

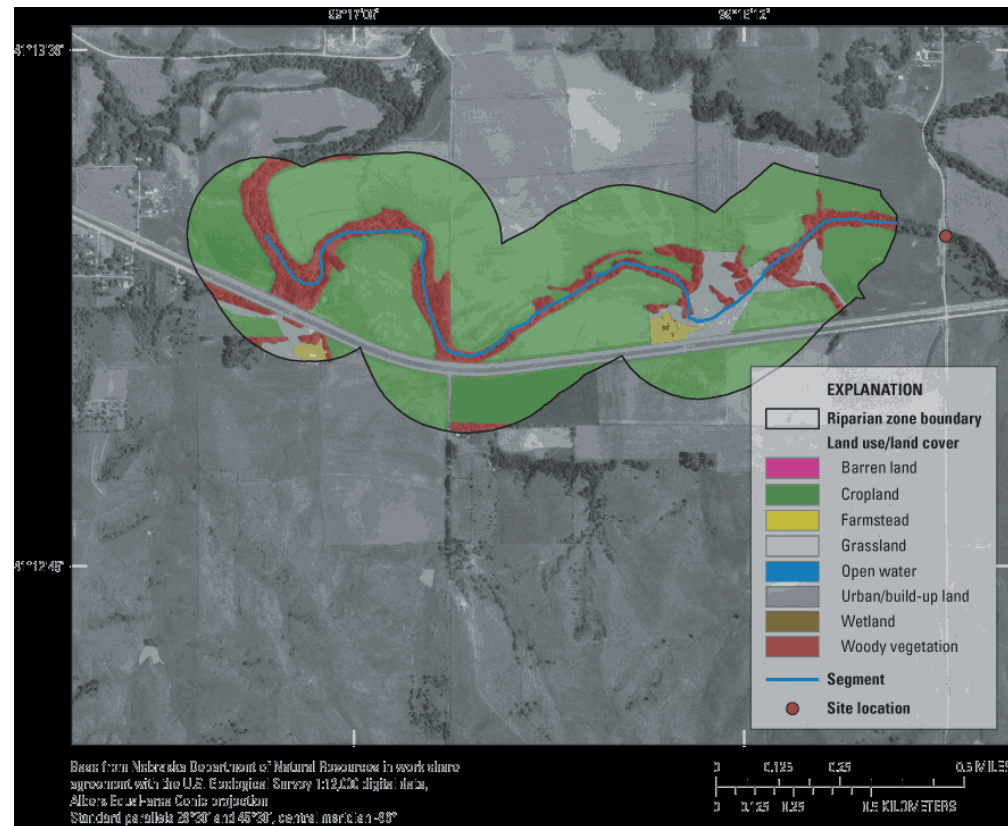
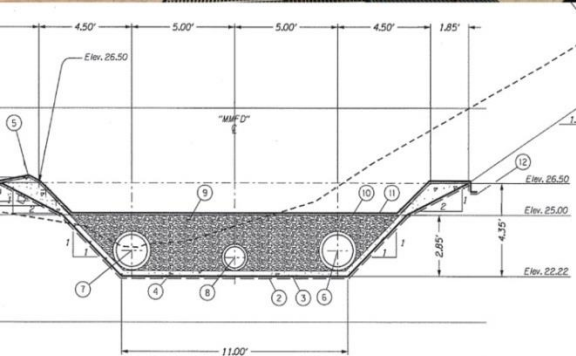
# **A Watershed Approach to Mitigating Stormwater Impacts Scope and Status of NCHRP 25-37**

An aerial photograph of a river delta, likely the Willamette River in Oregon. The river branches out into numerous smaller waterways and wetlands, surrounded by green agricultural fields and some developed areas. The sky is overcast with grey clouds.

