

E555 Urban Ecology – Course Calendar, spring 2019, 3cr, Final

E555 Urban Ecology – Topics/Readings, Sp 2019

All papers are located in Canvas Assignments Weekly Folders (1-15)

**Week #1 January 8 – Welcome to the Workshop and Urban Ecology; Course introduction and all that stuff
Topics – What is Urban; Urban Ecology Themes handout – discussion; Review “The Anthropocene” as needed;
Fischer prepared introductory handout and PPT on urban ecosystems**

Check out and register to receive The Nature of Cities blog at <http://www.thenatureofcities.com/>.

Assigned Readings: Before class – See Reading Assignments & Themes (see Themes & Defining UE) Folders
From Atlantic Cities “The Rise of Urban Ecology” (see Citations from Rise of UE folder, this is really the good stuff) <http://www.citylab.com/weather/2012/11/rise-urban-ecology/4032/>

Fischer BC. 2017. Defining Urban Ecology & the Connection to Urban Forestry. IAA Newsletter (Winter), p 14-15.

See Folder – Anthropocene Readings - Browse as necessary to be sure you are up to speed on this concept per UE.

Pickett et al. 2016. Evolution and future of urban ecological science: ecology in, of, and for the city. *Ecosystem Health and Sustainability* 2(7):e01229. doi:10.1002/ehs2.1229

Book introduction - Baltimore School of Urban Ecology: Scale, Space and Time for the Study of Cities. Yale Press

**Week #2 January 15 – Clean-up lingering course format questions; Intro Book Review & Research Paper.
Topics this week - Finalizing class understanding of urban, urban ecology, etc.; Discuss Assignments of
topics/teams (4/team) for Wks 4-7 and beyond including possible guest discussants.**

Assigned Readings: Week 2 Reading Assignments Folder

From The Nature of Cities (TNoC) (2018) “What should every ecologist know about urban ecology?”
<https://www.thenatureofcities.com/2018/01/29/one-thing-every-ecologist-know-urban-ecology/>

Pickett, STA., JM Grove. 2009. Urban Ecosystems: What would Tansley Do? *Urban Ecosystems* 12: 1-8.

Strauss et al. 2015. Cities and the Environment: Eight Years of Urban Ecology Research and Practice. *Cities and the Environment (CATE)*: Vol. 8: Iss. 2, Article 23. Available at: <http://digitalcommons.lmu.edu/cate/vol8/iss2/23>

Tanner C, et al. 2014. Urban ecology: advancing science and society. *Front Ecol & Environ* 12(10): 574-581

Week #3 January 22 – Urban Patch Dynamics, a key theme in Urban Ecology

Reading Assignments:

From TNoC (2013) Marshall V. 2013. “Patch Reflection.” *The Nature of Cities*.

www.thenatureofcities.com/2013/04/14/aerial-reflection-for-urban-ecology/. Accessed 19 Jan. 2017.

Grove JM et al. 2015. The Baltimore School of Urban Ecology: Space, Scale and Time for the Study of Cities. Yale Press, Chap 3, 38-76.

Avins M. 2013. Baltimore’s Forest Patches: Emerald Assets for Ecosystem Services. 34p. Baltimore Green Space <http://baltimoregreenspace.org/downloads/ForestPatchesWeb.pdf>

Redlining of 1930’s, a lens for urban patch dynamics – two examples – Durham NC (Cooper) and Indianapolis IN.
[Zoom interview with Donovan Moxley, former UE Student \(2017\)](#)

Week #4 January 29 - Succession and Ties to SES Theory

Statement: Examining ecological succession of abandoned properties and its environmental and social implications for cities.

Marten, G.G. *Human Ecology: Basic Concepts for Sustainable Development*. Earthscan, 2001. Retrieved from: <http://gerrymarten.com/human-ecology/chapter06.html>

Millard, A. 2014. Indigenous and spontaneous vegetation: their relationship to urban development in the city of Leeds, UK. *Urban Forestry & Urban Greening*.

Hunter, P. 2014. Brown is the new green: Brownfield sites often harbour a surprisingly large amount of biodiversity. *European Molecular Biology Organization Journal* 15(12): 1238-1242.

Perry, P. 2019. Insect Community Assembly in Vacant Lots. Gardiner Lab Website, Ohio State. <https://u.osu.edu/gardinerlab/>

Week #5 February 6 – Habitat Fragmentation/Wildlife Corridors

Statement: Habitat fragmentation is the process by which large continuous habitats get divided into smaller fragments, usually due to human interference and activity, resulting in habitat loss and disruption in ecosystem services. Habitat corridors are natural spaces designed to connect fragmented environments to preserve ecological systems.

