

# Economic Analysis in Support of the Comprehensive Aquifer Management Plan

Presentation to CAMP Advisory Committee  
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# Presentation Outline

1. About WestWater Research
2. Economic Study Objectives
3. Study Approach
4. Questions and Discussion



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# WestWater Research, LLC

- **Offices in Boise (Idaho), Middlebury (Vermont), and Vancouver (Washington)**
- **Water Resource Economics and Water Market Analysis**
- **Broad Client Base Including Private Industry, State and Federal Government, Tribes, and Non-Profit Organizations**
- **Specialize in Economic Analysis of Proposed Water Development and Reallocation Projects**
- **Water Right Appraisals**





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## Selected Projects

- Upper San Joaquin Basin Storage Investigation
- Los Vaqueros Reservoir Expansion
- Lake Shasta Enlargement Study
- Yakima Basin Water Reliability Benefits
- Pecos River Basin Produced Water Analysis
- Columbia River Basin Water Market Analyses
- Water Banking in the United States
- Water Values in the Scott River Basin
- Water Values in the Shasta River Basin
- Over 50 Water Right Appraisals for Various Uses

# Study Objectives

## Economic Study Objectives:

1. Help inform CAMP Committee of the potential costs and benefits of the management alternatives
2. Identify the economic risks and uncertainties associated with the management alternatives
3. Provide input to assist the CAMP Committee in evaluating and prioritizing among the various management alternatives
4. Develop economic tools that can be utilized to consider refinement of the water management alternatives throughout the planning process

## Economic Study Outcomes:

1. Quantify, where possible, the economic effects (positive and negative) of the water management alternatives
  - A. Potential direct costs of the alternatives (\$/AF)
  - B. Potential economic effects
2. Qualitatively describe potential economic effects where quantification is not currently possible (e.g. ecosystem effects)

# General Study Approach

## Comparison of “with and without” conditions

The benefits and costs of the water management alternatives are measured against the benefits and costs of “doing nothing.”

## Defining the “Without” Condition

Curtailement of water users based upon existing priority calls  
Reliance on existing mitigation opportunities to minimize economic effects

## Hydrology models provide the basis for comparison

Describe the change in water availability to existing users

# Proposed Methods

<i>Category</i>	<i>Economic Analysis Approach</i>			
	<b>Productivity</b>	<b>Alternative Costs</b>	<b>Market Prices</b>	<b>Reduction in Costs</b>
<b>Agriculture</b>	X			
<b>Aquaculture</b>	X			
<b>Municipal &amp; Industrial</b>		X		
<b>Hydropower</b>			X	
<b>Rural Domestic</b>				X
<b>Development</b>		X		
<b>Environment</b>				

# Agriculture

## Approach

- **Regional Model – water availability, crops, location**
- **Optimization Model – Maximize Net Revenue**
- **Constraints (land, water, crop rotation, markets, etc.)**

## Model Inputs

- **Water Availability – Hydrology Models**
- **Available Land (Irrigated Acres)**
- **Irrigation Technology**
- **Crop Yields and Prices**
- **Crop Production Costs (Crop Budgets)**
- **Water Costs**

## Model Outputs

- **Value of an Additional Increment of Water Supply**
- **Net and Gross Revenue to Irrigated Agriculture**
- **Crop Mix**
- **Water Use**

## Dairy/Livestock Producers



# Aquaculture

## Approach

- **Production Budget**
- **Type of Operation (Size, Species, etc.)**
- **Location (River Reach)**

## Model Inputs

- **Water Availability – Hydrology Models**
- **Output Prices**
- **Production (temperature, flow, raceways)**
- **Production Costs (feed, labor, O&M)**
- **Processing (Vertical Integration)**
- **Hydropower?**

## Model Outputs

- **Value of an Additional Increment of Water Supply**
- **Net and Gross Revenue to Aquaculture**
- **Total Production**
- **Water Use**

# Municipal and Industrial

## Approach

- Survey of Potentially Affected Users
- Identify Alternative Water Sources

## Model Inputs

- Current Water Use and System Capacity
- Expected Water Use
- Future Water Development Plans
- Effects of Water Management Alternatives (inc. No Action)

## Model Outputs

- Cost of Replacement Water Supply
- Water Use

# Hydropower

## Approach

- Identify Potentially Affected Facilities
- Determine Market Value of Power

## Model Inputs

- Regional Market Power Price Forecast
- Hydrology Model - Water Use
- Power Production Model (Idaho Power)
- Private Producers?

## Model Outputs

- Market Value of Hydropower Production
- Water Use

# Rural Domestic

## Approach

- Project Rural Domestic Water Use
- Location – Representative Use

## Model Inputs

- Well Depth
- Well Construction Cost
- Water Costs

## Model Outputs

- Change in Water Cost
- Water Use

# Real Estate Development

## Approach

- Survey Developers
- Identify Constraints on Development

## Model Inputs

- Building Permits
- Water Needs
- Water Costs – Water Right Purchases
- Water Right Transfers

## Model Outputs

- Describe Constraints on Development
- Identify Potential Costs of Water Purchases

# Environment

## Approach

- Survey Environmental Interests
- Identify Areas of Potential Concern

## Inputs

- Hydrology Models – Change in Flow
- Timing of Environmental Needs

## Outputs

- Qualitatively Describe Potential Effects

# Questions/Discussion?