**William B. Fletcher  
Oregon DOT**

# Watershed Approach for this project

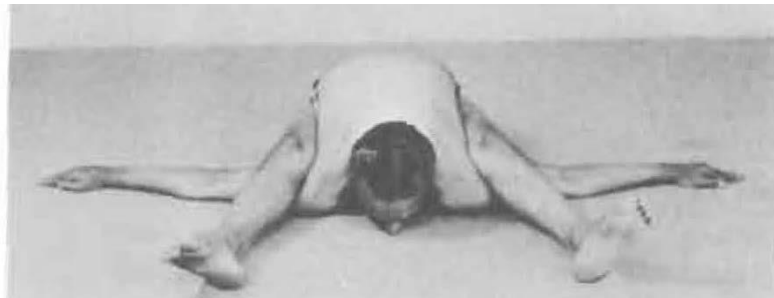
Select and place BMPs so they mitigate impacts and of benefit the watershed



# Goals of the project

## Project level stormwater mitigation strategies to:

- Compensate for project impacts
- Provide enhanced environmental benefits
  - Address watershed priorities
  - Support watershed ecological services
- Give DOTs more flexibility in how they meet stormwater management requirements



# Objective

A product that

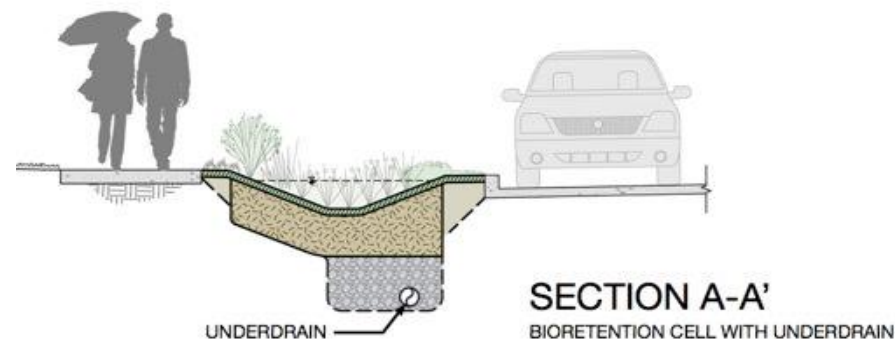
- Is widely applicable and can be used in areas without watershed assessments or plans
- Assists in identifying and evaluating mitigation options
- Assesses the environmental benefits of the mitigation options





