

Mountain West Water Institute "Water Ways and Means"

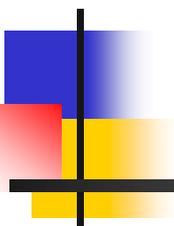
May 15-16, 2012

Hilton Garden Inn

Idaho Falls, Idaho



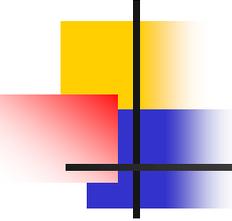
# Meeting the Challenges of Increasing Water Demands – The Idaho Experience



Dave Tuthill, PhD, PE

May 15, 2012





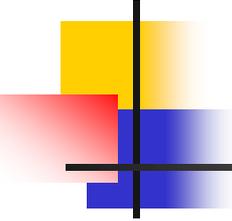
# Prediction...

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Relative to water delivery in  
the Mountain West...

# *Change*

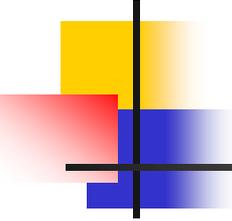
is coming  
between now and 2020



# Outline

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- Drivers of change
- Water administration basics
- Implementation of conjunctive administration
- The challenge for water researchers

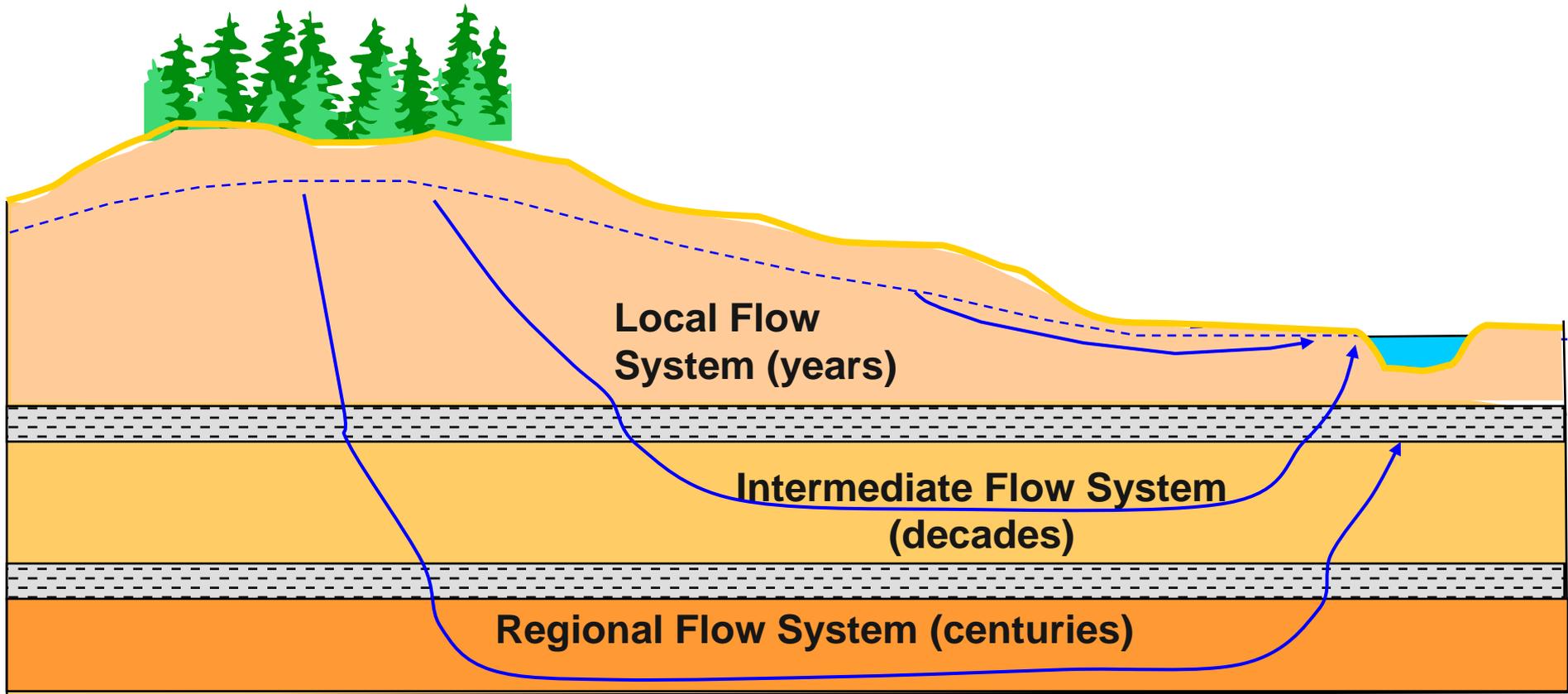


# Drivers of Change – Increasing Water Requirements and Reduced Availability

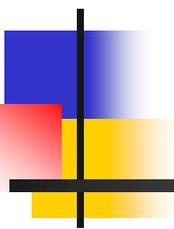
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- Energy production
- Urbanization
- Climate change
- Conjunctive Impacts

