



Colorado River Basin Hydrology

**Glen Canyon Adaptive Management Work Group Meeting
March 2005
Phoenix, Arizona**

Colorado River



Hite Bay looking upstream

Full Pool Elevation

Five Year Historic Drought

2000 - 2004

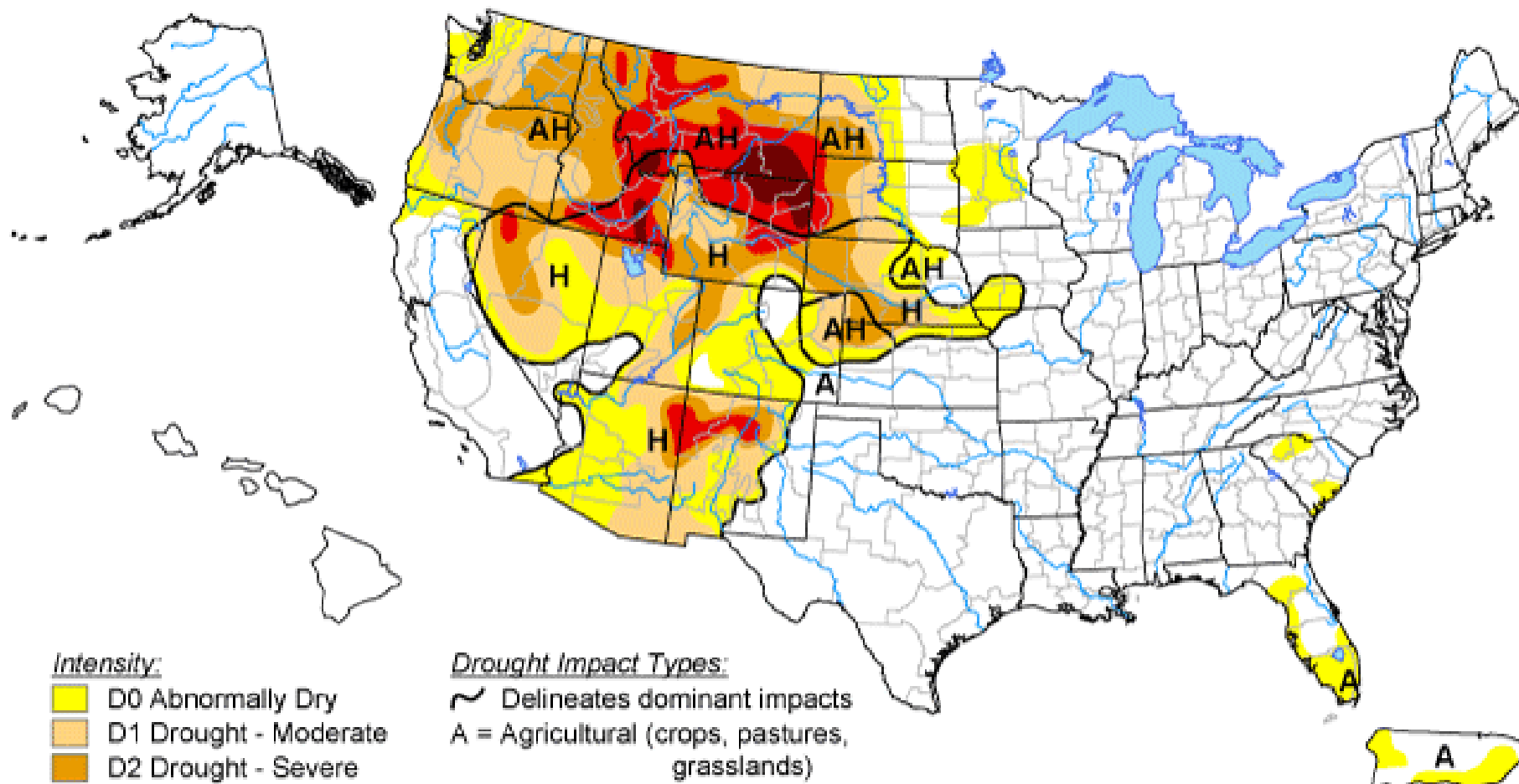


Lake Powell
03/09/2003

U.S. Drought Monitor

February 22, 2005

Valid 7 a.m. EST



Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

Drought Impact Types:

- Delineates dominant impacts
- A = Agricultural (crops, pastures, grasslands)
- H = Hydrological (water)
- (No type = Both impacts)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

