

Where Will My Water Come from in Five Years?

Impacts of the Recent Colorado River Drought Contingency Plan on Lower Colorado River Basin States

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The Colorado River System

The Colorado River provides water to cities, farms, industries, and ecosystems across 7 states and Mexico. It's not the largest river in the US, but it's the hardest working.

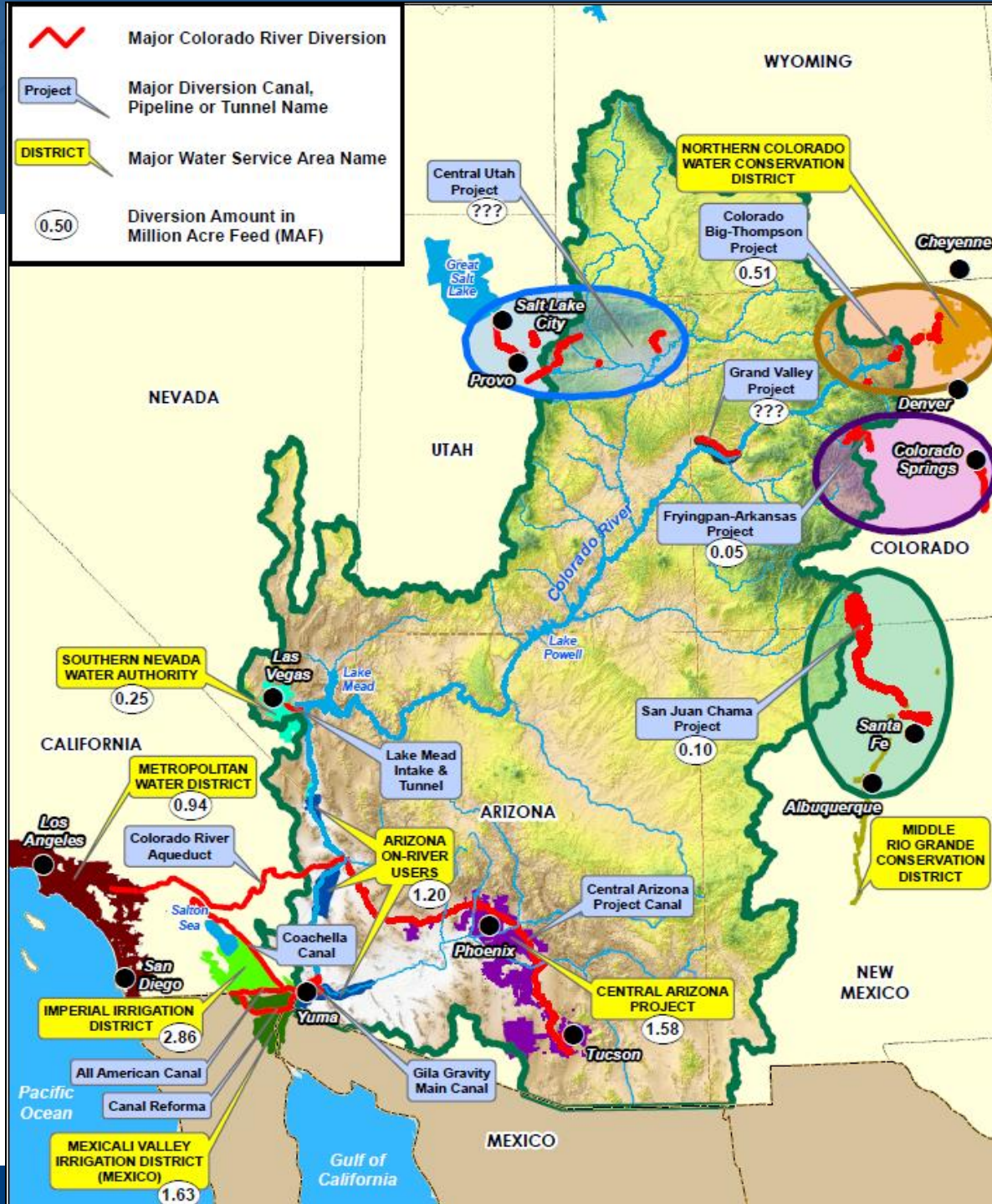
- 1,450 mainstream river miles
- 246,000 sq mile watershed
- 14 million acre feet (MAF)/yr runoff
- 10 major reservoirs
- Provides 90% of water used in basin



