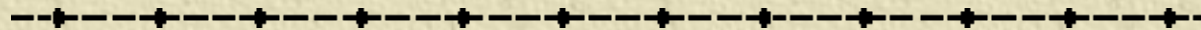




Using GIS Data for Your Byway



Stephen Clyde
NSB Website Team



Overview

- ✦ What is GIS?
- ✦ What can be done with geographically referenced data?
- ✦ Common challenges
- ✦ Tools for working with GIS data
- ✦ What GIS data are available for the byways?
- ✦ Other sources for GIS data

What is GIS?

✦ Geographical Information Systems (GIS) are computer-based systems that facilitate the input, storage, manipulation and output of geographically referenced data

✦ Examples:

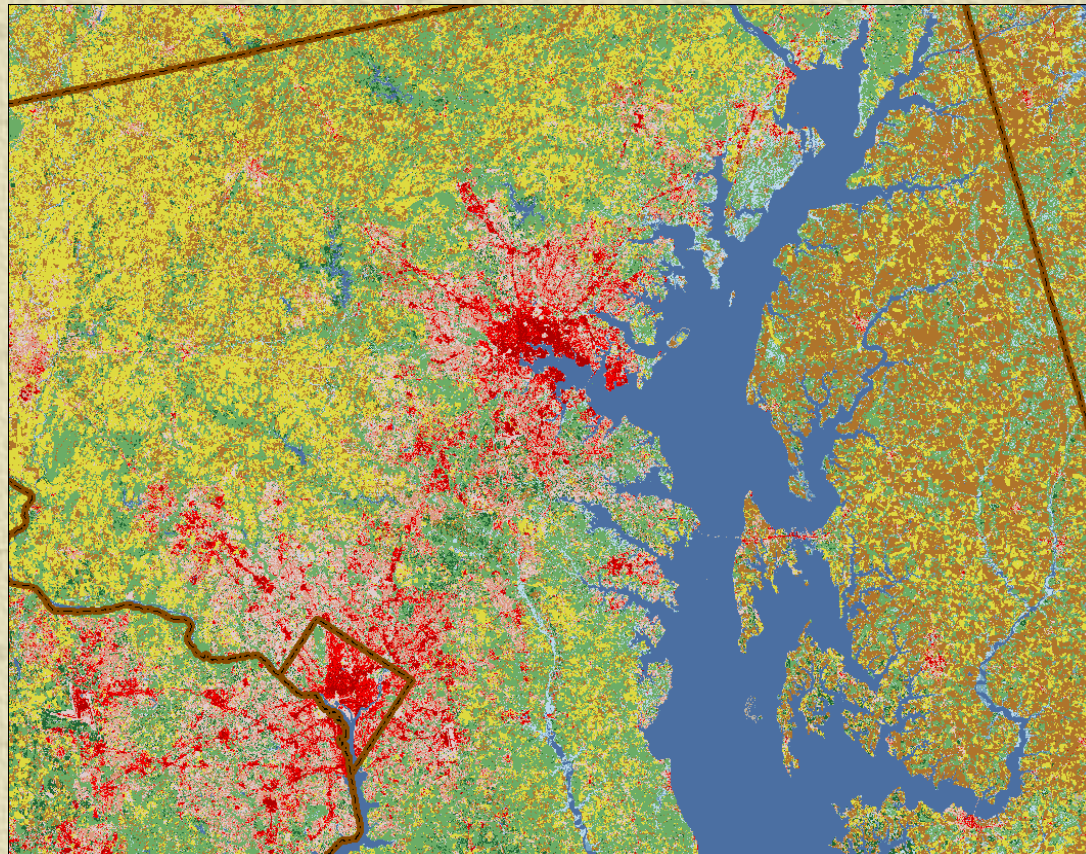
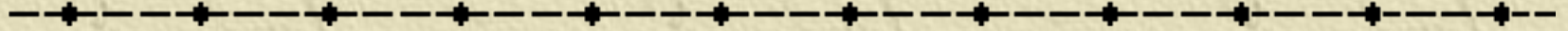
◆ Land cover

◆ Byways

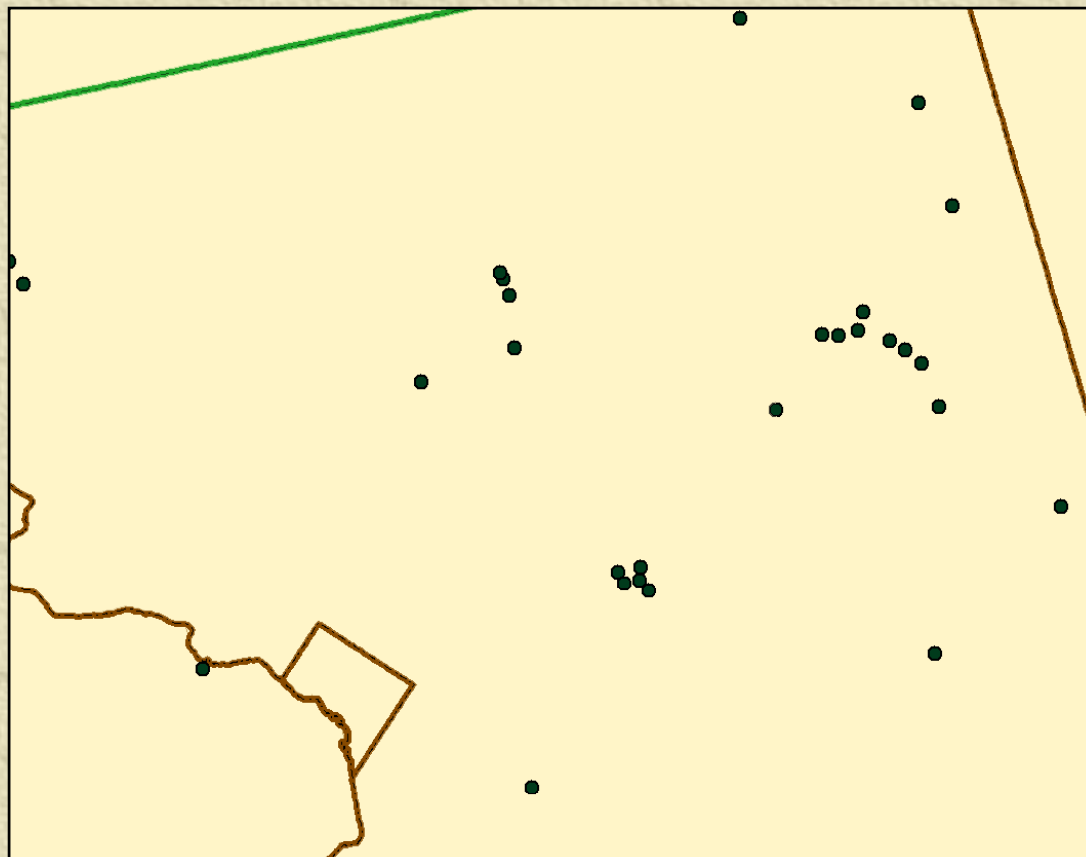
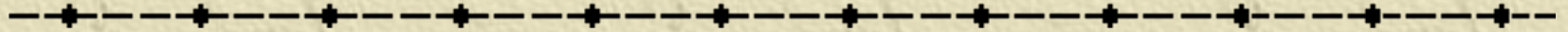
◆ Cultural areas

