

An aerial photograph of a large dam and reservoir situated in a deep, rugged canyon. The canyon walls are composed of layered, reddish-brown rock. The reservoir is a deep blue color, and the dam is a long, curved structure across the middle of the canyon. The sky is a clear, pale blue.

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

Elvy Barton, Manager, Water & Forest Sustainability

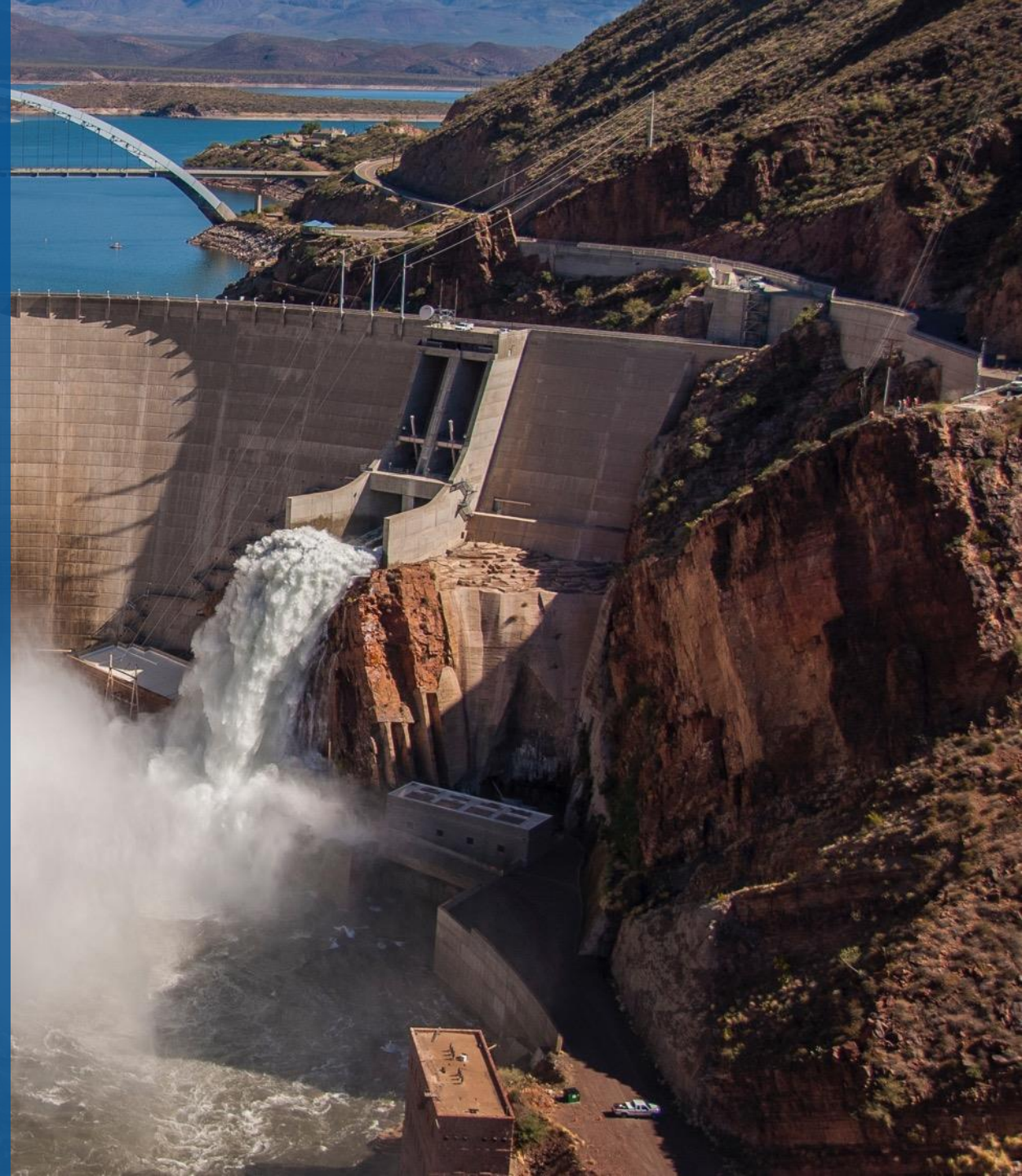
Ron Klawitter, Manager, Water System Projects

Salt River Project

September 11, 2023

What is SRP?

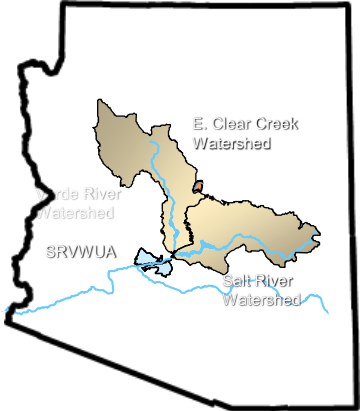
- One of the nation's largest public power utilities
- Provide reliable, affordable water and power to more than **3 Million** people
- The largest raw-water supplier in the Valley, delivering about **800,000** acre-feet of water annually
- Managing a **13,000** square-mile watershed



