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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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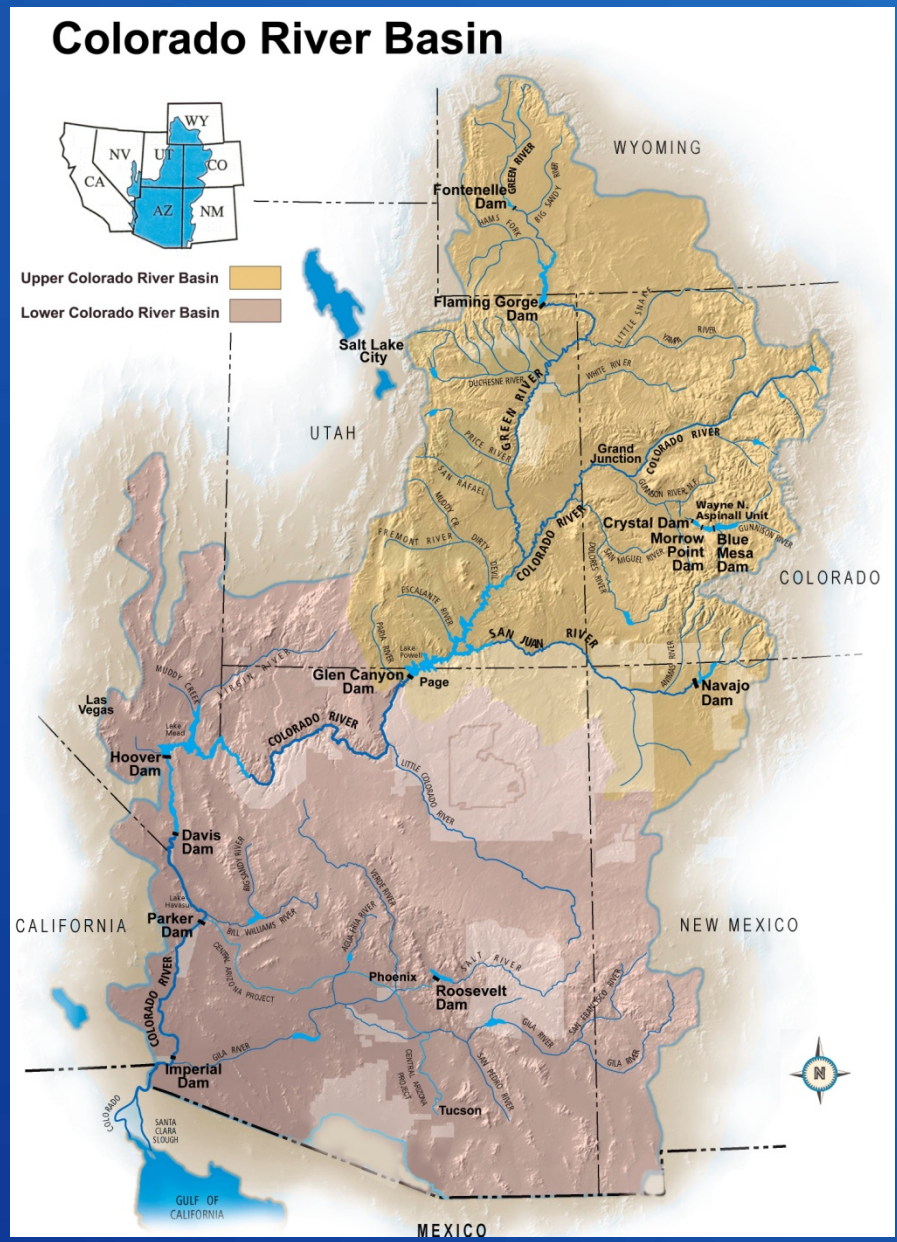
Colorado River Basin Hydrology

- 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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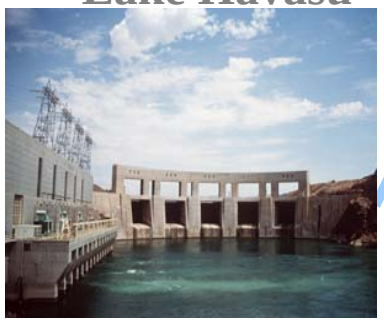
Lake Mead

