

An aerial photograph of a rural landscape in Iowa, showing a mix of green fields, brown soil, and a winding road. The image is slightly blurred and serves as a background for the text.

Using the Past to Create a Sustainable Future for Agriculture:

Linking Environmental and Social Landscape Change in Iowa

Paul W. Brown and Lisa A. Schulte

Diversity- Stability



Research Question

What quantifiable linkages exist between environmental and social landscape change in rural Iowa?

Conceptual Definitions:

Environmental landscape = the ecological interaction that occurs within the selected area of activity.

Social landscape = the human interaction that occurs within the selected area of activity.

Objective One:

Understand the linkages between environmental and social landscape change in Iowa from 1930 to 2002.

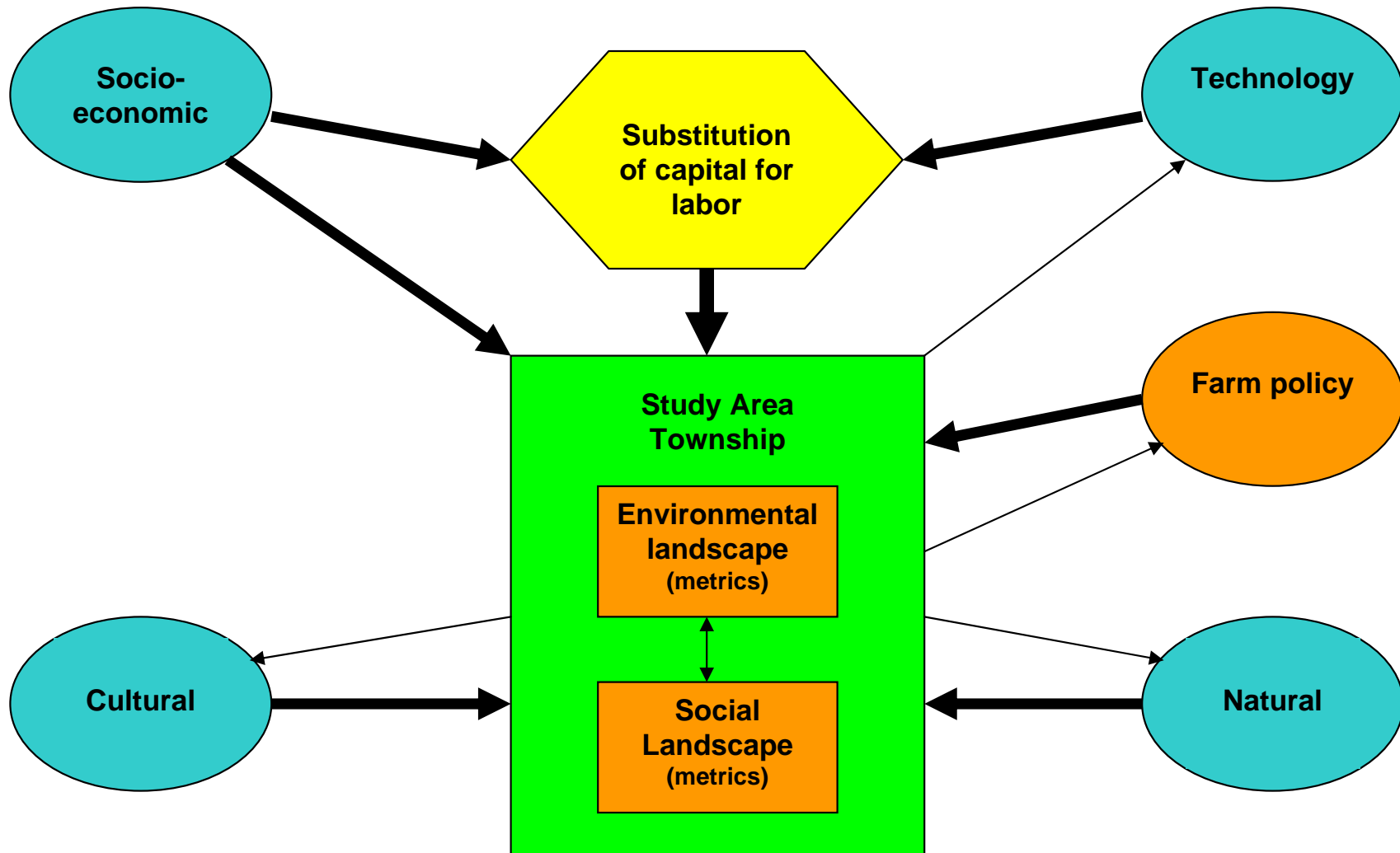
- Lack of diversity negatively affects social stability
- Linkages differ by physiographic region

Objective Two:

Understand the role of federal farm policy as a key driver of environmental and social landscape change in Iowa over the study period.

- Policy objectives have achieved intended outcomes
- Policy objectives produce unintended outcomes that vary by physiographic region