# Ground Water Flow Systems



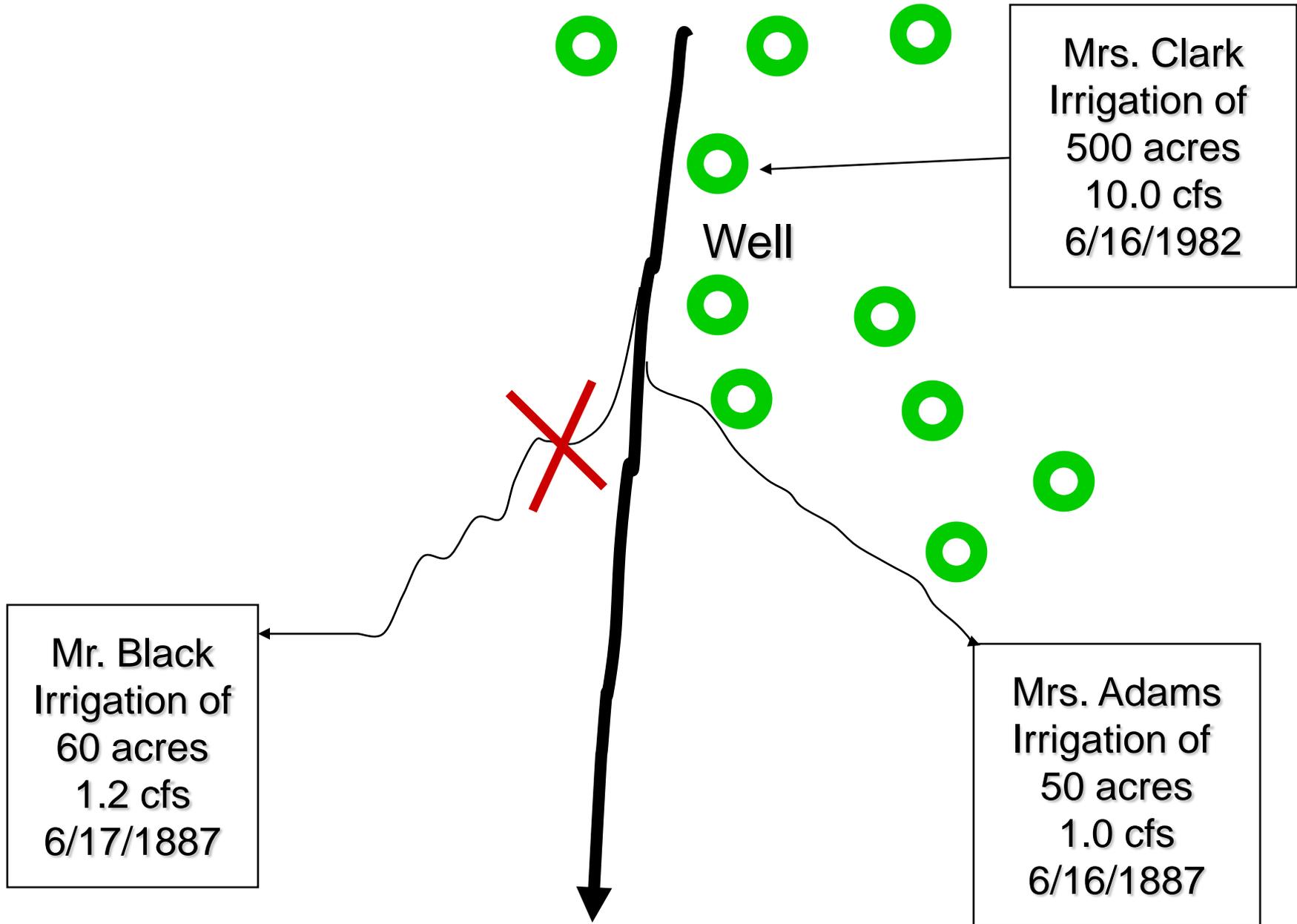
Why consider conjunctive relationships between ground water and surface water?



Throughout the Mountain West,  
the *appropriation doctrine* is used  
for the delivery both surface water  
rights and ground water rights—

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“first in time is first in right”



