

NYC°CoolRoofs

ANNUAL REVIEW 2012



NYC °CoolRoofs

NYC °CoolRoofs, is a collaboration between NYC Service and the NYC Department of Buildings. It supports and encourages building owners to cool their rooftops by applying a reflective white coating that reduces energy consumption, cooling costs and carbon emissions. Utilizing the power of volunteers, NYC °CoolRoofs aims to coat 1,000,000 square feet of rooftop each season.

This program supports Mayor Michael R. Bloomberg's goal to reduce New York City's greenhouse gas emissions 30 percent by 2030.



NYC °CoolRoofs by the Numbers

2010

1,596 volunteers
135 buildings + 1,168,369 square feet

2011

1,239 volunteers
153 buildings + 1,307,572 square feet

2012

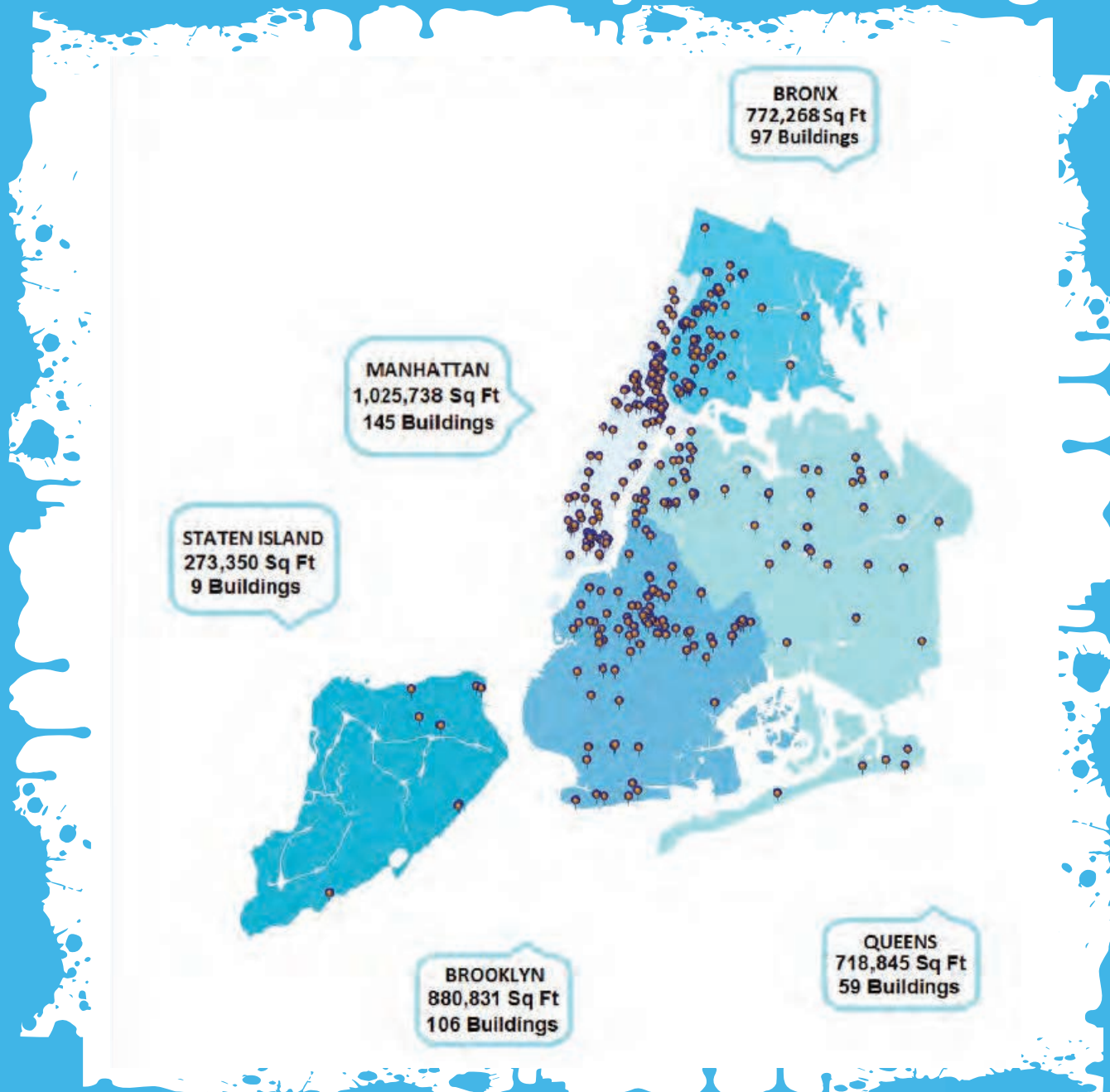
1,417 volunteers
128 buildings + 1,195,091 square feet

