

RECLAMATION

Managing Water in the West

The Colorado River: Operation and Current Conditions

June 9, 2008



U.S. Department of the Interior
Bureau of Reclamation

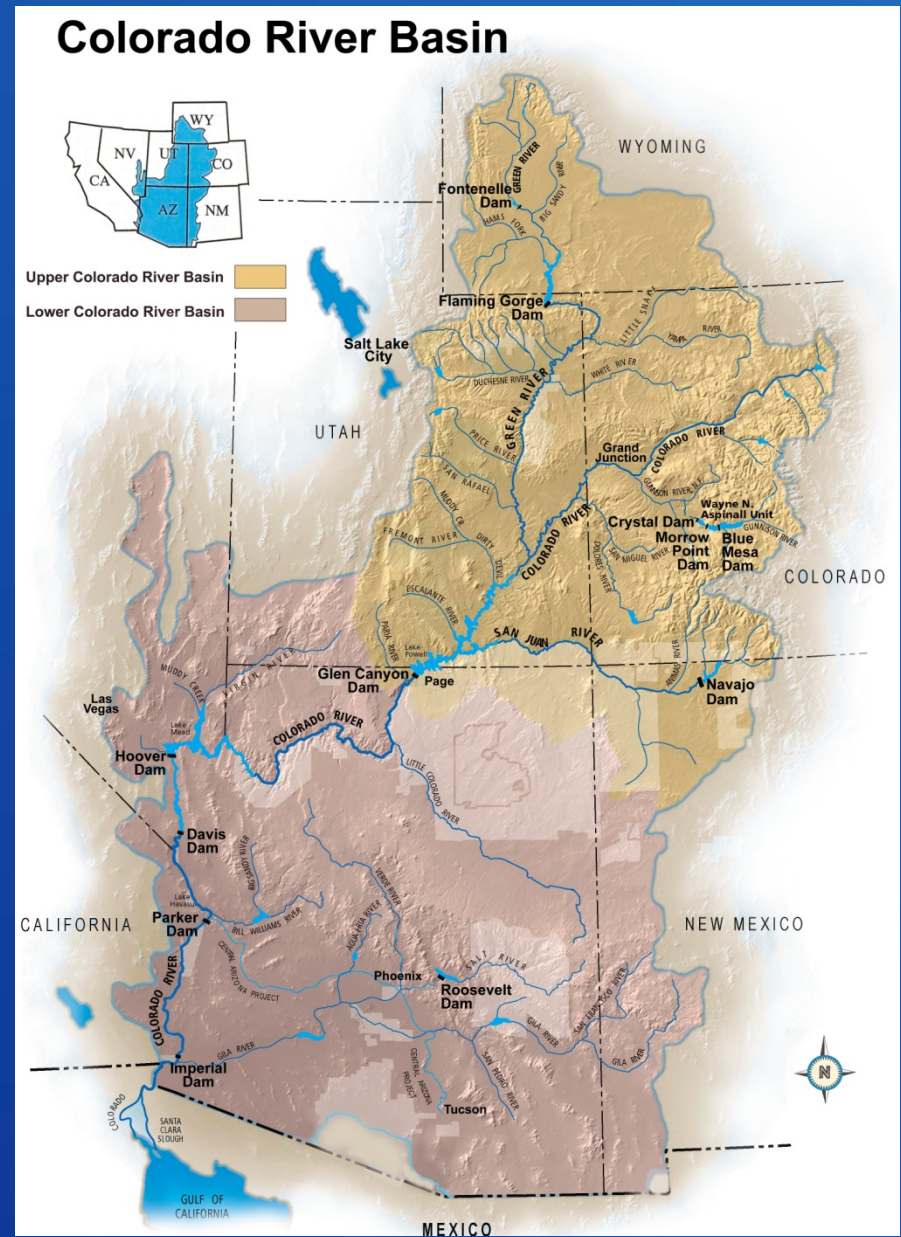
The Colorado River: Operation and Current Conditions

- Overview of Basin
- Overview of the Interim Guidelines
- Current and Projected System Conditions

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Colorado River Basin Hydrology

- 16.5 million acre-feet (maf) allocated annually
- 13 to 14.5 maf of consumptive use annually
- 60 maf of storage
- 15.1 maf average annual “natural” inflow into Lake Powell over past 100 years
- Inflows are highly variable year-to-year



