



Los Angeles
Department of
Water & Power

Achieving Resiliency Through Groundwater Storage and Recovery

**Eastern Sierra Environmental Group
Water Operations - Aqueduct**

Overview

A vertical photograph on the left side of the slide shows a dynamic splash of water. The water is captured mid-air, with numerous droplets suspended against a background of a sunset or sunrise over a body of water. The lighting is warm, with orange and yellow tones from the sun reflecting on the water's surface and the splash itself. The splash is the central focus, with water droplets of various sizes scattered around it.

Situation

Definitions

Project Examples

LADWP

Situation

Climate Change

Increased Frequency

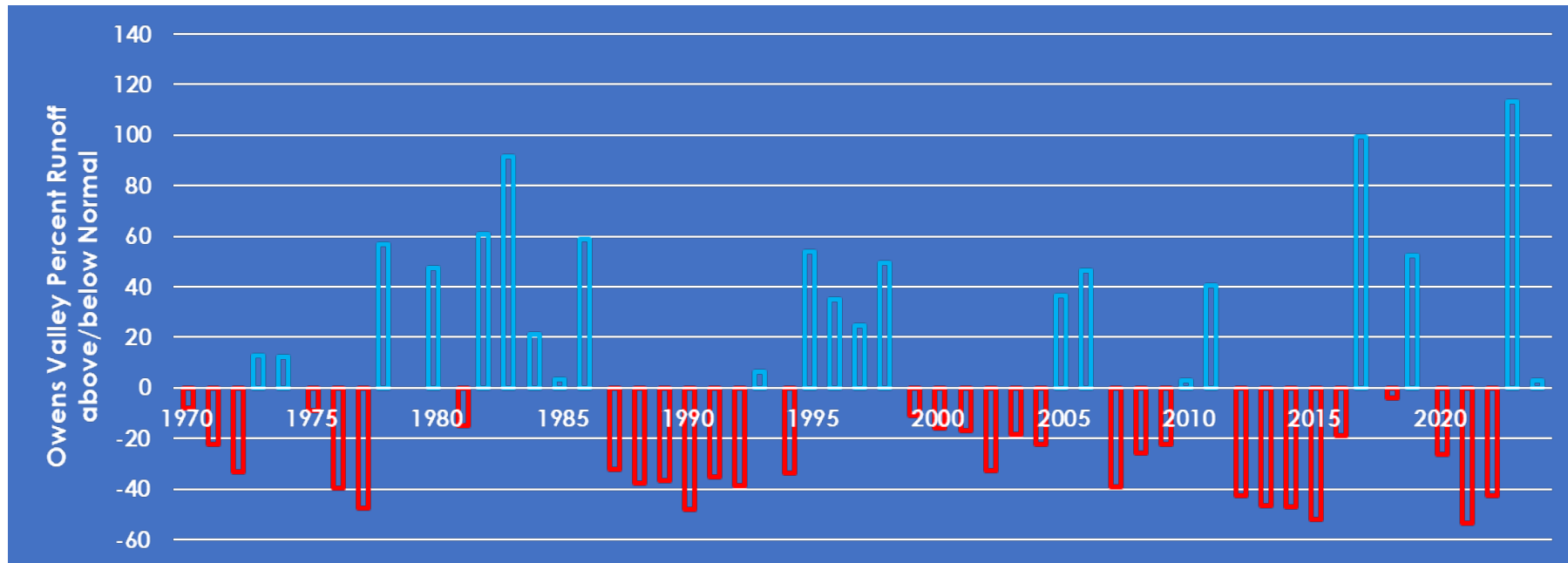
Wetter wet years,
drier dry years

2017 - 2018

199% of Normal

2023 - 2024

217% of Normal

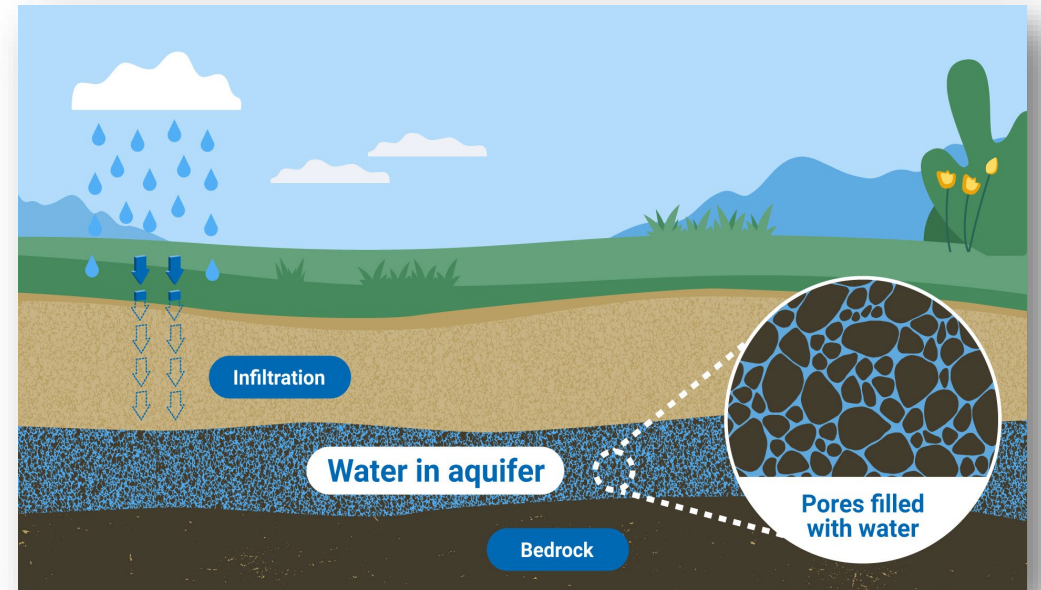


Situation

Resiliency

“Water storage is water security; the question is where to store the water. By far the largest space to store water is underground.”

