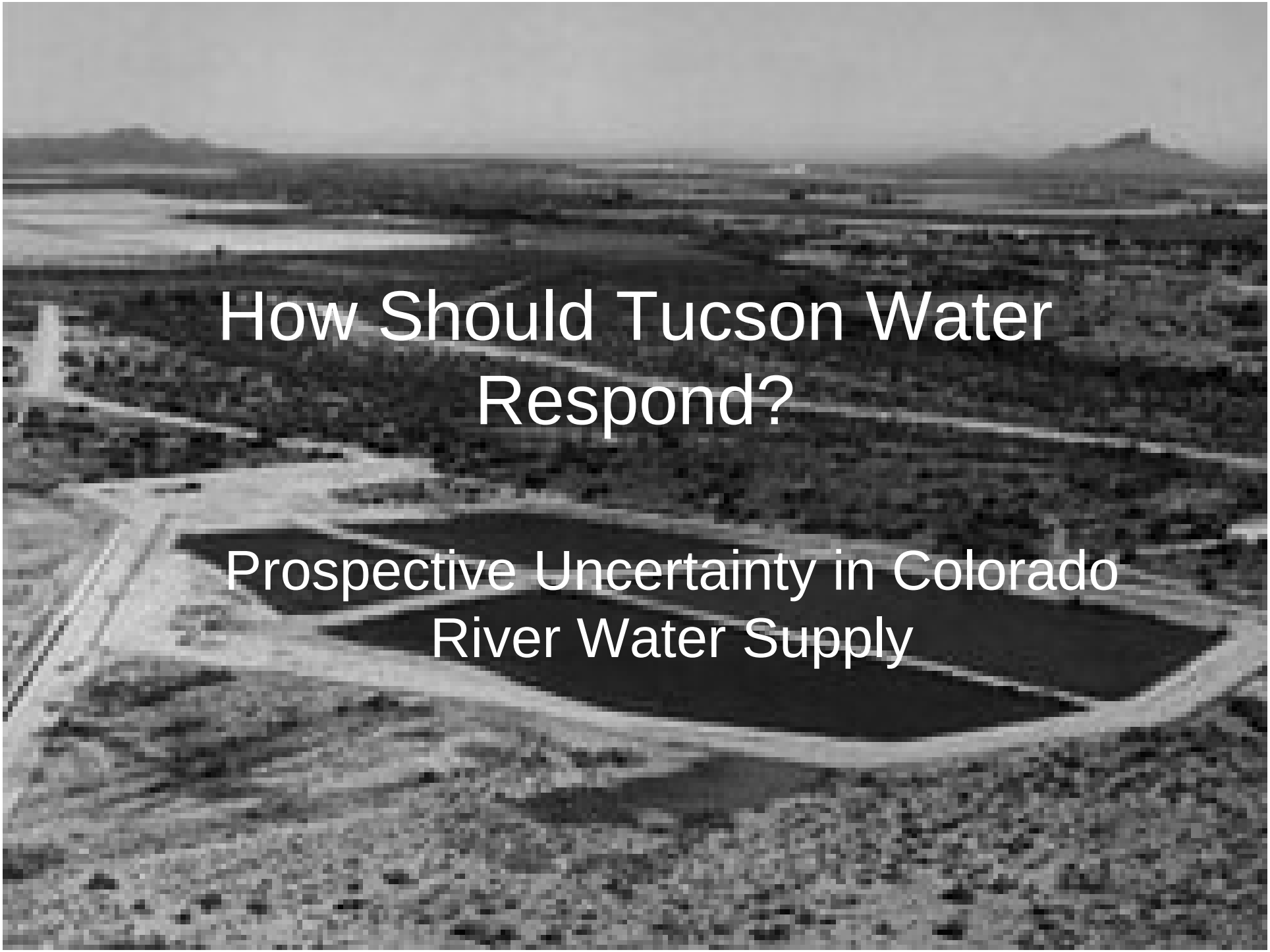


How Should Tucson Water Respond?