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Lake Mead



Hoover Dam

Lake Mohave



Davis Dam

Lake Havasu



Parker Dam

Yuma

Lower Basin Colorado River Management Objectives

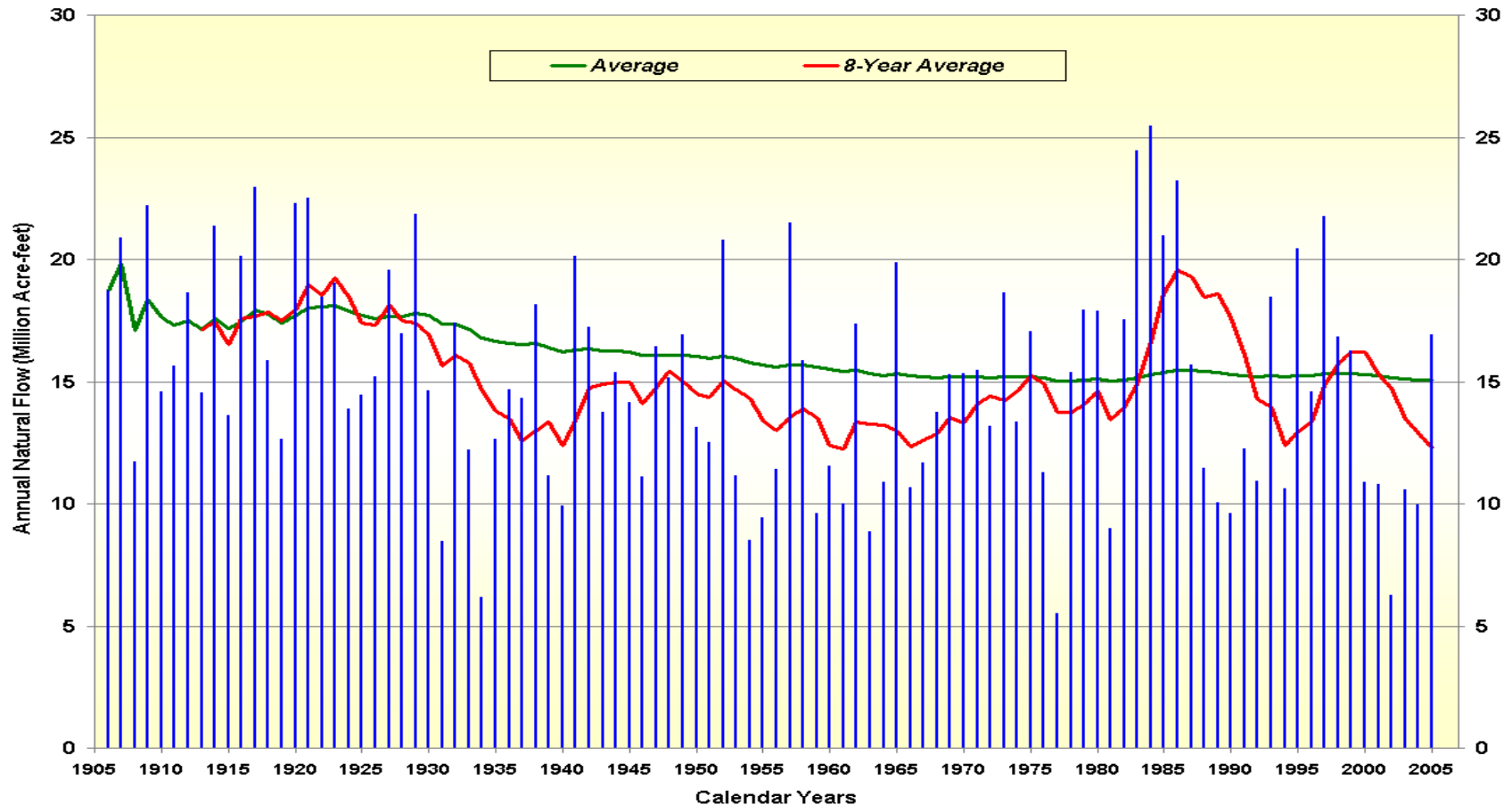
- Provide flood control and river regulation
- Meet water demands
- Generate hydropower
- Enhance and maintain ecosystem habitat
- Recover and protect endangered species
- Provide recreation

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Natural Flow

Colorado River at Lees Ferry Gaging Station, Arizona

Calendar Year 1906 to 2005



Provisional data, subject to change

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State of the System (1999-2008)

| WY | Unregulated inflow into Powell % of Average | Powell and Mead Storage, maf | Powell and Mead % Capacity |
|-------|---|---------------------------------|-------------------------------|
| 1999 | 109 | 47.59 | 95 |
| 2000 | 62 | 43.38 | 86 |
| 2001 | 59 | 39.01 | 78 |
| 2002 | 25 | 31.56 | 63 |
| 2003 | 52 | 27.73 | 55 |
| 2004 | 49 | 23.11 | 46 |
| 2005 | 104 | 27.24 | 54 |
| 2006 | 72 | 25.80 | 51 |
| 2007 | 68 | 24.43 | 49 |
| *2008 | 107 | 27.04 | 54 |