◆ Project locations

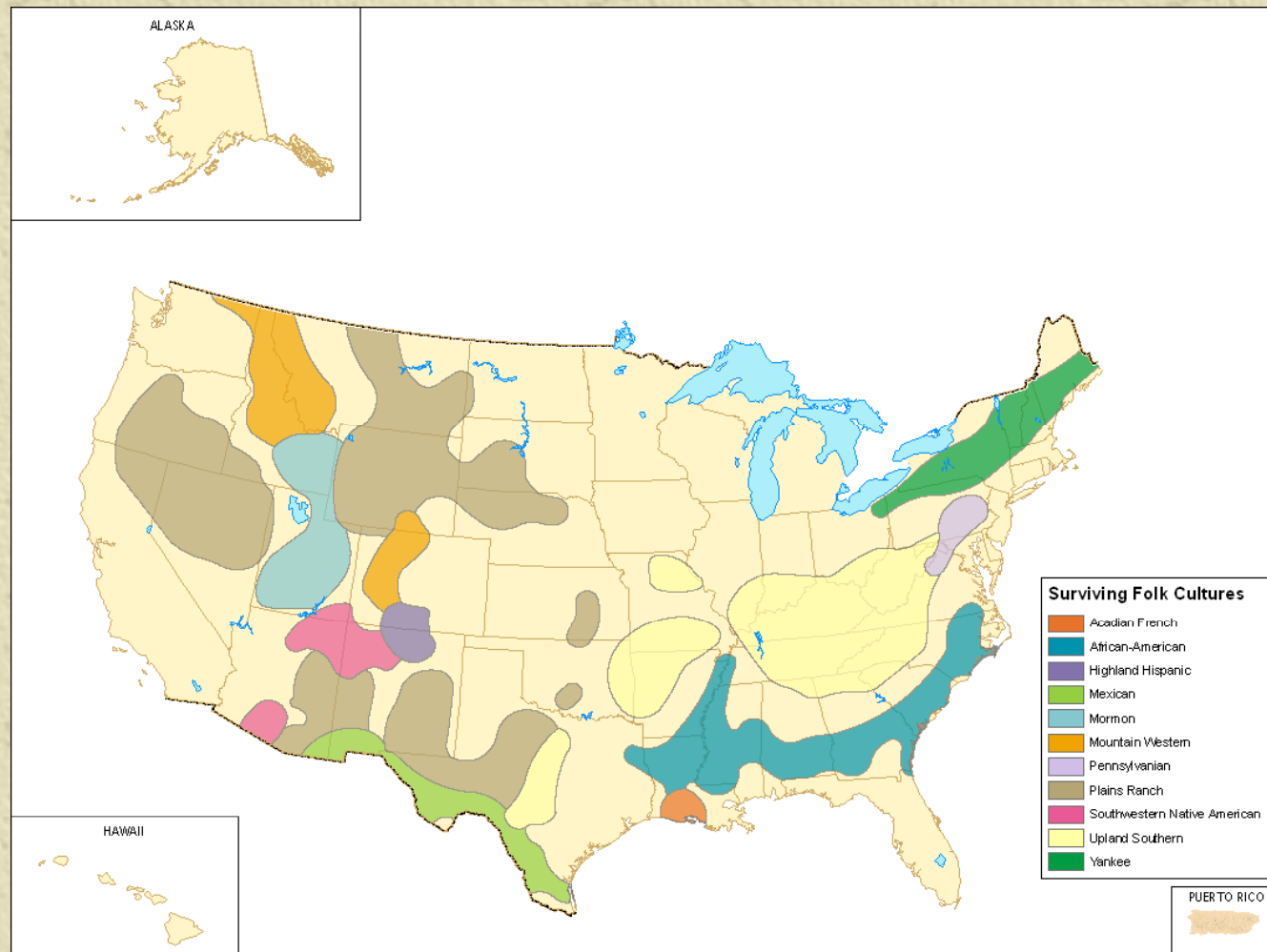
Land cover for part of Maryland



Project Locations



Cultural Areas



Geographical Data

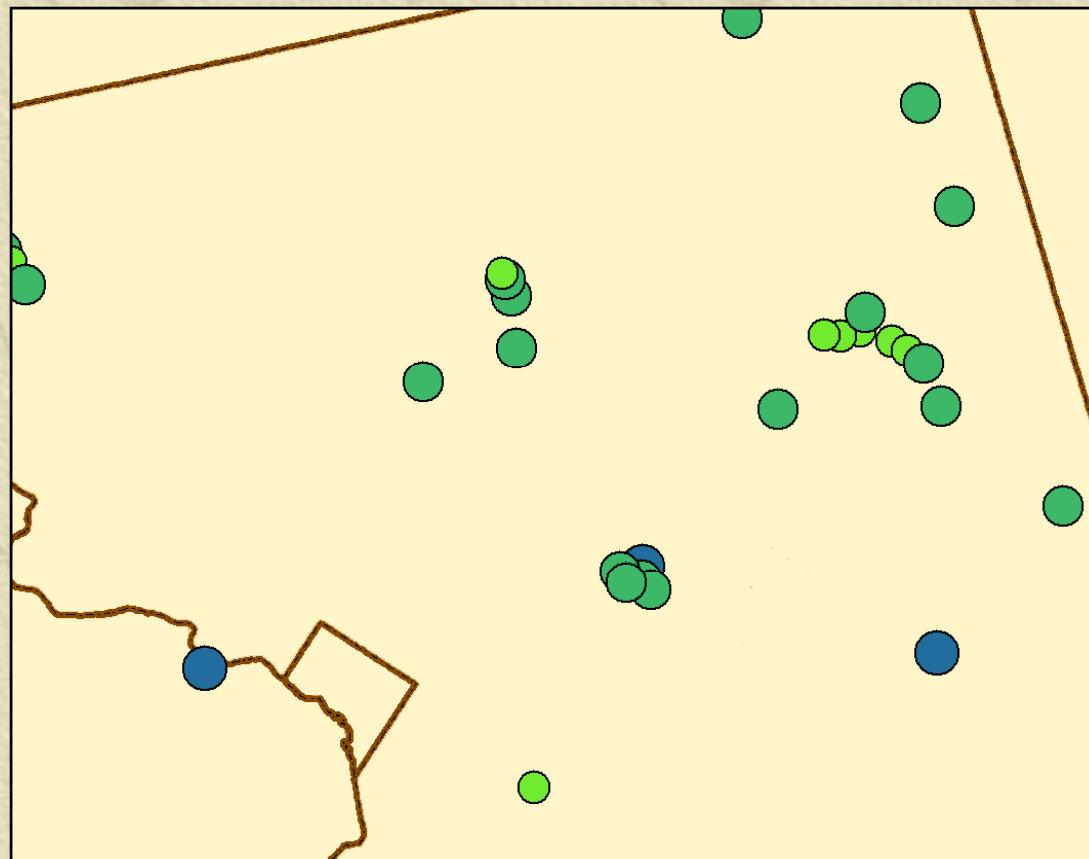
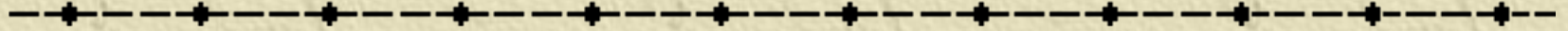
✦ Three basic elements:

- ✦ **Points** e.g., project locations, points of interest, etc.
- ✦ **Lines** e.g., roads, borders, small rivers, etc.
