2018 Colorado River Water Users Association Annual Conference

Central Arizona Project Climate Adaptation

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Climate Change Adaptation Activities

Research Projects

- Improving Predictability in the Colorado River Basin by utilizing winter synoptic patterns with Sea Surface Temperature (SST) states (DRI/CAP, 2013-2015)
- Sensitivity of Reservoir Storage to Hydro-Meteorological variables in the Colorado River Basin (DRI/CAP, 2017-2018)
- Exploring response of the Colorado River Basin to Future Climate using CMIP5 climate data and custom-modified Variable Infiltration Capacity (VIC) model (ASU/CAP, 2018-2019)
- Colorado River Climate and Hydrology Workgroup

Water Storage

Water Banking

Groundwater recharge

Water Augmentation

Weather Modification

Cloud Seeding

Desalination

Feasibility Studies

Water Conservation

Intentionally Created Surplus

Drought Response Actions (Pilot MOU)

Pilot System Conservation

Lake Mead Protection Volumes

Water Supply Focused!

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WUCA

Water Utility Climate Alliance

10 YEARS · 2008-2018

Key messages from WUCA

Warming is here and now. Climate adaptation planning is not just about the future. Water utilities are experiencing the effects of a changing climate on their water resources today.

Know your system and explore its vulnerabilities. Assess your water system to identify vulnerabilities. Risks can only be reduced if they are identified.

Plan for multiple futures. Predicting the future is not feasible but anticipating plausible warmer future climates is. Prepare to face a variety of scenarios.

Capacity building and assessment are part of the adaptation equation. Developing the technical and managerial expertise to identify and assess climate risks to a system is as much a part of adaptation as the steps taken to implement risk reduction measures.

WWW.WUCAONLINE.ORG

Primary Climate Change Impacts to CAP

Climate Effect	Impact on CAP

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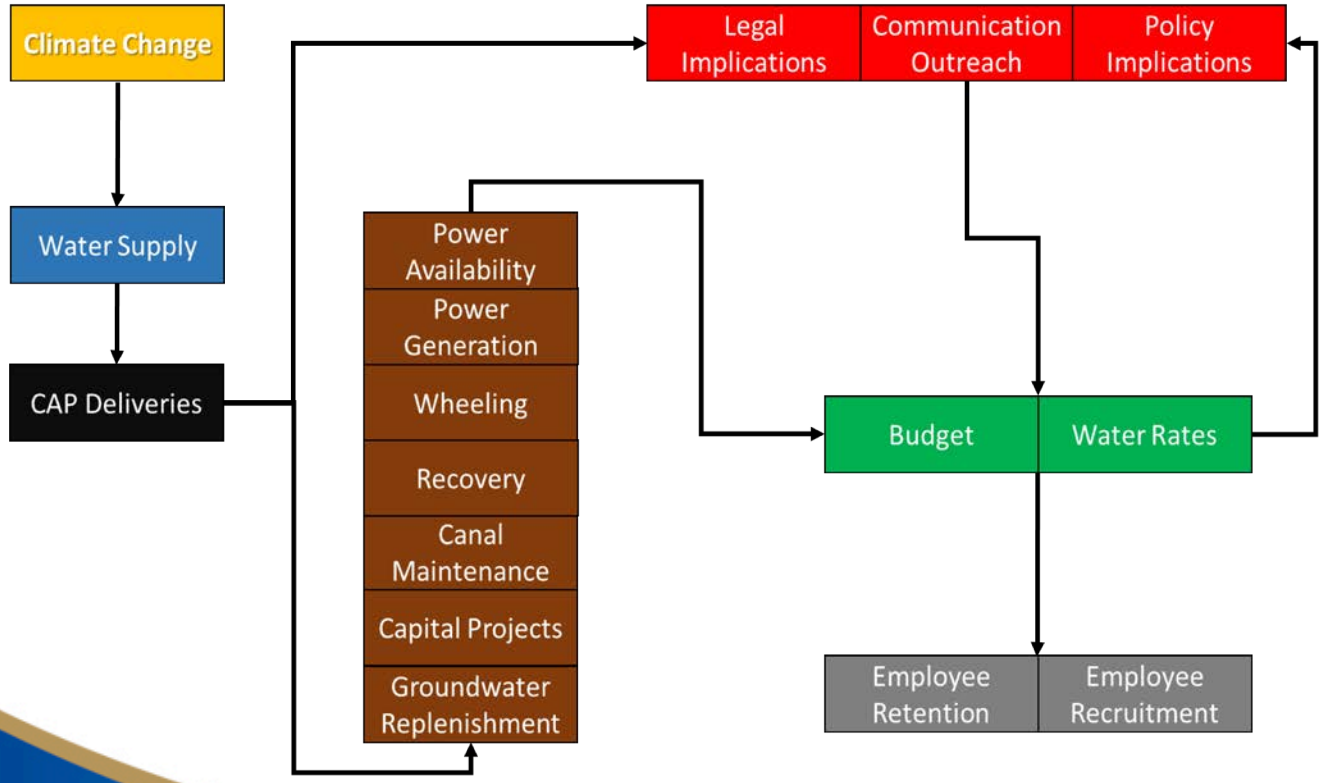
CAP Climate Adaptation Plan

- 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?

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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

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Evaluation of Implications and Strategies

Implications

- **Likelihood of occurrence**: How many scenarios is the implication present in?
- **Severity of implication**: Requires conditional strategies to address
- **Ability to mitigate implication**: How many strategies address this implication?

Strategies

- **Ease of implementation**: Determined by functions involved with the strategy
- **Applicability across scenarios**: Strategy can be applied in how many scenarios?
- **Effectiveness of strategy**: How many implications does this strategy address?

Portfolios

- **No regrets strategies**: easy to implement, applicable across scenarios
- **Low regrets strategies**: generally easy, pre-emptive, risk of underinvestment
- **Conditional strategies**: for specific circumstances, costly, risk of overinvestment

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Adaptation Plan Highlights

- Drivers that generate the most challenges:
  - **Colorado River Supply**
  - **Water Demand Changes**
- Drivers that generate the most opportunities:
  - **Technology**
  - **Interagency coordination/collaboration**
- Implications with the most strategies:
  - **Increased cost to customers – demand driven (13)**
  - **Reduced ability of customers to pay rates (11)**
  - **Collaborative planning environment (11)**
- Strategies that address the most implications:
  - **Find other supplies – augmentation (11)**
  - **Changing staffing resource distribution, functions (10)**
  - **Decrease level of service (9)**
- Adaptation plan provides framework and guideline towards implementation plan for adaptation strategies portfolios