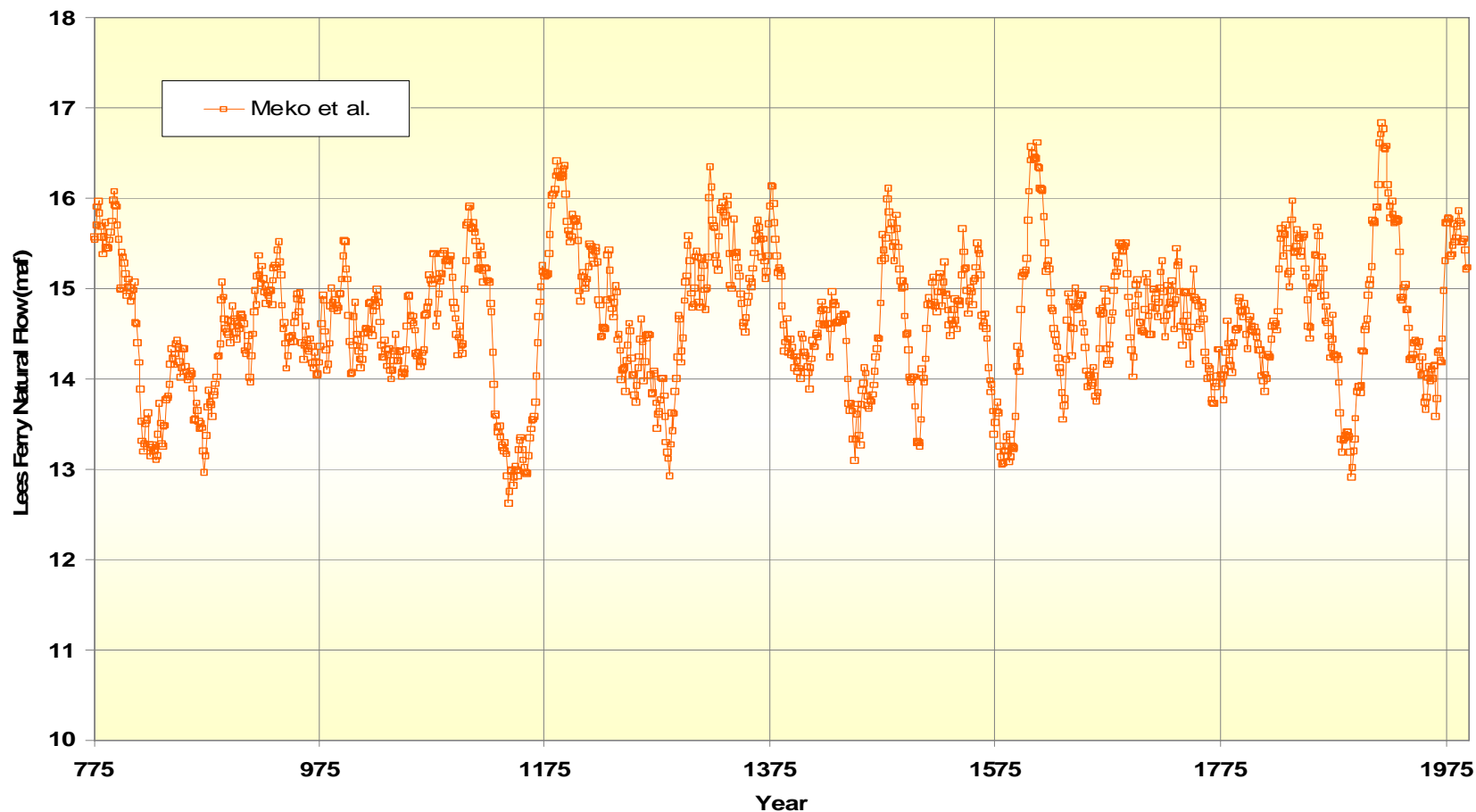
* Based on May 24 Month Study

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Colorado River Drought

- 2000-2007 was the driest 8-year period in the 100-year historical record
- Tree-ring reconstructions show more severe droughts have occurred over the past 1200 years (e.g., drought in the mid 1100's)
- Projected 2008 April through July runoff forecast 116% of average (as of June 4, 2008)
- Not unusual to have a few years of above average inflow during longer-term droughts (e.g., the 1950's)

Annual Natural Flow at Lees Ferry Tree-ring Reconstruction (Meko et al., 2007) 25-Year Running Mean



2008 Upper Colorado Projected Apr–Jul Inflow

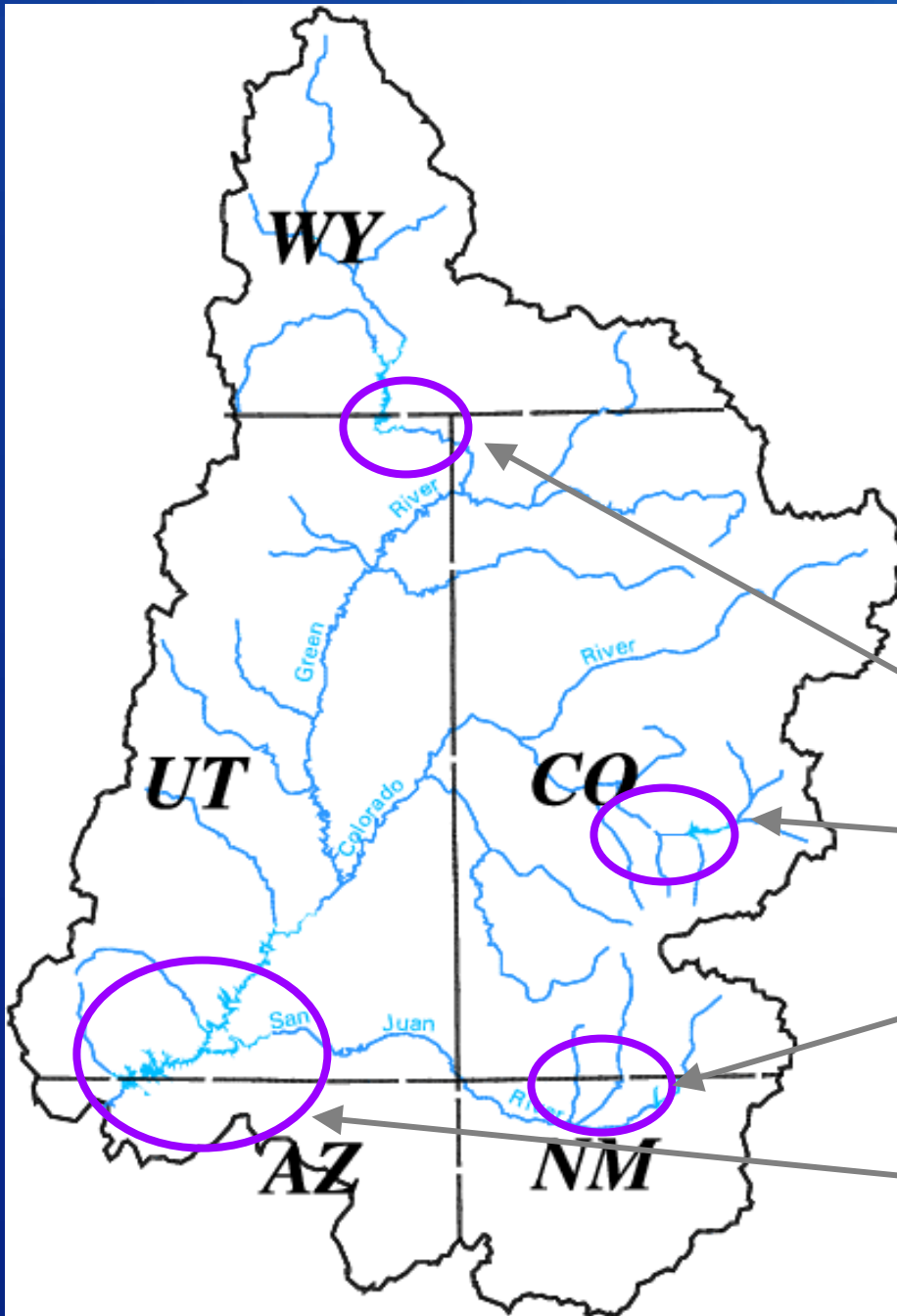
Flaming Gorge – 66%

Blue Mesa – 156%

Navajo – 131%

Lake Powell – 116%

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Impetus for the Interim Guidelines



- Eight years of unprecedented drought
- Increased water use
- To date, there has never been a shortage in the Lower Basin and there were no shortage guidelines
- Operations between Lake Powell and Lake Mead were coordinated only at the higher reservoir levels (“equalization”)

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Interim Guidelines¹ - A Robust Solution

- Operations specified through the full range of operation for Lake Powell and Lake Mead
- Encourage efficient and flexible use and management of Colorado River water through the ICS mechanism
- Strategy for shortages in the Lower Basin, including a provision for additional shortages if warranted²
- In place for an interim period (through 2026) to gain valuable operational experience
- Basin States agree to consult before resorting to litigation

