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



WATERSHEDS AS LEARNING PLACES

by
**Bidisha
Banerjee**

June 30, 2009 will be a monumental day for URI. By then, two units from the Open Spaces as Learning Places program will officially have entered New Haven's district-wide science curriculum. Since 2001, Yale students have been teaching and testing the hands-on nine-week Open Spaces curriculum, which was devised by URI board member Susan Foster. Last November, after eight years of working with twelve schools, forty-two classroom teachers, and seventeen hundred students, the Open Spaces program was officially retired. Although this was a bittersweet moment for URI, it was also exhilarating. The Open Spaces program's Pond and River units (now repackaged as Watersheds as Learning Places, and aligned with state science standards) will be taught in every 6th grade classroom in New Haven.

"The Open Spaces as Learning Places program over the last several years has offered the opportunity to New Haven

students to be able to put their science and social studies learning in the context with the world around them. Teachers and administrators have been enthusiastic about the programs and the URI staff. As we implement the Watersheds as Learning Places curriculum district wide for the first time this year, we hope to replicate that success for all sixty-eight sixth grade classes across the district," says Richard Therrien, the Science Curriculum Supervisor for the New Haven School District.

While such widespread acceptance is heartening, it also raises a few questions. How will busy teachers fit the demanding hands-on curriculum into their schedule? What if some teachers do not feel comfortable with the content? And finally, this fall, if teachers want their students to go canoeing on the West River, or to hunt for dragonfly larvae at Lake Wintergreen, will they be on their own?

(continued on page 3)

In this issue:

A Rock And A Soft Place 4

Community Greenspace At A Glance 5

Interview with Karen Seto 6

Hixon Fellows' Urban Research 8

Community Carbon Fund 10

Many Thanks to Our Most Recent Donors 11

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Urban Issues
Bidisha Banerjee, Editor

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This edition of *Urban Issues* celebrates the many partnerships that make possible the impacts our small organization accomplishes. Our cover article "Watersheds as Learning Places" is both a tale of success and letting go. The mission of URI has never been to take the place of public servants – teachers or park rangers or others – but rather work through partnerships which bring resources that improve the lives of people in cities.

That has always been the vision at URI – to bring resources to bear to support community-based initiatives. Teens that plant trees through our Greenskills program come to work at URI through our partners, Solar Youth and Common Ground High School. This spring these high school interns will also work with a new partner, Yale's Office of Sustainability. Jen Baldwin

writes how the Office is piloting a "Community Carbon Fund" to engage neighbors in the global warming crisis.

In "A Rock and a Soft Place," Justin Elicker tells poignantly how he confronts a graffiti artist – and his own preconceptions. His article embraces the hope of the Community Greenspace Program: that caring about our land together can help us to also care more about each other. The Friends of East Rock Park, like the other 50 volunteer groups participating in Community Greenspace this year, are showcased on a new web-based interactive map. Greenspace Manager Chris Ozyck is thrilled to champion the hard work of these volunteers.

In "The Hixon Fellows," and the interview with Yale's new faculty member – Dr. Karen Seto, important scientific research is portrayed. Dr. Seto's interview helps us to better understand the global scale of change in the urban landscape. Bringing global scientific understanding to the neighborhood scale is paramount. As URI's founder, Faculty Emeritus Bill Burch, has said from the start, we can't solve environmental problems without addressing the human behaviors that have caused them. He has always counseled his students that as environmental professionals you will not solve the world's environmental problems on your own. You will only be successful if you involve local communities who understand local needs and priorities, and why the landscape looks as it does. The communities must be part of setting the agenda, and they must wish to carry out the solutions. The world continues to change rapidly, but this vision of working collectively to understand and address environmental problems remains constant. At URI we are proudly carrying out that vision.



Colleen Murphy-Dunning

Watersheds as Learning Places

(continued from page 1)

In order to answer such questions, URI is planning an ambitious training in August that will bring thirty teachers together for an intensive week of immersion into the Watersheds as Learning Places curriculum. Thanks to support from the National Oceanic and Atmospheric Administration (NOAA), teachers will receive a \$1,000 stipend for attending. For many teachers, the training will be a rare opportunity to remove themselves from the front of the classroom. "I'm all for it. The transition is good as long as we are trained for it," says Lois Kaliszewski, a 5th and 6th Grade teacher at Clinton Avenue Elementary in Fair Haven. Kaliszewski notes that she enjoyed the content-specific expertise of the Yale students who have taught in her classroom. "Teachers who haven't been outside and seen how kids come alive are not comfortable with using the outdoors. A lot of teachers say I don't have a lot of time – but if they find out it's fun there's always time for it."

