Moving From Assessment to Management Plan

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Mattole Watershed Assessment

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Mattole Basin
Northern
Eastern
Estuary
Western
Southern
Pacific Ocean
Long Ridge
Joel Flat
Apple Tree
Rainbow
Cow Pasture Opening
Petrolia
McGinnis Creek
Oil Creek
Rattlesnake Creek
Sivenangan Ridge
Camp Mattole
Dry Creek
Squaw Creek
Honeydew Creek
Westard Creek
Mattole Canyon
Sholes Creek
Blue Slide Creek
North Fork Bear Creek
Big Finley Creek
Bear Creek
Bridge Creek
Thompson Creek
Humboldt County
Mendocino County
CalWater 2.2a
Subbasins
County
0 1 2 4 6 8 10
Miles

Watershed Assessment – Key Questions

- What are the history and trends of the size, distribution, and relative health and diversity of salmonid populations?

- What are the current salmonid habitat conditions? How do these conditions compare to desired conditions?

- What are the past and present relationships of geologic, vegetative, and fluvial processes to stream habitat conditions?

- How has land use affected these natural processes?

- Based upon these conditions, trends, and relationships, are there elements that could be considered to be limiting factors for salmon and steelhead production?
- What watershed and habitat improvement activities would most likely lead toward more desirable conditions in a timely, cost effective manner?

Summary of Watershed Assessment and Recommended Action

	Estuary sub-basin	Northern sub-basin	Eastern sub-basin	Southern sub-basin	Western sub-basin
Identified conditions					
Instream sediment	-/R	-/R	-	-/R	-
Water temperature	-	-	~	+	~
Pools	-	-	-	~	-
Flow	+	~	~	-	~
Escape cover	-	-	-	-	-
Fish passage barriers	+	~	~	~	~
Natural sediment sources	-	-	~	+	+
Management-related sediment sources	-	-	+	-	+
Recommended improvement activity focus areas					
Flow				X	
Erosion/sediment		X	X	X	X
Riparian/water temperature	X	X	X		X
Instream habitat	X	X	X	X	X
Gravel/substrate			X	X	X
Fish passage barriers				X	X

+	*Condition is favorable for anadromous salmonids*
-	*Condition is not favorable for anadromous salmonids*
~	*Condition is mixed or indeterminate for anadromous salmonids*
R	*Trend indicates improved conditions 1984-2000*
X	*Recommended improvement activity focus areas*

Watershed Assessment Products

- Geologic Report – Maps of landslides and geomorphic features.
- Synthesis Report – Description of current and historic conditions (land use, geology, water quality, wildlife…)
- Monitoring Recommendations.
- EMDS analysis – A watershed based assessment of conditions and hazards; and a stream reach based model.

