

Aspinall Operations Meeting

August 25, 2005

Review of Blue Mesa Inflow Forecasts for Water Year 2005

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NWS

Who We Are ... Colorado Basin River Forecast Center



**National Oceanic Atmospheric
Administration**

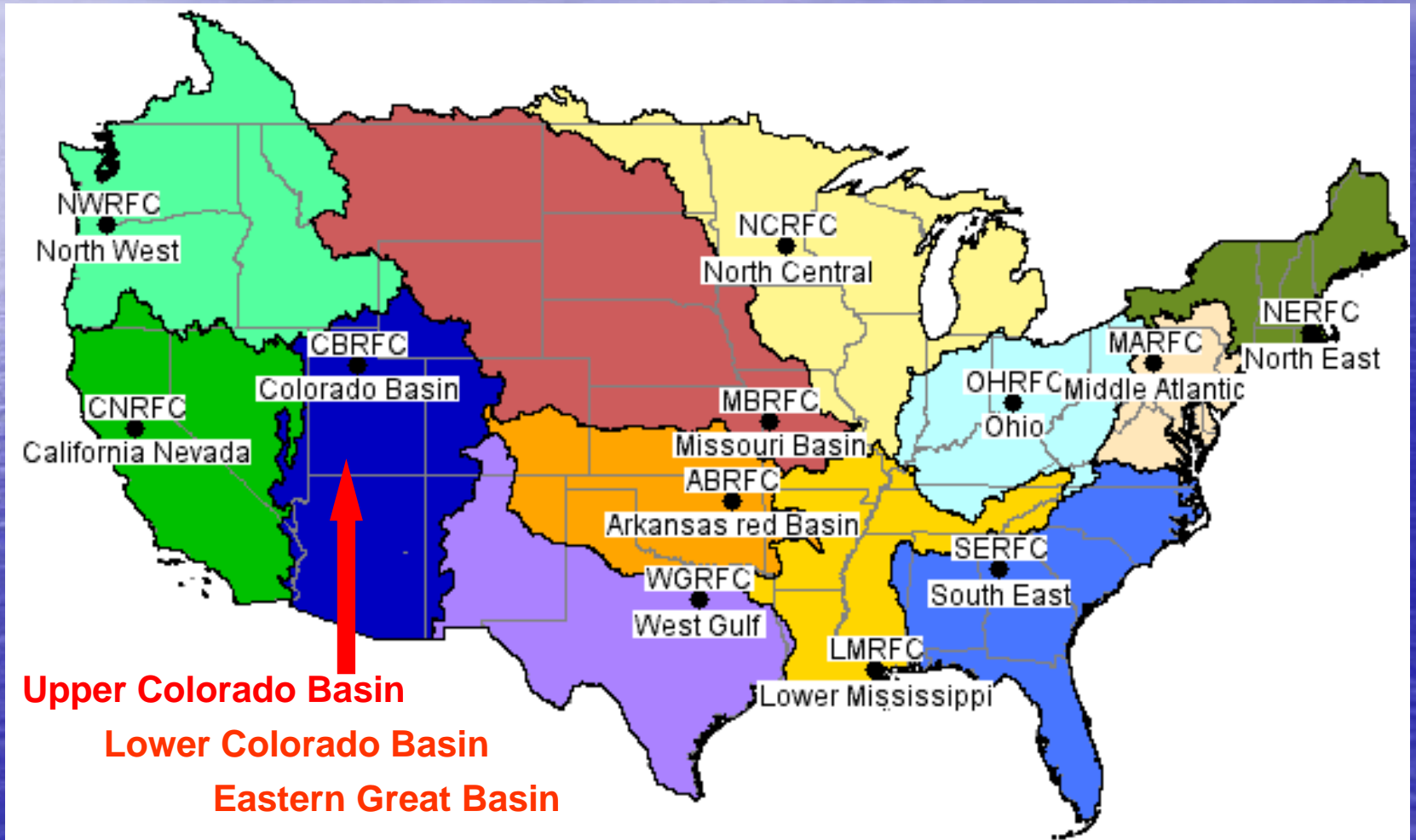
National Weather Service

Colorado Basin River Forecast Center



NWS

Location: Salt Lake City, Utah



Upper Colorado Basin
Lower Colorado Basin
Eastern Great Basin



NWS

Mission: Protect lives and property - Enhance national economy

Event Driven (rain, snowmelt) River Forecasts => Warnings

Flash Flood Guidance => Warnings

Recreational Forecasts (River trends – Peak Flows)



Water Supply => Reservoir Management

Review of Blue Mesa Inflow Forecasts for Water Year 2005

- Water Supply Forecasting Overview
- Basin Conditions and Forecasts
- April-July Observed Runoff

Water Supply Forecasting

- Statistical Water Supply (SWS)
- Ensemble Streamflow Prediction (ESP)
- Coordination with the Natural Resources Conservation Service (NRCS)

Statistical Water Supply

- Equations built on correlations between the inputs and the output

Input Variables



Snow water equivalent
example:

Apr 1 swe Station #1
Apr 1 swe Station #2



Precipitation
example:

Oct+Nov+Dec Station #3
Feb+Mar Station #4

Output Variable



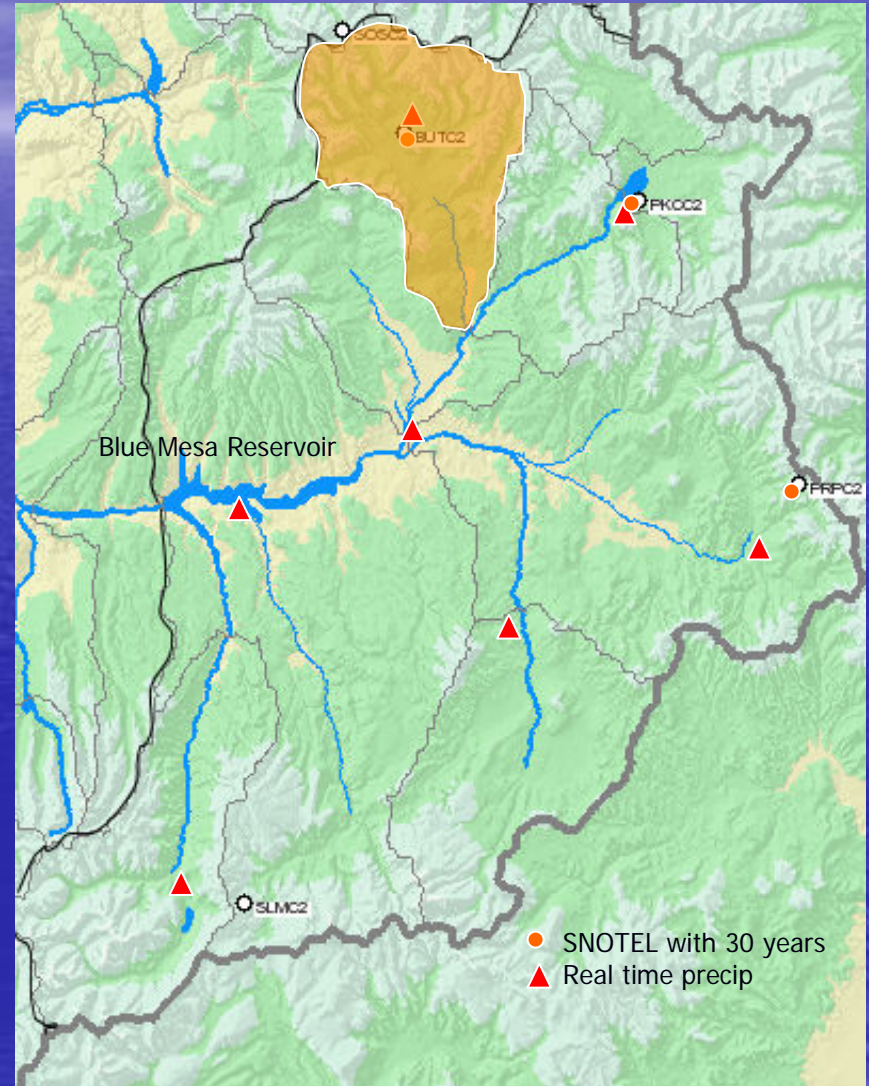
April – July runoff volume

Statistical Water Supply

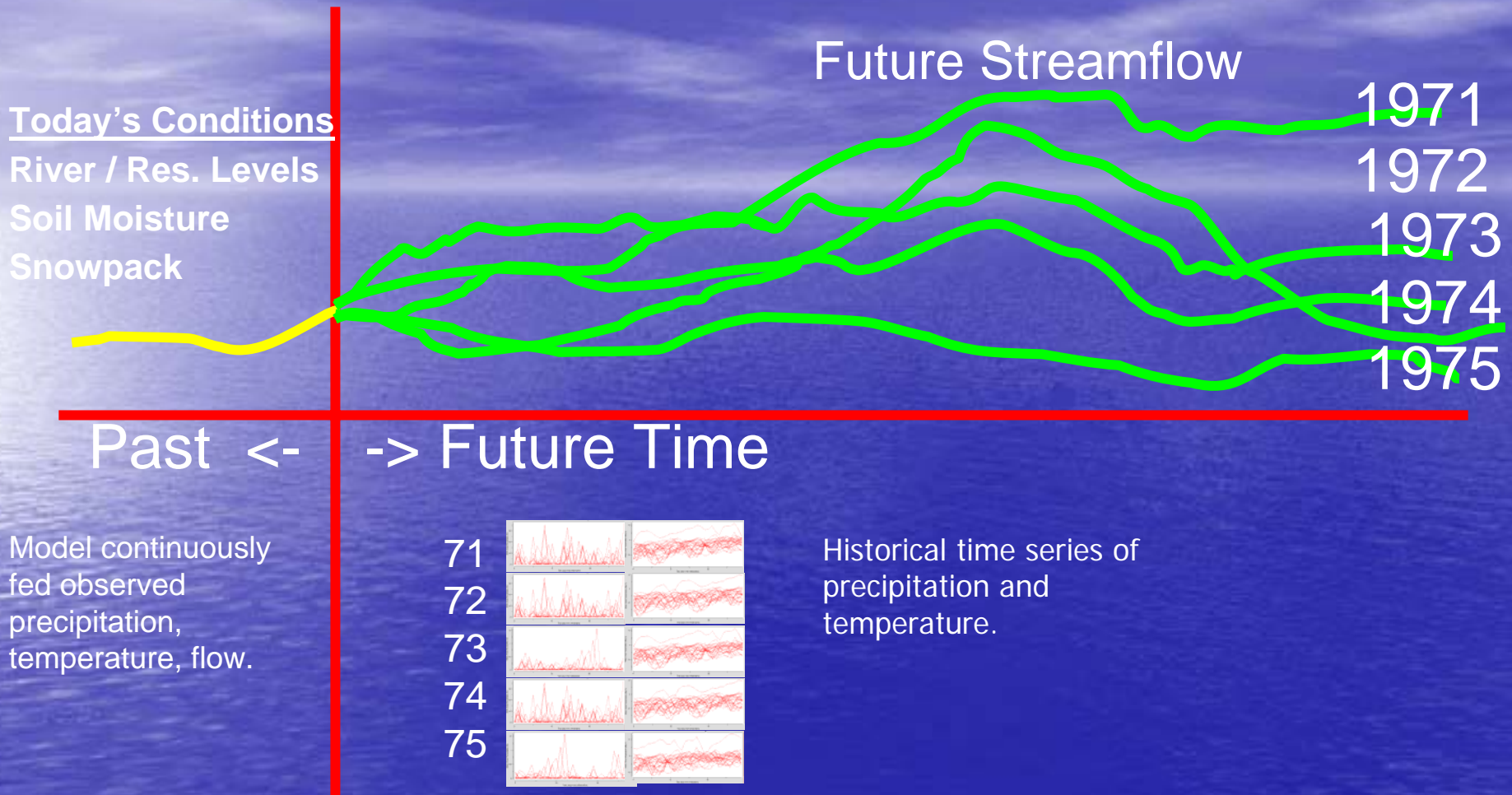
- Limitations for sites used as equation input
 - 30 year continuous record ('71-'00)
 - real time reporting

