

An integrated watershed-based approach for urban runoff and stormwater quality of Los Angeles County

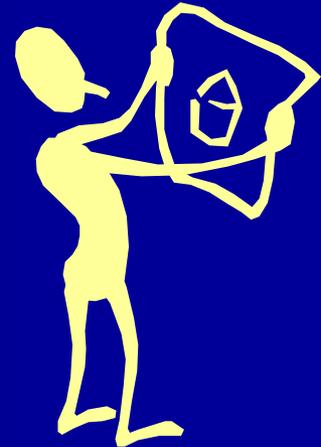
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NACO Stormwater TMDL Webinar
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Outline

- Coastal watersheds of the Los Angeles County
- Why “Integrated watershed-based” approach?
 - Background-challenges
- Project Goals
- Tasks
 - Watershed management modeling system
 - Water Quality Improvement Plan
- Schedule and milestones

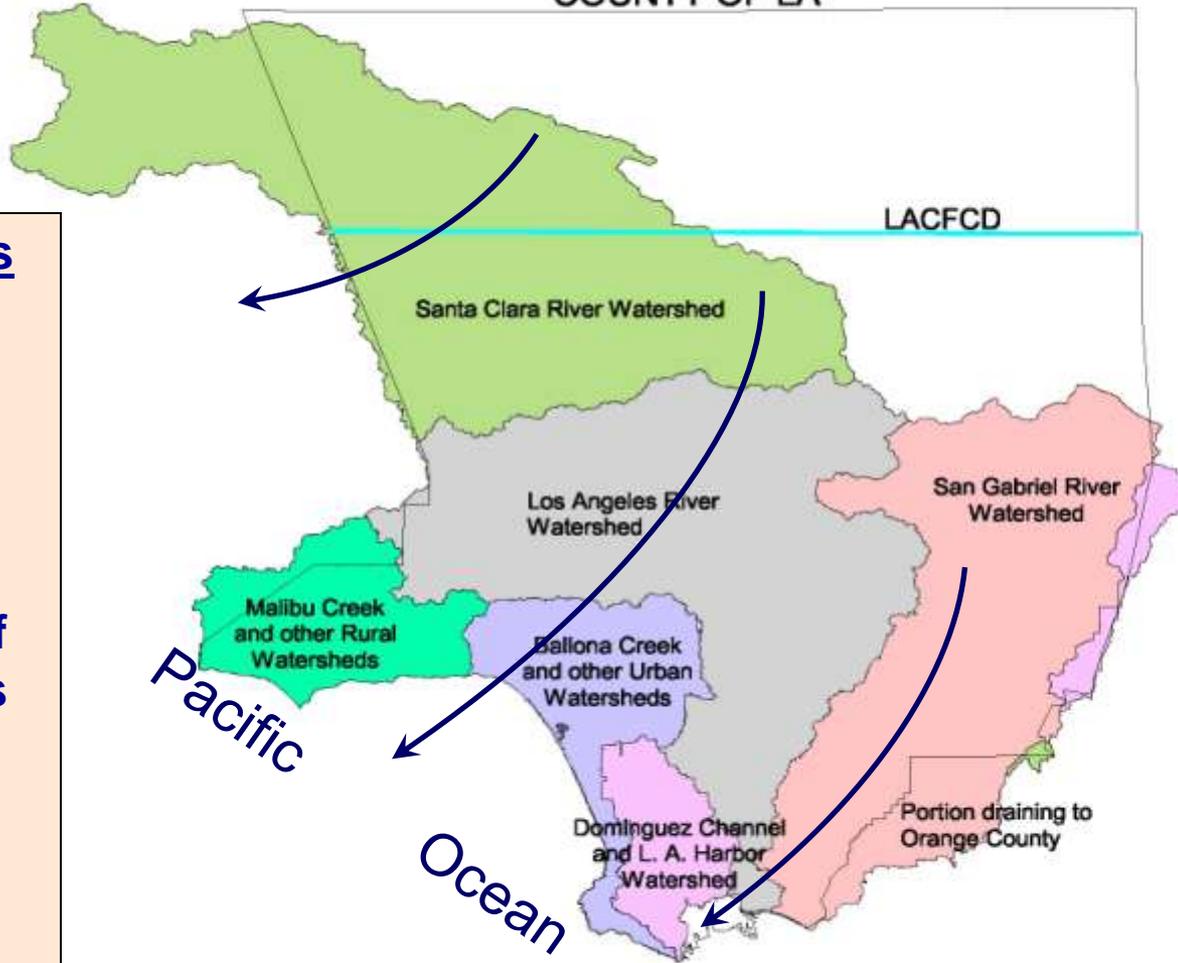


Coastal watersheds of the Los Angeles County

- Drainage from pristine mountains, urban areas, to pacific ocean
 - A. 530 miles of open channels and 2,800 miles of storm drains
- Total 3,100 sq-miles of watershed areas
 - A. Los Angeles River Watershed
 - B. Santa Monica Bay Watershed (BC & MdR)
 - C. Malibu Creek Watershed
 - D. San Gabriel River Watershed
 - E. Dominguez Channel/Harbor Watershed
 - F. Santa Clara River Watershed



COUNTY OF LA



LACFCD

Santa Clara River Watershed

Los Angeles River Watershed

San Gabriel River Watershed

Malibu Creek and other Rural Watersheds

Ballona Creek and other Urban Watersheds

Dominguez Channel and L. A. Harbor Watershed

Portion draining to Orange County

Pacific

Ocean



Watershed Facts

- 530 Miles of open channel
- 2,800 miles of storm drain
- 3,100 sq-mile of watershed areas
- Total 23 TMDLs developed
- Total 5,600 NPDES permits

TMDLs in Los Angeles County

- To date, total 23 TMDLs are currently effective
 - Trash
 - Indicator bacteria
 - Metals
 - Toxic pollutants
 - Nutrients (N and P)
 - Chlorides



TMDLs in Los Angeles County

(cont)

- ❖ TMDLs are allocated to
 1. Point Sources
 - POTWs effluent (non-storm discharges)
 - Municipal stormwater dischargers
 - California DOT stormwater discharges
 - Industrial and construction storm and non-storm dischargers
 2. Non-point sources
 - Aerial deposition, natural sources (forests and animals), and urban runoff
 - Since LA county is highly urbanized, most of County's pollution is from non-point sources
- ❖ Two indicator bacteria TMDLs have been incorporated in the MS4 permit as enforceable standards



NPDES in Los Angeles County

Type of discharges	Permit type	No. of permits
Artificial Discharges	Major discharges (WWTP, generation stations, refineries)	31
	Minor discharges	549
Stormwater discharges	Industrial	2645
	construction	2218
	CALTRANS	1
	Municipal (city of Long beach)	1
	Municipal (LA county, LACFCD, 84 cities)	1

Handwritten red annotations: A bracket groups the 31 and 549 permits under 'Artificial Discharges' with the number 600. Another bracket groups the 2645, 2218, 1, and 1 permits under 'Stormwater discharges' with the number 5000.

Sanitary Sewer Overflow + natural sources (i.e., birds)

