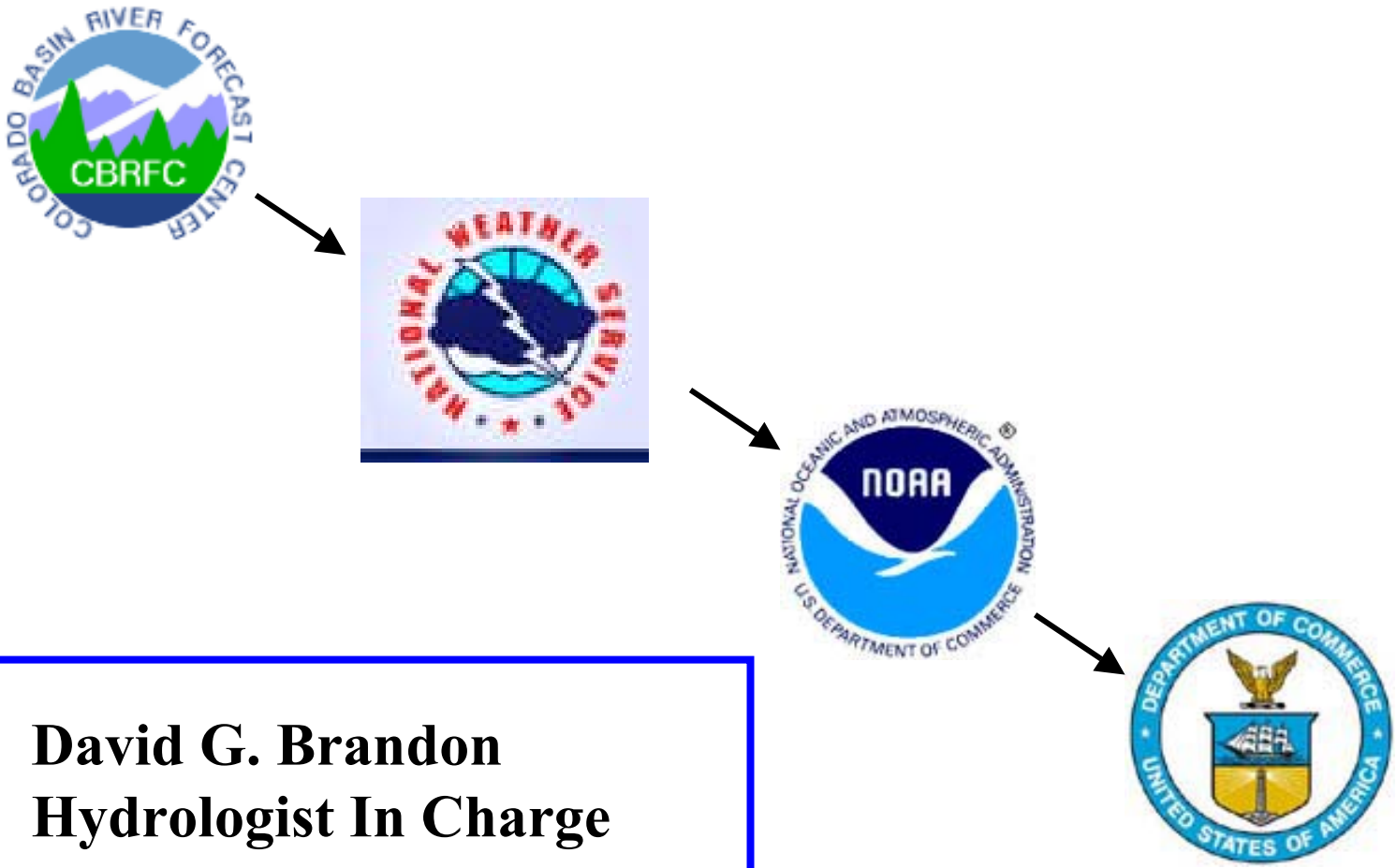
COLORADO BASIN RIVER FORECAST CENTER



David G. Brandon
Hydrologist In Charge

OUR MISSION …

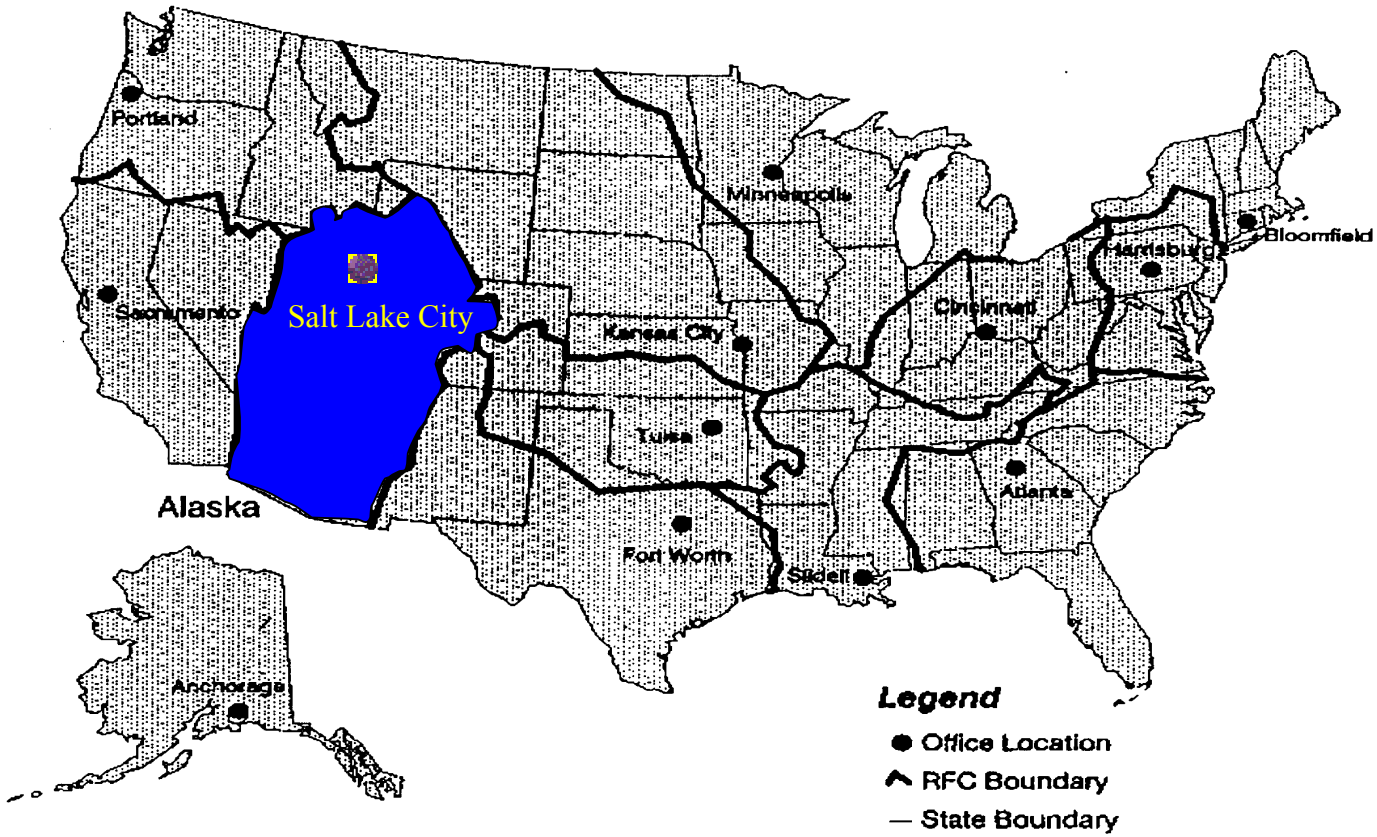
THE PROTECTION OF LIFE AND PROPERTY AND ENHANCEMENT OF THE NATIONAL ECOMOMY