Engaging teachers who can effectively communicate the importance of stewardship of local ecosystems has long been a priority for URI. Originally, the program's founders had envisioned that Yale students would work in the same classroom for three years; during the first year they would lead the curriculum, during the second year they would co-teach it, and by the third year, the teachers would take the lead. Unfortunately, due to the high teacher rotation rate in New Haven public schools, this vision did not come to fruition. Very few teachers stayed at the same school for three years. Thus, with Therrien's support, in 2007 URI began to discuss incorporating the Watersheds as Learning Places unit into the district-wide curriculum, and providing on-line, print, and video resources to better accommodate the rotation rate. At the same time, "We have learned from our years in the classroom that the curriculum and materials kits alone will not prepare teachers to facilitate meaningful watershed educational experiences," says URI's Director, Colleen Murphy-Dunning, who helped organize a day-

long teacher training at Lake Wintergreen in October '08.

"Our emphasis on helping teachers get over their own sense of intimidation seemed to have paid off. By the end of the session, teachers who had previously been timid about handling the creatures were enthusiastically reaching to hold salamanders and caddisfly cases," reminisces former URI Education Coordinator Mira Manickam, who led the October teacher-training (see images on front and back cover).

The week-long August training at Yale and at Lake Wintergreen and West River Memorial Park will build on the success of last year's workshop. It will be run by Susan Foster, and Yale Professor Gaboury Benoit (an expert in aquatic chemistry). The immersive experience will permit teachers to share concerns, fresh discoveries, and strategies for both teaching and learning.

The training week promises to be action-packed. Teachers will strengthen their understanding of New Haven's watershed, learn iconic Open Spaces as Learning Places activities like Fred the Fish and River Cutters, become certified as canoe leaders, and test water quality – and that's just the first two days. Over the next two days, teachers will focus on ponds and wetlands, learn how to find macro-invertebrates in Lake Wintergreen,

and learn how pollution moves through urban watersheds. They will also meet with the Regional Water Authority, review the structures and properties of water, and practice specialized methods to measure nitrate, bicarbonate, bacteria, temperature, and pH. On the last day, teachers will have an opportunity to reflect on the training, resolve lingering doubts, and form peer-mentoring groups.

Therrien, who notes that there are few opportunities for outdoor science education within the New Haven public schools, is enthusiastic about the training: "We know that in this pilot year there are some challenges; the Watersheds unit is designed to be done throughout the school year, which is a different model for science curriculum, there are challenges in getting all teachers and administrators to put forth the efforts required to supplement the in class learning with the outside activities, and teachers still report having some issues with setting up and delivering the instruction with limited time and background knowledge. Those teachers who have been trained and taken advantage of the resources available, such as the Parks Department and Lake Wintergreen, report that the students now have a much better appreciation for the world around them, and the excitement that learning about science outdoors can bring."

Mindy Schwartzman, who co-teaches 5th and 6th Graders at Clinton Avenue

(continued on page 5)



Lincoln-Bassett School's Ms. Perrault discusses a caddis fly larva found by one of her students.

A Rock and a Soft Place

by
**Justin
Elicker**

He introduced himself as Henry. We shook hands and I asked him if he would show me his graffiti "artwork." He was so flattered that someone was interested in his work, it probably never occurred to him that I found his graffiti deeply offensive.

