

Cornerstones Report

Market-based Responses to Arizona's Water Sustainability Challenges

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Presentation Overview

Arizona's Water Sustainability Challenges and Driving Forces

Arizona Water Geographies

Market-Based Reallocation Alternatives

Challenges and Opportunities



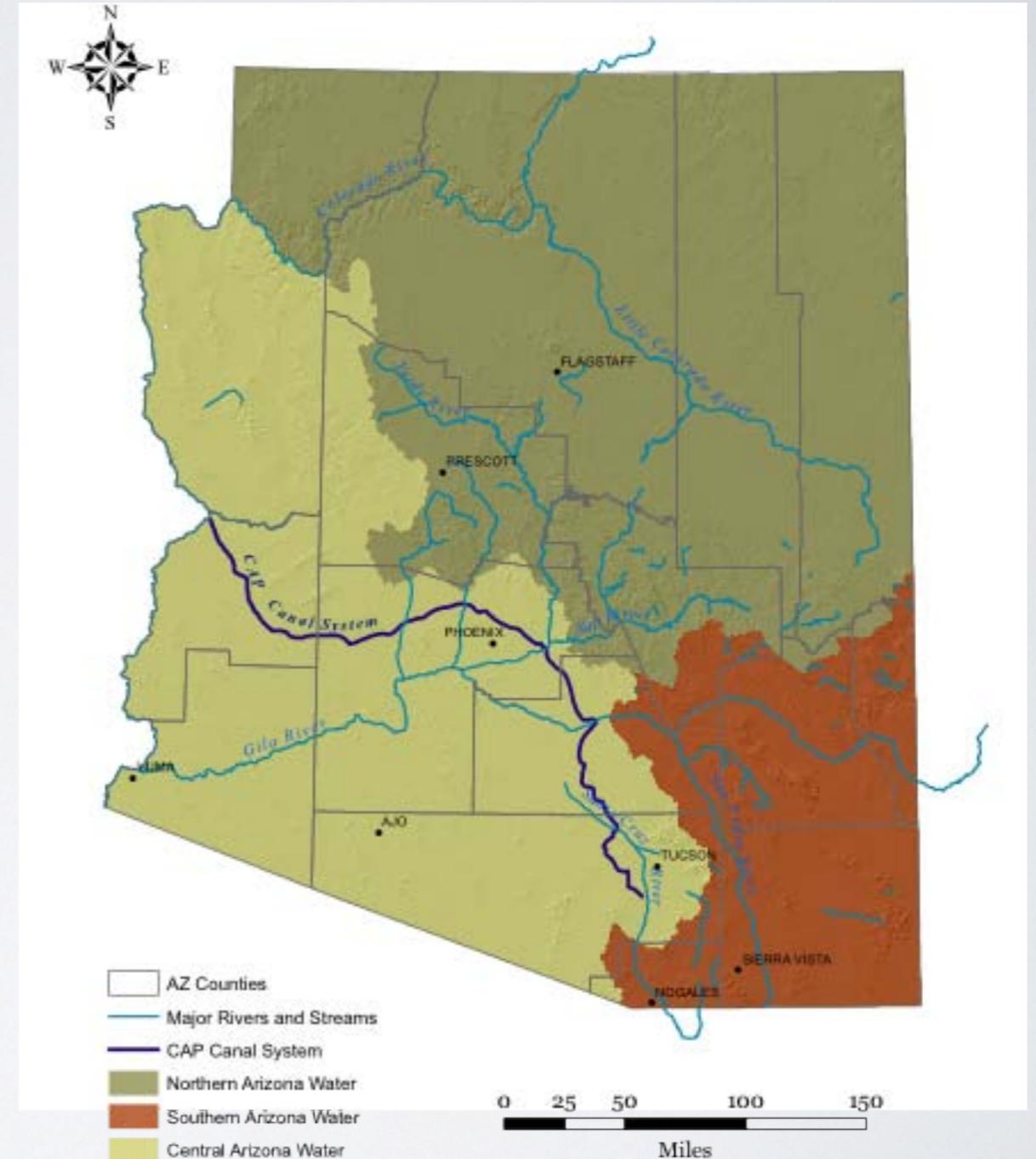
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Arizona's Water Sustainability Challenges and Driving Forces

Water Sustainability

Water is successfully divided among the water needs in the state - including maintaining the health of freshwater ecosystems - at a level that meets the goals of water users and the state.



