Columbia Slough: a watershed approach

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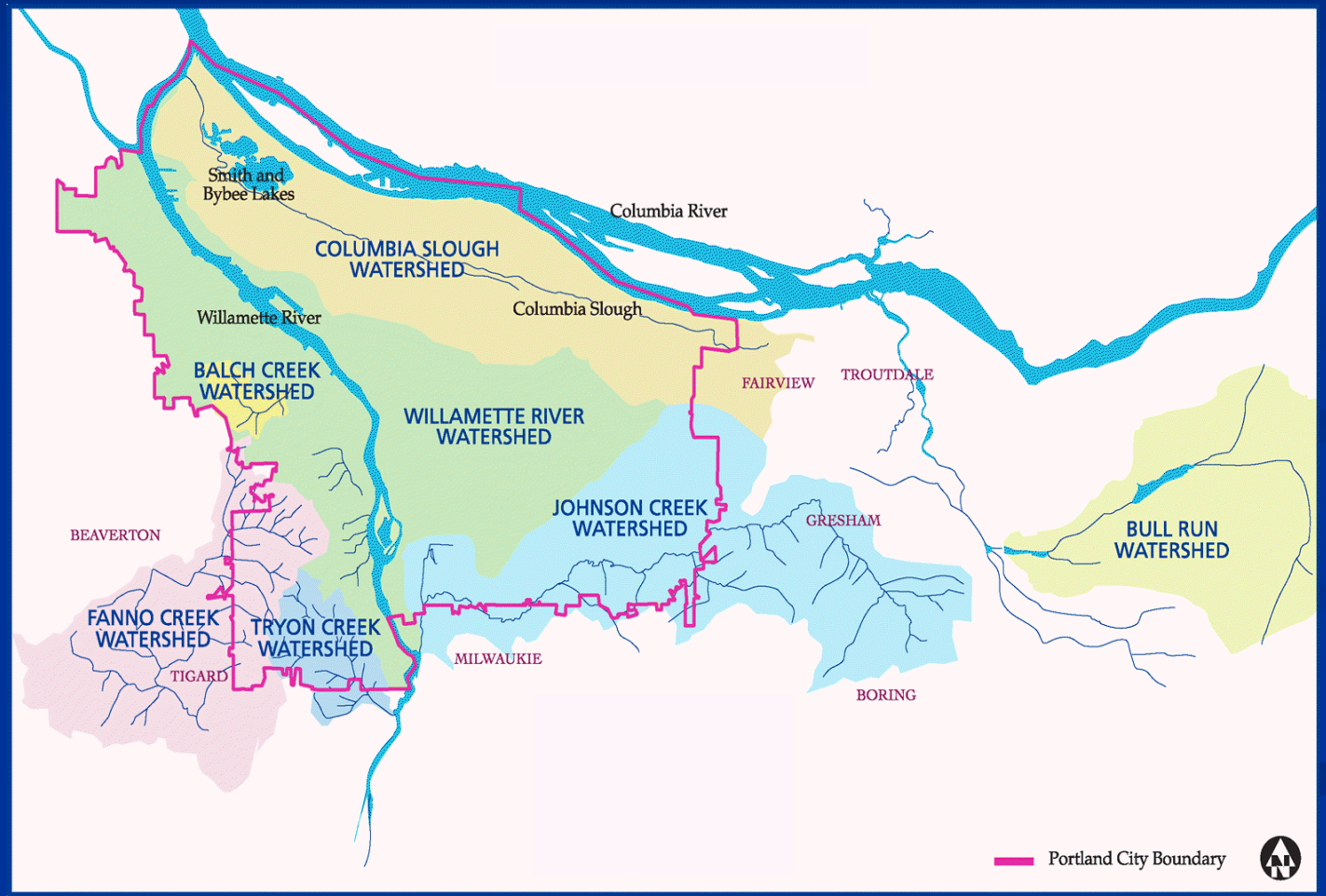
City of Portland BES
July 30, 2009

Outline

- Regulatory Programs
- Portland Watershed Management Plan
- Implementation Strategies
- Integration Example