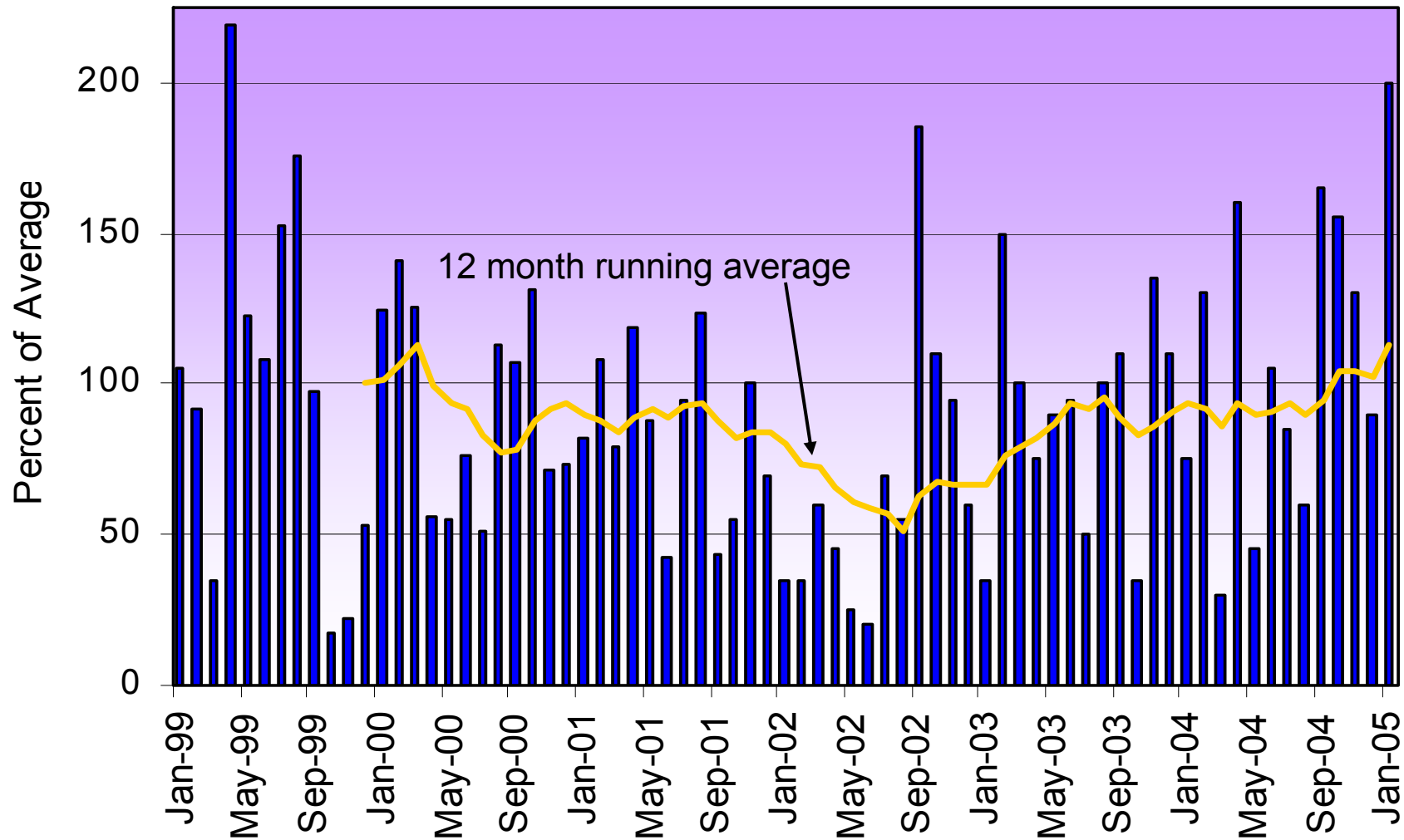
<http://drought.unl.edu/dm>



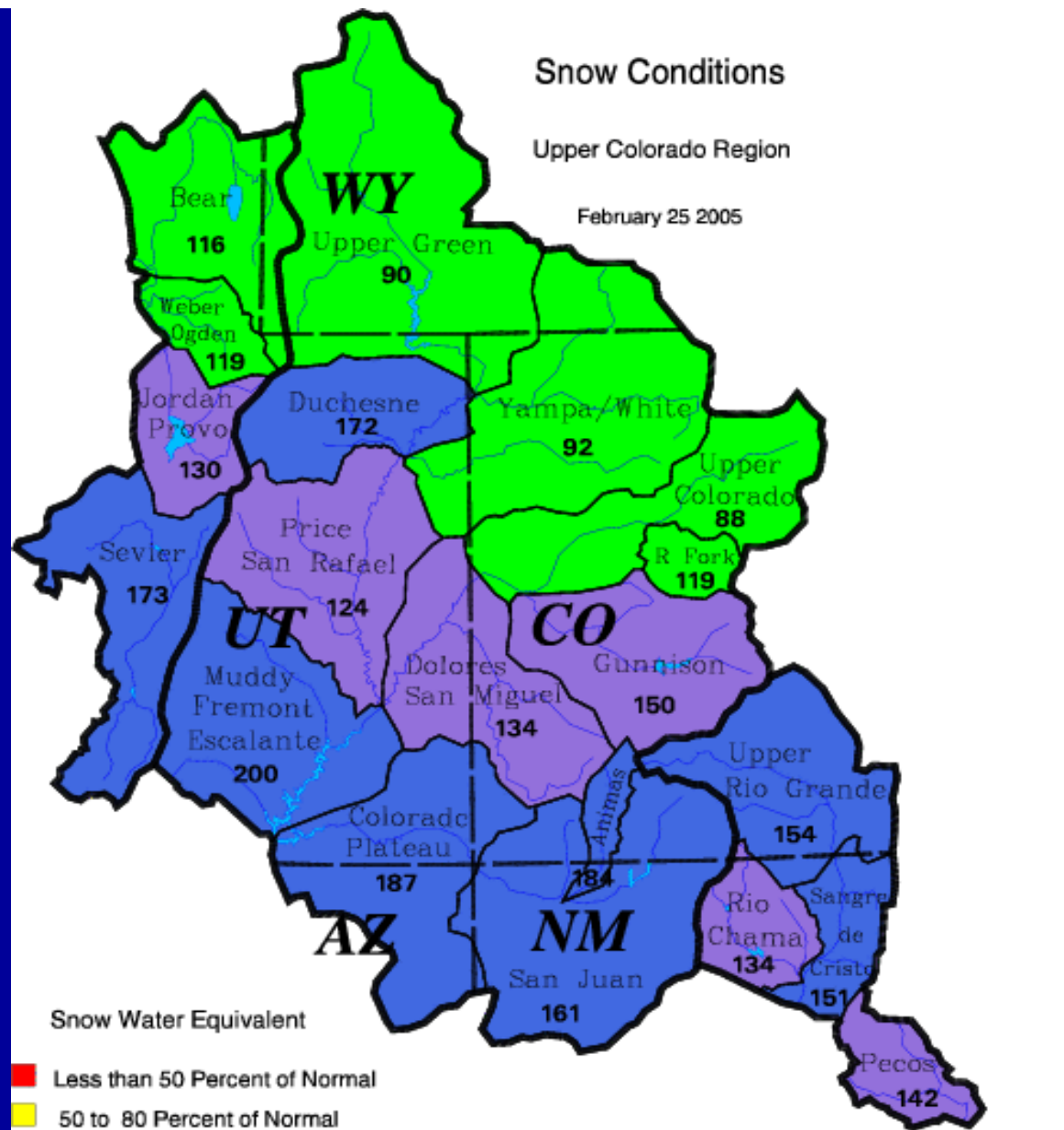
Released Thursday, February 24, 2005

Authors: Richard Heim/Candace Tankersley, NOAA/NESDIS/NCDC

Upper Colorado River Basin Precipitation January 1999- January 2005