Flash Flood Forecasts/Warnings

River Forecasts/Warnings

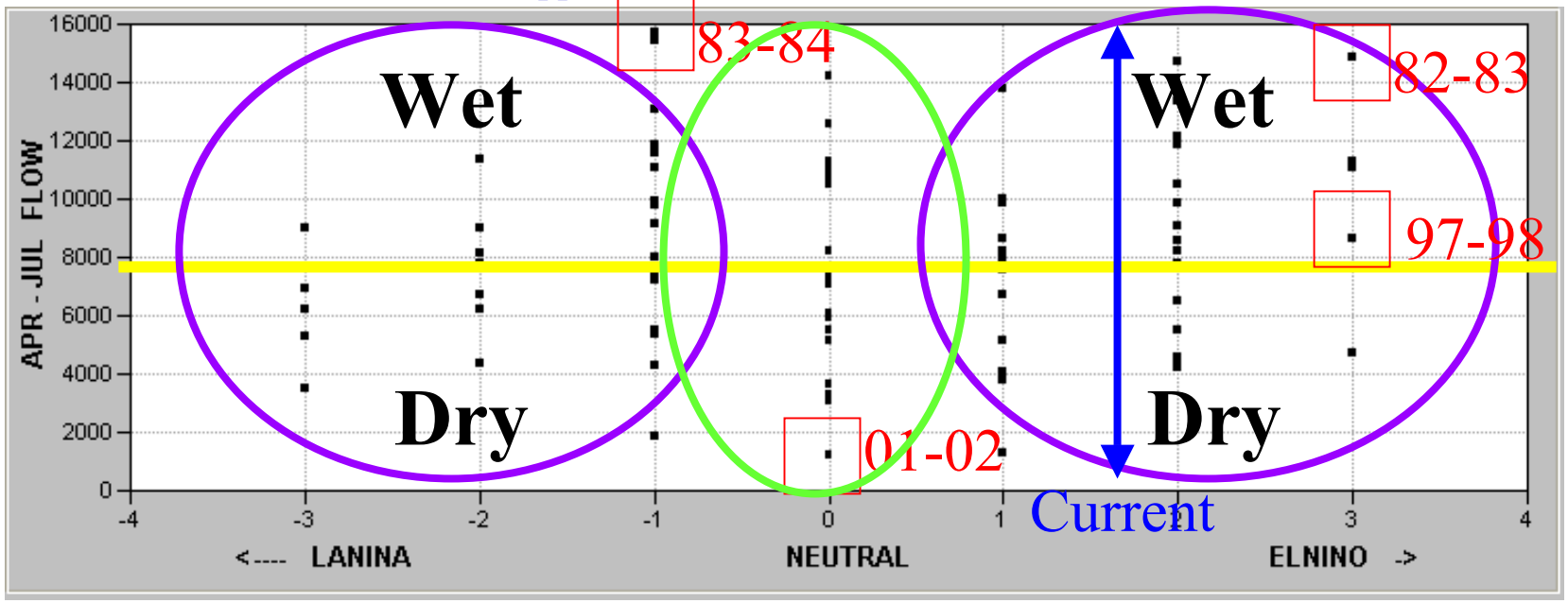
Recreational Forecasts

Water Supply/Management



NWS RIVER FORECAST CENTERS

Upper Colorado – Lake Powell Inflow

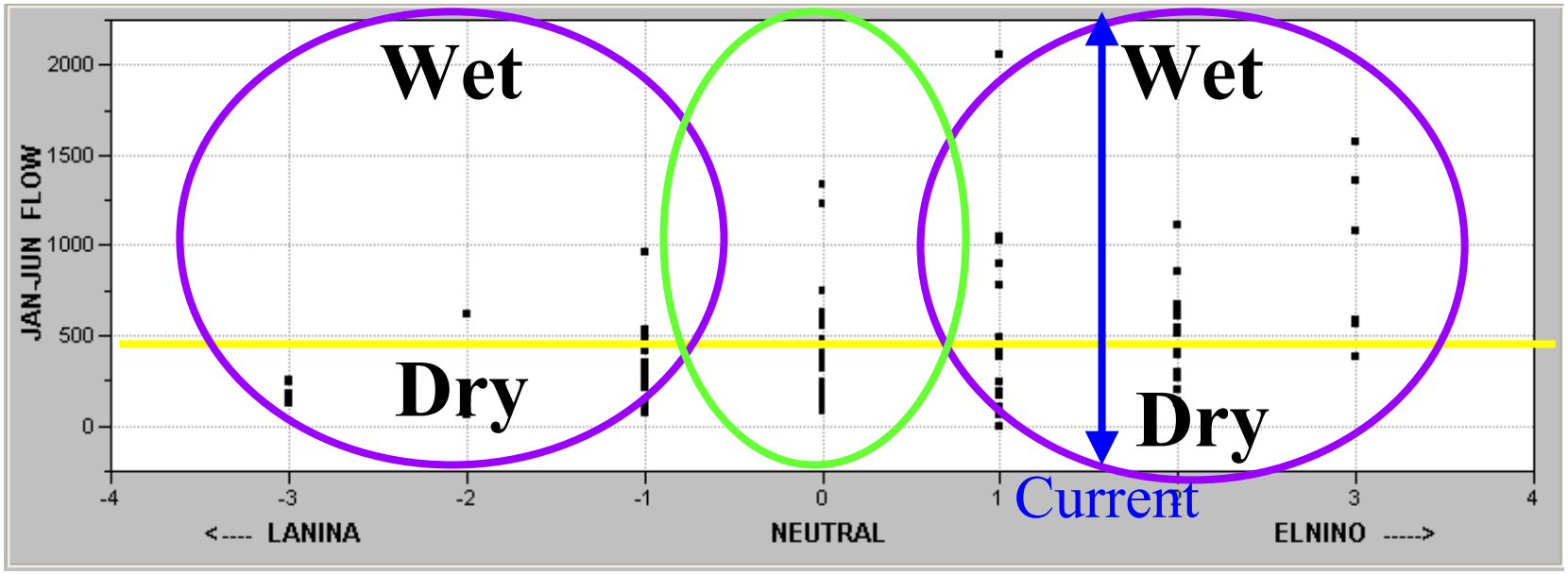