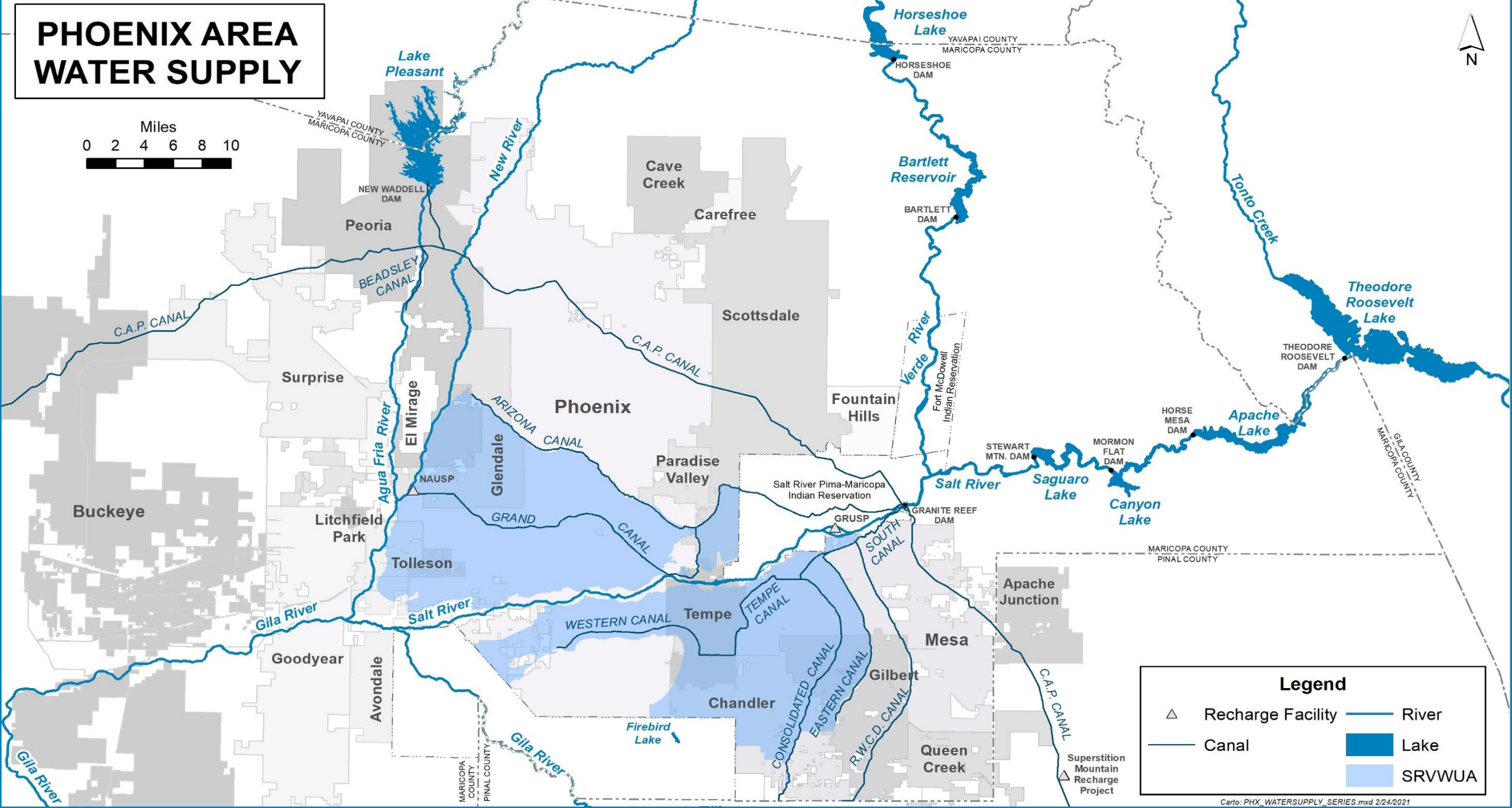
SRP Watersheds



KEY MAP



PHOENIX AREA WATER SUPPLY



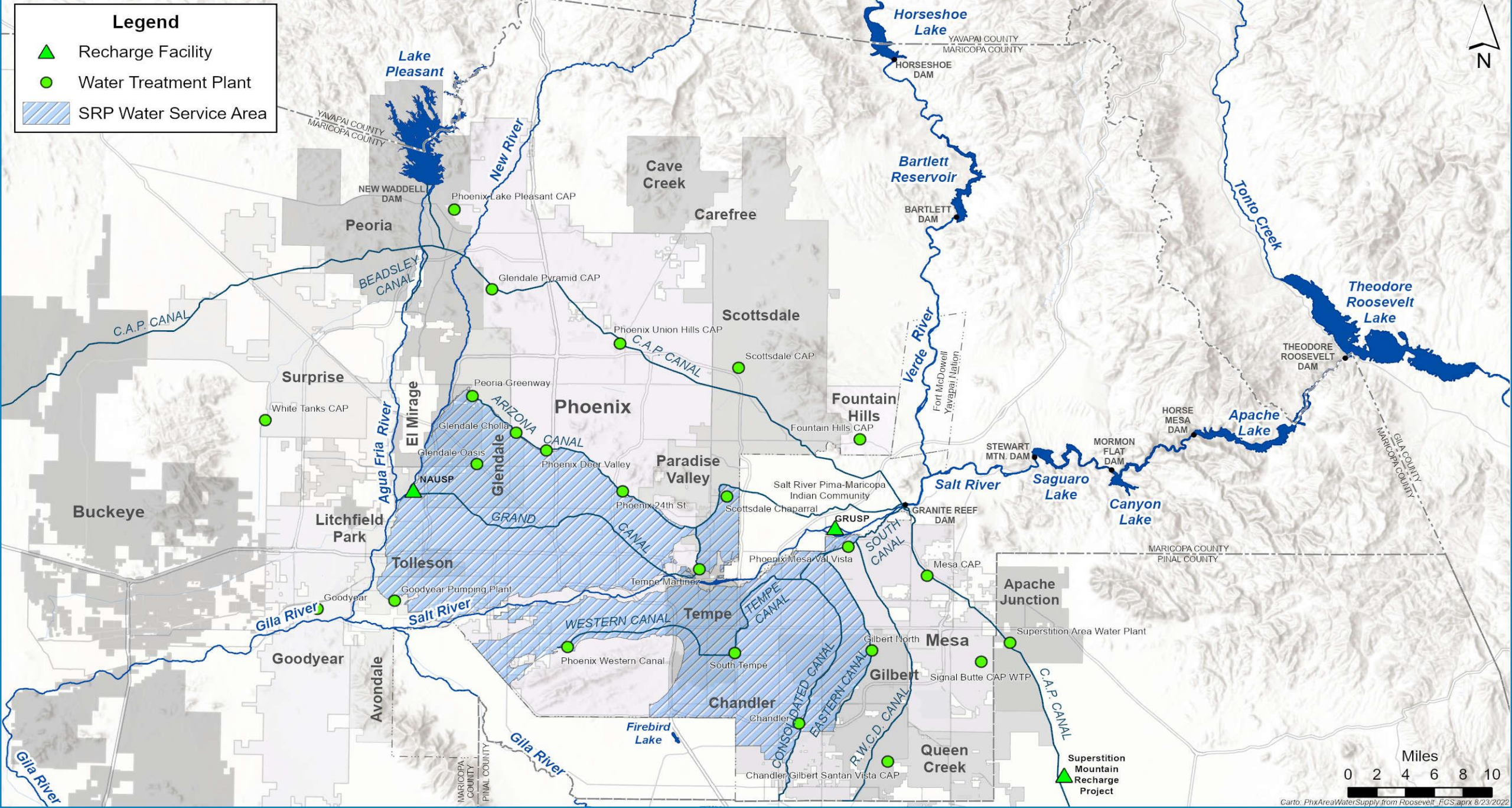
Legend

- △ Recharge Facility
- Canal
- River
- Lake
- SRVWUA

Carto: PHX_WATERSUPPLY_SERIES.mxd 2/24/2021

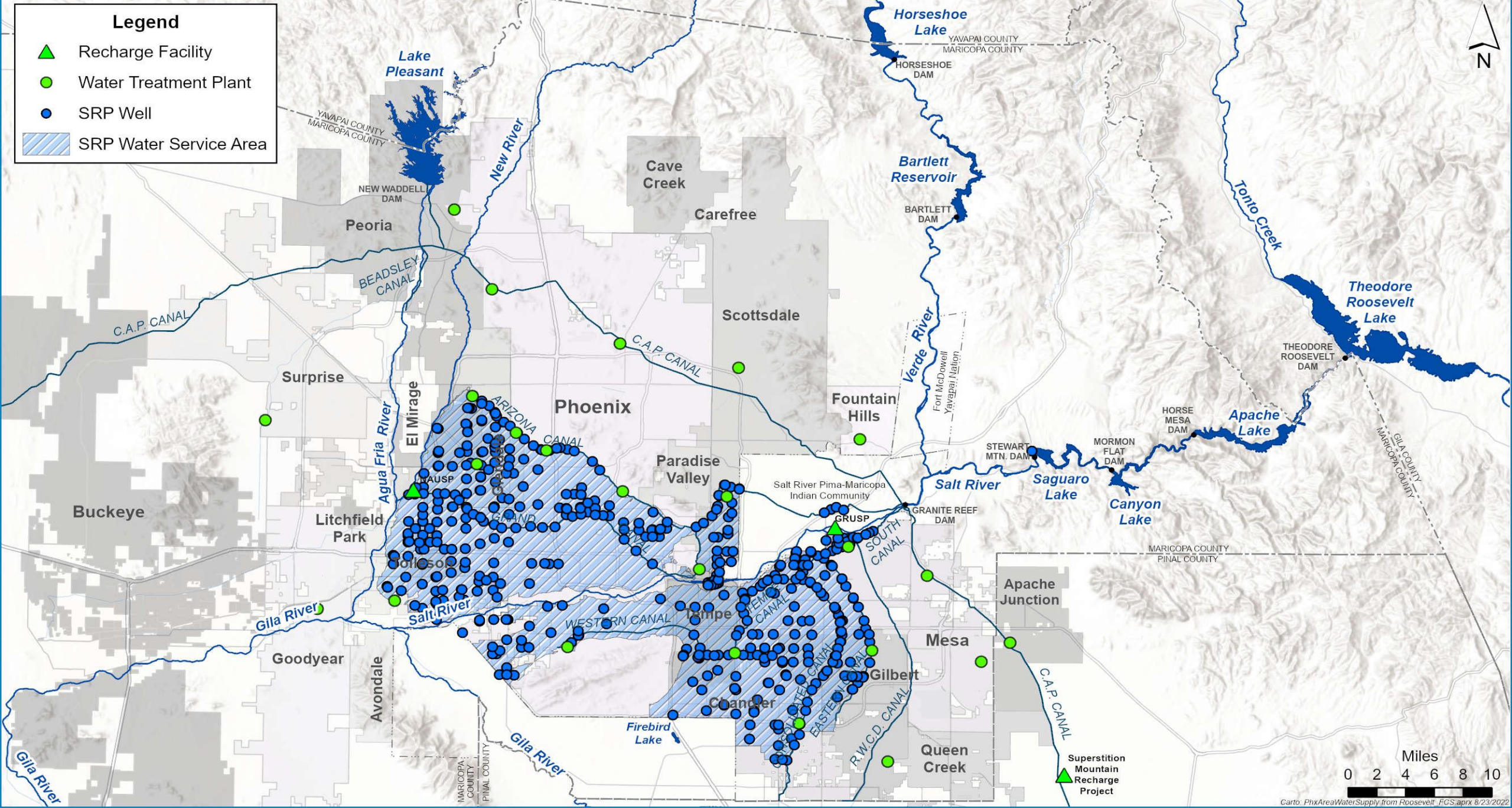
Legend

- ▲ Recharge Facility
- Water Treatment Plant
- SRP Water Service Area

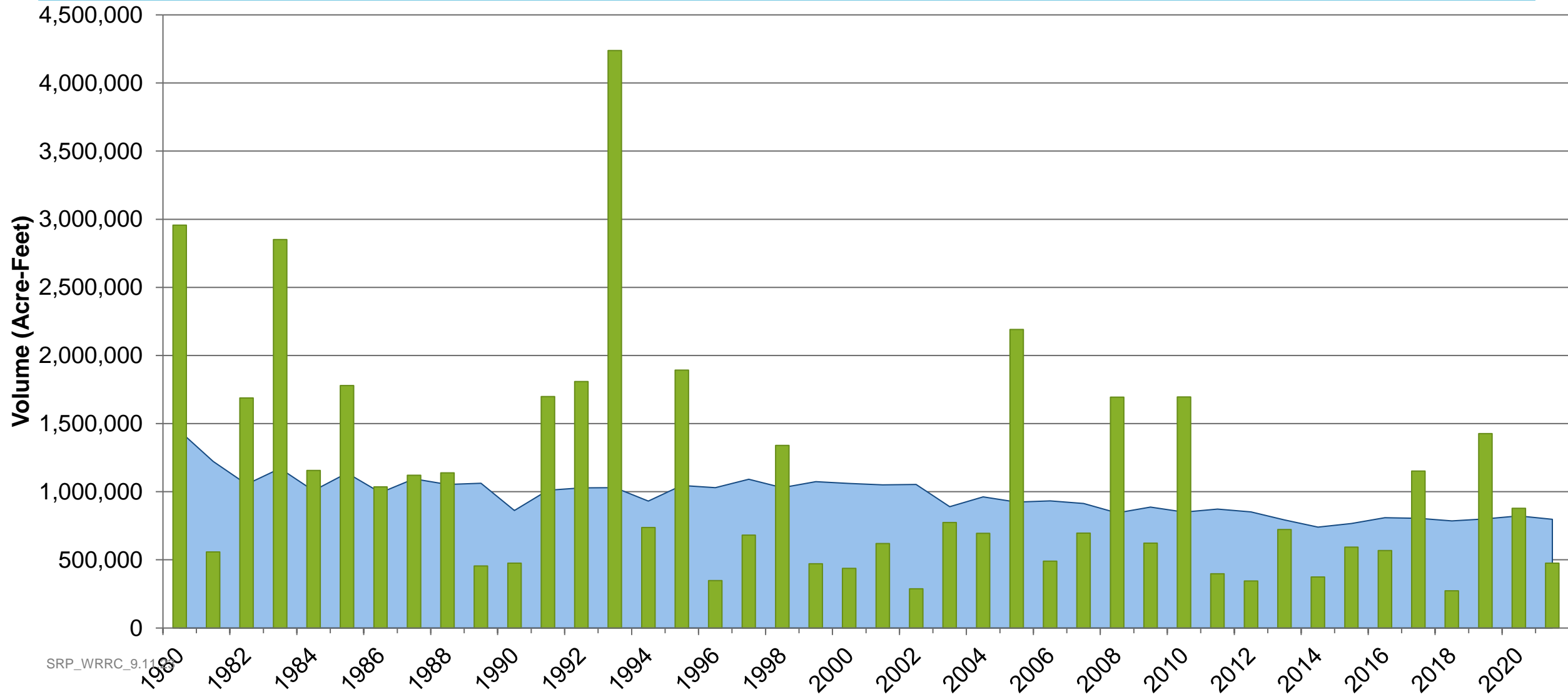


Legend

-  Recharge Facility
-  Water Treatment Plant
-  SRP Well
-  SRP Water Service Area



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