RECLAMATION

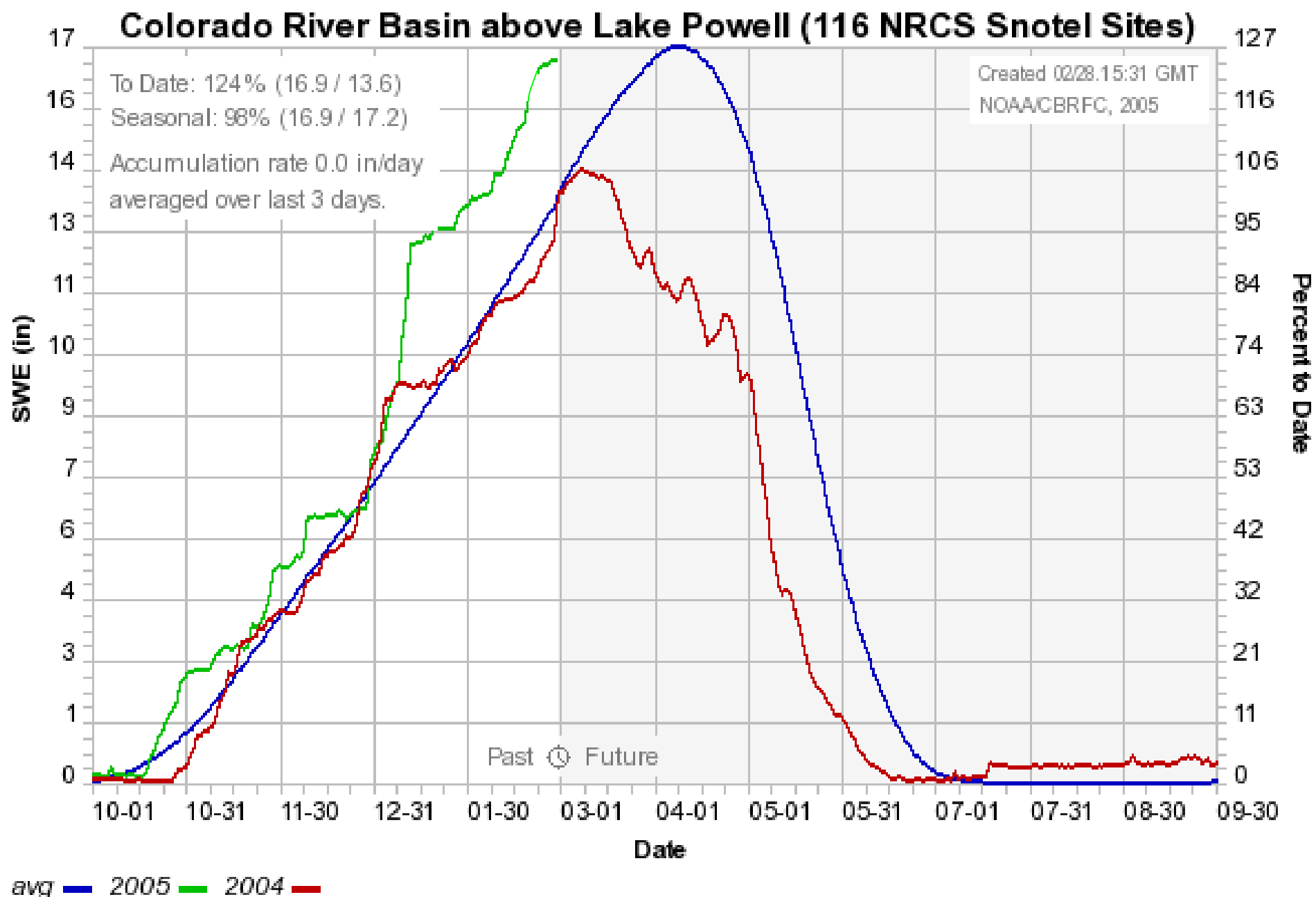


Data Provided by the Natural Resource Conservation Service

Upper Colorado
GIS
Region

Basinwide
Snowpack
in the
Upper
Colorado
River Basin
Is
119 %
of Average
March 1, 2005