➤ Sample Equation for May 1:

$$\begin{aligned} \text{Ap-II volume East - Almont} = & \\ & + 8.26 * \text{Oc-De precip Crested Butte} \\ & + 13.94 * \text{Fe-Ap precip Blue Mesa Lake} \\ & + 7.97 * \text{Fe-Ap precip Aspen} \\ & + 3.65 * \text{My swe Butte} \\ & + 3.92 * \text{My swe Independence Pass} \\ & + 1.29 * \text{Ap flow East - Almont} \\ & - 77.83 \end{aligned}$$

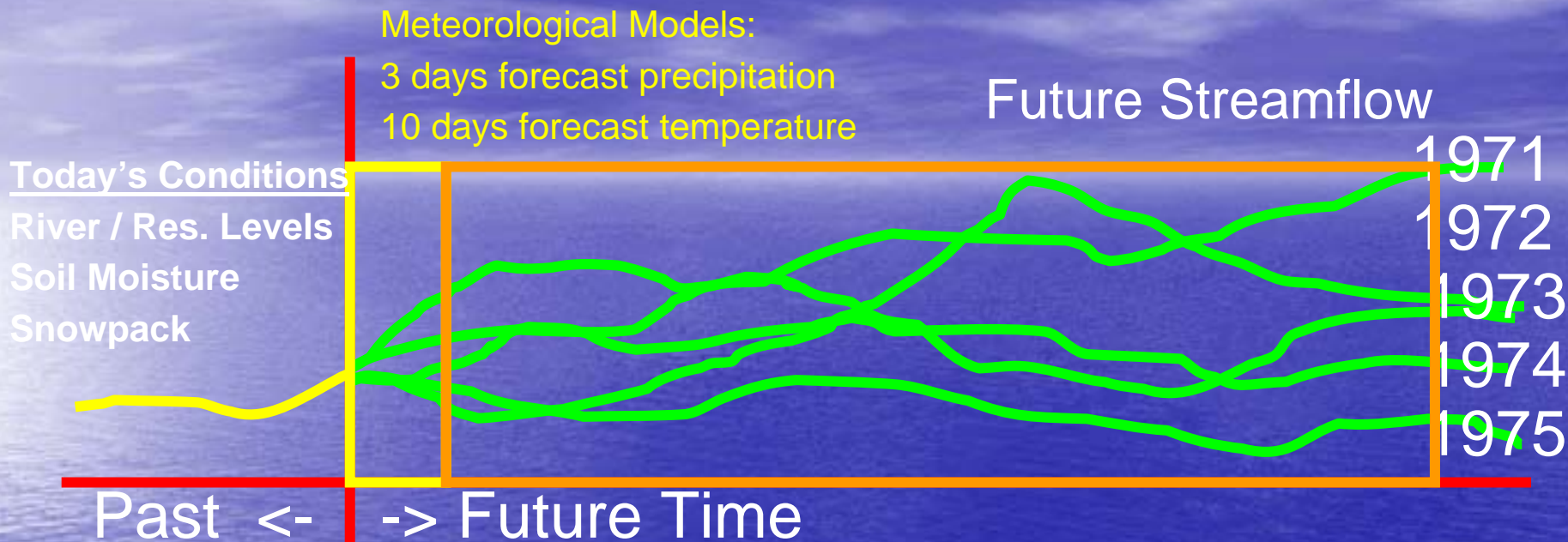


Ensemble Streamflow Prediction

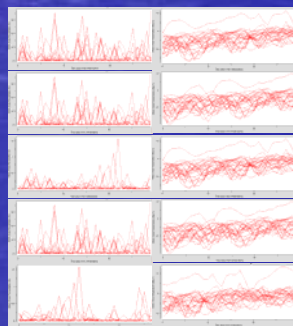


Start with Today's Conditions - Create several possible future streamflow patterns - Based on historical climate.