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

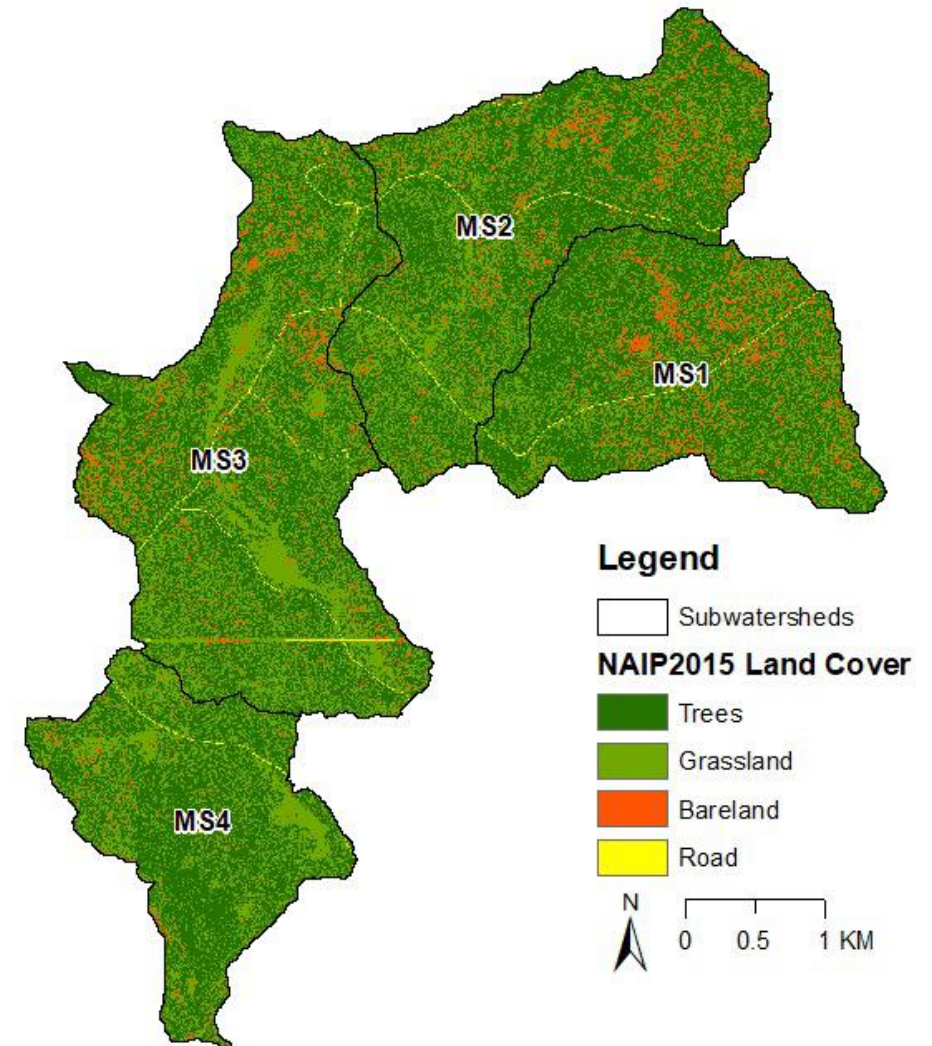
- Active Forest Management improves hydrologic conditions
- Past research relies on implementing treatments and then monitoring
- New approach taken by SRP - ASU:
 - Estimates hydrologic benefits before treatments begin
 - Hydrologic estimates for water stored in the soil and streamflow
 - Uses various 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 Flowtopography® images and data
- Model ready to cut trees!

