

# Methods in Spatial Research



From left:

[Dennis Wood. 2011. "Everything Sings: Maps for a Narrative Atlas" via Places Journal](#); Hans Haacke Shapolsky et al. *Manhattan Real Estate Holdings, a Real-Time Social System, as of May 1, 1971*. 1971; [Folder. Italian Limes. 2014](#)

## Syllabus

Spring 2025 Friday 9-11, session A 1.5 credits 300 Buell South

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## Description

This course provides an introduction to the critical use of geographic information systems (GIS) and the use of spatial methods for urban humanities research.

Maps and geographic analysis are key tools for interpreting the built environment and the social conditions it contains. GIS methods allow for the analysis of geographic features together with attributes (environmental, social, demographic, political) of those places. The thoughtful use of spatial data can reveal previously unseen patterns, changing the way we see and engage with our world. However, maps are never just representations, they are nearly always active agents in shaping the worlds they describe. With this in mind, students will be introduced to a range of approaches for creating and manipulating spatial data with a focus on the forms of authorship, design, subjectivity embedded in spatial data and its uses.

This is a "making & doing" workshop course that is open to students from within GSAPP, GSAS and the Columbia and Barnard Colleges and is designed to expand the disciplinary locations in which spatial data analysis takes place. Through hands-on exercises and weekly assignments participants will develop basic fluency with open-source mapping software, QGIS, methods of data collection and creation, and approaches and concepts in critical spatial analysis and map design.

# Learning Objectives

After completing the course participants will:

- Develop robust familiarity with QGIS and its functions
- Gain fluency with foundational GIS concepts (including how the GIS data model abstracts geographic phenomena)
- Understand GIS spatial data types and the kinds of analysis that are possible with each
- Create new spatial datasets from field observation and participatory sensing
- Create new spatial datasets from archival sources
- Access and use multispectral satellite imagery
- Acquire fluency with visual design concepts central to cartographic representations

## Course Overview

Date	Week	Topic	Tutorial due	Assignment due
1/24	1	Introduction to Critical GIS + Spatial Data Types		
1/31	2	Cartographic Projections + Mapping Existing Datasets	Tutorial 1 & 2	Assignment 0
2/07	3	Making Data from Archives		Assignment 1
2/14	4	Making Data From Observation & Sensing	Tutorial 3	Assignment 2
2/21	5	Making Data from Satellites	Tutorial 4 OR Tutorial 5	Assignment 3
2/28	6	Maps & Narrative	Tutorial 6 OR Tutorial 7	Assignment 4
3/28		Portfolio Due		Assignment 5 (for extra credit)

## Weekly Schedule, Readings, & Assignments

All course tutorials and assignments will be posted [here](#) on the course website.

All readings and previous lecture slides will be posted on Canvas and in the [course drive](#).

### 1/24 | Week 1 | Introduction to Critical GIS + Spatial Data Types

#### In class

Group map critiques. Examples to be distributed during class

### 1/31 | Week 2 | Cartographic Projections + Mapping Existing Datasets

Assignment 0 due – NYC Trees

Readings (available in [course Drive](#))

Corner, James. "The Agency of Mapping." 2014.

Couclelis, Helen. "People Manipulate Objects (but Cultivate Fields): Beyond the Raster-Vector Debate in GIS." 1992.

Cooper, Danika. "Drawing Deserts, Making Worlds." Essay. In *Deserts Are Not Empty*, edited by Samia Henni, 79-107. Columbia University, 2022.

*Review projects/precedent examples page. Pick out two-three examples each week to review thoroughly on your own.*

Optional: Rankin, William. "Introduction Territory and the Mapping Sciences" in *After The Map: Cartography, Navigation, and the Transformation of Territory in the Twentieth Century*. Chicago: University of Chicago Press. 2016. [available online via CLIO [here](#)]

## **2/07 | Week 3 | Making Data from Archives**

### **Assignment 1 due – Intentional Misuse**

#### **Readings (available in course Drive)**

Baics, Gergely, and Leah Meisterlin. "Zoning Before Zoning: Land Use and Density in Mid-Nineteenth-Century New York City." 2016.

- This is an interdisciplinary paper with insights about both the history of land use in New York City and new methods for uncovering such histories with GIS. The link between these two aspects of the paper is really key and helpful, I think, as an illustration of how to develop spatial projects. They discuss three different sets of methods about three different urban land use phenomena. If you need to skim this piece read the introduction/conclusion and then pick at one of the sections on methods to focus on.