Each dot on the graph represents a runoff year.

When you hear 'ElNino' do not always assume high runoff in the Upper Colorado Basin Above Lake Powell. But…

<u>Extremely strong</u> ElNino's are usually wetter and <u>Extremely strong</u> LaNina's are usually dryer.

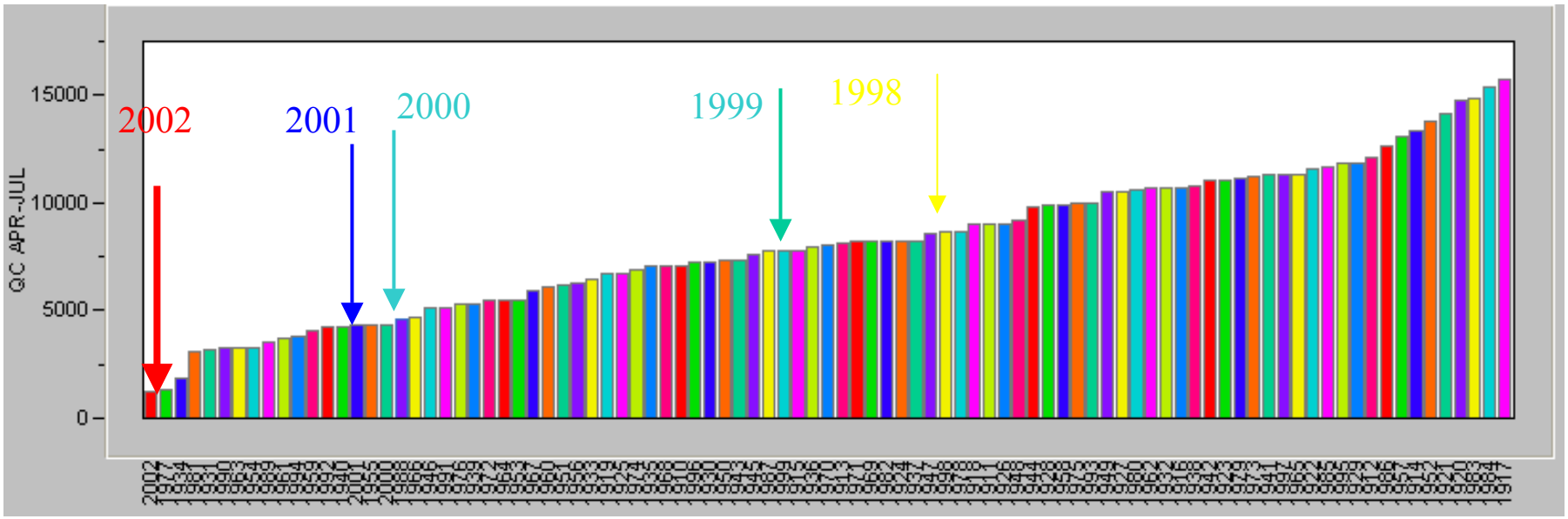
Lower Colorado – Salt River Inflow



Each dot on the graph represents a runoff year.

When you hear 'ElNino' it is usually wetter in the Lower Colorado Basin.
When you hear 'LaNina' it is almost always dry In the Lower Colorado Basin.