Ensemble Streamflow Prediction



71
72
73
74
75



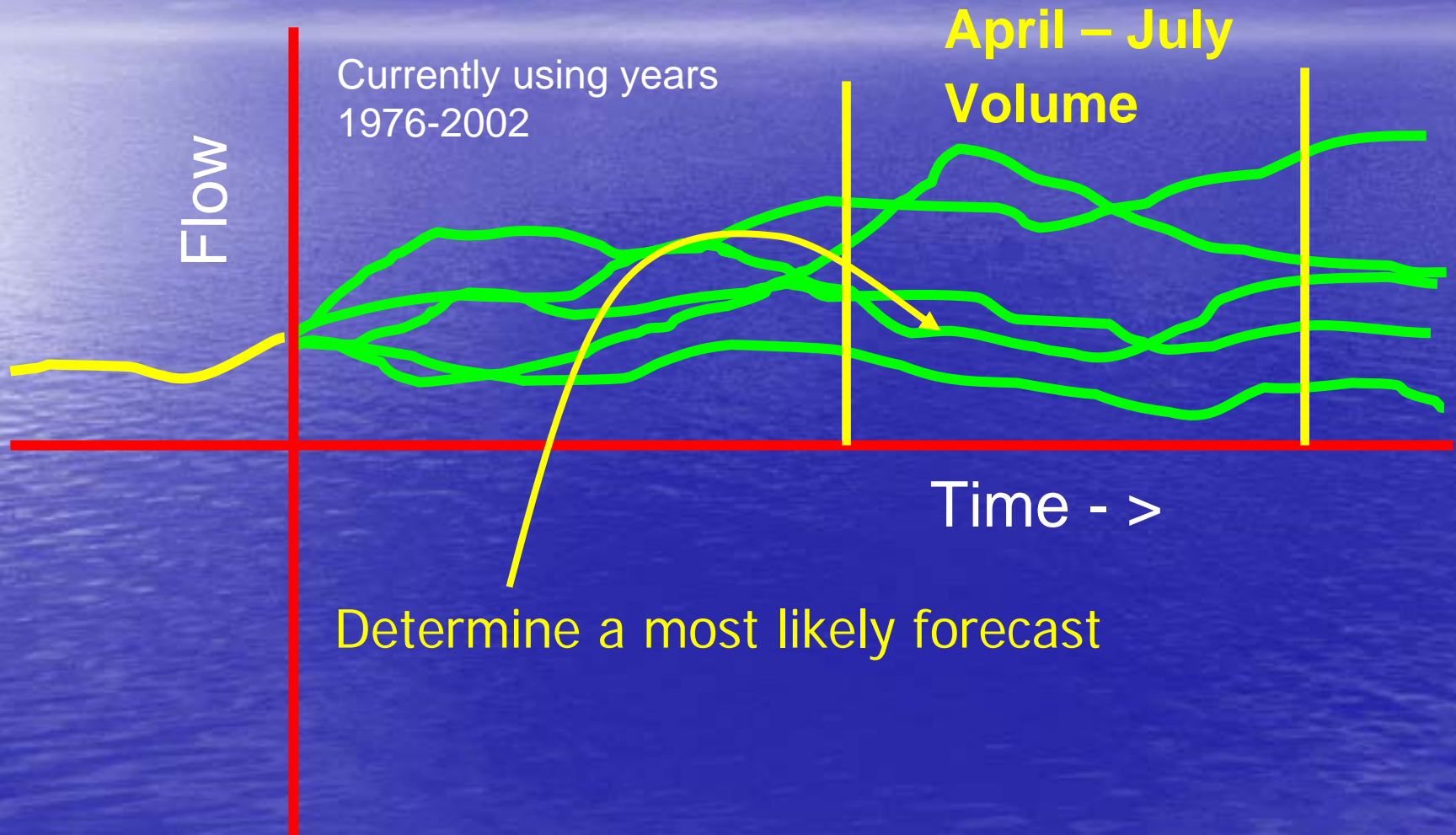
Historical temperature and precipitation

Climate Model Forecasts:

Adjust input temperature and precipitation based on future climate expectations.