RECLAMATION



RECLAMATION

2005 Upper Colorado Apr–Jul Inflow

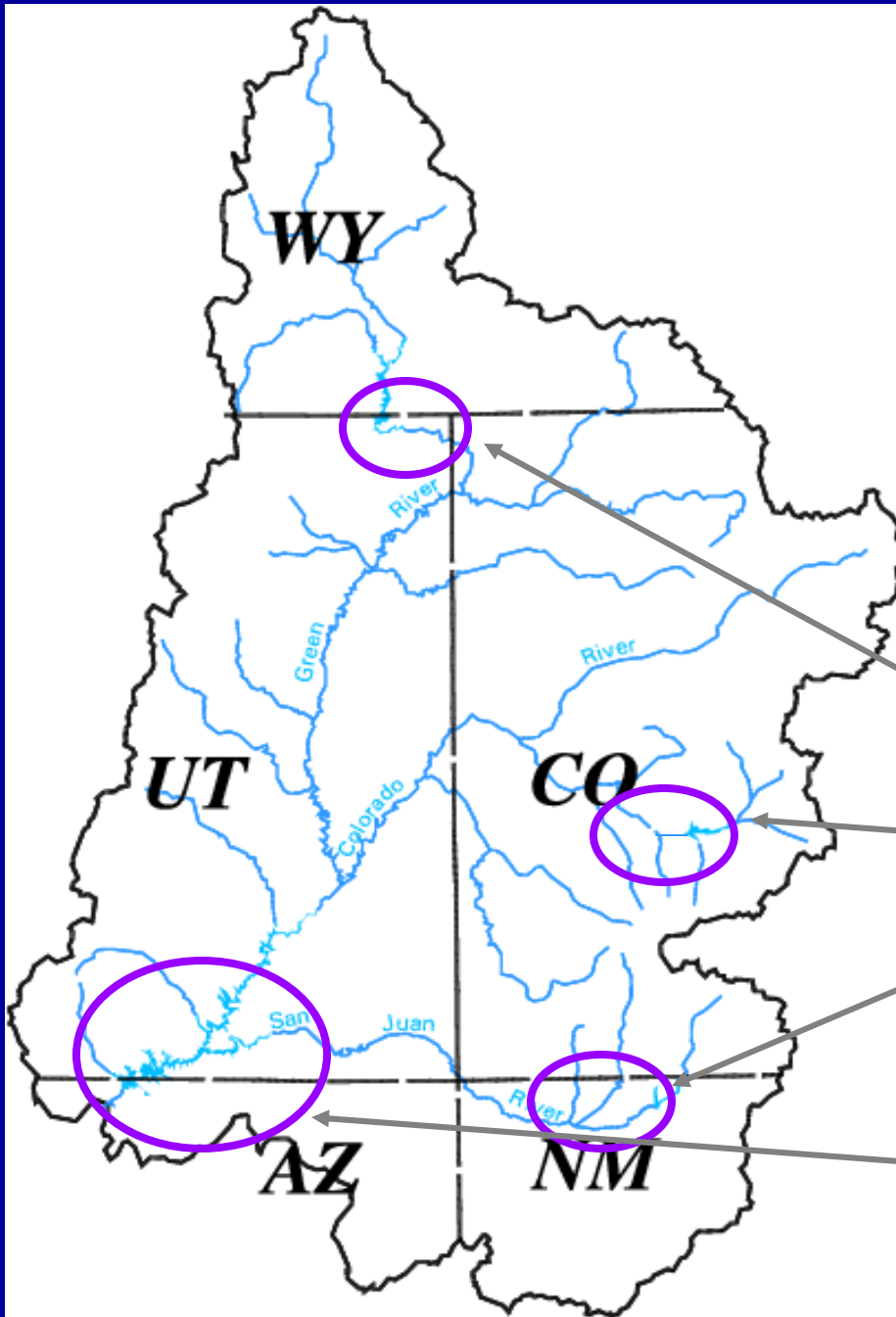
March 2005
Preliminary Forecasts

Flaming Gorge – 84 %

Blue Mesa – 115 %

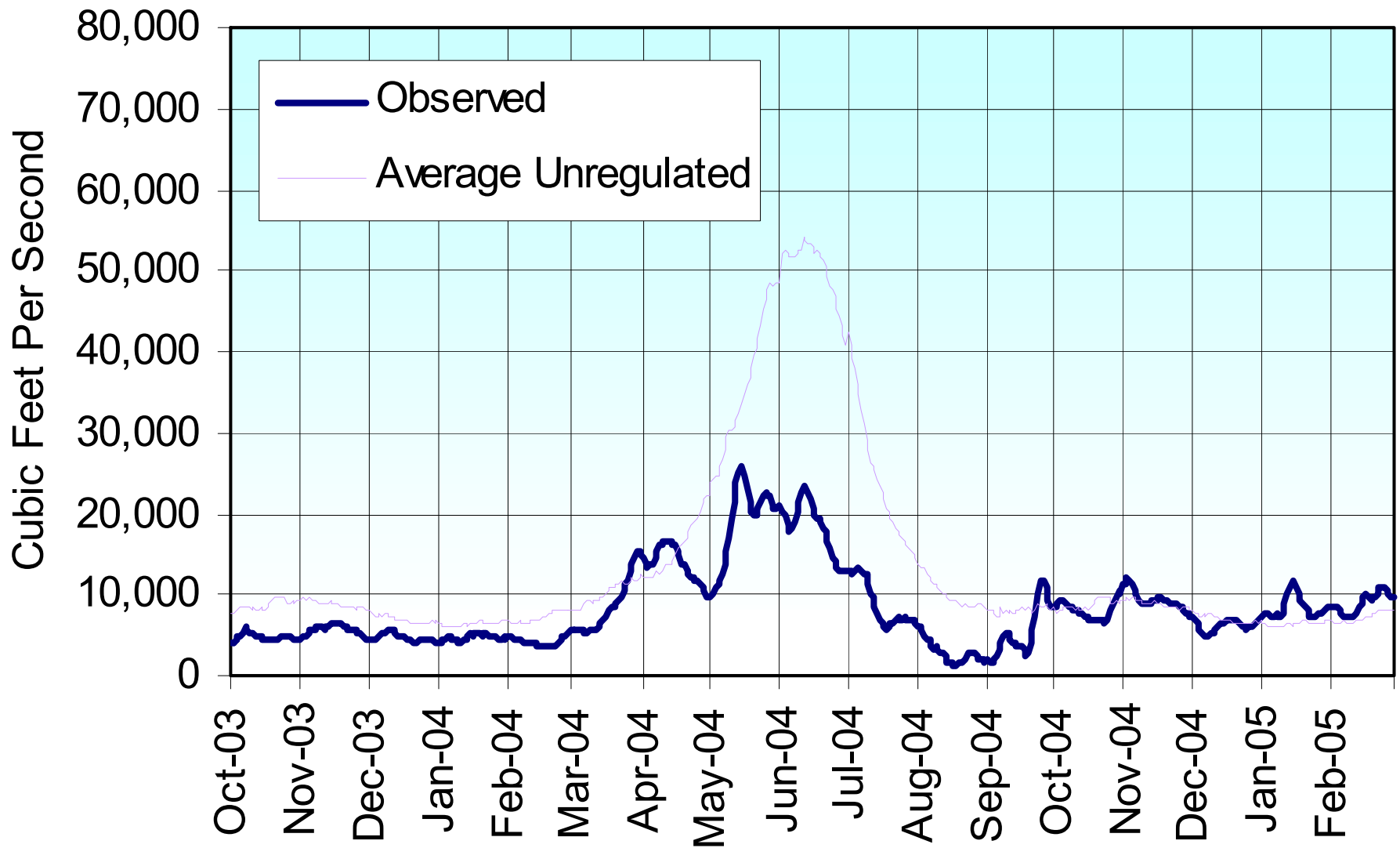
Navajo – 162 %

Lake Powell – 110 %



RECLAMATION

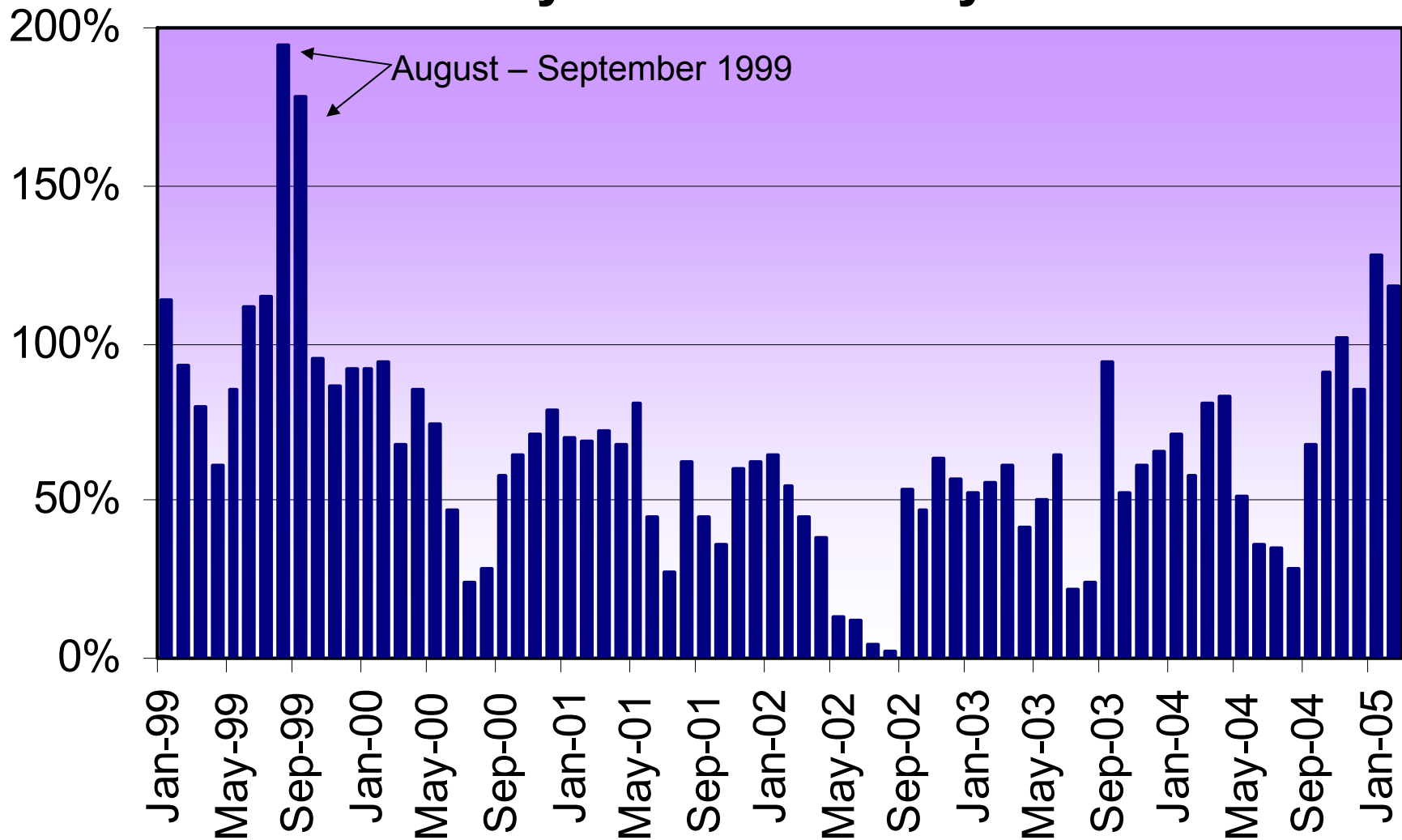
Lake Powell Unregulated Inflow October 2003 - February 2005



