

# Risk Management Strategies of the Upper Basin

## Addressing Potential Shortages

June 10, 2011



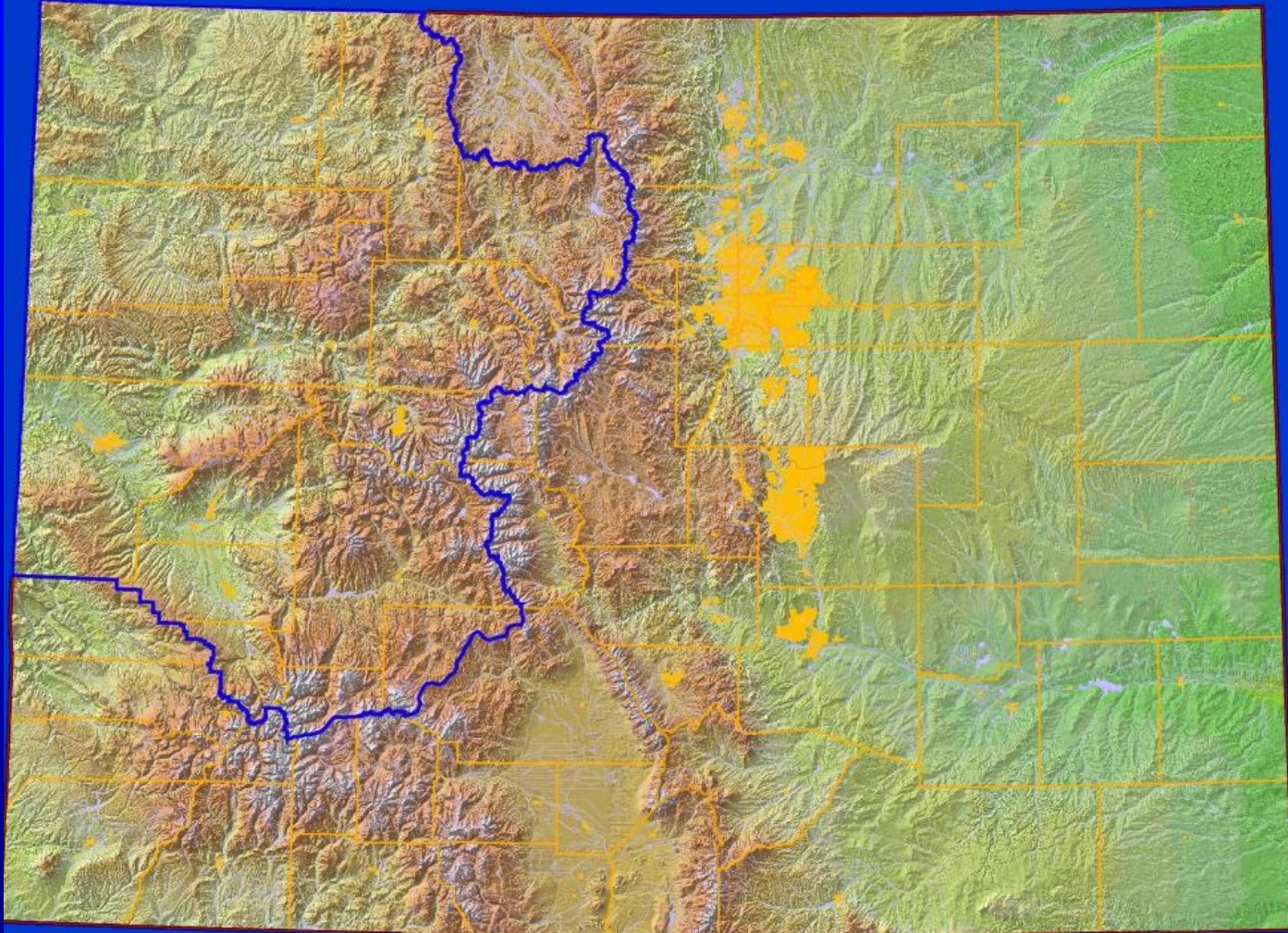
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**Colorado River District**

*Protecting Western Colorado Water Since 1937*



**Mission:** *To lead in the protection, conservation, use and development of the water resources of the Colorado River basin for the welfare of the District, and to safeguard for Colorado all waters of the Colorado River to which the state is entitled.*



# Colorado River Compact of 1922

**Colorado, like all Upper Division states, shares obligations to the Lower Division**

- **III (d) the Upper Division shall “not cause the flow of the river at Lee Ferry to be depleted below an aggregate of 75,000,000 acre-feet for any ten consecutive years.”**
- **III (c) regarding Mexico...the Upper Division must “deliver at Lee Ferry water to supply one-half of the deficiency so recognized in addition to that provided in paragraph (d).”**

# Upper Colorado River Basin Compact of 1948

## *Purposes of the 1948 Compact include:*

- “...equitable division and apportionment of the use of the waters...apportioned in perpetuity to the Upper Basin”
- “...establish the obligations of each State of the Upper Division with respect to deliveries of water required to be made at Lee Ferry”
- procedures and methodology for determining how much water Colorado would have to provide in the event the “curtailment of the use of water...becomes necessary in order that the flow at Lee Ferry shall not be depleted below that required by Article III (of the 1922 Compact).”