Drivers of Landscape Change



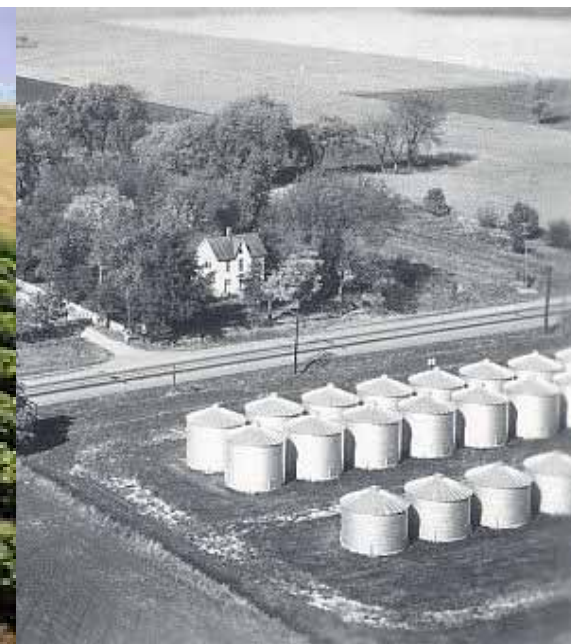
Federal Farm Policy Era

Great Depression & New Deal: 1930-1940



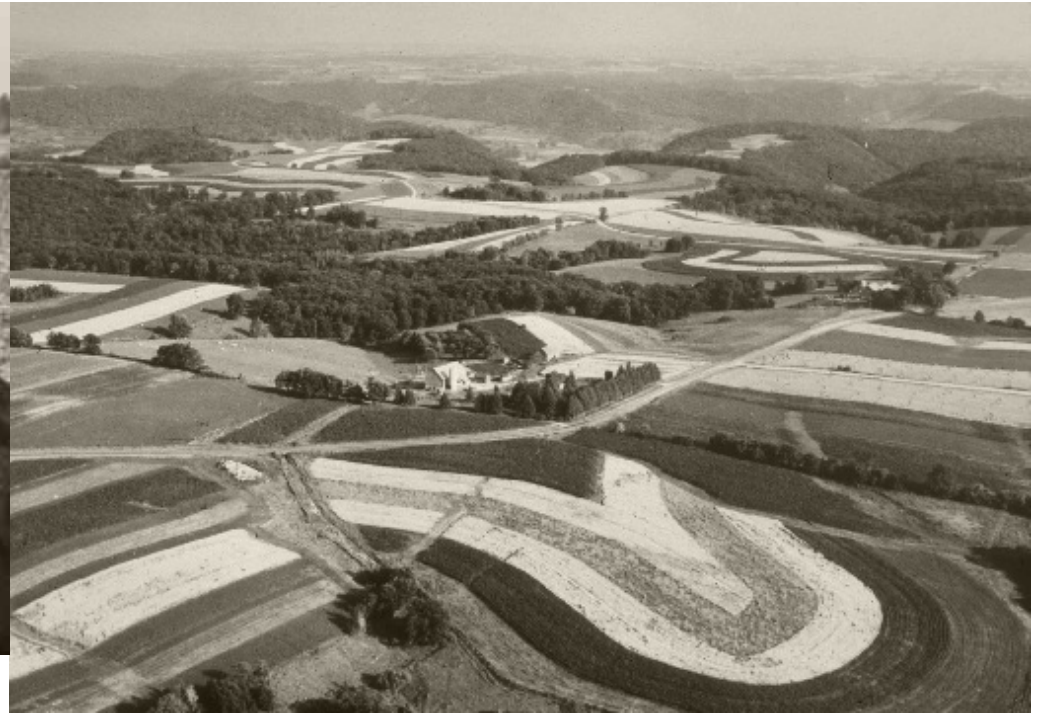
Federal Farm Policy Era

War, Peace & Plenty: 1941-1955



Federal Farm Policy Era

Soil Bank & Food Security: 1956-1970



Federal Farm Policy

Plant Fence Row to Fence Row: 1971-1985

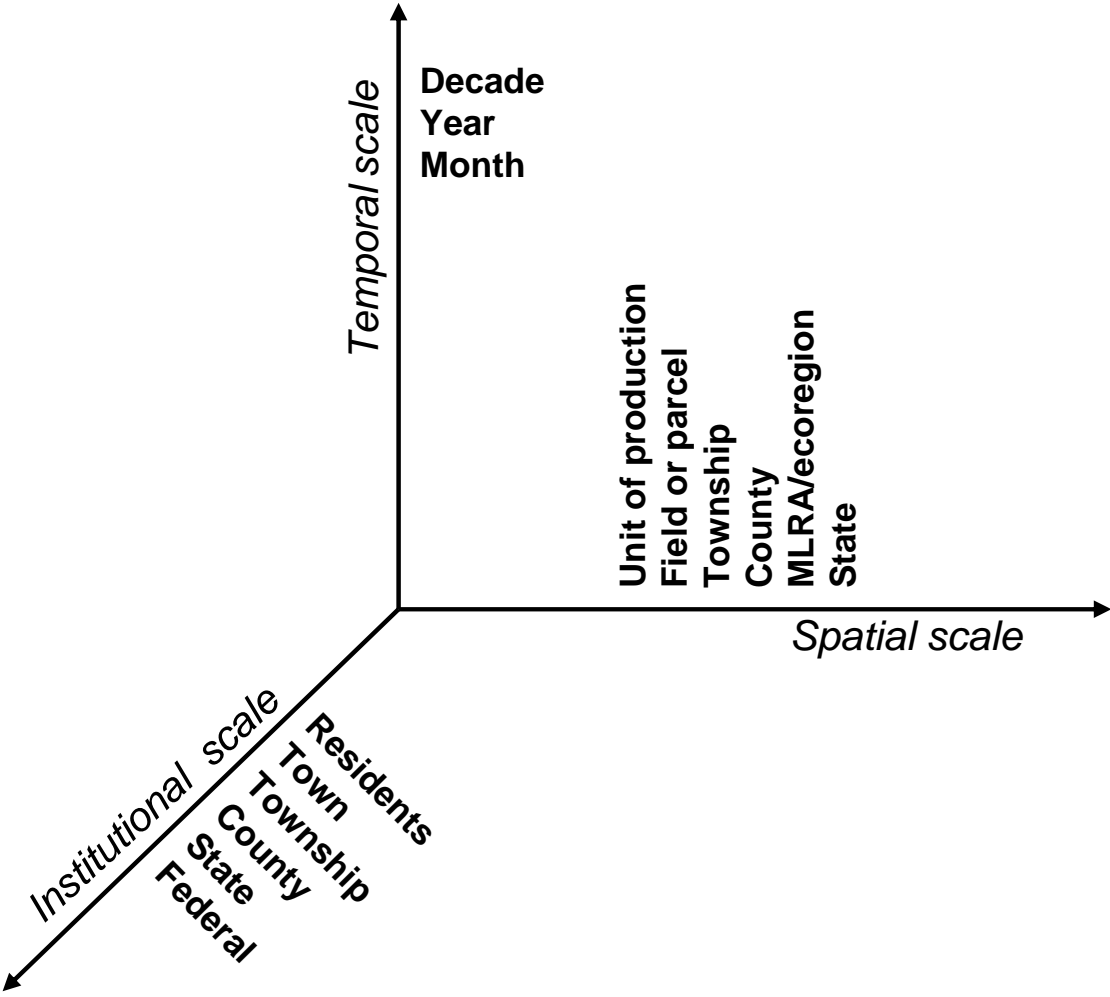


Federal Farm Policy Era

Budget Concerns & New Approaches: 1986-2002



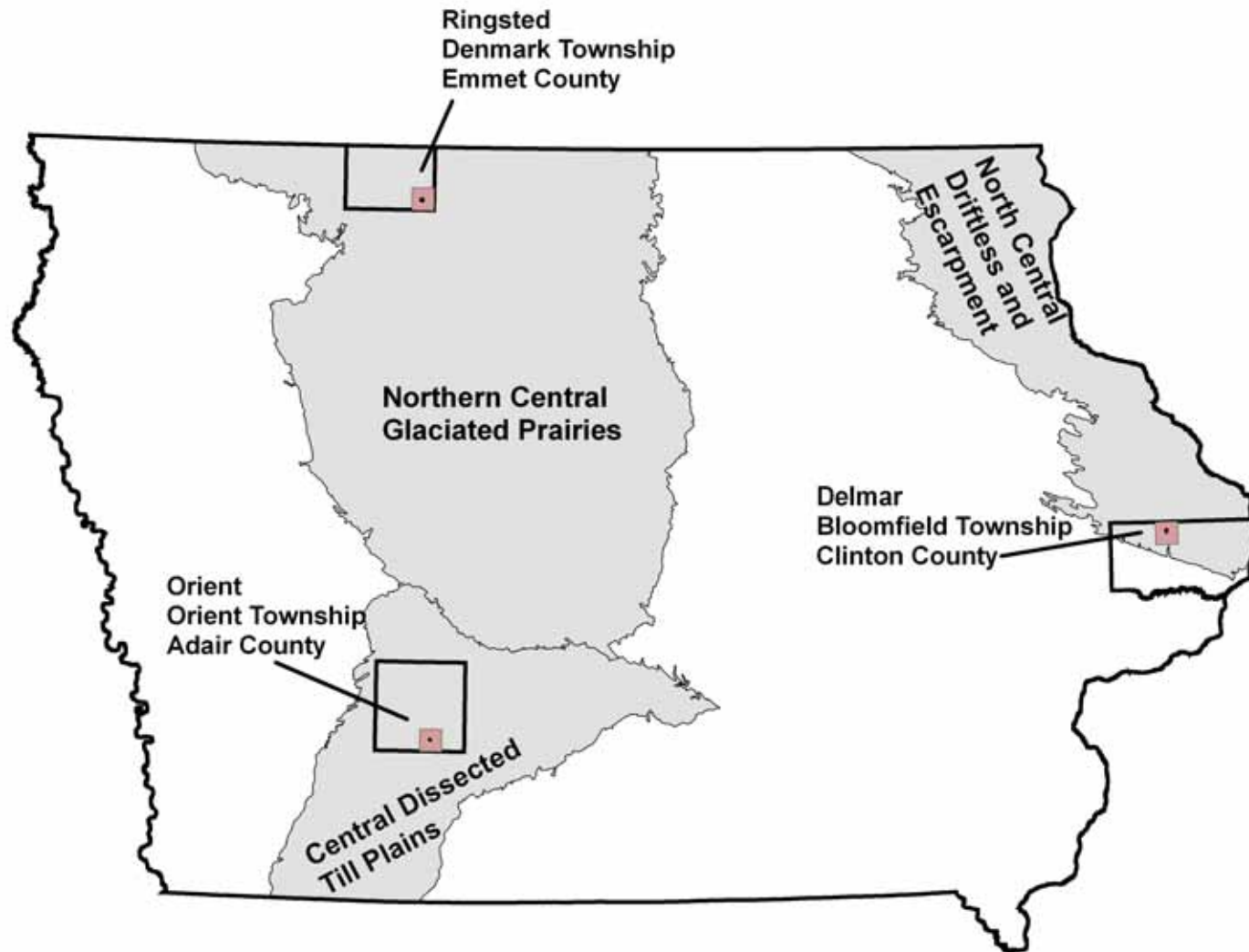
Spatial, Temporal, and Institutional Scale of the System Under Study