Prospective Uncertainty in Colorado River Water Supply

Colorado River Compact & Treaty Allocations

Upper Basin (7.5 maf)

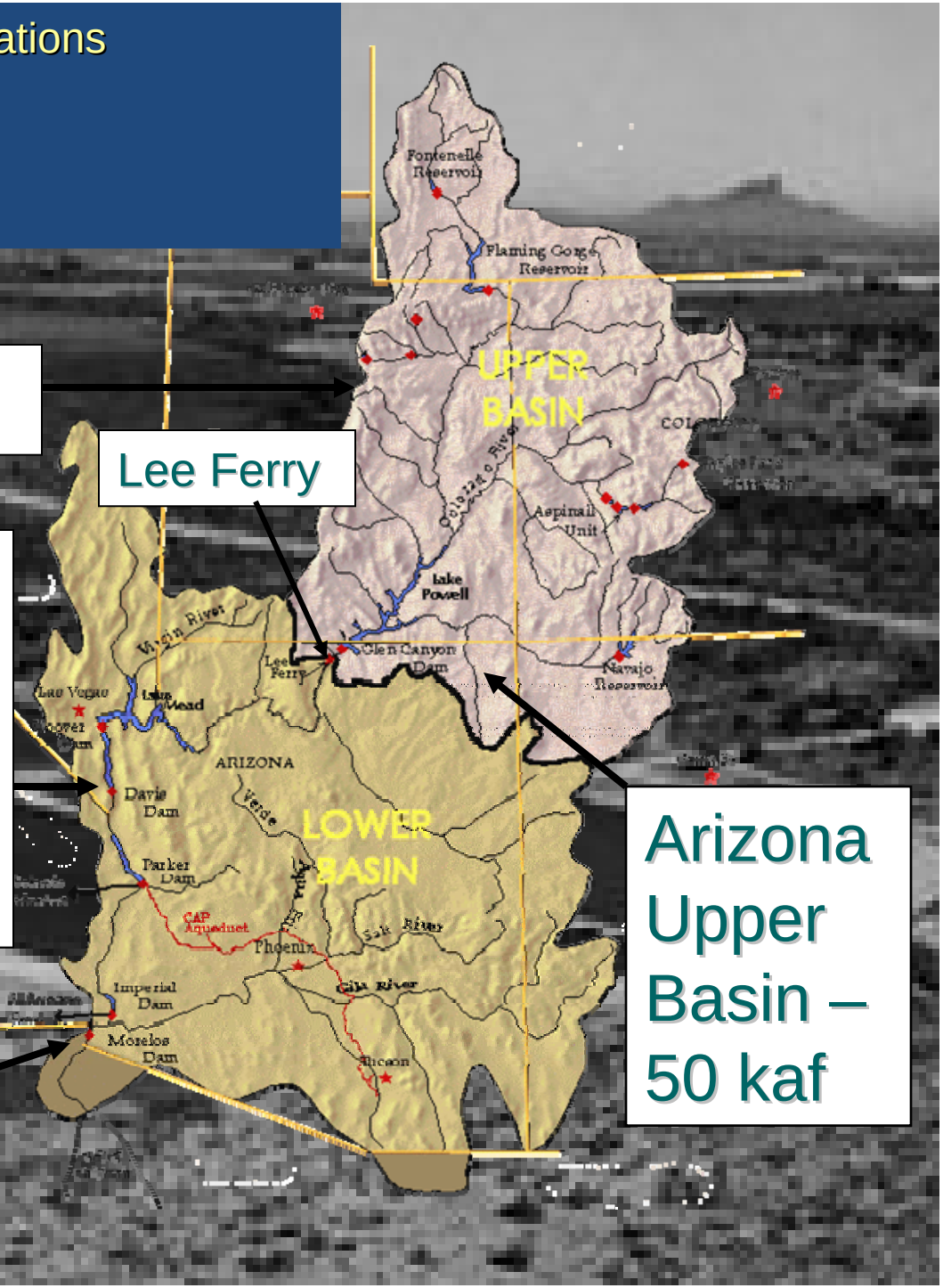
Lower Basin (7.5 maf)

CA – 4.4 maf

AZ – 2.8 maf

NV – 0.3 maf

Mexico 1.5 maf



Lee Ferry

Arizona Upper Basin – 50 kaf

Slide from ADWR

How Much Water in the River?

