

# Producer Response and Economic Incentives for Agricultural Water

## Agricultural Water Conservation Symposium

USDA - CSREES National Water Conference  
February 3 - 7, 2008  
Reno, Nevada

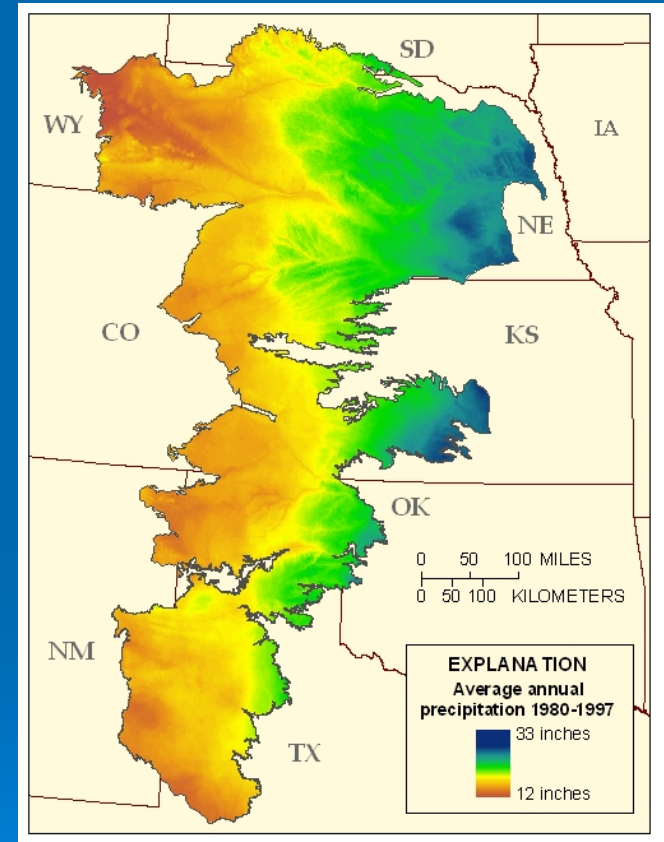


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# The Ogallala Aquifer

- 💧 Water levels are declining
- 💧 10% - 70% depletion rates
- 💧 Increasing irrigated acres
- 💧 Rural economies are vertically linked with irrigated agriculture



# Problem

- 💧 The Ogallala Aquifer is in decline
  - 💧 Everyone wants to extend the economic life of the aquifer
  - 💧 It has to be a regional effort
  - 💧 No one wants to adversely impact rural economies

# Solution

- 💧 Voluntary and incentive based policies that achieve an absolute reduction in groundwater use