# Example – Which right is most likely to be curtailed?

Scenario 1 – during 2010

Scenario 2 – during 2014

Scenario 3 – during 2020

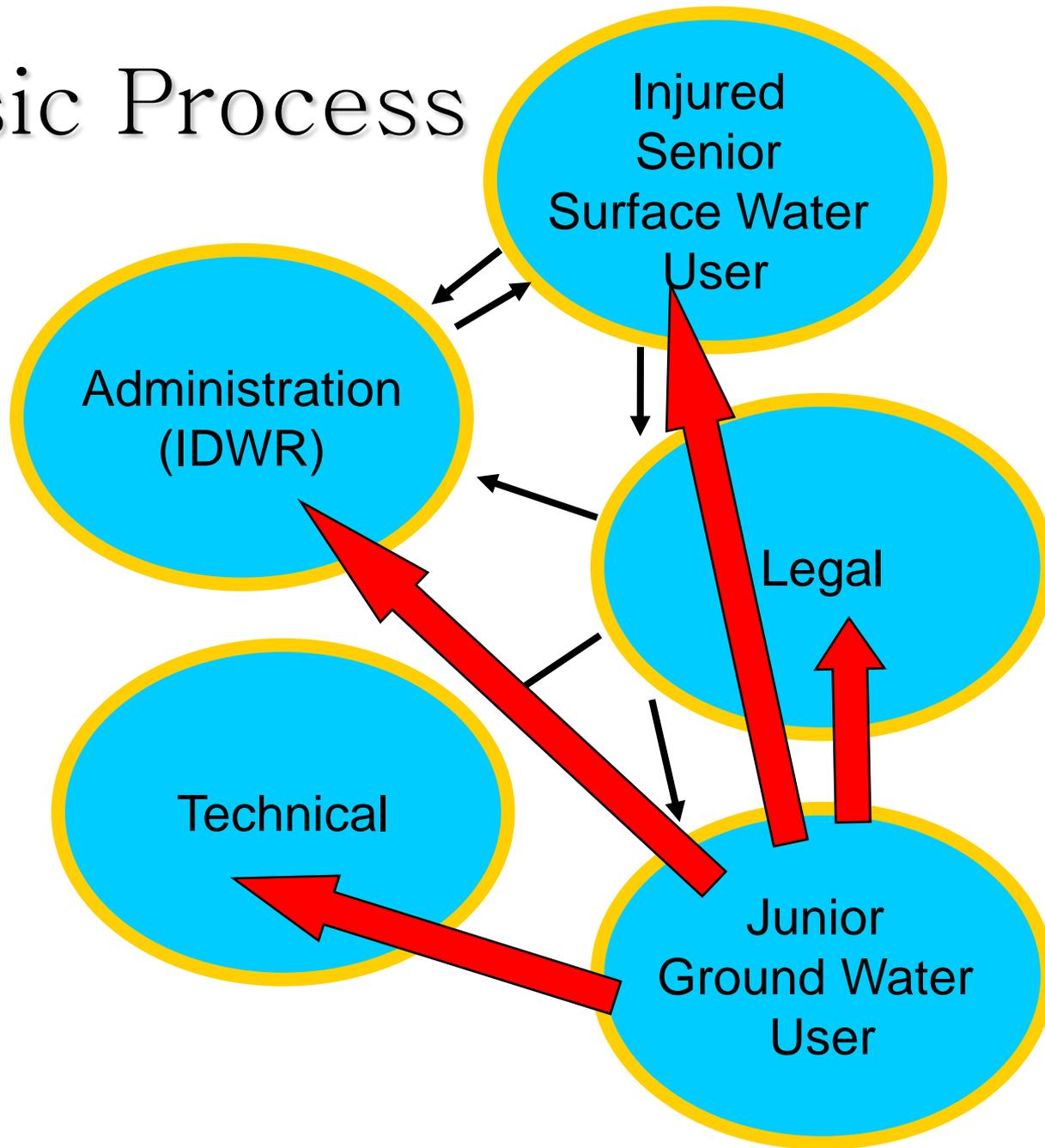
1959 Water Right  
Non-tributary  
24 acres irrigation

1954 Water Right  
Ground Water  
City of Ketchum, Municipal

1956 Water Right  
Ground Water  
½ acre lawn irrigation

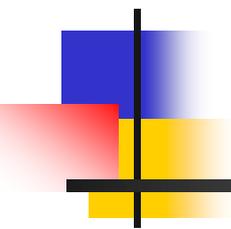
1886 Water Right  
Big Wood River  
32 acres Irrigation

# Classic Process





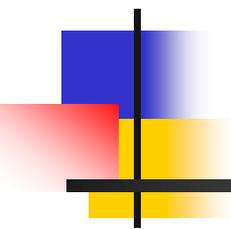
With increased demands coming down the track, what is a Water Researcher to do?



