Conditions
Wet Initial Soil Conditions

Advanced Hydrologic Prediction Service
Graphic
Description
Operational Prototype
Concepts

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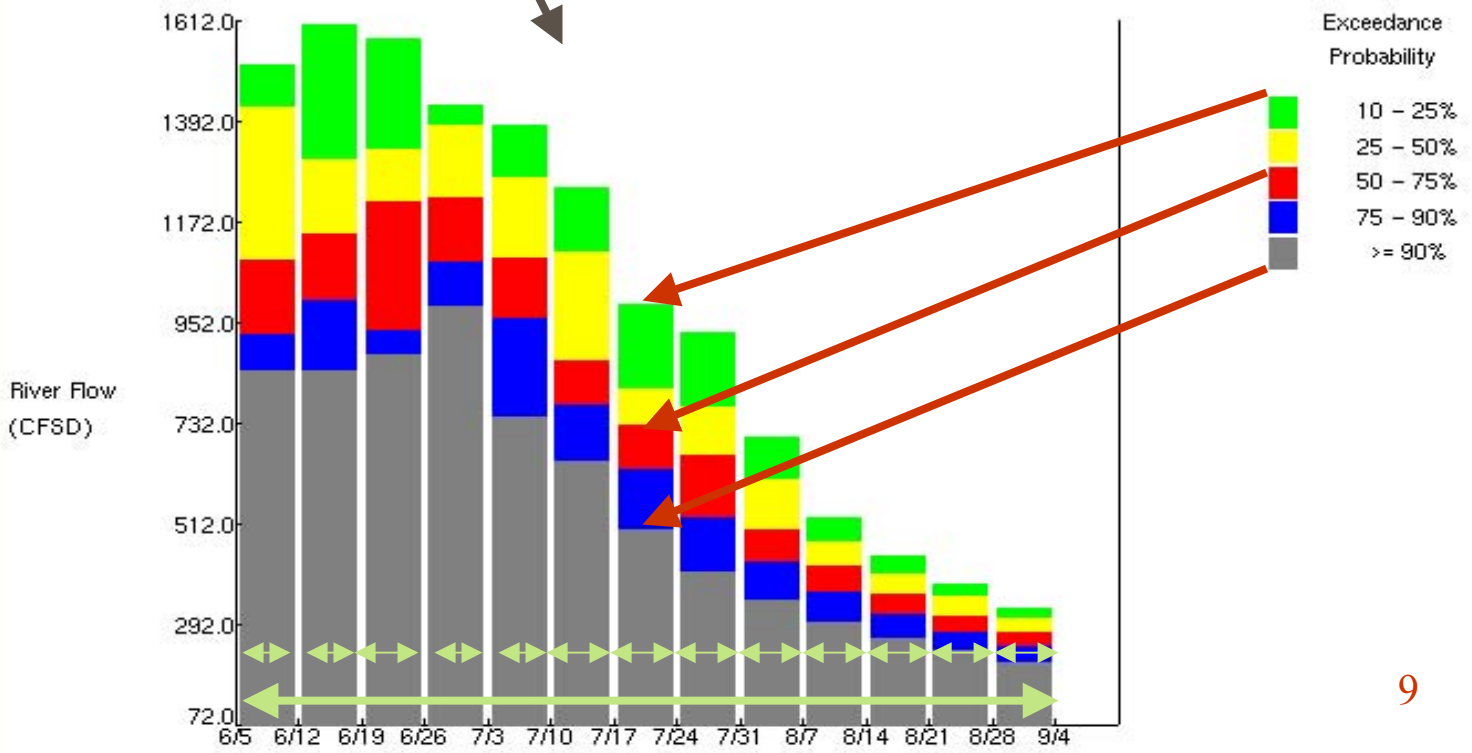
1 Week Chances of Exceeding River Levels on the GREEN-WARREN BRIDGE
Latitude: 43.0 Longitude: 110.1
Forecast for the period 6/5/2002 - 9/4/2002
This is a conditional simulation based on the current coditions as of 6/5/2002