Professor Graham Fogg, UC Davis



Situation

Resiliency

Inyo/LA Water Agreement Section VIII

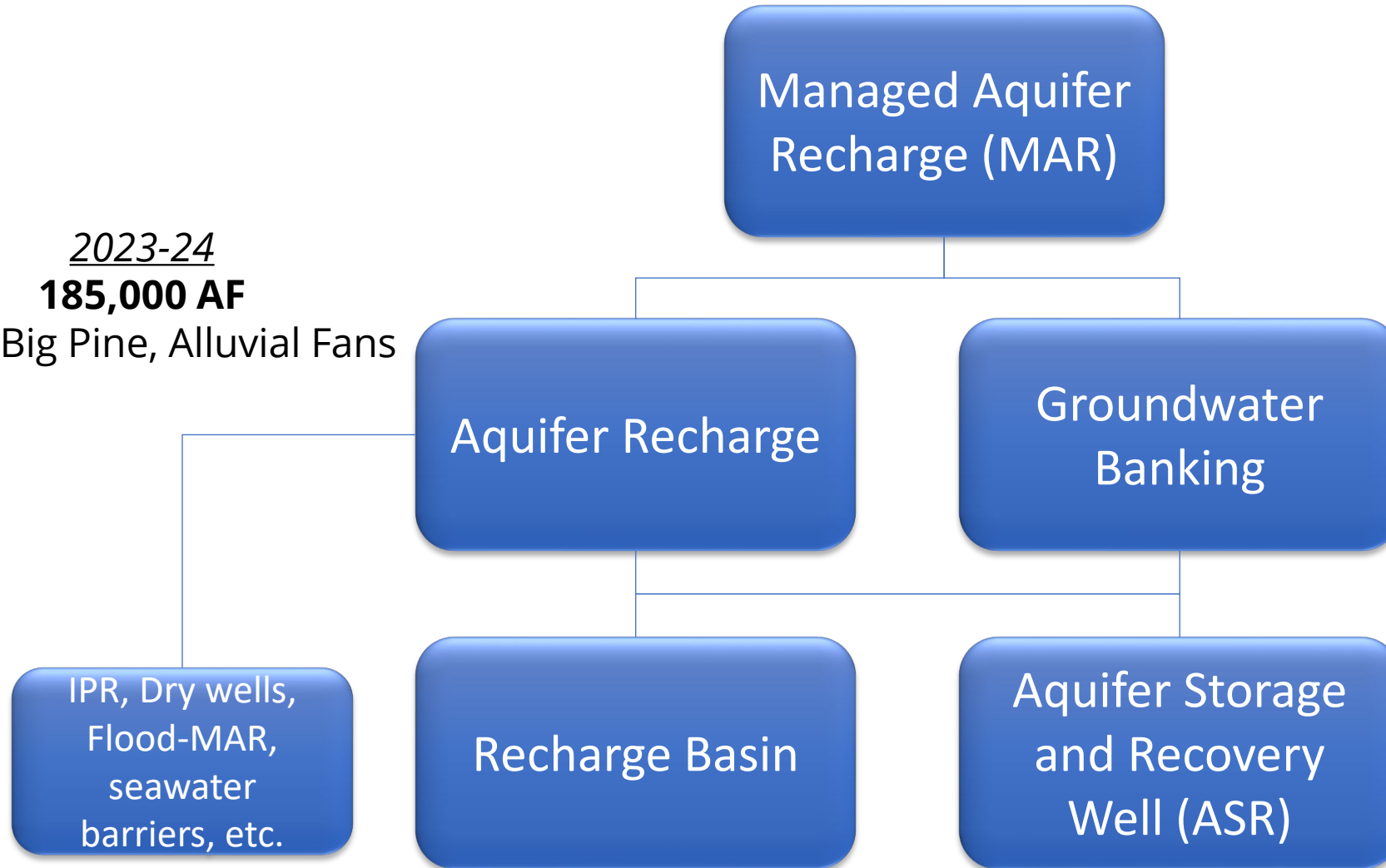
- It is recognized that development of new groundwater storage, and the implementation and operation of feasible groundwater banking and recharge facilities in the Owens Valley and in the Rose Valley that will not cause significant effects on the environment may be beneficial.
- Inyo Board shall not unreasonably refuse to agree to a feasible groundwater banking facility that will not cause significant decrease or change in vegetation or a significant effect on the environment.

Governor's Executive Order N-4-23

- Whereas capturing and storing storm and snowpack runoff underground to recharge aquifers is an important strategy to help regions stabilize water supplies in the face of hydrologic extremes

