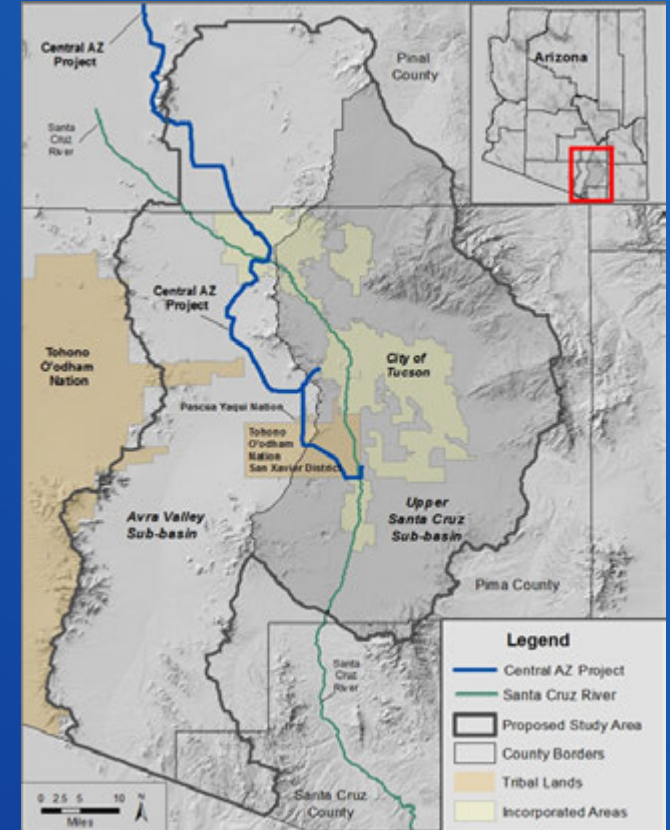


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Managing Water in the West

**Water Supply/Demand
Imbalance in the Face of
Climate Change:
How will we prepare?**

*An Overview of the
Lower Santa Cruz River
Basin Study*



U.S. Department of the Interior
Bureau of Reclamation

Presentation Outline

- **Background: Bureau of Reclamation**
 - Organization and Mission
 - Climate Change and Basin Study Program
- **Lower Santa Cruz River Basin Study**
 - Elements and Partners
 - Spatial Imbalances of Water Resources
 - How to Get Involved

The Bureau of Reclamation operates in 17 Western States and is divided into regions