APRIL-JULY Runoff Above Lake Powell/Lees Ferry
2002 Was the Lowest for 93 Years of Record



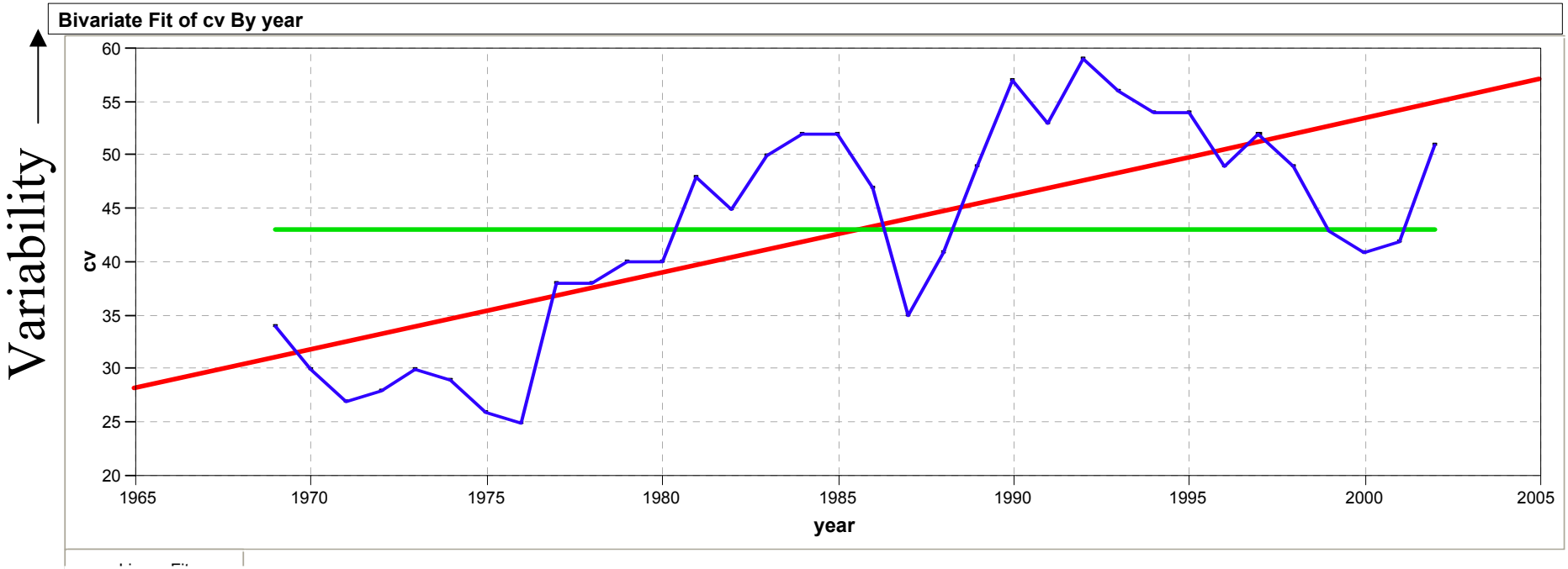
1981 1990

The Last Time We Had Above Average Flow

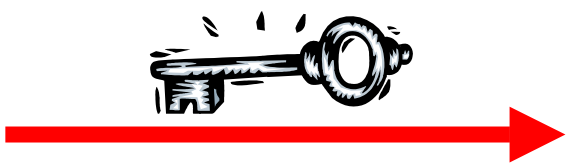
Four Consecutive Dry Years

1998	8.6 maf
1999	7.8
2000	4.4
2001	4.3
2002	1.1

1984



10 year running mean CV
Mean of 10 yr running mean
Trend Line of running mean



10 Year Running Mean of the CV (Coefficient of Variation) of Observed APR – JUL Flow Into Lake Powell

Observed flows are becoming more Variable over time – Harder to Forecast a moving target

Forecast Dilemma …

"For every complex problem (forecasting)…

There is a solution that is …

Simple,

Neat,

And Wrong !"

