




Trade-offs in Water Management: Adapting to Scarcity

WRRC Annual Conference | March 21, 2016

ecosystem
economics 
Amy McCoy

Definitions

scarcity

1. Deficient in quantity compared with the demand
2. Very small in amount or number, not plentiful

Definitions

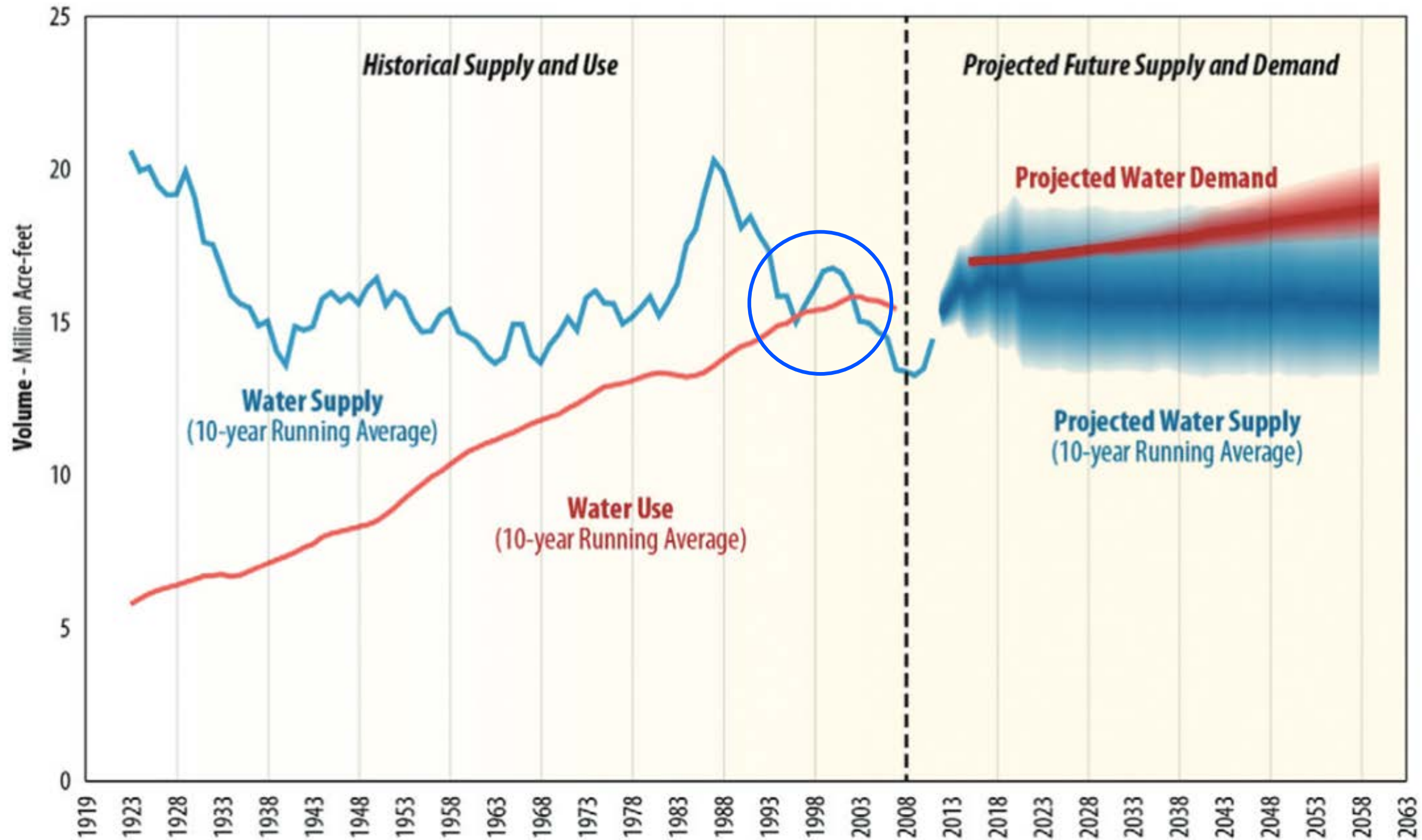
scarcity

1. Deficient in quantity compared with the demand
2. Very small in amount or number, not plentiful

trade-off

1. A balancing of factors all of which are not attainable at the same time.
2. A giving up of one thing in return for another.

