Intro to Geographic Information Systems

Using the My World GIS

What is a GIS?

- An information system that can *collect, store, analyze,* and *display* geographically referenced information

- GIS can be used for *scientific investigations, resource management,* and *development planning*.

Geographic Data

- Unit of geographic reference can be presented in many different ways:
  - Coordinate systems
  - Countries, cities, neighborhoods
- How can it be used as a basis for scientific inquiry?

GIS and public health: Dr. John Snow

- skeptic of the then dominant theory that diseases such as cholera was caused by ``bad air''

- traced the source of a cholera outbreak in Soho, England, to one specific water pump using spatial analysis

You can use GIS to:

- Study the distribution of populations
- Study physical features of the earth and natural phenomena
- Identify patterns like clustering
- Inform decision making:
  - locations for starting a business or locating an event
  - Identify target markets
- Tie together disparate pieces of data to create maps

NYC's GIS and datasets

- NYC DOHMH Epiquery

  - Community Health Survey

  - NYC Health and Nutrition Examination Survey

  - Youth Risk Behavior Survey

  - Vital Statistics

  - World Trade Center Health Registry

  - NYC Population Estimates

- NYC.gov NYCity Maps

  - User Guide

  - Locations of schools, hospitals, subways

  - Property, building, statistics, and census information.

- Use public data, build your own map

  - NYC_Health.shp

  - MapPluto and other City Planning Dept datasets
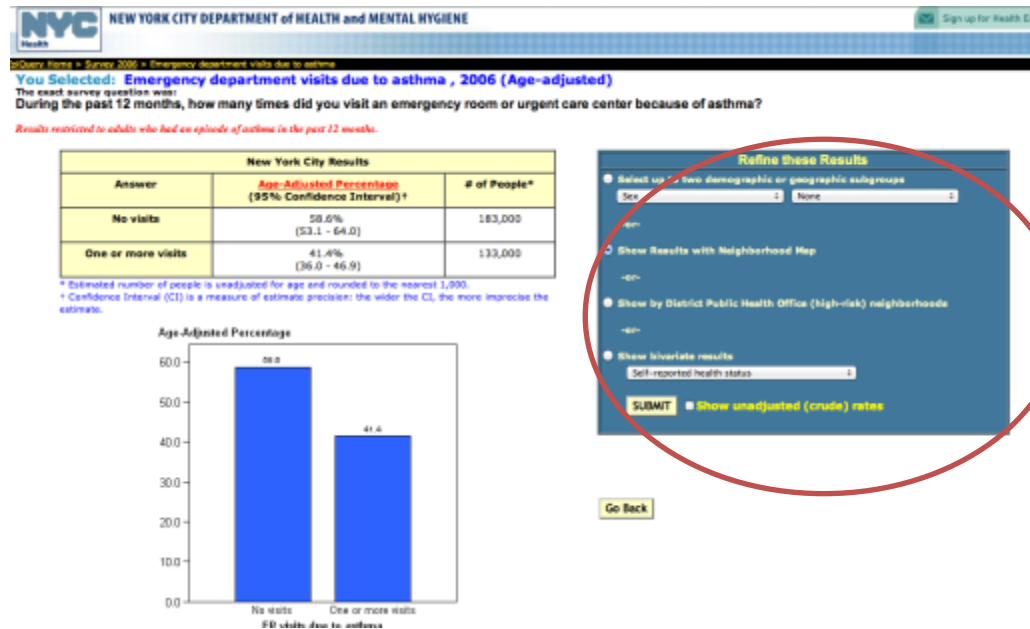
  - Baruch's GIS Librarian

