PUTTING REDISTRICTING SOFTWARE TO WORK AFTER REDISTRICTING IS OVER

National Conference of State Legislatures
Chicago
August 7, 2012

Clare Dyer, Texas Legislative Council
GIS uses after redistricting

- District maps for display and information
- Interactive maps
- Policy maps for legislative use
District Maps

with legislator’s name and district number

- Help your legislators learn about their new districts

- District maps for walls and newsletters
  - constituents can indicate where they live or a location of interest

- Basic information — cities, streets, boundaries, school districts, voting precincts

- Overlay districts on maps of policy issues
District Maps

Urban district maps show cities and neighborhood street detail.
Rural or suburban district maps show major county roads, cities, and water.
Benefits of a mapping system

- A mapping system for maps that you produce on a regular basis makes it easier to generate multiple maps.

- A major development project, but worthwhile in the long term.
District Maps Development

- For consistency, determine road sizes and patterns and water patterns; city shading; font types and sizes
- Design the different geographic layers to work well with each other
- Predetermine what will display at various extents so that both urban and rural districts look good
- Two layouts to maximize extent: portrait and landscape
Add geographic data to inform districts

- Map Census data
- Display precincts and election results
- Display school districts (and school points)
- Display policy subject w/ districts overlaid
- Use your GIS to calculate area and perimeter of districts
Per Capita Income
In El Paso County
with Senate Lines

Per Capita Income
In Dallas County
with Senate Lines

The average per capita income in Texas was $19,617 in 2000.

Source: 2000 Census
Plan01188S: Texas Legislative

Per Capita Income by Block Group
- No Population
- 1 to 10,000
- 10,001 to 19,616
- 19,617 to 30,000
- 30,001 to 50,000
- 50,001 to 75,000
- 75,001 to 100,000
- Greater than 100,000

Source: 2000 Census
Plan01188S: Texas Legislative
Ex. Hospital districts with senate districts
Interactive maps are a great tool

- Census Bureau data visualization site - updated weekly
  www.census.gov/dataviz

- Census Application Programming Interface (API) that can be used to design online and mobile apps from Summary File 1 and the 5-year American Community Survey (ACS) data
  http://www.census.gov/developers/

- NYT - Mapping the 2010 U.S. Census used to browse population growth and decline, changes in racial and ethnic concentrations, and patterns of housing development
Mapping the 2010 U.S. Census

Browse population growth and decline, changes in racial and ethnic concentrations and patterns of housing development.

**Change in population since 2000**
- Over 20% increase
- 10% to 20%
- 0% to 10%
- 0% to -10%
- -10% to -20%
- Over 20% decline

**Pennsylvania**

<table>
<thead>
<tr>
<th>2010 POPULATION</th>
<th>CHANGE FROM 2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>12,702,379</td>
<td>+3.4%</td>
</tr>
</tbody>
</table>

**Race/Ethnicity**

- Whites: 79%  -2%
- Blacks: 10% +10%
- Hispanics: 6% +83%
- Asians: 3% +59%
- Native Amer.: 0% +13%
- Multiracial: 1% +58%
- Other groups: 0% +22%
### Illinois

**2010 Population:** 12,830,632  
**Change from 2000:** +3.3%

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Share of Pop.</th>
<th>Change from 2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whites</td>
<td>64%</td>
<td>-3%</td>
</tr>
<tr>
<td>Blacks</td>
<td>14%</td>
<td>-1%</td>
</tr>
<tr>
<td>Hispanics</td>
<td>16%</td>
<td>+32%</td>
</tr>
<tr>
<td>Asians</td>
<td>5%</td>
<td>+38%</td>
</tr>
<tr>
<td>Native Amer.:</td>
<td>0%</td>
<td>+3%</td>
</tr>
<tr>
<td>Multiracial:</td>
<td>1%</td>
<td>+19%</td>
</tr>
<tr>
<td>Other groups:</td>
<td>0%</td>
<td>+14%</td>
</tr>
</tbody>
</table>

**Interactive Map:**
- [Zoom to State]
Largest racial and ethnic groups in 2010

**Illinois**

<table>
<thead>
<tr>
<th>2010 POPULATION</th>
<th>CHANGE FROM 2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>12,830,632</td>
<td>+3.3%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RACE/ETHNICITY</th>
<th>SHARE OF POP.</th>
<th>CHANGE FROM 2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whites:</td>
<td>64%</td>
<td>-3%</td>
</tr>
<tr>
<td>Blacks:</td>
<td>14%</td>
<td>-1%</td>
</tr>
<tr>
<td>Hispanics:</td>
<td>16%</td>
<td>+32%</td>
</tr>
<tr>
<td>Asians:</td>
<td>5%</td>
<td>+38%</td>
</tr>
<tr>
<td>Native Amer.:</td>
<td>0%</td>
<td>+3%</td>
</tr>
<tr>
<td>Multiracial:</td>
<td>1%</td>
<td>+19%</td>
</tr>
<tr>
<td>Other groups:</td>
<td>0%</td>
<td>+14%</td>
</tr>
</tbody>
</table>
Multiple selections at same geographic extent
Issues with creating interactive maps and where to host them

- At an Investigative Reporters and Editors conference (IRE), differing views about which software to use were expressed.