Arizona's Water Sustainability Challenges and Driving Forces

Law Inherited from the Past



Arizona's Water Sustainability Challenges and Driving Forces

Law Inherited from the Past

Growth



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Change and Uncertainty



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Tribal Settlements



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Environment



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Competition and Conflict



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Institutional Capacity



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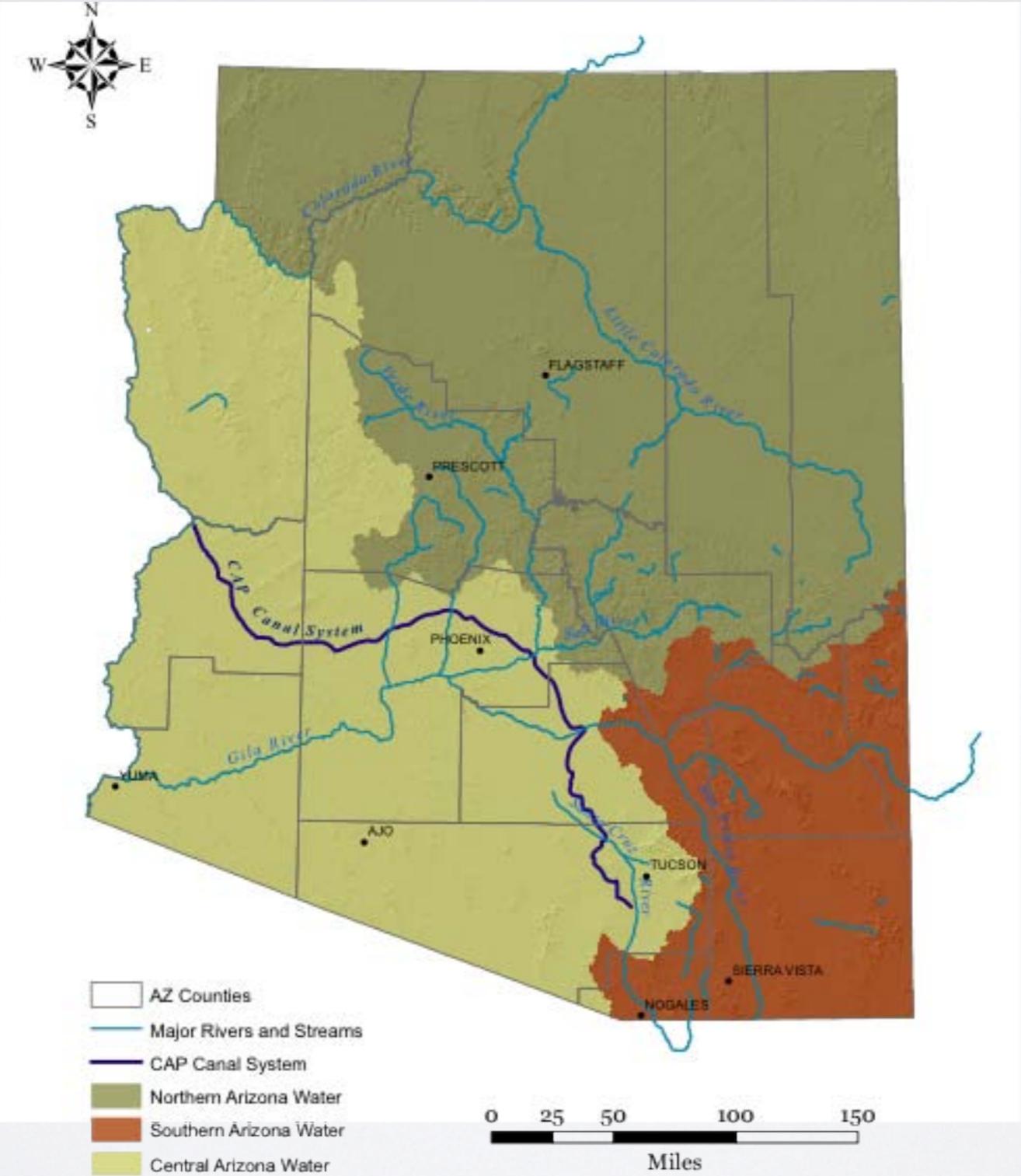
Competition and Conflict

