

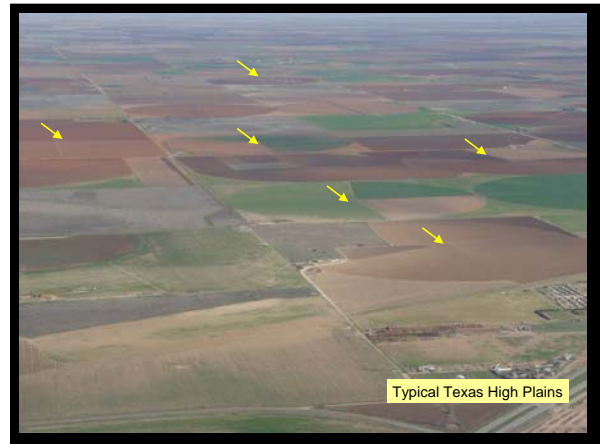
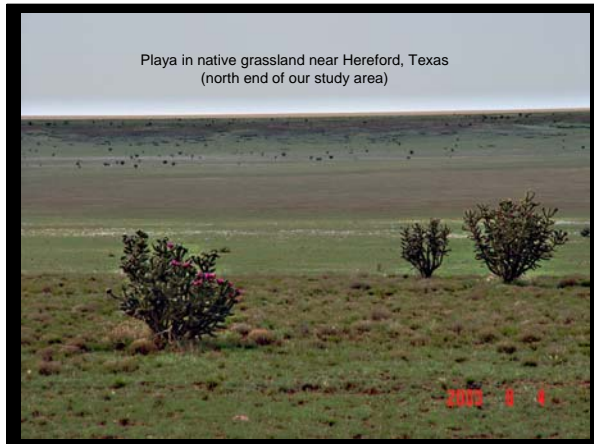
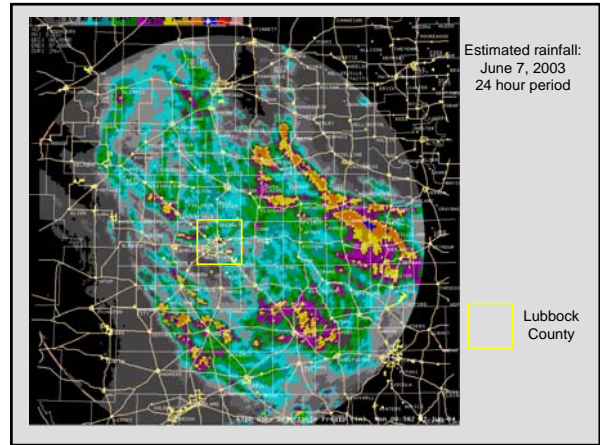
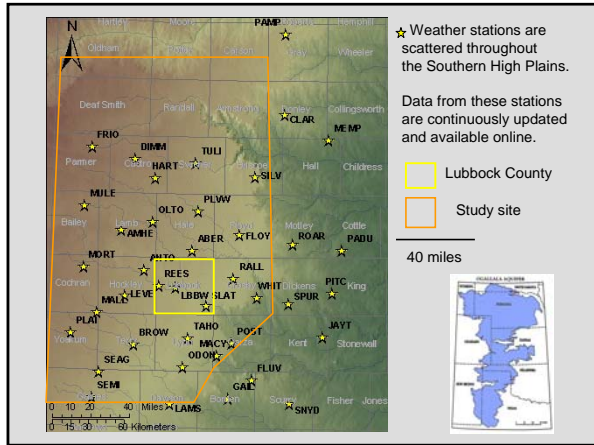
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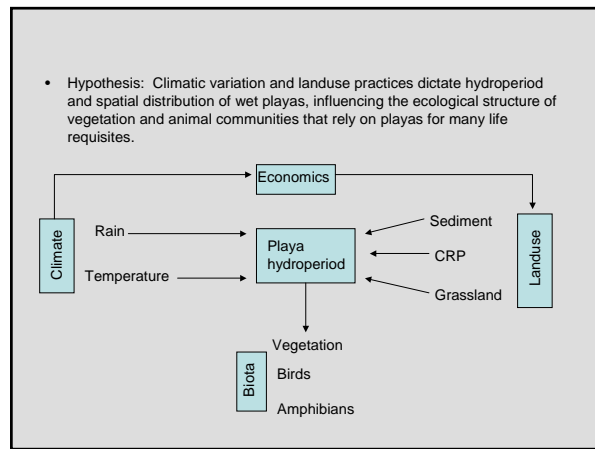
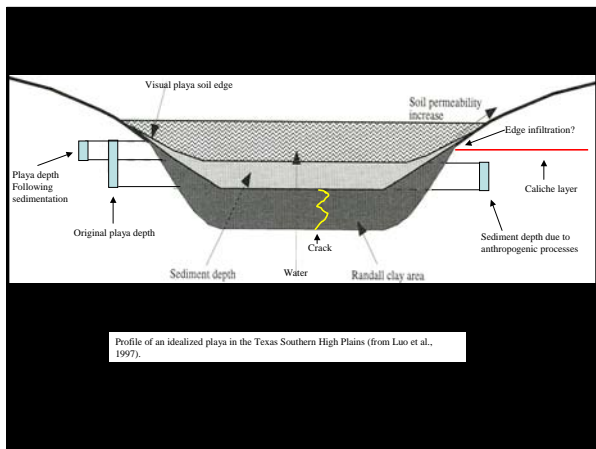
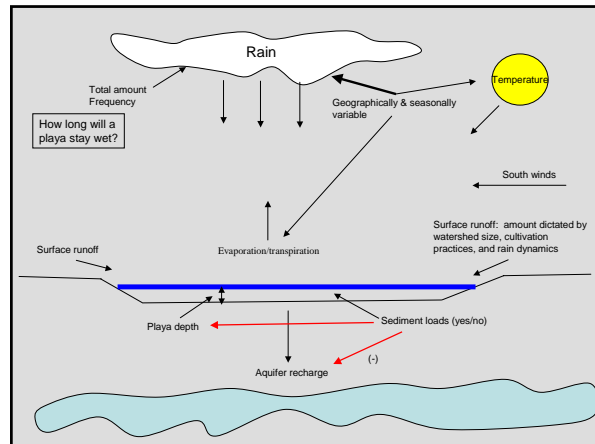
Interactions among climate, humans, and playa wetlands on the Southern High Plains

