

# Water prices and water values: Applying economics to Texas water management

Sheila Olmstead  
LBJ School of Public Affairs, UT Austin

Texas Water Summit  
May 19, 2014



# Economists' three basic contributions to water management

- Water pricing
  - Users (municipal, industrial, agricultural) should cover the full opportunity cost of their water consumption.
- Water markets
  - Where the value of water differs among users, mutually beneficial trades make everyone better off.
- Benefit-cost analysis
  - Water supply (e.g., infrastructure) investments should have economic benefits > economic costs.



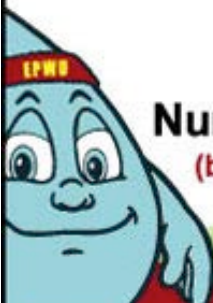
# Water pricing

- In most markets for goods and services prices are signals of:
  - Resource scarcity, and
  - Value in use
- For many reasons (some good, some bad), most water is not traded in markets.
- Water managers *could* set prices to signal both scarcity and value in use, as real market prices would. But water pricing serves many goals, and these are secondary at best.
- Water prices seldom reflect scarcity and economic value in Texas or elsewhere.



# When water is scarce, prices are rarely used to curb demand.

**TODAY'S WATERING SCHEDULE**



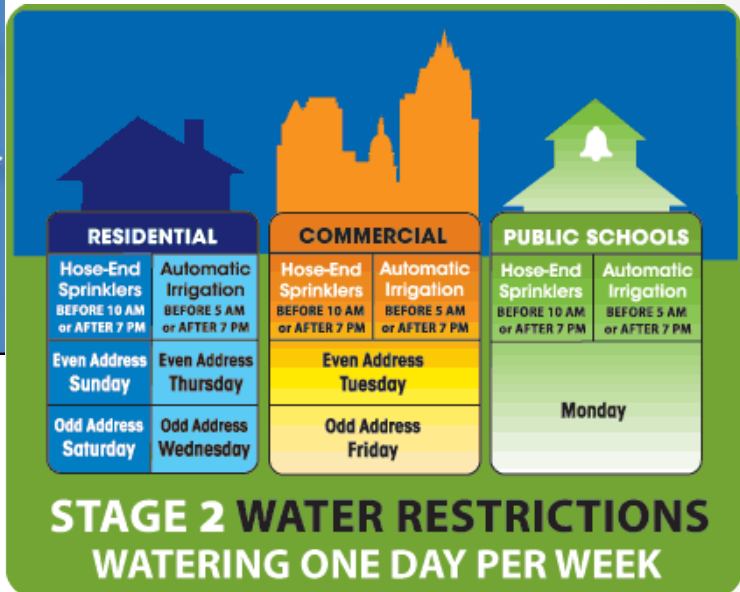
**ODD**  
**Numbered Addresses**  
 (before 10am or after 6pm)

[View Water Conservation Ordinance >>](#)

**FREE Low-Flow Showerheads**

available at  
 Customer Service Center  
 6400 Boeing Dr.  
 M-F; 8-5

Tech<sub>2</sub>O Center  
 10751 Montana Ave.  
 M-F; 8-5 - Sat. 9-1




RESIDENTIAL		COMMERCIAL		PUBLIC SCHOOLS	
Hose-End Sprinklers BEFORE 10 AM or AFTER 7 PM	Automatic Irrigation BEFORE 5 AM or AFTER 7 PM	Hose-End Sprinklers BEFORE 10 AM or AFTER 7 PM	Automatic Irrigation BEFORE 5 AM or AFTER 7 PM	Hose-End Sprinklers BEFORE 10 AM or AFTER 7 PM	Automatic Irrigation BEFORE 5 AM or AFTER 7 PM
Even Address Sunday	Even Address Thursday	Even Address Tuesday		Monday	
Odd Address Saturday	Odd Address Wednesday	Odd Address Friday			

**STAGE 2 WATER RESTRICTIONS**  
**WATERING ONE DAY PER WEEK**

Austin  
**WATER**

THE  
 Lawn Whisperer  
 Says



"Great ways to save water."

Commercial  
**Toilet Retrofit Programs**

Install a new high-efficiency toilet and stop flushing money down the drain.