- ✦ **Shapes** e.g., large rivers, lakes, culture areas, etc.

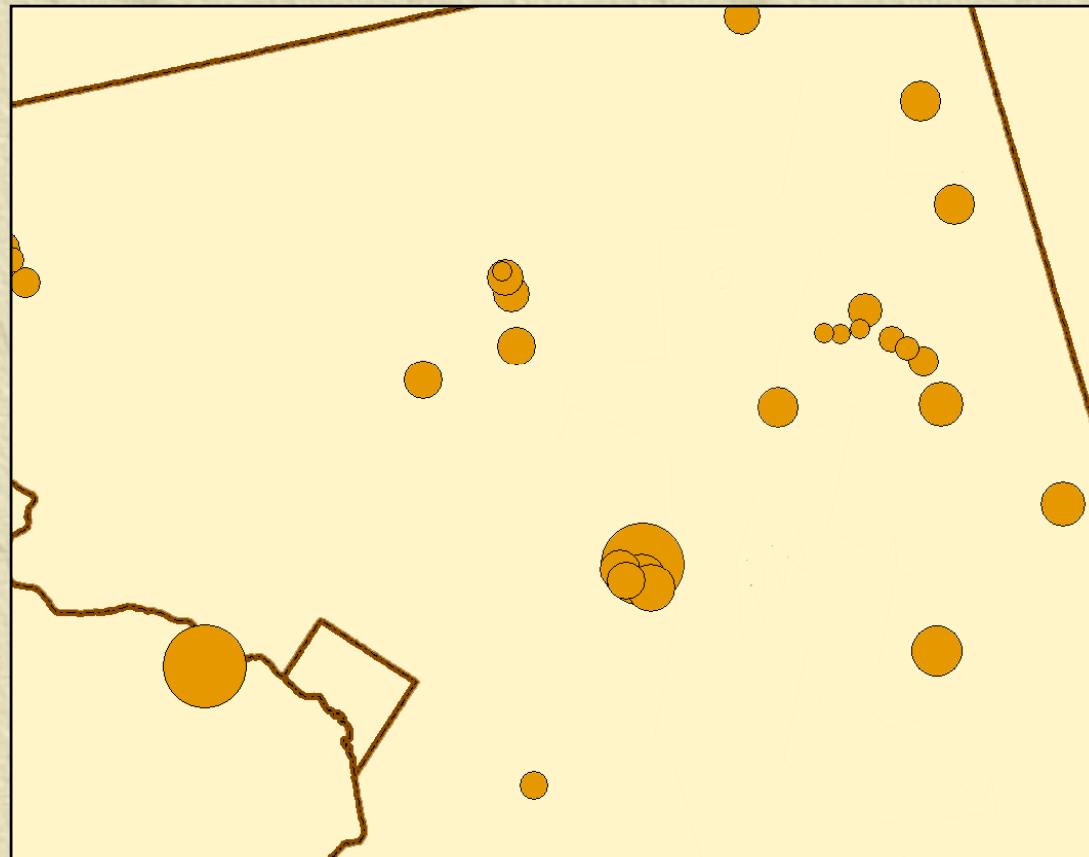
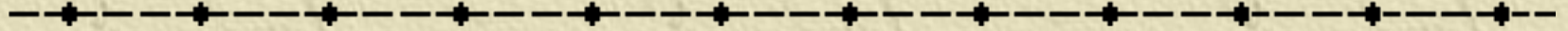
✦ These basic elements can have “attributes” that describe them in more detail or connect them to additional data

✦ Elements with different attribute values can look different (color, font, etc.)

