



# Drought: A Nevada Prospective

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SOUTHERN NEVADA WATER AUTHORITY



# Colorado River

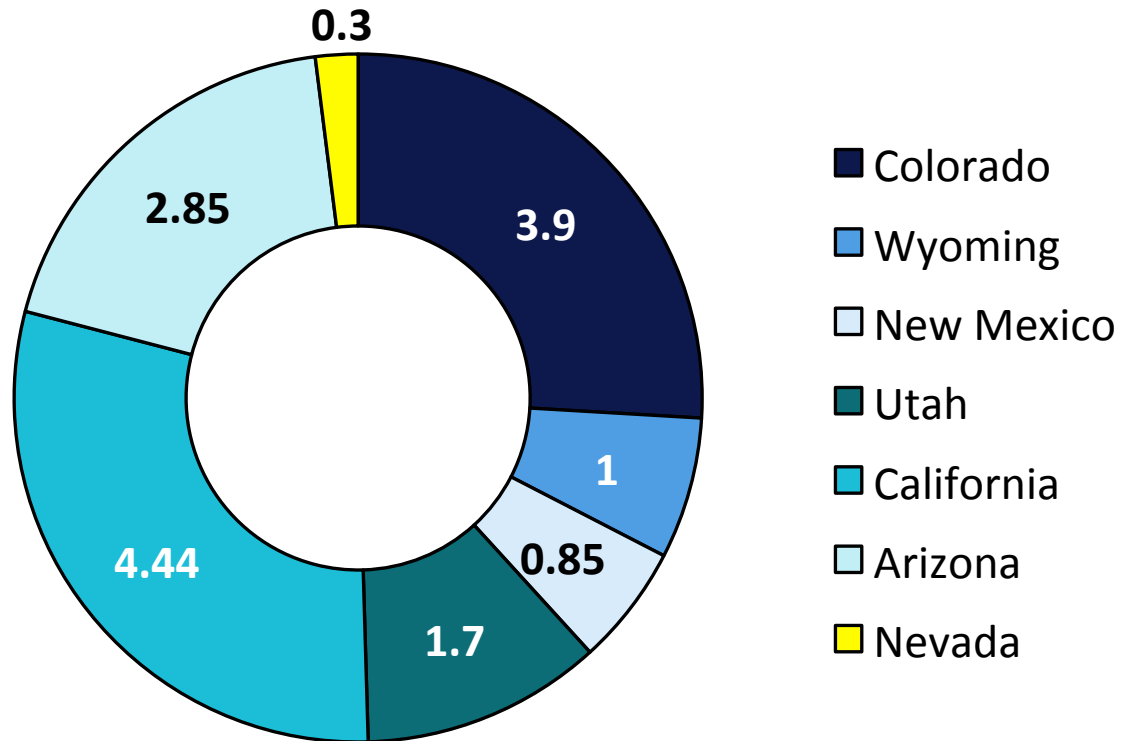
The Colorado River is shared among seven U.S. states and the country of Mexico.



# Colorado River

The states share 15 million acre-feet of water.

