

Stormwater as Entertainment

Integrating stormwater management with the urban landscape



Photo: City of Portland
A piece from the exhibit Landscapes for Rain: The Art of Stormwater

By Margaret Buranen

Cities trying to comply with the public education requirement of their National Pollutant Discharge Elimination System (NPDES) permits know how important the public education and outreach components are, so they print lots of brochures to hand out during tours and local events. Often, they post stormwater information on their Web sites as well.

Portland, OR's Bureau of Environment Services (BES) also prints brochures and posts helpful information on its Web site, but this municipal agency does more than just give residents the facts about managing stormwater runoff and pollution. Maybe that is because Portland has so much more stormwater to cope with (37 inches of annual rainfall) and on more days of the year.

In any case, the city's BES does more than the obvious to meet the NPDES requirement for public education and outreach. It gives Portland residents the chance to learn about stormwater by interacting with it in a number of entertaining and interesting ways.

BES director Dean Marriott, commissioner of public utilities Sam Adams, and some of the BES employees have created opportunities for Portland residents to have fun while learning about sustainable best management practices (BMPs) for dealing with stormwater. Other cities could easily emulate Portland and make stormwater the *raison d'être* for some art, physical fitness, sightseeing, and special events.

Portland connects stormwater to physical fitness well, involving both children and adults. BES staffers designed a tour for bicyclists and then printed a brochure to show them how to cycle around the city for close-up views of some interesting sites related to stormwater. The route follows streets with less traffic, and those streets with heavy traffic are clearly marked.

"Stormwater Cycling" is a two-page leaflet (also downloadable from BES's Web site). It's billed as "a pedal-powered tour of some of the innovative ways Portlanders handle stormwater." Within the leaflet are brief descriptions of the 21 numbered sites on the map page. They read almost like a treasure map: go to ___ and look for ___.

"The bicycle tour is our most popular tour publication, receiving Web hits that consistently put it in the top five interested categories," says Emily Hauth, project manager for the Sustainable Stormwater Management Program at BES.



Photo: City of Portland
Portland Green Streets at SE 12th and Clay

“Portland is a big bicycling town, and our citizens are very tuned in to our stormwater management issues. We also get support from staff in the city’s Bureau of Transportation; they lead regular biking tours, which often include stormwater management features,” Hauth adds.

At site No. 10, the da Vinci Water Garden on NE Everett Street, the cyclists should look for aboveground cisterns that collect water from disconnected downspouts. “Runoff from the roof and the parking lot is directed to an abandoned tennis court that was converted into a beautiful water garden,” the entry reads.

At site No.16, the New Seasons Market on SE 20th Avenue and Clinton Street, cyclists find interconnected swales collecting runoff from three points: the roof, an outdoor plaza, and the parking lot. When it is raining, visitors can see what might best be described as “performance art”: one downspout opens over a sculpture, thereby giving it a shower.

Runoff from another downspout at New Seasons flows into a stormwater planter. The Green Street (a nationally recognized program in Portland) design along nearby Division Street collects runoff from the road.

The People’s Food Co-op on SE 21st Avenue (site No. 15) features two ecoroofs (aka green roofs). Like a tour guide’s insider tip, the brochure suggests that the cyclists ask to look from the community room for a better view. Also worth seeing are downspouts from the roof that drain to an underground cistern, the cob walls and benches, and the pervious pavement in the courtyard.

Sunnyside Elementary/Environmental School at 3421 SE Salmon Street (site No. 11) shows cyclists and other visitors how sustainable stormwater techniques not only fit in, but also improve things. The school’s outdoor basketball court features strips of porous concrete. That means that the students don’t have to wait around so long for the court to dry after rainfall. Visitors to Sunnyside also find landscaping with native plants, cob structures, and art projects.

While the sites draw attention to various ways that the city and private property owners are managing runoff, the tour also gives cyclists a clear picture of the serious problem that too much stormwater presents. At site No. 3, along the Eastbank Esplanade, are the CSO (combined sewer overflow) outfall pipes that carry sewage and stormwater into the Willamette River during storms.

The cyclists’ tour ends at the Willamette River (site No. 21). Along the bike path there, they can read signs that explain how stormwater runoff affects the river, its tributaries, and Portland’s water supply.

The tour brochure lists major pollutants and contact information for various municipal departments and private organizations. BES hopes that after cyclists see the stormwater sites, they will want to become part of the solution instead of part of the problem. With that in mind, the brochure’s resource list includes the Web addresses for a guide to rain barrels, the Downspout Disconnect Program, and Community Watershed Stewardship Grants for neighborhoods and organizations.

Fitness via stormwater is not limited to bicyclists. The BES Web site also includes downloadable directions (also available as printed brochures) for three separate walking tours of sites that use innovative ways to manage stormwater.