Projects Colored by Type

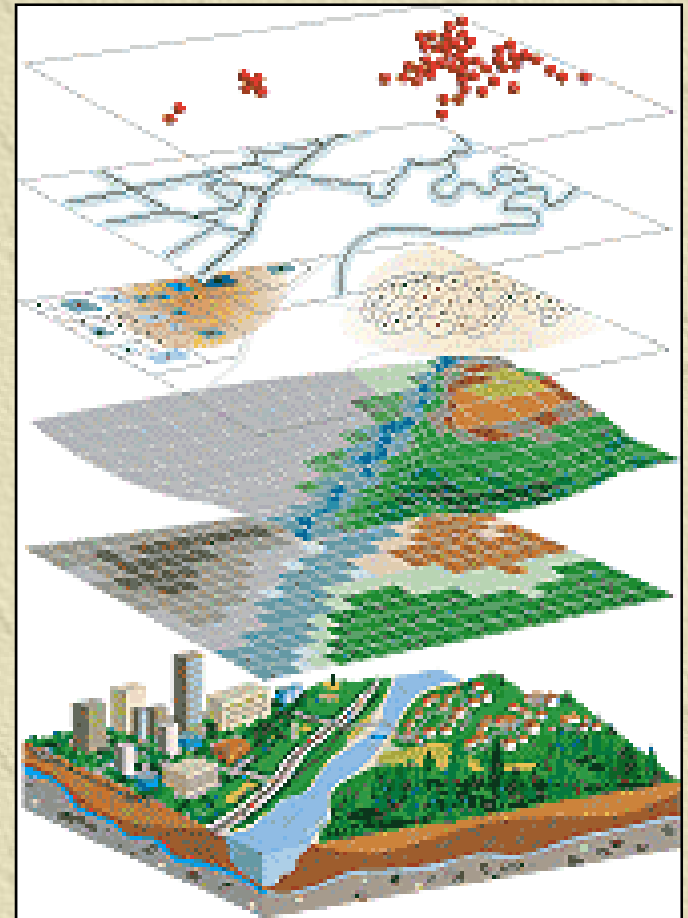


Projects with Dots Varying According to Funding Amount

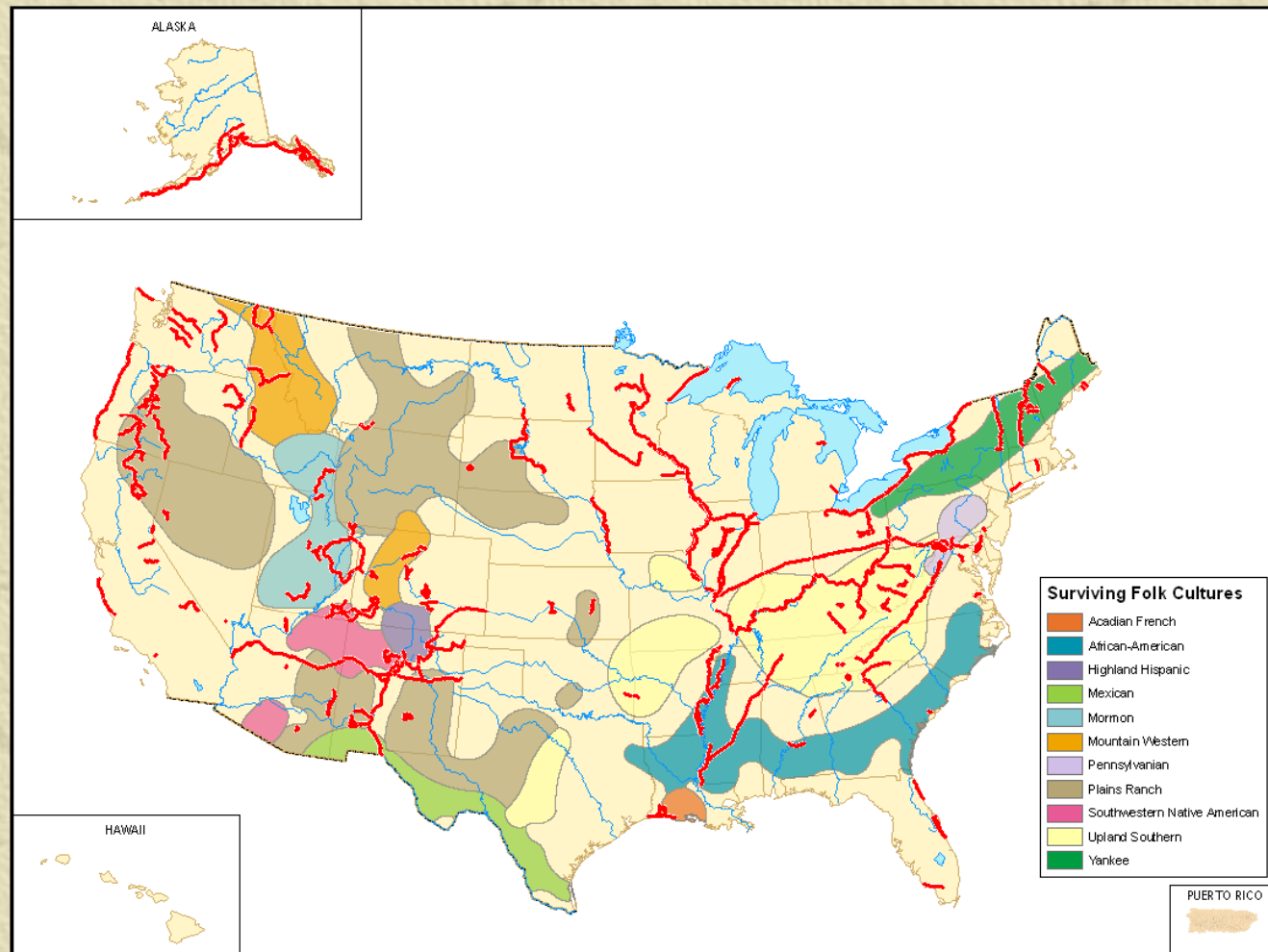


Layers

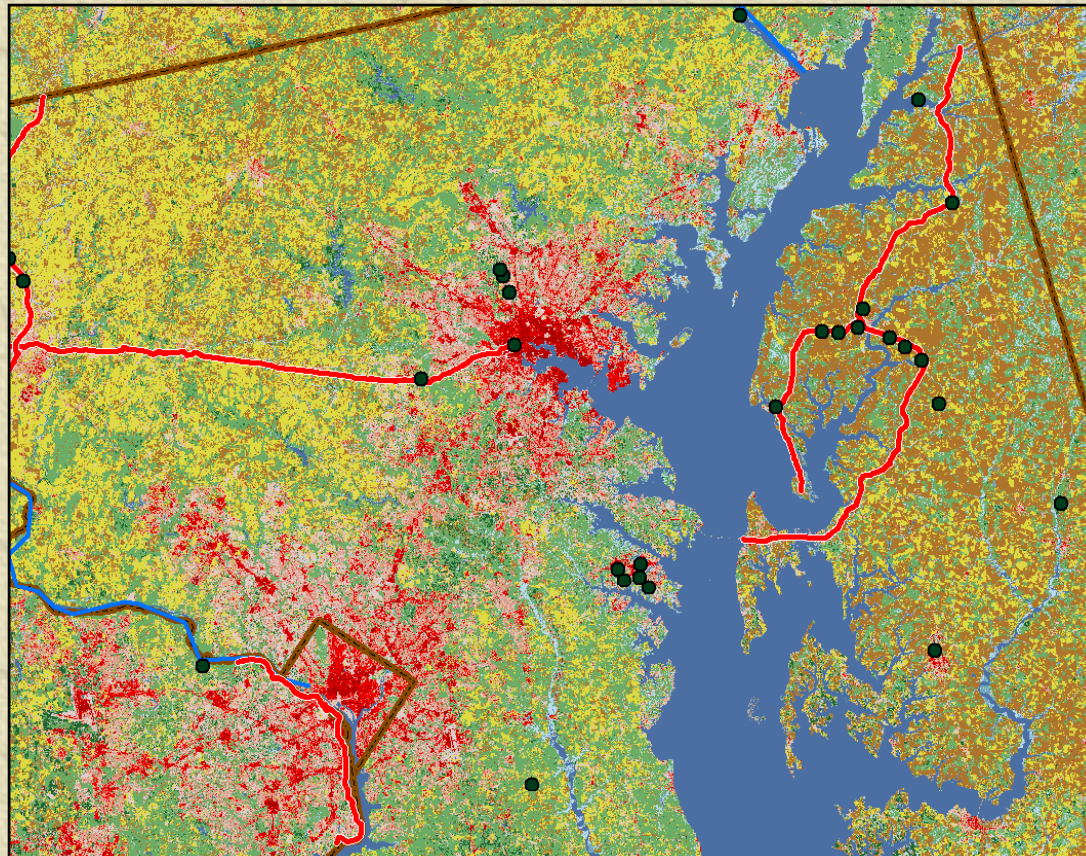
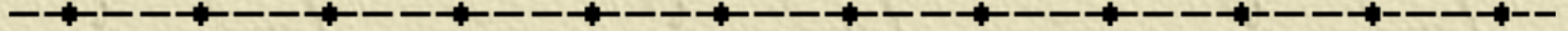
- ✦ One of the powerful features of GIS is the ability to compose multiple layers