Study area selection

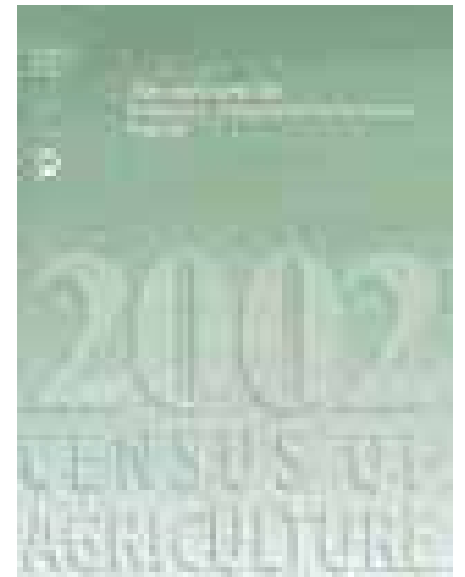
1. Three ecoregions; different landforms but also differ climatically
2. Towns identified in 1930:
 - with a population between 300 and 499
 - offering a high school education program
 - with at least one through road
 - more than 10 miles from a city of 5,000 or more people
3. Townships exclude lakes and publicly owned land

Study Area Selection

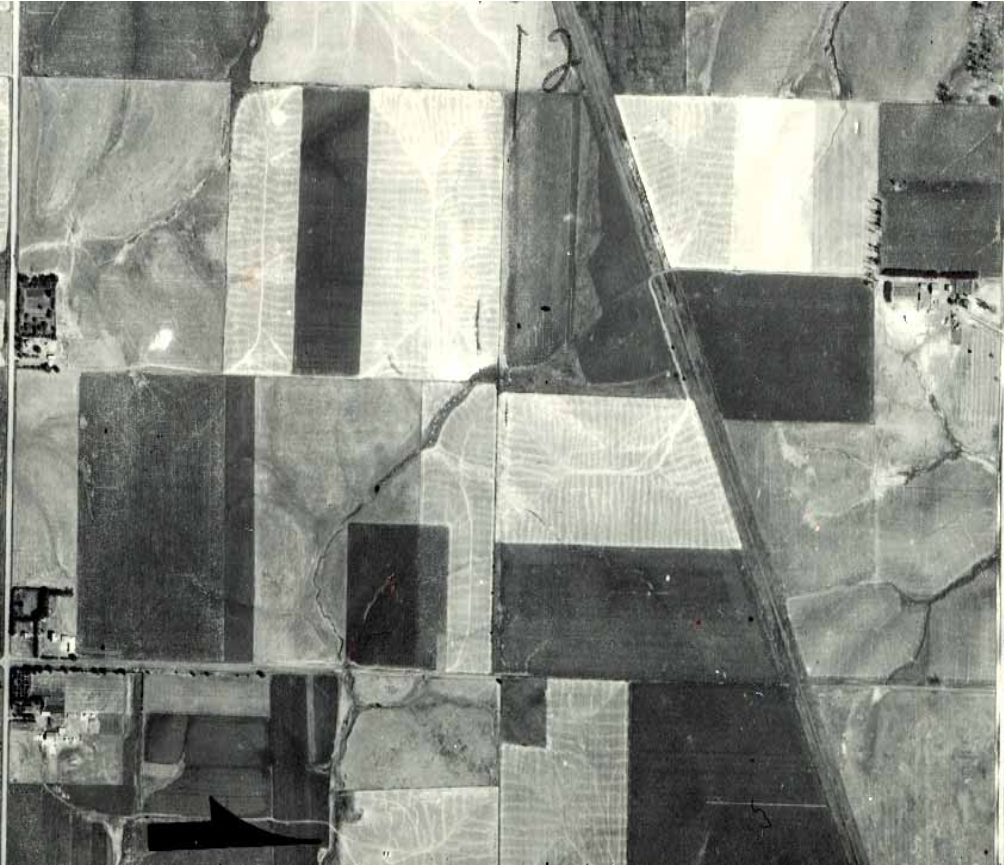


Data Sources

- Historic aerial images
- U.S. Census – 1930 to 2000
- Census of Ag – 1930 to 2002

