Giacomo Faiella

Geography 360
November 14, 2016

# Final Projects and Spatial Analysis (cont.)

1. *Questions and Announcements*
   - 24 hour extension on the NEAR AND far assignment.
   - Extra Credit 'Assignment': CUGOS Wednesday evening
   - Tutorial: Intro to ArcMap and Spatial Analysis
   - One more tutorial, due next week, to help build skills for Final Project.
   - 'Interesting data' discussion…helps with ideas for the Final Project.

2. *Introduction to Final Project*
   - Project worksheet, constructive peer comments, and TA conference
   - Final Report (due in one month)
   - Geographical Questions

3. *Spatial Analysis (continued)*
   - Spatial analysis: concepts and examples

# Introducing the Final Project

- Final report due a month from today.
  - …but there are intermediate steps to get you there. There is a Project Worksheet to work on over time.

- You use spatial data and GIS to **explore a geographical research question of interest to you**;

- In doing so, you acquire and prepare spatial data for analysis in a GIS, **implement at least two spatial analysis operations**, prepare at least one cartographically-sound map showing your analysis, and interpret or draw conclusions from the results.

# "But how do I know if my research question is *geographical*?"

Does it focus upon forms of spatial characteristics and interactions, such as:

- Location/extent: Where is it, how much is there, why is it there?

- Distribution/pattern: What is the distribution? Are there sharp limits? Where this phenomenon in relation to some other? Is the pattern regular? What factors lead to this distribution?

- Spatial association: What phenomena appear together? What causal relationships may be leading to this association?

- Spatial interaction: Is one phenomenon linked to others elsewhere? How?

- Spatial change: Has the distribution/pattern, spatial interaction, location/extent, changed over time? How and why?

- Interpretative questions: How does someone come to have a particular belief or framing on one of the above issues? Where and why might people have different perspectives?

In groups, jot down and discuss several possible 'geographical research questions.'
Try to (re)phrase them so they might be answerable by using GIS (at least in part).

# Spatial Analysis

As you think about solving problems,
ponder these two modes of spatial analysis:

- Exploratory Analysis, versus
- Confirmatory Analysis

Exploratory Analysis:

Interacting with the data, analyzing it and visualizing it, searching for possible patterns, for statements you can make about the data, for relationships in the data.

Confirmatory Analysis:

You have an idea about phenomena and their relationships in the world and you are seeking to confirm (or often, make sure you can't easily reject) that relationship by analyzing data.

These are not entirely incompatible, and you'll often be doing degrees of both.

# Spatial Analysis

How does a spatial operation *happen*?

- Algorithms
    - What is an algorithm?
        - Literal, step-by-step procedures that allow a computer to solve a problem.
        - Someone writes them down in code.
          But they should be understood in human language, too.
    - For an algorithm, one can ask:
        - What does it seek to do?
        - What sort of data does it assume you will give it?
            - What data model used to represent data?
        - How does performance 'scale up'?
            - Is the algorithm only feasible when the amount of data is small?