Program Total

4,252 volunteers
416 buildings + 3,671,032 square feet

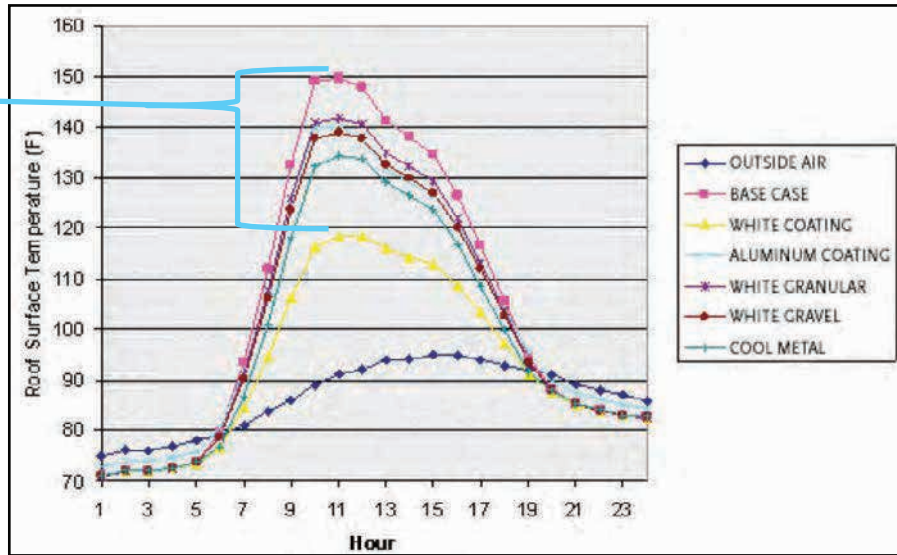


NYC °CoolRoofs by the Boroughs



The Science of Cool Roofs

At peak temperatures, a white roof is 20°F cooler than a roof with aluminum coating and 30°F cooler than a dark roof.



DDC Cool & Green Roofing Manual, Roof Surface Temperature in DDC Model

Exterior Surface Temperatures, Min ASHRAE 90.1 Insulation Peak Cooling Day Roof (Central Park TMY₂, July 1) DDC Roofing Systems Analysis

- ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) Standard 90.1 provides minimum requirements for the energy-efficient design of buildings except low-rise residential buildings.
- TMY₂ is a Typical Meteorological Year

1. White rooftops can reduce the temperature of a roof by 30° F.¹
2. There are cost savings from reduced maintenance: Roofs last longer due to less heat damage, and air conditioner units operate more efficiently and last longer.

¹ DDC Cool & Green Roof Manual

² Operations estimate based on data from Long Term Planning and Sustainability

SPOTLIGHT: Affordable Housing

NYC °CoolRoofs focuses on coating a range of non-profit, low-income housing, and government buildings, among others. During the 2012 season, NYC °CoolRoofs concentrated efforts on affordable housing, which include low- and mixed-income dwellings, homeless shelters, and housing for seniors and veterans. These buildings accounted for 71% of the buildings coated.

