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WRRC WEBINAR

March 3, 2020

The Next 40 Years:

Central Arizona Project Long-Range

History of Central Arizona Project

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Patrick Dent, Director of Water Policy

CAP: The Past 40 Years

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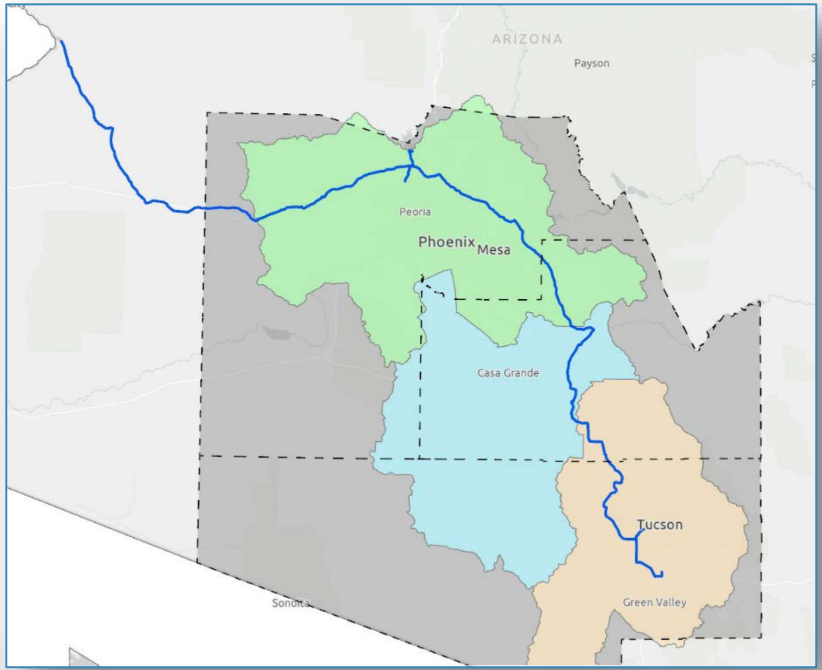
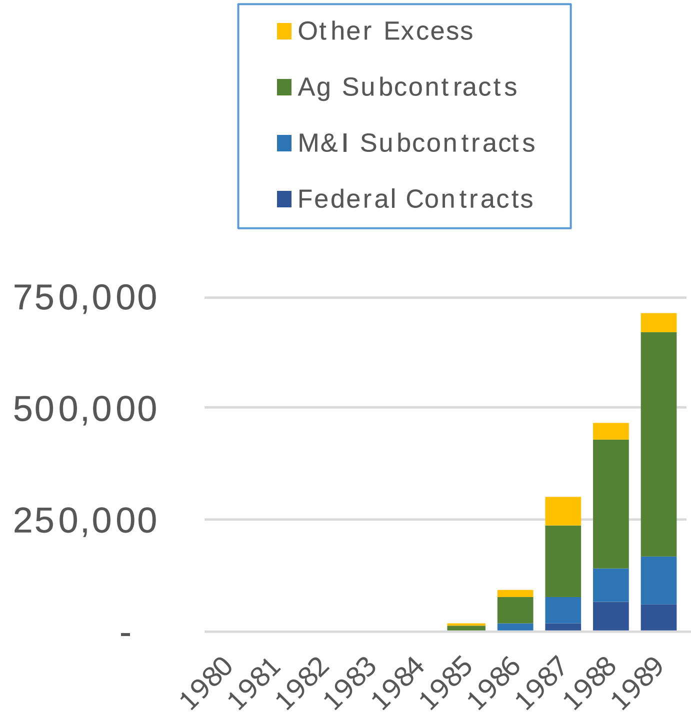
1968 & 1980

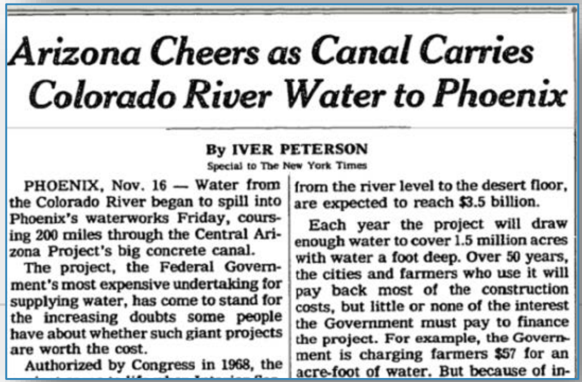

ARIZONA
Payson
Peoria
Phoenix
Mesa
Casa Grande
Tucson
Green Valley


EARTH
FISSURES
POSSIBLE
25
MPH

1980s

1980s Deliveries: **1.6 MAF**





Arizona Cheers as Canal Carries Colorado River Water to Phoenix

By IVER PETERSON
Special to The New York Times

PHOENIX, Nov. 16 — Water from the Colorado River began to spill into Phoenix's waterworks Friday, coursing 200 miles through the Central Arizona Project's big concrete canal.

The project, the Federal Government's most expensive undertaking for supplying water, has come to stand for the increasing doubts some people have about whether such giant projects are worth the cost.

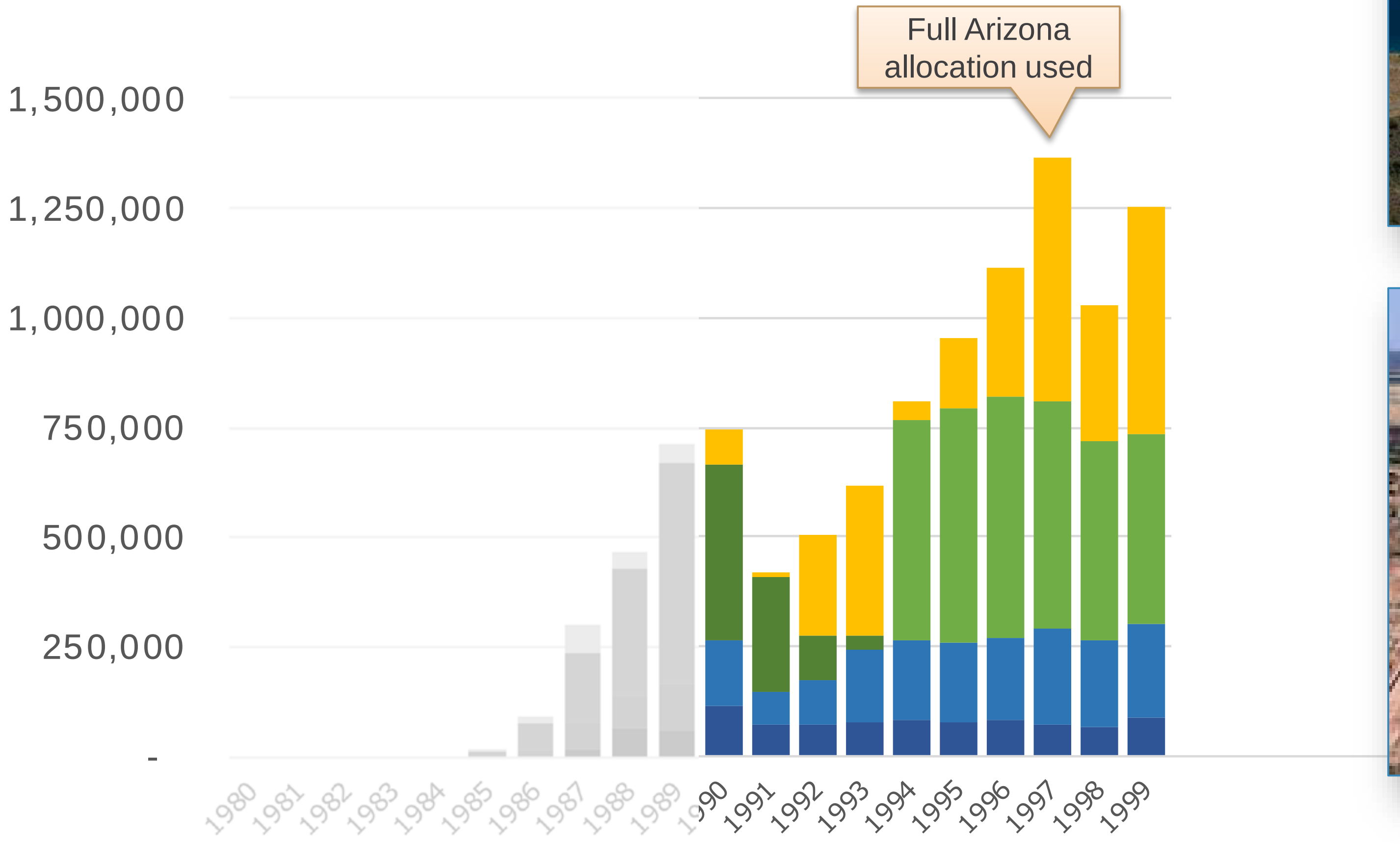
Authorized by Congress in 1968, the

from the river level to the desert floor, are expected to reach $3.5 billion.

Each year the project will draw enough water to cover 1.5 million acres with water a foot deep. Over 50 years, the cities and farmers who use it will pay back most of the construction costs, but little or none of the interest the Government must pay to finance the project. For example, the Government is charging farmers $57 for an acre-foot of water. But because of in-

1990s

1990s Deliveries: **8.8 MAF**



New Waddell Dam & Lake Pleasant

Avra Valley Recharge Project

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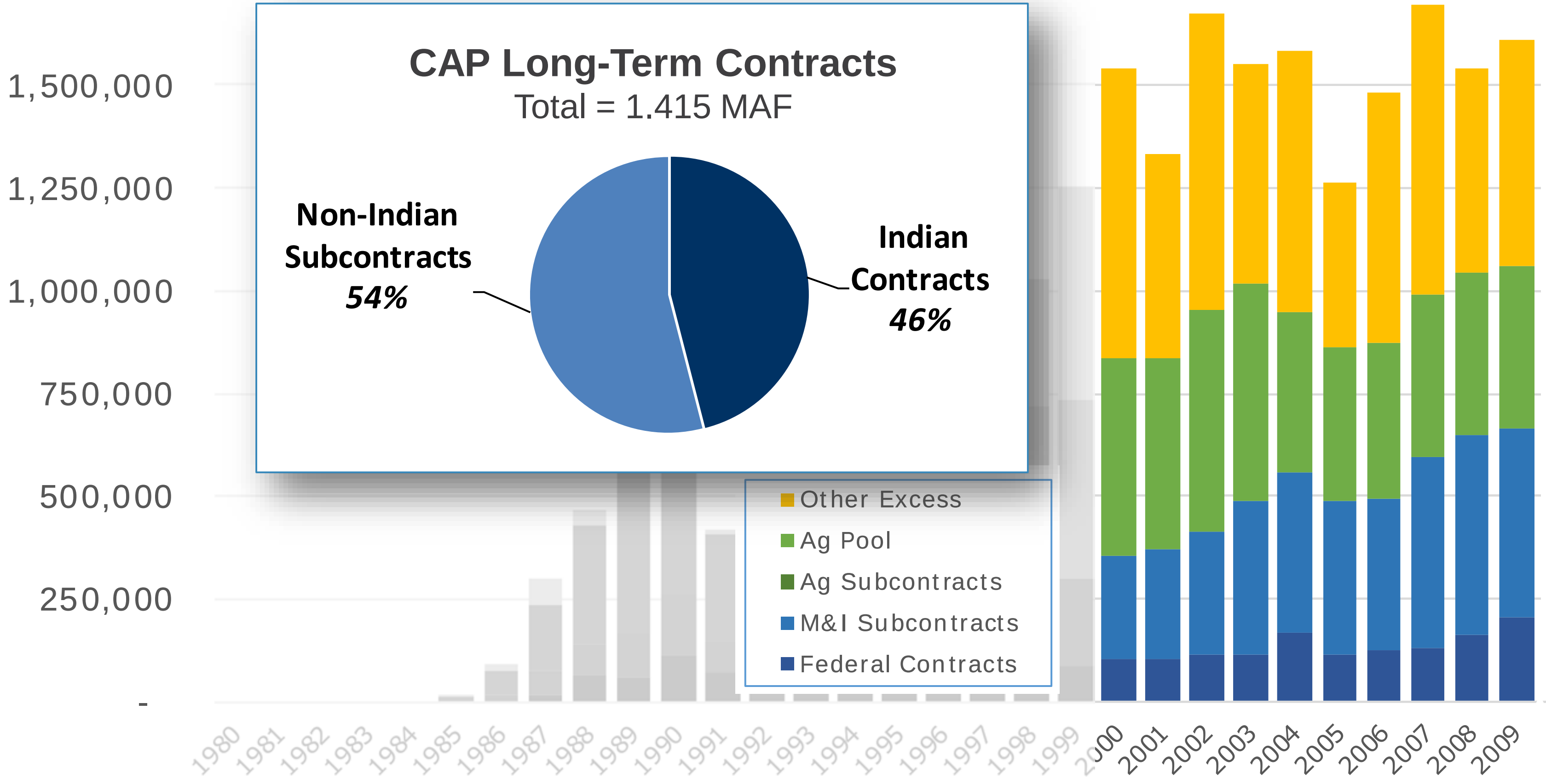
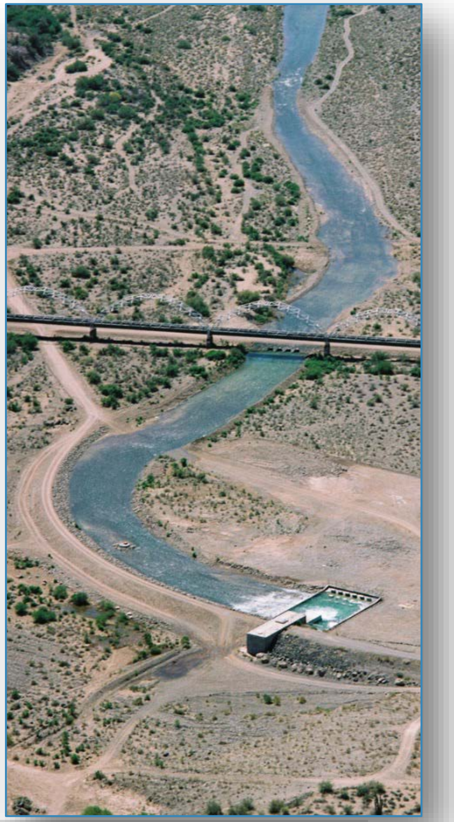
2000s

