Course Syllabus
Geography 280/380
Fall 2011

Urban Ecology: Cities as Ecosystems

Time: Class Tuesdays 2:50-5:50 pm; Field trips Thursdays 2:50-5:50 pm
Place: Geography 104
Instructor: Dianne Rocheleau  Office: Jefferson Academic Center, 201 B
email: drocheleau@clarku.edu
Telephone: 508-887-5001
Office Hours: Tues/Thurs 10:30-11:30, or by appointment

Teaching Asst.: Alida Cantor  Office: Geography Mezzanine, M101
email: acantor@clarku.edu
Phone: 609-651-5960
Office Hours: Tuesday 12:00-2:00, or by appointment

Description
“Recognizing nature in the city, where our language itself has taught us to believe nature no longer exists, challenges our ability to see the world clearly – but to miss the city’s relation to nature and the country is in fact to miss much of what the city is.” William Cronon, *Nature’s Metropolis* (1991, 19).

When people think and talk about ‘nature’ it is most often in reference to ancient rainforests, national parks, African savannas and Arctic tundra. These are popularly understood as peopleless landscapes – places of ‘pure nature’. Even these places, however, have been influenced and transformed by people and their social, economic and political institutions, from local to global scale. In contrast, urban landscapes are generally understood to be the opposite of nature, an anti-nature, and thus not a popular subject of ecological enquiry. And yet, the urban form has developed in concert with, and exists intertwined with, “natural” systems and flows. The city is not purely social, just as the forest is not purely “natural”, (and in fact these very categories are highly contested, but that’s another course). The city can be thought of as a particular product of social, economic and biophysical processes, among others.

This course will use systems and networks approaches to the study of urban ecology. We will study the city as part of a larger system by looking at cities as centers of production, reproduction and consumption, that play an important role in shaping regional and global ecologies. Cities, and the people who live in them, consume land, water, air and energy resources that originate far outside the city’s political boundaries. They also produce air and water pollution, sewage and solid waste that find their way to far off places and ecologies. Within this context we will review and apply “footprint” analysis, as well as several specific indicators of environmental quality and impact. Recent advances in network and complexity theories (social, ecological and technological) also allow us to go beyond systems in territories to complex systems and socio-ecological networks rooted in multiple territories across scales.

While cities are embedded in larger systems we will focus even more closely on the city as a network and an ecosystem in its own right. The city creates unforeseen as well as planned effects on its human and non-human inhabitants. For example, the building and paving of transportation networks facilitates access to parts of the city for certain groups of people while dividing neighborhoods and claiming the land of other groups of people. Meanwhile, pavement
alters water cycles by inhibiting water absorption and affects climate by retaining energy in the form of heat. Yet cities also concentrate water in new places and provide new habitats and opportunities for everything from parrots and coyotes to mosquitoes. Decisions about landscaping, city parks and home gardens create unique assemblages of vegetation that enable certain activities and provide habitat for certain creatures. The urban ecology is a product of the interaction of energy flows, water and material cycles, topography, vegetation, animals, economic processes, technology, culture and politics. Processes of consumption, transformation and production sometimes result in urban ecosystems that resemble each other more than they do their original, diverse sites. Cities, as such, can be as valid a class of ecosystem as estuaries, dry savannas or coastal dunes. Urban ecology -- integrating ecosystems, human, cultural and political ecology -- treats the entire city in all its diversity as a valid ecosystem and a rich laboratory of ecological structure and process.

This course illustrates how cities acquire, utilize and modify a range of “resources” (such as land, water, food and energy) and in the process generate a complex set of waste streams and environmental impacts (such as habitat alteration, solid wastes, atmospheric emissions and water quality impacts). These patterns of consumption and disposal are regulated through social systems such as technology, law, politics and economics. We will study these consumption and waste streams to understand how they relate to each other, to the city and to ourselves. Importantly, however, we will also explore how they are envisioned, designed, managed and regulated. Further, we will address the social dimension of this regulation and how regulation might be done differently to allow for more socially and environmentally sustainable urban futures.

In this class we have three good academic reasons to study urban ecology: to understand human welfare, social relations of power, and ecology in and near cities; to understand the role of cities in regional and global environmental processes; and to understand cities as a distinct class of ecosystem with diverse and unique assemblages of organisms. There are also compelling practical reasons. Those who aspire to work as urban or environmental planners, educators, advocates, or activists need to develop critical and technical skills to analyze and act upon problems and opportunities that combine social, ecological and political elements in cities. Moreover, we may apply the study of urban ecology to design alternative urban forms and processes. And those of us who are or aspire to be educators can develop new curricula that use urban physical and social infrastructure to teach students (K thru Ph. D.) about their world.