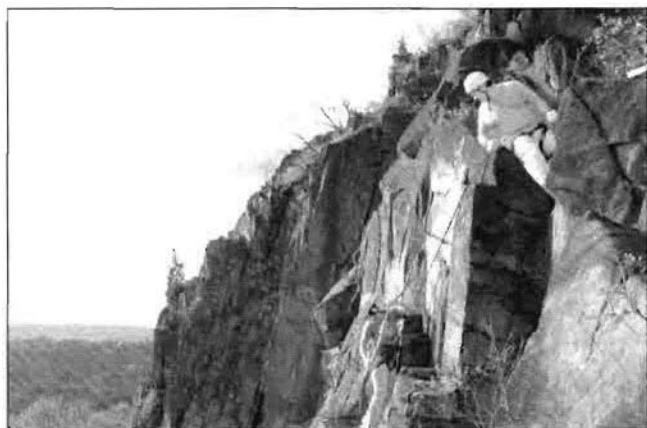
It was mid-summer, 2008. Betty Thompson and I were ecstatic at the initial success of the rebirth of Friends of East Rock Park. Joining the URI Community Greenspace program brought regularity, legitimacy and sorely needed expertise and planting assistance to our emerging Park Friends group. Thanks to URI's support, we had a core group of community members getting to know each other and experiencing our park.

it." I responded enthusiastically, hoping I could keep him talking while I sorted out what to do.

Henry proudly showed the graffiti to me, pointing out the symbolism in different sections, explaining that this was the first time he and his friends had tried their hand at graffiti art and sharing his personal story. He told me where he lived, where he planned on going to college, what his parents did. And it was then I realized that Henry was a good kid. He certainly was not the malicious spray painter I had conjured up in my mind when I first saw the graffiti. As the conversation continued, Henry became more eager and leaned in to tell me that he and his friends planned to spray paint other locations in the park. Understanding

The answer is Henry. Henry or someone with a similar story does these things. Good people who aren't thinking about the results of their actions. And that is why I believe groups like Friends of East Rock Park and each URI Greenspace group are so vital to our communities.

When someone digs up a flower, they see us replant another. When someone tags our bench, they see us repaint it. When someone throws trash, they see us pick it up. We're visible. We visibly care. And I believe that makes other people care. Our community groups make people think about the result of their actions. When we work out on the street, we make connections with people - through a conversation, a word, or even just eye contact. And even though a passerby



Friends of East Rock and NH Parks staff cleaning up graffiti on the Giant Steps.



Betty Thompson and Justin Elicker - co-leaders of Friends of East Rock Park.

A week earlier, I was jogging on my usual route on the Giant Steps and was shocked to find that someone had stained the golden cliffs of East Rock Park with fluorescent colored graffiti. I felt anger and disbelief that any person could do such a thing to our park, and I vowed to clean it up. A few days later, I stood on the cliff taking photos of the graffiti to send to the New Haven Parks Department. And that is when I met Henry.

"Do you like the graffiti?" said a voice behind me. I turned to see a scrawny, freckle-faced teenager with a huge head of hair. "My friends and I did it," he said cautiously. I realized that the boy thought I was taking photographs because I admired his graffiti. "I love

I needed to stop Henry from further damaging the park, I told him that I did not, in fact, like the graffiti and that it tainted this beautiful site for the many nearby residents and park visitors. I urged him not to do it again and then we shook hands and parted ways.

What kind of person steals the flowers we planted with our URI Greenspace group? Who writes their initials in black ink on our newly renovated and freshly painted park benches? Who thinks it is okay to throw McDonalds trash out their car window and into our woods? Who dumps a 20-foot-long boat, yes a 20-foot-long boat, into our park?! And who spray paints our beautiful Giant Steps?

might not pick up a shovel and join us, we've made a connection. A connection like the one I made with Henry.

A week later I jogged by the place Henry and I met and was surprised to find him sitting out on the cliff smoking a cigarette. "Hi Henry," I said. "Hey Justin," he casually replied. I stopped and we both gazed out on New Haven and the sun setting behind West Rock. I remarked on how perfect the evening was and Henry responded that this spot was his favorite in the park. After a pause, he looked at me and said he was sorry about the graffiti. I smiled, thanked him for the apology and we shook hands.

Another two weeks later, the graffiti was gone - except for a faint outline that you

A Rock and a Soft Place

(continued from previous page)

wouldn't see unless you were looking for it. Now, you can believe what you want, but I'm convinced Henry was the one that cleaned it up. Henry and I were lucky enough to connect - to understand where each other was coming from if

only for a moment. And not only is our park a better place because of that connection, but more importantly, so are we better people.

