

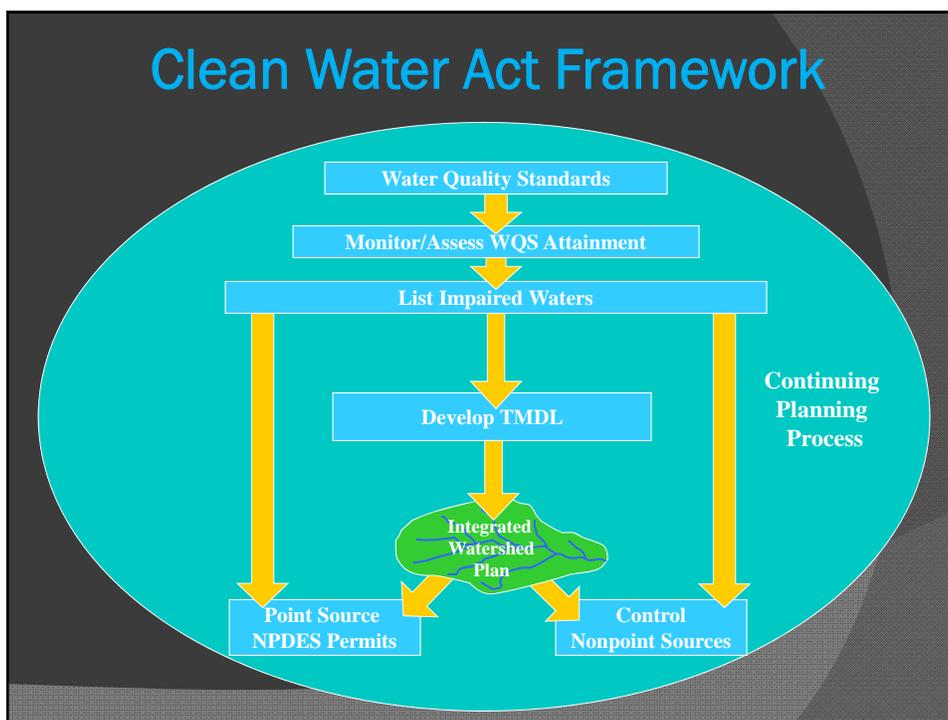
EXPECTATIONS FOR ELEMENT A

Identifying Sources And Causes Of Impairment In The Waterbody

Brian E. Fontenot
New Mexico and Tribal NPS Program Manager
EPA Region 6

TX Watershed Planning Short Course
Bandera, Texas
November 15, 2011

Clean Water Act Framework



Element A

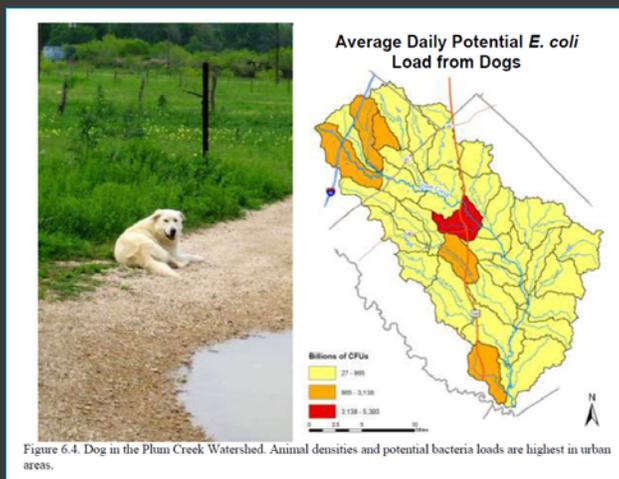
An identification of the causes and sources or groups of similar sources that will need to be controlled to achieve the load reductions estimated in this watershed-based plan



Characterizing the Watershed

- ◉ Gather existing data and create inventory
- ◉ Identify data gaps and collect additional data
- ◉ Analyze data
- ◉ Estimate pollutant loads and necessary reductions
- ◉ Identify locations and sources of pollution that need to be controlled