Didham, R. November 15, 2010. “Ecological Consequences of Habitat Fragmentation”. *Encyclopedia of Life Sciences*. <https://publications.csiro.au/rpr/download?pid=csiro:EP101968&dsid=DS1>

Ariori, C. et al. 2017. Plant invasion along an urban-to-rural gradient in northeast Connecticut, *Journal of Urban Ecology* 3(1) 1-13, January 2017, jux008, <https://doi.org/10.1093/jue/jux008>

Christopher A. et al. 2017. Biodiversity in the City: Fundamental Questions for Understanding the Ecology of Urban Spaces for Biodiversity Conservation. *BioScience* 67(9):799 – 807. <https://doi.org/10.1093/biosci/bix079>.

Introduction to Wildlife Corridors, Elizabeth Borneman <https://www.geolounge.com/introduction-wildlife-corridors/>

Week #6 February 12 – Urban Wildlife Adaptions

Statement: Wildlife colonizing novel ecosystems in urban areas represent unique research opportunities as well as management challenges. Many species are adapting to urban settings on a behavioral and genetic level, leading to increases in human-wildlife interactions.

Soulsbury, CD, White, PCL. 2015. Human–wildlife interactions in urban areas: a review of conflicts, benefits and opportunities. *Wildlife Research* 42(7):541-553.

Dell’Amore, C. 2016. How Wild Animals are Hacking Life in the City. National Geographic. <https://news.nationalgeographic.com/2016/04/160418-animals-urban-cities-wildlife-science-coyotes/>

DeCamdia, AL, et al. 2019. Urban colonization through multiple genetic lenses: The city-fox phenomenon revisited. *Ecology and Evolution*. 1-15, <https://doi.org/10.1002/ece3.4898>

Menke, S.B. et al. 2011. Urban areas may serve as habitat and corridors for dry-adapted, heat tolerant species; an example from ants. *Urban Ecosystems*, 14(2):135-163. Retrieved: <https://link.springer.com/article/10.1007/s11252-010-0150-7>

Week #7 February 19 – Urban Forests

Statement: Urban trees provide diverse benefits to city inhabitants and surrounding ecosystems. However, due to new threats and disturbances, many cities' valuable tree populations are at risk. The urban forest can continue to provide ecosystem services if ecologists and city planners work together and consider the entire urban ecosystem in municipal planning.

Livesley, S.J., McPherson, E.G., & Calfapietra, C. 2016. The Urban Forest and Ecosystem Services: Impacts on Urban Water, Heat, and Pollution Cycles at the Tree, Street, and City Scale. *Journal of Environmental Quality*. 45: 119-124.

Sass, C. K., Lodder, R. A., & Lee, B. D. (2019). Combining biophysical and socioeconomic suitability models for urban forest planning. *Urban Forestry & Urban Greening*, 38, 371-382.

Ordóñez C, Duinker PN. (2014) Assessing the vulnerability of urban forests to climate change. *Environmental Reviews* 22 (3). pp. 311-321.

Lurking in the Trees, Documentary about Don't Move Firewood, <https://www.youtube.com/watch?v=BbxsJj68Ezc>

Week #8 February 26 – Urban Aquatic Systems

Statement: Re-envisioning urban aquatic ecosystems: using stream restoration to reconnect habitats and people

Up the Creek, With a Paddle: Urban Stream Restoration and Daylighting

<https://www.thenatureofcities.com/2013/10/30/up-the-creek-with-a-paddle-urban-stream-restoration-and-daylighting/>

- An example: Daylighting Saw Mill Creek in Yonkers

<https://ny.curbed.com/2016/12/15/13963898/yonkers-saw-mill-river-photo-essay>

Up the Creek, With a Paddle: Urban Stream Restoration and Daylighting Adrian Benepe, New York City 30 Oct 2013

<https://www.thenatureofcities.com/2013/10/30/up-the-creek-with-a-paddle-urban-stream-restoration-and-daylighting/>

Moggridge, HL, et al. 2014. Urban Aquatic Ecosystems: the good, the bad and the ugly. *Fundamental and Applied Limnology*, 185(1): 1-6.

Helfield, J., Diamond, Miriam. (1997). Use of Constructed Wetlands for Urban Stream Restoration: A Critical Analysis. *Environmental Management*. 21. 329-341. 10.1007/s002679900033.