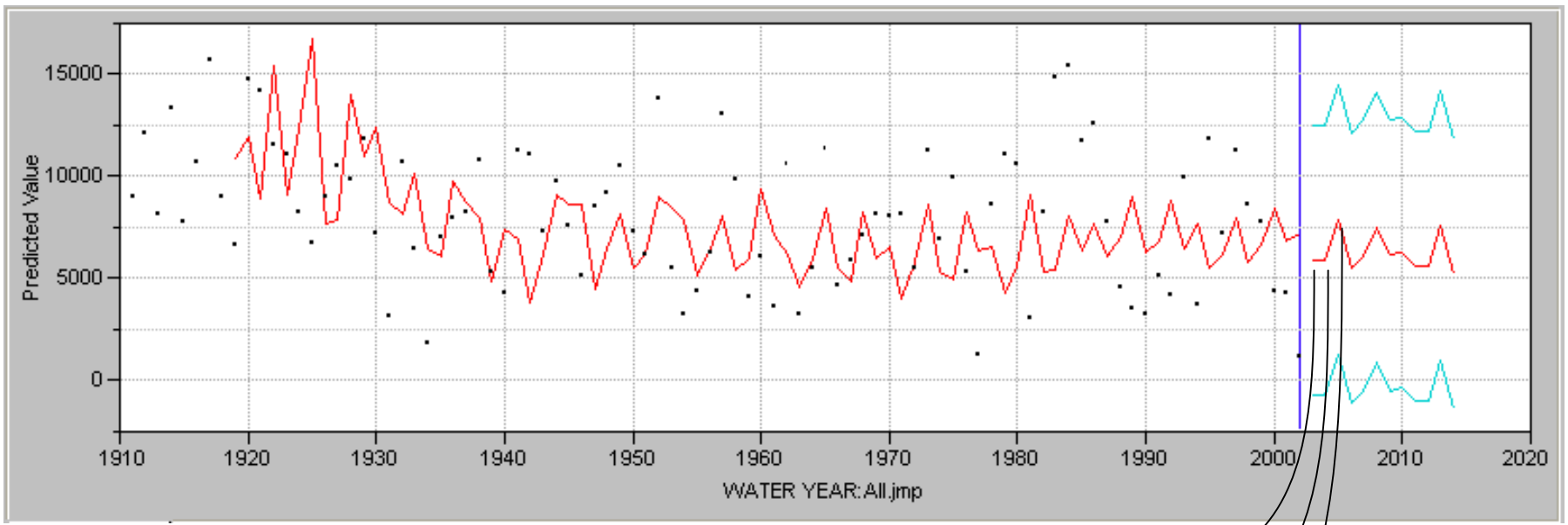
H. L. Mencken … 1880-1956

Early Season Outlook for the Spring Runoff In the Colorado Basin

We Use Several Methods

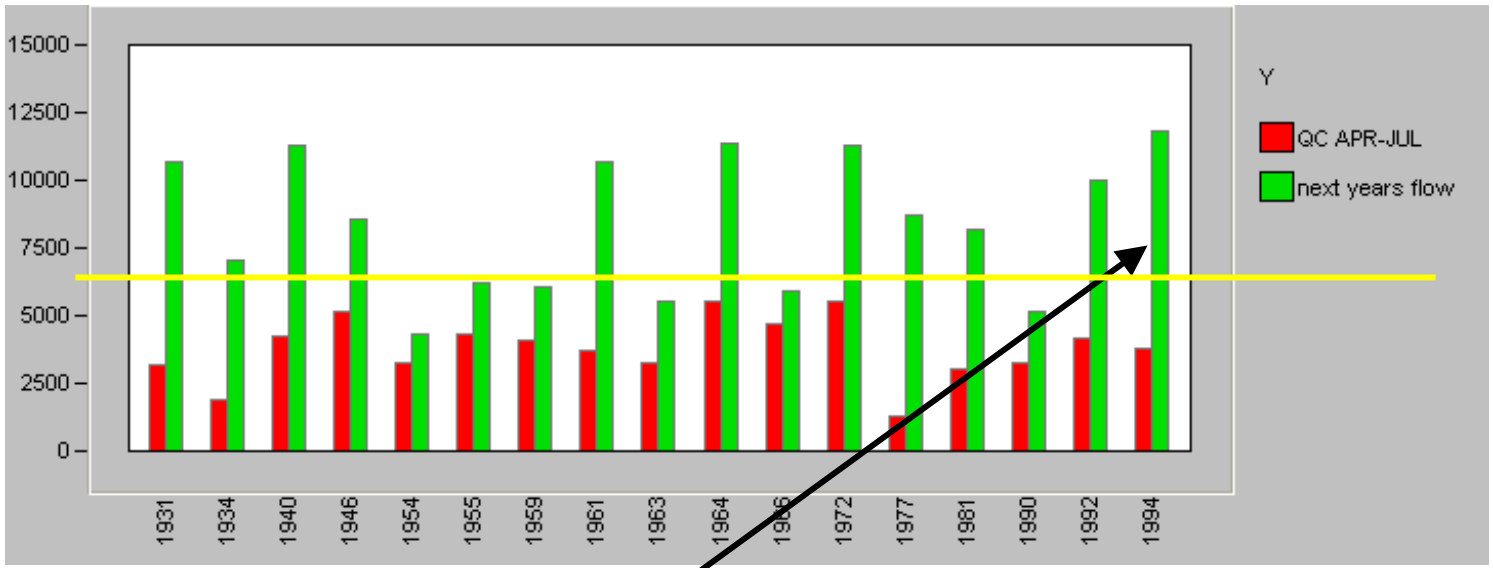
Time Series Analysis
Ensemble Streamflow Prediction
Various Statistical Relationships
Snow Water Equivalent Plots
Climate Prediction Center Seasonal Forecasts