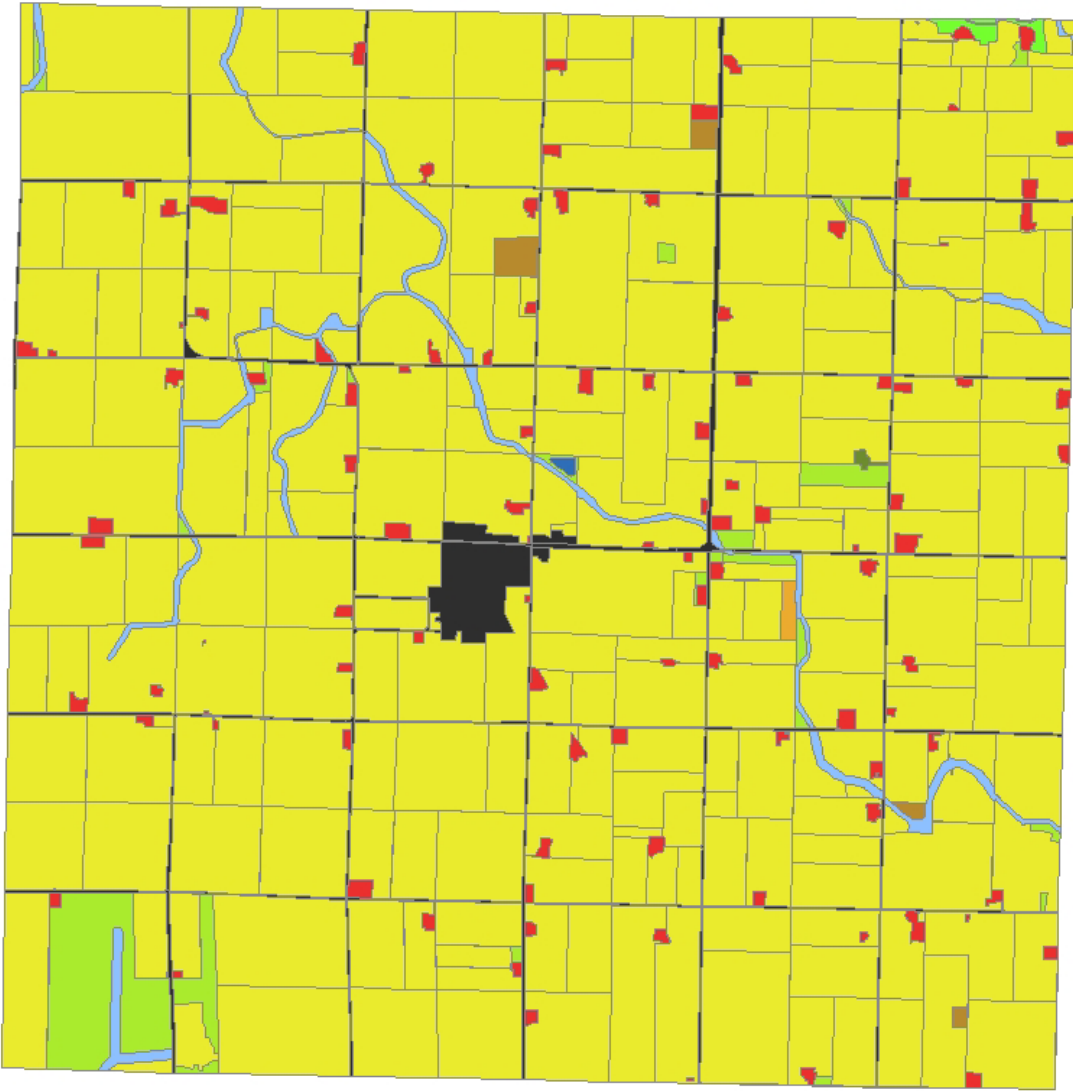


Orient Township 1938 and 2002



Denmark Township

- Drainage Way
- Forest
- Grass
- Hay
- Homesite
- Row Crop
- RailRoad
- Road
- Small Grains
- Timber Pasture
- Town
- Wetland