NYCity Maps

- New York City's online map portal (slow, be patient): www.nyc.gov/citymap
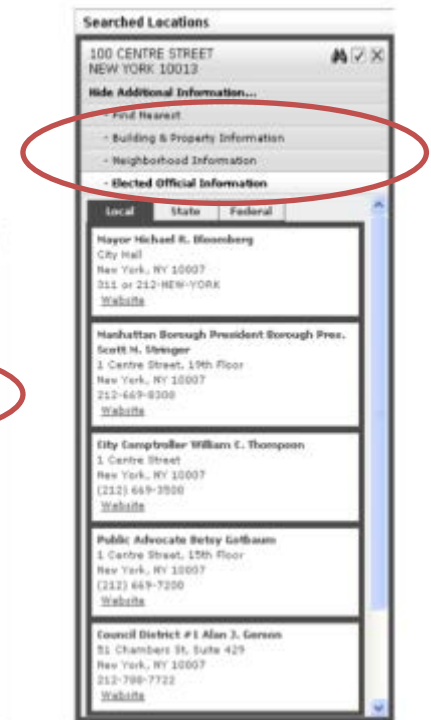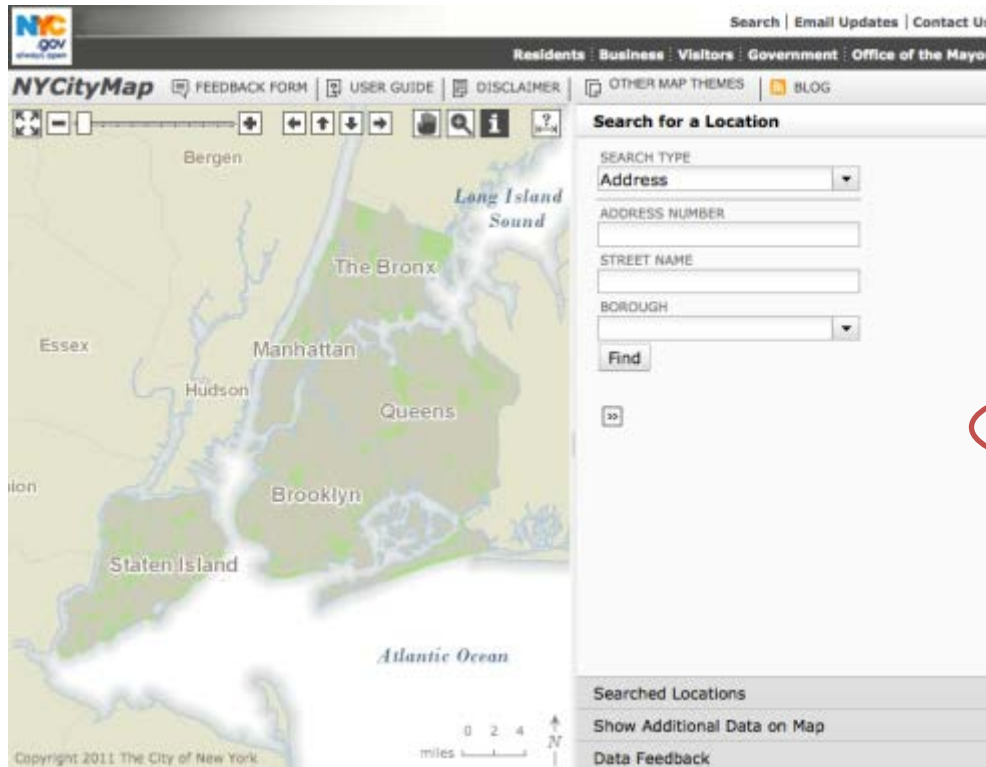
NYC DOHMH - EpiQuery

- Web-based, designed to guide users through basic data analyses on several municipal datasets: https://a816-healthpsi.nyc.gov/epiquery/EpiQuery/

- For example, the Community Health Survey EpiQuery dataset:

NYC Community Health Survey 2006

Percentage of one or more emergency department visits due to asthma by neighborhood
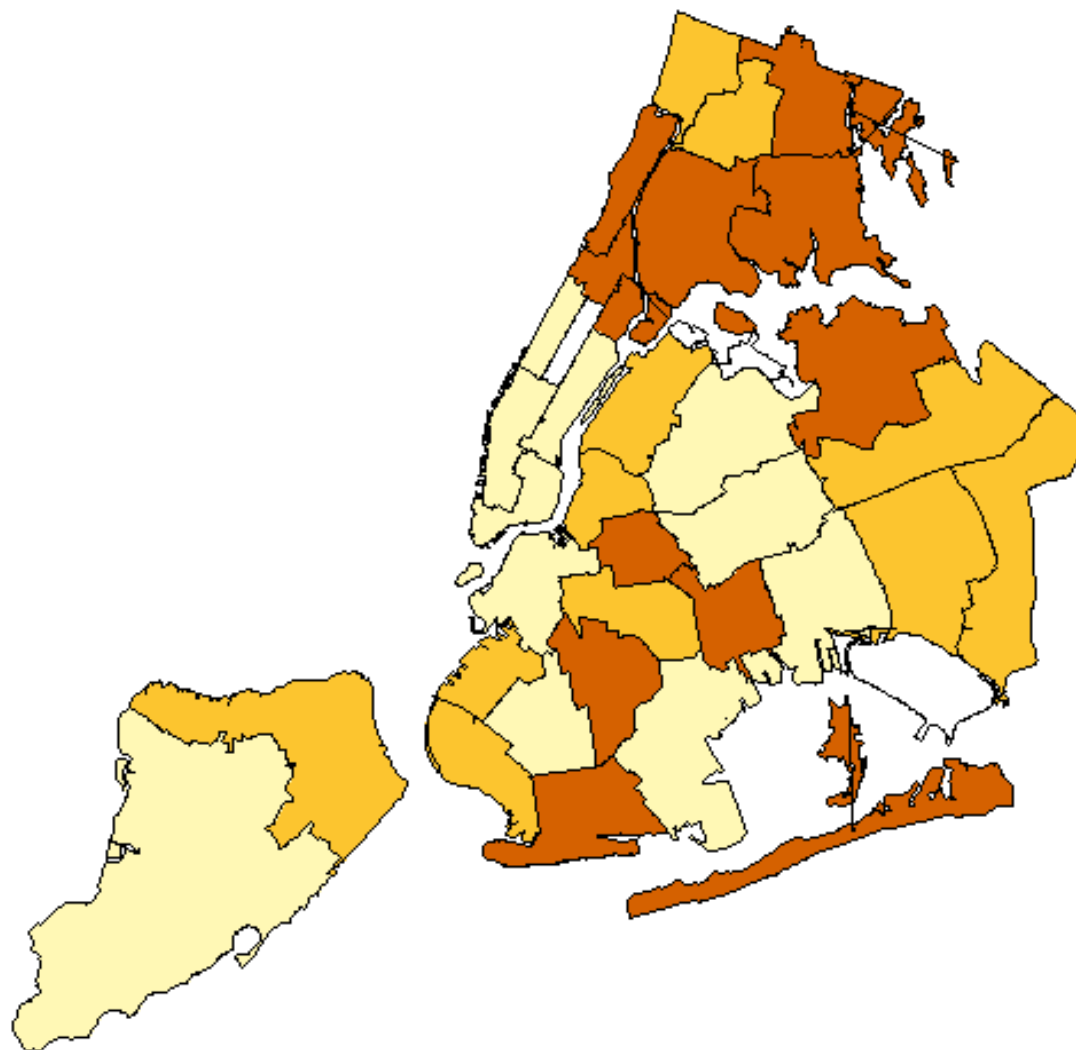
Percent of Total Frequency | 0.0 - 29.6 | 31.7 - 47.5 | 51.4 - 75.3

Bureau of Epidemiology Services, NYC DOHMH

Community Health Survey

GIS Workshop – 9/13

You will need to install **My World GIS** and download the **NYC_Health.zip** files for the in class workshop on Tuesday, Sept 13th. After you enter your information for the free trial, download the version of the software for Mac OSX (the .dmg file).

My World GIS 45 day trial
NYC Health Zip File

http://macaulay.cuny.edu/eportfolios/seminar3fall2011/

Case Study: Asthma Prevalence and Geographic Disparities

Our goal: create a custom map that helps to *show asthma related disparities among NYC neighborhoods*

- Dataset – CHS extract

- Tool – My World GIS

- Basic steps:

  - Construct – import shape file (NYC_Health.shp) into data library

  - Visualize – identify the variable(s) of interest from CHS

  - Analyze – select, compute as needed

 - Layout – format, insert key, export map

My World GIS

- Just one of many GISs
  - Northwestern University
  - GEODE initiative adapts scientific visualization and data analysis tools to support inquiry-based learning
  - Powerful, user-friendly, designed for beginners
  - 45 day trial, easy to uninstall, skills gained extend to ArcGIS
  - Website
    - http://www.myworldgis.org/
  - Public use datasets
    - http://www.myworldgis.org/data/

Step 1: *Construct*

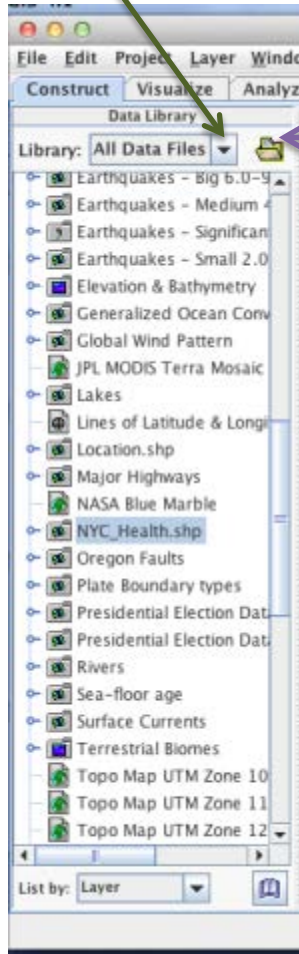Import shape file (NYC_Health.shp) into data library