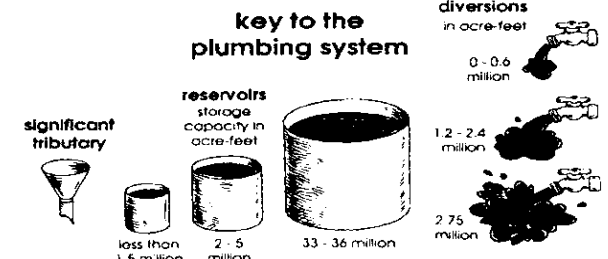
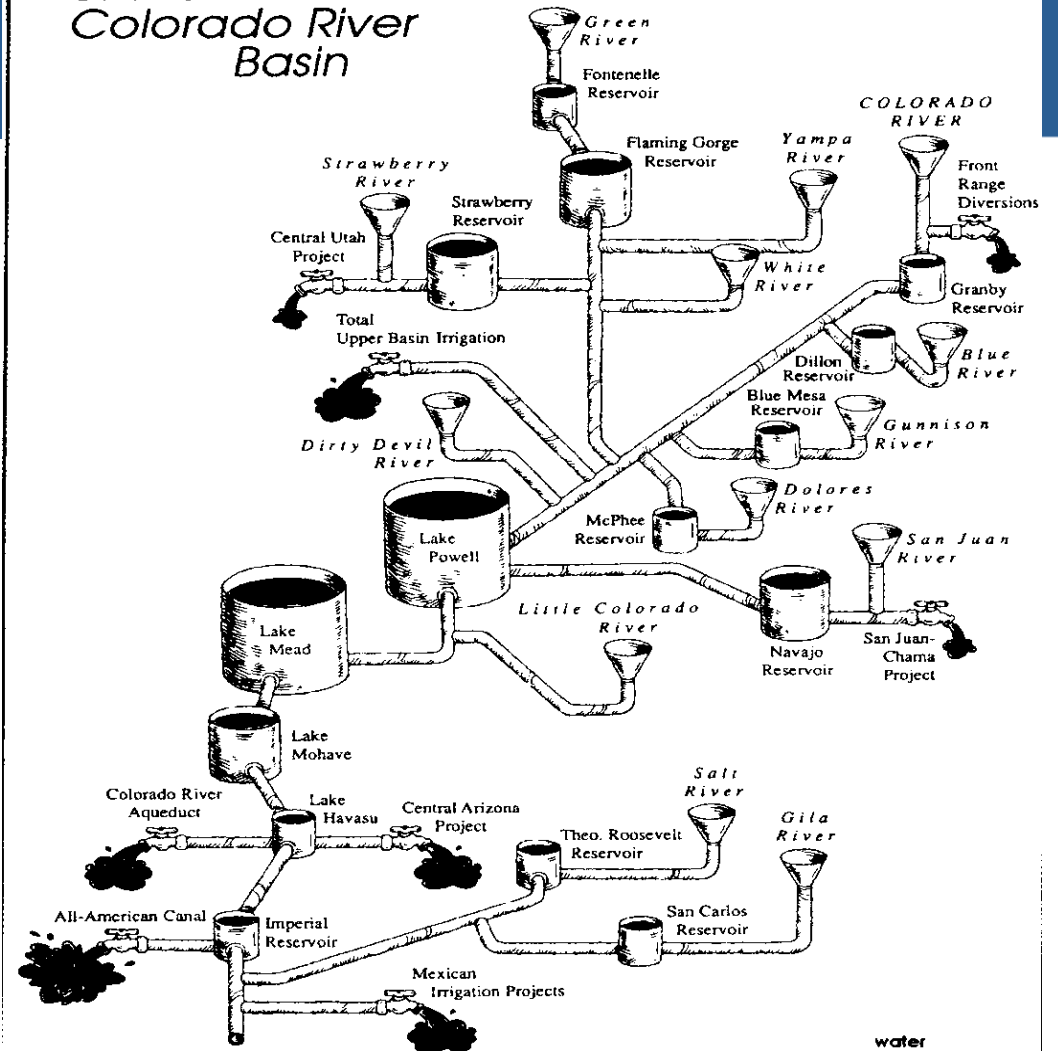
The Colorado River System

- 40 million people + industry
 - \$1.7 trillion/yr economic activity;
 - 12th largest GDP, globally
- 28 federally recognized tribes
- 4 million irrigated acres
 - \$5 billion/yr agricultural value
- 10 million Mega watt hours per yr power generation
- Habitat for endangered/threatened species from alpine headwaters to Mexican delta





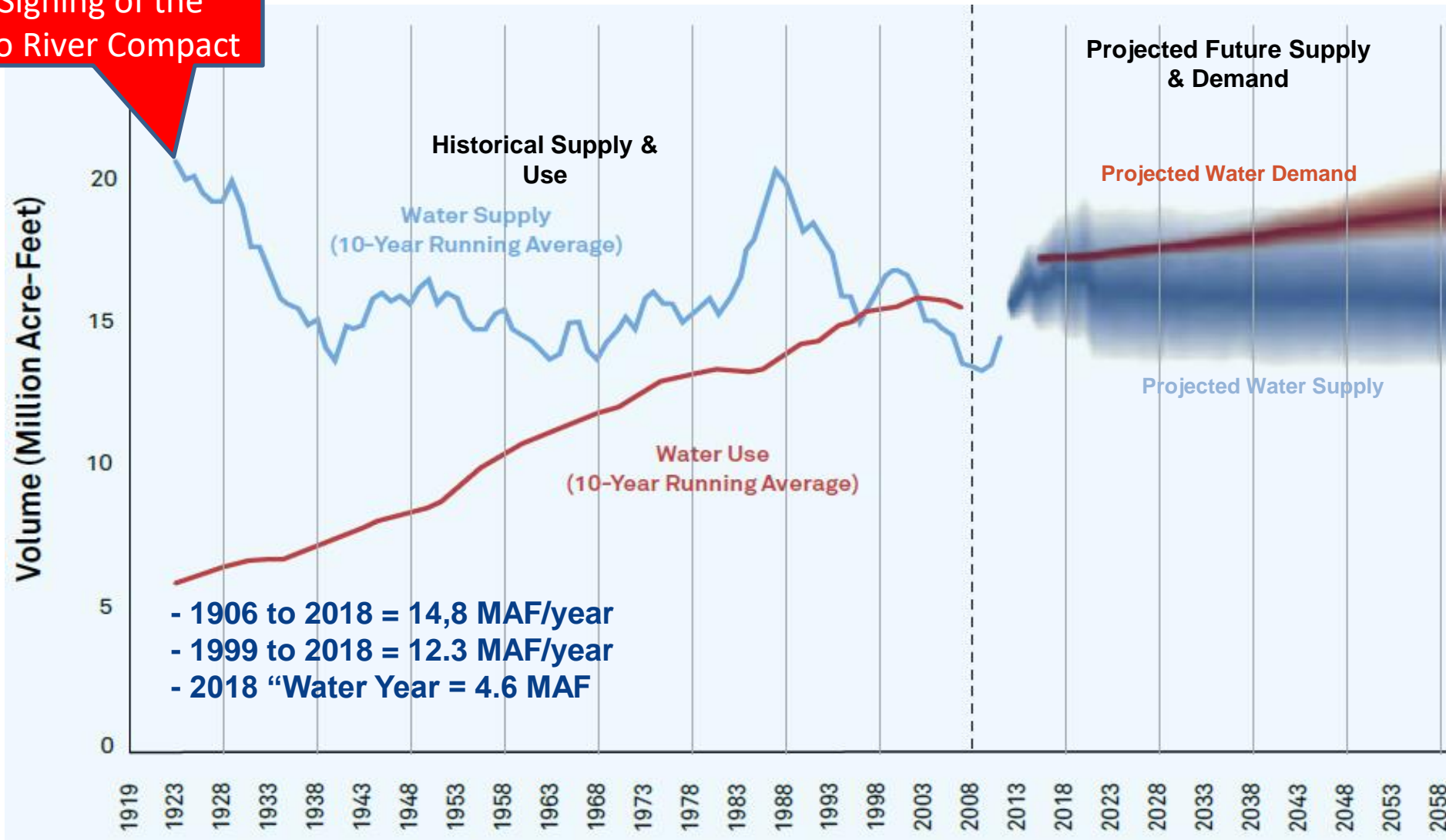
the plumbing of the Colorado River Basin