1 Week Chances of Exceeding River Levels on the GREEN-WARREN BRIDGE

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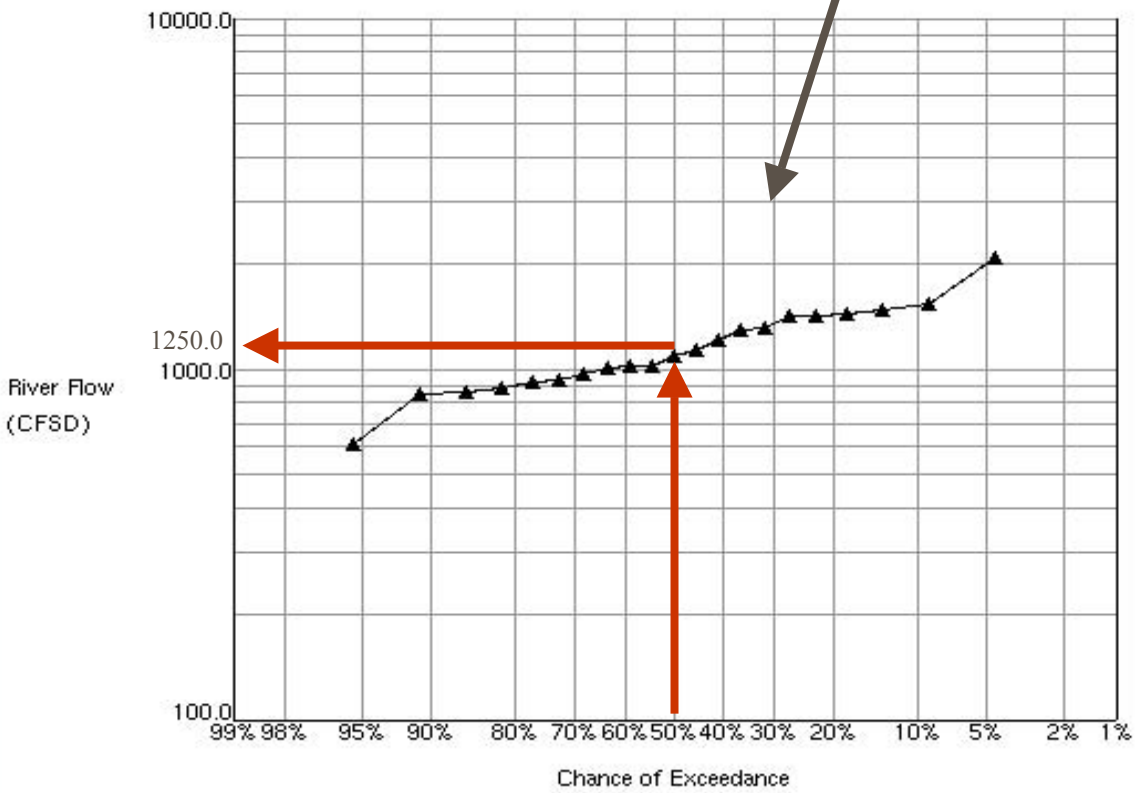
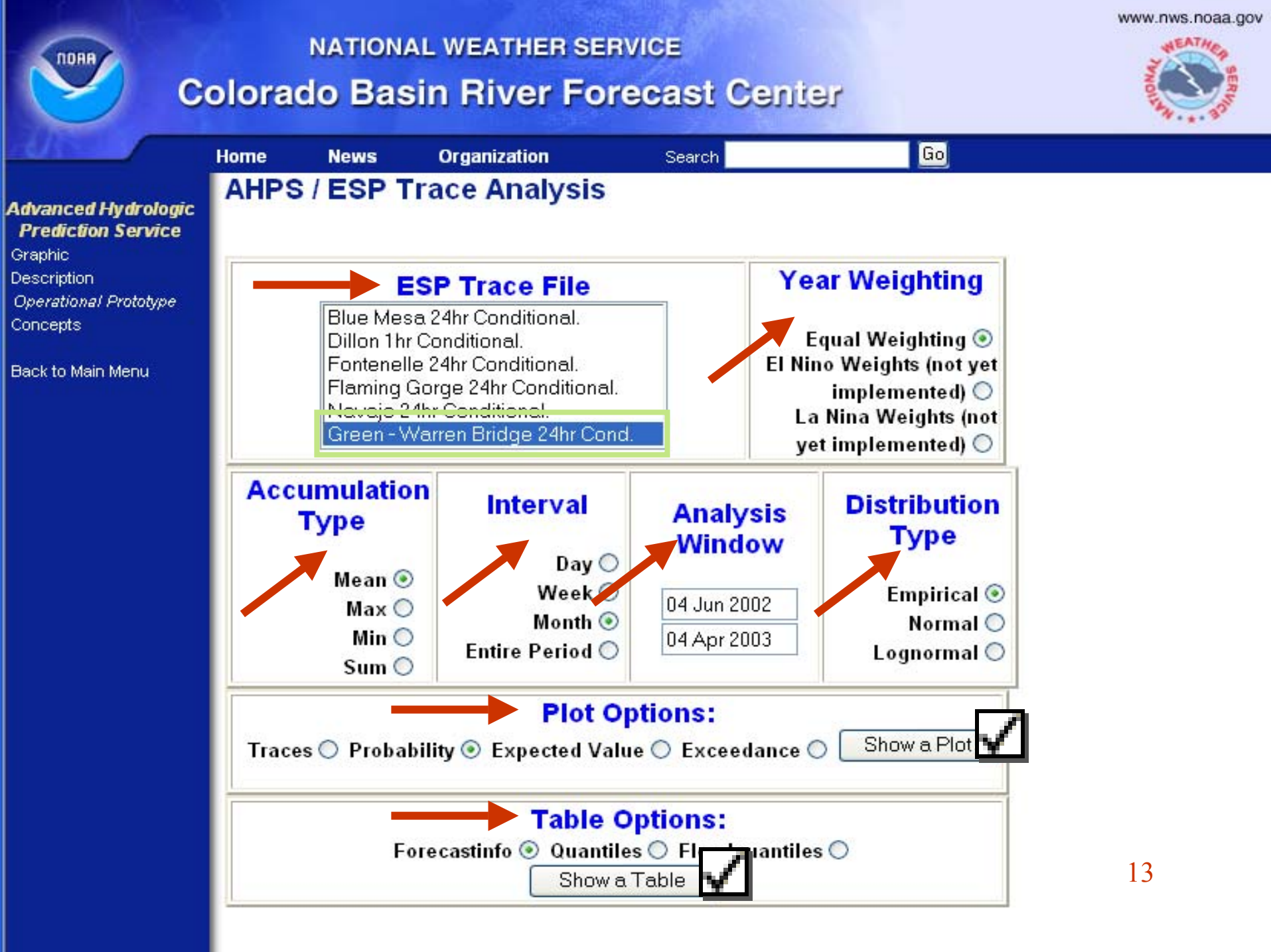
Chances of Exceeding River Levels on the GREEN-WARREN BRIDGE at
Latitude: 43.0 Longitude: 110.1
Forecast for the period 6/5/2002 – 6/12/2002
This is a conditional simulation based on the current conditions as of 6/5/2002