1939

1953

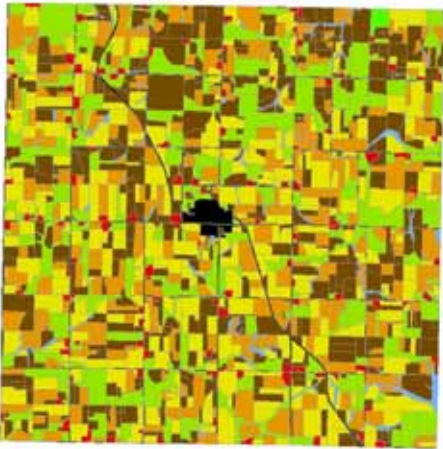
1972

1985

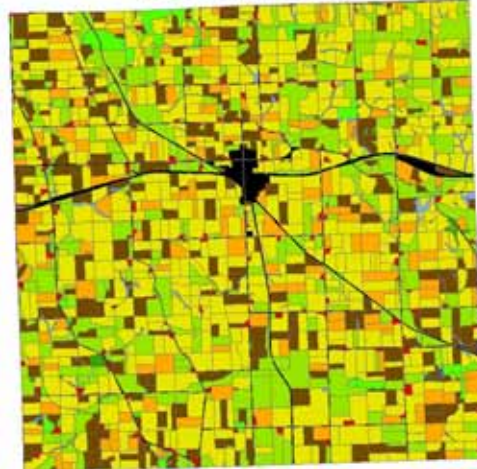
2002

Comparison of Land Cover Composition and Field Size

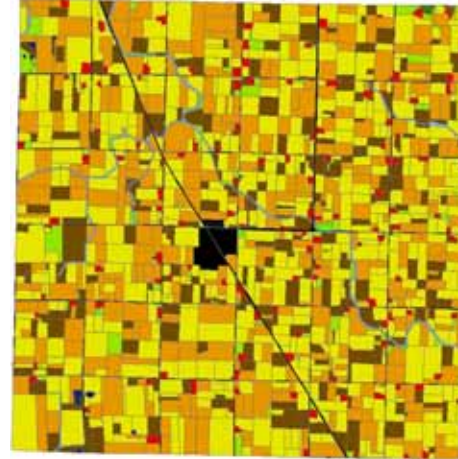
Adair 1938



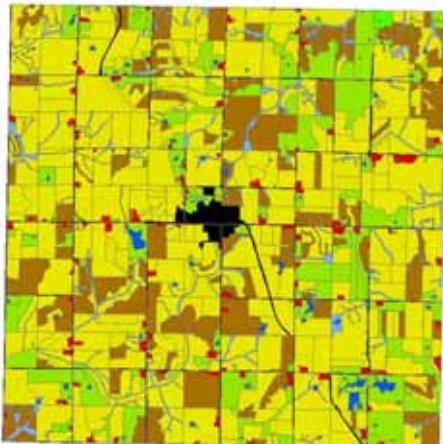
Clinton 1937



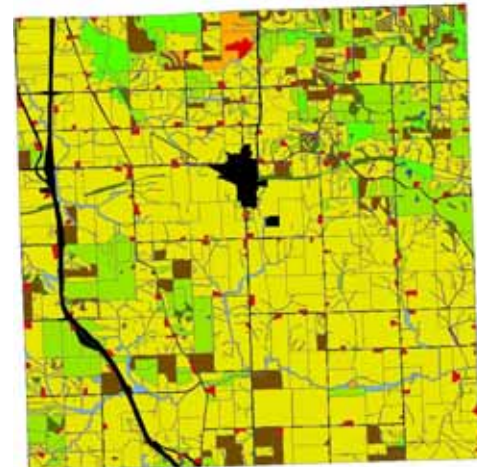
Emmet 1939



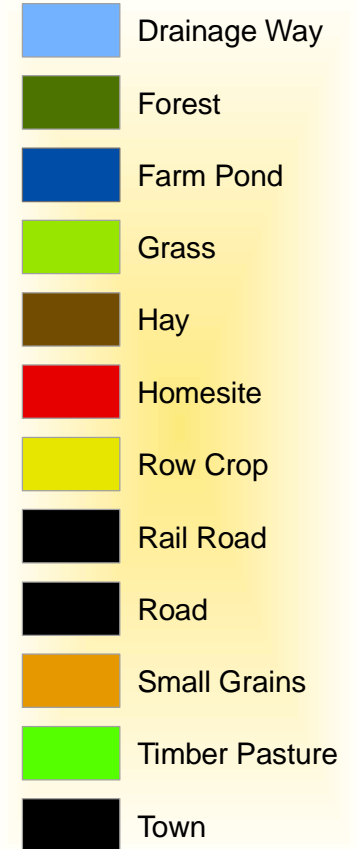
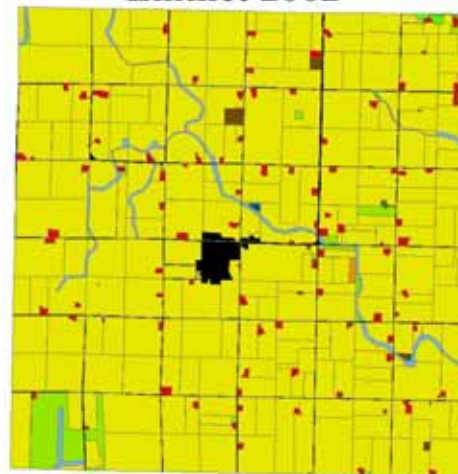
Adair 2002



