RECLAMATION

Managing Water in the West

2005 Colorado River Annual Operating Plan

Colorado River Management Work Group (CRMWG)

Mid-Year Review Consultation

April 26, 2005

U.S. Department of the Interior
Bureau of Reclamation

2005 Colorado River AOP
Mid-Year Consultation Meeting

- Welcome and Introductions – Rick Gold, Bob Johnson
- Setting – Tom Weimer
- Upper Basin Hydrology and Operations – Tom Ryan
- Lower Basin Hydrology and Operations – Terry Fulp
- Operational Scenarios for 2005 – Terry Fulp
- Discussion on Annual Releases from Lake Powell in WY 2005 - CRMWG
- Conclusion and Wrap-up

RECLAMATION

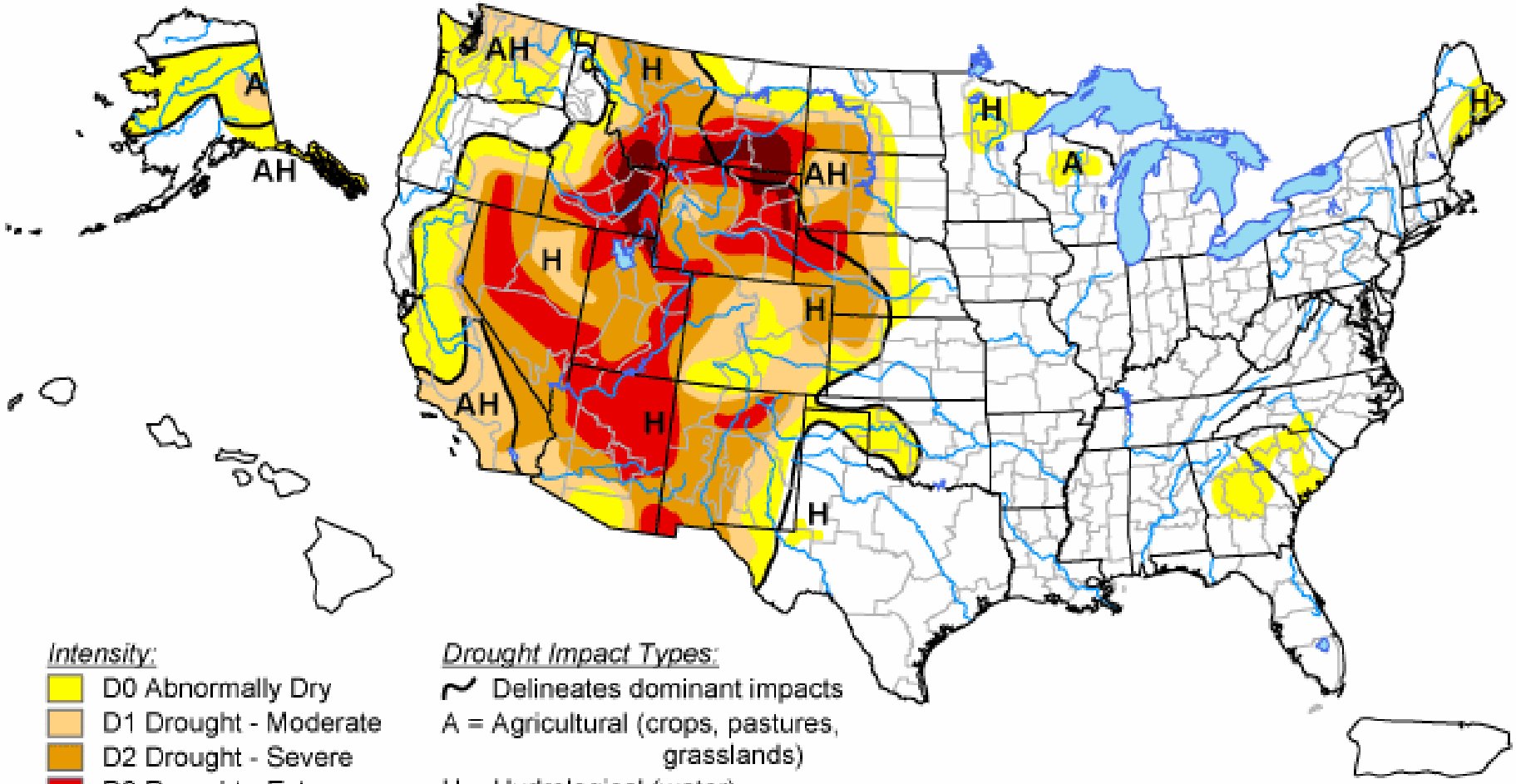
Upper Basin Hydrology and Operations

Five Year Historic Drought

2000 - 2004

U.S. Drought Monitor

August 3, 2004
Valid 8 a.m. EDT



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

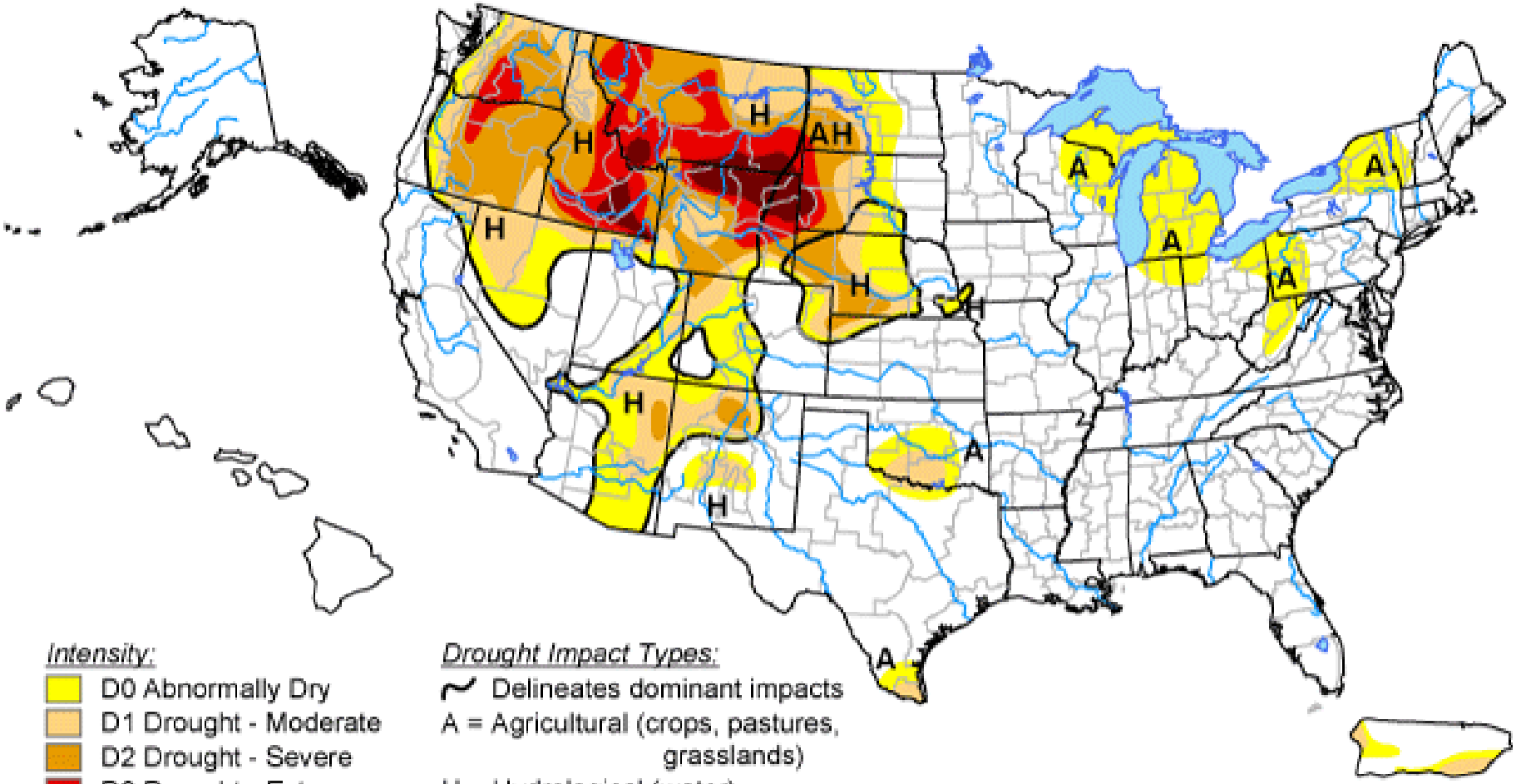
USDA | National Drought Mitigation Center

Released Thursday, August 5, 2004

Author: Mark Svoboda, NDMC

U.S. Drought Monitor

April 19, 2005
Valid 8 a.m. EDT



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http://drought.unl.edu/dm

USDA National Drought Mitigation Center

Released Thursday, April 21, 2005

Author: Richard Tinker, NOAA/NWS/NCEP/CPC

Water Year 2005
Improving Hydrologic Conditions
In the Upper Colorado River Basin

- Cooler than average (but also dry) summer in 2004
- Significant precipitation in the UB in the autumn of 2004
- Increases to baseflows throughout the UB in response to the fall rains
- Average to above snowpack in the winter of 2004-2005
- Inflow to Lake Powell forecasted to be near average in WY 2005
- Colorado River System Storage (UB and LB)
  - 9/30/2003 – 57 percent
  - 9/30/2004 – 50 percent
  - 9/30/2005 – 57 percent (projected) – roll back drought 1 yr
- One average inflow year does not undo the 5 year drought

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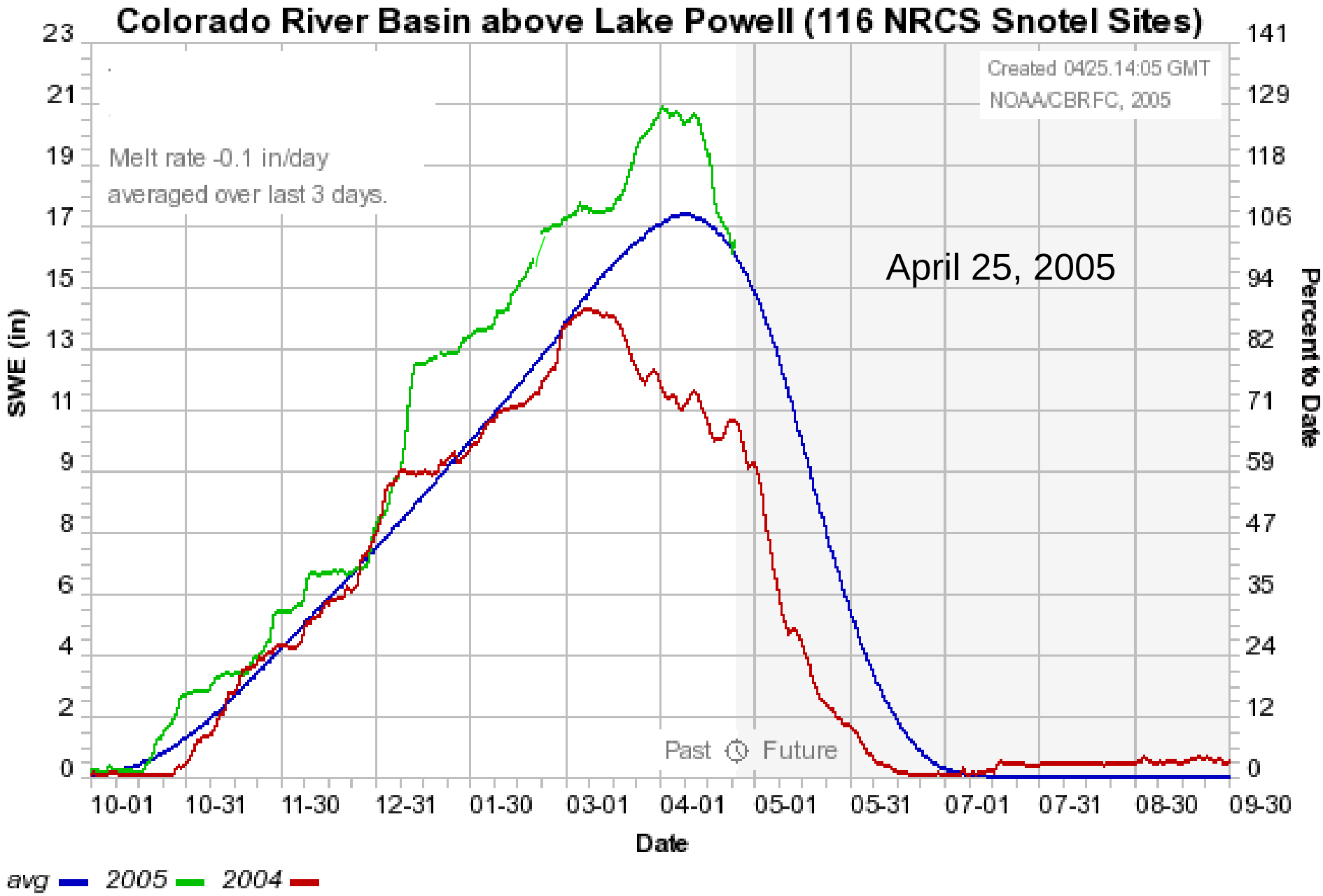