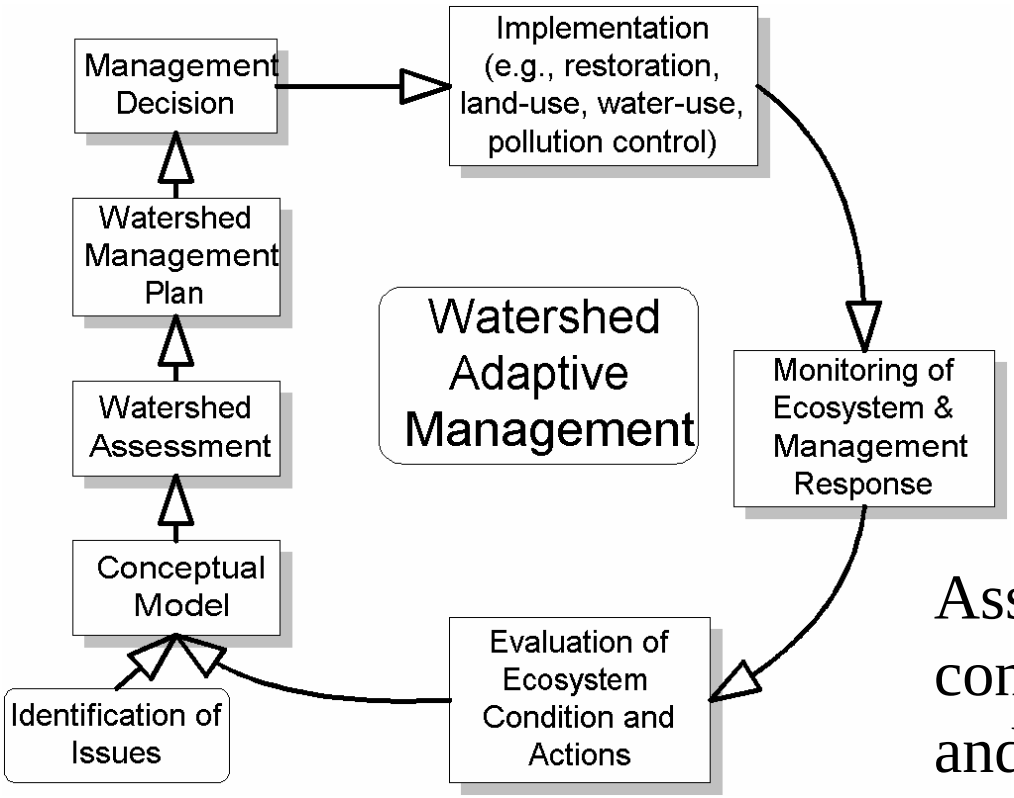
Comments

- The NCWAP report along with a long history of watershed work help produce a plan with specific recommendations for restoration needs.

- The result of detailed planning and collaboration has resulted in a high level of funding to support restoration activities in the basin.

1) Watershed Adaptive Management

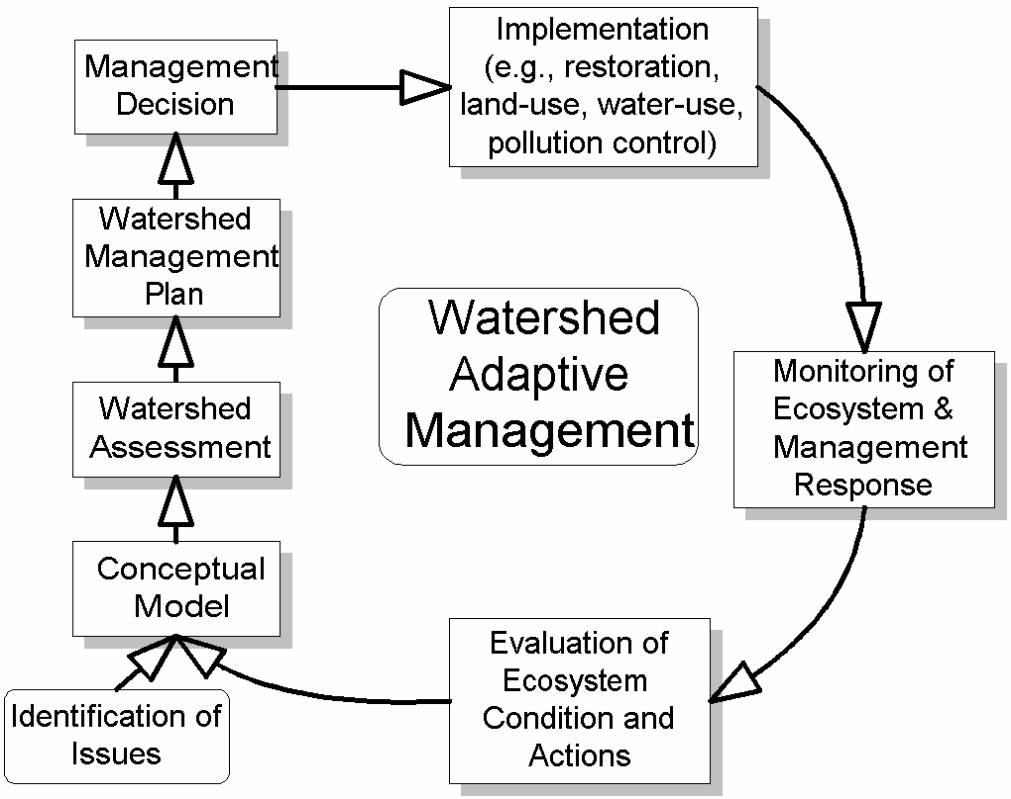
Management – using knowledge gained during monitoring and assessment to inform decisions



Monitoring – collecting information about a watershed process or feature

Assessment – determining condition of watershed attributes and places using monitoring data

1) Watershed Adaptive Management



This cycle requires explicit connections between assessment findings and management planning, decisions, and actions.