Clinton 2002

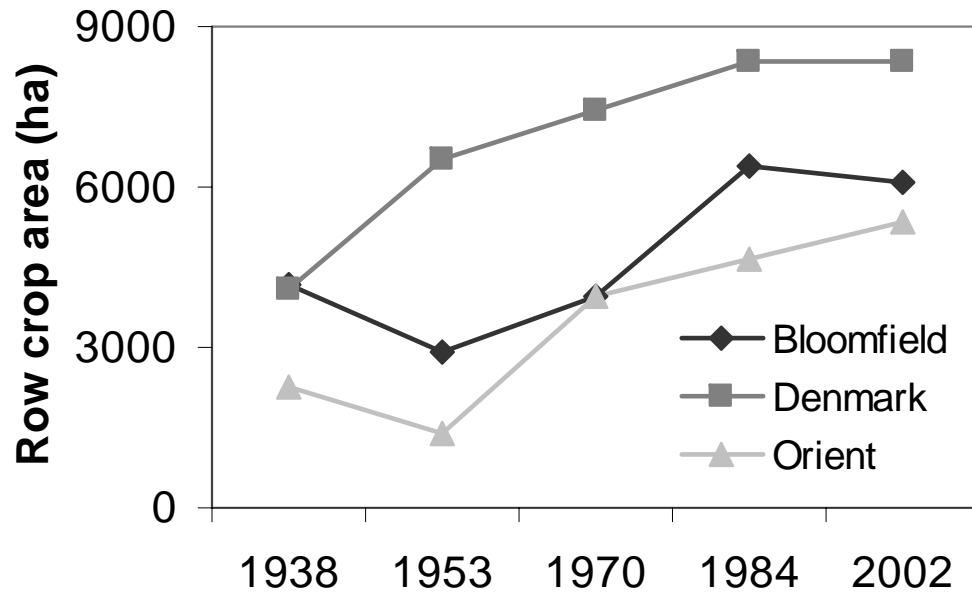


Emmet 2002

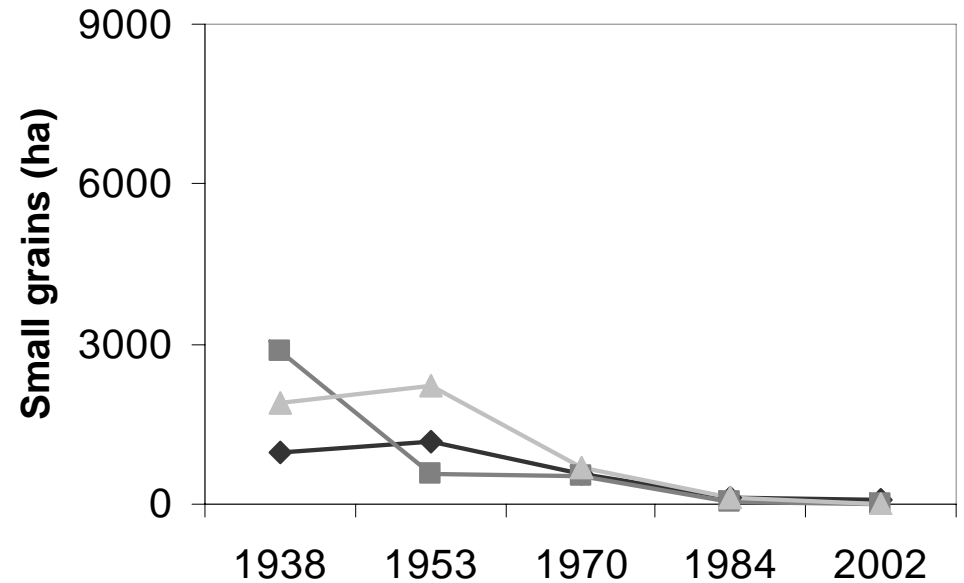


Land Cover Change

Row Crops

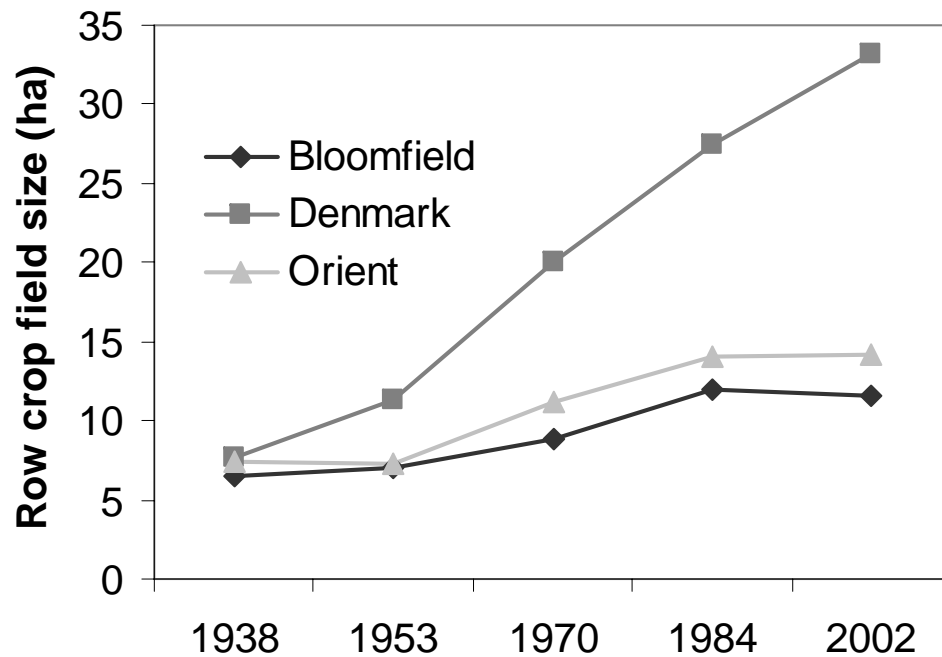


Small Grains

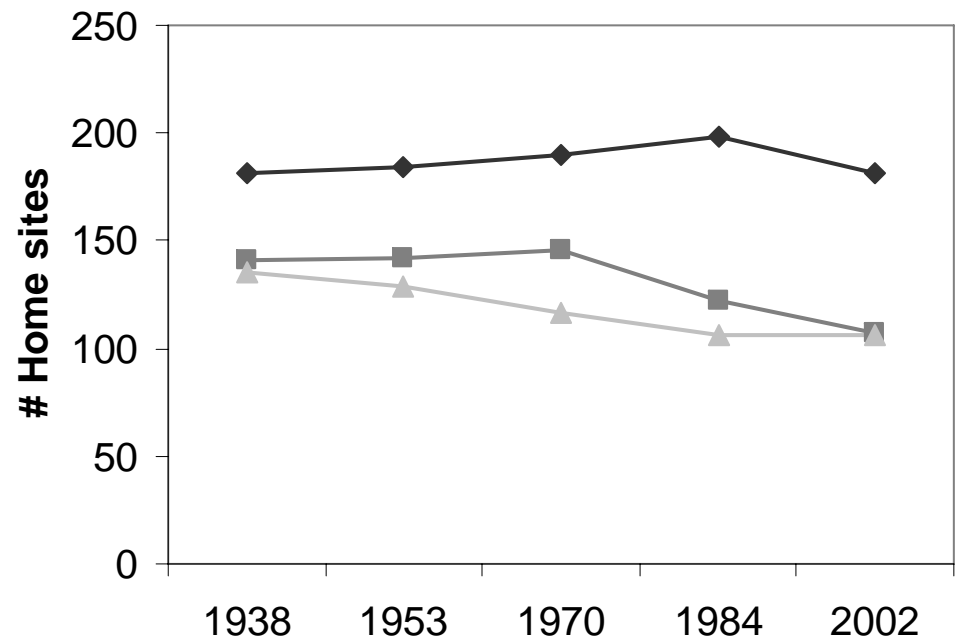


Land Cover Change

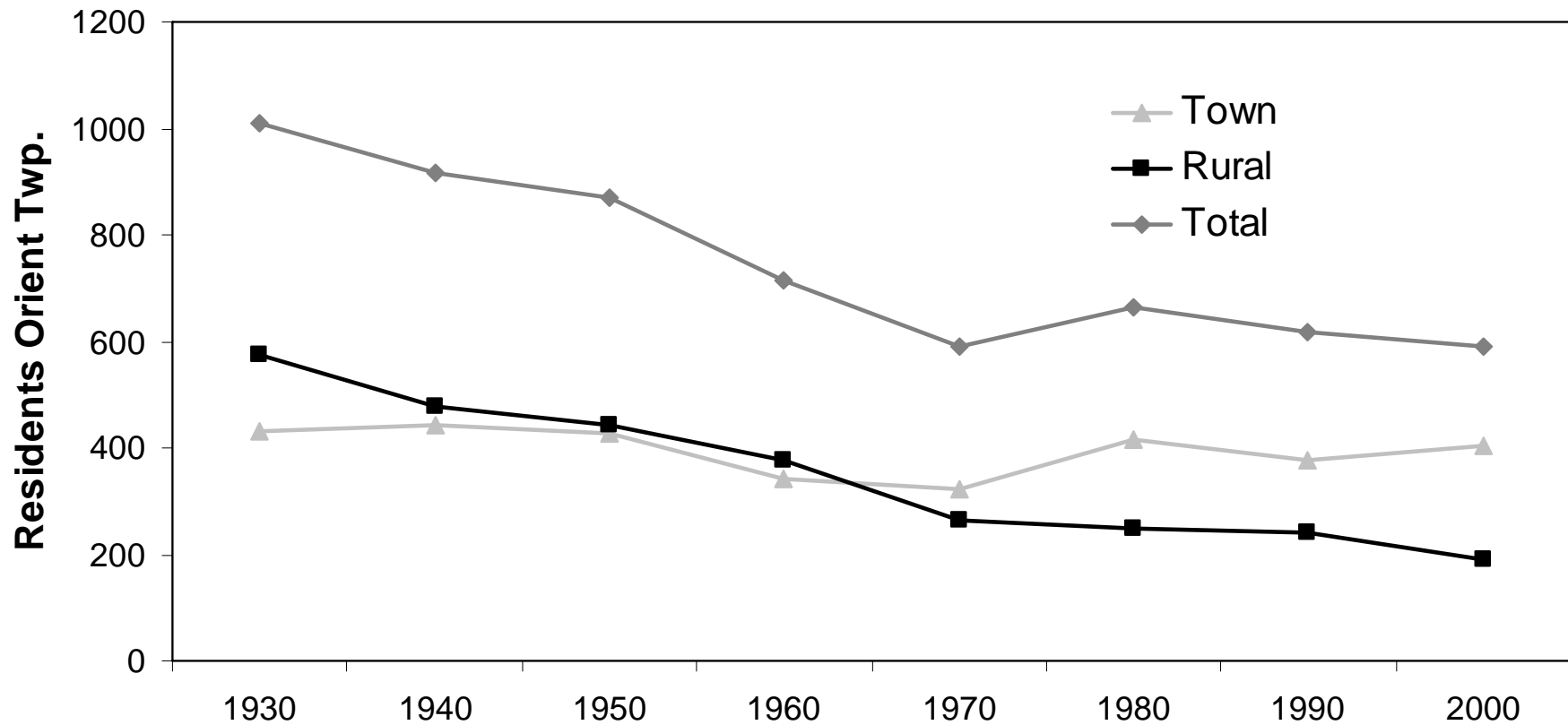
Field Size



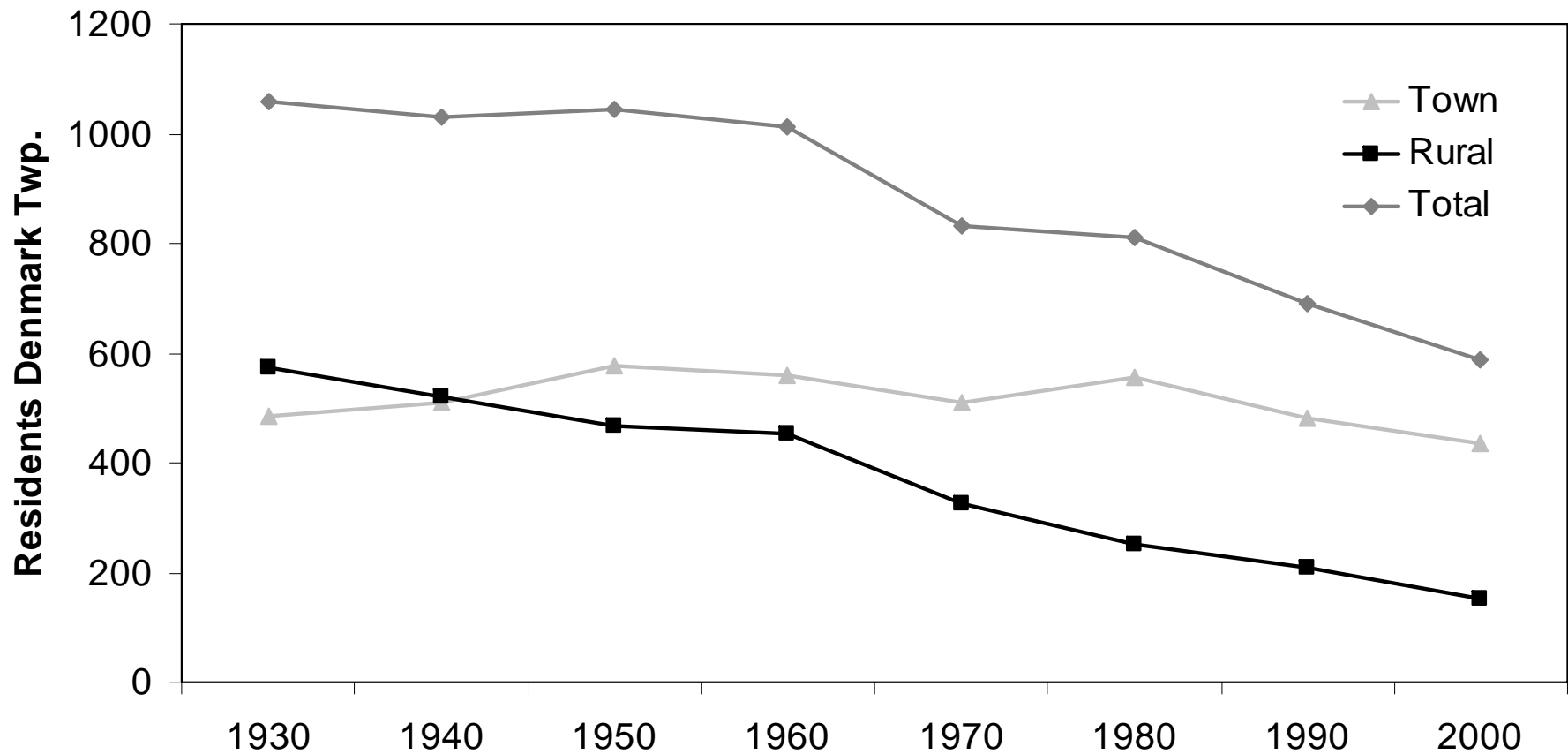
Home Sites