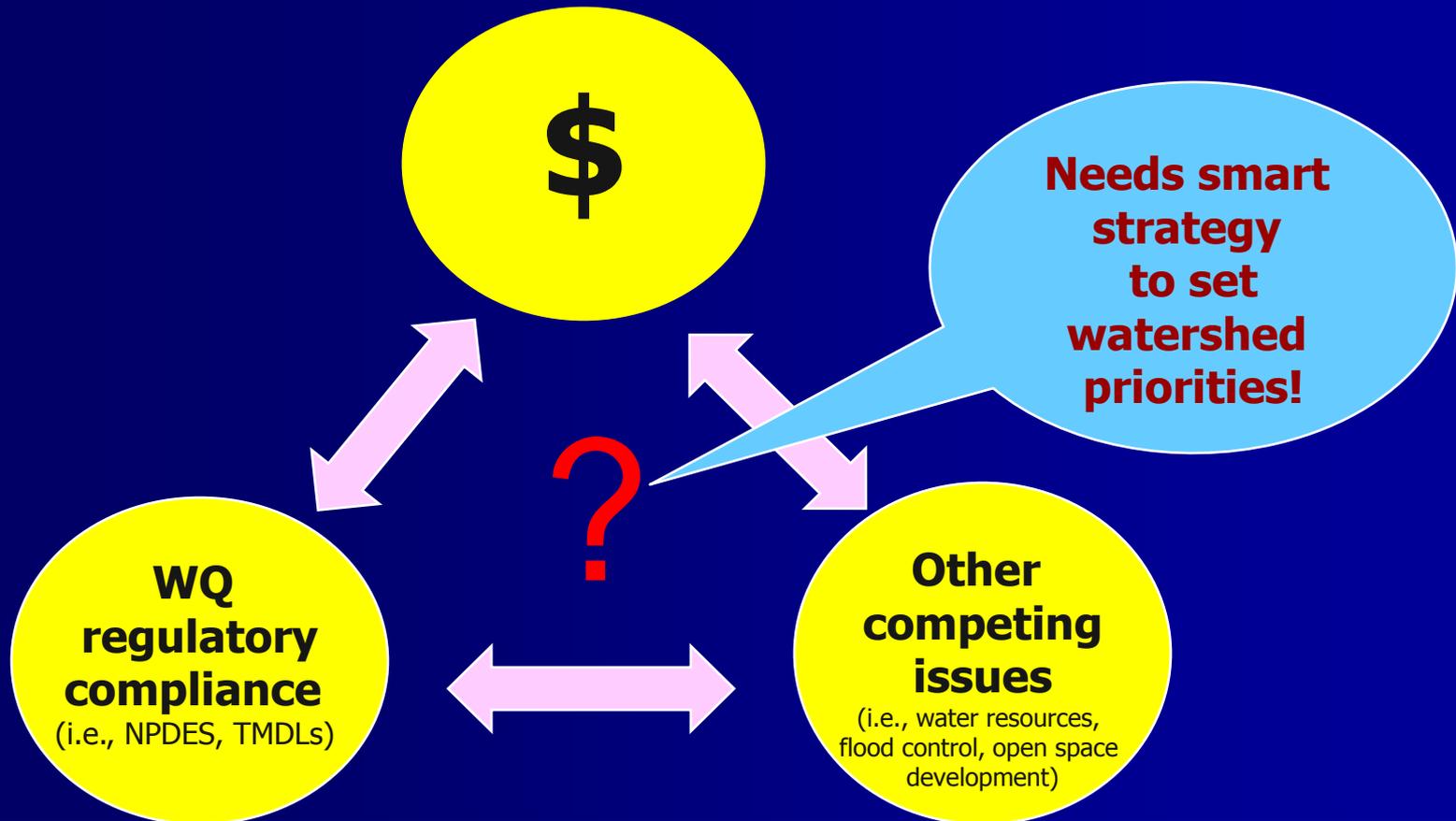


Why “Integrated watershed-based” approach?

- Challenges in WQ of the County’s watersheds
 - A. Thousands of discharges in the County
 - WWTP, refineries, generation stations, etc
 - Stormwater runoff from industrial and construction facilities
 - Other urban areas (roads, residential, commercial,
 - B. TMDL compliance is simply difficult, if not impossible
 - TMDLs are allocated only to MS4 at a system of 1000s of storm drain outlets
 - C. Multiple TMDLs are simultaneously in effect that require:
 - Different sources needed to be accounted for
 - Integrated solutions addressing multiple TMDLs
 - D. Effective stormwater management should involve all other aspects besides WQ simultaneously