1. Issued in Record of Decision, dated December 13, 2007; available at <http://www.usbr.gov/lc/region/programs/strategies.html>

2. Mexico water deliveries are not directly effected by these guidelines

Lake Powell & Lake Mead Operational Diagrams

| Lake Powell Elevation (feet) | Lake Powell Operational Tiers | Lake Powell Storage (maf) | Lake Mead Elevation (feet) | Lake Mead | Lake Mead Storage (maf) |
|------------------------------|--|----------------------------|----------------------------|--|-------------------------|
| 3,700 | Equalization Tier Equalize, Avoid Spills or Release 8.23 maf | 24.3 | 1,220 | Flood Control or 70R Surplus | 25.9 |
| 3,636 - 3,666 (2008 2026) | | 15.5 - 19.3 (2008 2026) | 1,200 | | 22.9 |
| | Upper Elevation Balancing Tier¹ Release 8.23 maf; if Lake Mead < 1,075 feet, balance contents with a min/max release of 7.0 and 9.0 maf | 11.3 | 1,145 | Domestic Surplus | 15.9 |
| 3,595 | | 9.5 | 1,125 | Normal Operations | 13.9 |
| 3,575 | | 8.3 | 1,100 | | 11.5 |
| 3,560 | Mid-Elevation Release Tier Release 7.48 maf; if Lake Mead < 1,025 feet, release 8.23 maf | 5.9 | 1,075 | | 9.4 |
| 3,525 | | 4.0 | 1,050 | Shortage 333 kaf² | 7.5 |
| 3,490 | Lower Elevation Balancing Tier Balance contents with a min/max release of 7.0 and 9.5 maf | 0 | 1,025 | Shortage 417kaf² | 5.8 |
| 3,370 | | | 1,000 | Shortage 500 kaf² and Consultation³ | 4.3 |
| | | | 895 | | 0 |

¹ Subject to April adjustments that may result in balancing releases or releases according to the Equalization Tier.

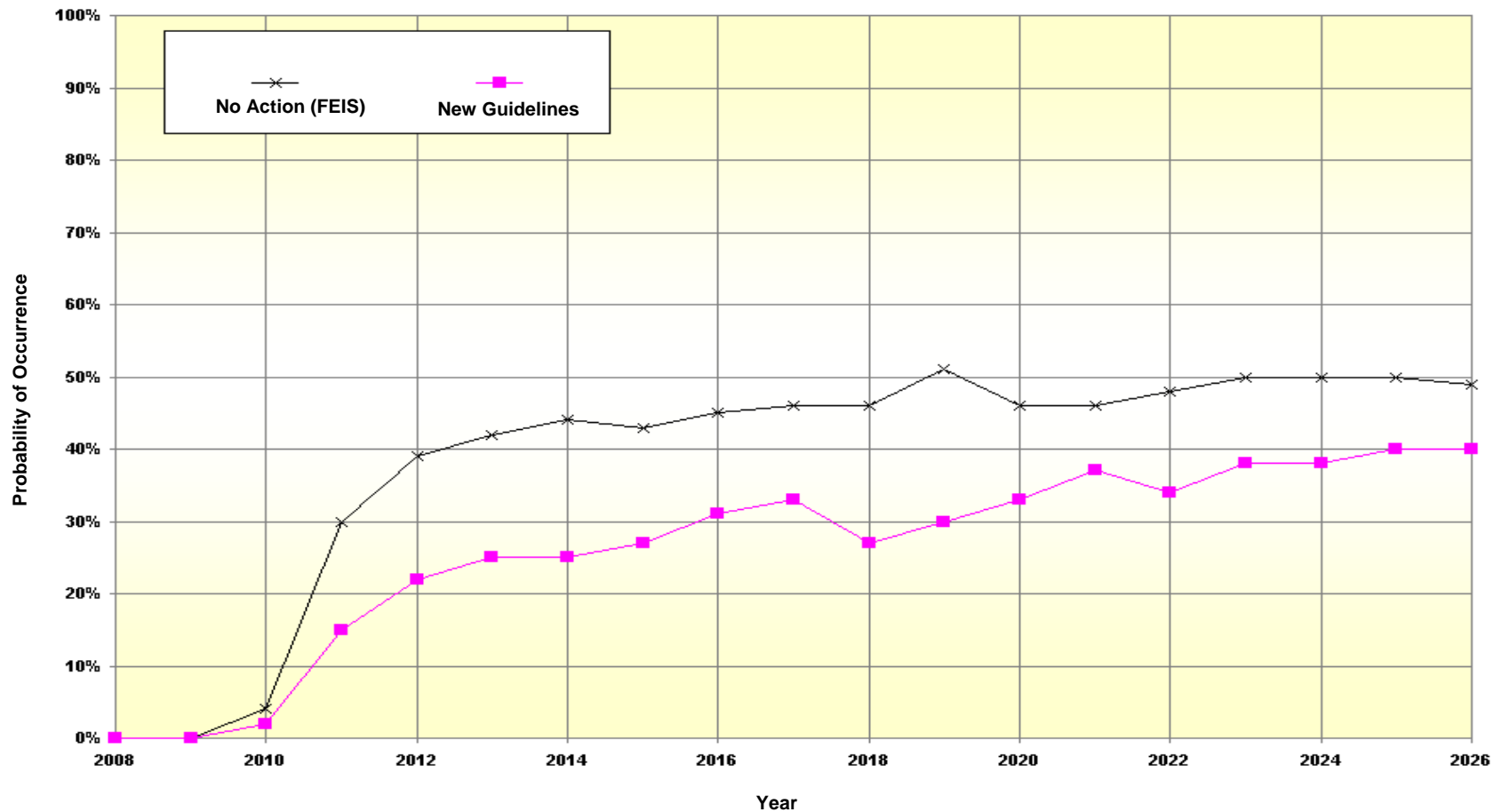
² These are amounts of shortage (i.e., reduced deliveries in the United States).

³ If Lake Mead falls below elevation 1,025 ft msl, the Department will initiate efforts to develop additional guidelines for shortages at lower Lake Mead elevations.