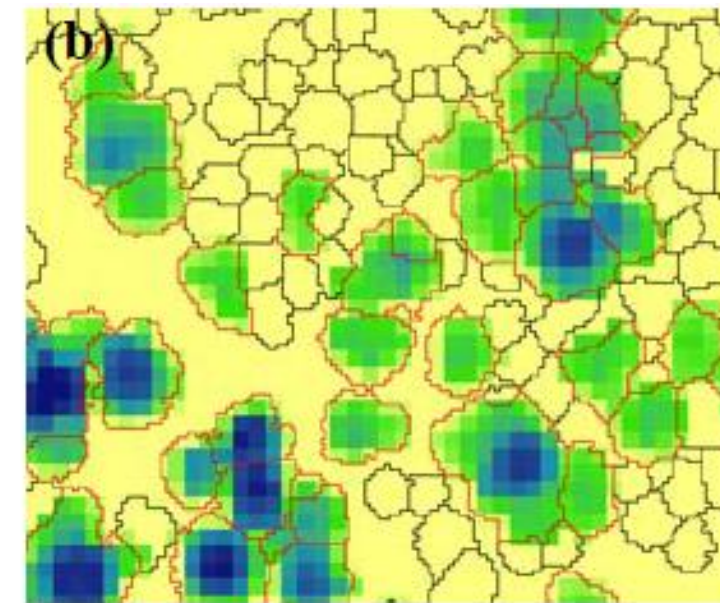
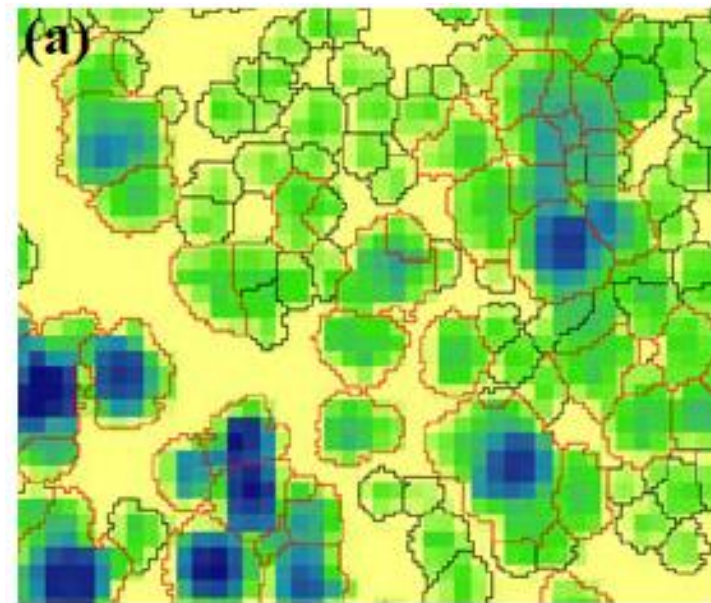
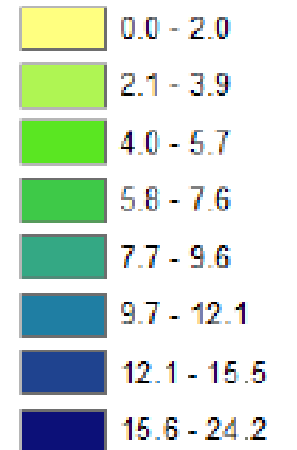
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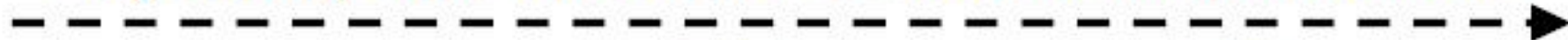
Watershed Hydrologic Model Process Continued

- 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)

Tree height (m)



Progressively more Ponderosa Pine trees removed from LiDAR



Number of trees

100,456

MS3

MS4

61,506

Baseline (B)

57,585

50,820

**Prescribed
Thinning (PT)**

45,888

34,624

**Light
Thinning (LT)**

24,658

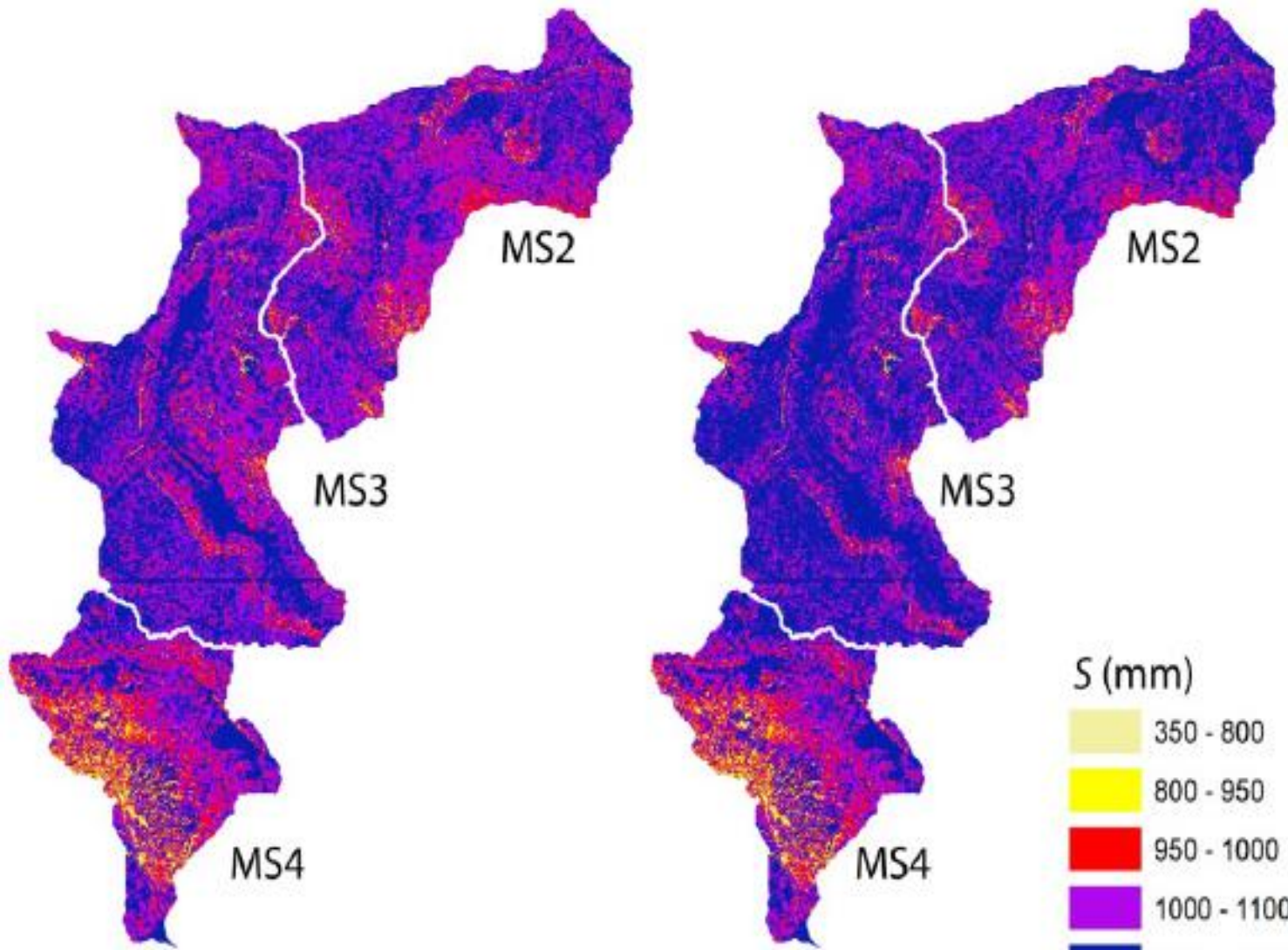
25,696

**Heavy
Thinning (HT)**

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





Baseline (B)

**Prescribed
Thinning (PT)**

An aerial photograph of a large concrete dam situated in a deep, rugged canyon. The canyon walls are composed of layered, reddish-brown rock. A river flows through the canyon, curving around the base of the dam. The sky is a clear, pale blue. The overall scene is bathed in the warm, golden light of late afternoon or early morning.