Terminology

2023-24
185,000 AF
Laws, Big Pine, Alluvial Fans



What

Why

How

Terminology

Water Banking vs. Water Banking

Water Banking (Storage and Recovery)

- Resource management technique based on water storage
 - **Equivalent to a reservoir**, but underground
- Water is physically stored
- Extra runoff stored underground for use during dry years

Water Banking (Water Bank Participation)

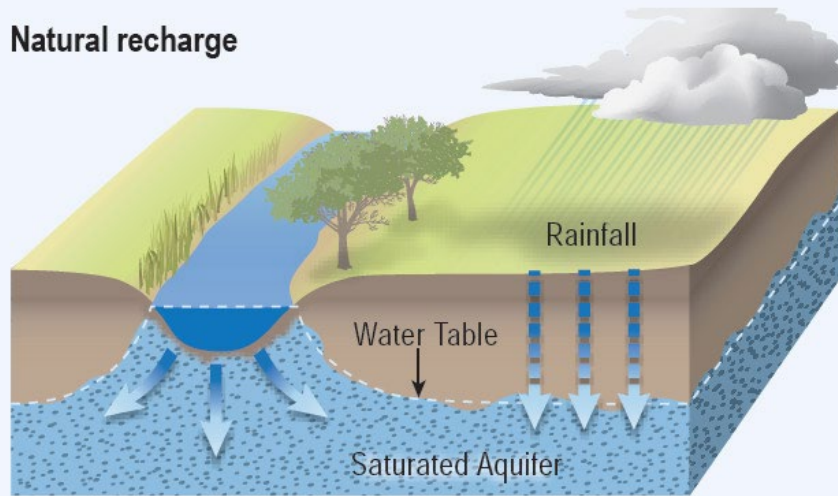
- Resource management technique based on a water market
 - **Institutional mechanism** to facilitate water transfers
- Water may or may not be physically stored
- Depositing water (actual or in-lieu) or water rights in a cooperative for deferred use or transfer