Lower Basin Shortages

No Action (FEIS) & New Interim Guidelines

Probability of Occurrence of Any Amount



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Colorado River Basin Storage

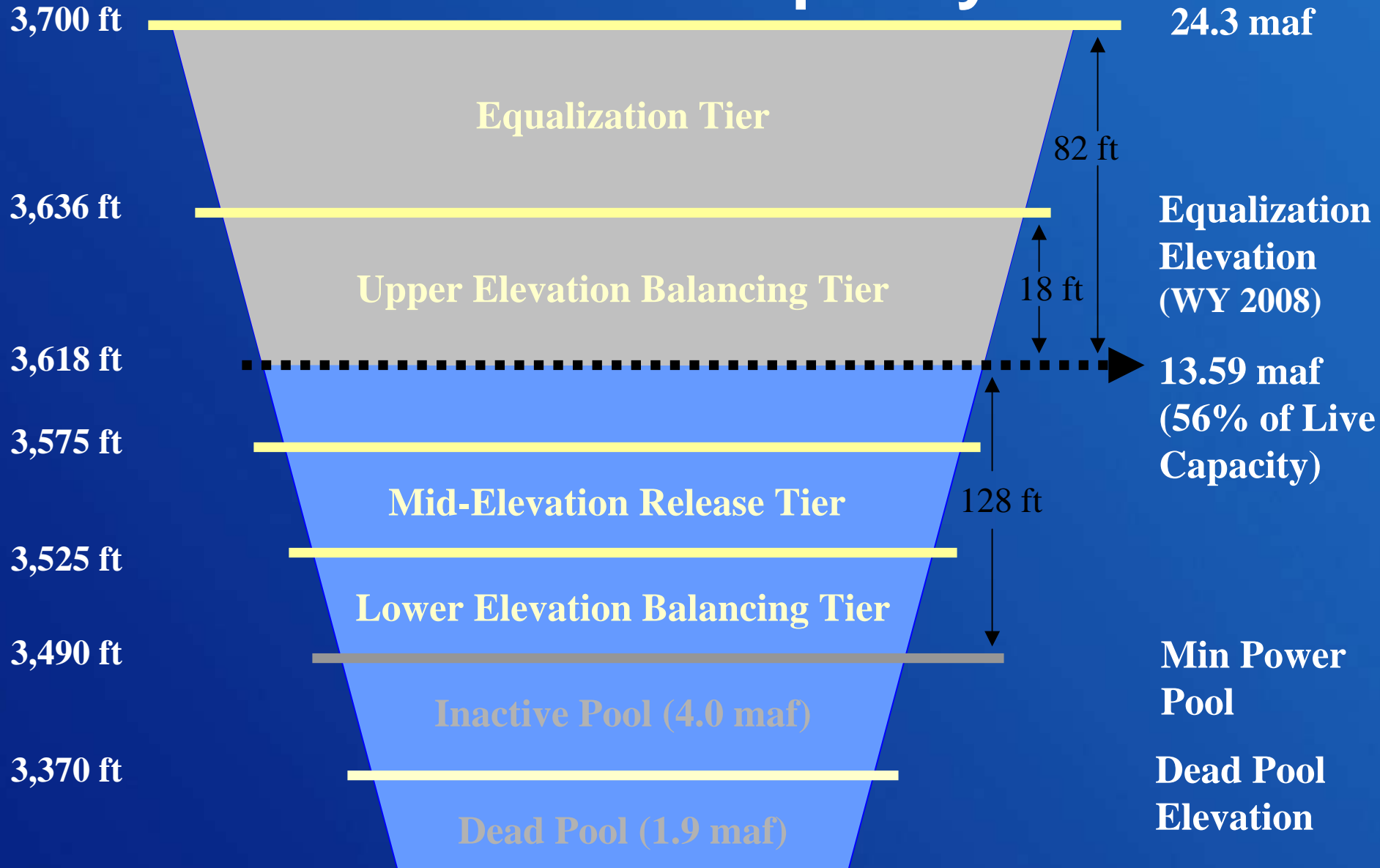
(as of June 8, 2008)

| Current Storage | Percent Full | MAF | Elevation (Feet) |
|----------------------|--------------|-------|------------------|
| Lake Powell | 56% | 13.59 | 3618 |
| Lake Mead | 47% | 12.06 | 1106 |
| Total System Storage | 56%* | 33.13 | NA |

