

Solving the Challenges Facing the Colorado River - Will a Collaborative, Incremental Approach Still Work?

Terrance J. Fulp, PhD

Former Lower Colorado Basin Regional Director
Bureau of Reclamation

CSU Grad 592

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Presentation Outline

- Overview of the Colorado River System
- Current State of the System
- Cooperative Efforts over Past 20 years
- Challenges Moving Forward
- Discussion

Acknowledgement and Disclaimer:

Slides provided by U.S. Bureau of Reclamation

All opinions are solely those of the speaker



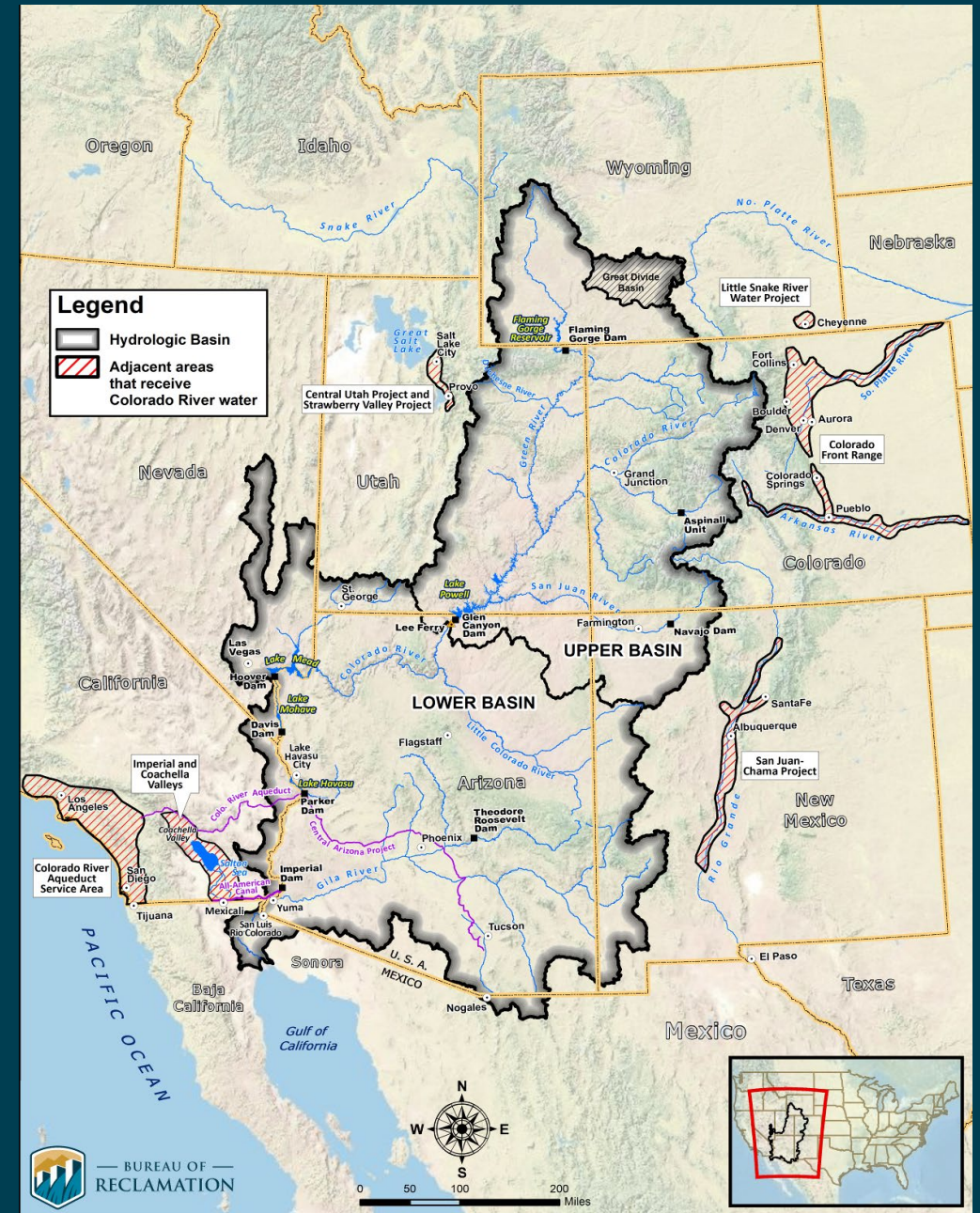
Overview of the Colorado River System

- 16.5 million acre-feet (maf) allocated annually
 - 7.5 maf each to Upper and Lower Basins
 - 1.5 maf to Mexico
- ~16 maf average annual “natural flow” (from historical record)
 - 14.8 maf in the Upper Basin and 1.3 maf in the Lower Basin
- Inflows are highly variable year to year
- 60 maf of storage (~4 times the annual average inflow)
- Operations and water deliveries governed by the “Law of the River”



Colorado River Water Allocations

- Upper & Lower Basins
 - 1922 Compact
- Lower Basin (AZ, CA, NV)*
 - 1928 Boulder Canyon Project Act
- Mexico
 - 1944 US/Mexico Treaty
- Upper Basin (CO, NM, UT, WY)
 - 1948 Upper Basin Compact
- * 1963 Arizona v. California
 - Supreme Court