# Economist's Role

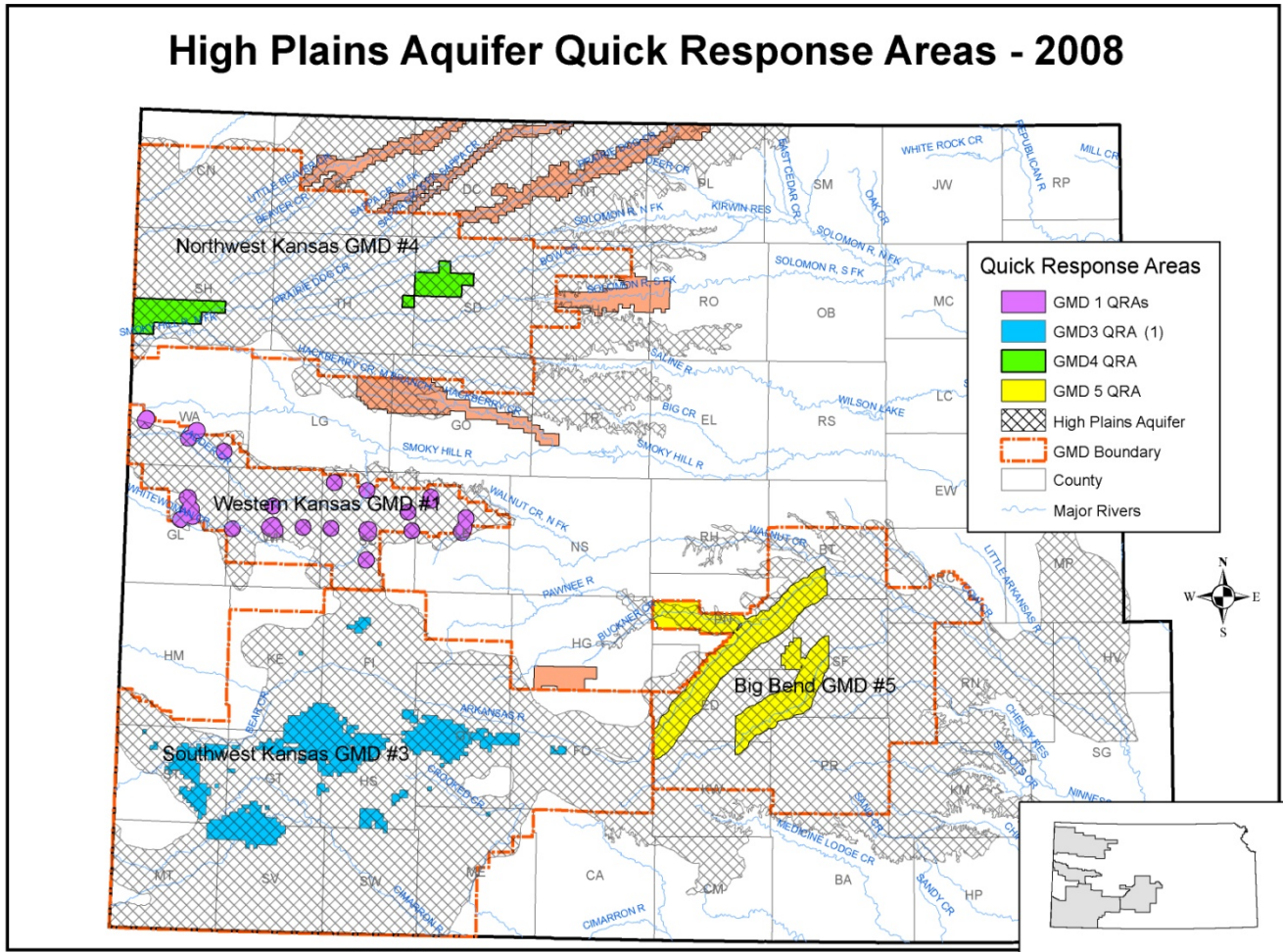
- 💧 Develop and analyze policy solutions

# Voluntary & Incentive Based Programs in Kansas

- 💧 Technology Cost Share Programs
- 💧 Water Right Buyouts
- 💧 Water Rights Leasing
- 💧 Conservation Reserve Enhancement Program

# Voluntary & Incentive Based Programs in Kansas

## High Plains Aquifer Quick Response Areas - 2008





# Technology Cost Share Program

Conventional Center Pivot Technology



Flood Technology



LEPA Center Pivot Technology

# Technology Cost Share Program

- 💧 **Question**: Did the program save water?
- 💧 **Answer**: No, the State expended \$2.7 million in taxpayer dollars on nearly 150,000 acres ( \$10 - \$35 per acre) and did not achieve a reduction in groundwater usage.
- 💧 **Unintended Consequence**: In many cases water use increased
- 💧 **Why**: Producers found other uses for the 'saved' water.
- 💧 **Reason**: The State's goal of improving irrigation efficiency as a means to conserve groundwater did not coincide with the individual producer's goal of improving irrigation efficiency as a means of increasing profits.
- 💧 **Lesson Learned**: To implement effective water conservation policy, we have to understand and predict individual behavior.

# Voluntary & Incentive Based Programs in Kansas

## 💧 Environmental Quality Incentive Program

- 💧 EQUIP is funded by the NRCS & local GMDs
- 💧 Stops ground water pumping for 3 – 4 years
- 💧 Allows non-irrigated production.
- 💧 \$100 per acre per year.