“Harlem Congregations for Community Improvement, Inc. (HCCI) through the assistance of NYC Service, was able to coat over 106,000 square feet of roof space in Harlem. This is a significant accomplishment since this neighborhood is one of New York City’s neighborhoods negatively impacted by a high concentration of environmental and health concerns. The NYC °CoolRoofs program allows the HCCI buildings and residents to participate in an environmentally friendly change in our neighborhood. We applaud The Mayor and look forward to making other significant positive changes in Harlem.”

Malcolm Punter
Director of Real Estate Development
Harlem Congregations for Community Improvement

Volunteers

NYC °CoolRoofs relies upon volunteers. This season, 1,417 volunteers coated rooftops throughout the five boroughs, helping the program coat 1,195,091 square feet this season. This would not have been possible without these volunteers.

“Developing volunteer activities that fight climate change at the local level and help create a greener New York City is a top priority for NYC Service.”

Diahann Billings-Burford
NYC Chief Service Officer

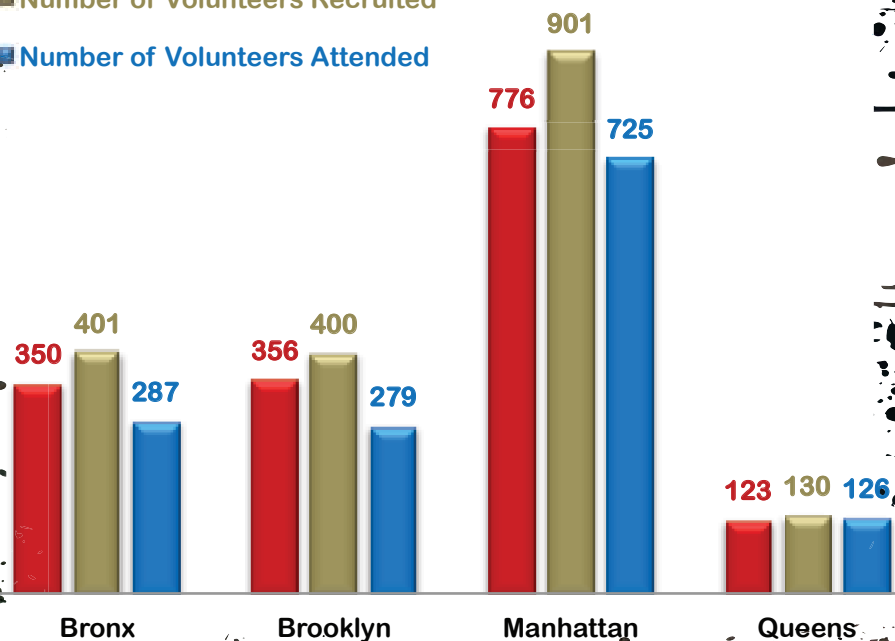
Individuals and organized groups volunteered to coat NYC rooftops white. One of the program’s most committed partners since the program’s inception in 2010 is Deutsche Bank.

“NYC °CoolRoofs has been a terrific complement to its commitment to community development, sustainability and employee engagement. It has been especially meaningful to ‘connect the dots’ in neighborhoods such as Harlem and central Brooklyn where the Bank has been involved for many years. Many employee volunteers still talk about their coating days weeks and even months later.”

Janet Wong
Vice President
Deutsche Bank Americas Foundation

Volunteers

- Number of Volunteers Needed*
- Number of Volunteers Recruited
- Number of Volunteers Attended



NYC Service

Michael R. Bloomberg
Mayor

Department
of Buildings

Partners

Community partners are crucial to the many facets of NYC °CoolRoofs. City agencies, corporations, non-profit organizations and research institutions generously donated resources and provided volunteers in 2012 to support the continued progress of this initiative.