Key issues in Watershed Planning



Project Goals

1. Develop a tool for TMDL compliance and stormwater management that allows:
 - A. Watershed planning at regional scale
 - B. BMP implementation at local scale
- Watershed Management Modeling System (WMMS)
 - Countywide watershed management planning tool
- Water Quality Improvement Plan (WQIP)
 - A. Comprehensive long-term TMDL compliance measures that account for all pollutants listed
 - B. With quantifiable water quality improvement benefits
 - C. Cost-effective approach for TMDL implementation
 - D. To avoid pollutant-specific TMDL implementation measures
 - E. Collaboration from EPA & Regional Board
 - F. General guidance for future WQ improvement efforts



Project Goals

(Cont.)

2. To provide technical guidance for LID implementation at new and re-development projects with quantifiable WQ benefits
 - A. Parcel scale planning for LID
 - B. Strategic planning for MS4 Permit implementation

3. To provide a integrated watershed management tool for future planning of multi-use projects
 - A. Flood control
 - B. Water Resources
 - C. Water Quality
 - D. Open space development



Tasks

- Watershed Management Modeling System
 - Watershed model
 - BMP selection system
- Water quality Improvement Plan



Watershed management modeling system

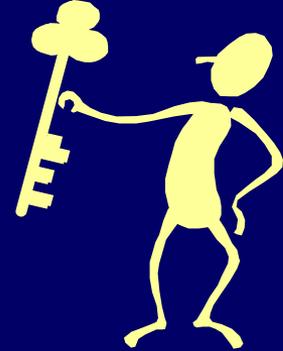
Background

- Watershed models
 - Previously created for TMDL development by USEPA (e.g., LAR, SGR, & DC, LAH Metal/Toxics TMDLs)
- BMP selection system
 - Based on BMPDSS program developed in Prince George's County through joint effort with USEPA
 - Optimization at local and regional scale
- Partnership with USEPA
 - Technical support
 - Joint funding for system development