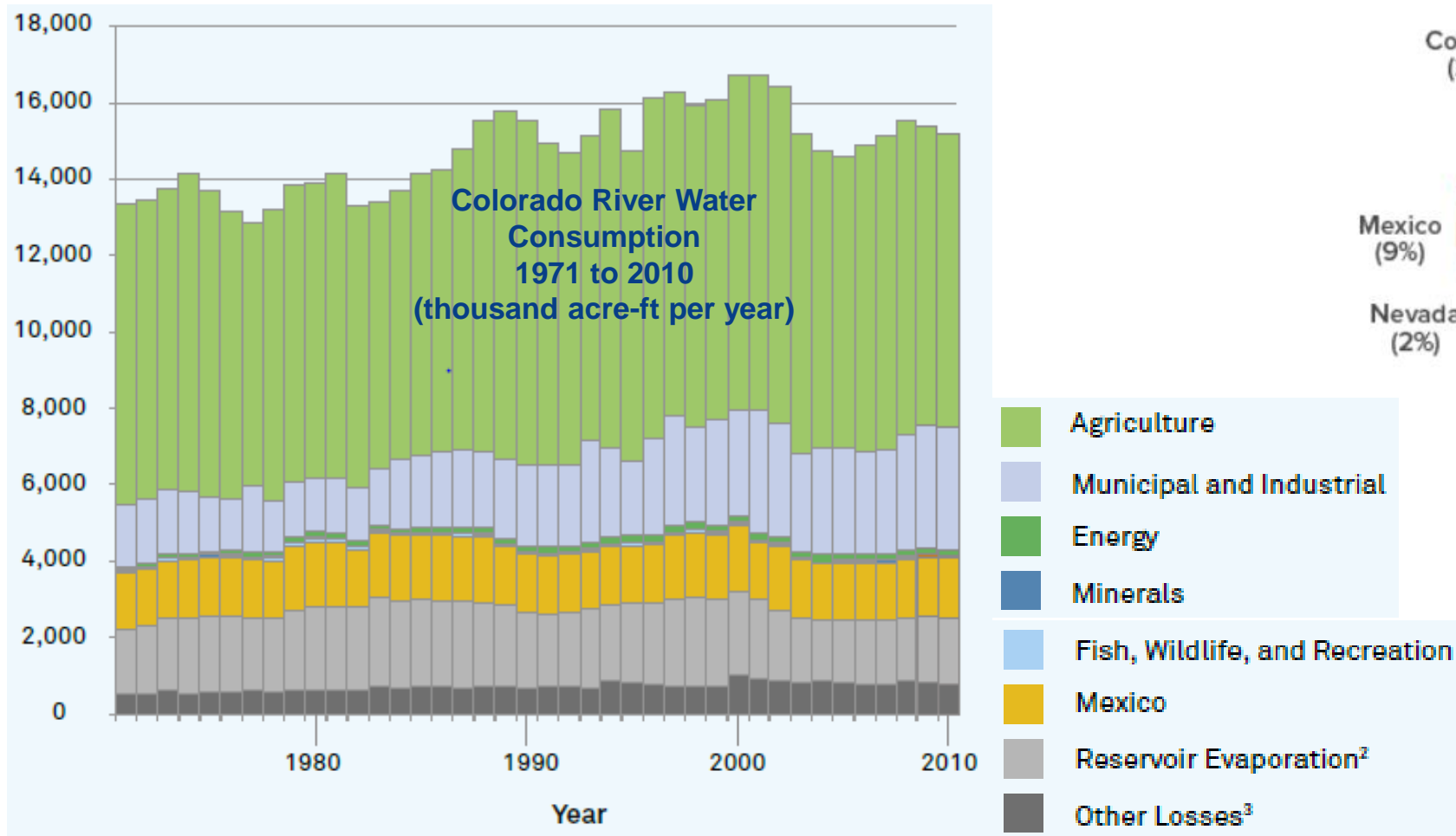
Clint McKnight,
based on art by Lester Doré,
High Country News