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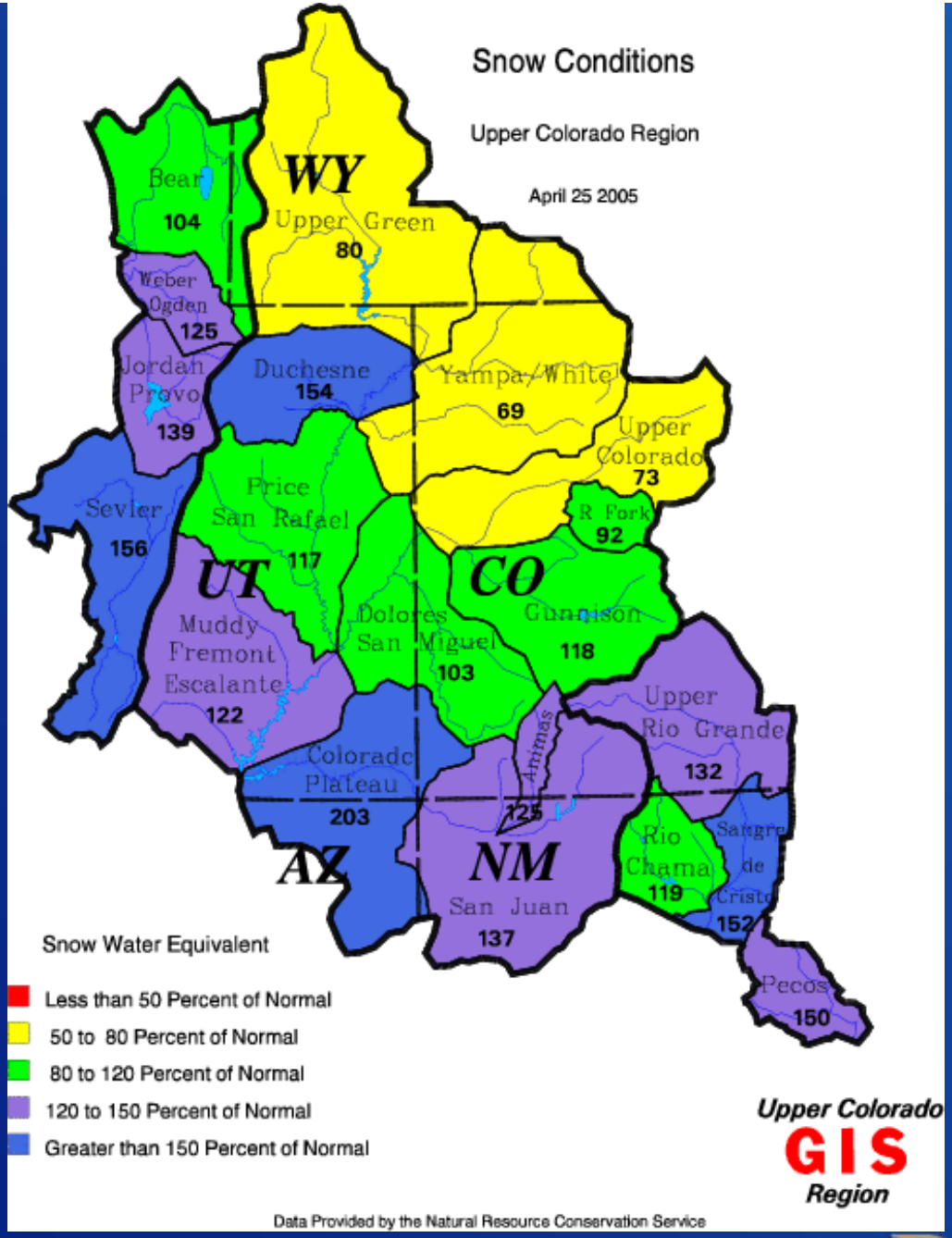

Basinwide
Snowpack
in the
Upper
Colorado
River Basin
is
101 %
of Average
April 25, 2005

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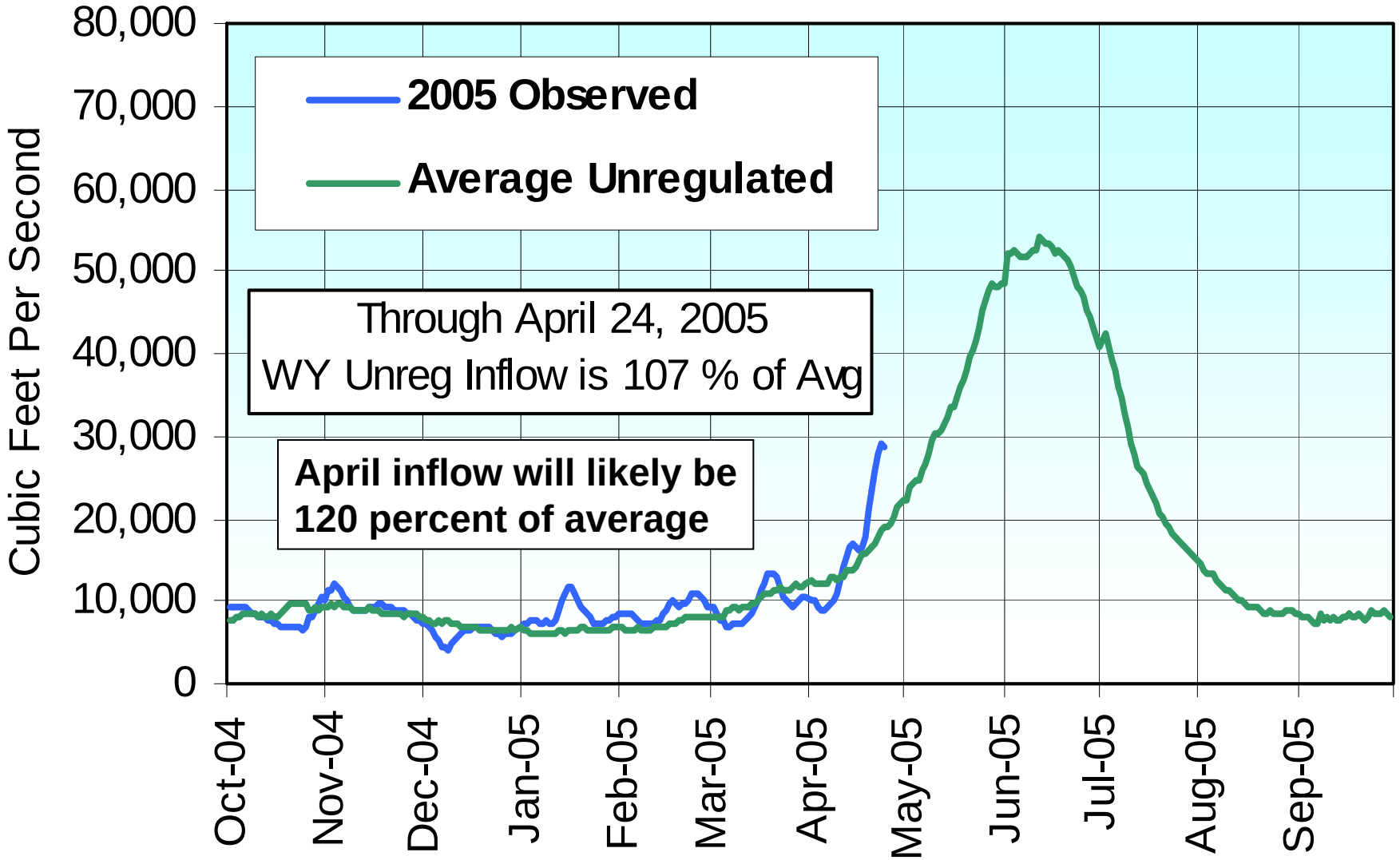
Lake Powell Unregulated Inflow
Water year 2005



