

Catching Rain: Low Impact Development & Green Stormwater Strategies *for* Real Estate Professionals

Spring 2013

Presented by:



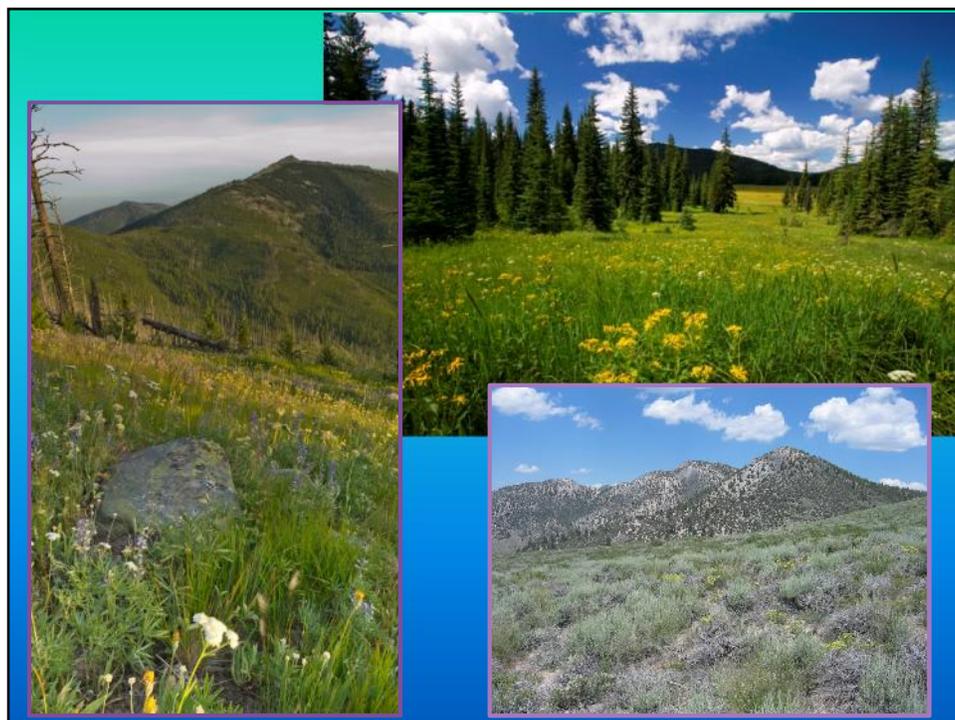
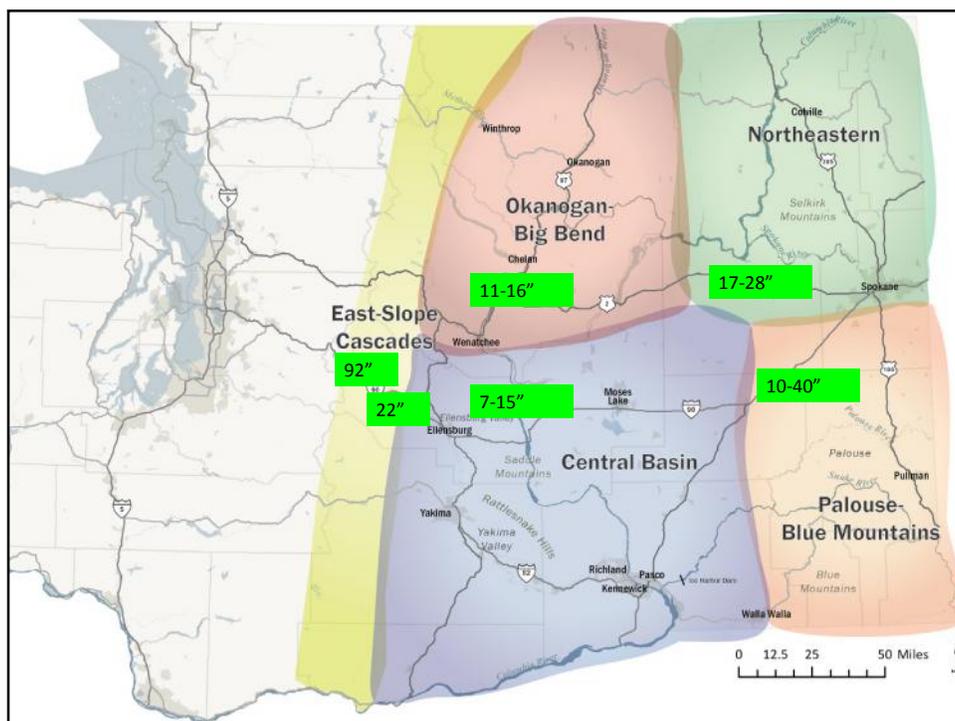
Funding from:

