

INFO 530
Geographic Information Systems for Public Health
Lance A. Waller, Ph.D.

<i>Number and title:</i>	INFO 530 GEOGRAPHIC INFORMATION SYSTEMS FOR PUBLIC HEALTH
<i>Instructor:</i>	Lance A. Waller, Ph.D. 326 Grace Crum Rollins Building, (404) 727-1057 lwaller@sph.emory.edu
<i>Time and location:</i>	Lecture: M 10-11:50am Lab hours: W, 10-11:50, P13 GCR
<i>Office hours:</i>	T 9-11, or by appointment
<i>Prerequisites:</i>	Experience with Windows-based computing is essential to successful completion of the course.
<i>Brief description:</i>	The course introduces the use of geographic information systems (GISs) in the analysis of public health data. We develop GIS skills through homework and case studies, and particularly address basic GIS operations such as buffering, layering, and spatial queries. In addition to GIS issues we address introductory cartography, and basic statistical aspects of spatial analysis.
<i>For whom intended:</i>	The course is designed for graduate students in Biostatistics/Public Health Informatics, but we expect students from throughout the Rollins School of Public Health.
<i>Text and readings:</i>	Monmonier, M. (1996) <i>How to Lie with Maps, Second Edition</i> . University of Chicago Press. ISBN: 0226534219 Mitchell, A. (1999) <i>The ESRI Guide to GIS Analysis. Volume 1: Geographic Patterns & Relationships</i> . Redlands, CA: ESRI Press. ISBN: 1879102064
<i>Evaluation:</i>	Homework, 40% Labs, 30% Final project, 30%
<i>Next offered:</i>	Fall 2008

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Topic list:

1. Basic Cartography

- Elements of maps. Scale, projections, and generalization.
- Map symbolization and display.

2. GIS Fundamentals

- Vector versus raster GIS.
- Locations and attributes.
- Points, lines, and areas.
- Spatial queries, distances, buffers, summaries.
- Relational joins, map layering.

3. Public Health applications

- Site selection.
- Assessment of the spatial pattern of disease locations (points), and disease rates (choropleth mapping and rate uncertainty).
- Spatial interpolation of exposures.
- Environmental justice assessments.

Evaluation methods:

1. Weekly reading assignments from Monmonier (1995) and Mitchell (1999), weekly homework including brief summaries of readings, interpretation of maps and analyses.
2. Labs involve guided exercises using ArcView GIS. Most lab work can be completed during the scheduled lab sessions, but may also be completed on your own time. Each lab requires a short written report to be emailed to me.

The GPS (global positioning system) lab is somewhat different and involves using hand-held GPS units to find the latitude and longitude of various landmarks around campus. I will assign students into 3-5 person teams and provide a list of landmarks to geolocate. Data from the GPS unit will be transferred to our GIS package and mapped for comparison with the results from other teams. The project (like all other labs) involves a short written report from each team member.

3. Final individual project. Written project report.

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Timeline, Topics List, and Due Dates

- 9/5 *Lab*: Introduction to maps, GIS. Types of maps. Introduction to ArcView. Drawing your first map. Introduction to Views and Layouts.
- 9/10 *Classroom*: Points, lines, and areas. Distance to points, lines, areas. Buffering. Summarizing information. Case studies in Public Health GIS.
Reading: Monmonier Chapter 3. Mitchell Chapter 1.
- 9/12 *Lab*: Layers, layouts, text, and features.
- 9/17 *Classroom*: Global positioning system (GPS) data in public health.
Hand out GPS units.
Reading: Monmonier Chapter 6.
- 9/19 *Lab*: GPS Lab (outside).
- 9/24 *Classroom*: Colors and symbolization. Merging spatial data. Ecological fallacy and the modifiable areal unit problem.
Reading: Monmonier Chapter 10. Mitchell Chapter 2.
- 9/26 *Lab*: Joining data tables, classification, and legends.
- 10/1 *Classroom*: Census geography, ZIP codes, and data confidentiality.
(*Assign individual project.*)
Reading: Monmonier Chapter 11. Mitchell Chapter 3-4.
- 10/3 *Lab*: Adding points to a map, buffers, and data summaries.
- 10/8 **Fall Break.**
- 10/10 *Lab*: Color choice, project work time.
- 10/15 *Classroom*: Application summaries. Environmental justice. Site selection.
Reading: Monmonier Chapter 12. Mitchell Chapter 5-6.
- 10/17 *Lab*: Project work time.
- 10/19, 5pm **Individual Project due.**