

# Mapping and Analyzing Social Patterns in Greater Boston

## SOC 157

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Course Meets: MW 2-3:30 in CGIS K-050

**Required Texts:** Theobald, David M., *GIS Concepts and ArcGIS Methods*  
Other readings to be posted online, listed below

**Course Mission:** Sociologists have long observed that the neighborhoods and municipalities of any metropolitan area vary considerably on a host of outcomes, from crime to academic achievement, from activism to engagement in the arts. Greater Boston is no exception to this rule. There has been much study of how such differences arise, and what they indicate about the social patterns of human communities. The course will focus on the theory and methods surrounding this classical question, with an emphasis on the spatial data necessary for such work. We will explore this theme in the greater Boston area through a data library provided by local researchers, governments, and organizations. At the end of the course, the insights generated by these data sets will be shared with the communities they describe.

**Learning Goals:** The course will cover five skill sets surrounding the central theme of variation across neighborhoods and municipalities:

- 1) Theory on how such variation arises from the interplay of the physical, demographic and social characteristics of a community.
- 2) Identifying and accessing sources of spatial data
- 3) Visualizing and manipulating spatial data in ArcGIS 10.
- 4) Conducting statistical analyses appropriate to spatial data
- 5) Using public platforms intended for sharing, collaborating and disseminating spatial information.

### **Course Format:**

#### *Class Structure*

- Class meetings will combine lecture, discussion, and computer lab activities. The course will be highly interactive and students should attend all class periods. Attendance will be taken.
- There will be weekly readings and written responses to them will be collected.

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There will also be out-of-class assignments based on the skills learned that week.

- There will be times outside of class meetings when students can meet with an instructor to practice using the computer programs involved in the curriculum

### *Assignments*

- Assignments will have students practice working with spatial data through a topic of their choosing.
- At the beginning of the semester, students will propose a topic they would like to focus on. They will also identify data sets that will allow them to explore this question.
- Out-of-class assignments will be open-ended, with each student working on the topic and data that he or she elected at the beginning of the semester.
- Work on the topic of choice will culminate in two final assignments:
  - A final paper that presents and evaluates a hypothesis or theoretical model for the topic of choice (12-15 pgs.).
  - A collection of spatial data sets and visualizations that will be uploaded to public platforms, sharing the findings with the public.
- There will be no quizzes or exams, and no final exam.
- Late assignments will be discounted **20% per weekday**. After a week, they will no longer be accepted.

### *Computer Usage*

- The course will rely heavily on ArcGIS v10, which can be downloaded from Harvard's Center for Geographic Analysis (<http://gis.harvard.edu/icb/icb.do?keyword=k235&pageid=icb.page480715>).
- Statistical analysis will be done using computer software.
- Students will become acquainted with WorldMap, a public GIS platform created by Harvard's Center for Geographic Analysis, and the MetroBoston DataCommon, a space for visualizing and analyzing spatial data for greater Boston.
- For these reasons **those students who own laptops will be expected to bring them to each class meeting**, so that we will be able to work together on the topic for the day.

### **Grading:**

10% Attendance  
10% Participation  
25% Weekly Assignments  
25% Final Data Sets, Visualizations  
30% Final Paper

### **Other Expectations:**

- The use of communication devices during class will not be tolerated. Upon entering, please turn off all cellular phones, Blackberries, or other such devices.
- Late assignments or absences will only be considered excused in the case of a doctor's note, or evidence of an academic conflict.

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**Course Schedule:** (Note that the schedule and associated assignments are subject to change.)

## Unit 1 Visualizing and Describing Neighborhoods

| Date | In-Class   | Reading Due  | Assignment Due  |
|------|--|--|---|
| 9/5  | --Introduction to the course   | —  | —   |
| 9/10 | --The Elements of Neighborhoods<br>--Data Sources for the semester   | --Theobald: Chap. 1:<br>pgs. 1-13; Chap. 2: pgs.<br>35-66  | —   |
| 9/12 | --Intro to ArcGIS<br>--The logic of base layers  | --Theobald: Chap. 1:<br>pgs. 14-34<br>--Ecometrics:<br>Raudenbush &<br>Sampson, 1999   | Proposing a topic of<br>interest for the semester   |
| 9/17 | --The Built Environment as cause<br>--Symbology<br>--Cadastral maps  | --Theobald: Chap. 4<br>--Walkability and<br>Health: Sallis, et al.,<br>2009; Frank, Saelens,<br>Powell, & Chapman,<br>2007                             | Read code book on<br>planimetric data, propose<br>three variables you think<br>are most informative |
| 9/19 | --The Built Environment as<br>outcome<br>--Geocoding<br>--Continue cadastral maps  | --Theobald: Chap. 3<br>--Neighborhood<br>Appearance: Wilson &<br>Kelling, 1982 AND<br>Caughy, O'Campo, &<br>Patterson, 2001 OR<br>Harris & Brown, 1996 | Neighborhood map using<br>My Neighborhood<br>Census Viewer  |
| 9/24 | --Demographics as cause<br>--Downloading Census data<br>--Joins & Relates in ArcGIS  | --Theobald: Chap. 2: pg.<br>67-80<br>--Ethnic Heterogeneity:<br>Putnam, 2007; Stolle,<br>Soroka, & Johnston,<br>2008                                   | Final cadastral map with<br>new geocoded variable;<br>Why that variable?                            |
| 9/26 | --Demographics as outcome<br>--Selection in GIS<br>--Overview of lit review  | --Theobald: Chap. 5<br>--Moving to<br>Opportunity: Clark,<br>2005; Gay, 2012   | What did you download<br>from Census? Why?  |
| 10/1 | --Social Process as cause<br>--Collective efficacy and social<br>disorganization theory<br>--Introduction to the Boston<br>Neighborhood Survey | --Theobald: Chap. 6:<br>pgs. 222-235<br>--Collective Efficacy:<br>Sampson, Raudenbush,<br>& Earls, 1997<br>--Plus: Find a study                        | A report on where people<br>with a certain motivation<br>might move in Boston                       |