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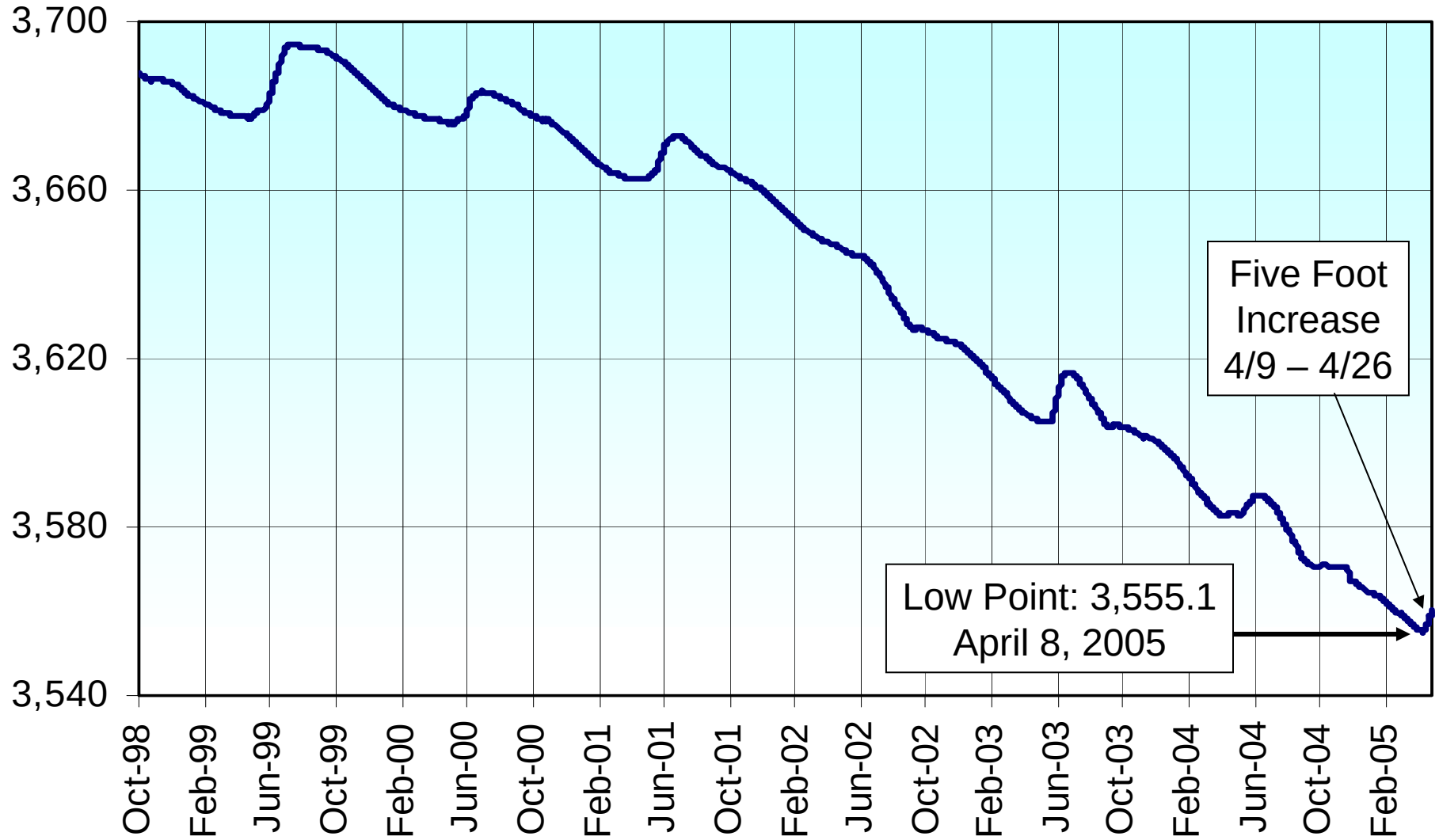
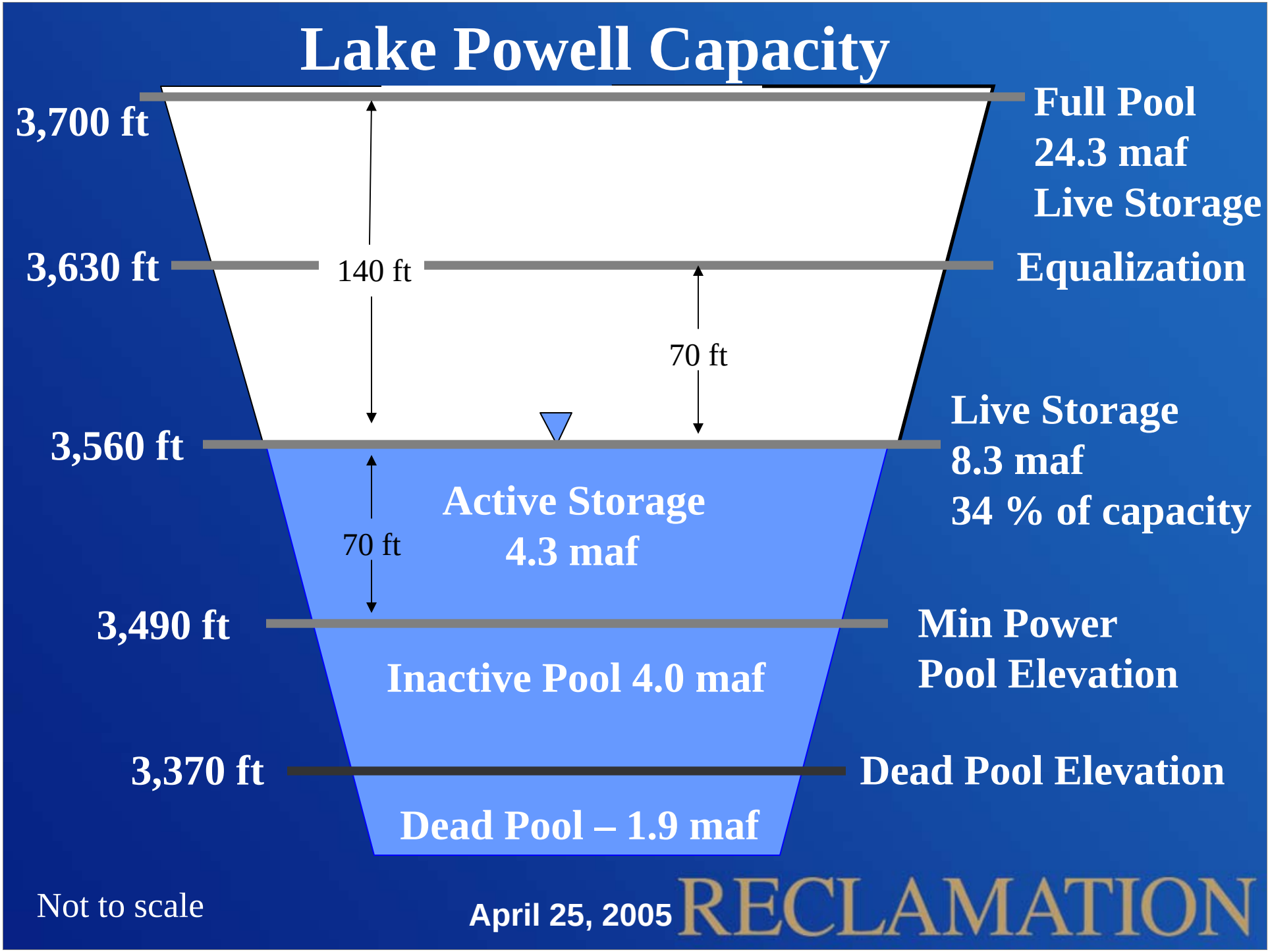
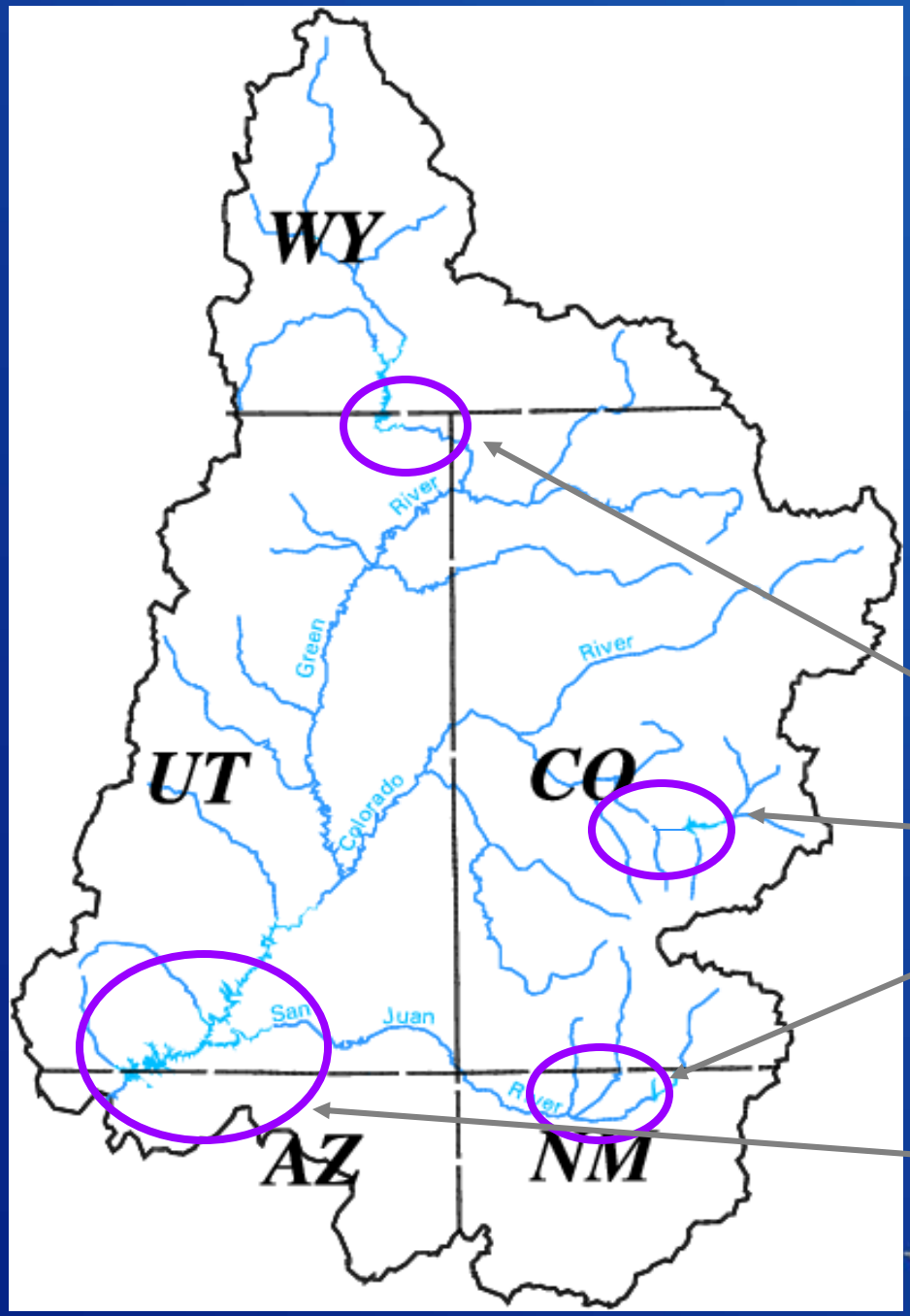
Lake Powell Water Surface Elevations
October 1998 through April 2005



RECLAMATION


Lake Powell Capacity
3,700 ft
Full Pool
24.3 maf
Live Storage
3,630 ft
140 ft
Equalization
70 ft
3,560 ft
Live Storage
8.3 maf
34 % of capacity
Active Storage
4.3 maf
70 ft
3,490 ft
Min Power
Pool Elevation
Inactive Pool 4.0 maf
3,370 ft
Dead Pool Elevation
Dead Pool – 1.9 maf
Not to scale
April 25, 2005
RECLAMATION



2005 Upper Colorado Apr–Jul Inflow

April mid-month
2005 Forecasts

Flaming Gorge – 88 %

Blue Mesa – 107 %

Navajo – 159 %

Lake Powell – 106 %

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2005 Lake Powell Inflow Scenarios

April 2005

Scenario	April – July	WY 2005
Minimum Probable	6.0 maf (76 %)	9.9 maf (82 %)
Most Probable*	8.4 maf (106 %)	12.5 maf (104 %)
Maximum Probable	11.0 maf (139 %)	15.4 maf (127 %)