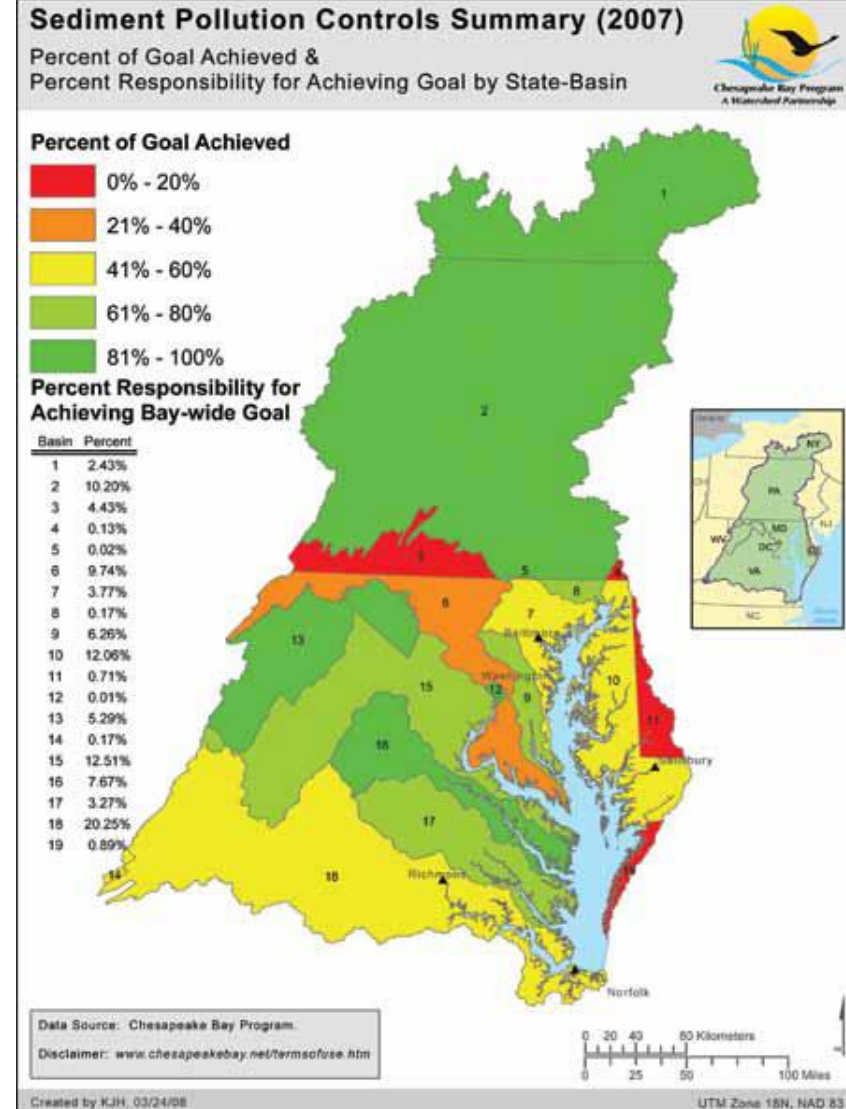
# Stormwater Mitigation Options

- On-site, in-kind (standard project mitigation)
- Off-site, in-kind
- Trading/banking/off-set
- Out-of-kind
- Combination of on-site and other options



# Project Elements

- Identification and evaluation of data sources and tools
  - Watershed conditions and priorities
  - Project impacts
  - BMP types and effectiveness
  - Existing offset, trading and banking programs
  - DOT resources, requirements and limitations



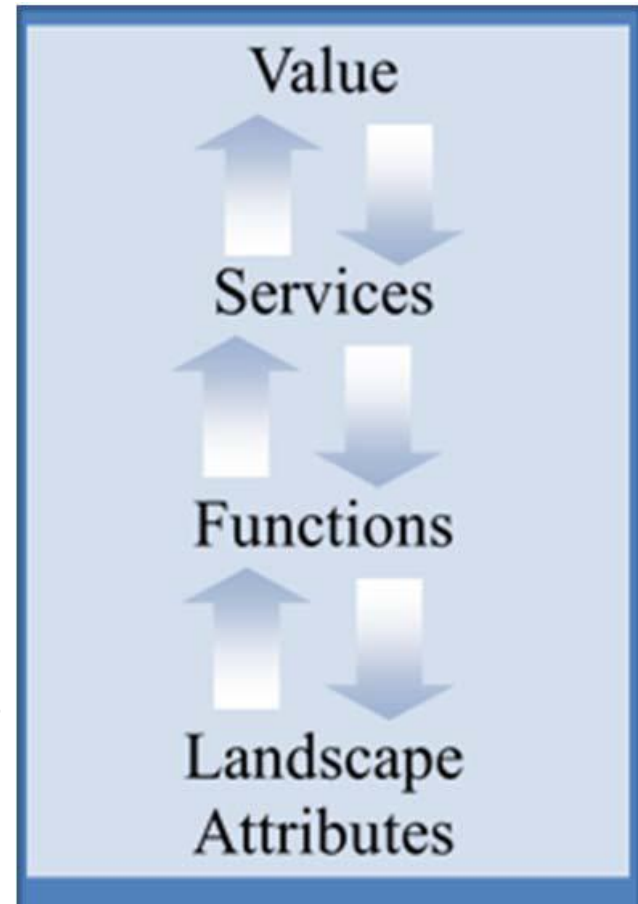
# Project elements

- Development of a mitigation option evaluation process, which supports:
- Development of an electronic Toolbox and guidance document to direct and assist in mitigation evaluation and selection



# Ecosystem Services

- Takes mitigation evaluation one step (or more) beyond just meeting water quality criteria.
- Can be used in comparing the value of different mitigation options, including off-site and out-of-kind.





