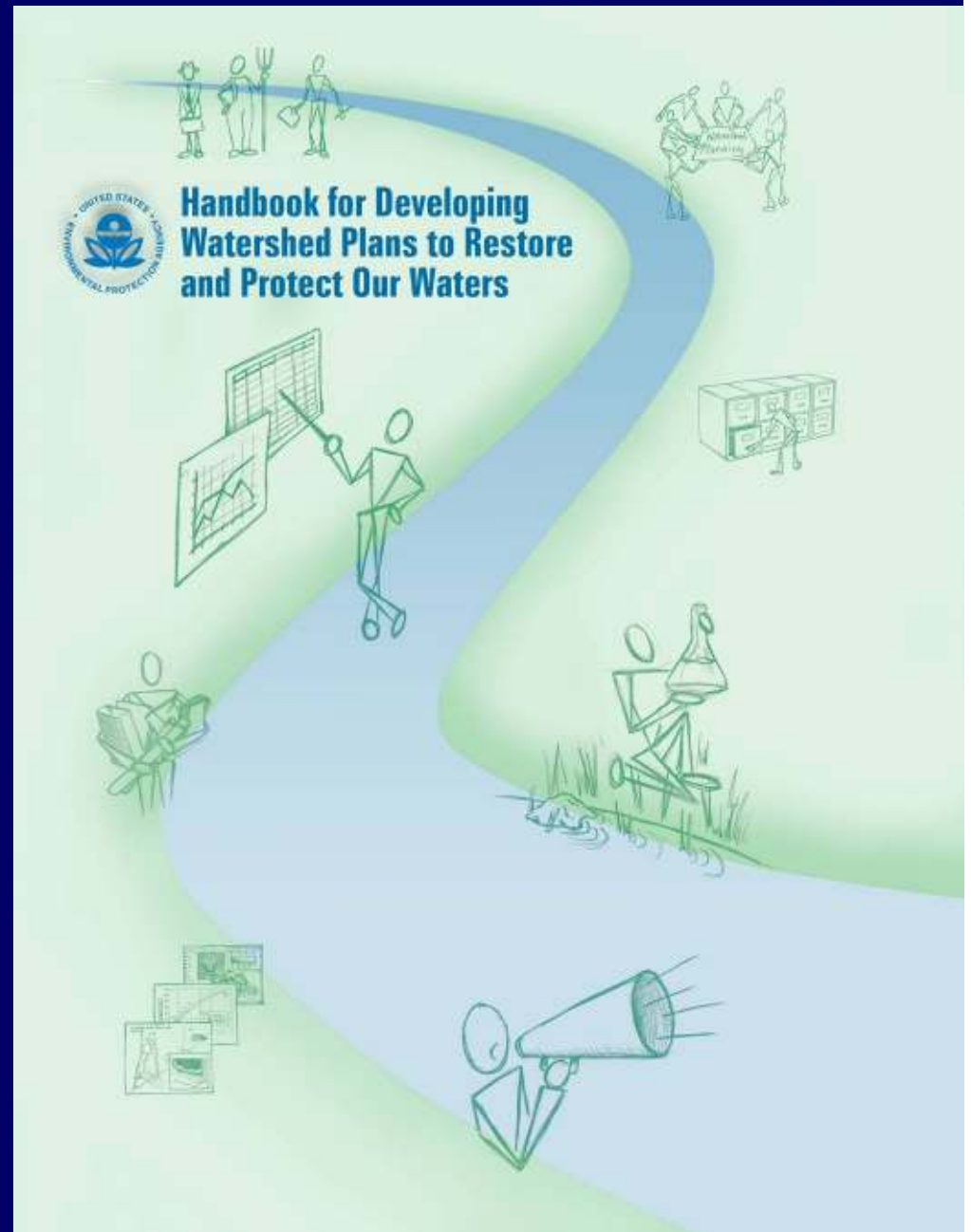


Watershed Planning & Management



A Framework for Action!

