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READING LIST

SOC 5650: INTRODUCTION TO GIS
SPRING, 2017
SAINT LOUIS UNIVERSITY

Reading Notes

Reading Abbreviations

Abbreviation	Full Title
Brewer	Brewer, Cynthia. 2015. *Designing Better Maps: A Guide for GIS Users*. Redlands, CA: ESRI Press.
GIS Policy	Thomas, Christopher and Nancy Humenik-Sappington. 2009. *GIS for Decision Support and Public Policy Making*. Redlands, CA: ESRI Press.
Gorr & Kurland	Gorr, Wilpen L., and Kristen S. Kurland. 2013. *GIS Tutorial 1: Basic Workbook*. 10.3.x edition. Redlands, CA: ESRI Press.
Mitchell	Mitchell, Michael M. 2010. *Data Management Using Stata: A Practical Handbook*. College Station, TX: Stata Press.

Reading Locations

Abbreviation	Location
ER	Electronic Reserves
GH	GitHub
Link	Website URL
PL	Pius Library

Notes: Github readings will be available in repository for the week that they are assigned repository; you will need to be a member of the course organization to access them. The password for the Electric Reserves site will be emailed to students at the beginning of the semester.

Reading List

Week 1 - January 17th

Course Introduction

Topics

- Spatial Data - Thinking Spatially; What are GIS and GISc?
- Data Management - Intro to Stata, GitHub, and Atom
- Data Visualization - Intro to ArcGIS
- GISc and Public Policy - What We Learn From Maps
- Spatial Research - What is a Workflow?

Readings

- Goodchild, M.F. 2010. "Twenty Years of Progress: GIScience in 2010." *Journal of Spatial Information Science* 1:3-20. [ER]
- Logan, J.R. 2012. "Making a Place for Space: Spatial Thinking in the Social Sciences and Humanities." *Annual Review of Sociology* 38:507-524. [ER]
- Logan, J.R., W. Zhang, and H. Xu. 2010. "Applying Spatial Thinking in Social Science Research." *GeoJournal* 75(1):15-27. [ER]
- Long, J.S. 2009. "Introduction." Pp. 1-10 in *The Workflow of Data Analysis Using Stata*. College Station, TX: Stata Press. [ER]

Optional Readings

- Mitchell - Chapter 1
- Wilson, G. et al. 2016. "Good Enough Practices in Scientific Computing." *arXiv*. [Link]

Lab Activity

- Lab 01 - Introduction to the Course Tools

Week 2 - January 24th

Working with Data (Part 1)

Topics

- Spatial Data - Types of Data
- Data Management - Do-Files, Literate Programming, and Exploring Data
- GISc and Public Policy - Open Data and Open GIS; Financial Benefits of GIS
- Spatial Research - Getting Organized for Replication

Readings

- Acock, A. 2014. "Working with Commands, Do-files, and Results." Pp. 75-90 in *A Gentle Introduction to Stata*. 4th edition. College Station, TX: Stata Press. [ER]
- GIS Policy - Chapter 1, pp. 1-6 & 13-15
- Haghish, E. F. 2016. "markdoc: Literate programming in Stata." *The Stata Journal* 16(4):964-988. [Link]
- Long, J.S. 2009. "Planning, organizing, and documenting." Pp. 11-46 in *The Workflow of Data Analysis Using Stata*. College Station, TX: Stata Press. [ER]
- Longley, P.A. et. al. Rind. 2015. "Representing Geography." Pp. 55-76 in *Geographic Information Science and Systems*. 4th edition. New York, NY: John Wiley & Sons. [ER]
- Sui, D. 2014. "Opportunities and Impediments for Open GIS." *Transactions in GIS* 18(1):1-24. [ER]

Optional Readings

- Green, R.W. 2005. *GIS in Public Policy: Using Geographic Information for More Effective Government*. 2nd edition. Redlands, CA: ESRI Press. [PL (previous edition)]
- Mitchell - Chapter 2, pp. 9-39

Lab Activity

- Lab 02 - Working with Data in Stata

Assignment Due

- Student Information Sheet and Syllabus Agreement

Week 3 - January 31st

The Nature of Spatial Data (Part 1)

Topics

- Spatial Data - Methodological Challenges in GISc
- Data Management - Cleaning Data
- GISc and Public Policy - Decision Making with GIS (Part 1)

Readings

- GIS Policy - Chapter 2, pp. 19-30
- Mitchell - Chapter 3 [ER]

Optional Readings

- Anselin, L. 1989. "What is Special About Spatial Data? Alternative Perspectives on Spatial Data Analysis." [Link]
- Haining, R. 2009. "The Special Nature of Spatial Data." Pp. 25-40 in *The SAGE Handbook of Spatial Analysis*, edited by A.S. Fotheringham and P.A. Rogerson. Thousand Oaks, CA: Sage. [Link and PL]

Lab Activity

- Lab 03 - Cleaning Data

Week 4 - February 7th

The Nature of Spatial Data (Part 2)