Lower Colorado Region

Reclamation's Regions are defined by River Basins

RECLAMATION



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Central AZ Project



Conservation



Recharge



Water Treatment



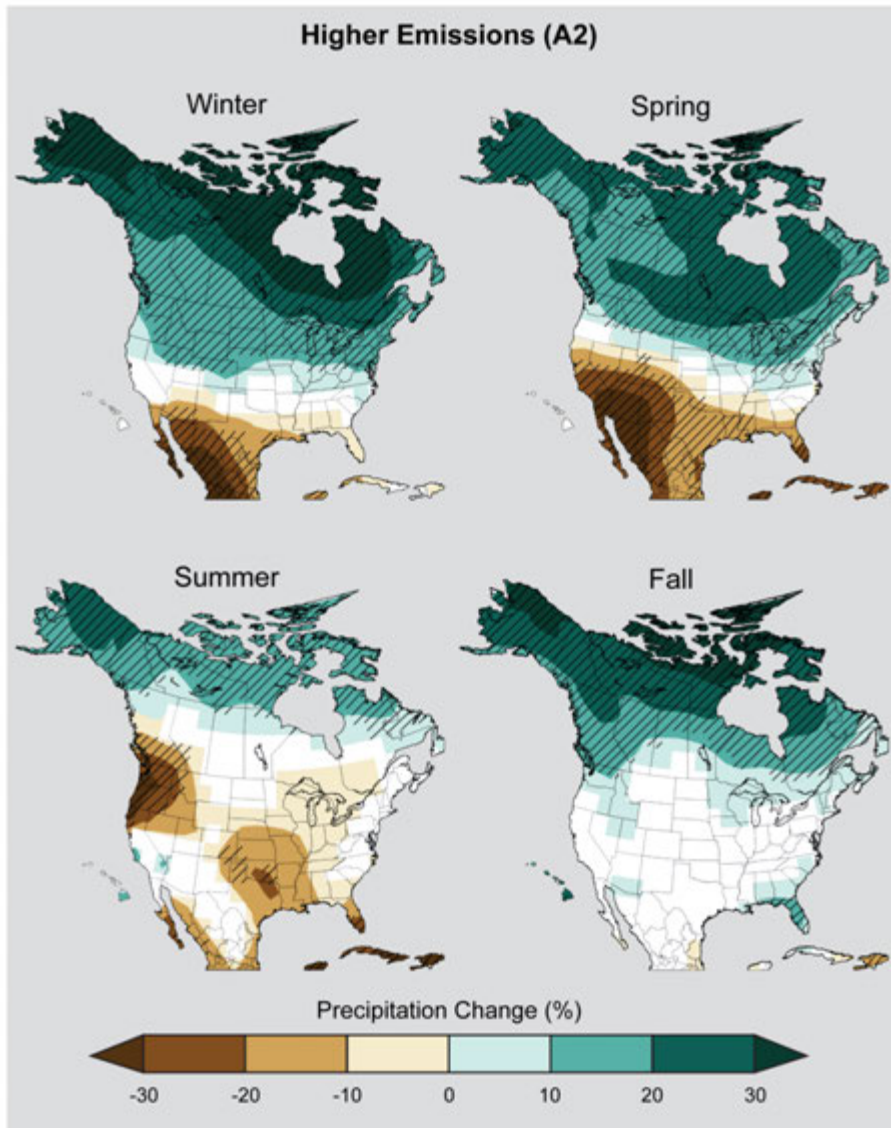
Wetlands



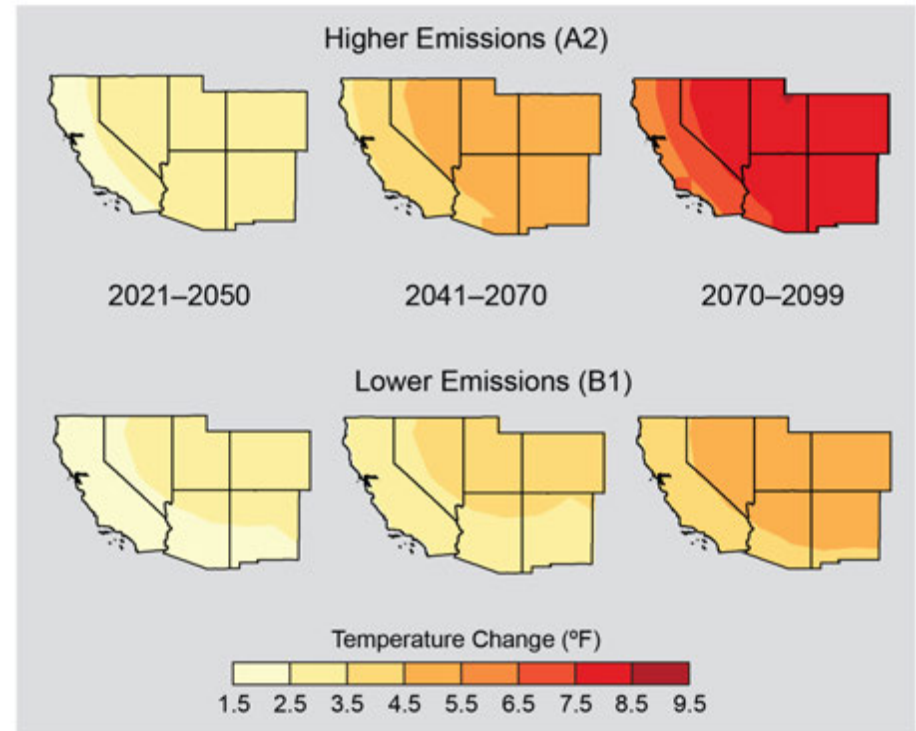
Irrigation Efficiency

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Projected Precipitation Change by Season



Projected Temperature Increases



Adapted from: Regional Climate Trends and Scenarios for the U.S. National Climate Assessment: Part 5. Climate of the Midwest U.S. NOAA Technical Report NESDIS 142-5

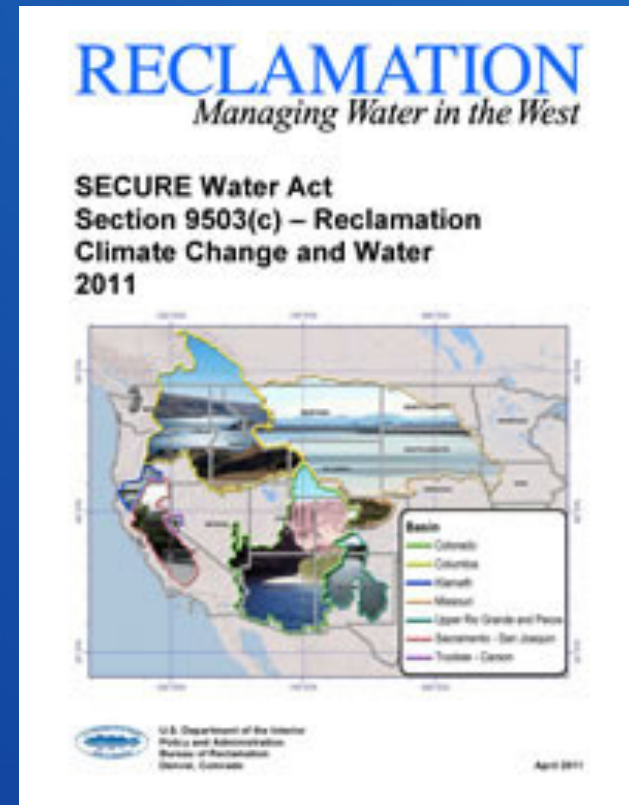
In general, our local climate is expected to become hotter, with drier winters and springs

Kenneth Kunkel, Cooperative Institute for Climate and Satellites – NC World Climate Research Programme's (WCRP's) Coupled Model Intercomparison Project phase 3 (CMIP3) multi-model dataset

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Reclamation and Climate Change