RECLAMATION

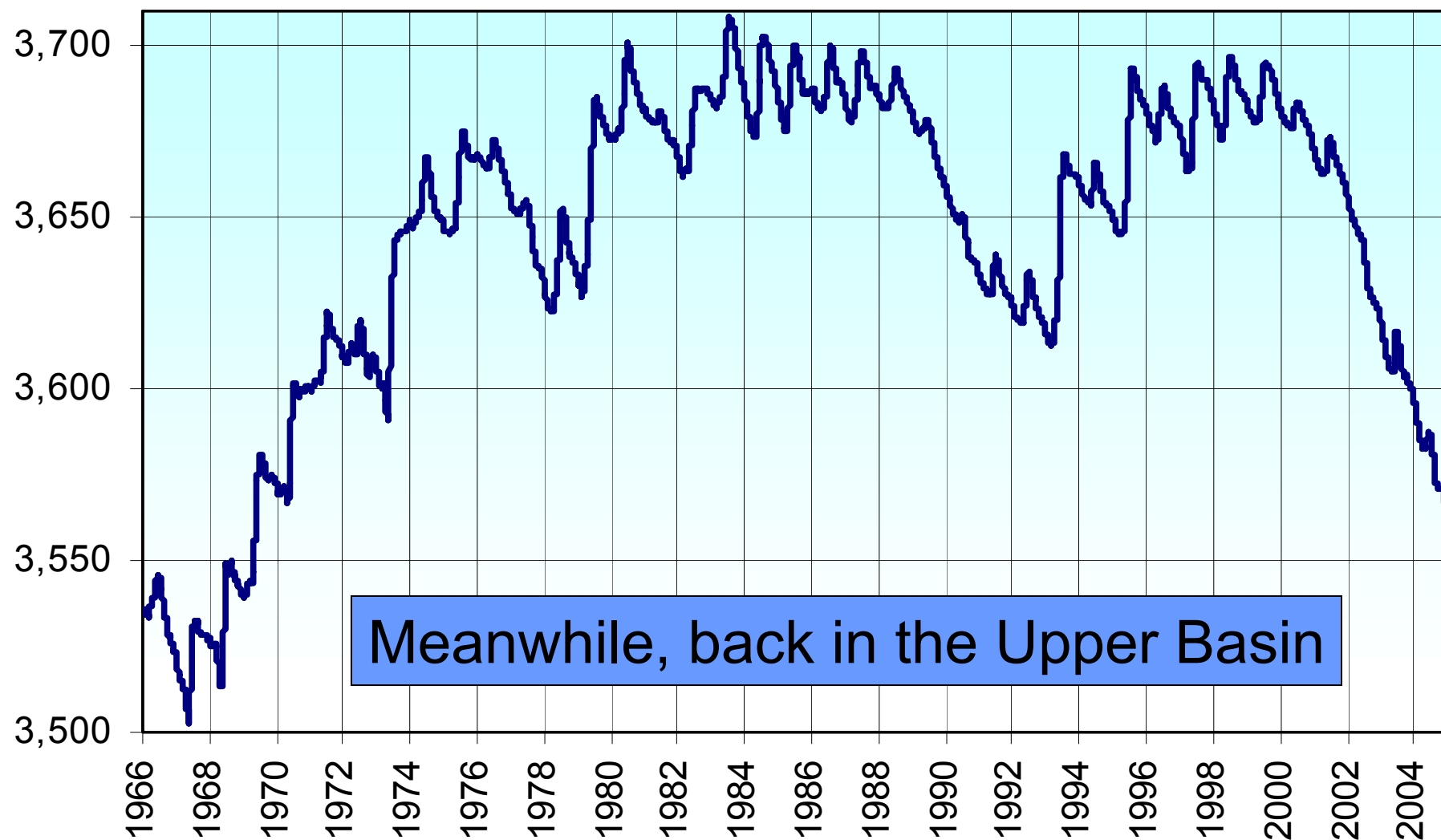
Unregulated Inflow to Lake Powell

January 1999 - February 2005



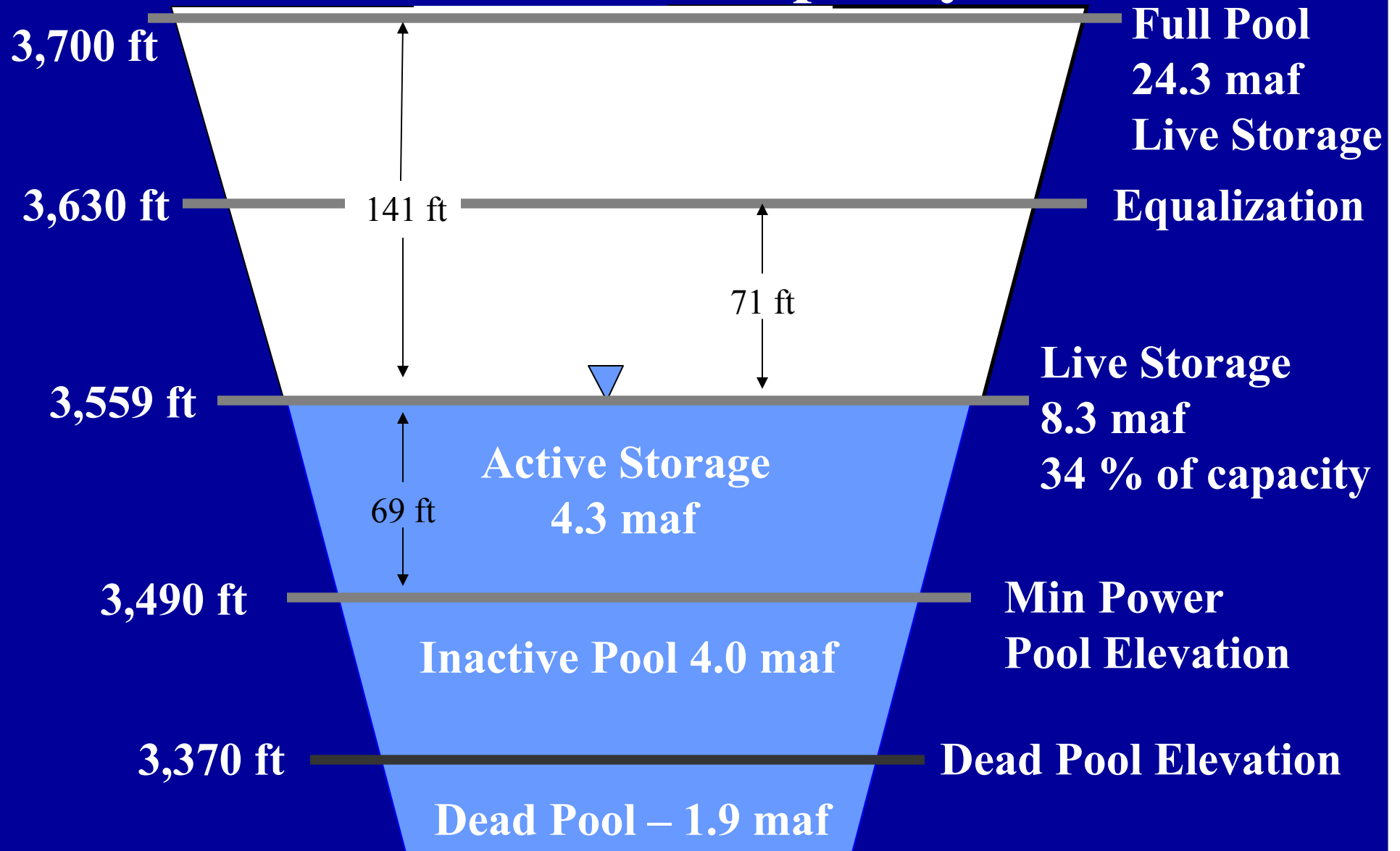
RECLAMATION

Lake Powell Water Surface Elevations 1966 through March 1, 2005



RECLAMATION

Lake Powell Capacity



Not to scale

