



ECONOMICS IN ACTION: POLICY RELEVANT RESEARCH

Kurt E. Schnier
Department of Economics
Georgia State University
Andrew Young School of Policy Studies



ECONOMICS AND POLICY

- Economics studies human behavior
 - Markets
 - Human interactions
- Two central tenants
 - TANSTAAFL
 - Incentives are the key
- Allows us to inform and evaluate policy



OUTLINE

- Fishery Policy
 - Habitat protection
 - Commercial impacts of eco-labeling
 - Heterogeneous spatial behavior and production
- Current Research
 - Behavioral responses to regulator change
 - Water pollution markets (interdisciplinary)
 - Health economics (interdisciplinary)
- Potential Applications for the WRRC



WHY FISHERIES?

- Complex economic systems
 - Spatial behavior
 - Dynamic behavior
 - Competitive interactions
- Complex ecological systems
 - Metapopulation structure
 - Multi-species interactions
- Combined:
 - Two-tiered system
 - Data sets are extremely rich (time, space, individual)



FISHERIES HABITAT

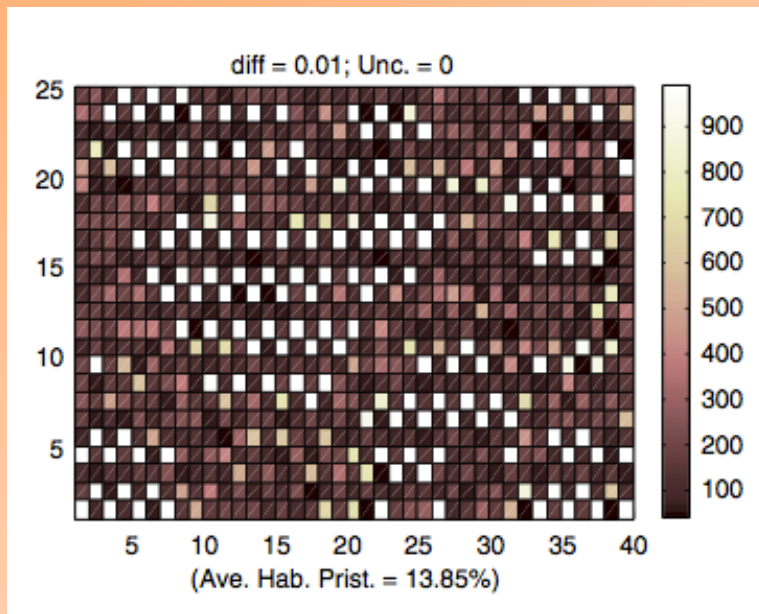


- Research motivated by Essential Fish Habitat Concerns
- Developed an agent-based simulation model to compare different policies
 - Marine Protected Areas
 - Rotating Marine Protected Areas
 - Individual Habitat Quota (IHQs) Markets



HABITAT

Spatial Patterns (2006a)



General IHQ findings Holland and Schnier (2006a,b,c)

- A more cost effective measure for habitat protection
 - Decreases with diffusion and uncertainty
- Effective at protecting sessile non-target species
- Results are robust to spatial heterogeneity in cost and regulation