2000s Deliveries: **15.3 MAF**





Agua Fria Recharge Project

2010s

2010s Deliveries: **14.9 MAF**

Drought Contingency Plan signing ceremony

1980—2019

Total Deliveries: **40.6 MAF**

Supply & Demand in the CAP Service Territory

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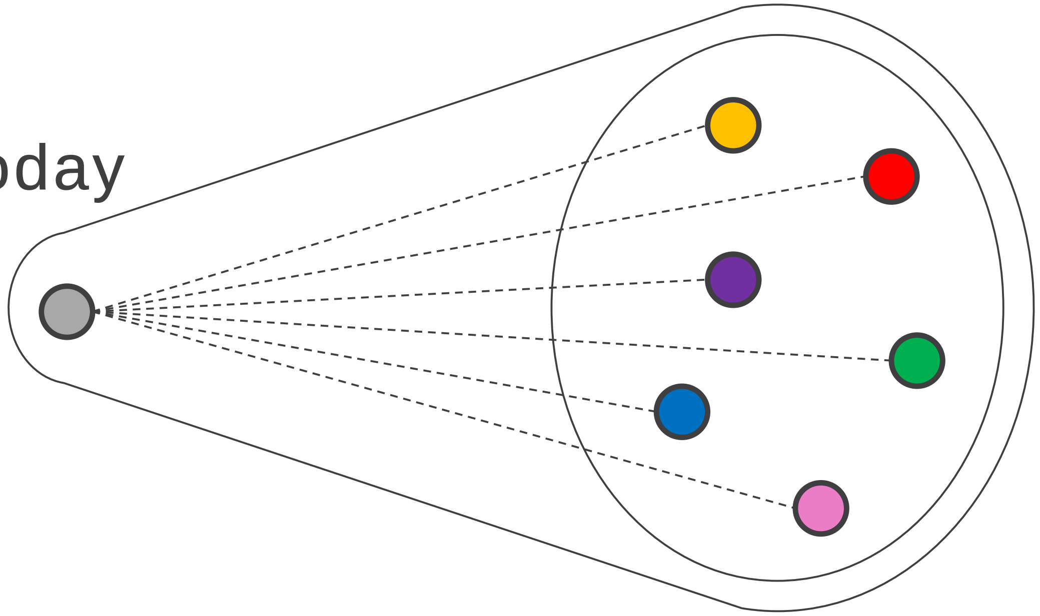
Supply & Demand Projections in the CAP Service Area

AUSTIN CAREY, PLANNING ANALYST

The Next 40 Years

- Projecting water supply & demand conditions over the next 40 years…
  - Is challenging
  - Is highly uncertain
  - Is full of assumptions
  - Requires technical capability and capacity

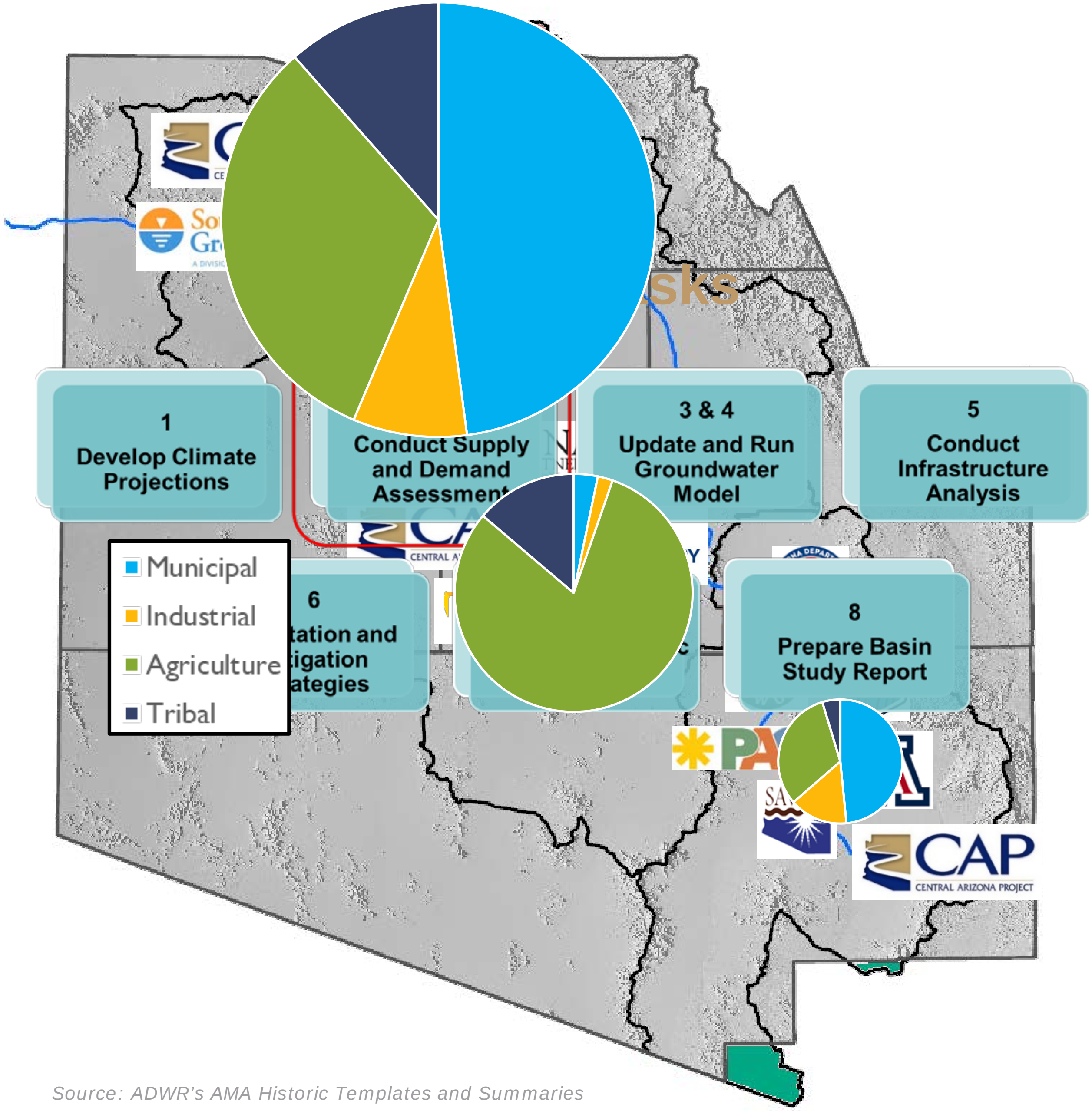


CAP Service Area Model (CAP:SAM)

- Tool for projecting supply & demand in CAP’s three county service area
  - 135+ entities (municipal providers, irrigation districts, Tribes, AWBA, CAGRD, etc)
  - 16 water supply types
- Not a hydrological model
- Designed to easily generate “what-if” scenarios

Basin Studies

- **Goal**: Evaluate future water supply & demand imbalances in key basins through the year 2060
- Three studies in Arizona:
  - West Salt River Valley – 2014
  - Eloy and Maricopa-Stanfield – 2018
  - Lower Santa Cruz – 2015
- Sector demand varies amongst study areas



Source: ADWR's AMA Historic Templates and Summaries

Scenario Approach

Factors → **Scenario** → **Projection**

Factors

- “Driving forces” of water supply, demand & reliability:
    - Growth
    - Climate Variability
    - Agricultural Trends
    - Policy Changes
    - Socio-Economic Changes
    - Behavioral Shifts
    - …

Scenario

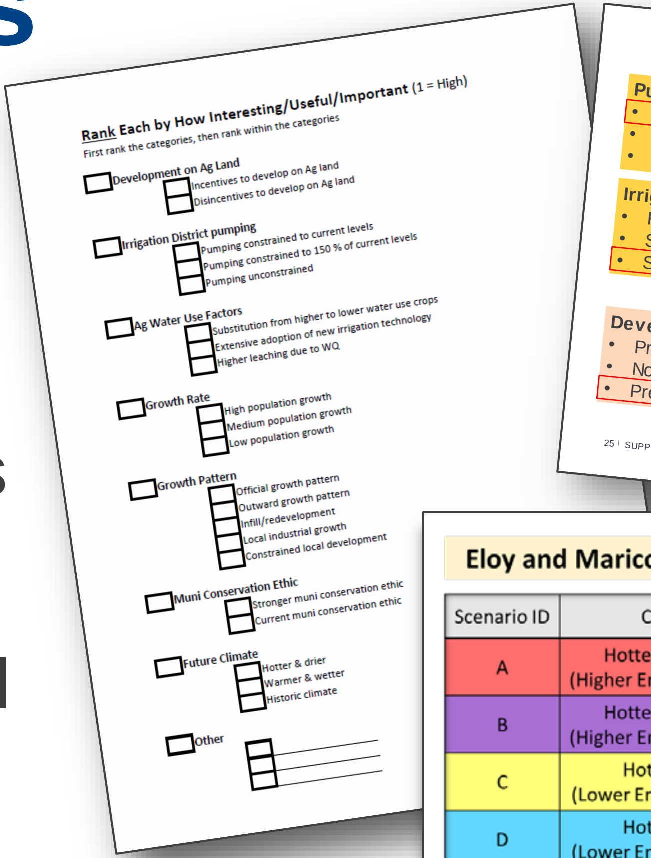
- Combination of multiple, internally consistent factors
- Represents a plausible narrative about how the future might unfold

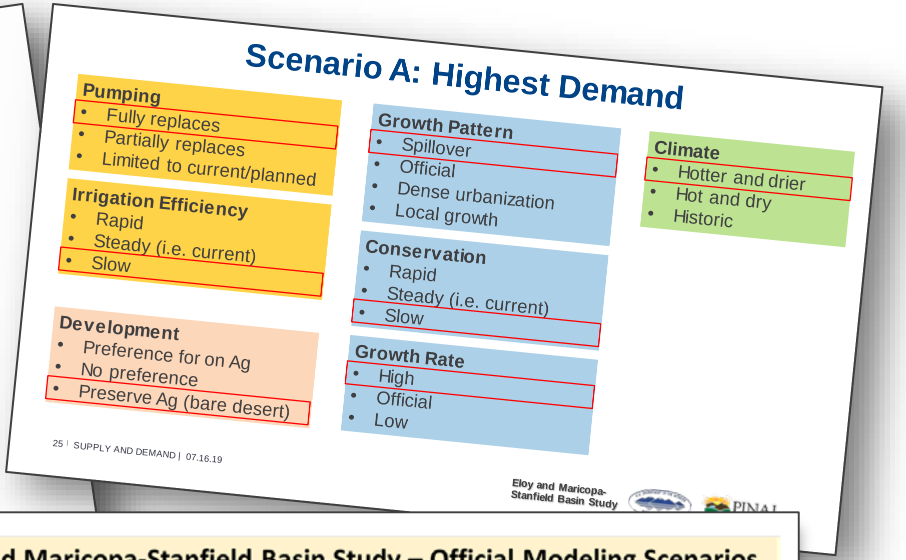
Projection

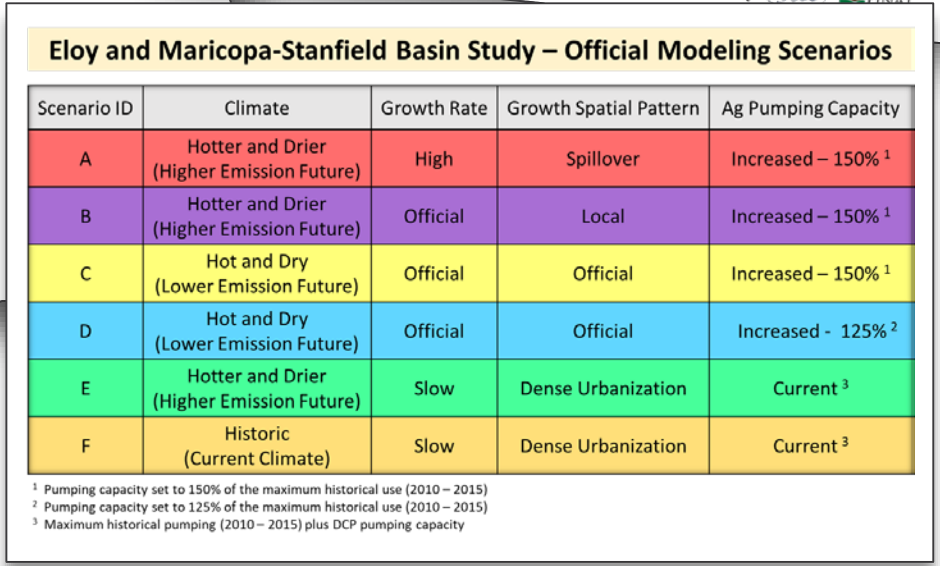
- Magnitude and spatial distribution of water demand through 2060
- Supplies available to meet demands

Building Scenarios

- Part of the supply and demand subcommittee process
- Involves collaborative exercises amongst stakeholders
- Results in selection of a handful of unique and plausible scenarios to model





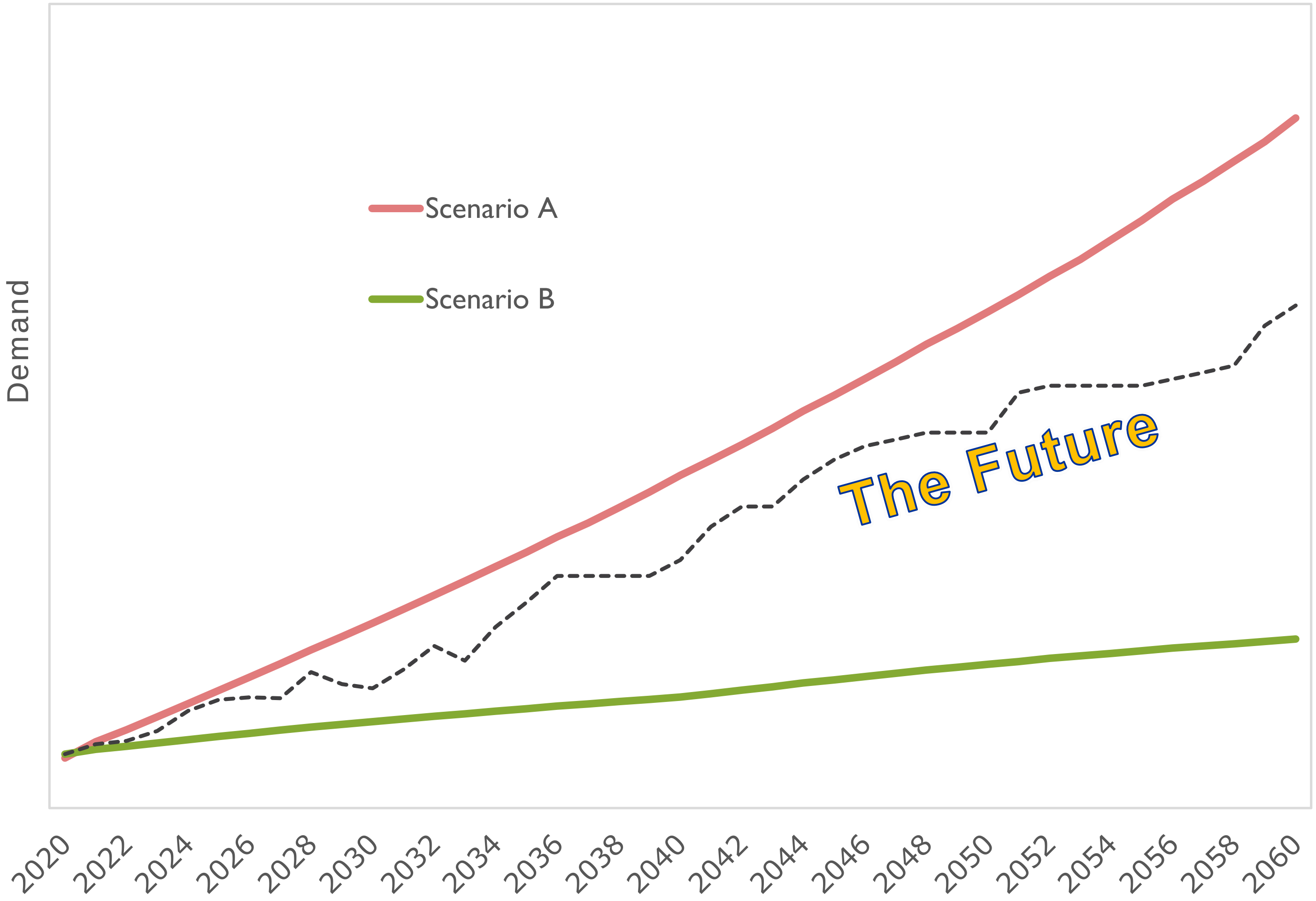


Eloy and Maricopa-Stanfield Basin Study – Official Modeling Scenarios

Scenario ID	Climate	Growth Rate	Growth Spatial Pattern	Ag Pumping Capacity
A	Hotter and Drier (Higher Emission Future)	High	Spillover	Increased – 150% [1]
B	Hotter and Drier (Higher Emission Future)	Official	Local	Increased – 150% [1]
C	Hot and Dry (Lower Emission Future)	Official	Official	Increased – 150% [1]
D	Hot and Dry (Lower Emission Future)	Official	Official	Increased - 125% [2]
E	Hotter and Drier (Higher Emission Future)	Slow	Dense Urbanization	Current [3]
F	Historic (Current Climate)	Slow	Dense Urbanization	Current [3]