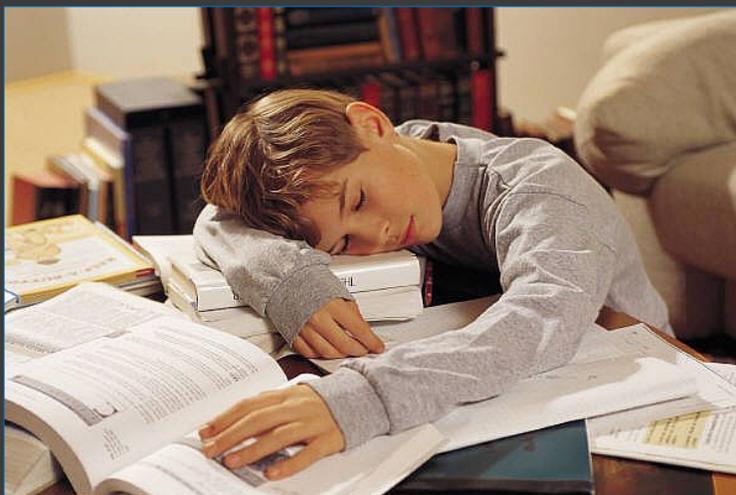
Watershed Plans should include maps identifying major sources and locations of impairments.



What Does This Mean?

- Account for point and nonpoint sources as well as natural background levels for pollutant loads
- If TMDL exists, incorporate existing data into plan
- Set goals to address impairments to meet WQ standards criteria

Do your homework up front!



U.S. ENVIRONMENTAL PROTECTION AGENCY

Watershed Planning

[Contact Us](#) Search: All EPA This Area

You are here: [EPA Home](#) » [Water](#) » [Wetlands, Oceans, & Watersheds](#) » [Watersheds](#) » [Watershed Planning](#) » [Watershed Planning Process](#) » [Characterize the Watershed](#)

Watershed Planning Process - Characterize the Watershed

[BUILD PARTNERSHIPS](#) [CHARACTERIZE WATERSHEDS](#) [SET GOALS & IDENTIFY SOLUTIONS](#) [DESIGN IMPLEMENTATION PROGRAM](#) [WATERSHED PLAN](#) [IMPLEMENT WATERSHED PLAN](#) [MEASURE PROGRESS MAKE ADJUSTMENTS](#)

Characterizing the watershed, its problems, and pollutant sources provides the basis for developing effective management strategies to meet watershed goals. The characterization and analysis process helps you focus the planning efforts on the most pressing needs and targets your data collection and analyses to your specific watershed within the scope of the plan. The scope is defined as not only the geographic area to be addressed but also the number of issues of concern and the types (and breadth) of the goals you want to attain. If you define your scope and set preliminary goals early in the planning process, you will find it easier to work through the later steps in the process. The process of watershed characterization includes the following steps:

- [Gather Existing Data and Create a Watershed Inventory](#) - Data gathering and analyses helps you to characterize the existing condition of the watershed, identify pollutant sources, and estimate the pollutant loads entering the waterbodies. Data analysis is an iterative process. You will first identify what information already exists about the watershed through existing reports and datasets. Then you will create an inventory of that data.
- [Identify Data Gaps and Collect Additional Data](#) - There will always be more data to collect, but you need to keep the process moving forward and determine whether you can reasonably characterize watershed conditions with the existing information you have gathered. Conduct a data review to examine data quantity and quality and identify any significant data gaps. If you determine that you need to collect additional data, develop a sampling plan.

More info on Characterize the Watershed

- Gather Existing Data and Create a Watershed Inventory
- Identify Data Gaps and Collect Additional Data if Needed
- Analyze Data
- Identify Causes and Sources of Pollution That Need to Be Controlled
- Estimate Pollutant Loads
- Results and Next Steps