- S. McMurry, L. Smith, W. P. Dayawansa, D. Willis, C. Martin, K. Dixon, and C. Theodorakis
- Texas Tech University
- Lubbock, Texas

### Description of region

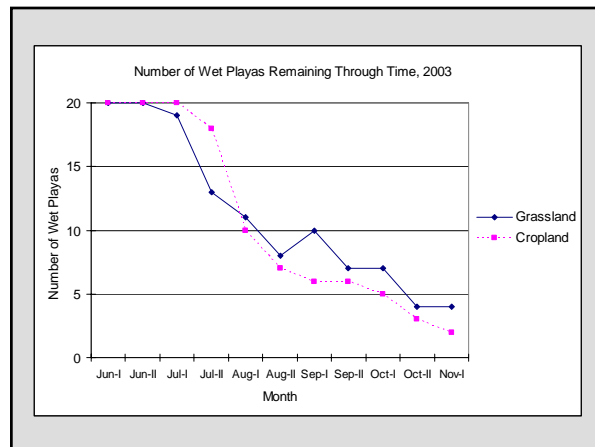
- Southern Great Plains
- About 30,000 playas (ideal experimental replicates)
- Each playa within its own watershed
- Heavy agriculture, mostly cotton and under irrigation from the Ogallala
- Significant wildlife use of playas





### Experimental Design

- Southern High Plains in west Texas
- 40 wet playas selected per year (20 cropland and 20 grassland)
- Sample amphibian, avian, and vegetative communities
- Determine playa hydroperiod, volume, sediment depth.
- Estimate extreme temperature and precipitation patterns.
- Estimate sediment runoff into playas.

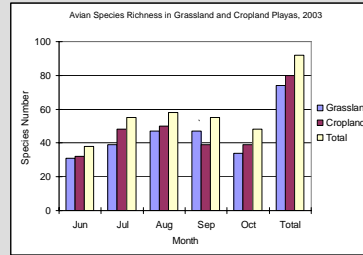


## Avian Studies

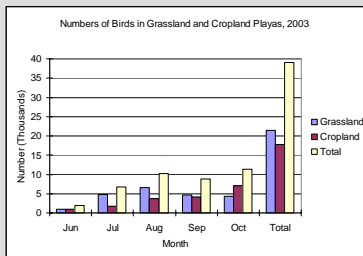
- Avian community composition in crop and grass plays
- Water fluctuation effects on avian community composition
- Local and landscape variable correlations to avian density, richness, and diversity



## Avian species richness



## Avian abundance

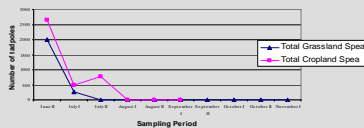


## Amphibian Studies

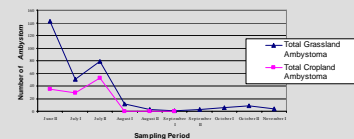
- Amphibian community composition in crop and grass plays
- "Mechanistic" analysis of community responses (differential sensitivity of species to hydroperiod)
- Local variable correlations with amphibian community composition