When Scarcity Meets Trade-offs



Evolution of Water Management

Responses to Trade-offs from Increased Demands



Innovations Towards Water Sustainability



Evolution of Water Management

Responses to Trade-offs from Increased Demands



Supply Development

Traditional Sources

Surface Water
Dams/Storage
Groundwater
Basin Transfers

New Sources

Recharge
Storage & Recovery
Treated Effluent
Desalinization

Innovations Towards Water Sustainability



Evolution of Water Management

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Demand Development

Water Conservation

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Dams/Storage
Groundwater
Basin Transfers

Institutional Approaches

Pricing
Planning
Training
System Consolidation
Water Users Associations

Trade-Offs



Price
Signals

Innovations Towards Water Sustainability



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Reallocation

Regulatory (Involuntary)

Uncompensated
Compensated

Market-Based (Voluntary)

Market Tools
Water User Agreements
Transfers
Banking
Exchanges

Trade-Offs



Price
Signals

Trade-Offs



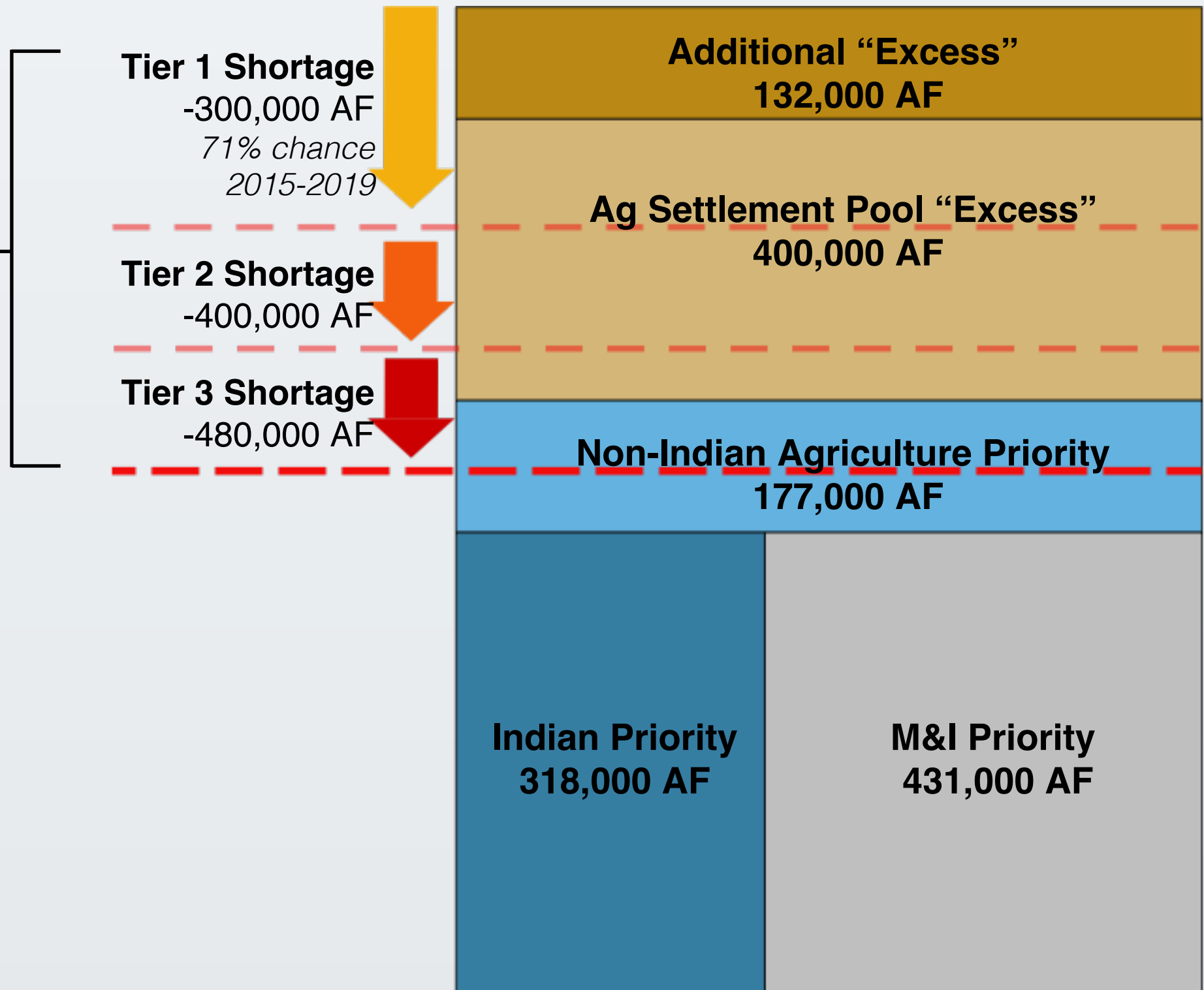
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Innovations Towards Water Sustainability