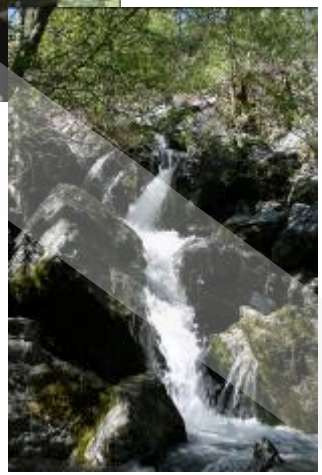
1) Watershed Adaptive Management

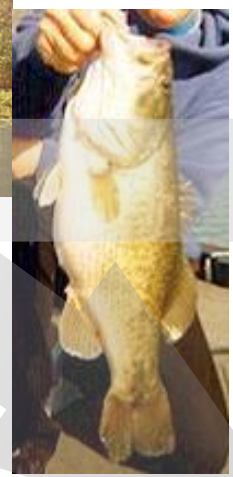
Monitoring Watershed Management Plans

Effectiveness measurement is linked directly to goals and can consist of monitoring the inputs to and outputs from a system and comparing to 1) a baseline or original condition or 2) a standard or ideal.

For example, if water quality improvements are expected from managing a site, then the outgoing water – into the ground or out to a waterway – should be cleaner than a stated benchmark or conditions prior to the management.

2) Measuring Effectiveness (Monitoring)

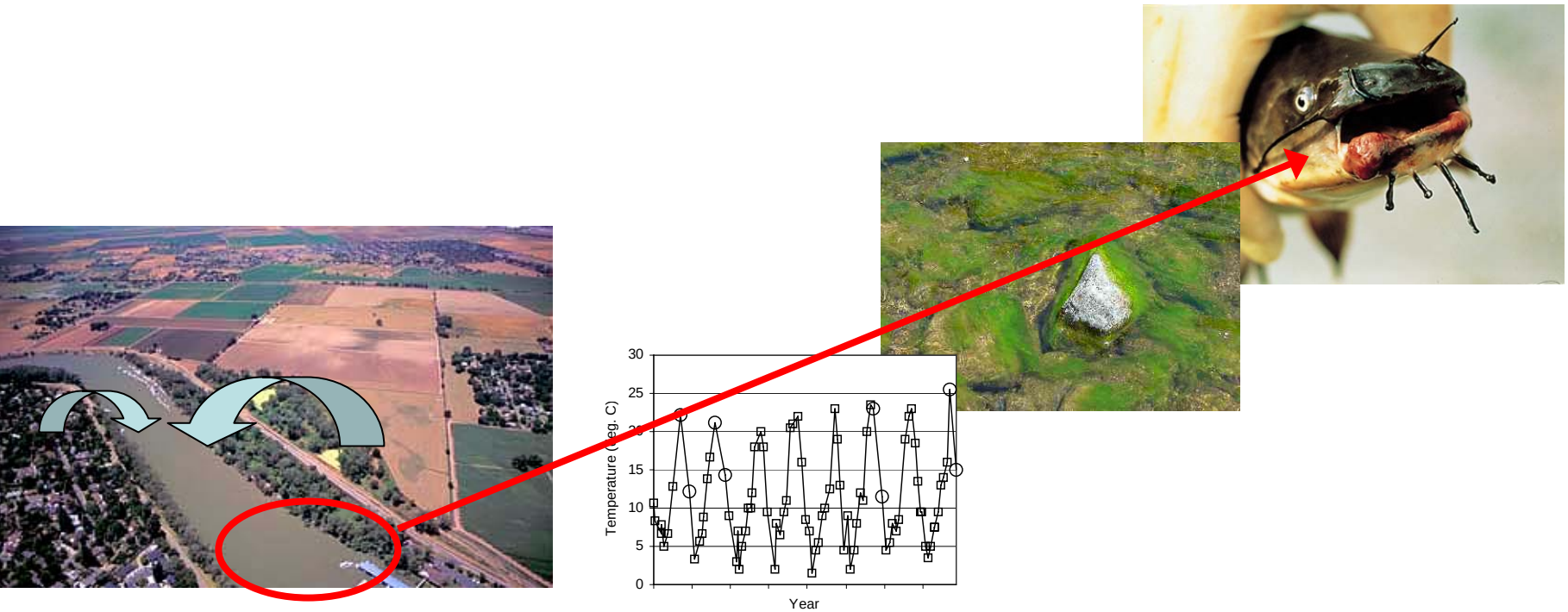




How do we know that the management actions are effective in achieving goals?

Choose and monitor conditions and/or processes you are interested in.

2) Measuring Effectiveness (Monitoring)



Its about asking the right questions for your goals, measuring the appropriate indicators, and evaluating using the best analytical tools available.