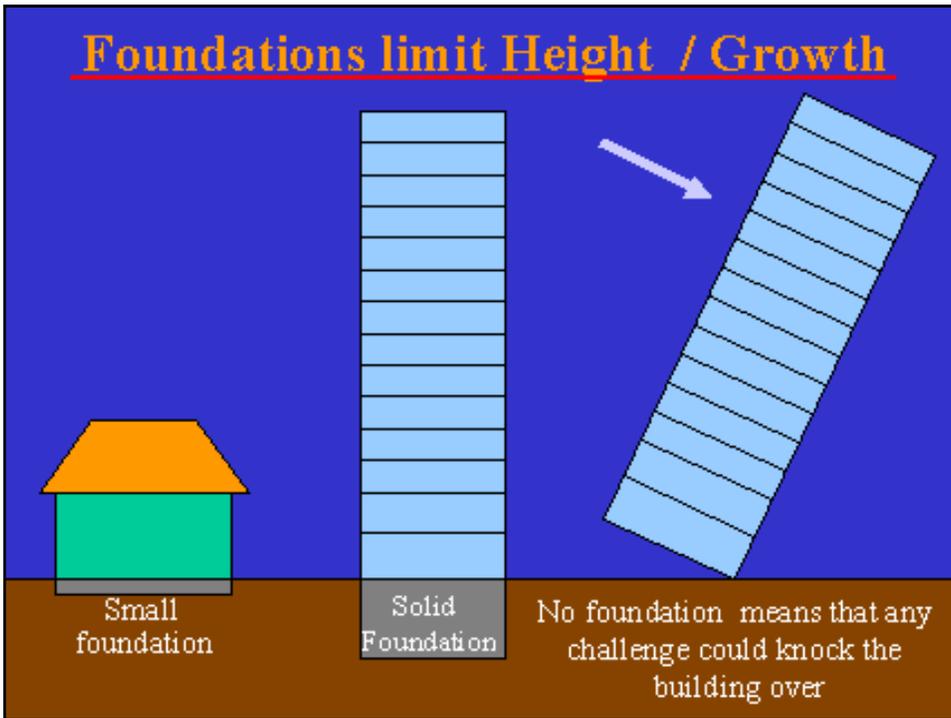
[EPA Programs Plan Outline](#)
[Plan Examples](#)

Tools You'll Need for Characterization and Analysis

- ◉ GIS
- ◉ Statistical Packages
- ◉ Monitoring
- ◉ Load Calculations
- ◉ Models and Model Selection Tools
- ◉ Databases (Social and Environmental tools)

Data Typical for Watershed Characterization

- ◉ Physical and Natural Features
 - boundary, topography, soils, climate
- ◉ Land Use and Population Features
- ◉ Waterbody and Watershed Conditions
 - info from 305b report, source water assessments, existing TMDL, 303d list
- ◉ Pollutant Sources
- ◉ Monitoring Data
 - water quality and flow, biology





Failing to Plan is Planning to Fail

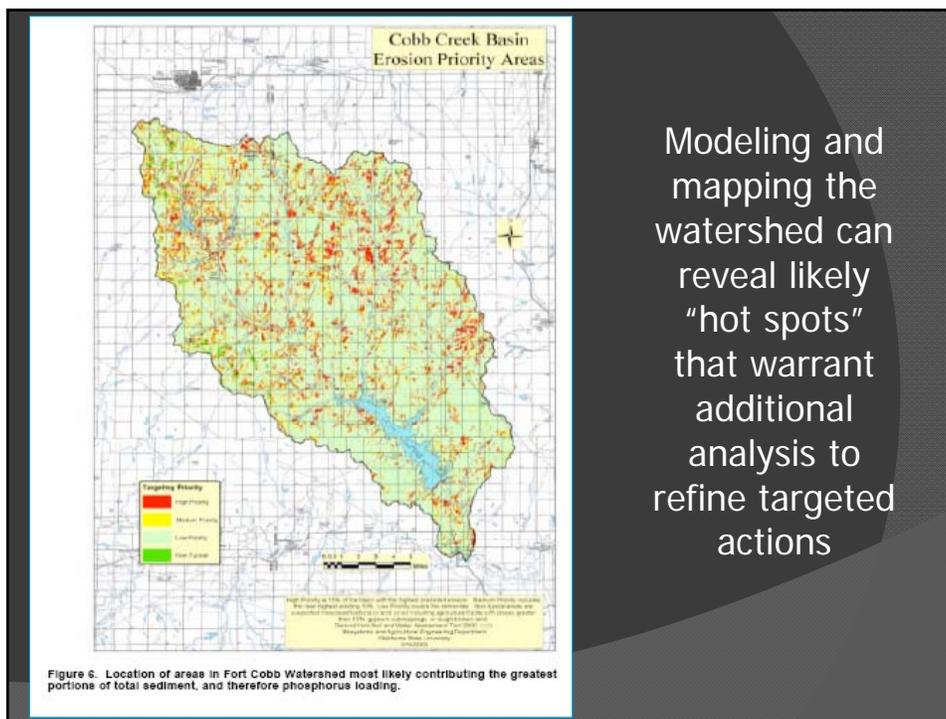
EPA's "Handbook for Developing Watershed Plans" dedicates the first 11 Chapters to characterizing the watershed, water quality and identifying load reductions and management strategies PRIOR to beginning development of the Watershed Plan.