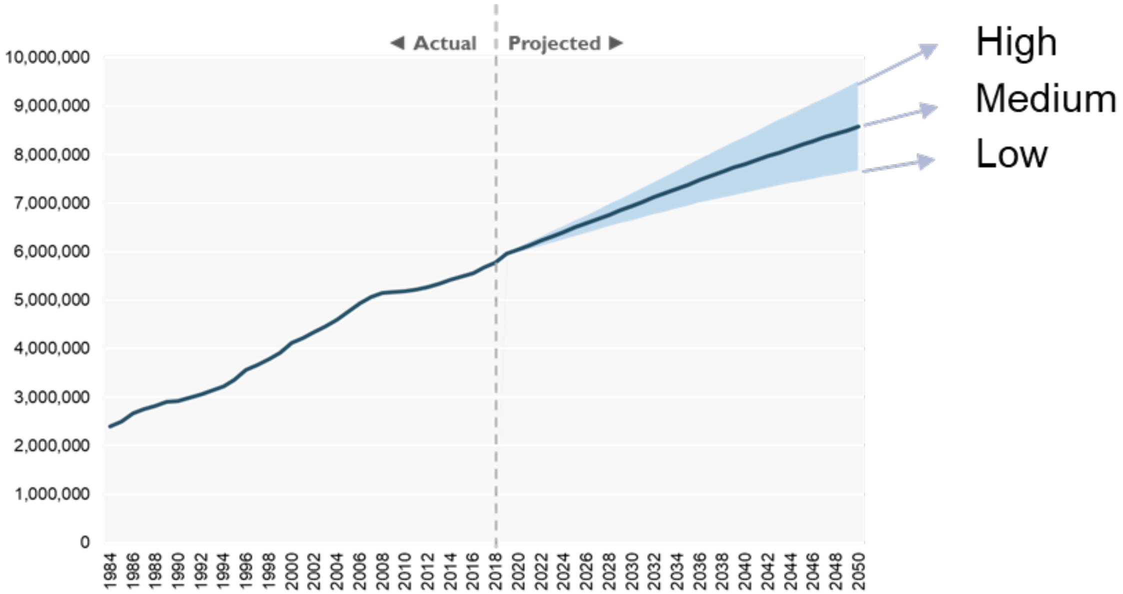
[1] Pumping capacity set to 150% of the maximum historical use (2010 – 2015)
[2] Pumping capacity set to 125% of the maximum historical use (2010 – 2015)
[3] Maximum historical pumping (2010 – 2015) plus DCP pumping capacity

Scenario Examples



Growth

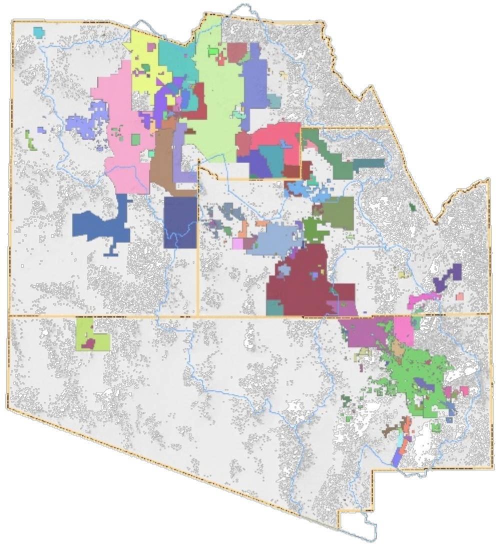
Rate:



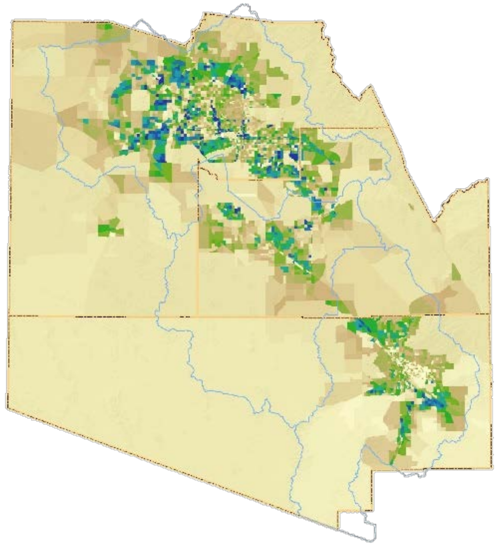
AZ Department of Administration (Low, Med, High Series)

Spatial Distribution:

Water Providers

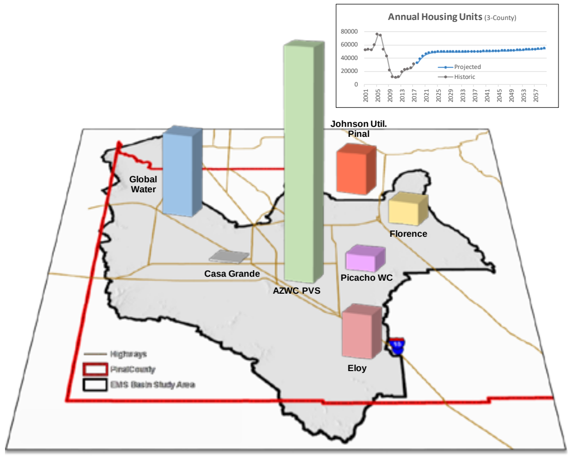


Official Growth Pattern

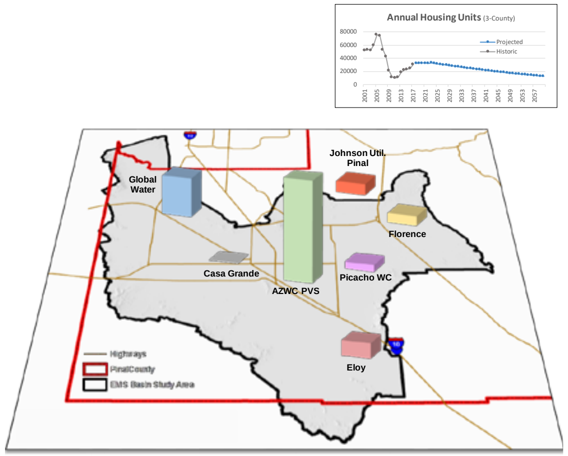


Effect of Growth

Rate: Rapid
Pattern: Outward

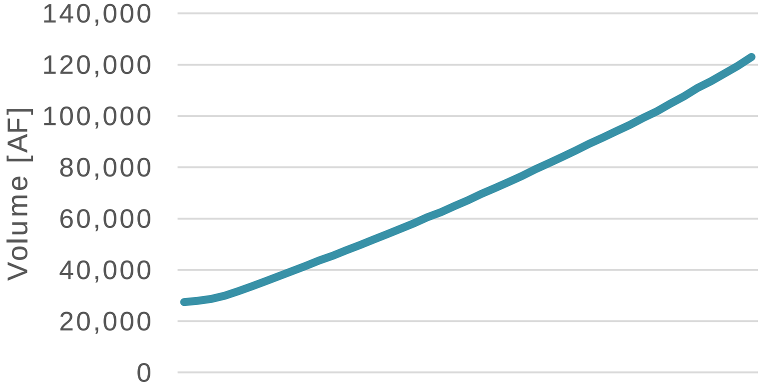


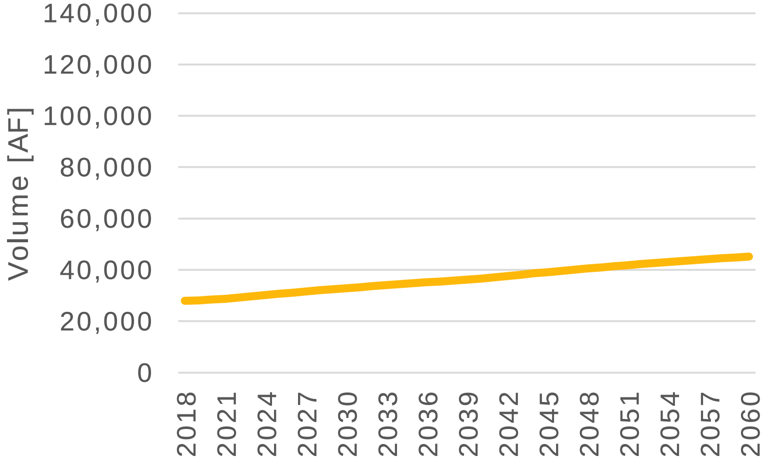
Rate: Slow
Pattern: Infill



Housing Units

Municipal Demand





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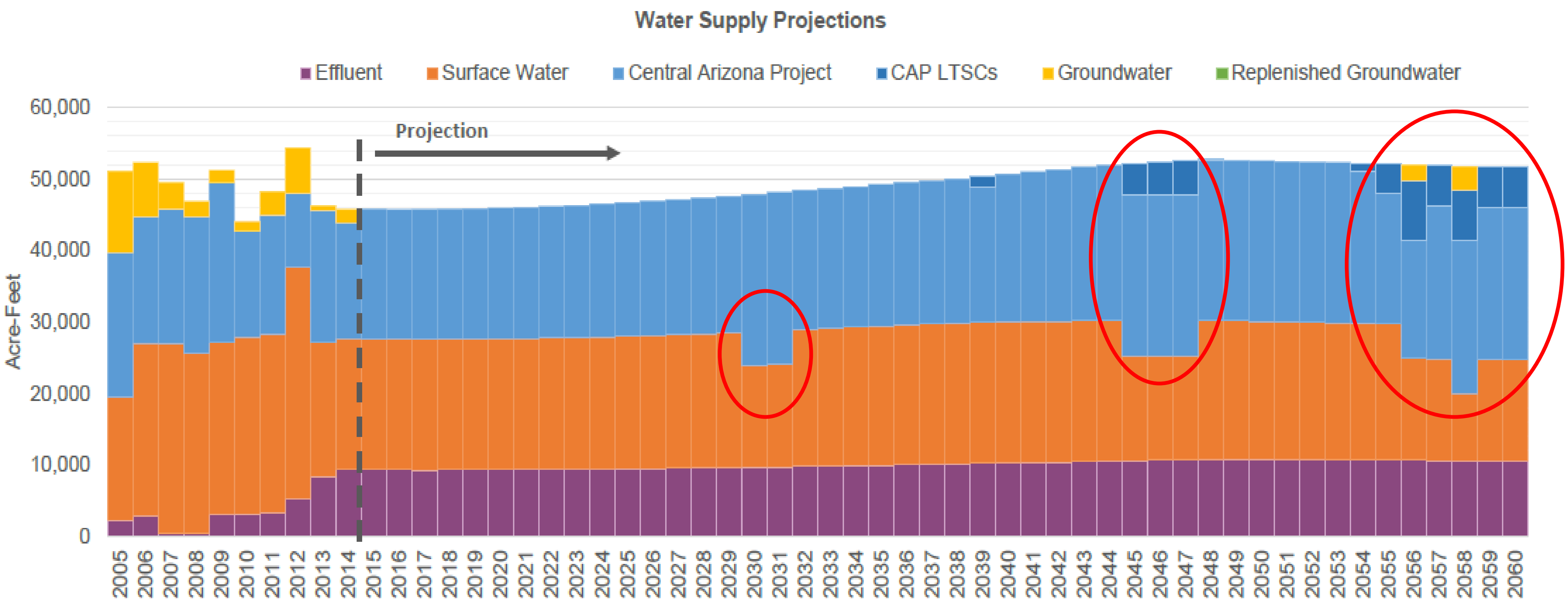
Climate

- Per capita water use
- Increase in crop consumptive use
- Shortages to water supply
  - Frequency
  - Duration
  - Severity