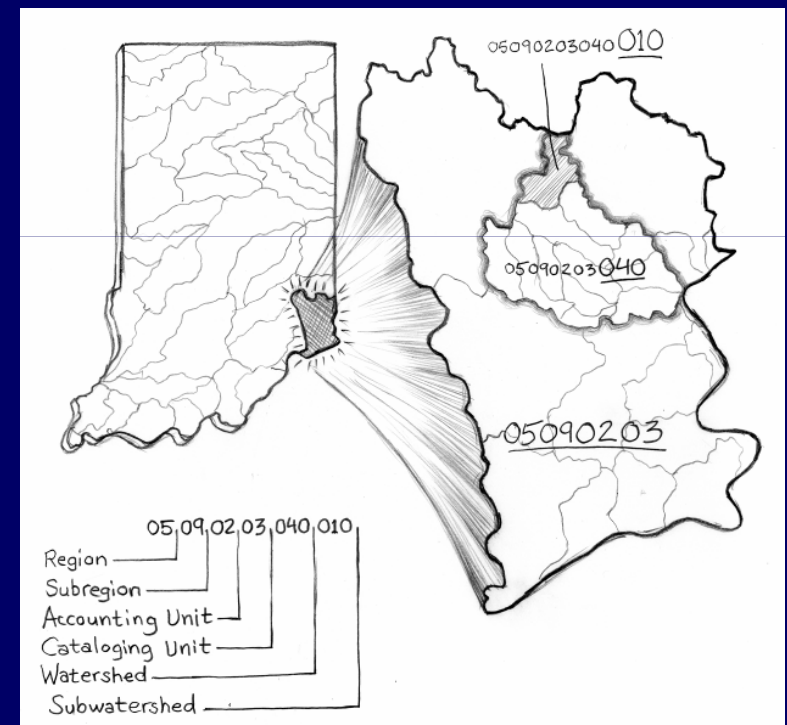
Watershed Planning Handbook



http://www.epa.gov/owow/nps/watershed_handbook/

EPA's Nonpoint Source Guidelines

- Watershed plans needed to restore impaired waters & protect other waters
- Plans are required for projects funded with 319 incremental funds
- If TMDL exists, plan must incorporate TMDL load reductions
- If TMDL developed after plan, it must be amended to reflect TMDL load limits
- Plans should be designed to meet WQS
- Plans must include nine elements (“a-i”)



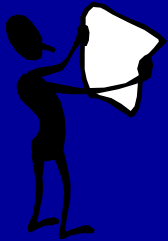
EPA's Nine Elements for Plans

- a. Identify causes & sources of pollution
- b. Estimate load reductions expected
- c. Describe mgmt measures & targeted critical areas
- d. Estimate technical and financial assistance needed
- e. Develop education component
- f. Develop project schedule
- g. Describe interim, measurable milestones
- h. Identify indicators to measure progress
- i. Develop a monitoring component

Source: US EPA, 2004 319 Supplemental Guidelines

The Process:

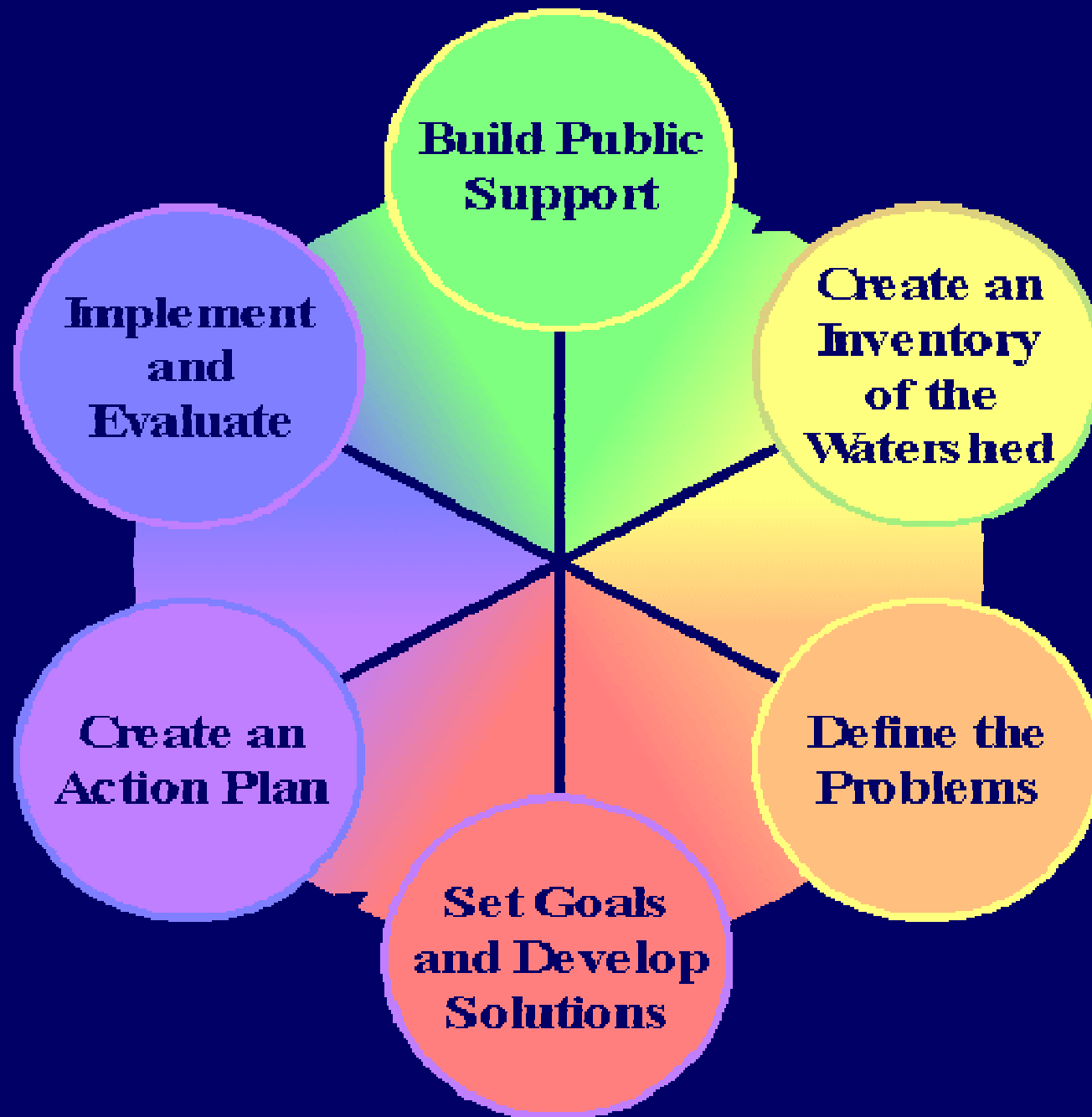
Watershed Planning Steps

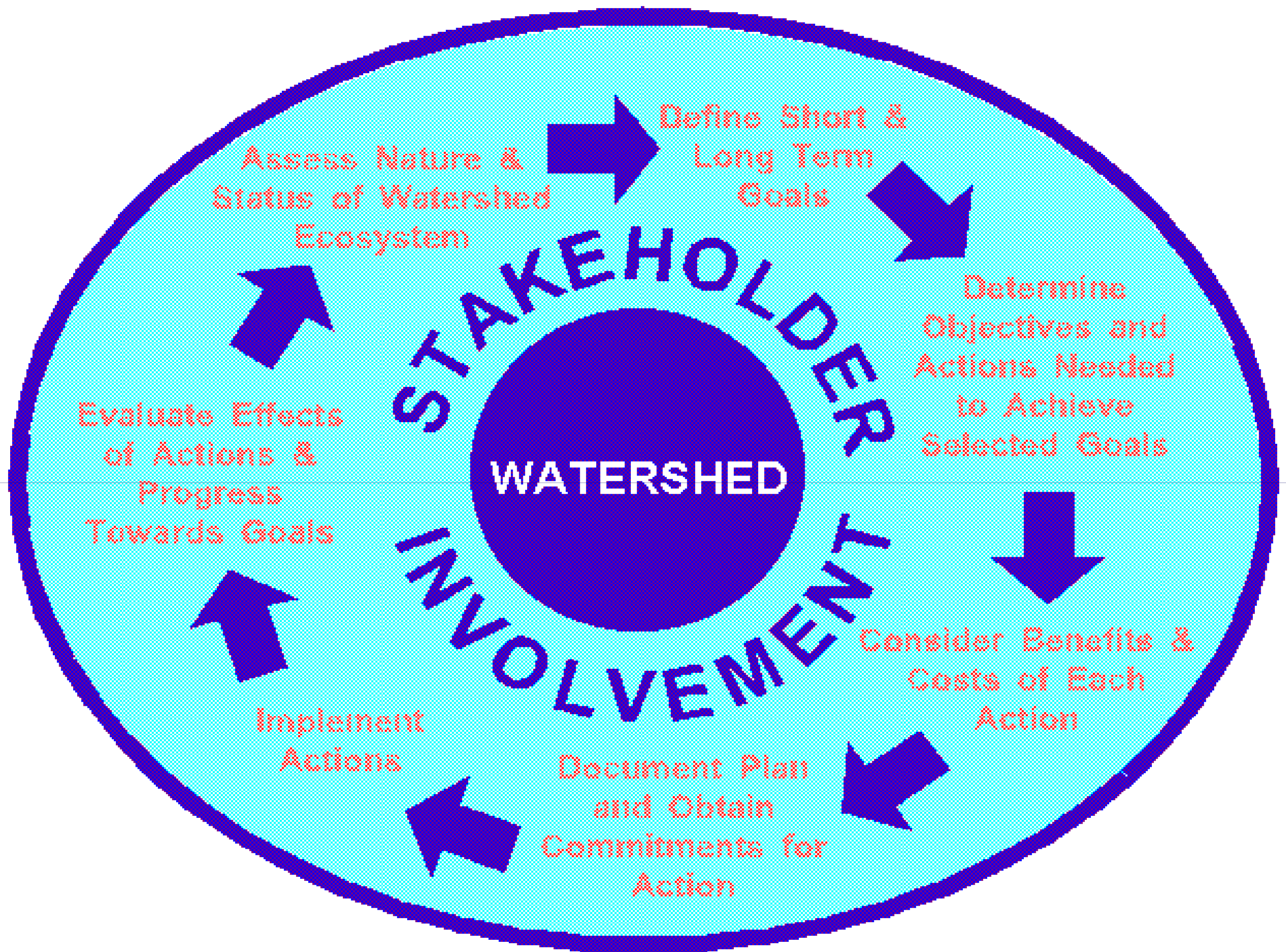


STEP I

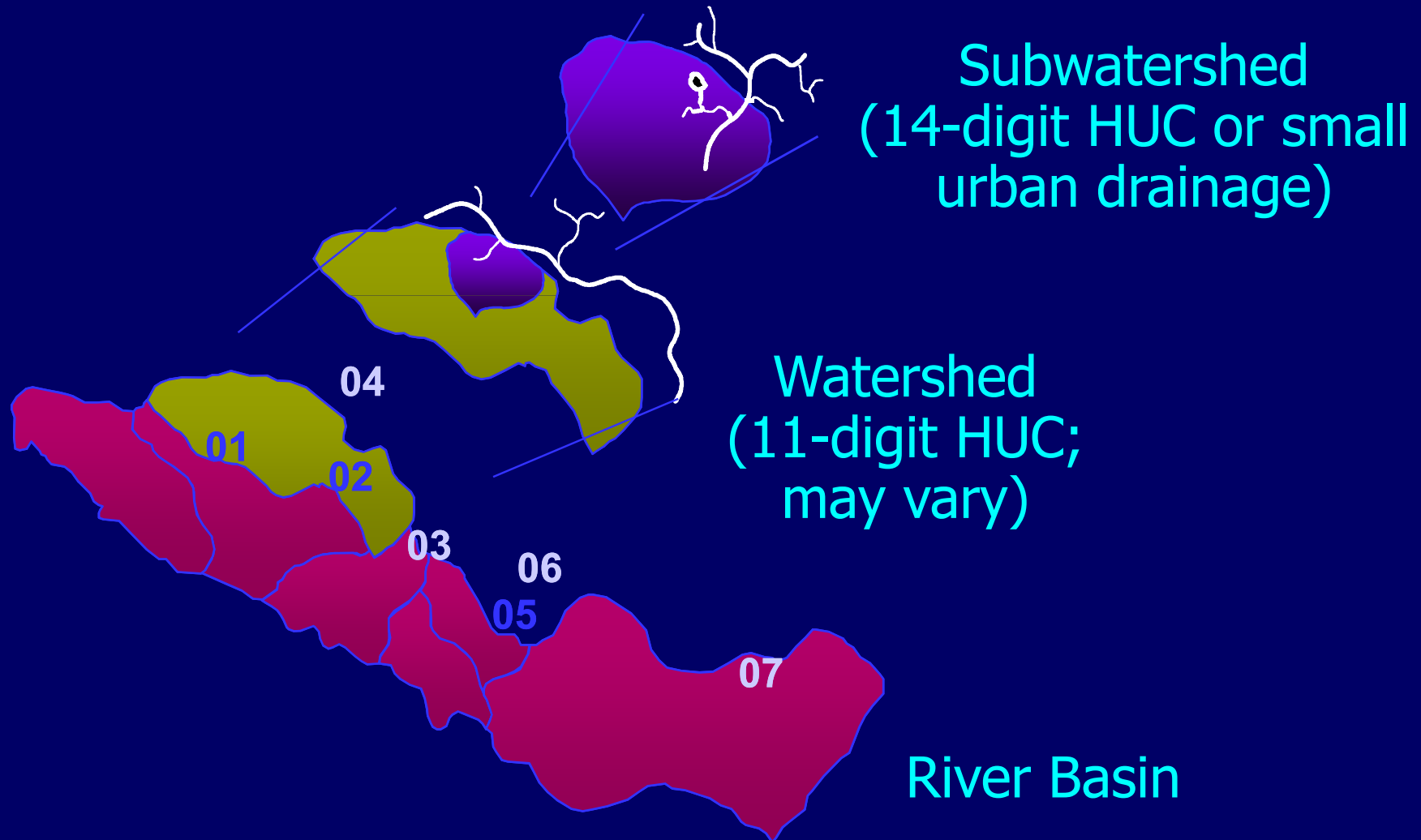
BUILD PARTNERSHIPS

- ◆ ID stakeholders
- ◆ ID issues of concern
- ◆ ID scope of effort & planning area
- ◆ Set preliminary goals
- ◆ Conduct outreach