The Portland State University (PSU) walking tour also describes stormwater’s major pollutants and explains how green streets, stormwater planters, ecoroofs, and trees help lessen both runoff volume and pollution. Nine separate places on the downtown campus show the walker how stormwater can be managed.

The Park Blocks (site No. 1), where elms, poplars, and other large trees grow, are Portland’s first parks. The city started planting trees there in 1877, and now, more than 300 trees grow in the section closest to campus. The canopy of these mature trees intercepts about 30% of the rain that falls on it. In 2004, PSU students working on a research project estimated that the South Park Block trees contribute over \$3 million dollars in natural beauty and environmental value to Portland.

PSU students built several structures on campus to study natural building materials and structural design. They used recycled local materials and cob—a mixture of sand, clay, and straw similar to adobe. Ecoroofs top these structures. Nearby, the university’s Native American Student and Community Center (site No. 3), at 71 SW Jackson Street, features a rooftop garden. This garden adds beauty, provides insulation to the building, and captures stormwater.

Visitors who walk along the plaza beside Epler Hall (site No. 4) at SW 12th Avenue and Montgomery Street can see parts of an innovative stormwater system. Roof runoff from this building flows to river-rock splash boxes then into granite-block-lined channels, or runnels, which send it into vegetated stormwater planters. The runnels also collect runoff from surrounding pavement and planters from the King Albert Hall roof. The water then goes to an underground storage vault.

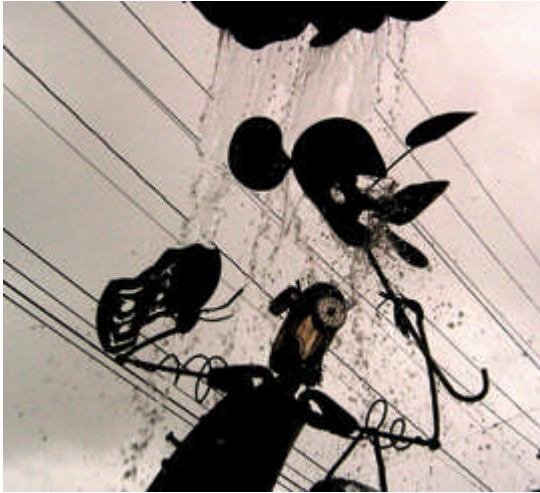


Photo: City of Portland
The rain man sculpture at New Seasons Market

After additional sand and UV filtering, the water is pumped inside and used for flushing toilets on the first floor of Epler Hall, and also used to irrigate the landscape around the building. The system saves over 100,000 gallons of potable water each year.

Another stormwater walking tour in Portland focuses on the Hosford-Abernethy neighborhood. Hauth says that this walking tour brochure "was specifically requested by the neighborhood residents so they could promote the facilities themselves."

Photos and brief comments explain how ecoroofs, naturescaping, planters, swales, and rain gardens manage stormwater. There is a plug for Portland's Downspout Disconnection Program with a phone number to call.

This neighborhood walking tour concentrates on five locations, with an additional five nearby, for walkers who have the extra time to spend. The Urban Grounds Coffee Shop (site No. 1) at SE 12th Avenue and Division Street might be a better choice for the final stop of the tour instead of being the first. Its planting strips along Division Street show how both runoff and pollution are absorbed from the adjacent sidewalk.

St. Philip Neri Church, (site No. 2) at SE 16th Avenue and Division Street has a vegetated swale to absorb stormwater from the parking lot. The New Seasons Market and the People's Food Co-op (site No. 3 and No. 5) are also featured on the stormwater cycling tour for their various stormwater features.

At the Local 49 Building (site No. 4), SE 21st Avenue and Clinton Street, stormwater from the roof drains into a sculpted waterfall, flows through a planted courtyard, and then into a drywell. Visitors can also see a planting strip along the street to absorb runoff.

A third walking tour covers Portland's signature stormwater project, its Green Streets program. The first Green Street, SW 12 Street, won the 2006 ASLA General Design Award of Honor. This project was described in the January/February 2007 issue of Stormwater.

The highlight of the Green Streets program is the way that onsite stormwater management is integrated with an urban setting. The comprehensive approach uses different low-impact development (LID) strategies at different sites. Some of the seven locations on the Green Streets tour are included in other tours, such as PSU with the innovative vegetated street planters and New Seasons Market with its green roof and other LID techniques.



Photo: City of Portland
A runnel from a downspout at Mt. Tabor Middle School rain garden

Although the seven locations are too far apart for walking in one afternoon, the tour could be divided and the locations viewed separately. The BES Web site explains the city's guiding principle of managing stormwater with LID strategies that must be attractive to the public. Photos and shaded sidebars listing the benefits of the LID techniques appear for each particular project. Costs are also included, along with community partners where applicable.

