



Ecosystem Services of Urban Trees

What are ecosystem services?

Ecosystem services are the benefits that people get from ecosystems. An ecosystem is a “community of people, plants, animals, and microorganisms interacting with one another and their environment (water, soils, nutrients).” In NYC, 5.2 million trees growing in parks, gardens, streets and other places are part of the urban ecosystem. City residents depend on many services from their urban ecosystem and these fall into two main categories: cultural services and regulating services.

Cultural Ecosystem Services are nonmaterial benefits for people. Researchers or policy makers sometimes overlook the importance of cultural services of trees. It is hard to put a monetary value on these services or to quantify them, but they are essential for human wellbeing. Some examples of cultural services are below.



Aesthetic

People naturally find areas with trees more attractive and peaceful than areas without trees. Trees beautify neighborhoods and add a sense of nature to dense city landscapes. Research shows that property values are higher in greener neighborhoods. Also, studies have shown that shoppers tend to spend more money in greener retail areas.

In which of these two neighborhoods would you prefer to live?



Community building

Research has shown that in neighborhoods with trees, people are more likely to go outside, talk to one another, and participate in shared activities. Trees have been linked to positive behavior in adults and youth. In greener communities residents more often get involved in environmental volunteering. Even vandalism and crime rates are lower in communities with more trees.



Educational

Trees create suitable places for learning, discovery, and play. Trees in city parks and neighborhoods provide habitat for wildlife and therefore serve as ideal spaces to watch birds, study biodiversity, and engage in other educational activities.



Recreational

Large stands of trees, such as in parks and urban forests, provide many opportunities for sports exercise, and recreation. Trees and associated green space support outdoor exercise and physical activity. Trees foster a sense of peace and calm, encourage quiet contemplation and creative pursuits such as painting, and provide a place to re-energize and recharge away from the daily rigors of urban life.

Regulating Ecosystem Services improve the physical environment in cities. Trees play a major role in achieving a healthy urban environment. Examples of regulating services are below.



Microclimate regulation

Urban trees that grow close to residential and commercial buildings significantly reduce the total energy for heating and cooling. Trees save city residents money by shading buildings during hot summers and protecting them from the cold wind in winter. The annual energy cost reduction in NYC is \$50 per tree. Planting trees in the right places can help slow down climate change by reducing use of fossil fuels for heating and cooling.



Reducing water runoff

Large areas of the city are covered with hard surfaces (such as asphalt and concrete) that do not absorb water. During storms, high volumes of rainwater run off into the sewer system, causing overflow of sewage into rivers and bays. Rain also washes pollutants (industrial and toxic wastes; construction sediment and oil) from roadways into rivers. Trees and other vegetation reduce water runoff by enhancing water absorption by soil, and transpiring water from their leaves.



Noise reduction

Noise from traffic and other sources may lead to stress and other health problems. Vegetation, including trees, helps to dampen noise.



Air filtering

Trees improve air quality by filtering some gaseous pollutants and small particles in the air people breathe. While trees will only remove a small percent of the total amount of pollutants, they can serve as a barrier, redirecting pollutants away from their canopies.

New York City Tree Facts ¹

- Number of trees in NYC: 5.2 million
- Number of tree species: 168
- Estimated annual pollution removal: 2,202 tons
- Annual stormwater capture: 890 million gallons, which would fill 1,340 Olympic-sized swimming pools
- Average annual energy cost reduction: \$50 per tree, or \$28 million/year
- Land covered in trees: 24%

¹ (www.MillionTreesNYC.org)

What can I do?

- Learn more about urban and community forestry through Cornell's Urban Horticulture Institute: <http://www.hort.cornell.edu/uhi>
- Support local tree planting efforts for the multiple benefits trees provide. To get started, visit the MillionTreesNYC website: <http://www.milliontreesnyc.org>
- Attend a MillionTreesNYC tree stewardship workshop and learn how to take care of NYC trees. Visit the MillionTreesNYC website or call 718-667-2165 for a schedule.
- Request a street tree from the NYC Department of Parks and Recreation: http://www.milliontreesnyc.org/html/involved/request_a_tree.shtml
- Take a Citizen Pruner Tree Care course. For more information contact Trees New York at 212-227-1887 or visit the website: <http://www.treesny.com>
- Learn more about Cornell University Cooperative Extension – NYC's (CUCE-NYC's) Urban Environment Program by visiting: <http://nyc.cce.cornell.edu> ; also become a fan of the *Urban Environment*, CUCE-NYC Facebook page!

Sources

A number of published research findings were used to prepare this factsheet. The Millennium Ecosystem Assessment framework and the MillionTreesNYC website were among the sources used. For the full list of references, please contact the Urban Environment program at CUCE-NYC. CUCE-NYC website: <http://nyc.cce.cornell.edu>

Developed by Cornell University Cooperative Extension-NYC, June 2009.

"Urban Silviculture," conducted by Cornell University Cooperative Extension-NYC and Cornell's Department of Horticulture, is supported by Congressman José E. Serrano. This material is based upon work supported by the Cooperative State Research, Education, and Extension Service, US Dept. of Agriculture, under Agreement Nos. 2006-06269 and NYC-145442. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the US Dept. of Agriculture.