- ✦ Layers can be added and removed quickly
- ✦ Examples:
 - ◆ Projects along byways
 - ◆ Projects and land cover
 - ◆ Byways and culture areas
 - ◆ The America's Byways[®] map



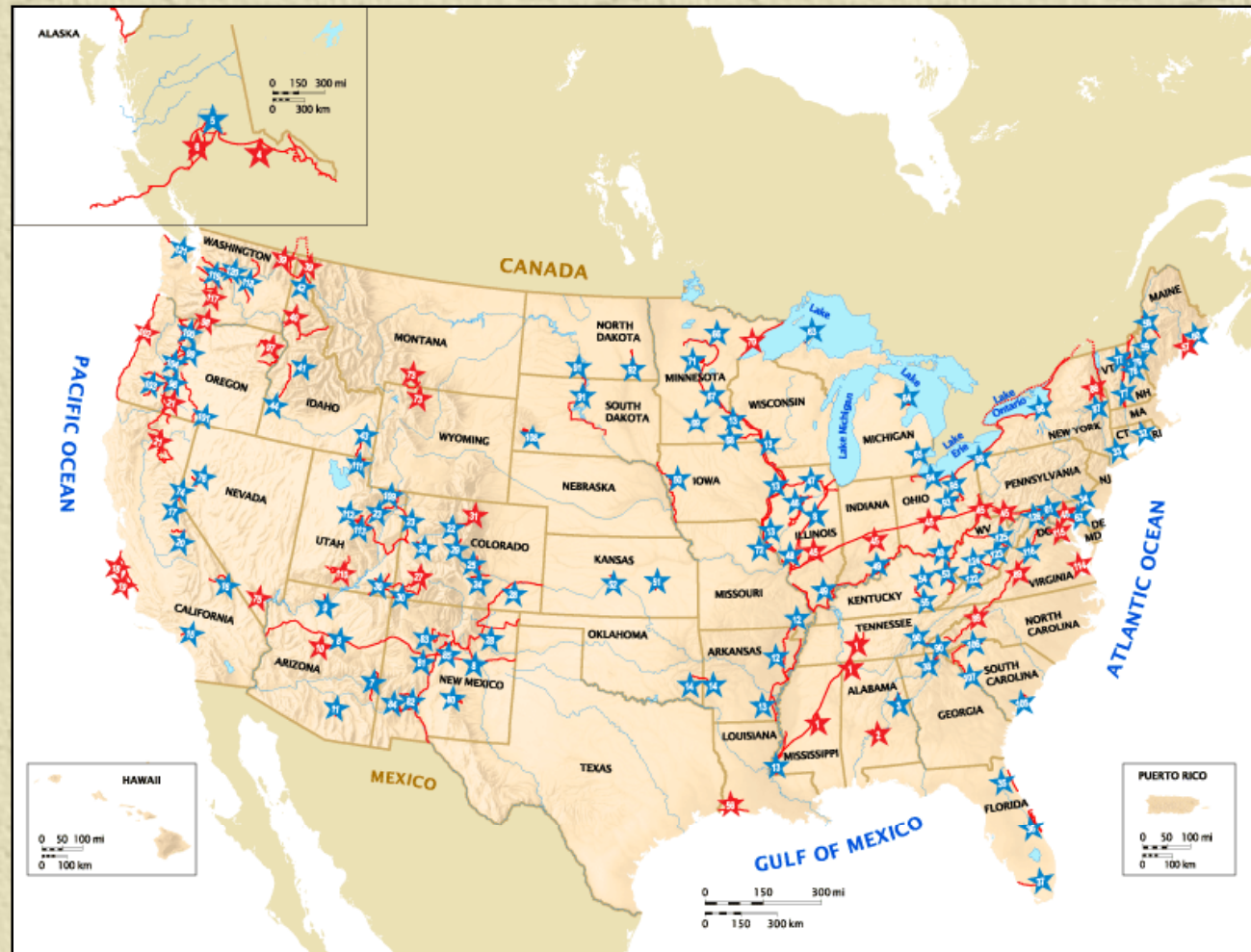
Cultural Areas with America's Byways[®]



Byways, Projects, and Land Cover



Layers in America's Byways[®] Map



So, What Is GIS Good For?