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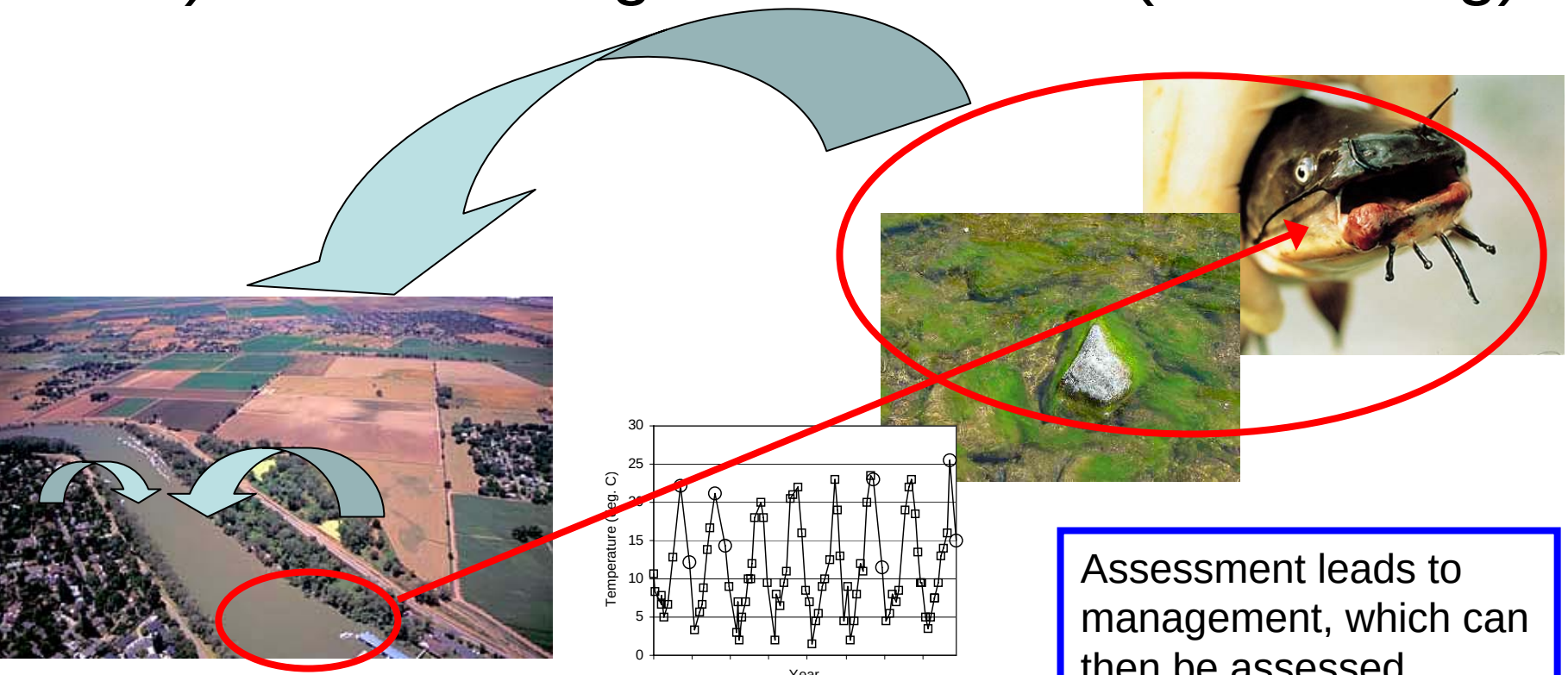

Assessment leads to management, which can then be assessed.

Its about asking the right questions for your goals, measuring the appropriate indicators, and evaluating using the best analytical tools available.

2) Measuring Effectiveness (Indicators)