Annual Water Apportionment/Allocation¹

percent²

acre-feet

Upper Basin

Arizona	-	50,000
Colorado	51.75%	3,855,375
New Mexico	11.25%	838,125
Utah	23.00%	1,716,500
Wyoming	14.00%	1,043,000
Total		7,500,000

Lower Basin

Arizona	-	2,800,000
California	-	4,400,000
Nevada	-	300,000
Total		7,500,000

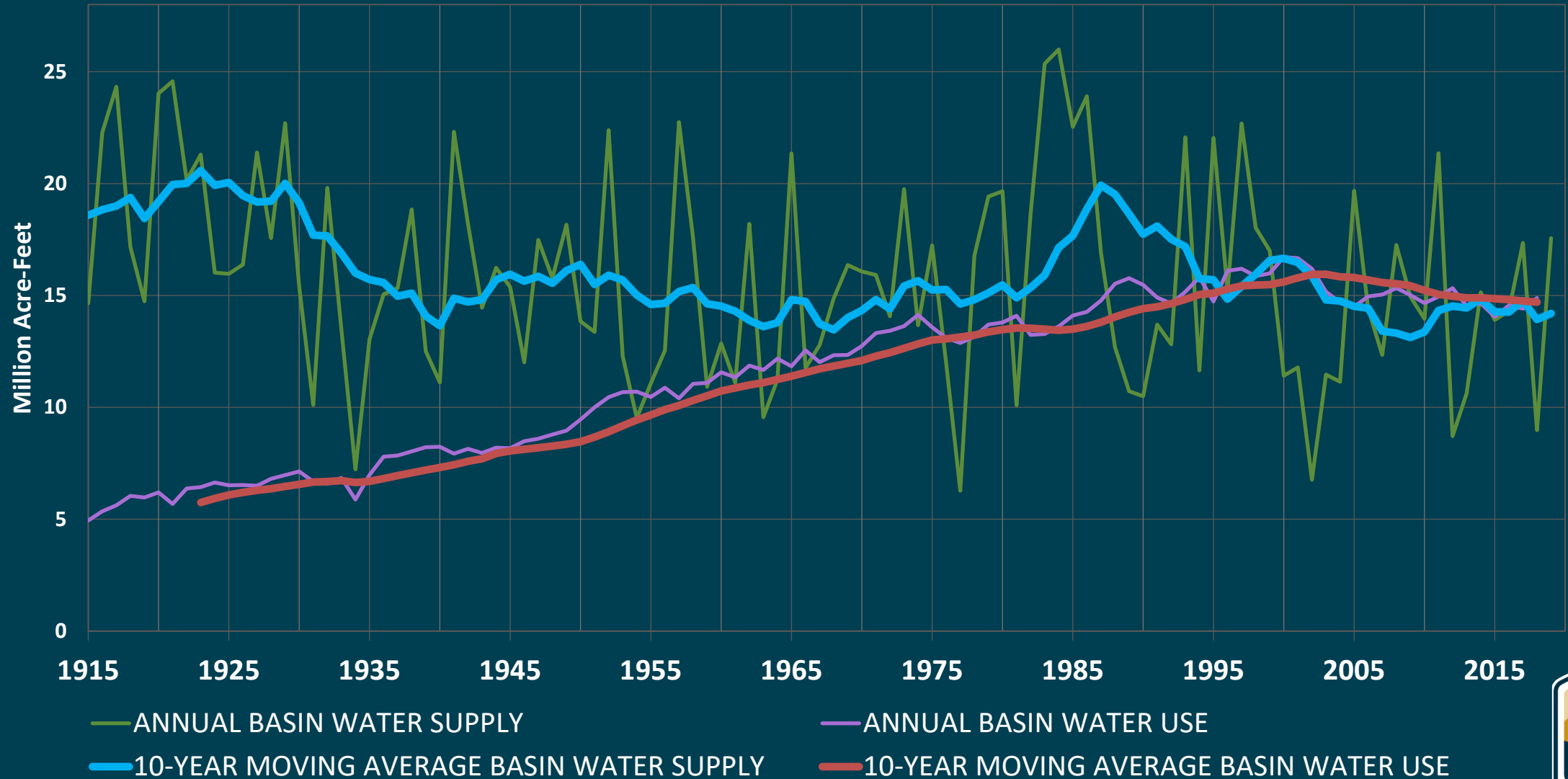
Mexico

1,500,000

¹All U.S. entitlements, including tribal rights, are included in these apportionments.

²Percentages are listed for the Upper Basin as the 1948 Upper Basin Compact apportioned the available water on a percentage basis to Colorado, New Mexico, Utah, and Wyoming, after apportioning a fixed volume to Arizona.

