

# The Colorado River

*then, now & the future*

**Kay Brothers**



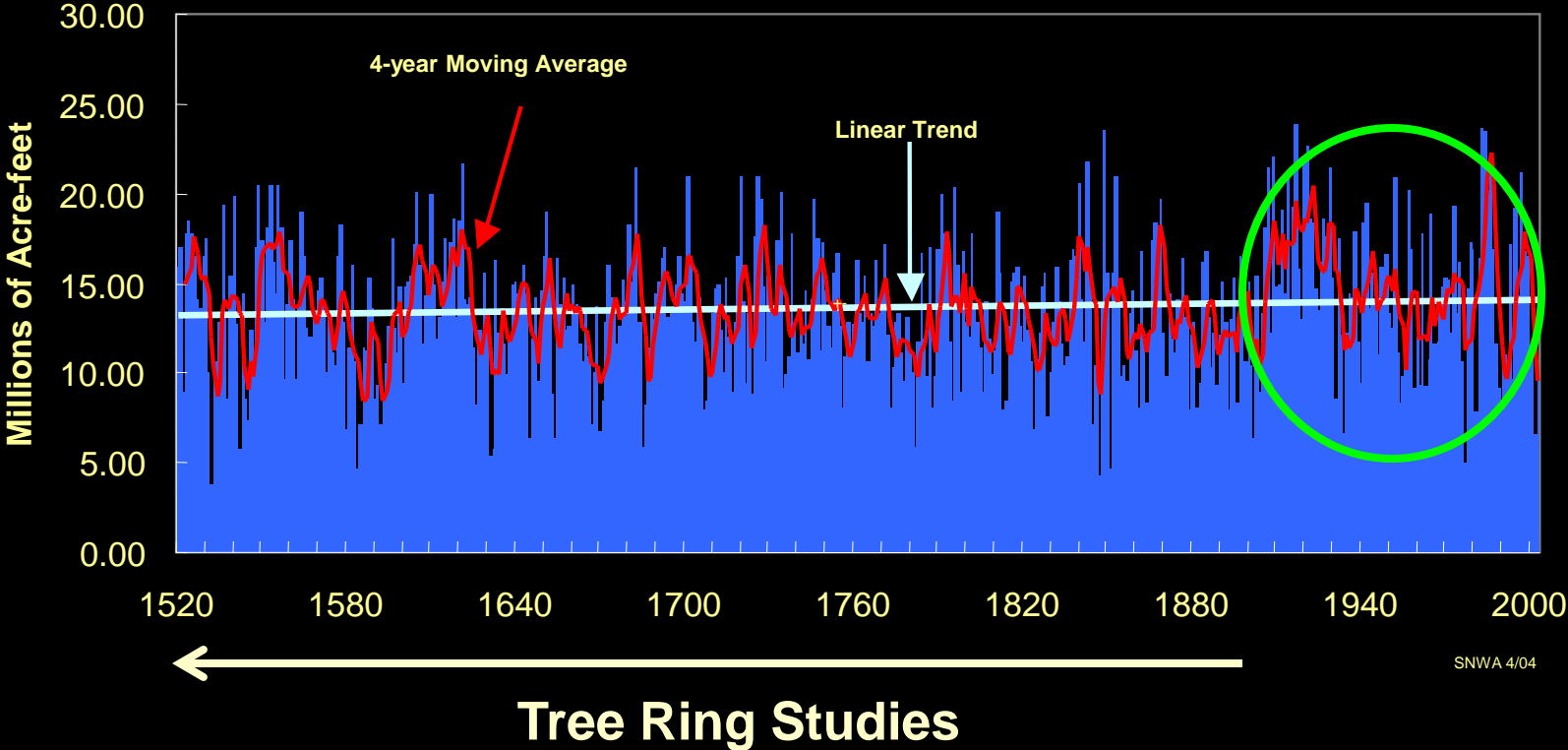
April 8, 2014



Southern Nevada  
Water Authority

# Colorado River – Historical Flow

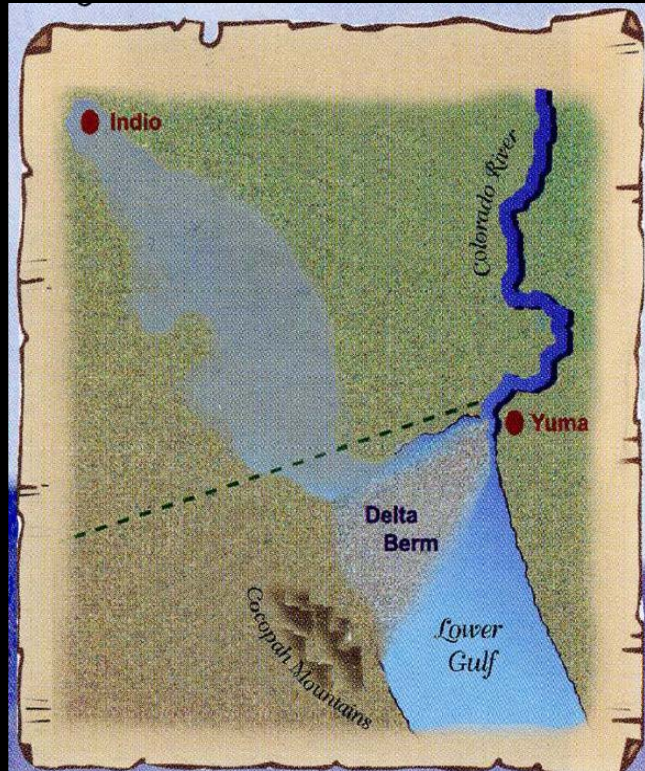
Recorded History



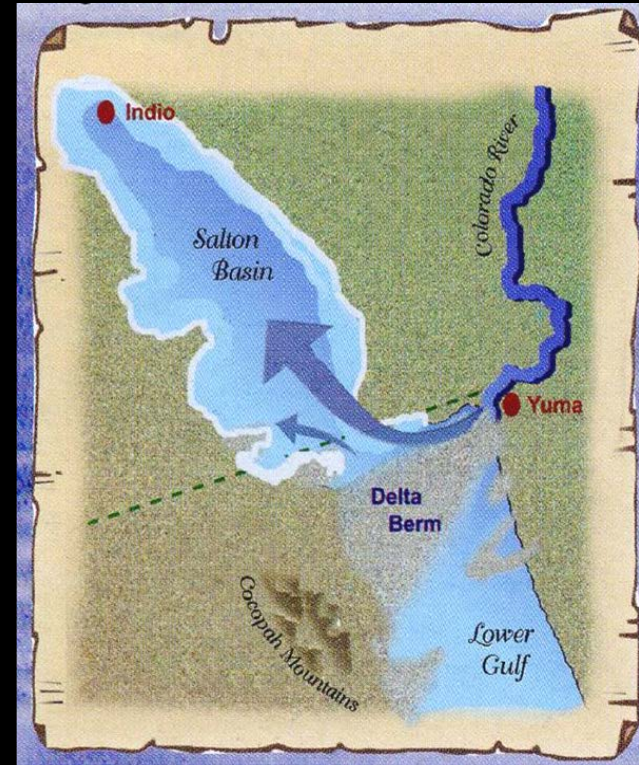




# Colorado River – Historical Flow



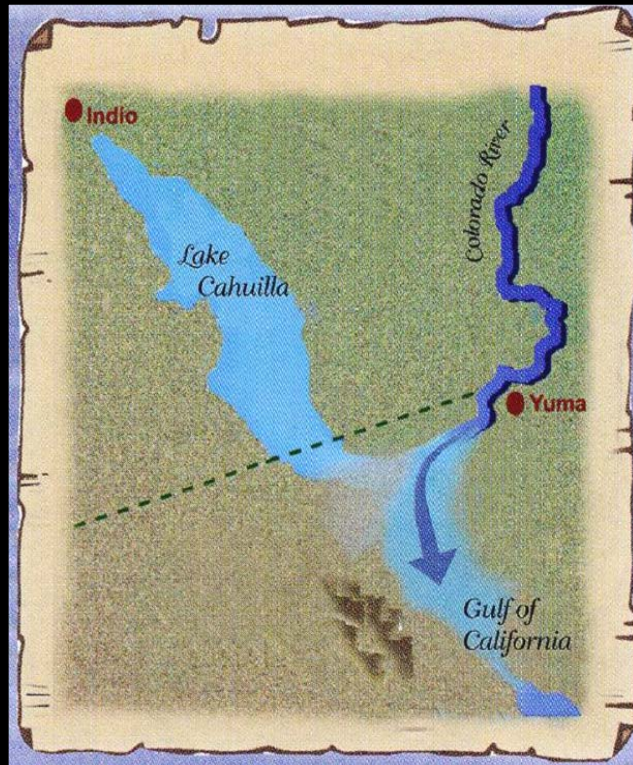
*The lake to the north dries up....*



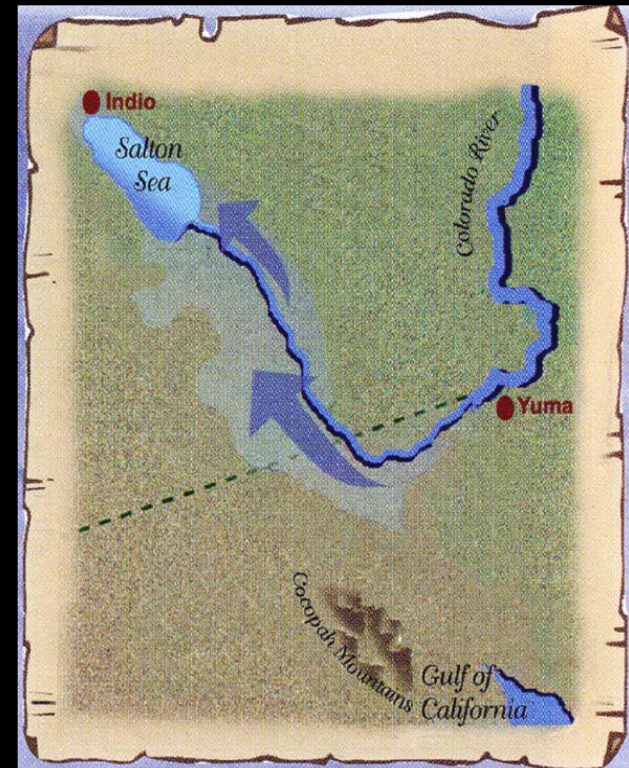
*At times, the river flowed north to the Salton Basin...*



# Colorado River – Historical Flow

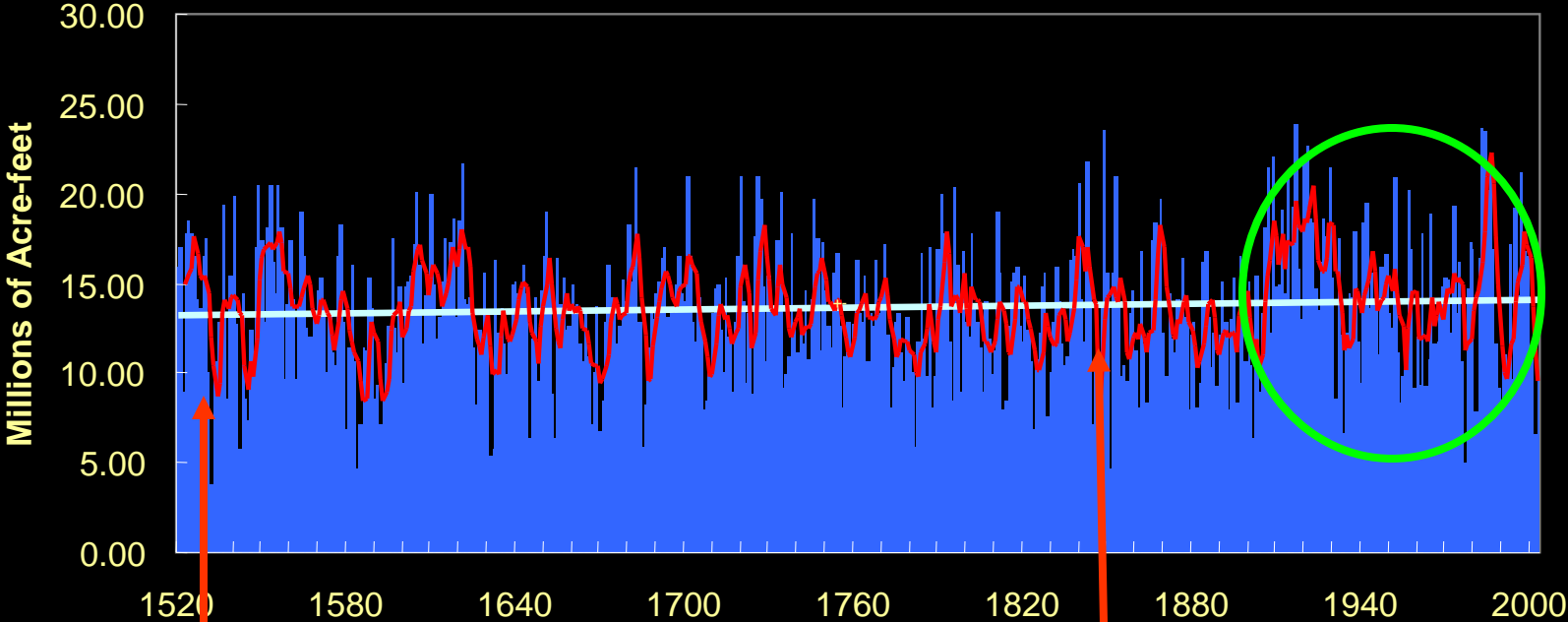


*At times, it flowed south to the Gulf...*



*Formation of the Salton Sea, 1905*

# Colorado River – Historical Flow



**Early 1500's**

**1840 - 1870**

# 1500's – Early Exploration

## Francisco Vasquez de Coronado



## Coronado travels West in search of Gold

*...But what I am sure of is that there is not any gold nor any other metal in all that country."*

# Las Vegas – 1840's

**John C. Fremont maps the West.**



**After his maps are published, hundreds to travelers come through the Las Vegas Springs and use it as a campsite because of its water.**



