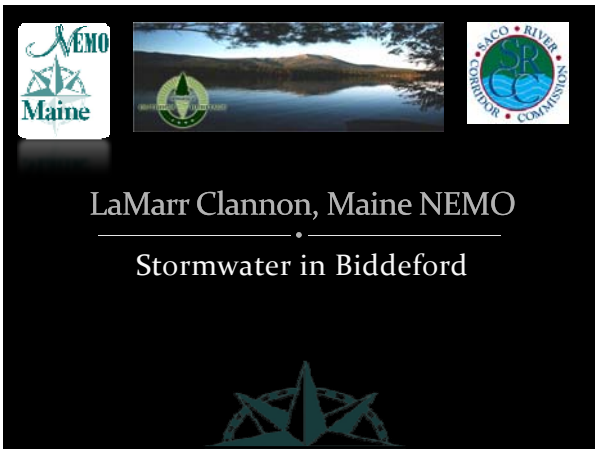
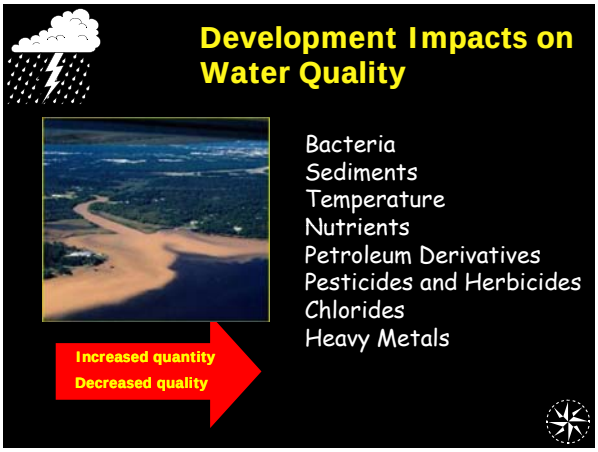
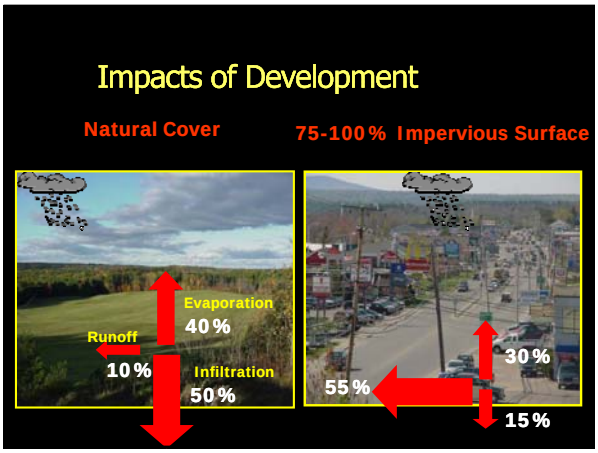

NEMO
Maine
SACO RIVER CORRIDOR COMMISSION
LaMarr Clannon, Maine NEMO
Stormwater in Biddeford


Nonpoint source pollution: When it rains, pollution happens.


Development Impacts on Water Quality
Bacteria
Sediments
Temperature
Nutrients
Petroleum Derivatives
Pesticides and Herbicides
Chlorides
Heavy Metals
Increased quantity
Decreased quality


Impacts of Development
Natural Cover
75-100% Impervious Surface
Evaporation
40%
Runoff
10%
Infiltration
50%
30%
55%
15%


What makes an impact?
2 Acre Residential
10% impervious

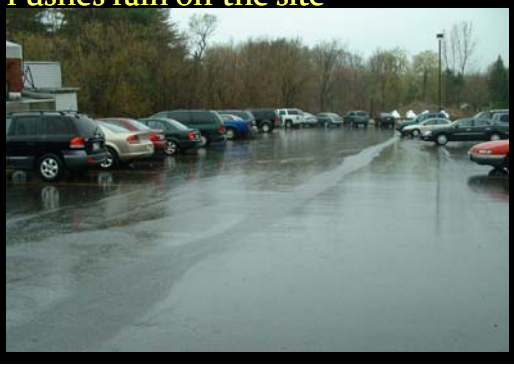
Impervious Area and Stream Habitat

Traditional Development
Pushes rain off the site

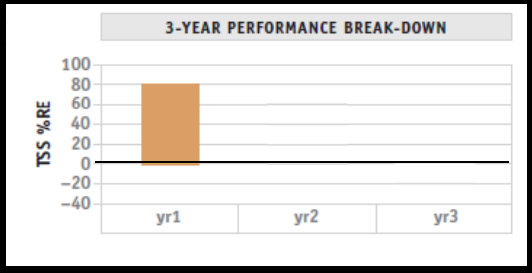
Traditional Development
Pushes rain off the site