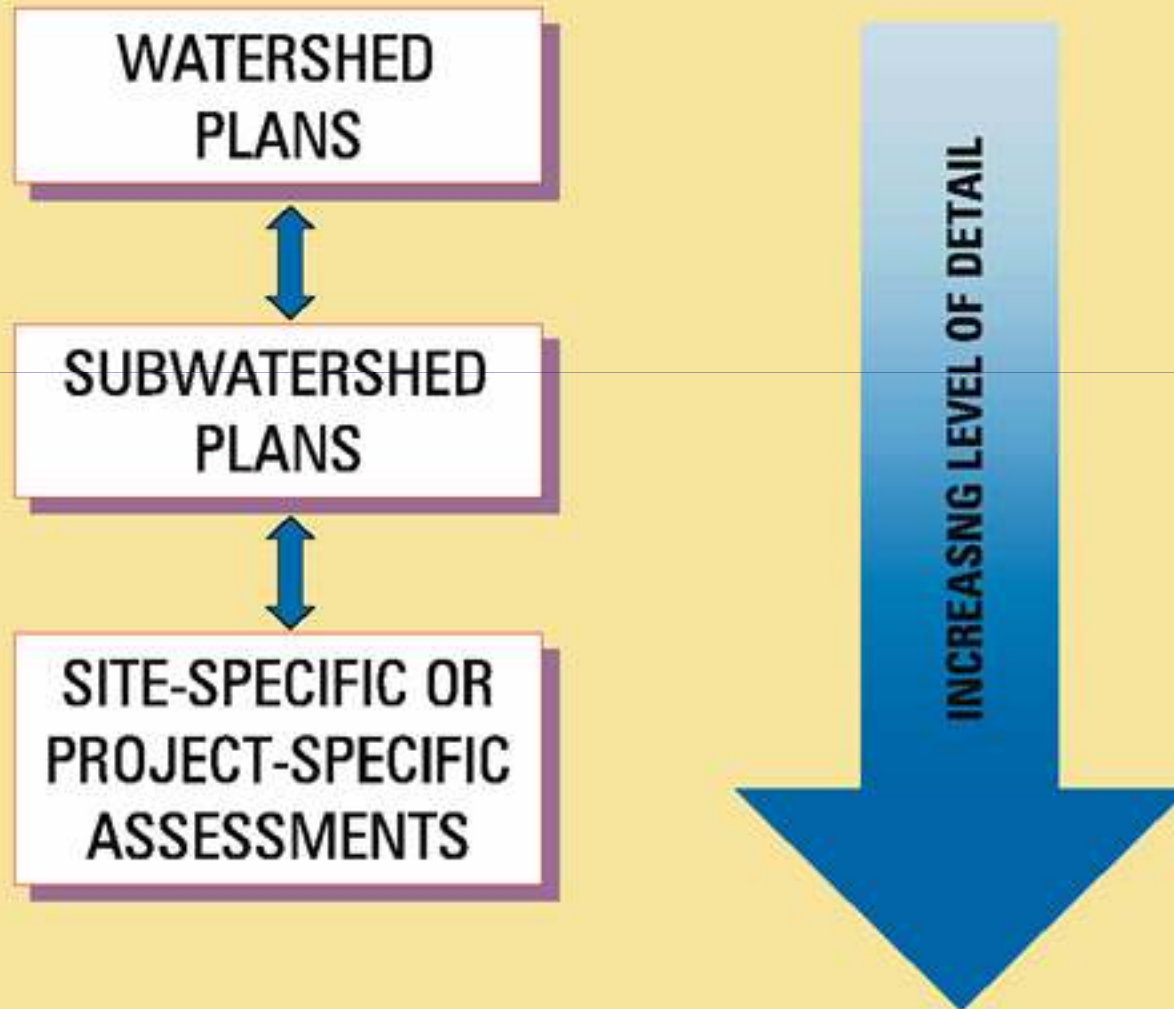




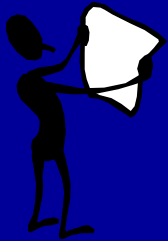
How large a planning area?



Scale and Data Collection in Watershed Planning



Watershed Planning Steps



STEP 1 BUILD

- ◆ ID stakeholders
- ◆ ID issues
- ◆ ID scope
- ◆ Set priorities
- ◆ Conduct

STEP 2 CHARACTERIZE WATERSHED

- ◆ Gather existing data
- ◆ Create data inventory
- ◆ ID data gaps
- ◆ Collect additional data, if needed
- ◆ Analyze data
- ◆ ID causes and sources
- ◆ Estimate pollutant loads

Types of Data for Watershed Characterization

■ Physical and Natural Features

- ◆ Watershed boundaries
- ◆ Hydrology
- ◆ Topography
- ◆ Soils
- ◆ Climate
- ◆ Habitat
- ◆ Wildlife

■ Land Use and Population Characteristics

- ◆ Land use and land cover
- ◆ Existing management practices
- ◆ Demographics

■ Waterbody Conditions

- ◆ Water quality standards
- ◆ 305(b) report
- ◆ 303(d) list
- ◆ TMDL reports
- ◆ Source Water Protection Areas

■ Pollutant Sources

- ◆ Point sources
- ◆ Nonpoint sources

■ Waterbody Monitoring Data

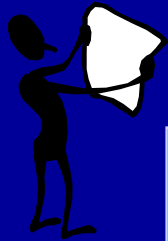
- ◆ Water quality data
- ◆ Flow data
- ◆ Biological data

Who has assessment data?