Planning for Water Resilience: Strategic Investment in Traditional Infrastructure

Ron Klawitter | 2023

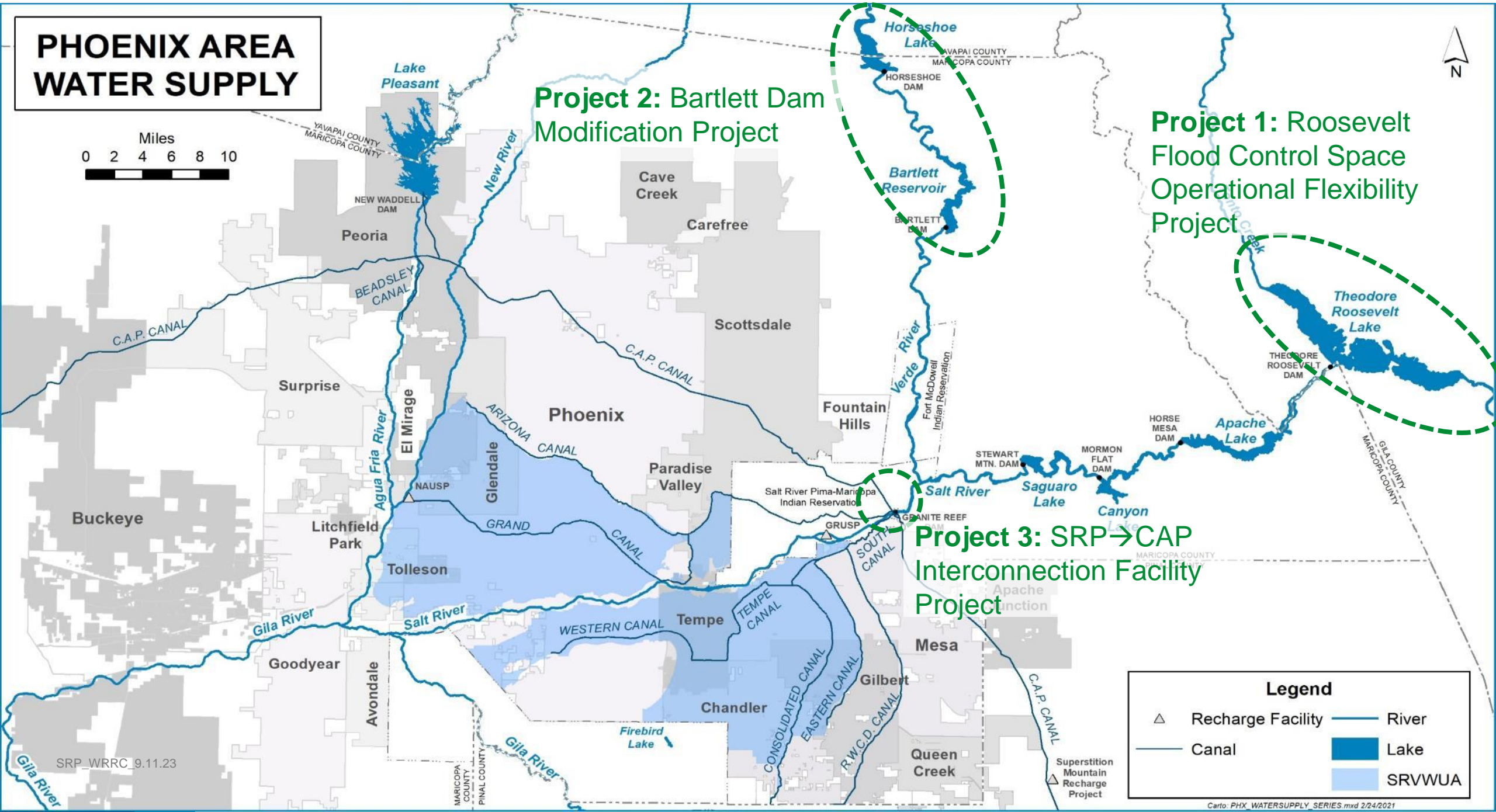
PHOENIX AREA WATER SUPPLY



Project 2: Bartlett Dam Modification Project

Project 1: Roosevelt Flood Control Space Operational Flexibility Project

Project 3: SRP → CAP Interconnection Facility Project



Reservoir Inflows – 2023 Winter Runoff Season

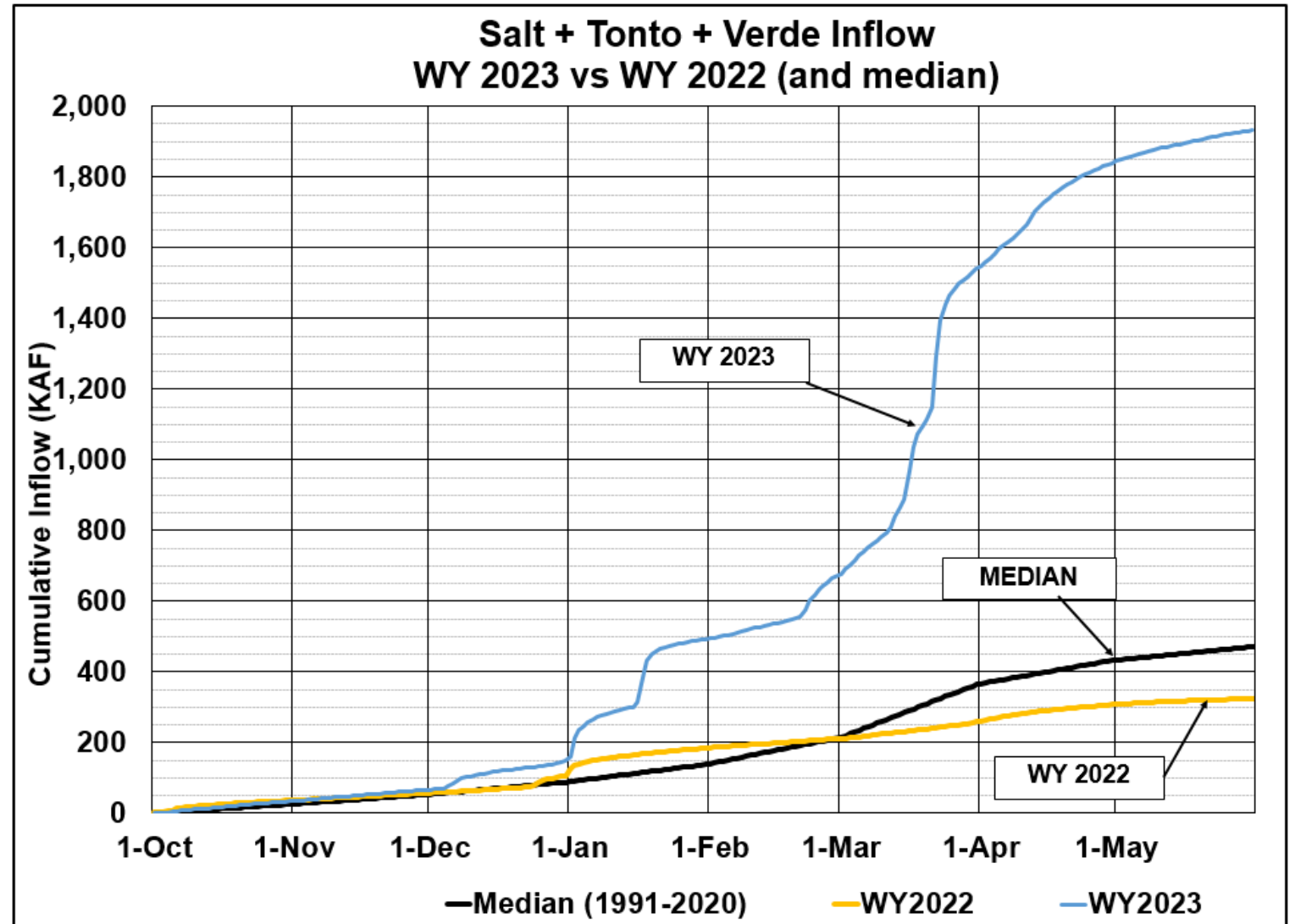
Jan - May Reservoir Inflows:

Total SRP reservoir inflow:

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

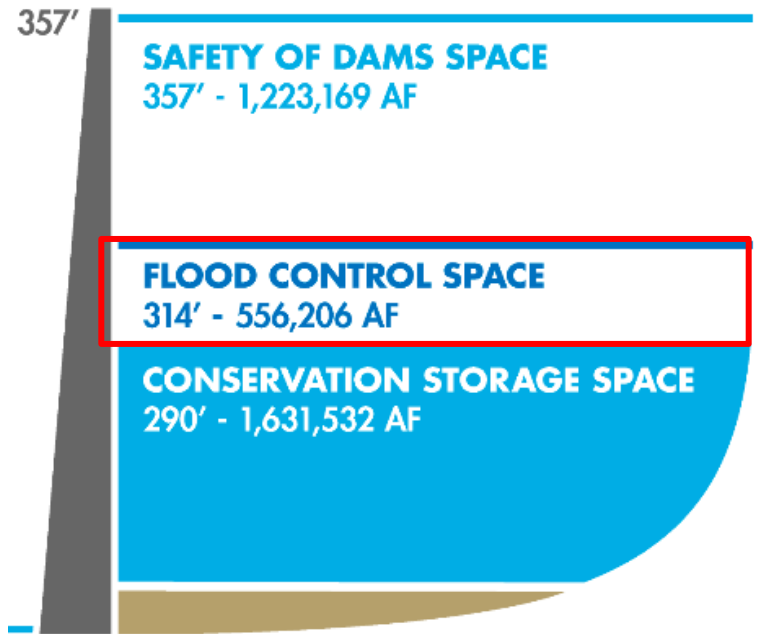
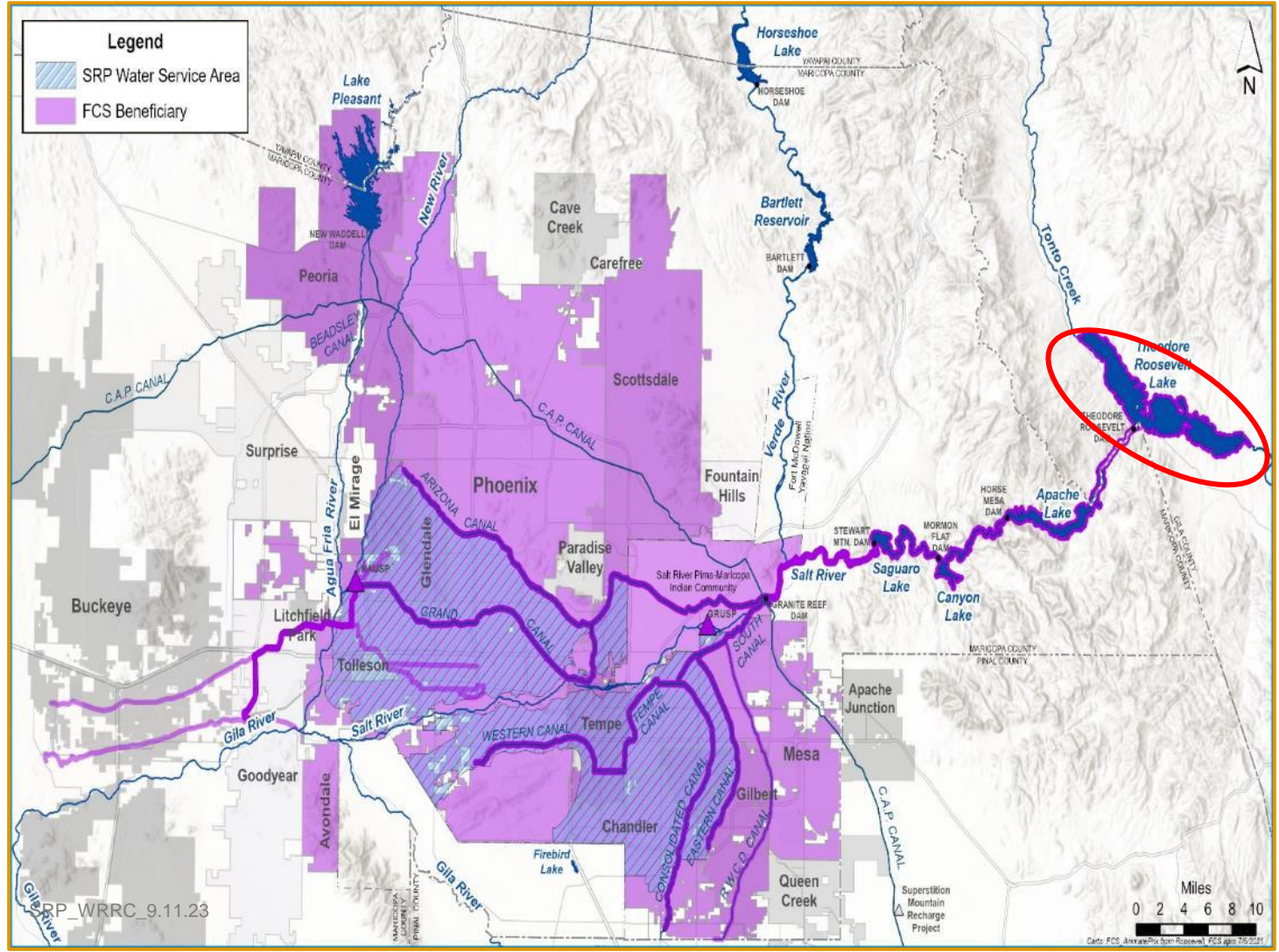
Peak March 22 Storm Inflows:

- 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)



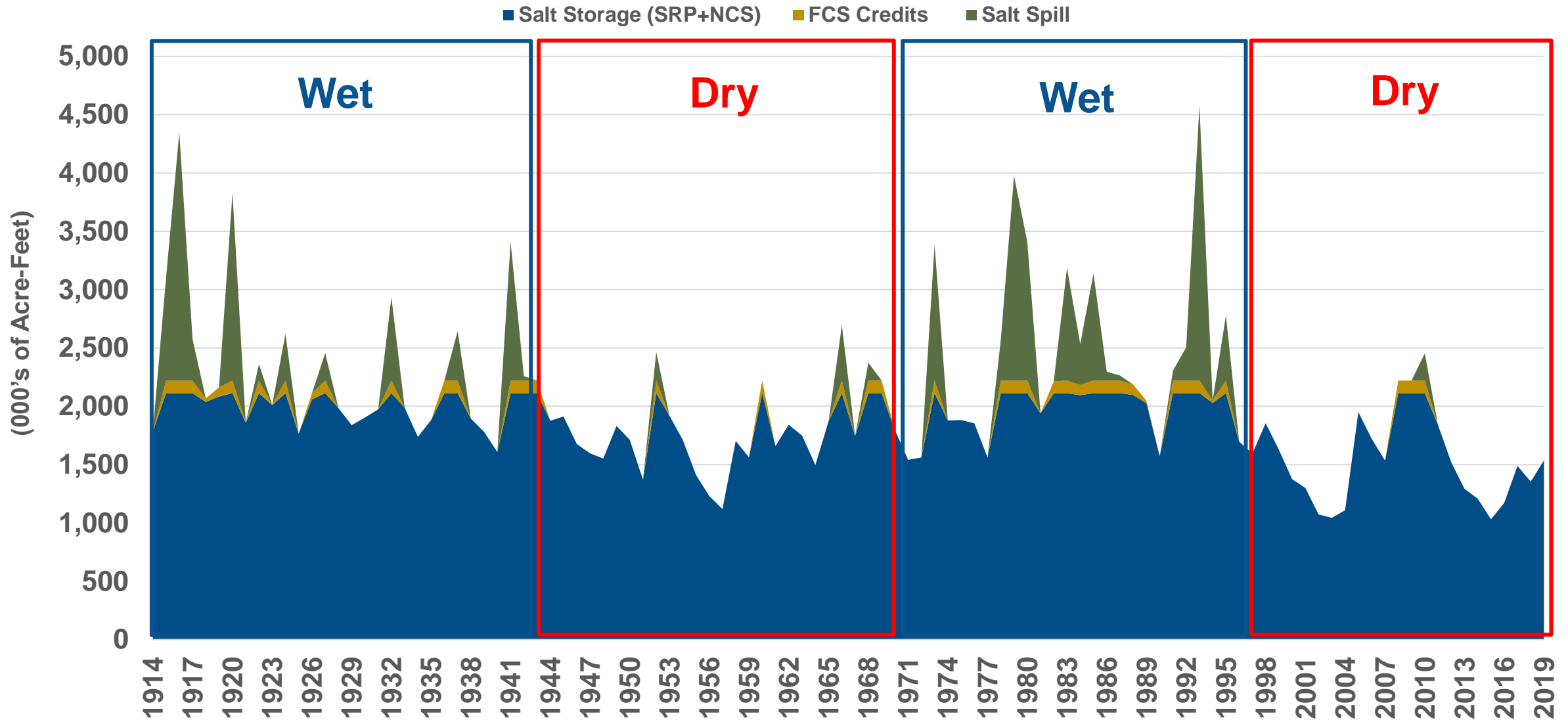
Roosevelt FCS Operational Flexibility Project