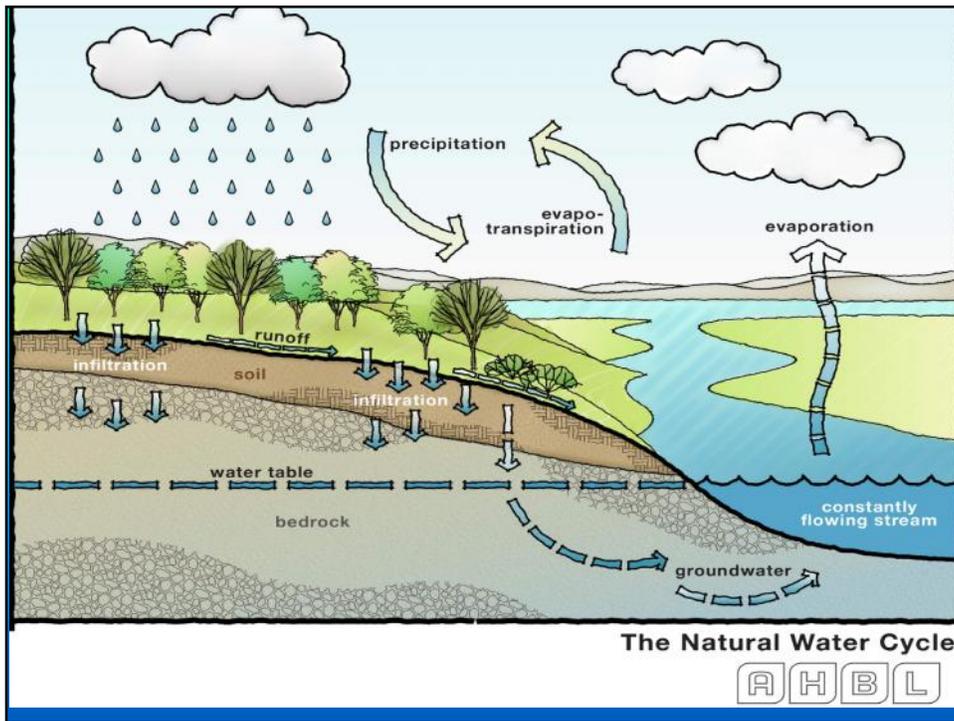


Water Resources Overview



Erica Guttman, WSU Extension
Water Resources Program



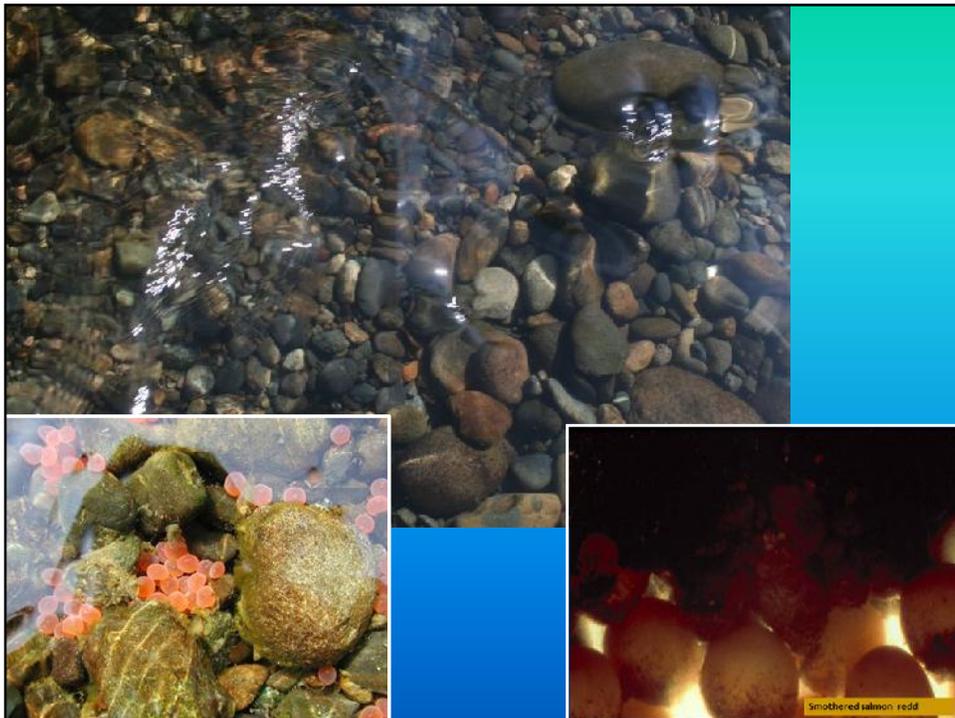


So what's the problem?