- **SECURE Water Act Section 9503** directs the Secretary to establish a climate change adaptation program which includes
 - *Assess risks* to water supply
 - *Analyze the impacts* of changes in water supply on a variety of demands
 - *Develop mitigation strategies* in consultation with non-Federal participants



Basin Study Program

- *Basin Studies*
- Landscape Conservation Cooperatives
- West-Wide Climate Risk Assessments

Drought
Response
Program

Reclamation WaterSMART Program

Water and
Energy
Efficiency
Grants (WEEG)

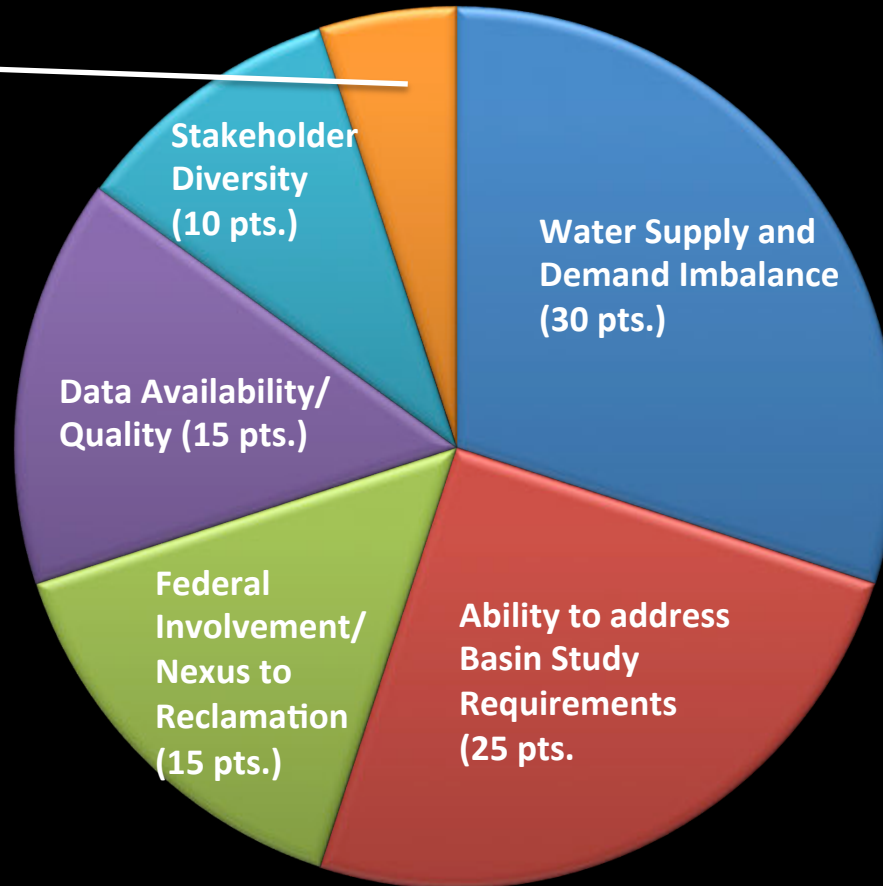
Cooperative
Watershed
Management
Program

Title XVI

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Basin Study Evaluation Criteria

Inclusion of
integrated
watershed
planning and
management
(5 pts.)

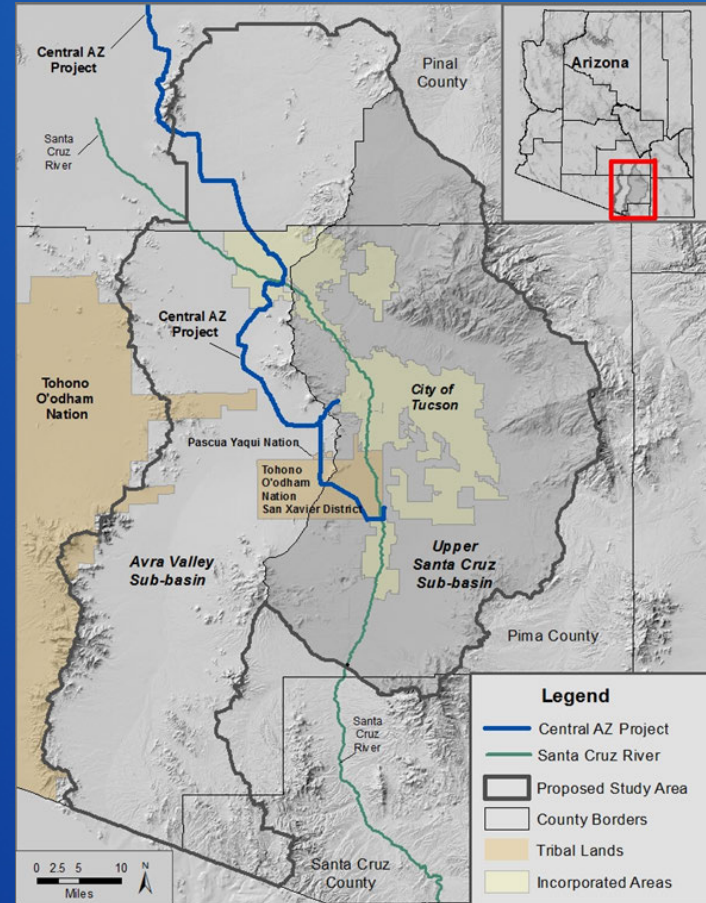


Funded Basin Studies



LSCR Basin Study Overarching Goal:

- 1) Identify where physical water resources are needed to mitigate supply-demand imbalances due to climate change and other factors
- 2) Develop a strategy to improve water reliability for the following sectors:
 - municipal
 - industrial
 - agricultural
 - cultural
 - environmental



LSCR Basin Study Elements

Three year, \$785,750 collaboration between Reclamation and partners to:

- Project future supply/demand imbalances (due to climate change and other factors)
- Evaluate risks to infrastructure and other systems
- Develop and investigate adaptation strategies (structural and non-structural)
- Perform trade-off analysis of strategies

Cost-Share Partners: Southern AZ Water Users' Association (SAWUA):



- Avra Water Co-op, Inc.



- BKW Farms



- Community Water Company of Green Valley



- Farmers Investment Company



- Flowing Wells Irrigation District



- GV Water Improvement District



- Kai Farms



- Marana Water



- Metro Water District



- Oro Valley Water Utility



- Pima County Regional Wastewater Reclamation Dept.



- Red Rock Utilities



- Sahuarita Water Company



- Sahuarita Wastewater Utility



- Tucson Water Department

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Cost Share Partners



The University of
Arizona



Arizona
Department of
Water Resources



Central Arizona
Water
Conservation
District



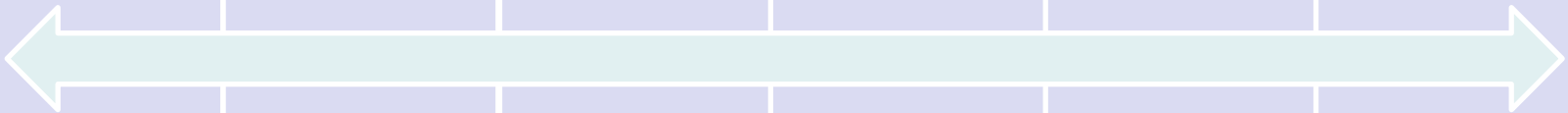
Cortaro-Marana
Irrigation District
Cortaro Water
Users
Association



Southern Arizona
Water Users
Association



Pima Association
of Governments



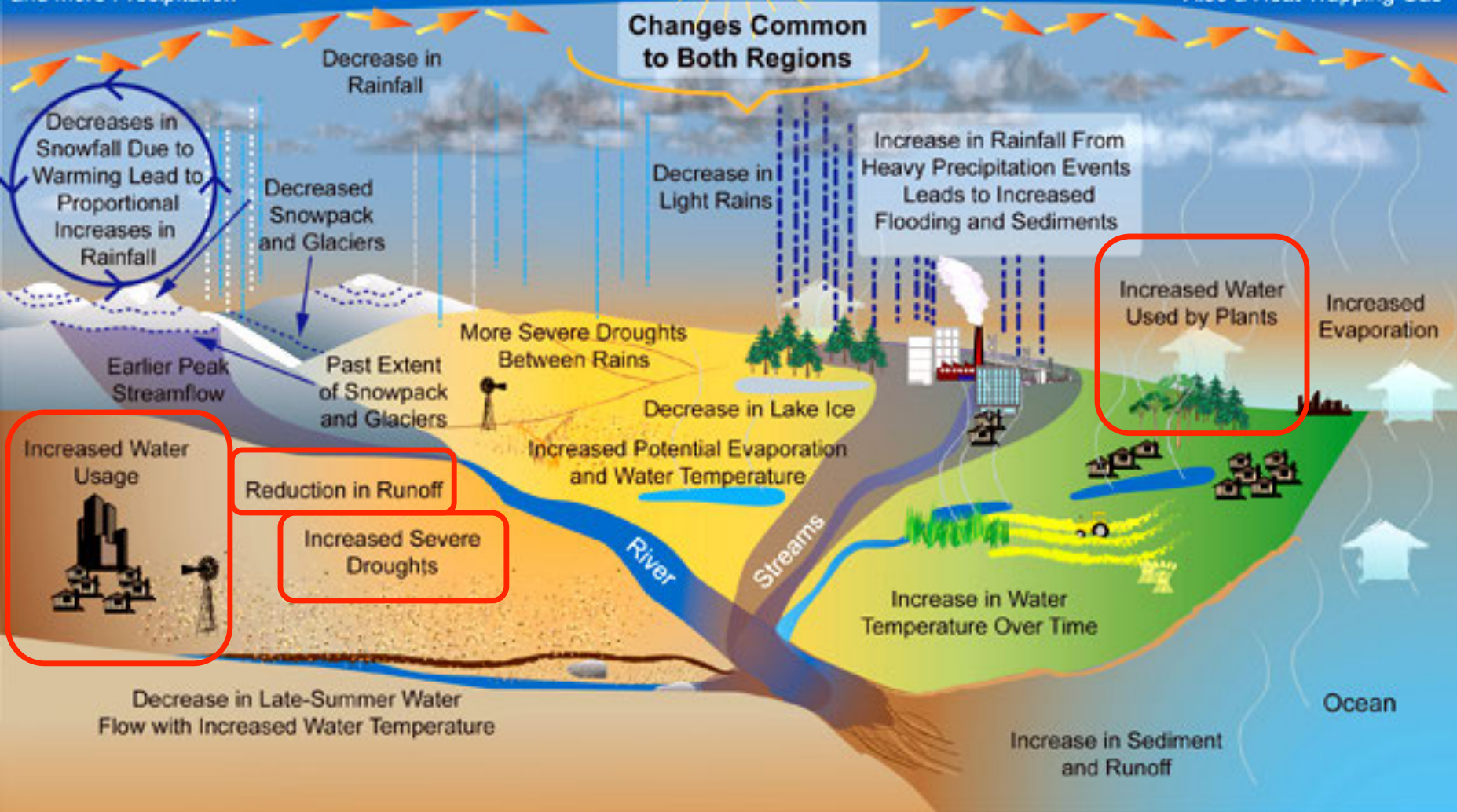
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Hotter/Drier Conditions (Interior West)