Justin Elicker and URI Board Member Betty Thompson co-lead the Friends of East Rock Park, a group that works

closely with URI and the Greenspace program. Justin is a second-year Masters of Environmental Management and Masters of Business Administration joint-degree student at Yale F&ES and Yale SOM. He plans to remain in New Haven following graduation.

Watersheds as Learning Places

(continued from page 3)

Elementary with Kaliszewski, echoes this sentiment, "I like being outdoors and when it comes to doing observations and building an indoor pond and bringing the outside inside, it gets the most apprehensive learner engaged." One of her former students, Diamond Guerra, has warm memories of the Open Spaces program's outdoor components: "We went on a canoe ride and we went into the forest and we learned about scat and the footprints that are in the dirt and what all the types of animals are," she says.

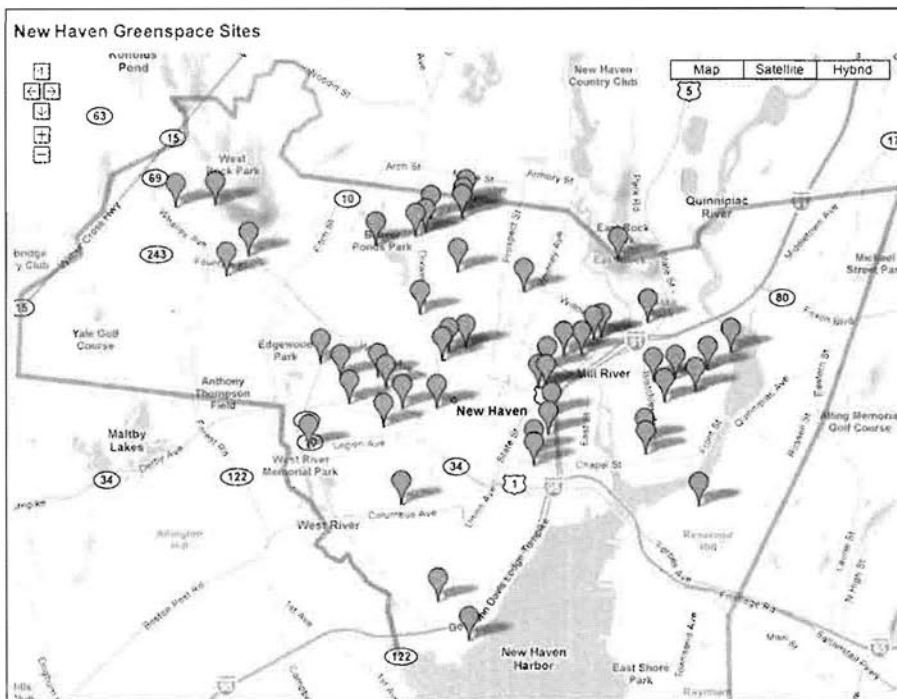
Getting extra help with field-trips may

be one of the biggest challenges that most teachers will face. However, the trips are crucial to the spirit of the Watersheds as Learning Places curriculum. Indeed, in a 2006 URI student evaluation, over 85% of the children surveyed said they had never taken a canoe ride before, and more than 50% discovered a new open space on each field-trip. Thus, the week-long training is intended to make teachers much more at home at Lake Wintergreen and at New Haven's three rivers. And, happily, the original Open Spaces as Learning Places program has left a strong legacy behind. This spring, a group of former Open Spaces interns started an

Environmental Education Student Interest Group at Yale Forestry School. "Hopefully Yale students can continue to facilitate outdoor education in New Haven public schools," says Xiaoting Hou, a founding member.

Bidisha Banerjee is a first year Master of Environmental Science candidate at the Yale School of Forestry and Environmental Studies. She was an Open Spaces as Learning Places intern last fall and is a firm advocate of outdoor education, having seen its effects first-hand while working on environmental education in India and Vermont. She is editing the URI newsletter this spring.

Community Greenspace at a Glance



Please visit www.yale.edu/uri to learn more about the accomplishments of Greenspace volunteers.

The URI website has a new tool – an interactive map of over 50 Community Greenspace sites throughout New Haven. Clicking on each site pulls up a photo and a wealth of information about each Greenspace group – you can learn how to join the group, not to mention how many trees were planted last year! Being able to see all of the groups side-by-side creates a powerful impression of the collective greening efforts underway in New Haven. "Instead of just sharing the important results accomplished by Greenspace groups with our donors, we wanted to create a tool that would celebrate their hard work with the broader public," says Greenspace Manager Chris Ozyck, emphasizing that there are a lot more community-oriented greening projects that aren't on the map. Ozyck says, "Any and every effort is astonishing in the sea of common apathy. Every action is an outward expression of your thoughts about yourself and your community. Thank you."