## 💧 Conservation Reserve Enhancement Program

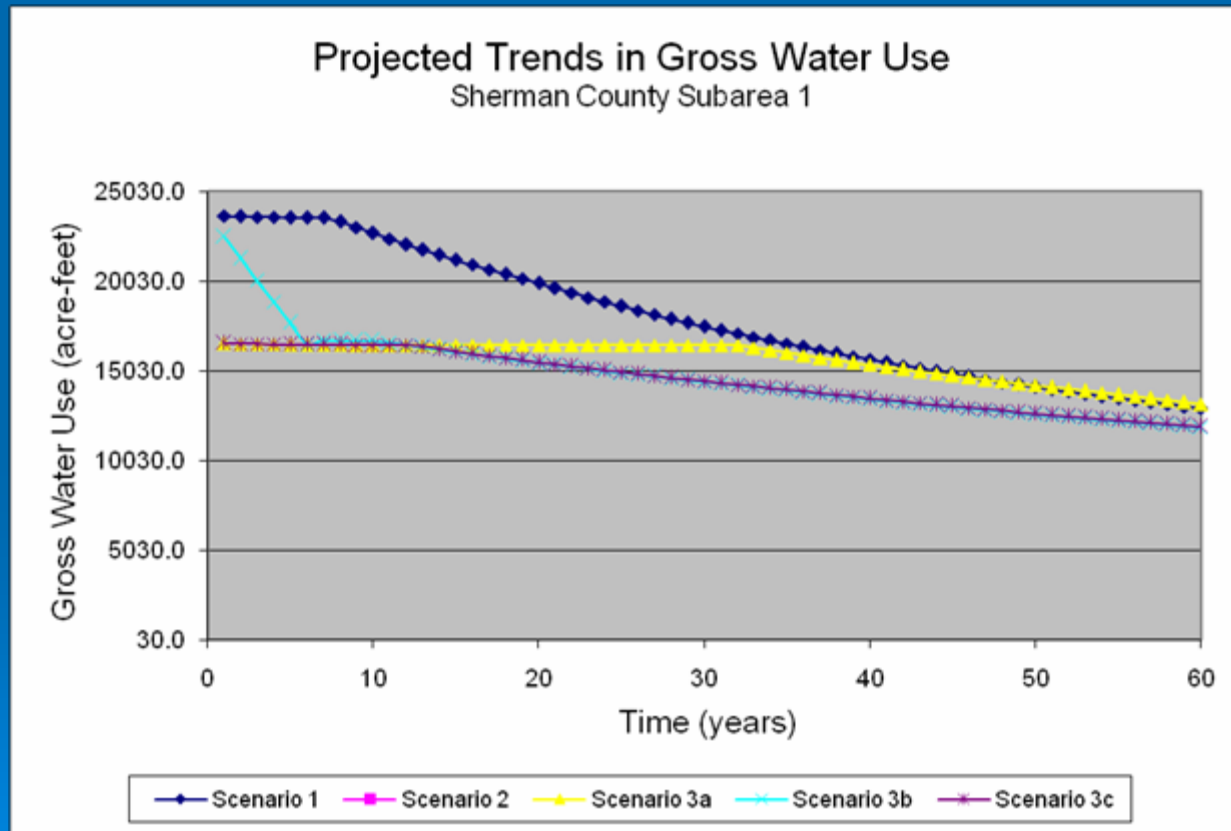
- 💧 CREP is funded by the FSA & the state of Kansas
- 💧 Permanently retires the water right
- 💧 Does not allow non-irrigated production for 15 years (CRP).
- 💧 \$125 per acre for 15 years