Historical Colorado River Basin Supply & Use

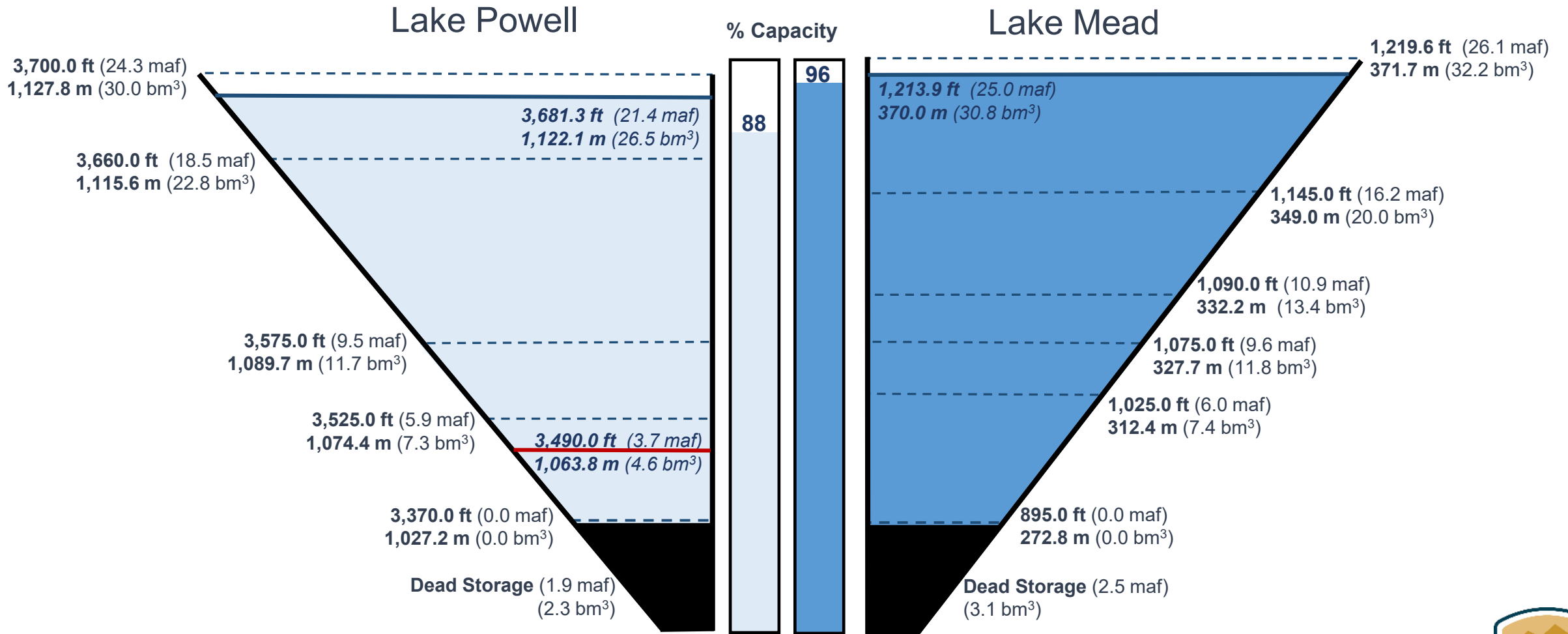


Colorado River Drought

- The period from 2000-2022 is provisionally the driest 23-year period on record.
- In addition, the period from 2012-2021 is provisionally the driest 10-year period ever recorded, supplanting the previous driest 10-year period from 2000-2009.
- Only five years of above-average inflow have occurred in the last 23 years.
- While tree-ring reconstructions show more severe droughts over the past 1,200 years (e.g., a drought in the mid 1100s), this current 23-year period is projected to be among the driest of the 1,200-year period
- We are likely seeing aridification as evidenced by higher temperatures, declining snowpacks, earlier runoff, more rain than snow, etc.



