

ECONOMICS OF WATER RESOURCES

Yellowstone Basin Advisory Council

December 13, 2013

Tim Bryggman, Montana DNRC

MAIN POINTS

- Economics Provides a Set of Tools to Address Resource Valuation
- Water is a Special Commodity
- Instream Flow May Be Provided Through Markets, but Allocation is Likely to be Insufficient

ECONOMICS

- How society uses scarce resources

ECONOMIC CONCEPTS

- Markets
- Institutions
- Supply and Demand
- Opportunity Costs
- Marginal Analysis
- Externalities
- Public Goods
- Information

NATURAL RESOURCE ECONOMICS

- Microeconomic Theory
- Welfare Economics
- Examples of Resources:
 - Forestry
 - Energy
 - Minerals
 - Fisheries
 - Air Quality
 - Water
 - Recreation
 - Ecosystem Services
 - Natural Areas
 - Climate

WATER AS A COMMODITY

- Input for Various Goods and Services
- Water from a Particular Source
- Special Characteristics
 - **Mobility**
 - Highly Variable Supplies
 - Solvent
 - **Pervasive Interdependency**
 - **Site-Specific Issues**
 - Economies of Large Size
 - Groundwater Attributes
 - **Public Goods Attributes**
 - Consumptive/Non-Consumptive
 - Non-Use Values
 - High Transportation Costs
 - Low-Valued
 - Variable Demand
 - Essential for Life
 - High Social, Cultural Values
 - High Transaction Costs
- Problematic for Market Allocation

REASONS TO ESTIMATE WATER VALUES

- Feasibility
- Asset Valuation
- Justify Transactions

VALUATION METHODS

COMMODITY USES

- Production Function
- Water Right Transactions
- Land Value Comparisons
- Residual
- Demand Function
- Contingent Valuation

VALUATION METHODS

PUBLIC GOODS

- Water Quantity and Quality for Habitat, Recreation, and Aesthetics
- Contingent Valuation
- Travel Cost Model
- Hedonic
- Comparable Transactions
- Damages Avoided

Instream Flow

- Likely to be Inadequately Provided by Markets– Public Good
- Recognized as Beneficial Use
- May Be Provided by Downstream Senior Right
- Programs to Provide Instream Flows
- Provided from Storage, Water Rights, Conservation

MAIN POINTS

- Economics Provides a Set of Tools to Address Resource Valuation
- Water is a Special Commodity
- Instream Flow May Be Provided Through Markets, but Allocation is Likely to be Insufficient