# 1. Recognize the problem

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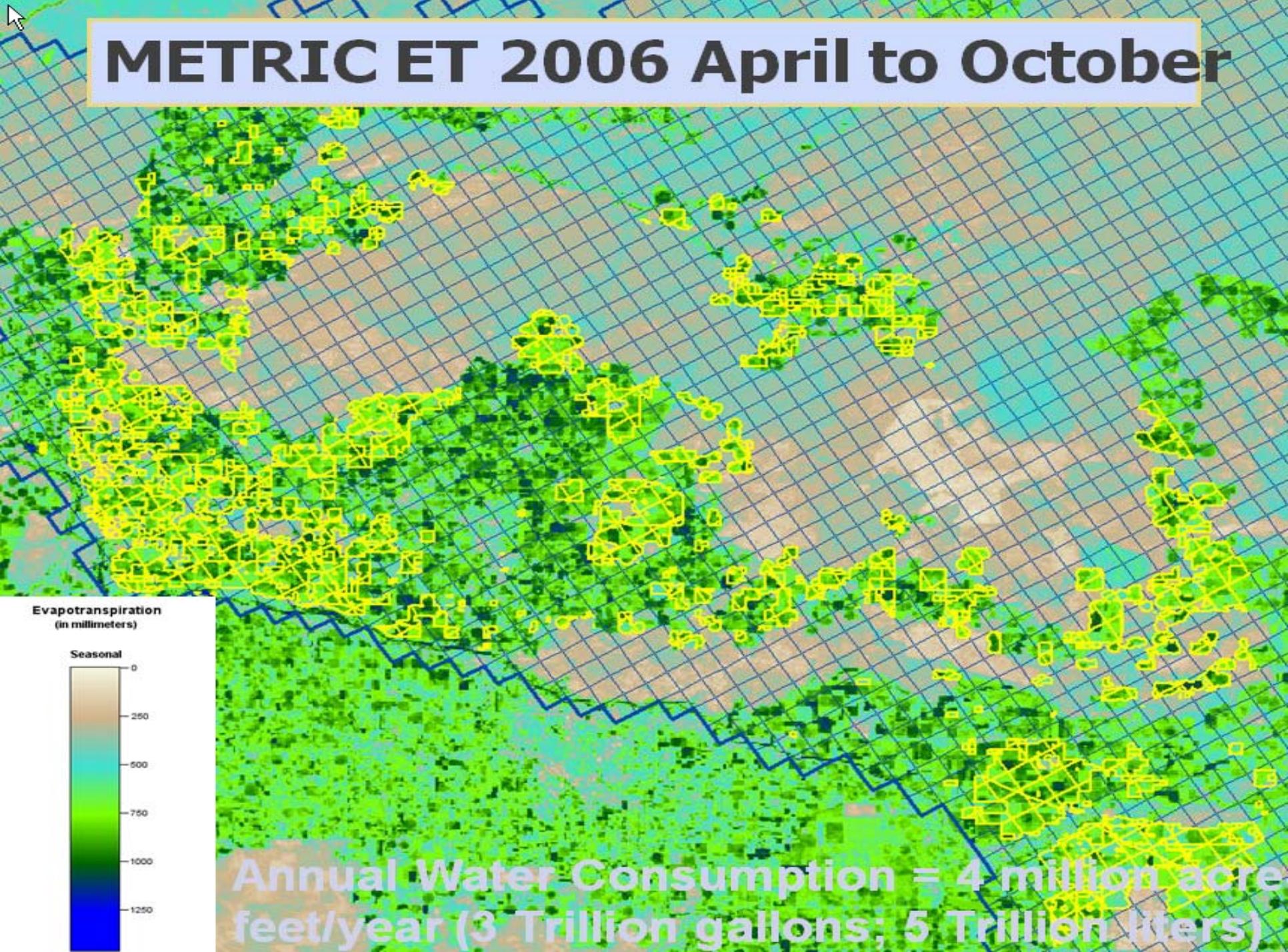
- Technical Community
- Governmental Community
- Water User Community



## 2. Quantify present needs

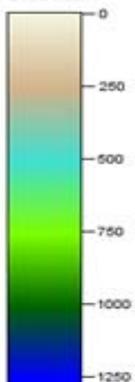
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# METRIC ET 2006 April to October

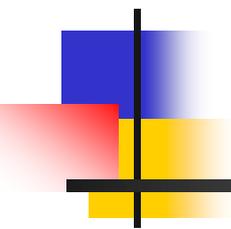


Evapotranspiration  
(in millimeters)

Seasonal

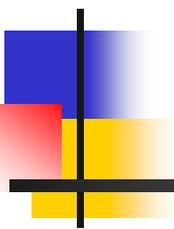


Annual Water Consumption = 4 million acre  
feet/year (3 Trillion gallons; 5 Trillion liters)



## 3. Quantify future needs

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## 4. Develop *and Implement* Innovative Solutions

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1. Watershed approach to resolve water quality and water quantity issues
2. Aquifer storage
3. Public Private Partnerships
4. "Dream" approach to conjunctive administration