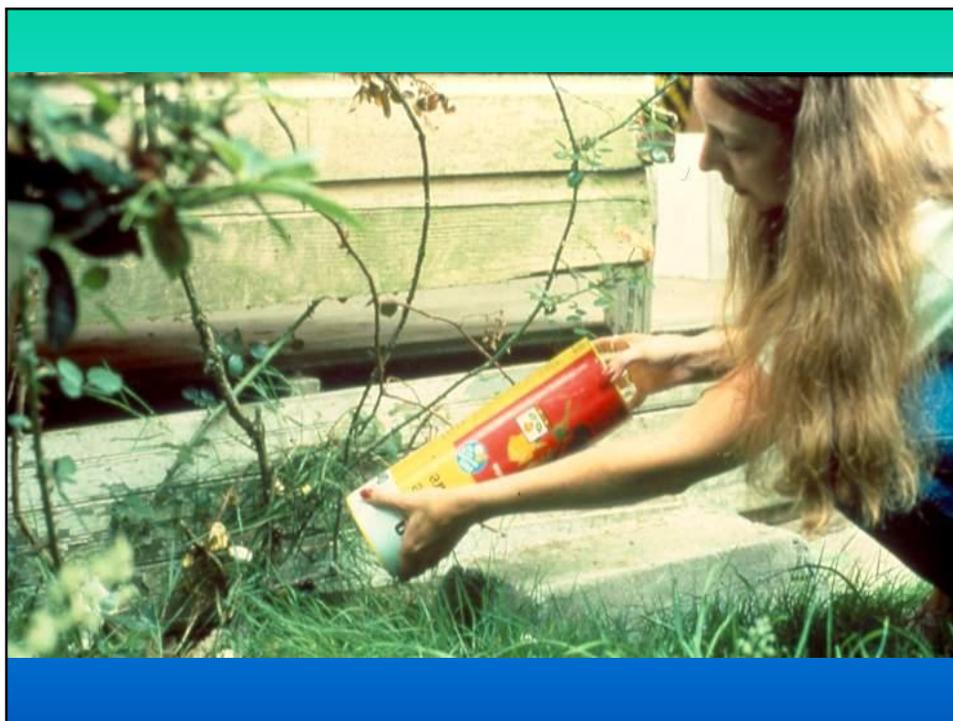












**Majority of toxics are carried to
our waterways by runoff**



Contaminants of concern:

- Nutrients – (Fertilizers & Animal Wastes)
- Bacteria
- Pesticides – (Mostly home gardening products)
- Toxic chemicals
- Petroleum products



Source: Washington Dept. of Ecology, May 2011, Pub. #11-03-025

Specific contaminants of concern:

- Dissolved copper
- Lead
- Zinc

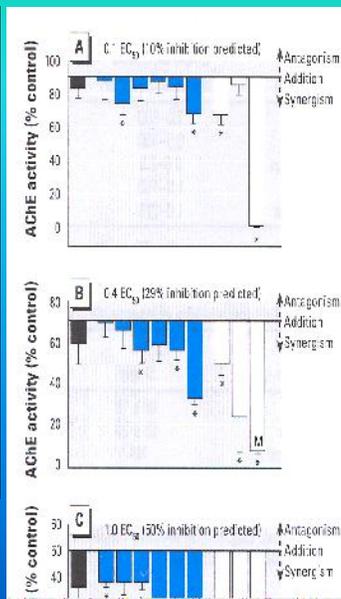


Source: Washington Dept. of Ecology, May 2011, Pub. #11-03-025

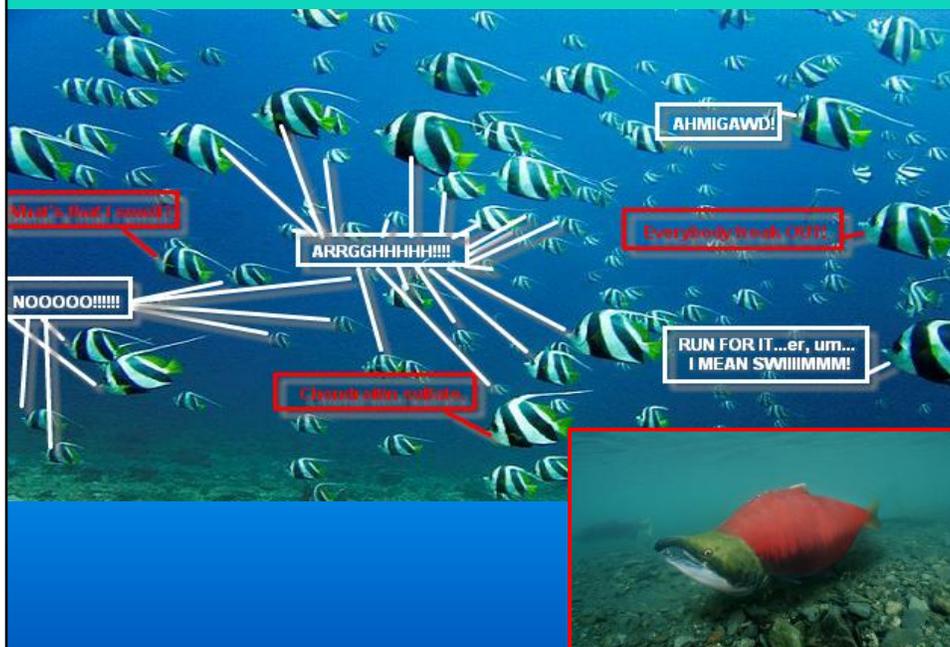
Synergistic Effects: NOAA & WSU Research