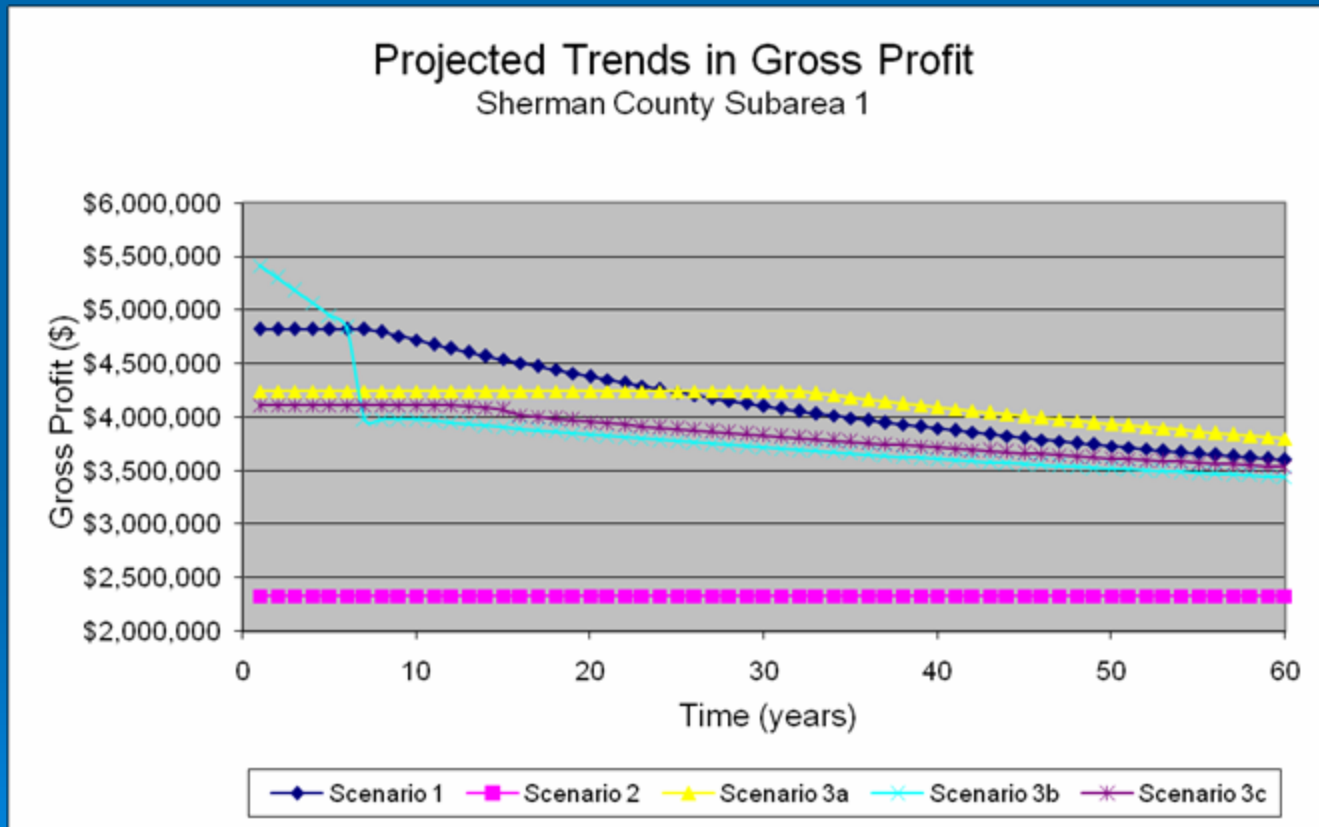
# Economic Methods Used in Policy Analysis

- 💧 Typical stakeholder questions
  - 💧 What is the taxpayer cost
  - 💧 What is the impact on the aquifer
  - 💧 What are the economic impacts on producers & the rural economy
- 💧 Budgetary Approach
  - 💧 Annual lease value of water
- 💧 Hedonic Models
  - 💧 Values for water rights
- 💧 Dynamic Temporal Allocation Models
  - 💧 60 year forecast for the impacts to the producer and aquifer
- 💧 IMPLAN models
  - 💧 Economic impacts on the rural economies