Status of Lake Powell and Lake Mead December 1999



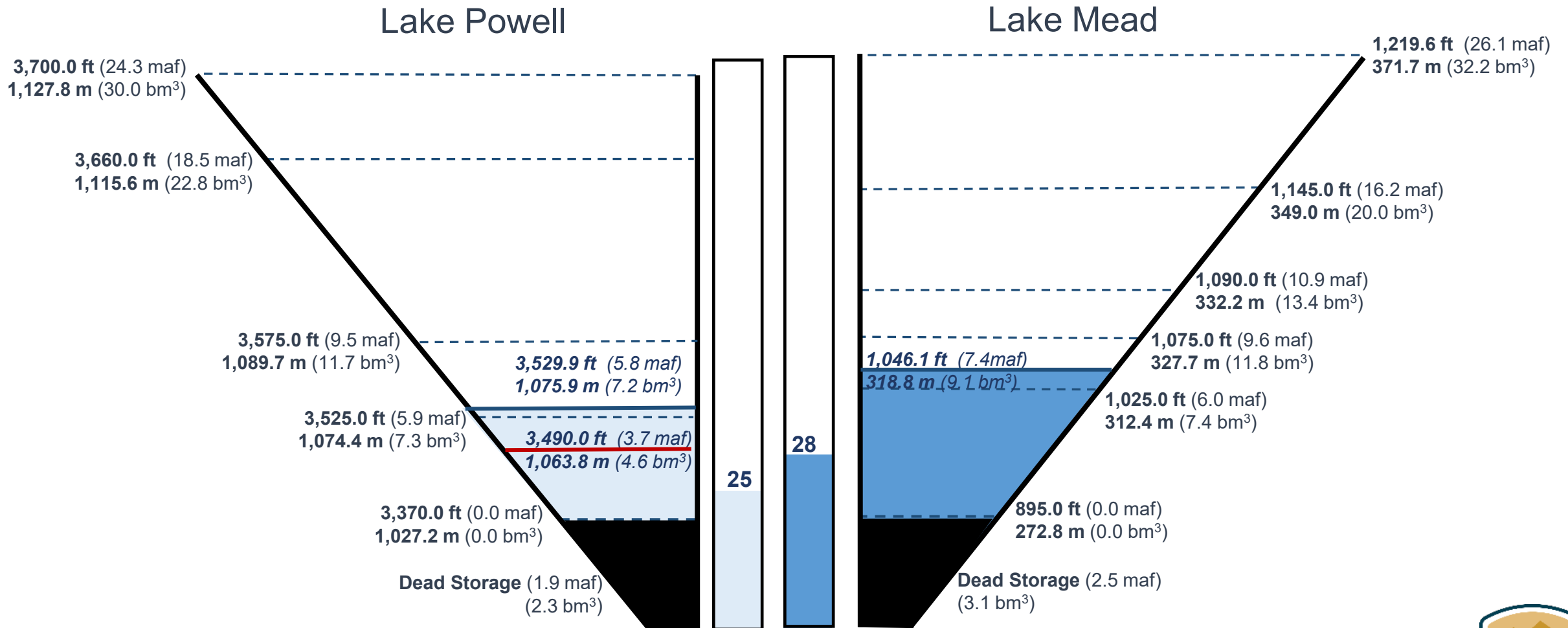
Notes

- Units: feet (ft); meter (m); million acre-feet (maf); billion cubic meters (bcm³)
- Water stored in Dead Storage cannot be released or withdrawn from the reservoir and, therefore, is not available for use.
- Schematic is for illustrative purposes only and is not to scale.