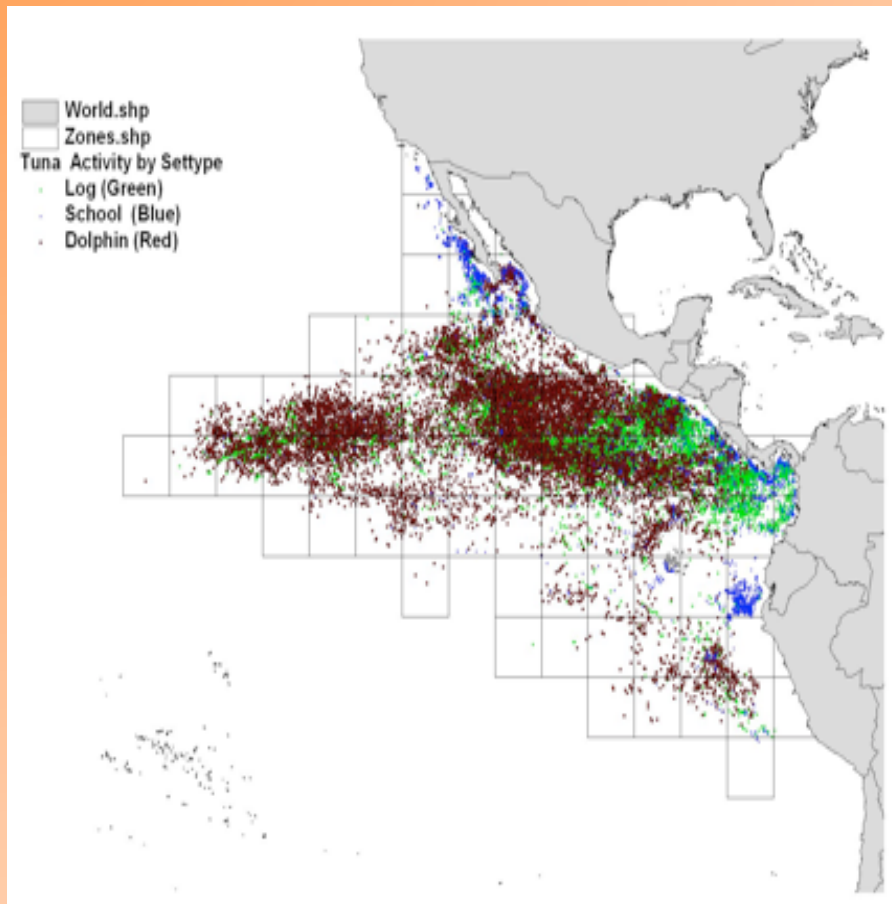


DOLPHIN-SAFE ECO-LABELING

- Develop a dynamic discrete choice model of fishing effort in the Eastern Tropical Pacific Ocean (Hicks and Schnier, 2008)
- Investigate the spatial/welfare impacts of the dolphin-safe tuna label
- Labeling defined by fishing technology choice



DOLPHIN-SAFE ECOLABELING



- Label considerably altered the dynamic spatial behavior of fishermen
- Resulted in sizeable welfare losses : 19 – 23% of average cruise revenues
- Resulted in the exodus of the U.S. fleet

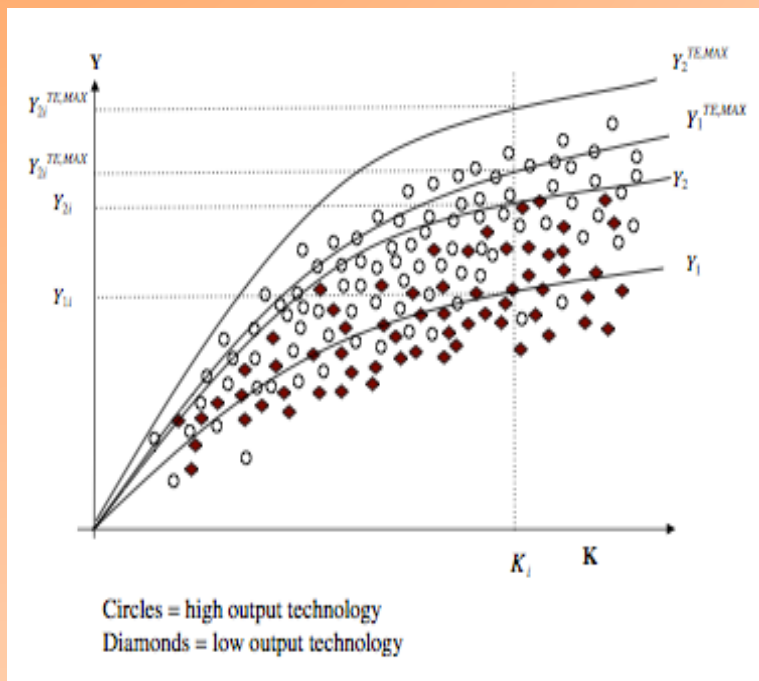


HETEROGENEOUS BEHAVIOR IN FISHERIES

- Fisheries are highly heterogeneous
- These forms of heterogeneity may have sizeable policy impacts if ignored
- Technological heterogeneity: (Flores-Lagunes et al. 2007; Felthoven et al. 2009)
 - Production in fisheries
- Heterogeneity in Regulatory Responses: (Haynie et al. 2009)
 - Provision of public goods (avoiding prohibited species)



