

UP/ENVS 406—Urban Ecology

Spring 2022

Professor Daniel Schneider

ddws@illinois.edu

Office Hours: email me for a zoom meeting

Over half the global population now lives in cities, and urban land use is expected to triple in area by 2030. As a result of the increasing dominance of cities, ecologists have increasingly focused their attention on urban environments in order to understand the important processes affecting urban ecosystems. Perhaps more than any other ecosystem, however, an understanding of urban habitats requires an analysis of the social as well as ecological factors affecting ecosystems. In this course, we will examine the new urban ecology, and combine ecological analyses with historical, anthropological, and sociological studies of urban nature. How are urban ecosystems similar to or different from other habitats? What are the characteristic features of urban ecosystems? How are cities connected to the ecology of distant ecosystems? What distinctive ecosystems are created in urban areas? How do we construct nature in urban ecosystems? As a human-dominated ecosystem, cities require both scientific and social-scientific analysis in order to evaluate the ecological footprint of cities, assess their ecological sustainability, examine growth management, unravel the connections between ecology and public health, or work to protect plants and animals from encroaching urbanization.

Objectives

- I. Expose students to recent research on the ecology of urban ecosystems
- II. Understand the interdisciplinary nature of urban ecosystems
- III. Familiarize students with recently developed tools for analyzing urban ecosystems

Course Structure:

The course will be a mixture of lecture and discussion. Lectures will cover concepts and new research on the scientific aspects of urban ecology. For each lecture I have assigned a review article or article from the primary literature that introduces the lecture topic. I will also provide bibliographies for further reading. After every 3 lectures or so, we will read and discuss a paper from the humanities or social sciences that addresses topics, questions and concepts raised in the preceding lectures. In this way we will be able to appreciate how understanding urban ecology requires an interdisciplinary approach.

In addition, there will be two exercises utilizing web applications to analyze urban ecology data. The first will look at the relation between tree canopy cover and socio-economic characteristics of neighborhoods. The second will analyze the urban metabolism.

All readings will be posted on the course Compass site. These readings are required, but there is no additional textbook or course packet to purchase.

Course Requirements:

Students will read all of the assigned material. For discussions, students will have read the article in advance, and will take an active part in discussion. Write down notes and questions on the readings. Bring them up in class discussion.

Students will write one 5-page paper on a particular species of urban plant, animal or other organism. I will provide a list of species from which to select. The paper will account for 15% of the grade.

Students will write a paper of about 15 pages on a topic of their choice. The paper must integrate scientific and humanities/social scientific approaches to urban nature. The paper will be due on May 10. The paper will account for 35% of the grade. Graduate students will write a paper of about 20 pages.

Two exams. The second exam, on the last day of class, will not be cumulative. Each exam accounts for 25% of the grade. There is no final exam scheduled during finals week. Graduate students will answer 1 additional question for each exam.

Academic Honesty--You are strongly encouraged to discuss class assignments with others, but your work in papers and exams must be your own. Do not quote directly (and direct quotations must be indicated with quote marks “ ”) or paraphrase from published works (including the web, and including Wikipedia) without a proper citation. Footnote ideas and information that are not common knowledge. When in doubt about what academic integrity requires, ASK! Failure to abide by the principles of academic honesty will result in a failing grade for the course. University of Illinois guidelines can be found at http://studentcode.illinois.edu/article1_part4_1-401.html. You are expected to be familiar with this section of the student handbook.

Course Schedule

Jan 18. Introduction

Jan 20 **Urban Ecology**

Schwarz, Kirsten, Dustin L. Herrmann, and Melissa R. McHale. "Abiotic Drivers of Ecological Structure and Function in Urban Systems." *Urban Wildlife conservation*. Springer US (2014) 55-74.

Jan 25. **Ecological Niche**

Kark, Salit, et al. "Living in the city: can anyone become an 'urban exploiter'?" *Journal of Biogeography* 34.4 (2007): 638-651.

Jan 27. **Urban Species**

Judy Irving, "The Wild Parrots of Telegraph Hill" film at www.kanopy.com. (you will need to sign in with your public library card. If you do not have one, you can get one for free at Champaign (champaign.org) Urbana (urbanafreelibrary.org) or Savoy (tolonolibrary.org), depending on where you live.

Feb 1. **Discussion.**

Biehler, Dawn Day. *Pests in the city: flies, bedbugs, cockroaches, and rats*. University of Washington Press, 2013. Chapter 3, "Flies: Agents of Interconnection in Progressive Era Cities."

Feb 3. **Island Biogeography and Fragmentation—**

Ramalho, Cristina E., and Richard J. Hobbs. "Time for a change: dynamic urban ecology." *Trends in ecology & evolution* 27.3 (2012): 179-188.

Collinge, Sharon K. "Ecological consequences of habitat fragmentation: implications for landscape architecture and planning." *Landscape and urban planning* 36.1 (1996): 59-77.