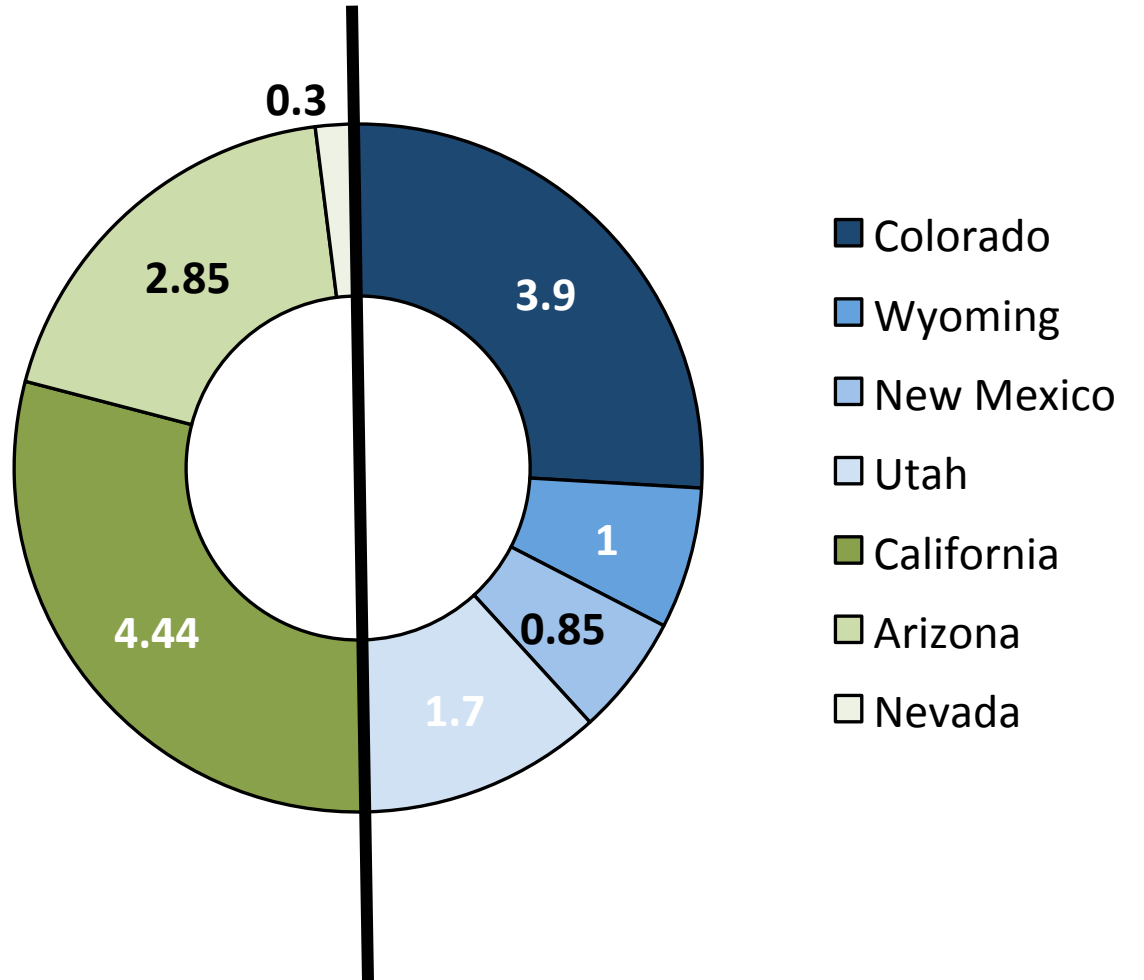
1.5 million acre-feet is also delivered to Mexico.



# Colorado River

**The Basin is divided into the Upper Basin and Lower Basin.**

**The Upper Basin is obligated to deliver 75 MAF to the Lower Basin over 10 years.**



# Declining Lake Levels



1984 vs. 2016

**Ongoing Colorado River drought has significantly impacted Lake Mead's water elevations.**

# Declining Lake Levels

**The seven Colorado River Basin States and the country of Mexico have been working for nearly 15 years to address drought impacts.**

## Major Agreements:

- ✓ Interim Guidelines
- ✓ Minute 319
- ✓ Glen Canyon Adaptive Management Program