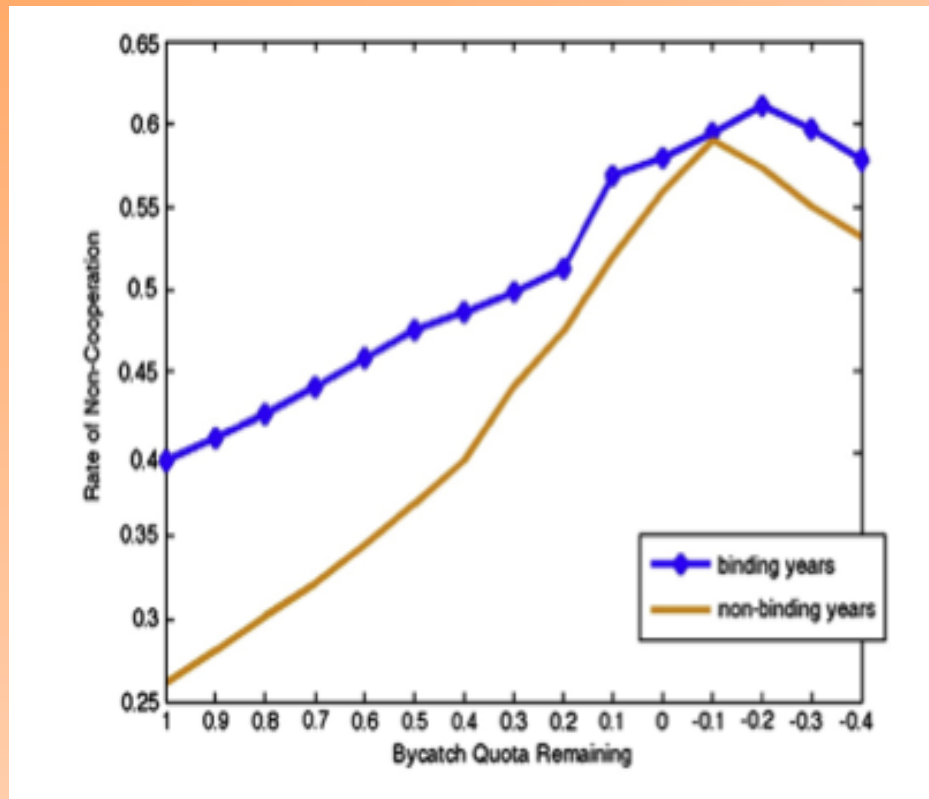
HETEROGENEOUS PRODUCTION IN FISHERIES



- Estimate production functions with heterogeneous technologies
 - Finite Mixture Model : Estimation Classification Algorithm
- Ignoring technological heterogeneity will bias technical efficiency estimates as well as capacity estimates