Colorado River Shortages

DRAFT

Effect of Climate – Water Provider



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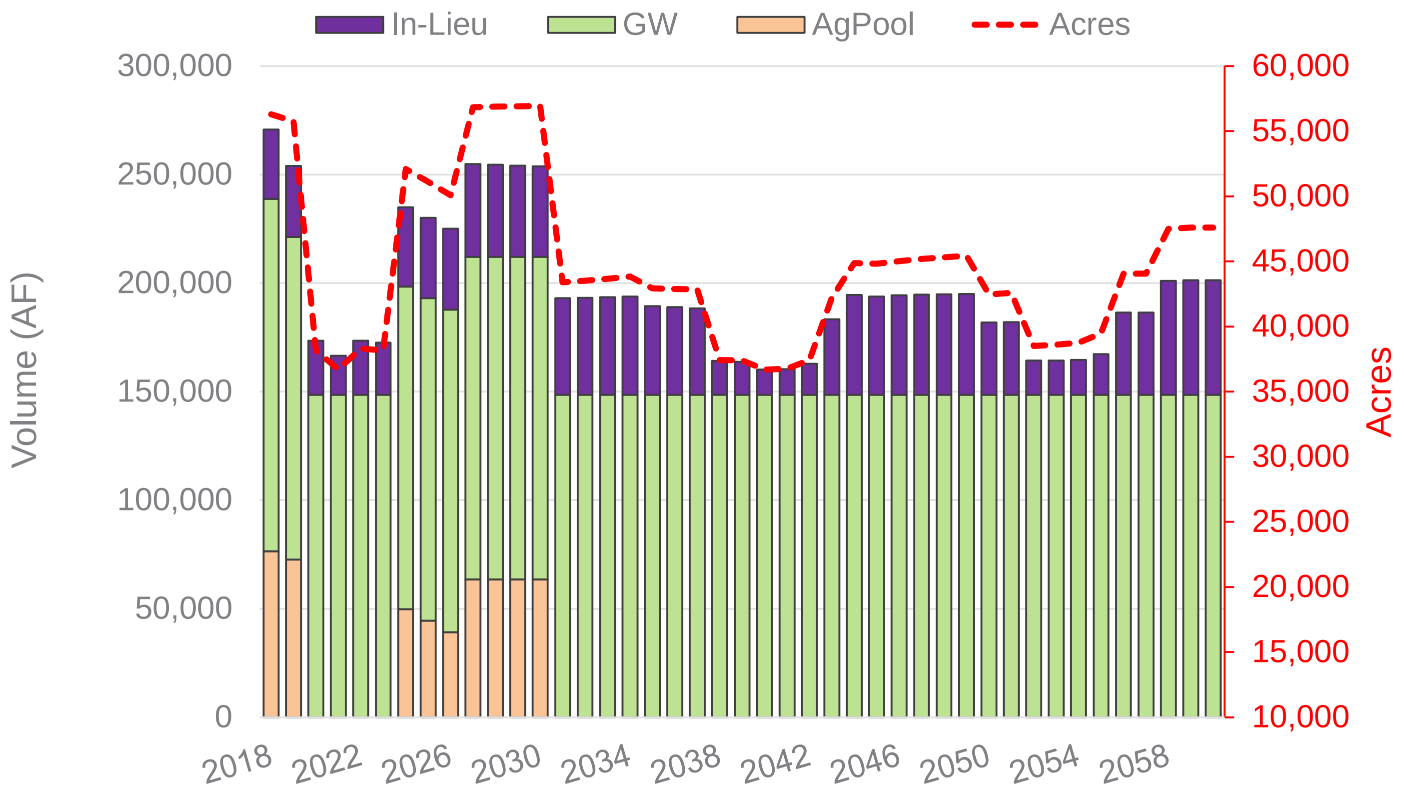
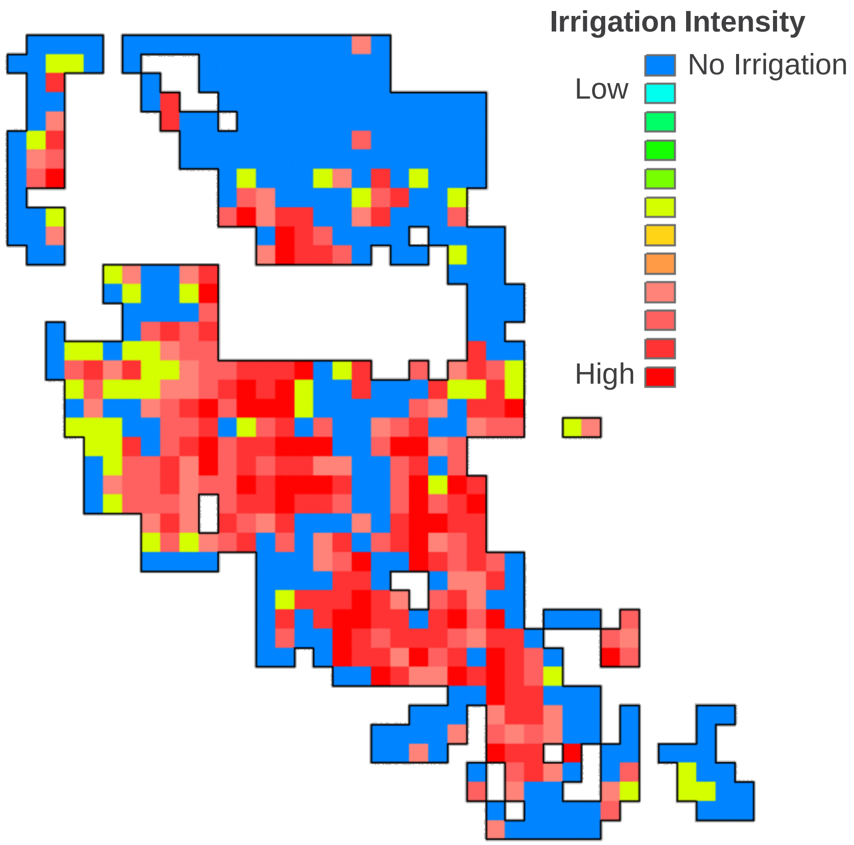
Effect of Climate – Irrigation Districts



Example Irrigation District



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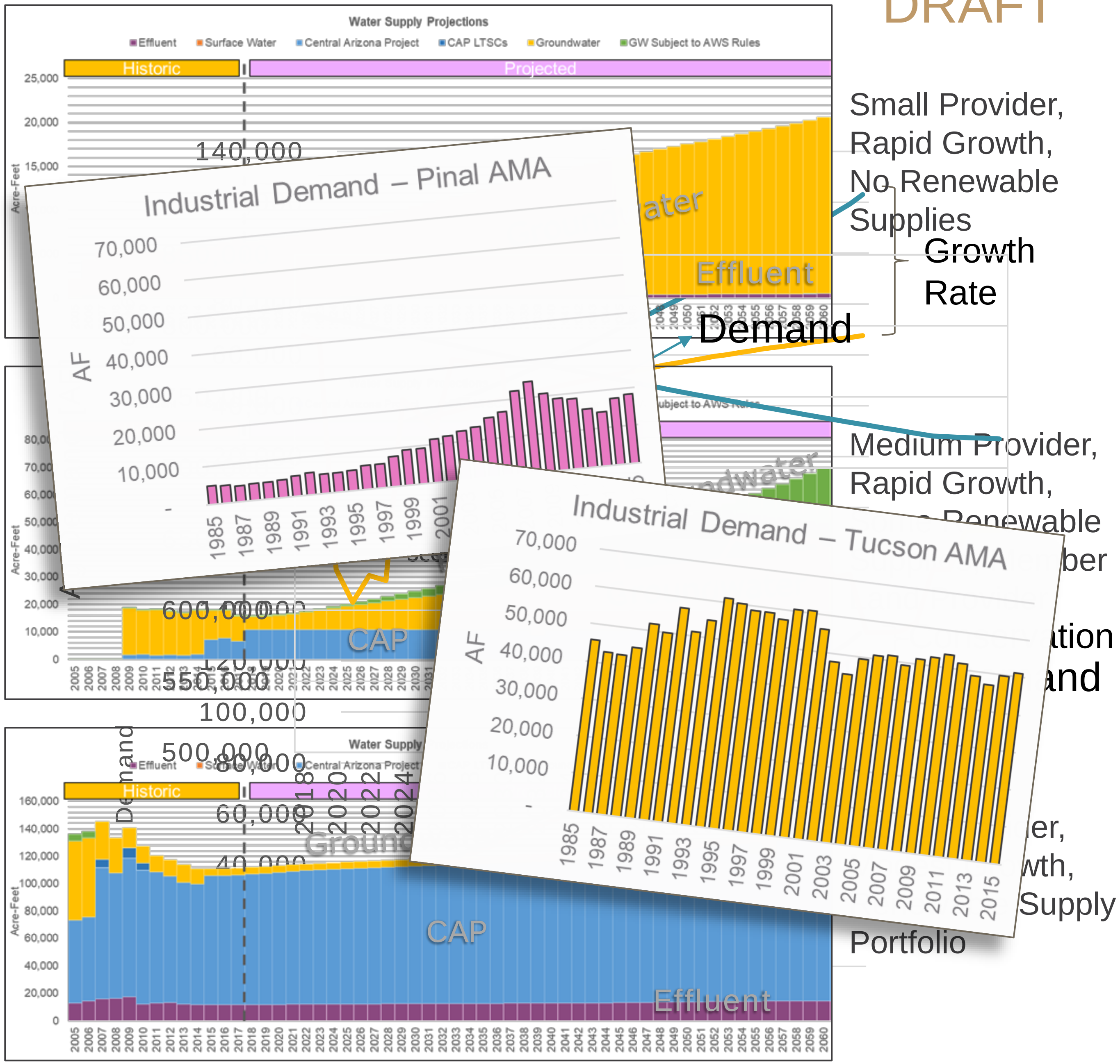
Takeaways

- Per capita use has been on the decline but growth rate drives municipal sector demand
- The location of growth is critical for:
  - Community characteristics
  - Types of water supplies
  - Regulatory requirements
- Agriculture demand is influenced by pumping capacity and surface water availability
- Industrial demand is site-specific



Recovery planning

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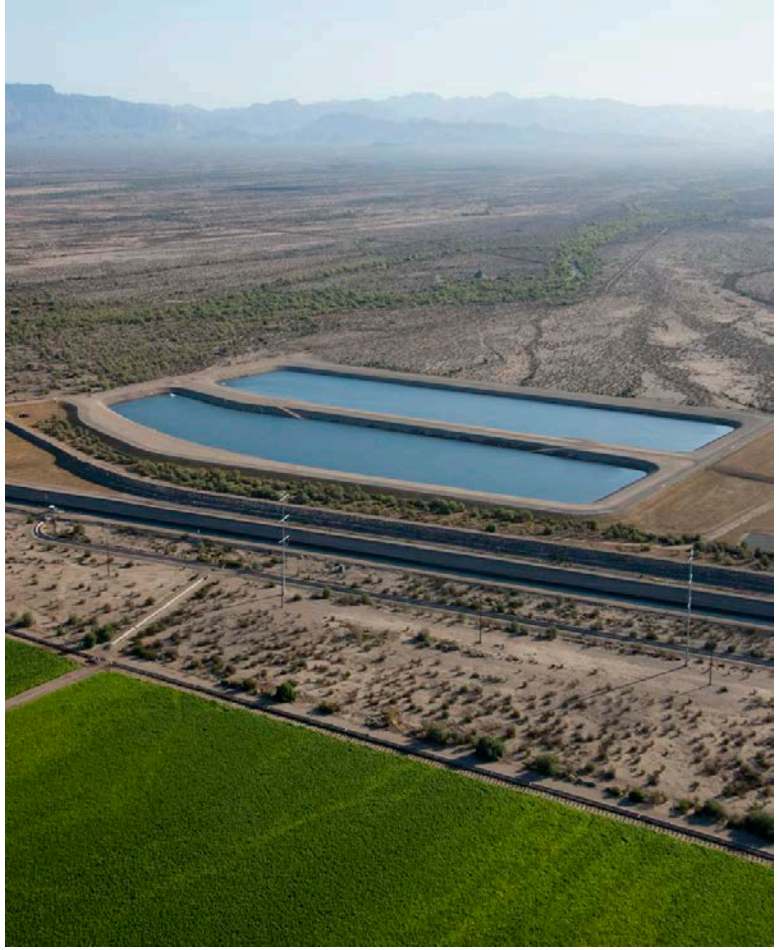
ANGIE LOHSE

Recovery of Banked Water

Planning and Implementation

Water Banking and Recovery

- Water banking and recovery is one of Arizona's strategies for mitigating future shortages on the Colorado River
  - Storing (banking) water underground
  - Recharge earns credits tracked by ADWR
  - More than 12 MAF of water stored
- During shortages, the stored water is pumped (recovered) from wells to supplement (firm) deliveries of Colorado River water



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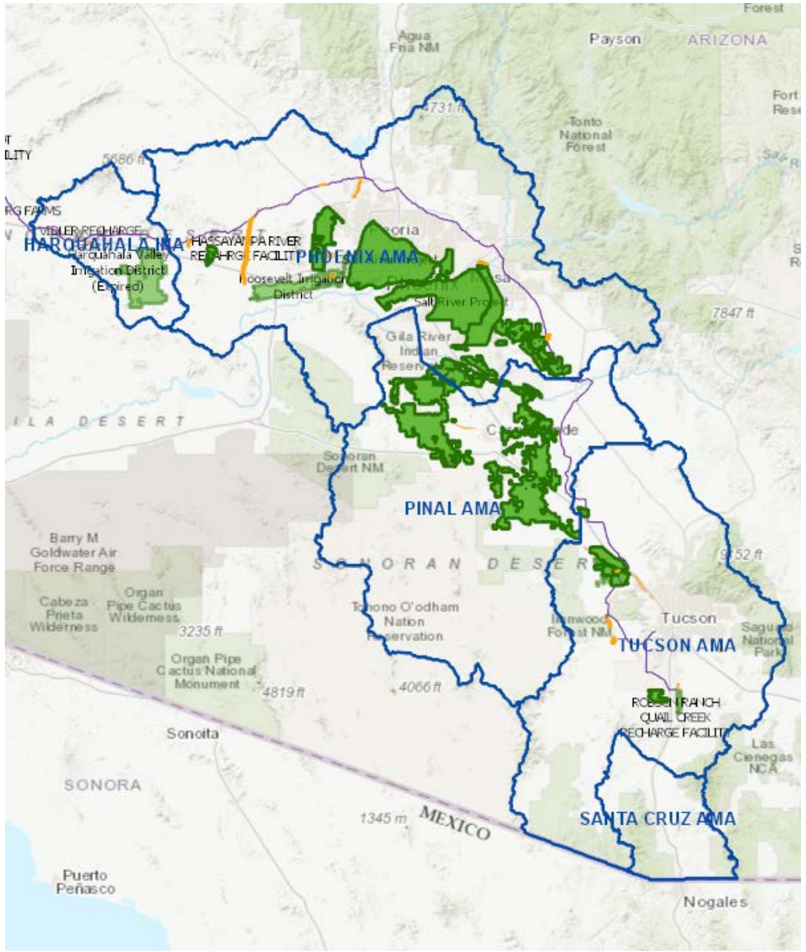
Arizona Water Banking Authority

- The State established the AWBA in 1996
- ABWA has accrued 4.28 MAF
  - 3.68 MAF for Arizona uses
  - .61 MAF for Nevada
- AWBA stores for a variety of purposes
  - To firm CAP M&I Priority Pool
  - To firm P4 M&I On-River users
  - To firm a specific portion of the CAP water held by tribes
  - To meet interstate obligations for Nevada