Over Allocation of Colorado River Water

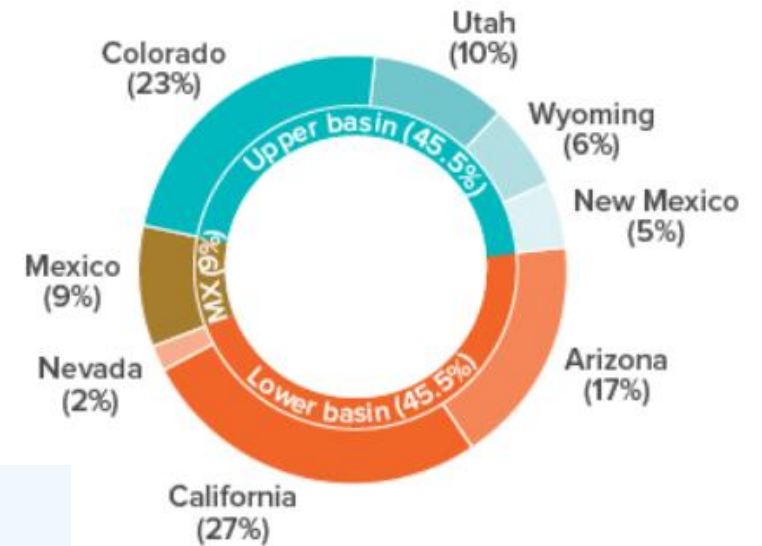
1922 Signing of the
Colorado River Compact



Over Allocation of Colorado River Water



COLORADO RIVER ALLOCATIONS OF THE SEVEN BASIN STATES



*2.8 MAF/Year Allocated
to Tribal Communities*

Over Allocation of Colorado River Water

“Things turned really bad really fast— much faster than we thought...



*...We have to find a way to permanently reduce our demands, and
find a way to augment our supply”*

Jeff Kightlinger, Head of the Metropolitan Water District of Southern California

Over Allocation of Colorado River Water



“There is a risk that Arizona, and CAP in particular, will be required to take catastrophically deep reductions, with associated adverse impacts on the society, environment and economy of Arizona.”

Ken Seasholes, Central Arizona Project
Manager of Resource Planning & Analysis, 27 October 2016

Over Allocation of Colorado River Water

| Lake Mead Elevation | Shortage Reductions | | | |
|---------------------|---------------------|-----------|------------|------------|
| | Arizona | Nevada | California | Mexico |
| 1075' | 320,000 AF | 13,000 AF | 0 AF | 50,000 AF |
| 1050' | 400,000 AF | 17,000 AF | 0 AF | 70,000 AF |
| 1025' | 480,000 AF | 20,000 AF | 0 AF | 125,000 AF |

FEET ABOVE SEA LEVEL

1,220 ft.

Lake Mead is considered "full" at this level—which it hasn't reached since 1983.

SURPLUS CONDITIONS

1,075 ft.

Water managers have been working to keep the reservoir at or above this level.

TIER 1 SHORTAGE

1,050 ft.

TIER 2 SHORTAGE

1,025 ft.

TIER 3 SHORTAGE

895 ft.

Empty—or what managers ominously refer to as "dead pool".

DEAD POOL

As of Monday, March 2, 2020
1,096.38 ft.

Lower Basin Drought Contingency Plan (DCP)

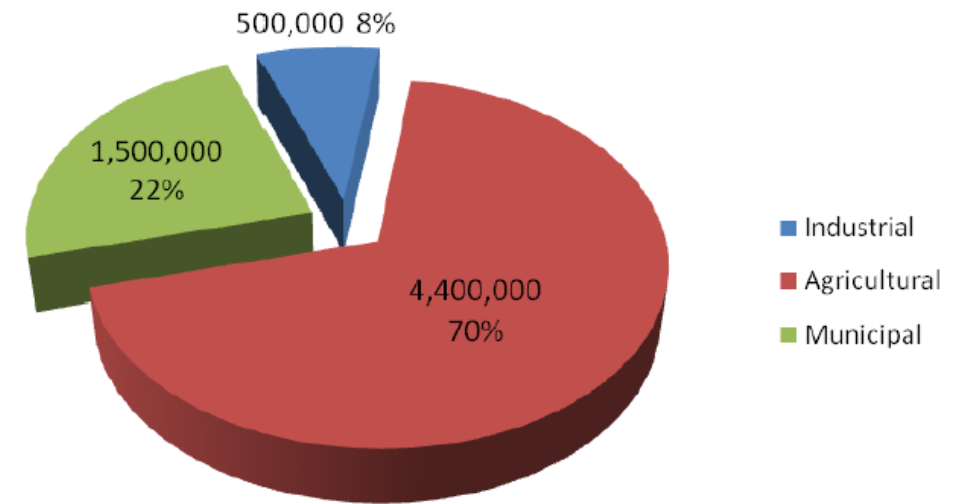
- The DCP is an “insurance policy” to provide certainty/protection of Colorado River water led by Bureau of Reclamation
- Driven by decline in Lake Mead
 - Unprecedented duration of drought
 - Increased water use
 - Elevated tensions among Basin States
 - As low as 24% of average
 - *There had never been a shortage in Lower Basin and there were no shortage guidelines*
- Shared reductions by AZ, CA and NV