March 1, 2005

RECLAMATION

2005 Lake Powell Inflow Scenarios

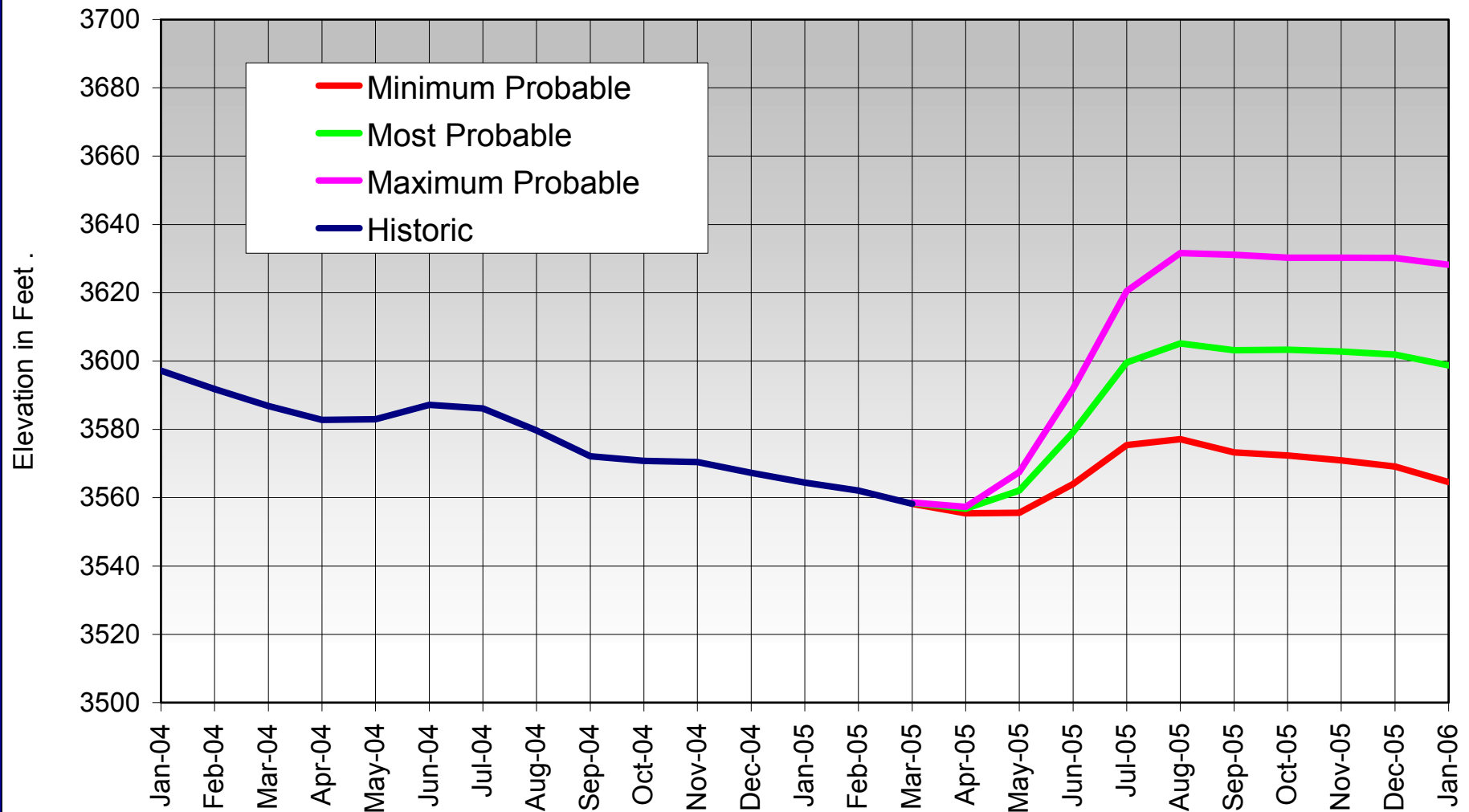
February 15, 2005

Scenario	April - July	WY 2005
Minimum Probable	5.95 maf (75 %)	9.89 maf (82 %)
Most Probable	9.0 maf (113 %)	13.2 maf (110 %)
Maximum Probable	12.1 maf (153 %)	16.6 maf (138 %)