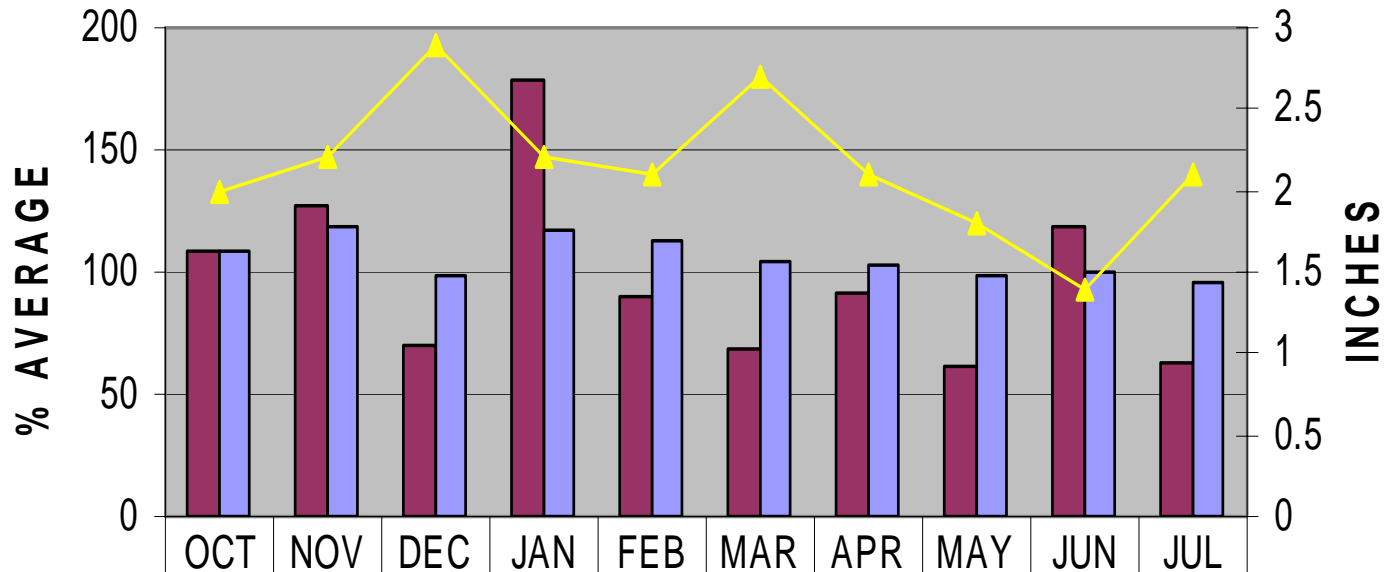
Ensemble Streamflow Prediction






Basin Conditions and Forecasts

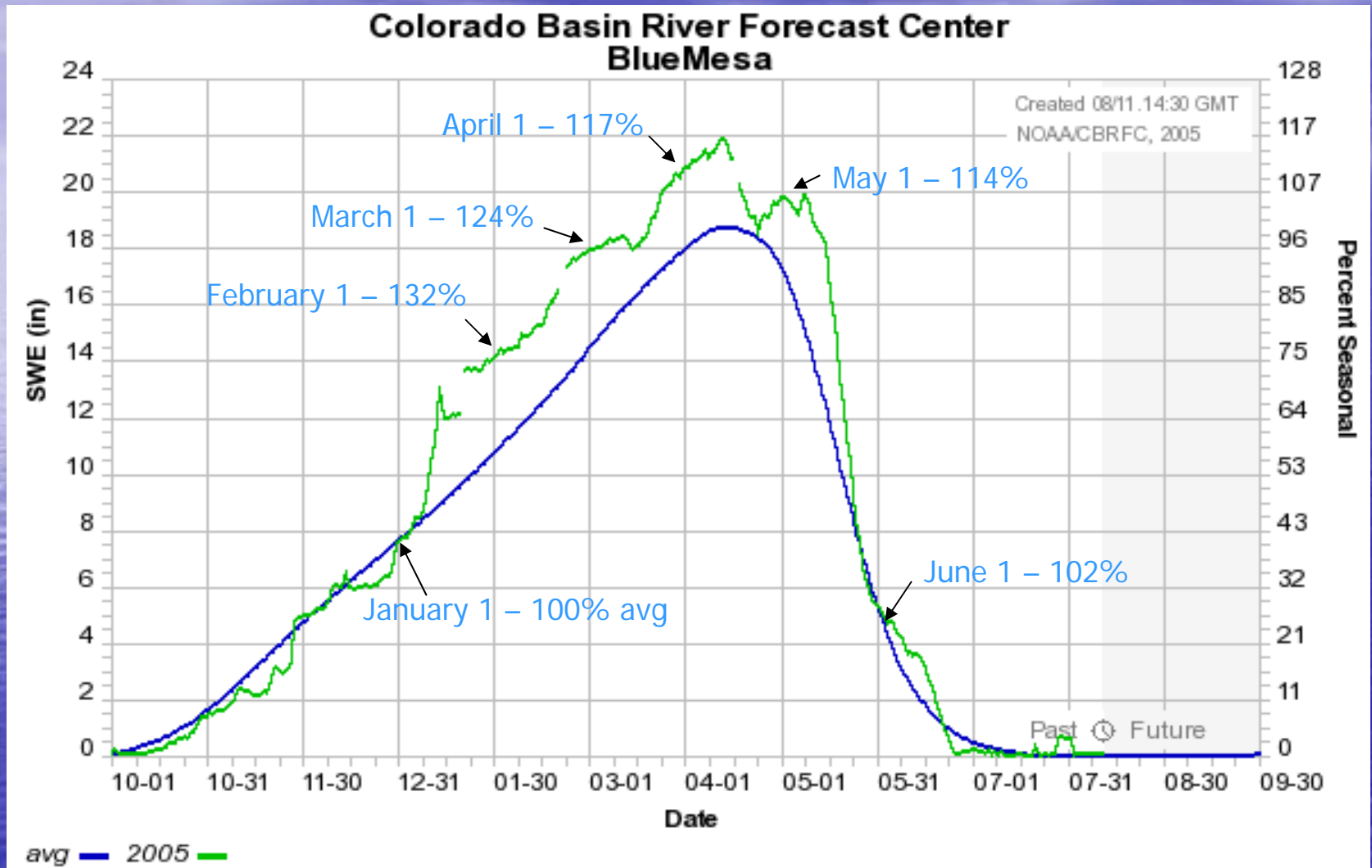
Precipitation

Gunnison Basin above Blue Mesa WY 2005 Precipitation



 MONTHLY (%)	109	127	70	179	90	69	92	62	119	63
 SEASONAL (%)	109	118	99	118	113	104	103	99	100	96
 AVG (IN)	2	2.2	2.9	2.2	2.1	2.7	2.1	1.8	1.4	2.1
OBS (IN)	2.2	2.8	2.0	3.9	1.9	1.9	1.9	1.1	1.7	1.3

