Using GIS in Public Service II
W. Webb Sprague, Ph. D.
May 6-8 (2 units)

TESC MPA MISSION STATEMENT

"Be the Change"

Our students, faculty and staff create learning communities to explore and implement socially just, democratic public service. We think critically and creatively; communicate effectively; work collaboratively; embrace diversity; we value fairness and equity; advocate powerfully on behalf of the public; and imagine new possibilities to accomplish positive change in our workplaces and in our communities.

COURSE DESCRIPTION

Making maps and analyzing spatial data is useful in all phases of public service, from policy development to program implementation to final evaluation. In this course, students will develop skills in accessing and transforming data to be used in GIS projects and maps. We will become familiar with four core publicly available sources, but also practice making our own data sets "from scratch."

The core of the class will be four data sources. First, we will cover the U.S. Census Bureau's TIGER dataset in some detail, as it is ubiquitous and foundational. We will then look at "Public Use Microdata Sample" (PUMS) data and historical geographic data from the University of Minnesota's Population Center. Following that, we will gain some practice with imagery data from the USDA's NAIP program, which is as foundational as Census data in its own way. We will practice creating data from scratch, creating original shapefiles and tabular data. Finally, we will look briefly at some advanced data / computer program languages and environments that are useful in data analysis.

A course in data sources must also include a section on "cleaning" data. Often data is available that would be useful for a project but it is not quite ready and there a number of steps that must be followed to make it ready. One must always evaluate the dataset for quality. There may be errors that need to be corrected or deleted; often errors must be discovered in the first place. Data might need to reformatted or "recoded" to match the question you are trying to answer. Often a dataset needs to be "joined" to other datasets in order to make it more useful, a process which often includes reformatting values to get them to match. Finally, an analyst might want to create a totally new dataset. We will cover all these steps in class.

Students are expected to have at least introductory skills in GIS, as would have been taught in GIS I by the same instructor. The course will be taught workshop style, with students creating their own maps while following along with the instructor. We will use QGIS, a "Free and Open Source" (FOSS) alternative to proprietary GIS systems, to develop students skills. An important component of the course will be discussions of the students' and instructor's use of GIS for their own projects.

The instructor received his Ph.D. from University of California, Berkeley in Demography in 2013; he currently works at Washington Department of Social and Health Services, in the division of Research and Data Analysis.

LEARNING OBJECTIVES

- Find and download useful geographic and demographic data
- Evaluate, clean, and transform the data to make it useful for a given project
- Create a dataset from scratch
- Be able to make a map using QGIS and data from multiple sources
- Use maps to support and expand a broader qualitative argument

EVALUATION

Evaluation will be based on student's discussion in seminar, their participation in workshop, and their final project -- a one page document with an embedded map and supporting text that makes an argument supported by the map.

SUGGESTED READING

Read *Mapping It Out* by Mark Monmonier. It is available plentifully online, for example:

http://www.amazon.com/Mapping-Out-Expository-Cartography-Humanities/dp/0226534170/

I would also suggest having a more conventional cartography book for reference as well. I use *Elements of Cartography* by Robinson et., al. You can find very cheap old editions online, for example:

http://www.abebooks.com/Elements-Cartography-5th-Edition-Robinson-Arthur/2326751590/bd

There are also some great, but optional, tutorials for QGIS linked at the end of the syllabus.

EXPECTATIONS

Format of Assignment Submissions: All papers will be submitted via email. All papers must meet assignment parameters and cite works using the Chicago citation style. All written work will be of high quality, grammatically correct, clear and without spelling errors. If you require it, please request resource writing assistance from faculty and/or contact the Graduate Writing Assistant. Check assignment details for each submission. Sometimes your faculty will ask you to work with the Graduate Writing Assistant; if so, you are required to do to the satisfaction of your faculty member.

Late assignments: No late assignments will be accepted without previous arrangement with the instructor.

Participation & Attendance: Students are required to attend each class meeting. Participation includes focusing on class content, being engaged in class and seminar, listening to others, taking notes, completing class interactive exercises, avoiding distractions, and listening to and dialoging with the guest speakers. If an absence is unavoidable, faculty must be notified prior to a class and/or seminar absence. After one absence per quarter, make-up work may be assigned at faculty discretion, case-by-case. Makeup work must be completed by the end of the quarter in question for course credit.

Use of Electronic Devices: this course is Canvas-based and mostly paperless. We understand, and expect, that you will need to use electronic devices in class. However, the class is also participatory and the learning community is dependent upon people being present to what is happening in class. This means that electronic devices should not be used for anything other than for class-related activities. Resist the siren call of all the ways in which your devices can distract you from what is going on in the classroom. We will ask people to put away their devices, except for note taking, for guest lectures. Please extend similar courtesies to the faculty when they are lecturing.

Credit: Students will receive **2** credits at the completion of each quarter if all course requirements have been satisfactorily completed to meet course objectives. No partial credit will be awarded. Incompletes may be offered on case-by-case basis. Refer to the MPA student handbook.

Academic dishonesty and plagiarism (i.e., using other peoples' work as your own, see MPA Handbook for more), failing to complete one or more assignments, completing more than one assignment late, or multiple absences may constitute denial of total credit. Students will be evaluated based upon their progress towards the learning goals, assessed from classroom, seminar, and assignment performance. Students at risk of losing credit will receive written notification prior to the end of the term.

Evaluation: Written self-evaluations and a faculty evaluation are required for credit at the end of each quarter, along with faculty evaluations of students. **Self-Evaluations are due Friday Friday 3, 2016, with the finished report.**

Multiculturalism & Diversity: Faculty and students work toward weaving multiculturalism and diversity throughout our learning in readings, lectures, seminar and group projects.