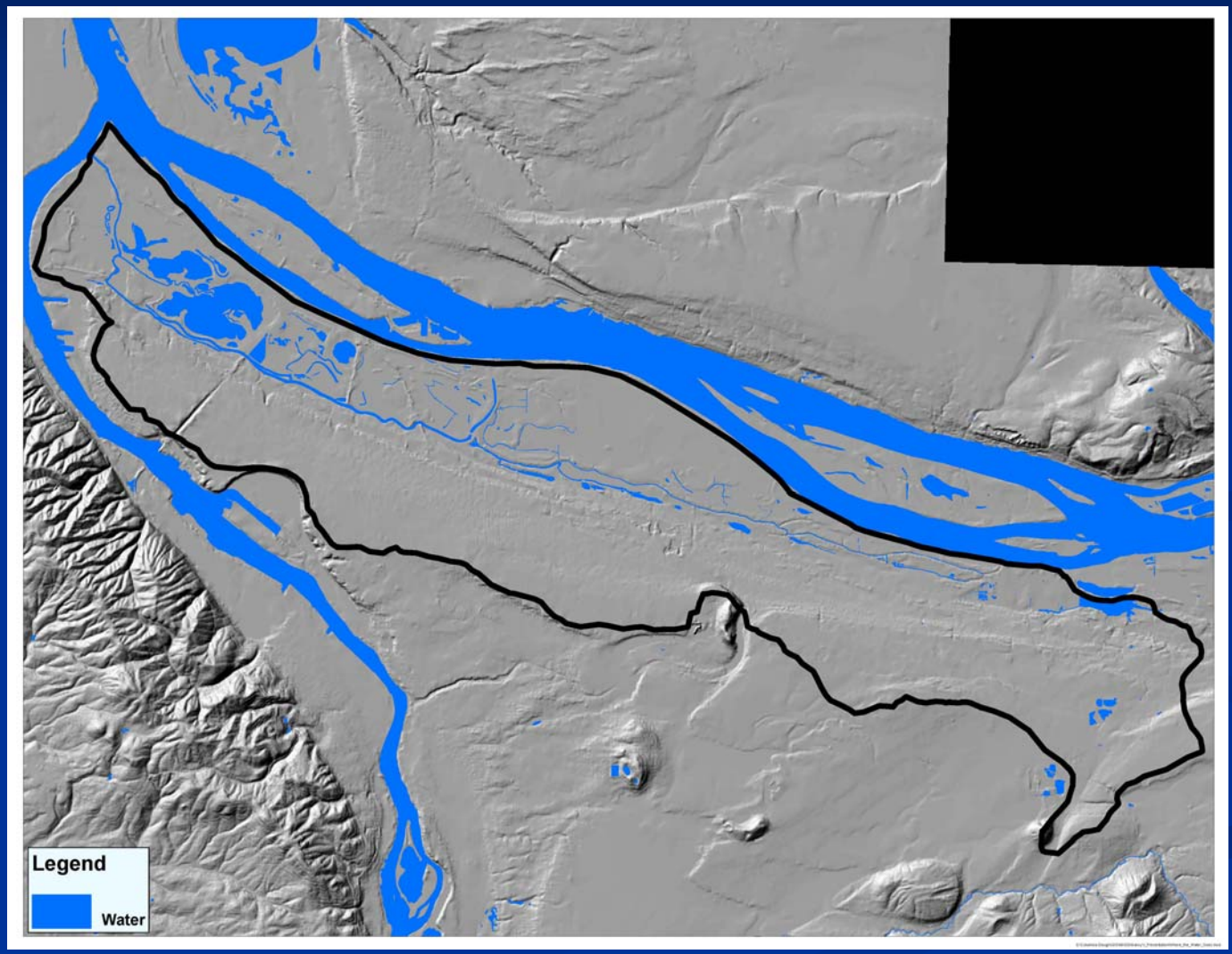
Portland's Watersheds



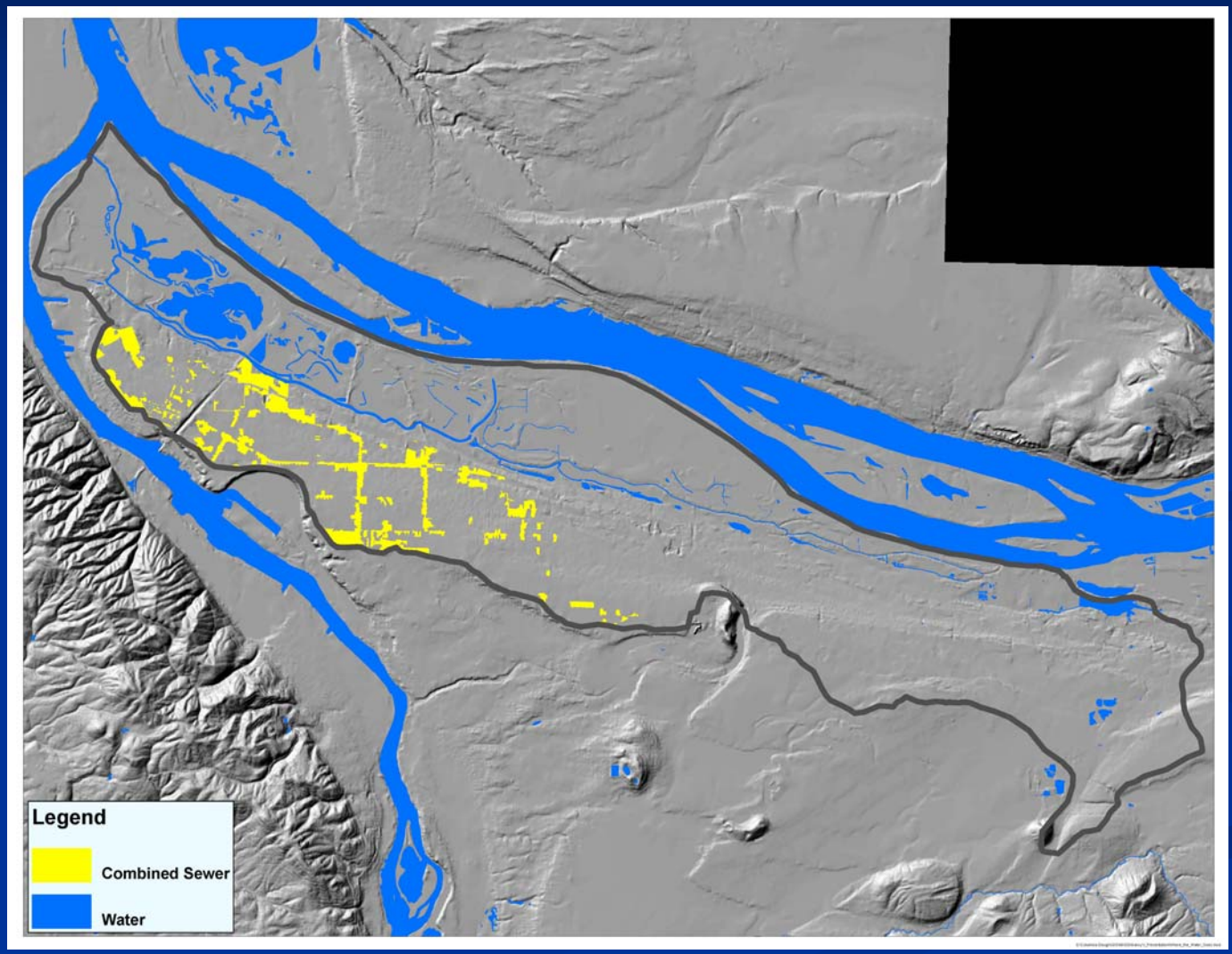
Regulatory Programs

- 1991 SFO (amended 1994)
- 1993 Columbia Slough Sediment CO
- 1995 MS4 permit
- 1998 ESA listing (salmonids)
- 1999 TMDL
- 2005 UIC WPCF permit