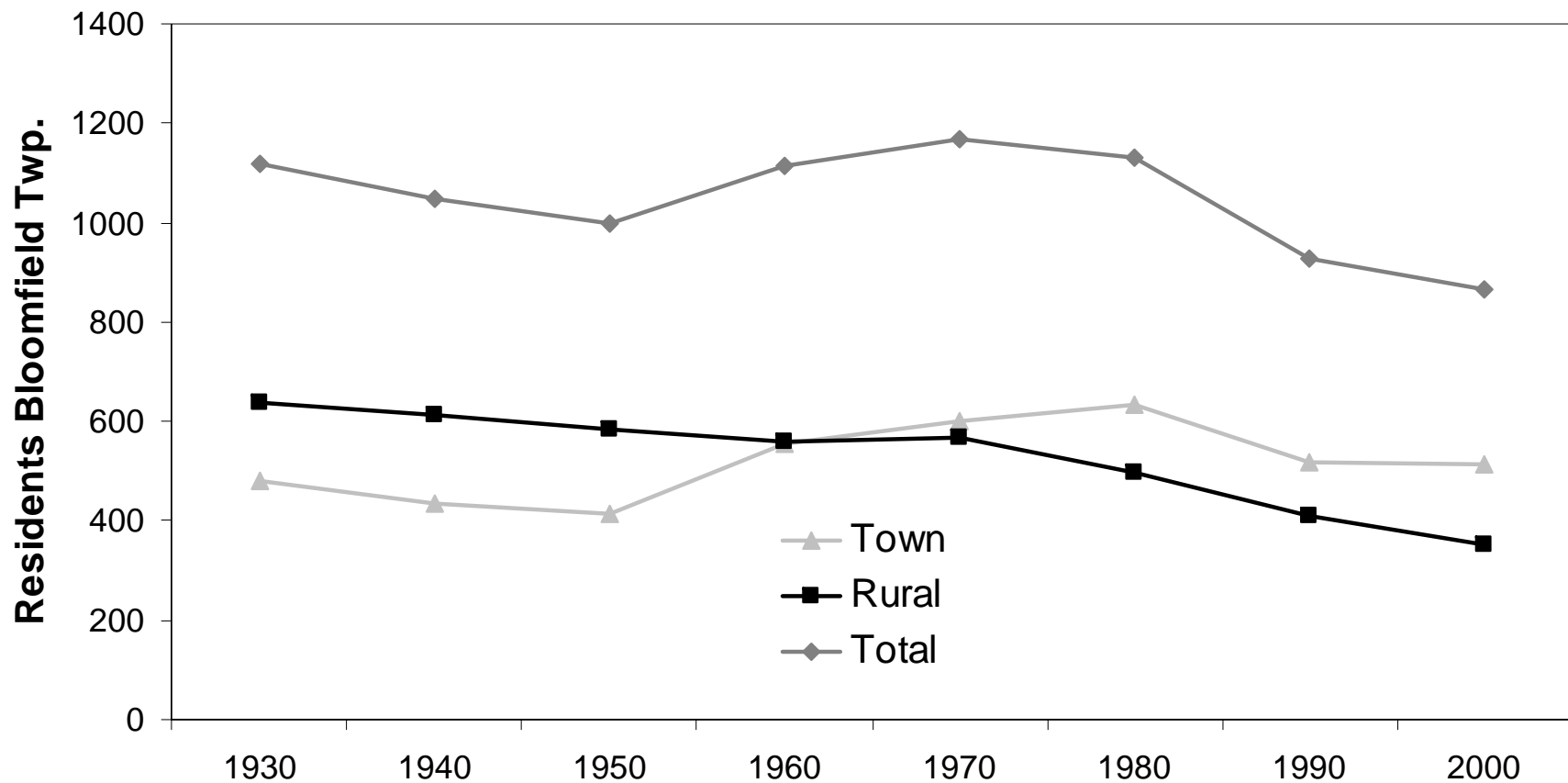
Change: Rural and Town Population in Orient Township



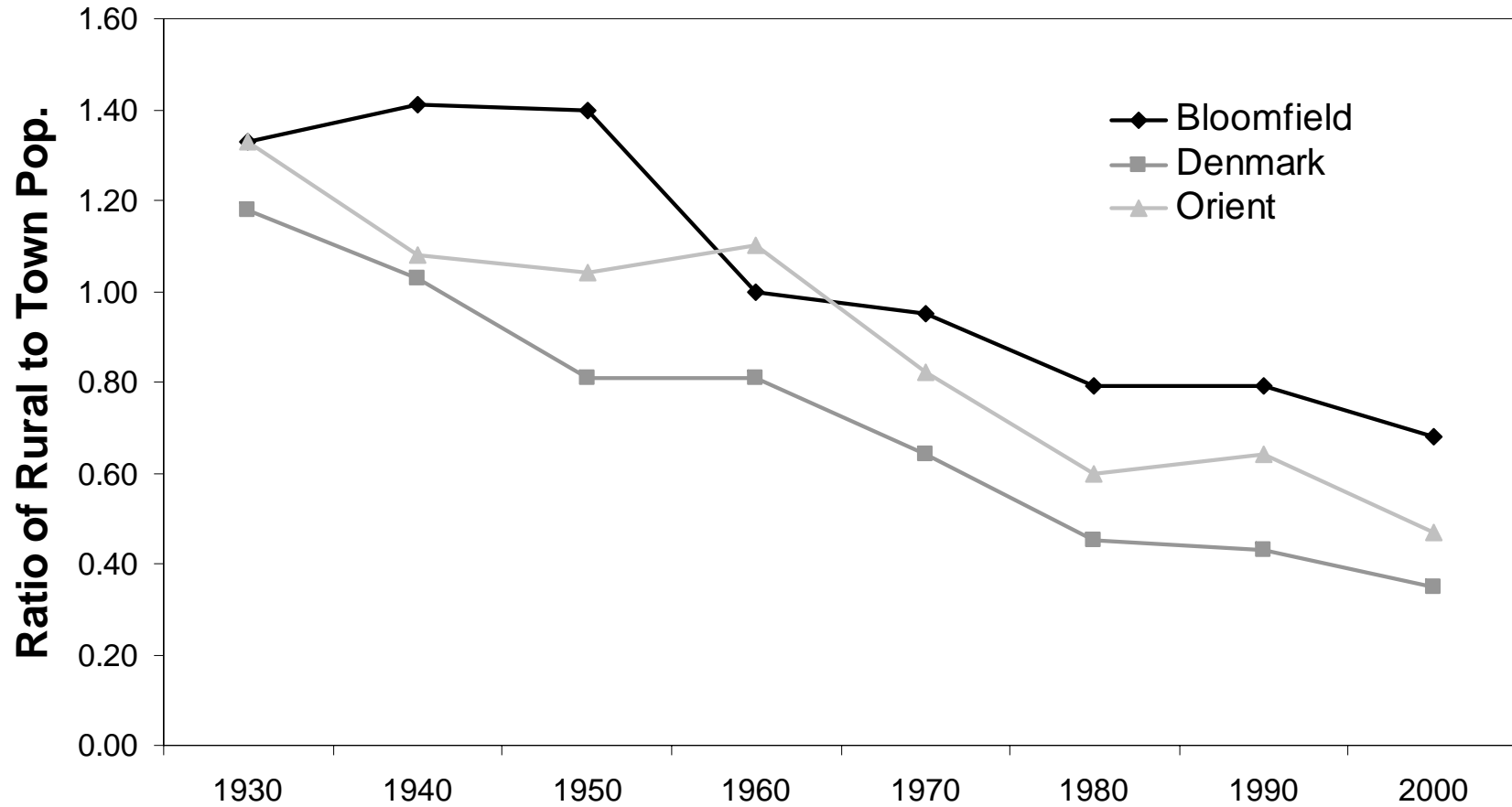
Change: Rural and Town Population in Denmark Township



Change: Rural and Town Population in Bloomfield Township



Rural:Town Population



Preliminary Conclusions

- Topo-edaphic constraints temper declines in environmental and social diversity
- Increasing size of farm fields is negatively associated with indicators of social stability
- Environmental and social linkages are different between physiographic regions

What We Hope to Accomplish

- Recommendations to stakeholders and policy-makers:
 - Agroecosystem design
 - Sustainable practices and systems
 - Policy options
 - Barriers to change

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