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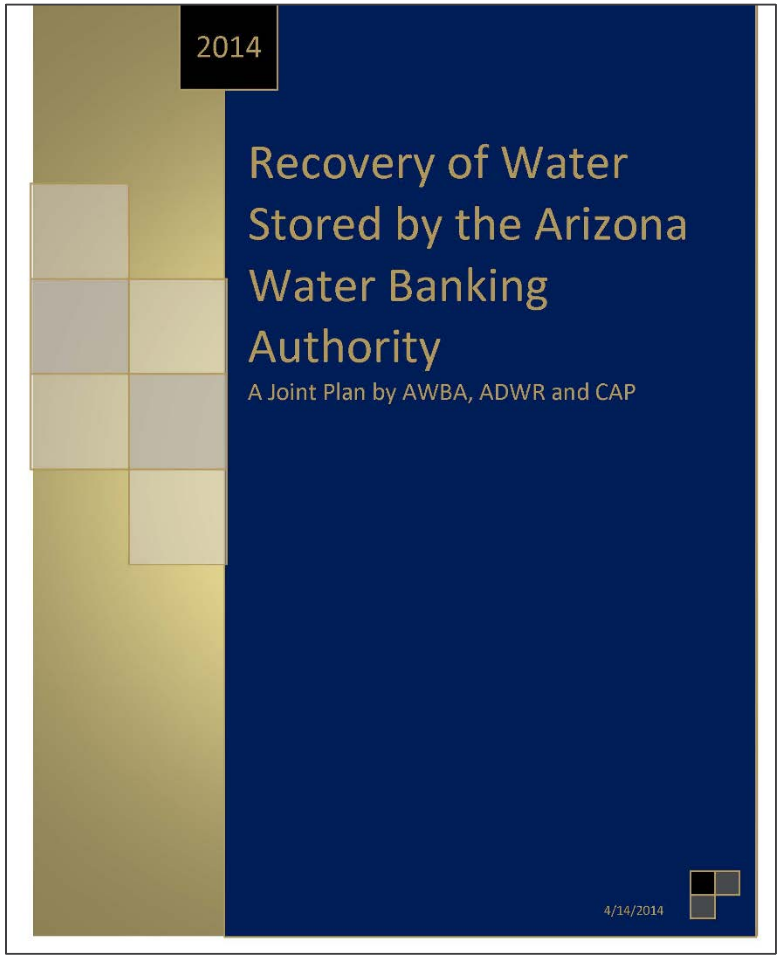
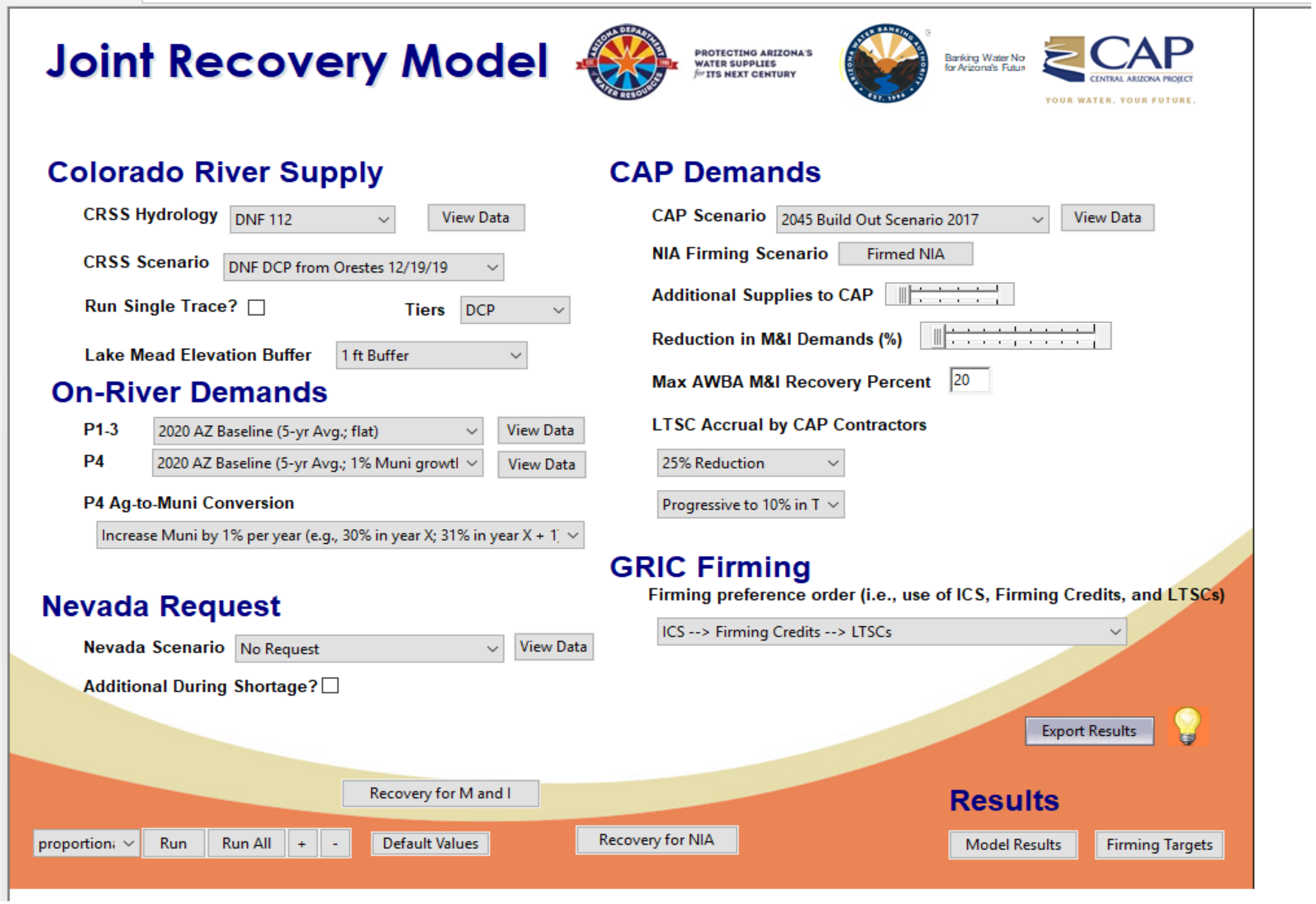
Recovery Planning

- Over time there have been a number of separate recovery planning efforts by AWBA, ADWR and CAWCD
- In 2014, a Joint Recovery Plan was developed
- Describes the basic framework, methods timing, volume and potential partnering opportunities
- Recovery Planning Advisory Group was convened by ADWR, AWBA and CAP to further refine recovery implementation



Likelihood, Timing and Magnitude



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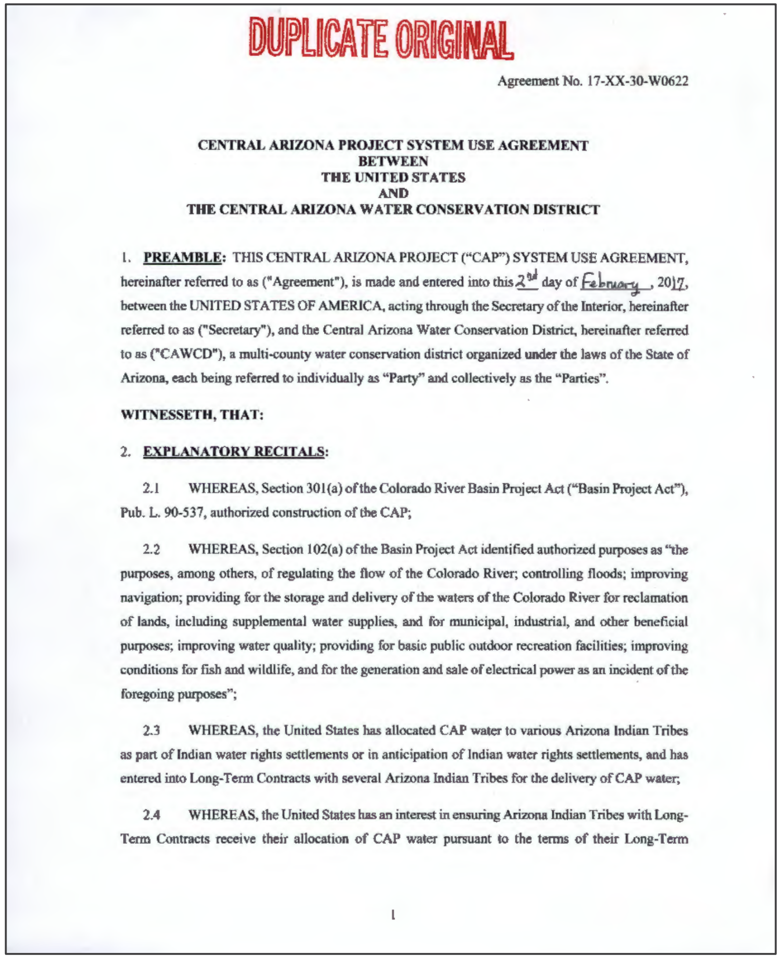
CAP System Use Agreement

- CAP and Reclamation staff developed a legal framework outlining how non-project water will move through the system
- “Firming Water” is available to satisfy reductions to contract orders due to shortage
- Sources of firming water are identified
  - Direct recovery into the canal
  - Exchanges


DUPLICATE ORIGINAL

Agreement No. 17-XX-30-W0622

CENTRAL ARIZONA PROJECT SYSTEM USE AGREEMENT
BETWEEN
THE UNITED STATES
AND
THE CENTRAL ARIZONA WATER CONSERVATION DISTRICT

1. **PREAMBLE:** THIS CENTRAL ARIZONA PROJECT (“CAP”) SYSTEM USE AGREEMENT, hereinafter referred to as ("Agreement"), is made and entered into this 2nd day of February, 2017, between the UNITED STATES OF AMERICA, acting through the Secretary of the Interior, hereinafter referred to as ("Secretary"), and the Central Arizona Water Conservation District, hereinafter referred to as ("CAWCD"), a multi-county water conservation district organized under the laws of the State of Arizona, each being referred to individually as “Party” and collectively as the “Parties”.

WITNESSETH, THAT:

2. **EXPLANATORY RECITALS:**

2.1 WHEREAS, Section 301(a) of the Colorado River Basin Project Act (“Basin Project Act”), Pub. L. 90-537, authorized construction of the CAP;

2.2 WHEREAS, Section 102(a) of the Basin Project Act identified authorized purposes as “the purposes, among others, of regulating the flow of the Colorado River; controlling floods; improving navigation; providing for the storage and delivery of the waters of the Colorado River for reclamation of lands, including supplemental water supplies, and for municipal, industrial, and other beneficial purposes; improving water quality; providing for basic public outdoor recreation facilities; improving conditions for fish and wildlife, and for the generation and sale of electrical power as an incident of the foregoing purposes”;

2.3 WHEREAS, the United States has allocated CAP water to various Arizona Indian Tribes as part of Indian water rights settlements or in anticipation of Indian water rights settlements, and has entered into Long-Term Contracts with several Arizona Indian Tribes for the delivery of CAP water;

2.4 WHEREAS, the United States has an interest in ensuring Arizona Indian Tribes with Long-Term Contracts receive their allocation of CAP water pursuant to the terms of their Long-Term

1

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How Recovery will be Implemented

- Direct Recovery
  - Pump water through wells, treat and introduce directly into the CAP system
- Development of Exchange Agreements and partnerships with cities, irrigation districts and Indian communities
  - CAP staff have developed exchange partnership agreements
- Exchange partnerships are mutually beneficial
  - Lower recovery cost
  - Increased flexibility
  - May not require new infrastructure

Example of Recovery/Exchange

- An M&I subcontractor agrees to exchange 3,000 AF of their CAP water that would have gone to their water treatment plant for 3,000 AF of recovered LTSCs
- This recovered water could either be pumped from the subcontractor’s wells or a third party that has infrastructure nearby
- The CAP water that would have gone to the M&I subcontractor can be redirected to those who do not have recovery wells or partnerships

Technical Studies – Tonopah Desert Recharge Project

- 2009 – Direct Recovery Plan
- 2015 – Recovery Plan Update
- 2016 – Exploratory Well Drilling
- 2017 – Test Well
- 2018/19 – Alternative Recovery Locations
- 2019 – Geophysical Studies

Key Take-away

- Arizona has mitigation strategies for Colorado River shortages
- On-going recovering planning and implementation will ensure Arizona is prepared for these shortages

CAGRD supplies & mid-plan review

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CHRIS BROOKS – SENIOR WATER RESOURCES ANALYST

Central Arizona Groundwater Replenishment District

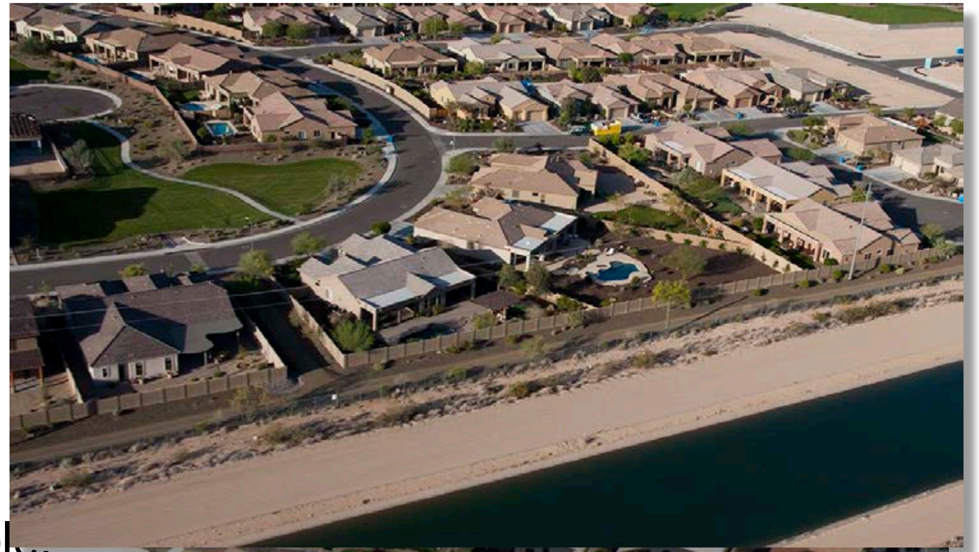
Planning and Water Supply Acquisition

Focus of Presentation:

- CAGRD Role in Assured Water Supply Program
- CAGRD Planning Processes
- CAGRD Water Supply Program
- Compare currently available supplies to projected obligations
- Need for future water supply acquisitions

CAGRD – One Component of an Assured Water Supply

- An Assured Water Supply must be:
  - Physically, continuously, legally available;
  - Of adequate quality;
  - Financial capability;
  - Consistent with management plan;
  - Consistent with ***management goal***.
- Enrollment in CAGRD allows consistency with management goal.
- Water provider must have the legal right to a physically available, 100-year water supply of suitable quality in order to enroll in CAGRD.
- Replenishment obligation based on quantity of “excess groundwater” pumped by the water provider (annual pumping minus “allowable” groundwater).
- Replenishment occurs in same AMA (but East vs West distinction in Phoenix AMA)



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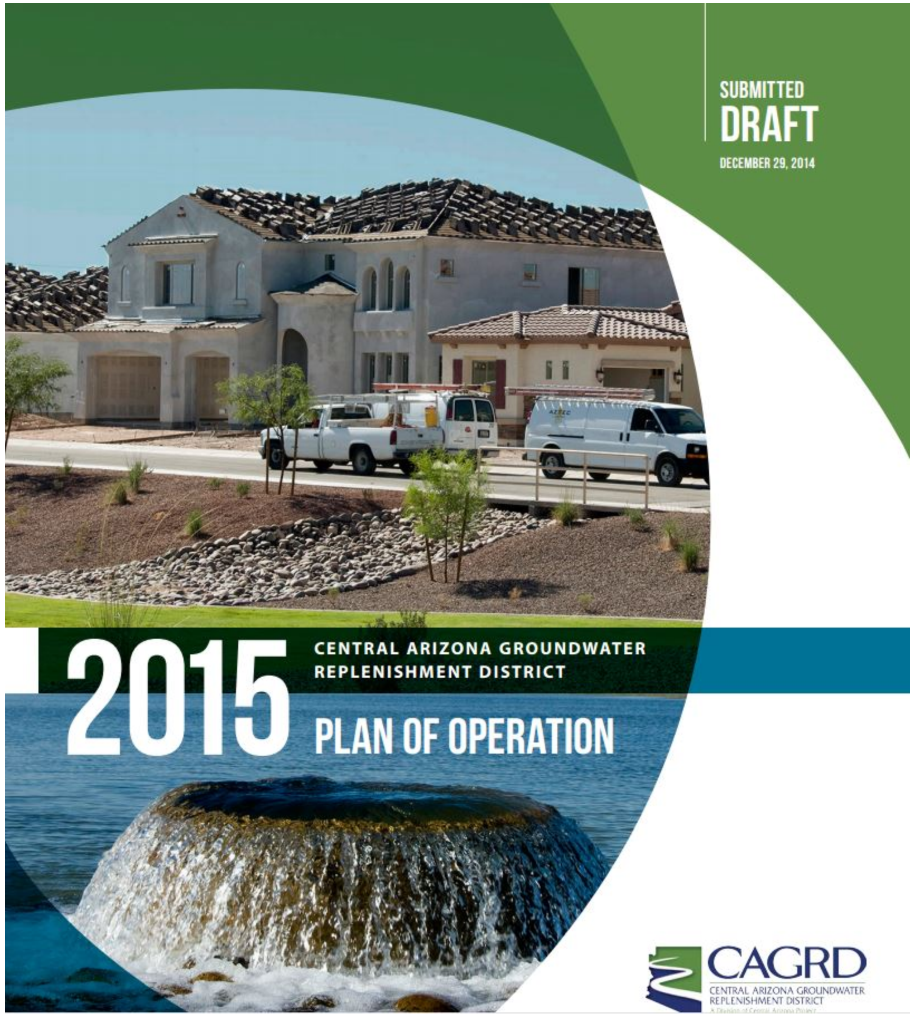
CAGRD Plan of Operation

- By statute, CAGRD operates under a 10-year Plan of Operation.
- All Plans developed with public input and approved by ADWR.
- The current 10-year Plan of Operation was approved by ADWR on August 5, 2015.
- Describes the projected obligations and supplies to meet those current and future obligations.
- CAP Board policy also mandates Mid-plan review – completed this year.
- All documents available at: www.cagrd.com/operations/plan-of-operation



Water Supply Program

- CAGRD Water Supply Program (WSP) established in 2012 to build robust water supply portfolio to meet future replenishment obligations.
- Water Supply Acquisition Plan in 2012, updated 2015, 2020 update underway.
- 25 agreements to acquire water supplies approved and implemented:
    - Incl. LTSCs, effluent, CAP leases, CAP exchange
- Agreements are unique to each particular water supply; designed to provide financial/water supply management benefits to buyer and seller.