- Federal agencies
 - ◆ USGS, USFWS, USFS, BLM, USACE
- State agencies
 - ◆ Water, fish & game, forest, ag
- Colleges & universities
 - ◆ Special studies, class projects
- Watershed groups
 - ◆ Volunteer monitoring programs, local knowledge
- Local agencies
 - ◆ Water/wastewater, health, planning and zoning, etc.



Watershed Planning Steps



STEP 1 BUILD PARTNERSHIP

- ◆ ID stakeholders
- ◆ ID issues
- ◆ Set preliminary goals
- ◆ Develop a plan
- ◆ Conduct



STEP 2 CHARACTERIZE THE PROBLEM

- ◆ Gather existing data
- ◆ Create data gaps
- ◆ ID data gaps
- ◆ Collect additional data
- ◆ Analyze data
- ◆ ID causes
- ◆ Estimate problem



STEP 3 FINALIZE GOALS AND IDENTIFY SOLUTIONS

- ◆ Set goals and management objectives
- ◆ Develop indicators/targets
- ◆ Determine load reductions needed
- ◆ ID critical areas
- ◆ ID management measures needed

Proposed management measures

■ Load reductions needed

- ◆ Estimate quantitatively
- ◆ Metrics selected should make sense!

■ BMP types proposed

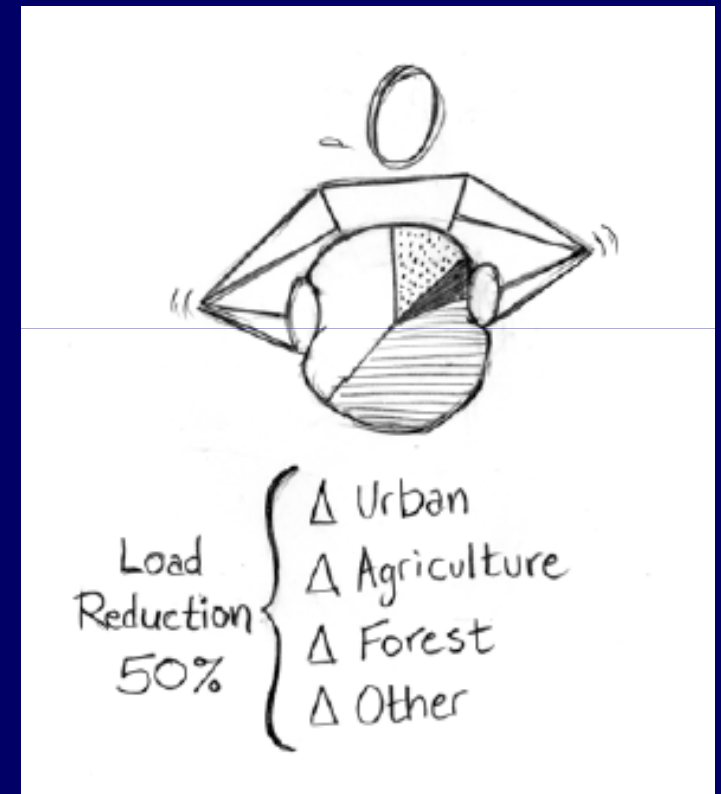
- ◆ What will lessen your 'loads'?
- ◆ Applicable to your situation?

■ Load reductions from BMPs

- ◆ How can you measure BMP impacts?
- ◆ Use literature or actual values

■ BMP installation sites

- ◆ Which sites will hit the source(s)?
- ◆ Are there critical areas to focus on?



References for determining BMP effectiveness

- Stormwater/Urban (BMP Effectiveness database; Menu of BMPs)
- Agriculture (Ag Management Measure document)
- Forestry (Forestry Management Measures document)
- Mining (Development document for proposed Effluent Guideline for Mining)



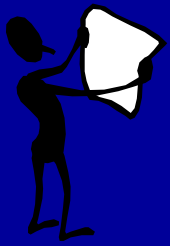
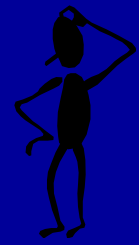
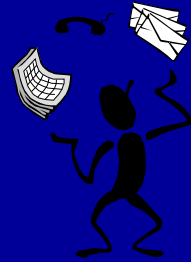
www.epa.gov/nps

Prioritizing/targeting BMPs

- Importance of waterbody
 - ◆ Drinking water source, recreational resource
- Magnitude of impairment(s)
 - ◆ Level of effort needed; public interest/attention
- Existing loads (stressors & sources)
 - ◆ Magnitude, spatial variation, clustering
- Ability of BMPs to reduce loads
 - ◆ Sure thing, or a shot in the dark?
- Feasibility of implementation
 - ◆ Willing partners? Public support?
- Additional benefits
 - ◆ Recreational enhancements, demonstration