✦ Five general uses of GIS

◆ Mapping

MapQuest

◆ Route or Directions Computation

GoogleMaps

◆ Visualization

Elevation Chart

GoogleEarth

◆ Analysis

Byway Sinuosity

◆ Planning

Byway Viewshed

◆ Recreation and Entertainment

Geocaching

Common Challenges and Problems

-
- ✦ Working with different projections
 - ✦ Inaccuracy and incompleteness
 - ◆ Variations in data collection
 - ◆ Inaccuracy caused by simplification
 - ◆ Mis-labeled, missing, or wrong attributes
 - ◆ Inaccuracy caused by change
 - ◆ Misinterpretation

1992 vs. 2001
Land Cover Data

Road and Land
Formation
Simplifications

Zip Codes and
Population

GIS Tools

-
- ✦ Tools for creating and manipulating GIS Data
 - ✦ Tools for storing / retrieving GIS Data
 - ✦ Tools for analyzing GIS Data
 - ✦ Tools for viewing GIS Data, particularly over the Web

What's Easy and What's Hard

✦ Easy things

- Adding layers to a map, assuming the data is available
- Removing a layer from a map
- Changing the appearance of components of the map based on data attributes
- Comparing or analyzing data across multiple layers

✦ Hard things

- Gathering new data
- Checking the data for accuracy
- Handling differences in the granularity or projection of data across layers

GIS Data Available Through NSBP

✦ Downloadable, free data

- ✦ GIS file containing your byway route
- ✦ GIS file containing points-of-interest near your byway
- ✦ Adobe Illustrator (AI) or PDF files of our standard map for your byway

✦ Free data, based on approval from FHWA

- ✦ Other byway routes
- ✦ Points of interest near other byways
- ✦ AI or PDF files of other byway maps

✦ Data available for a fee

- ✦ Custom GIS data files
- ✦ Custom maps

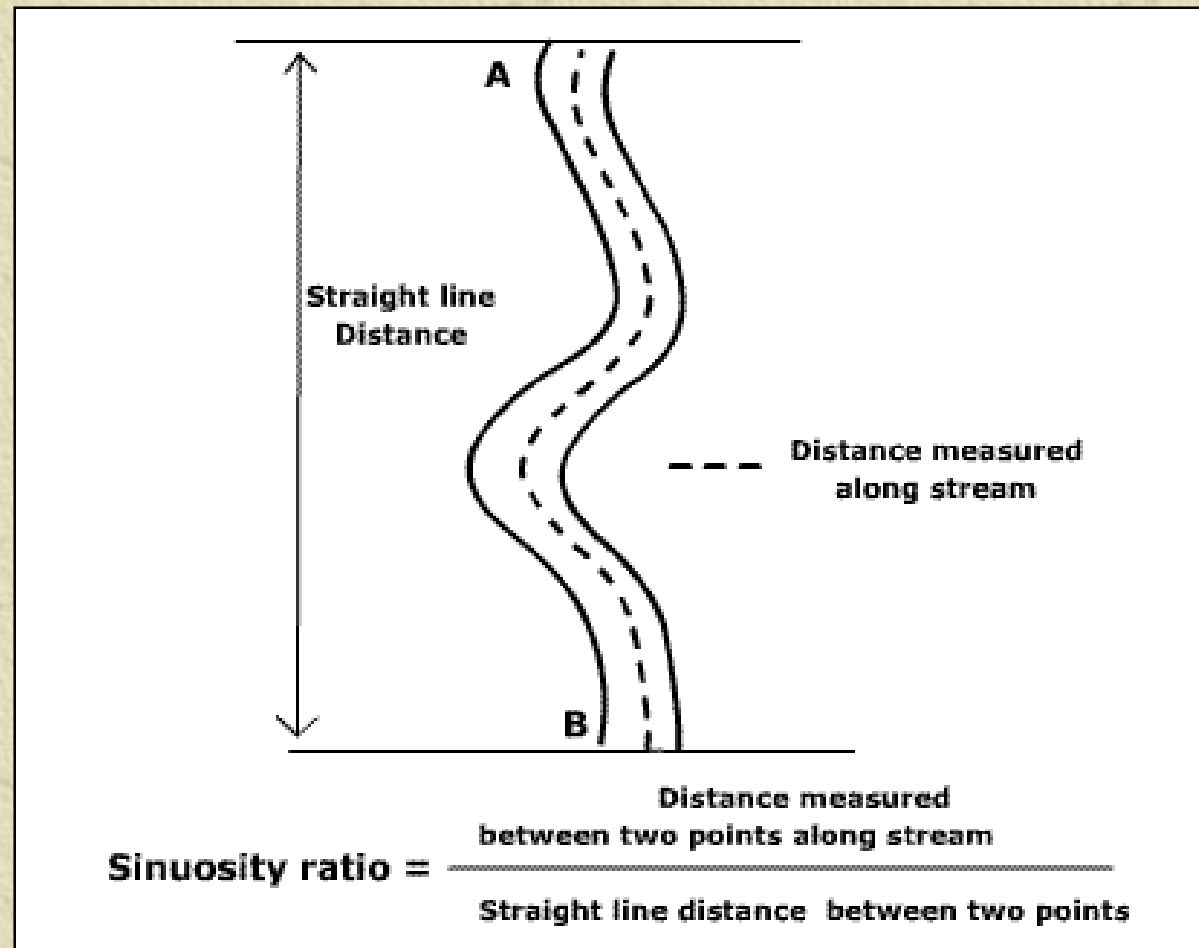
Some Sources for GIS Data

- ✦ USGS has good data <http://store.usgs.gov>
- ✦ Good information about GIS and free sources including tiger data on:
<http://www.census.gov/geo/www/index.html>
shape files will be available this fall.
- ✦ Most state DOT departments have free data for their state.
- ✦ ESRI has map drawing and manipulating programs, along with data. See <http://www.esri.com>
- ✦ Web search for GIS data or open GIS



Questions?