Hotter/Wetter Conditions (NE and Coasts)

Heat Trapped by the Atmosphere Causes More Evaporation and More Precipitation

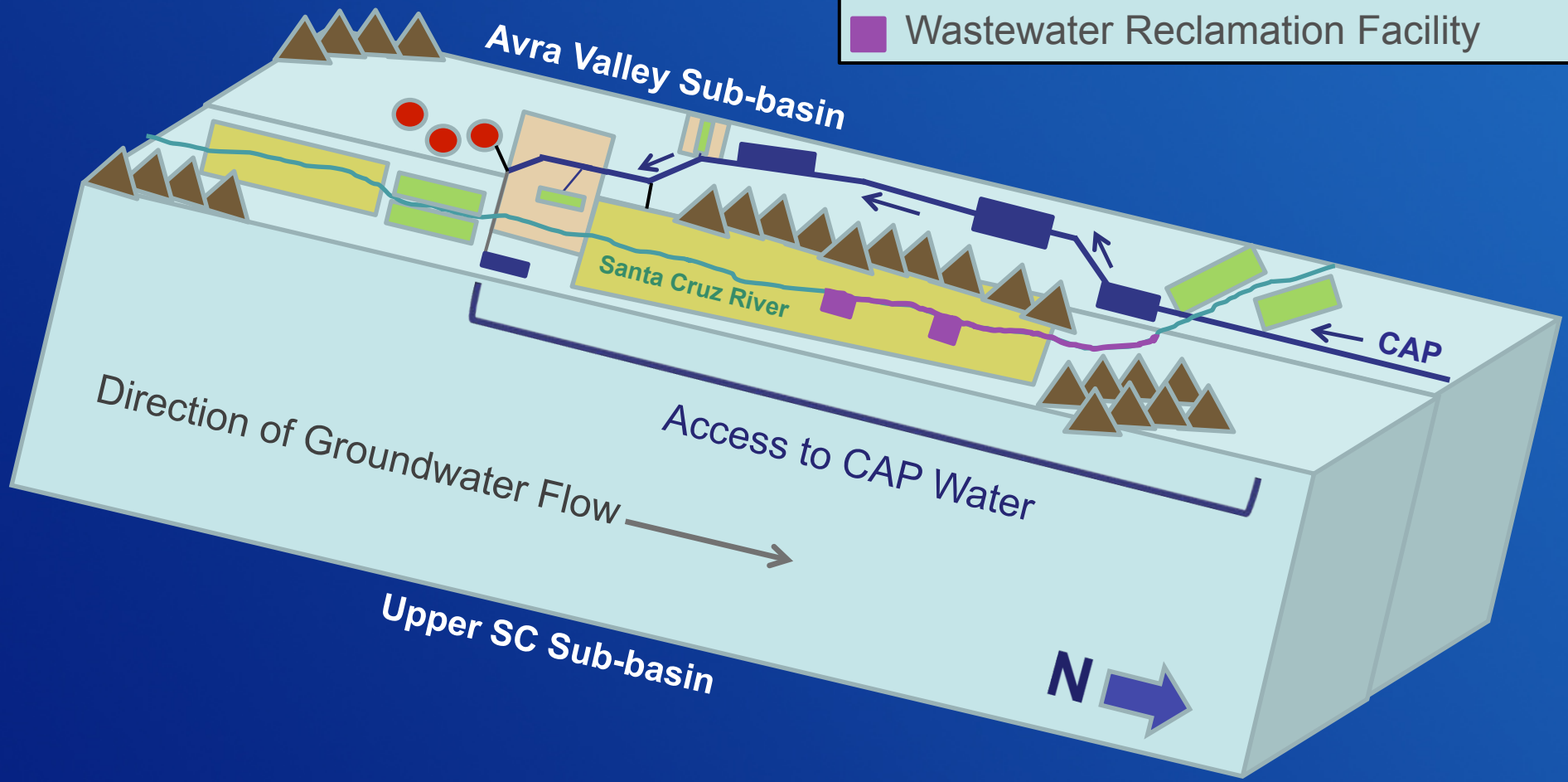
A Warmer Atmosphere Holds More Water Vapor, Which is Also a Heat Trapping Gas



Source: U.S. Global Change Impacts in the U.S., 2009 Report, <https://nca2009.globalchange.gov/index.html>

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- CAP Canal or Recharge Facility
- Agriculture
- Tribal Land
- Municipal Use
- Mining
- Wastewater Reclamation Facility