Interview with Karen Seto

by
**Marshall
Duer-
Balkind**

Karen Seto is Associate Professor of the Urban Environment at the Yale School of Forestry and Environmental Studies, and came to Yale last Fall, after 8 years at Stanford University. She uses satellite remote sensing, socioeconomic and biophysical data, field interviews, and computer modeling to understand and predict urban land use change. Her work focuses on the rapidly growing cities of Asia, particularly China. She has also done research in India, Vietnam, Qatar, and the US. She was recently named an Aldo Leopold Leadership Fellow. The Fellowship was founded in 1998 to help academic scientists make their scientific knowledge accessible to decision makers, and is funded by the David and Lucile Packard Foundation.

Marshall Duer-Balkind: What are some of the main questions you are trying to answer in your work?

Karen Seto: My work is on understanding, characterizing, and forecasting land cover and land use change, primarily in the urban and urban/rural environments. By that I mean: how are urban areas changing? How are they changing their land cover? What ecosystems do urban areas expand into? What's the relationship between urban expansion and agricultural land loss? Where are cities likely to develop? How does urban form change over time? A lot of what I do is trying to understand how urban areas have grown in the past, how they will likely grow in the future, and what are the environmental effects of urbanization.

I'm a geographer by training. What geographers do is we like to explore Earth, and understand how humans modify the planet. When we do an analysis of how an area has changed, for example, from agriculture to urban, we take our satellite data and GPS receivers into the field and through ground-truthing and interviews, try to reconstruct the historical land-uses of

urban fringe what the place was like ten years ago is difficult when they might have just migrated there five weeks ago. And in fact, a lot of times, especially in China, urban development takes place on what was previously agricultural land, and therefore [the original residents] have been moved elsewhere. So trying to find people to help you understand how the city has grown is a challenge.

MDB: *When the UN issues reports projecting rapid growth in urbanization, each country has their own definition of what that means. Do you have a standard definition for 'urban' that you apply?*

KS: A lot of what we do is using satellite data to look at urban areas and how they change—so our definition is defined by our data. We look at things like impervious surface, soils, or impervious surfaces with vegetative qualities; it really is land cover characteristics that define urban. It's not people. If there is a parking lot in the rainforest, but no one uses it, is it urban? But if you define urban as just people, industry, commerce, then you could have urban in very vegetative lush landscapes that don't have concrete or steel or any modern materials. This is why I don't talk about cities that

much. I'm not looking at the administrative conditions. Most people don't know where Hamden begins and New Haven ends. And in terms of the ecosystem, administrative boundaries don't matter. And in studying cities you also have to look at the global scale, because very few regions are self-sufficient.



our study area. This is the most fun part of our work.

MDB: *What are the particular challenges you face in working in cities?*

KS: One big challenge is you don't get good GPS signals in cities. The other challenge is you don't have people who have lived in these cities for a very long time. Asking someone on the

One of the things I find really surprising is at the global scale, and even at national scales, we often don't have good maps of where urban areas are. Pull out any map; you'll have *points* where cities are. There isn't a contiguous landscape map of the world or even of states. We need to understand the morphology of how cities grow, and what are the ecosystems under threat by urban expansion. We have forecasts of how urban population will grow but those are point estimates. Are cities going to become more expansive or more compact? This is where the remote sensing comes in and is very useful. With the availability of high-resolution data via sites like Google maps, communities can really educate themselves in terms of their resources and environmental services and disservices. It is a very powerful tool.

MDB: How does your work connect to New Haven?