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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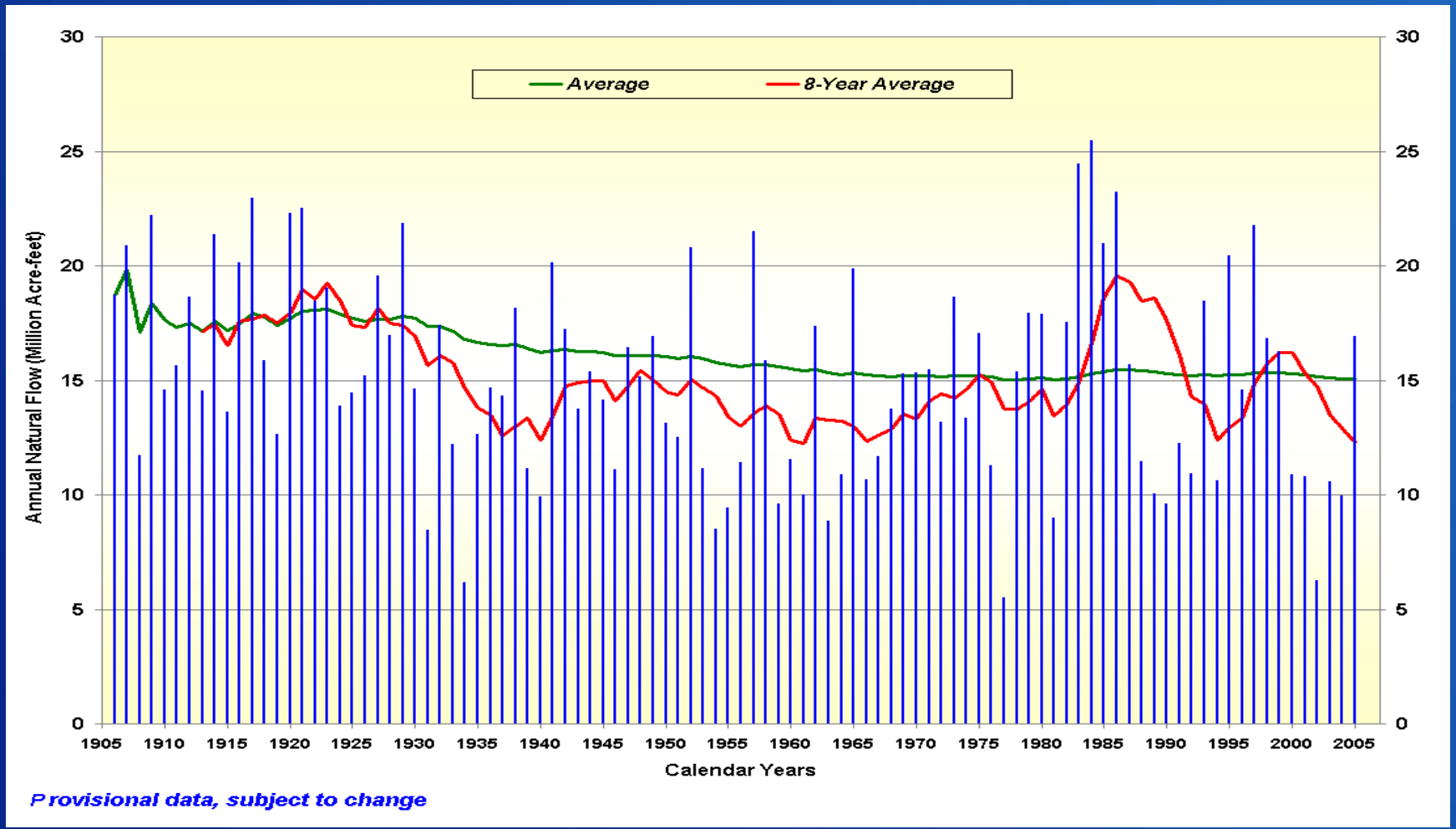
Natural Flow
Colorado River at Lees Ferry Gaging Station, Arizona
Calendar Year 1906 to 2005



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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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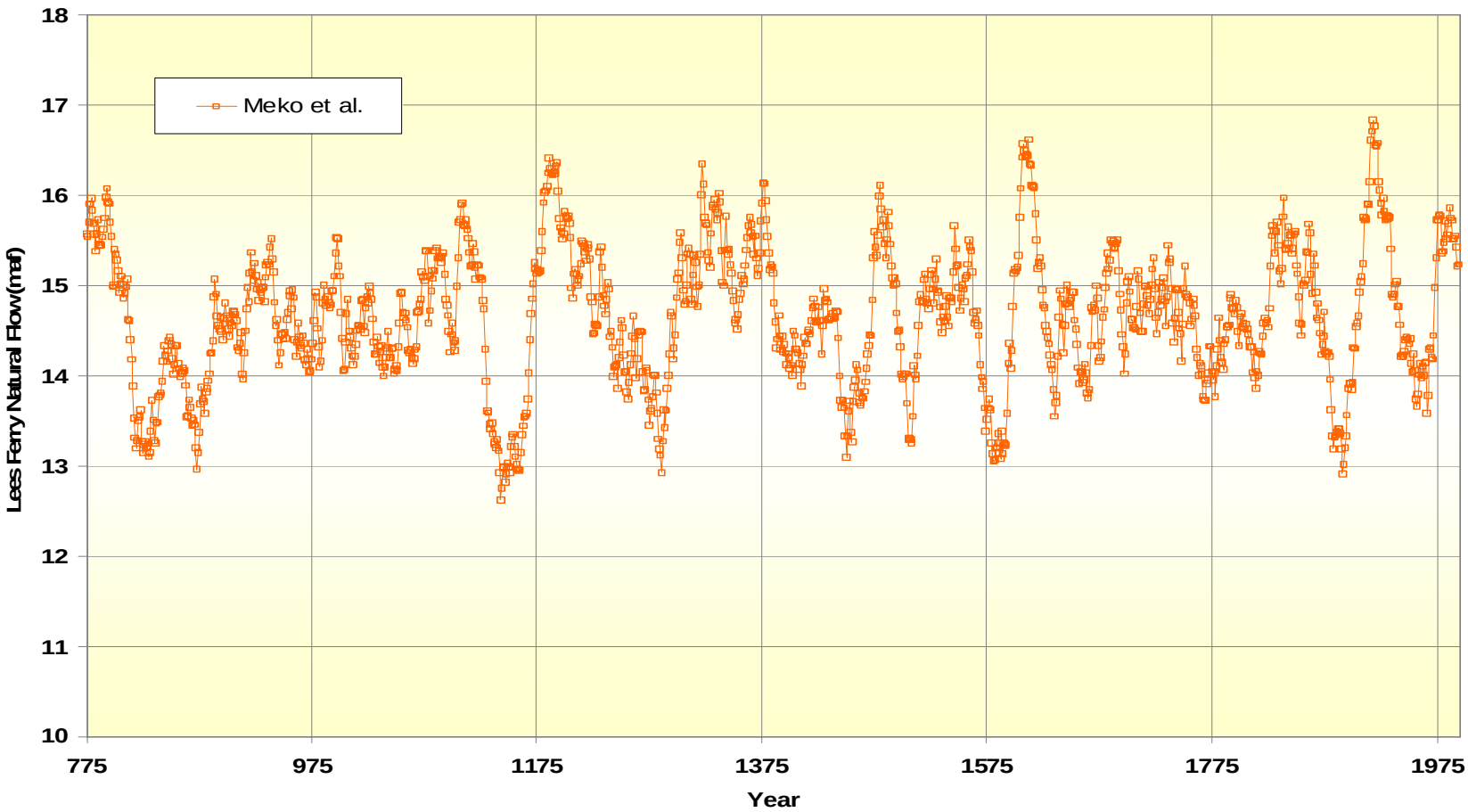
Colorado River Drought

