

The Urban Ecology Initiative

The world's urban population is expected to equal the current world population (~6 billion) by the year 2025. In our increasingly urbanized world, a clearer understanding of *urban ecology*—the process of dynamic interaction among human and ecological systems, is crucial to guide urban change towards more sustainable environments. A multidisciplinary initiative led by University of Washington researchers from the fields of forest resources, landscape architecture, urban design and planning, civil engineering, public affairs, and geography is providing graduate students with an interdisciplinary approach to problem solving as well as providing the community at large with data on urban landscapes and their relationship to ecological processes.

What is Urban Ecology?

Urban ecology is a multidisciplinary approach to the study of dynamic interactions among human and ecological systems. Its goal is to understand both:

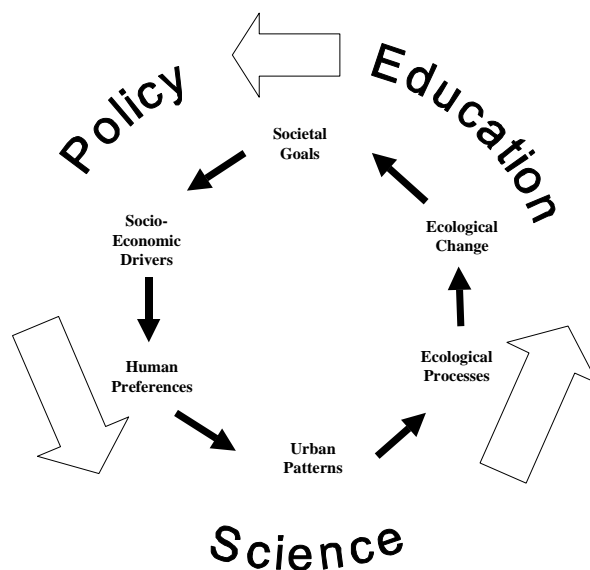
- the processes of urbanization and
 - urbanization's impacts on the earth's ecology.
- Urban ecologists seek to understand how socio-economic factors (demographics, organizations, political institutions, and technology) and human preferences drive urban patterns and how these patterns affect ecological processes and cause ecological change. This knowledge is crucial to inform societal goals and guide urban change towards more sustainable urban environments.

Urbanization is one of the most pervasive and large-scale forces affecting the earth's ecosystems, with effects that go well beyond local transformations of the landscape. Urbanization can:

- fragment and reduce habitats
- introduce exotic organisms
- significantly modify energy flow and water and nutrient cycles
- concentrate people and their activities
- appropriate vast amounts of natural resources
- generate and export large quantities of emissions and waste

A Research Approach

A new research approach is necessary to understand the complex interactions among human and biophysical processes through which urban areas evolve. Ecological and social knowledge gained from such



research is relevant to planners and urban managers who make strategic choices about which issues deserve priority and about how to allocate scarce resources. It is also critical for educating the public. New research must address policy-relevant questions centering on issues such as:

- establishing a new relationship between science and policy
- understanding urban patterns
- developing new monitoring and predictive capacity
- developing a causal understanding of how urbanization affects ecological processes and how ecological change impacts human decisions
- making new knowledge available to and usable by decision-makers

A major problem in today's policy processes is the

lack of genuinely effective two-way communication and trust between the scientific and political communities—communication and trust that is critical to address complex urban ecological problems. Scientists need to participate actively in the political process, informing policy decisions and translating scientific results into usable knowledge. In turn, policy-makers must help formulate relevant scientific questions and participate actively in defining priorities.

Training a New Generation of Urban Ecologists

Urban ecology seeks to develop a new educational paradigm to generate and test hypotheses to help answer complex questions. A new approach to graduate education, focusing on skills and qualities rarely provided by traditional graduate programs, is needed. These skills and qualities include:

- interdisciplinarity
- breadth
- synthesis
- flexibility
- sophisticated and unambiguous communication

Disciplinary fields contributing to the study of urban ecology are more often hindered than helped by their common vocabulary (but disparate meanings). Interdisciplinarity fails when communication issues are not studied, understood, and resolved. Urban ecologists need to receive formal training in how to not only recognize and address, but to also transcend communications problems.

The Urban Ecology Initiative

The University of Washington's Urban Ecology Initiative is developing an interdisciplinary approach to teaching designed to expose students to the very different ways in which social scientists, ecologists, policy makers, and natural resource managers define problems, gather information, and analyze issues.

Beginning with an interdisciplinary class in urban ecology, students progress into a year-long capstone experience that mirrors successful approaches to the teaching of team problem solving. Interdisciplinary teams of students function as consultants to analyze urban environmental issues for clients (typically local and regional governmental, policy, and regulatory bodies). A laboratory experience improves communication and partnering among urban ecology students with diverse backgrounds by housing up to 15 students in a common space designed to facilitate interdisciplinary work in a relaxed setting.

Graduates of the urban ecology program will solve problems by focusing on a teamwork approach, shifting away from thinking they can solve a problem alone to thinking about how they can assemble, lead, and work in an interdisciplinary team.

The Urban Ecology Initiative will also produce substantial, empirical databases that will be used by students, faculty, and the community at large. Two specific projects, to be available on the program's Web site (<http://www.urbaneco.washington.edu>) are underway: a quantification of urban landscapes and their relationship to ecological processes, and a retrospective mapping of landcover change in the Puget Sound region.

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