In terms of New Haven, and how New Haven is related to the work that we do, climate change is affecting cities, but cities are affecting the regional climate, so how these two interact is completely unclear. I think we'll see in the next 30-40 years, storm surges and more extreme weather patterns along the coast. Like many cities around the world, New Haven is a moderate sized city on the coast. The cities that are growing the fastest are not the mega-cities; they're these medium size cities like New Haven. New Haven, in the world portfolio of cities is considered a small city, but in the US portfolio is actually a medium-sized city. New Haven, like many cities overseas, is in a large urban corridor. What happens if storm surge that wipes out the electricity in New York City? That is going to affect New Haven, and the same thing with Boston. The fact that you have I-95 cutting across the region, separating the city from the shore, has a very big impact as

well. A storm surge that takes out parts of I-95 could cripple New Haven. The geographic location of New Haven, its size, and its vulnerability makes it similar to many cities around the world, and in many parts of the world, leaders are trying to understand how their regions will be affected by climate change.

MDB: What are the big challenges for urban sustainability?

KS: I don't think there is such a thing as urban sustainability. I think that urbanization is a critical component of sustainability. But urban areas by their nature rely on the hinterland and wild lands and other ecosystems to support themselves. And similarly, worldwide, cities are where you have an agglomeration of economies and ideas and creativity and people, and so there is this very symbiotic relationship between urban and non-urban areas. You can say that a building is "carbon neutral" or is a "green building," but ultimately, those resources come from someplace. And so the question is if you were to design a series of green buildings, and everyone drove in hybrid cars, does that mean a city is sustainable? No. And that's why we need to start re-thinking what we mean by sustainability. I'm a strong believer that urbanization is one of the keys to sustainability. The world population is estimated to grow to 10-12 billion by 2050; low estimates say it'll be 9 billion. We're at 6 $\frac{3}{4}$ billion now. So on about 40 years we're adding 4 billion people to the planet. The last thing you'd want is four billion additional people living in low density communities or in prime agricultural land or national parks or really pristine areas—the solution is to have people live in cities.

It's efficient. I like to think of cities as Costco-izing life. Costco is so efficient, because you don't need to have all these small little packages of cereal. You buy a massive box of cereal that lasts you for

six months. Cities run in that same way. You can provide a lot of services to a lot of people in a small area, as opposed to "here's a box of cereal for you, and a box of cereal for you, and a box of cereal for you, etc." We need to start thinking about cities and urban areas and how they interact with agriculture. And not just agricultural land, but how people in cities get food. Our current method of providing food to people in cities is not sustainable. Trucking lettuce from California to New Haven in the dead of winter is probably not sustainable. That's not just an energy issue or an agriculture issue—it's an urban issue. I believe that if we think about an energy policy, we need to think about urban policy, because how cities are designed affects how people use energy. We want to design cities so people can live very close to where they work, or they can walk to services. Urban form directly affects transportation needs, infrastructure, energy, the loss of agricultural land, etc.

MDB: Have you had much success working with policy-makers?

KS: I would say moderate, because I'm not working at the temporal scales they're working on. It's very rare for policy-makers to do a post-hoc assessment of whether the policies made a difference. That's what we do. We say if you had a policy to steer growth here, did it really steer growth there, or did the city grow in a totally different area? That's what we look at—it has a lot of policy applications, but whether policy makers want to learn from past lessons is unclear.

Marshall Duer-Balkind is a first year Master of Environmental Management candidate at the Yale School of Forestry and Environmental Studies. He focuses on green jobs and environmental justice, and works as a URI student assistant.

Hixon Fellows' Urban Research

The Hixon Center sponsors Yale Forestry & Environmental Studies students to undertake research projects that increase our understanding of urban ecosystems.

Urbanization of New England Wetlands: Evaluating the Effects on Pond-Breeding Amphibians

Helen McMillan

Urbanization often causes wetland loss and alteration, which can have significant effects on amphibian populations that utilize wetlands for breeding and adult habitat. Reduced connectivity and density of ponds, alteration of the surrounding terrestrial habitat, and changes to the chemical, physical or biological characteristics of wetlands may all be possible contributors to decreases in amphibian populations. This study evaluated these potential causes of decline on two species of tree frogs in Connecticut: the gray tree frog (*Hyla versicolor*) and the spring peeper (*Pseudacris crucifer*). I surveyed 30 ponds located along an urbanization gradient in the Salmon River watershed of eastern Connecticut during the spring/summer of 2008. Many pond characteristics, such as salinity and the presence of fish, showed clear differences with increased urbanization. In contrast to other studies, I found amphibian diversity to be highest in suburban areas, likely due to the combination of more permanent ponds that many species require and the relatively close proximity to forested areas. However the factors that best predicted amphibian density varied with each species, indicating that in order to effectively protect amphibians a variety of habitats need to be protected.