Week #9 March – Book Review presentations

March 11-15 Spring Break

Week #10 March 19 –Ecology of post-industrial cities

Statement: Industry is known to have a positive economic influence on society and a negative impact on the environment. This week we explore different ways in which cities attempt to move past their industrial roots to restore and transform various ecosystems.

Krusky, A. et al (2015). The Effects of produce gardens on neighborhoods: a test of the greening hypothesis in a post-industrial city. *Landscape and Urban Planning* 136: 68-75.

Rich, K. J., Ridealgh, M., West, S. E., Cinderby, S., & Ashmore, M. (2015). Exploring the Links between Post-Industrial Landscape History and Ecology through Participatory Methods. *Plos One*, 10(8)

Green, Olivia Odom, et al (2016) “Adaptive governance to promote ecosystem services in urban green spaces”. *Urban Ecosystems*: 19 (77-93).

Burkholder, S. (2012) The New Ecology of Vacancy: Rethinking Land Use in Shrinking Cities. *Sustainability*, 12(4), 1154-1172. Retrieved from: <https://www.mdpi.com/journals/sustainability>

Week #11 March 26 – Urban Disease and Pathogens

Statement: Urban settings present unique environments that affect the quality of soil, air, and aquatic ecosystems. Such conditions can have drastic impacts on the general health of human populations and may also encourage the survival and spread of certain disease-causing organisms.

Jenerette, G. D. (2018). Ecological contributions to human health in cities. *Landscape Ecology*, 33(10), 1655-1668. doi:10.1007/s10980-018-0708-y

Douglas, I. (2012) Urban ecology and urban ecosystems: understanding the links to human health and well-being. *Current Opinion in Environmental Sustainability*. 4:385-392.

Afshinnekoo E. (2015). Geospatial Resolution of Human and Bacterial Diversity with City-Scale Metagenomics. *Cell Systems*, 1, 72-87. Retrieved from: doi:10.1038/nrg3921

Week #12 April 2 Butler Center for Urban Ecology and Sustainability – Interview with Director (Julia Angstrom) and Sustainability Asst. Director (Jamie Valentine)

Statement: Center for Urban Ecology are educational and non-profit organization concerned with connecting the human community with urban ecosystems through education, research, active engagement and policy advocacy. The goal this week is to become familiar with the structure and function of Centers for Urban Ecology at universities and in cities across the country. We explore how these organizations balance education and research initiatives, in addition to collaborations with community groups and other institutions.

Review various UEC websites, etc.

Week #13 April 9 – Environmental Change & Urban Ecosystems

Statement: Environmental change impacts are happening globally, including in urban ecosystems. As we are becoming an increasingly urbanized society, cities must be prepared to take on the challenges brought on by environmental change and society needs to shift toward environmental resiliency and sustainability.

Brandt, L. et al. (2016). A framework for adapting urban forests to climate change. *Environmental Science & Policy*, Vol. 66 pp. 393–402.

Childers, D. et al (2015). An Ecology for Cities: A Transformational Nexus of Design and Ecology to Advance Climate Change Resilience and Urban Sustainability. *Journal of Sustainability*, Vol. 7 pp. 3774-3791. Accessed doi:10.3390/su7043774

Reynolds H. et al. (2018). [Maintaining Indiana's Urban Greenspaces: A Report from the Indiana Climate Change Impacts Assessment](#). Purdue Climate Change Research Center. Purdue University. West Lafayette, Indiana. 9 pages.

Week #14 April 16 – Urban Sprawl

Statement: The centuries-old, very visible pattern of Urban Sprawl is being studied by scientists seeking insights into its unforeseen effects. Now, modern planning and policies are being informed by science to help minimize the environmental impacts of human activity.

See Wikipedia – Urban Sprawl https://en.wikipedia.org/wiki/Urban_sprawl

Manfred Kühn. 2003. Greenbelt and Green Heart: separating and integrating landscapes in European city regions. *Landscape and Urban Planning*. 64:19–27.

Concepción, Elena D., Martin K. Obrist, Marco Moretti, Florian Altermatt, Bruno Baur, Michael P. Nobis, 2016. Impacts of urban sprawl on species richness of plants, butterflies, gastropods and birds: not only built-up area matters. *Urban Ecosystems* 19:225–242.

Artmann, M., Kohler, M., Meinel, G., Gan, J., & Ioja, I. 2019. How smart growth and green infrastructure can mutually support each other – A conceptual framework for compact and green cities. *Ecological Indicators*. 96, pp 10-22.

Week #15 April 23 - Research Paper Presentations, discuss final Reflections to Burney after Semester.