

# Demographic and Socioeconomic Research in the Baltimore Ecosystem Study

## BACKGROUND

The inclusion of social scientists in any of the LTER projects is relatively new. The Demographic and Socioeconomic (Dem&Soc) Team includes Bill Burch (School of Forestry & Environmental Studies, Yale University), Morgan Grove (Northeastern Research Station, USDA Forest Service), Shawn Dalton (University of New Brunswick), Geoff Buckley and Chris Boone (Ohio University), Mathew Wilson and Austin Troy (University of Vermont), Mike Ratcliffe and Todd Gardner (US Census Bureau), and Karen Hinson (Baltimore County Public School System). Overall, the team works within the context of the Human Ecosystem Framework and a patch dynamics approach.

Since the establishment of the urban LTER projects in Baltimore and Phoenix, the Dem&Soc team has worked with social scientists from other LTER projects to establish core social science areas, address data issues, and identify strategies for integration with physical and biological scientists.

## LIST OF TYPES OF STUDIES

### Development of Patch Approaches

- Patch Delineation and Classification: methods and measurements
- Patch Pattern and Spatial Analysis
- Utility of Historical Census Data for Long Term Ecological Studies

### Network Analysis

- The Gwynns Falls Watershed: A case study of public and non-profit sector behavior in natural resource management

### Environmental Equity

- An Examination of Toxic Releases and Population Characteristics in Baltimore in Baltimore City

- Measure of Environmental Equity and the Gwynns Falls Watershed

### Public Works and Public Health

- History of Public Health for the City of Baltimore: 1906 – 1916
- Urbanization and Public Health: A study of the spatial distribution of infant mortality in Baltimore, Maryland, 1880

- Urban Infrastructure and Human Ecological Systems: A comparative study of wastewater management in Baltimore, Maryland (Baltimore Ecosystem Study) and Paris, France (Piren-Seine Zone Ateliers)

### Forest Institutions and Management

- Forest History of the Baltimore Ecosystem Study Area: 1906-1916

### Assessment and Valuation of Ecological Services

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### Modeling Human Ecological Systems

- Land Use Modeling
- Exploring the Spatial and Ecological Dimensions of Social Capital

### Education

- Education, Social Ecology, and Urban Ecosystems, with examples from Baltimore, Maryland

## GENERAL TYPES OF QUESTIONS AT NEIGHBORHOOD, CITY, AND REGIONAL SCALES

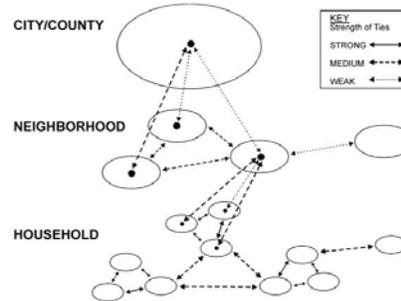
We are interested to study four types of questions at neighborhood, city, and regional scales:

- *Feedback characteristics:* Are feedbacks among social and ecological systems loosely or tightly connected?
- *Temporal characteristics:* does the relative significance of social and ecological drivers change over time? If yes, how and why?
- *Spatial characteristics:* are the relationships between social and ecological drivers affected by spatial adjacency, boundaries, connectivity, and configuration?
- *System characteristics:* Are changes in social and ecological systems characterized by gradual or sudden change? If change is sudden, are there key features that contribute to the resilience and stability of neighborhoods, the City, and the region?

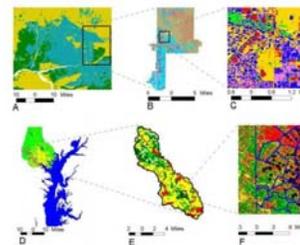
## TYPES OF ANALYSIS: scale, space, and time

Scale: the relationships among levels of social organization and their spatial influence.

### Scale: Diagram

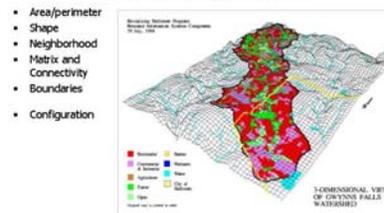


### Scale: Geography



## Spatial Analysis

### Spatial Dynamics



### Historic Census Geographies: 1990 – 1960 Census Comparison

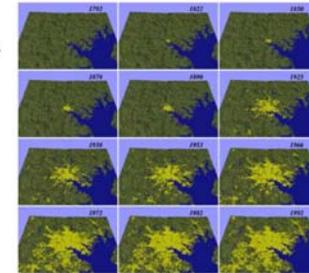


Boundaries of Census Tracts for Baltimore City. Red lines are 1990 boundaries, black are 1960. The first number of the census tract identifiers for 1960 correspond to the old ward numbers (1910). Reconstructing digital ward boundaries from 1990 census tract boundaries is a matter of "working backward" and aggregating or disaggregating areal units.

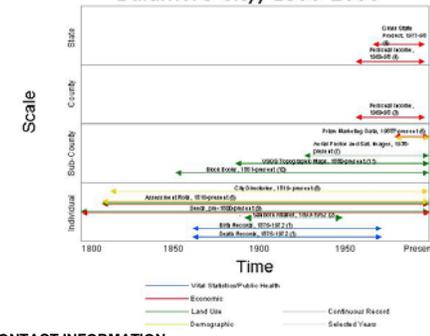
## Temporal Analysis

### Temporal Dynamics

- Non-linear change and thresholds
- Feedbacks within and among scales
- Time lags
- Legacies



### Historic Attribute Data over Time: Baltimore City, 1800-2000



## CONTACT INFORMATION

BES Website: [www.ecostudies.org/bes](http://www.ecostudies.org/bes)

### Principal Investigators

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### PRODUCTS

Products from the Dem&Soc team take many forms, including research reports, data, consulting in the development of policies, plans, and projects, and monitoring and evaluation of policies, plans, and projects.

### Two examples

Long term data for local and regional GIS-based data collection, analysis, and planning systems for efforts such as  
 • The Baltimore Neighborhood Indicators Alliance ([www.bnai.org](http://www.bnai.org)) and  
 • Baltimore Watershed Atlases ([www.parksandpeople.org/publications/special\\_reports/gfatlas.pdf](http://www.parksandpeople.org/publications/special_reports/gfatlas.pdf)).

These data can help address the questions of where have we been, where we are now, where are we going?

"Community Forestry" market profiles: what are the likely social organization(s), knowledge(s), behaviors, and responses to existing and new community forestry policies, plans, and management activities?