# Status

- White Papers on:
  - Existing Data Sources
  - Foundation and approach for the Toolbox
  - Characterization of the Watershed
  - Characterizing watershed goals and mitigation effectiveness



watershed resources registry



United States Environmental Protection Agency

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## EnviroAtlas

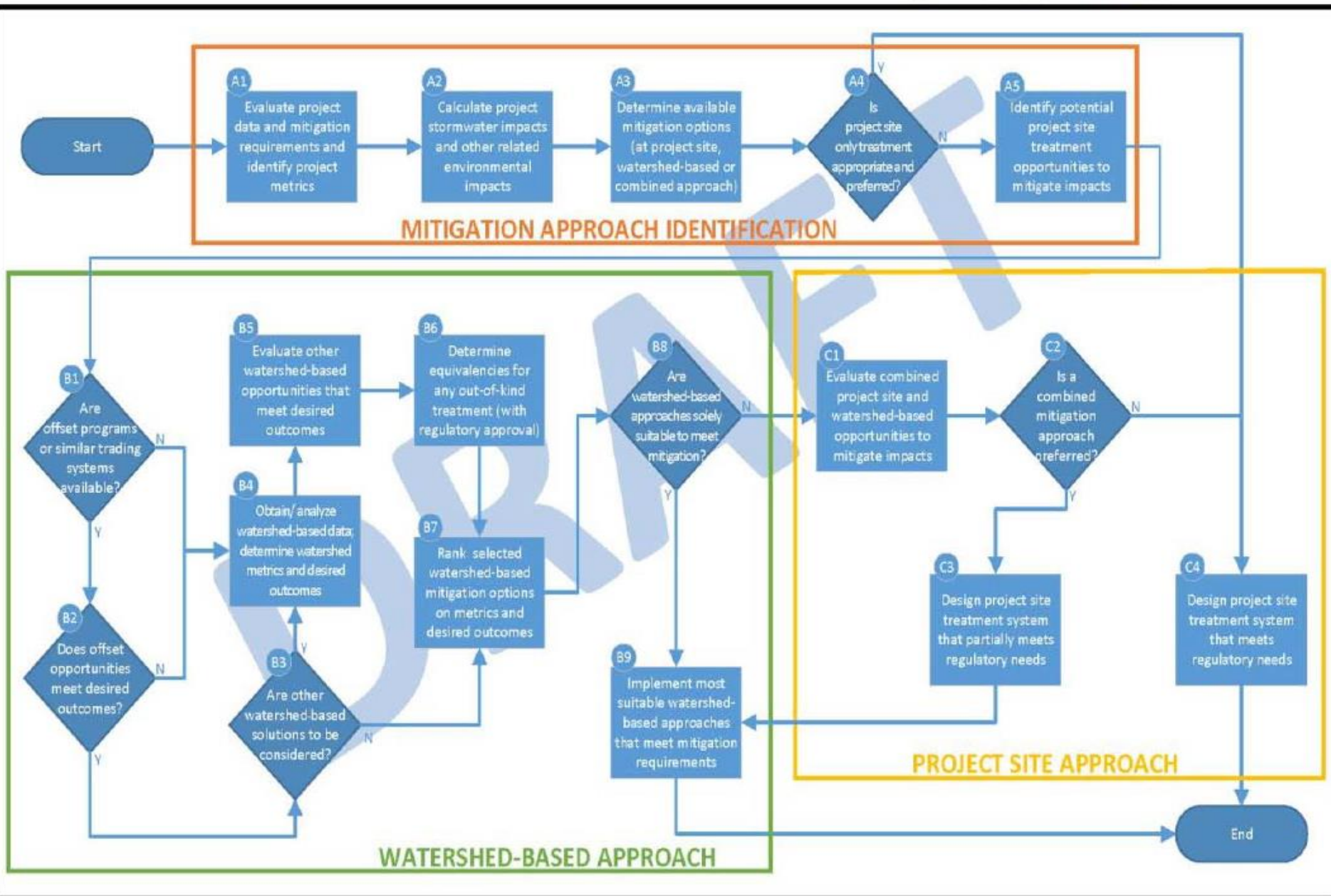
You are here: [EPA Home](#) » [Research](#) » [Ecosystem Research](#) » [EnviroAtlas Home](#)