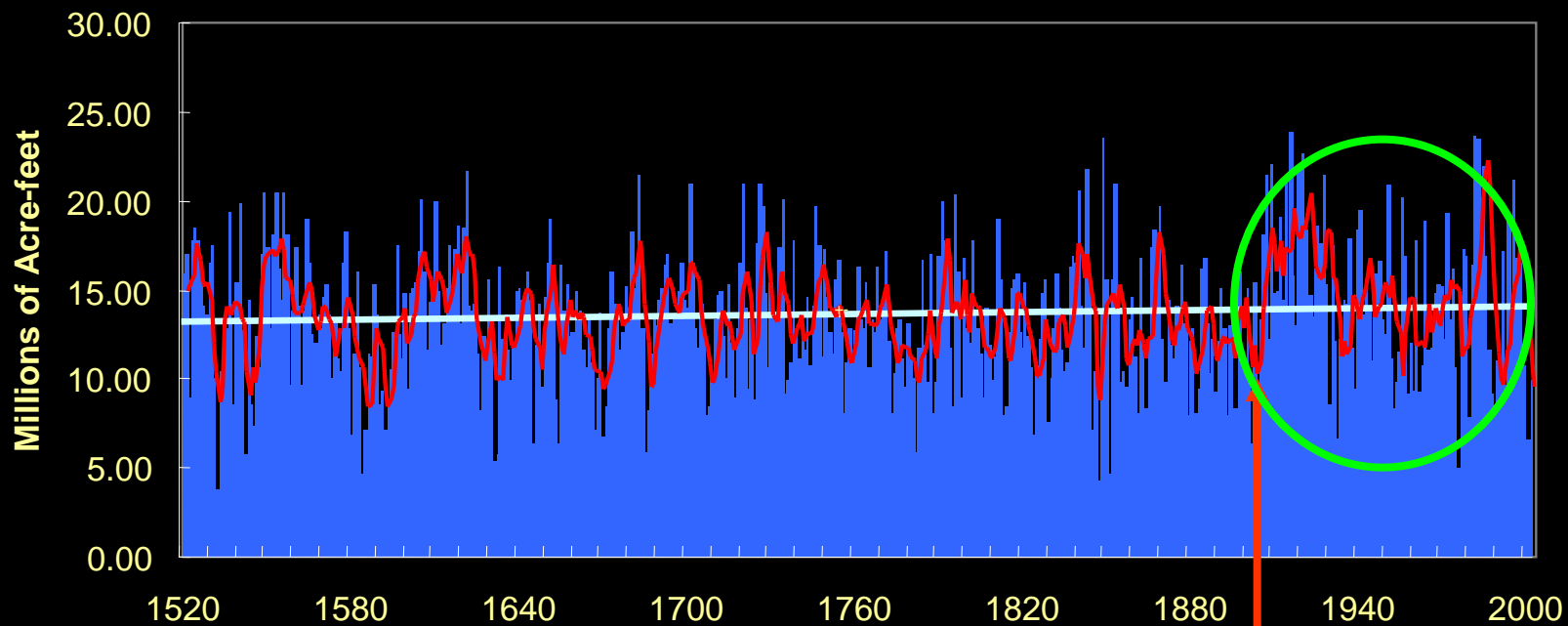
**1869**

**John Wesley Powell explores the  
Colorado River**



*"We have an unknown distance yet to  
run, an unknown river to explore. "*

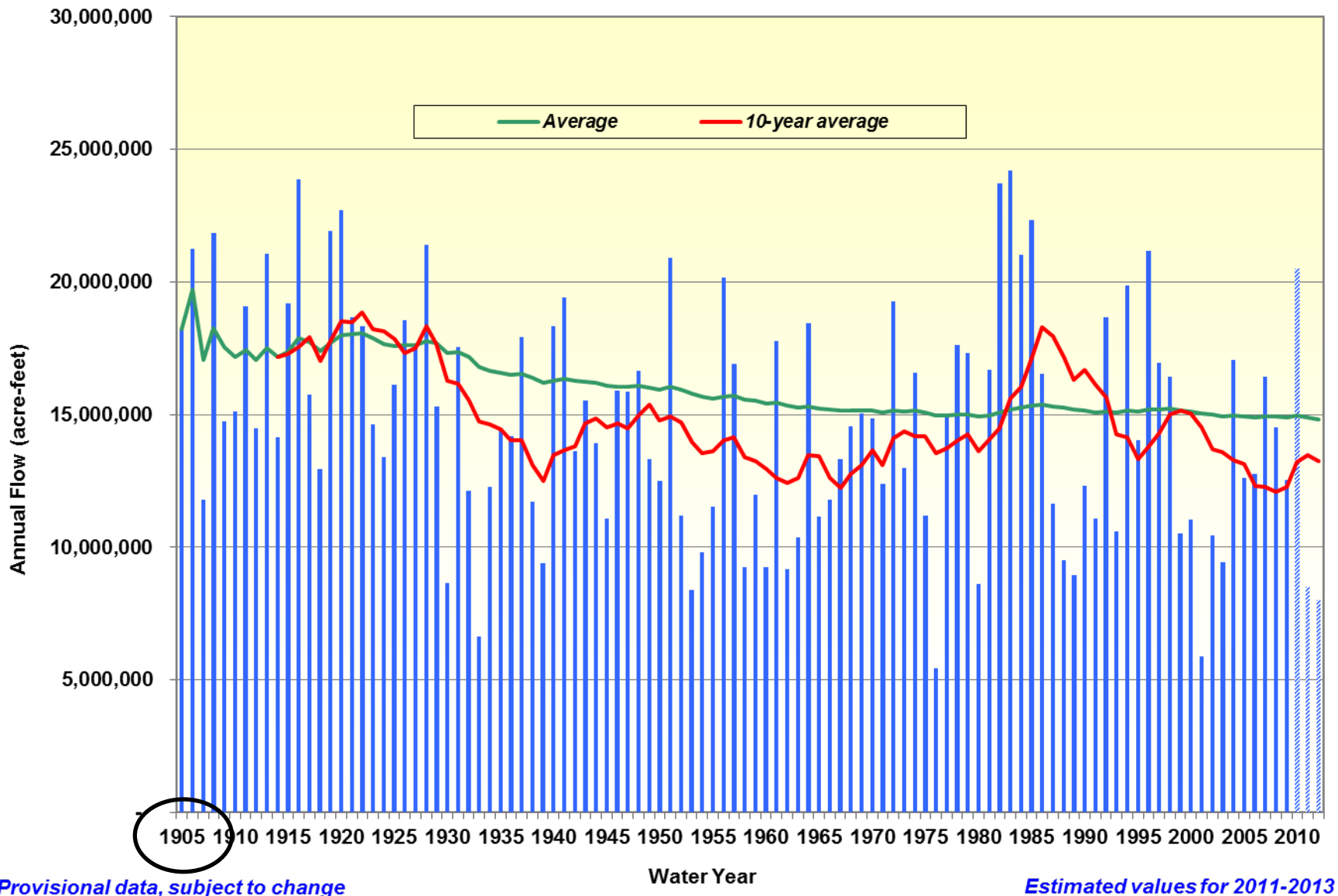
# Colorado River Historic Flows



SNWA 4/04

1905

# Historical Lake Powell Annual Inflows



# Las Vegas – 1905

Las Vegas is founded on May 15, 1905

**LAS VEGAS**

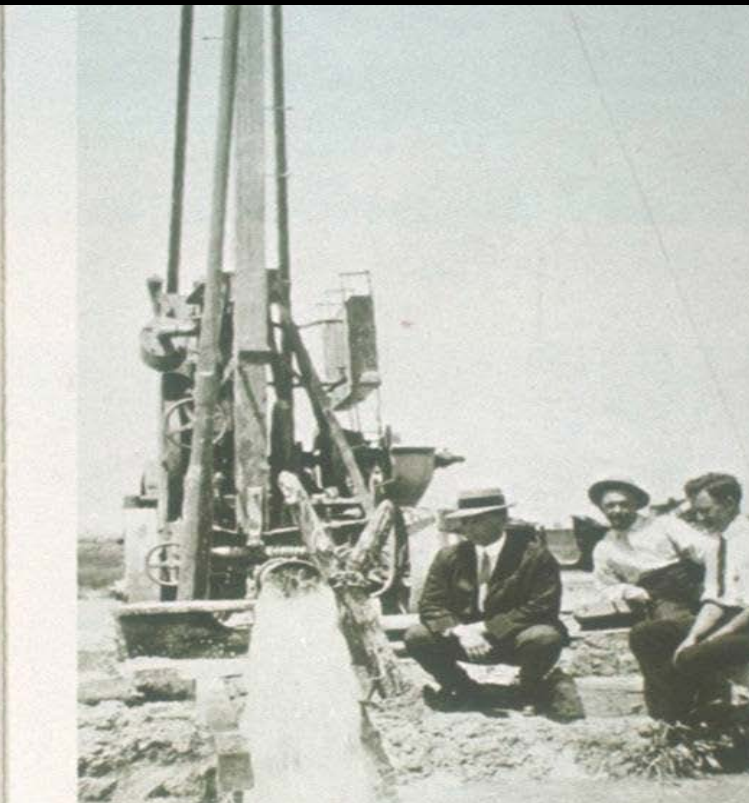
**"THE CITY OF DESTINY"**

**WHAT SHE IS AND HAS:**

County Seat of Clark County.  
Population 1,250. Age four years.  
The Gateway to the Southern Nevada Mining Districts  
—the richest on earth.  
Division point on main line of Salt Lake Route.  
Southern terminus of Las Vegas & Tonopah Railroad.  
The main shops of Salt Lake System (now building).  
Handsome Business Blocks of brick and cement.  
First State Bank—one of the most substantial financial  
institutions in the state.  
Ice Factory—largest and finest in Nevada.  
Six good Hotels and several lodging houses.  
Handsome Opera House.  
Numerous Fraternal Societies.  
Electric Light Plant.  
Modern Telephone Exchange.  
Graded Schools and High School.  
Two handsome Churches.

and streets.  
sure, piped to every lot.  
ty ("Has Nothing to Sell")  
es men, conducting, among