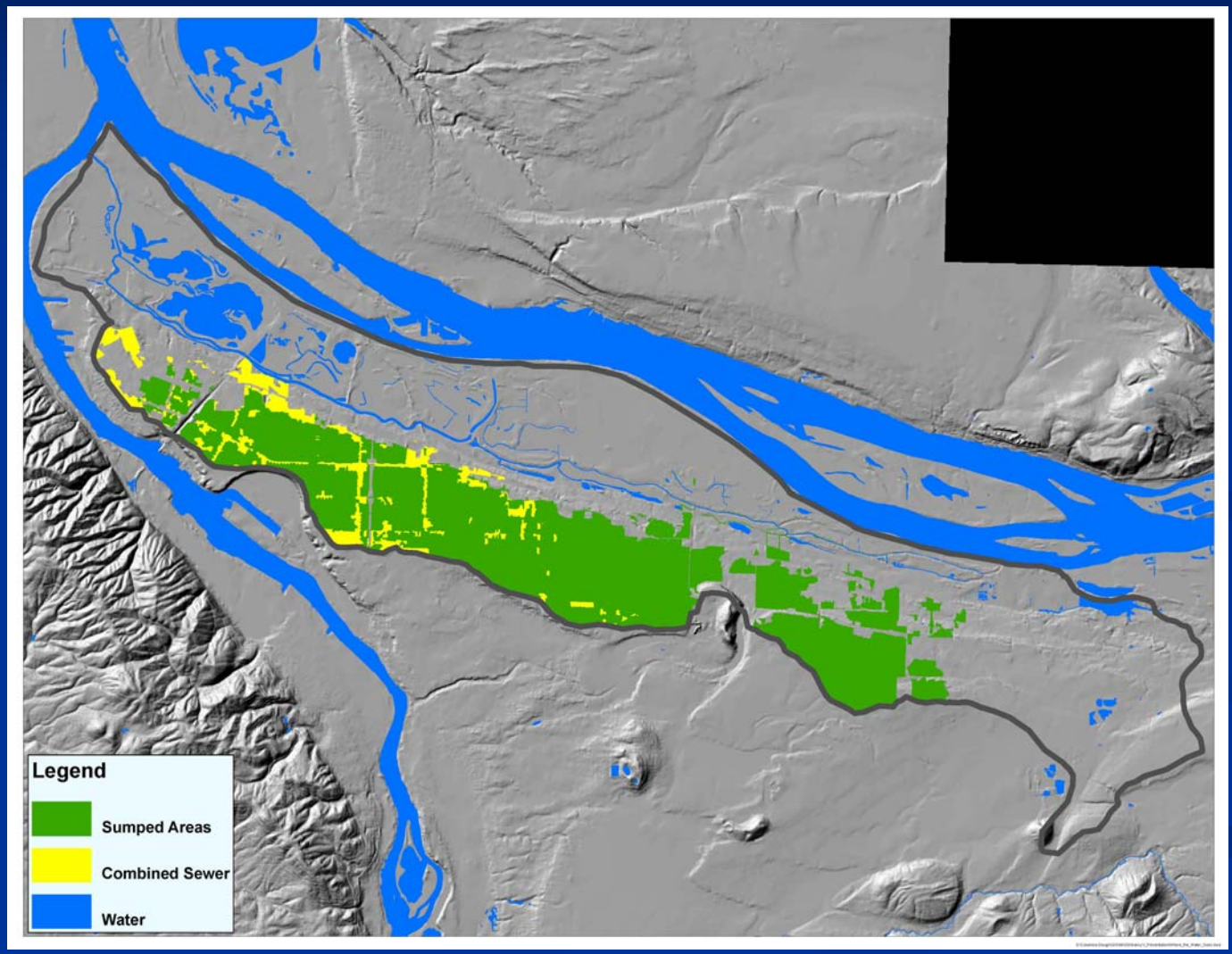
Columbia Slough Watershed



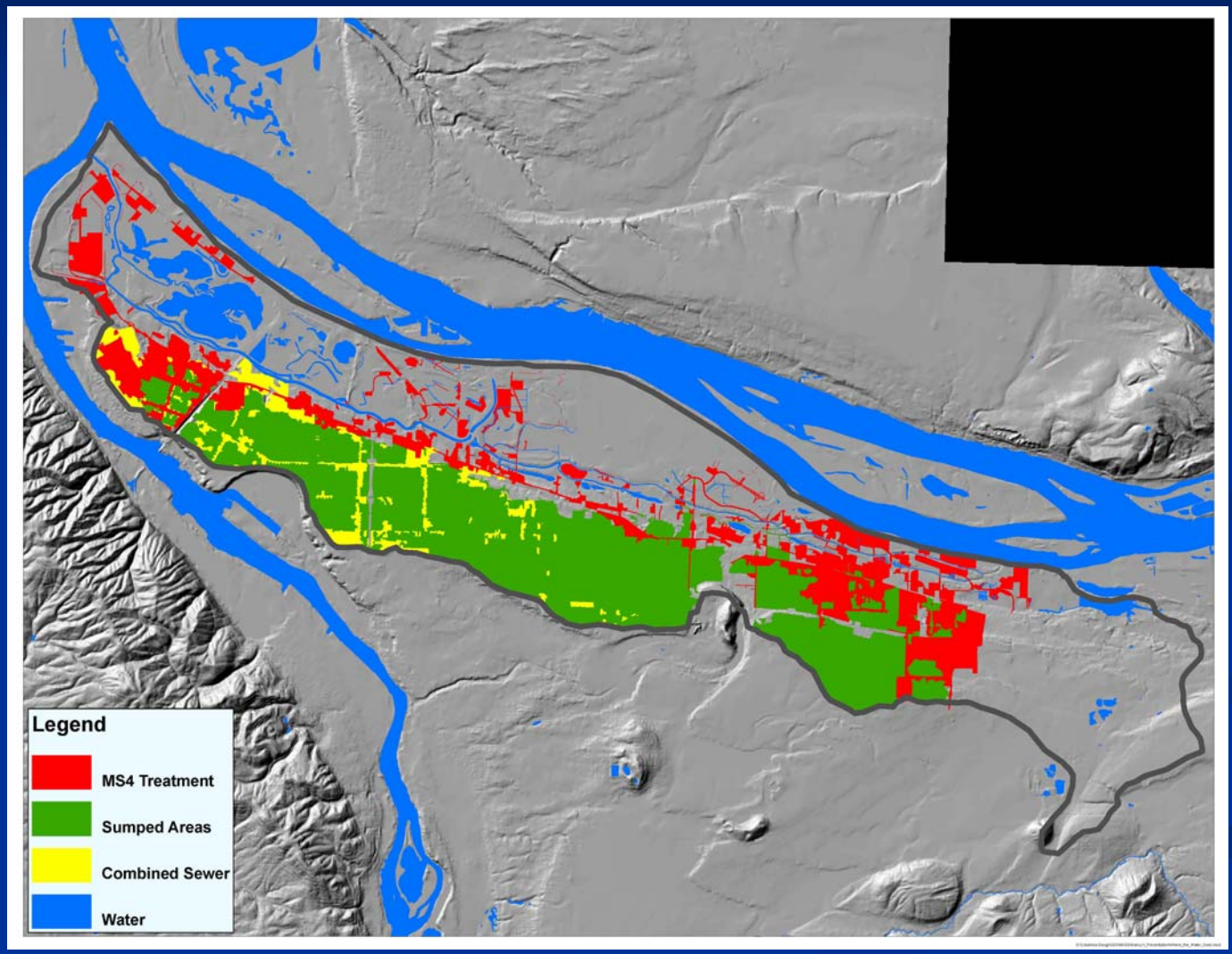
Combined Sewer Drainage



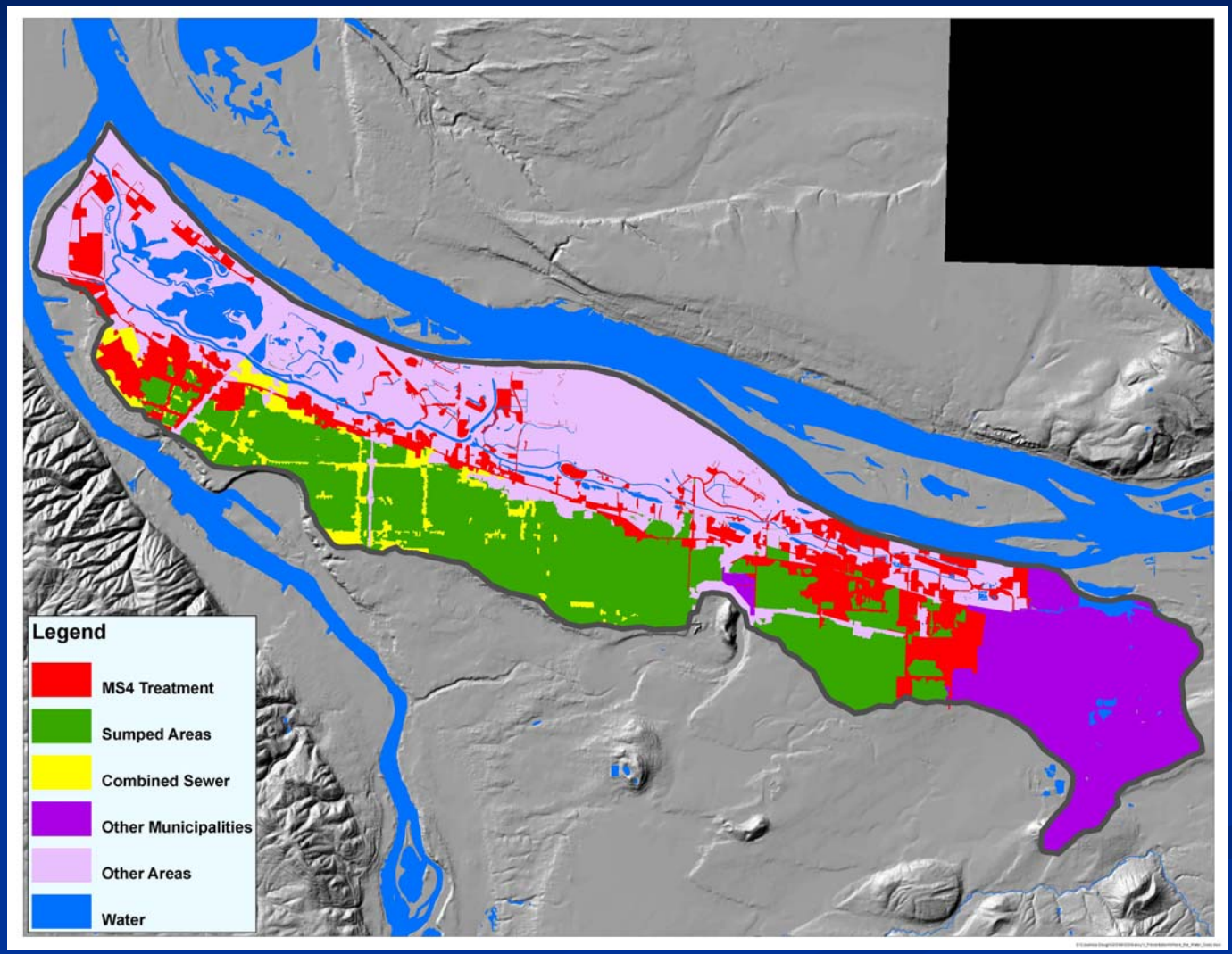
UIC area drainage

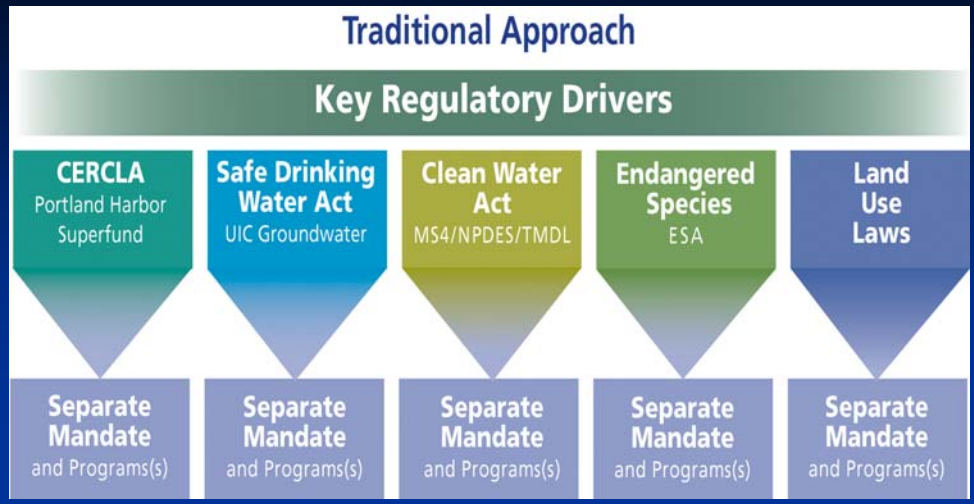


City MS4 area drainage



Other drainage areas




Traditional Approach
Key Regulatory Drivers
CERCLA
Portland Harbor
Superfund
Safe Drinking
Water Act
UIC Groundwater
Clean Water
Act
MS4/NPDES/TMDL
Endangered
Species
ESA
Land
Use
Laws
Separate
Mandate
and Programs(s)
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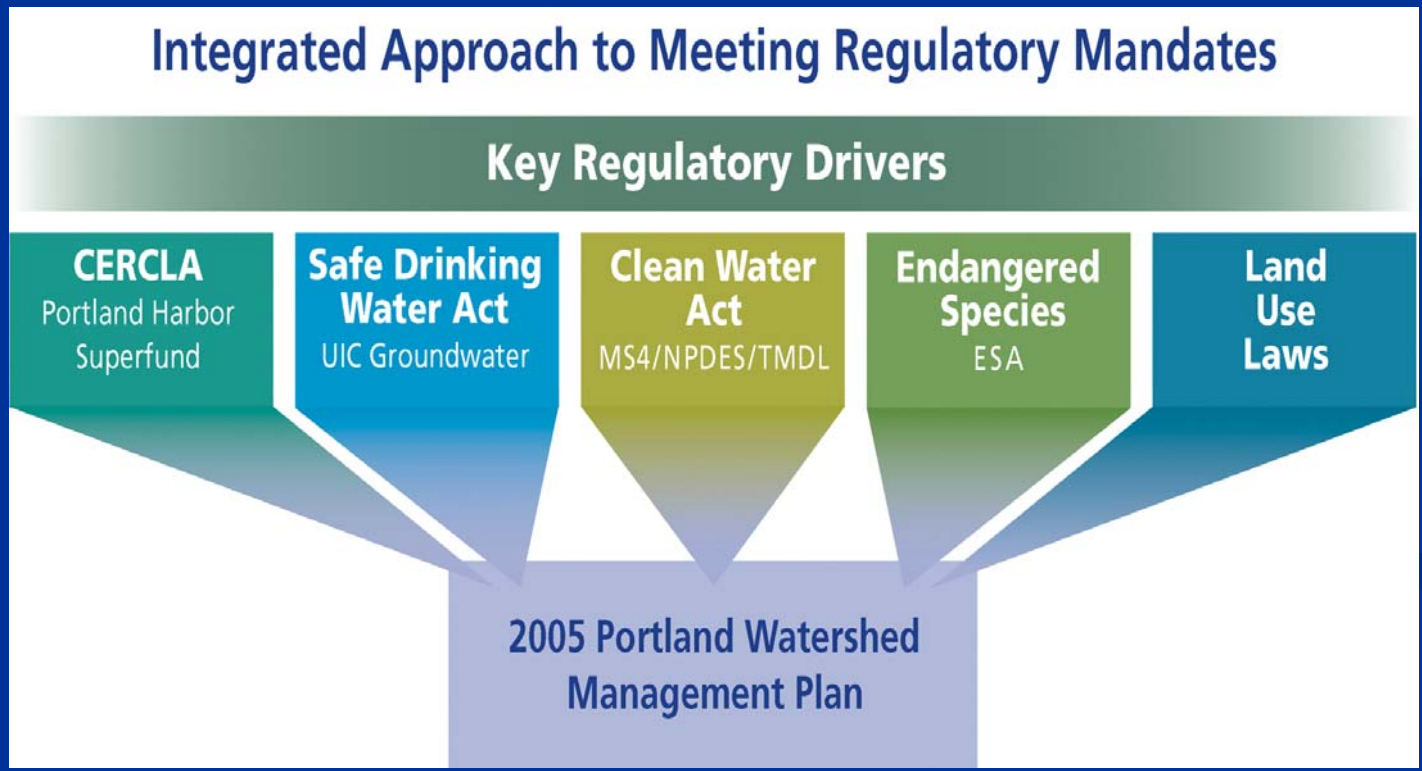
Integrated Approach to Meeting Regulatory Mandates
Key Regulatory Drivers
CERCLA
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Superfund
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MS4/NPDES/TMDL
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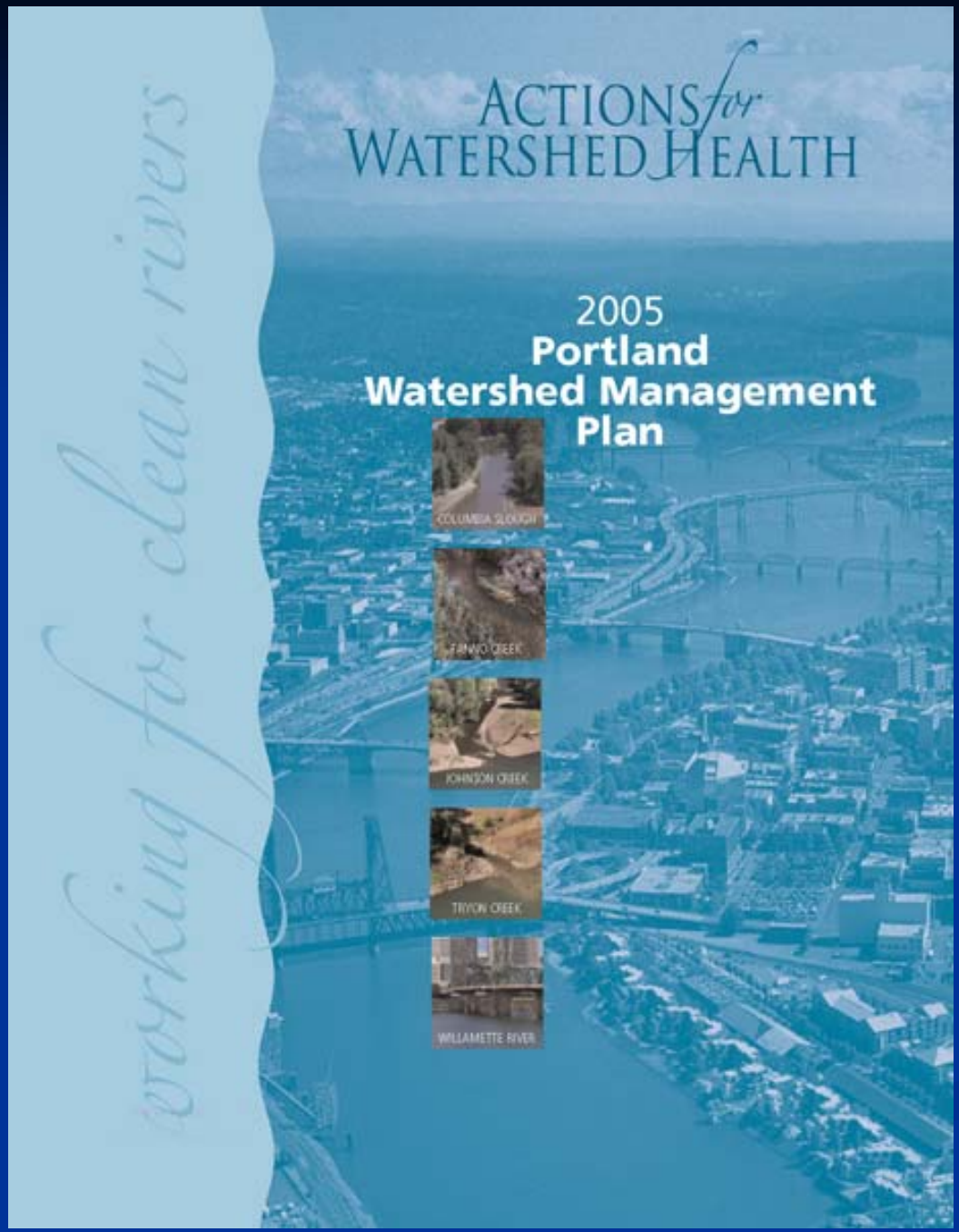
Land
Use
Laws
2005 Portland Watershed
Management Plan