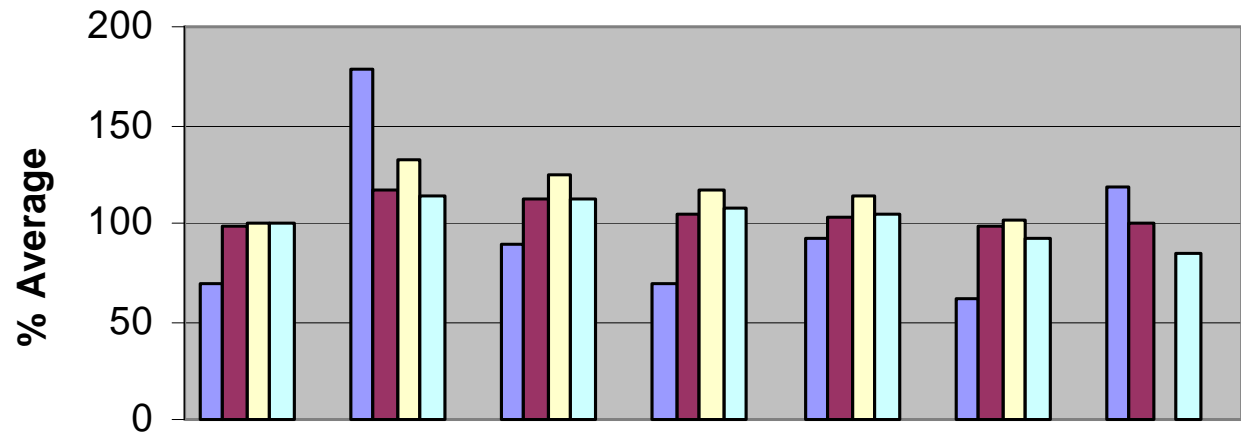
Snow Water Equivalent



Butte + Schofield Pass + Park Cone + Porphyry Creek + Slumgullion SNOTELs

Forecasts

Blue Mesa Unregulated Inflow WY 2005 Forecasts

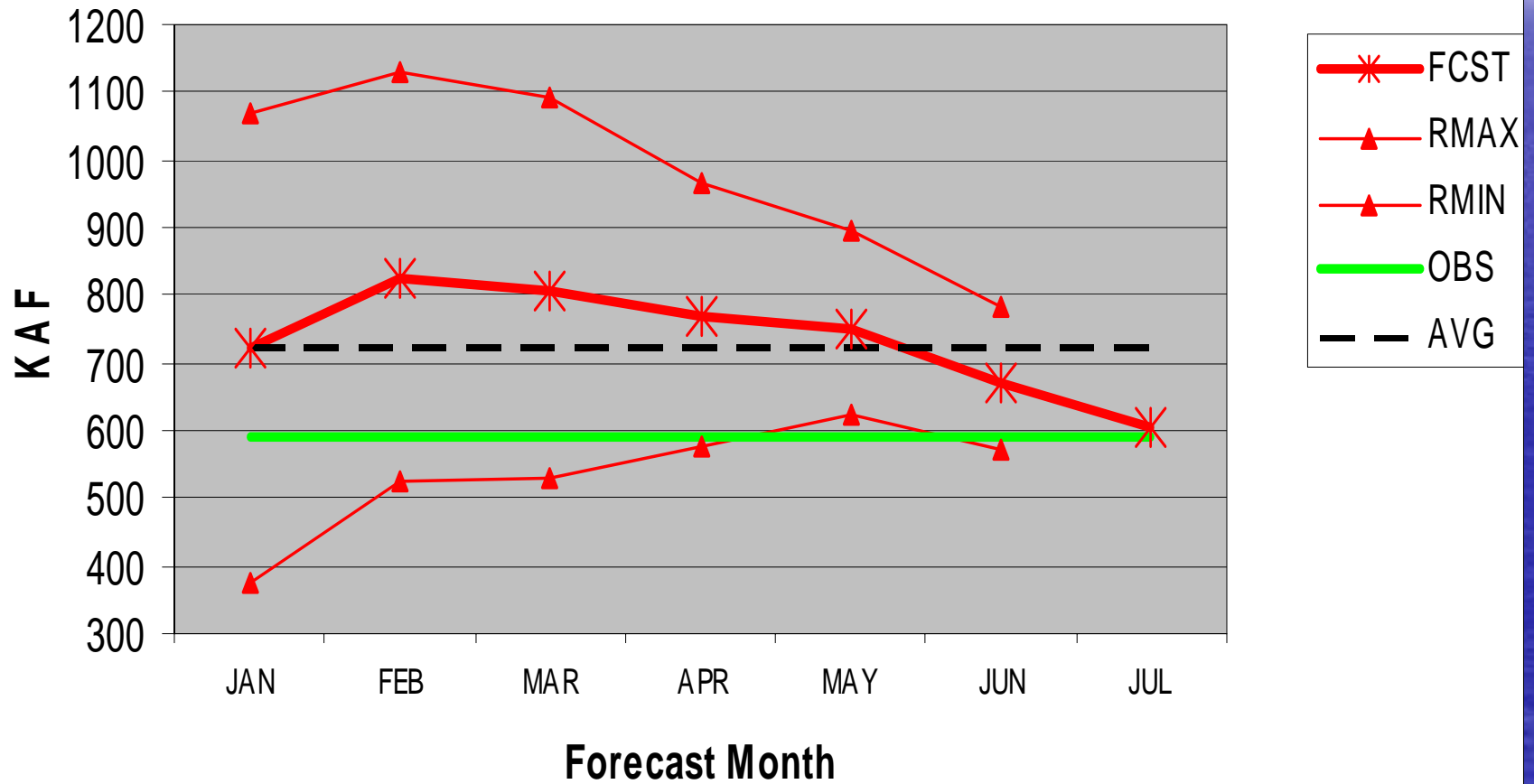


	1-Jan	1-Feb	1-Mar	1-Apr	1-May	1-Jun	1-Jul
Prev month precip	70	179	90	69	92	62	119
Seasonal precip	99	118	113	104	103	99	100
Snow Water Equivalent	100	132	124	117	114	102	
Apr-Jul Forecast	100	115	112	107	104	93	84
Forecast Volume (kaf)	720	825	805	770	750	670	605