- 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



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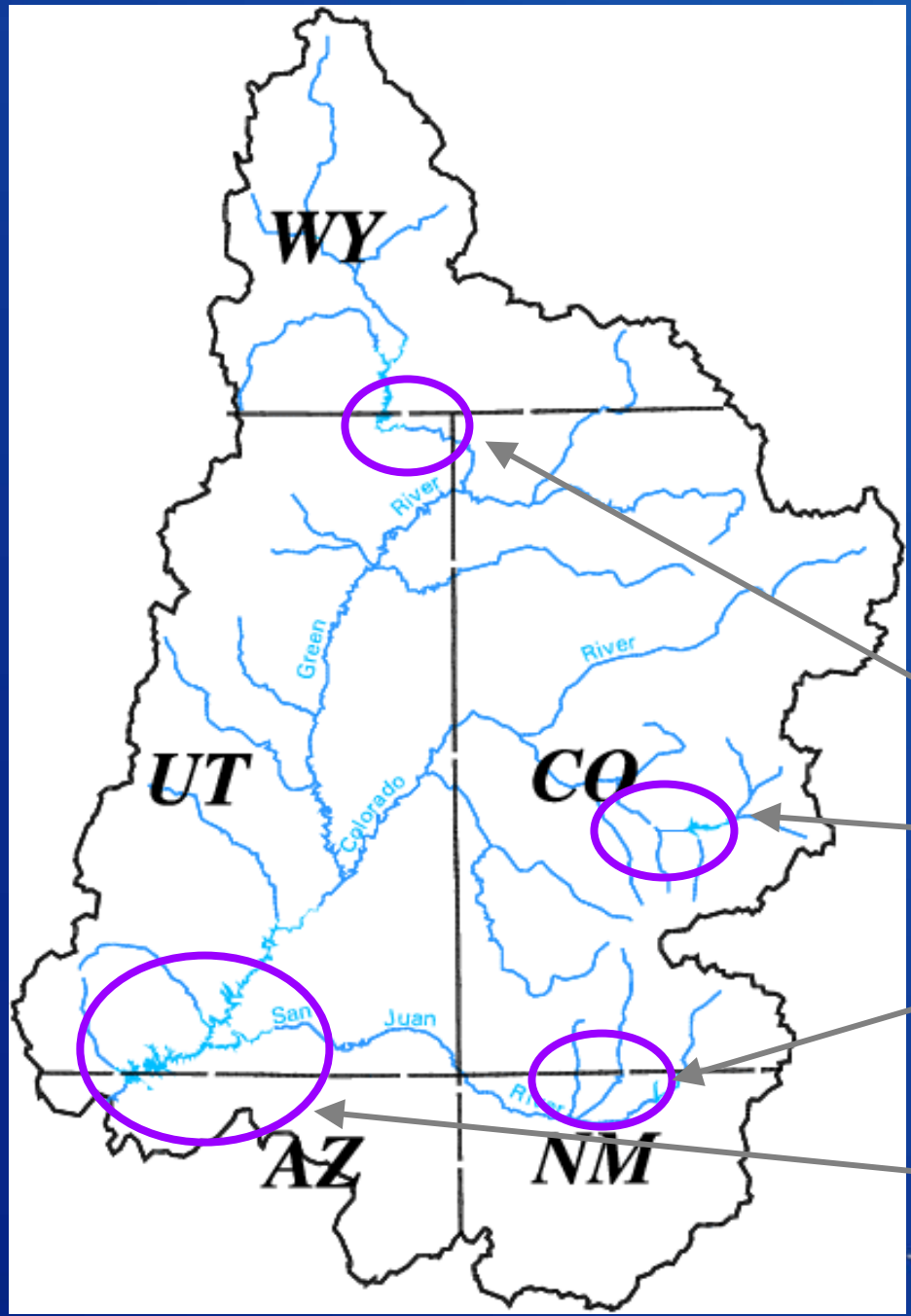

2008 Upper Colorado Projected Apr–Jul Inflow

Flaming Gorge – 66%

Blue Mesa – 156%

Navajo – 131%

Lake Powell – 116%

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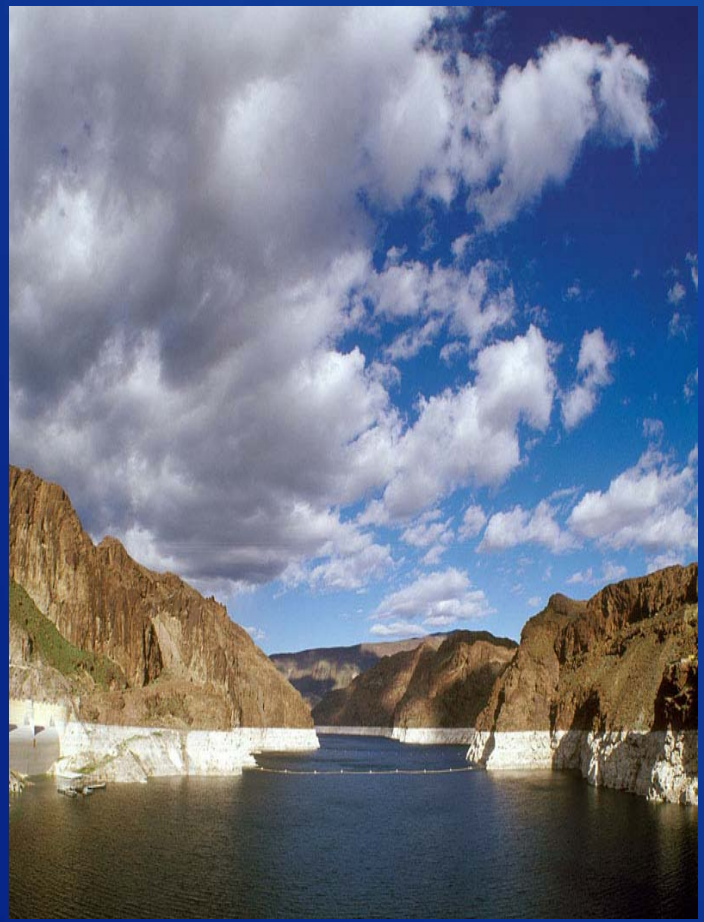
Impetus for the Interim Guidelines