*** April Mid-Month Forecast (0.1 maf reduction from April 2 forecast)**

maf = million acre-feet

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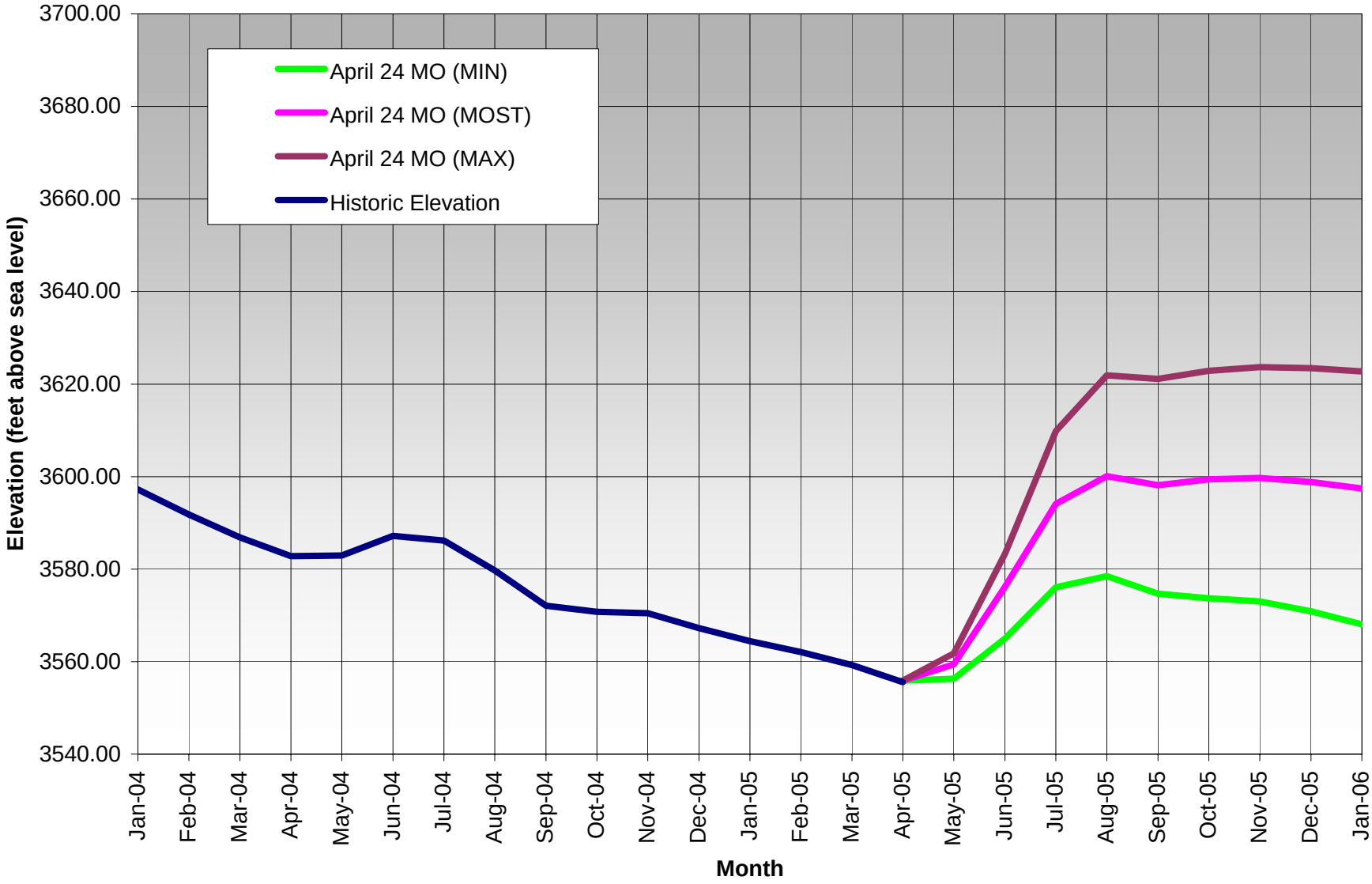
Lake Powell Reservoir Elevations

April 24 Month Study Minimum, Most and Maximum Probable Scenarios



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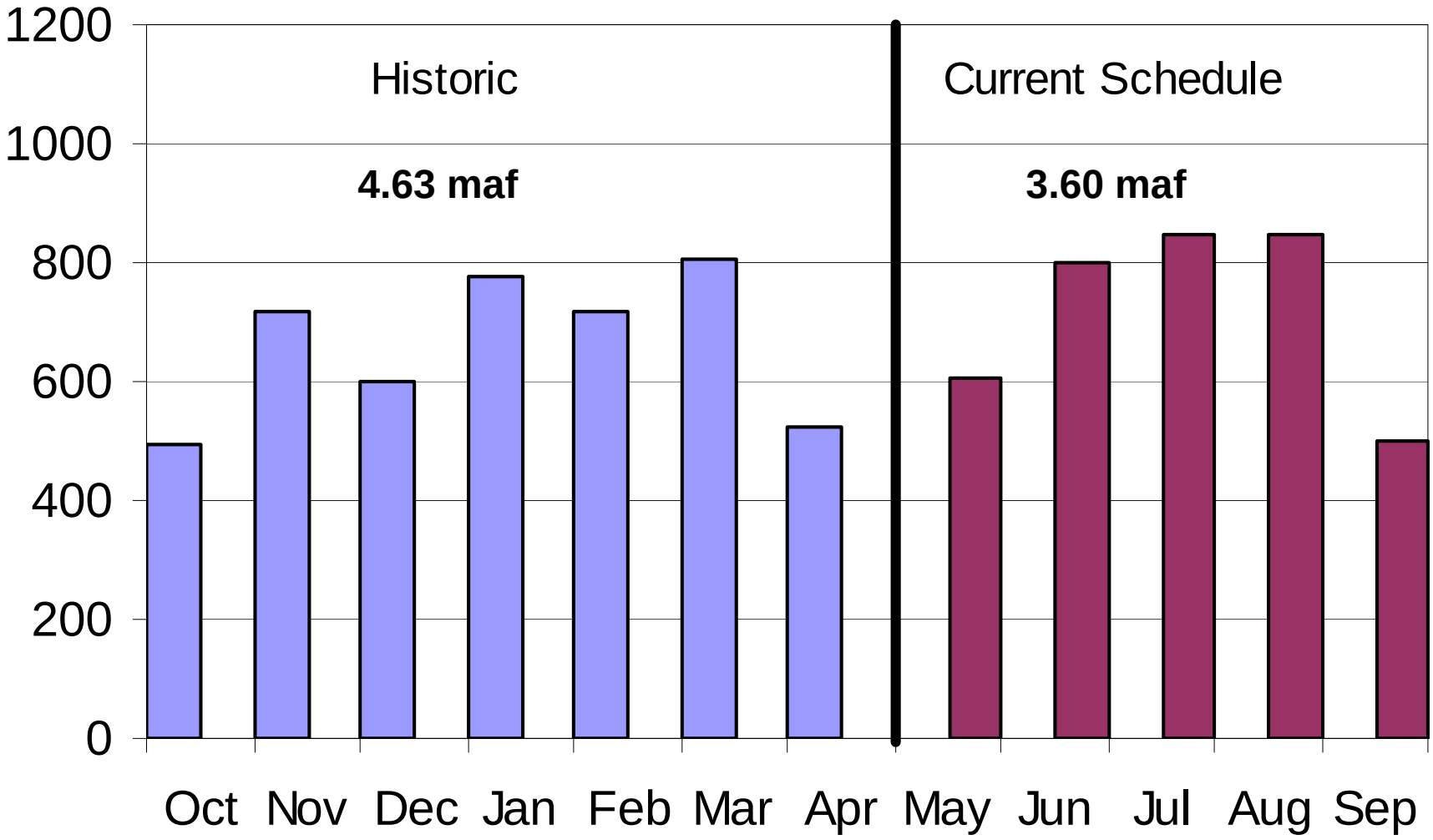
Lake Powell Monthly Release Volumes (TAF)
Water Year 2005



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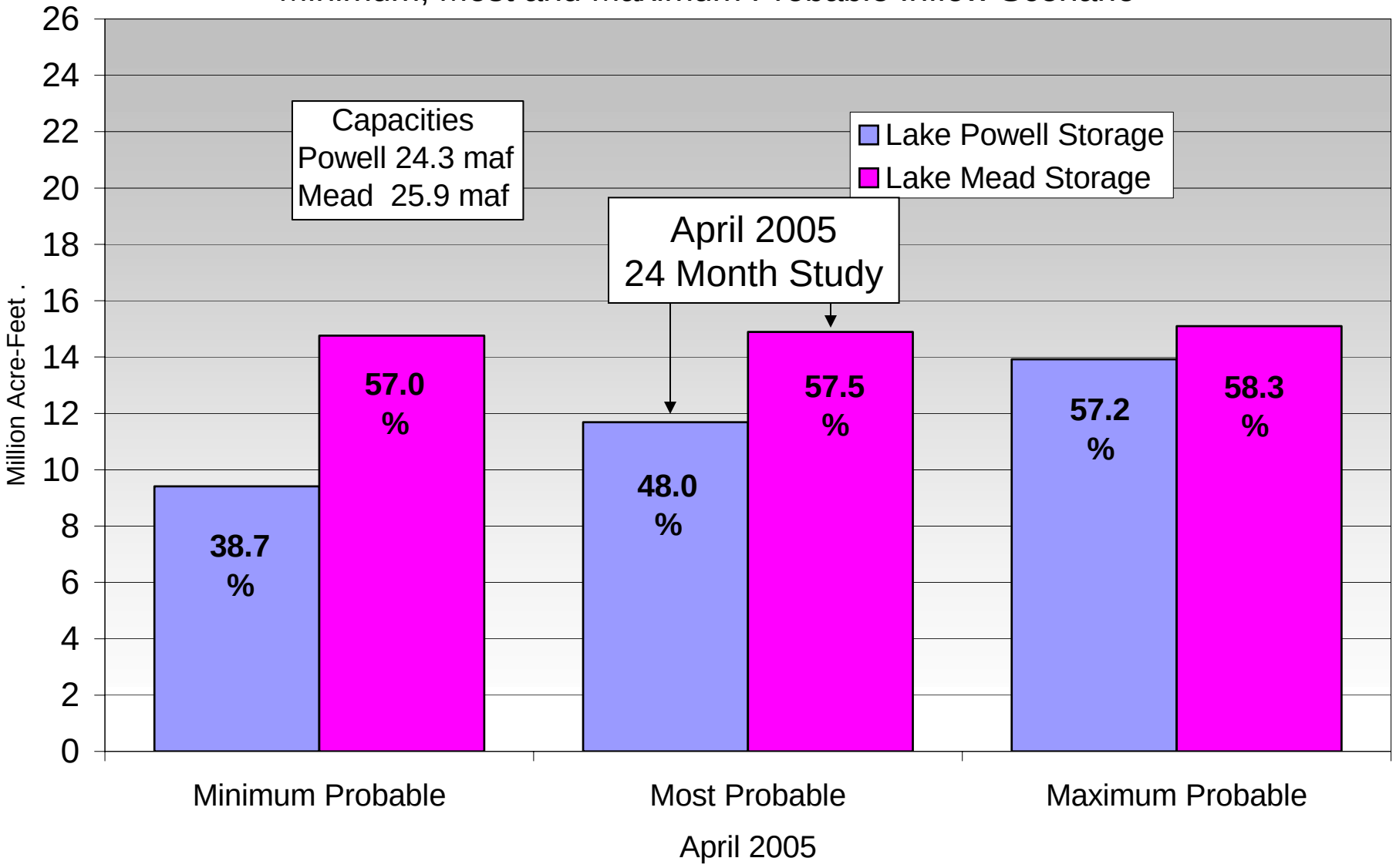
Projected Storage on September 30, 2005