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|      |   | about collective efficacy shaping some behavioral or health outcome.   |  |
| 10/3 | --Social Process as outcome<br>--A review of univariate statistics<br>--Introduction to WEAVE | --Review statistics textbook<br>--Creating collective efficacy: Sampson & Groves, 1989 AND Leyden, 2003 OR Ross, Mirowsky, & Pribesh, 2001 | Memo on a neighborhood walk, visiting the region of your cadastral map |

## Unit 2 Defining "Neighborhood"

| Date  | In-Class  | Reading Due  | Assignment Due  |
|-------|---|--|---|
| 10/8  | No Class  |  |   |
| 10/10 | --What is a neighborhood?<br>--Spatial joins, summary statistics in GIS                                     | --Theobald: Chap. 8: pgs. 329-340; Chap. 9: pgs. 375-378<br>--What is a neighborhood: Galster, 2001  | Final Proposal  |
| 10/15 | --What are the bounds of neighborhood?<br>--Variation within and between neighborhoods<br>--Review of ANOVA | --Review statistic textbook<br>--How residents experience neighborhood: Coulton, Korbin, Chan, & Su, 2001; Guest & Lee, 1984; Vajjhala, 2006 | Pick an outcome variable, map at an aggregated level                            |
| 10/17 | --How are neighborhood boundaries created?<br>--What boundaries exist in Boston?                            | --Theobald: Chap. 8: pgs. 353-364<br>--Processes that create neighborhood: Grannis, 1998   | Compare your outcome variable at multiple levels of aggregation. Which is best? |
| 10/22 | --Spatial clustering<br>--Moran's I   | --Burt et al., Chap. 14: pgs. 544-559<br>--Bernasco & Luykx, 2003  | Memo on walking a t-community   |
| 10/24 | --Different ways to define neighborhoods<br>--Creating new types of boundaries                              | --Theobald: Chap. 9: pgs. 365-375<br>--Creating nbhds for research purposes:   | Describe results of Moran's for outcome variable                                |

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|       |  | Gauvin, et al., 2007;<br>Haynes, Daras, Reading,<br>& Jones, 2007              |                                    |
| 10/29 | --Talking about types of boundaries<br>--Getis-Ord $G_i^*$ | --Burt et al., Chap. 14:<br>pgs. 559-566<br>--Alger, Agrawal, &<br>Lewis, 2006 | What boundary did you create, how? |

### Unit 3 Studying Neighborhood Effects

| Date  | In-Class   | Reading Due   | Assignment Due  |
|-------|--|---|---|
| 10/31 | --Recap of correlation and regression<br>--Returning to WEAVE          | None  | How has your thinking evolved on the project?<br>At what boundary level do you want to attack this question, why? |
| 11/5  | --Spatial diffusion<br>--Accounting for lag                            | --Burt et al., Chap 14:<br>pgs. 566-570<br>--Browning, Feinberg,<br>& Dietz, 2004 | Run a correlation using WEAVE. What stands out?   |
| 11/7  | --Thinking about data as continuous<br>--Rasters and kriging           | --Diez Roux, 2001   | Conduct a regression using spatial lag, interpret.  |
| 11/12 | --Data nested in neighborhoods<br>--Hierarchical Linear Modeling (HLM) | --Tabachnick & Fidell, Chap. 15<br>--Sampson, Morenoff, & Gannon-Rowley, 2002     | Memo on walking a neighborhood that stands out in bivariate relationship.   |
| 11/14 | --Incorporating raster data into HLM                                   | --Search for papers featuring HLM   | <b>**Work on final project**</b>  |
| 11/19 | --Geographical Weighted Regression (GWR)                               | --Charlton et al, "Geographically Weighted Regression"                            | An analysis using HLM   |
| 11/26 | --GWR, Day II  | --Ogneva-Himmelberger, Pearsall, & Rakshit, 2009                                  | <b>**Work on final project**</b>  |
| 11/28 | A return to BostonMap; Workshop  | TBA   | An analysis using GWR   |
| 12/3  | Workshop   | TBA   |   |

