RUTGERS

New Jersey Agricultural
Experiment Station

May 2018

WATER PAGES eNEWSLETTER

Water Resources Program Partnership with PVSC Earns Utility "Forward Thinking" Award

For New Jersey municipalities to alleviate localized flooding, protect and improve water quality, and prevent processes that cause untreated wastewater from entering local waterways, targeted efforts using green infrastructure are needed for the management of stormwater runoff and nonpoint source pollution.

An example of such an initiative, for the past five years the Passaic Valley Sewerage Commission (PVSC) has partnered with the Rutgers Cooperative Extension Water Resources Program to implement an outreach and technical assistance program providing guidance and direction to the 48 municipalities in the PVSC service area regarding the benefits and opportunities of implementing green infrastructure practices. PVSC is committed to helping struggling communities better manage their existing water infrastructure. Through the PVSC partnership with RCE Water Resources Program, the program has:

Rain garden planting at Horace Mann School in Bayonne

- Provided outreach and education programs about green infrastructure strategies to municipalities working to make practical, science-based, and cost-effective decisions about water, wastewater, and stormwater infrastructure
- Developed and installed six demonstration green infrastructure projects to reduce stormwater runoff volumes
- Completed assessments and prepared green infrastructure feasibility studies for 40 communities in the PVSC service area

The "Clean Waterways, Healthy Neighborhoods" endeavor earned Passaic Valley Sewerage Commission (PVSC) a 2018 "Forward Thinking" Wave Award from the Association of Environmental Authorities (AEA) at its 2018 Recognition Luncheon, March 13-14 in Atlantic City.

The Association of Environmental Authorities (AEA) is a non-profit professional organization for the managers of the water, wastewater, solid waste and improvement authorities statewide. AEA's Forward Thinking Award recognizes regular or municipal member innovation. It is presented to AEA members that adopt successful new approaches or techniques in use of

technology, facility design, or management.

A cistern to store rain water was installed at Paterson School #5 for its community garden

Working in conjunction with the Water Resources Program on community outreach, this project has helped inform the public on how green infrastructure can be utilized for stormwater management. It has achieved this through workshops, the development of nearly 40 municipal green-infrastructure feasibility plans, and seven demonstration projects, with three more planned for 2018. The goal is to create and utilize a branding that would help encourage the public and the municipalities to embrace the area waterways as a resource that can improve the health of their communities, and in turn, to win their support for investing in clean water infrastructure through improvements to the wastewater treatment plant, CSO and stormwater controls.

In addition, the Clean Waterways, Healthy Neighborhoods project helps showcase PVSC as a steward of the Passaic River, committed to investing in and improving the Passaic River as a resource to the region. This extended effort to shape public perception and understanding will benefit the community for years to come.

The Water Resources Program, directed by the extension specialist in water resources, Christopher Obropta, aims to identify and address community water resources issues, using sustainable and practical science-based solutions. One of the program's areas of focus is stormwater management and green infrastructure, which is realized through the partnership with PVSC, led by senior research project manager, Jeremiah Bergstrom. Green infrastructure is an approach to wet weather management that is cost-effective, sustainable, and environmentally friendly. Green infrastructure management approaches and technologies capture and reuse stormwater to maintain or restore natural hydrology.

Rutgers participating in PVSC Municipal Day at PVSC in Newark

To learn more about this collaboration, visit **http://water.rutgers.edu/PVSC/PVSC.html**.

The Rutgers Cooperative Extension Water Resources Program's Rain Garden Rebate Program

The RCE Water Resources Program currently offers a rain garden rebate program that was piloted in the Raritan River Basin. The program offers a one-hour educational

presentation on rain gardens, and those that attend this presentation are invited to participate in a technical session. In the technical session, the homeowner works with an engineer and a landscape architect to design a rain garden for their property. At the end of the session, the homeowner leaves with a design plan. After the homeowner builds the rain garden, they contact the RCE Water Resources Program and schedule a time for an inspection. The RCE Water Resources Program inspects the rain garden and then provides a $3 per square foot rebate for the rain garden built up to a maximum rebate of $450 (150 square feet).

The program was greatly successful when piloted in the Raritan River Basin. A total of 13 educational sessions were held over four years. Attendance ranged from 3 to 22 people per session, with a total attendance of 206. To further recruit participants for the rebate program, our funding partner, the New Jersey Water Supply Authority (NJWSA), conducted one-on-one educational sessions for individuals interested in potentially participating in the rain garden rebate program but were unable to attend the formal session. Of the 206 people educated about rain gardens and the rebate program, 107 attended one of the 17 technical support sessions. Of the 107 attending the technical support sessions, 91 were eligible to receive a rebate if they installed a rain garden.