# Opportunities for a Watershed Approach in a River Basin

Automation of  
Irrigation Delivery  
Systems

Reuse of Ag  
and  
Municipal Water

Precision  
Agriculture

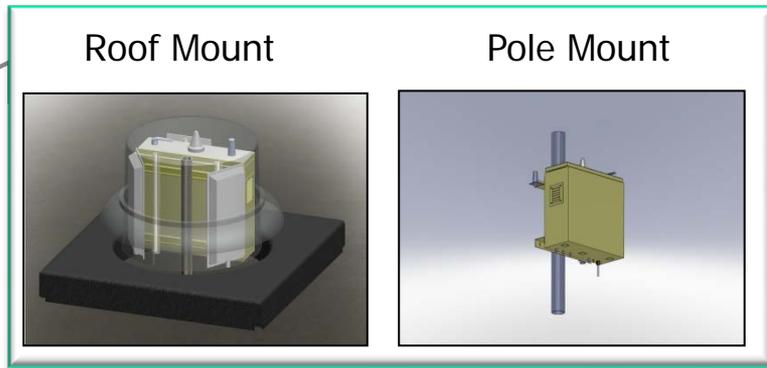
Riparian  
Activities



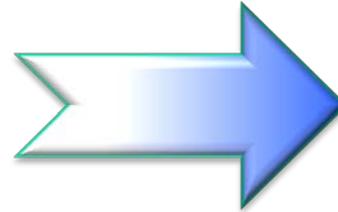
# Automation

Objective: Take only what you need –  
leave the rest in the river

# RECON Dynamics



Receivers



Web Site



Tags

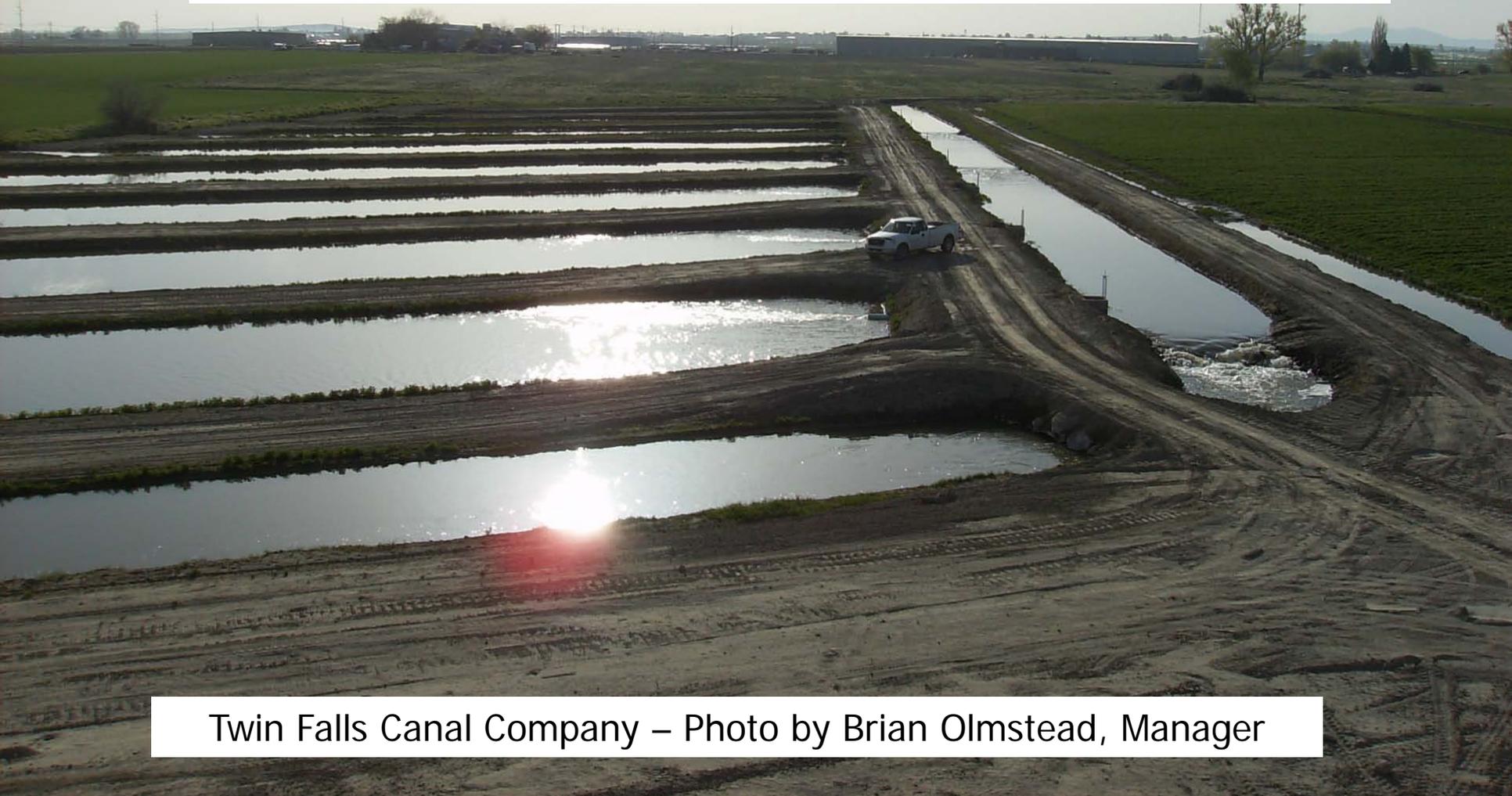


- Low Cost Devices
- Simple Integration & Interface
- Deep Indoor Radio Coverage
- Long Battery Life