Status of Lake Powell and Lake Mead

November 1, 2022

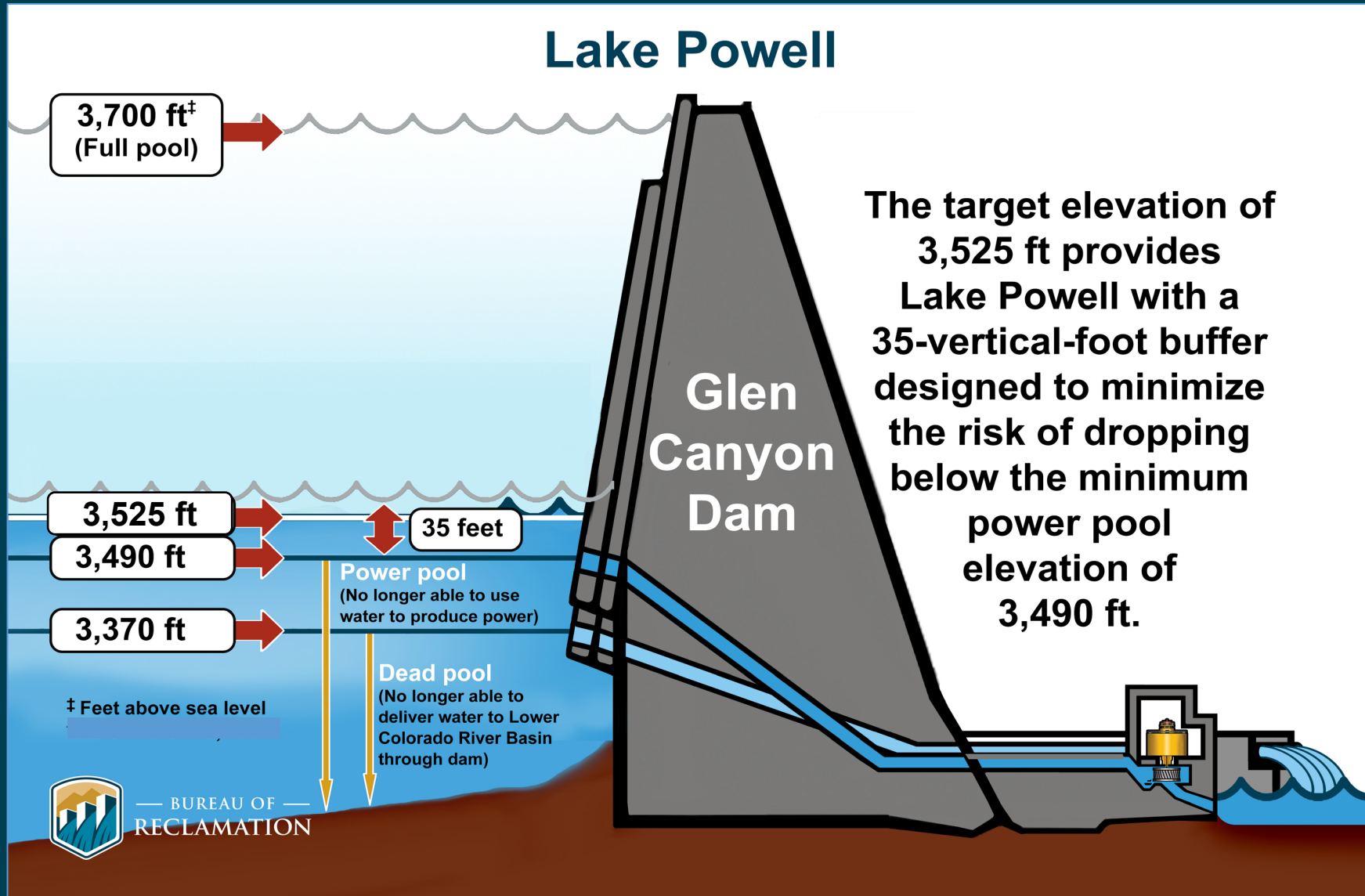


Notes

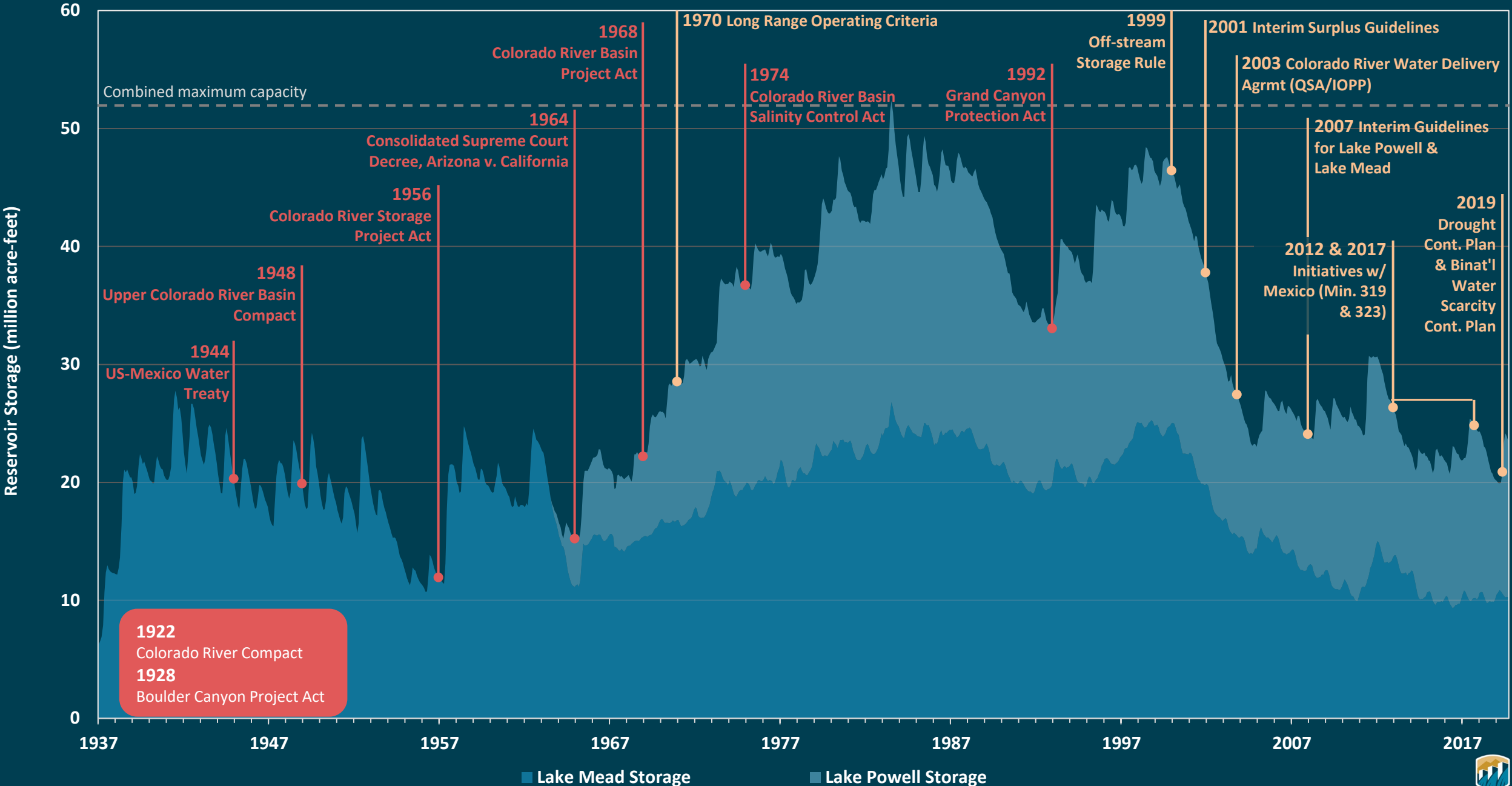
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Lake Powell Key Elevations