By October 2017, a total of 46 rain gardens were installed on 41 properties in the Raritan River Basin. The total amount of rebate money distributed was $15,615, which was for 38 applications that included 43 rain gardens. Three demonstration sites were included in the rain garden rebate program for the Raritan River Basin as well. The size of the rain gardens range from 48 square feet to 900 square feet, with a combined total area of 9,535 square feet. Together these 46 rain gardens capture, treat, and infiltrate 928,065 gallons of stormwater per year.

As a result of the accomplishments of the Raritan River Basin rain garden rebate program, the RCE Water Resources Program expanded the rebate area in 2016 to include properties within the Royce Brook Watershed with funding from a 319(h) grant from the New Jersey Department of Environmental Protection. Rain garden rebate programs are also now being offered in Manville (Somerset County), Hammonton (Atlantic County), Evesham (Burlington County), and Hamilton Township (Mercer County), New Jersey this spring and summer with support from the Dodge Foundation and the National Fish and Wildlife Foundation.

To learn more about the program, please visit our website at **http://www.water.rutgers.edu/Projects/RGRebate/RGRebate.html**.

Improving the Effectiveness of Green Infrastructure by Enhancing the Urban Tree Canopy

As research into improving the effectiveness of green infrastructure by enhancing the urban tree canopy continues here at the Water Resources Program, we became aware of a newly released study (1) by Nowak and Greenfield showing that US metropolitan areas are losing 36 million trees each year, leading to economic losses of $96 million per year. In 2012 the same authors published their research (2) that assessed the total percentage of impervious cover area of each state, and this research showed New Jersey to be the most urbanized state in the country with 12.1% of its total area being impervious cover.

In our study, we have targeted six major cities (Newark, Paterson, Jersey City, Camden, Trenton, and Perth Amboy) in New Jersey which are highly urbanized and are also communities with combined sewer systems. During heavy storm events, these combined sewer systems often overflow, posing a public health hazard. Thus far we have been able to determine the tree canopy percentages for each combined sewer overflow (CSO) sewershed and will use this information to identify key locations to place green infrastructure, which will reduce stormwater loads into the combined sewer systems. We will then explore how much more effective green infrastructure practices are when trees are incorporated into the design by using iTree modeling software. Now more than ever, our towns and cities in New Jersey should be considering the importance of sustainable stormwater management.
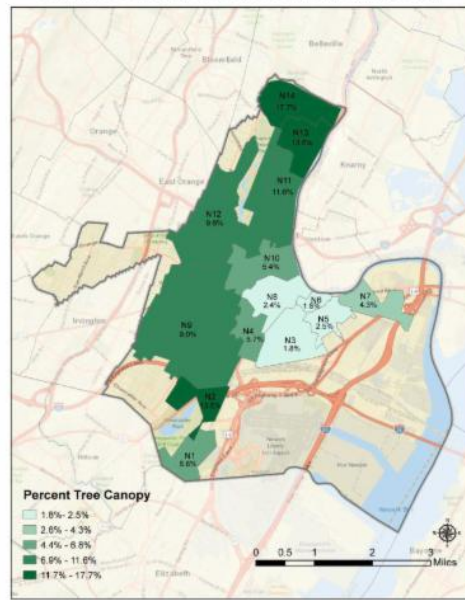
(1) David J. Nowak, Eric J. Greenfield. Declining urban and community tree cover in the United States. Urban Forestry & Urban Greening. Volume 32. 2018. Pages 32-55.
(2) David J. Nowak, Eric J. Greenfield. Tree and impervious cover change in U.S. cities. Urban Forestry & Urban Greening. Volume 11, Issue 1. 2012. Pages 21-30.
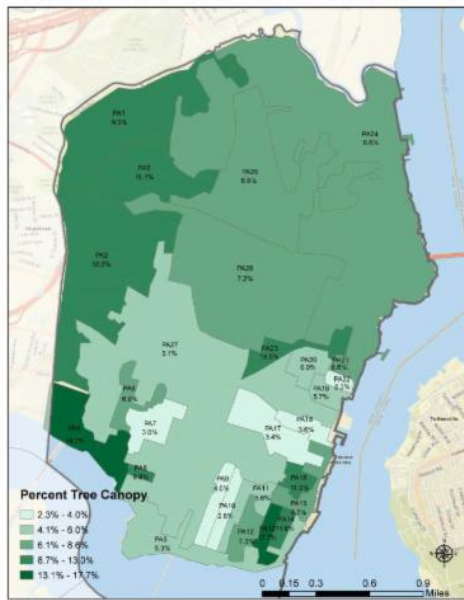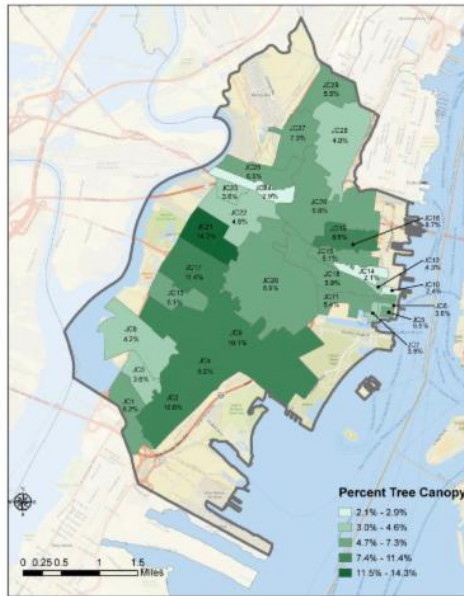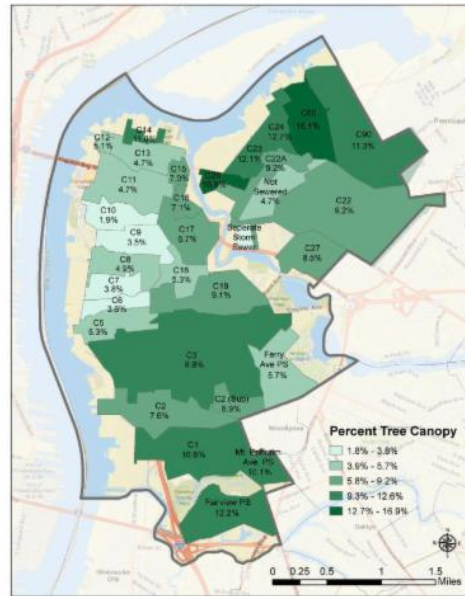
Shown here are maps of four of the six cities which display the urban tree canopy in each of their sewersheds.