Minimum, Most and Maximum Probable Inflow Scenario

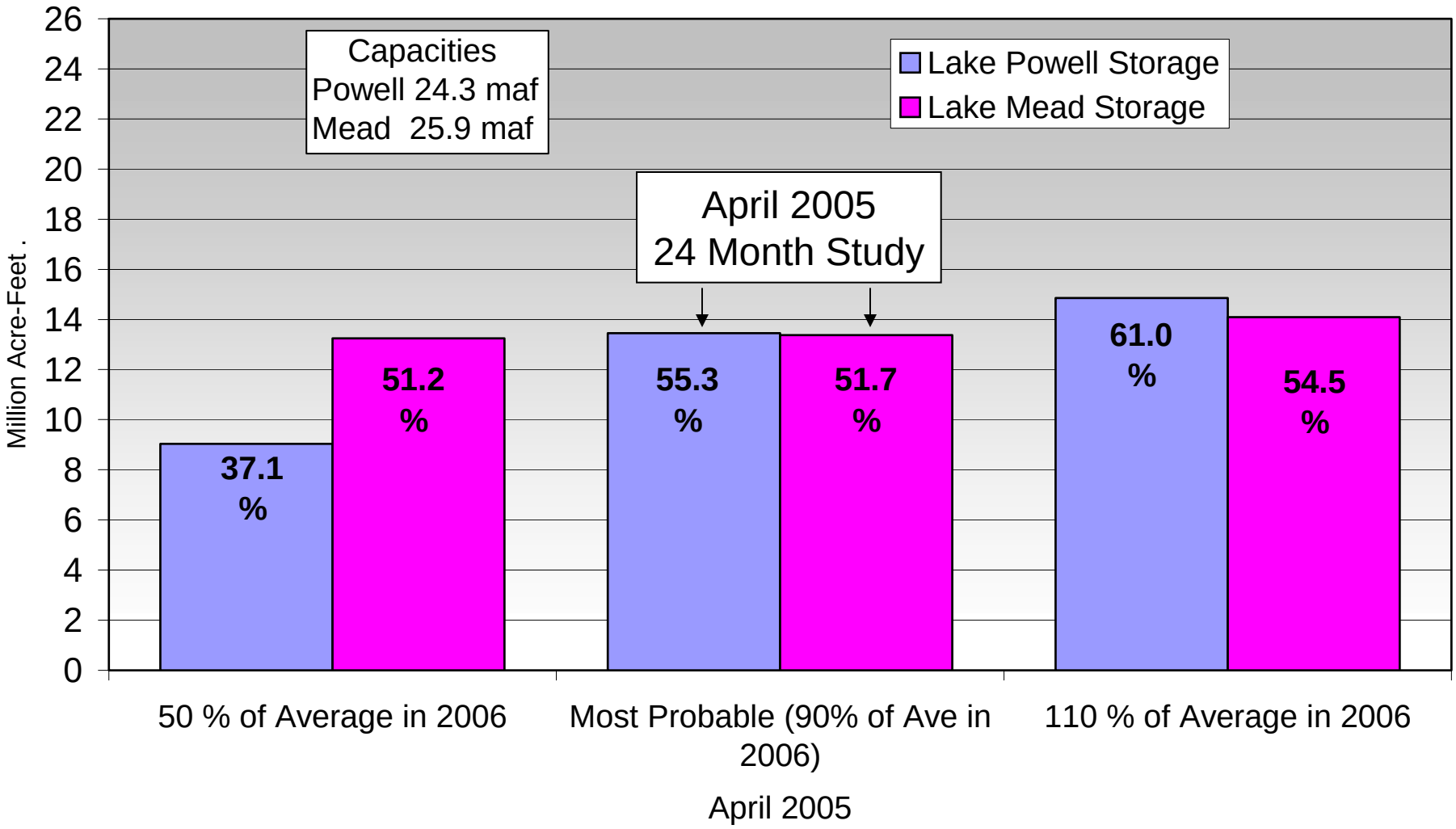


RECLAMATION

Projected Storage on September 30, 2006

Most Probable Inflow in WY 2005 (105 % of average)

Three inflow scenarios for WY 2006



April 2005

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Lower Basin Hydrology and Operations

Five Year Historic Drought

2000 - 2004

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Colorado River Basin Storage
(as of April 25, 2005)

Current Storage	Percent Full	1000 Ac-Ft	Elev. (Ft)
Lake Powell	34%	8,308	3559.80
Lake Mead	62%	15,964	1145.33
Total System Storage	53%*	31,439	NA

- Total system storage was 31,838 kaf or 54% this time last year

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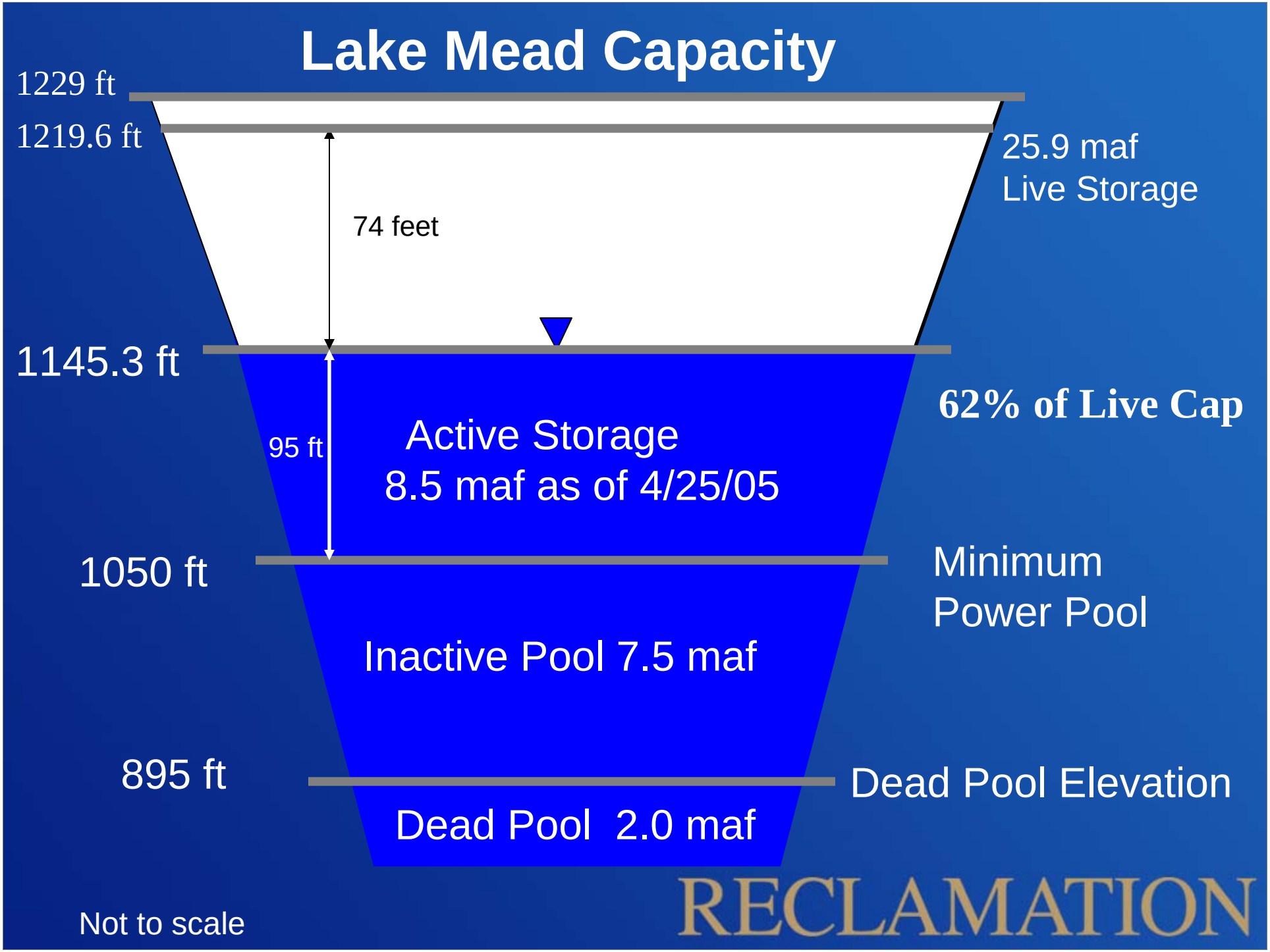
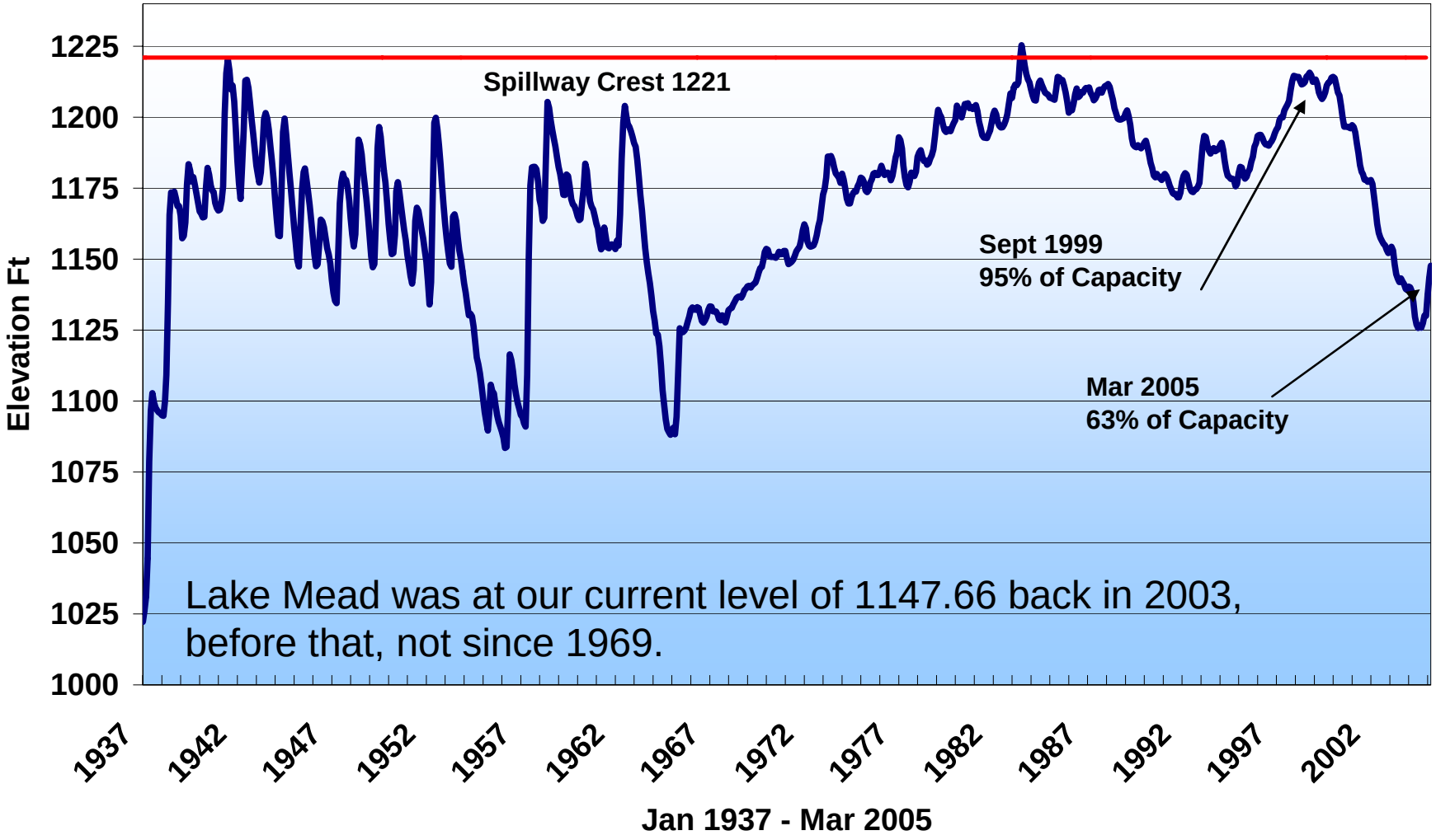
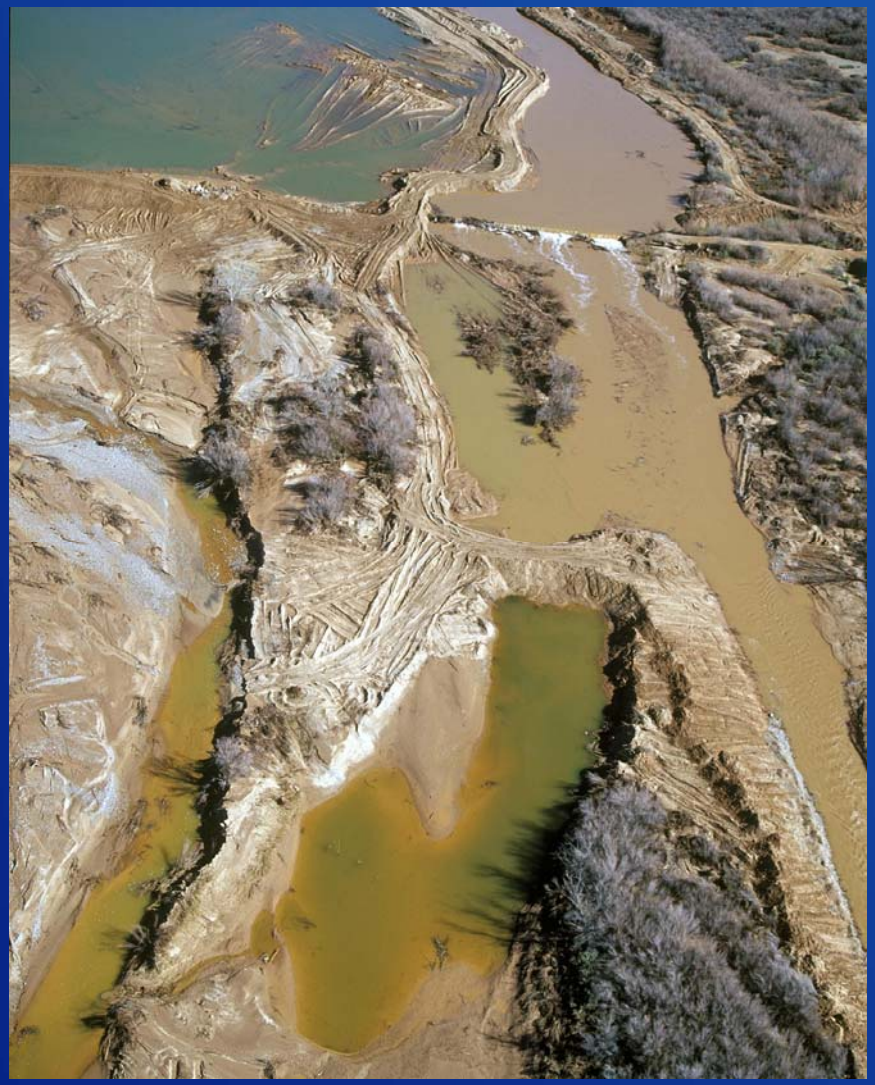