Wilson, Mabel. "The Cartography of W.E.B. Du Bois's Color Line" in *W.E.B. Du Bois's Data Portraits: Visualizing Black America: The Color Line at the Turn of the Twentieth Century*. Battle-Baptiste, Whitney, and Britt Rusert, eds. Princeton Architectural Press, 2018. [selections]

- This is a short essay on the significance and context of the cartographic work of W.E.B. Du Bois, a scholar and civil rights leader working in the United States in the early-mid 20th century. This essay discusses a historical mapping project, but unlike the other readings/projects for this week, it does not re-draw or further develop GIS methods/data from that historical material. Instead a key point this article brings to our conversations in class is the importance of interrogating historical/archival materials in relation to the context in which they were created.
- Scan includes required short essay by Mabel Wilson as well as optional introduction to the scanned plates and a selection of a few of the maps/data visualizations that were included in the exhibition discussed.

Digital Scholarship Lab, University of Richmond. *Mapping Inequality* 2015-ongoing

- explore the [interactive maps](#) & be sure to read [the introduction](#)

## **2/14 | Week 4 | Making Data From Observation & Sensing**

## Assignment 2 due – Selective Digitization

### Readings (available in [course Drive](#))

[House, Brian. "Stalking the Smart City." 2019](#)

[Folder. Italian Limes. 2014](#)

Ferrari, Marco, Elisa Pasqual, Alessandro Busi, Aaron Gillett. *A Moving Border: Alpine Cartographies of Climate Change* [Selections]. 2019

Williams, Sarah, Jacqueline Klopp, Daniel Orwa, Peter Waiganjo, and Adam White. "Digital Matatus: Using Mobile Technology to Visualize Informality." 2015.

## 2/21 | Week 5 | Making Data from Satellites

### Assignment 3 due – Mapping Observations

#### Readings (available in [course Drive](#))

Kurgan, Laura. "Mapping Considered as a Problem of Theory and Practice." 2013.

Please also review from week 2: Couclelis, Helen. "People Manipulate Objects (but Cultivate Fields): Beyond the Raster-Vector Debate in GIS." 1992

## 2/28 | Week 6 | (last day of Session A) | Maps & Narrative

### Assignment 4 due – Mapping Remotely

#### Readings

Please watch: [In Plain Sight. by Diller Scofidio + Renfro, Laura Kurgan, Robert Gerard Pietrusko with Columbia Center for Spatial Research at the 2018 U.S. Pavilion.](#)

Please read these map-based articles from the New York Times:

- [Serkez, Yaryna. "Opinion: Every Place Under Threat." The New York Times, October 2, 2020, sec. Opinion.](#)
- [Plumer, Brad, Nadja Popovich, and Brian Palmer. 2020. "How Decades of Racist Housing Policy Left Neighborhoods Sweltering." The New York Times, August 31, 2020, sec. Climate.](#)
  - across these articles and when watching *In Plain Sight* try to focus on identifying the core narrative, and then on discerning how the narrative is being conveyed via the maps and other media used
  - there is a longer list of New York Times map-based articles included at the end of the precedents page [here](#), please feel free to read several of these in addition to the two listed above (if you choose to read an NYT map article that is not already on cited on the precedents page list, please include a link to the article in your discussion question post on Canvas).

- Columbia University Libraries provides access to NYTimes.com for all students. Please see instructions [here](#) to set up an account

## 3/28 | Mapping Portfolio Due

Combine all of your assignments in one PDF. This is also your chance to catch up on assignments that may have stumped you, or refine them now that you have a bit better control of the software. Add a title to the top of each page with the assignment number, which tutorial they are following (for assignment 3, 4, and 5) and your two sentence summary.

If you are missing any assignments on courseworks, or have updated the maps, please upload them there as well.

All assignments are grade on completion. That said, they must answer the prompts laid out in each of the assignments, contain relevant elements of the map (like legends), and most importantly, **use the tools taught in the relevant tutorials.**

Assignment 5 is available for those who would like an extra credit point (as described below).

## Class Requirements and Grading

Grading for the class is as follows:

There are a total of 12 possible points, attendance for each session, assignments and in class contribution each count for one point. 12 points is a HP, 10 points is a P, 8 points is a LP, and anything below that is a F.

Attendance (6 points)

Attendance at all six class sessions is required. Per GSAPP attendance policy, three unexcused absences is an automatic Unofficial Withdrawal (UW).

In-class participation (1 point)

You are expected to give engaged and generous participation in class discussions and in critique workshops with your peers.

Assignments + Portfolio (5 points, 1 point each) Weekly map assignments will allow you to apply the skills acquired via tutorials and begin to experiment with creative applications of spatial methods. Five map assignments will be completed over the course of the six week course and as such are intended to be limited in scope; experimental; and geared towards learning and creative engagement rather than demonstrating advanced skills. Assignment descriptions and associated assessment rubrics can be found on the assignments tab of the course site.

For the final course session you will assemble your map assignments into a single document/portfolio/atlas.