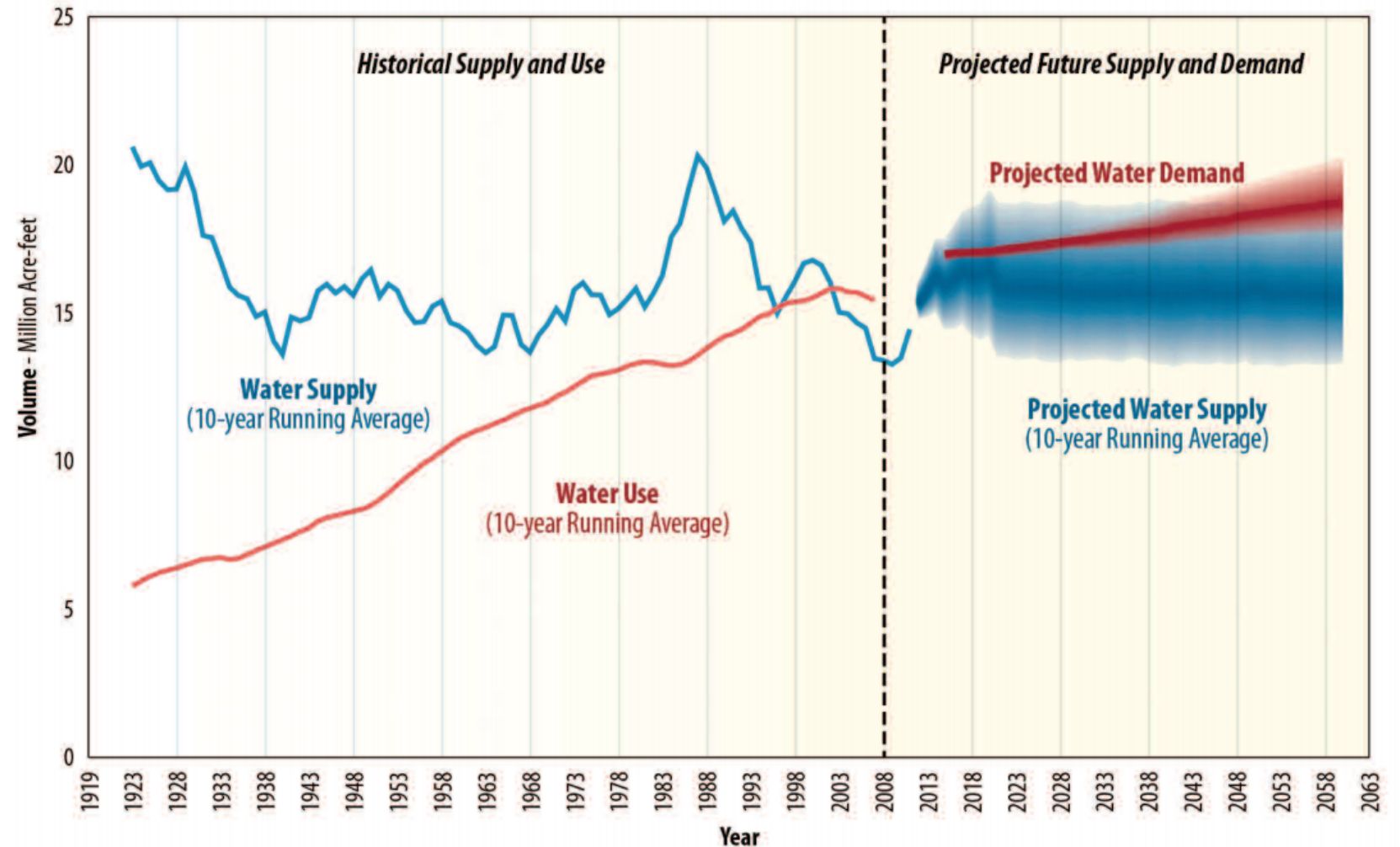
## Major Programs:

- ✓ Colorado River System Conservation
- ✓ Multi-Species Habitat Conservation Program



# Declining Lake Levels

In 2012, the Bureau of Reclamation published the “Colorado River Basin Water Supply and Demand Study,” to define river imbalances and evaluate mitigation strategies.



# Declining Lake Levels

**In Southern Nevada, declining lake levels impact:**



**Treatment Costs  
and Approach**



**Access to Supplies  
(Infrastructure)**



**Availability of  
Supplies  
(Resources)**



# Reducing Demands

Despite population increases, water use has declined since 2002.

Southern Nevada  
**POPULATION**



UP  
**37%**

Per Capita  
**WATER USE**



DOWN  
**37%**

Colorado River Water  
**CONSUMPTION**



DOWN  
**32%**

# Addressing Infrastructure

## NEW INTAKE

A third intake was constructed under the lake to ensure system capacity and protect customers from water quality issues.

- 2.5 mile tunnel underneath Lake Mead
- Approximately 2,400 concrete rings—each weighing more than 32 tons—used to line tunnel
- Elevation: 860 feet
- Cost: \$817 million