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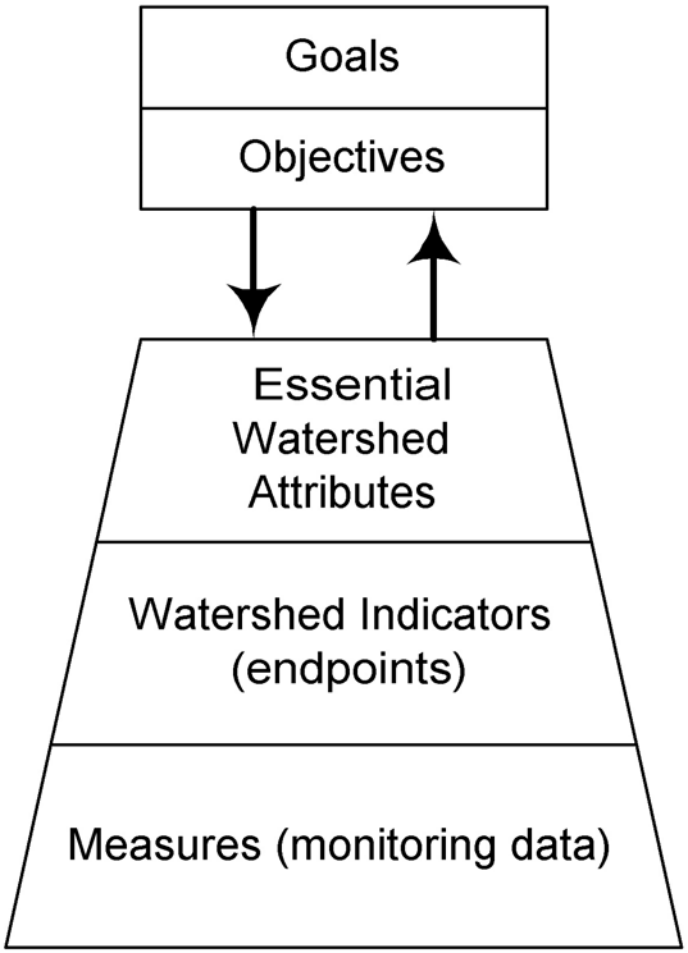
➢Indicators are measurable attributes of a system that can be used to determine condition of the system, usually relative to standards or references and to measure the ecosystem services being provided.

How are algal populations changing over time?

➢"Performance measures" is a similar concept and is usually applied to programmatic performance.

How are runoff management practices changing lake productivity?

2) Measuring Effectiveness (Indicators)

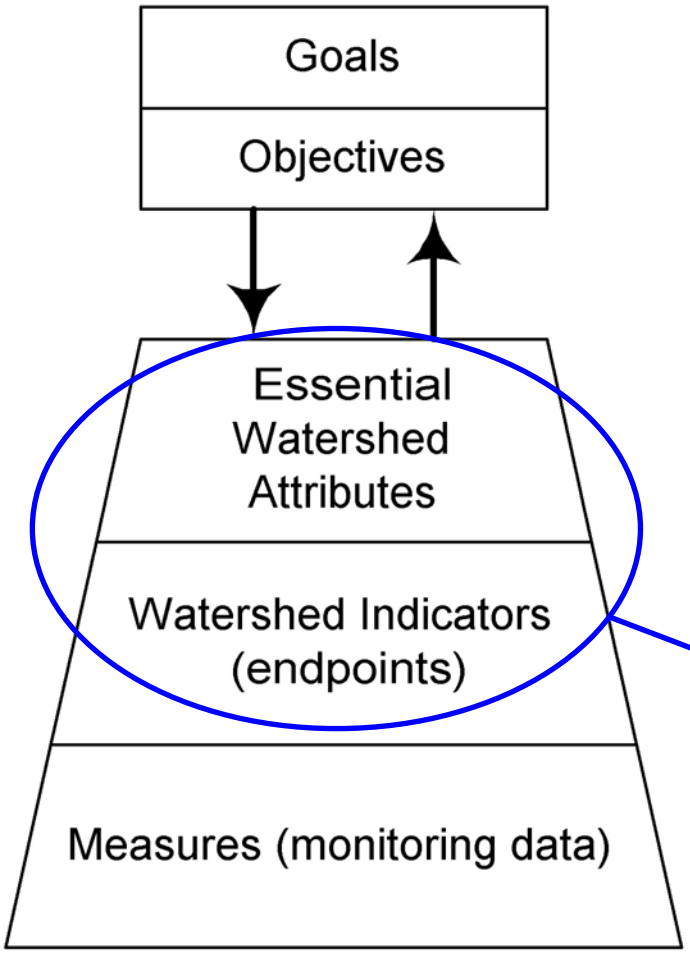


One approach is based on the design on the EPA Science Advisory Board's suggestions for ecological indicators.

The goal is that the framework will tell us both how watersheds are doing over time and how management actions are performing in protecting watershed condition.

(Adapted from EPA-Science Advisory Board)

2) Measuring Effectiveness (Indicators)



The highest process scale is the "goals and objectives" level. This scale could apply to the whole state, or a district/municipality area.