Roosevelt Flood Control Space Operational Flexibility Project



ROOSEVELT DAM

Salt River Water Yield with Improved Flood Ops (climate adjusted)



Bartlett Dam Modification Project

Bartlett Dam Modification Feasibility Study Partners

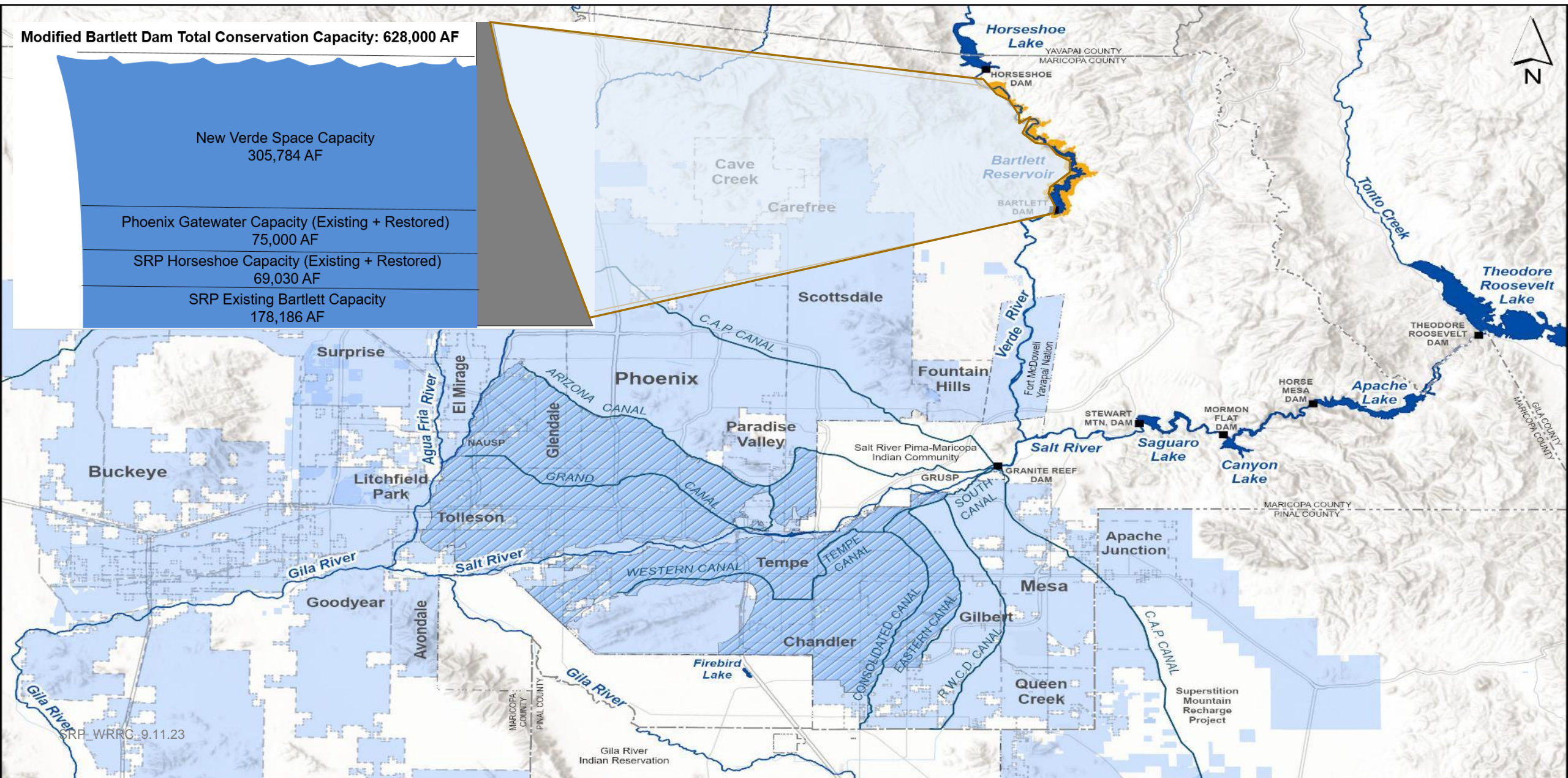
Modified Bartlett Dam Total Conservation Capacity: 628,000 AF

New Verde Space Capacity
305,784 AF

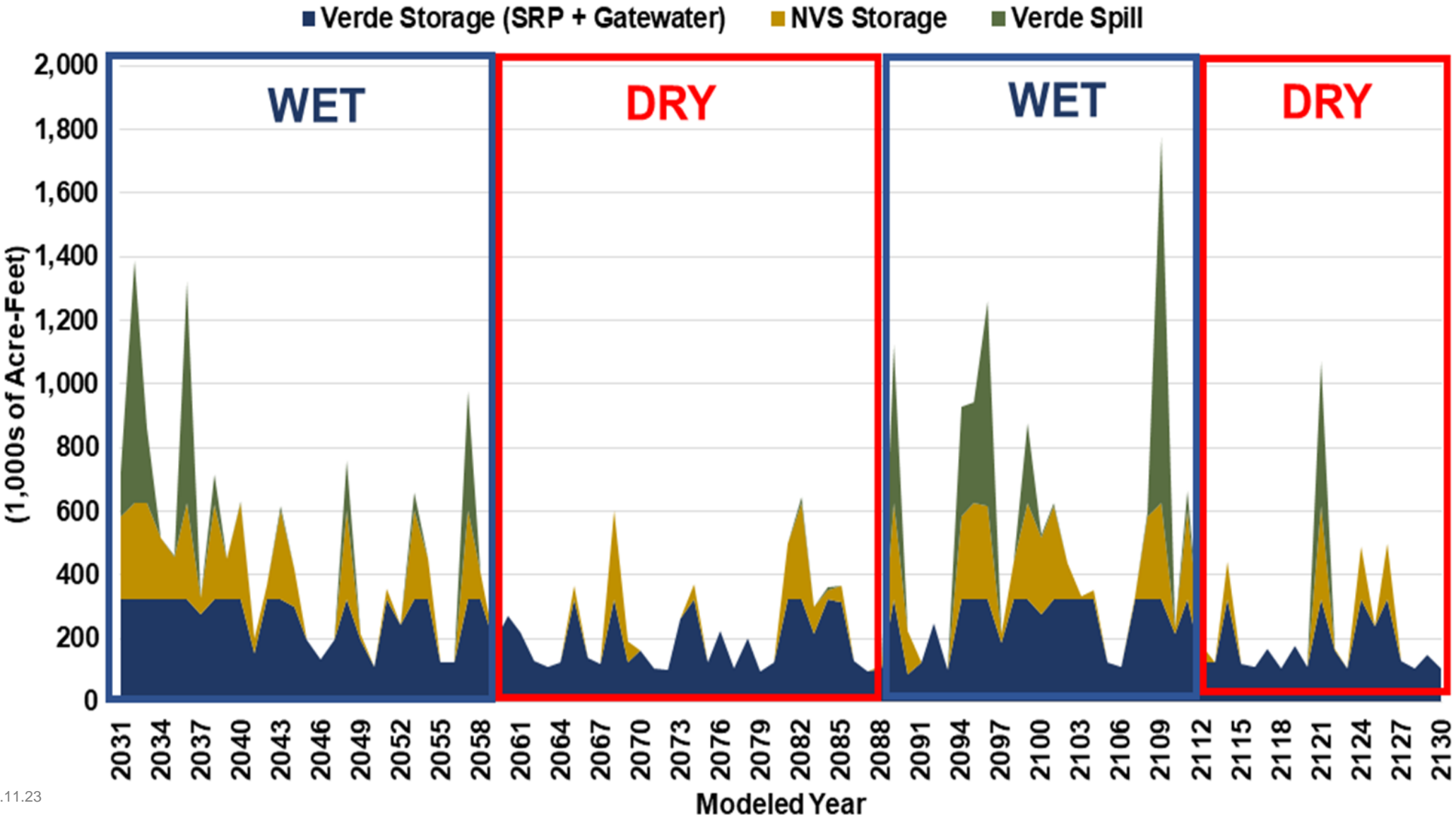
Phoenix Gateway Capacity (Existing + Restored)
75,000 AF