maf = million acre-feet

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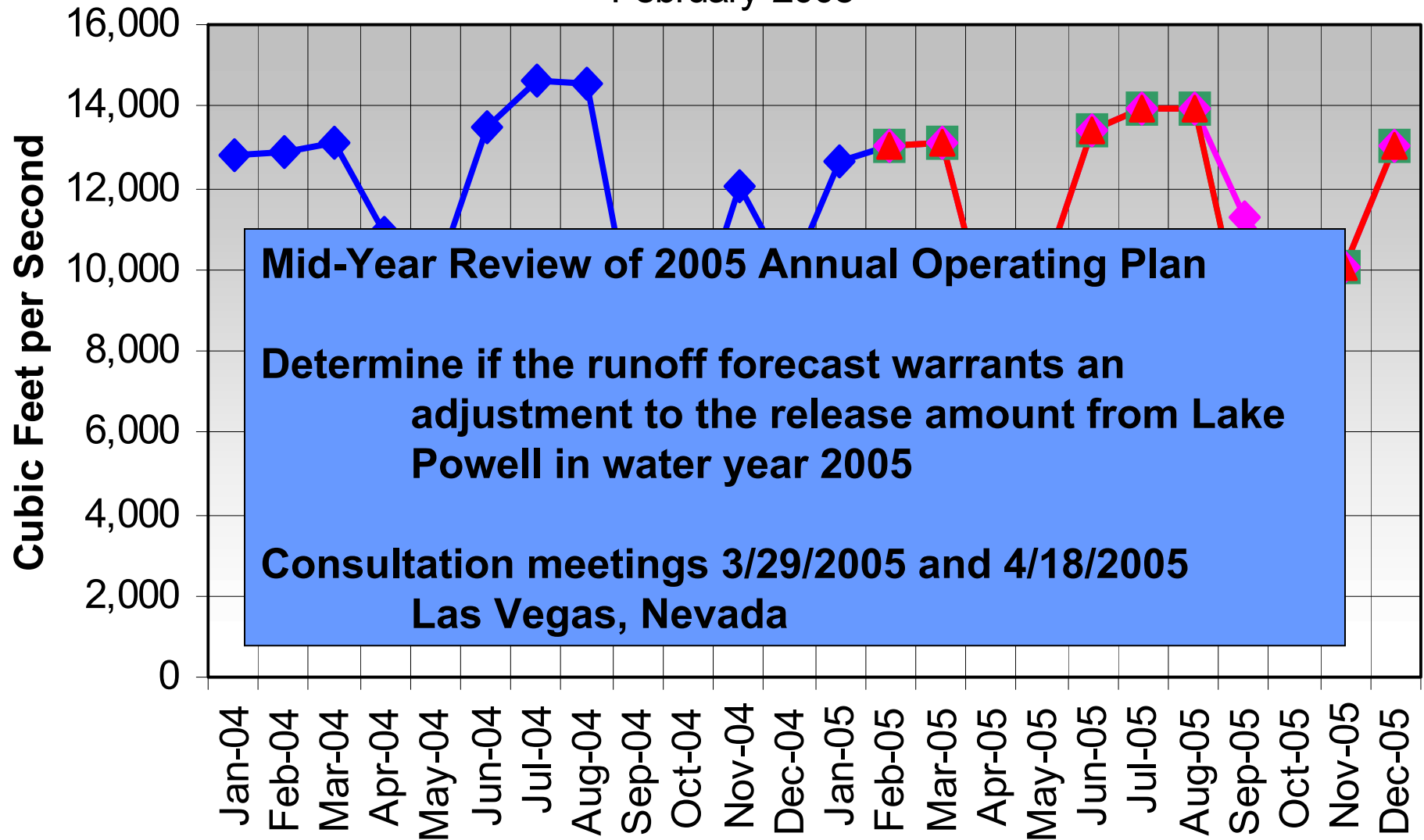
Projected Lake Powell Elevations
Most, Minimum, and Maximum Probable Inflow Scenarios
February 15, 2005



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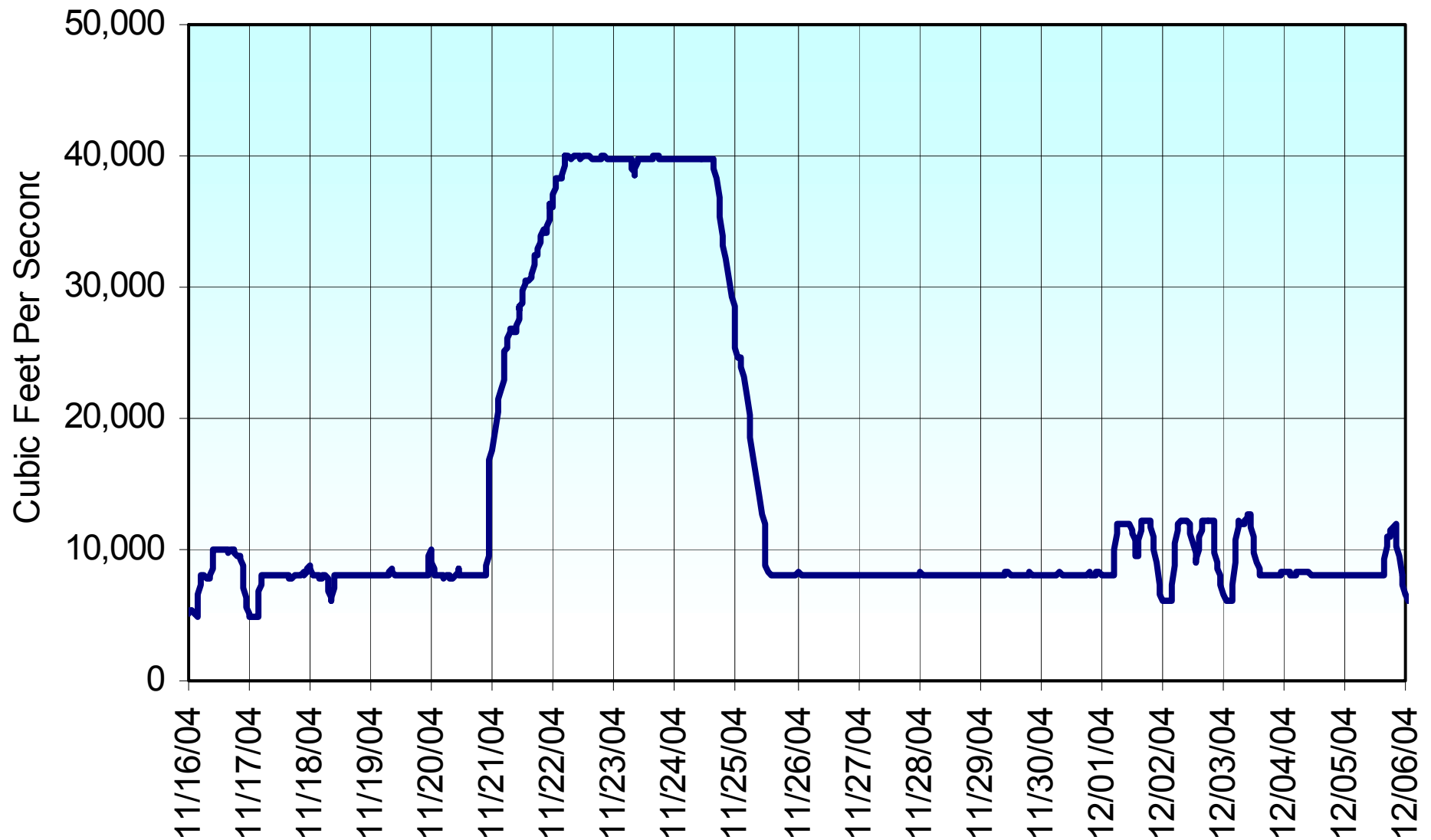
Projected Releases from Lake Powell