Example of Using GIS Data for Analysis: Byway Sinuosity

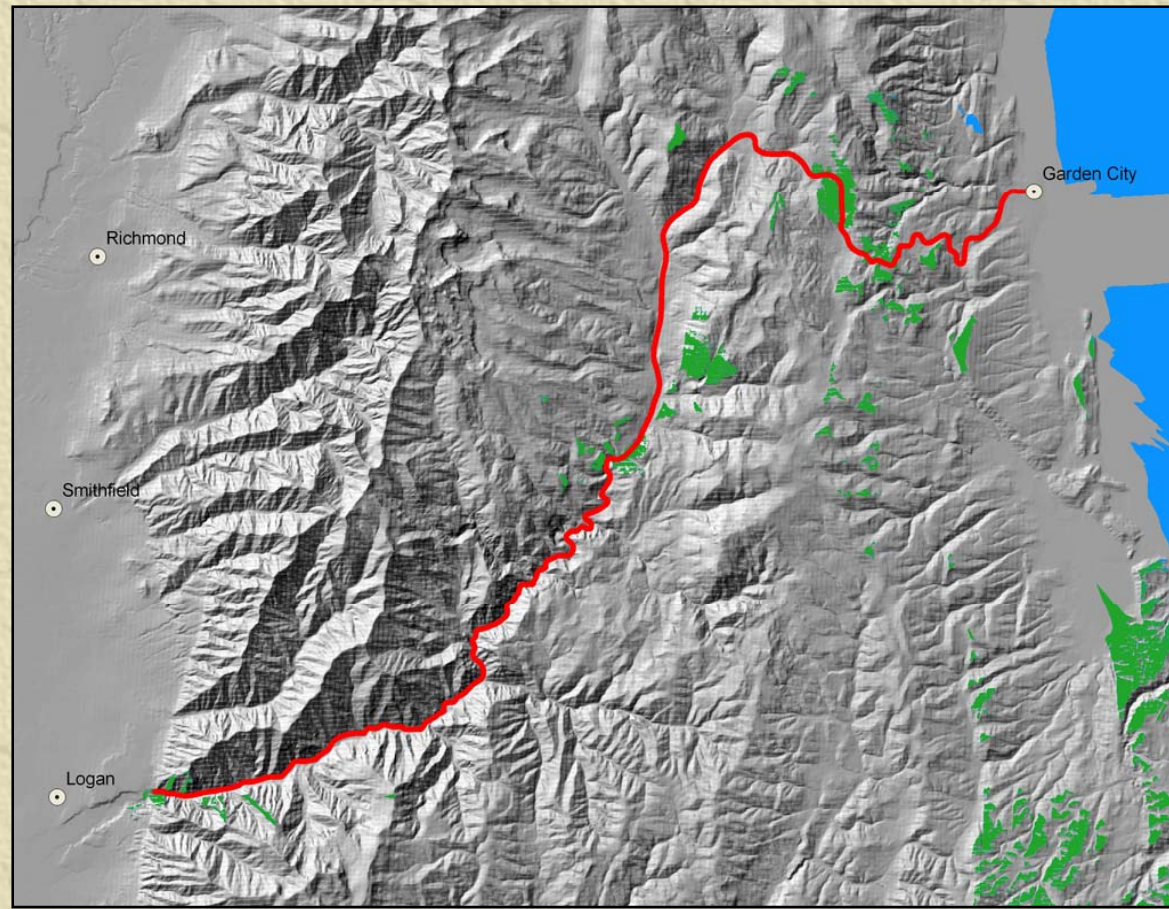


Example of Using GIS Data for Analysis: Byway Sinuosity



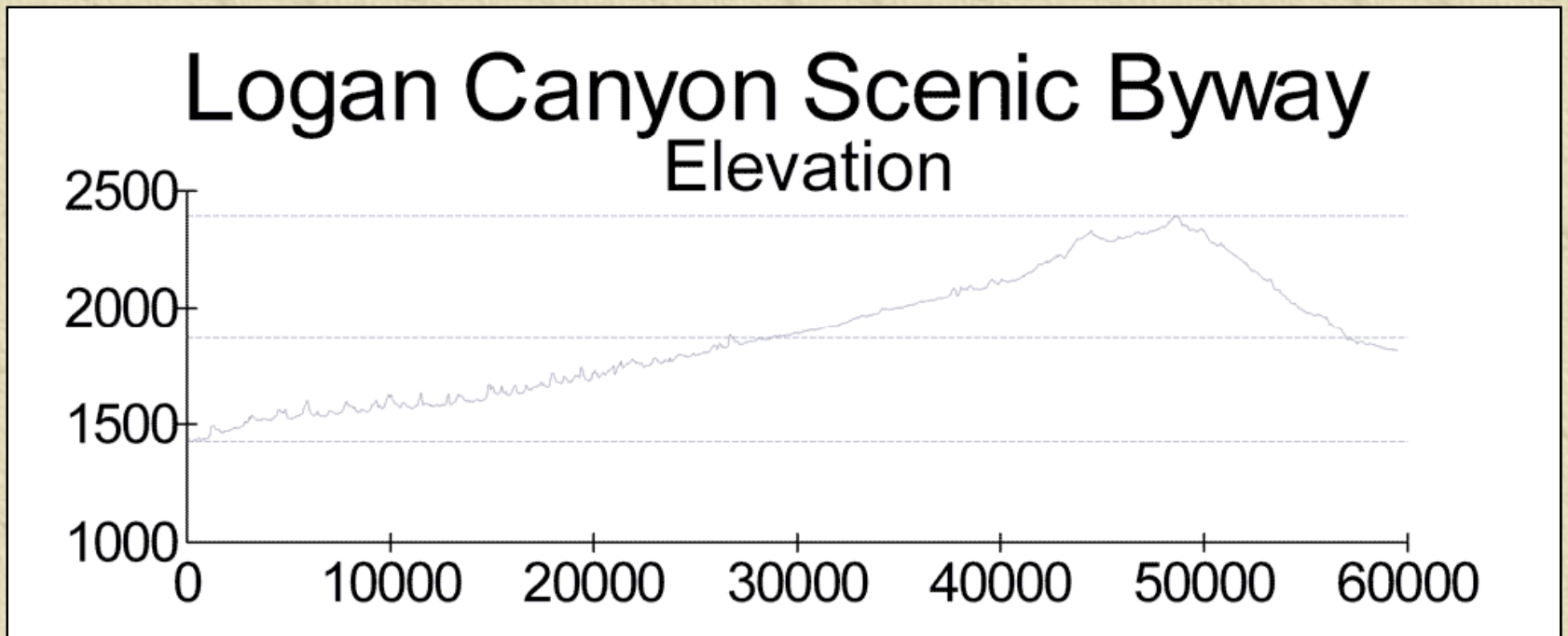
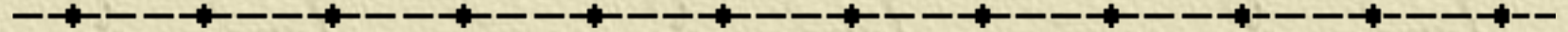
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Example of Using Data for Planning: Viewshed