Municipal Waste Management in Two Brazilian Cities

Norio Takaki

The present work compares municipal waste management practices in two Brazilian cities in terms of their

potential as mechanisms for the social inclusion of trash pickers. The Federal District, home to the Capital, is taking measures to implement an integrated waste management program that aims to improve recycling rates through curbside collection of separated recyclables and support the work of trash pickers through the creation of cooperatives. In contrast, the city of Porto Alegre has had such a program since 1990 and thereby constitutes a valuable reference framework for Brasília. The comparison focuses on the advances Brasília's cooperatives have achieved as well as the obstacles they face to

Perceived and Actual Urban Water Quality Risks

Lauren Adams

Ubiquitous non-point source (NPS) pollution is a dominant cause of biogeophysical degradation in urban catchment systems, the residual effects of which damage community health, safety and property values. Remediation of water resources contaminated by NPS requires both political participation as well as scientific information, particularly for drinking water supply sources, where the human impacts of NPS pollution are more acutely realized. To better understand the relationship



Trash pickers separating municipal solid waste in Porto Alegre.

establish themselves structurally and administratively. Some of the more important lessons learned from this investigation come from the recognition that Porto Alegre's program, despite its near twenty-year experience, has not contributed significantly to the social inclusion of trash pickers, neither in terms of income nor in terms of effecting operational and financial self-sufficiency amongst cooperatives. Since the situation in Brasília is still in a process of incubation, local stakeholders and institutions could use Porto Alegre's case as a cautionary example of the potential political and economic pitfalls facing the emerging system of cooperatives.

between the demand for clean water and the supply of scientific education and information, my research compared actual and perceived pollution risks within the urban Mill River watershed in New Haven, Connecticut to determine the magnitude and characteristics of the watershed's manufactured risk. The preliminary results from this study found that people have a difficult time describing their local water supplies both at the source and from the tap and that a general lack of interest in and understanding of the mechanistic links between watershed, human and ecosystem health prevails, despite people's intense preference for the trusted delivery of clean water supplies within their urban homes.

Motivating and Sustaining Urban Ecological Stewardship at the Neighborhood Scale: Case Studies in Three Baltimore Neighborhoods

Meg Arenberg

My research grant from the Hixon Center allowed me to spend the summer exploring the motivations and resources for sustaining neighborhood level urban ecological stewardship activities in the Madison/East-End, Southwest Baltimore and Pigtown communities of Baltimore City. Using the ethnographic methods of semi-structured interviews, oral history and participant observation, I gathered qualitative data from community members and institutional informants on past and present urban ecological stewardship projects in these three communities. I sought to supplement the on-going research findings of the larger-scale Baltimore Ecosystem Study and the Stewardship Mapping and Assessment Project by contributing a richer understanding of what motivates urban stewards to initiate neighborhood-scale projects and what resources, both material and social, they depend upon to sustain them. My

What's the best place to sunbathe, spot a black-crowned night heron, or avoid trampling a trout lily in East Rock Park? A new website, *East Rock Park: Inside and Out*, co-created by Hixon Fellow Haley Gilbert, makes it easy for park lovers to tag an interactive map with photos, recommendations, and more. Gilbert and other students spent months interviewing neighborhood residents and learning about the Park's history. Since the city of New Haven incorporated it in 1881, the park has housed a zoo, restaurant, hotel, and a tree-dwelling hermit who died of frostbite one winter. Add to the site at: <http://friendsofeastrockpark.org/map.php>



final paper includes both a typology of motivations for neighborhood-level stewardship and an analysis of the social and funding networks built around and depended upon by stewards in these neighborhoods.