Lake Powell and Lake Mead Combined Storage

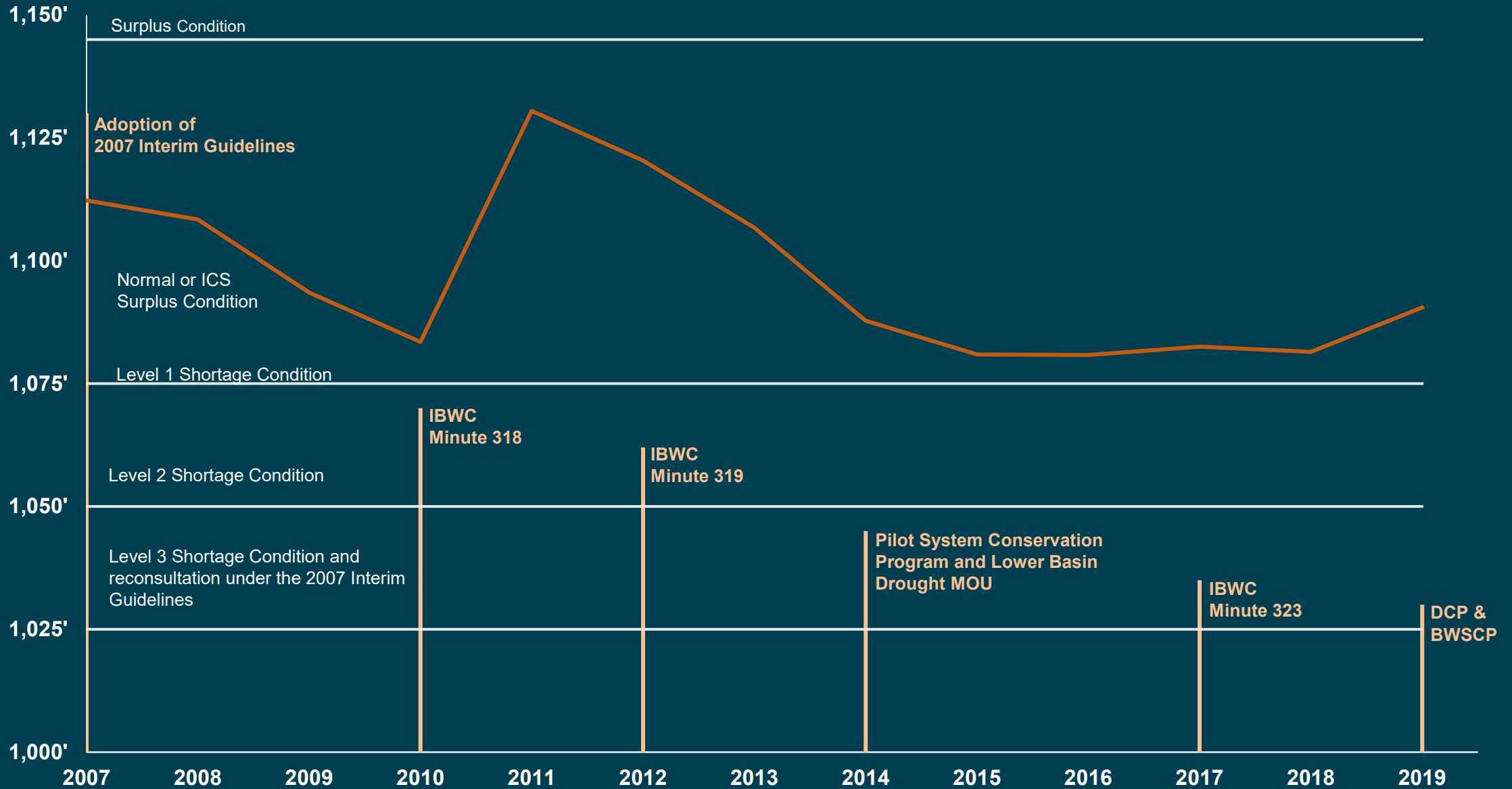


2007 Interim Guidelines



- Key provisions:
 - Coordinated operation for Lake Powell and Lake Mead is specified throughout the full range of operation
 - Strategy for shortages in the Lower Basin is specified, including a provision to consult if additional shortages are warranted
 - Mechanism (Intentionally Created Surplus or ICS) is established to encourage efficient and flexible water use in the Lower Basin
- In place for an interim period (through 2026)
- States agree to consult prior to litigation
- Do not include provisions for Mexico

Lake Mead End of Calendar Year Elevation



April 2010 – Mexicali Valley Devastating Earthquake (7.2 magnitude)