Lake Mead Capacity
1229 ft
1219.6 ft
25.9 maf
Live Storage
74 feet
1145.3 ft
62% of Live Cap
95 ft
Active Storage
8.5 maf as of 4/25/05
1050 ft
Minimum
Power Pool
Inactive Pool 7.5 maf
895 ft
Dead Pool Elevation
Dead Pool 2.0 maf
Not to scale
RECLAMATION

Lake Mead End of Month Elevation



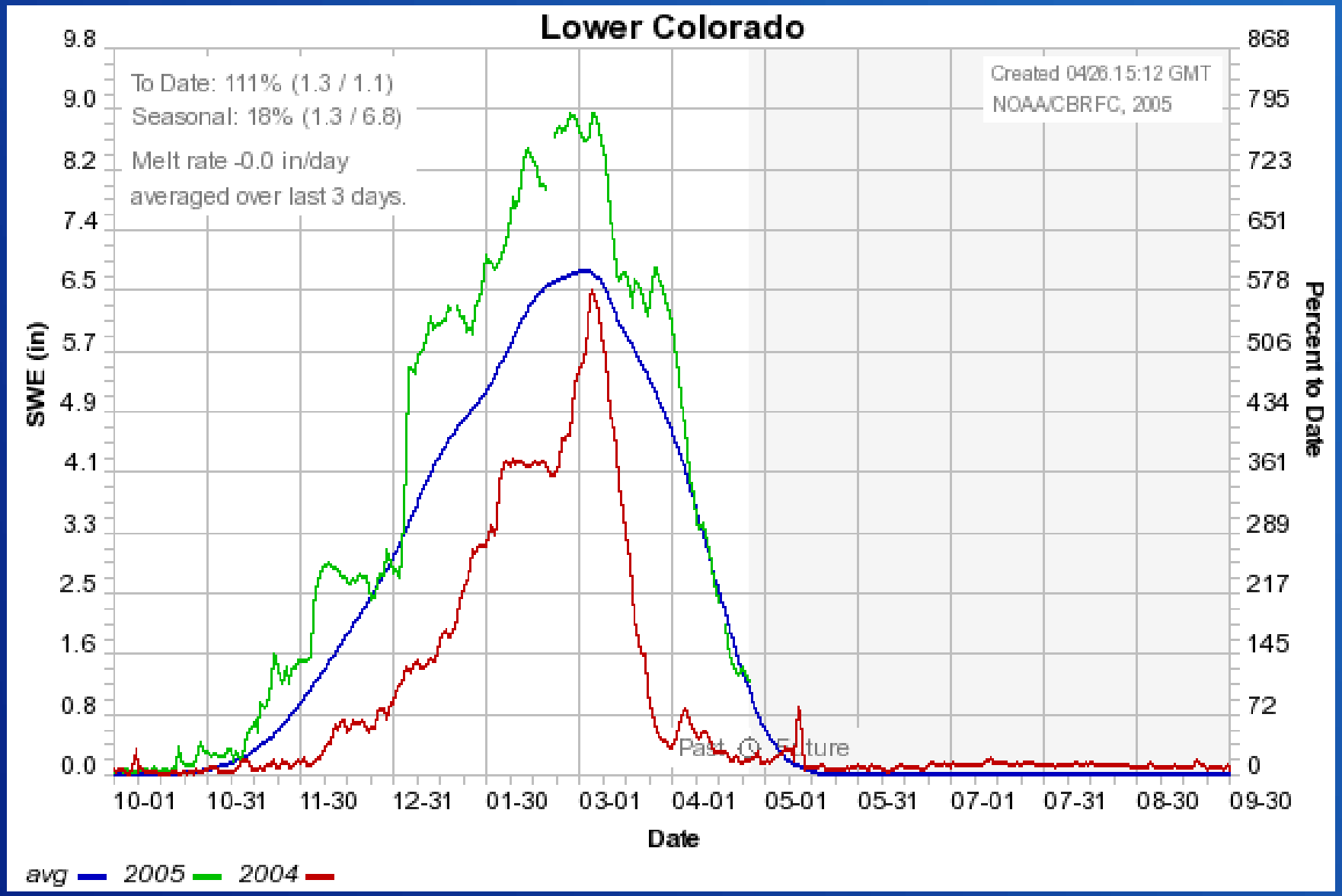
RECLAMATION

Recent Lower Basin Inflows

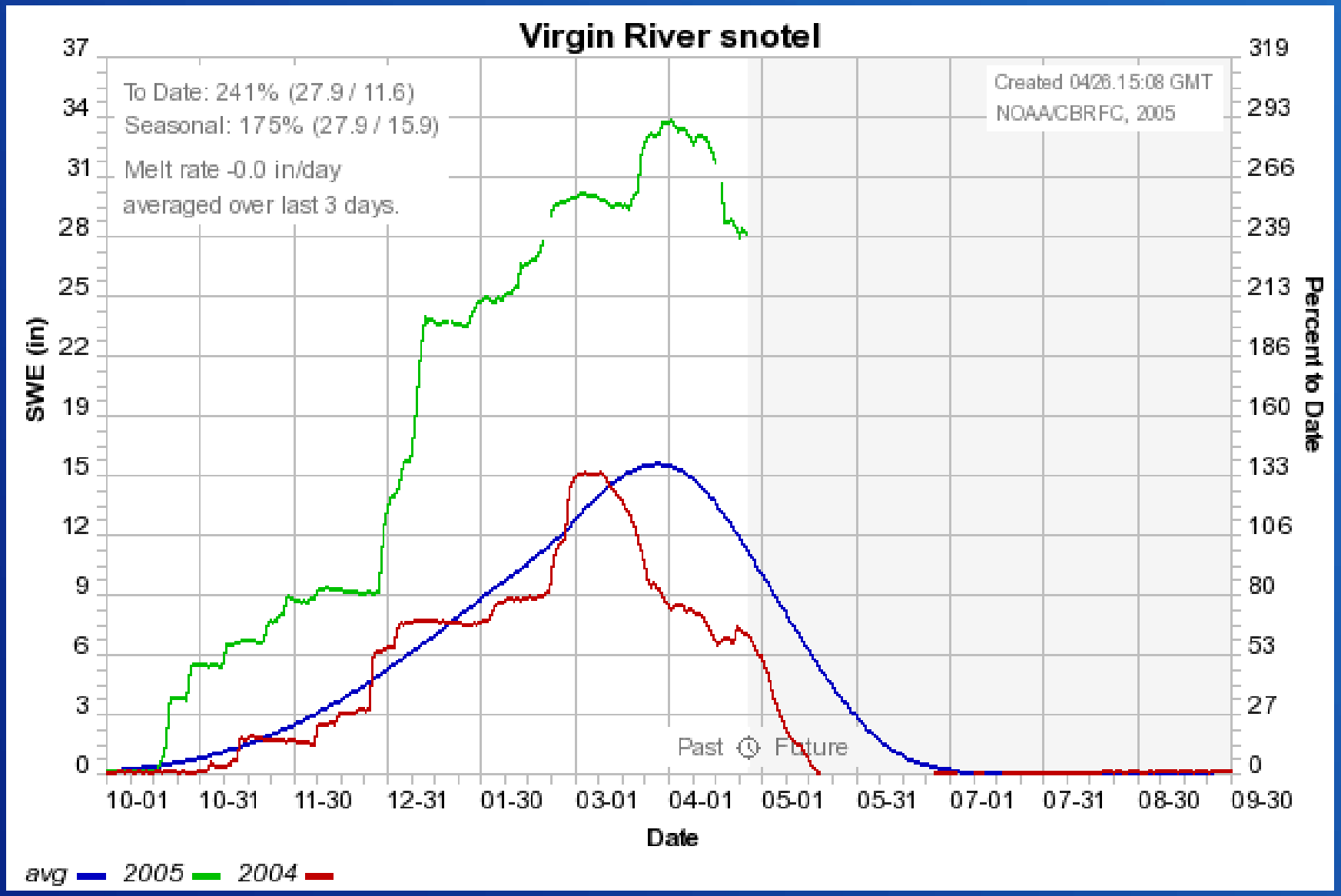


- Total LB tributary inflow (October 1 through April 22) approximately 2.07 maf
- Long-term average is 1.3 maf per year
- Total inflow projected to be approx. 2.6 maf for WY 2005
- Excess flows to Mexico (October 1 through April 22) approximately 112.9 kaf (approx. 58 kaf since January 1)

RECLAMATION



RECLAMATION



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April Operations Modeling
Lower Basin Assumptions

- Tributary Inflows (April through December)
  - Min probable 761 kaf above average[1]
  - Most probable 902 kaf above average[2]
  - Max probable 1116 kaf above average[3]

- LB states depletion totals at normal apportionments (minus payback in CA) for 2005

[1] Increase of 86 kaf from mid-month March
[2] Increase of 72 kaf from mid-month March
[3] Increase of 21 kaf from mid-month March