	Cu ($\mu\text{g/L}$)	Diazinon and Malathion
Level of concern	5 $\mu\text{g/L}$ Loss of olfactory function and behavioral impairment (predator avoidance and navigation)	Paired diazinon (7.3 $\mu\text{g/L}$) and malathion (3.7 $\mu\text{g/L}$) produced severe (>90%) AChE inhibition and anticholinesterase poisoning => synergism. Loss of ability to avoid predators.

Acetylcholinesterase: enzyme for neurotransmission. Organophosphate and N-methyl carbamate insecticides designed to inhibit anticholinesterase; affects fish and humans.
Jen McIntyre, et al.



“Schreckstoff”



Specific Contaminants of Concern:

•PAHs (polycyclic aromatic hydrocarbons) – byproducts of combustion



Source: Washington Dept. of Ecology, May 2011, Pub. #11-03-025

Urban stream impacts studied

Urban runoff is toxic to coho embryos

filtered



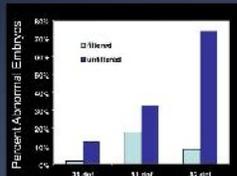
unfiltered



Longfellow Creek experimental facility, ~ 50 days of development

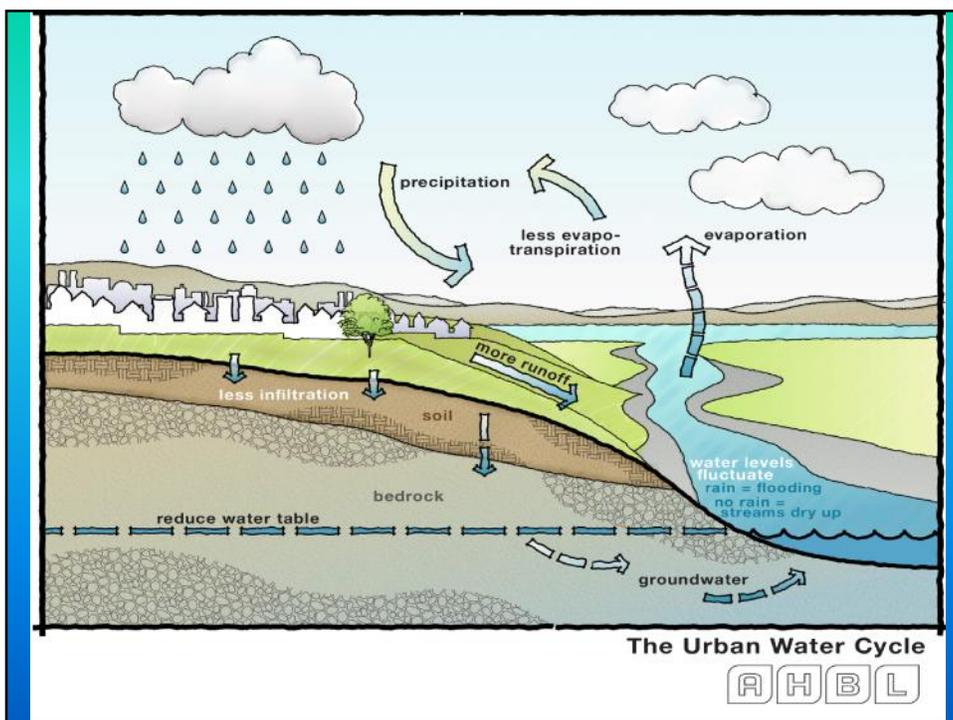
Coho embryo development affected in urban stream

Unfiltered stream water resulted in higher rates of developmental defects and mortality than embryos exposed to filtered stream water