Watershed Planning Steps



STEP 1 BUILD PARTNERSHIP

- ◆ ID stakeholders
- ◆ ID issues
- ◆ Set preliminary goals
- ◆ Develop initial plan
- ◆ Conduct

STEP 2 CHARACTERIZE PROBLEM

- ◆ Gather information
- ◆ Create data base
- ◆ ID data gaps
- ◆ Collect additional data
- ◆ Analyze data
- ◆ ID cause and effect
- ◆ Estimate

STEP 3 FINALIZE GOALS

- ◆ Set goals and objectives
- ◆ Develop indicators
- ◆ Determine location
- ◆ ID critical areas
- ◆ ID management

STEP 4

DESIGN IMPLEMENTATION PROGRAM

- ◆ Develop Implementation schedule
- ◆ Set Interim milestones
- ◆ Determine how you will measure success
- ◆ Develop monitoring component
- ◆ Develop evaluation process
- ◆ ID technical and financial assistance needed
- ◆ Assign responsibility

Asking the right questions . . .

- Who can help implement the BMPs or controls?
 - ◆ Agencies, businesses, non-profits, citizens, producers
- How can they be implemented?
 - ◆ What has been done in the past?
 - ◆ How well did it work?
 - ◆ Can we do it (or adapt it) here?
- When can we get started?
 - ◆ Reasonable short-term actions
 - ◆ Long-term or major actions
- How do we know if it's working?
 - ◆ And what do we do if it's not?



Estimate technical and financial assistance needed

- Funding sources
 - ◆ Grants, contracts, donations
 - ◆ Supplemental Env. Projects
- Sources of technical assistance
 - ◆ Internal and external
 - ◆ Design/engineering services
 - ◆ Volunteer & other groups
- Regulatory or other authority
 - ◆ Health dept. planning/zoning
 - ◆ WHPP, SWPP, etc.
- Matching support sources
 - ◆ Outreach & education support
 - ◆ Be creative!



Describe interim, measurable milestones

“A description of interim, measurable milestones for determining whether NPS management measures or other control actions are being implemented.”



Contents of a Watershed Plan

■ Introduction

- ◆ Plan area & description, partners, background

■ Water quality information & analysis

- ◆ WQ goals, monitoring/assessment results
- ◆ Key pollutants / stressors, sources, current loads

■ Proposed management measures

- ◆ Load reductions needed, BMP types proposed
- ◆ Reductions expected from BMPs, installation sites

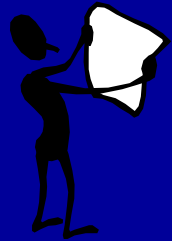
■ Implementation plan

- ◆ Public info/education & outreach/involvement plan
- ◆ BMP/\$\$/TA support sources, project schedule & costs

■ Monitoring and adaptive management approach

- ◆ Interim measurable milestones, load reduction criteria
- ◆ Evaluation framework, monitoring plan & partners

Watershed Planning Steps



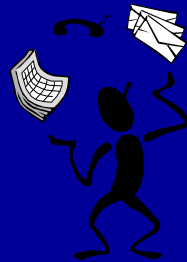
- STEP 1
BUILD PARTNERSHIP**
- ◆ ID stakeholders
 - ◆ ID issues
 - ◆ Set preliminary goals
 - ◆ Develop initial plan
 - ◆ Conduct outreach



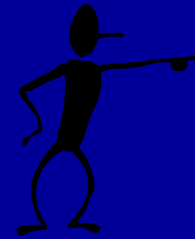
- STEP 2
CHARACTERIZE WATERSHED**
- ◆ Gather existing data
 - ◆ Create data gaps
 - ◆ ID data gaps
 - ◆ Collect additional data
 - ◆ Analyze data
 - ◆ ID causes
 - ◆ Estimate impacts



- STEP 3
FINALIZE GOALS**
- ◆ Set goals and objectives
 - ◆ Develop indicators
 - ◆ Determine location
 - ◆ ID critical areas
 - ◆ ID management strategies



- STEP 4
DESIGN IMPLEMENTATION**
- ◆ Develop Implementation Plan
 - ◆ Set Interim milestones
 - ◆ Determine how to implement
 - ◆ Develop monitoring plan
 - ◆ Develop evaluation plan
 - ◆ ID technical assistance
 - ◆ Assign responsibilities



- STEP 5
IMPLEMENT WATERSHED PLAN**
- ◆ Implement management strategies
 - ◆ Conduct monitoring
 - ◆ Conduct outreach activities

Who will implement the plan?