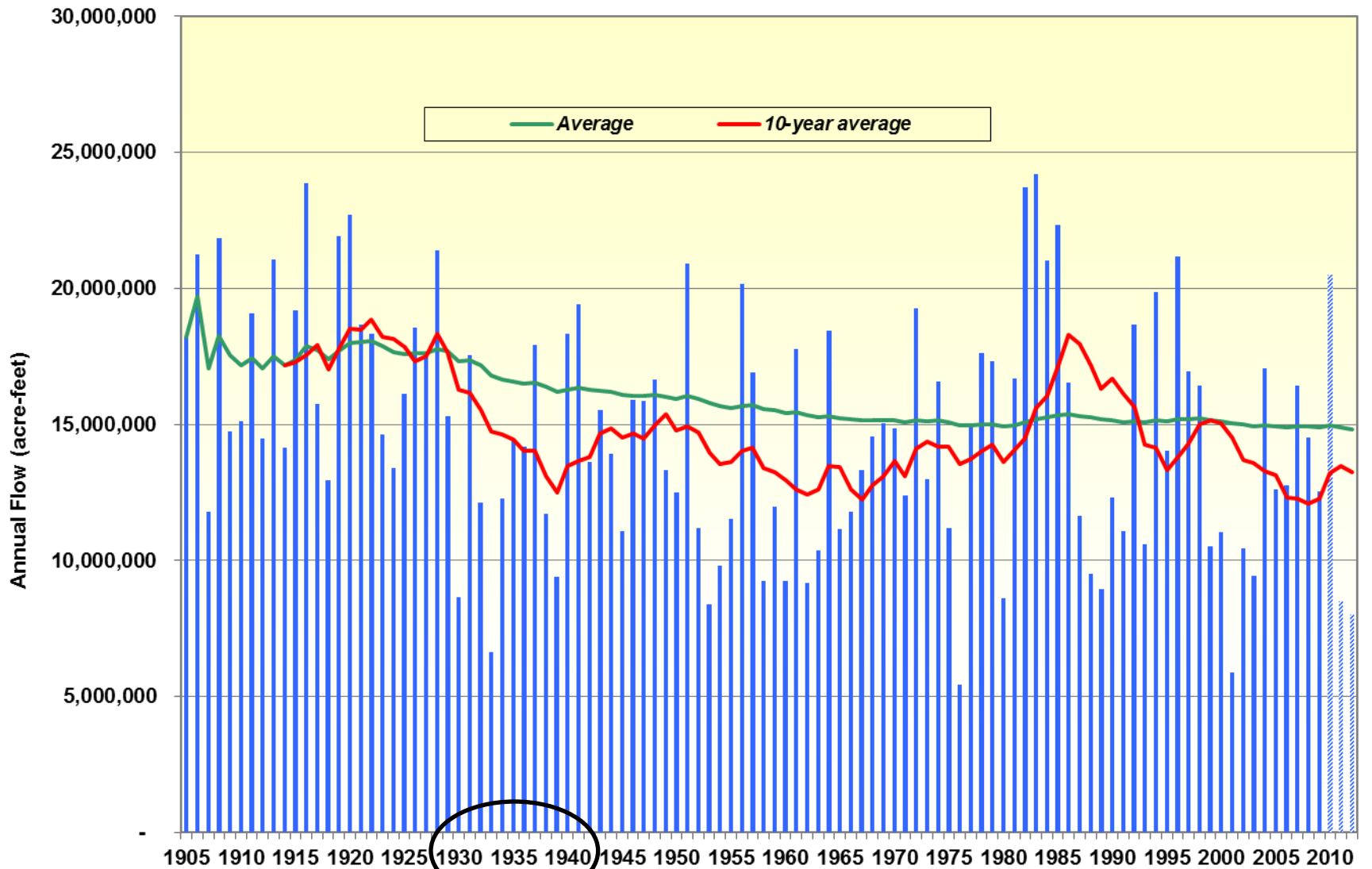
es (5)—Clothing (4)  
inery (3)—Hard-  
Ladies' Wear (1)—  
ps (3)—Meat Mar-  
—Restaurants (6)—



*In these early years and lasting for the next several decades, the community viewed its supply of artesian groundwater as virtually "inexhaustible."*



