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# **URBAN ISSUES**

Newsletter of the Urban Resources Initiative at the Yale School of Forestry & Environmental Studies



GreenSkills workers Antjuan Martin, Carl Harvey, Jeremiah Smart, and Shawn Pinto spent three days constructing the first West Park bioswale. Seven more installations are planned for March.

# GREENING NEW HAVEN'S INFRASTRUCTURE

**by** On a blustery Thursday in December, Kelsey Associate Director of URI Chris Ozyck and a crew of GreenSkills workers Semrod finished installing a beautiful rain garden on West Park Avenue near West Rock. This rain garden, or bioswale, is both aesthetically pleasing and functional. It will serve as a stormwater drainage basin for the street, naturally removing pollutants while allowing rainfall to recharge the groundwater aquifer and gradually feed streams and rivers. This is one of eight bioswales that will be constructed by URI's GreenSkills team along the West River, and it represents an example of something called "green infrastructure," which New Haven is starting to explore.

What exactly is *green infrastructure*? Green infrastructure (GI) is a natural water management solution designed to

reduce and treat stormwater runoff before it reaches sewers. Cities across the country are building GI in the form of green roofs, rain gardens, and permeable pavement. However, these systems and their capabilities have not yet been extensively researched; nor has GI been widely implemented in Connecticut. This means that questions remain: is this really a solution to urban flooding and stormwater management? How effective is GI in restoring natural ecological processes?

With Professor Gaboury Benoit at the Yale School of Forestry & Environmental Studies, I am attempting to answer these questions. We're looking specifically at the effect of green infrastructure in a small, heavily urbanized watershed

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Celebrating 20 Years



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Selfie of Margaret, Chris and Colleen planting together in the November rain.

In 1995, we began transforming vacant lots into pocket parks-former liabilities into assets-through our neighborhood Greenspace program. This fall, we celebrated the 20-year anniversary with an event at the house of Yale President Peter Salovey. Newsletter editor Dylan Walsh describes the occasion, raising the natural question: what comes next?

One answer is bioswales. In our cover story, Kelsey Semrod describes our newest endeavor to remediate New Haven's nonpoint source pollution with green infrastructure. Ongoing efforts to install eight bioswales along West Park Avenue may presage much more extensive construction in the years to

come. Meanwhile, URI intern Uma Bhandaram describes the exciting evolution of the Yale Experimental Watershed, or YEW, into New Haven's newest living laboratory.

**FROM THE DIRECTOR** 

But the question of what comes next applies to individuals as much as projects. In her profile of Carl Harvey, GreenSkills Manager Margaret Carmalt writes about the desire to live a fulfilling life beyond the prison walls. Margaret herself, after returning to work at URI in late 2009, will begin a master's in social work this summer. Under her leadership, the GreenSkills program has matured and flourished, training dozens of adults and planting many more trees than URI had in the past. Margaret is now poised to pursue her own advancement.

I have found Margaret's work ethic and commitment to our mission extraordinary. The job of GreenSkills Manager is demanding in all aspects. Margaret is responsible for training Yale interns and adult work crews in city tree planting six months out of the year. As a licensed arborist, Margaret brings her technical expertise to the position, annually selecting 500-1,000 tree species for specific locations. But regardless of demands, Margaret's lighthearted disposition made it a joy to work alongside her. I know I speak for the rest of the staff and board of URI that we will miss her smile and spark. I would like to dedicate this newsletter to her.

She has left the GreenSkills program with a strong foundation that will be enormously helpful to her successor. With her new knowledge and skills as a social worker, coupled with her personal integrity and commitment, Margaret will no doubt continue to improve organizations and lives in her future work.

Colleen Murphy-Dunning

## **Greening New Haven's Infrastructure**

#### *(continued from page 1)*

in Westville. We hope that this project will demonstrate the feasibility of bioswale installation in our region and the extent to which GI can reduce contamination and flooding associated with stormwater runoff. Ultimately, this work can contribute to the health of Long Island Sound.

