Mapping NYC’s Urban Environment: An Introduction to GIS

Coursework at Wave Hill
What is GIS?

• GIS is a tool used to organize, display, analyze and present geographic information.
Layers in GIS

- GIS organizes real-world features into data files known as layers.
- Layers can be composed of features like trees, U.S. states, rivers, cities, and roads.
Attribute Tables

- Each layer has its own attribute table, where data about each individual feature are stored.
- Data may include such as information state population, tree height and land-cover type.
What to Expect from the Course

• Course meets at the College of Mount Saint Vincent once, or sometimes twice a week.
• Class time is divided between lecture and lab.
• Each session is about 5 to 6 hours long, and includes a long lunch break, as well as several shorter breaks.
What to Expect from the Course

• Students spend an additional day each week collecting data in Wave Hill’s woodlands.

• Students use this data to create maps as part of a final course project.
What to Expect from the Course

• Basic map-making
• Data management
• Using different types of maps and data
• Using GIS to solve environmental issues
• Map design and cartography
What to Expect from the Course

- Each week, students have at least one in-class lab assignment based on real-world GIS applications.
- Students make at least 10 maps, including several of their study site at Wave Hill.
What to Expect from the Course

• At Wave Hill, students use GPS equipment and survey tools to collect data about their work/study sites.

• By supplementing their lab and lecture time with hands-on workshops and field projects, students learn how to use GIS as a real-world, problem-solving skill.
What to Expect from the Course

• Excerpt from 2014 syllabus
  – July 2, WED, 12:30–5pm
    • Reading: Chapter 1, Basics of Mapping and GIS (Maantay & Ziegler)
    • Lecture theme: Course overview, introduction to GIS, history of cartography
• Laboratory
  – Lab 1: Exploring Basic GIS Functionality
  – Lab 2: Introduction to ArcGIS
  – Lab 3: Displaying and Manipulating Spatial Information
  – Lab 4: Making a Thematic Map
Site 1 Project: *Studying Erosion and Canopy Gaps* by Anike Cherry & Mamadi Jallow

This map depicts Site 1’s canopy gaps and erosion levels. The canopy gaps were determined by observing the gaps in the overstory trees at the site, which allowed sunlight to pour in. Erosion is represented by polygons in four colors, showing how much erosion has occurred in an area of the site. This information was used to determine areas that are most at-risk for invasive plants.
Excerpts from Final Student Projects

Site 4 Project: *Buried Treasure by Shalom Kouaka & Margalit Shetreat-Klein*

This project focused on a less serious scenario: where would be the best place to bury treasure in Site 4. To show off their cartographic skills, this group looked at understory density, slope and other factors to determine where pirates should bury their treasure.