# Historical Lake Powell Annual Inflows



Provisional data, subject to change

Water Year

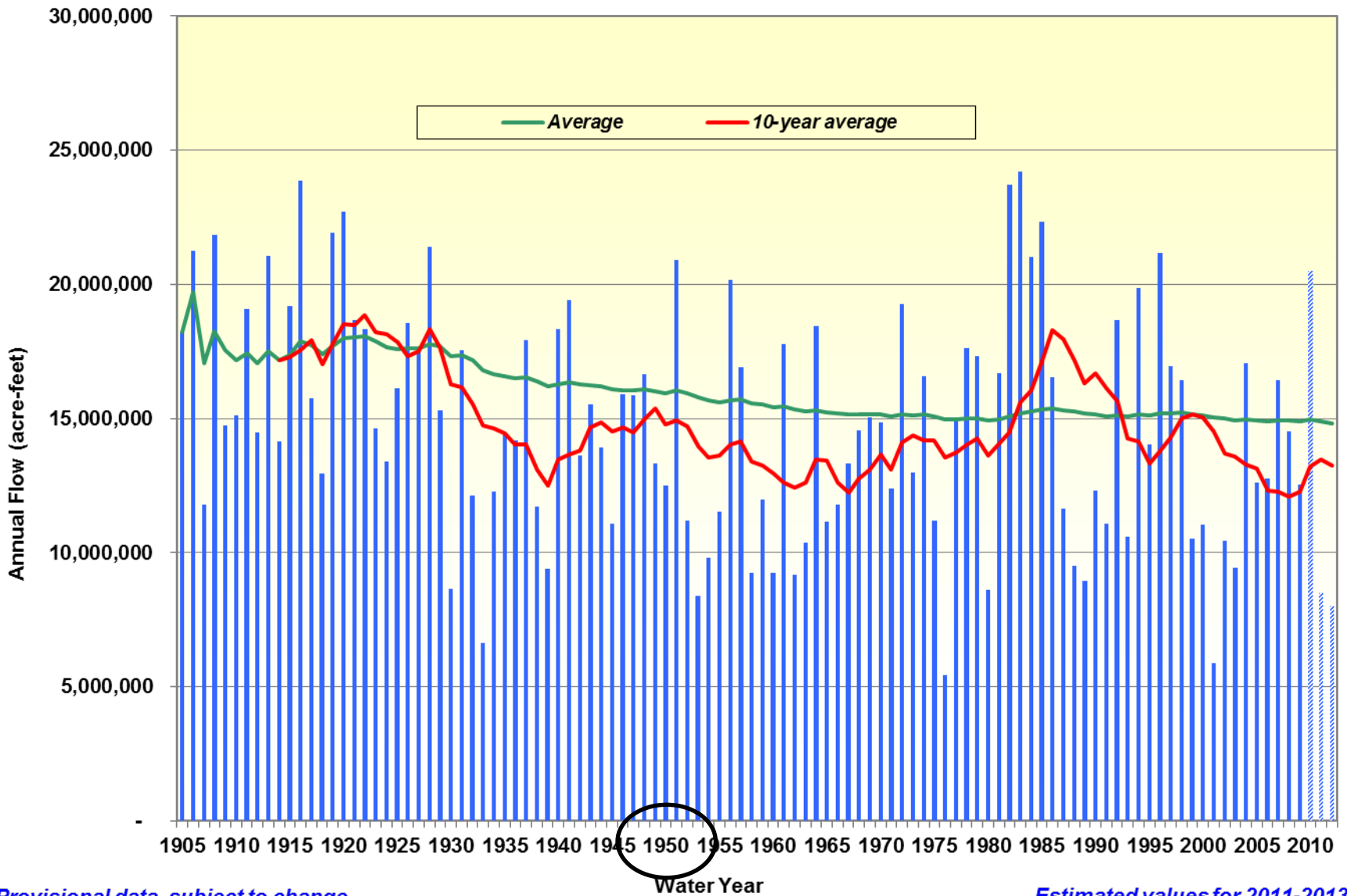
Estimated values for 2011-2013

**1930's**



**Work begins on Hoover Dam**

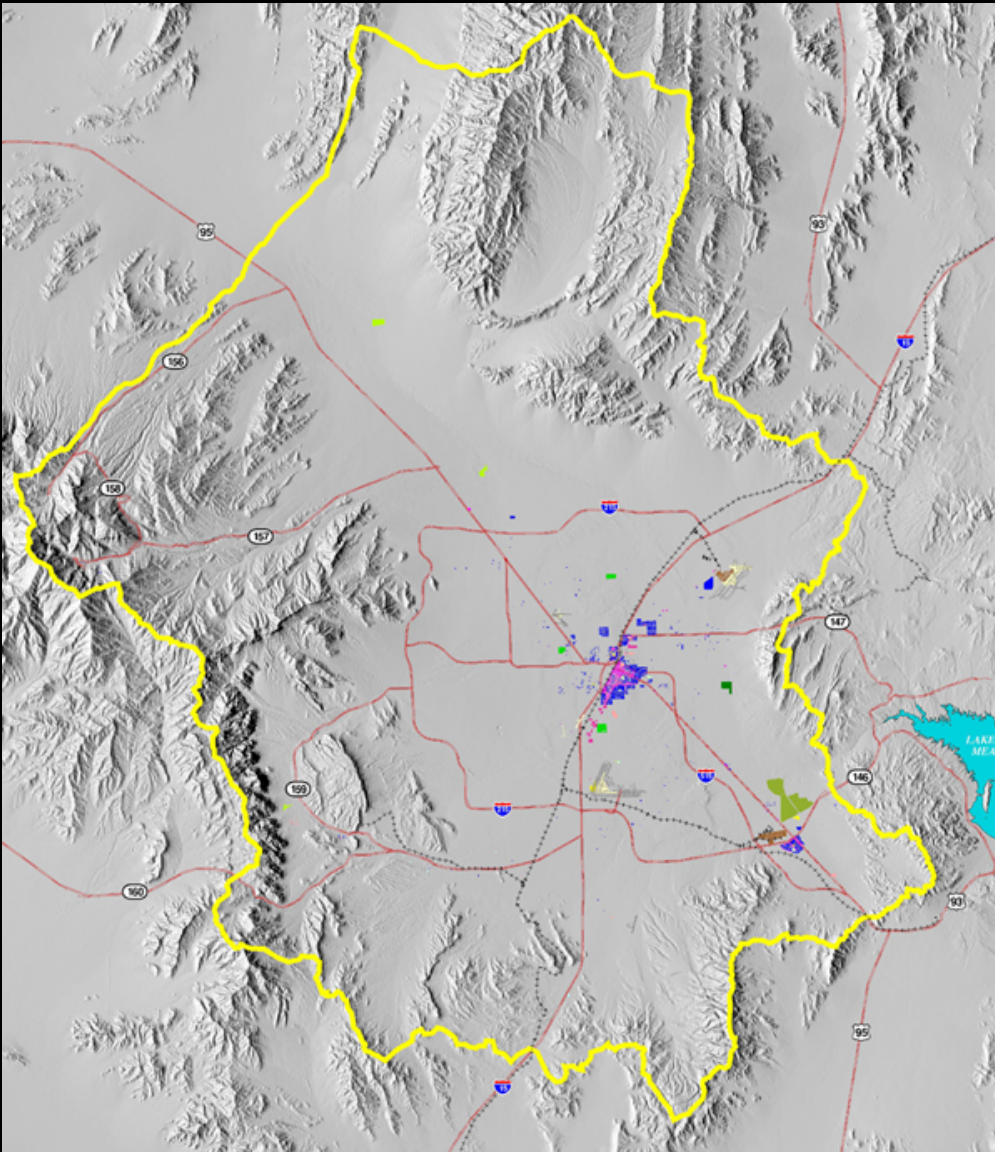
# Historical Lake Powell Annual Inflows



Provisional data, subject to change

Estimated values for 2011-2013

# Land Use – 1950



**40,000+ residents**  
**7,000 developed acres**



# Population 1900 – 1990

**“The population of the Southwestern United States has increased by approximately 1,500% over the last 90 years, while the population of the United States as a whole has grown by just 225%.”**