- **Provides a scientific foundation and sets our future course**
- **Integrates regulatory drivers with action-oriented strategies**
- **Monitors progress**

Watershed Health Goals

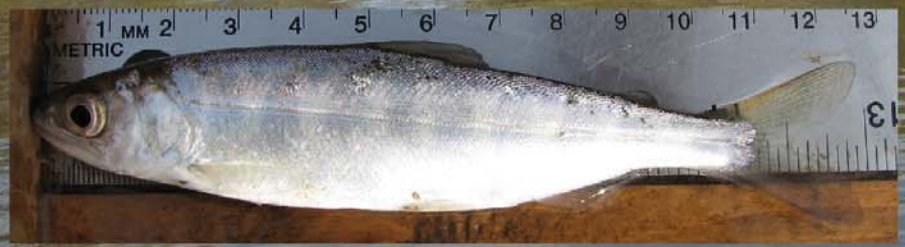
- Stream flow and hydrology
- Physical habitat
- Water quality
- Biological communities

PWMP Strategies

- Stormwater Management
- Revegetation
- Aquatic and Terrestrial Enhancement
- Policy and Protection
- Operations and Maintenance
- Education, Involvement and Stewardship

Revegetation along Slough banks

Aquatic Enhancement



Replacing Culverts

Replacing Culverts

Terrestrial Enhancement

Protection and Policy

Operations and Maintenance

Education, Involvement, Stewardship

Slough School

Columbia Slough Regatta

Guiding Principles for Stormwater Management in the City of Portland

- Develop our urban environment in ways that promote healthy rivers, watersheds, and natural resources.
- Avoid impact to natural resources.
- Use a “natural system” approach in existing, new and redevelopment.