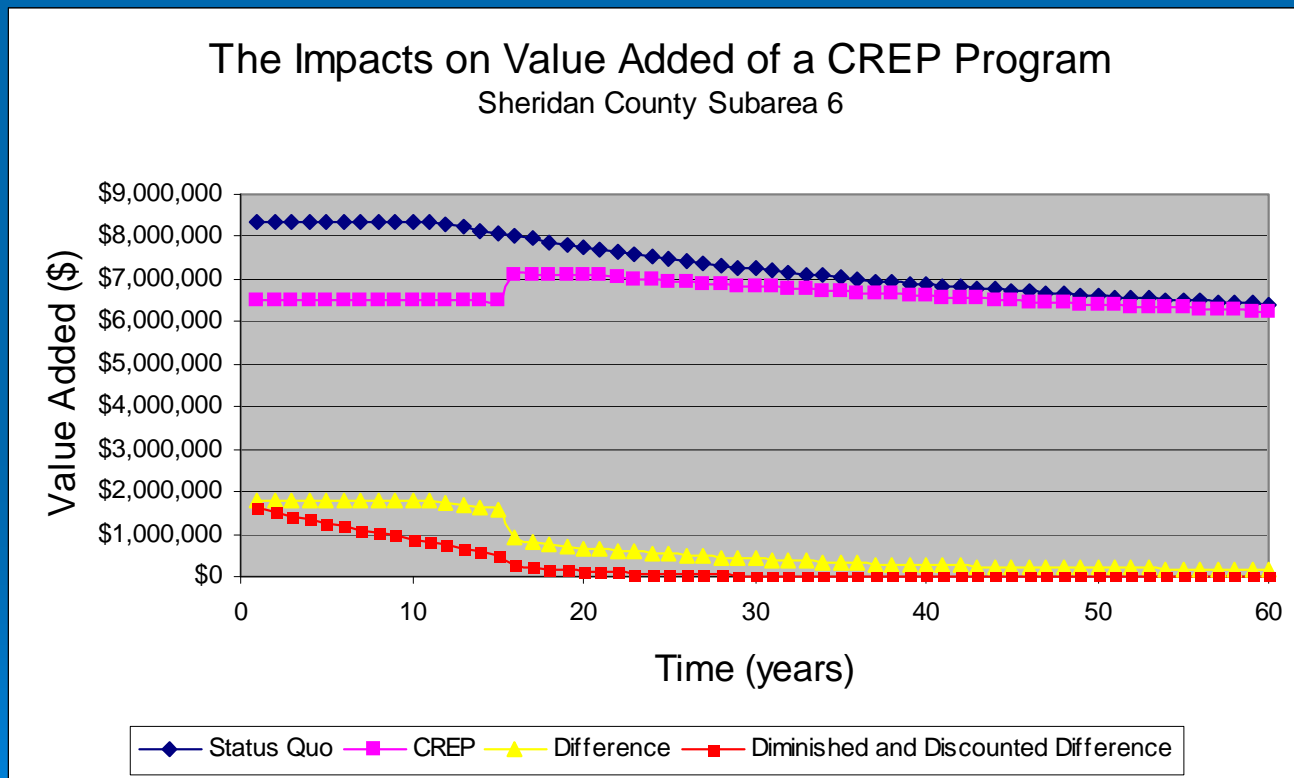
# Economic Methods Used in Policy Analysis



# Economic Methods Used in Policy Analysis



# Economic Methods Used in Policy Analysis



# Impacts

- 💧 Technology cost share program was stopped
- 💧 Water valuations used as basis for CREP
- 💧 IMPLAN analysis used as the basis for CREP
- 💧 Research has been incorporated into the IGUCA process
- 💧 A new conservation policy based on 'limited irrigation' is being developed by the state.
- 💧 A lot of positive response from producer groups
- 💧 A lot of negative response from business groups



# Gaps in Conservation Research

## 💧 IMPLAN

- 💧 The duration of economic impacts
- 💧 Producer and business responses to reduced water use
- 💧 Determinants of program participation
  - 💧 Participant demographics
  - 💧 How landowners view the value of a water right (production value, option values....)
  - 💧 Cropping characteristics of participants
  - 💧 Aquifer characteristics of participants

# Questions