Topics

- Spatial Data - Representing Geography
- Data Visualization - Tools for Mapping in ArcGIS; Basic Design Principles
- GISc and Public Policy - Decision Making with GIS (Part 2)

Readings

- Brewer - Chapters 1 and 2
- GIS Policy - Chapter 2, pp. 31-44
- Gorr and Kurland - Chapter 1
- Tufte, E. 2001. "Data Maps." Pp. 16-27 in *The Visual Display of Quantitative Information*. 2nd edition. Cheshire, CT: Graphics Press. [ER]

Optional Readings

- Martin, D. 2009. "The Role of GIS." Pp. 41-62 in *The SAGE Handbook of Spatial Analysis*, edited by A.S. Fotheringham and P.A. Rogerson. Thousand Oaks, CA: Sage. [PL]

Lab Activity

- Lab 04 - Basic Map Production

Assignment Due

- Problem Set 01 - Cleaning Data

Week 5 - February 14th

Cartographic Design

Topics

- Spatial Data - Cartography and Map Production
- Data Visualization - Designing Maps in ArcGIS; Working with Color
- GISc and Public Policy - Public Participation with GIS (Part 1)

Readings

- Brewer - Chapters 7 and 8
- GIS Policy - Chapter 3, pp. 47-57
- Gorr and Kurland - Chapter 2
- Tufte, E. 1990. "Color and Information." Pp. 81-95 in *Envisioning Information*. Cheshire, CT: Graphics Press. [ER]

Optional Readings

- Brewer, C.A. 2006. "Basic Mapping Principles for Visualizing Cancer Data Using Geographic Information Systems (GIS)." *American Journal of Preventive Medicine* 30(2S): S25-S36. [ER]
- Brewer, C.A. 2008. *Designed Maps: A Sourcebook for GIS Users*. Redlands, CA: ESRI Press. [PL]
- Harrower, M. and C.A. Brewer. 2003. "ColorBrewer.org: An Online Tool for Selecting Color Schemes for Maps." *The Cartographic Journal* 40(1): 27-37. [Link]

Lab Activity

- Lab 05 - Cartographic Design

Assignment Due

- Problem Set 02 - Basic Map Production

Week 6 - February 21st

GIS Outputs

Topics

- Spatial Data - Geovisualization
- Data Visualization - Building Map Layouts for Dissemination

Readings

- Brewer - Chapters 3 and 4
- Gorr and Kurland - Chapter 3
- Tufte, E. 1990. "Small Multiples." Pp. 67-79 in *Envisioning Information*. Cheshire, CT: Graphics Press. [ER]
- Tufte, E. 2006. "Analytical Design." Pp. 125-139 in *Beautiful Evidence*. Cheshire, CT: Graphics Press. [ER]

Optional Readings

- Demsar, Urska. 2009. "Geovisualization and Geovisual Analytics." Pp. 41-62 in *The SAGE Handbook of Spatial Analysis*, edited by A.S. Fotheringham and P.A. Rogerson. Thousand Oaks, CA: Sage. [PL]

Lab Activity

- Lab 06 - GIS Outputs

Assignments Due

- Problem Set 03 - Cartographic Design
- Final Project - Topic Memo
- Quiz 01 (covering Weeks 1 through 5)

Week 7 - February 28th

Geodatabases

Topics

- Spatial Data - Storing Spatial Data
- Data Management - Creating New Variables
- GISc and Public Policy - Public Participation with GIS (Part 2)
- Spatial Research - Digging in to the Final Project: Planning, Organizing, and Documenting

Readings

- GIS Policy - Chapter 3, pp. 58-75
- Gorr and Kurland - Chapter 4, pp. 145-154

Optional Readings

- Mitchell - Chapters 4 and 5

Lab Activity

- Lab 07 - Geodatabases

Assignment Due

- Problem Set 04 - GIS Outputs

Week 8 - March 7th

Spatial Joins

Topics

- Spatial Data - Combining Data Sources
- Data Management - Modifying Strings and Merging Data
- GISc and Public Policy - GIS and Public Safety (Part 1)

Readings

- GIS Policy - Chapter 4, pp. 77-87
- Gorr and Kurland - Chapter 4, pp. 155 onward

Optional Readings

- Mitchell - Chapter 6

Lab Activity

- Lab 08 - Spatial Joins

Week 9 - March 14th

Online Lecture: Demographic Data

Topics

- Spatial Data - Georeferenced Demographic Data
- Data Management - Exporting Data
- Spatial Research - Expanding Documentation

Readings

- Gorr and Kurland - Chapter 5, pp. 193-203

Lab Activity

- Lab 09 - Accessing Demographic Data

Note: There is no scheduled class meeting this week. Watch the online lecture on your own and complete the lab assignment.