Traditional BMP's don't work well

Traditional Development
Pushes rain off the site



Retention Pond without Maintenance



Your Stormwater Management System

- Road Ditches
- Culverts
- Pipes
- Catch Basins
- Curbs and Gutters
- Detention Ponds

Owned or Operated by the Town
Discharge Directly to Surface Waters, or Wetlands

Maintenance

Maintenance

Maintenance

Cost of deferred maintenance and undersized infrastructure

Projected Culvert Replacement $28,000

Cost to repair $93,000

Maintenance

Chicago Tribune

NEWS

Insurance co. sues Will County, 12 towns over flood damage

April 29, 2014 | By Geoff Ziezulewicz | Tribune reporter

...fundamental issue in this action is whether the Defendants have failed to safely operate retention basins, detention basins, tributary enclosed sewers and tributary open sewers/drains for the purpose of safely conveying stormwater,

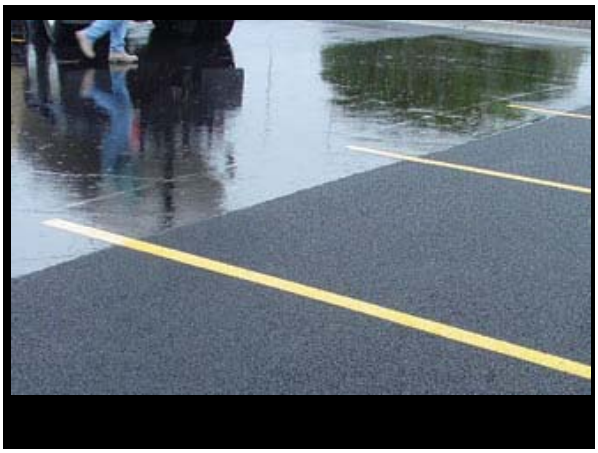
How do we pay for it?

Your Stormwater Management System

- Road Ditches
- Culverts
- Pipes
- Catch Basins
- Curbs and Gutters
- Detention Ponds

- Swales
- Floodplains
- Wetlands

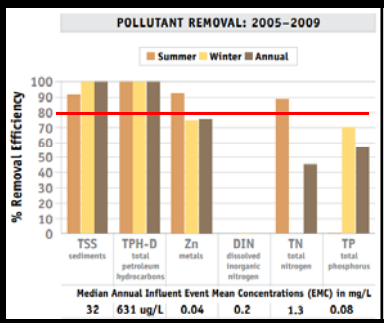
} FREE!



Low-Impact Development (LID)—
Try to soak rain in close to where it falls

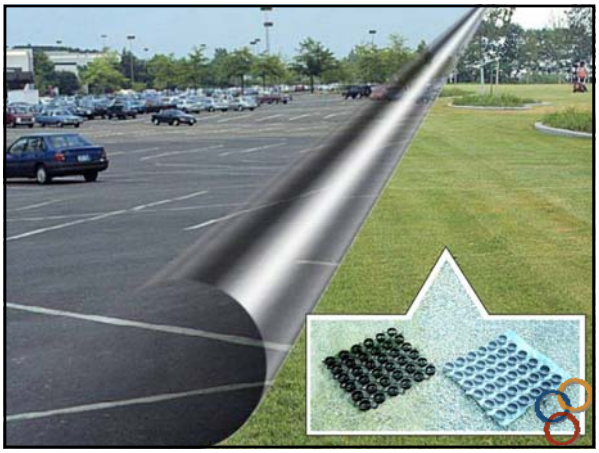
Porous Pavements

Porous Asphalt ○ 2008 $2.80 sf ($2.25)



Roberts Maine Grill, Kittery

Sidewalks and roadways can infiltrate stormwater

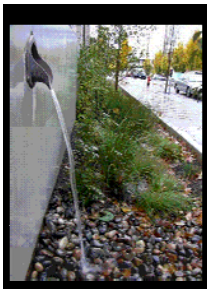


Soak in Roof Water

It Works!

Roof Runoff is very clean- soak it back into the ground!