Watershed management modeling system

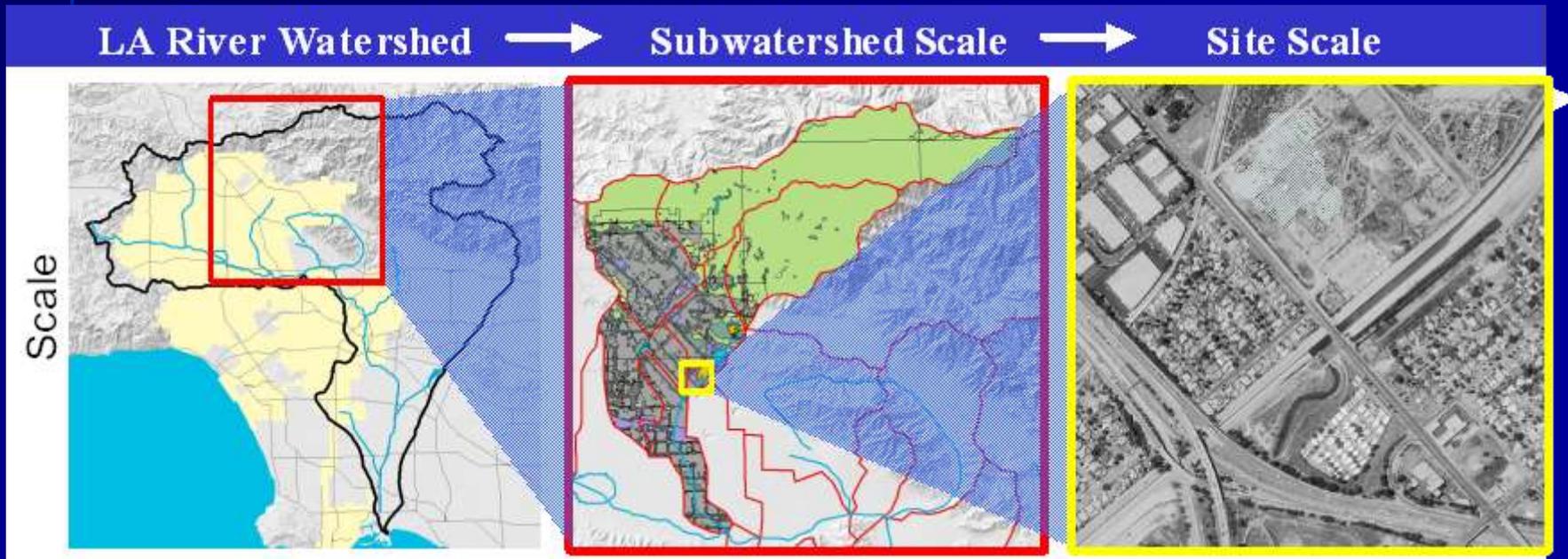
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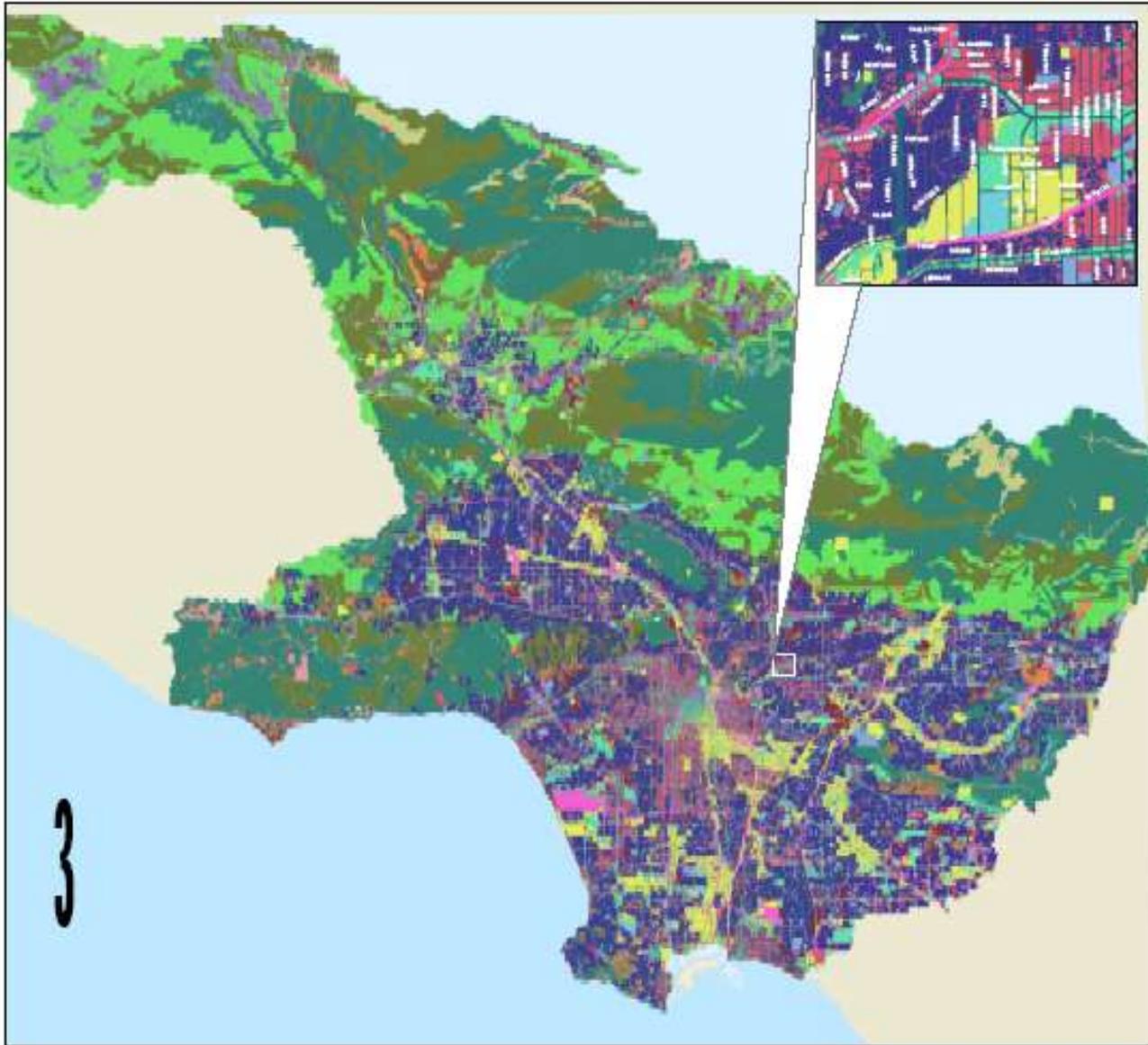
1. The system accounts for key elements of watershed characteristics:
 - A. Rainfall, infiltration, ET, and runoff
 - B. Pollutant generation, transportation, and removal mechanisms
 - C. Impact on receiving water quality (channels, streams, rivers, and ocean)
2. The system identifies the most optimal set of distributed and centralized BMPs by calculating:
 - A. Existing, site-specific runoff volume and pollutant load
 - B. Pollutant removal effectiveness and costs
 - C. Expected runoff volume/pollutant load reduction with selected BMPs
3. The system also allows for optimization of load reduction scenarios among different areas within a watershed.
4. Facilitates water quality credit trading among communities or cities