Drought Contingency Plan Signing Ceremony May 20, 2019



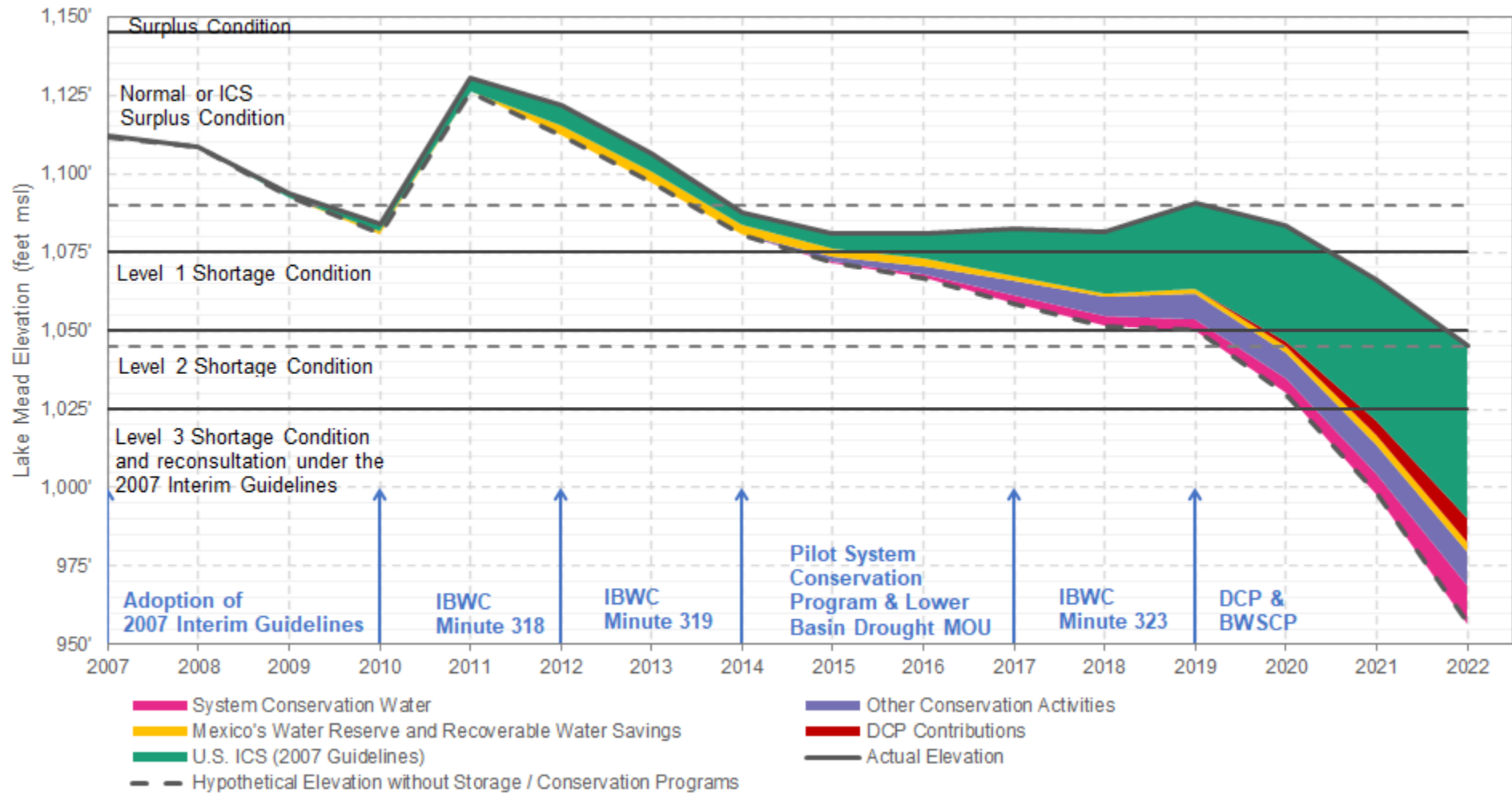
2007 Interim Guidelines, Minute 323, Lower Basin Drought Contingency Plan, and Binational Water Scarcity Contingency Plan Total Volumes (kaf)

Lake Mead Elevation (feet msl)	2007 Interim Guidelines Shortages		Minute 323 Delivery Reductions	Total Combined Reductions	DCP Water Savings Contributions			Binational Water Scarcity Contingency Plan Savings	Combined Volumes by Country <i>US: (2007 Interim Guidelines Shortages + DCP Contributions)</i> <i>Mexico: (Minute 323 Delivery Reductions + Binational Water Scarcity Contingency Plan Savings)</i>					Total Combined Volumes
	AZ	NV	Mexico	Lower Basin States + Mexico	AZ	NV	CA	Mexico	AZ Total	NV Total	CA Total	Lower Basin States Total	Mexico Total	Lower Basin States + Mexico
1,090 - 1,075	0	0	0	0	192	8	0	41	192	8	0	200	41	241
1,075 - 1050	320	13	50	383	192	8	0	30	512	21	0	533	80	613
1,050 - 1,045	400	17	70	487	192	8	0	34	592	25	0	617	104	721
1,045 - 1,040	400	17	70	487	240	10	200	76	640	27	200	867	146	1,013
1,040 - 1,035	400	17	70	487	240	10	250	84	640	27	250	917	154	1,071
1,035 - 1,030	400	17	70	487	240	10	300	92	640	27	300	967	162	1,129
1,030 - 1,025	400	17	70	487	240	10	350	101	640	27	350	1,017	171	1,188
<1,025	480	20	125	625	240	10	350	150	720	30	350	1,100	275	1,375