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Inflows

Mountain Front Recharge

Stream Infiltration

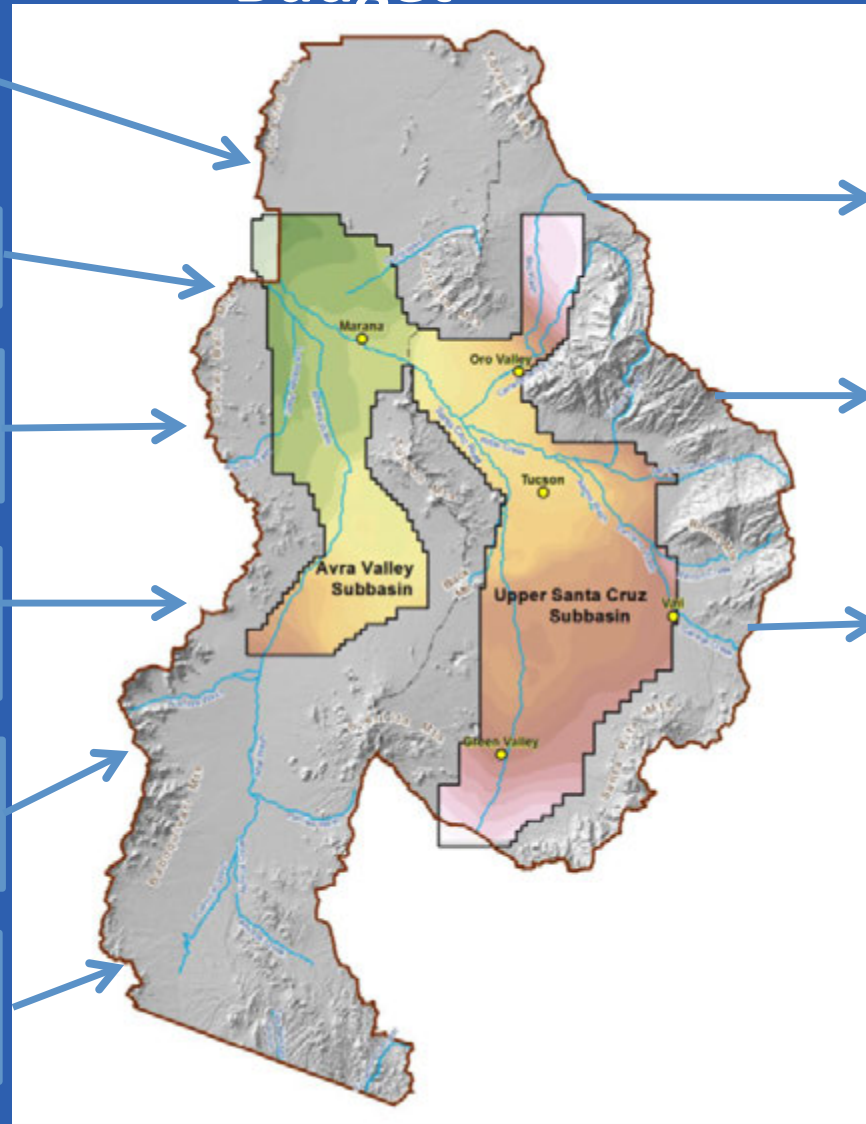
Artificial Recharge
(CAP and effluent)

