Multiscale Map Design in ArcGIS

Cynthia A. Brewer, Pennsylvania State University

Research Collaborators:
Barbara P. Buttenfield, Univ. of Colorado-Boulder
E. Lynn Usery, USGS/CEGIS
Lawrence V. Stanislawski, USGS/CEGIS

Penn State Research Assistants:
Chelsea Hanchett
Stephen Butzler, Paulo Raposo, Andrew Stauffer, Wesley Stroh

18 slides
Maplex for label placement
Abbreviation Dictionaries

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Abbreviation(s)</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Saint Louis City Engine House&quot;</td>
<td>&quot;Fire Station&quot;</td>
<td>Translation</td>
</tr>
<tr>
<td>&quot;Fire Station&quot;</td>
<td></td>
<td>Translation</td>
</tr>
<tr>
<td>&quot;Bureau of Land Management&quot;</td>
<td>BLM</td>
<td>Translation</td>
</tr>
<tr>
<td>&quot;County Road&quot;</td>
<td>CR</td>
<td>Translation</td>
</tr>
<tr>
<td>&quot;Farm-to-Market&quot;</td>
<td>FM</td>
<td>Translation</td>
</tr>
<tr>
<td>&quot;Ranch Road&quot;</td>
<td>RR</td>
<td>Translation</td>
</tr>
<tr>
<td>&quot;Ranch-to-Market&quot;</td>
<td>RM</td>
<td>Translation</td>
</tr>
<tr>
<td>&quot;County Route&quot;</td>
<td>CR</td>
<td>Translation</td>
</tr>
<tr>
<td>&quot;Mountain&quot;</td>
<td>Mt</td>
<td>Translation</td>
</tr>
<tr>
<td>&quot;Public Road&quot;</td>
<td>PR</td>
<td>Translation</td>
</tr>
<tr>
<td>&quot;Delta Road&quot;</td>
<td>DR</td>
<td>Translation</td>
</tr>
<tr>
<td>&quot;State Route&quot;</td>
<td>SR</td>
<td>Translation</td>
</tr>
<tr>
<td>&quot;State Highway&quot;</td>
<td>SH</td>
<td>Translation</td>
</tr>
<tr>
<td>Lane</td>
<td>Ln</td>
<td>Translation</td>
</tr>
</tbody>
</table>
Modest control of label placement
Which labels have priority and which symbols should not have labels overlap
Practical considerations in design

- No custom edits on TNM data (**no data clean up**)
- Simple **geometric symbols**, so no missing fonts or pictures on export
- **Regular fonts** for export and file sharing (vs. USGS-look with Souvenir and Univers)
- Lots of **group layers** to easily turn off categories while evaluating appearance
- Attention to **Symbol Levels** and Maplex weightings
- All rasters and layers with **transparency at bottom** of TOC so export retains editable vectors and type
- **No over/under passing** on bridges and ramps
Layer order and transparency:

Cultural
Transportation
Admin lines
Hydro
Admin areas
  Reserve
  Incorp place
Hillshade
Contours
Wooded
Layer order and transparency:

Cultural
Transportation
Admin lines
Hydro

Transparency starts

Admin areas
Reserve
Incorp place
Hillshade
Contours
Wooded

These rasterize
WV Table of Contents Before Scale Ranges
... And After
... And After
Tools like Symbol Levels can get complicated with multiscale file
Church symbol on leader
Symbol only when label

Four churches with label/symbol (24K ST)

Magenta dots at all churches
Church symbol on leader
Symbol only when label

Four churches with label/symbol (24K STL)

Magenta dots at all churches (90K)
Road network is too dense for scale

Thinned roads (level 2) symbolized as local
Road network is too sparse for scale

Thinned roads (level 2) symbolized as local

TX
Too sparse at 160K
Road network is too sparse for scale

Thinned roads (level 3) symbolized as collectors