# Status

- White Papers
  - Development of the Toolbox
    - Selection of on and off-site BMPs
    - Data and tools for Watershed-based mitigation and Ecosystem Services
    - DOT organizational capacity for mitigation programs
    - Watershed based trading and off-set programs
- Report Chapters:
  - Chapter 2: Toolbox Datasets
  - Chapter 3: Methods to Develop Mitigation Options
- Process Flow Chart

# Process Flowchart



# Toolbox Requirements

- National data and appropriate state/local information
- Quantification of impacts
- Identification of candidate mitigation tools
- Identification of known watershed opportunities
- Rank mitigation approaches based on “*apparent benefits*” to ecosystem services

**WBSMT**  
4/14/2014 10:28

**WBSMT Watershed-Based Stormwater Mitigation Toolbox (WBSMT) v1.2014.04**

## STEP 1 - Watershed Characterization

**1 Project**

Project information to identify this project

Project Name:

Description:


Watershed:

Username:

**2 LOCATION & WATERSHED CHARACTERIZATION**

Select a location on the map or search by name to select a state and a watershed. Select the watershed characteristics using links.

**Map Select**



**Refine Selection**

State:

Gage ID:

**Location Climate**

COOPID	356751
Elevation (ft)	19
Average Annual Precip. Depth (in)	36.7
Override Ave. Ann. Precip. Depth (in)	<input type="text" value=""/>

**Other Characteristics Based on Location**

Link:	Value:	Risk:
Aquatic Barriers		
Existing Wetlands Near Project & Wetland Type		
Fish Habitat		
Number of Impaired Waterbodies		
Number of Watershed DW Intakes		
Number of Stream Crossings		
Number of Threatened and Endangered Species		
Percent Urban/Impervious Landcover		
Percent of Wetlands in Watershed		
Recreational Resource		
Riparian Area Soil Stability		
Sediment Risk		
Watershed Slope		
Watershed Stream Miles Impaired		
Watershed Waterbody Acres		
Watershed Soil Stability		

**3 PROJECT MITIGATION CONSIDERATIONS**

Enter information on the appropriate target (multiple targets are not allowed)

or listed impairment?

No

Find out at:

[MyWaters Mapper](#)

If Yes, the constituent of concern is:

Phosphorus

Probable Cause(s) Contributing to Impairment

**4 GOALS**

Enter information on the appropriate target (multiple targets are not allowed)

**GOALS**

**Regulatory** ☐ **Comply with NPDES permit**

**Hydraulics** ☐ **Manage flow characteristics upstream, within, or downstream of project**

**Hydrology** ☐ **Improve runoff characteristics (peak shaving and/or volume reduction)**

**Water Quality** ☐ **Reduce downstream pollutant loads and concentrations (TSS, Nutrients, Volume Flow)**

**Water Quality** ☐ **Improve/minimize downstream temperature impact**

**Water Quality** ☐ **Mitigation for development in other areas**

**Water Quality** ☐ **Opportunistic BMP installation**

**Target % Runoff Capture**

80%

**Target % Volume Reduction**

20%

**Target % Constituent Reduction**

20%

# Toolbox Organization:

1. Pre-screening evaluation of offsite criteria
2. Watershed characterization and project mitigation goals
3. Project impacts and equivalencies
4. Linking mitigation options with ecosystem services
5. Mitigation and equivalency reporting metrics



# Next Steps

- Linkage of mitigation actions to ecosystem services
- Evaluation of mitigation equivalency
- Finding and assessing off-site mitigation opportunities
- Ranking mitigation options based on watershed goals and project objectives



# Next Steps



- Integrate Watershed Approach mitigation with existing planning efforts
- Prepare a programmatic decision framework
- Conduct Pilot projects
- Develop model institutional framework for DOTs using a watershed approach

Stay tuned for the  
exciting conclusion!

