

Approaches to Residential Stormwater Management Retrofits

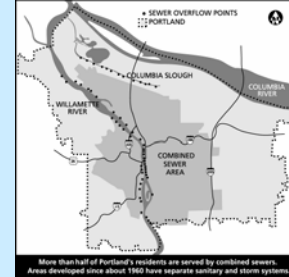
ACWA Education Summit
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 Watershed Division, City of Gresham**

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 BES, City of Portland**



Downspout Disconnection Program



Program History

- 1991: BES proposes a 20-year, \$1.4B CSO Management Plan:
 - Cornerstone projects (sumps, stream and stormwater separation, downspout disconnection)
 - Columbia Slough Big Pipe
 - West Side Big Pipe
 - East Side Big Pipe
 - Treatment plant expansion
- 1993: Two years of pilot testing with residential properties
- 1995: Program adopted by Council
- 2004: Program expands to include small multifamily and commercial sites



Program Goals

- Meet CSO Plan performance goals by deadline
 - Low cost, effective and meeting safety standards
- Community engagement through one-time per downspout financial incentives
 - Technical assistance and reimbursement to property owners
 - Community groups receive reimbursement to disconnect at no cost to property owners
 - Gutter contractor completes more complicated work at no cost to property owners



Performance Goals

Program Area	Approach	Deadline	Original Goal	Completed Rate
Columbia Slough	Voluntary	2000	51%	54%
St. Johns	Mandatory	1999	80%	86%
Sellwood	"Voluntary"	2006	70%	72%
Willamette	Voluntary	2011	1127 acres	1065 acres to date




Cost effectiveness

1993 Projections	2009 projections
\$55M	\$13M

Site Averages
 2 downspouts per site (safety standards)
 60% roof managed
 Over 52,000 downspouts disconnected!


Average Costs
 \$430 per property
 \$215 per downspout
 \$0.02 per gallon



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Outreach

- Ease and simplicity of solution
 - Every downspout makes a difference
- We only pay for work that is safe
 - Established safety standards
 - Only 31 risk claims out of 26,000 sites
- Consistent and persistent messages
 - Emphasize direct connection to river
 - 14 years of publications and door-to-door canvassing



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Other financial incentives for private property retrofits

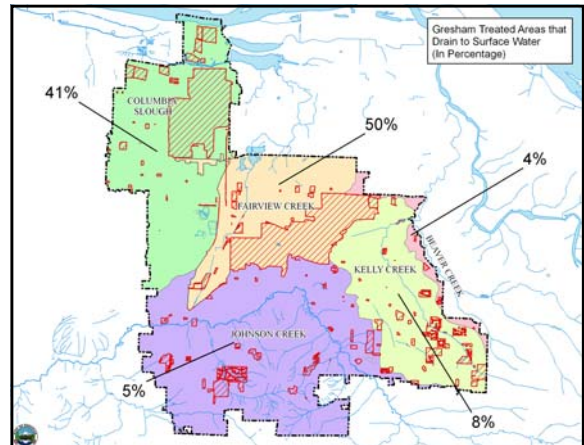
- Clean River Rewards
 - Ongoing onsite stormwater utility fee discount
 - Residential accounts: up to \$7/mo
 - MFR/Commercial accounts: up to \$3/1,000 ft²
 - At startup, required 18% utility fee increase to be revenue neutral
- Ecoroof Grant Program (**New!**)
 - Reimburse up to \$5/sq. ft.
 - Grant applications due twice a year

Retrofit Analysis

Limiting Factors

- Treated Areas v. Untreated Areas
- Watershed Regulatory Drivers (TMDLs)
- Soil Capacity
- Staff and Money
- Public Land v. Private Land







COLUMBIA SLOUGH WATER QUALITY FACILITY

- \$2.9 M in CIP Costs
- Over \$2M estimated value of donated land



BOEING LAND DONATION AREA



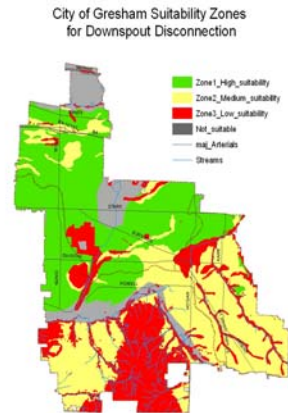
Tool Box

- Capital Improvement Projects
- Free Technical Assistance & Parts
 - AmeriCorps Volunteers
 - College Students
 - Nonprofit group partners (watershed councils)
- SW Fee Rebates
- Incentives to home owners (checks)
- Grants