EPA Handbook for Developing Watershed Plans

- ◉ Chapter 4 defines the scope – both geographic and scale – of water quality issues
- ◉ Development through engagement with stakeholders
- ◉ Stakeholders likely have information on activities that have taken place in the watershed that will be useful in identifying causes and sources

EPA Handbook for Developing Watershed Plans

- ◉ Stakeholders need access to water quality data from the responsible agencies in order to be successful
- ◉ Linkages and pathways of pollution between the sources and water body must be identified and defined
- ◉ Chapters 5 & 6 provides information on laying the groundwork towards establishing Element A



Modeling and mapping the watershed can reveal likely “hot spots” that warrant additional analysis to refine targeted actions

EPA Handbook for Developing Watershed Plans

- ⦿ Chapter 5 – identifying and gathering water quality data – building an inventory
- ⦿ Chapter 6 – review data, identify data gaps, and collect additional data
 - This analysis is ESSENTIAL to defining the watershed’s water quality goals
- ⦿ Chapter 7 is where Element A development begins

EPA Handbook for Developing Watershed Plans – Chapter 7

- Identifying locations and timing of impairments and problems
- Identifying potential sources
- Determining areas for quantifying source loads (NPS hotspots)

Element A – Cornerstone of a Watershed Plan

- Element A serves as the cornerstone for the logical development of the remaining eight elements of a watershed plan.
- Good sampling data (water quality monitoring program, field surveys, and land-use characterization) are necessary to identify and quantify the pollution sources.
- These data serve as a baseline from which to determine whether water quality goals have been met.
- Sufficient resources should be allocated to accumulate and analyze data before developing Element B.

Minnesota – SB Watershed continued

Contributions from Point and Non-Point Sources			
Category	Source	Contribution	Contribution
		Wet	Dry
Livestock	Overgrazed Pasture near Streams or Waterways	4%	32%
	Feedlots or Stockpiles without Runoff Controls	18%	
	Surface Applied Manure***	63%	
	Incorporated Manure	13%	
Human	Failing Septic Systems and Unsewered Communities	2%	66%
	Wildlife	0.3%	3%
Pets	Dogs and Cats	0.4%	
Total		100.00%	100.00%

“Bacteria Matrix”
Spreadsheet
Method

Percent Reductions Necessary to Meet TMDL Allocation

Sources:	Wet Dry		All sources reduce equally				Reduction GOALS (1-x)
	[assumed shares]		RS1 Wet x	RS1 Wet Concen.	RS1 Dry x	RS1 Dry Concen.	
Overgrazed Pasture	4%	32%	22%	7	20%	6	78%
Feedlots/Stockpiles	18%	63%	22%	31	100%	60	78%
Surface Applied Manure	63%	0%	22%	110	20%	0	78%
Incorporated Manure	13%	0%	22%	22	100%	0	78%
Failing Septic Systems	2%	66%	22%	3	20%	12	78%
Wildlife**	0.3%	3%	100%	2	100%	3	0%
Pets	0.4%	0.0%	22%	1	100%	0	78%
	100%	100%					
			Conc goal	177		81	
			WQG	180		180	
				200		200	

Results

- Identified existing reports and data sets that exist within the watershed and created inventory of water quality
- Identified water quality data gaps and plan to address these gaps
- Developed a monitoring plan and collected new water quality data as necessary

Results

- Analyzed the data to determine the causes of impairments and the pathways and linkages of pollutants
- Identified and prioritized critical areas (NPS hotspots) to focus restoration and management efforts
- Estimated the relative contributions of the various pollutants

Next Steps: On to Element B

- Identify load reductions needed to attain WQ standards
- Identify management strategies to reduce pollutant loads and ideal BMP implementation sites
- Implement control measures and regularly monitor to see if it is working
- If reductions are found to attain water quality standards, write success story

Questions?