- Recharge groundwater



Rain Gardens

Beautiful treatment

Designs can vary to fit many situations

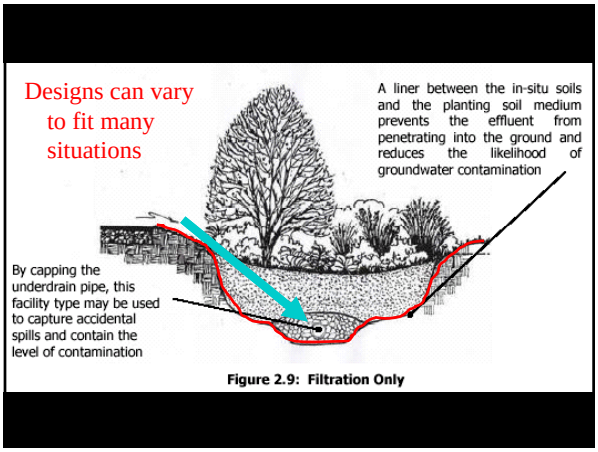
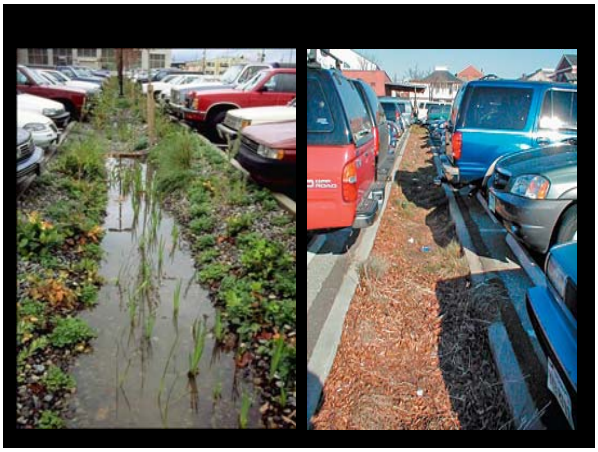
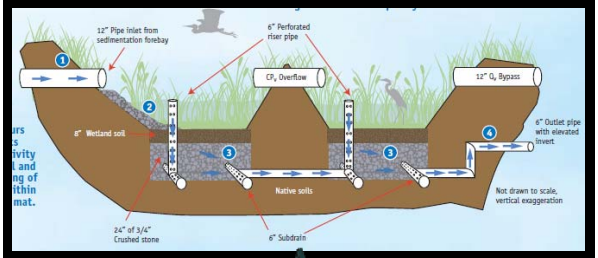


Figure 2.9: Filtration Only

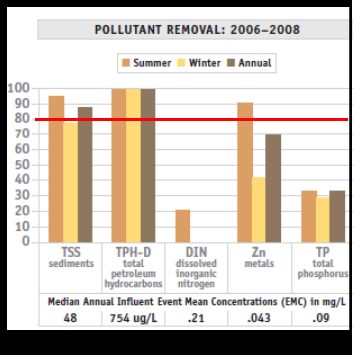


Subsurface Gravel Wetland $22,500/acre

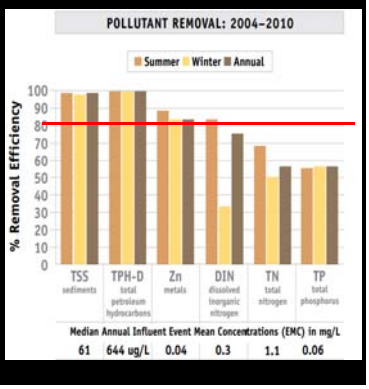
Subsurface Gravel Wetland



Bioretention Systems $18,000/acre

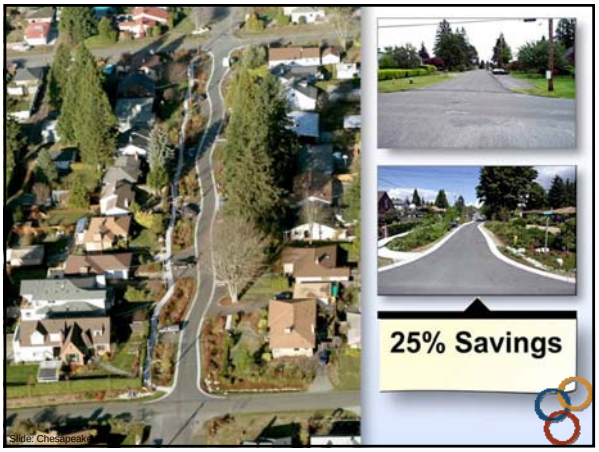


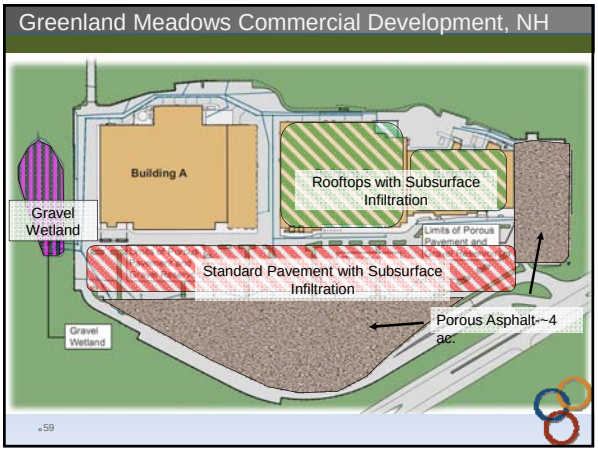
Subsurface Gravel Wetland $22,500/acre




Many Communities are struggling with the costs of treating stormwater runoff
$200,000 Ponds
$160,000 Clearing & Grading
$ 60,000 Swales
= $420,000 Cost Savings
+ $90,000 Value (2 additional lots)
Slide: Pembroke Maryland , Chesapeake NEMO


