

**Berkeley Heights
canopy study**

**Deepening the
Delaware**

**Planning for the
future**



Berkeley Heights studies the benefits of its trees

By **Kerry Miller**, ANJEC Assistant Director, and **Len Berkowitz**, Berkeley Heights Environmental Commission Chair

Although the many environmental and economic benefits of trees are well documented, most towns do not know the precise value of their community forest. The Berkeley Heights Environmental Commission obtained a \$10,000 Sustainable Jersey grant in 2010 to collect accurate data on its tree canopy and quantify the “green infrastructure” functions of the trees. The Commission used the grant to hire the Global Ecosystem Center (GEC) of Washington, DC, to carry out a canopy study and modeling that took five months to complete.

GEC created a land use and land cover dataset for Berkeley Heights by analyzing high-resolution aerial photos. It developed precise measurements of the percentages of land in each of six classes (open space/grass, trees, impervious surface, impervious undercover, water and bare surface) for 2008. It also analyzed lower resolution satellite data for Berkeley Heights and ten surrounding towns covering the years 1984, 1996, 2001, 2006 and 2010. The data enabled GEC to quantify the land cover trends and patterns of change over those years. A larger area than just Berkeley Heights was required for trend analysis because of the lower resolution for the historical data set.

GEC used CITYgreen software, created by the nonprofit American Forests, to analyze the land cover data and quantify the impact of Berkeley Heights’ trees on stormwater runoff, air pollution removal, and carbon storage/sequestration.



Project findings

Overall, Berkeley Heights had a robust tree canopy in 2008, estimated at about 57 percent of its land area. Impervious surfaces covered 26 percent of the town. This included impervious areas shaded by tree cover, categorized as “impervious understory.” As might be expected, canopy cover was high (78 percent) in park areas, relatively high (59 percent) in residential areas, and low (20 percent) in commercial, industrial and multi-family housing areas.

The CITYgreen analysis indicated that in 2008 Berkeley Heights’ tree canopy provided 14.3 million cubic feet of stormwater detention services, valued at \$28.6 million. This figure reflects the cost of structural stormwater facilities that would be needed if the town’s canopy cover were removed.

The study also showed that the trees remove 125 tons of air pollutants (carbon monoxide, ozone, nitrogen dioxide, particulate matter and sulfur dioxide) per year. The model assigned a value of approximately \$700,000 to this service, based on avoided externality costs to society, such as public health costs due to

respiratory illness. The cooling effect of trees actually prevents the formation of ground level ozone, which can exacerbate asthma and other serious breathing problems. Trees in Berkeley Heights help avoid the creation of about 73,000 pounds of ozone annually.

Leonard Berkowitz, chairman of the Environmental Commission, is convinced that the canopy study has provided a lot of useful information. It educated municipal officials and the public on the value of trees in the community, and put a dollar figure on that benefit. More specifically, it emphasized the tree canopy's contribution to controlling stormwater runoff, a function the community may not have associated with trees, but which is a concern for residents due to local flooding problems.

The importance of "small" decisions

Trend analysis for the eleven area towns showed tree canopy disappearance

amounting to over 1 percent of total area since 1984 and a similar increase in impervious surface. Modeling showed that a change of this magnitude increased stormwater runoff by about 5 percent. It is important for the public and officials to understand the dynamics of trees and stormwater because this amount of conversion likely results from a series of very small, seemingly innocuous decisions, the kind that planning boards and officials make every day. The Commission is currently exploring possible changes in the town's ordinances related to impervious coverage.

Berkeley Heights has distributed its canopy study report to the environmental commissions of the neighboring towns. The findings have already been publicized through a number of talks and articles, and the Environmental Commission plans to continue its community outreach. The full report is posted on the Commission's web site, www.bh-ec.org. 

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