Recap of Last Week's Homework

- Mapping Census Data
- About Color Ramps: Check out the Color Brewer!
- Using the Processing Extent to Spatially filter your results
- Adding a point, line or polygon to your experimental scheme table.

Questions or Adventures related to Mid-Term Research Project?

Segue: From Vector Data Models to Raster Data Models

As we have been discussing: Geographic Information Systems provide a way of encoding and exchanging observations about places. If we have a decision-making situation, we can often reduce it to a conceptual model that describes particular things and conditions that may make a difference. Then we can find data to represent those things and conditions; and organize the data with tools into a data-model that we can use to represent the situation in different ways. IN future workshops we will be looking at how data models can be used to explore alternative futures and the possible consequences of one change scenario, or another.

For the past couple of weeks have been exploring a set of tools (relational Databases and SQL) which let us explore other sorts of associations among the things represented as rows in tables (Vector-Relational GIS). Vector data models are good for representing entities that are, or behave like distinct entities that may be represented with **points, lines or polygons** tagged with various types of attributes.

This week, we are going to explore the second major way of encoding observations – not as rows in tables. Rasters are a means of transforming data layers into finely-diced locations: **Pixels (aka Cells).** Rasters provide a means of accomplishing several important representation and modeling tasks. Each of the representation and modeling tasks highlights a need for a different sort of raster encoding as listed below.

- Representing phenomena that vary continuously over space. (as opposed to hard-edged discrete, categorical, points lines and polygons. Encoded as **Floating** (decimal) **Point** rasters.
- Encoding and exchanging pixelated observations of brightness made by photographs and electronic scanners. Encoded as **Multi-Spectral** (aka: **Multi-Channel** or **Multi-Band**) rasters.
- A vocabulary and language of functions that model hypothetical spatial mechanisms involving overlays and interpolation. (Map Algebra). Use any of the encodings above, and also Categrical, Discrete Value Rasters.

The first thing we will tackle is an exploration of the basic raster data-types, as described on the Data Formats for Encoding Geographic Observations .

Then we will look at a very good repository of detailed raster data including Orthophotos and Digital Elevation Models from the U.S. Geological Survey Data Download SIte. Following this week's tutorial: Terrain Mapping: Contours and Synthetic Hillshade

For more information, check out these pages from the ArcMap On-Line Help

- What is the Spatial Analyst extension?
- Solving spatial problems with representation and process models
- Using the conceptual model to create a suitability map

Bonus Topics!

- Optional Independent Reading: Where do elevation models and orthophotos come from?
- CropSacpe!

Break

Terrain Mapping: Contours and Synthetic Hillshade.