San Antonio Water System



# Water demand does respond to price changes.

- Industrial water use
  - A 10% increase in the price of water reduces demand by 1-8% in the short run, depending on industry type.
- Residential water use
  - A 10% increase in the price of water reduces demand by 3-4% in the short run, and 6-7% in the long run.
- Agricultural water use
  - A 10% price increase reduces demand by 4-5% (with higher responses where prices are higher, and where water is more scarce).

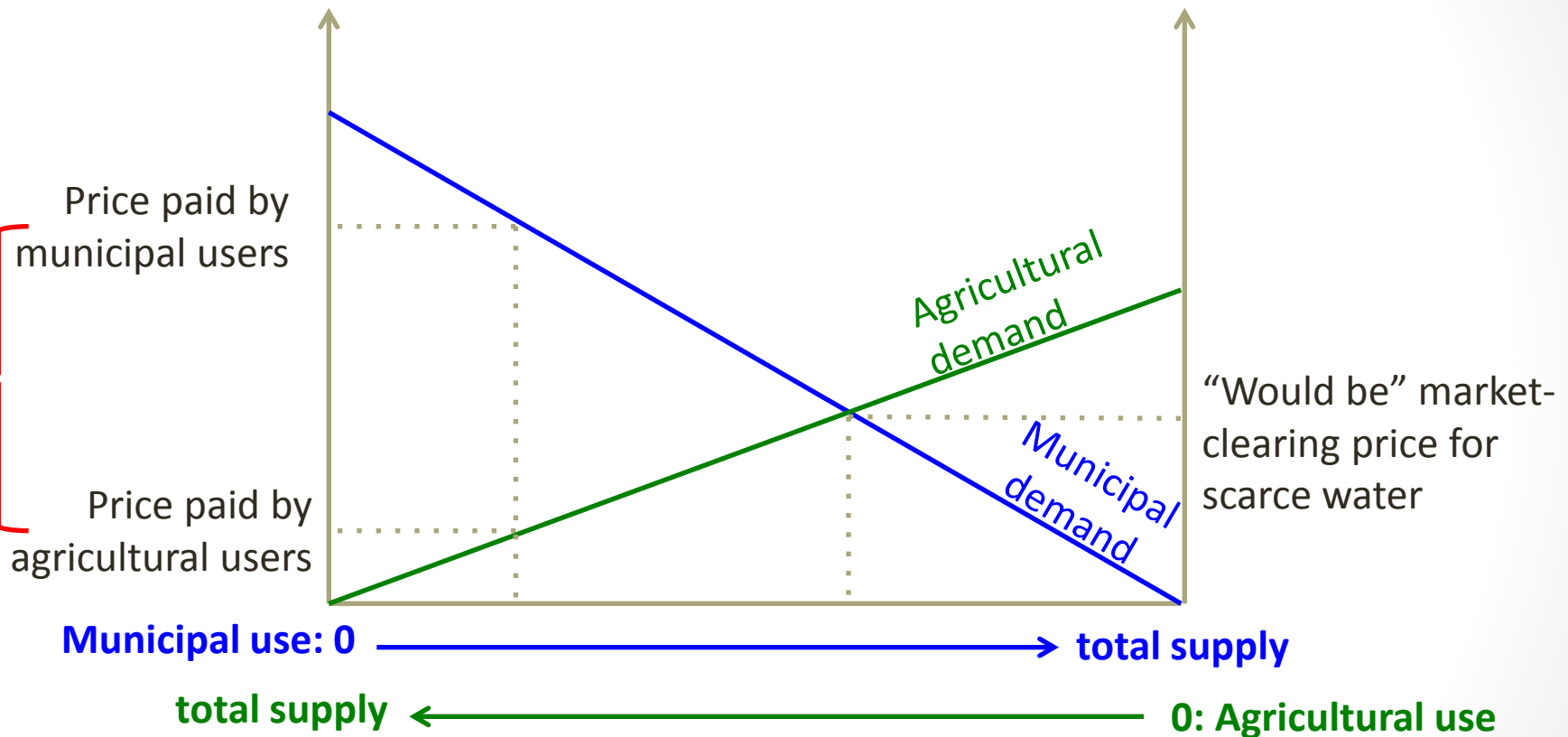


# Prices achieve conservation cost-effectively

- Households, firms and farms decide how to reduce consumption, and by how much.
- Households and firms with different costs and benefits of water use can react differently.
- Water use reductions occur among users with the lowest value for water use.