Feb 8. **Metapopulations and corridors—**

LaPoint, Scott, et al. "Ecological connectivity research in urban areas." *Functional Ecology* 29.7 (2015): 868-878.

Feb 10. **Bed bugs**

Wang, Changlu, et al. "Characteristics of *Cimex lectularius* (Hemiptera: Cimicidae), infestation and dispersal in a high-rise apartment building." *Journal of Economic Entomology* 103.1 (2010): 172-177.

Feb 15. **Discussion**

Landy, Frédéric . 2017. Urban leopards are good cartographers. Human-nonhuman and spatial conflicts at Sanjay Gandhi National Park, Mumbai, in A. Rademacher, K. Sivaramakrishnan ed., *Places of nature in ecologies of urbanism*, Hong Kong University Press, 2017, pp.67-85.

Feb 17. **Urban Ecology and Disease**—

LaDeau, Shannon L., et al. "The ecological foundations of transmission potential and vector-borne disease in urban landscapes." *Functional ecology* 29.7 (2015): 889-901.

Feb 22. **Discussion.**

Coreil, Jeannine, Linda Whiteford, and Diego Salazar. "The household ecology of disease transmission: Dengue fever in the Dominican Republic." *The anthropology of infectious diseases: International health perspectives* (2000).

Feb 22. Species Paper Due

Feb 24. **Disturbance and Succession,**

Oldfield, Emily E., et al. "FORUM: challenges and future directions in urban afforestation." *Journal of Applied Ecology* 50.5 (2013): 1169-1177.

Mar 1. **Discussion.**

Mike Davis, "The Case for Letting Malibu Burn," from *Ecology of fear: Los Angeles and the imagination of disaster*. Macmillan 1998,

<https://www.jacobinmag.com/2018/12/california-fires-let-malibu-burn-mike-davis-interview>

Mar 3. **Restoration**

Hobbs, Richard J., et al. "Managing the whole landscape: historical, hybrid, and novel ecosystems." *Frontiers in Ecology and the Environment* 12.10 (2014): 557-564.

Mar 8. Matthew Gandy. *Natura Urbana. The Brachen of Berlin*. Film (available starting March 1), at <https://www.youtube.com/watch?v=Ufs81sDxtw0>

Mar 10. **Discussion. Detroit**

Safransky, Sara. "Rethinking land struggle in the postindustrial city." *Antipode* 49, no. 4 (2017): 1079-1100.

Mar 22. **Midterm Exam.**

Mar 24. **Ecosystem Services**—

Gómez-Baggethun, Erik, and David N. Barton. "Classifying and valuing ecosystem services for urban planning." *Ecological Economics* 86 (2013): 235-245.

March 29. **Urban Forests**

Chen, Wendy Y., and C. Y. Jim. "Assessment and valuation of the ecosystem services provided by urban forests." *Ecology, planning, and management of urban forests*. Springer New York, 2008. 53-83.

Mar 31. **i-tree lab. Analyzing race and tree canopy coverage in Champaign-Urbana**

<http://www.itreetools.org/>

April 5. **Discussion**

Heynen, Nik, Harold A. Perkins, and Parama Roy. "The political ecology of uneven urban green space: the impact of political economy on race and ethnicity in producing environmental inequality in Milwaukee." *Urban Affairs Review* 42.1 (2006): 3-25.

April 7. **Ecological Footprint and Urban Metabolism,**

Baccini, Peter, and Paul H. Brunner. Chapter 3, *Metabolism of the anthroposphere: analysis, evaluation, design*. MIT Press, 2012.

April 12. **Urban bacterial habitats: sewage treatment plants, landfills, industrial ecosystems**

Read, Adam D., Mark Hudgins, and Paul Phillips. "Aerobic landfill test cells and their implications for sustainable waste disposal." *The Geographical Journal* 167.3 (2001): 235-247.

April 14. **Sewage Sludge,**

Schneider, Daniel. "Purification or Profit: Milwaukee and the Contradictions of Sludge." *Histories of the Dustheap: Waste, Material Cultures, Social Justice* (2012): 171

April 19. **Film** Lucy Walker, *Wasteland*. 2010.

<https://www.youtube.com/watch?v=UnfG11aHFoA> or on Amazon Prime, free with 7-day trial subscription to Docurama.

April 21. **Discussion.**

Demaria, F., & Schindler, S. (2016). Contesting urban metabolism: Struggles over waste-to-energy in Delhi, India. *Antipode*, 48(2), 293-313.

April 26. **Domestic spaces**

Belaire, J. Amy, Christopher J. Whelan, and Emily S. Minor. "Having our yards and sharing them too: The collective effects of yards on native bird species in an urban landscape." *Ecological Applications* 24.8 (2014): 2132-2143.

April 28 **Discussion. Lawns**

Robbins, Paul, and Julie T. Sharp. "Producing and consuming chemicals: the moral economy of the American lawn." *Economic Geography* 79.4 (2003): 425-451.

May 3. **2nd Exam**

May 10. **Final Paper due**