Forecast For APR-JUL Streamflow for Lake Powell
Winter's Method Time Series Analysis of Past Flows



2003 5880
2004 5901
2005 7867

April-July Total Flow For One Year And The Next When Flows Increase - Lake Powell for DRY Years



Greatest Change : 8.1 maf

2002: + 1.1 maf

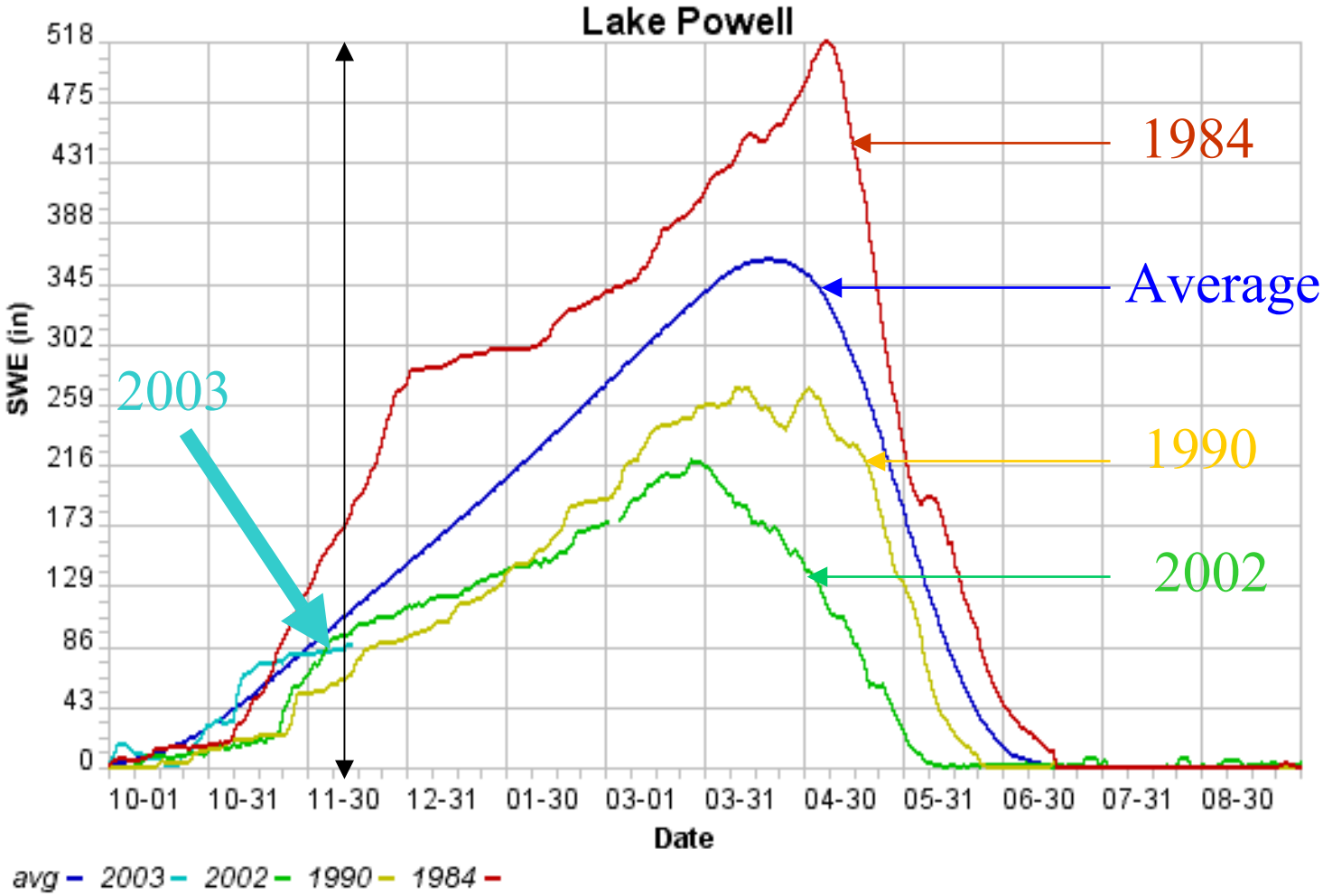
2003: 9.2 maf

Average Change: 4.6 maf

2002: +1.1 maf

2003 5.7 maf

Snow Water Equivalent Accumulations In the Upper Colorado Basin Above Lake Powell