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NATIONAL WEATHER SERVICE
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ESP Trace File
Blue Mesa 24hr Conditional.
Dillon 1hr Conditional.
Fontenelle 24hr Conditional.
Flaming Gorge 24hr Conditional.
Green - Warren Bridge 24hr Cond.
Year Weighting
Equal Weighting
El Nino Weights (not yet implemented)
La Nina Weights (not yet implemented)
Accumulation Type
Mean
Max
Min
Sum
Interval
Day
Week
Month
Entire Period
Analysis Window
04 Jun 2002
04 Apr 2003
Distribution Type
Empirical
Normal
Lognormal
Plot Options:
Traces
Probability
Expected Value
Exceedance
Show a Plot
Table Options:
Forecastinfo
Quantiles
Show a Table

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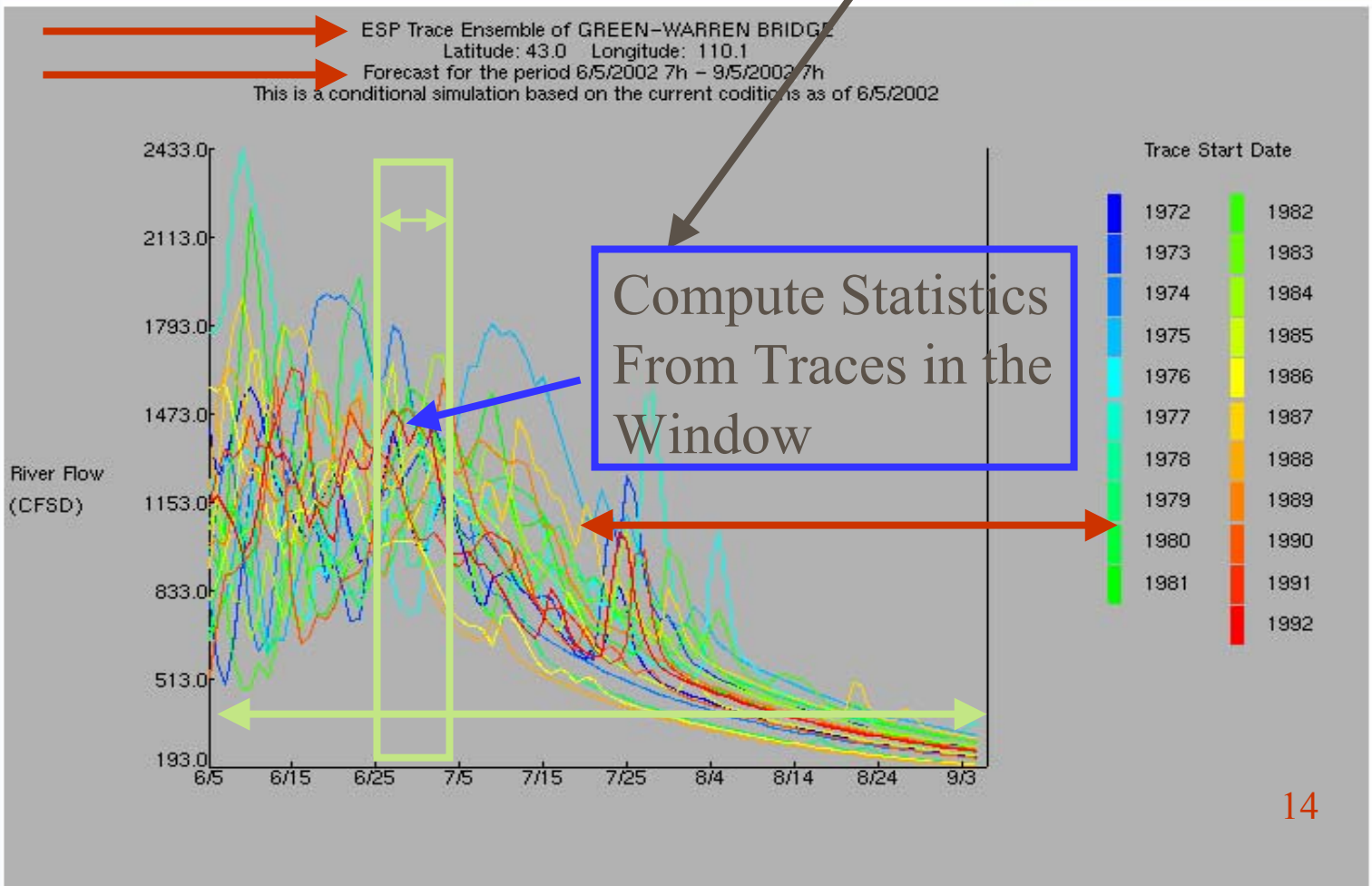
River Level Forecast Info | Weekly Chance of Exceedance | Chance of Exceedance During Entire Period



ontact Us

NVRN5 NVRN5L_F.SIM24.SQME.24.CS Navajo 24hr Conditional.

xxxxx NVRN5L_F.SIM24.SQME.24.HS Navajo 24hr Historical.

GBRW4 GBRW4R_F.SIM24.SQME.24.CS Fontenelle 24hr Conditional.

xxxxx GBRW4R_F.SIM24.SQME.24.HS Fontenelle 24hr Historical.

WBRW4 WBRW4H_F.SIM24.SQME.24.CS Green - Warren Bridge 24hr Cond.

||TE|| TraceEnsemble=WBRW4H_F.SIM24.SQME.24.CS

xxxxx WBRW4H_F.SIM24.SQME.24.HS Green - Warren Bridge 24hr Hist.