Before Intake No. 3 was put into service

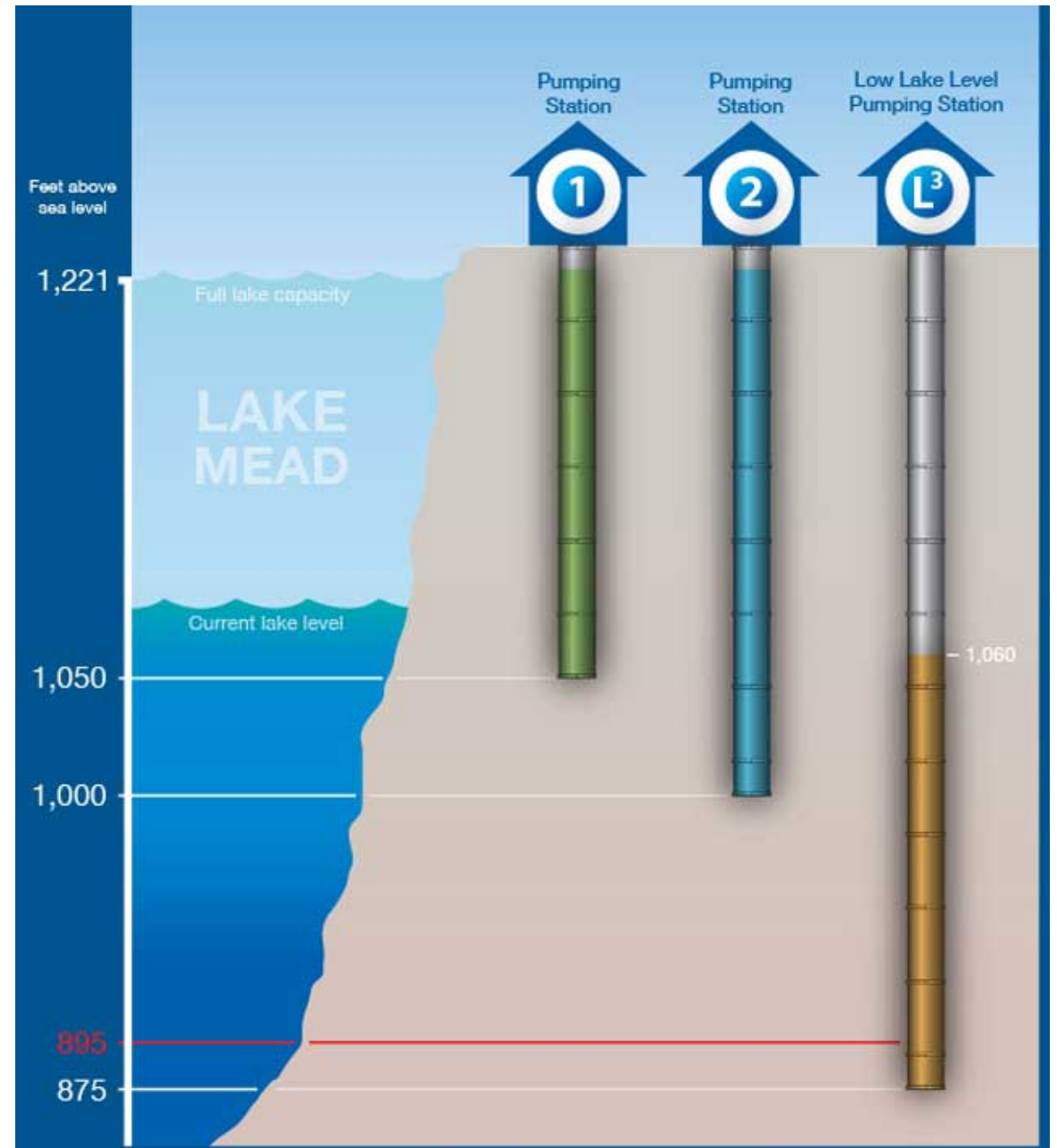
# Addressing Infrastructure

## NEW PUMP STATION

A new Low Lake Level Pumping Station is currently being constructed near Lake Mead.

When complete, the pump station will ensure water deliveries down to 875 feet.