## Arizona

2,880%

## Nevada

2,840%

## **Maricopa County**

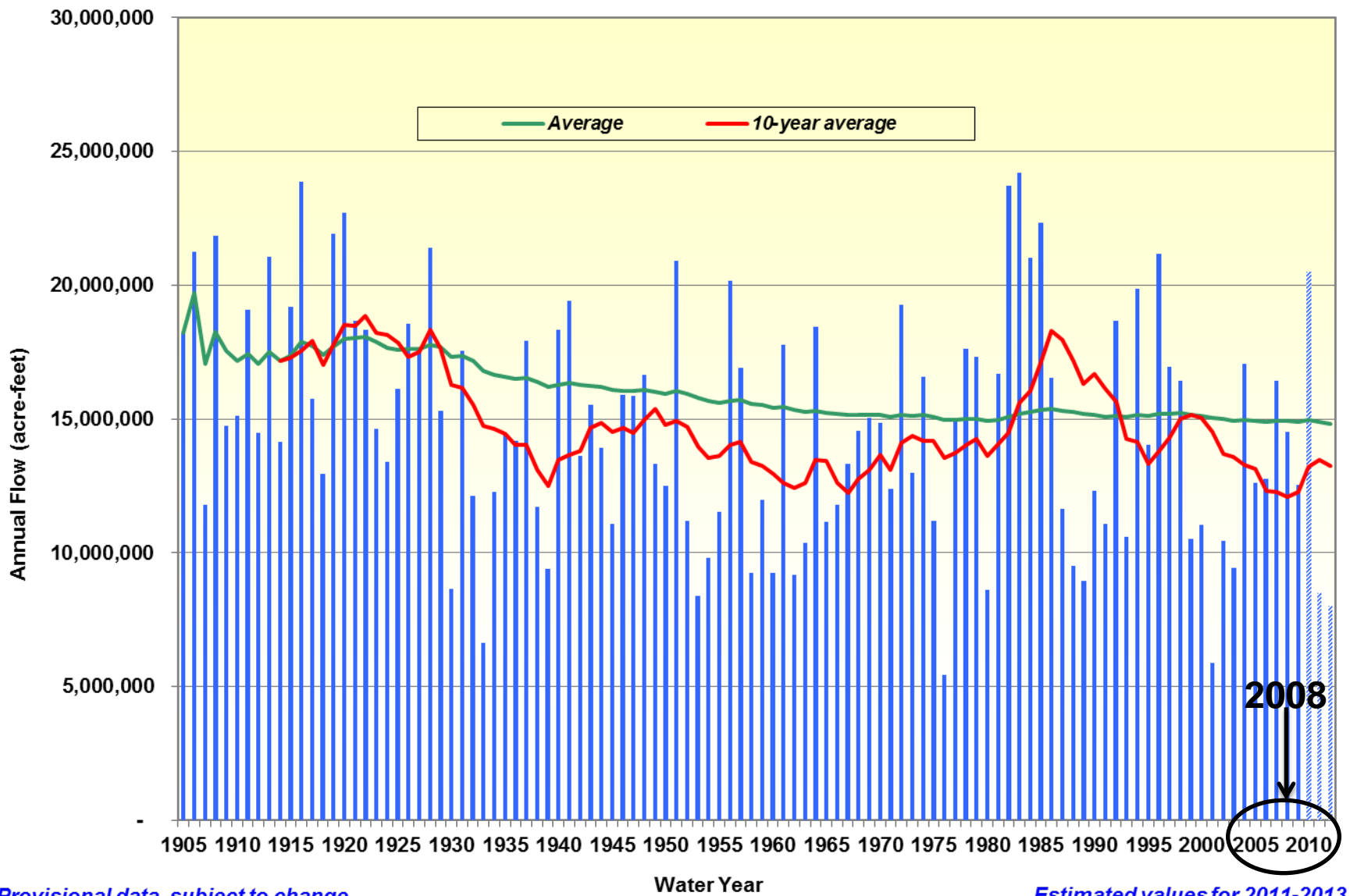
10,275%

## **Clark County**

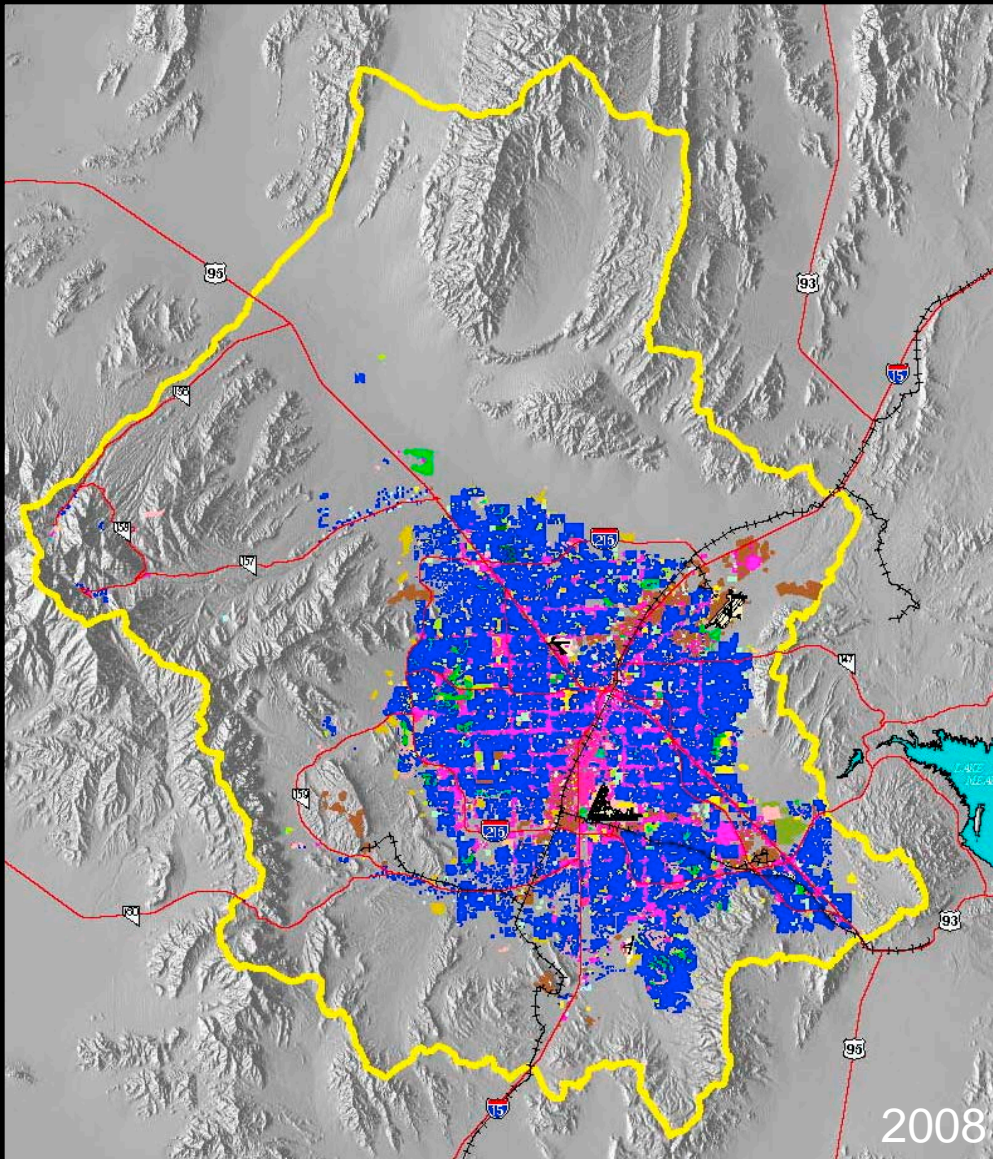
22,480%



# Historical Lake Powell Annual Inflows



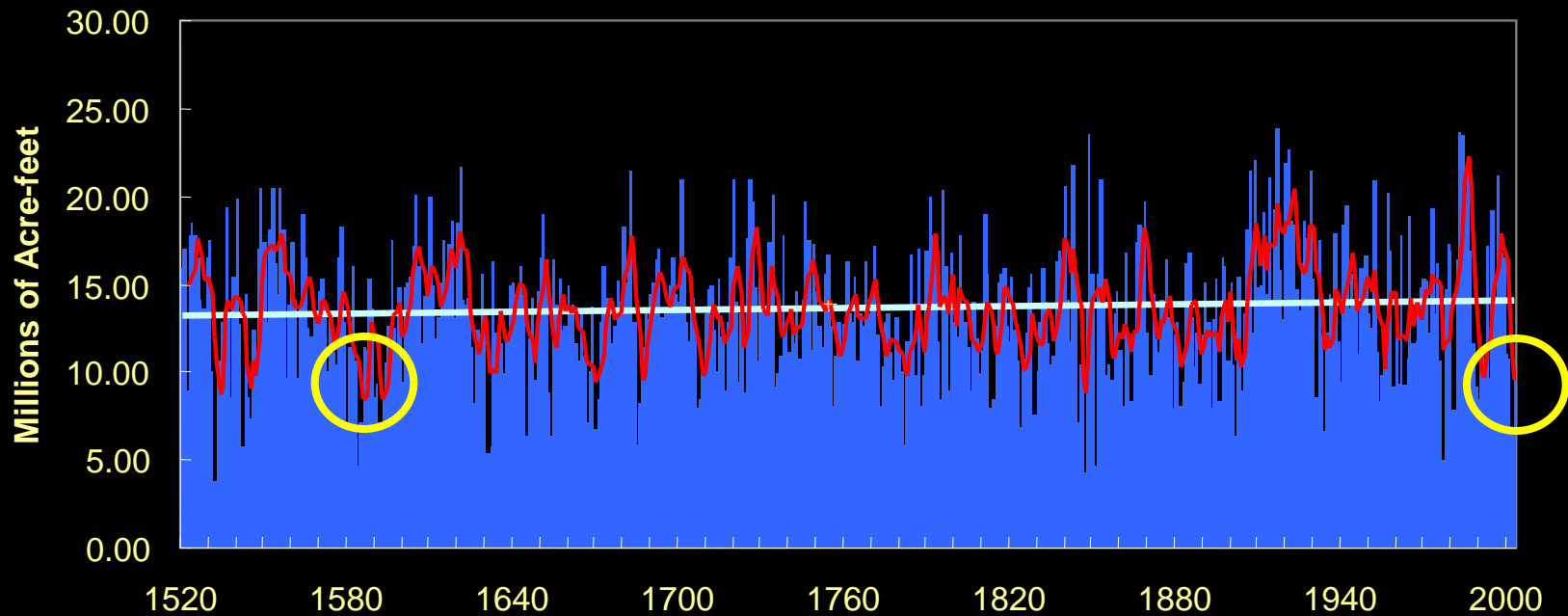
# Land Use – 2008



**2 Million residents**  
**162,773 Developed Acres**



# Colorado River Historic Flows



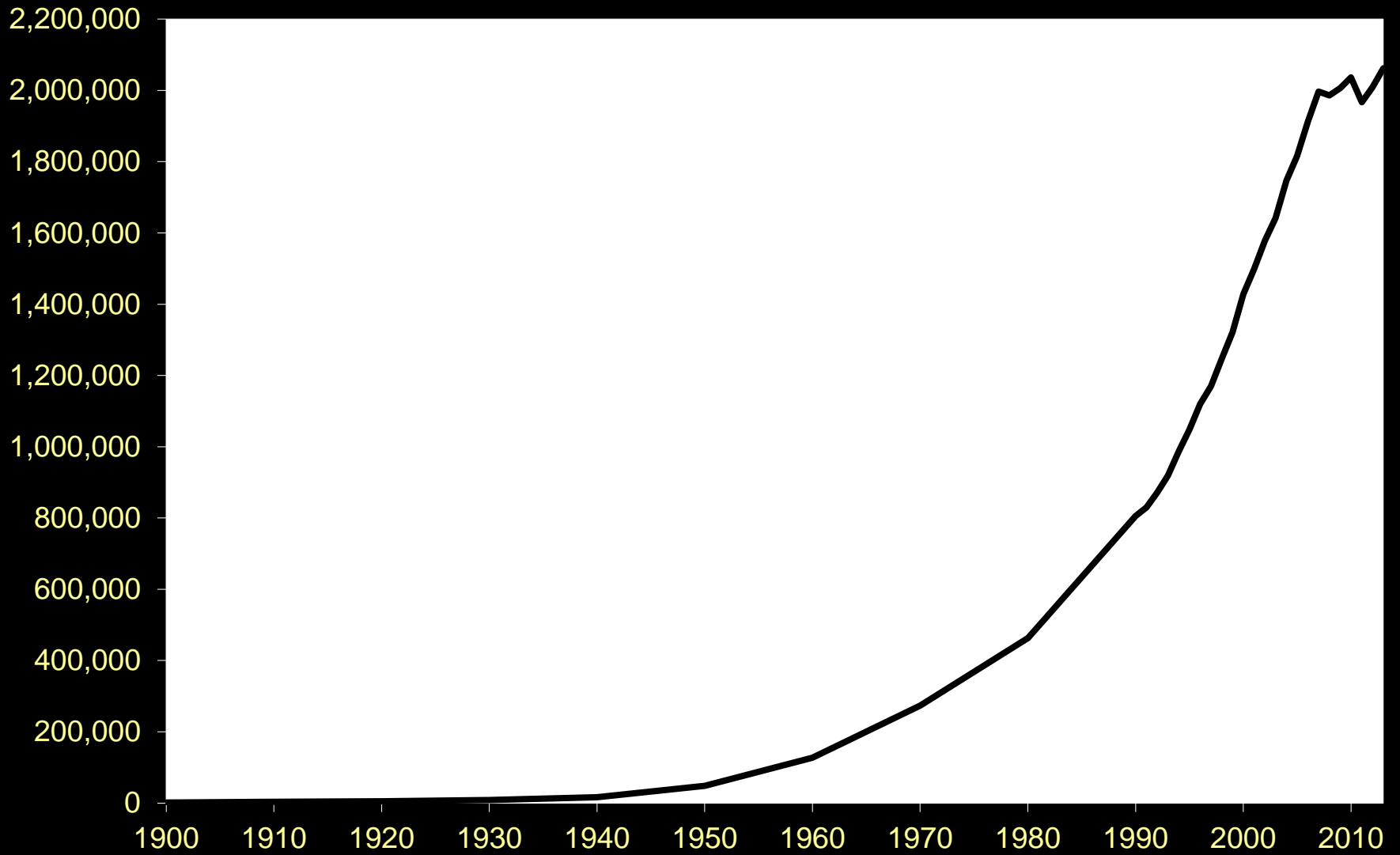
SNWA 4/04

**1583 – 1587 & 1590 – 1594**  
**66% of Normal**

**2000 - 2004**  
**50% of Normal**

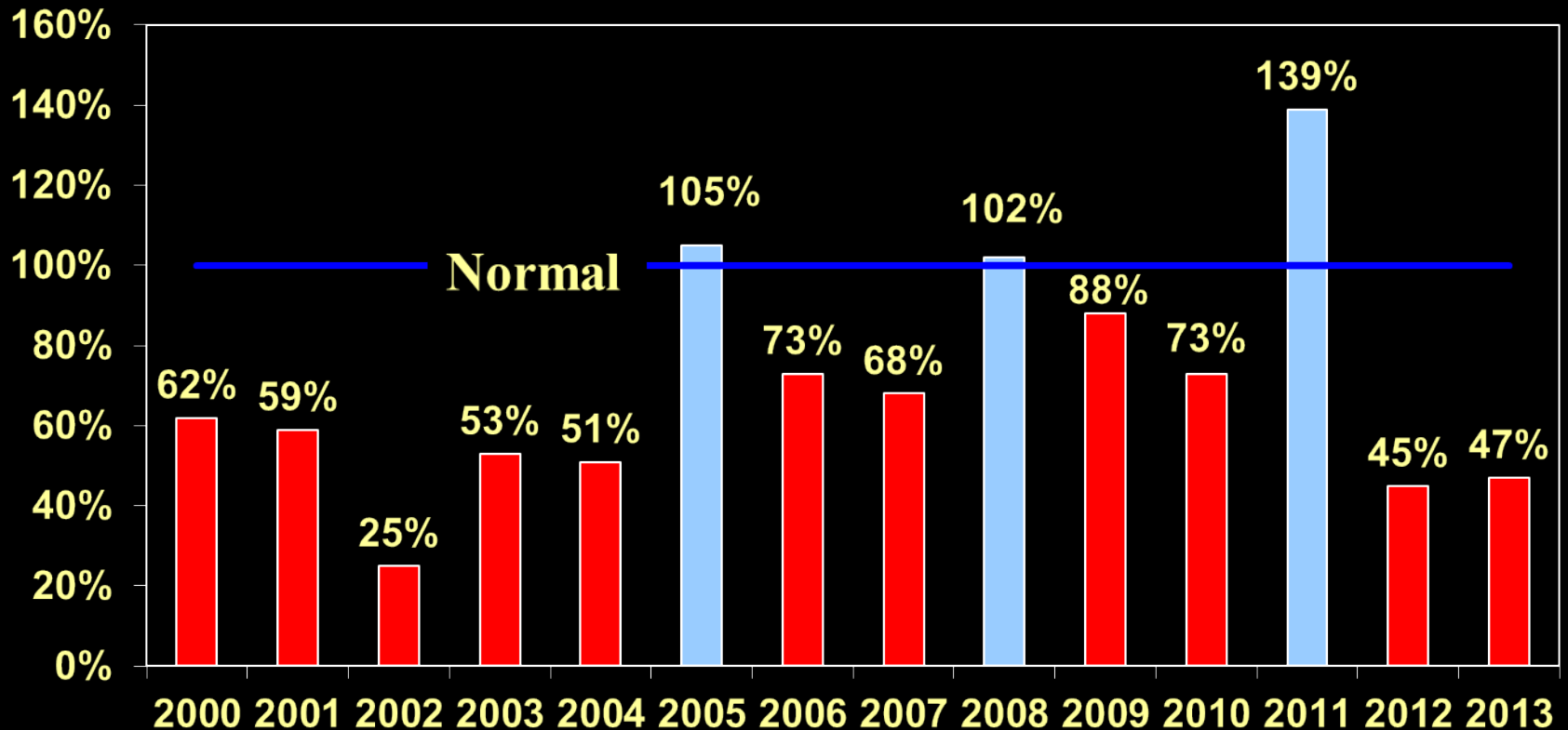