ESP Forecast Information

#

Analysis Period: 5/6/2002 24 - 12/6/2002 24 (MST)

Forecast Parameters: River Flow (Max) - (CFSD)

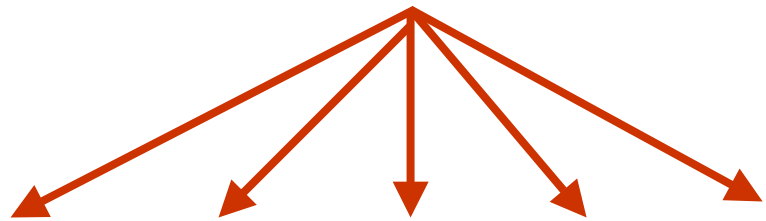
#

Forecast Interval: 1 Month

Forecast Point:

#

TEXT OUTPUT



#	0.90	0.75	0.50	0.25	0.10 Units
05/01/2002 - 05/31/2002	-999.00	-999.00	-999.00	-999.00	-999.00 (CFSD)
06/01/2002 - 06/30/2002	1094.29	1247.01	1380.99	1679.17	1793.95 (CFSD)
07/01/2002 - 07/31/2002	846.34	942.42	1176.40	1339.09	1754.95 (CFSD)
08/01/2002 - 08/31/2002	309.09	357.09	455.17	573.03	790.22 (CFSD)
09/01/2002 - 09/30/2002	182.06	206.78	264.84	314.11	341.17 (CFSD)
10/01/2002 - 10/31/2002	135.45	159.84	180.79	225.60	320.62 (CFSD)
11/01/2002 - 11/30/2002	108.67	125.45	140.12	158.11	175.40 (CFSD)

River Forecasts & Data
Graphic
List
APNC2 Data/Forecasts
Hydrograph
Probabalistic
Water Supply
APNC2 Model Data
Precipitation
Temperature
Freezing Level
Snow Information
Soil Moisture
Combination Plot
APNC2 Gage Info
Conditions Map Location
Basin/Location Maps
Aerial Photos/Topo Maps
Photos
Gage Information
Records
Rating Table
APNC2 Verification
Short Range
Long Range (ESP)
Water Supply
Model Simulation

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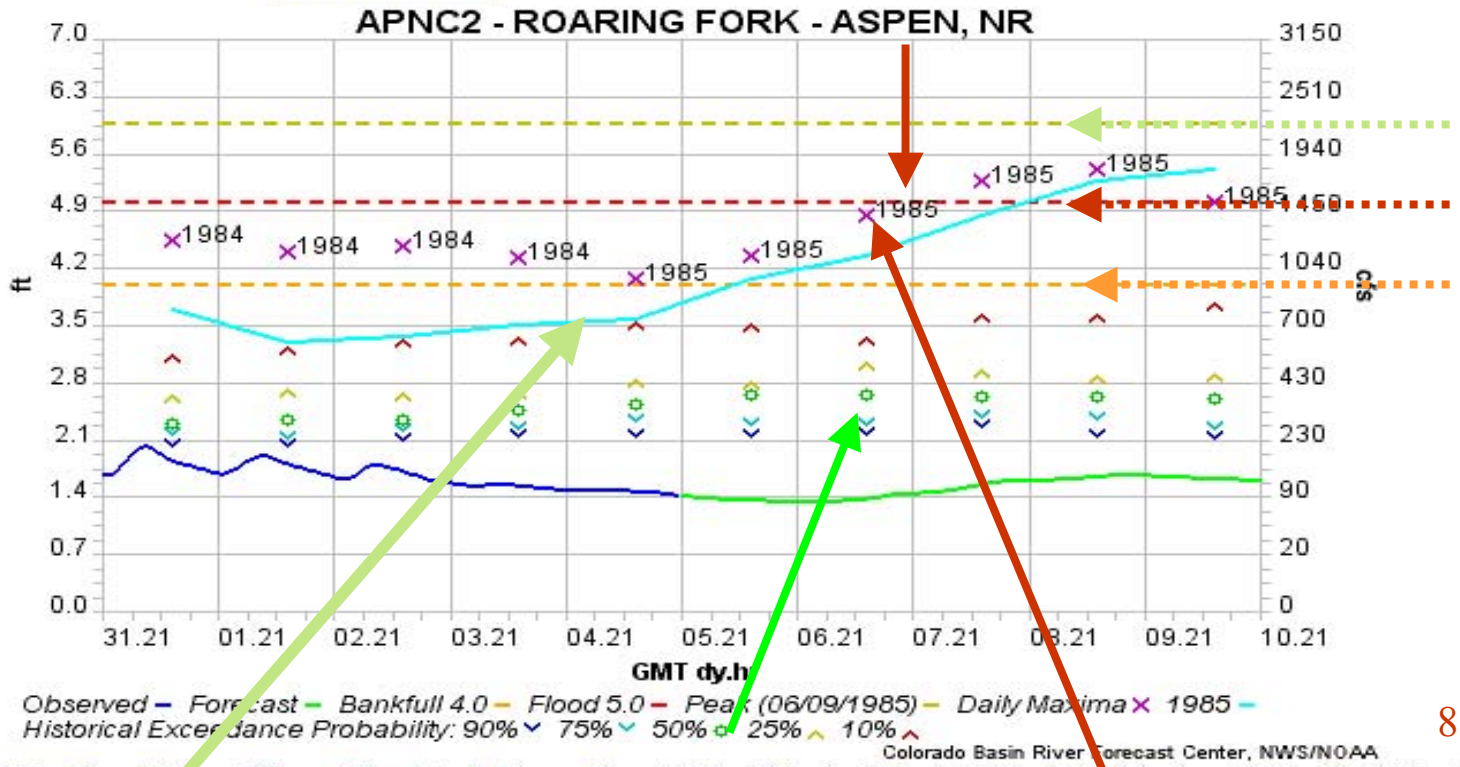
APNC2 Observed/Simulated Hydrograph