Impacts of the DCP on Municipalities

- Arizona uses ~7 MAF of water annually.
 - One acre-foot = 325,851 gallons.
 - Enough to serve a family of five for one year

*Arizona's uses 40%
groundwater
57% surface water
3% reclaimed water*



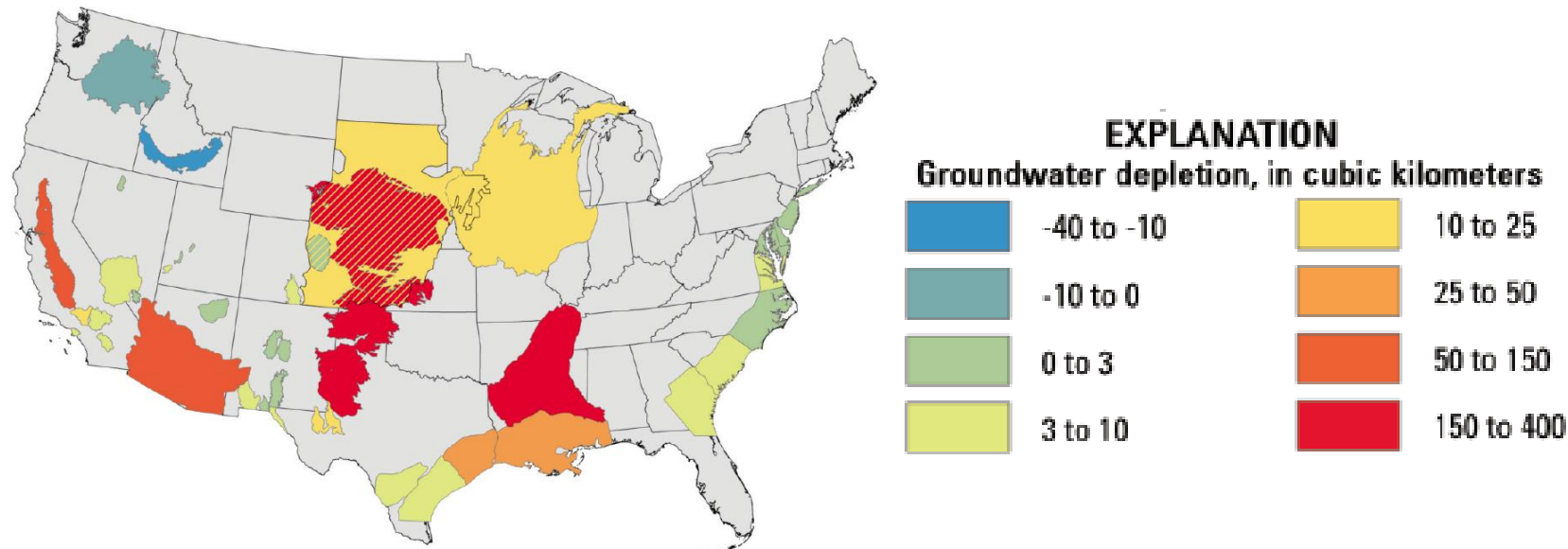
Impacts of the DCP on AZ Municipalities

- Major AZ municipalities are currently heavily reliant on surface water
 - Phoenix, AZ: 98% surface water (SW)
 - Significant areas of impacted groundwater
 - Scottsdale, AZ: 63% SW
 - 12% recycled/reclaimed water
 - 20 MGD of treated wastewater to 22 golf courses
 - 4.2 billion gallons of potable water from Federal Superfund Site remedies from 1999 to 2019
 - Goodyear, AZ: 100% Groundwater (future 50% SW)
 - Primary production wells impacted by Federal Superfund Site
 - Constructing 8 MGD (to be 16 MGD) surface water plant