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## Readings

- Algert, S. J., Agrawal, A., & Lewis, D. S. (2006). Disparities in access to fresh produce in low-income neighborhoods in Los Angeles. *American Journal of Preventive Medicine, 30*(5), 365-370.
- Bernasco, W., & Luykx, F. (2003). Effects of attractiveness, opportunity and accessibility to burglars on residential burglary rates of urban neighborhoods. *Criminology, 41*(3), 981-1001.
- Browning, C. R., Feinberg, S. L., & Dietz, R. D. (2004). The paradox of social organization: Networks, collective efficacy, and violent crime in urban neighborhoods. *Social Forces, 83*(2), 503-534.
- Caughy, M. O., O'Campo, P. J., & Patterson, J. (2001). A brief observational measure for urban neighborhoods. *Health & Place, 7*, 225-236.
- Clark, W. A. V. (2005). Intervening in the residential mobility process: Neighborhood outcomes for low-income populations. *Proceedings of the National Academy of Sciences of the United States of America, 102*(43), 15307-15312.
- Coulton, C. J., Korbin, J., Chan, T., & Su, M. (2001). Mapping residents' perceptions of neighborhood boundaries: A methodological note. *American Journal of Community Psychology, 29*(2), 371-383.
- Diez Roux, A. V. (2001). Investigating neighborhood and area effects on health. *American Journal of Public Health, 91*(11), 1783-1789.
- Frank, L. D., Saelens, B. E., Powell, K. E., & Chapman, J. E. (2007). Stepping towards causation: Do built environments or neighborhood and travel preferences explain physical activity, driving, and obesity? *Social science & medicine, 65*(9), 1898-1914.
- Galster, G. (2001). On the nature of neighbourhood. *Urban Studies, 38*(12), 2111-2124.
- Gauvin, L., Robitaille, E., Riva, M., McLaren, L., Dassa, C., & Potvin, L. (2007). Conceptualizing and operationalizing neighbourhoods. *Revue Canadienne de Sante Publique, 98*(S1), S18-S26.
- Gay, C. (2012). Moving to Opportunity: The political effects of a housing mobility experiment. *Urban Affairs Review, 48*(2), 147-179.
- Grannis, R. (1998). The importance of trivial streets: Residential streets and residential segregation. *American Journal of Sociology, 103*(6), 1530-1564.
- Guest, A. M., & Lee, B. A. (1984). How urbanites define their neighborhoods. *Population and Environment, 7*(1), 32-56.
- Harris, P. B., & Brown, B. B. (1996). The home and identity display: Interpreting resident territoriality from home exteriors. *Journal of Environmental Psychology, 16*, 187-203.
- Haynes, R., Daras, K., Reading, R., & Jones, A. (2007). Modifiable neighbourhood units, zone design and residents' perceptions. *Health & Place, 13*, 812-825.
- Leyden, K. M. (2003). Social capital and the built environment: The importance of walkable neighborhoods. *American Journal of Public Health, 93*(9), 1546-1551.
- Ogneva-Himmelberger, Y., Pearsall, H., & Rakshit, R. (2009). Concrete evidence & geographically weighted regression: A regional analysis of wealth and the land cover in Massachusetts. *Applied Geography, 29*, 478-487.
- Putnam, R. D. (2007). *E Pluribus Unum: Diversity and community in the twenty-first century. Scandinavian Political Studies, 30*, 137-174.

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- Raudenbush, S. W., & Sampson, R. J. (1999). Ecometrics: Toward a science of assessing ecological settings, with application to the systematic social observation of neighborhoods. *Sociological Methodology*, 29(1), 1-41.
- Ross, C. E., Mirowsky, J., & Pribesh, S. (2001). Powerlessness and the amplification of threat: Neighborhood disadvantage, disorder, and mistrust. *American Sociological Review*, 66(4), 568-591.
- Sallis, J. F., Saelens, B. E., Frank, L. D., Conway, T. L., Slymen, D. J., Cain, K. L., et al. (2009). Neighborhood built environment and income: Examining multiple health outcomes. *Social Science & Medicine*, 68(7), 1285-1293.
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- Sampson, R. J., Raudenbush, S. W., & Earls, F. (1997). Neighborhoods and violent crime: A multilevel study of collective efficacy. *Science*, 277, 918-924.
- Stolle, D., Soroka, S., & Johnston, R. (2008). When does diversity erode trust? Neighborhood diversity, interpersonal trust and the mediating effect of social interactions. *Political Studies*, 56, 57-75.
- Vajjhala, S. P. (2006). "Ground truthing" policy: Using participatory map-making to connect citizens and decision makers. *Resources*(162).
- Wilson, J. Q., & Kelling, G., L. (1982). The police and neighborhood safety: Broken windows. *Atlantic Monthly*, 127, 29-38.