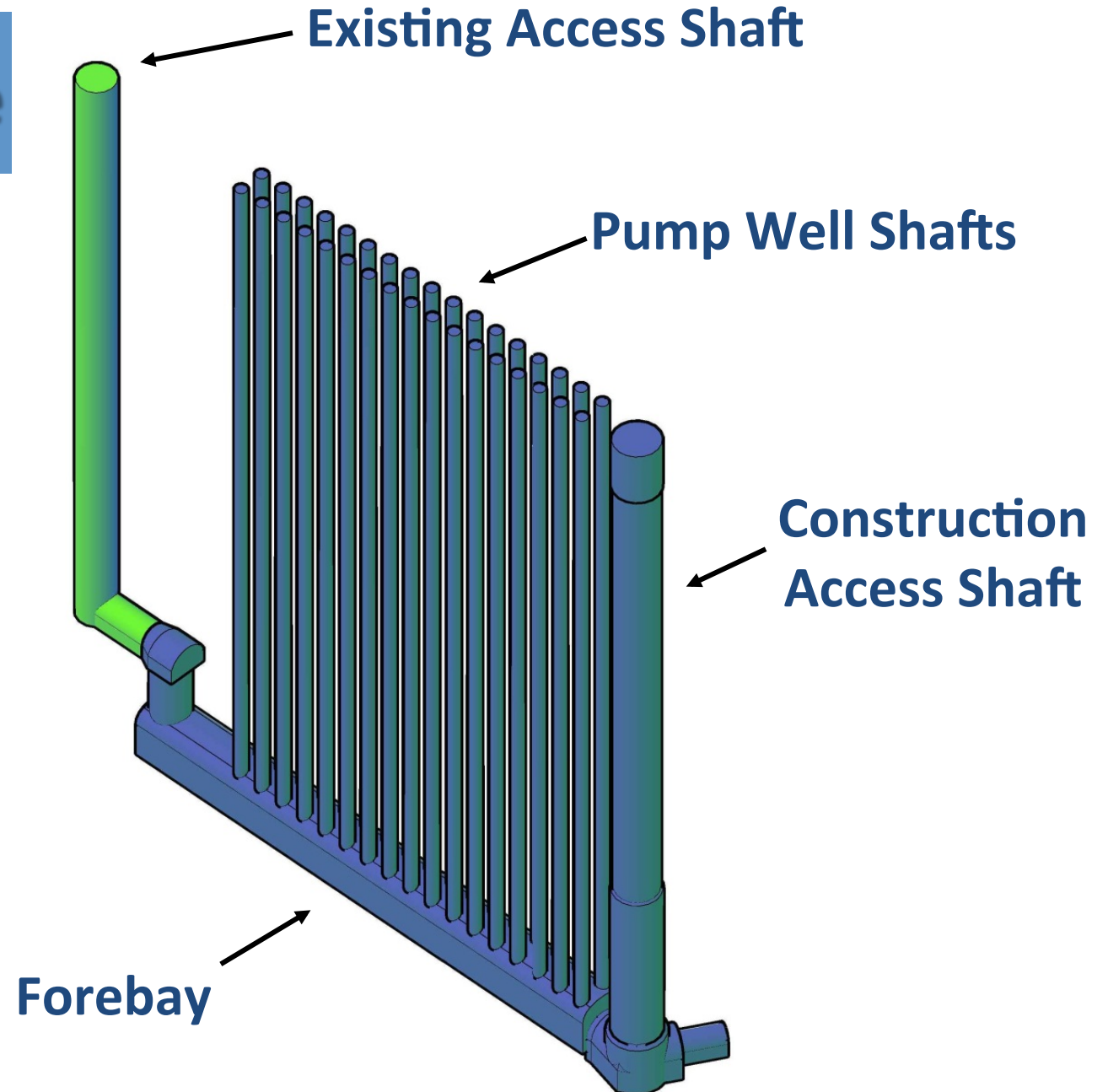
Estimated cost: \$650 million





# Addressing Infrastructure

- Connects to Intake No. 3
- Substitutes for Intake Pumping Stations 1 and 2 at very low lake levels.
- Will operate between lake elevations 875 and 1,060 feet.



# Securing Resources

**The SNWA maintains nearly 400,000 acre-feet in permanent water resources.**

**More than 1.8 million acre-feet is banked for future use.**

Local groundwater bank

Water banking arrangements in Arizona and California

Brock Reservoir ICS credits

Yuma Desalting Plant ICS credits

Bi-national ICS credits

Virgin River and Muddy River ICS credits

Coyote Springs ICS credits



# Voluntary Reductions

**In the face of continued drought, Colorado River Basin States are negotiating changes to existing operating agreements.**