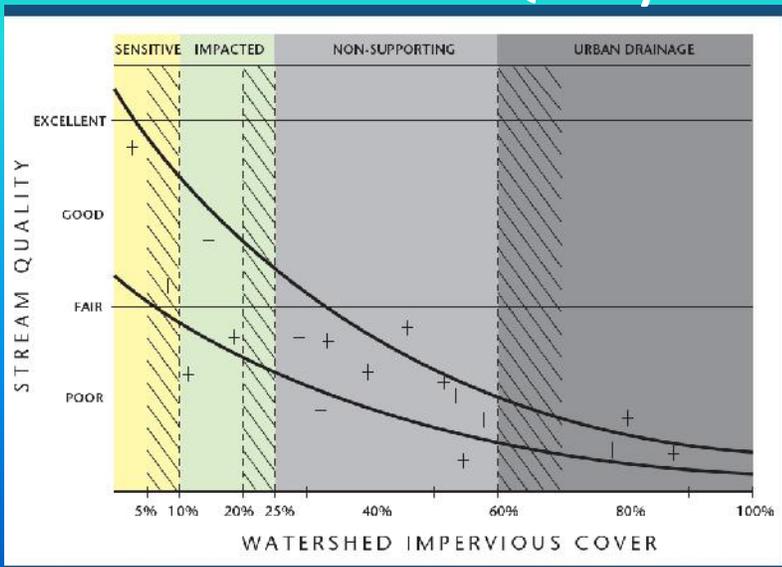


Jen McIntyre et al.



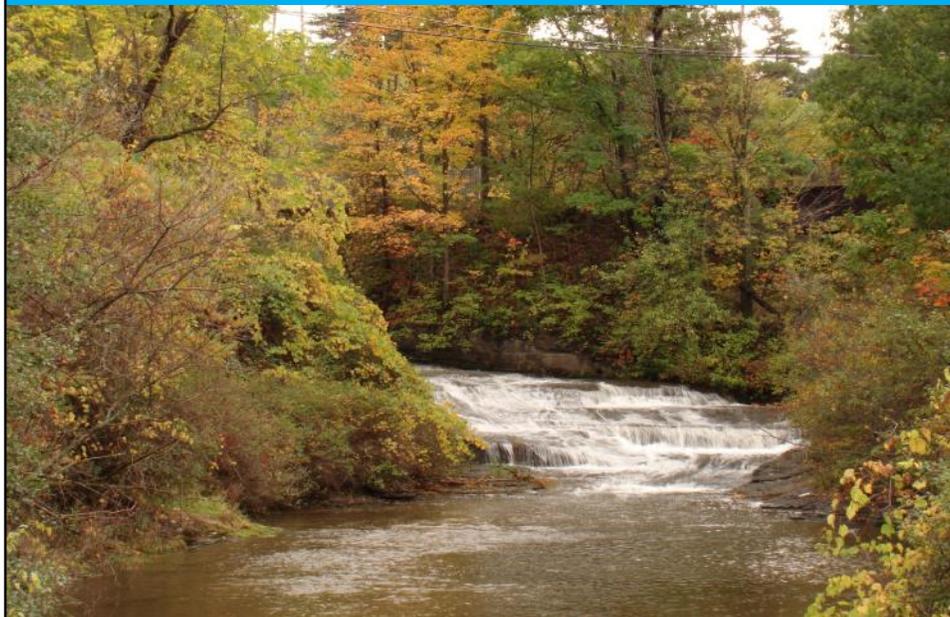


Relationship Between Impervious Cover & Stream Quality



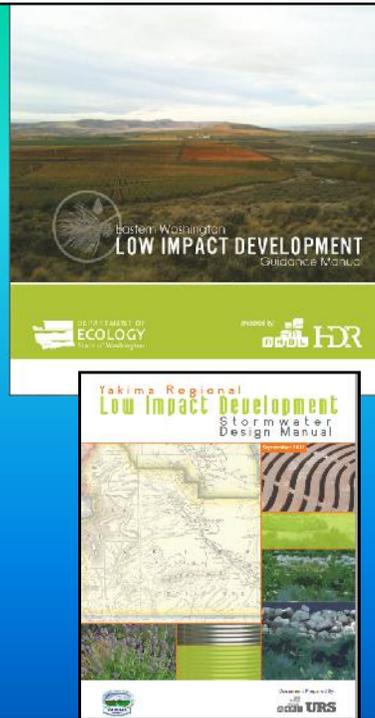
Schueler et al., 2009

That's where Low Impact Development or Green Stormwater Infrastructure comes in:



LID or GSI Defined

“To create a hydrologically functional landscape that prevents measurable harm to streams, lakes, wetlands and other natural aquatic systems.”