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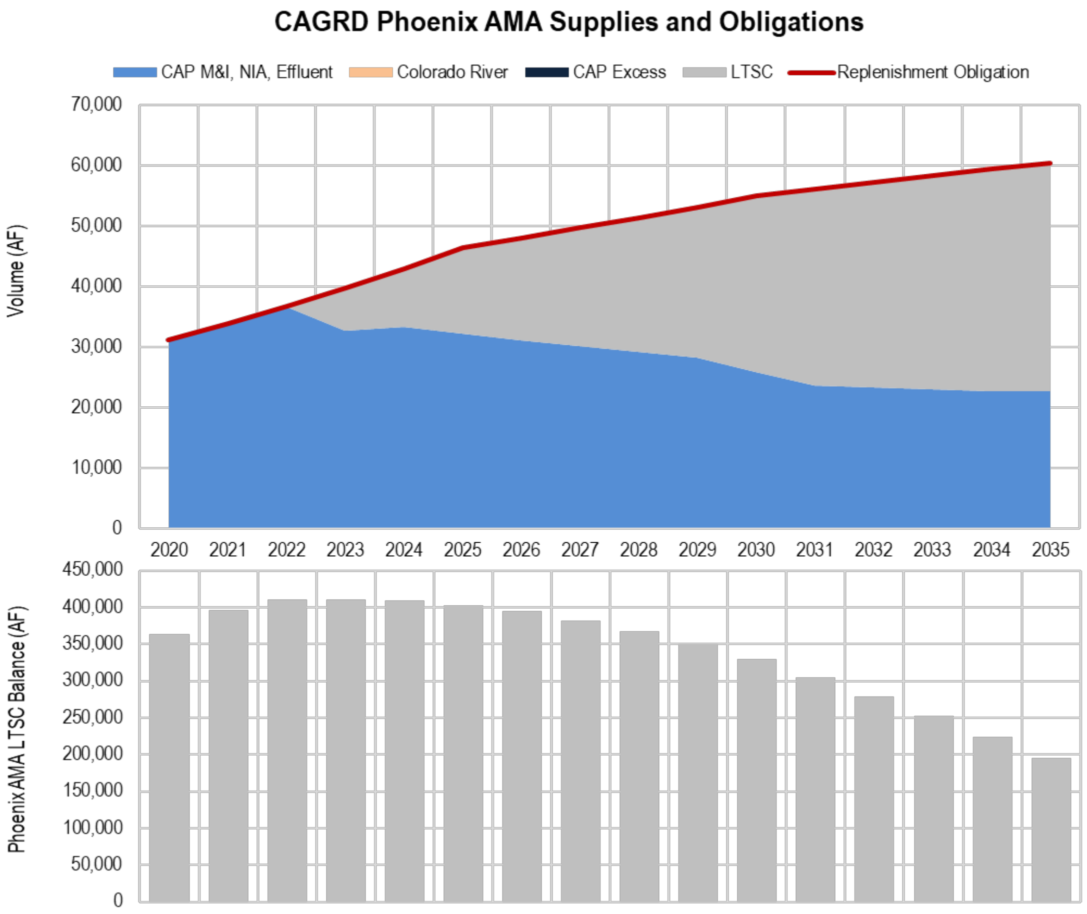
Modeling CAGRD Water Supplies and Obligation

Variables:

- Existing water supply utilization
- Overall CAP supply utilization
- Shortage tier onset and duration
- Deployment of LTSCs
- CAGRD Enrollment
- CAGRD financials



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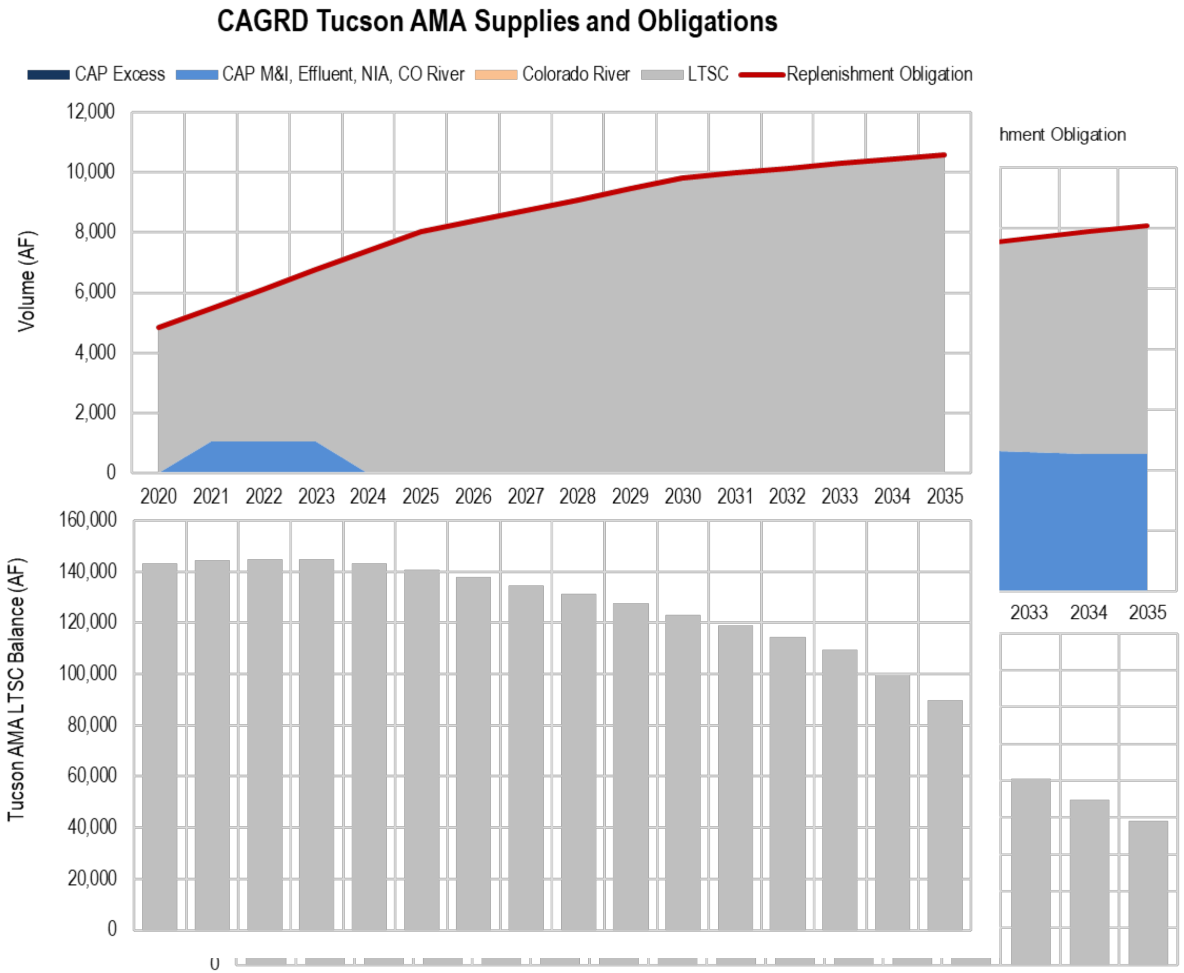

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Modeling CAGRD Water Supplies and Obligation

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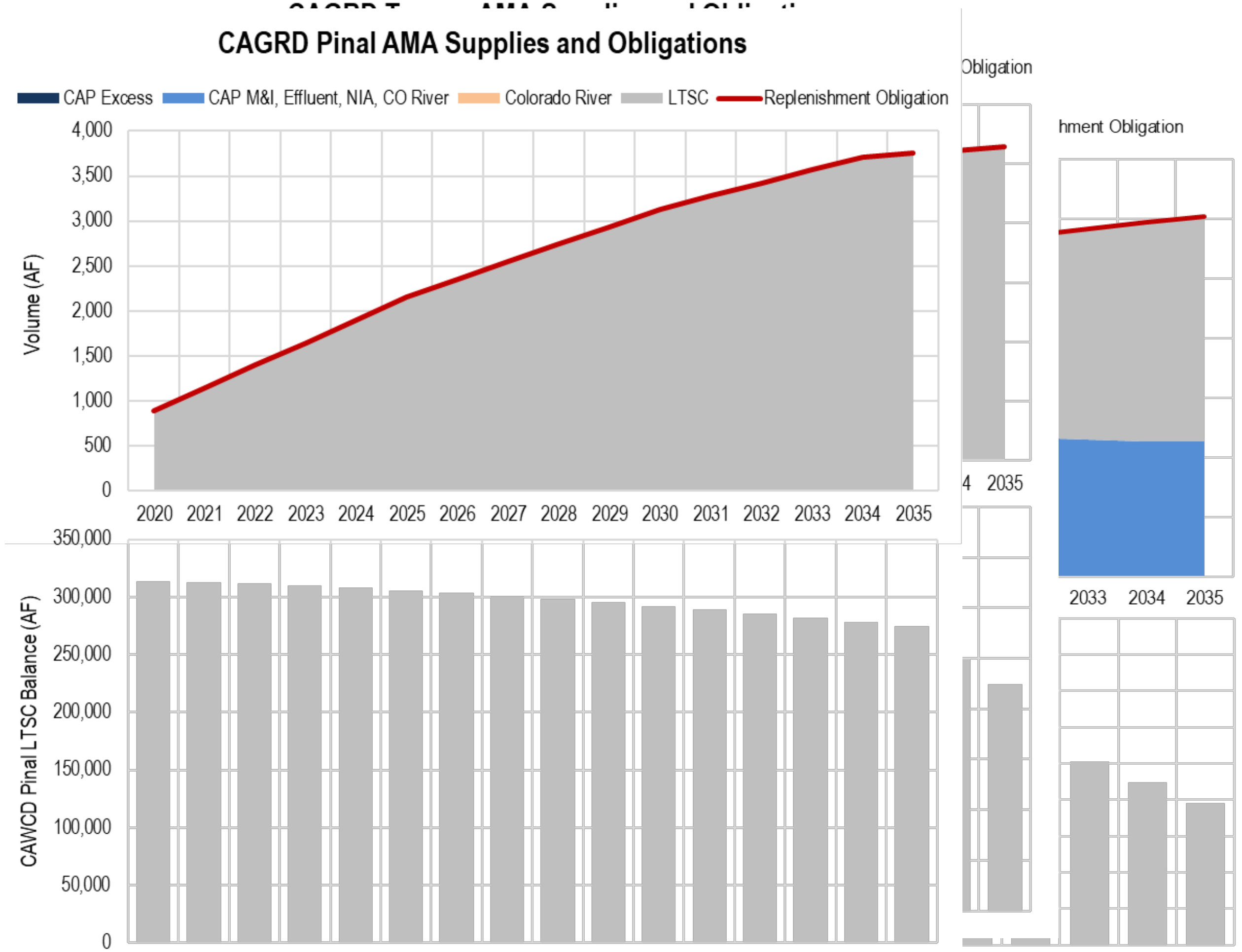

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CAGRD Water Supply Portfolio

Supply Class	Volume (AF)	Availability	Description
CAP M&I	8,311	Annually	Permanent entitlement
CAP Indian (GRIC)	15,000	Annually from 2020 to 2044	**25 year lease**
CAP NIA (GRIC)	18,185	Annually from 2020 to 2044	25 year lease, subject to shortage reduction
Effluent	2,400	Annually, began 2017	100 year lease
CAP Indian (WMAT)	2,500	Annually from 2024	100 year lease, awaiting final authorization; subject to shortage
CAP NIA	18,185	Annually from 2024	Permanent, awaiting final authorization; subject to shortage
TOTAL	**64,581**		
Long-term Storage Credits (current)	427,000	As needed	Currently in CAGRD Subaccount; equivalent to 4,270/year for 100 years
Long-term Storage Credits (future)	390,000	2020-2114	To be acquired under existing purchase agreements; equivalent to 3,900/year for 100 years
TOTAL (with current and future credits)	**72,751**		

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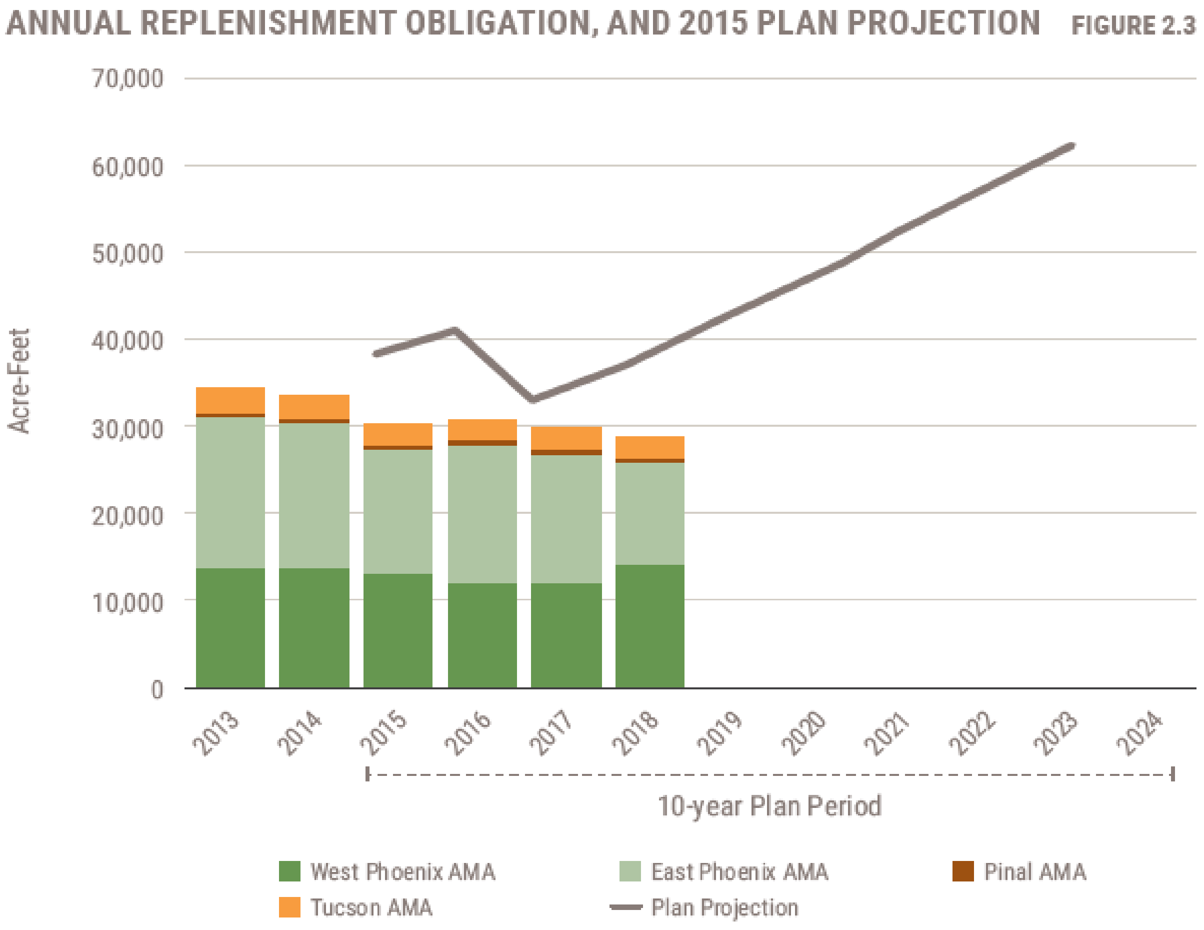
CAGRD Replenishment Obligations – Planned vs. Actual

- Mid-plan review describes how recent obligations have trended below 2015 Plan projections.
- Multiple factors have limited growth of obligation in recent years.
- Current supplies approx. 2X recent obligations.