Municipal Action Teams' Green Infrastructure Initiative Updates

Camden SMART (Stormwater Management and Resource Training) partners and the Camden Collaborative Initiative are hosting the annual Camden Environmental Summit at Rutgers-Camden Campus Center on June 6th. Please join us and register for the Camden Environmental Summit! Learn about the environmental initiatives and partners working in Camden to protect natural resources, rebuild infrastructure, and improve the quality of life for residents.

Gloucester City Green Team continues to meet monthly.

Municipal action teams have been formed to foster collaboration and collective action that helps the municipality speak with a common voice and achieve a common goal while advocating for green infrastructure. Updates on the various municipal action

Partners are beginning work on a rain garden at the Gloucester City Water Department. The City will assist with the installation, and local volunteers will be planting. The next monthly meeting is scheduled for June 13th.

Harrison TIDE (Transforming, Infrastructure and Defending our Environment) met at City Hall on May 24th. Rutgers and PVSC are leading the design of a right-of-way bioswale along South 7th Street adjacent to the Harrison Fire Headquarters. Members are also working to collaborate with the local schools to develop and implement green infrastructure demonstration projects in the community.

Jersey City START (Stormwater Treatment and Resiliency Team) partners postponed the May meeting to June. The next meeting will be June 14th. For more information, contact Kate Lawrence at KLawrence@jcnj.org.

Newark DIG (Doing Infrastructure Green) partners met in City Hall on May 22nd. The City of Newark is working to finalize efforts for implementing several green infrastructure demonstration projects in partnership with the New Jersey Environmental Infrastructure Financing Program. These projects were developed through Newark DIG and include rain gardens, stormwater bioswales, and tree plantings in the public right-of-way at several locations in the South and East Ward.

Paterson SMART (Stormwater Management and Resource Training) partners postponed the May meeting and will next meet on June 27th. Partners are working to install rainwater harvesting systems at three community gardens beginning in June. Partners will also be leading a rain garden cleanup day with students at School 4, School 28, and JFK High School in the coming month.

Perth Amboy SWIM (Stormwater Infrastructure Management) has continued their efforts toward promoting green infrastructure throughout the city of Perth Amboy. Over the last few months, the group has learned about and discussed the implications of the new Long Term Control Plan regulations on combined sewer system communities. In the upcoming months the group will continue to promote green infrastructure as a sustainable option for mitigating the effects of combined sewer overflows in a cost-effective way. They are currently working on a series of marketing materials to educate the public on these issues. The partners recently met on May 19th for their monthly meeting and continue to meet regularly on the 3rd Thursday of the month.