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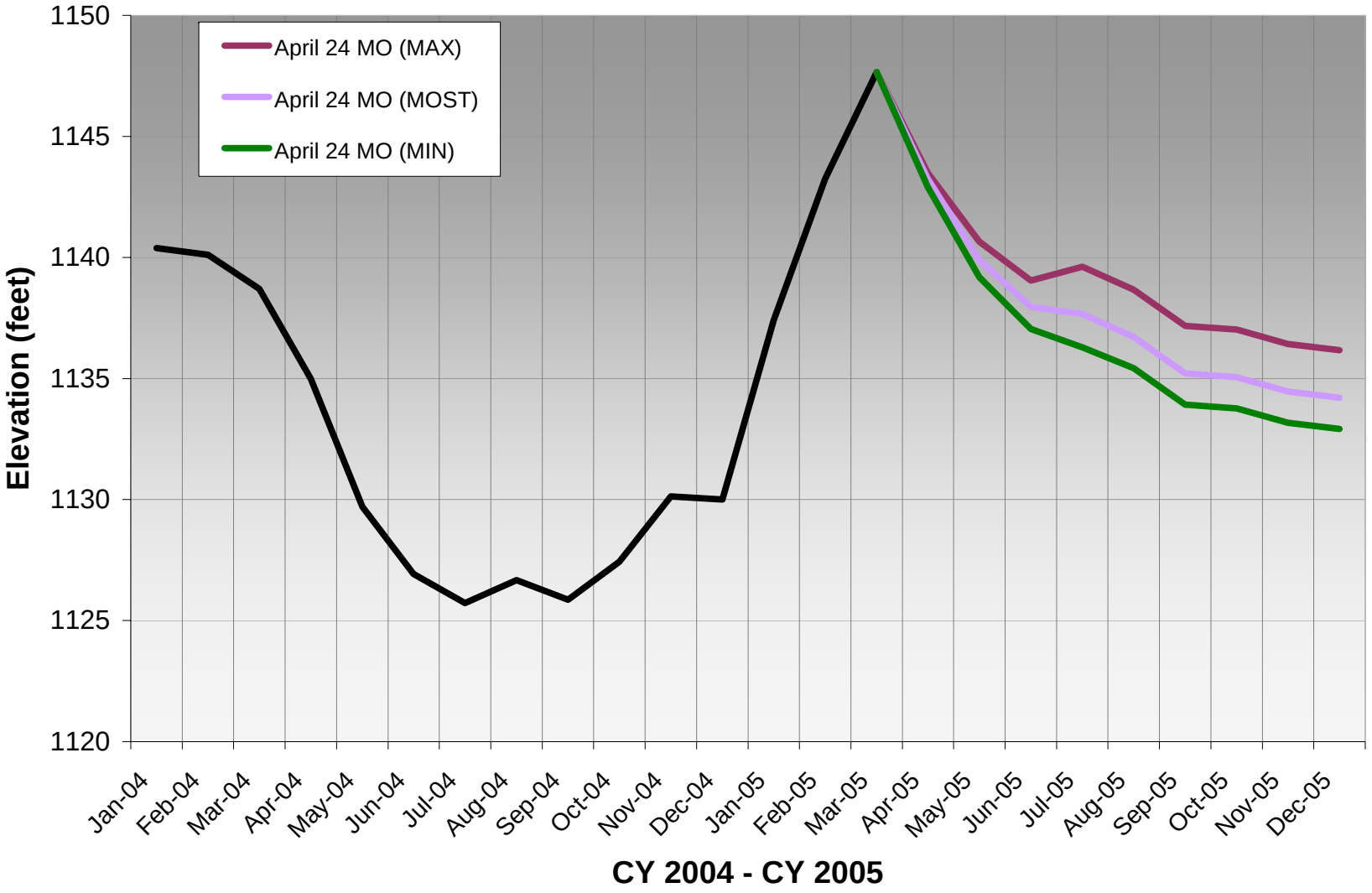
Lake Mead EOM Elevations



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Operational Modeling Scenarios

CRMWG
April 26, 2005

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Operational Modeling Scenarios

- Three scenarios:
  - April 24-month Study (8.23 maf release for WY 2005)
  - Reduction in Powell release of 200 kaf (8.03 maf release for WY 2005)
  - Reduction in Powell release of 500 kaf (7.73 maf released for WY 2005)
- Purpose:
  - Provide information to the CRMWG with regard to the hydrologic effects at Lakes Powell and Mead of a range of Lake Powell releases in WY 2005
  - Facilitate discussion/comments from the CRMWG

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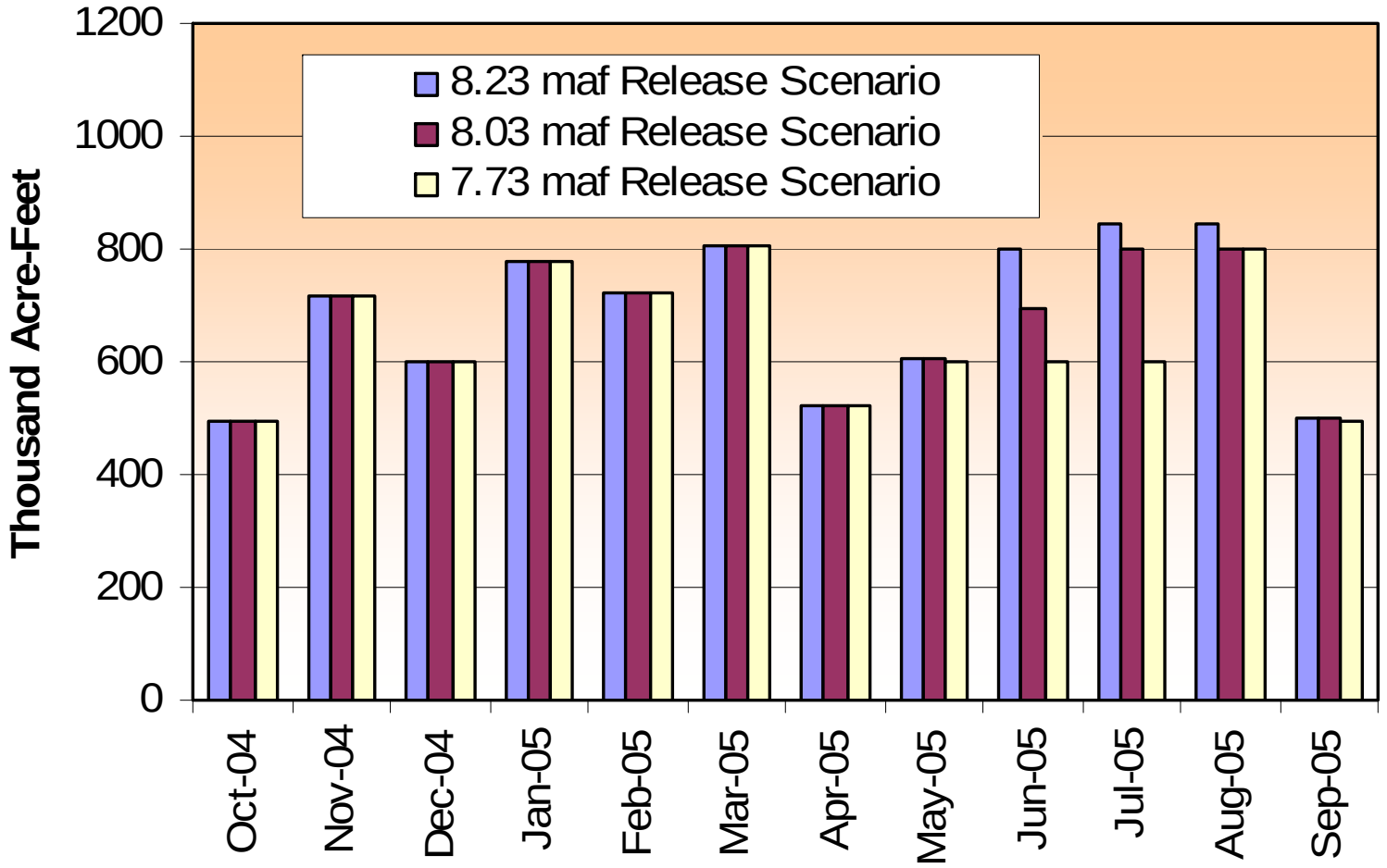
Operational Modeling Scenarios

- Assumptions:
  - All scenarios assume most probable inflow for 2005 and 2006
  - All scenarios assume 8.23 maf release from Lake Powell in WY 2006
  - All scenarios assume a Partial Domestic Surplus condition in CY 2006

2005 Lake Powell Release Scenarios



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2005 Glen Canyon Release Scenarios
2005 Reductions to Releases from May through September

	April 24-mo Study kaf	200 kaf Red. kaf	500 kaf Red. kaf	
Oct-04	493	493	493	
Nov-04	716	716	716	
Dec-04	599	599	599	
Jan-05	777	777	777	
Feb-05	720	720	720	
Mar-05	803	803	803	
Apr-05	525	525	525	4633 kaf (through April)
May-05	605	605	600	
Jun-05	800	692	600	
Jul-05	846	800	600	
Aug-05	846	800	800	
Sep-05	500	500	497	
Total	**8230**	**8030**	**7730**	

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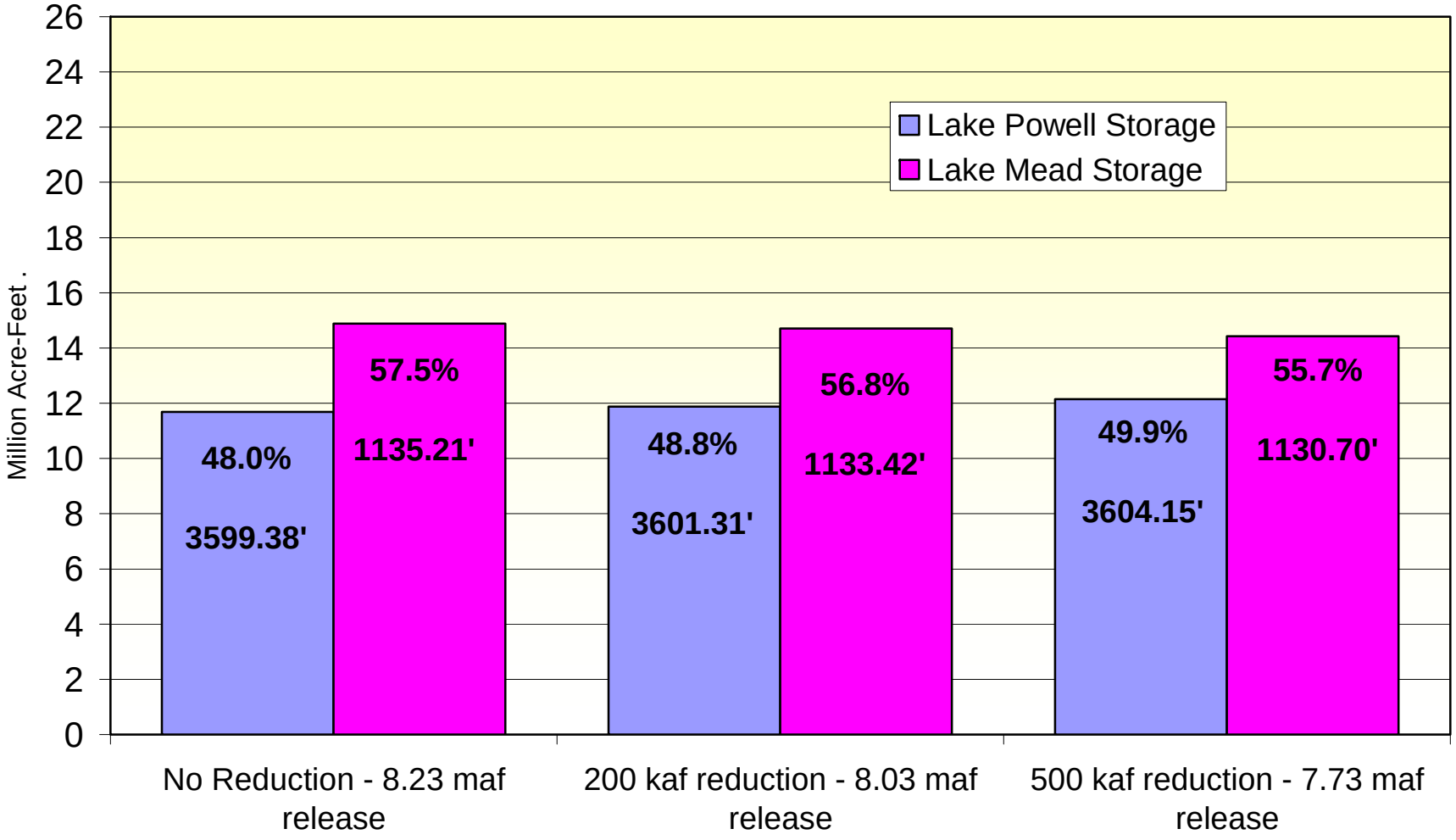
Projected Storage on 9/30/2005