***Total system storage was 33.78 maf or 57% this time last year**

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Lake Powell Capacity

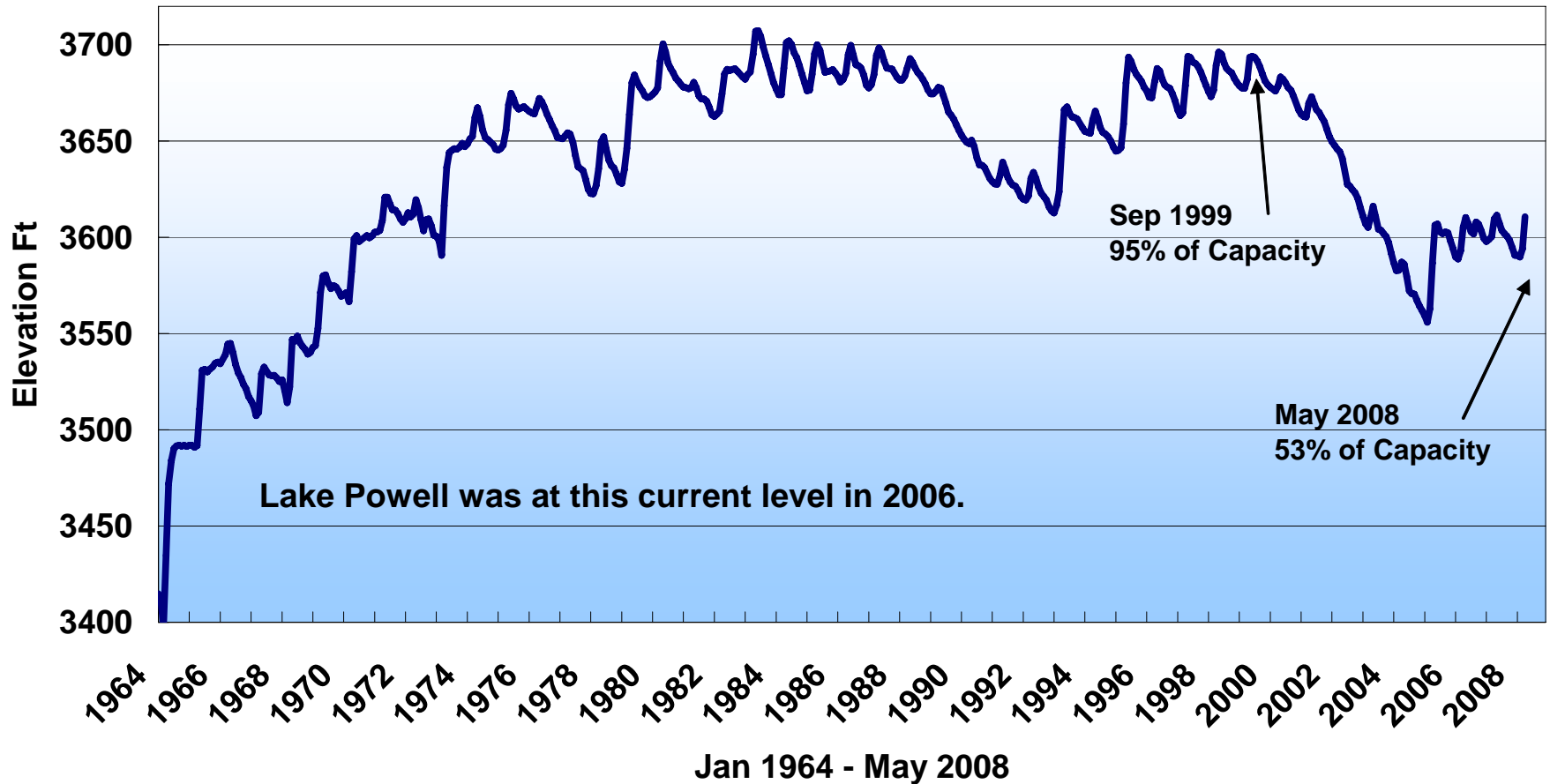


