

Researchers find green roof is a cost-effective way to keep water out of sewers

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Green roofs like the one atop a Con Edison building in Long Island City, Queens can be a cost-effective way to keep water from running into sewer systems and causing overflows, Columbia University researchers have found.

The Con Edison Green Roof, which is home to 21,000 plants on a quarter acre of The Learning Center, retains 30 percent of the rainwater that falls on it. The plants then release the water as vapor, the researchers said in the study (<http://www.coned.com/greenroofcolumbia>).

If New York City's 1 billion square feet of roofs were transformed into green roofs, it would be possible to keep more than 10 billion gallons of water a year out of the city sewer system, according to the study led by Stuart Gaffin, research scientist at Columbia's Center for Climate Systems Research.

New York City, like other older urban centers, has a combined sewer system that carries [storm water](#) and wastewater. The system often reaches capacity during rains and must discharge a mix of storm water and sewage into New York Harbor, the Hudson River, the East River and other waterways.

Con Edison built the green roof and formed its research partnership with Columbia in 2008. The partners saw the green roof and an adjoining white roof as an outdoor laboratory for environmental research.

Gaffin's team found last year that the green roof and white roof save energy and reduce urban [air temperatures](#). Under its "cool roofs" program, Con Edison has turned many roofs on company facilities white to save energy and protect the environment.

"The information we are collecting from Con Edison's roofs is invaluable in helping us determine the costs and benefits of green infrastructure projects," Gaffin said. "Without solid data from experiments like this, it is impossible for us to know which projects are the best options for protecting the environment."

"When we built our green roof we were confident that researchers from Columbia would gain important knowledge about protecting the environment," said Saddle Smith, vice president for Facilities for Con Edison. "Three years later, it's clear that our project has helped us understand how roofs can save energy, cool the atmosphere and prevent storm water runoff."

The researchers used instrumentation to measure sunlight, and other forms of energy entering and leaving the green roof. That data allowed them to calculate the amount of energy leaving the roof in the form of water vapor.

The study concluded that based on the cost of building and maintaining a [green roof](#) it costs as little as 2 cents a year to capture each gallon of water.

Provided by Columbia University

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