Construct

Map
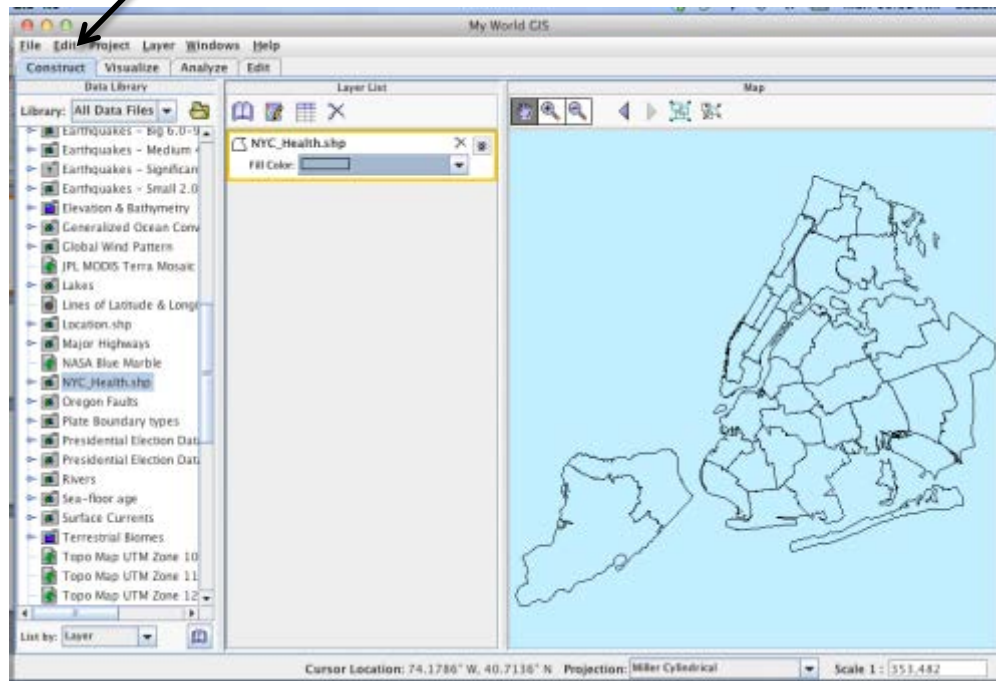
Move Map
Zoom in/out
Zoom to Active
Layer