# Important Implications

## Article VIII of the 1922 Compact:

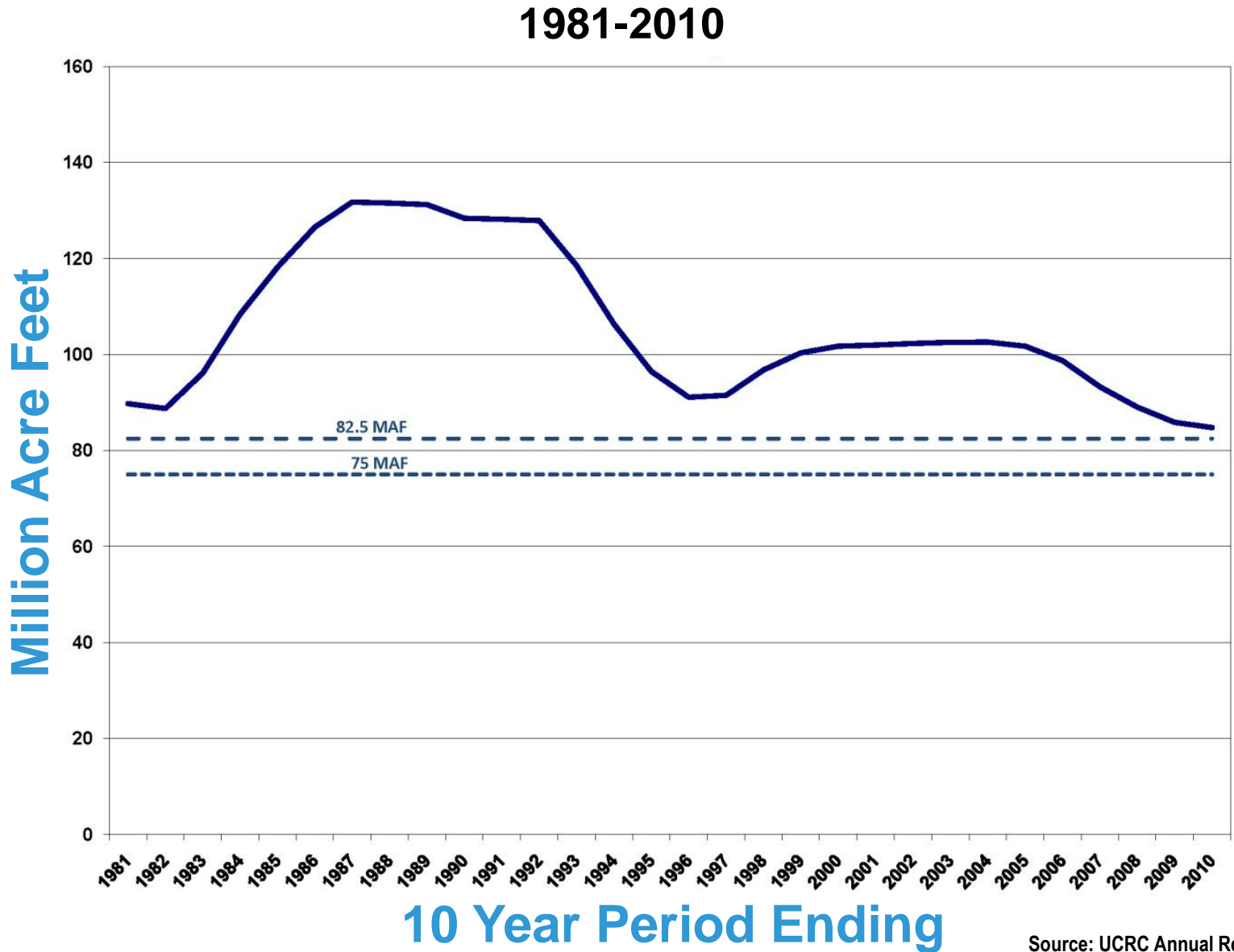
“...present perfected rights to the beneficial use of waters of the Colorado River System are unimpaired by this compact.”

## Article IV(c) of the 1948 Compact:

excludes water rights perfected prior to Nov. 24, 1922 from curtailment

NOTE: The 1964 *Arizona v. California* Supreme Court decree includes a definition of “present perfected rights” that MAY apply.