In recent years, New Haven has significantly reduced its point source pollution, which comes from discrete, identifiable sources. But Long Island Sound is still plagued by so-called nonpoint source pollution, like street runoff and combined sewer overflows (CSOs). In older sewer systems, street runoff doesn't drain into a separate set of pipes, but mixes into the sewer system that serves houses. When weather is dry, sewage is carried to the treatment plant and the effluent discharged into the Sound. However, during most storms, especially when the rain is heavy, water overloads the system and, in Westville, a mixture of untreated sewage and stormwater drains directly into the West River and other urban waterways. Each year, 260 million gallons of this waste is discharged into New Haven streams, and, ultimately, the Sound. This challenge presents an opportunity to test the effectiveness of green infrastructure in New Haven.

To get this work started, in November of 2014, the Long Island Sound Futures Fund awarded a grant to URI and our partners, the City of New Haven, Common Ground High School, and F&ES faculty. The grant enables us to install green infrastructure along waterways that feed into the Long Island Sound and document the effect of GI in reducing the impact of stormwater runoff. The specific form of green infrastructure we're building is called a right-of-way bioswale; each bioswale is constructed in the planting strip between the street and sidewalk and is optimized for high capacity stormwater retention. Along with the eight bioswales on West Park Ave., one will also be constructed outside of Common Ground School. This one will contribute to a larger collection and conveyance process that includes a stormwater infiltration system, a created wetland, two infiltration ponds, four vegetated biocells, and 6,000 square feet of pervious concrete.

Community outreach and stewardship,

along with the support of the West Park Avenue neighborhood, are integral to the project's success. Over the course of siting each bioswale, Chris Ozyck and I met with homeowners to discuss the project and placement possibilities. Residents with bioswales in front of their homes are included in the design process, choosing the plants, flowers, and shrubs that they want. By being included in this process, the homeowners have a deeper understanding of bioswale functions and will likely take greater ownership of the sites going forward.

The work at these bioswales will also engage students from Common Ground High School, who intern with URI's GreenSkills team and will be involved in various educational components of the project. Throughout the process, students will have the opportunity to learn about urban stormwater management and develop necessary skills to continue work in this field.

Educational workshops designed to continue community engagement are also part of this project. The first workshop occurred on a Saturday at the end of January. Chris Ozyck, Giovanni Zinn, the city engineer, and I met with West Park residents over breakfast. The conversation began with current stormwater management practices and ended with discussion about street speeding, tree plantings, and rain garden maintenance. It was exciting to see the energy and enthusiasm from the community members as they imagined the neighborhood transformation. GreenSkills interns will lead the second workshop on more stormwater management practices and the third workshop will focus on maintenance and additional stewardship of bioswales.

The evaluation, monitoring, and documentation of West River hydrology have already started. The treatment site, where bioswales are constructed, will be studied along with a nearby control site. (The control site will not have any changes made to it.) We have installed Instruments will also be installed directly



The author descends into a cistern on West Park Avenue to take measurements for instrument installation.

in four of the bioswales to see how water moves through the systems. By comparing the treatment and control sites, we will be able to measure the effect of green infrastructure on water quality and quantity.

The entire scope of this project is exciting because it brings together scientific research, community outreach, and environmental education. We expect that these green infrastructure systems will lead to measurable decreases in storm impact on a vulnerable urban coastal community, and demonstrate the potential of green infrastructure in a small, highly urbanized city. Through experimenting with different bioswale construction designs, we can evaluate optimum characteristics to maximize flow reduction and water quality improvement for scaling to additional GI installations throughout the area. In the end, this research will add significant value in high-visibility education, demonstration, and community engagement efforts, building a case for additional investments in New Haven and other cities.

Kelsey Semrod is a Master of Environmental Science candidate hydrologic instruments to measure flow at the Yale School of Forestry at the outlets of these storm sewersheds. & Environmental Studies. Her The goal is to capture how much water academic and work interests include is coming in and how much is leaving. urban stormwater management and environmental education.