## Spea abundance in plays in two different land-uses, 2003

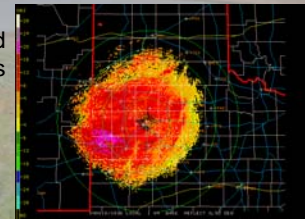


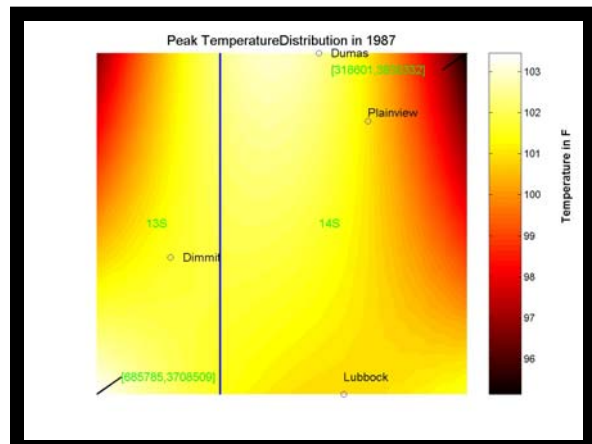
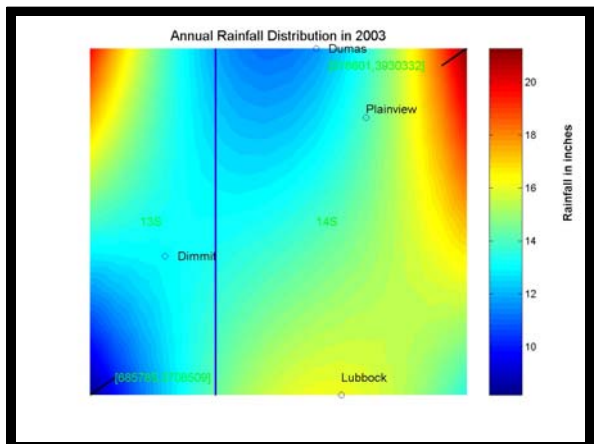
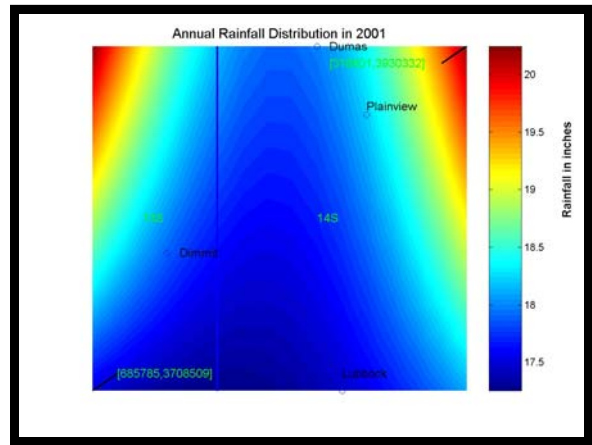
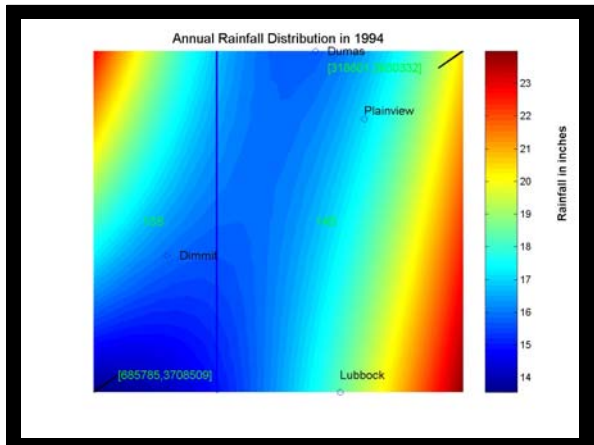
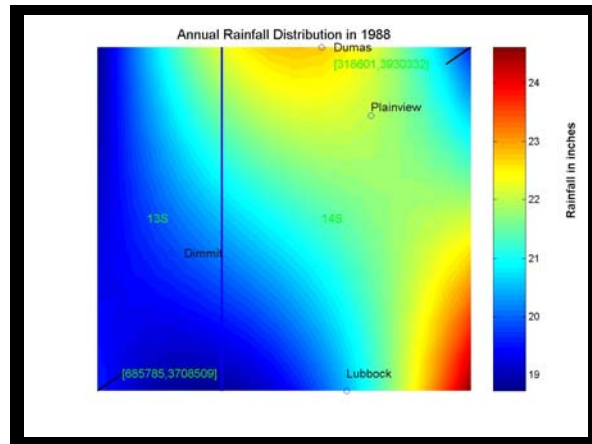
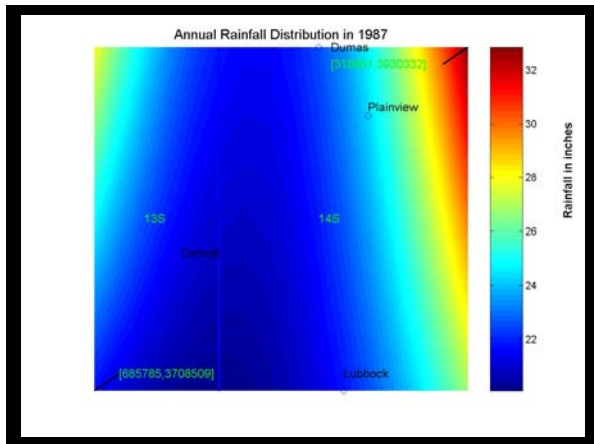
## Ambystoma abundance in plays in two different land-uses, 2003