# 10 Year Flow at Lee Ferry



# Variables of Curtailment Risk

- obligation at Lee Ferry
- development of Upper Basin
- future hydrology within Basin

# Future Hydrology

↑ **Upper Basin demands** (new development)

↑ **Upper Basin uses** (existing development)

↑ **temperature** (likely)

↑ **or ↓ precipitation?**

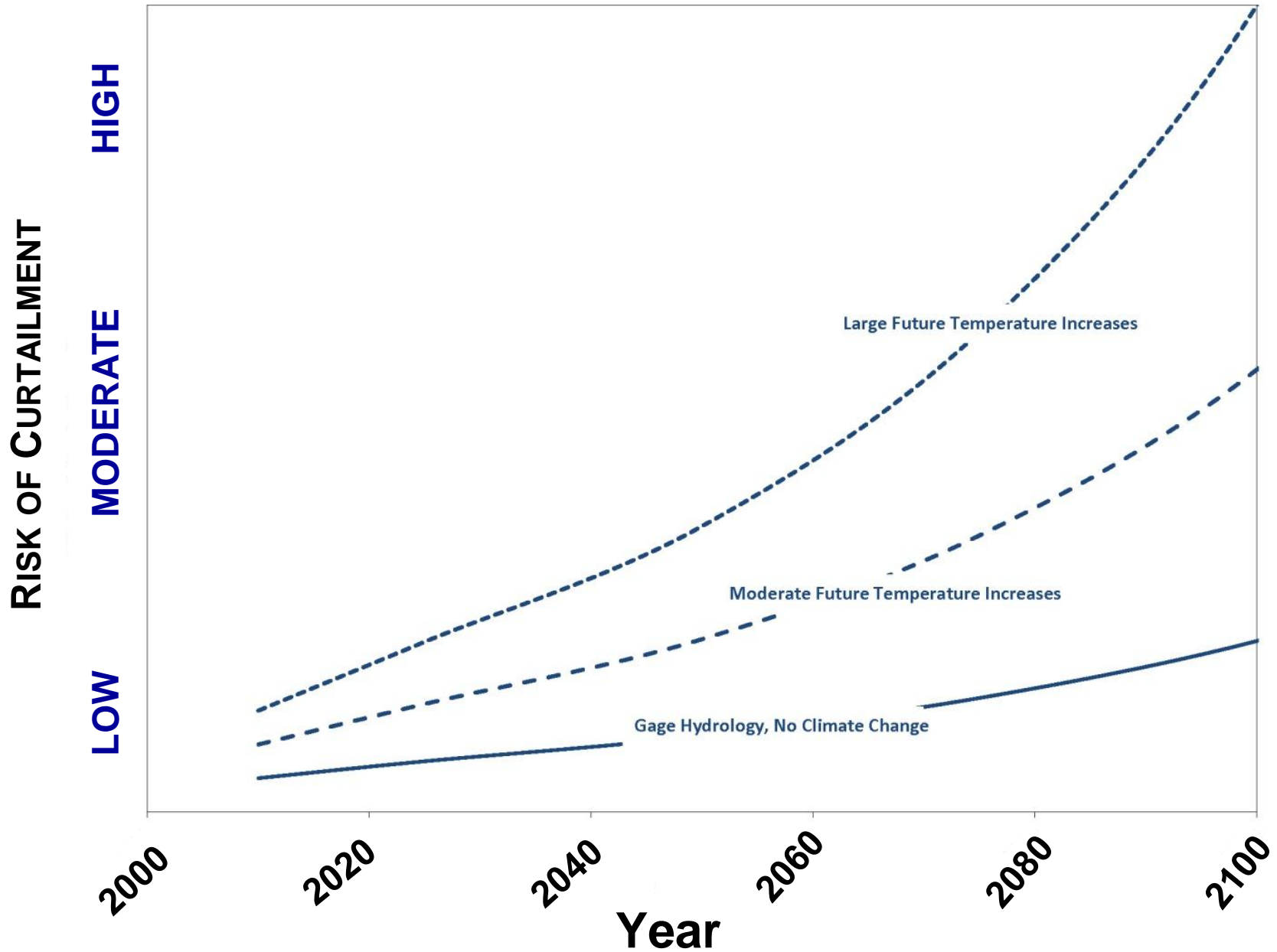
# Curtailment Triggers

**75.0 maf / 10 years?**

**82.5 maf / 10 years?**

**something in between?**

# CONCEPTUAL GRAPH: Risk of Curtailment Under Different Future Scenarios



# Impacts of Curtailment

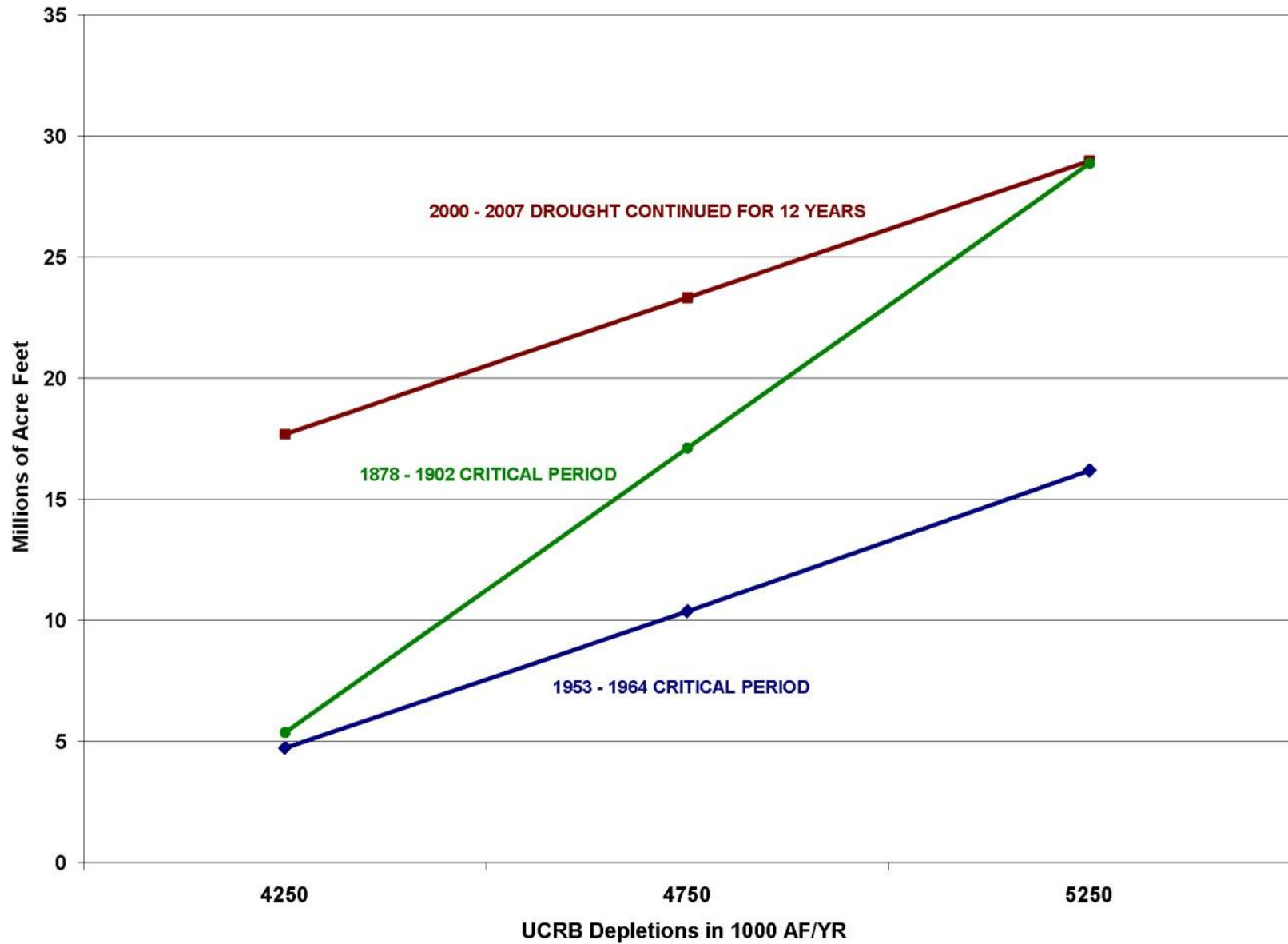
- pre-1922 rights
- West Slope cities
- post 1922 storage rights
- major Front Range water diverters
- snowmaking
- thermal electric power plants

# Strategies to Minimize the Risk

- **CRSPA optimization**
- **litigation**
- **curtailment compliance & contingency plans**
- **new institutional arrangements/ joint projects**

# Upper Basin Storage Requirement - 602 (a) Calculations

assumptions: 6% shortage; 350 KAF/YR CRSP evaporation; 8.23 MAF minimum release; minimum power pool not included



# Amount of water “probably used” for ag irrigation as of 1920

State	Acre Feet
Wyoming	550,500
Colorado	1,100,000
Utah	538,500
<u>New Mexico</u>	<u>68,000</u>
<b>Totals</b>	<b>2,267,000</b>

**SOURCE: Minutes of the 6<sup>th</sup> meeting of the Colorado River Commission**

# Summary / Conclusions

- **Risk management will be a top priority**
- **Entities that prepare today will have the upper hand**



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