LID/GSI Principles

- Conserve and restore vegetation and soils.



LID/GSI Principles

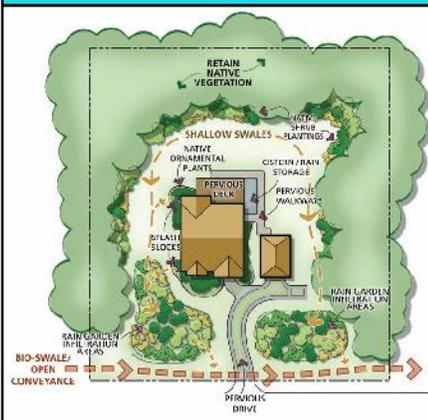
- Design site to minimize impervious surfaces.



Photos: Williams Contracting; PIN Foundations Inc.

LID/GSI Principles

- Manage stormwater close to where rain falls.



Intersection of LID & Real Estate Profession

- Understanding regulations (Ben)
- Valuation (Robbi)
- Guiding clients



Intersection of LID & Real Estate Profession

- Disclose or remedy problems



Intersection of LID & Real Estate Professionals

- Knowledge of remedy options
- Clarity on what's fixable



Intersection of LID & Real Estate Profession

- Guidance about keeping important features (even if they're not quite perfect yet!)



Intersection of LID & Real Estate Professionals

- Recommending maintenance and prevention strategies



Intersection of LID & Real Estate Profession

- Explaining LID features that may be permitted & required



Catching Rain

Low Impact Development &
Green Stormwater Strategies
for Real Estate Professionals

***New stormwater regulations –
Where did they come from and
where are they going?***

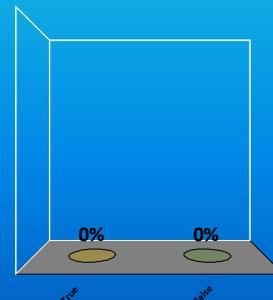
**Ben Alexander
Sound Native Plants, Inc.**

MYTHBUSTERS

**Eastern Washington will have to meet
the same stormwater requirements as
Western Washington.**

- A. True
- B. False

**False. Western Washington
requirements are more
prescriptive than those for
eastern Washington.**



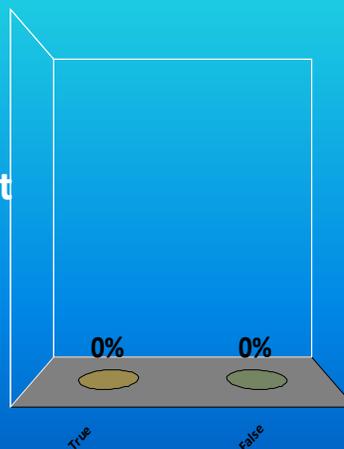
MYTHBUSTERS

LID will be required in Eastern Washington

A. True

B. False

False. LID will be allowed but not required in Eastern Washington. In contrast, LID will be required in Western.



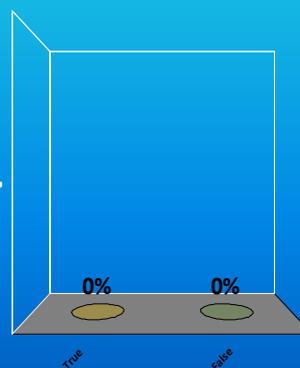
MYTHBUSTERS

The stormwater performance standard for Eastern Washington is lower than for Western Washington

A. True

B. False

True. E. Washington systems must handle the 24-hour, 10-year event. W. Washington limits runoff to pre-development discharge for a range of conditions including 50-year events.

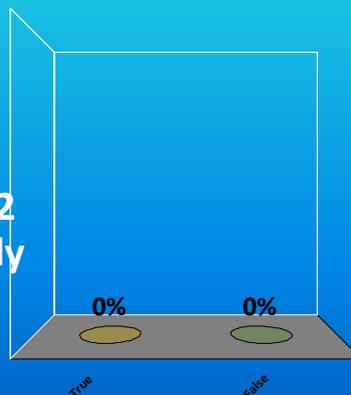


MYTHBUSTERS

Most Eastern Washington jurisdictions already comply with the stormwater permit standards

- A. True
- B. False

True. As of 2011, 16 of the 22 regulated jurisdictions already comply with the stormwater performance standard for Eastern Washington.