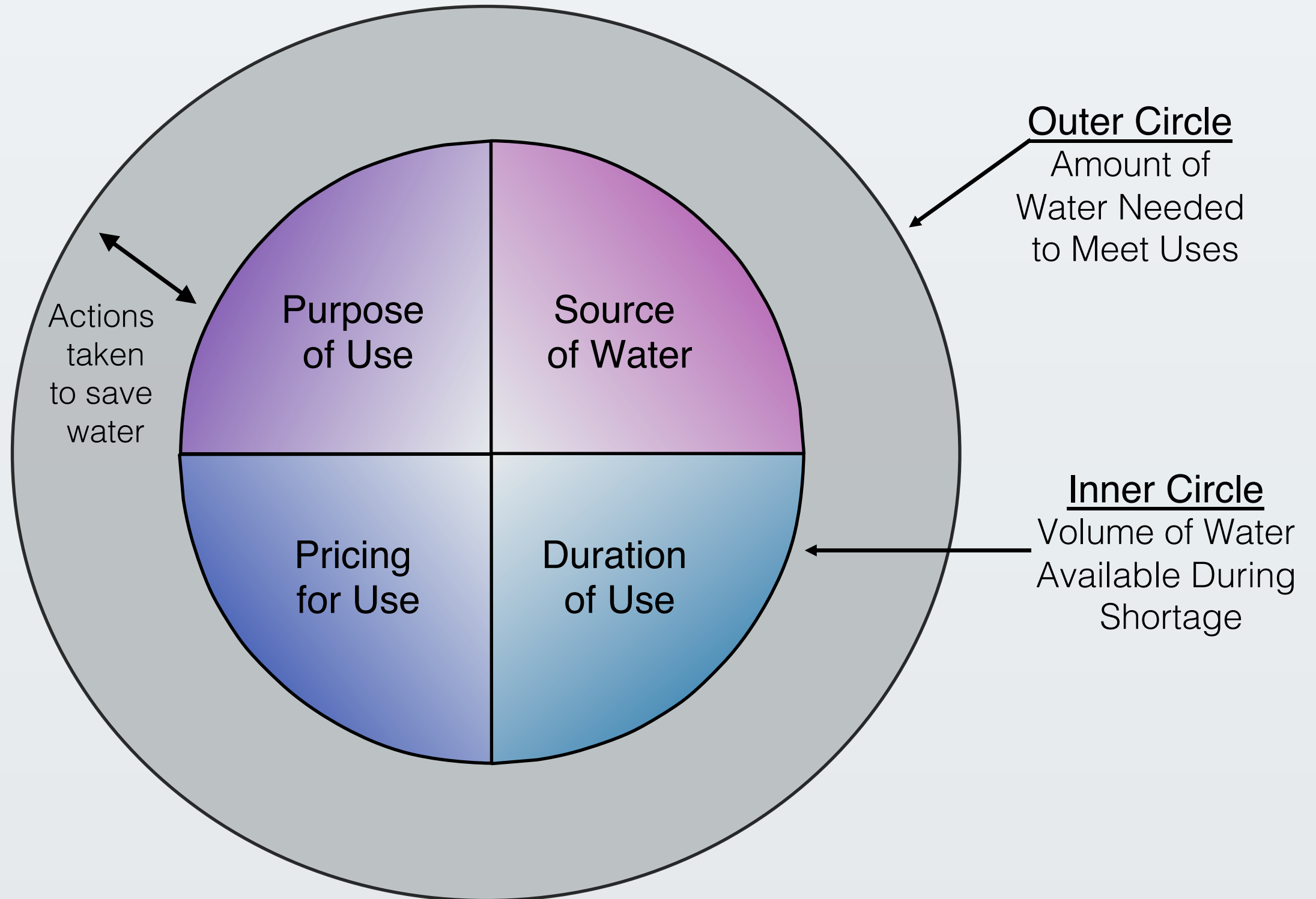
Arizona CAP Delivery Curtailments Under Shortage

Potential cuts to Arizona CAP deliveries under the 2007 Shortage Sharing Plan to ensure Lake Mead levels do not drop below 1,025 ft elevation



Market-Based (Voluntary) Reallocation

Considerations in Valuing Trade-offs



Market-Based (Voluntary) Reallocation

Tools

Timing of Storage
Releases

Switching Sources
of Water

Municipal
Conservation

Infrastructure
Efficiencies

On-Farm
Efficiencies

Deficit Irrigation

Lower Water Use
Cropping

Fallowing

Water
Management
Transactions

Consumptive
Use Reductions

*Changing When/Where/
How Water is Diverted
and Used*

*Reducing Overall
Water Use*





Thank you

"It's all a question of story. We are in trouble just now because we do not have a good story. We are in between stories. The old story, the account of how the system came to be and how we fit into it, is no longer effective. Yet we have not learned the new story."

~ Thomas Berry ~