# Clark County Population



# Historical Lake Powell Annual Inflows

2000-2013 *Natural Flow* 12.16 million acre-feet or 82% of average



10-Year Average (2004-2013): 79% of normal

Historical 14-Year Average Inflow: 71% of normal

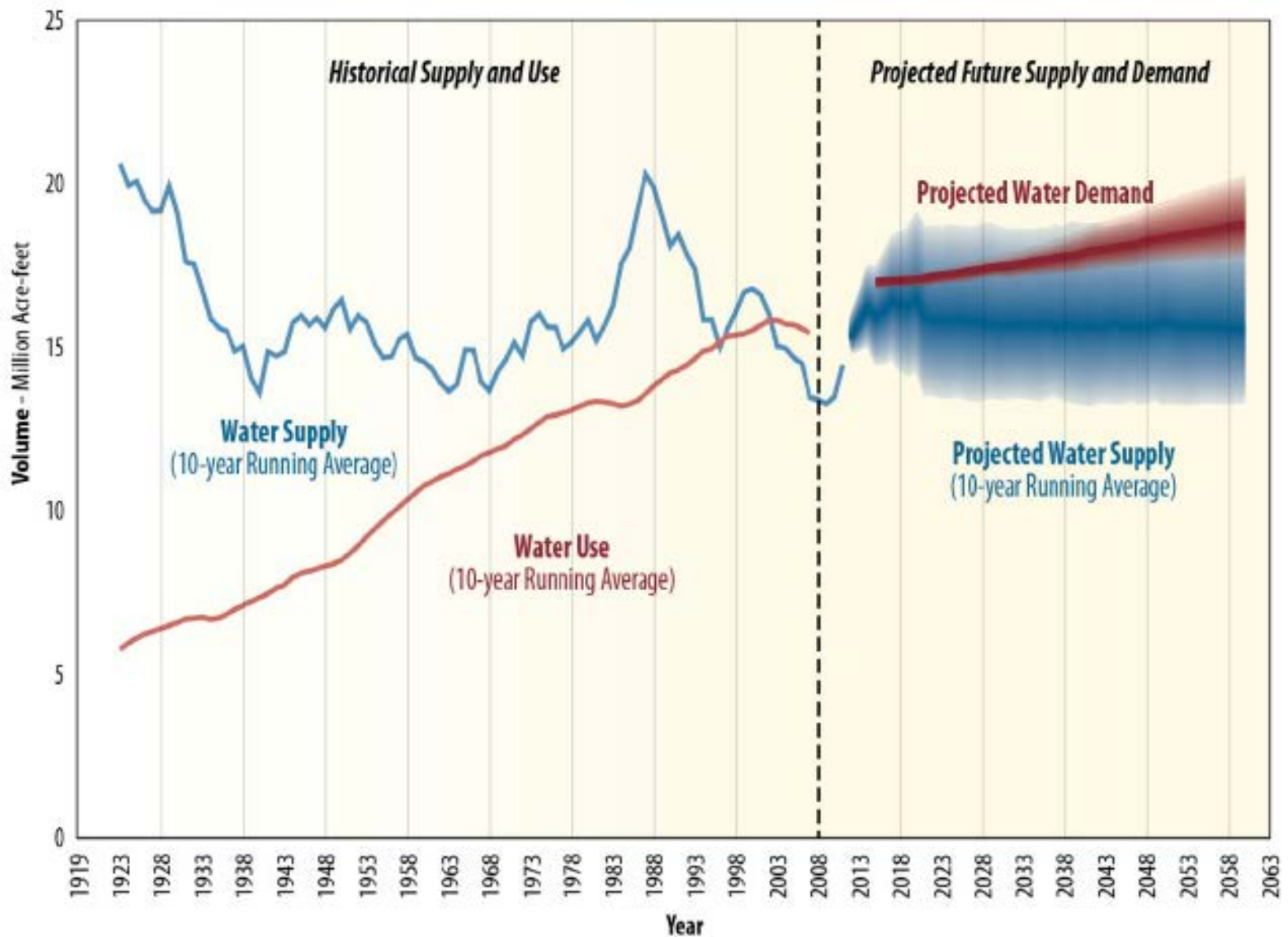
# Las Vegas



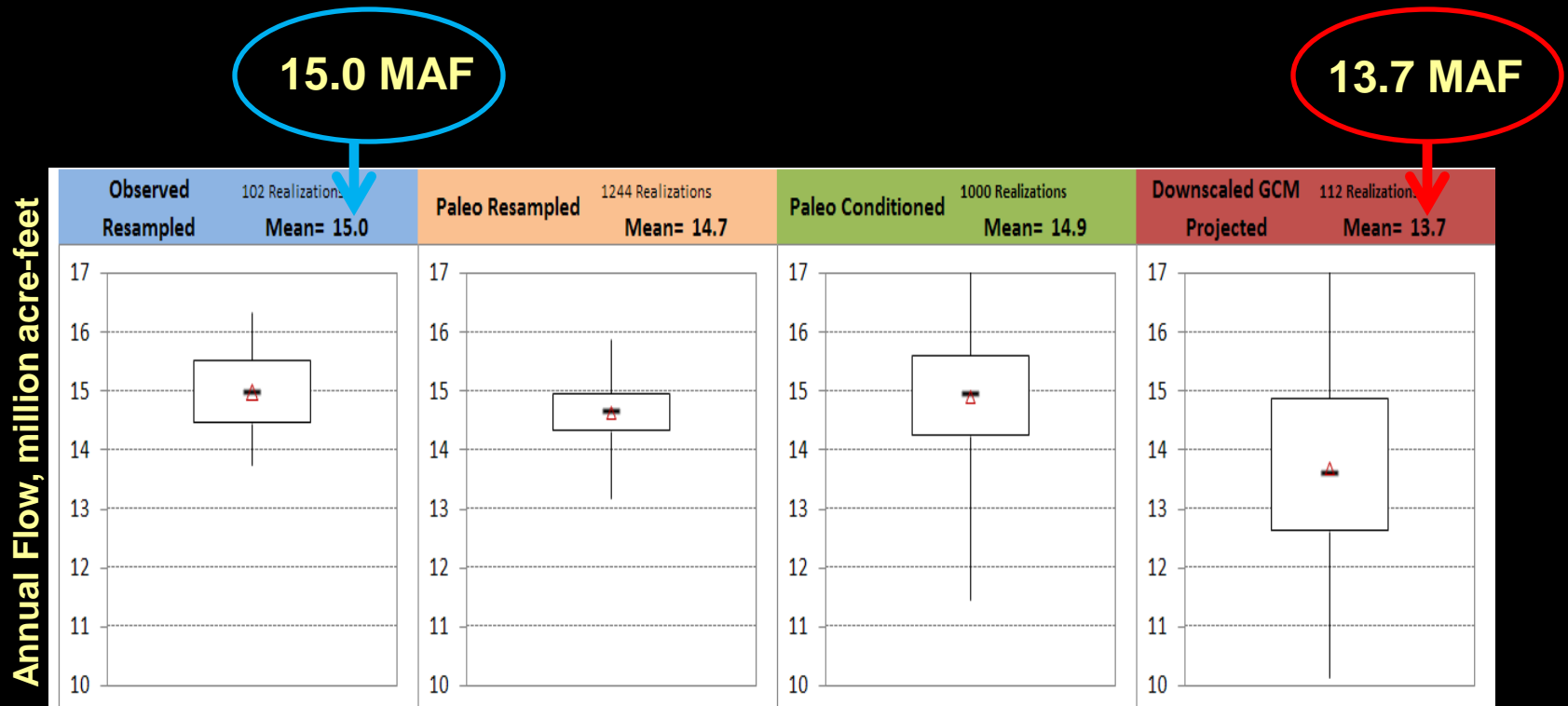




# Colorado River Basin Water Supply and Demand Study

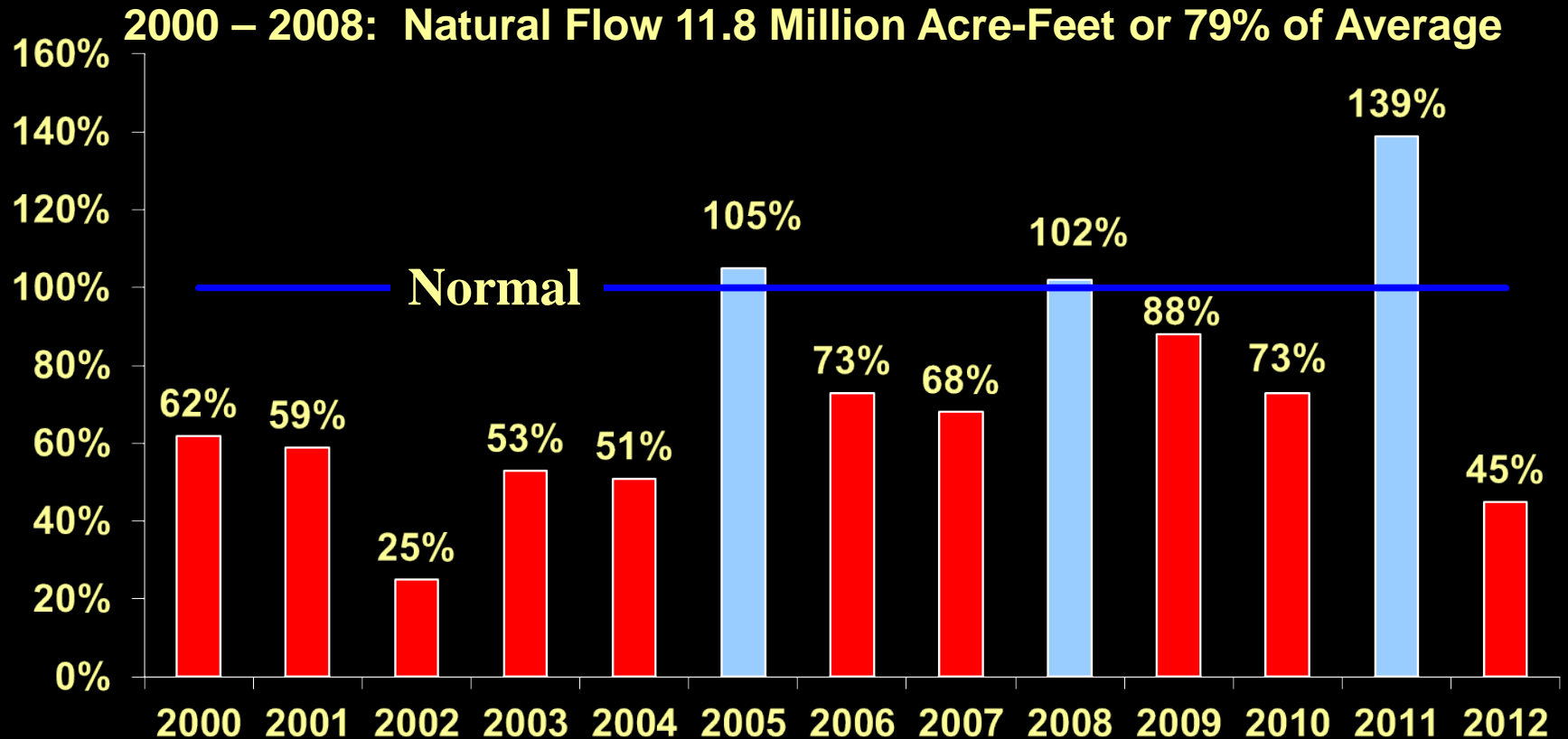


# Projections of Natural Flow at Lees Ferry



- The Downscaled GCM Projected scenario indicates higher variability and a mean less than other scenarios, ~ 9% less than the observed record by 2060.

# Historical Lake Powell Annual Inflows



10-Year Average (2003-2012): 80% of normal

Historical 13-Year Average Inflow: 73% of normal

# Future Colorado River Water Supply and Demand

- Median supply and demand imbalance in 2060 is 3.2 million acre-feet / year
- The range of supply and demand imbalances ranges from 0 to nearly 8 million acre-feet / year



# Next Steps

## Additional Conservation and Reuse

### Regional Solutions

- Weather Modification

### Augmentation

- Feasibility Studies

### Discussions

- “What happens when Lake Mead Reaches 1,025?”

## Future Planning Using Tools Developed for the Basin Study

# Southern Nevada Water Authority