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Example of Using Data for Visualization: Elevation Chart



Differences in Land Cover Categories

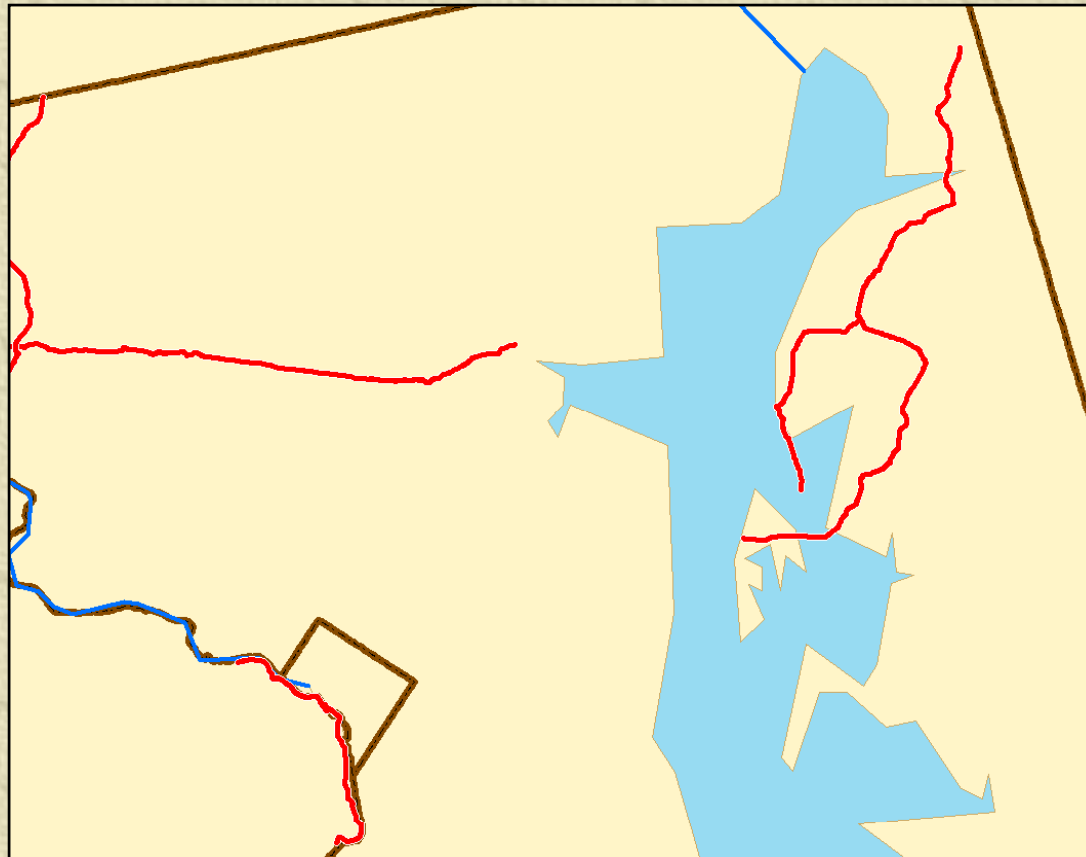
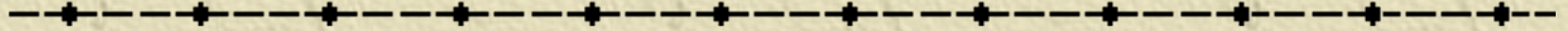
Sky Island Scenic Byway

<i>1992</i>	
<i>Label</i>	<i>Sq. km</i>
No Data	0
Open Water	0
Perennial Ice/Snow	0
Low Intensity Residential	1.3986
High Intensity Residential	0
Commercial/Industrial/Transport'n.	0.063
Bare Rock/Sand/Clay	0.0153
Quarries/Strip Mines/Gravel Pits	0
Transitional	0
Deciduous Forest	0.0036
Evergreen Forest	15.4692
Mixed Forest	0.2322
Shrubland	17.4555
Orchards/Vineyards/Other	0
etc.	

<i>2001</i>	
<i>Label</i>	<i>Sq. km</i>
No Data	0
Open Water	0.0108
Perennial Ice/Snow	0
Developed, Open Space	3.2346
Developed, Low Intensity	1.6236
Developed, Medium Intensity	0.2079
Developed, High Intensity	0.0342
Barren Land (Rock/Sand/Clay)	0.0531
Unconsolidated Shore*	0
Deciduous Forest	0
Evergreen Forest	14.877
Mixed Forest	0.0738
Dwarf Scrub	0
Shrub/Scrub	14.6097
etc.	

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Inaccuracies Caused By Simplifications



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Inaccuracies Caused By Misinterpretation