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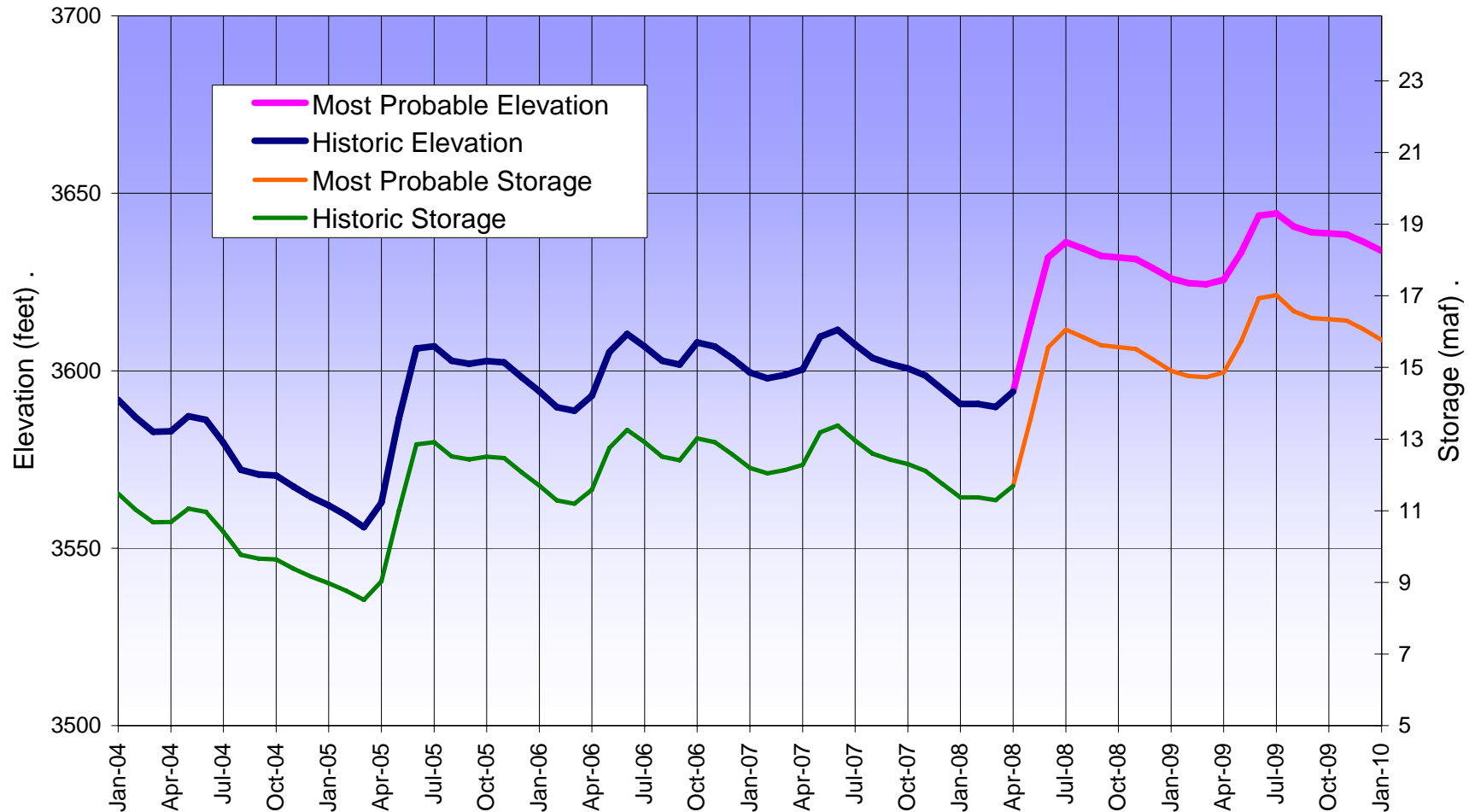
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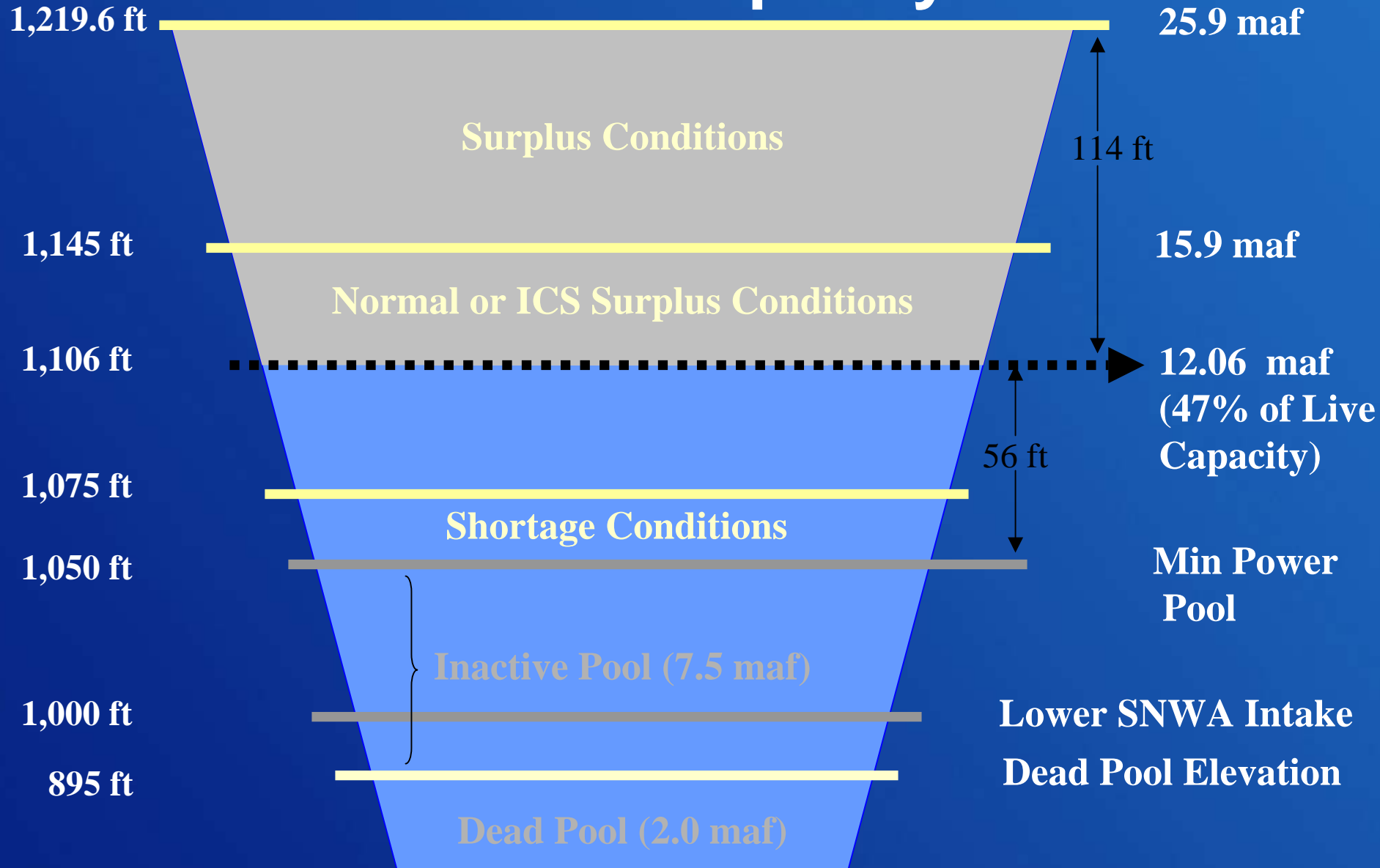
Lake Powell End of Month Elevation 1964 through Present