SRP Horseshoe Capacity (Existing + Restored)
69,030 AF

SRP Existing Bartlett Capacity
178,186 AF

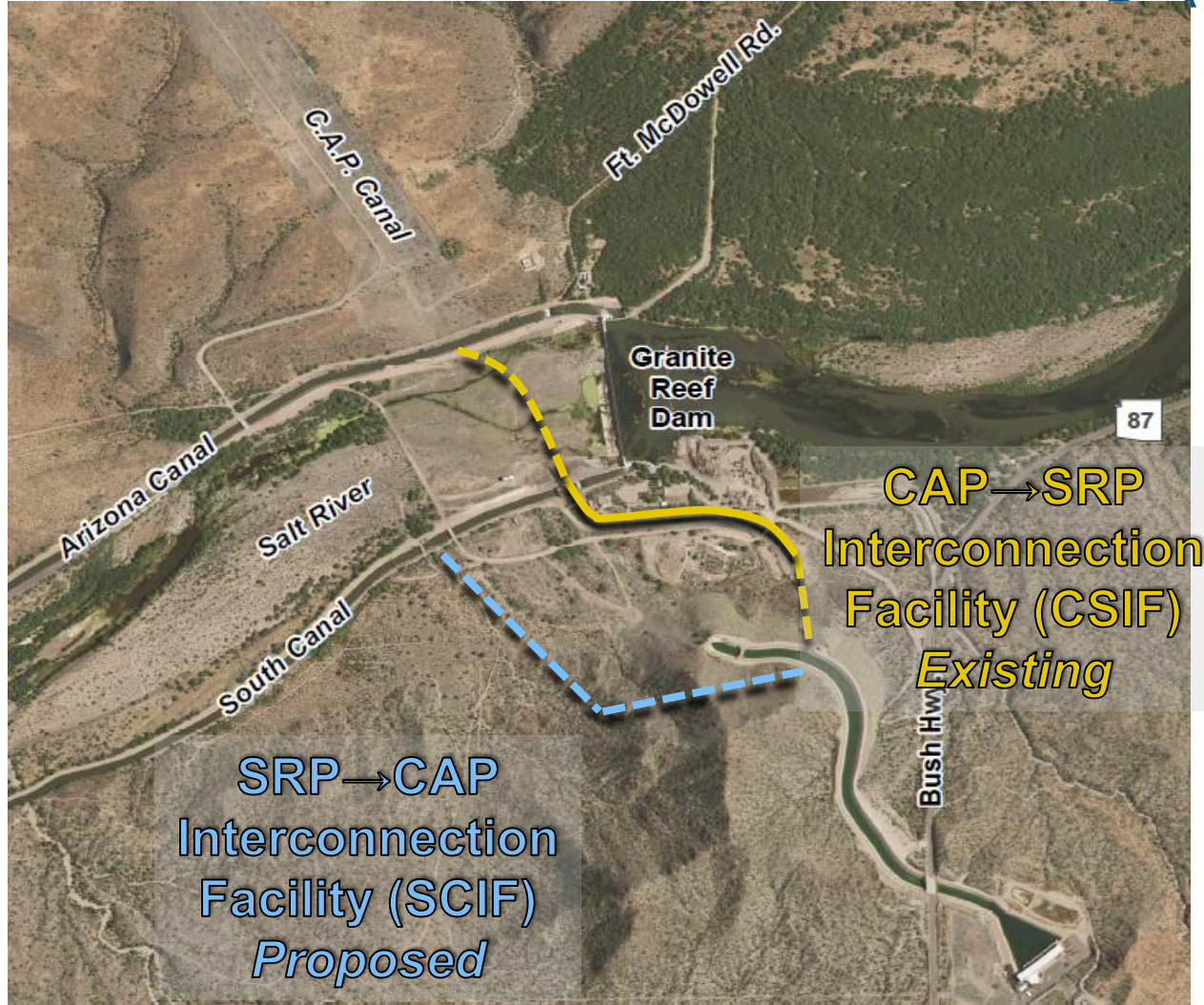


Verde River Water Yield with Modified Bartlett Dam (climate adjusted)



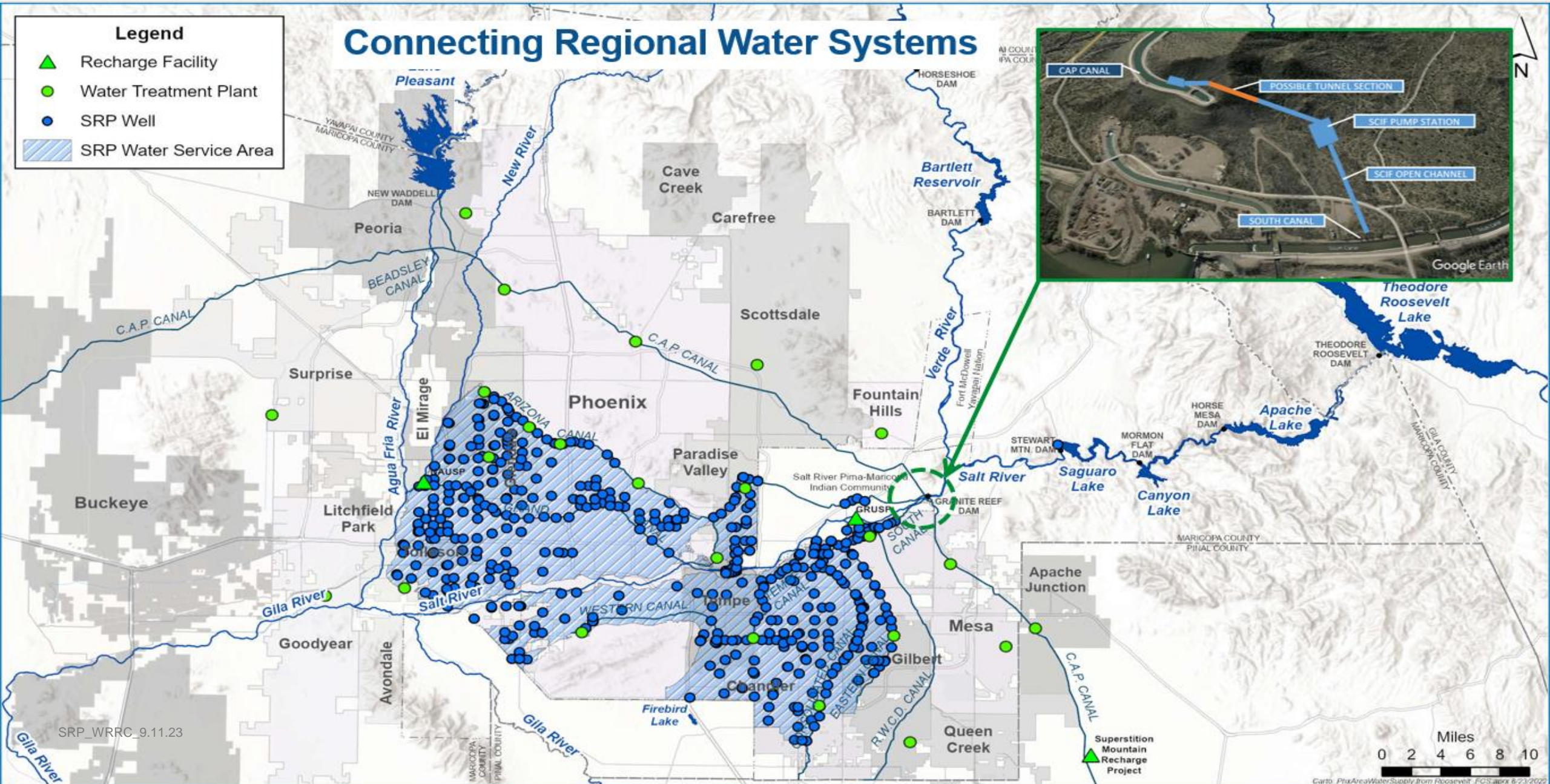
**SRP-CAP
Interconnection Facility
(SCIF) Project**

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)



Questions