The current time is: 06/05.21:47 GMT.



Hide Flood Stage | Show Simulated | Linear Flow | Hide Historical Peak | Hide Daily Maxima | Hide Statistics |

Add Year: 84 02 01 00 99 98 97 96 95 94 93 92 91 90 89 88 87 86 84 83 82 81 80 79 78 77 76 75 74 73 72 71 70
Delete Year: 85

Cooperative Project

CBRFC & CDC (Climate Diagnostics Center)

Objective:

Produce improved river forecasts by utilizing precipitation and temperature derived from the MRF meteorological model as input to the NWS Extended Streamflow Prediction forecast system for the first 14 days in lieu of using historical climatology.

Cooperative Project

CBRFC & CDC (Climate Diagnostics Center)

Method:

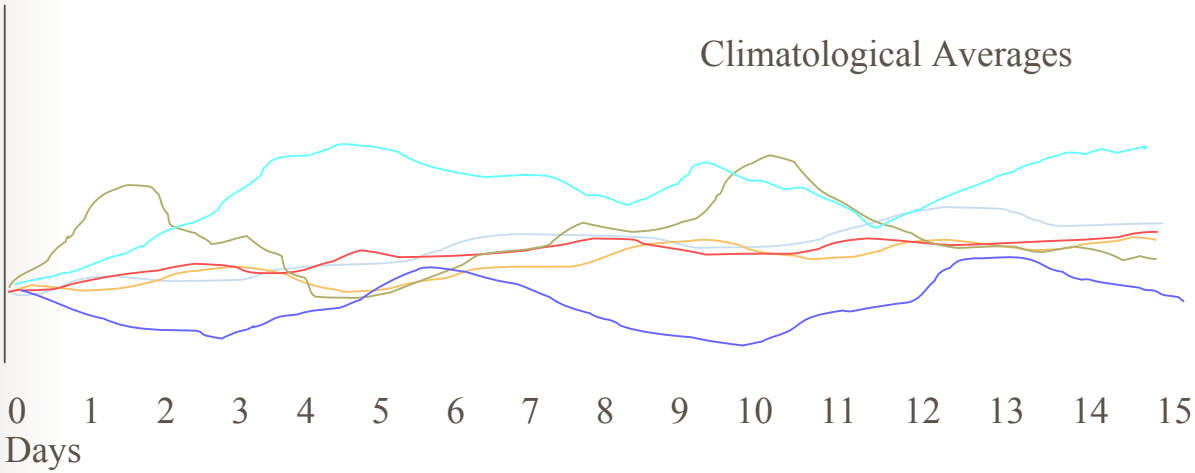
Mean areal precipitation (MAP) and mean areal temperature (MAT) will be calibrated to a frozen version of the MRF by using historical MAPs/MATs and historical output from the MRF model.

