How The Project Came About

• Important theoretical and methodological work was undertaken by ERS and Purdue University as part of a Cooperative Agreement.

• PCRD took the lead role in the harmonization of data from 1970 – 2016 period.

• In 2017, the North Central Regional Center for Rural Development funded the PCRD to build on the ERS data work, seeking to examine poverty in the context of the NC region. Purdue's EDA University Center grant also provided resources needed to support our work.

• Our webinar today is intended to share our latest work with you.

Understanding the Data Harmonization Process

• Whereas the census tracts were first conceptualized in 1910 in New York, it was only in 1990 that tracts covered the entire U.S.

• Challenges for 1970 to 2010 periods: Tracts did not cover the entire U.S. in 1970 and 1980; Tracts changed their geographies every decade; Some of the counties changed their geographies as well.

<table>
<thead>
<tr>
<th>Year</th>
<th>Census tract polygons</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>34,489</td>
<td>mainly urban tracts</td>
</tr>
<tr>
<td>1980</td>
<td>42,917</td>
<td>mainly urban tracts</td>
</tr>
<tr>
<td>1990</td>
<td>60,947</td>
<td>urban and rural tracts</td>
</tr>
<tr>
<td>2000</td>
<td>65,310</td>
<td>urban and rural tracts</td>
</tr>
<tr>
<td>2010</td>
<td>73,669</td>
<td>urban and rural tracts</td>
</tr>
</tbody>
</table>

• Harmonization process developed 72,000 consistent census tracts from 1970 to 2010. We also harmonized roughly 140 county boundary changes in that period.
Understanding the Data Harmonization Process

- Census tracts are delineated based on population thresholds.
  - As population grows, a single tract can be split into many tracts (ONE 2 MANY).
  - As population declines, many tracts can be merged into a single tract (MANY 2 ONE).
  - Mergers and splits can happen for portions of the census tracts.
  - Based on geographical area and assuming uniform population densities with ancillary data.

---

Understanding the Data Harmonization Process

- Based on Logan, Xu and Stults (2014) and Spatial Data Documentation by Purdue University
Mapping Example: Race

- Even through harmonization and filling-in process of untracted areas in 1970 and 1980, there were areas of the U.S. where Black populations were nonexistent at the tract level.
- Definition query in ArcMap is a useful tool to filter out such areas.

Methodology: Fixed Ratio Interpolation

\[
\text{Tract}_{i,j} = \frac{\text{County}_{i}}{\text{Tract}_{i,j}} \times \text{County}_{j}
\]

Experimental Mapping: Space-Time
Overview of the Site

- PCRD opted to prepare a story map of poverty in the NC region rather than a more traditional report for submission to the NCRCRD.

Types of Poverty Examined

- Persistent Poverty
- High Poverty
- Child Poverty

Spatial Dimensions Explored

- US & Its Regions
- Nonmetro Tracts in the NC Region
- NC Region, States & Counties
- Metro Tracts in the NC Region
- Census Tracts in the NC Region
Socioeconomic Variables Explored

• Examined the three types of poverty by the following variables (if the number of cases was of sufficient size):

- Metro Status
- Population
- Race
- Ethnicity
- Family Type
- Industry of Employment

Story Map Sections

Overview
- Section 1: Poverty in the U.S. & Its Regions
- Section 2: Nature of Poverty in the North Central Region, Its States and Counties
- Section 3: The Census Tract Level in the North Central Region
- Section 4: Metropolitan Tracts
- Section 5: Nonmetropolitan Tracts
- Section 6: Extension Products and Programs
- Section 7: Poverty Articles (a select list)

Also... The site includes extensive use of maps, charts & tables along with discussions of results.

Now... let’s visit the Story Map Site

http://pcrd.purdue.edu/ncpoverty
Programs Offered by LGUs (Section 6)

Poverty-Related Research Articles (Section 7)

• We focus our attention on over three dozen academic journal articles and book chapters that give attention to the spatial aspects of poverty.

• New articles will be added over time.

How the Site Can Be of Value

• Support poverty-related research given the value of the harmonized data

• Pursue the targeting of key Extension educational programs (i.e., youth, family, community) to these areas

• Guide investment efforts of state and federal agencies having a focus on high poverty areas (such as the new federal legislation on opportunity zones)

• Track changes in poverty and other socioeconomic conditions in areas that have been targeted for interventions/investments in the past.
Our Next Steps . . .

• Update data on poverty as they are released

• Add information on the opportunity zones in each state in the NC region

• If possible, expand website to include other regions of the US if funds can be secured

CONTACT INFORMATION

Bo Beaulieu, PhD
Director, Purdue Center for Regional Development
1341 Northwestern Avenue
West Lafayette, IN 47906
765-494-7273 | lb@purdue.edu