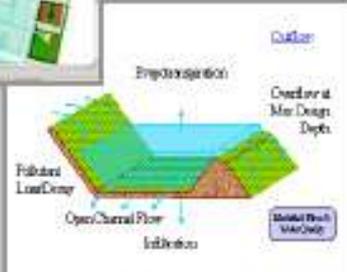
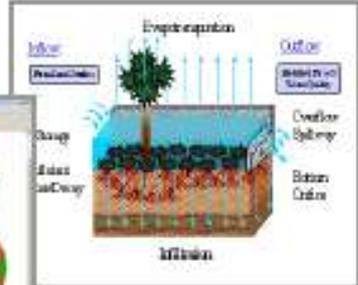
The Challenge of Scale



WATERSHED MODEL RESOLUTION

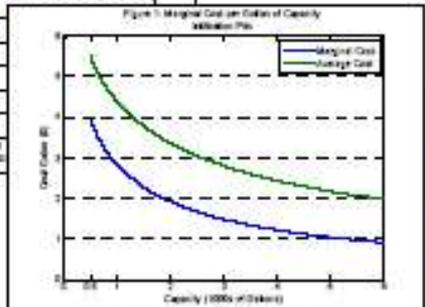
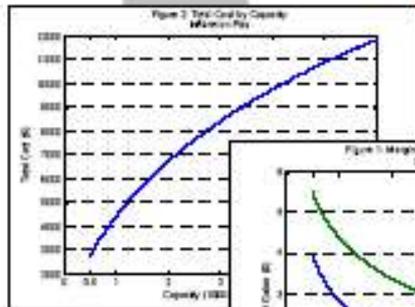