Extra Credit (1 point each) Extra credit will be given for the completion of assignment 5, and additional extra credit can be assigned by the instructor in the even that a student has a LP or F.

## Software

Geographic Information Systems is not a software. As such this course will not seek to provide students with proficiency in a particular software platform.

Tutorial resources will be primarily provided for QGIS 3.16 (LTR). This is an open source software program for geographic analysis that runs on Windows, Mac, and Linux operating systems. All students will be expected to download and install QGIS 3.16 (LTR). Documentation for QGIS is available [here](#), and a training manual with good basic tutorials is available [here](#) and an introduction to GIS methods using QGIS is available [here](#). Information regarding other GIS softwares will be provided in course resources.

Knowledge of design and layout programs (Adobe Illustrator, and InDesign) may be useful to you but is not required.

## Course google drive folder

All readings and course data will be available via Google Drive [here](#).

## Academic Integrity

The intellectual venture in which we are all engaged requires of faculty and students alike the highest level of personal and academic integrity. As members of an academic community, each one of us bears the responsibility to participate in scholarly discourse and research in a manner characterized by intellectual honesty and scholarly integrity.

Scholarship, by its very nature, is an iterative process, with ideas and insights building one upon the other. Collaborative scholarship requires the study of other scholars' work, the free discussion of such work, and the explicit acknowledgement of those ideas in any work that inform our own. This exchange of ideas relies upon a mutual trust that sources, opinions, facts, and insights will be properly noted and carefully credited.

In practical terms, this means that, as students, you must be responsible for the full citations of others' ideas in all of your research papers and projects; you must be scrupulously honest when taking your examinations; you must always submit your own work and not that of another student, scholar, or internet agent.

Any breach of this intellectual responsibility is a breach of faith with the rest of our academic community. It undermines our shared intellectual culture, and it cannot be tolerated. Students failing to meet these responsibilities should anticipate being asked to leave Columbia.

For more information on academic integrity at Columbia, students may refer to the [Columbia University Undergraduate Guide to Academic Integrity](#) as well as the [GSAPP Honor System](#) and [Plagiarism Policy](#).

## Community & Accessibility

This is a discussion and collaborative-critique based course. All students and the instructor must be respectful of others in the classroom. If you ever feel that the classroom environment is discouraging your participation or is problematic in anyway please contact me.

GSAPP is committed to full inclusion of all students. Students needing any form of accommodation due to a disability should check in with [Disability Services \(DS\)](#) and speak with me at the

beginning of the semester to provide the accommodations letter from DS. Alternatively you may ask your advisor to consult with me regarding your accommodations.

## Email Policy

Students should not rely on or expect an immediate response to questions sent via email to the instructor. Please begin assignments with enough time to attend office hours or ask a question several days before the assignment is due.

Learning how to troubleshoot technical issues and locate relevant resources is crucial in your long-term success with GIS methods. With this in mind emails with technical questions must at a minimum contain the following:

- a clear description of what you are trying to do, and what the problem is
- a summary of the steps you have already taken to address the issue
- screenshots (where applicable) that help to explain the problem
- a link to at least one website you consulted for assistance with the issue before writing the email. The [QGIS docs](#) is a good starting place as is [GIS Stack Exchange](#).

## Bibliography

Baics, Gergely, and Leah Meisterlin. "Zoning Before Zoning: Land Use and Density in Mid-Nineteenth-Century New York City." *Annals of the American Association of Geographers* 106, no. 5 (September 2, 2016): 1152–75.

Battle-Baptiste, Whitney, and Britt Rusert, eds. *W.E.B. Du Bois's Data Portraits: Visualizing Black America: The Color Line at the Turn of the Twentieth Century*. First edition. [Amherst, Massachusetts]: Hudson, NY: The W.E.B. Du Bois Center at the University of Massachusetts Amherst; Princeton Architectural Press, 2018.

Corner, James. "The Agency of Mapping." In *Landscape Imagination: Collected Essays of James Corner 1990-2010*. New York, UNITED STATES: Princeton Architectural Press, 2014.

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Desimini, Jill, and Charles Waldheim. "Introduction: Projecting the Landscape Imaginary." In *Cartographic Grounds: Projecting the Landscape Imaginary*. New York: Princeton Architectural Press, 2016.

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Mörtenböck, Peter, and Helge Mooshammer, eds. *Informal Market Worlds: The Architecture of Economic Pressure*. Rotterdam: NAI010 Publishers, 2015.

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Wood, Dennis. "Everything Sings: Maps for a Narrative Atlas." In *Places Journal*. 2011.

Woods, Clyde Adrian., and Katherine. McKittrick. "No One Knows the Mysteries at the Bottom of the Ocean." In *Black Geographies and the Politics of Place*. Toronto, Ont.: Cambridge, Mass.: Between the Lines; South End Press, 2007.