- 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”)

Interim Guidelines[1] - 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 warranted[2]
- 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)
3,700	**Equalization Tier** Equalize, Avoid Spills or Release 8.23 maf	24.3
3,636 - 3,666 (2008-2026)		15.5 - 19.3 (2008-2026)
3,595	**Upper Elevation Balancing Tier**[1] 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
3,575		9.5
3,560	**Mid-Elevation Release Tier** Release 7.48 maf; if Lake Mead < 1,025 feet, release 8.23 maf	8.3
3,525		5.9
3,490	**Lower Elevation Balancing Tier** Balance contents with a min/max release of 7.0 and 9.5 maf	4.0
3,370		0

Lake Mead Elevation (feet)	Lake Mead	Lake Mead Storage (maf)
1,220	**Flood Control or 70R Surplus**	25.9
1,200		22.9
	Domestic Surplus	
1,145		15.9
	Normal Operations	
1,125		13.9
1,100		11.5
1,075		9.4
	Shortage 333 kaf[2]	
1,050		7.5
	Shortage 417kaf[2]	
1,025		5.8
	Shortage 500 kaf[2] **and Consultation**[3]	
1,000		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.

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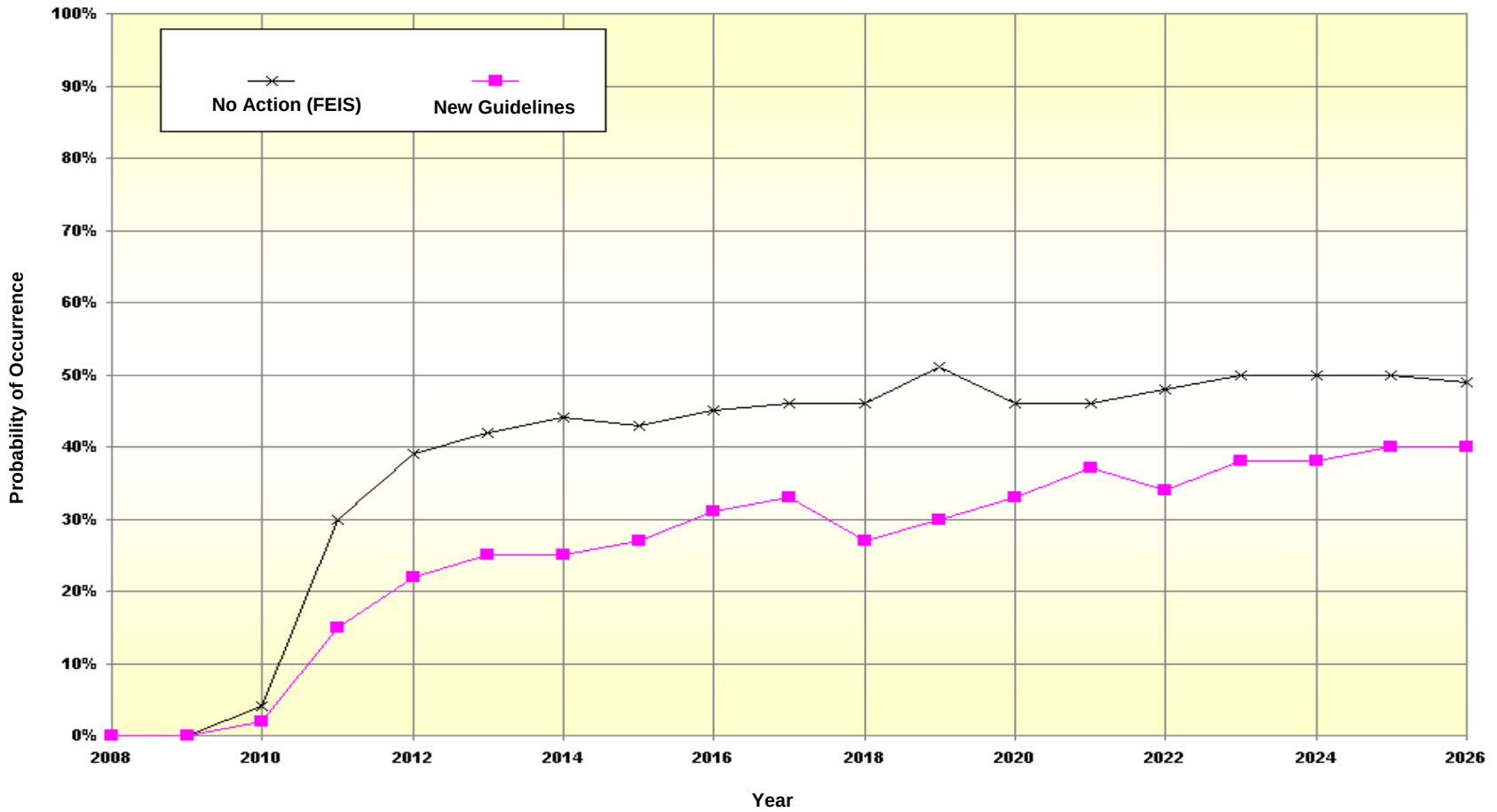
Lower Basin Shortages
No Action (FEIS) & New Interim Guidelines
Probability of Occurrence of Any Amount