**Once finalized, the Drought Contingency Plan aims to:**

- **Protect Lake Mead's elevations from falling below 1,020 feet**
- **Implement voluntary reductions in water use beyond those required by the 2007 Interim Guidelines**
  - **Includes a commitment by the U.S. to work to create or conserve Colorado River system water**
- **Permit recovery of additional reduction volumes under certain conditions**
- **Incentivize ICS creation/storage**



## Reducing Risk

If Lake Mead reaches elevation 1,000 feet there is **less than 4.5 million acre-feet of water in storage** to meet the downstream demands of Arizona, California, and Mexico

Without proactive action, maintaining that elevation could require **between 2.0 and 6.0 million acre-feet** of reductions in a single year

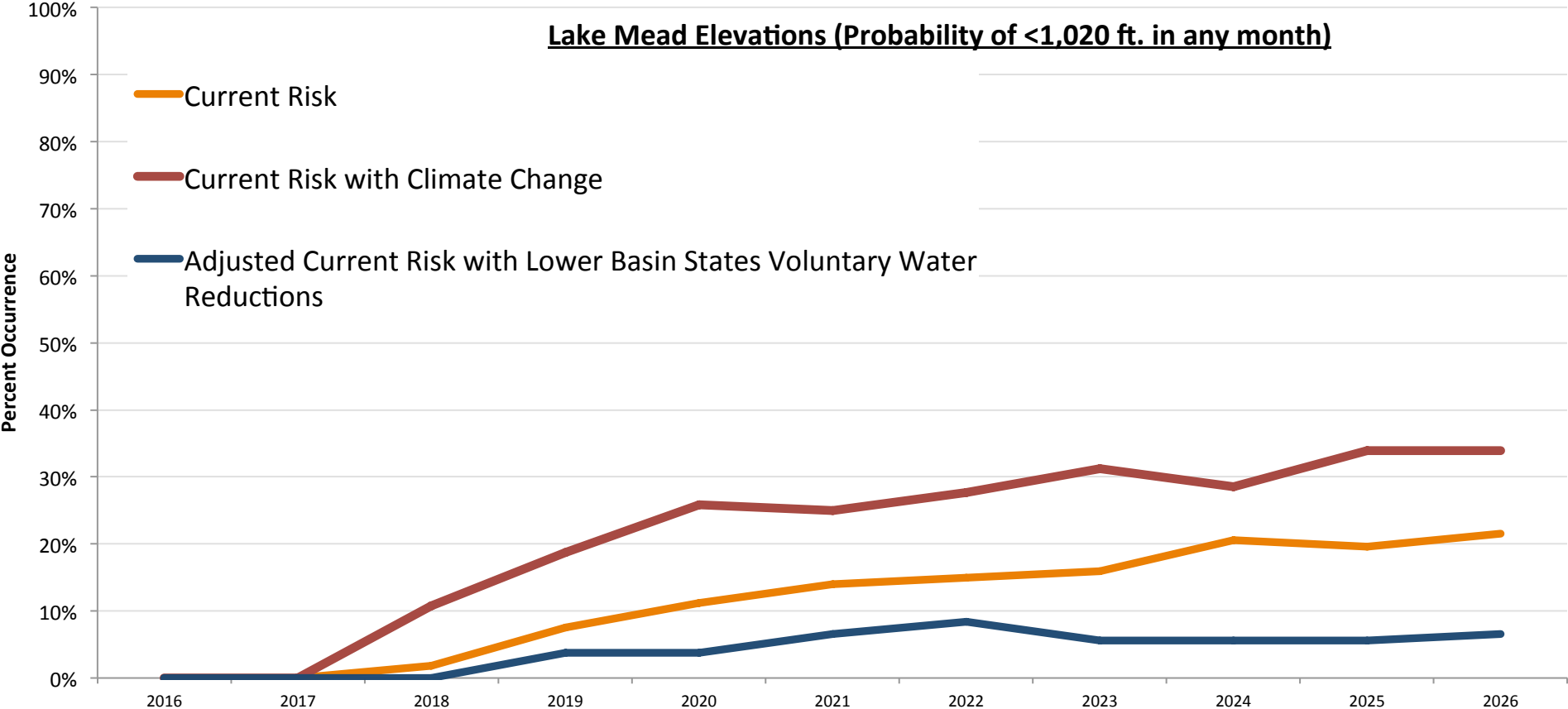