Future Water Supplies: Need and Availability

- Near-term supply outlook is positive
  - Ample wet water supplies with GRIC/GRWS agreements
  - Anticipated availability of NIA water
  - Shortage impacts firmed with LTSCs/Replenishment Reserve
  - Replenishment obligations trending below projections
  - No projected reliance on Excess Water
- Future supplies needed to hedge drought risk to CAP NIA supplies, meet longer-term obligations, meet RR targets
  - Primary need in Phoenix AMA
- Combination of wet water and LTSCs

Colorado River modeling

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ORESTES MORFIN

Colorado River Modeling

Goals of Interstate and International Water Management

- Reduce Uncertainty, Increase Resiliency
- Develop Stable Operations
- Provide Opportunities for Collaboration
- Balance Upstream and Downstream Risks
- Acknowledge Shared Resources/Responsibilities
- Cooperatively Respond to Change & Crises

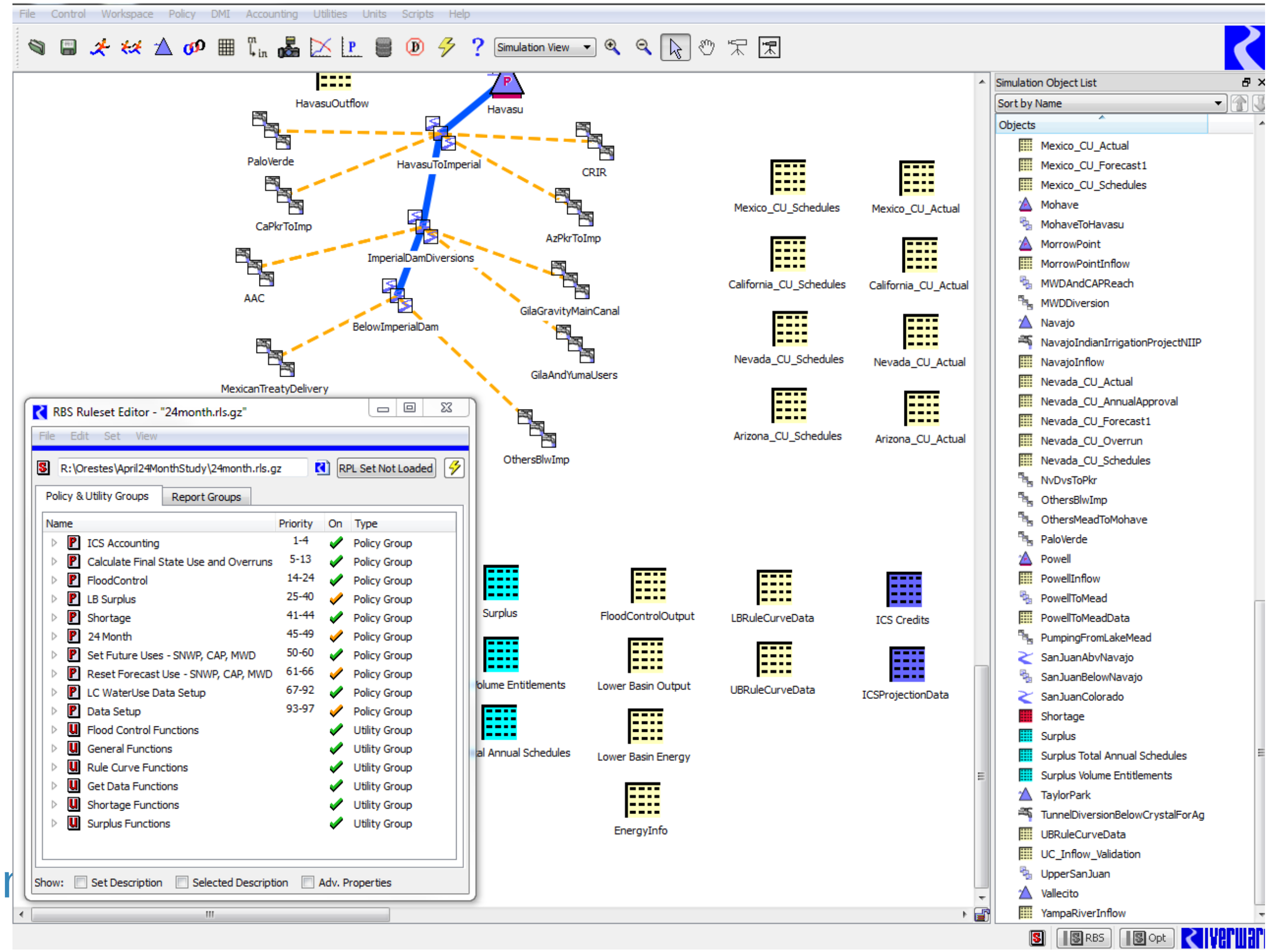
To Build ***Trust*** – Use consistent and verifiable interstate and international data with shared models/analytical tools

3 Colorado River Modeling Tools

- Used to characterize the supply of Colorado River water available to CAP
  - 24-Month Study Model
  - Mid-Term Operations Model (MTOM)
  - Colorado River Simulation System (CRSS)
- All models include:
  - Hydrology (streamflows) – USGS (historical) or NOAA (predicted)
  - Reservoirs (operating rules, laws, etc.) - USBR
  - Water uses (diversions, returns, and losses) – USBR (historical) or predicted

Modeling Tools: 24-Month Study Model

- Deterministic (forecast)
- Decision framework model
- Rule-based
  - 2007 Interim Guidelines + DCP
- ≤2 yr operations
- Hydrology Inputs
  - Colorado Basin River Forecast Center
  - “min-”, “max-”, and “most probable”
- Run parameters
  - Duration = 24 mo.
  - Monthly initial conditions
  - Monthly time-step
- Outputs of interest
  - EOM Dec. Lake Mead pool elevation
    - Aug 24MS
  - EOM Sept. & Dec. Lake Powell pool elevation
    - Apr & Aug 24MS



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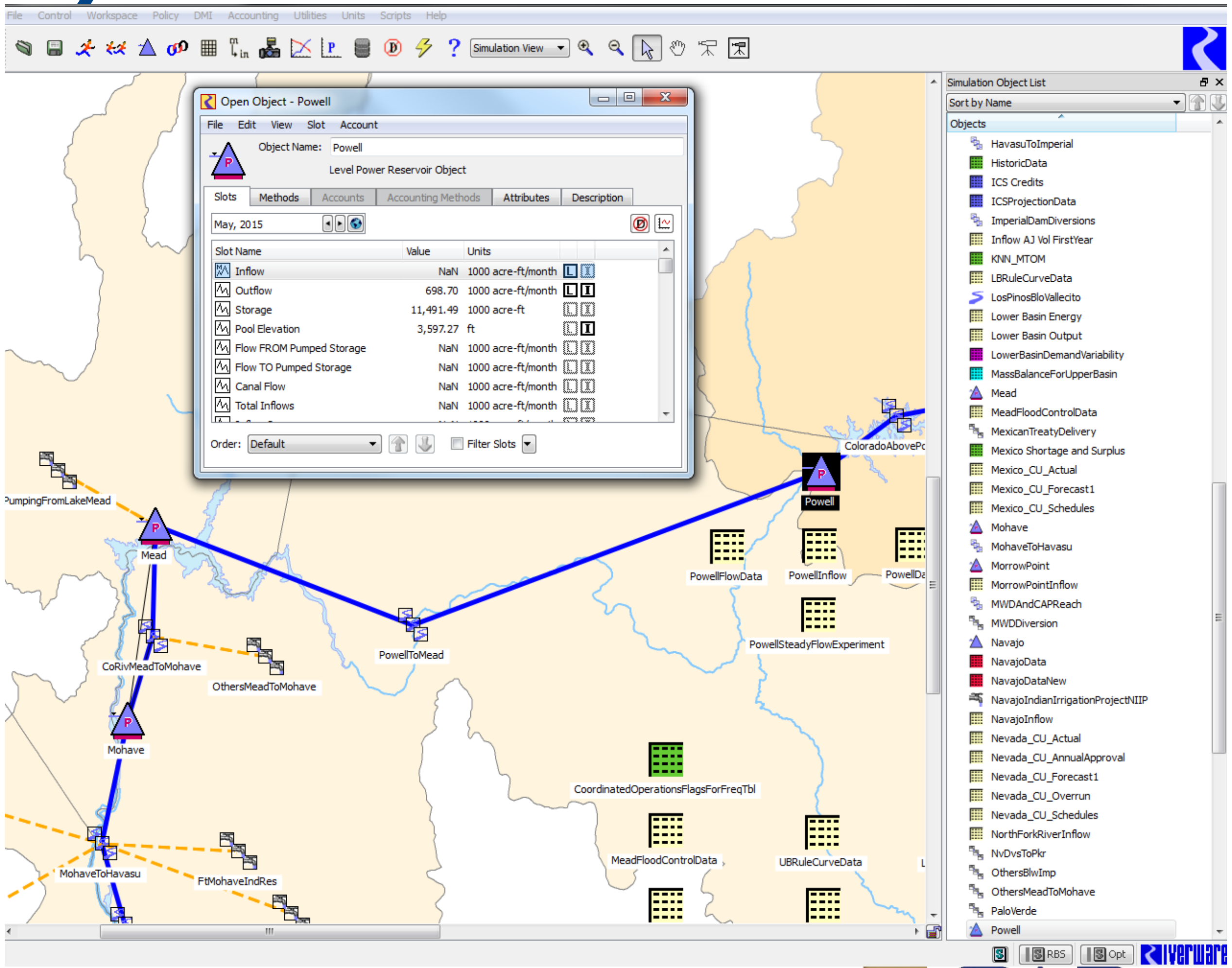
Modeling Tools: Mid-term Probabilistic Operations Model (MTOM)

- Probabilistic
- Planning tool
- Rule-based
  - 2007 Interim Guidelines + DCP
- 1-5 yr planning
- Hydrology Input
  - UB: unregulated flows as modeled by Colorado River Basin Forecast Center “Calibration Period (1981-2010)” precip. & temp.
  - LB: observed side inflows 1981-2010”
- Run parameters
  - Duration = 5 yrs
  - Initial conditions: current 24MS results
  - Monthly time-step
- Outputs of interest
  - Lake Mead pool elevation
  - Lake Powell pool elevation
  - Releases
  - Shortages



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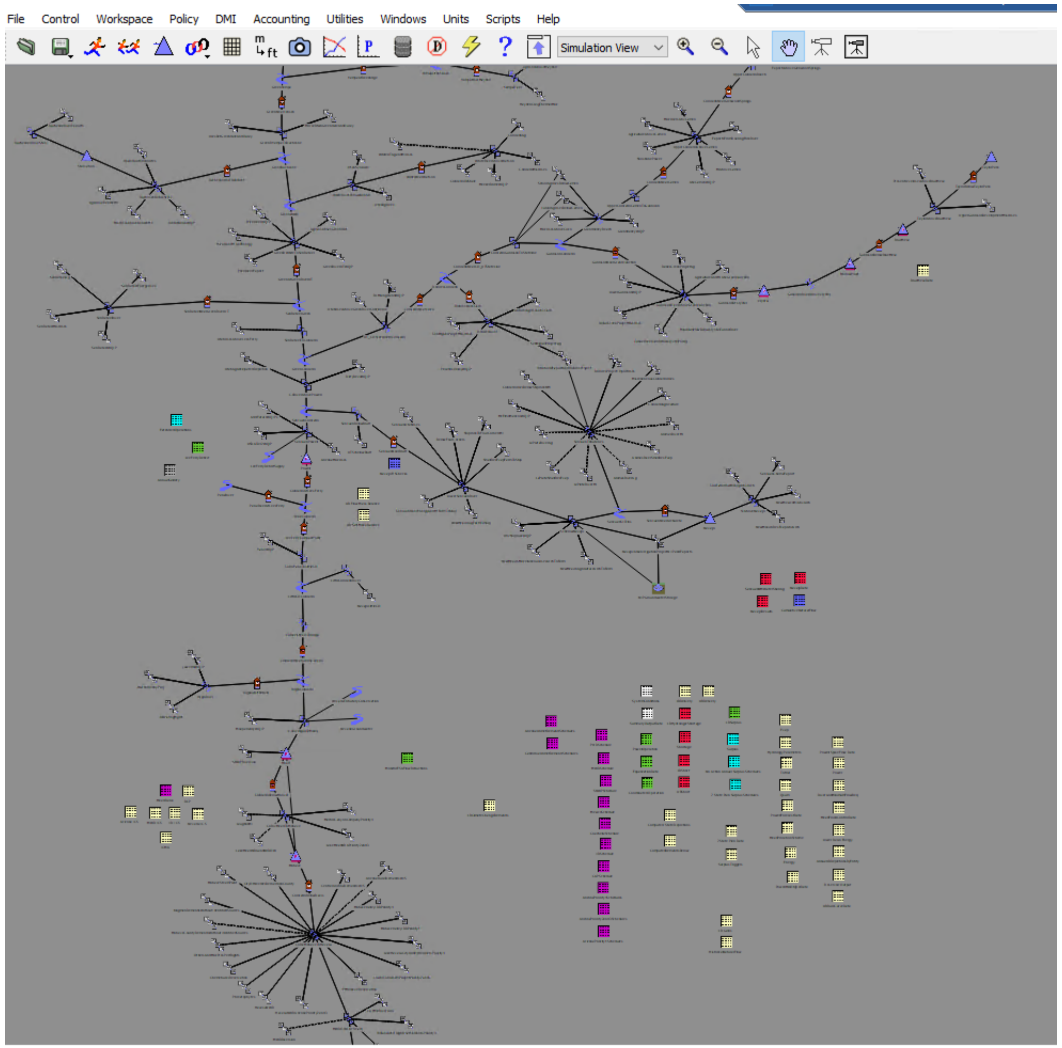
Modeling Tools: Colorado River Simulation System (CRSS)