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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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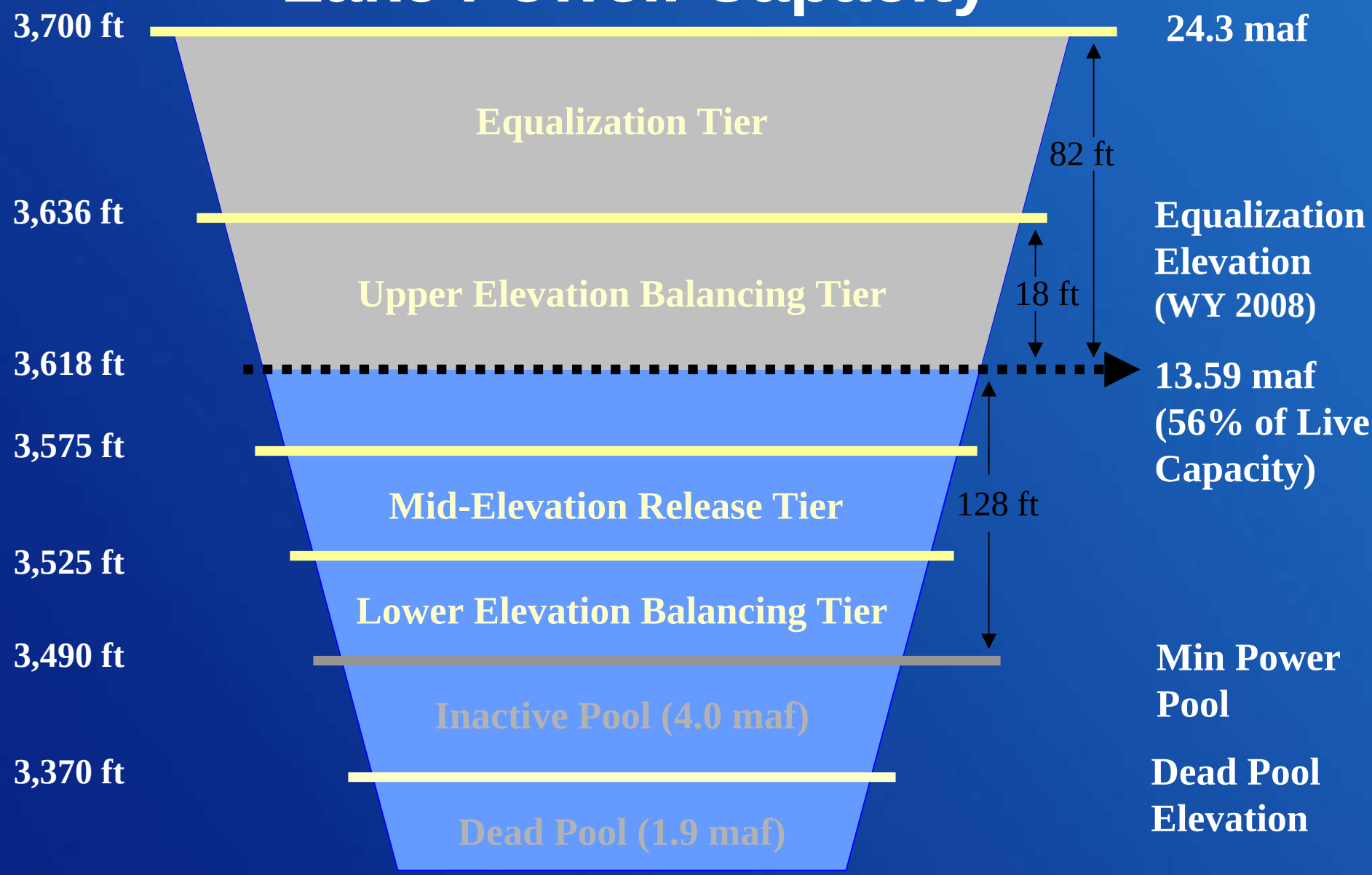
Lake Powell Capacity