# Voluntary Reductions

## Proposed voluntary reductions would be tied to Lake Mead's elevations

Lake Mead Elevation (ft)	2007 Interim Guidelines Shortages (kaf)		Voluntary Reductions (kaf)			Combined Reductions (kaf) (2007 Interim Guidelines Shortages + Voluntary Reductions)			
	AZ	NV	AZ	NV	CA	AZ	NV	CA	TOTAL
1,090	0	0	192	8	0	192	8	0	200
1,085	0	0	192	8	0	192	8	0	200
1,080	0	0	192	8	0	192	8	0	200
1,075	320	13	192	8	0	512	21	0	533
1,070	320	13	192	8	0	512	21	0	533
1,065	320	13	192	8	0	512	21	0	533
1,060	320	13	192	8	0	512	21	0	533
1,055	320	13	192	8	0	512	21	0	533
1,050	400	17	192	8	0	592	25	0	617
1,045	400	17	240	10	200	640	27	200	867
1,040	400	17	240	10	250	640	27	250	917
1,035	400	17	240	10	300	640	27	300	967
1,030	400	17	240	10	350	640	27	350	1,017
< 1,025	480	20	240	10	350	720	30	350	1,100

# Reducing Risk

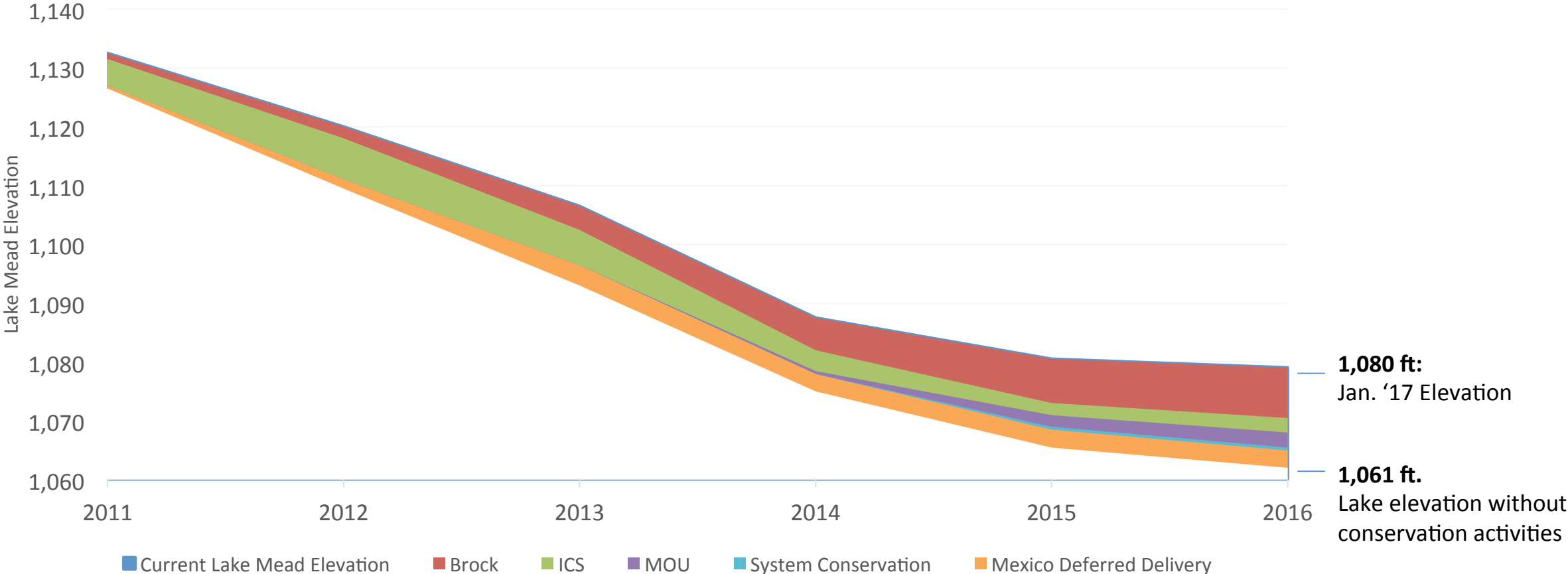
Proposed voluntary reductions would help reduce risk to Lake Mead's elevations.





# Protecting Elevations

**Investments in conservation have slowed Lake Mead's declines.**





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