The BES Web site offers people another entertaining way to learn firsthand about stormwater: a tour of ecoroofs or green roofs in Portland. Hauth says that in 2008, BES updated the ecoroof tour book to coincide with a series of ecoroof seminars that were open and free to the public.

This lecture series variation of stormwater-as-entertainment "was so popular that we placed people on a wait list for a second series we'll offer," Hauth adds. Because the very popular stormwater cycling tour includes some ecoroof sites, "we assume ecoroofs are a popular site to visit as well."

In 1996, Tom Liptan, a landscape architect with BES, installed a green roof on top of the regular roof on his garage and monitored the amount of runoff it soaked up. The statistics from Liptan's research helped give Portland a head start among US cities using green roofs.

More ecoroofs have been added each year since. Whether people are just curious to see what an ecoroof looks like, or whether they are planning to install one on their property, they can see a variety of green roofs on this tour.

The 13 green roofs, plus a few nearby sites with other stormwater features, are grouped by location. The Pearl District, Downtown, and Inner Eastside offer enough sites to fill an afternoon, and there is also one site in Beaverton. Most of the places with ecoroofs have additional stormwater management or green features to see as well.

Information about the tour includes a history of ecoroofs in Portland and an explanation of why managing stormwater onsite helps protect the Willamette River and its streams. For each location, a visitor finds an overall description, names, and contact information for landscape architects, engineers, and property owners; a photograph; and details of public access.

Additional facts for each site include the roof's size, slope, solar exposure, soil mix, depth, stabilizer, weight, type of plant(s), waterproof barrier(s), type of structure, cost, funding source(s), irrigation plan, and overflow route.

One interesting profile on the tour is for the Hawthorne Hostel Ecoroof. This ecoroof is described as the most visible one in the Portland area. Members of the community retrofitted a green roof onto the roof above the porch of the 95-year-old Victorian house that is home to the hostel. Signs along the sidewalk educate pedestrians about the project and stormwater management.



Photo: City of Portland

A piece from the exhibit *Landscapes for Rain: The Art of Stormwater*

Another ecoroof on the tour is that of the Ecotrust Building, an 1895 warehouse that earned a LEED Gold rating for its remodeling. It was the first project in Oregon, and the first historic renovation, to earn a LEED Gold rating. Stormwater that is not handled onsite by the green roof drains from downspouts to bioswales in the parking lot. Visitors can climb an outside staircase and enjoy views of the city along with the ecoroof.

Not everyone in Portland will snatch up a brochure about a walking tour or download the bike tour to go see stormwater locations. Portland's BES staff members have found that they can also entertain and educate the public by linking stormwater with art.

The department's traveling art exhibit is called "Landscapes for Rain: The Art of Stormwater."

Hauth describes the exhibit as "a unique and creative format to draw people's attention to the use of stormwater as a resource, not a waste." To obtain artwork, she says, "We targeted the artists based on their work that we see around town that incorporates stormwater in some way."

BES has received compliments on the exhibit, and the Web site has received "several hundred hits in the last year," says Hauth. "I had individuals from other states inquiring about the exhibit and telling us how much they liked it."

In 2008, this exhibit was seen by thousands of visitors at several locations, including the Cup and Saucer Café, the Ecotrust Building, and the 15th annual Division/Clinton Streets Fair. The exhibit also hung at People's Food Co-op, a location on several of the stormwater tours.

The stormwater art exhibit opened at the Belmont Branch of the Multnomah County Public Library. Bridget Cain-Bushman, supervisor at Belmont, says that this library was chosen for the exhibit because "our neighborhood's citizens have used some of the water features displayed. For example, one of our employees remarked that she recently incorporated 'rain chains' from her downspouts on her patio. This type of use is fairly common in this neighborhood."

Cain-Bushman says that she was impressed with the different ways downspouts, driveways, paving stones, and other elements have been used to divert rainwater. "There were many artistic elements in the various designs. I particularly liked the plants growing out of the downspouts—having greenery where you least expected it was neat."

Locations and dates for the exhibit are listed on the BES Web site. The name and number of the person to contact to procure the exhibit is also given, along with a link to download a guide to the exhibit. The guide contains a photo and brief description for each work of art. Also included are links to artists, architectural and landscape architectural firms, and other public works of art.

Photographs in the exhibit tempt viewers to go see Tanner Springs Park, an urban refuge for residents and wildlife, with wetlands, a bubbling spring, and native plants. The 10th @ Hoyt Apartments, by Koch Landscape Architecture, shows the influence of Persian gardens in its creative approach to stormwater collection and detention.