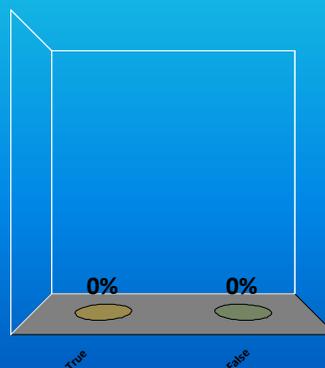


MYTHBUSTERS

The minimum size for regulated developments is the same in eastern and western Washington

- A. True
- B. False

False. E. Washington minimum is 1 acre or larger, or projects that are part of a development. W. Washington requirements may apply to projects as small as 2,000 square feet.

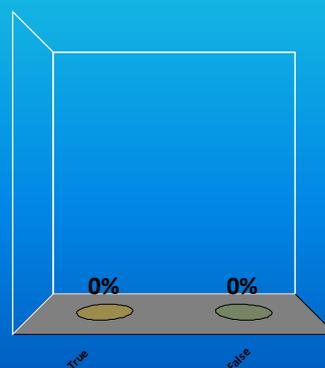


MYTHBUSTERS

Both sides of the state use the same criteria for reducing or bypassing the stormwater standards

- A. True
- B. False

False. E. Washington jurisdictions may develop their own "infeasibility criteria." W. Washington jurisdictions must use the criteria specified in the Ecology permit.



What is the purpose of the stormwater rules?

- Protect lakes, rivers, streams
- Prevent water pollution
- Limit cumulative impacts to natural resources



Point sources of pollution such as industrial discharges

- Point sources are contained in a pipe, like an industrial outfall
- Flows are unaffected by weather
- Wastewater composition is predictable & consistent



Photo by Tom Check

Where did the stormwater rules come from?

- Federal Clean Water Act passed in 1972
- NPDES permits originally created to regulate point sources



NPDES applied to stormwater systems later

- Non-point sources dispersed across landscape
- Influenced by weather soils and geology
- Rules for municipal stormwater systems added later
- Address non-point sources with cumulative impacts



Stormwater Regulations

Federal

- Clean Water Act – 1972
- NPDES stormwater permits created – 1987

State

- EPA grants Ecology authority to administer stormwater permits
- Phase I permits issued in 1995; Phase II permits issued in 2007
- LID added to reissued permits – 2013

Local

- Local regulations generally in place ahead of Federal and State requirements
- Phase I and II permits increased requirements, resulting in new local regulations & programs

Phase I Cities and Counties

<p>Seattle Tacoma Snohomish County</p>	<p>King County Pierce County Clark County</p>
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Phase II Western Washington coverage

<p>Phase II Cities</p> <p>Aberdeen Algona Anacortes Arlington Auburn Bainbridge Island Battleground Bellevue Bellingham Black Diamond Bonney Lake Bothell Bremerton Brier Buckley Burien Burlington Camas Centralia Clyde Hill</p>	<p>Covington Des Moines DuPont Duvall Edgewood Edmonds Enumclaw Everett Federal Way Ferndale Fife Fircrest Gig Harbor Granite Falls Issaquah Kelso Kenmore Kent Kirkland Lacey Lake Forest Park</p>	<p>Lake Stevens Lakewood Longview Lynnwood Maple Valley Marysville Medina Mercer Island Mill Creek Milton Monroe Mountlake Terrace Mount Vernon Mukilteo Newcastle Normandy Park Oak Harbor Olympia Orting</p>	<p>Pacific Port Angeles Port Orchard Poulsbo Puyallup Redmond Renton Sammamish SeaTac Sedro-Woolley Shoreline Snohomish Steilacoom Sumner Tukwila Tumwater University Place Vancouver Washougal Woodinville</p>	<p>Phase II Counties</p> <p>Phase II county permits apply to urban areas around permitted cities. Cowlitz County Kitsap County Skagit County Thurston County Whatcom County</p>
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Phase II Eastern Washington Coverage

Phase II Cities

Asotin	Pasco	Sunnyside
Clarkston	Pullman	Union Gap
East Wenatchee	Richland	Walla Walla
Ellensburg	Selah	Wenatchee
Kennewick	Spokane	West Richland
Moses Lake	Spokane Valley	Yakima

Phase II Counties

Phase II county permits apply to urban areas around permitted cities.