GIS Tools and Watershed Models



System Optimization

BMP Process Simulation

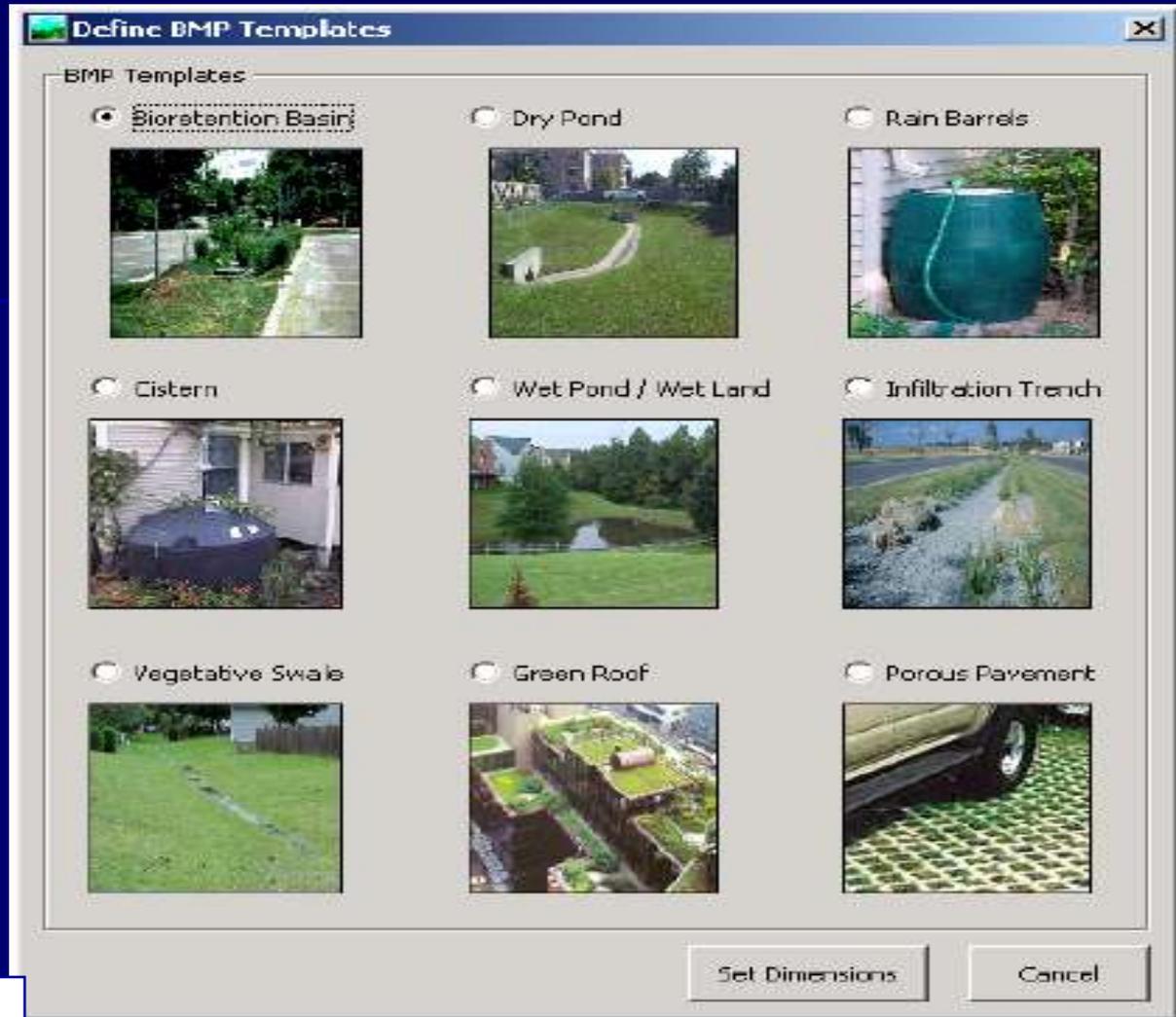


BMP Cost Functions



TETRA TECH, INC.