East Rock Park: Inside and Out

Haley Gilbert

East Rock Park: Inside and Out is an interactive web based project empower-

ing local communities to map how they use a local park – East Rock Park. The website was created to explore emerging community mapping technologies and uses like neogeography. Since the introduction of geobrowsers, like Google Maps, the layperson has been empowered to create and share spatial information over the internet with ease. This project examines community mapping trends, the technologies associated with neogeography, and details the process of creating the Inside and Out website. Can community groups or neighbors band together to apply these technologies to map their communities and local ecosystems? Experience from the website and research supports the position that the technologies are easier to use, the financial investments have been reduced, and people are actively engaging with these types of interactive mapping websites. In conclusion, community groups and neighbors can create, engage and utilize interactive mapping websites. However, more research still needs to be conducted to learn if groups are using these sites to improve, enhance, or protect their communities and/or local ecosystems.



Neighbors in Pigtown taking care of the playground garden they created.

Community Carbon Fund

by
**Jennifer
Baldwin**

How can Yale and New Haven neighborhoods work together to fight climate change? Yale's Office of Sustainability's is trying to answer this question with its new Community Carbon Fund (YCCF), which is partnering with URI's GreenSkills program to offset local carbon dioxide emissions by planting trees and installing free energy efficiency packages in New Haven's West River neighborhood. The YCCF, a collaborative effort between the Yale Office of Sustainability and the Center for Business and Environment at Yale, was founded when graduate students participating in a Yale Clinic began exploring opportunities to develop carbon offsets by investing in local community projects.

"It is very exciting that this pilot project will be supporting local and innovative solutions to climate change. By engaging the local community and its residents to create real and meaningful greenhouse gas emission reductions, this pilot project could truly be sustainable model for addressing a complex global problem," commented Keri Enright-Kato, Sustainability Project Manager at the Yale Office of Sustainability.

Recognizing the opportunity to not only reduce greenhouse gas emissions, the pilot project will also evaluate opportunities to create "green jobs" within the local community. URI has

been a local leader in this arena, pioneering the GreenSkills training program, which teaches New Haven teens about urban environmental science and ecosystem services, in addition to life skills that are valuable in any workplace. Teens hired through this program will be planting the fifteen trees being placed in West River as result of this pilot project. The energy efficiency packages consist of compact fluorescent light-bulbs (CFLs), a programmable thermostat and a low-flow shower head and will be provided to 30 households. Installed by a local, certified electrician the energy efficiency package will save each household up to \$150 per year on their energy bills.

The "green jobs" movement has been at the forefront of national dialogue lately. President Obama demonstrated a commitment to expanding green skills training programs throughout the United States as part of the recently passed stimulus package. The President's New Energy for America plan will create "millions of new green jobs," including jobs in energy efficiency, weatherization, and renewable energy. Obama's plan also pledges to make the U.S. a leader on climate change by decreasing our nation's greenhouse gas emissions 80 percent by 2050. The Yale Community Carbon Fund pilot project hopes to contribute to these efforts by developing a community model that can be adopted by communities around the country.

The YCCF selected trees as a carbon offset measure because street trees "sequester," or "capture", carbon as they grow – while also making the community a healthier, more beautiful place to live and work. Street trees are chosen for their rapid growth, hardiness, and longevity, making them ideal candidates for carbon sequestration. The 15 street trees planted will store approximately 6.5 metric tons of carbon dioxide equivalent over their lifetime. (By comparison, every U.S. citizen emits approximately 20 tons of carbon per year).

While the YCCF will not sell the offsets created as result of this initial pilot project, it does hope to expand its model in the future and sell carbon offsets to Yale students, staff and faculty as a means to offset their travel and event related emissions. The funds received would then be reinvested to develop future offset projects resulting in a sustainable, local carbon offset market. And as GreenSkills interns gain more experience with "green jobs," their confidence in their ability to build a sustainable future will continue to grow.

Yale's academic excellence in fields that contribute to mitigating climate change, combined with its ability to put into practice its research, presents Yale, its students, and the local community an opportunity to address a pressing global issue through efforts such as the pilot project conducted by the YCCF. A unique approach to both reduce greenhouse gas emissions and enhance current efforts made by local residents to solve global warming, the YCCF ultimately hopes this project will contribute to national and international dialogue about the value of investing in local community carbon offset projects.

Jennifer Baldwin is a first year Master of Environmental Management candidate at the Yale School of Forestry and Environment Studies. A passionate advocate for developing solutions to address climate change, the advancement of the carbon market is a major focus of her academic studies at Yale.



West River neighbors participate in an informational meeting about the YCCF pilot project.
Photo: Keri Enright-Kato

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