Institutional Capacity

Economics



Arizona's Water Geographies



Supplies

Colorado River Water

Effluent

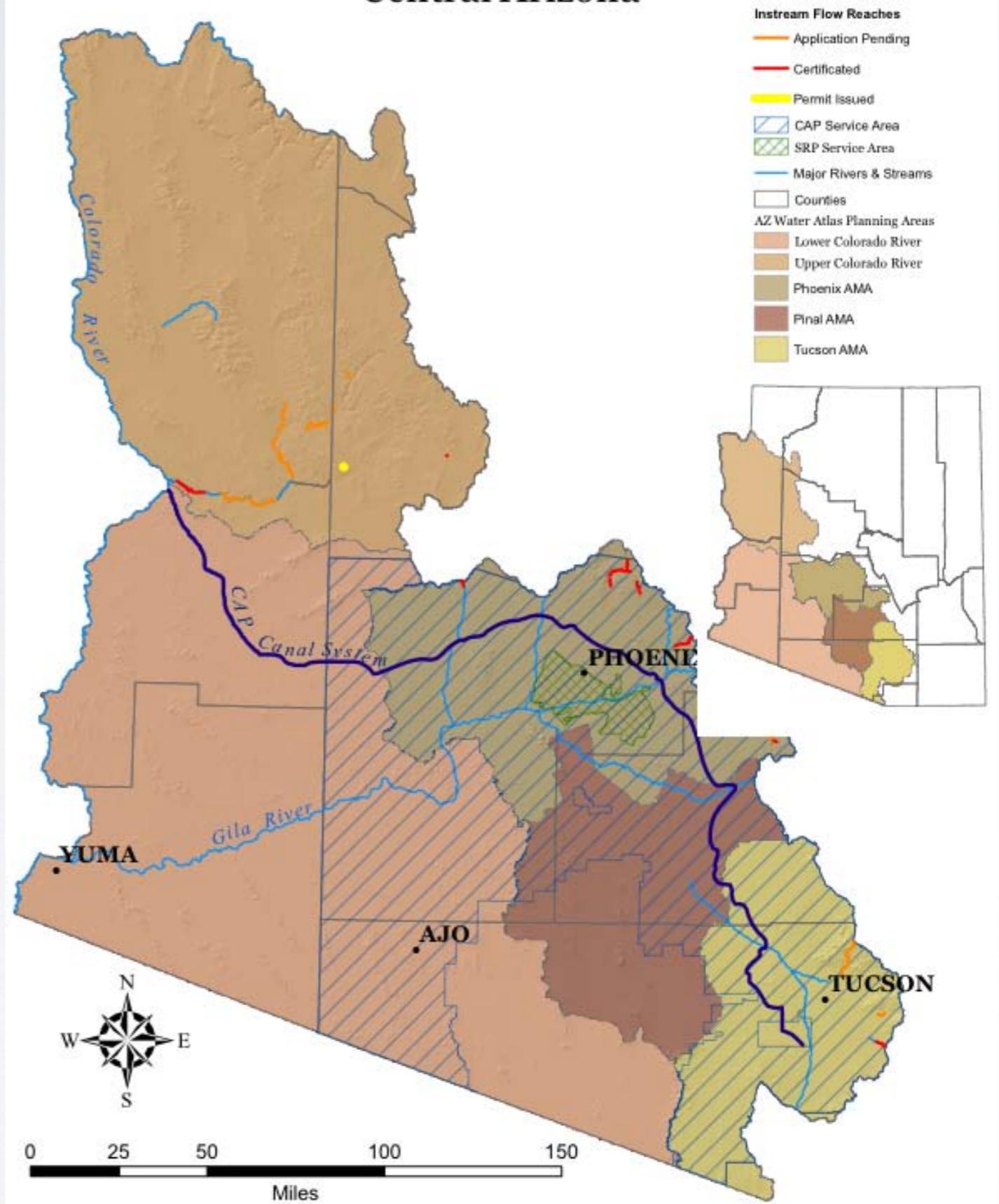
Groundwater

Demand

Municipal Use

Irrigated Agriculture

Mainstem of the Colorado River and CAP Service Area: Central Arizona



Supplies

Headwater Streams

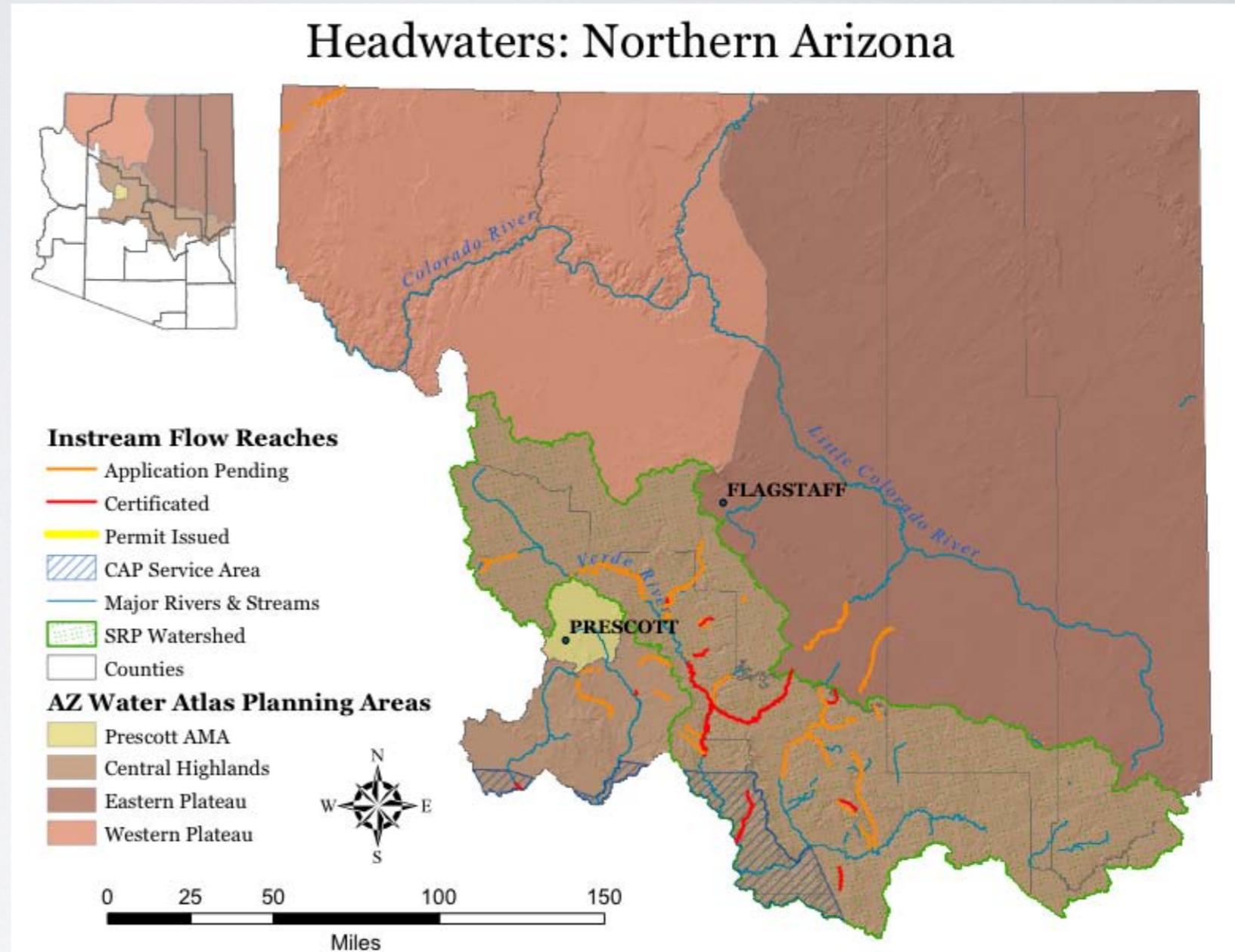
Effluent

Demand

Senior Surface Water
Rights Holders

Small-scale Agriculture

Growing Communities



Supplies

Groundwater

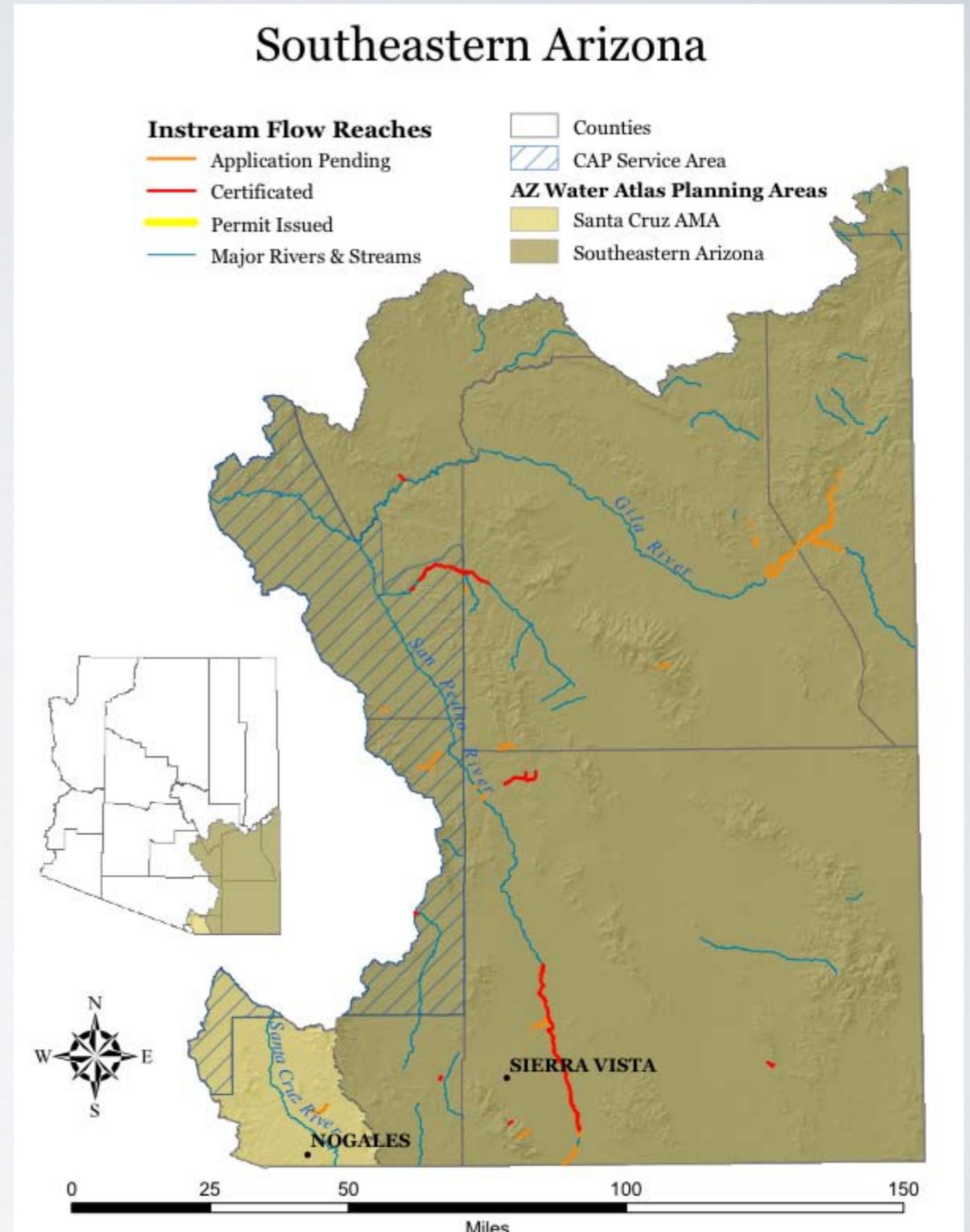
Effluent

Limited Surface Water

Demand

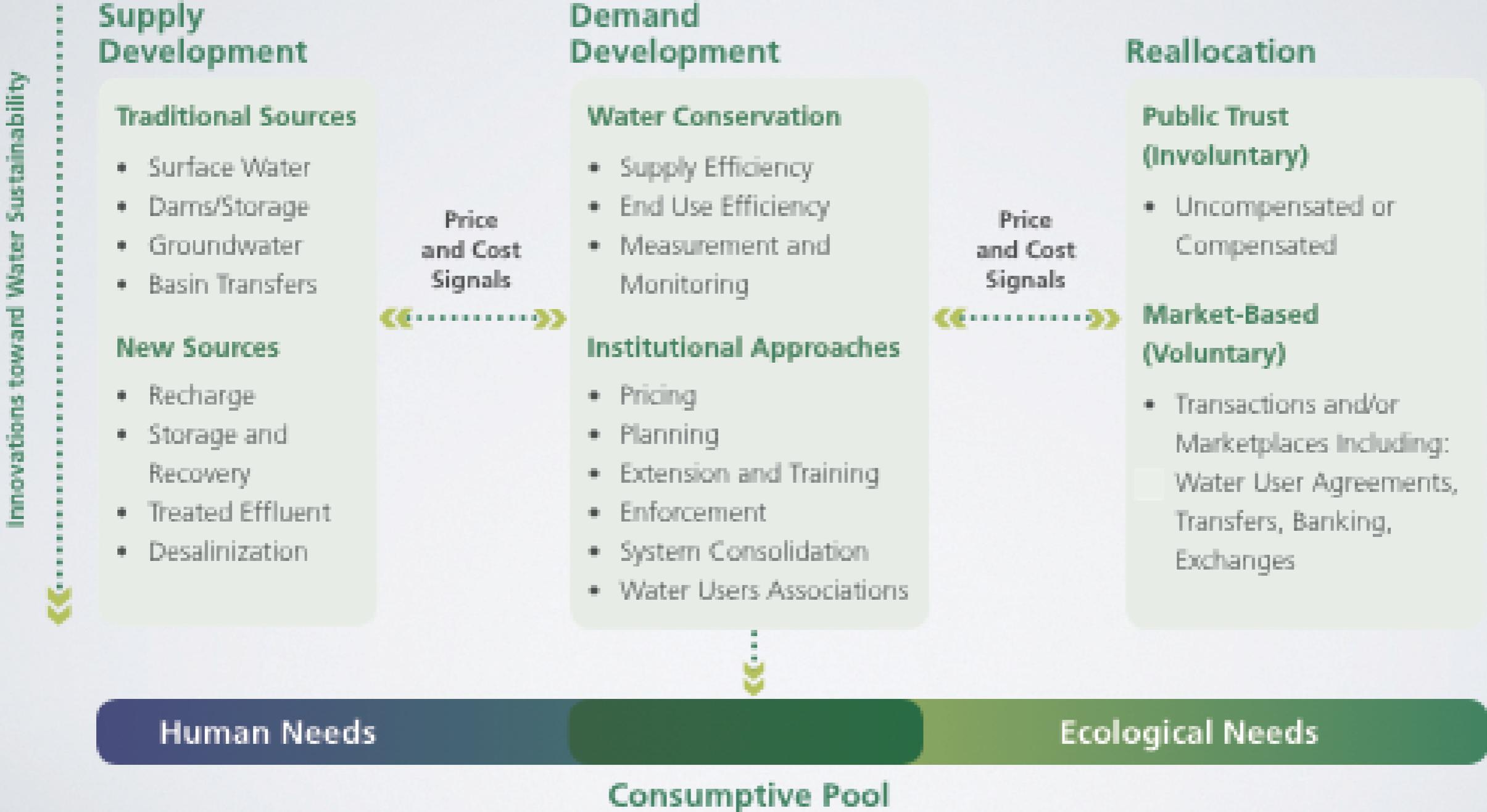
Small-scale Agriculture

Growing Communities



Market-Based Reallocation Alternatives

Evolution of Water Management in Response to Scarcity and Variability



