

# Behavioral Economics and Water Policy

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# Outline

- Assumptions of Water Policy
- Behavioral Economics
- Amended Water Policy Principles



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# Assumptions of Water Policy

- Property rights are a focus
  - Negotiation over surface water uses
  - Rights of access for groundwater
- If we get the rates “right” behavior will change
  - Block structures



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# Decision Making Processes

- Deliberative
  - Rational planning, taking a long time and involving much analysis
- Automatic
  - Immediate, quick decision and involving emotion more than rational processes



# Homo Economist – The Planner



# Homer Economus – The Doer



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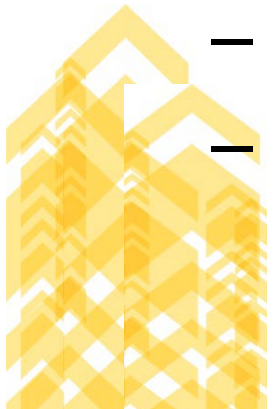
# Automatic Thinking Quiz

- An algae bloom in a pond doubles in size every day. If it takes 24 days for the bloom to cover the pond entirely, how many days did it take for the bloom to cover half of the pond?
  - A: 23 days
  - Most people answer 12 days



# Behavioral Economics & Prospect Theory

- In the classical theories, individuals make decisions by weighing all alternatives equally by their final effects on wealth
- In prospect theory, decisions are a product of two stages
  - Editing
  - Evaluation



# Implications of Prospect Theory: Decision Framing

- In a choice between alternatives, people often disregard components that the alternatives share and focus on components that distinguish the alternatives



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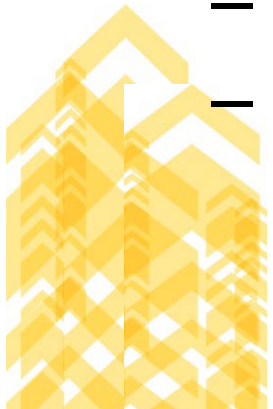
# Availability Heuristic

- People predict the frequency of an event based on how easily an example can be brought to mind
  - Implication: Events that are more “vivid” and occur more frequently tend to be overforecast versus those that are less vivid
  - Example: How likely is it that your area will exhaust its groundwater supply?



# Corollary of Availability Bias: Choice Architecture

- Notion of “choice architecture” forwarded by Thaler and Sunstein is based on the notion that the information available to people when they make a decision helps to frame it
  - Example: “Don’t Mess with Texas!”
  - Example: How much water did you use today?
  - Example: How much would you pay to “avoid losing access to water” versus “gain access to water”?



# Properties of Water Make Valuation Difficult

- Quantity available
- Time
- Space
- Reliability
- Quality



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# Varying Estimates of Value (EPA, 2012)

- Public supply and domestic self-supply: Up to \$4,500/af
- Agriculture: \$12 – 4,500/af
- Manufacturing: \$14 – 1,600/af
- Electric power generation: \$12 – 87/af  
thermoelectric cooling; \$1 – 157/af  
hydroelectric
- Mining & resource extraction: \$40 – 2,700/af

# Loss Aversion

- People tend to be risk averse with respect to gains, and risk seeking with respect to losses

Decision	Choice 1	Choice 2
1	(4,000, 0.8)	(3,000, 1)



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# Loss Aversion

- People tend to be risk averse with respect to gains, and risk seeking with respect to losses

Decision	Choice 1	Choice 2
2	$(-4,000, 0.8)$	$(-3,000, 1)$



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# Loss Aversion

- People tend to be risk averse with respect to gains, and risk seeking with respect to losses

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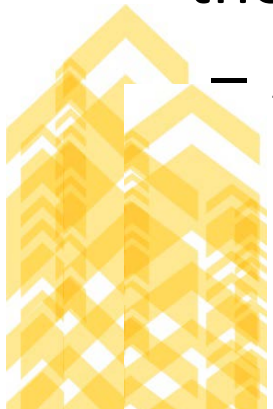


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# Corollary of Loss Aversion: Status Quo Bias

- People tend to overweight their current allocation of resources
  - Current allocation becomes the reference point
- This produces highly inflected indifference curves (people have to be compensated a lot to shift from their current allocation of resources)
  - Application: It's very difficult to make large changes in resource allocation
    - The “free water” problem



# Endowment Effect

- People who become “endowed” with an allocation of resources tend to demand more in compensation in order to part with the resources than they themselves would pay to acquire the resource in the first place
- Makes the concept of exchange less workable
  - Destroys the “Law of One Price”
    - Must be careful in giving people the impression that they “own” something
    - Coasian solutions are problematic



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# Amended Water Policy Principles

- For surface water, the goal should be to maximize the net value to users AND to monitor for rent capture
  - External costs should be incorporated into the decisions of users BUT LIKELY WILL NOT
  - Coasian solutions (described next) are NOT possible
- For groundwater, the goal should be to equate the marginal benefit of users with marginal social cost of use
  - This will likely involve innovative information provision along with heavy monitoring



# Sustainable Water Rate Programs

- Current programs involve setting not only increasing block rate structures but also setting water budgets for each user
- Could/should involve smart metering & reporting systems