Stormwater Management

Pervious Paving

30% Evaporation

Ecoroof

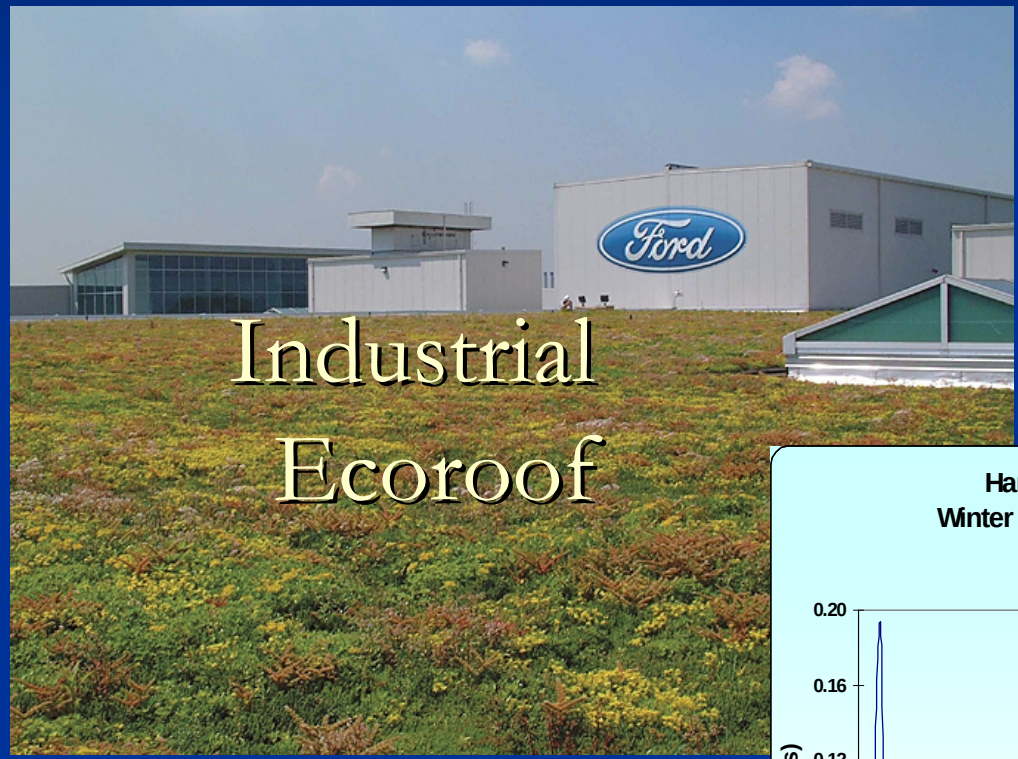
Street Trees

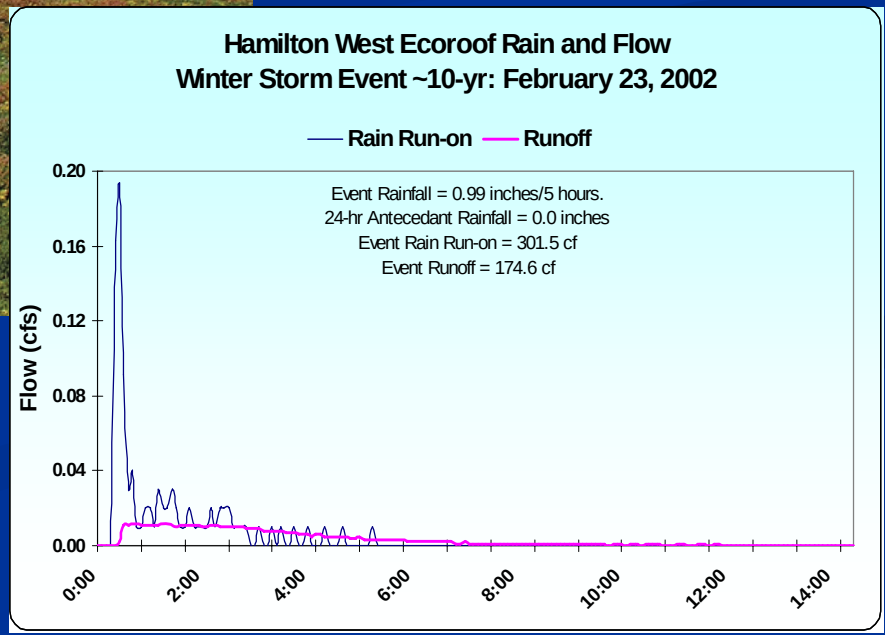
Parking Lot Swales

Implementation Strategies

Reduce impacts from impervious surfaces such as streets, parking lots, rooftops and other paved surfaces.

Reducing site runoff





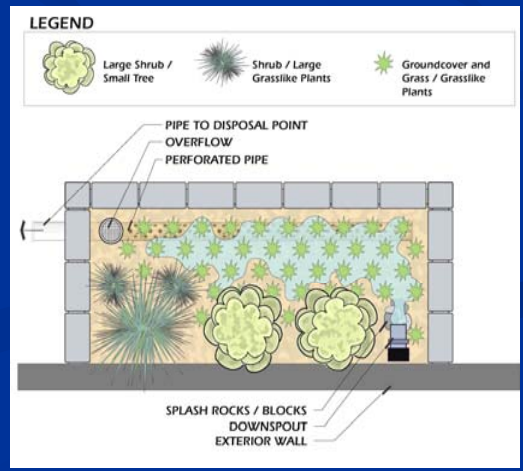
Implementation Strategies

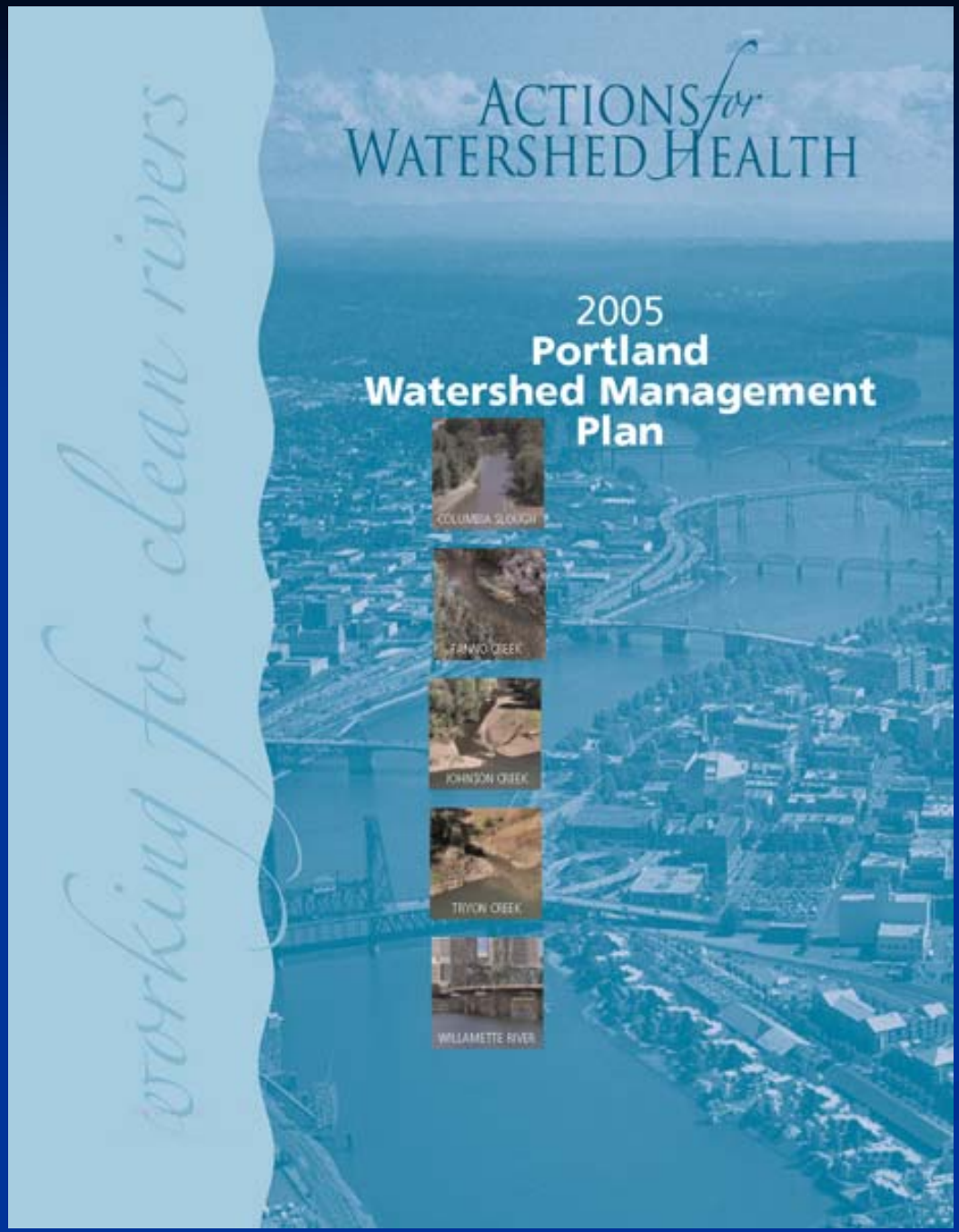
Integrate stormwater in site development, building and landscape design.