Data Library
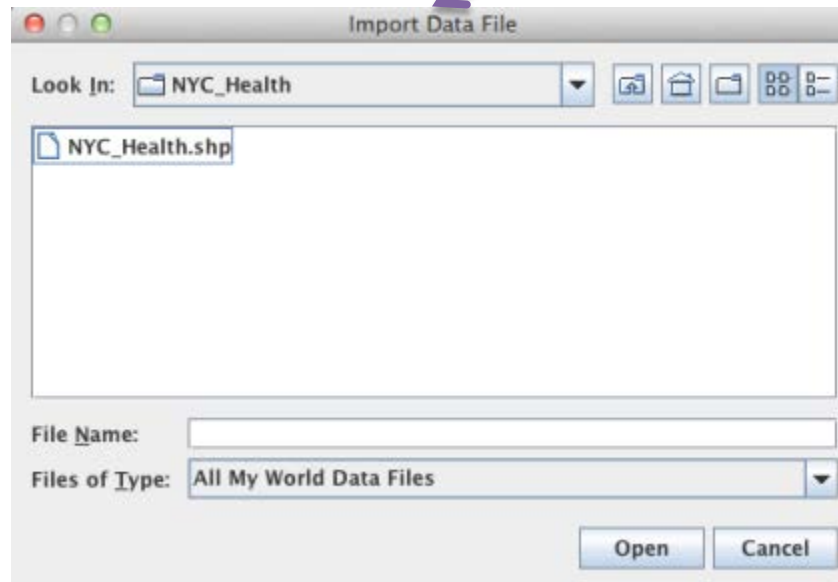
View Projects
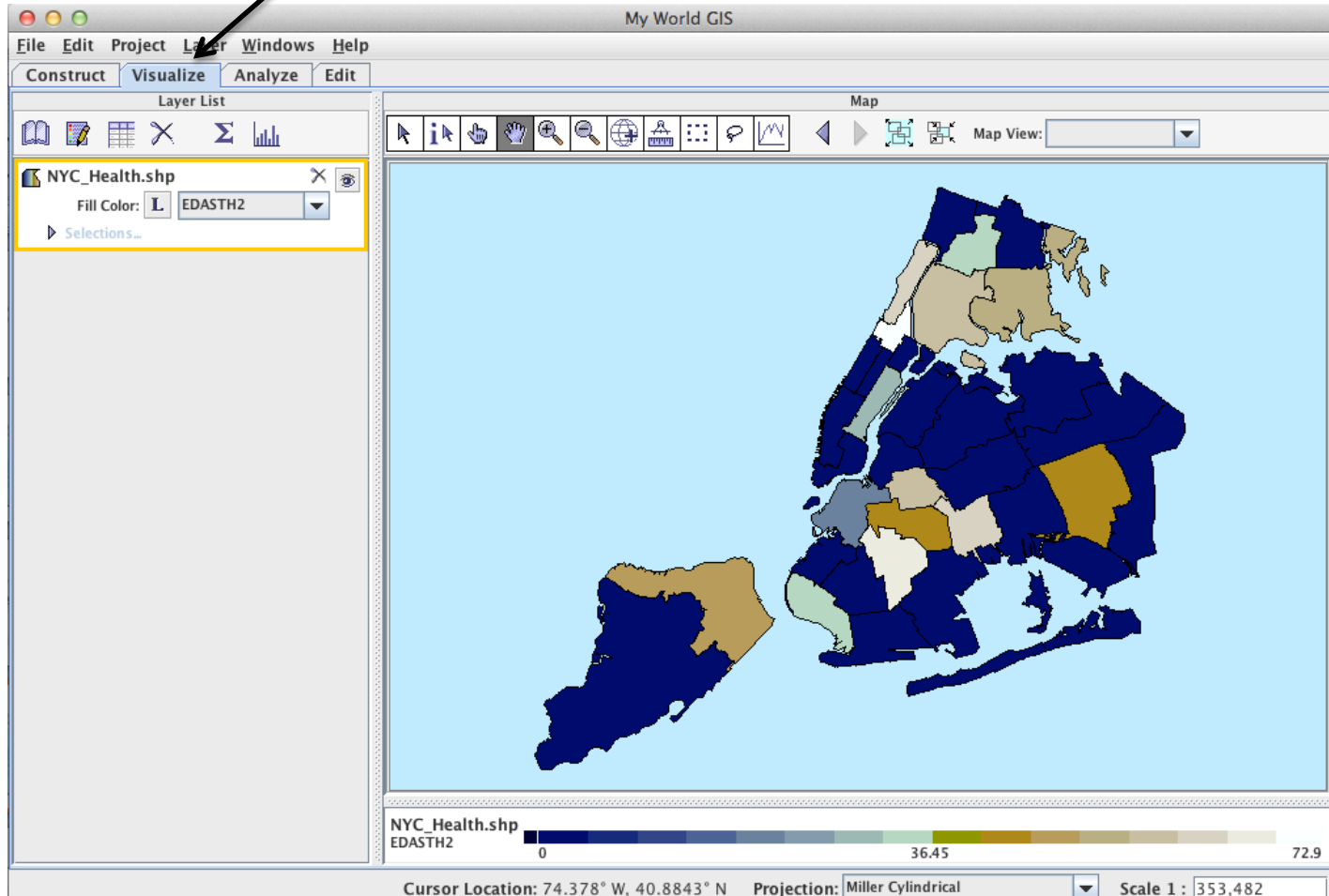
Import Data Files from another locations
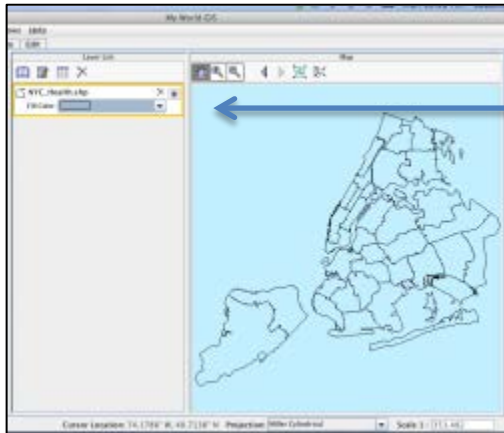
View Data Files

Step 2: *Visualize*

Find the asthma related variables using the codebook, and show those that may be indicative of geographic disparities