April – July Observed Runoff

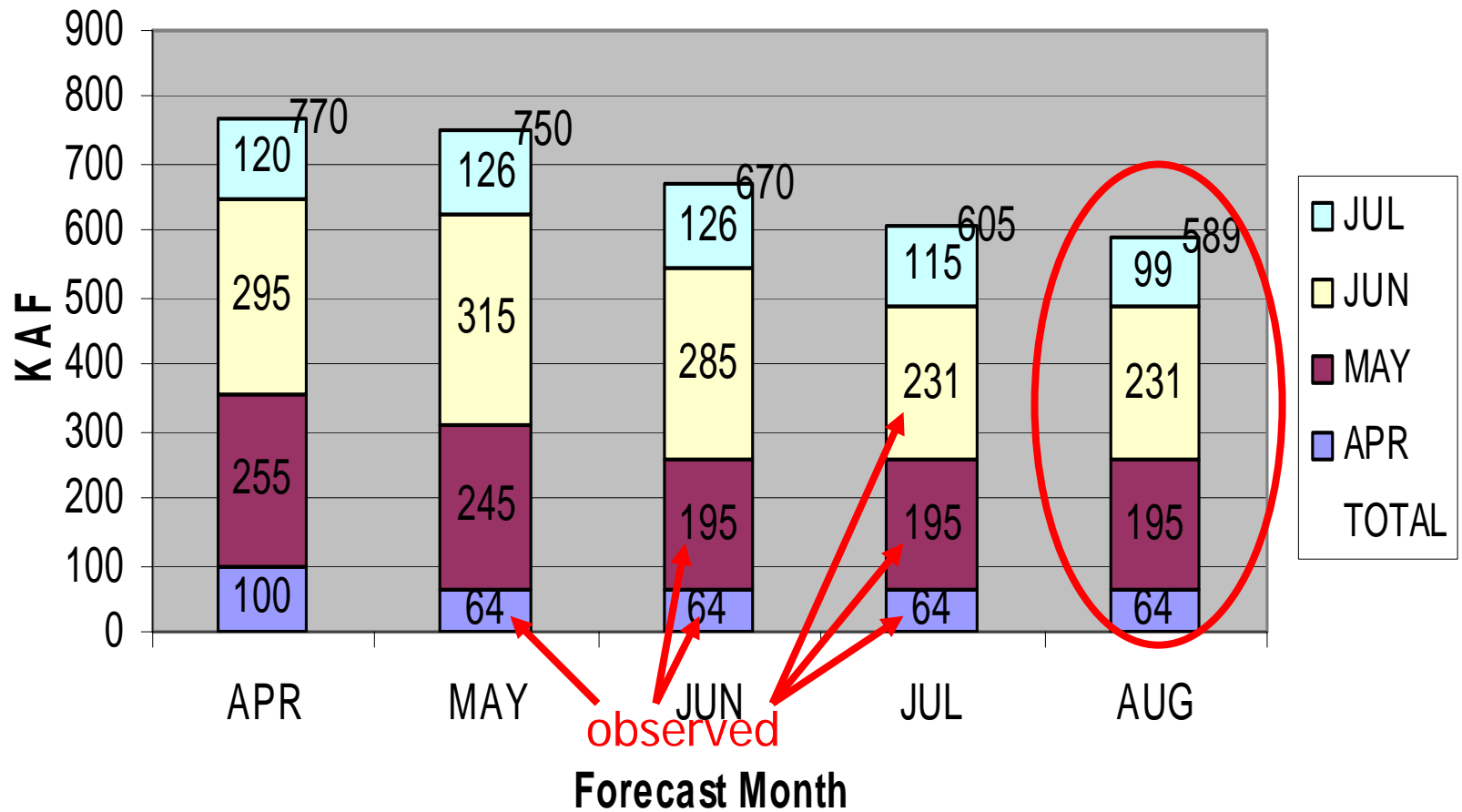
Observed Inflow

Blue Mesa Unregulated Inflow
April-July 2005



Monthly Volumes

Blue Mesa Unregulated Inflow Monthly Forecasts and Observed