- Probabilistic
- Rule-based
  - 2007 Interim Guidelines + DCP
- ≥10 yr planning
- Hydrology Inputs
  - Observed (112 yr record: 1906-2017)
  - “Stress Test” (1988-2017 extremely dry period)
  - Variable Infiltration Capacity (VIC [climate change scenarios])
  - Other (“Paleo”, etc.)
- Run parameters
  - Duration ≤ 40years
  - Initial conditions: actual or predicted January
  - Monthly time-step
- Outputs of interest
  - Lake Mead pool elevation
  - Lake Powell pool elevation
  - Conservation volumes
    - State
    - USBR
    - Users



Uses

- 24-Month Study
  - Forecast system responses from operation decisions
  - Used to determine operating tier
    - April: for EOM September (Water Year)
    - August: for EOM December (Calendar Year operating tier)
- MTOM
  - Bridge from deterministic to stochastic (probabilistic)
  - Aid in initializing CRSS
  - Useful in determining near-term risk
- CRSS
  - Useful for planning and evaluating operating regimes and policy decisions
  - Large-scale trends
  - Provides for range(s) of system response to variations in:
    - Hydrology
    - Climate
    - Initial Conditions
    - Operation Decisions

Summary

- Standard issue software (RiverWare™, RiverSmart ™)
- Standard issue data
  - USGS
  - USBR
  - NOAA/CBRFC
- Coordination with USBR
  - Curated environment
  - “Refereed” models
- Common set of facts and tools
  - Fosters relationships
  - Fundamental to negotiations
- Parties collaborate to improve model tools (e.g. NASA, ASU, Basin States)

CAP Climate Adaptation Plan

CAP Climate Adaptation Plan

Mohammed Mahmoud, Ph.D., Senior Water Policy Analyst

Primary Climate Change Impacts to CAP

Climate Effect	Impact on CAP

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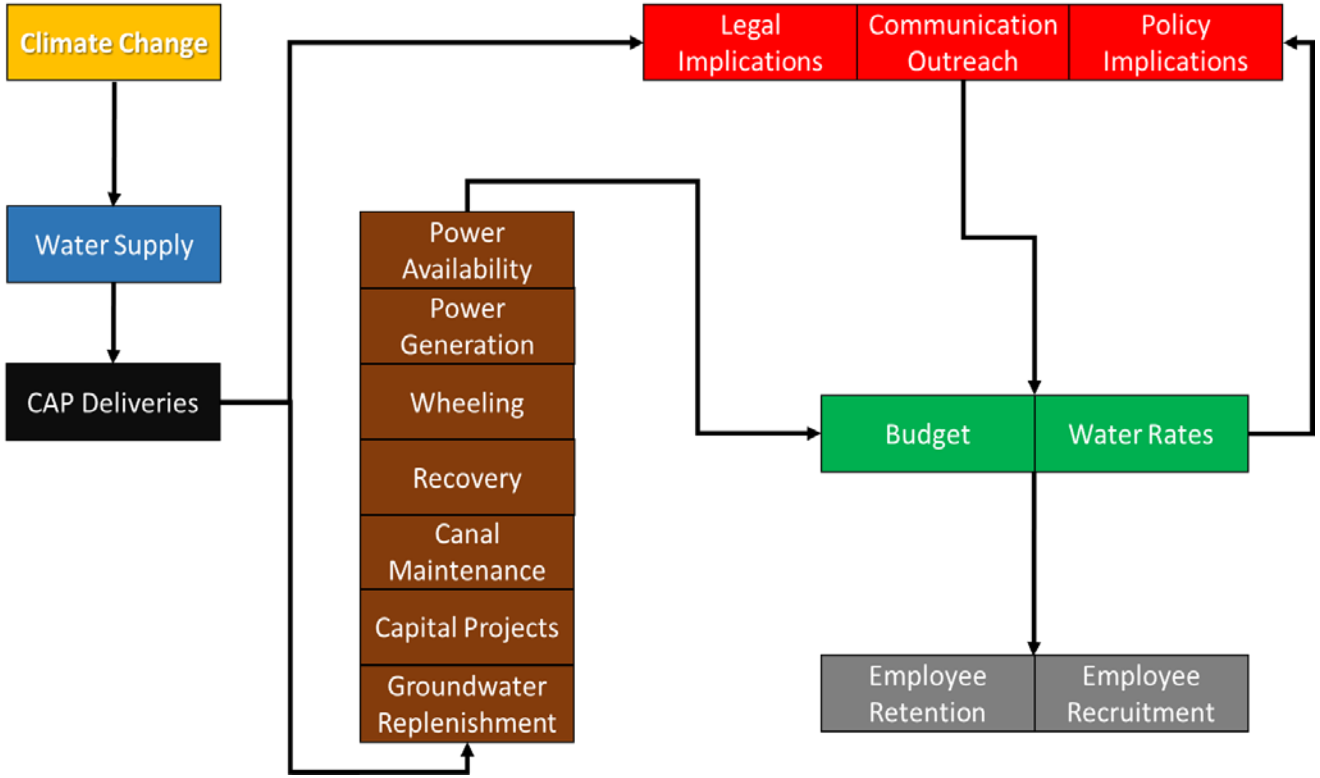
CAP Climate Adaptation Plan

- Prepare the business and function of CAP to be resilient under an uncertain future impacted by climate change
- Explore CAP's organizational adaptation to climate change using scenario analysis



How resilient is CAP to climate change?

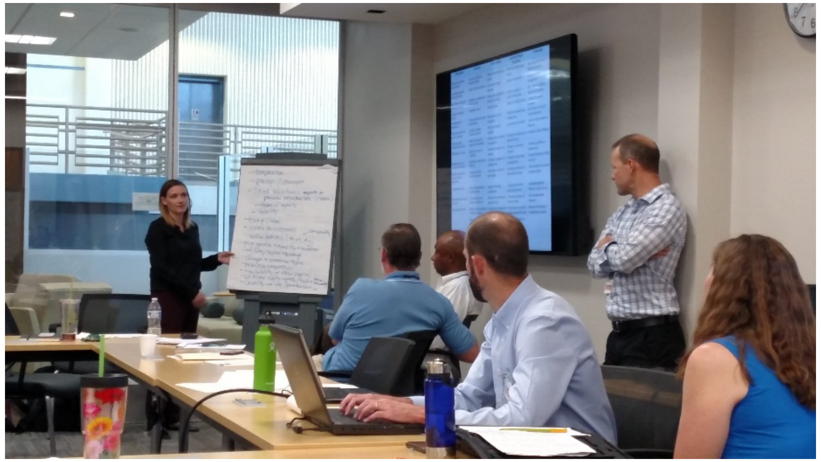
How do we improve resiliency to climate change?

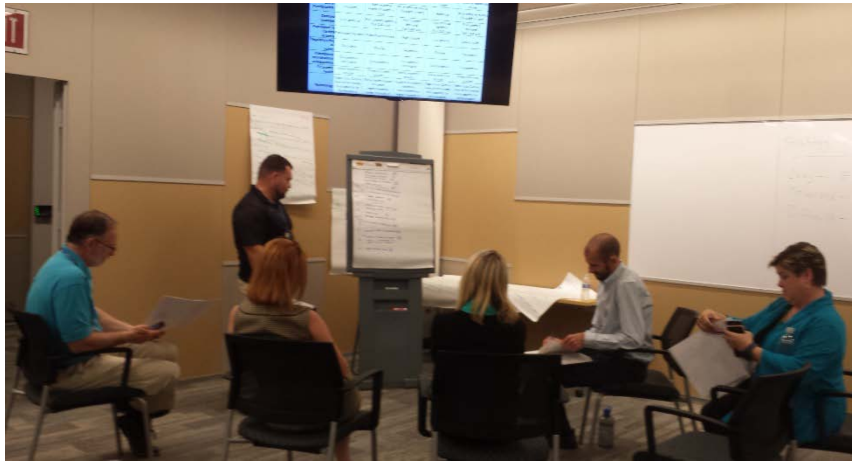
CAP Climate Adaptation Plan Project Team

Multi-disciplinary team composed of staff representing the diverse range of CAP's organizational functions

The role of the team was to explore:

- The impact of climate change to CAP's water supply, infrastructure, organization, etc. (**Climate Change Implications**)
- The suite of adaptation measures that can be implemented in response to these impacts (**Climate Adaptation Strategies**)





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Business Mapping and Scenario Planning Approach

Key Driver	Scenario 1	Scenario 2	Scenario 3
Colorado River supply	Frequent deep shortages	Normal CAP supply, with some infrequent excess supply above historical amount	Frequent deep shortages
Temperature	Significantly warmer	Warmer overall, but potentially seasonally cooler	Warmer overall, but potentially seasonally cooler
Local precipitation	More extreme events (drought or rain)	Historical	More extreme events (drought or rain)
Demand changes	Full contract demand (full CAP use)	Low contract demand (full CAP use)	Full contract demand (full CAP use)
Population of Central Arizona	High growth	Low growth	Low growth
Regulatory/legal/policy	Restrictive	Flexible	Restrictive
Interagency coordination/collaboration	Competitive/combative	Collaborative	Collaborative
Economic health	Strong economic growth	Weak economic growth	Weak economic growth
Technology	Rapid technological advances; mainstreaming; higher capacity of utilization	Status quo. Current level of technology and capacity for technological improvements	Status quo. Current level of technology and capacity for technological improvements

Select Key Drivers → Define Scenarios → Identify Implications (Challenges and Opportunities) → Develop Adaptation Strategies and Portfolios → Analyze Impacts of Implications and Strategies to Functions

Most Common Implications

Implications that affect all scenarios

Challenge Implications	Opportunity Implications	Mixed Implications
#21. Biological: increased algae, aquatic vegetation, terrestrial weeds, invasive species. **#41.** Increased health and safety issues – temperature driven. **#54.** Ongoing need to manage perceptions (public image).	**#39.** Increased maintenance efficiency.	**#36.** Change in seasonal demand curve.

Common scenario implication themes:

- Implications that CAP is currently managing or will need to manage in near future
- Mostly driven by temperature conditions (warmer future)
  - Biological incursions impacting canal system
  - Health and safety concerns due to higher temperatures
  - Managing seasonal customer demand due to “lengthening” of summer season
- Maintenance efficiency attributed to technology
- Need to manage public image is ongoing implication regardless of driver state

No/Low Regrets Strategies

25 Strategies that are easy to implement across all scenarios:

- **No Regrets (easy to implement, applicable across all scenarios)**
- **Currently being implemented by CAP** (e.g. banking water, generating ICS in Lake Mead, working with others to address water supply/demand imbalance)
- **Can easily be implemented with little to no additional resources/staff** (e.g. increasing water quality communication, staff and board outreach, prioritizing work activities)

Strategies that are uniformly easy to implement in all scenarios

#4. Communicate potential for increased rates to customers. **#11.** Bank water. **#19.** Reprioritize non-critical capital improvement projects to future budget. **#24.** Create technology replacement fund. **#32.** Look to CAGRD to help supplement other areas. **#37.** More intentionally created surplus (ICS) in Lake Mead. **#39.** Monitor changes to prepare for changes. **#46.** Operational flexibility to facilitate maintenance. **#49.** Share water quality management with customers/manage customer expectations.	**#51.** Increase external/internal communications on water quality. **#64.** Increase training, awareness, safety campaigns regarding weather issues/conditions. **#82.** Flexible operations to respond to changes in seasonal demand. **#83.** Change maintenance schedule to reduce costs. **#84.** Enforce existing contract condition that limits monthly supply to 11 percent of annual supply. **#85.** Decrease rates due to increased operational and/or maintenance efficiency. **#86.** Implement more flexible and efficient operational practices. **#87.** Shift schedules/alternative work schedule.	**#91.** Staff subject to exposure; take days off when conditions are dangerous. **#99.** Prioritize work activities. **#103.** Stakeholder workshops, collaboration, outreach. **#105.** Board outreach and education, on CAP's behalf. **#106.** Staff outreach and education (employees promote message), on CAP's behalf. **#110.** Increase patrolling/surveillance. **#116.** Increase collaboration with other agencies to facilitate permitting and environmental compliance. **#121**. Collaborate with others to address water supply/demand imbalance.

Conditional Strategies

- **10 Conditional Strategies**:
  - **Difficult to implement, address only one implication each**
  - Only applicable when particular implication or set of conditions arise
  - Implementation difficulty can limit frequency of their application
  - **Huge financial investments in physical assets** (e.g. automating equipment, increasing system capacity to generate and store power)
  - **Lengthy implementation timelines** (e.g. pursuing legislation and regulatory changes)
  - **Time-intensive evaluations and analyses** (e.g. increasing staff, reducing or reorganizing staff duties)

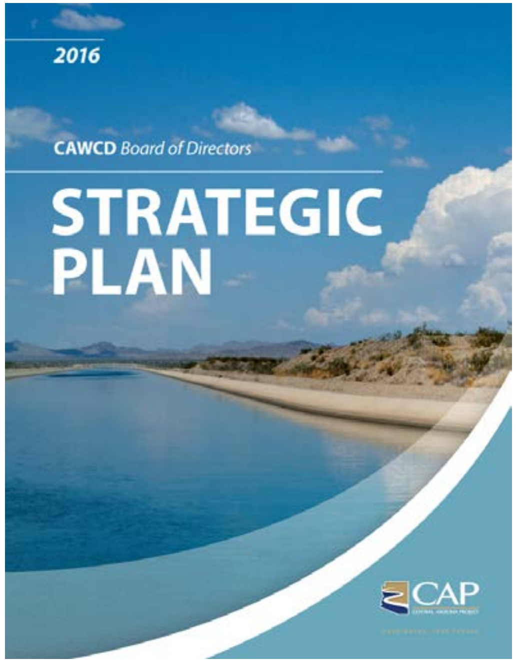
Difficult strategies that only address a single implication each

#13. Workforce restructuring/reduction. **#20.** Additional service charges. **#25.** Incentives for stakeholders' own projects in service area.	**#27.** Firm more water supplies. **#36.** Infrastructure investment: groundwater facilities. **#62.** Pursue legislation to further minimize subsidence.	**#76.** Increase power generation, capture, and storage. **#81.** Pursue regulatory changes. **#90.** Automate resources/equipment. **#119.** Increase staff.

Next Steps

Implementation Process:

- Review generated adaptation strategies:
  - Identify strategies currently implemented **(No Regrets)**
  - Identify new strategies that can be easily implemented (time, resources [cost and manpower], frequency) **(Low Regrets)**
  - Identify difficult strategies to “preserve the option” to implement **(Conditional)**
  - Catalog these subset of strategies as implementation recommendations
  - Link the recommended strategies to the CAP’s strategic plan



Central Arizona Project Climate Adaptation Plan

- www.cap-az.com/departments/planning/climate-adaptation-plan

WRRC ANNUAL CONFERENCE 2020

WATER AT THE CROSSROADS: The Next 40 Years

1980 GROUNDWATER MANAGEMENT ACT

Questions?

Patrick Dent

Austin Carey

Angie Lohse

Chris Brooks

Orestes Morfin

Mohammed Mahmoud

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