Visualize

Layer List

Click to Active Layer

Options for Active Layer:
- Documentation
- Edit the appearance
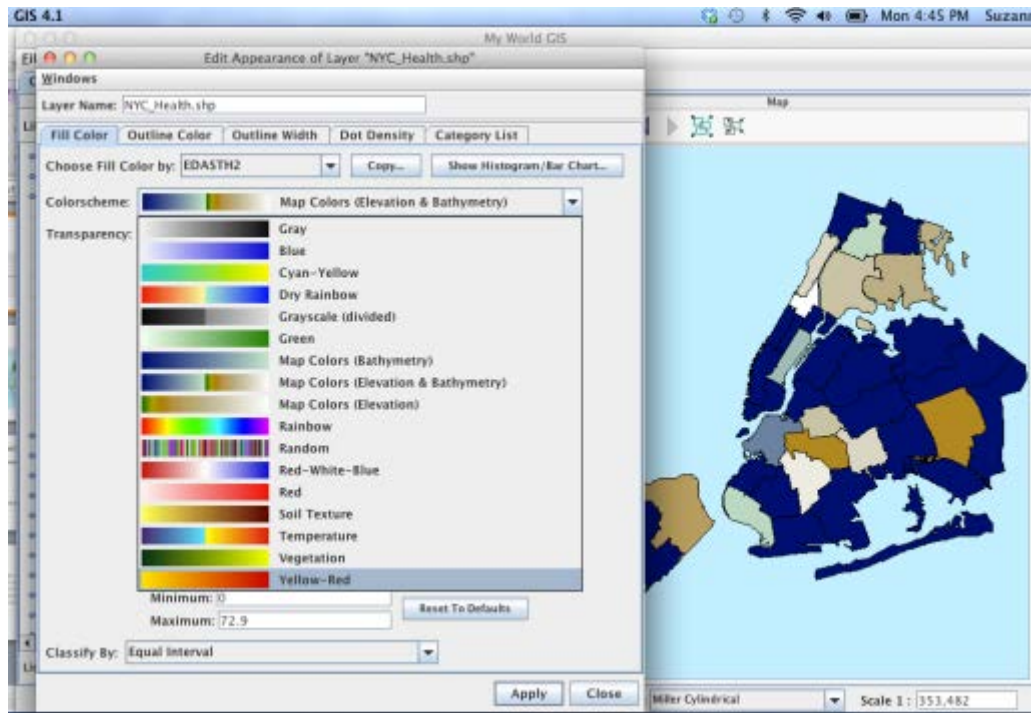- Show data table
- Delete
- Show Stats
- Show Histogram

To do:
- Find the asthma related variables using the data definitions.
- Show the histogram/bar chart for EDASTH2 by neighborhood. How can histograms help you identify health disparities by neighborhood?
- Experiment with changing the number of bins in the histogram.

Visualize

Change the colorscheme.
Which colors are better?

Visualization Options

- Fill color
- Outline color
- Outline width
- Dot Density
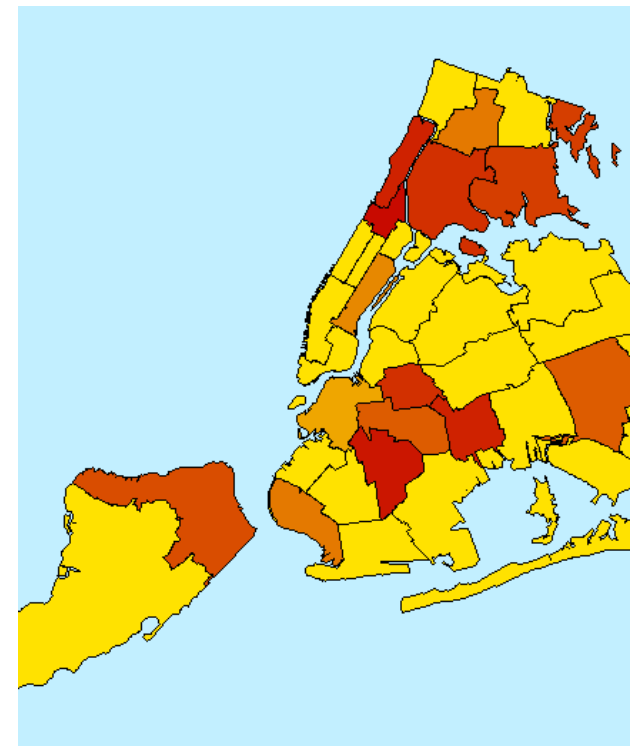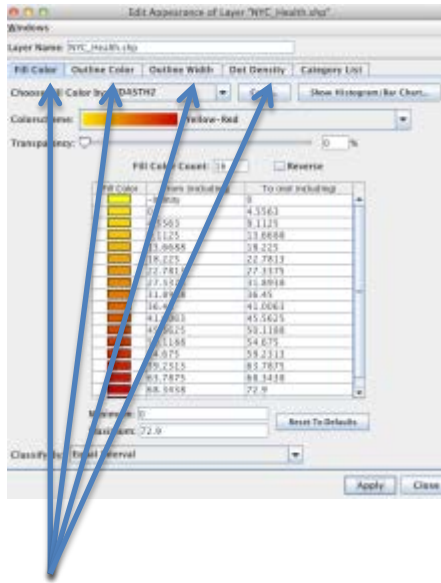
Step 3: *Analyze*