Boulder Hills, NH
$5,000 in Site Preparation
$72,000 Drainage
$6,500 Curbing Reductions
$19,500 Permanent Erosion Control
NET Savings: $50,000
approx 6% of the total project


25% Savings
Slide: Chesapeake


Greenland Meadows Commercial Development, NH
Building A
Rooftops with Subsurface Infiltration
Gravel Wetland
Limits of Porous Pavement and
Standard Pavement with Subsurface Infiltration
Porous Asphalt~4 ac.
Gravel Wetland
59


Boulder Hills, NH
CATCH BASINS
STORMWATER POND
CONVENTIONAL PAVEMENT
DWELLING CLUSTERS
DRAINAGE INFRASTRUCTURE
Winterberry Road
CATCH BASINS


Greenland Meadows Commercial Development, NH
12/16/2014
60

Greenland Meadows Commercial Development, NH

$71,000 Earthwork
$1,750,000 Stormwater
NET Savings: $930,000
or 26% of the project stormwater costs

Portland, Oregon

Added 500 green streets, 4000 street trees

Portland, Oregon

Portland, Oregon

11 M in green infrastructure

Savings of $63M

Portland, Oregon

Estimated $144M for new pipes

Require all development to soak in some rain

Belgrade

York Ordinance language 2007

- Low Impact Design. Each applicant is *required* to *submit a statement* to the Planning Board *documenting proposed* Low Impact Design (LID) *for the site*, which will help to reduce stormwater volumes and help to enhance stormwater quality. LID includes, but *is* not limited to green roofs, rain gardens, tree wells, infiltration basins, and permeable pavement. The applicant shall submit technical documentation about the suitability of such designs with the request for LID features.

South Portland

Promoting Small-Lot Stormwater Treatment Practices at the Municipal Level

Paying for Stormwater with Stormwater Utility Districts

What is a SW Utility?

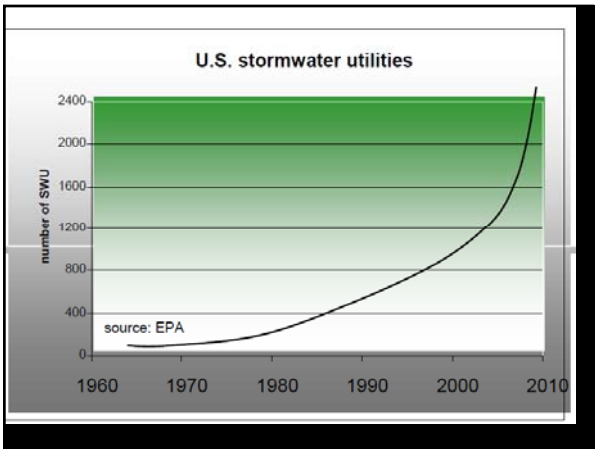
User fee based on how much a property uses the Municipal Stormwater System

Why Would We Want One?

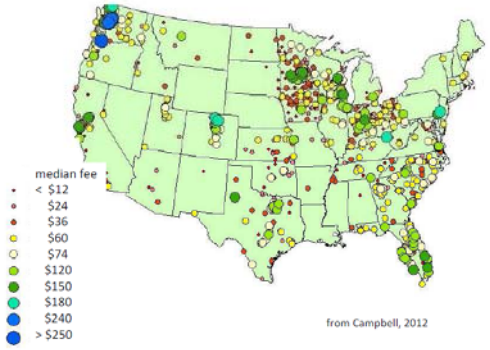
- Reliable source of funding
- More fair way to pay for stormwater
- Gives people the right incentives

71

- Incentives for LID like decreased review times or reduced permitting fees.



Annual Stormwater Fees



Take Away for Municipalities

- You have permit obligations to deal with Stormwater. This is not optional.
- Encouraging development to soak in rain will reduce system maintenance, reduce upgrade needs and make communities more resilient.
- A reliable and consistent source of funding helps deal with long term maintenance and planning.

U.S. data on stormwater utilities:

Median community population: 18,700

Largest pop. for SWU: 3,000,000 (Los Angeles)
Smallest pop. for SWU: 33 (Indian Creek FL)

from Campbell, 2012

To prevent this

EPA FINES
$$

Stormwater Utility

• *A utility that collects revenue to manage stormwater, by assessing the imperviousness of developed property – a 'user fee' just like any other utility* funding.

This incentivizes people to soak in water on site

Encourage these