

**E555 Urban Ecology – A Readings Course, Topics/Readings, F 2011, B.C. Fischer
Indiana University-Bloomington, School of Public and Environmental Affairs**

Weeks 1 & 2 - The Urban Ecosystem: An introduction

Cities as Human and Ecological Systems
Larger Context of Social Ecological Systems
What is Urban?

Pickett et. al. 2008. Beyond Urban Legends: An Emerging Framework of Urban Ecology, as Illustrated by the Baltimore Ecosystem Study. *Bioscience* 58(2): 139-150.

Pickett, S.T.A. and J.M. Grove. 2009. Urban Ecosystems: What would Tansley Do? *Urban Ecosystems* 12: 1-8.

Alberti et al. 2003. Integrating Humans into Ecology: Opportunities and Challenges for Studying Urban Ecosystems. *Bioscience* 53(12): 1169-1179.

Grove, J.M. 2009. Cities: Managing Densely Settled Social-Ecological Systems, p281-294. In Chapin, F.S, et.al. *Principles of Ecosystem Stewardship: Resilience-Based Natural Resource Management in a Changing World*. Springer. 402p. ISBN 978-0-387-73032-5

Week 3 - Humans as a Component of Ecosystems

Public Health and Education
Social Justice
Influence of Culture on the Landscape

Frank, L.D. and P.O. Engelke. 2001. The built environment and human activity patterns: Exploring the impacts of urban form on public health. *Journal of Planning Literature* 16: 202-218. DOI 10.1177/08854120122093339.

Nijman, J. 2010. A study of space in Mumbai's slums. *Tijdschrift voor Economische en Sociale Geografie* 101(1): 4-17.

Pedlowski, M.A., V.A. Carneiro da Silva, J.J.C. Adell, and N.C. Heynen. 2002. Urban forest and environmental inequality in compos dos Goytacazes, Rio de Janeiro, Brazil. *Urban Ecosystems* 6: 9-20.

Redman, C.L., J.M. Grove, and L.H. Kuby. 2004. Integrating social science into the Long-Term Ecological research (LTER) Network: Social Dimensions of Ecological Change and Ecological Dimensions of Social Change. *Ecosystems* 7: 161-171.

Week 4 - Urban Patterns and Ecosystem Functions

Biodiversity, Nutrient Cycling
Pests and Natural Predators

Dearborn, D.C. and S. Kark. 2009. Motivations for conserving urban biodiversity. *Conservation Biology* 24(2): 432-440.

Ditchkoff, S.S., S.T. Saalfeld, and C.J. Gibson. 2006. Animal behavior in urban ecosystems: Modifications due to human-induced stress. *Urban Ecosystems*: 9: 5-12. DOI 10.1007/s11252-006-3262-3.

Kowarik, I. 2011. Novel urban ecosystems, biodiversity, and conservation. *Environmental Pollution* 159: 1974-1983.

Shochat, E., P.S> Warren, S.H. Faeth, N.E. McIntyre, and D. Hope. 2006. From patterns to emerging processes in mechanistic urban ecology. *TRENDS in Ecology and Evolution* 21(4): 186-191.

Week 5 - Landscape Signatures

Landscape Patterns

Case Studies

Fraser, E.D.G. and W.A. Kenney. 2000. Cultural background and landscape history as factors affecting perceptions of the urban forest. *Journal of Arboriculture* 26(2): 106-113.

Pickett, S.T.A. and M.L. Cadenasso. 1995. Landscape ecology: Spatial heterogeneity in ecological systems. *Science* 269: 331-334.

Wheeler, S.M. 2008. The evolution of built landscapes in metropolitan regions. *Journal of Planning Education and Research* 27: 400-416. DOI 10.1177/0739456X08315889.

Xie, Y., M. Yu, Y. Bai, and X. Xing. 2006. Ecological analysis of an emerging urban landscape pattern—desakota: A case study in Suzhou, China. *Landscape Ecology* 21: 1297-1309.

Week 6 - Hydrological Processes

Riparian Corridors / Urban Waterways

Wetland & Riparian Corridor Restoration

Chadwick, M.A., D.R. Dobberfuhl, A.C. Benke, A.D. Huryn, K. Suberkropp, and J.E. Thiele. 2006. Urbanization affects stream ecosystem function by altering hydrology, chemistry, and biotic richness. *Ecological Applications* 16(5): 1796-1807.

Grayson, J.E., M.G. Chapman, and A.J. Underwood. 1999. The assessment of restoration of habitat in urban wetlands. *Landscape and Urban Planning* 43: 227-236.

Hwang, L. and B.A. LePage. 2011. "Floating islands – An alternative to urban wetlands." In: LePage, B.A. (ed.), *Wetlands*, Springer Science+Business Media B.V., New York. pp. 237-250.