Select by value, plot, compute and create new layers

Analyze

To do:
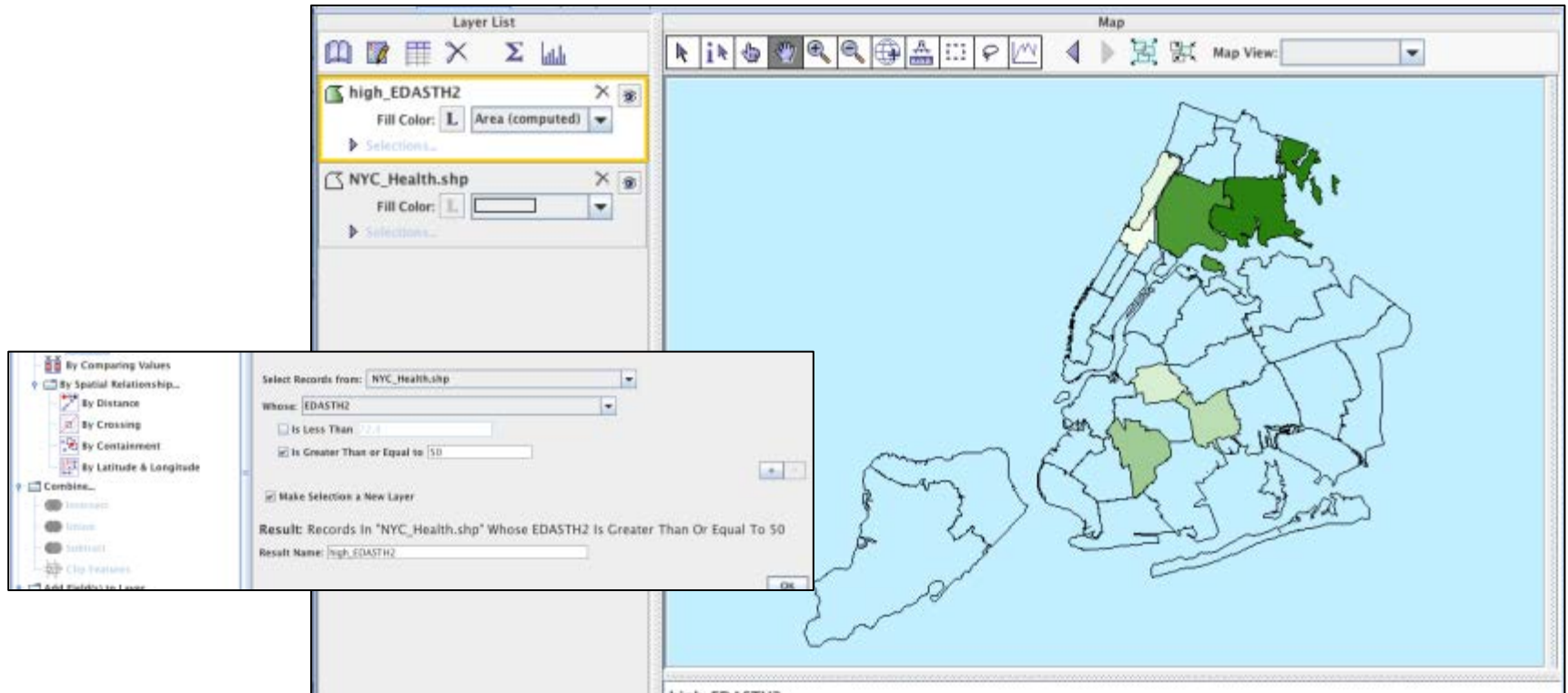- Select only those neighborhoods with higher than 50% of people reporting at least 1 ED visit for the color fill.
- Select only Brooklyn and Manhattan
- Save as a new layer

Step 4: Layout and Exporting

Insert the legend, set display area, change, background color, adjust any other map attributes and save your map.
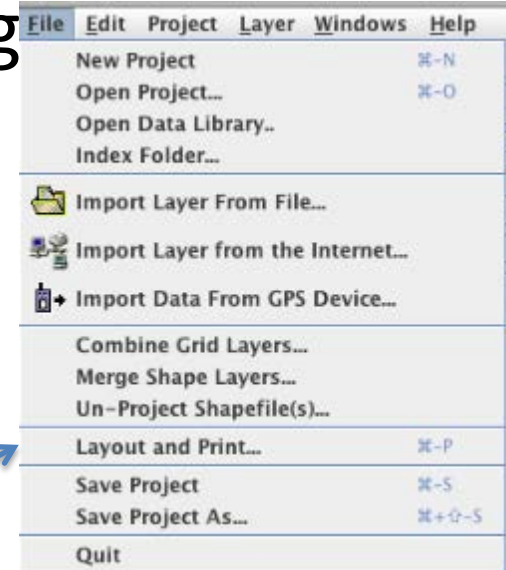
Style Guidelines

- Inserting a Legend and Exporting
- Your map should convey no more information that needed. Keep it:
  - simple
  - aesthetically pleasing
    - Size, colors, format
- Prepare your map in Layout mode
- Insert a title and legend so it is easy for others understand
- Print to an external file and voila!

File	Edit	Project	Layer	Windows	Help

New Project ⌘-N
Open Project... ⌘-O
Open Data Library..
Index Folder...

