



Cleveland Botanical Garden Transforms Vacant Property Using Green Methods to Reduce Runoff

Stormwater runoff, caused by rain and other wet weather events, is the flow of water that occurs when soil is over saturated and excess water flows over roads, parking lots, and other areas. This flow of water creates runoff pollution from motor oil, pesticides, and other contaminants. This polluted water can overload sewer pipes, causing flooding, and other problems. Communities can use low-cost, natural methods, known as green infrastructure (GI), to reduce flooding and pollution from runoff water. Soil treatments and low-cost plant technology developed by experts are used to reduce toxic levels in the soil. Cleveland has been a leader in using creative methods to fix problems caused by stormwater runoff.

ABOVE: Vacant property in Cleveland treated with soil mixture and low-cost plants to reduce stormwater runoff

In July 2012, the *Cleveland Botanical Garden (the Garden)* was awarded a \$59,680 grant from the U.S. Environmental Protection Agency (EPA) through the *Urban Waters Small Grant program*. This funding is supporting a project aimed at reducing contaminated stormwater runoff and water pollution in Cleveland, Ohio using a low-cost soil mixture and plants that improve soil on vacant neighborhood lots. Funding from the EPA Urban Waters program, and the involvement of EPA Region 5, Ohio Environmental Protection Agency (OEPA) and the Cleveland-Cuyahoga County Port Authority have helped to support and focus attention to the project.

The Garden is a nonprofit organization whose mission is “to spark a passion for plants and cultivate an understanding of their vital relationship to people and the environment.” Their commitment extends beyond the gardens and into the community through various projects and programs that work to engage people in learning about the importance of a healthy environment.

Project Highlights

- As seen in other cities and communities across the country, storms and rain events have caused Cleveland, Ohio’s waterways to be polluted with dirty rainwater (also known as stormwater runoff). This stormwater runs into combined sewers that handle both rainwater and sewage, resulting in combined sewer overflows (CSO).
- 9 vacant lots in Cleveland will be converted using natural plants and other soil treatments to reduce stormwater runoff and help clean the city’s waterways.
- This model is a low-cost, low-maintenance approach to addressing toxic soils and reducing stormwater runoff that can be used in other communities across the United States.
- Vacant land reuse and improved waterways can result in improved community health, increased property values, and reduced crime.

A New Hope for Improved Waterways and Vacant Land in Cleveland, Ohio

Cleveland, Ohio has experienced ongoing challenges with regard to water pollution. Urban stormwater runoff is a major problem affecting the city's waterways and soils, which not only threatens the environment and fish and wildlife, but it can also cause health concerns. Additionally, unmanaged vacant land poses a problem for urban communities because of its association with crime and poverty.



ABOVE: A vacant parcel in Slavic Village, Cleveland, OH that will be a site for rain garden installations to reduce stormwater runoff

The EPA Urban Waters grant builds on earlier work to identify soil treatments to reduce toxic lead in soils and improve plant growth on vacant properties. The project results are expected to include: reduced stormwater runoff, improved neighborhood vacant lands, reduced toxic soil lead amounts, and reduced vacant land maintenance costs.

Partnerships: Overcoming Challenges Together

A combination of supportive partners, resources and expertise are needed to achieve the goals of reduced runoff and soil contamination. During the project, challenges have included the need to attract support for the project, develop soil treatments to meet environmental standards in residential areas, and maintain partner commitment.

In addition to assistance from EPA, OEPA, and the Cleveland-Cuyahoga County Port Authority, experts from Ohio State University (OSU), the U.S. Geological Survey (USGS), and *Kurtz Brothers, Inc.* have conducted and supplied useful research and have developed soil treatment recipes to improve soils, reduce stormwater runoff, and meet environmental standards.

The *Slavic Village Development Corporation* has provided valuable information on the community and is helping to identify key vacant lots for the project. The *City of Cleveland Land Bank* helps to acquire abandoned and foreclosed properties from government and other bank-owned properties.

In addition, the *Northeast Ohio Community and Neighborhood Data for Organizing* collects social and economic information that will be used to measure impacts of the project on social and economic conditions in the community.

To overcome project challenges, the Garden routinely meets with partner experts. For example, EPA, the Slavic Village Development Corporation, USGS, and OSU participate in bi-weekly calls to ensure that soil treatments and the selection of vacant lands will meet environmental standards. This partnership model makes efficient use of the partners' time and resources.

Measuring Progress

The Cleveland Botanical Garden and its partners have identified several ways to measure and monitor the impacts of the project. Noteworthy measurements include:

- The creation of soil treatments that meet EPA standards for use in residential areas;
- Reduced stormwater runoff from treated vacant lots;
- Soil nutrient improvements in treated vacant lots;
- Community surveys about the usefulness of the project; and
- Other social and economic impacts (e.g., crime reduction, health improvements, and property value increases).

Expected Project Outcomes

In 2013, the Garden will finish identifying the vacant lots to be treated, apply the soil treatments and low-cost plants to the vacant lots, and start recording soil improvements and the reduced quantity of stormwater. In 2014, the Garden plans to construct "curb cuts" that direct more stormwater runoff towards the treated vacant lots and away from storm drains.

The Garden effort will likely result in a model for other cities that also want to improve their communities, reduce stormwater runoff, and clean their local waterways. This effort is also helping to improve the science of soil treatments to promote easy reuse in other cities across the United States.