Structure can vary widely

- ◆ Public agencies
 - ◆ Cities, counties
 - ◆ Water or wastewater utility
 - ◆ State agency or river authority
 - ◆ Basin planning teams
- ◆ Private entities
 - ◆ Watershed association
 - ◆ Ag producer council



Any well-organized single or multiple entity approach can coordinate and document the effort

Coordinate with other water resource and land use programs

- Section 303, Water Quality Standards, TMDLs
- Section 319, NPS Program
- Section 402, NPDES Permits, CAFOs, Stormwater I & II
- Source Water Protection Plans – local water utilities
- Wetlands Protection Programs
- EQIP, CRP, BLM, USFS, USFWS
- More...

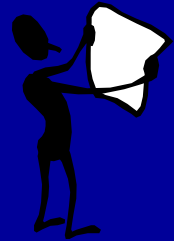


During implementation, remember:

- Plans are guides, not straitjackets
- Be aware of unforeseen opportunities
- Picking the low-hanging fruit is easy, but it helps to build a sense of progress & momentum
- If possible, work quietly for as long as you can on the most contentious issues



Watershed Planning Steps



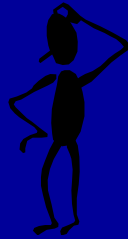
STEP 1 BUILD FOUNDATION

- ◆ ID stakeholders
- ◆ ID issues
- ◆ Set priorities
- ◆ Develop a plan
- ◆ Conduct a baseline assessment



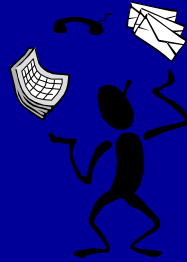
STEP 2 CHARACTERIZE WATERSHED

- ◆ Gather information
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- ◆ ID data gaps
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- ◆ ID causes
- ◆ Estimate impacts



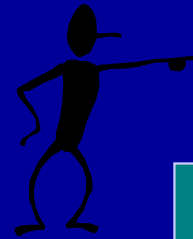
STEP 3 FINALIZE GOALS AND OBJECTIVES

- ◆ Set goals and objectives
- ◆ Develop indicators
- ◆ Determine location
- ◆ ID critical areas
- ◆ ID management strategies



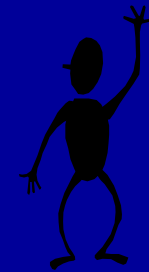
STEP 4 DESIGN IMPLEMENTATION

- ◆ Develop Implementation Plan
- ◆ Set Interim milestones
- ◆ Determine how to implement
- ◆ Develop monitoring and evaluation plan
- ◆ ID technical assistance
- ◆ Assign responsibilities



STEP 5 IMPLEMENT

- ◆ Implement
- ◆ Conduct monitoring
- ◆ Conduct evaluation



STEP 6 MEASURE PROGRESS AND MAKE ADJUSTMENTS

- ◆ Review and evaluate
- ◆ Share results
- ◆ Prepare annual plans
- ◆ Make adjustments

Monitoring and adaptive management

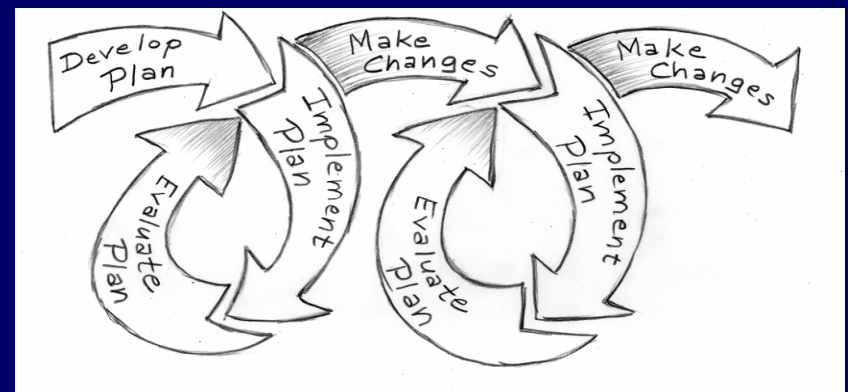
- Interim measurable milestones
 - ◆ Load reduction targets
- Monitoring component
 - ◆ Who will help with monitoring?
 - ◆ Measuring your chosen indicators
- Develop evaluation framework
 - ◆ Indicator targets vs. collected data



PHOTO: GORDON ENGLAND

Make Adjustments!

- Monitor water quality and BMPs
 - ◆ Compare results to goals
 - ◆ Are you making progress?
 - ◆ Are you meeting your goals?
- If you aren't meeting implementation milestones . . .
- If you aren't making progress toward reducing pollutant loads....



The Bottom Line:

- Load reduction *estimates* are critical for point & nonpoint sources
- Preliminary info & estimates can be modified & corrected over time
- NPS 319 - funded management measures should proceed only after **reasonable estimates** are made of how far they will go towards achieving water quality targets.