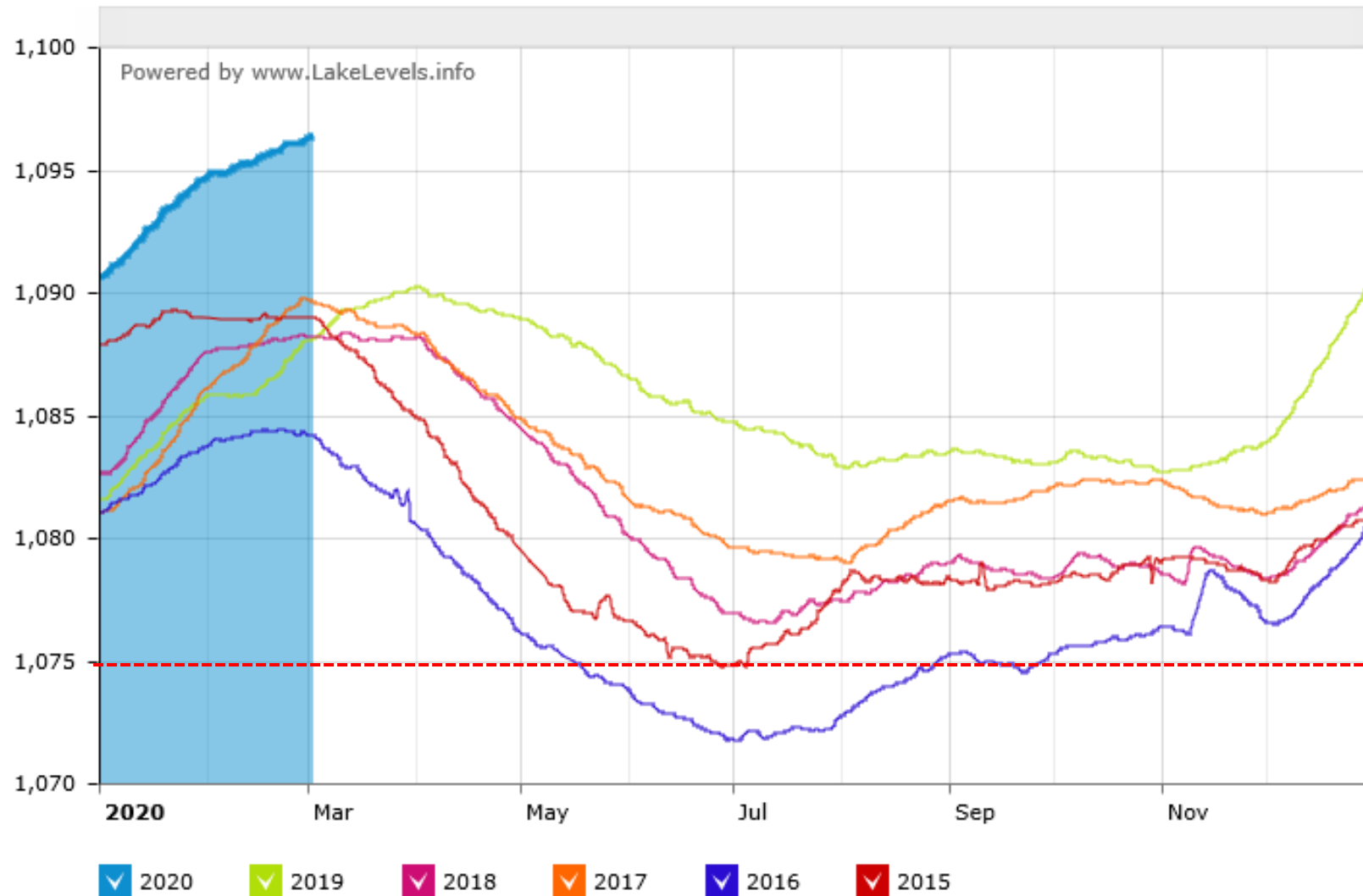


Our Groundwater

- Groundwater depletion has increased markedly since 1950
- Max depletion during most recent period (2008 - 2018)
 - 2008 avg. depletion = ~6.6 billion gal/yr
 - 1900–2008 avg. depletion = ~2.4 billion gal/yr
 - 1900-2008 AZ alluvial basin total depletion = ~27 billion gal (83K acre-feet)
- Map: 1900-2008 cumulative groundwater depletion in 40 aquifer systems



Lake Mead in 2020!!