City of Portland Development Standards – reducing runoff

Manage stormwater as close to the source as possible to reduce or eliminate the volume of water and pollutants leaving the site.

- Parking Lots
  - Bioretention
  - Swales
- Roofs
  - Eco-roofs
  - Planters
- Streets
  - Inlet controls
  - Green Streets designs
  - Tree planters





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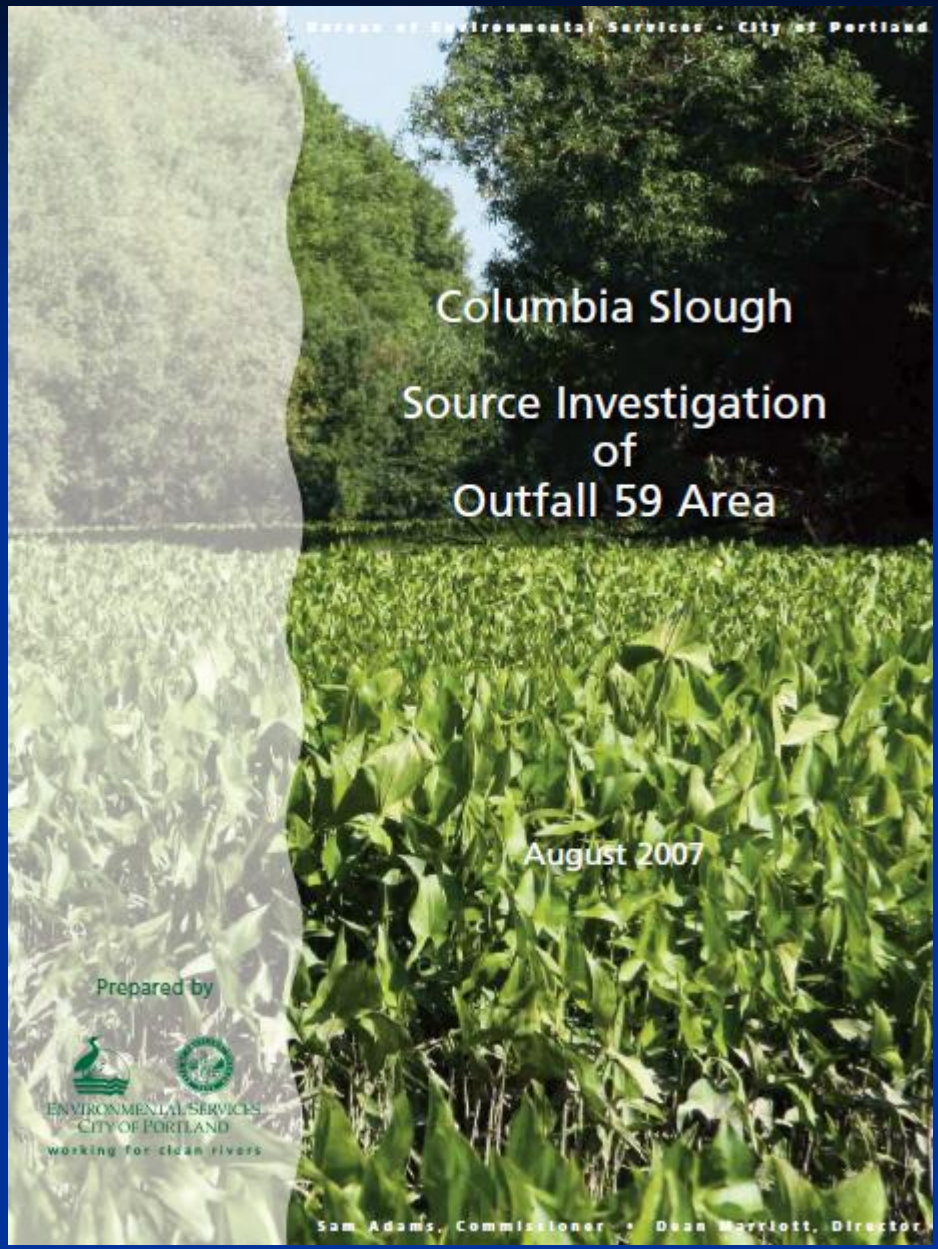
Integrated Response to Regulations: EXAMPLE

- 2005 ROD under VCP
- 2005 ROD for VCP
- 2006 IGA with DEQ
- 2006 WAP

WAP Components

- Site Discovery and Investigation
- Stormwater permit administration: COLS
- Stormwater Management
- Prioritize Target Areas
- Education and Involvement
- Long-Term Monitoring



Joint DEQ/City Source Investigation and Control Work

Identify significant sources of contaminants using DEQ and City authorities

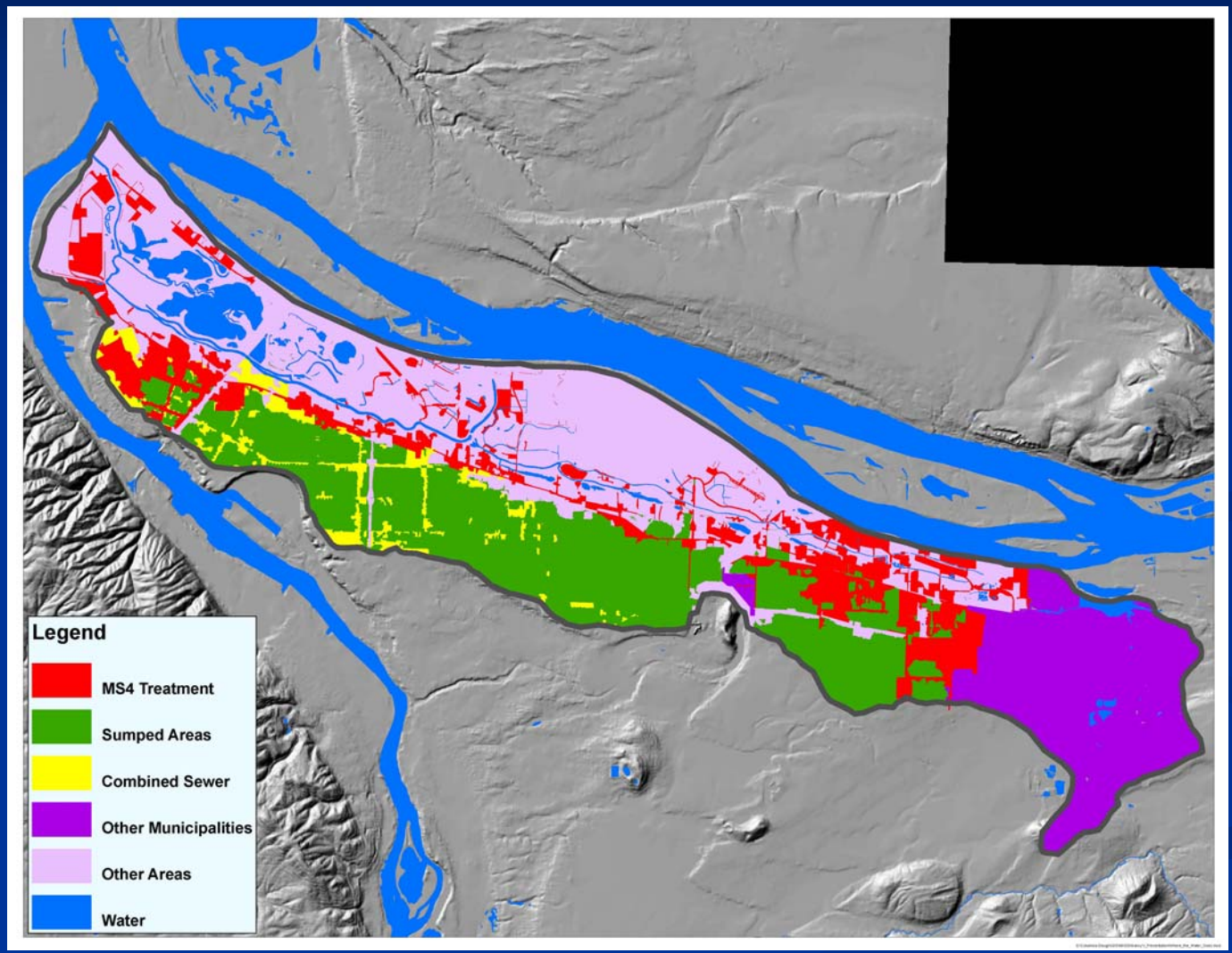
Conduct stormwater site inspections under the authority of the City Industrial Stormwater Program