Most Probable Inflow with three Lake Powell Release Scenarios



Based on April 2005 24 Month Study

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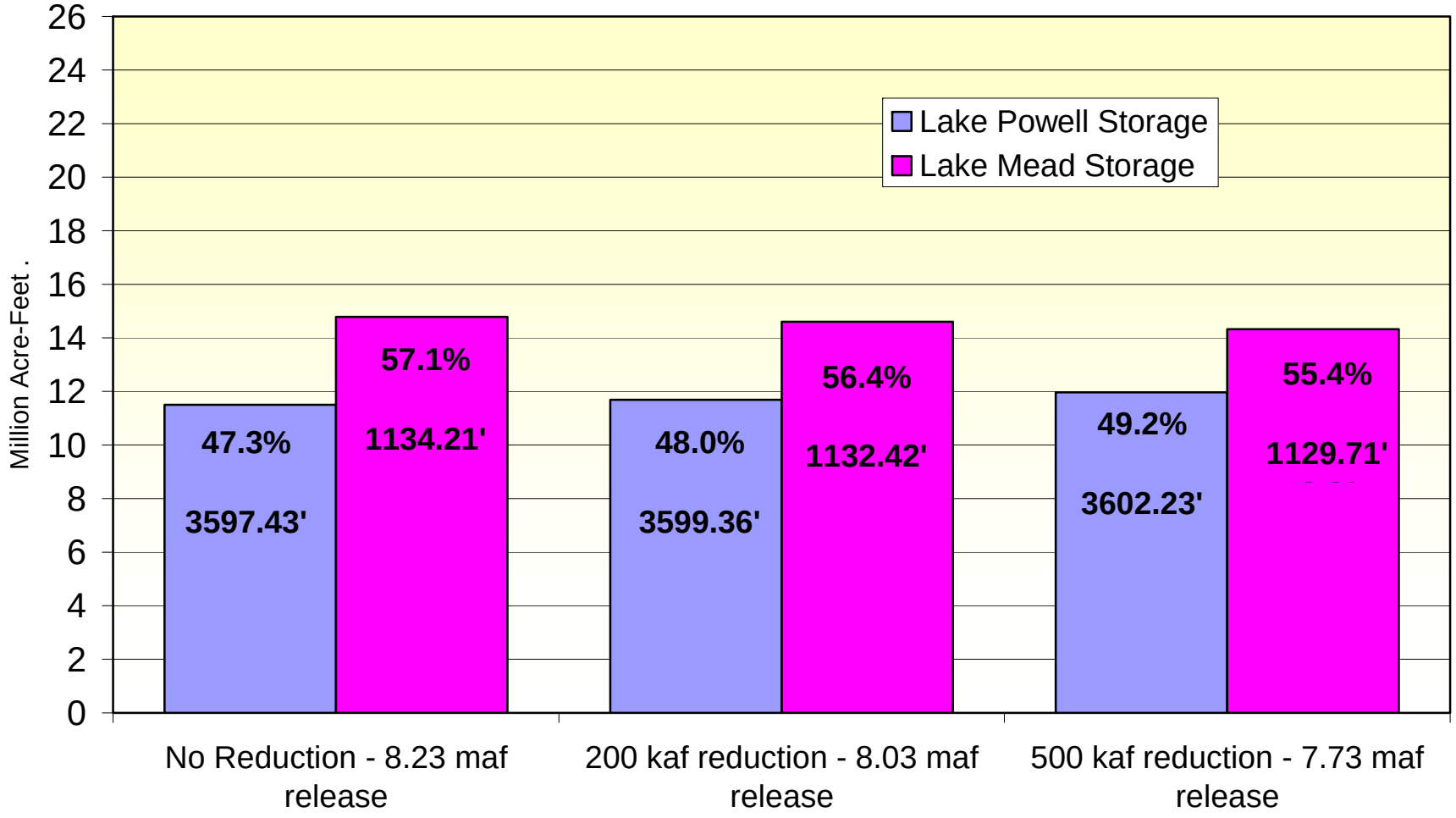
Projected Storage on 12/31/2005

Most Probable Inflow with three Lake Powell Release Scenarios



April 2005 Projections

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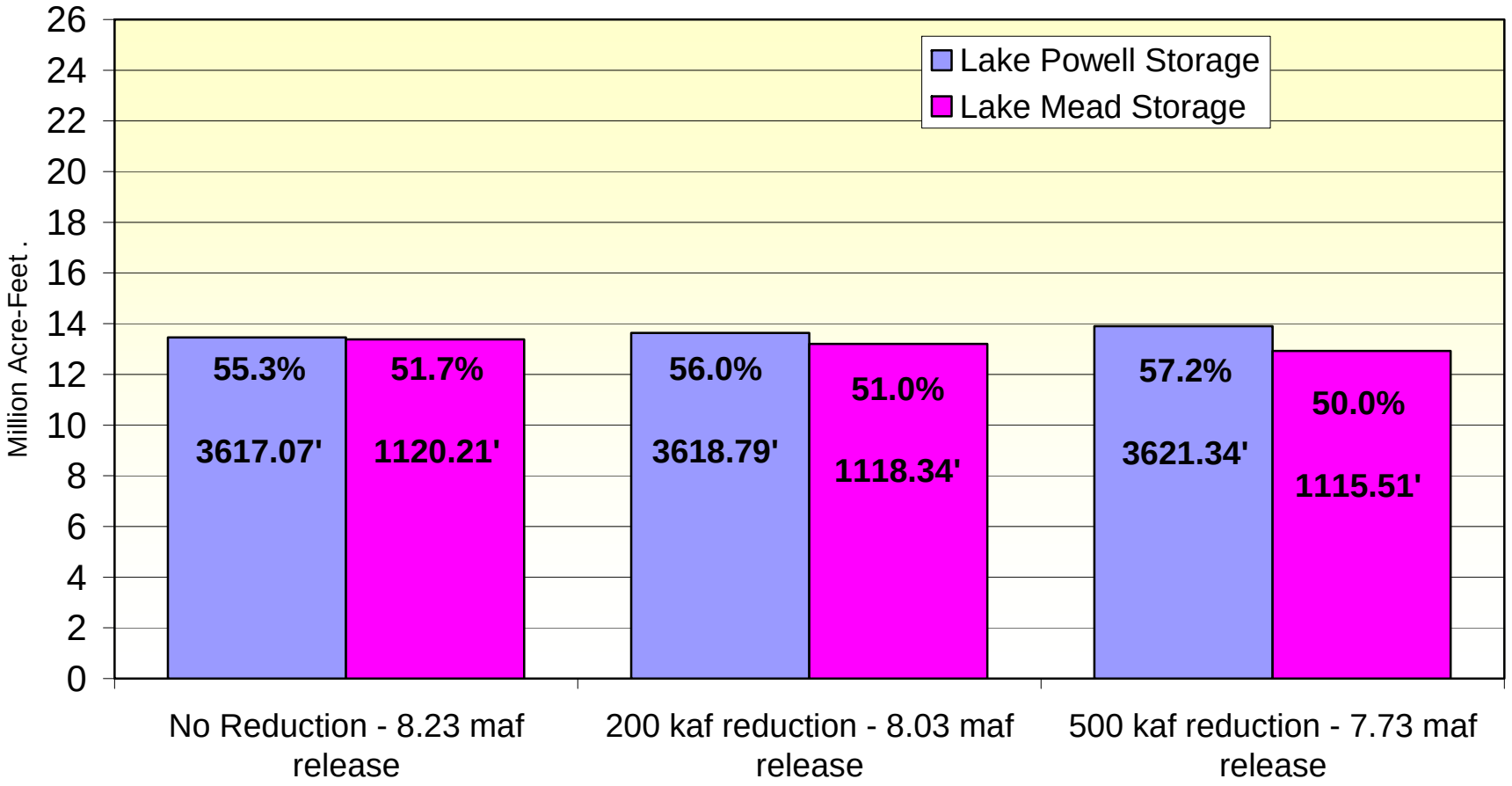
Projected Storage on 9/30/2006

Most Probable Inflow with three Lake Powell Release Scenarios



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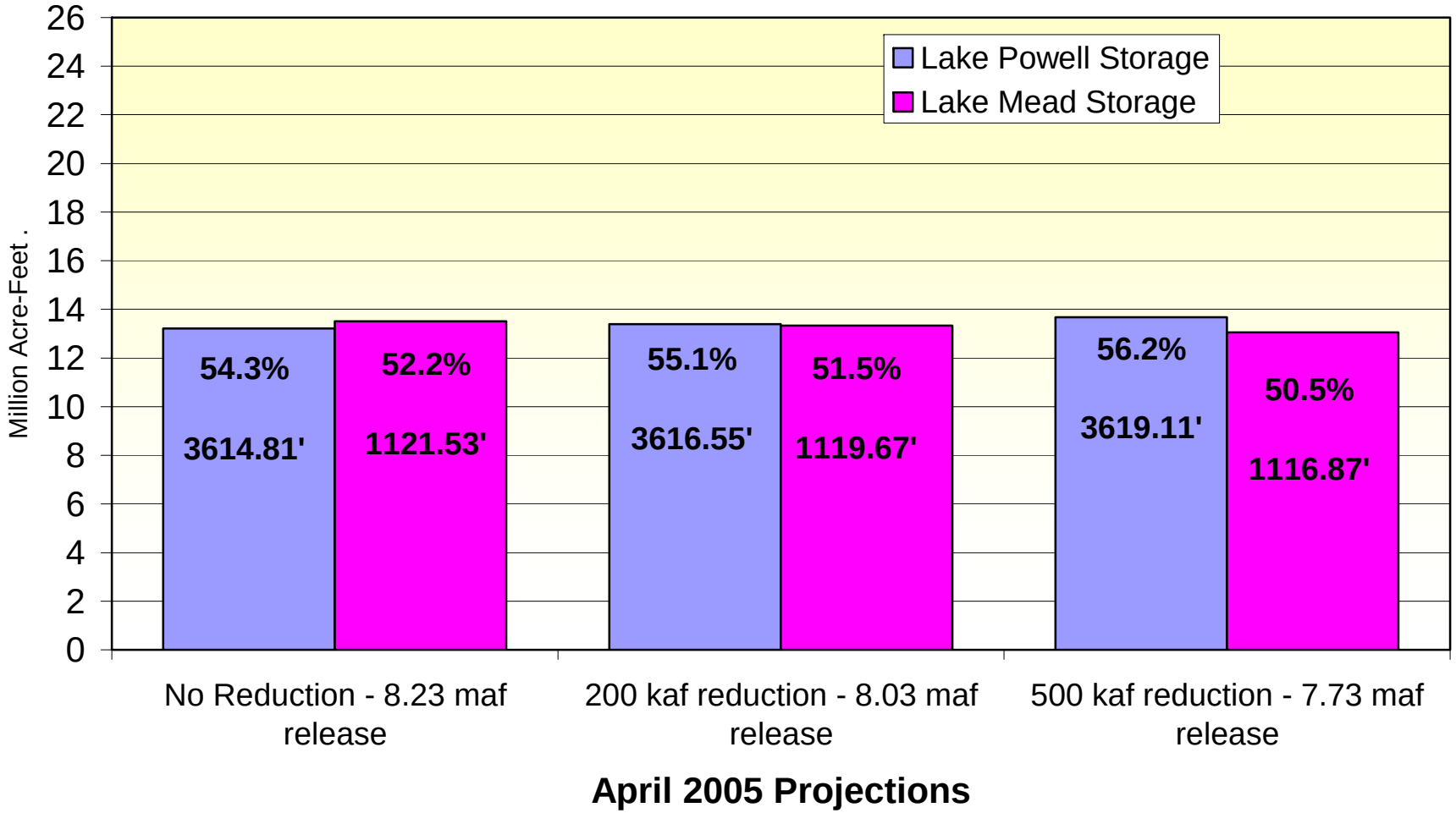

April 2005 Projections

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