Asotin County
 Chelan County
 Douglas County
 Spokane County
 Walla Walla County
 Yakima County

Implementation Timeline

Timeline for New LID Requirements in Washington State



The basic requirements in Eastern Washington are:

Retain stormwater on-site or in regional facilities (most jurisdictions already do this)

OR

Develop criteria for conditions where this cannot be done (AKA infeasibility criteria)

AND

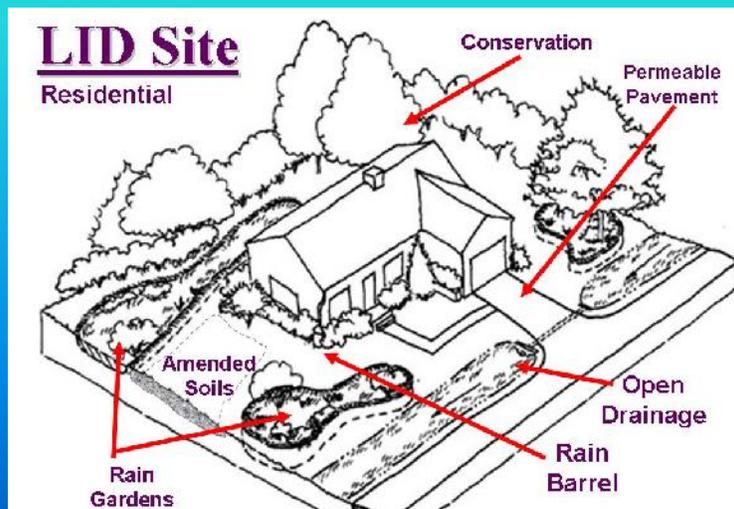
Allow for LID in local development codes

Infeasibility criteria for special situations

Examples could include:

- High groundwater table
- Rock substrate that does not infiltrate
- Increases landslide or erosion hazards
- Could cause damage to structures
- Conflicts with other regulations such as fire codes, health codes, etc.

Local development codes will allow for LID designs



Vegetated swales for treating and conveying stormwater

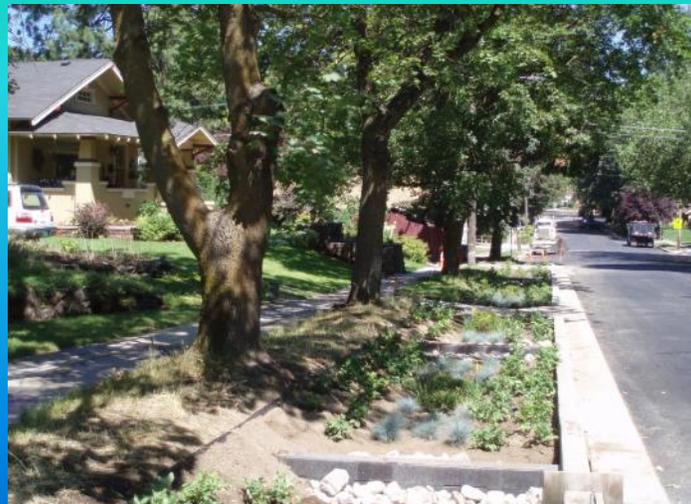


Plants and soils filter sediments, reduce potential erosion, remove pollutants and protect and recharge groundwater

Permeable pavements



Rain gardens



Alternative to traditional catch basins, pipes and ponds

LID specs contained in companion documents

- 2012 Stormwater Management Manual for Western Washington
- Stormwater Management Manual for Eastern Washington (new draft due June 30, 2013)
- Low Impact Development Technical Guidance Manual for Puget Sound (WSU)
- Rain Garden Handbook for Western Washington Homeowners (WSU)

Site clearing practices may change



THIS



Developments
may have
unfamiliar
features



Maintenance may differ



THIS



NOT THIS



The wrap-up:

- Local jurisdictions implement & enforce the stormwater regulations (no new permits needed)
- Deadline for E Washington is end of 2017
- Some developments may be vested under old rules - deed restrictions could help determine which properties are subject to which rules

Questions about the permits?

Island, Skagit and Whatcom Counties	Christina Maginnis	360-715-5212
Phase I Permittees (City of Seattle, Port of Seattle, King and Snohomish Counties) and Phase II permittees in Snohomish County	Rachel McCrea	425-649-7223
Kitsap County and Phase II Cities within King County and Kitsap County	Anne Dettelbach	425-649-7093
Clallam and Pierce Counties and the Port of Tacoma (Phase I and Phase II)	Deborah Cornett	360-407-7269
Clark, Cowlitz, Grays Harbor, Lewis, and Thurston Counties	Lisa Cox	360-690-7120
Benton, Chelan, Douglas, Kittitas, and Yakima Counties	Terry Wittmeier	509-574-3991
Asotin, Franklin, Grant, Spokane, Walla Walla, and Whitman Counties	Dave Duncan	509-329-3554
WSDOT Statewide Permit	Foroozan Labib	360-407-6439
Stormwater Education and Outreach, Community Based Social Marketing, Program Evaluation, and Outreach Resources	Jocelyn Jones	360-407-7529

More questions for us?

- Ben Alexander, Sound Native Plants
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- Erica Guttman, WSU Extension
(360) 867-2164 or
erica@nativeplantsalvage.org
- Robbi Currey, SEEC LLC
(360) 561-8623
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