Week 7 - Biogeochemical Processes

Brown Fields / Used Spaces

Bioremediation

Hofer, C., F.J. Gallagher, and C. Holzapfel. 2010. Metal accumulation and performance of nestlings of passerine bird species at an urban brownfield site. *Environmental Pollution* 158: 1207-1213.

Litt, J.S., N.L. Tran, and T.A. Burke. 2002. Examining urban brownfield through the public health "macroscope." *Environmental Health Perspectives* 110, Supp. 2: 183-193.

Park, S.-J., Z. Cheng, H. Yang, E.E. Morris, M. Sutherland, B.B. McSpadden Gardener, and P.S. Grewal. 2010. Differences in soil chemical properties with distance to roads and age of development in urban areas. *Urban Ecosystems* 13: 483-497. DOI 10.1007/s11252-010-0130-y.

Pavao-Zuckerman, M.A. 2008. The nature of urban soils and their role in ecological restoration in cities. *Restoration Ecology* 16(4): 642-649.

Week 8 - Atmospheric Processes

Urban Heat Island Effect

Urban Air Quality

Transportation Design

Firnborn, J. and M. Muller. 2011. What will be the environmental effects of new free-floating car-sharing systems? The case of car2go in Ulm. *Ecological Economics* 70: 1519-1528.

Grimmond, S. 2007. Urbanization and global environmental change: local effects of urban warming. *Cities and Global Environmental Change* 83-88.

Guhathakurta, S. and P. Gober. 2007. The impact of the Phoenix urban heat island on residential water use. *Journal of the American Planning Association* 73(3): 317-329.

Song, J., A. Webb, B. Parmenter, D.T. Allen, and E. McDonald-Buller. 2008. The impacts of urbanization on emissions and air quality: Comparison of four visions of Austin, Texas. *Environmental Science and Technology* 42: 7294-7300.

Week 9 – Dr. Travis Ryan, Urban Ecologist, Urban Ecology Center, Butler University

4pm – Speaker at ES Seminar at SPEA

5:30pm – Roundtable discussion with Travis, pizza's and soft drinks at SPEA afterwards

Ryan, T, et.al. 2008. Movement and habitat of two aquatic turtles (*Gratemys geographica* and *Trachemys scripta*) in an urban landscape. *Urban Ecosystems*. DOI 10.1007/s1 1252-008-0048-8

Week 10 - Population and Community Dynamics

Urban Ecosystems Processes and Dynamics

Urban Patch Dynamics

Corridors

Bastin, L. and C.D. Thomas. 1999. The distribution of plant species in urban vegetation fragments. *Landscape Ecology* 14: 493-507.

McDonnell, M.J. and S.T.A. Pickett. 1990. Ecosystem structure and function along urban-rural gradients: An unexploited opportunity for ecology. *Ecology* 71(4): 1232-1237.

Sparks, D.W., C.M. Ritzi, J.E. Duchamp, and J.O. Wotaker, Jr. 2005. Foraging habitat of the Indiana bat (*Myotis sodalis*) at an urban-rural interface. *Journal of Mammalogy* 86(4): 713-718.

Week 11 - Human Health and Urban Ecosystems

Emerging Research Questions

Policy/Management Implications

Farber Taylor, A., F.E. Kuo, and W.C. Sullivan. 2002. Views of nature and self-discipline: Evidence from inner city children. *Journal of Environmental Psychology* 22: 49-63.

Fuller, R.A., K.N. Irvine, P. Devine-Wright, P.H. Warren, and K.J. Gaston. 2007. Psychological benefits of greenspace increase with biodiversity. *Biology Letters* 3: 390-394. DOI 10.1098/rsbl.2007.0149.

Northridge, M.E., E.D. Sclar, and P. Biswas. 2003. Sorting out the connections between the built environment and health: A conceptual framework for navigating pathways and planning healthy cities. *Journal of Urban Health: Bulletin of the New York Academy of Medicine* 80(4): 556-568.

Tzoulas, K., K. Korpela, S. Venn, V. Yli-Pelkonen, A. Kazmierczak, J. Niemela, and P. James. 2007. Promoting ecosystem and human health in urban areas using green infrastructure: A literature review. *Landscape and Urban Planning* 81: 167-178.

Week 12 - Urban Ecology: A Synthesis

Scenario Planning and Adaptive Management

Emerging trends and technologies

Ecological Design

Building Integrated Models

Policy Management Implications

Brueste, J. and S. Qureshi. 2011. Urban sustainability, urban ecology and the Society for Urban Ecology (SURE). *Urban Ecosystems* 14: 313-317. DOI 10.1007/s11252-011-0186-3.

Pickett, S.T.A., G.L. Buckley, S.S. Kaushal, and Y. Williams. 2011. Social-ecological science in the humane metropolis. *Urban Ecosystems* 14: 319-339. DOI 10.007/s11252-011-0166-7.

Swenson, J.J. and J. Franklin. 2000. The effects of future urban development on habitat fragmentation in the Santa Monica Mountains. *Landscape Ecology* 15: 713-730.