📁 Import Layer From File...
📡 Import Layer from the Internet...
📻▸ Import Data From GPS Device...

Combine Grid Layers...
Merge Shape Layers...
Un-Project Shapefile(s)...

Layout and Print... ⌘-P
Save Project ⌘-S
Save Project As... ⌘+⇧-S

Quit

Layout and Formatting

The layout window appears in the print preview. To enter free text, use the Add Note button.
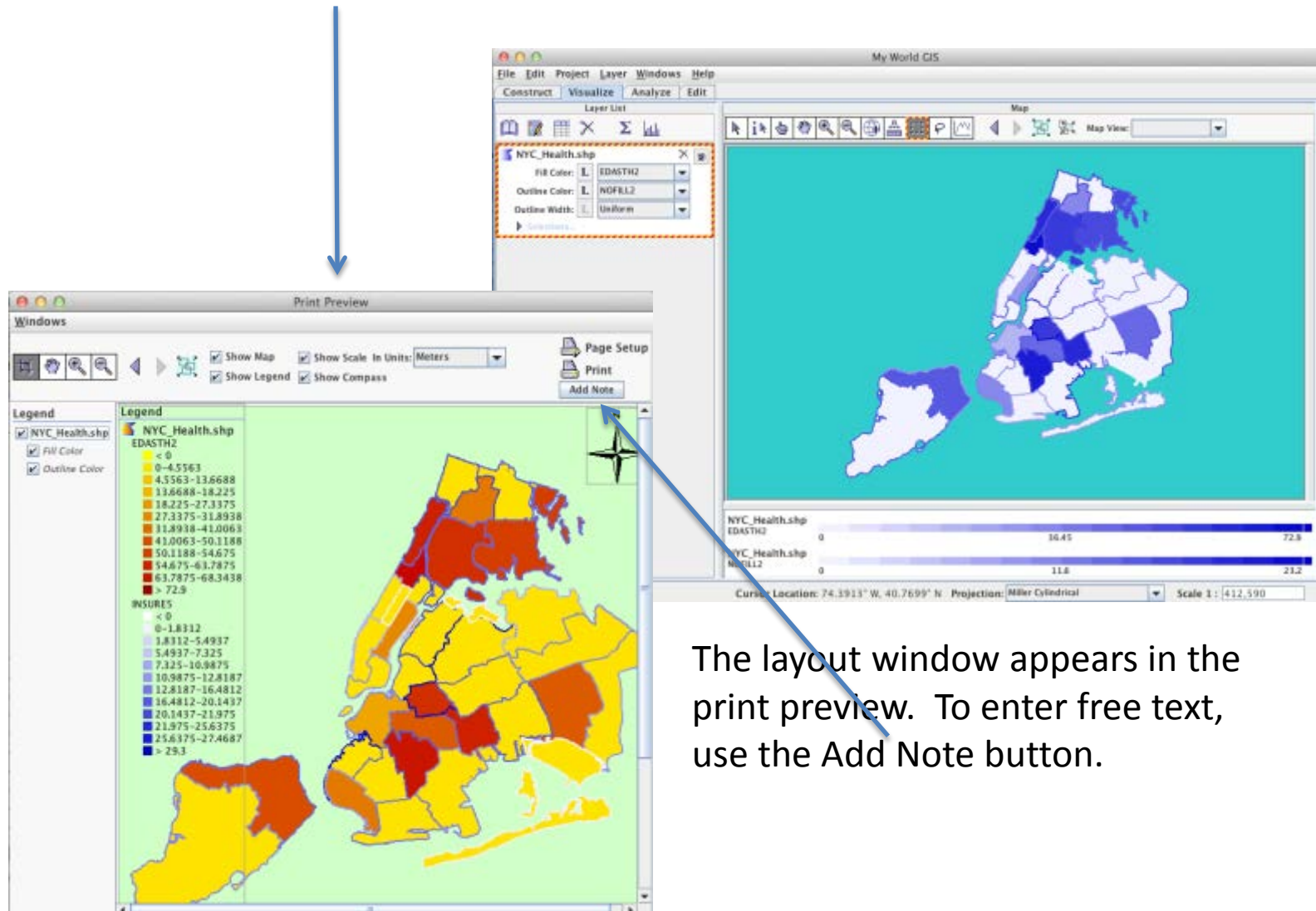
Assignment:

By Monday, create a map that visualizes at least two variables of interest at the neighborhood level. Briefly describe the basis for your selection and what information your map helps to visualizes. Be sure that your map includes a legend and is no larger that a letter size sheet of paper (8.5''x11'')

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Email me with any problems!

Resources: http://macaulay.cuny.edu/eportfolios/seminar3fall2011/