Planning for Water Resilience: Strategic Investment in Green and Traditional Infrastructure

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Salt River Project
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What is SRP?

• One of the nation’s largest public power utilities

• Provide reliable, affordable water and power to more than 3 Million people

• The largest raw-water supplier in the Valley, delivering about 800,000 acre-feet of water annually

• Managing a 13,000 square-mile watershed
SRP – Creating Resiliency from Variability
Planning for Water Resilience: Strategic Investment in Green Infrastructure

Elvy Barton | 2023
Almost 3.5 Million Acres Burned Since 2000

- 1980s: 71,742
- 1990s: 199,628
- 2000s: 1,184,944
- 2010s: 1,323,753
- 2020s: 721,357

Bush Fire (2020) 193,455 Acres
Rodeo-Chediski Fire (2002) 460,561 Acres
Wallow Fire (2011) 538,049 Acres
Woodbury Fire (2019) 123,870
Telegraph Fire (2021) 180,613
Wildfire Consequences

- Community, property and infrastructure damage
  - Power and water infrastructure damage or outages
- Post-wildfire flooding
- Water quality degradation
- Decreased long-term water storage (sedimentation)
- Carbon and air pollution emissions
- Wildlife and habitat loss
- Vegetation, seed bank, and soil loss
SRP Partnerships

Partners

• Federal Agencies
  • Three National Forests – 87,000 acres
• Arizona Tribes
• State Agencies
• County and Cities
• Wildlife Organizations
• Conservation Organizations
• SRP Customers
Watershed Hydrologic Model Overview and Purpose

• Active Forest Management improves hydrologic conditions
• Past research relies on implementing treatments and then monitoring
• New approach taken by SRP - ASU:
  • Estimates hydrologic benefits before treatments begin
  • Hydrologic estimates for water stored in the soil and streamflow
  • Uses various remote sensing technology and proprietary SRP Flowtography® data
Watershed Hydrologic Model Process

• Inputs:
  • Terrain including watershed boundaries, streams, gauges
  • Land cover
  • Soils and soil saturation
  • Hydrometeorological variables including precipitation, temperature, wind, solar radiation, soil moisture, discharge

• Model Testing
  • Compared model runs to SRP Flowtography® images and data

• Model ready to cut trees!
Watershed Hydrologic Model Process Continued

• Modeling tree removal
  • Used Forest Service prescriptions aka “Rules”
  • Used various remote sensing tools to classify trees into groups
• Developed three thinning scenarios
  • Heavy Thinning (HT)
  • Light Thinning (LT)
  • Prescribed Thinning (PT)
Progressively more Ponderosa Pine trees removed from LiDAR

Number of trees

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<th>Baseline (B)</th>
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<th>Heavy Thinning (HT)</th>
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Watershed Hydrologic Model Results

- More thinning = increases in water stored in soils and streamflow
- Creates a one-time immediate hydrologic response
- Model results based on the Prescribed Thinning Scenario:
  - Middle Sycamore 2: 80.3 acre-feet
  - Middle Sycamore 3: 137.1 acre-feet
  - Middle Sycamore 4: 19.3 acre-feet
- Largest contributor is Middle Sycamore 3 due to large area and higher thinning
- 59% of the benefit is water stored in the soil
- Final Result: thinning 3,467 acres creates a 236.7 acre-feet hydrologic response in the Sycamore area
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**Project 1:** Roosevelt Flood Control Space Operational Flexibility Project

**Project 2:** Bartlett Dam Modification Project

**Project 3:** SRP→CAP Interconnection Facility Project

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**Legend**
- Triangle: Recharge Facility
- River
- Canal
- Lake
- SRVWUA
Reservoir Inflows – 2023 Winter Runoff Season

Jan - May Reservoir Inflows:

Total SRP reservoir inflow:
- 2023: 1,800,000 AF (~400% of median)
- 2022: 217,000 AF (~55% of median)

Peak March 22 Storm Inflows:
- Salt River - 29,000 cfs (highest since 2010)
- Tonto Creek - 26,000 cfs (highest since 2010)
- Verde River – 68,000 cfs (highest since 1995)
- March Runoff – 877,000 AF (3rd highest on record)
Roosevelt FCS
Operational Flexibility
Project
Salt River Water Yield with Improved Flood Ops (climate adjusted)

- Salt Storage (SRP+NCS)
- FCS Credits
- Salt Spill


Bartlett Dam Modification Project
Verde River Water Yield with Modified Bartlett Dam (climate adjusted)
SRP-CAP
Interconnection Facility (SCIF) Project
SRP-CAP Interconnection Facility (SCIF) Background

Jointly funded project to move non-project water stored in SRP reservoirs and underground storage facilities through the CAP canal.
Proposed SRP-CAP Interconnection Facility (SCIF)

Connecting Regional Water Systems
Questions