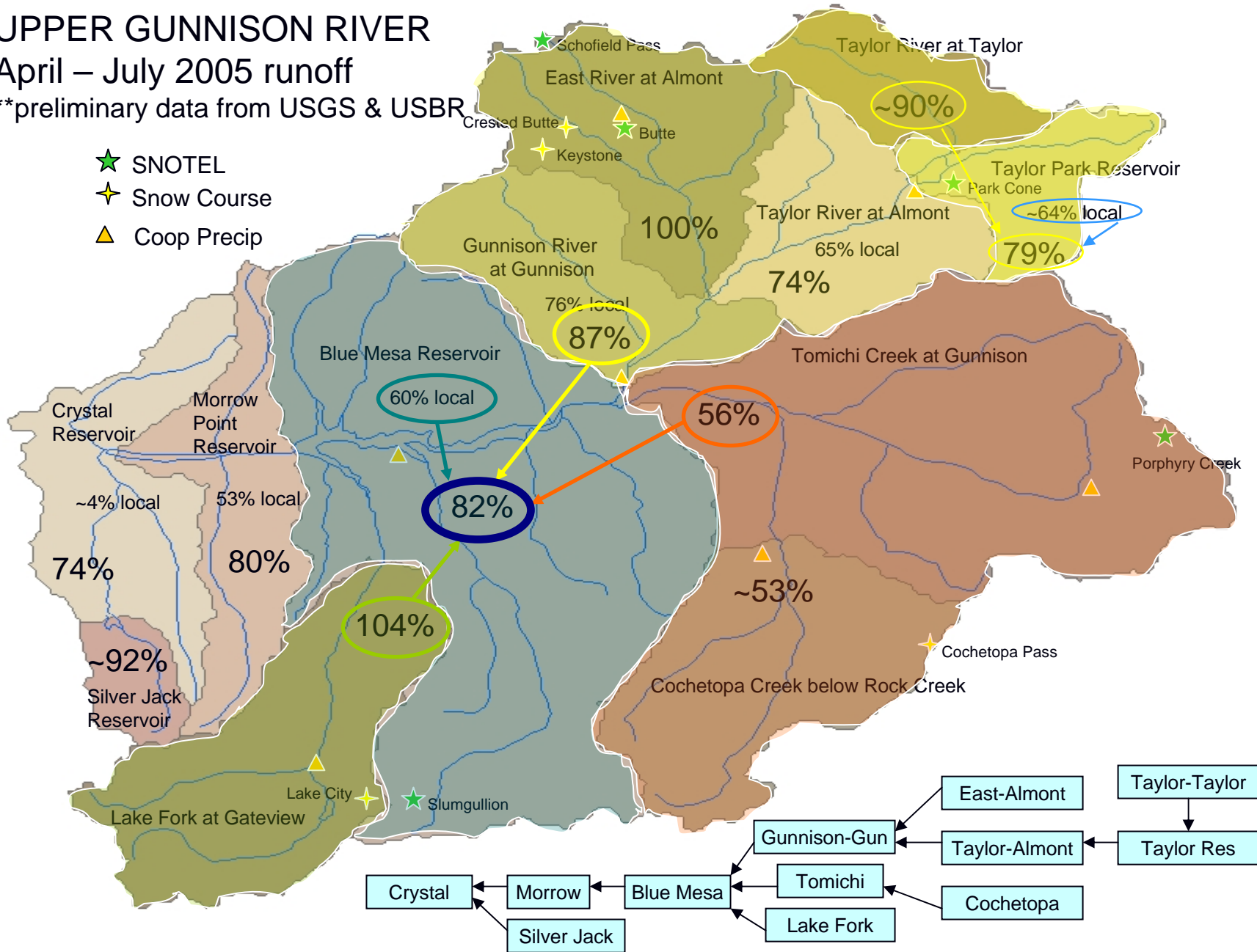


UPPER GUNNISON RIVER

April – July 2005 runoff

**preliminary data from USGS & USBR

- ★ SNOTEL
- ✦ Snow Course
- ▲ Coop Precip



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