Colorado Basin River Forecast Center, NWS/NOAA

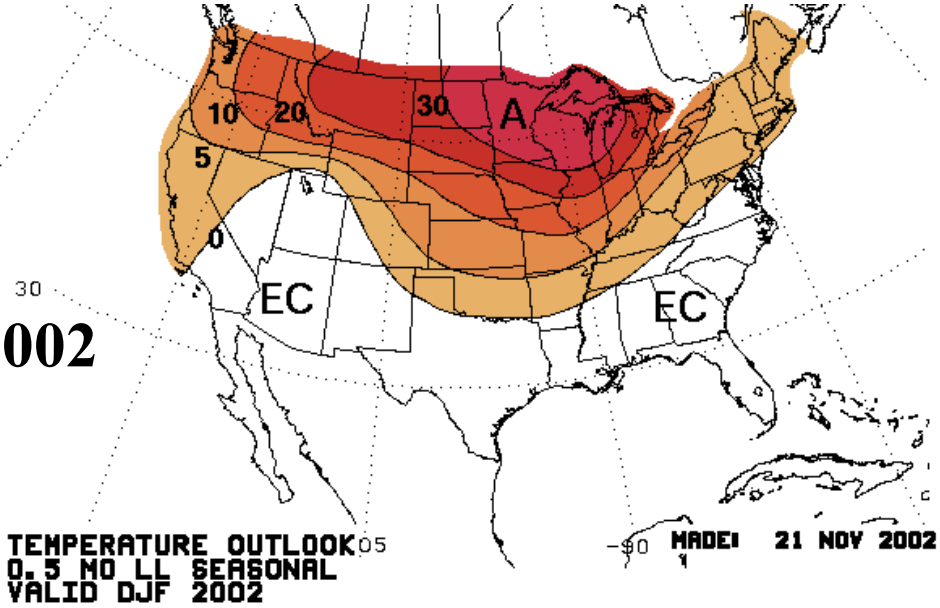
Raw SNOTEL Data From the NRCS

OUTLOOK FOR 2003 SPRING RUNOFF VOLUME INTO LAKE POWELL

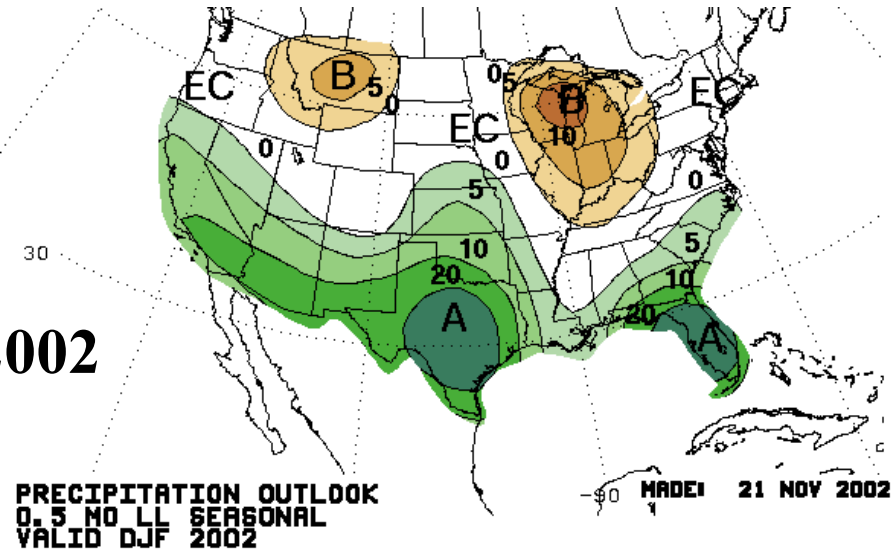
AVERAGE R.O. VOLUME (1971-2000) 7930 kaf

Time Series Analysis	**5880**
Ensemble Streamflow Prediction	**5950**
Statistical Relationships &	**4700**
Change in Annual Volume	**5700**
Statistical Data Patterning Of Antecedent Years	**6100**

Temperature Forecasts
For 2003 Winter
DEC-JAN-FEB
Issued: November 21, 2002



Precipitation Forecasts
For 2003 Winter
DEC-JAN-FEB
Issued: November 21, 2002



SUMMARY…

EARLY OUTLOOK IS FOR BELOW AVERAGE RUNOFF INTO LAKE POWELL

WWW.CBRFC.NOAA.GOV