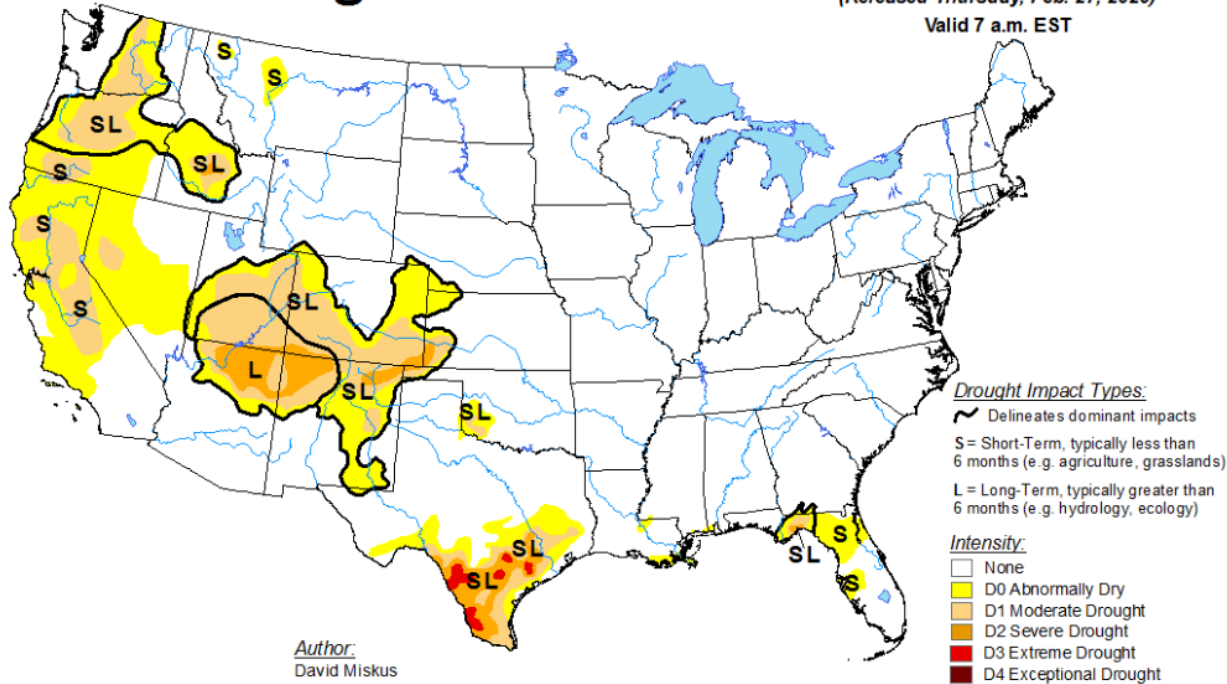


Triggers Tier 1
Shortage

Monitoring the Drought

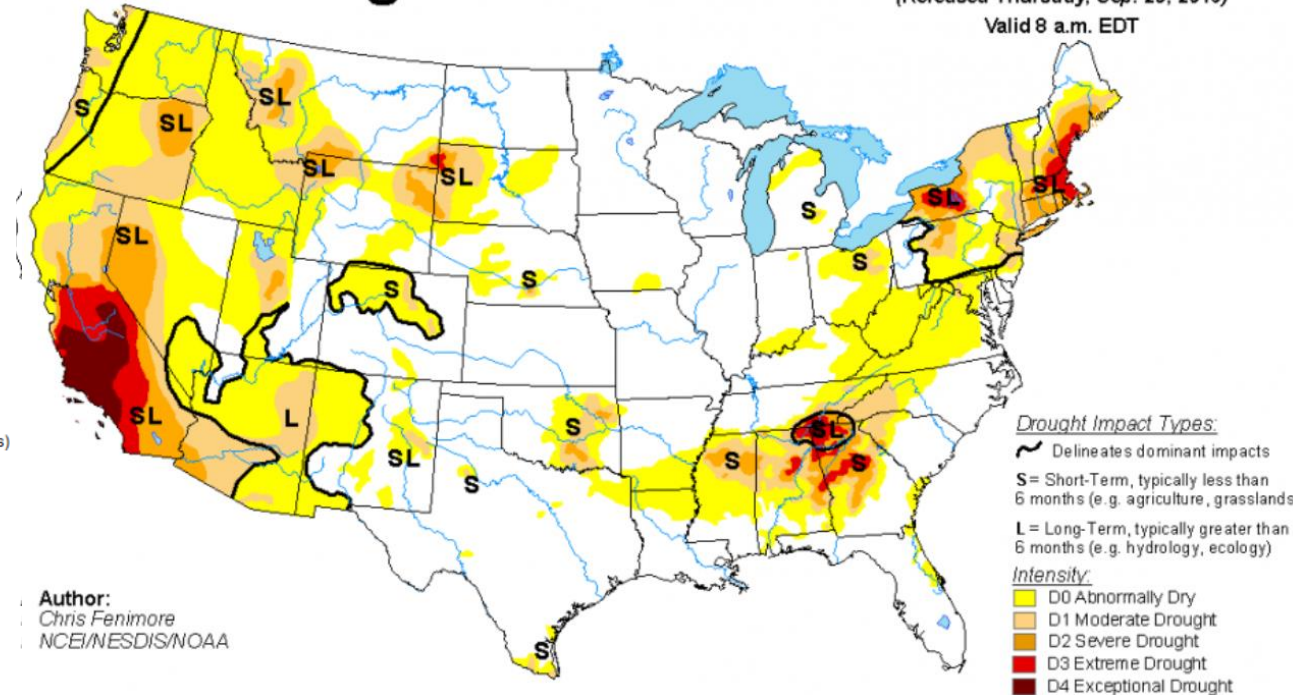
U.S. Drought Monitor

February 25, 2020
(Released Thursday, Feb. 27, 2020)
Valid 7 a.m. EST



U.S. Drought Monitor

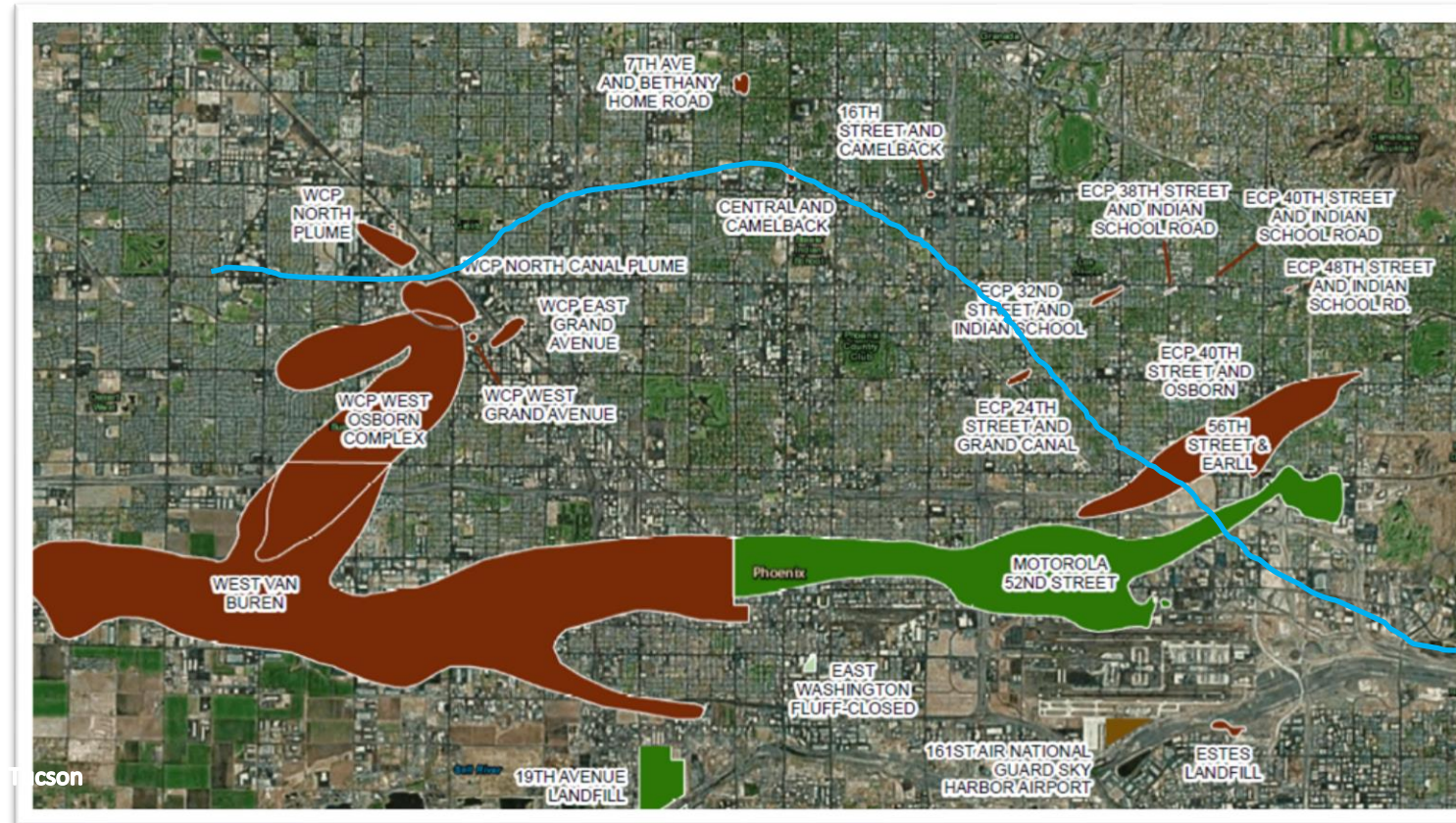
September 27, 2016
(Released Thursday, Sep. 29, 2016)
Valid 8 a.m. EDT



What challenges/opportunities does this create?

- Groundwater extraction & treatment
- Aquifer storage & recovery (ASR)
- Groundwater rights & assured water supply
- Recycled/reclaimed water
- Water conveyance infrastructure
- Industrial water reduction and reuse
- Stormwater management

“One Water”



Questions

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Tribal Diversions and Consumptions

| State | Reservation / tribe | Diversion Right (af/yr) | Estimated Use in 2015 (af/yr) | |
|---------------|---------------------|----------------------------|-------------------------------|----------------|
| | | | Diversions | Consumption |
| California | Chemehuevi | 11,340 | 221 | 119 |
| Arizona | Cocopah | 10,847 | 2,569 | 1,684 |
| Arizona | Colorado River | 662,402 | 595,889 | 300,860 |
| California | Colorado River | 56,846 | 5,095 | 2,970 |
| Arizona | Ft. Mohave | 103,535 | 69,515 | 37,275 |
| California | Ft. Mohave | 16,720 | 15,164 | 8,157 |
| Nevada | Ft. Mohave | 12,534 | 4,683 | 3,137 |
| California | Ft. Yuma / Quechan | 71,616 | 96,403 | 47,621 |
| Arizona | Ft. Yuma / Quechan | 6,350 | 1,286 | 1,017 |
| TOTALS | | 952,190 | 790,825 | 402,840 |

AZ Tribal Allocations