Downspouts are a necessary and practical part of stormwater management. Most people think of them only in terms of function. But in Portland, and other areas of the Northwest, downspouts go beyond the practical to become works of art. Nowhere is that more apparent than in the sometimes dramatic, sometimes whimsical, creations of metal smith Vladimir Sumchenko.

An artist working with copper, Sumchenko creates completely functional yet eye-catching downspouts in the forms of a blue heron and frog, a salmon on a wave, a dragonfly, a flying goose, twin elephants, and a tulip. To see photos of these and other works by Sumchenko, visit www.artofrain.com.

The Portland exhibit includes a photograph of his waterwheel and salmon downspout. In some models, rainwater flowing down the downspout and out from the salmon's mouth powers a hidden waterwheel, which continues the sound of falling rain.

Another exhibit photo shows a stone sculpture of a turtle embryo, one of several sculptures that collect rainwater for birds, near a system of bioswales. Fernanda D'Agostino and Valerie Otani were the sculptors, and Lango Hansen Landscape Architects designed the bioswales. Another exhibit photo features sleek sculptures by Valerie Otani and Brian Borrello that collect stormwater and also pay tribute to the ship building history of nearby Swan Island.

Seeing the exhibit's photographs of the varied practical, but very artistic, ways of managing stormwater is, of course, an invitation for the viewer to go see the locations in person, or at least to read more about them.

Municipal officials aren't the only Portland residents who see the entertainment potential of stormwater as a way to engage the public's attention. The National Meeting Company's headquarters is another Portland site that manages stormwater in a practical and innovative way. This firm manages corporate events from a building owned by the Portland Development Commission.

The building has served as headquarters for a dairy, an ice cream manufacturing company, and a bakery. Waterleaf Architecture & Interiors designed a 30,000-square-foot renovation for the building. All developments receiving funding from the PDC have to meet LEED certification standards.

Along with natural ventilation, extra daylight, landscaping with native plants, and recycling of demolished concrete into a retaining wall, the building features a disconnected downspout. Rainwater cascades like a waterfall from the roof before flowing into an infiltration swale. People walking by can't help but see the waterfall and, if they get close enough, feel the spray.

Attracted by the noise and splash of the water, they will notice the signs that explain the sustainable way of managing stormwater by keeping it out of Portland's overworked storm and sewer system. The waterfall created by runoff from the roof and the runoff from the parking lot (which flows into a dry well with a subsurface gravel layer for infiltration into the soil) both demonstrate that private companies can engage the public's attention with stormwater and, thus, show possible sustainable solutions.

BES offers still more entertainment for Portland residents. Besides the brochures for the walking and bicycling tours, the department's Web site includes other free, downloadable gifts, such as a poster of scenes from various Green Streets across the city. And for Portlanders who don't want to risk getting their feet wet in a downpour—or who don't have bicycles—the BES Web site has a virtual tour of the Green Streets.

For each of the past two years, BES has created a new calendar with an attractive photograph of a different local sustainable stormwater management or watershed improvement project for each month. Some of the calendar's photos are taken by BES staff members; other photos are submitted by designers and landscape architects in the area. BES also offers printed copies of this popular calendar.

Readers might wonder how Portland's BES thinks up the many ways to entertain and, hence, connect with the public. "Most of the tours and the art exhibit originated in house with input and ideas generated by various members of the staff," Hauth explains. "Usually there is a high level of support from the neighborhoods, institutions, and organizations in the surrounding area."

BES also takes advantage of opportunities to participate in events organized and staged by other organizations. One example is the Welcome The Rain! event that was held for the first time in 2008 at the beginning of the fall, rainy season. Along with information about stormwater solutions, BES staffers offered bike tours near the festival site to call attention to swales and other sustainable BMPs. Stormwater, as art, was included as a rain sculpture contest for artists from Oregon, Washington, and Idaho.

BES also offers bike tours at the Muddy Boot Organic Festival. This festival, to celebrate local organic foods and sustainable living, is held at St. Philip Neri Church, one of the sites on various stormwater tours. Live music, food vendors, workshops, and other activities draw a larger crowd each year.

BES also joins with other Portland municipal departments to engage and educate the public in entertaining ways. The city's collaborative Grey to Green strategy involves investing "an additional \$50 million in green infrastructure in the next five years," says Hauth. "These added funds will create more ecoroofs and green street facilities, add more street and yard trees to Portland

neighborhoods, step up efforts to combat invasive vegetation and restore native plants, and help acquire and protect more sensitive natural areas.”

As Hauth says of Portland, “Seems there is always something going on here!”

Topics: [Program management](#), [Low-impact development](#), [Watershed projects](#)