Distributed (LID type) BMP selection

Centralized BMP selection



Water Quality Improvement Plan

1. Includes cost-effective WQ improvement projects
 - A thorough list of distributed and centralized BMPs at subwatershed scale for all watershed areas
 - Pollution load reduction to be achieved and associated costs
 - To be updated with new WQ standards (i.e., TMDLs)
2. Will follow:
 - EPA's Watershed Management Plan Preparation Guides for WQ improvement purposes
 - Available state guidelines for Non-Point source control (Clean Water Act sec. 319)



Water Quality Improvement Plan

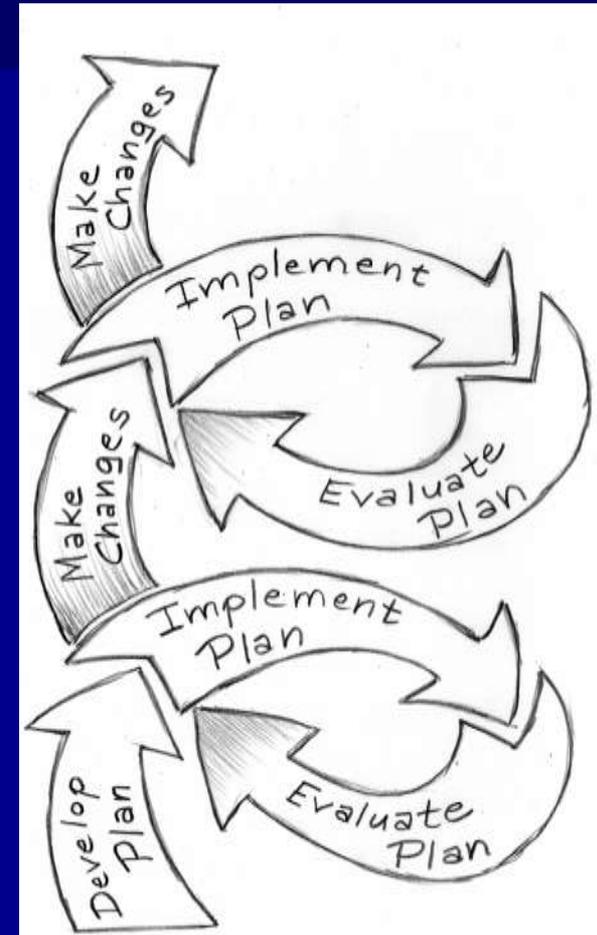
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3. Provides guidance for a short and long term planning for stormwater regulatory compliance (i.e., TMDLs) at a sub-watershed scale
4. Provides a starting layout from which specific multi-use projects can be developed
 - Green infrastructure planning
 - Open space development
 - Water conservation and flood protection
5. Provides guidance for LID implementation at new and re-development projects



Finally...Make Adjustments

- Monitor water quality and BMPs
 - Compare results to goals
 - Are you making progress?
 - Are you meeting your goals?
- Adjust!
 - If you aren't meeting implementation milestones
 - If you aren't making progress toward reducing pollutant loads....
- Iterative & adaptive approach
 - With specific, quantifiable WQ improvement goals with economics considered



Schedule and milestones

1. Phase 1 (1st yr, by May 2009)

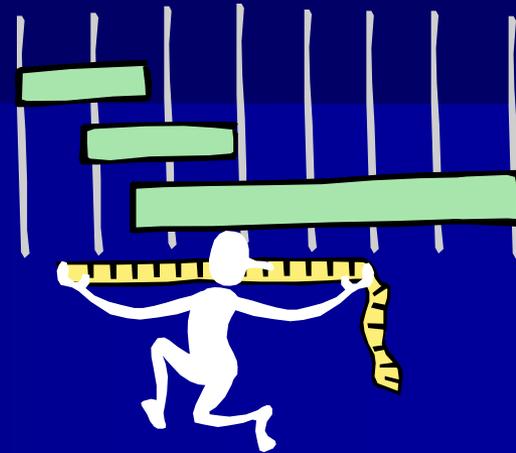
- Stakeholder outreach
- Watershed models completed

2. Phase 2 (2nd yr, by May 2010)

- BMP selection optimization engine development
- Complete selection of distributed & centralized BMPs at subwatershed scale
- Complete key components of WQIP

3. Phase 3 (3rd yr and on)

- Continuous refinement of Phase 2 BMP selection
- Project implementation level BMP selections for LID & TMDL implementation
- Assist in future watershed management planning



Questions?

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