**Objectives**

The primary objective of this course is to introduce the participants to how cities function as social-ecological systems and to explore ecological interactions amongst physical, biological, economic, social and political processes within the urban environment. Each person in the class should gain a general ecological understanding of cities as homes, workplaces and habitats of diverse groups of people and a multitude of other species. The field exercises as well as class assignments will leave open to individual expertise and interest the choice of whether to concentrate on social, physical or biological aspects of city ecosystems. However, everyone in the group should engage to some extent with all three aspects of urban ecology, and there will be a mid-term exam on basic urban ecological concepts. Likewise, students will be free to focus their paper and project on planning and design, environmental management and technologies, ecological analysis, community development or environmental justice applications, assuming that everyone makes an effort to learn something of each approach.
Our expectation is that you gain a new perspective into cities, city life and ecology that will motivate and enable you to explore these issues and topics further in academic, professional, community and/or personal pursuits. We do not expect you to agree with us or with each other or to adopt a fixed approach or to absorb a fixed package of "facts". We do expect an intensive engagement with the subject matter and with the process of learning in the class. We will encourage debate, discussion and (whenever possible) dialogue and cross-teaching as we engage in what is, above all, an exciting learning venture.

**Texts**

*Required:*


*Recommended:*


Additional readings and reference material will be available on Cicada and in the Kasperson Library (Marsh Institute). B.J. Perkins, director of the Kasperson Library, has compiled a collection of materials related to the course (including the above recommended texts), and you are invited and encouraged to use these materials. We have a significant collection of urban ecology material available in Geog 201 that can be checked out with our permission.
Requirements and Assignments

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mid Term</td>
<td>20%</td>
</tr>
<tr>
<td>Field Trip and Class Participation</td>
<td>25%</td>
</tr>
<tr>
<td>Field Exercises and Homework</td>
<td>20%</td>
</tr>
<tr>
<td>Term Project</td>
<td>25%</td>
</tr>
<tr>
<td>Project Presentation (group grade)</td>
<td>10%</td>
</tr>
</tbody>
</table>

Mid Term:
The mid-term exam is due on the 25th of October. You will receive a review sheet by the 13th of October, and the questions on the 20th, for a take home. The mid-term will cover the readings and lecture material, plus the field trips up until October 20th. This accounts for 20% of your final grade.

Field Trips:
This course is field intensive. We will use actual places and case studies to understand how a city functions as an ecological unit and how it is related to a larger regional ecology. Attendance and participation in the field trips are required as part of the course: attendance is mandatory, with possible exceptions for a single trip. There is one 4-day field trip to New York City from September 22-25. This trip is mandatory and not negotiable. Participants are required to pay for their own food and transportation while in New York, which usually means a $20 subway card (or more) and $10-20 per day for food. (Think of this as part of a lab fee). The department will arrange for transportation to NYC. The accommodation will be provided through private arrangements with friends and family of class members, organized through the class. This is not a tour but a field class activity with no promise of luxury and fixed timetables. If students remain enrolled in the class after the first class meeting and discussion they are indicating a willingness to participate in the NYC trip under these conditions.

Field trips to Worcester sites will take place on Thursday afternoons and will be announced during the second week and updated on Cicada as the field trip hosts respond with specific times. The Worcester trips will include visits to water treatment, sewage treatment, waste treatment and recycling facilities, urban parks and gardens, watersheds and river courses, and various housing sites and community centers.

25% of your grade will be based on your attendance AND participation in class and on the field trips. You will all be expected to attend all the classes and trips. The only exceptions will be in the case of documented illness or emergency. 20% of your grade will be based on homework assignments. These will consist of short write-ups of our field visits and field exercises related to the lectures and readings. These will be graded without detailed comment.

Term Project:
Throughout the semester students will co-design and contribute to a group project (individual project with permission). We will start discussing the possibilities for the group projects in the second week and the topics must be approved by us by mid-term break. The project will result in a documented and justified:

1) community-based research on a project topic in Worcester; OR
2) development/land use plan, landscape design, housing plan, home design, park plan or trail design, waste management or pollution abatement plan: OR
3) other form of research/action project (must be approved, see Instructor or TA).
Each of the project types will include both library/archival and field research. The group project will be developed as a work-in-progress. Each member will evaluate the process and content of the research conducted up to the point of project presentation, will suggest directions for further work and will summarize their substantive findings and preliminary conclusions in individual written papers (15 pages) and final presentations suitable for submission in the Spring Academic Spree Day.

Graduate Students
The paper for your term project will be slightly longer than those taking the course for undergraduate credit (20 pages instead of 15) and we expect you to treat the material at a graduate level. There will be discussions as well as lectures during class time and some of those will focus on practice and policy while others will address Gandy, Heynen et al.(x2) (required reading for grad. students) and other theoretically focused texts. Likewise, the projects should be presented in a manner that would be suitable for the Clark Graduate Student Interdisciplinary conference.
Course Schedule
Please note, schedule is subject to change because of our many field visits. Also please note that except for Week 1, all readings should be completed by Tuesday’s class each week.