Trenton Green Infrastructure Partners met on May 3rd. Partners are preparing to move forward with the installation of rainwater harvesting projects at two community gardens. In addition, a rain garden installation is being planned in partnership with the City Schools during summer 2018.
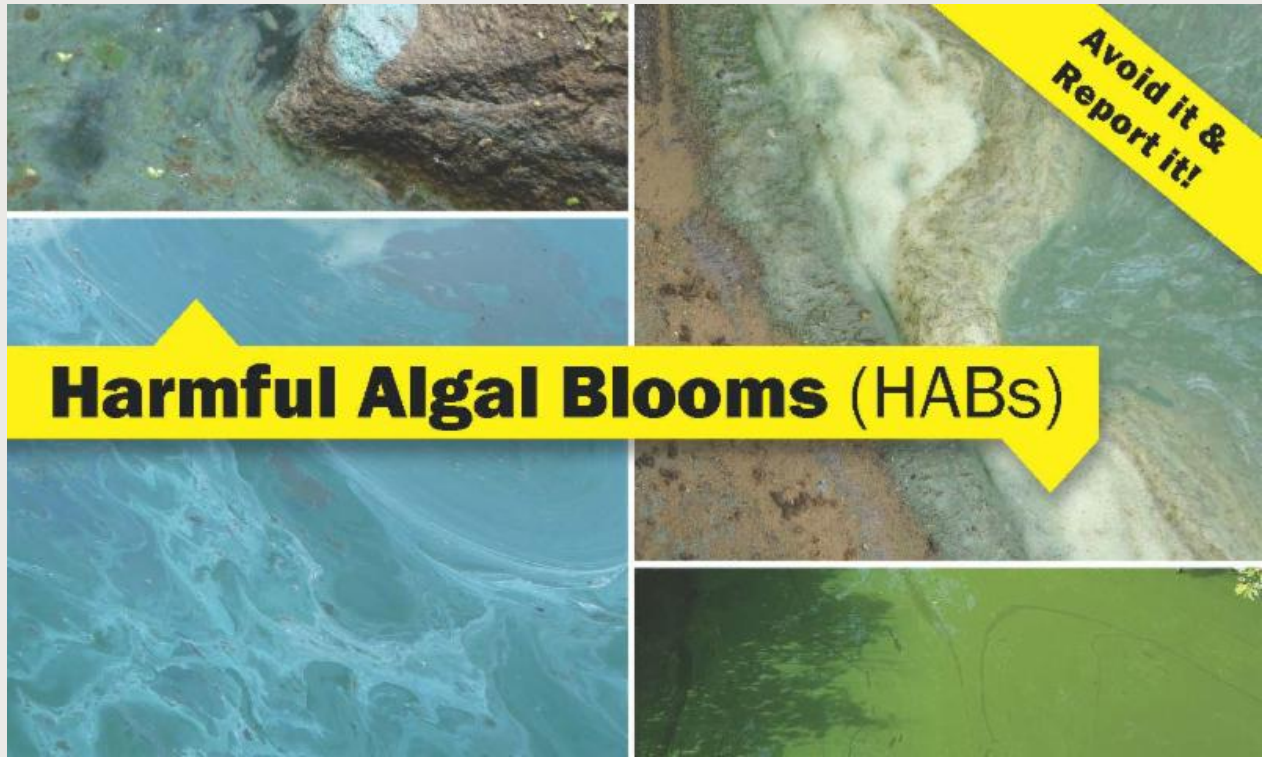
Camden SMART

Gloucester City Green Team

Harrison TIDE

Jersey City START

Newark DIG

Paterson SMART

Perth Amboy SWIM

Trenton Green Infrastructure Partners

Harmful Algal Blooms (HABs)

HABs Harmful Algal Blooms

What are they?
- Freshwater Harmful Algal Blooms (HABs), in rivers, streams or lakes, caused by cyanobacteria
- Cyanobacteria (also known as blue-green algae) are not true algae
- May form dense blooms under suitable environmental conditions – elevated temperatures, high levels of nutrients, and calm water
- Can produce toxins that are dangerous for humans, pets, livestock and wildlife
- Toxins are referred to as cyanotoxins
- Blooms not producing toxins can cause allergenic/irritative skin effects

What do they look like?
- May look like blue or green spilled paint, pea soup or parallel streaks
- Contact or ingestion may cause illness - *Avoid It & Report It!*

Report a suspected **Harmful Algal Bloom** call:
DEP Hotline at **1-877-WARNDEP** (927-6337) or
submit report through the **WARN NJDEP** *mobile app*
(download at www.nj.gov/dep/warndep.htm)
Visit the NJDEP Bureau of Freshwater and
Biological Monitoring (BFBM) Freshwater HAB website:
www.state.nj.us/dep/wms/bfbm/CyanoHABHome.html

HABs
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For more HABs info, scan the QR Code with your smart phone.

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Visit the NJDEP Bureau of Freshwater and Biological Monitoring (BFBM) Freshwater HAB website www.state.nj.us/dep/wms/bfbm/CyanoHABHome.html