Not to scale

As of Jun 8, 2008

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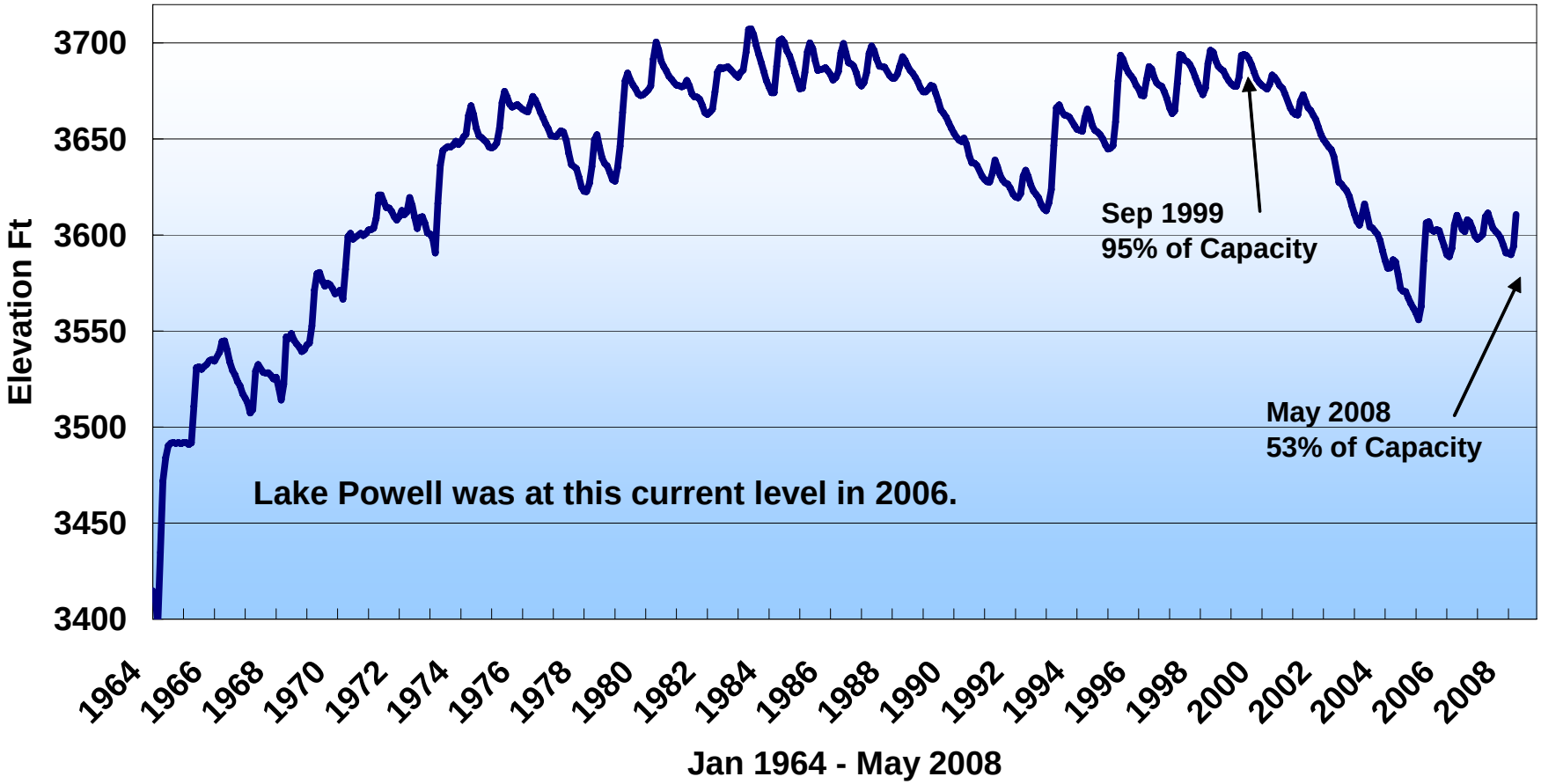
Lake Powell End of Month Elevation
1964 through Present



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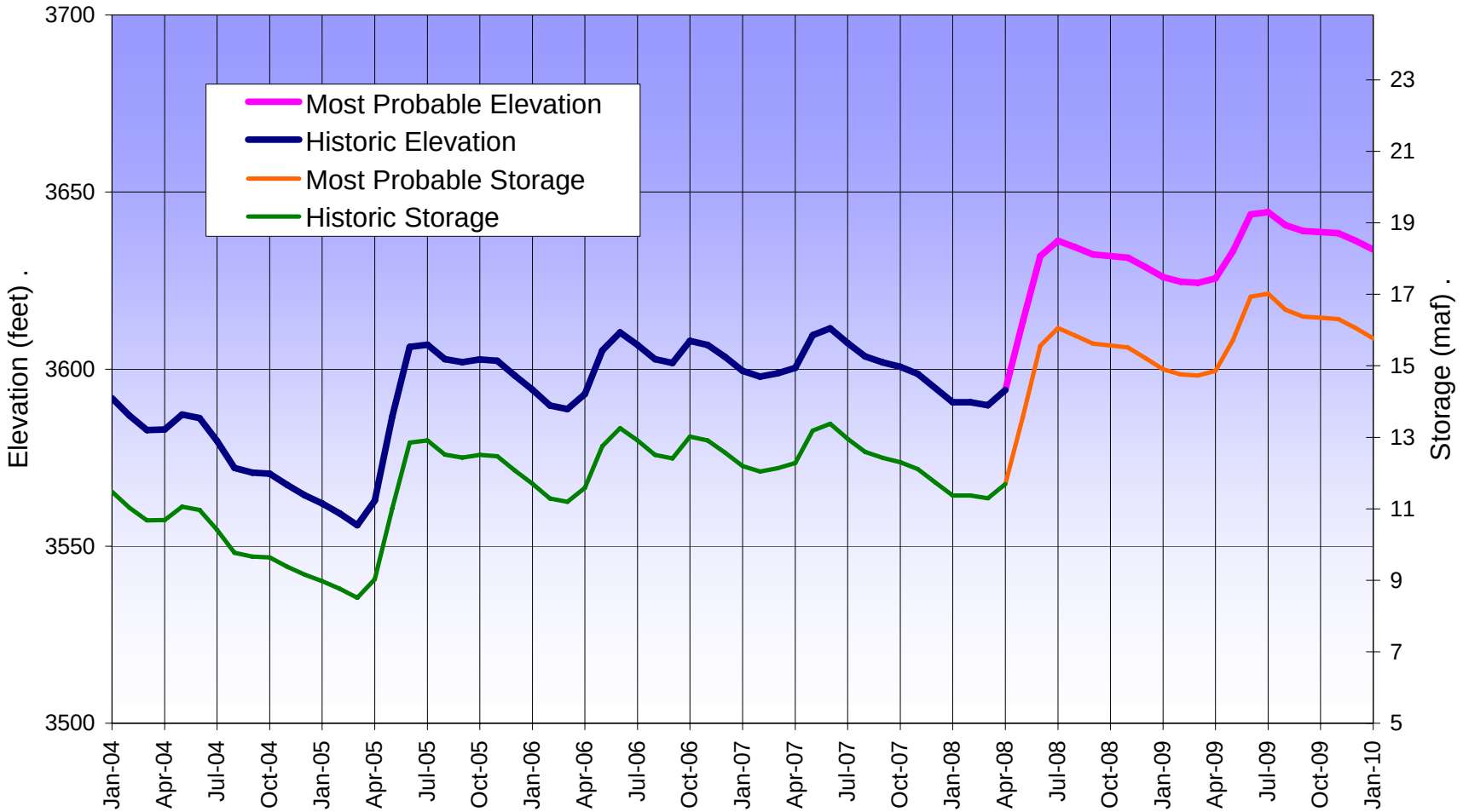
Lake Powell Projected EOM Water Surface Elevation and Storage
May 24 Month Study