## **New Haven's Living Lab**

by Have you ever wondered about the Uma piece of forested land beyond Ingalls **Bhandaram** Rink, behind the houses on Prospect and Mansfield Streets? Maybe you've taken a shortcut through it, or you pass it on your daily commute. Perhaps vou've used the Mansfield Community Garden that abuts it. Though somewhat hidden from view, this little stand of trees does have a name-the Yale Experimental Watershed, or YEWand it is used for research and education through the Yale School of Forestry & Environmental Studies (F&ES).

> The YEW is 5.5 acres, essentially rectangular, and within a drainage area of 19.2 acres. Research began in 2012 under the Hixon Center for Urban Ecology, which provided fellowships to students interested in working on the YEW. Since then, F&ES faculty and students have begun to study an everbroadening range of site characteristics, analyzing the soil, hydrology, vegetation, and biogeochemistry. The cardinals, downy woodpeckers, and goal is to watch how these conditions change over time and, that way, understand the basic behavior of small urban watersheds. The ultimate a generally underutilized site into a "living lab" where academic research and teaching is conducted alongside recreational and informal learning opportunities for community members.

Since I arrived at F&ES in September 2013, I have been involved with research efforts at the YEW as both a Hixon Center fellow and through classes. I came to F&ES to learn more about watershed management and this seemed like a perfect opportunity to do do show slightly elevated levels of lead and mercury, but this is common come from leaking sewer lines, paint scrapings, or atmospheric deposition.)



Catherine Kuhn, Dave Jaeckel, and the author (far right), all 2014 interns, working in the Yale Experimental Watershed.

song sparrows. Tree surveys have also been done to identify all the vegetation on-site. Results show that White Oak, Red Oak, Pin Oak, and Norway Maple vision for the YEW is to transform are the most dominant tree species.

More recently, students and faculty turned their attention to the YEW's hydrology. In February 2014, the Yale Office of Facilities installed groundwater monitoring wells on the eastern side of the YEW. There is also a weather station that records temperature, rainfall, atmospheric pressure, relative humidity, and wind speed and direction. During regular site visits, the recorded data is downloaded onto a computer and then uploaded a variety of responsibilities, from measurements are used to calculate all for the installation of monitoring watershed. This information is essential lead and mercury. (The soil samples of the YEW-that is, the continual surface water, or groundwater) through for urban soils. These metals may the site as it enters, circulates, and leaves.

a range of topics, from the effects of road salt on water quality, to the feasibility of diverting polluted stormwater away from the YEW, to modeling flooding risks on-site. In another class offered last spring, Silviculture, students took their final examination at the YEW; they had to identify trees, habitat, and the services and values provided. By using the YEW as an outdoor classroom, these classes explore the prospects of turning it into a fully functional living lab.

Future projects at the YEW are already under consideration, and they look well beyond the hallways of F&ES. One project, which is in the initial stages, is to construct a trail and install educational signage that explains various aspects so. My work at the YEW has covered to the Hixon Center website. These of the site-the weather station, the hydrology, the biogeochemistry, and faculty outreach, to pouring concrete of the water that enters and leaves the so forth. These projects will draw on much of the research that has already equipment and testing soil samples for to understanding the hydrologic cycle been done and allow for the YEW to be a living lab not just for the classroom, movement of water (whether rainfall, but for the community as well.

In the spring of 2014, F&ES offered Uma Bhandaram is a second-year a Watershed Cycles and Processes Master of Environmental Science Previous Hixon Center fellows have class that allowed students to design student at F&ES. Her work focuses done bird surveys and found a total of 14 research projects using the YEW as on stormwater management, green species in the YEW, including northern their experimental site. Projects covered infrastructure, and land-use planning.

## **Profile: Carl Harvey**

by In last year's Rock to Rock fund drive, Margaret Margaret Carmalt raised money to pay Carmalt for one GreenSkills participant. Carl Harvey generously donated his time to be interviewed in February 2015. This is Carl's story.