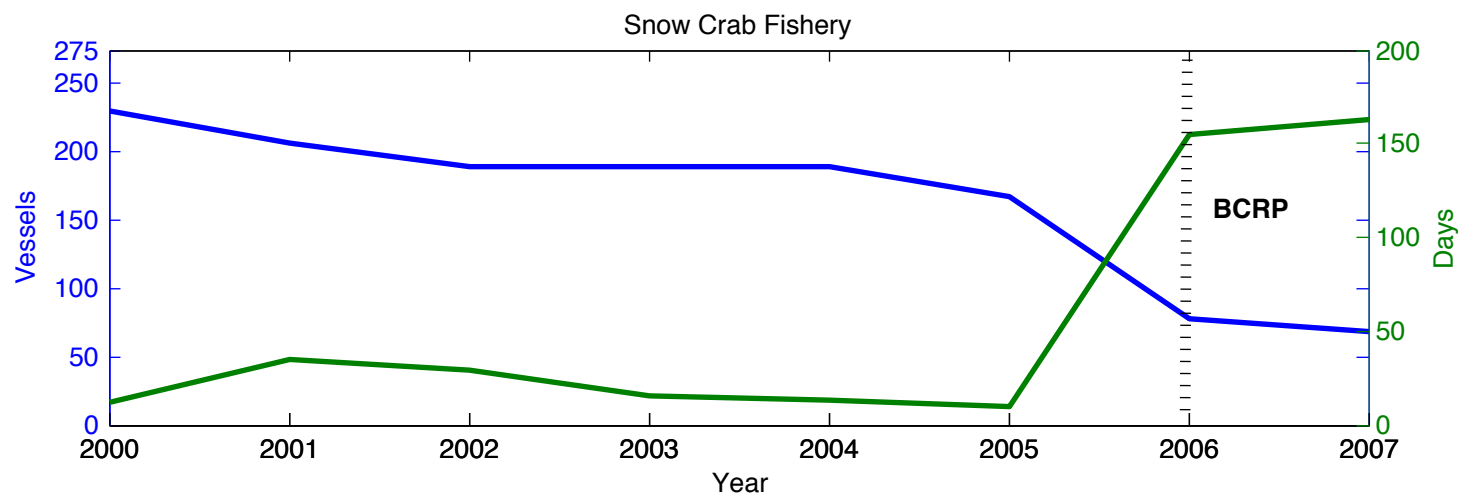
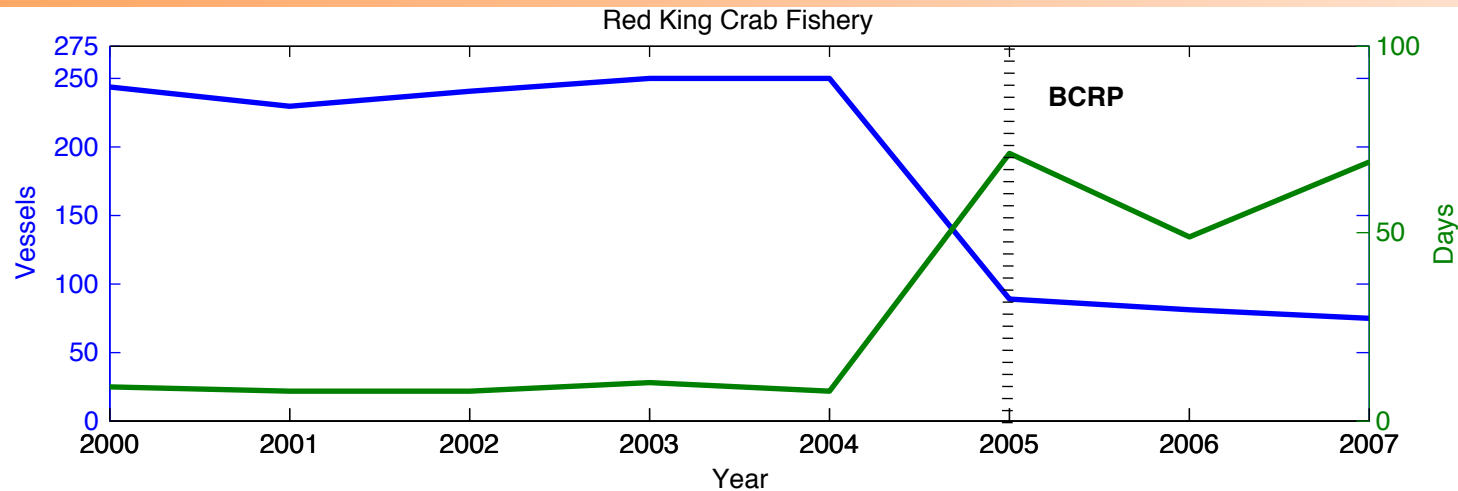
HETEROGENEOUS SPATIAL BEHAVIOR



- Investigate the rate of non-cooperation as PSC bycatch limits vary
- Utilize a random-parameters logit (mixed logit) model
- Rates of non-cooperation increase as the constraint becomes more binding
- “conditional cooperation” – Elinor Ostrom

