

Urban areas offer hidden biodiversity

March 23 2009, by Alvin Powell



Landscape architecture expert Kristina Hill (left) offers the surprising news that there's more biodiversity in urban than agricultural areas. Photograph by Rose Lincoln/Harvard News Office

(PhysOrg.com) -- Urban areas around the world are places of hidden biodiversity that need to be protected and encouraged through smart urban design, said an authority in green city design.

Kristina Hill, associate professor and director of the Program in Landscape Architecture at the University of Virginia, said considering biodiversity in urban design is particularly important as human density in coastal areas continues to increase. These areas are not just attractive for their beauty, they're also critical transition zones from marine to terrestrial and freshwater habitats, and are the sites of nurseries for a host of marine species in the form of salt marshes and eelgrass beds.

New urban plans have to take into account the additional danger of global-warming-induced <u>sea level rise</u>, which threatens to swamp these



sensitive areas around the world.

Hill spoke to a standing-room-only crowd at the Geological Lecture Hall on March 18. Her talk, "Designing the Urban Ark: Biodiversity and the Future of Cities," was the inaugural lecture in a new series sponsored by the Harvard Museum of Natural History (HMNH).

The annual series, called "New Directions in EcoPlanning," presents an opportunity for an exchange of ideas among scientists, urban planners, architects, and experts in other fields, according to HMNH Executive Director Elisabeth Werby. Werby, who introduced the talk, called Hill "one of the foremost practitioners of ecologically sustainable planning." Hill earned master's and doctoral degrees in landscape architecture at Harvard before becoming a faculty member at the University of Washington and the University of Virginia.

In her presentation, Hill discussed studies that showed that urban biodiversity — the number of different species living in cities — was actually higher than that of agricultural regions. Not only was overall biodiversity higher, the biodiversity of native species was also higher, perhaps due to agricultural practices that favor turning large tracts of land over to monoculture of specific food plants and animal species.

One particular area of traditional urban design that Hill targeted for reform is the handling of storm water runoff. As an example, she showed a slide of pristine Northwestern coastal forest, which originally stood where major cities such as Seattle are now. Those forests not only held a great deal of timber, they also served as natural sponges, absorbing and holding water in the litter on forest floors, filtering sediments out and slowly releasing water to streams and rivers.

The city that replaced them, by contrast, is a place of asphalt and concrete, building roofs and downspouts, drainage pipes and culverts.



The entire point of the urban system of handling rainwater runoff is to pump it out of the city and into streams and rivers as quickly as possible. This causes not only enormous pulses of water resulting from periodic storms, it also stirs up and carries large amounts of sediment. The sediment both clouds the formerly clear water and settles over gravel beds that are critical habitat for spawning salmon.

Hill showed examples of how smart design can manage rainwater, using man-made depressions in roadside landscaping, diversions through small, thickly planted roadside patches, and partial barricades in drainage pipes to slow water down, clean it up, and allow sediments to settle before the water hits the streams.

"The whole strategy ... is to make cities less like an umbrella and more like a sponge," Hill said.

Innovative thinking about water management is critical in this warming world, Hill said, since projections of climate change suggest sea levels will be rising in the coming decades. She showed a variety of different ways to handle enhanced storm surges, suggesting that New York City copy a barricade used in Rotterdam (the Netherlands) to protect its lowest-lying waterfront.

She also suggested an idea to use floating man-made structures that would provide an artificial foundation for planting coastal aquatic vegetation. The structures could be raised or lowered to keep the plants at an appropriate depth, providing additional nursery space for marine creatures or replacing critical areas that are swamped as sea levels rise.

Provided by Harvard University (<u>news</u> : <u>web</u>)



Citation: Urban areas offer hidden biodiversity (2009, March 23) retrieved 27 April 2024 from <u>https://phys.org/news/2009-03-urban-areas-hidden-biodiversity.html</u>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.