How it Works

Storage in Unconfined and Confined Aquifers

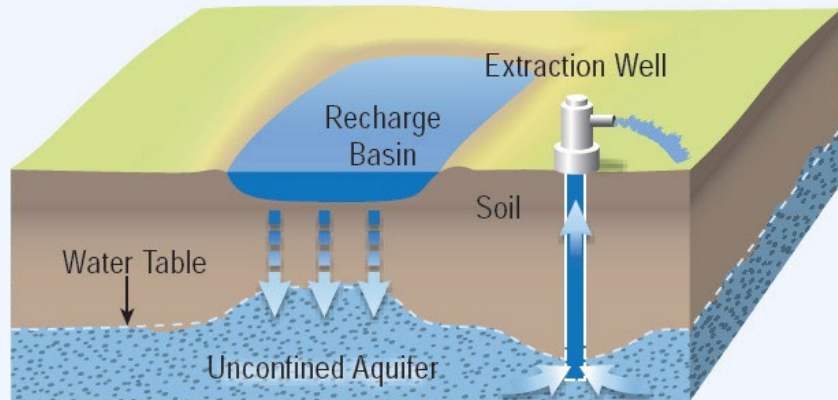
1

Natural recharge

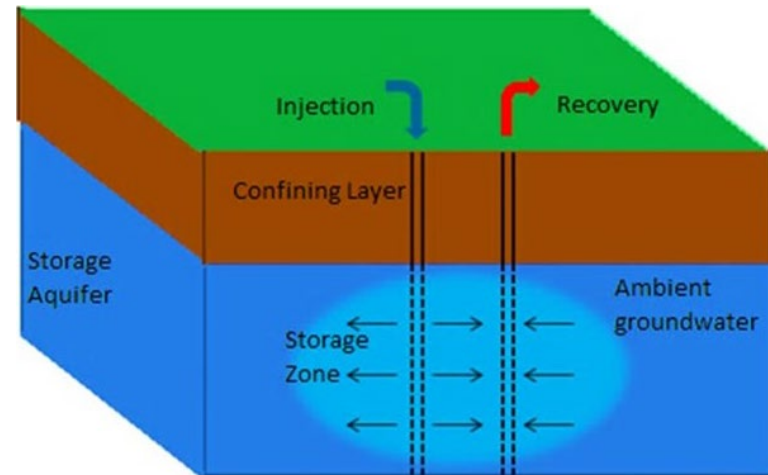


2

Managed recharge: recharge basins



3



DREAM – Demonstration Recharge, Extraction, and Aquifer Management

San Joaquin County

1

Joint pilot project between three water agencies

Short-term pilot testing project

2

Total Storage

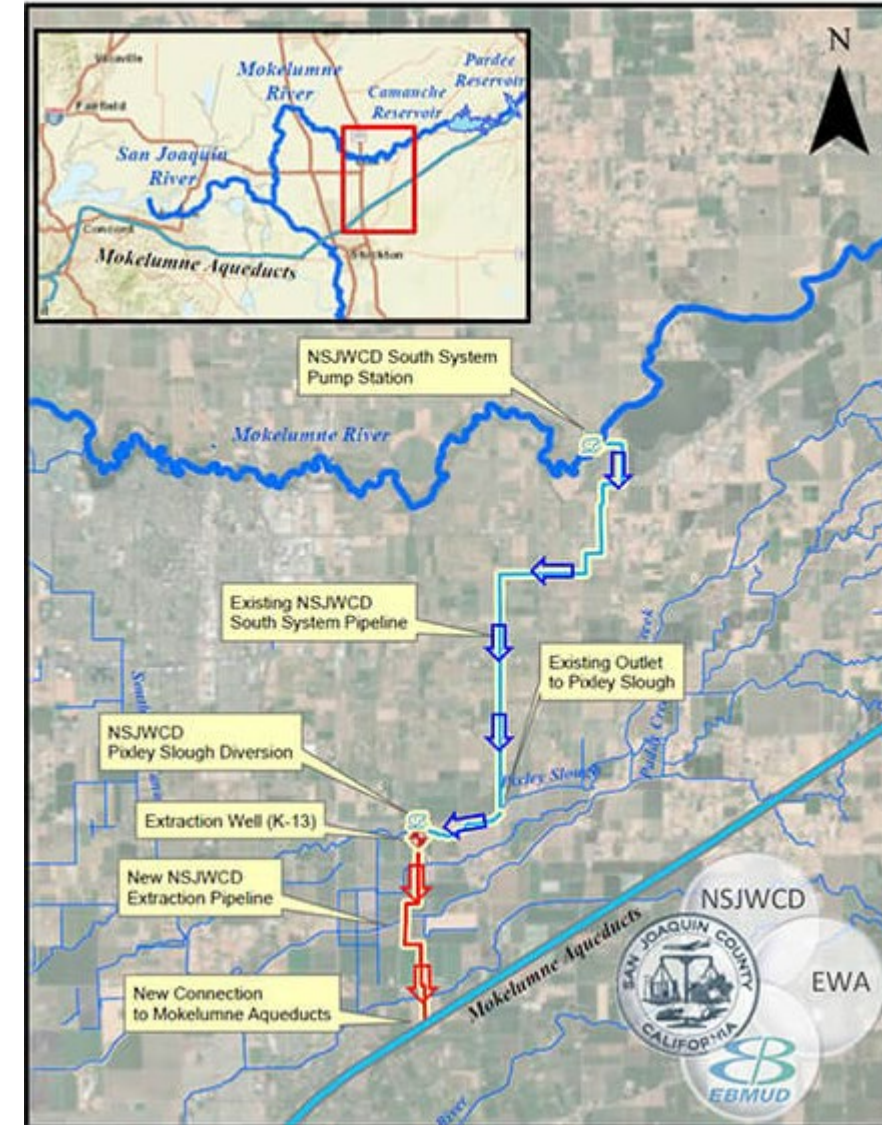
1,000 AF

3

Annual Recharge and Recovery

TBD, **223 AF** extracted in 2024 pilot

DREAM – Pilot Groundwater Banking Project





Monterey Peninsula ASR Project

Monterey

1

Operated by MPWMD (Monterey Peninsula Water Management District)

Completed in **1997**, expansion is ongoing

2

Total Storage

10,282 AF as of 2021 of excess Carmel River flows

3

Annual Recharge and Recovery

66 AF / 0 AF (2021)

Water Banking Evaluation

What makes a good water banking site?