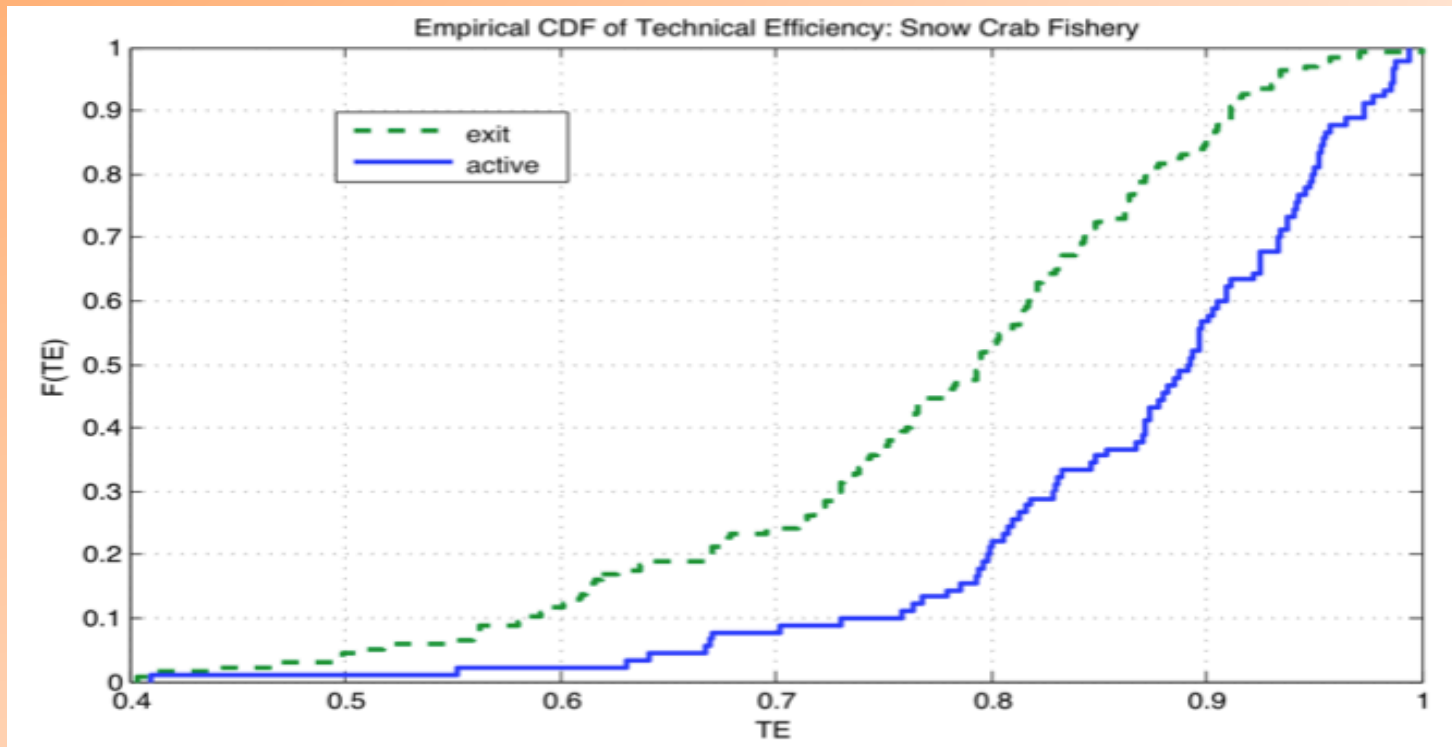


BEHAVIORAL RESPONSES TO REGULATION (BERING SEA CRAB RATIONALIZATION PROGRAM)



BEHAVIORAL RESPONSES TO REGULATION (BERING SEA CRAB RATIONALIZATION PROGRAM)

- Regional Delivery Requirements
- Behavioral Transitions



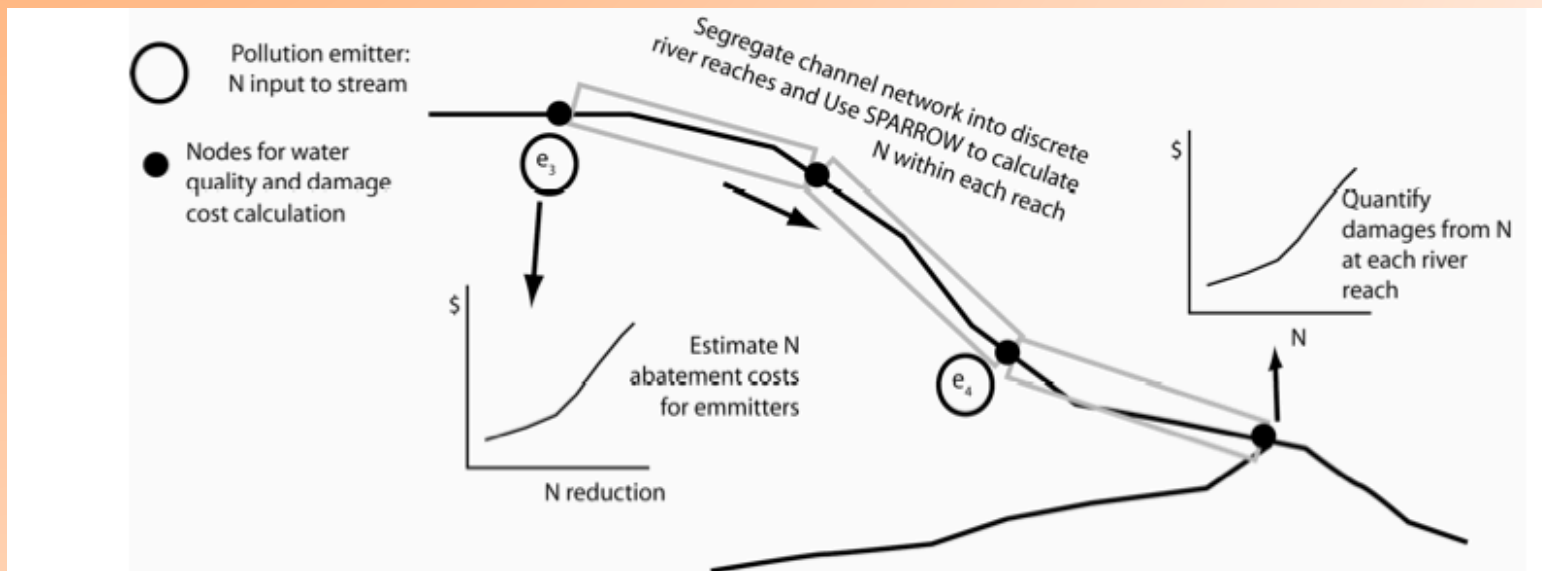
INTERDISCIPLINARY RESEARCH: WATER POLLUTION MARKETS