- Compact 16.5 MAF
- Best tree ring estimate 14.7 maf
- Lowest 20 year period 10.95 maf
- Climate change will likely cause decrease from these values
- River is over subscribed

Climate Change Impacts

- Climate change impact on Colorado R. variable
- Nearly all project less water than 20th century
- Potentially less than tree ring record
- Difficult to project amount
- Barnett and Pierce (Scripps report)
  - Guess at reductions
  - Assume almost no management
  - Do not take into account water rights or the law of the river
- Not surprisingly they find less water
- All water managers in Colorado basin knew this already
- Interesting questions are how to manage
- Likely decided existing law and brute politics

Consequences of Too Little Water

- Upper basin must deliver 75 MAF over 10 year period
- If they cannot lower basin can place a call
  - Upper basin junior rights holders lose first
  - Denver metro is largest junior right holder
  - Call has never occurred
  - There is a high likelihood it will in the future
  - Pain will ensue conflict possible

Within Lower Basin Arizona is Last

- Therefore lower basin shortages are disproportionately born by Arizona
- However reduced delivery to municipalities comes last
- Therefore likely that Tucson Water's ~144,000 acre feet /year will not be delivered in all years over the next 30
- Reductions should be modest
- How should we prepare

Our Friend Serendipity

- Due to political, cultural, and social conflict
  - Tucson Water cannot direct deliver Colorado River Water
  - Constructed Avra Valley recharge as work around
  - Ability to store and then deliver Colorado River water
    - Days to decades
    - Provides buffer
- Provides a bank account to deposit to buffer against external insult

Income Uncertainty

- We have a right to 144,000 acre feet per year
- But income could be reduced in some years
- As in personal finance we need a savings account to buffer us
- We have one in Avra Valley and in Central Well field
- We lived off of this savings account for ~60 years
- Groundwater Management act says we cannot overdraw account any more
- But can put more in than we take out and use later

Colorado River Water Balance

- We have a right to 144,000 acre feet per year
- Current annual use is a little over 100,000 acre feet
- Leaves ~30-40,000 acre-feet per year for storage
- Therefore storing annual consumption approximately every 3-4 years.
- This storage provides buffer against future shortage

Strategy Going Forward

- Must accept full Colorado delivery ASAP
  - Otherwise could lose full right during shortage
  - Starts depositing into the bank 30 years of use seems like a good target
- Must fully couple AVRA Valley systems to city
  - Cost is expensive
  - Hence (in part) the ~40% water rate increase in the current 10 year period
- Fully utilize effluent for non-potable uses
  - Improve quality
  - Restoration
  - Utilities
  - Parks

Further Strategies

- Outdoor use is lost therefore
  - Move to only reclaimed outdoors
  - Rain water harvest
  - Grey water?
- Acting responsibly should protect Tucson from loss of water security
  - Conserving
  - Banking for the future
  - Utilizing political clout

Conservation-Conservation-Conservation

- Santa Fe model
  - Growth pays for new water
  - Growth pays for conservation
- Right now around 150 GPCD – city wide
  - Can Support nearly 900,000 people on current amount
  - Prescott municipalities at 100 GPCD could support 1.2 million at this level
- Single Family at ~100 GPCD
- New South Wales in Australia has target of 40 GPCD residential
- O'odham rancheras as low as 20 GPCD
- Civano at ~40 GPCD interior with exterior minimal and reclaimed