Gather information under the authority of the Site Discovery/Site Assessment Program

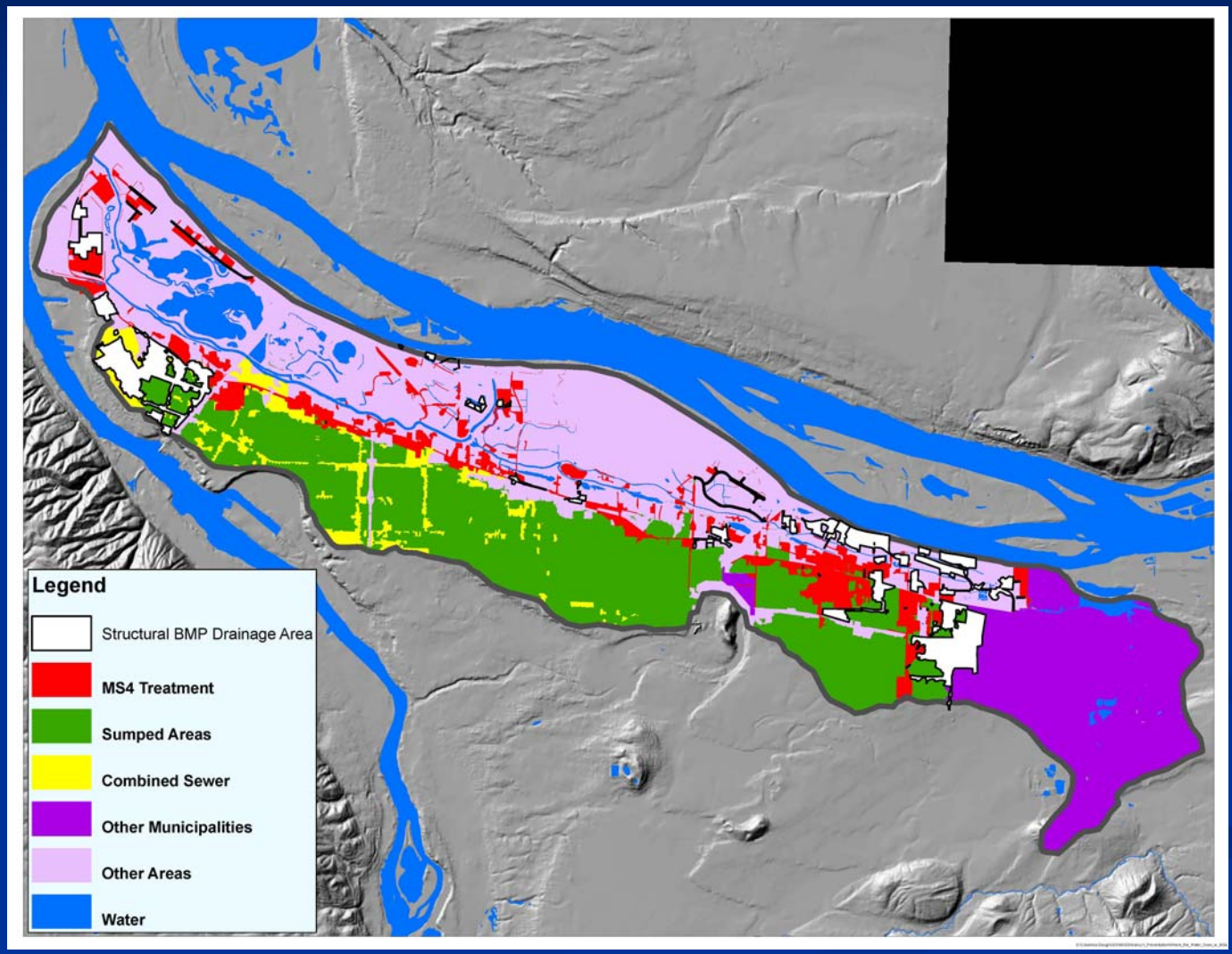
Determine follow-up actions:

- **Implement BMPs**
- **1200-COLS permit**
- **Clean up program screening**

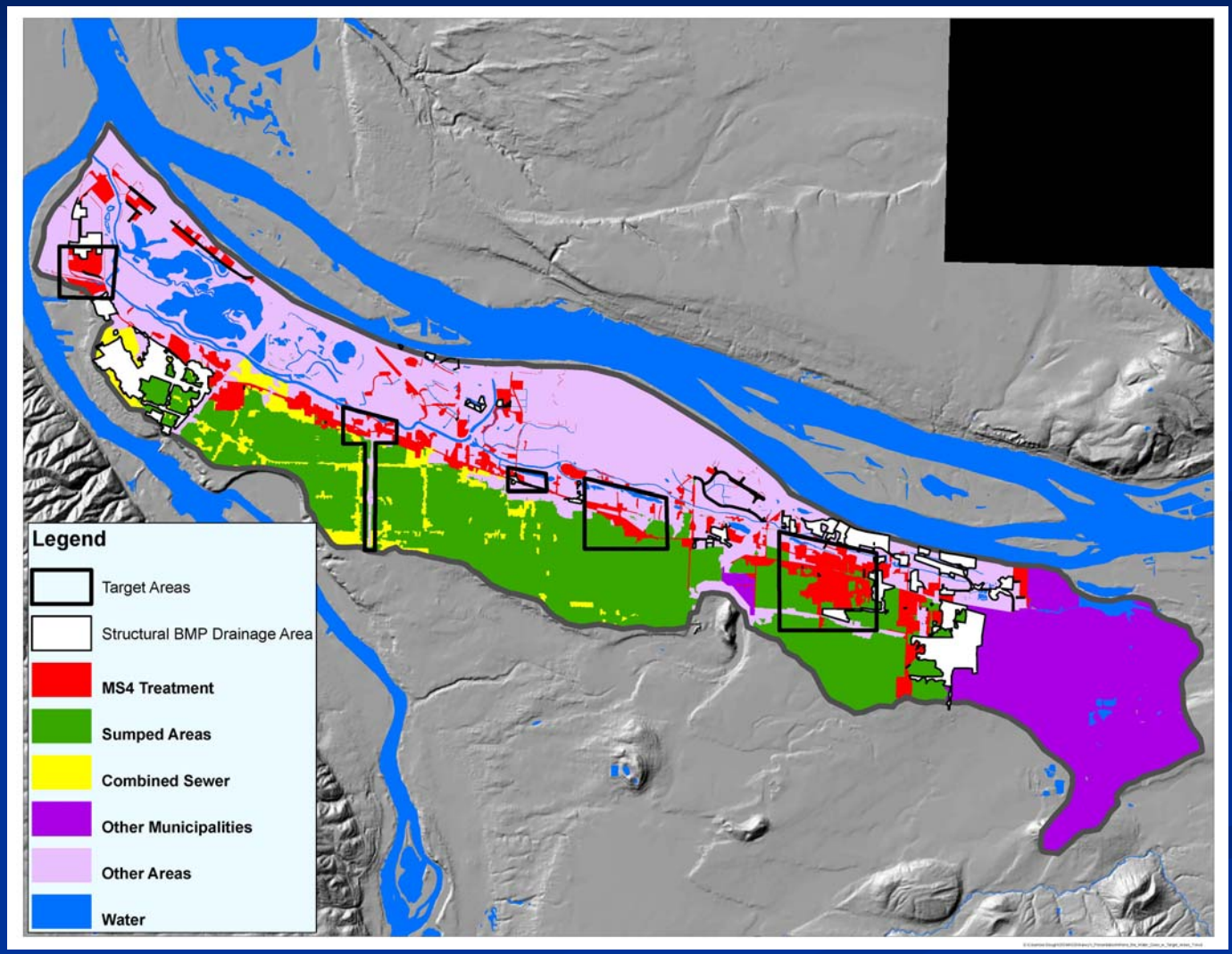
Where the Water Goes



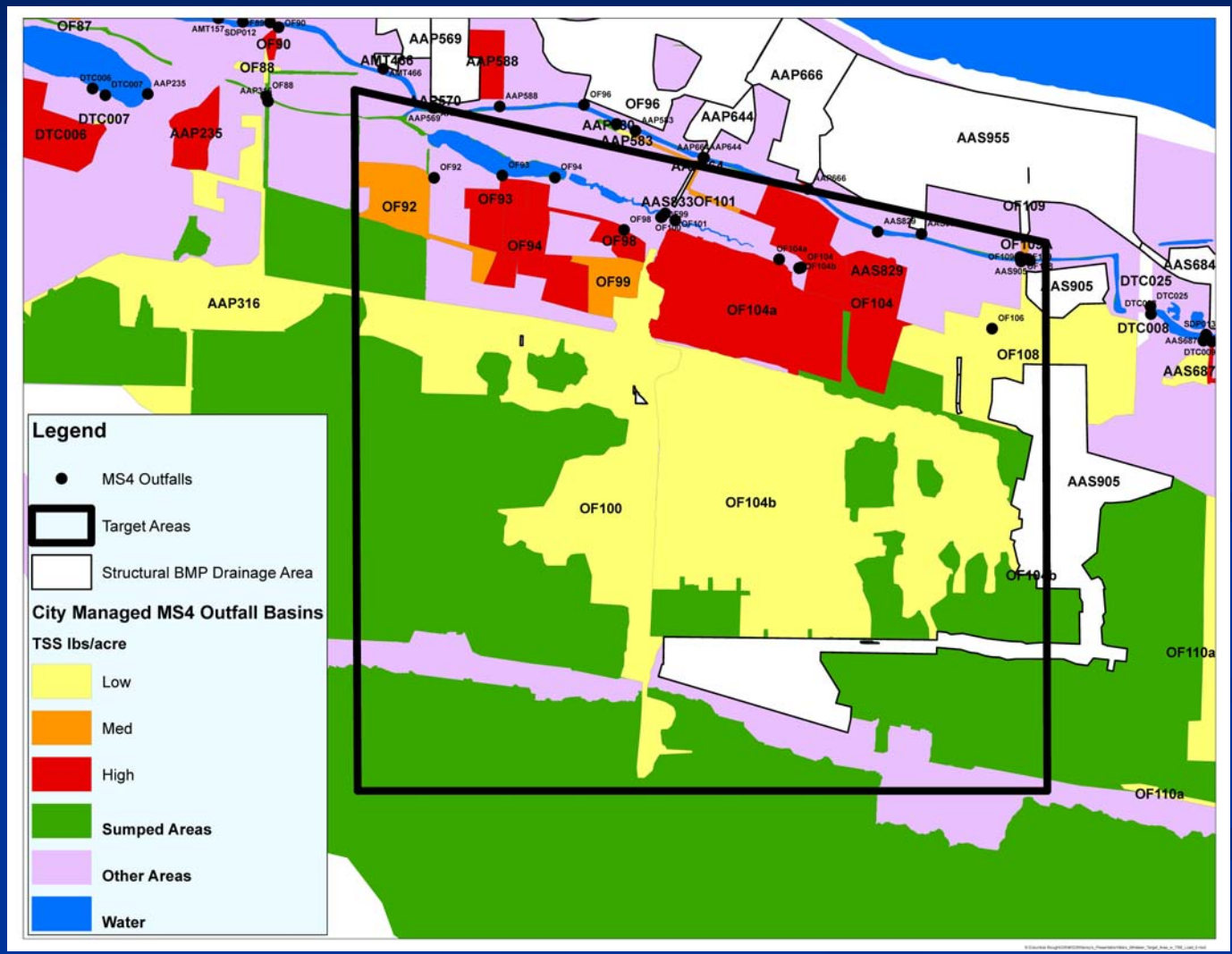
MS4 treatment



Target Areas



Prioritization of Drainage Basins



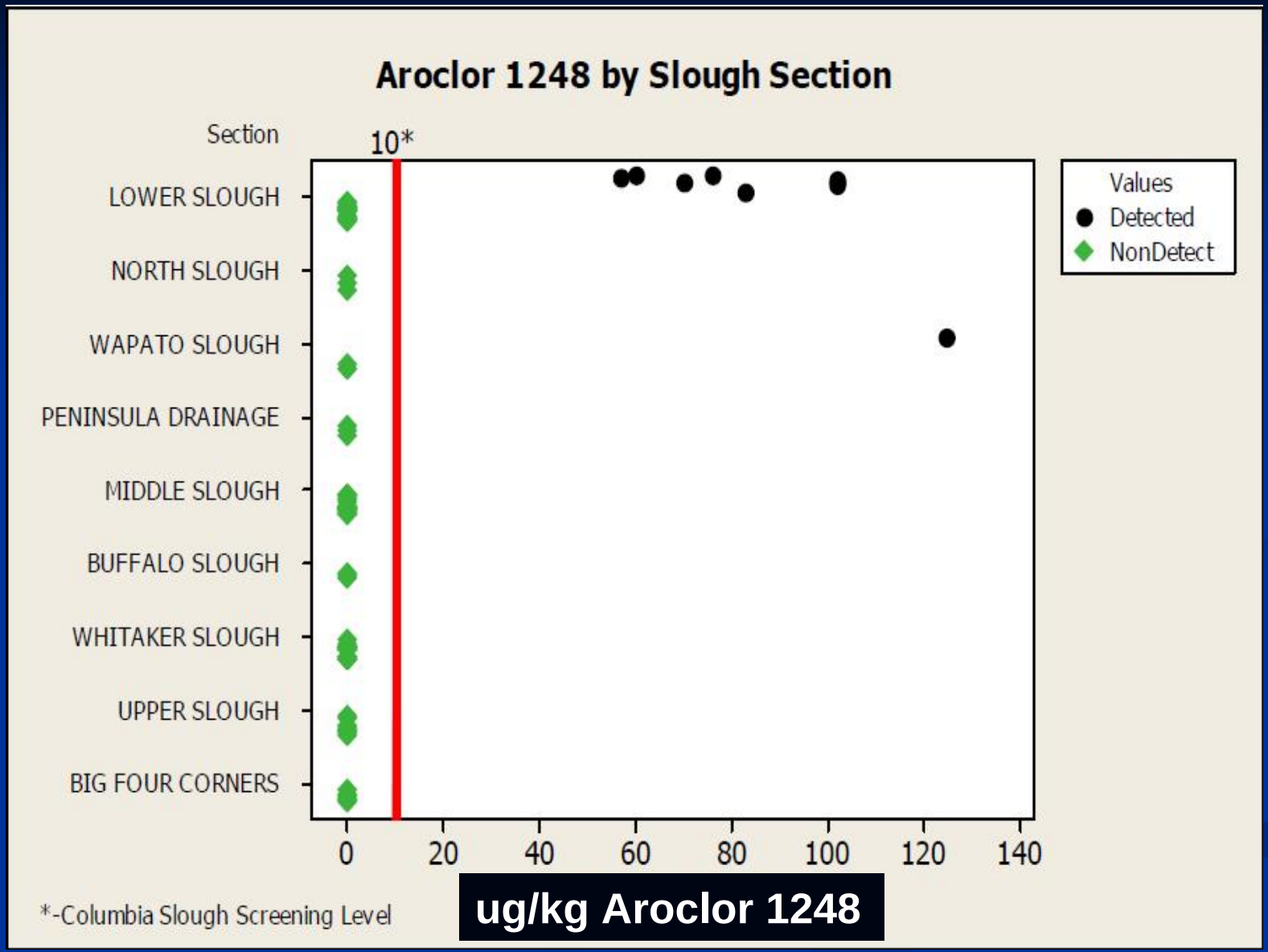
ROW treatment: potential sites

Stormwater Treatment in the ROW

Questions?

Long-Term Monitoring

- Eutrophication
  - Chlorophyll-a
  - Nutrients
- Temperature
- Dissolved Oxygen
- Bacteria
- Toxics
  - Metals
  - PAHs
  - PCBs
  - Pesticides


Aroclor 1248 by Slough Section
Section
10*
LOWER SLOUGH
NORTH SLOUGH
WAPATO SLOUGH
PENINSULA DRAINAGE
MIDDLE SLOUGH
BUFFALO SLOUGH
WHITAKER SLOUGH
UPPER SLOUGH
BIG FOUR CORNERS
0
20
40
60
80
100
120
140
Values
Detected
NonDetect
*-Columbia Slough Screening Level
ug/kg Aroclor 1248