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Rubicon Group

Skanska

St. John's University

Sustainable South Bronx

The After-School Corporation

Turner & Townsend

White Roof Project

Yale Alumni

Young Professionals in Energy

YouthBuild USA

Cool It Yourself

We encourage home owners and all New Yorkers to cool their own rooftops. For more information, visit nyc.gov/coolroofs to download our “Cool It Yourself” kit – and be sure to report your data via our online tracker. Some of the benefits of coating your roof include:

- **Reduce roof temperatures.** During a typical summer day, flat, black asphalt rooftops can reach temperatures up to 190°F – which is 90° hotter than the surrounding air temperature!
- **Reduce internal building temperatures.** Cool rooftops can reduce internal building temperatures by up to 30%, making the building cooler and more comfortable during the hot summer months.
- **Reduce the Urban Heat Island Effect.** New York City can be up to five degrees hotter than surrounding areas due to greater amounts of dark surfaces, such as roofs and roads, and less shading from vegetation.
- **Reduce carbon emissions.** Every 1,000 square feet of roof that is coated can reduce the city's carbon footprint by 1 ton of CO₂ and help fight climate change.
- **Improve air quality.** Cool roofs lower air pollution and greenhouse gas emissions by reducing power demand.
- **Extend the lifespan of rooftops and HVAC equipment.** A Cool Roof coating better regulates a roof's temperature as compared to typical rooftop surfaces. By decreasing the roof temperature and cooling loads, the life of the rooftop and cooling equipment can be extended.

ENERGY STAR qualified roof products can help reduce the amount of air conditioning needed in buildings, and can reduce peak cooling demand by 10-15 percent. Although there are inherent benefits in the use of reflective roofing, before selecting a roofing product based on expected energy savings consumers should explore the expected calculated results that can be found on the Department of Energy's "Roof Savings Calculator" website at www.roofcalc.com.

Building Legislation

The 2008 NYC Building Code requires that 75% of the roof area or setback surface on buildings permitted on or after July 1, 2009 be coated white or rated as highly reflective by ENERGY STAR®. Alterations involving the recovering or replacing of an existing roof covering shall comply with Building Code §1504.8, unless the area to be recovered or replaced is less than 50 percent of the roof area and less than 500 square feet.

Local Law 21 of 2011 amended this to align with LEED requirements. Effective January 1, 2012, existing buildings making alterations involving the recovering or replacing an existing roof must use more reflective and emissive materials. Visit nyc.gov/coolroofs for more information.



Research Opportunities

The Princeton Plasma Physics Laboratory (PPPL), Princeton University, and NYC °CoolRoofs are partnering in an initiative to capture the science of the benefits of white roofs including, but not limited to, urban cooling, carbon reduction, and health. They also intend to analyze the effectiveness of cool roof coating projects by determining the percentage of roofs in the City that are black versus white and with asphalt, concrete and vegetation. This mix of materials determines to a large extent building energy efficiency and the microclimatic conditions in urban areas.

Princeton University has developed a model that uses precise information from the PPPL sensors and weather stations to report on thermal conditions in multiple PPPL buildings and on the energy consumption from heating and air conditioning in automatic building systems. This collaboration will extend the findings and conclusions to NYC.



Research Opportunities – Health Impacts

Among extreme weather events, heat waves are the leading cause of death, on average nationally and in New York City. The urban heat island (UHI) effect increases ambient temperatures, heat stress exposure during heat waves and energy use for cooling. Multiple factors contribute to the UHI and are targets for potential UHI mitigation. As part of a comprehensive sustainability plan, New York City is engaged in multiple initiatives, including NYC °CoolRoofs and the Million Trees program, that will provide substantial UHI mitigation benefits over time, but these have not been fully quantified at the City or neighborhood level.

The NYC °CoolRoofs program, the Mayor’s Office of Long-term Planning and Sustainability (OLTPS) and the NYC Department of Health and Mental Hygiene are planning collaborative projects with academic researchers to improve understanding of the UHI and UHI mitigation measures on public health and to estimate future public health benefits of completed and planned UHI mitigation measures.



NYC Service

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