Summer 2009 Downspout Disconnect Pilot Testing

- PSU Capstone Students
- Train to Conduct Outreach and Initial Approval
- Staff Verification of Work
- Purchase Parts in Bulk
- Monitor w. Flow Gauge
- 14% reach = 2M gallons/yr diverted

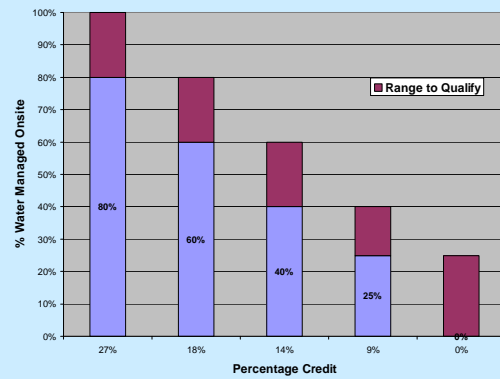


Stormwater Fee Rebate

- \$8.60 Base Monthly Charge
- 27% Max Credit/\$28/yr
- Downspout Disconnects, Drywells, anything that reduces EIA



Customer Rebate for Onsite Stormwater Management

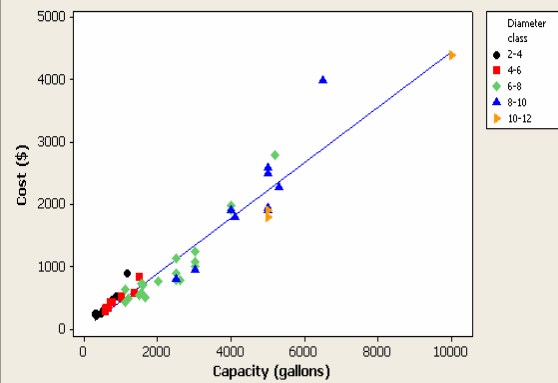


Stormwater Catchment

- Rain Barrels ?
- Cisterns



Cistern Cost Analysis



Planning for the Future

- Creating standards that encourage or allow water reuse as a footprint offset
- Marginal cost to the developer—major costs to the homeowner



Reverse Auction

- US EPA-Shepherd's Creek Watershed, Cincinnati, OH
- Utilized an auction to use limited budgets to cost-effectively allocate residential stormwater bmps
- Results: 85 rain gardens, 174 rain barrels on 105/350 (30%) eligible properties

RainScapes Rewards!

For your yard...
your watershed...
your community

Montgomery County, Maryland



2008 RainScapes Natural Drainage Project Rebate Application



RainScapes Rewards Application 2008

City of Palo Alto

Fee Increase Funds a Retrofit Program with a budget of \$125,000/yr

(\$1000 residential \$10,000 for commercial)



\$50/rain barrel or \$.15/gallon of water diverted for a cistern



\$1.50 sq ft for permeable pavers or ecoroof



Table 5.1.1 Summary of bids for rain gardens and rain barrels in 2007 and 2008

	2007	2008	Total	% Change
Rain gardens				
Number of bids	57	37	94	-21.3
Minimum bid	\$0.00	\$0.00	\$0.00	0.0
Maximum bid	\$500.00	\$1,000.00	\$1,000.00	50.0
Mean bid	\$58.16	\$88.54	\$70.12	43.3
Mean bid excluding max	\$50.27	\$63.22	\$60.12	21.5
Number of \$0 bids	30	16	46	-30.4
Percent \$0 bids	52.6	43.2	48.9	-19.2
Rain barrels				
Number of bids	63	45	106	-17.0
Average number of barrels per bid	1.9	1.7	1.8	-11.5
Minimum bid (per barrel)	\$0.00	\$0.00	\$0.00	0.0
Maximum bid (per barrel)	\$500.00	\$250.00	\$500.00	-50.0
Mean bid (per barrel)	\$32.06	\$44.30	\$36.44	33.6
Mean bid excluding max (per barrel)	\$24.51	\$34.74	\$32.03	31.9
Number of \$0 bids	38	20	58	-31.0
Percent \$0 bids	60.3	44.4	54.7	-29.0

Private Facilities

120 Total Facilities* (ponds, swales, rain gardens, black boxes)

16 were built before the 1999 requirements for maintenance agreements

62 have maintenance agreements

17 are under active construction or are being processed

25 are in arrears

Sustainable Planning

- 3% Acres are Treated by Private Facilities
- 20% Acres are Treated by Public Facilities
- Adding more public facilities over time will require additional staffing
- Adding more natural resource-type facilities requires a lot of manual labor to control invasives OR requires the use of herbicides—what is a safe and appropriate balance?