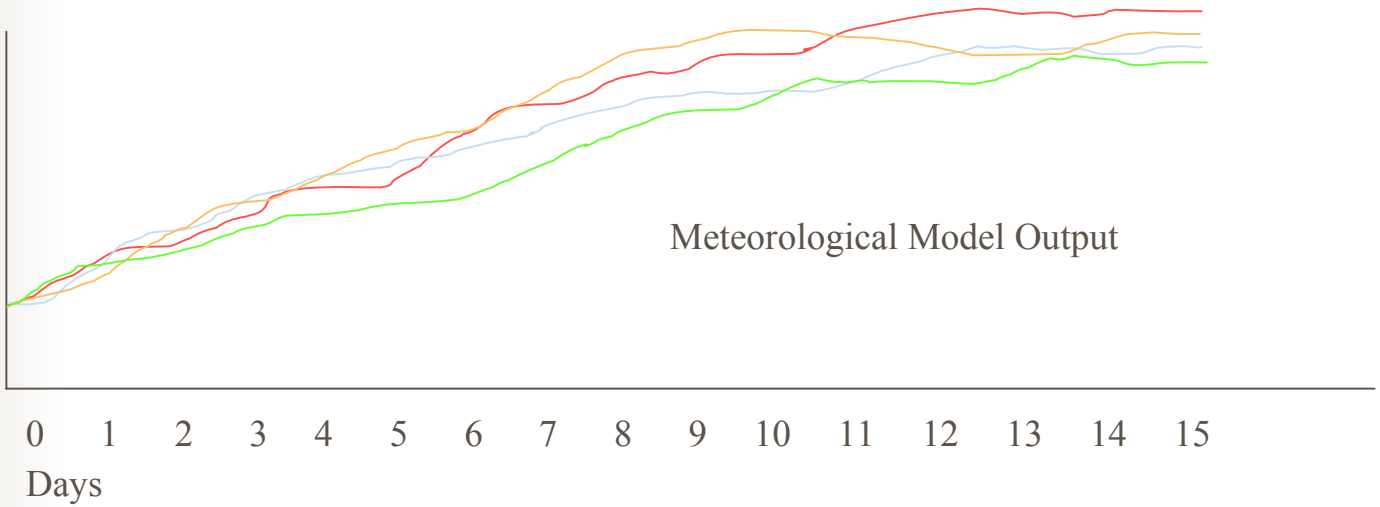
Operations:

CDC will provide a daily 16 member ensemble set of MAPs and MATs for all areas within a basin. The ensemble forecasts will be in 6 hour increments and go out for 14 days. They will be used in ESP.

Cooperative Project

CBRFC & CDC (Climate Diagnostics Center)





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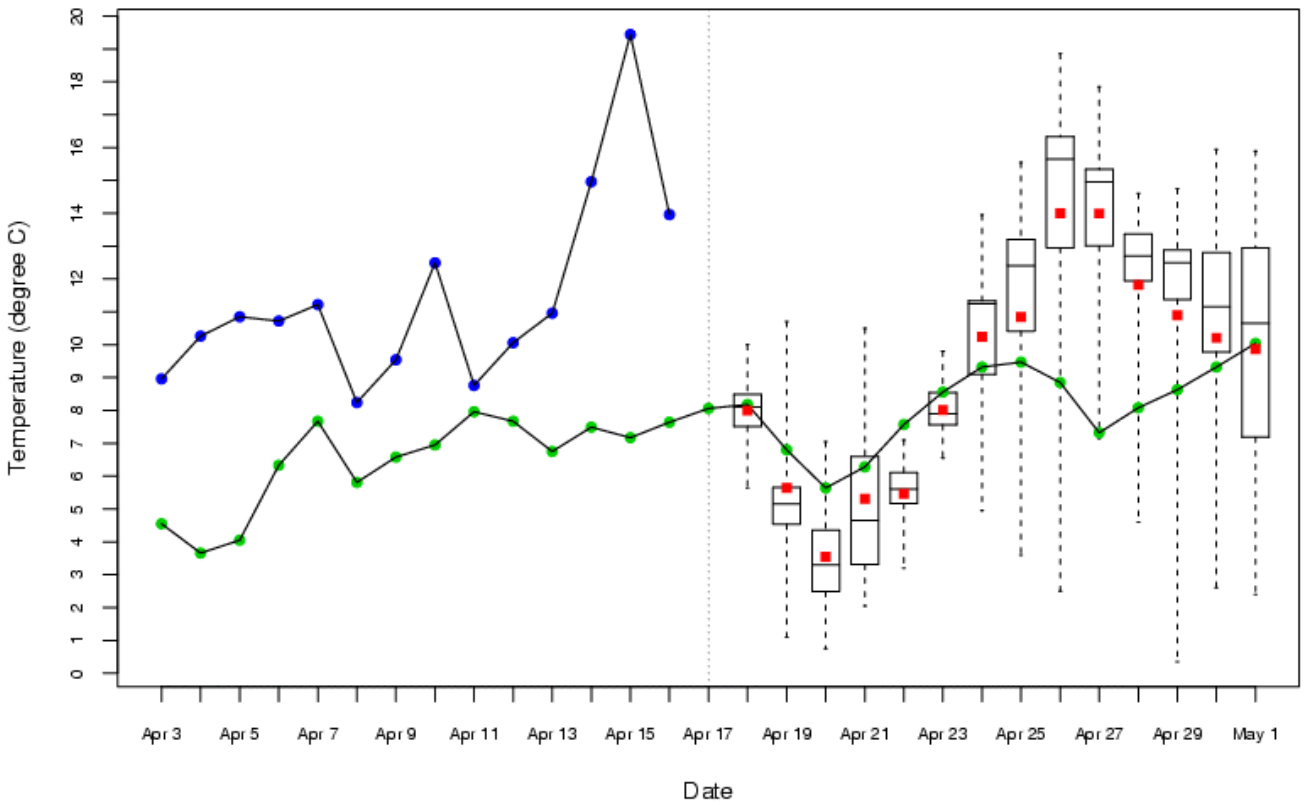