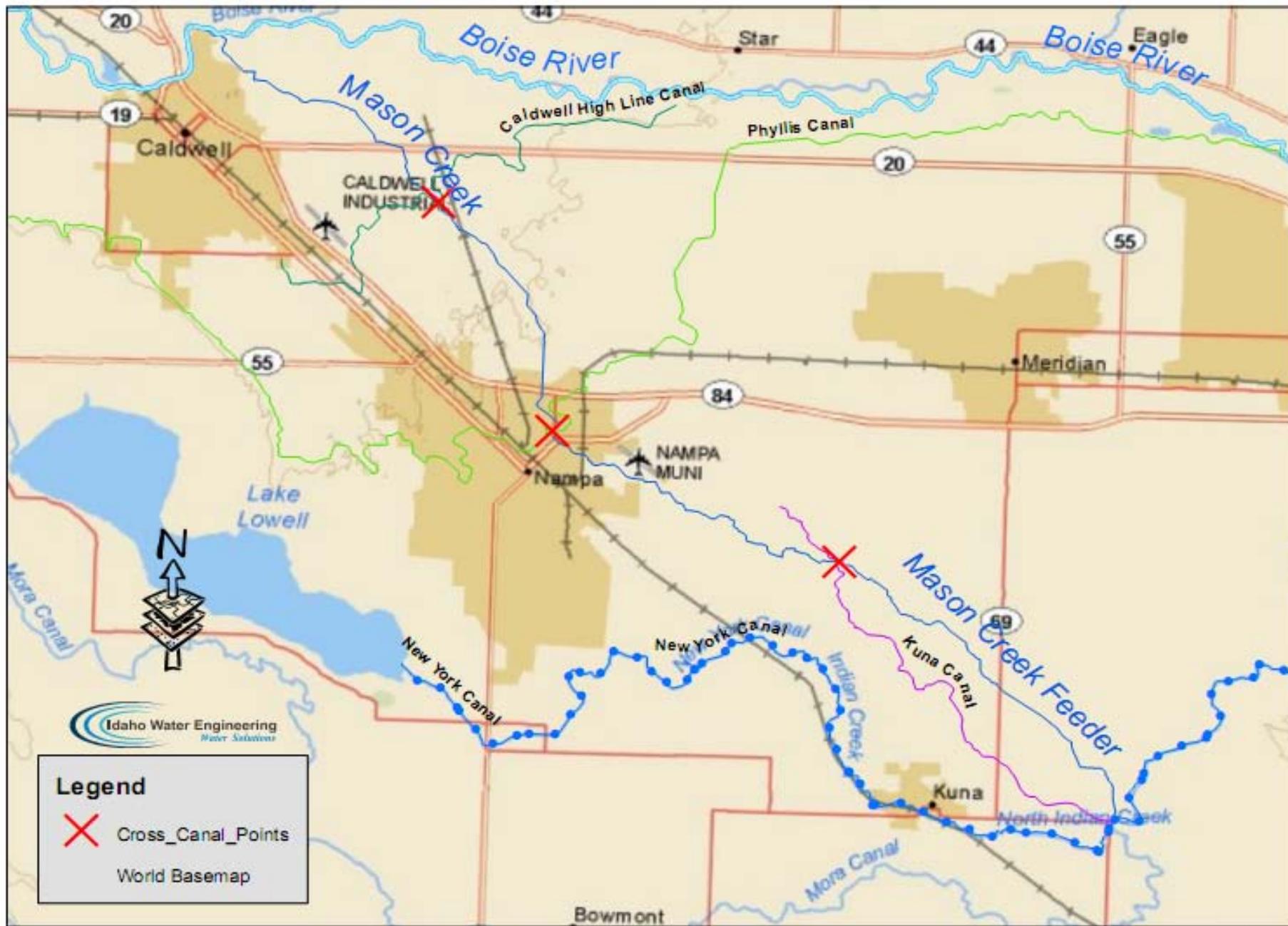
Confidential & Proprietary

# Reuse

Objective: Use nutrient laden water for Irrigation *before* it returns to the river



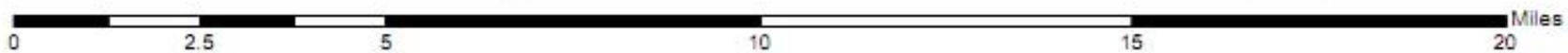
Twin Falls Canal Company – Photo by Brian Olmstead, Manager



Idaho Water Engineering  
Water Solutions

**Legend**

-  Cross\_Canal\_Points
-  World Basemap



# Precision Agriculture



Objective: Apply the correct amounts and types of nutrients in the right places

# Riparian Activities



Objective: Create wetlands to remove nutrients and lower temperatures

Photo by Dr. Rob Tiedemann

# Will EPA Accept a Watershed Approach?

“A watershed approach must be measured and verified, but if this can be done we are supportive.”

Mike Bussell, Director

EPA Region 10

Office of Water and Watersheds

(Meeting in Boise, December 15, 2011)

