Overview of Natural Resource Markets

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Lemonade Stand

• Springtime
• A lemonade stand.
• A second lemonade stand.
• Emergence of a market and market price
• A water well.
• Lemonade equilibrium.
• The onset of autumn.
Lemonade Stand

• Market Design
• Price
• Rules
• Source of Lemonade
Markets in the Environment

- Markets have been used in Environmental policy to:
  - Remove lead from gasoline
    (Kerr & Newell, 2005)
  - Reduce sulfur dioxide from the atmosphere
    (Bellas & Lange, 2008)
  - Limit carbon dioxide emissions
    (Burtraw & Evans, 2008)
  - Energy/electricity
    (Leveque, 2006)
  - Airport Landing/Takeoff Slots
    (Rassenti et al., 1982)
Integrated Modeling

Market Model
(e.g. Double Oral Auction)

Behavioral / Institutional Model
(e.g. Native American / Urban / Industrial / Ecosystem Demand / Property Rights / 3rd Party Effects)

Engineering Model
(e.g. Water Distribution System / Gage Points / Storage)

Physical Science Models
(e.g. GW and SW / Veg. / Avian/ Riparian / Wildlife)

Bids and Offers

Price

Demand

Supply

Extraction

Addition
Water Markets

- When thinking of water markets remember the lemonade stand and the organic formation of the market and the price.
- If we manage the water we manage the ecosystem service.
- Water markets have many complexities like energy and airports.
Water Market and the Ecosystem

- The connection between water and the surrounding ecosystem can be observed through integrated modeling.
- The ecosystem is effected by the trades in the water market.
- This leads to changes and externalities in the ecosystem.
- This is a market for ecosystem services.
Take Away

• When thinking of markets remember the lemonade stand.
• Integrated modeling is important for understanding the market.
• Markets and prices form organically.
• Environment ←market→ecosystem services