# More importantly, prices determine the allocation of water across sectors.



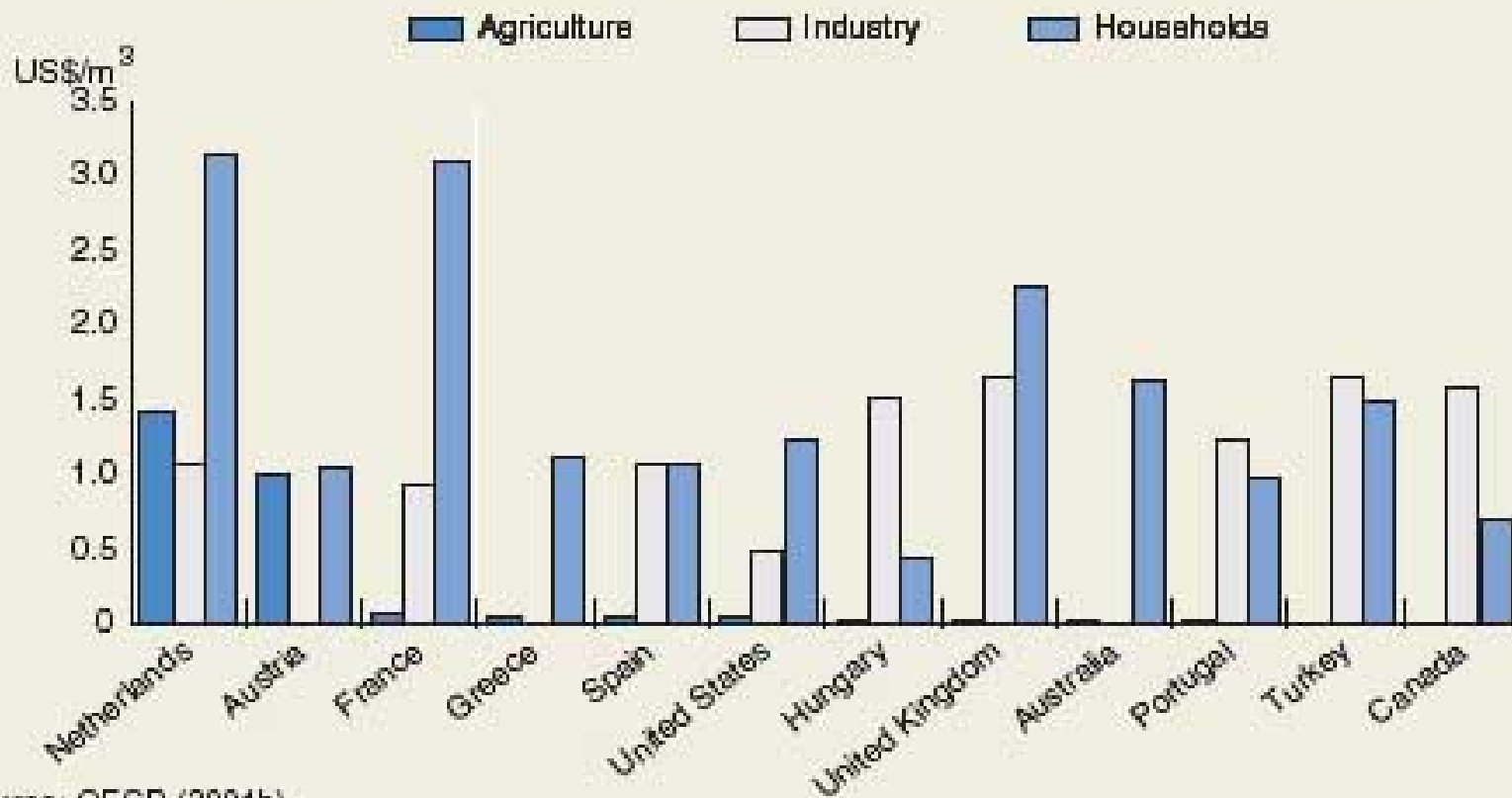
→ Different prices (in Texas' case, municipal/industrial prices higher than agriculture), open up a big gap in the value of water used in different sectors.