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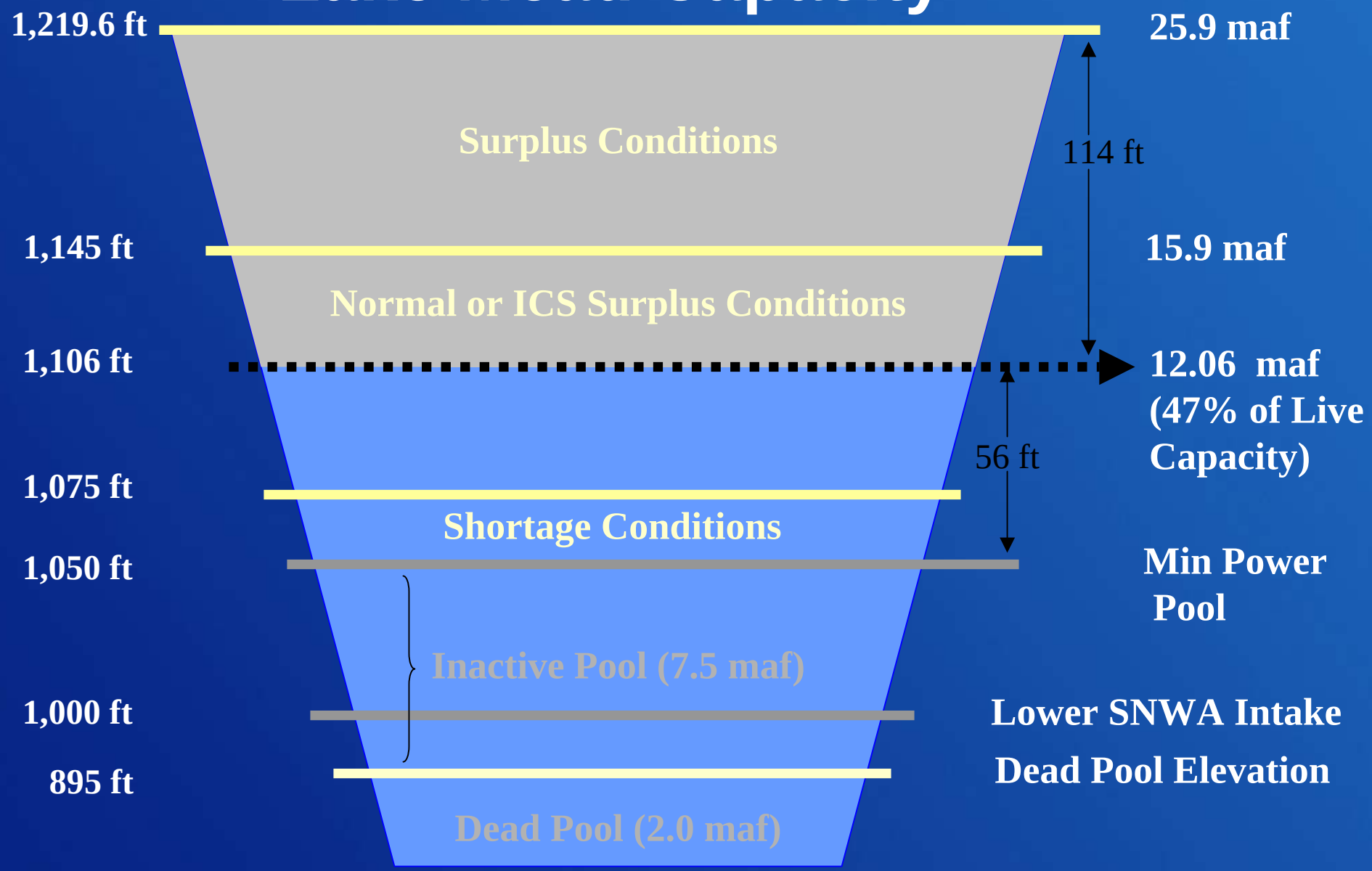
Lake Mead Capacity