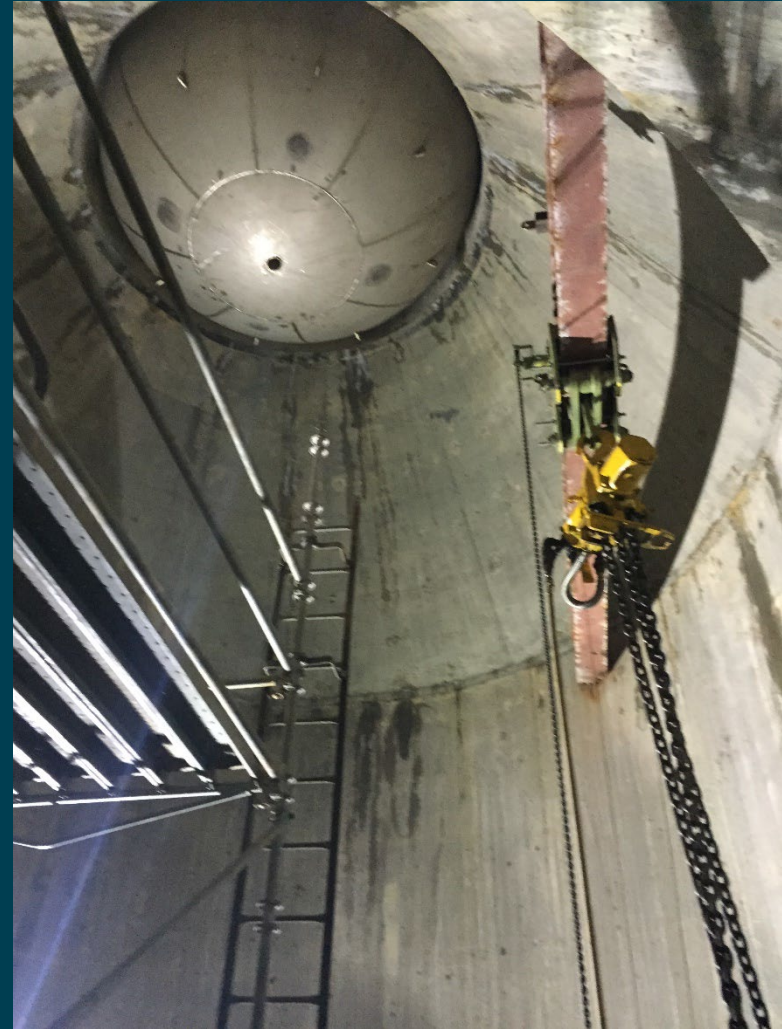


Lake Mead Storage and Conservation¹

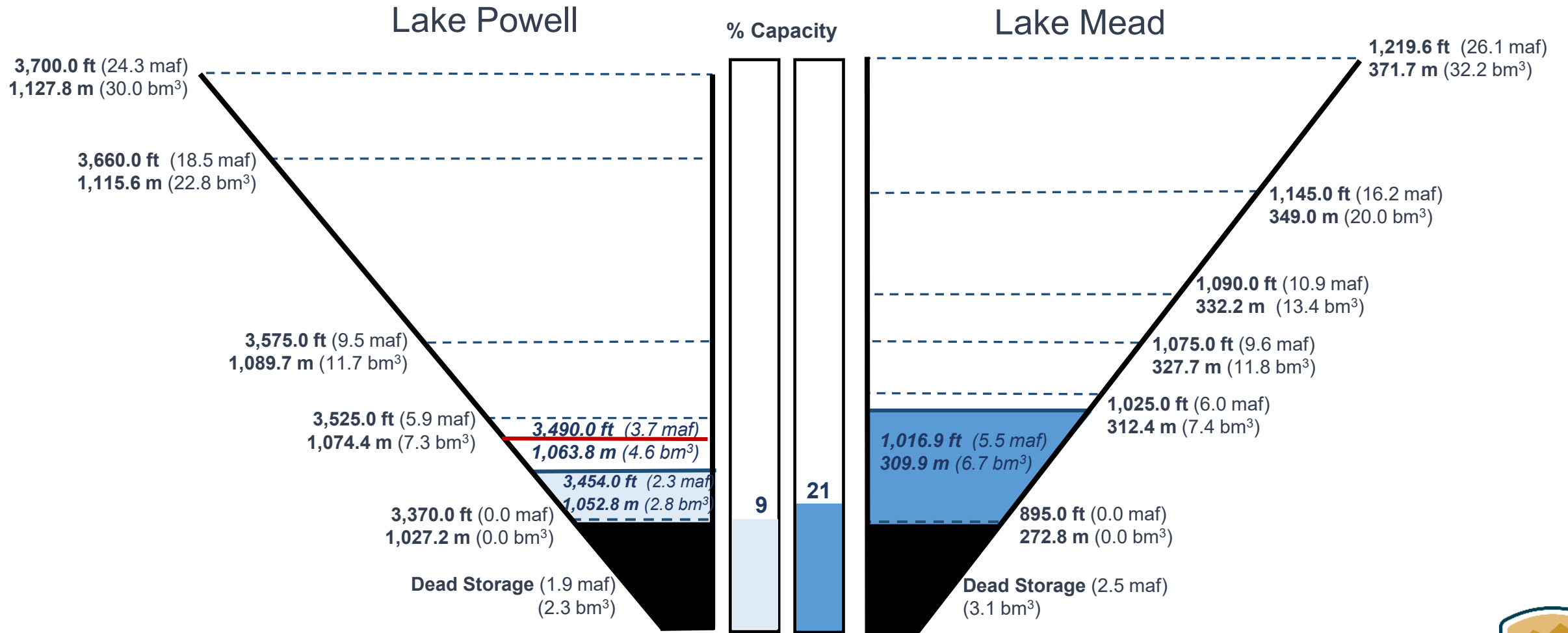
Lake Powell WY Release (maf)															
8.23	8.98	8.24	8.23	12.5	9.47	8.23	7.48	9.00	9.00	9.00	9.00	9.00	8.23	8.23	7.00



Southern Nevada Water Authority's 3rd Intake



Projected December 2023 Dry Hydrology from October CRMMS-ESP*



Notes

- * CRMMS Ensemble Output 2001-2002 Sequence (subject to change)
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Next Steps

- Commissioner Touton's call in June, 2022 for a Basin-wide plan to reduce deliveries by two to 4 million acre-feet in 2023
- Federal Notice of Intent to revise the 2007 Interim Guidelines, potentially changing Lake Powell and Lake Mead releases (October 28, 2022)
- Unilateral Federal action?



Collaborative, Incremental Approach - Past 20 Years

- Finding flexibilities within the existing Law of the River
- Establishing and nurturing basin-wide relationships
- Putting solutions in place for an interim period
- Can this approach still work? (i.e., sufficient commitment and enough time)