> "I was in the hospital the longest. I had a brain hemorrhage, but to me it was a life changing experience. I truthfully don't believe us four guys should be here because we almost went over a bridge and into a dam, but the guardrail saved us all."

> Though he was driving, Carl didn't remember what happened because he passed out. He was 26 years old, 12 years after his first arrest at age 14 when he was put in a group home for possession of marijuana. Between the ages of 16 and 22 Carl was arrested twice more. Little did he know that when he went to jail after the accident—his fourth arrest—things would be different.

> It's hard for me to imagine Carl living recklessly. We met in the fall of 2014 when he joined my planting crew. He stood out as quiet and reflective. I think of him as someone who takes his time to do well, who respects and supports his teammates.

> Before he entered high school, Carl was focused on basketball. He worked hard and stayed away from trouble, which was everywhere in Newhallville, a community still recovering from the loss of New Haven's booming arms industry. "It was tough growing up because my mother was a single parent with four kids. There was a lot of violence and negative activities going on around the house. I saw guys on the corner doing what they do," Carl said.

> Three New Haven high schools recruited Carl for basketball. He decided on Hillhouse, but sadly he never made it to the season. Like many teens, Carl became rebellious. He started being "hard-headed," as he put it. "I stopped listening to my mom, started hanging with different crews doing bad things. I just gave up." Then one day he didn't go home after school. He stayed out for an entire week without calling his mother. She became worried and filed a missing person's report. The police found him smoking pot and arrested him for possession.

> Nearly fifteen years later, he has gained



GreenSkills' Carl Harvey onsite.

perspective. "I think I was lost because [of what] my mother was going through with four kids, and my father—I'm his only child—he wasn't around like that. I felt kind of lost. I didn't have a father figure." Carl's mother moved to Atlanta with his siblings after Carl's second arrest. He hasn't seen them much since.

After his fourth arrest four years ago, Carl changed his attitude. "This time, I got my GED. That was my main focus." He also developed a friendship with an older inmate carrying a life sentence—a man Carl had read about just months earlier in a book on Philadelphia's Black Mafia. He and Carl spoke about crime, about the streets and the people who run them. "He broke it down. He said you call them your friends but they're not your friends."

Since his June 2014 release, Carl enrolled in EMERGE, a New Haven transitional program for ex-offenders. He has worked hard to avoid seeing his old "friends." When I asked if he's ever tempted, he head ... but the thought gets pushed right

over there it ain't gonna be as easy as I'm thinking."

Sticking with EMERGE gave Carl an opportunity to work at URI. I asked if he'd since learned anything new about himself. "I [learned I] could follow directions and all that, and if a supervisor gave me a task, I would do it. I used to be hard-headed."

One of the things that Carl liked best about the job was seeing the trees he planted, something he continues to enjoy to this day. He says he's constantly pointing out the trees he planted to people he knows. "I feel proud," he told me. "The city's where I'm from. I could at least say that I put in some work to make it look better. I feel like I'm part of it in a good way now."

Margaret Carmalt is the GreenSkills Manager at URI. She is grateful to all of her crewmembers for their hard work. dedication, and willingness to listen and trv something new. She is also thankful responded: "Sometimes it gets in my to her friends and family who donated to her Rock to Rock fundraising page and to the back because I know if I do go *helped make Carl's experience possible*.

## **Celebrating 20 Years**

**by** Nobody could have predicted the program's Dylan success when it started in 1995, a few Walsh hundred volunteers spread over a handful

of New Haven neighborhoods. This year, URI's Greenspace program marked its twentieth anniversary; 270 community groups have participated over the past two decades. More than 1,000 volunteers join together every summer, working across the city to convert unused lots into small parks and maintain spaces that have already been renovated.