Agricultural Recharge

Underflow from other basins

Incidental Recharge

Water Budget



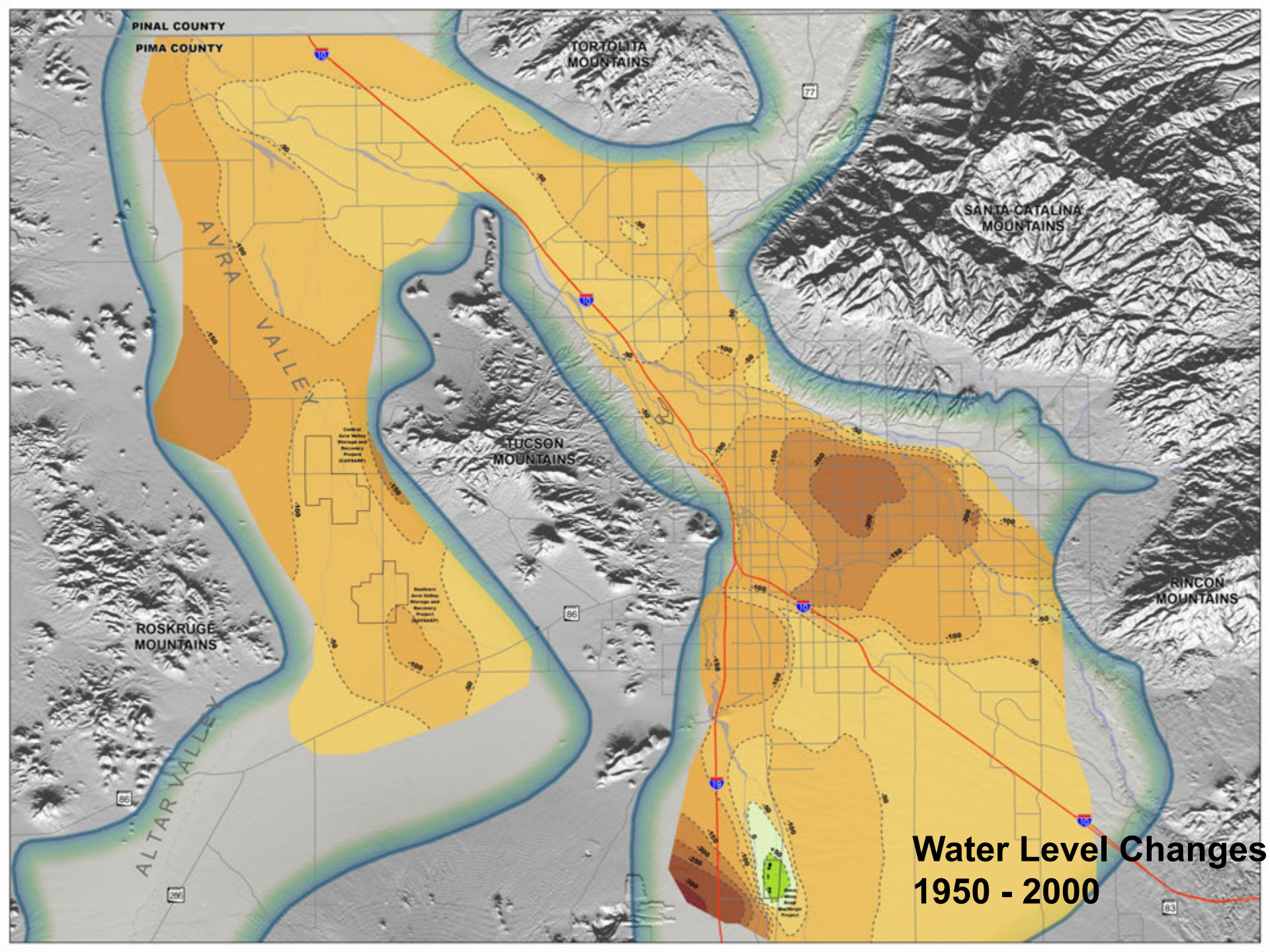
Outflows

Underflow to other basins

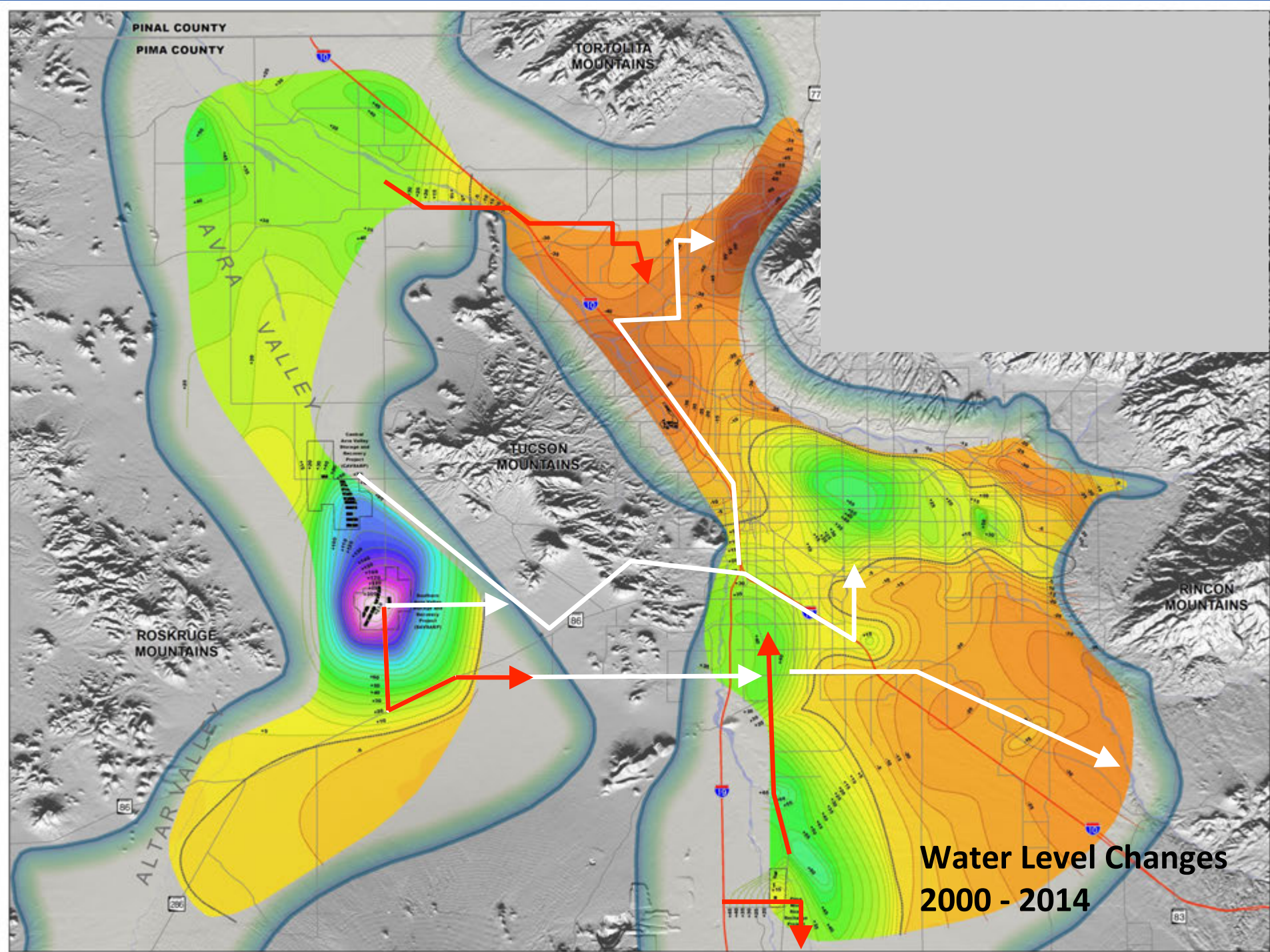
Evapotranspiration

Pumping
(Municipal,
Industrial,
Agricultural)

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**Water Level Changes
1950 - 2000**

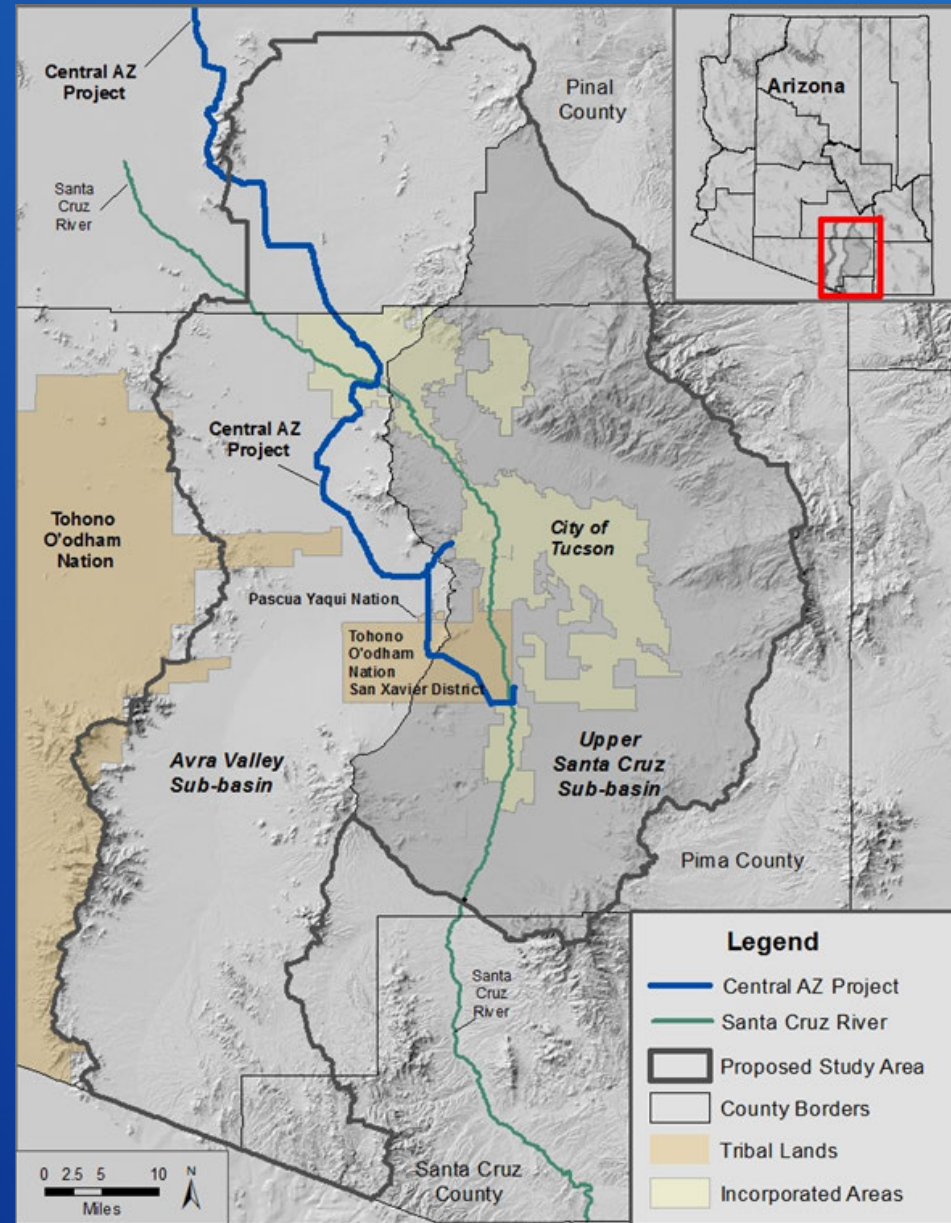


How do I get involved?

- **Annual Public Outreach Meetings**
 - Publicized through press releases, social media, print media, fliers
- **Stakeholder Advisory Team**
 - Opportunity for individuals and organizations who are not cost-share partners to provide input
 - Standing PAG committees (EPAC, WPS)
- **Study Website and email address**
 - All comments will be responded to.
 - Email distribution list for study information and updates

Questions? Ask the Co-study Managers

ehalper@usbr.gov
kathy.chavez@pima.gov



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