- Research Team: Hydrologists (UNC-Chapel Hill); Economist (Univ. of Richmond)
- NSF: Coupled-Human Natural Systems
- Investigate the effect of spatial scale in water pollution markets
 - Nature of firm heterogeneity
 - Spatial pattern of damages
 - Possible presence of market power (thin markets)
- Experimental analysis of supply function equilibria
 - Varying the number of firms
 - Varying degrees of heterogeneity



INTERDISCIPLINARY RESEARCH: WATER POLLUTION MARKETS

- Application: Neuse River in North Carolina
 - Market outcomes combined with a hydrological and biogeochemical model
 - Determines spatial implications of water pollution



INTERDISCIPLINARY RESEARCH: HOSPITAL DISCHARGE DECISIONS

- Research Team: Surgeons and Information Technology Specialists (Emory Medical School)
- NIH: Behavioral Economics for Nudging The Implementation of Comparative Effectiveness Research: Pilot Research
- Combines:
 - Applied econometric modeling (discharge decision; probability of readmission; anticipated length of stay)
 - IT software development
 - Experimental economics: field experiment of discharge software
- Focuses on hospital readmission



SUMMARY OF RESEARCH METHODOLOGY

- Applied Econometrics
 - Discrete choice modeling
 - Production modeling
 - Behavioral heterogeneity
 - Dynamic behavior
- Experimental Economics
 - Common-pool resources
 - Public goods
 - Auctions and markets





*“WHISKEY’S
FOR DRINKING,
WATER’S FOR
FIGHTING
ABOUT”*
– MARK
TWAIN



POTENTIAL APPLICATIONS FOR THE WRRC -- CURRENT AZ WATER ISSUES

- Blue Ribbon Panel on Water Conservation
 - Reuse, recycling and conservation
- Educating general population
- Transboundary water negotiations
- Utilizing water from environmental benefits
- Water banking
- Active Management Area (AMA) water regulations
- Water-Energy Nexus
- Forecasting future demands
 - Climatic and population uncertainty



WATER: DISCRETE CHOICE MODELING

- Water banking decisions
 - Dynamic resource allocation problem
- Information flows and policy use of climate diagnostics and cyclone prediction for adaptive water-resources management under climatic uncertainty in Western North America
 - Investigate role that climate plays in residential choice
- Water-Energy Nexus -- Trend analysis of population growth, water and energy use in Arizona
 - Land use modeling in GA
 - Construct a historical panel data set of population/land use change to develop a dynamic model of human choice related to these variables.



WATER EXPERIMENTS

- Project WET
 - Investigate efficacy of alternative information treatments on water demand
- Moving Forward: Adaptation and resilience to climate change, drought and water demand in the urbanizing southwestern United States and Northern Mexico
 - Investigate the link between climate change information and water demand
- NEMO
 - Similar to current work in water pollution markets
- Water for environmental services
 - Conserve to Enhance program
 - Ecosystem markets (bi-lateral)



WATER : APPLIED ECONOMETRICS

○ Topics

- Transboundary resource management
 - Current oil research
- Active Management Area policy

○ Methodology

- Program evaluation
 - Regression discontinuity
 - Propensity score matching
 - Difference-in-difference estimators



CONCLUSION

- Incentives Matter!
- Understanding behavior will...
 - Investigate efficacy of policy
 - Investigate efficacy of conservation efforts
 - Investigate the human-ecological interface