# We're not alone...

## Price of water

Comparison of agricultural, industrial and household water prices (late 1990s)



Source: OECD (2001b)





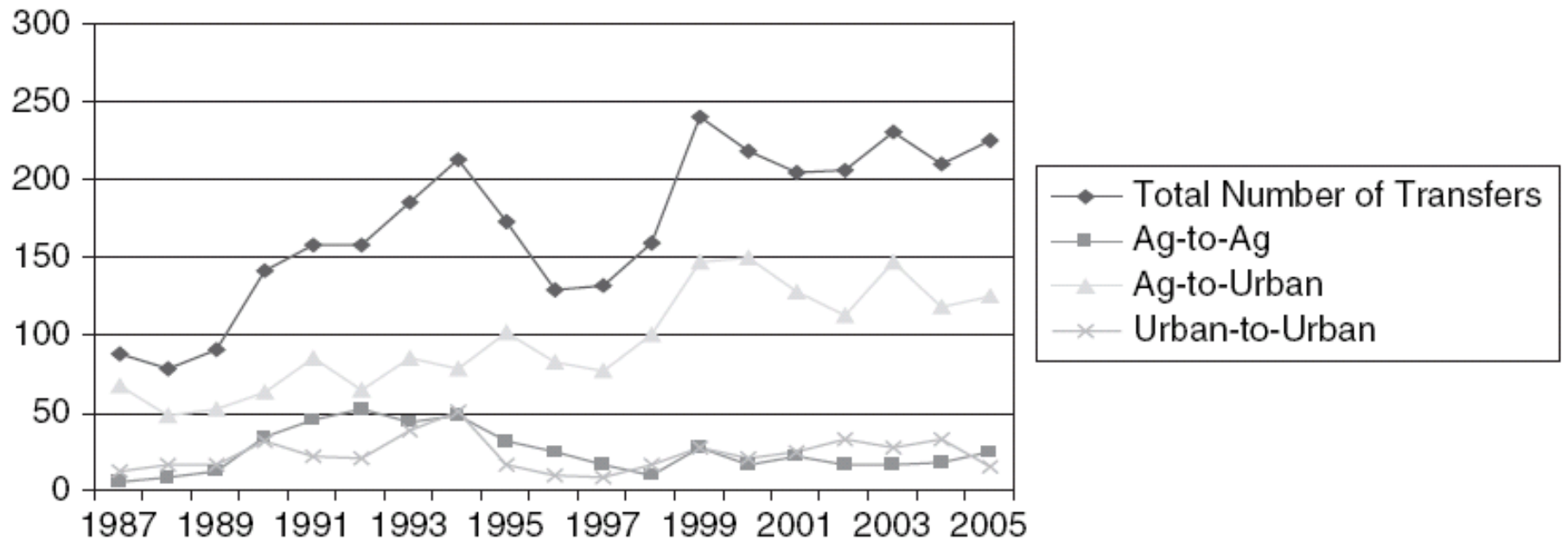
# Those big differences in water values produce pressure for change.

- Even without a formal market, the gains from trade (or some less appealing re-allocation mechanism) are obvious to some parties.
- Pressure to re-allocate is particularly strong when supplies are most scarce (water shortage, drought).



# Do water markets work?

**FIGURE 3**  
Water Transfers by Sector, 1987–2005



Brewer J., Glennon R., Ker A., Libecap G. 2008. Water markets in the West: Prices, trading, and contractual forms. *Economic Inquiry*. 46:91-112.



# Finally, benefit-cost analysis...

- State Water Implementation Fund for Texas (SWIFT) will leverage \$2 billion in taxpayer money to help finance projects in the state water plan.
- Large water infrastructure projects tend to have costs that exceed their benefits (they subsidize use in one location, or by one set of users, at the greater expense of others).
- SWIFT (and SWIRFT) should avoid this “pitfall” of western and southwestern water projects
  - Identify “best” projects using rigorous benefit-cost analysis
  - Count reduced instream flows, and/or reduced groundwater levels, on the cost side of the ledger.



# Concluding thoughts on water prices, markets, and benefit-cost analysis

- Pricing water at its full opportunity cost “signals” its scarcity, and its value.
- Many other pieces to the puzzle (education, etc.), but these are complements to, not substitutes for, the right price.
- Even with big price (and value) gaps across sectors, markets can maximize the net benefits of a water resource.
- Think like the market would when choosing new infrastructure investments – analyze benefits and costs, and “count” the depreciation of natural capital.