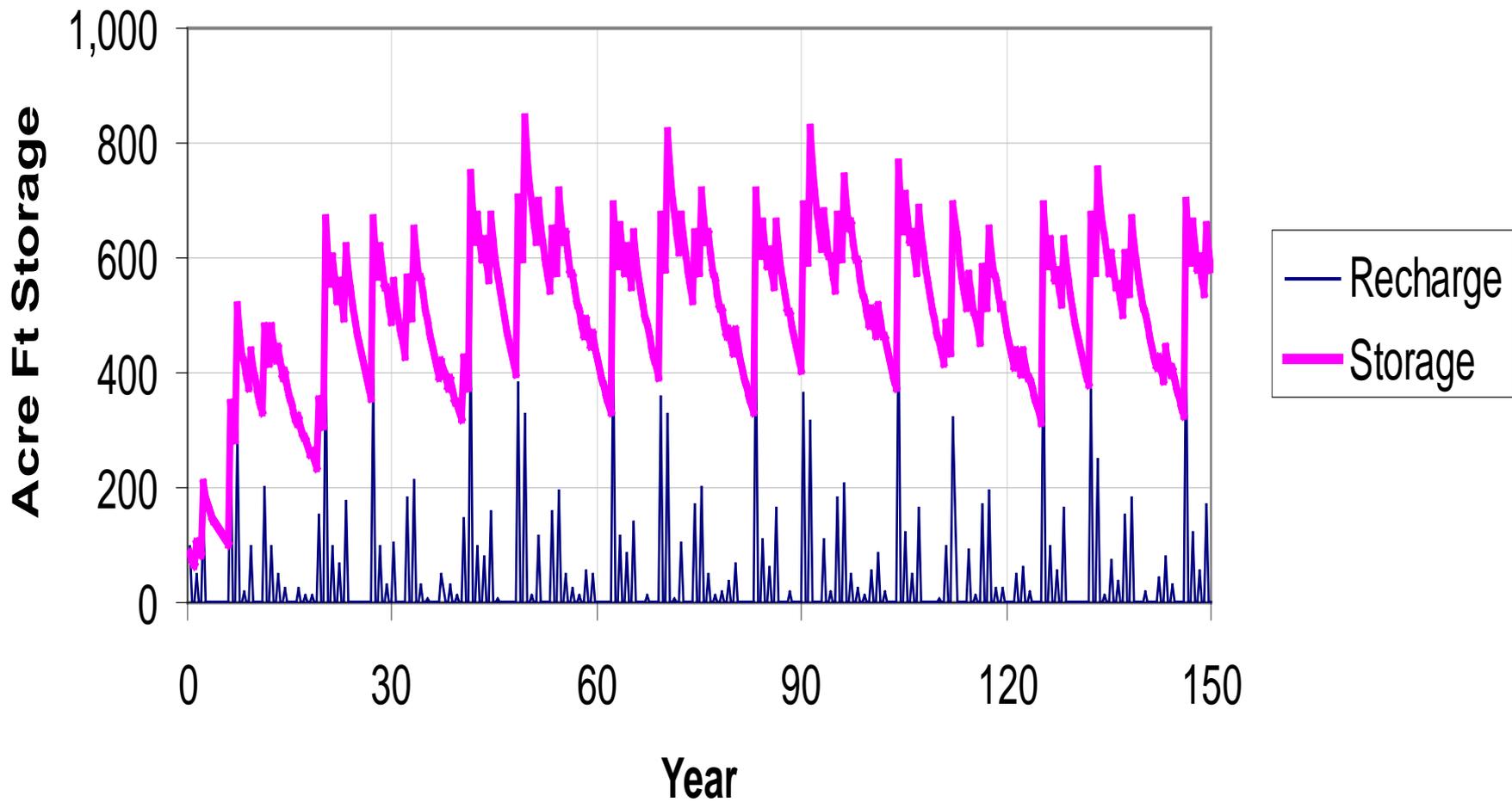


# Aquifer Storage

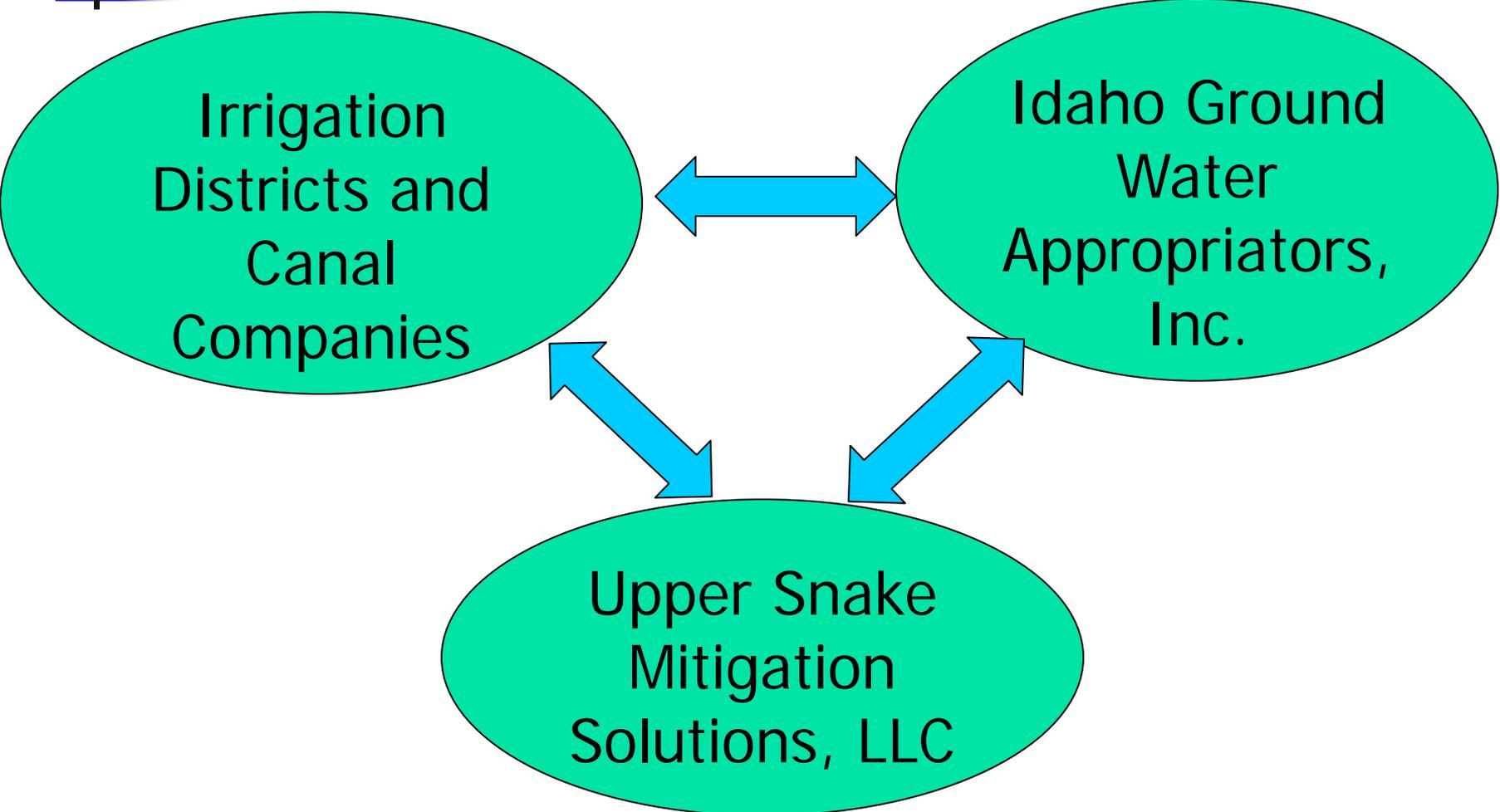
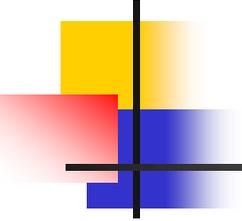
Photo by Bryce Contor