Hydrogeology

- Closed basin
- Available capacity

Aquifer characteristics

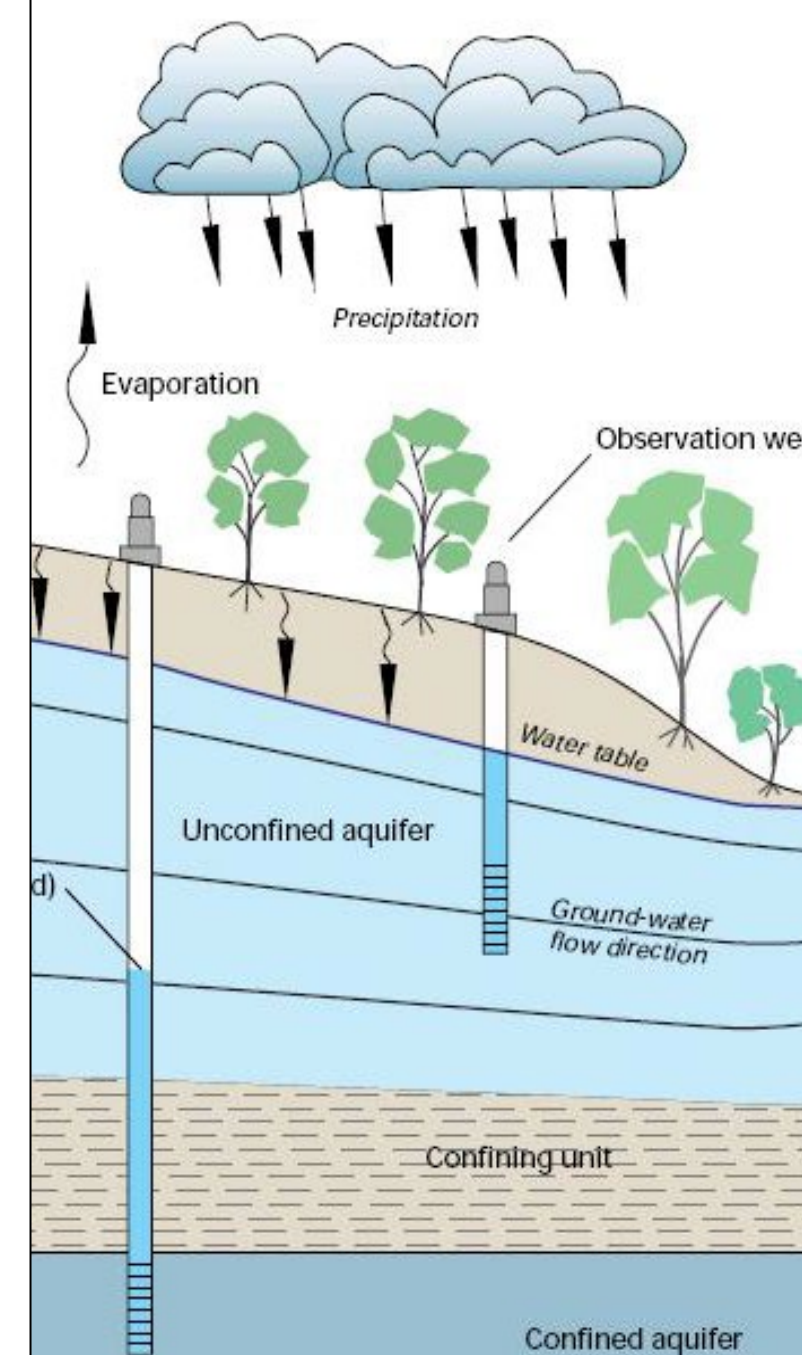
- Specific yield
- Hydraulic conductivity
- Heterogeneity
- Seasonal depth

Accessibility

- Power
- Conveyance

Regulatory

- Permitting
- Regulations
- Cultural resources
- CEQA



Inyo County

Investigations for Pilot

LADWP is evaluating Owens Valley / Rose Valley

- Are there areas **suitable** for a water banking project?
- How can water banking contribute towards **resilience** and **sustainability**?
- How can water banking be integrated into Inyo County operations? Aqueduct operations? LADWP operations?



Inyo County

Planning and Preliminary Investigations



1

Rose Valley
~10,000 AF

2

West of Owens Lake (Cottonwood)
10,000~20,000 AF

3

North of Owens Lake
2,000~5,000 AF

Inyo County

Current Status

Rose Valley

- **1992:** Preliminary Investigation Plan
- **2010:** Monitoring well T889 installed
- **2024:** Soil sieve testing performed
Installing 2-4 monitoring wells

Cottonwood (West of Owens Lake)

- **2020:** Preliminary desktop evaluation
- **2023:** Monitoring wells T991, T992 installed
- **2024:** Infiltration test performed