Market-Based Reallocation

Four Necessary Conditions

1. Water Scarcity

When water supplies are scarce, market-based reallocation is an alternative to other strategies.

Reallocation can help balance water needs among multiple uses.



Market-Based Reallocation

Four Necessary Conditions

2. Buyer and Seller

Willing buyer and sellers must be identified, both of whom will potentially benefit from the exchange.

Transaction costs must be reasonable and not cause prohibitively high expense or delay.



Market-Based Reallocation

Four Necessary Conditions

3. Water Rights

Limits on and rights to freshwater diversion and use.

Authority to trade water rights across competing uses, including ecosystem needs.



Market-Based Reallocation

Four Necessary Conditions

4. Institutional Capacity

Institutional capacity to address economic, environmental, legal, and cultural barriers



Market-Based Reallocation

Three Types of Transactions

1. Transfer

Permanent change in the water right

Does not alter source of water

Typically changes:

Point of Diversion

Place of Use

Manner of Use



Market-Based Reallocation

Three Types of Transactions

2. Exchange

Exchange the source of water

Typically requires a close hydraulic connection between the two sources



Market-Based Reallocation

Three Types of Transactions

3. Banking

Refers to temporary change in a water right.

Move water from one use to another authorized use for a short period of time

Carry water over from one season to another



Challenges / opportunities

Barriers to market-based reallocation also hinder water sustainability efforts more broadly.

Namely:

Absence of sustainable limits on freshwater use

Lack of tradable water rights

Limited institutional capacity for measurement and enforcement



Market-based Reallocation for Environmental Purposes

Enabling Conditions	Status in Arizona	
	Present/ Absent	Qualifications
Use of water for environmental purposes	Present	Only certain uses are recognized and do not cover the range of ecological needs.
Permanent or long-term change of out-of-stream rights to environmental uses	Present	
Short-term change of out-of-stream rights	Absent	
Residual environmental water is protected through limits on further appropriation or junior instream water rights	Absent	
Appropriation of groundwater allowed only when accompanied by effective mitigation for surface water impacts	Absent	
Use of conserved water for environmental uses	Absent	

Challenges / opportunities



Lack of adjudication

Political commitment to cheap water

Spatial disconnect in paper v. wet water

Need for data and solutions for exempt wells

Separation of groundwater and surface water

Challenges / opportunities



Coordination with planners and NGOs in areas of shared objectives

Conservation may allow reallocation of existing sources

Effluent generation as an option for meeting urban and ecological needs



Thank you!

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