February 2005



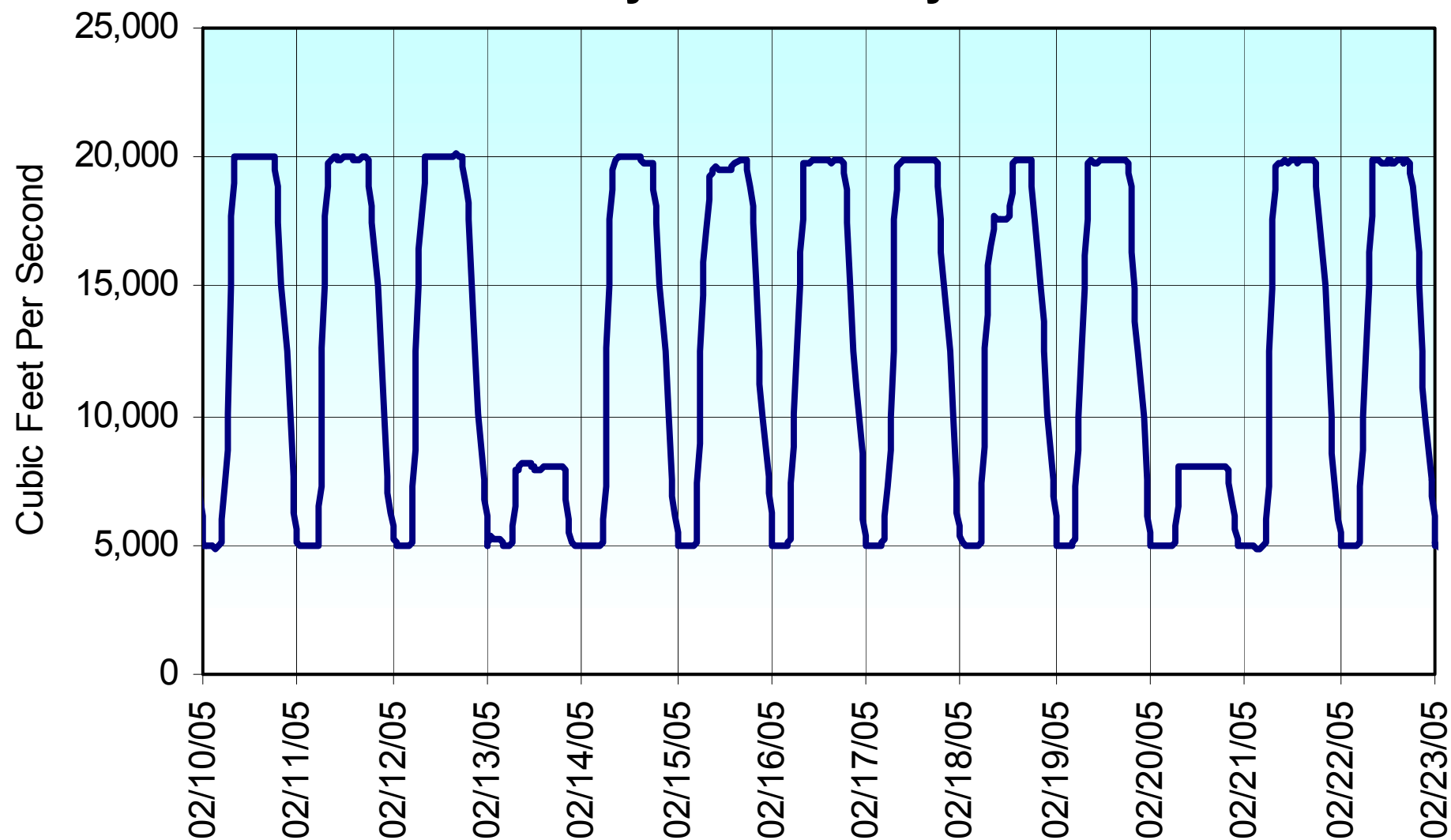
RECLAMATION

2004 Glen Canyon Dam High Flow Experiment



RECLAMATION

2005 Glen Canyon Dam High Fluctuating Flows February 10 - February 22



RECLAMATION

U.S. Drought Monitor. There is a weakening in the drought situation. Lake Mead is up 13 feet since January 1 but Lake Powell is still going down. It is also still very dry in the Montana area and in the Dakotas.

Upper Colorado River Basin Precipitation, Jan 1999-Jan 2005. 80-85 % range in 03-04. Have crossed average in the last 12 months. Sept-Oct-Nov were really good months. Set the stage for a good situation. Reasonably good in the upper basin through the winter but a lot of spatial distribution.

Basinwide Snowpack. Every year there is a gradient across the basin but this is the largest. Snowpack is much above average in the San Juan and Animas River Basin, but below average in the Upper Green, Yampa and Colorado River headwaters. These three are very important watersheds. The aggregate snowpack is 119% of average since yesterday for the whole Upper Colorado River basin above Lake Powell.

Colorado River Basin Above Lake Powell. This information comes from the Weather Service which tracks what the snowpack conditions are for the year. The peak snowpack is typically reached about April 10. Last year it got really hot and dry in March and almost nothing came in. From late Dec to Jan 12 it was extremely wet in the upper and lower basins. Since that time conditions have been trending back to average. No storms are forecasted for the next week.

2005 Upper Colorado Apr–Jul Inflow. The March preliminary inflow for Lake Powell is 110% for April through July. There is still quite a bit of variability left, however. It's looking like an average runoff year and won't be as bad as last year. This slide shows the average unregulated inflow on a regular daily basis. Base flows were running 60% of average a year ago. Inflows are running above average since November into Lake Powell.

Lake Powell Unregulated Inflow, Oct 2003-Feb 2005. Actually a little below average in December, 2004, but above average in November 2004, and in January and February of this year.

Unregulated Inflow to Lake Powell, Jan 1999-Feb 2005.

Lake Powell Capacity. This shows the cross-section at 3,490 feet and power can no longer be generated. Last fall, looking at 1 in 5 probability that we could drop below 3,490 feet or glance it. Sort of transitional range now, as we are not sure how the runoff is going to play out. If we have a dry spring, we'll be back where we were last year.

2005 Lake Powell Inflow Scenarios. Based on Feb. 15, inflow forecast which was a little higher 113% April – July, now looking at 110% of average. There is a 10% change of storage equalization releases with Lake Mead in 2005. The lower end is still not too bad. This is an inflow volume that keeps at about the same where it was last year.

Projected Lake Powell Elevations, Most, Minimum, and Maximum Probable Inflow Scenarios. This slide reflects the scenarios what were run through the model. Under the most probable conditions, the elevation came up to 3,605 feet. Under the maximum probable, there is an additional 168,000 acre-feet to equalize. You would go above 3,630 feet with some water going to Lake Mead. The chances for that are less than 10%.

Projected Releases from Lake Powell. 2005 Glen Canyon Dam High Fluctuating Flows. – Because we have only 6 units available right now, and because of the 40 MW regulation requirement, we don't have that capacity to reach 20,000 cfs. We are about 8 to 10 megawatts short. We have been peaking out at about 19,700 cfs, 300 cfs short of the 20,000 cfs. Very close but we have had to maintain the 40 MW regulation commitment.