LADWP Water Supply Portfolio

Imported Supply



Los Angeles
Aqueducts



Metropolitan Water
District

Local Supply



Groundwater



Stormwater



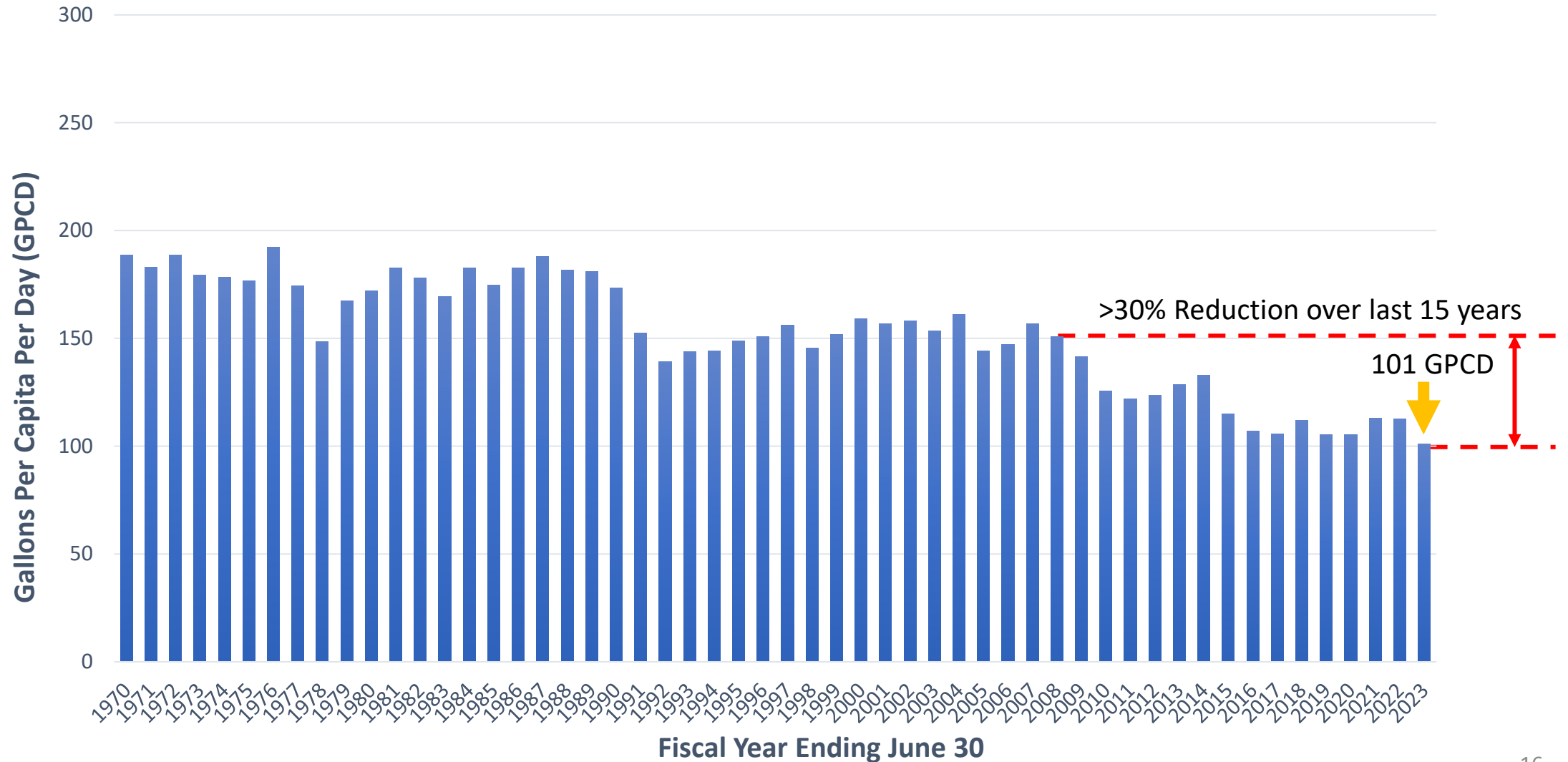
Water Reuse



Conservation / Water Use
Efficiency

Conservation

Ongoing Conservation Efforts





Questions