Week 1
30 Aug Welcome, Introductions, Review Syllabus, Confirm NYC trip dates, Walking Tour Part 1

31 August Optional: Walking Tour with Mayor Joe O’Brien on Storm Sewers/Watersheds Meet at Oread St. Farm: walk to Main and Oread right 2 blocks 5:30-7:00

1 Sept Walking tour of Main South (part 2); Elm Park


3 September King St. Block Party (optional, fun, and instructive: get connected! )

Week 2
6 Sept Soil in the City: Gardens, Trees and Urban Communities Worcester Roots Toxic Soil Busters with Matt Feinstein (to be confirmed)


8 Sept REC- Youth Grow Gardens/Farm: Discussion, tour farm work with Anna Lantz Benefit Street Gardens with Jude Fernando

Week 3
13 Sept Lecture and discussion on Gandy Ch. 4 and Miller et al. article


15 Sept Sewage Treatment Plant

Week 4
20 Sept Prepare for NYC; Web Sites and Reserve Readings

22-25 Sept NYC
Week 5
27 Sept  NYC Debriefing; Water and Wastewater

Reading:  Hough Ch 2 (Water) and follow-up on Chs 3-4 (Plants and Wildlife)

29 Sept  Presentation on Water Treatment Facility; Field trip TBC

Week 6
4 Oct  Worcester's Landscapes and Livelihoods: Industrial Legacy; Higher Education, Biotech, Bedroom and Social Service Community

Reading:  Sinha, Deb. 2009. Ch 4 (Environmental History of Worcester)

6 Oct  Open Spaces and Industrial Spaces in Worcester
       Coes Pond, Norton, RR Corridor

Week 7
11 Oct  Fall Break (Decide on Project Groups by Thursday)

Reading:  Gandy Ch 5 (Rustbelt Ecology)

13 Oct  Landfill or Alternative Sewage Treatment

Week 8
18 Oct  Water in Cities, Cities in Watersheds; Map tour of Worcester waterways

          Both in Heynen et al., Neoliberal Environments.  51-62, 163-176.

20 Oct  Tatnuck Watershed; Driving/Trekking Tatnuck Brook/Blackstone River

Midterms- weekend take home exam due in class on 25 Oct

Week 9
25 Oct  New Orleans and LA: Urban Hazards and EJ (Environmental Justice)
        Watch clips from Spike Lee’s When the Levees Broke


          Additional readings TBA: New York and Hurricane Irene
27 Oct  Incinerator

**Week 10**

1 Nov  Toxics, Technologies and EJ


Additional readings TBA

3 Nov  Recycling Plant

**Week 11**

8 Nov  Housing, Design, and Justice


Additional readings TBA: Detroit and Cleveland

10 Nov  Kilby Gardens- Jack Foley

**Week 12**

15 Nov  Urban Food Systems and Networks


Revisit Hough Ch 5 city farming

17 Nov  Trip to be determined or project work day

**Week 13**

22 Nov  In class project work day

24 Nov  Thanksgiving- No class

**Week 14**

29 Nov, 1 Dec In class or group field time (project work days)

**Week 15**

6,8 Dec  Class Presentations
NYC TRIP ITINERARY
22-25 SEPT 2011 DRAFT

Note: This is a DRAFT schedule, subject to changes!

Dianne Rocheleau 508.887.5001
Alida Cantor 609.651.5960

Thursday 22 September
8:00  Meet on Downing St—same place as Thursday field trips
8:15  Leave Worcester
      Breakfast before, and bring your lunch!
1:00  Sustainable South Bronx: Toxics and renewals
4:00  El Puente

Friday 23 September
7:30  Meet in front of the New York Stock Exchange
      20 Broad St between Wall and Exchange place, near the Wall St or Broad
      St subway stop
8:30  Walk out to waterfront
9:30  Leave for Brooklyn
10:00 Park Slope Food Coop
12:00 Lunch (buy in Park Slope area or at W. Harlem Grocery) in park on Hudson River
2:00  West Harlem Environmental Action (WE ACT)
4:00  Justicia para El Barrio (Movement for Justice in El Barrio)

Saturday 24 September
8:30  Meet at Union Square Farmers Market
      Corner of Union Square West at East 17th St.
11:00 Tour Lower East Side Gardens
1:00  Lunch in Lower East Side
2:00  High Line Park
3:00  Central Park
4:30  Museum of the City of New York: “From Farm to City: Staten Island 1661-2012"
      and “The Twin Towers and the City”

Sunday 25 September
9:00  Meet at central spot to leave: Bring your lunch for the way back!
10:30 Bronxdale Housing Community Center
12:00 Throgs Neck Housing
2:00  Leave for Worcester