"When we began in the mid-nineties, New Haven was plagued by trash-strewn vacant lots and neglected parks," said Colleen Murphy-Dunning, Director of URI. "The visible change to the landscape is remarkable. The City has undergone a real transformation."

To honor the 20-year milestone, URI invited community leaders, volunteers, board members, donors, and former interns to celebrate at the house of Yale President, Peter Salovey. On the evening of November 18, 100 guests filed into the Georgian residence on Hillhouse Avenue and were greeted at the door by Yale's First Lady, Marta Moret, who waved attendees to the rear reception room, the waiting hors d'oeuvres, the conversation.

An hour into the party, guests were ushered into the living room as four Whiffenpoofs alumni entered, dark blazers and boater hats, and broke into barbershop serenade. After their performance, F&ES Dean Peter Crane took to the lectern to reflect on URI's essential role at the School of Forestry & Environmental Studies. At a time when the work of F&ES is increasingly global, he said, URI maintains a deep local connection between the school and the community.

"It's a blessing that Greenspace even exists," according to Thomas Burwell, who first joined the Fair Haven Neighbors in Action group three years ago. This past summer, he founded his own Greenspace, Friends of Quinnipiac River Park. "The program just matches so well with the needs of the community." Beyond tree planting and trail maintenance along the Quinnipiac River, Thomas and other volunteers have helped lure the Farmers' Market, absent for years, back to the riverbank on summer Thursdays.

After Dean Crane, Marta stood at the



Along with Mayor Harp, First Lady Moret, Dean Crane, and Colleen Murphy-Dunning, Greenspace volunteers who have worked with URI for 15+ years.

lectern. "It is wonderful to have a project that gets communities together around being outdoors, around an activity that is healthy for the air, that may even reduce gun violence and crime," said Marta, who graduated with a Master's degree from the Yale School of Public Health. She wove the work of URI into a larger narrative about making New Haven a healthy city. "This is an organization that brings communities together and makes them more like communities."

In Edgewood Park, for instance, miles from campus, about 25 volunteers routinely meet, led by founder of the Edgewood Park Greenspace group Stephanie Fitzgerald. They plant trees in the 120-acre park that curves narrowly along the West River. They lay down mulch, maintain gardens and park entrances, clear hiking trails, and ward off the growth of invasives. "Whoever wants to come out has weight in what we do," said Stephanie.

## **Another Blowout**

The 2014 Banff Mountain Film Festival World Tour

February 21st, a heavy snowstorm outside, and the newly renovated Shubert Theater filled near capacity. The lights went down, and New Haven's third Banff Mountain Film Festival began.

URI would like to thank all of the friends who helped fill the theater that evening, and we would like to extend a special thank you to Trailblazer/ celebration, noting the service URI has provided as a city partner, both historically and today. Toward the end, board member Jody Bush rose to single out the heroic efforts of Colleen. "She is humble, ambitious, dedicated, kind," said Jody.

Speeches finished, the guests continued in conversation. One Greenspace crew that had worked together for 20 years reminisced about their first and second interns. Talk ran late into the evening. People left under the crisp cover of darkness on a late-autumn night. Who could predict what form the next twenty years would take? What legacy will be celebrated in 2035?

For Colleen, the vision is simple but far-reaching. "My hope is that we can continue to find ways for our Community Greenspace work to engage people in meaningful ways with nature while also making New Haven a resilient, livable city.'

Mayor Toni Harp also spoke at the 20-year Dylan Walsh is the editor of the newsletter.

Denali, who sponsored the screening

and donated all ticket proceeds to URI.

We'd also like to highlight this year's

VIP ticket option, which included front-

row seats and a preshow reception

with: a beer tasting featuring the new,

local brewery Overshores, sponsored

by G&G Beverage Distributors; an

assortment of eight different Kitchen

Zinc pizzas; and delicious desserts

donated by Katalina's bakery. As

winter gives way to spring, we look

forward to seeing you there next year!

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The Elm City Four sing to those in attendance at the 20-year Greenspace celebration.

1. A.