Learning Styles: Faculty endeavor to provide information in multiple formats: auditory, visual, kinesthetic, etc. However, style applications are limited to means appropriate for the classroom environment. Consult your seminar faculty to discuss learning style options or personal challenges.

Accommodations: are provided for any student who desires them through a working relationship with Access Services, the Writing Center and the Quantitative and Symbolic Reasoning Center. To request academic accommodations due to a disability, please contact the office of Access Services for Students with Disabilities (867-6348 or 6364). Information about a disability or health condition are regarded as confidential. Please refer to TESC's Students With Disabilities Policy here.

Other Expectations of Students and Faculty: We commit to promoting a cooperative, supportive atmosphere within the community; give everyone opportunity for self-reflection and expression; use high standards in reading the text and preparing our papers, lectures, and comments in seminar; handle all disputes in a spirit of goodwill; respect our differences; and, discuss any problems involving others in the learning community directly with the individuals involved.

We abide by the social contract**, the** student conduct code **and the** non-discrimination policies and procedures at TESC**. See the college's** Student Conduct webpage **for more.**

All students are expected to support and contribute to a well-functioning MPA classroom learning community. Behavior that disrupts the learning community may be grounds for disciplinary action, up to and including dismissal from the MPA program.

Guest Policy: Guests will not be allowed in the class without previous arrangement with the instructor.

Inclement Weather: In the event of bad weather or emergencies students should check with television, web pages, and radio stations for announcements of campus closures. Students can also call the main campus line 867-6000 to get the latest news regarding a campus closure or delay. Since many students in the program travel from relatively distant locations, faculty may decide to cancel program meeting even if campus is open. If we do this we will send an all-program email by 3:00 pm. If you've not already done so, sign up to receive alerts about campus closing or other emergencies here.

Communicating with Each Other: Email and Canvas are our primary means of communication. You are responsible for checking your Evergreen email and Canvas regularly.

ASSIGNMENTS

VERY IMPORTANT NOTE – Please name your files using the following convention: "sprague_assignment_extrainfo", followed by the extension. In other words, the first word in your assignment file name should be your last name, followed by an underscore, followed by a word or phrase describing the assignment (given below), optionally followed by an underscore and any supplemental information you want to encode in the file name. For example, "sprague_mapoutsummary.docx" would be how I would title the word document for assignment 1 below.

1. **Write a 300 word statement** that includes your career history (including unpaid experience), what you hope to do with the MPA program after you finish, your GIS experience, and how you imagine using GIS in the future, due April 29, 2016, submitted via email. Entitle the file name "lastname_bio.docx".
2. Follow the QGIS tutorial at http://manual.linfiniti.com/en/index.html, and **write a 200 word response** by April 29, 2016, submitted via email. QGIS is available at the CAL lab on campus. IF YOU CAN'T FOLLOW THE TUTORIAL YOU ARE PROBABLY NOT READY FOR THIS CLASS. Entitle the file name "lastname_tutorial.docx".
3. **Present a single page with a map and supporting text** to the class, Friday June 3, 2016. This presentation will serve as an example of using maps to support arguments

4. Edit the presentation and **submit a finished page (map with text)** by Friday June 3, 2016, via email. Include a self evaluation with this submission. Entitle the file name "lastname_projectandeval.docx".

SCHEDULE

Friday April 29, 2016, reading and responses due by email.

Friday May 6, 2016, 5:00 pm – 9:00 pm, computer room (CAL):

- "Round the room" introductions and discussion of experience with GIS and data analysis
- Lecture on the basic model of GIS (vectors, tables, rasters, and layers)
- Interactive demonstration of a simple GIS project, with questions from students. NOTE: This should be review for students, as we won't be covering GIS techniques in this class.

Saturday May 7, 9:00 am – 3:30 pm, CAL Lab:

- Census TIGER geography – structure and data
- IPUMS
- NHGIS
- Imagery
- GIS edit / digitize
- Text edit / digitize
- GPS tracks to maps
- SQL Fiddle and PostgreSQL
- Open Street Map
- R programming language

Saturday May 7, 3:30 pm – 5:00 pm, CAL Lab: Round-the-room discussion on designing student projects: Research question, data sources, sketch of map, rationale

Sunday May 7, 9:00 am - 3:00 pm, CAL lab: Workshop with students building their projects, with assistance from instructor

Sunday May 8, 3:00 pm - 5:00 pm, CAL lab: Student presentations and discussion. Ideas for next steps for students.

Friday June 3, 2016, final project and self-evaluation due by email.

REFERENCES AND USEFUL LINKS

Monmonier, Mark. (1993). *Mapping It Out.* Chicago, IL: The University of Chicago Press.

Robinson, et al. (1996) *Elements of Cartography, 6th ed.* New York: Wiley.

https://gdg.sc.egov.usda.gov/ The source for USDA NAIP imagery and other data.

http://www2.census.gov/geo/tiger/ The main link for US Census geographic data.

https://www.ipums.org/ A project to repackage US Census PUMS data for easier use, from the University of Minnesota.

https://www.nhgis.org/ A project to repackage US Census geographic data for easier use, also from the University of Minnesota.

http://www.qgis.org/en/docs/index.html The official QGIS documentation.

http://manual.linfiniti.com/en/index.html The tutorial referenced above.

http://www.qgistutorials.com/ An awesome collection of QGIS tutorials.

http://www.openstreetmap.org/ A wikipedia-like approach to geographic data, hugely successful, and founded by a Seattle guy.

http://prj2epsg.org/search A tool for determining the projection of a map based on the ".prj" file contents.

http://spatialreference.org/ A tool for finding projection information.