Lake Powell Projected EOM Water Surface Elevation and Storage May 24 Month Study



Lake Mead Capacity

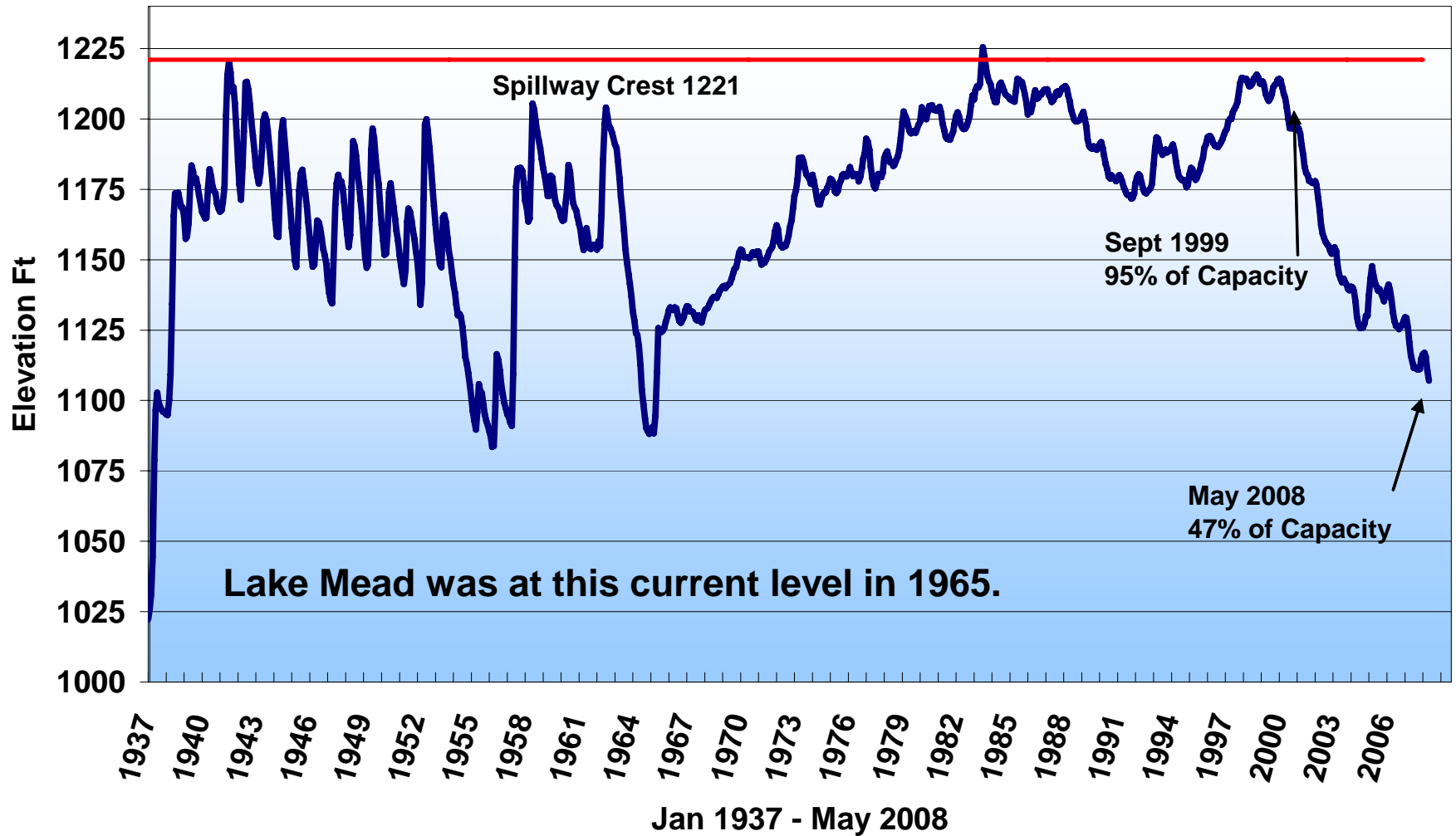


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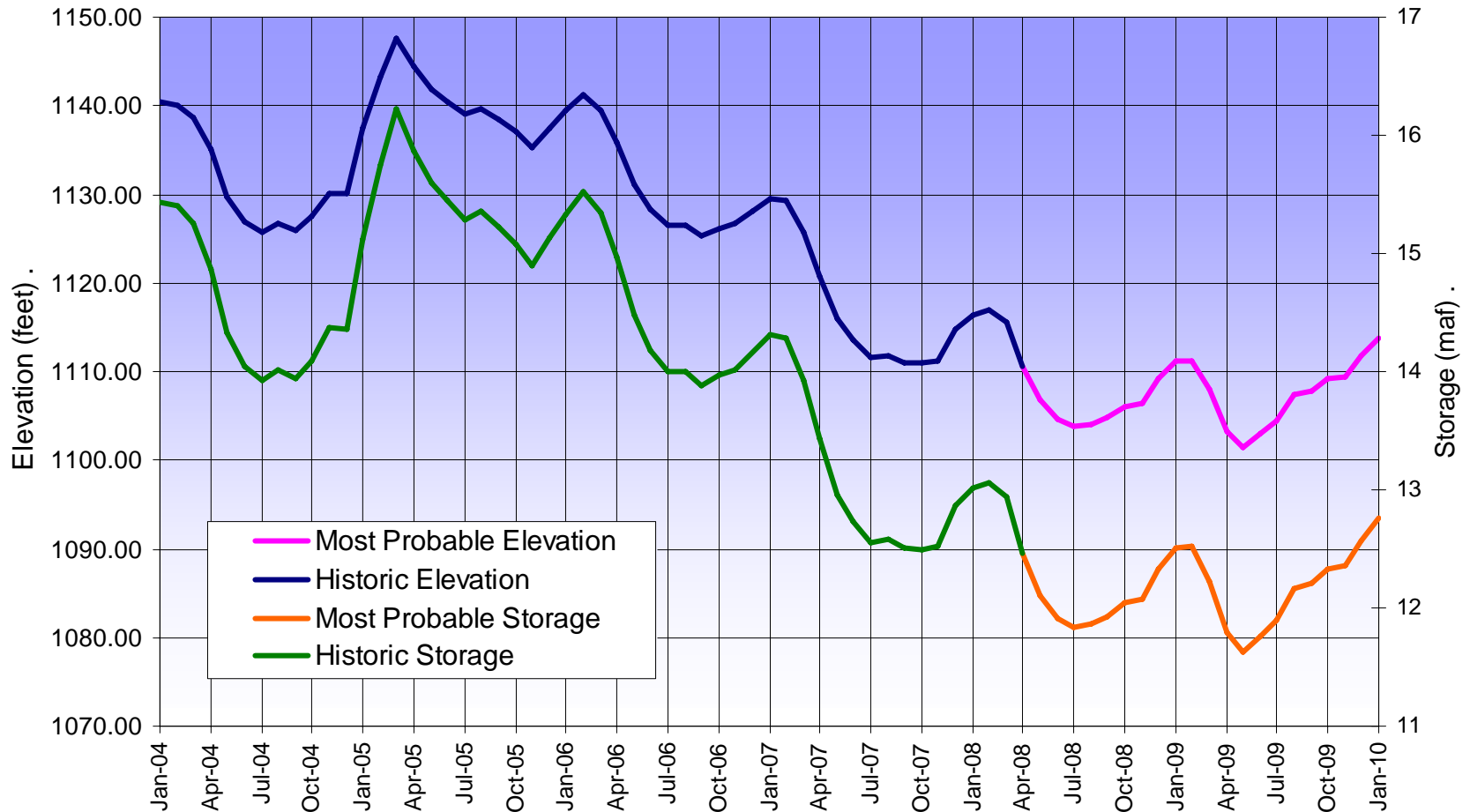
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Lake Mead End of Month Elevation



Lake Mead Projected EOM Water Surface Elevation and Storage May 24 Month Study



An aerial photograph of a large concrete dam with a curved crest, situated in a deep, arid canyon. The reservoir behind the dam is a vibrant blue-green color, contrasting with the brown, rocky terrain. Several spillways are visible on the right side of the dam. A winding road and some buildings are located on the left side of the dam. The background shows steep, rugged mountains under a clear sky.

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• For further information:
<http://www.usbr.gov/lc/region>

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