| Reservation / tribe | Settlement Act (where applicable) | Diversion Entitlement (af/yr) | Source |
|---|--|-------------------------------|------------------|
| Ak Chin | Ak Chin Settlement Act of 1978 (as amended) | 50,000 | Mainstream |
| | | 25,000 | CAP (Indian) |
| Ft. McDowell/ Yavapai | Fort McDowell Indian Community Water Rights Settlement Act of 1990 | 18,233 | CAP (Indian) |
| Gila River Indian Community / Pima and Maricopa | 2004 Gila River Indian Community Water Rights Settlement Act | 208,200 | CAP (Indian/M&I) |
| | | 120,600 | CAP (Ag) |
| Pascua Yaqui | * Rights are unquantified; water delivery contract with US (1980) | 500 | CAP (Indian) |
| Salt River Pima-Maricopa | Salt River Pima-Maricopa Indian Community Water Rights Settlement Act (1988) | 13,300 | CAP (Indian) |
| | | 22,000 | Wellton-Mohawk |
| San Carlos Apache | San Carlos Apache Tribe Water Rights Settlement Act of 1992 | 12,700 | CAP (Indian) |
| | | 18,145 | CAP (M&I) |
| | | 33,300 | From Ak Chin |
| Tohono O'Odham ² | Southern Arizona Water Rights Settlement Act of 1982/2004 | 28,200 | CAP (Ag) |
| | | 37,800 | CAP (Indian) |
| Tonto Apache | * Rights are unquantified; water delivery contract with US (1980) | 128 | CAP (Indian) |
| White Mountain Apache | White Mountain Apache Tribe Water Rights Quantification Act of 2010 | 25,000 | CAP (Indian) |
| Yavapai-Apache | * Rights are unquantified; water delivery contract with US (1980) | 1,200 | CAP (Indian) |
| Yavapai-Prescott | Yavapai-Prescott Indian Tribe Water Rights Settlement Act of 1994 | 500 | CAP (Indian) |
| <i>Total</i> | | 614,806 | |