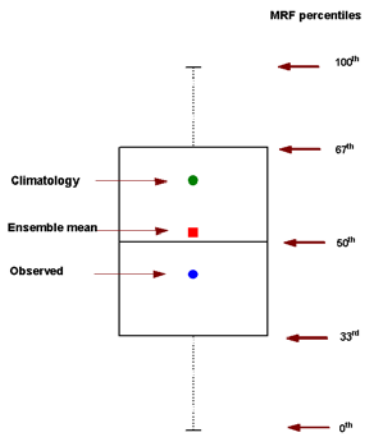

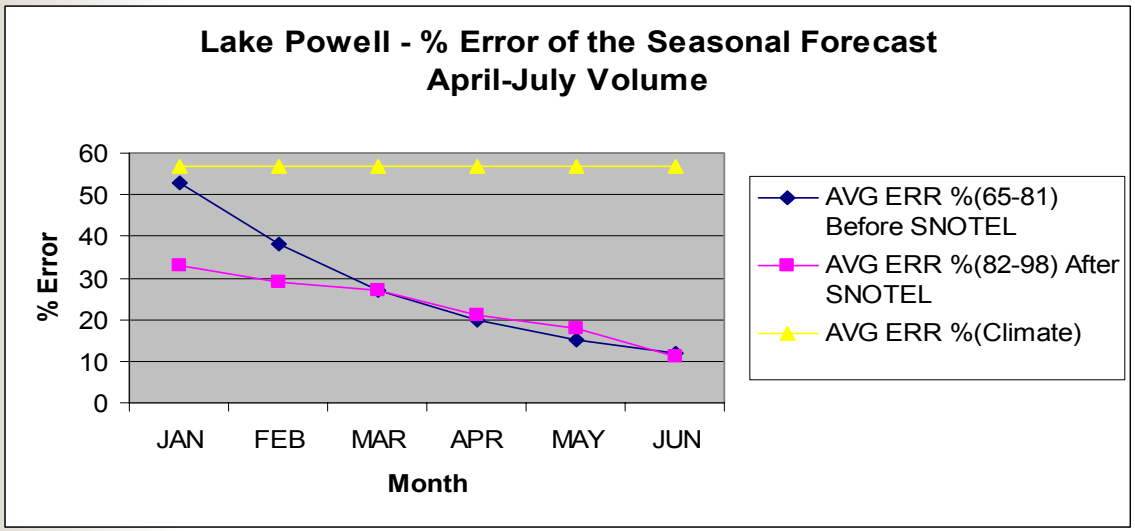
Lake Powell - % Error of the Seasonal Forecast
April-July Volume
60
50
40
30
20
10
0
% Error
JAN
FEB
MAR
APR
MAY
JUN
Month
AVG ERR %(65-81) Before SNOTEL
AVG ERR %(82-98) After SNOTEL
AVG ERR %(Climate)