

Grey to Green Strategies



Ecoroofs

An ecoroof is a vegetated roof system that decreases stormwater runoff, reduces building energy consumption, and provides habitat.



Green Streets

Green Streets are vegetated curb extensions or streetside planters that collect stormwater runoff, reduce stormwater flow to sewers, provide wildlife habitat and neighborhood green spaces, and restore groundwater supplies.



Trees

Trees hold rainwater to reduce stormwater runoff volume, filter air pollutants, provide habitat, absorb carbon to reduce greenhouse gases, and stabilize the soil to reduce erosion.



Invasive Removal

Removing invasive vegetation such as English ivy improves water quality, habitat and tree cover.



Culvert Removal

Replacing culverts that impede fish passage improves fish habitat and reduces flooding and erosion.



Land Purchases

Public acquisition of natural areas protects them from development, preserves watershed and floodplain functions, and preserves habitat.



Planting in Natural Areas

Restoring native plants in natural areas reduces stormwater volume, improves habitat, filters pollutants, and cools the air, pavement, and streams.

WS 1017 March 2010

GREY to GREEN

Portland's Grey to Green Initiative accelerates city investments in strategies that mimic natural systems to manage stormwater at its source. These strategies help enhance ecosystem services that improve health and community livability, reduce energy use, and counter climate change.

Ecosystem Services Benefits

Ecosystem services are the benefits we derive from natural ecosystems, including clean water and air, healthy habitat for wildlife and people, and many other environmental benefits.



ENVIRONMENTAL SERVICES
CITY OF PORTLAND
working for clean rivers

Dan Saltzman, Commissioner
Dean Marriott, Director

Beyond Watershed Health

Grey to Green strategies will help meet Portland Watershed Management Plan goals of improving watershed health, water quality, and fish and wildlife habitat. Additional benefits include improving public health and community livability, and saving energy.

The Bureau of Environmental Services convened a group of experts to study and quantify these additional benefits. The panel identified the following benefit categories, and determined a way to measure the impact of the Grey to Green Initiative on each category.

Additional Grey to Green Benefits

Benefit	Benefit Category
Health	<ul style="list-style-type: none"> ✓ Air Quality Improvement ✓ Increased 'Greenness'
Energy and Carbon Sequestration	<ul style="list-style-type: none"> ✓ Energy Savings ✓ Greenhouse Gas Reduction ✓ Carbon Sequestration
Community Livability	<ul style="list-style-type: none"> ✓ Amenity/Aesthetics Improvements ✓ Community Cohesion ✓ Access to Nature ✓ Environmental Equity

The report *Portland's Green Infrastructure: Quantifying the Health, Energy and Community Livability Benefits* presents the panel's findings in detail. This is a summary of the findings.

Environmental Services
503-823-7740
www.portlandonline.com/bes



Benefits for:

Health

Vegetation improves air quality, which may relieve respiratory symptoms. A greener environment may improve physical and mental health.

✓ Air Quality Improvement

Inhaling tiny particles of soot, dust, smoke, fumes and aerosols can cause health problems. Vegetation filters these particulates and other pollutants to improve air quality. Grey to Green projects could reduce harmful particulate levels by more than 17 tons per year.

✓ Greenness

Grey to Green projects add trees and other vegetation to make our surroundings greener. Some studies indicate that increasing greenness encourages more walking and other physical activity, has mental health benefits for children and adults, and reduces obesity and mortality rates.

Benefits for:

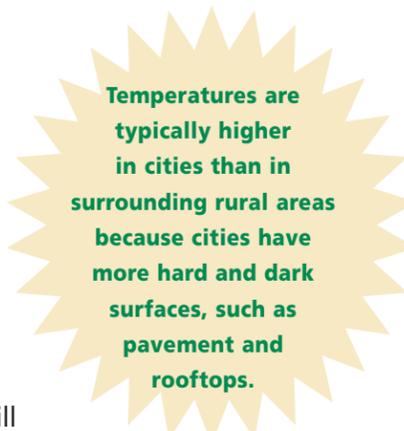
Energy and Carbon Sequestration

Trees and other urban vegetation reduce stormwater volume, cool the air, shade and insulate buildings, and absorb and hold carbon from the atmosphere. The energy savings and carbon sequestration reduce greenhouse gases.

✓ Energy

Swales, rain gardens and planters that manage stormwater onsite keep runoff out of the sewer system to reduce the volume of wastewater pumped and treated. That conserves energy and saves money. Grey to Green projects could save about 277,000 kilowatt hours (kWh) annually, enough energy to power 25 Portland homes a year.

A kilowatt hour (kWh) is a common energy unit used to meter electricity. The average Portland home uses 10,800 kWh per year.



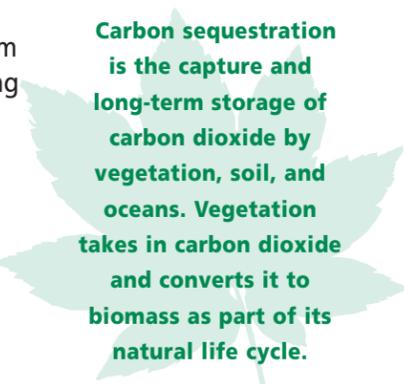
Vegetation cools the air to reduce the urban heat island effect, ecoroofs insulate buildings and trees shade buildings. Grey to Green projects will reduce the energy used to heat and cool buildings by more than 650,000 kWh annually, enough energy to power 60 homes a year.

✓ Greenhouse Gas Reduction

Altogether, these energy savings will reduce annual greenhouse gas emissions in Portland by over 280 metric tons, or the amount of emissions from consuming over 31,000 gallons of gasoline.

✓ Carbon Sequestration

Vegetation removes and stores carbon dioxide from the atmosphere. Removing invasive vegetation can also reduce decomposing organic matter, which releases carbon into the atmosphere. Vegetation added by Grey to Green projects will sequester an estimated 8,800 metric tons of carbon dioxide annually, or the amount of carbon dioxide sequestered annually by nearly 1,900 acres of pine or fir forest.



Benefits for:

Community Livability

The Grey to Green Initiative increases access to natural areas, social connections, recreation and walkability, and may help reduce crime.

✓ Amenity/Aesthetics Improvements

Grey to Green projects improve neighborhood aesthetics and increase property values. A Seattle study found that adding green streets and

removing culverts in neighborhoods increases property values by up to five percent. A Portland study found that a tree in front of a house increases the home's value by more than \$7,000.

✓ Community Cohesion

Grey to Green projects that add vegetation and create inviting urban green spaces may bring neighbors together. Green spaces encourage people to be outside, which promotes contact among neighbors. Some studies indicate that trees and vegetation are associated with lower crime rates.

✓ Access to Nature

The Grey to Green Initiative increases public access to trees, vegetated swales, views of ecoroofs, and wildlife.

✓ Environmental Equity

Grey to Green projects in low income and minority neighborhoods can enhance environmental equity in Portland. Projects are planned throughout Portland, ensuring that these neighborhoods will not be underserved.

Moving Forward

The benefits described in the report, *Portland's Green Infrastructure: Quantifying the Health, Energy, and Community Livability Benefits*, will help guide decisions and funding priorities for future green stormwater management investments. Complete details of this project, including participants, citations, and resources, are included in the report. Environmental Services will assign monetary values to the benefits to provide a common unit for comparing costs and benefits. This research will help ensure that future investments contribute maximum benefits to watershed and community health.