

# Dynamics of Semi-Arid Vegetation in Response to Climate and Water-Use Policy

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# Introduction

## Questions:

- How do semi-arid communities respond to anthropogenic and natural environmental forcing?
- What are the fundamental thresholds to ecological change and how do human activities contribute to observed change?

## Goals:

- Use variability in water resources driven by climate and human response that diminished resources in Owens Valley CA to observe and quantify landscape-scale response to environmental forcing

## Approach

- Remotely sensed measurements of % live cover of green vegetation, acquired annually from 1984-2000
- Classify temporal changes in % live cover and link these to changes in water resources and to the decision making process for Owens Valley

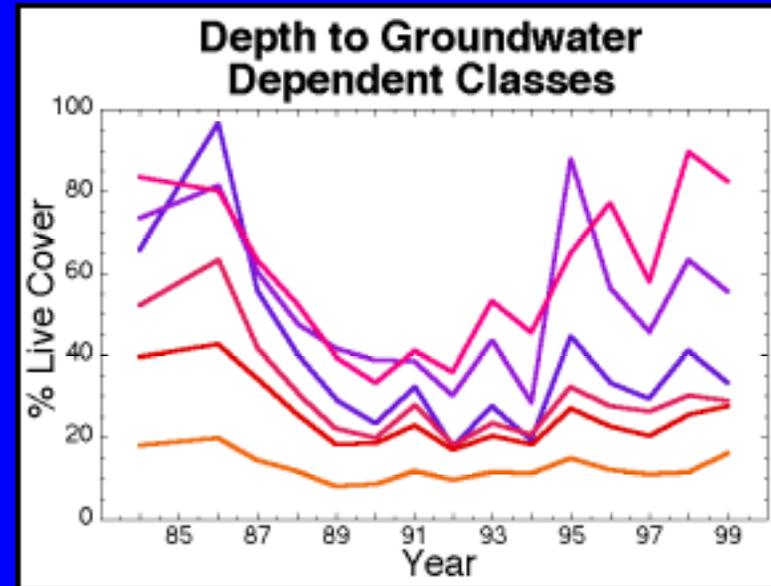
# Results

## Dynamics in % Live Cover of Owens Valley floor (1000 km<sup>2</sup>):

55%: No Significant Change

23%: Precipitation Response, correlated with land use history (abandoned agriculture) or degraded phreatophyte communities.

19%: Large declines in % live cover, variable recovery, correlated with decreases in depth to ground water, some transition to precipitation dominated, degraded response.



## Future steps:

Establish clear thresholds to fundamental and long-term environmental change

Establish a successional model that incorporates natural and anthropogenic disturbance

# Conclusions

- Succession and response is a function of land-use and water-use history
- Short-term decisions have long-term impacts on semi-arid vegetation dynamics
- Publications:
  - Elmore, A. J., J. F. Mustard, S. Manning, and D. Lobell, Quantifying percent live cover in multitemporal data of a semi-arid region: Comparison between spectral mixture analysis and NDVI, *Remote Sensing of Environment (in press)*, 2000.