Texas anglers are willing to pay for some short- and long-term changes in water quality

The value of water quality to recreational anglers

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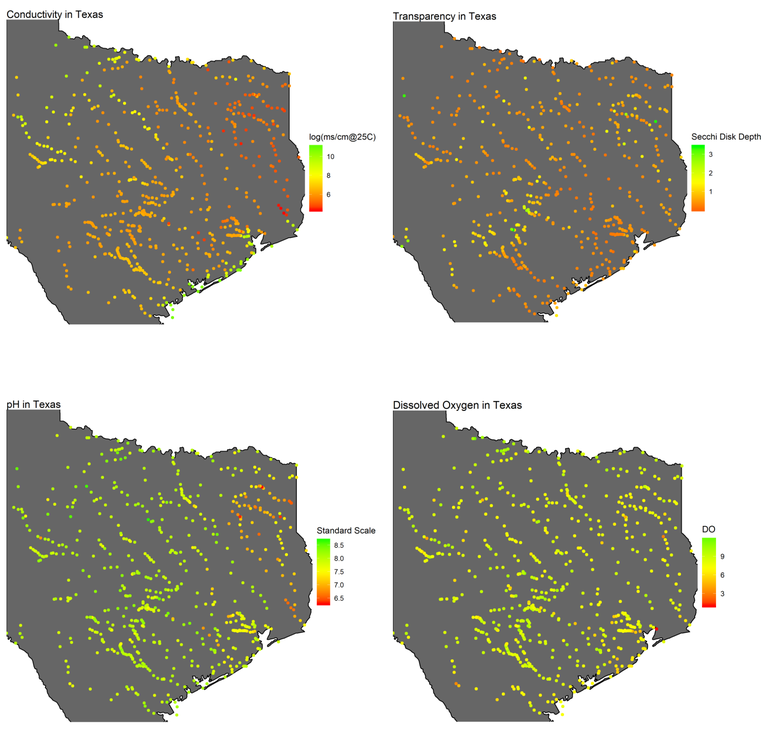
OUR QUESTION

- Water quality is regulated through direct measurements
- Water quality varies across time (annual deviations) and space (spatial variation), so each fishing site has acute (short-term) and chronic (long-term) conditions that may affect angler welfare
- **What is the willingness to pay for short- and long-term changes in direct water quality measurements?**

DATA

- Angler data: *Survey of Texas Anglers*, a cross-section repeated 5 times from 2001 – 2015.
- Water quality: *Surface Water Quality Monitoring Information System*, spotty panel from Texas Commission on Environmental Quality.



ESTIMATION

- First-stage:

$$V_{ijt} = \alpha_j + \beta_1 C_{ijt} + \beta_2 Q_{jt}$$

or

$$V_{ijt} = \alpha_j + \beta_1 C_{ijt} + \beta_2 Q_{jt} + \beta_3 LD_{ij} + \beta_4 \left(LD_{ij} \cdot C_{ijt} \right)$$

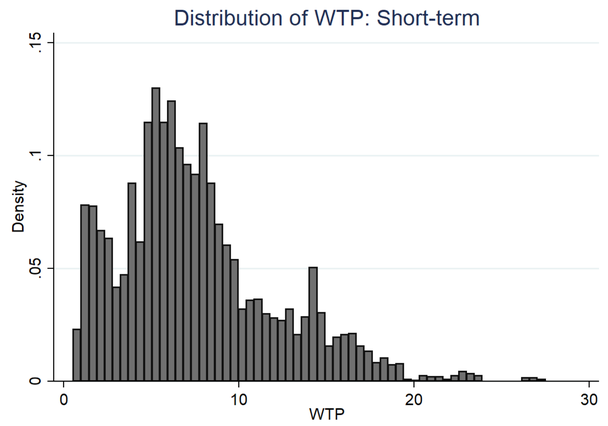
- Second-stage:

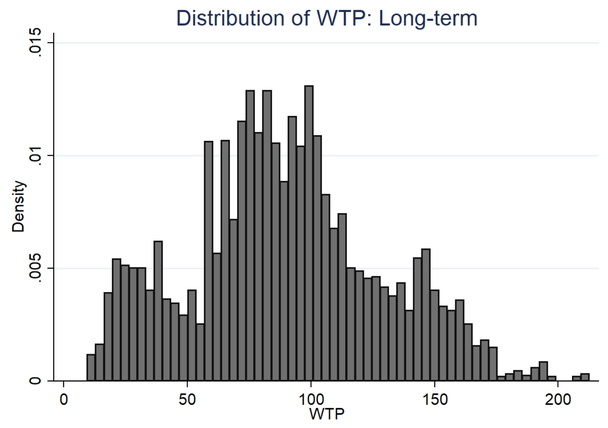
$$\alpha_j = \rho \bar{Q}_j + \tilde{\alpha}_j$$

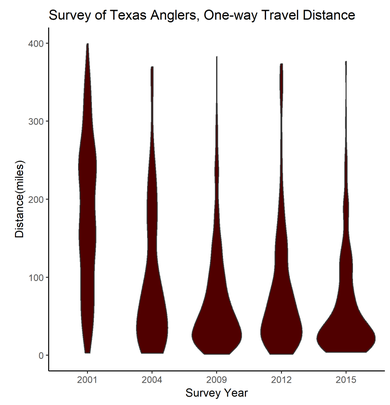
- We account for unobserved alternative heterogeneity and allow for different travel preferences for long-and short-distance trips (threshold = 100 one-way miles). The first-stage recovers the short-term effect, the second-stage recovers the long-term effect of water quality on recreational demand.

RESULTS

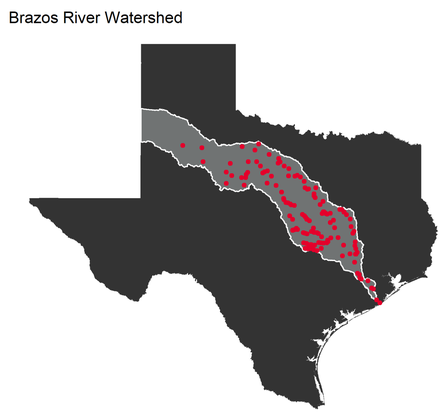
Using standard inclusive value techniques, we estimate the distribution of WTP for a 0.5 standard deviation improvement in water quality for a central Texas watershed:

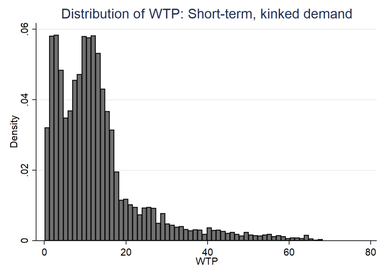


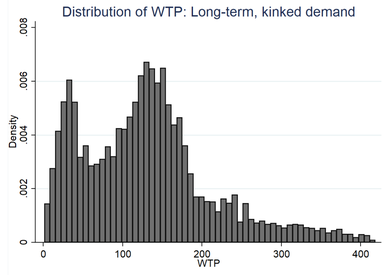




	Short-term (First Stage)		Long-term (Second Stage)		
	(1) No-Kink	(2) Kink at 100	(1) No-Kink	(2) Kink at 100	
Travel Cost	-0.00810*** (0.000301)	-0.0187*** (0.000756)			
Long-distance dummy		-4.379*** (0.223)			
LD x (Travel Cost)		0.0142*** (0.000771)			
DO	0.101* (0.0593)	0.0976 (0.0596)	-1.025 (0.747)	-1.059 (0.742)	Long-term DO
pH	0.585*** (0.207)	0.626*** (0.208)	1.177 (0.961)	1.114 (0.949)	Long-term pH
Cond	-0.336*** (0.109)	-0.408*** (0.119)	-1.651** (0.659)	-1.530** (0.645)	Long-term Cond
Trans	0.344*** (0.120)	0.348*** (0.124)	1.700 (1.445)	1.711 (1.442)	Long-term Trans
AIC	11631.9	11046.9		202	Obs.
LL	-5609.0	-5314.5		0.441	Adjusted R^2







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