- Some preferred Google Fusion, others preferred HTML 5, and there are other options. We are still exploring this and have not used them.

- Attached are links to some of the highlights from the conference if you wish to explore this.
Links to some sources on interactive mapping

- [http://datajournalismhandbook.org/1.0/en/](http://datajournalismhandbook.org/1.0/en/)
- [http://datajournalismhandbook.org/1.0/en/delivering_data_7.html](http://datajournalismhandbook.org/1.0/en/delivering_data_7.html)
- [https://sites.google.com/site/fusiontablestalks/talks/fusion-tables-where-2-0-workshop](https://sites.google.com/site/fusiontablestalks/talks/fusion-tables-where-2-0-workshop)
Support legislative issues with GIS

- Policy Maps
- Data Analysis
Making connections

- GIS can help policy makers and the public discover connections that become apparent only with geographic visualization.

- GIS developers should make it easy for casual users to explore content and make their own connections.

  (John Guthrie, Washington, D.C., Jan. 2011)
GIS for policy makers

- What differentiates legislative use of GIS?
  - Used for policy decisions
  - Used to demonstrate purpose for a bill
  - Used to show other policy makers why they may have an interest in a topic
Examples of using geographic analysis to inform policy

- Map municipalities affected by reductions in state aid
- Map projects that received money from a sales tax increase
- Map predominant home languages by school district for planning ESL classes
- Determine proximity of schools to vendors of alcohol and tobacco
- Demonstrate areas within a county underserved by community colleges and universities
- Map the multiple definitions of “rural” in law to help bill writers decide which is appropriate for particular legislation
- Map school accountability
- Map availability of education or health care facilities
Promote your services
Reports – Maps - Data

- Internal website for the legislature - content is by subject area related to items of current interest and to interim charges

- Maps are predesigned and can be printed or can be amended and printed upon request

- Develop for both printing and online display
Subject Areas

Agriculture
Business and Economic Development
Census and Demographics
Criminal Justice and Public Safety
Drought and Wildfire
Education--Higher
Education--K-12
General Government
Health and Human Services
Judiciary
Military and Veterans
Natural Resources
Rural Issues
Transportation

Reports, Maps, and Data
Texas Legislative Council

Health and Human Services

This page contains health and human services maps relating to Health Care Professionals and Other Topics that include the aging population, hospital districts, hunger, and disability services.

Health Care Professionals [back]

Dental Care
Health Professional Shortage Areas

Healthcare Employment
(2010 Monthly Average)
(Data available here.)

Mental Health Care
Health Professional Shortage Areas

Primary Care Physicians (PCPs) - Shortage
Geographic area maps –
Simple visualization of extents and boundaries

Community College Taxing Districts
July 2011

Boundaries other than for legislative, congressional, or State Board of Education districts are for informational purposes only and are not precise.
Point location maps –
Associate colors or symbols w/ points for added value
Thematic maps -
Comparative data with a legend

Estimated Average Daily Attendance (ADA)
by School District
2010-2011 School Year
Geographic knowledge

- More than points on a map
- More than simple visualizations
- Use to perform complex spatial analyses

(John Guthrie, Washington, D.C., Jan. 2011)
Data analysis with GIS

- Proximity – how many of $y$ are within $x$ distance of $z$?
- How far is $y$ from $z$?
- What is the area of $y$?
- What would a 5-mile or a 200-mile buffer look like?
- How many people live within $x$ miles of a facility?
Combine information to assist analysis - Coal plants and mines w/ air quality & house districts
Public schools within 1,000 feet of a railroad by senate district
The State of Texas
with Counties All or Partially Within 100 Miles
and Within 150 Miles of the Gulf Coast

Source: 2000 Census
Map results of 50-state surveys
Caveat

Major research or mapping projects that involve collecting and analyzing new information or designing new maps cannot be turned around quickly.
Planning

- Document work: should be reproducible at a later time by different staff
- Train your staff – utilize online GIS classes
- Maintain data: USPS - quarterly; ISDs and precincts - annually
- Maintain and periodically upgrade hardware and software
- Promote your services—but be aware of consequences—may lead to complicated research and products. Are you staffed?
Final thoughts

Build your databases in advance

- Identify topics that may be coming up and take the initiative to locate the data so that you will have current databases in place
- Look at interim studies and see where you can use maps to supplement the reports

Develop a style and templates or layouts

Develop a review process

Join the state GIS community to standardize projections and share data