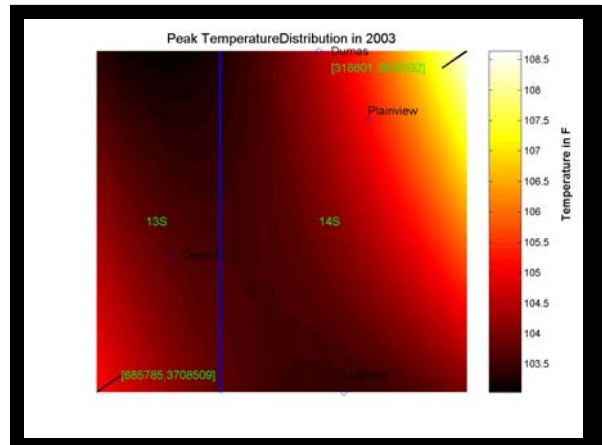
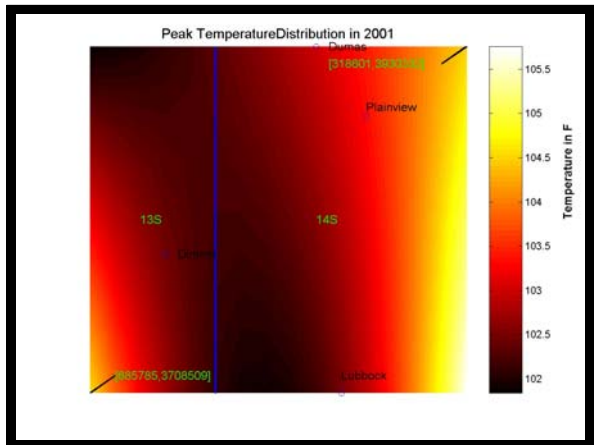
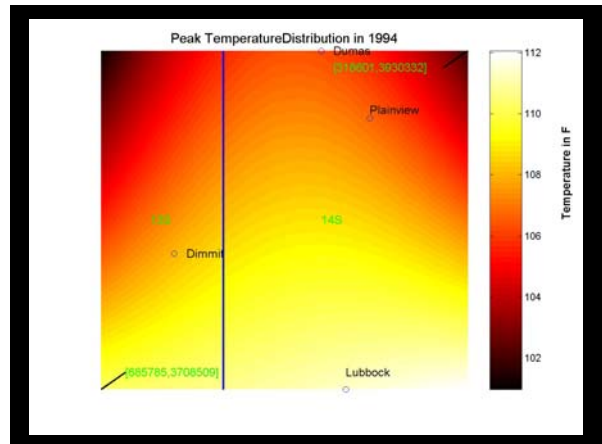
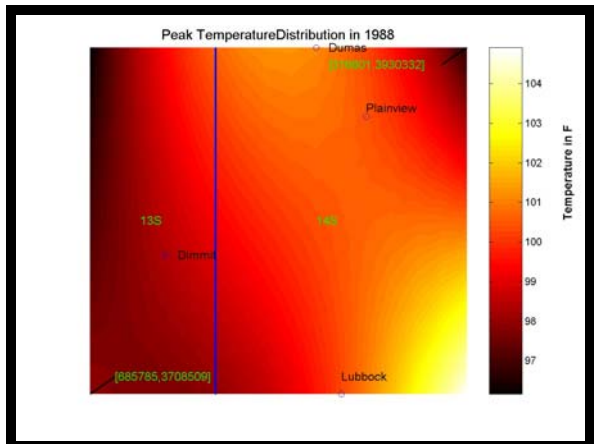


## Climatic predictions

- Spatial distributions of rainfall and temperature
- Long-term forecasts
- Correlate rainfall and temperature patterns with biotic data







### Integration

- Rainfall and temperature – 3 levels
- Playas & watersheds – vary soil, slope, sediment loads
- Biotic data
- Economic cost-benefit models
  - Predicted outcomes under current and new policies (mitigation strategies)
  - e.g., dryland, crop rotations, buffer strips, excavation