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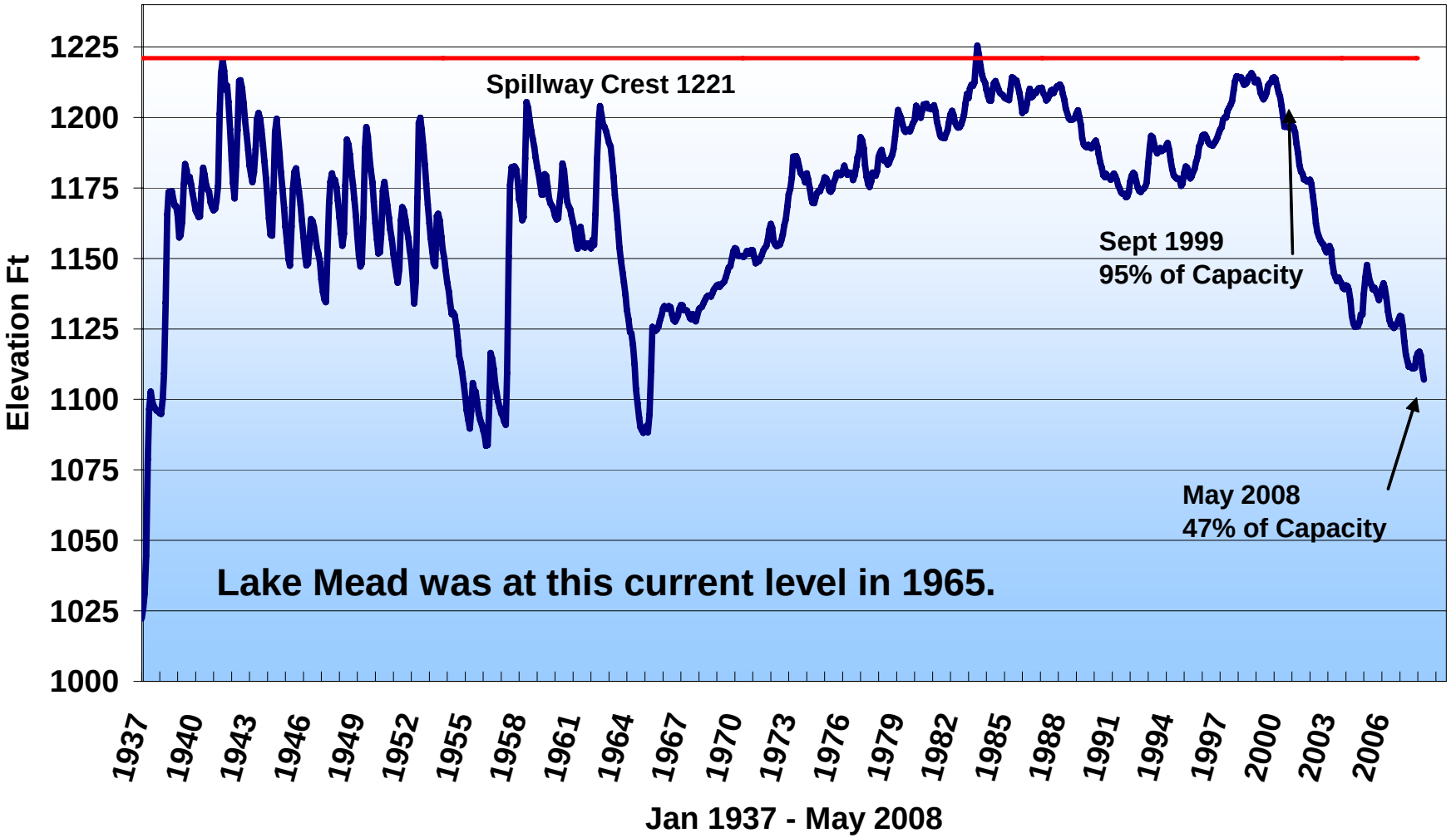
Lake Mead End of Month Elevation



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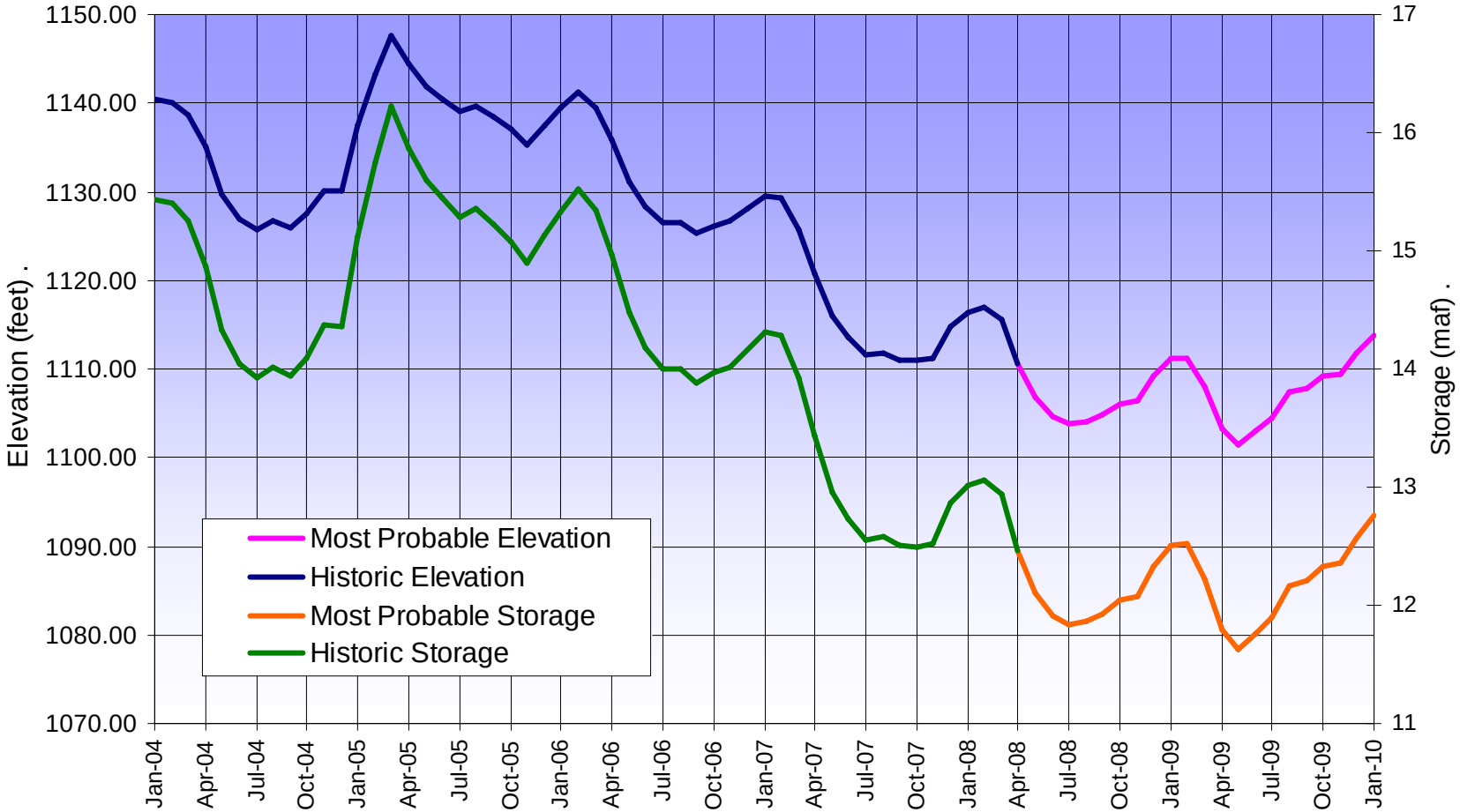

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For further information:
http://www.usbr.gov/lc/region

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