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# Egin Lake Recharge Accumulated Storage - 100 AF/Yr Average Recharge



# Public and Private Partnership – Recharge Alliance, Inc.

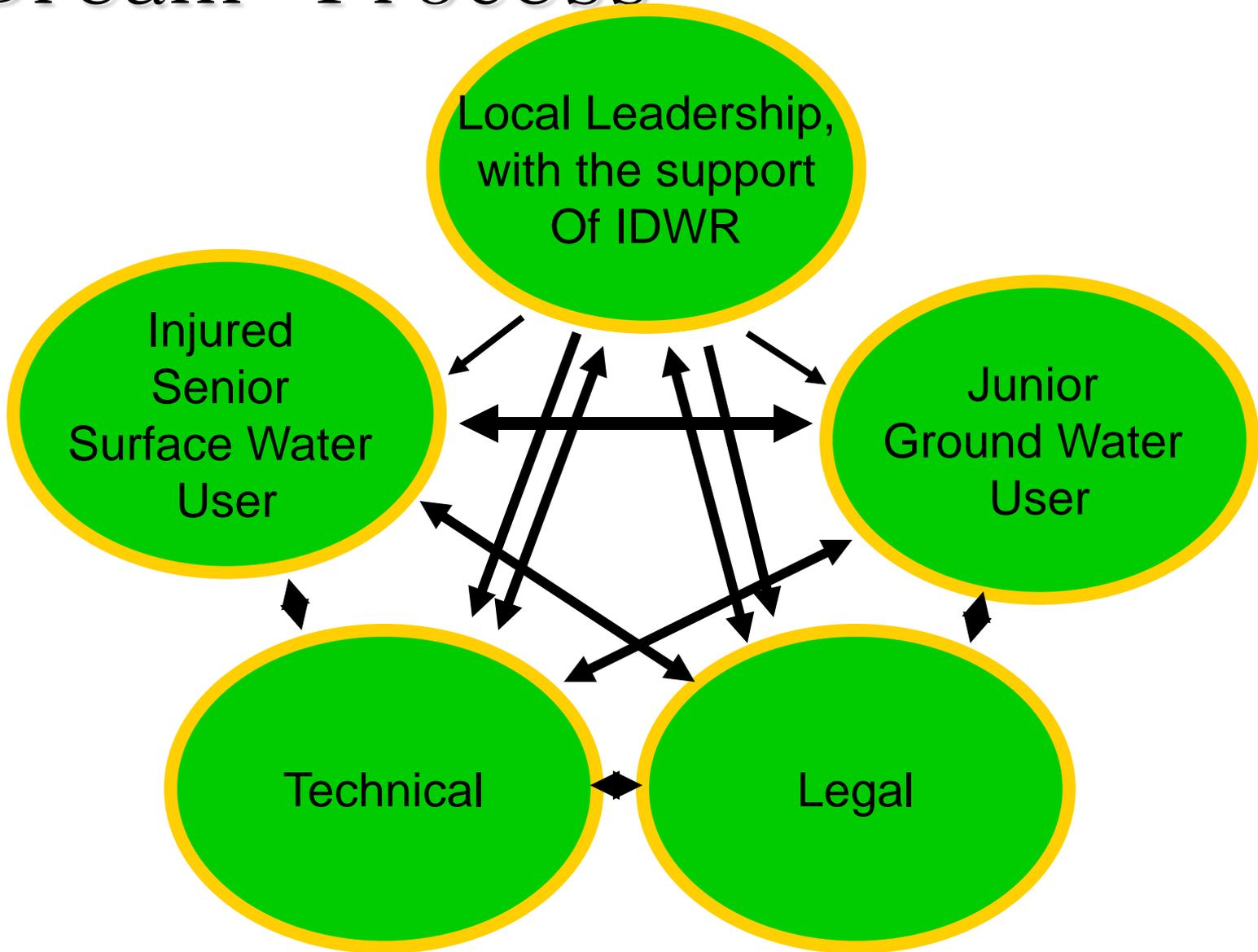


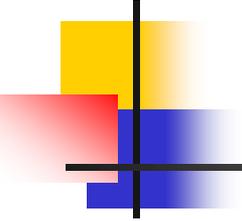
Irrigation  
Districts and  
Canal  
Companies

Idaho Ground  
Water  
Appropriators,  
Inc.

Upper Snake  
Mitigation  
Solutions, LLC

# “Dream” Process





# Summary

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- Water research activities are key to the future well-being of the Mountain West
- Combined efforts are needed to address these large problems
- The Mountain West Water Institute is a key contributor to these efforts



Thank You