Using Rasterization to Overcome Boundary Changes

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Bradford Mapping
Study: Land Values, 1860-1870

• How did the Civil War and the first 5 years of Reconstruction affect land values across the US?

• Given wildly varying land values (min: $1, max: $7309) changes needed to be expressed in % difference

• Data Source: County Average Land Values, US Agricultural Census, 1860 & 1870

• From National Historical GIS (nhgis.org)

• Data in contemporary dollars per acre

• 40% inflation 1860-1870
Boundary Changes
("Year 2 Raster" - ("Year 1 Raster" X "Inflation Factor"))
("Year 1 Raster" X "Inflation Factor")
Advantages

• Easy to model
  - No statistics with difficult-to-interpret results
  - Can adjust equation for total rather than % change

• Raster can be averaged to jurisdiction boundaries for correlation with other variables
Faults

- No weighting with other variables
- Some slices that change jurisdictions can have difference values that are out of sync with either their origin or destination polygons, or regional trends.

<table>
<thead>
<tr>
<th>Year</th>
<th>Value 1</th>
<th>Value 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1860</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>1870</td>
<td>6</td>
<td>9</td>
</tr>
</tbody>
</table>

% Change:
- 1860: -25%
- 1870: -10%
- 1870: +12%
Land Value Data Source: 1860&1870 Census of Agriculture, retrieved from NHGIS.
County Boundary Data: Minnesota Population Center.
Lakes and Rivers: US Census Bureau
Continent: ESRI