Week 10 - March 21st

Working with Projections

Topics

- Spatial Data - Projected Coordinate Systems; Projecting x,y Data
- Data Visualization - Typography
- GISc and Public Policy - GIS and Public Safety (Part 2)
- Spatial Research - Posters (in-class) and Papers (online; *SOC 5650 only*)

Readings

- Brewer - Chapter 5
- GIS Policy - Chapter 4, pp. 88-92
- Gorr and Kurland - Chapter 5, pp. 175-184
- Maher, M. 2013. "Identifying the Projected Coordinate System". Pp. 35-55 in *Lining Up Data in ArcGIS*. 2nd edition. Redlands, CA: Esri Press. [ER]
- Maher, M. 2013. "Defining Projections and Their Parameters; Adding x,y Data; Analyzing the Shape of Buffers." Pp. 167-182 in *Lining Up Data in ArcGIS*. 2nd edition. Redlands, CA: Esri Press. [ER]

Note: Read Maher's (2013) chapter on "Defining Projections" before reading her chapter on "Identifying the Projected Coordinate System". Read both of these before reading the assigned section of Goor and Kurland (2013).

Optional Readings

- Maher, M. 2013. *Lining Up Data in ArcGIS*. 2nd edition. Redlands, CA: Esri Press. [PL]

Lab Activity

- Lab 10 - Projection Systems

Assignment Due

- Problem Set 05 - Spatial Joins
- Final Project - Annotated Bibliography (SOC 5650 *only*)

Week 11 - March 28th

Geoprocessing (Part 1)

Topics

- Spatial Data - Modifying Shapefiles - Select By, Clip, and Dissolve
- Data Visualization - Labeling Features

Readings

- Brewer - Chapter 6
- Gorr and Kurland - Chapter 6, pp. 219-228

Lab Activity

- Lab 11 - Geoprocessing (Part 1)

Assignment Due

- Problem Set 06 - Working with Projections
- Quiz 02 (covering Weeks 6 to 10)

Week 12 - April 4th

Working with Data (Part 2)

Topics

- Spatial Data - Open GIS Data - GeoJSON
- Data Management - Appending and Collapsing Datasets
- Data Visualization - Mapping and Plotting in Stata
- GISc and Public Policy - Supporting Decisions and Policy (Part 1)
- Spatial Research - Presenting Results - Graphs

Readings

- GIS Policy - Chapter 5, pp. 93-105
- Tufte, E. 2001. "Chartjunk." Pp. 107-121 in *The Visual Display of Quantitative Information*. 2nd edition. Cheshire, CT: Graphics Press. [ER]

Optional Readings

- Mitchell, M. 2012. *A Visual Guide to Stata Graphics*. 3rd edition. College Station, TX: Stata Press.

Lab Activity

- Lab 12 - Working with Data (Part 2)

Assignment Due

- Problem Set 07 - Geoprocessing (Part 1)

Week 13 - April 11th

Geoprocessing (Part 2)

Topics

- Spatial Data - Modifying Shapefiles - Merge, Intersect, and Union
- Data Visualization - Customizing Symbols
- GISc and Public Policy - Supporting Decisions and Policy (Part 2)
- Spatial Research - Presenting Results - Tables

Readings

- Brewer - Chapter 9
- GIS Policy - Chapter 5, pp. 106-117
- Gorr and Kurland - Chapter 6, pp. 229-238

Lab Activity

- Lab 13 - Geoprocessing (Part 2)

Assignment Due

- Final Project - Poster Drafts (all students) and Paper Drafts (SOC 5650 *only*)

Week 14 - April 18th

Digitizing Data

Topics

- Spatial Data - Digitizing Data and Working with Raster Data
- GISc and Public Policy - Supporting Policies with GIS (Part 1)

Readings

- GIS Policy - Chapter 7, pp. 135-156
- Gorr and Kurland - Chapter 7

Lab Activity

- Lab 14 - Digitizing Data

Assignment Due

- Problem Set 08 - Geoprocessing (Part 2)

Week 15 - April 25th

Geocoding Data

Topics

- Spatial Data - Mating Data to ZIP Codes and Street Addresses
- GISc and Public Policy - Supporting Policies with GIS (Part 2)

Readings

- GIS Policy - Chapter 7, pp. 157 onward
- Gorr and Kurland - Chapter 8

Lab Activity

- Lab 15 - Geocoding Data

Assignment Due

- Problem Set 09 - Digitizing Data

Week 16 - May 2nd

Spatial Analyses & Course Wrap-up

Topics

- Spatial Data - Proximity and Site Suitability Analyses
- Spatial Research - Project Checklist; Final Thoughts

Readings

- Gorr and Kurland - Chapter 9, pp. 313-322

Lab Activity

- Lab 16 - Spatial Analyses

Assignment Due

- Problem Set 10 - Geocoding Data
- Quiz 03 (covering Weeks 11 to 15)

Week 17 - May 9th

Finals Week - Presentations

Location: TBA
Time: 4:00pm to 5:50pm

Assignment Due

- Final Project - Posters and Brief Presentations
- Final Project - Papers (SOC 5650 *only*)