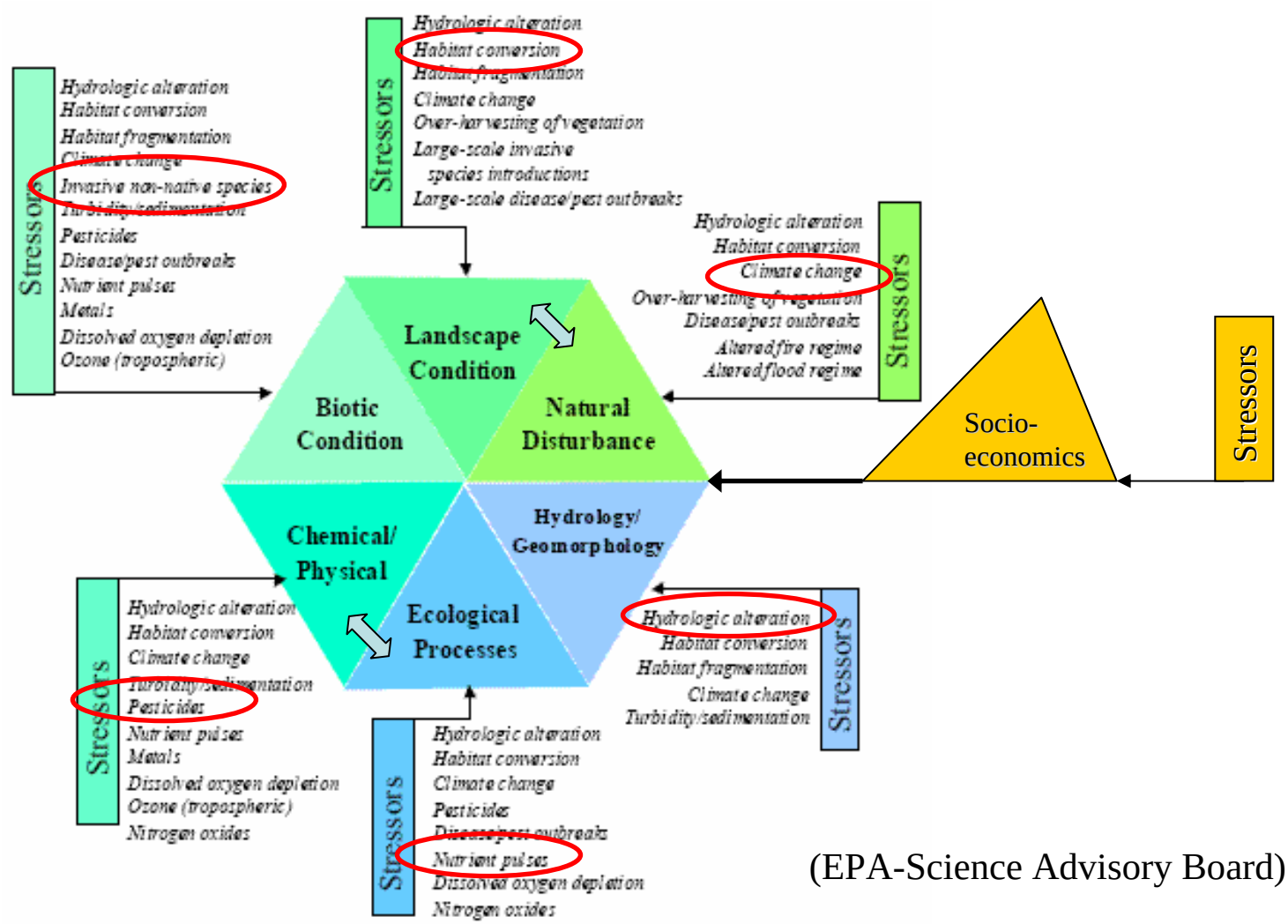
Goals and objectives drive the selection of attributes and indicators. They can also be modified in reaction to what is found when indicators are measured.

Goals and objectives can also result in new investigations if knowledge or data are lacking in the area of concern.

Next Slide

(Adapted from EPA-Science Advisory Board)

2) Measuring Effectiveness (Indicators)



Examples

(EPA-Science Advisory Board)

2) Measuring Effectiveness (Indicators)

Chemical and Physical Characteristics (Water, Air, Soil, Sediment): SOIL			
	Nutrient Concentrations		
		Nitrogen	nitrate in streams and groundwater in farmlands, forests , grass- and shrublands, urban and suburban areas
Ecological Processes			
	Energy Flow		
		Primary Production	Plant growth index; production capacity, as chlorophyll concentrations in coastal systems

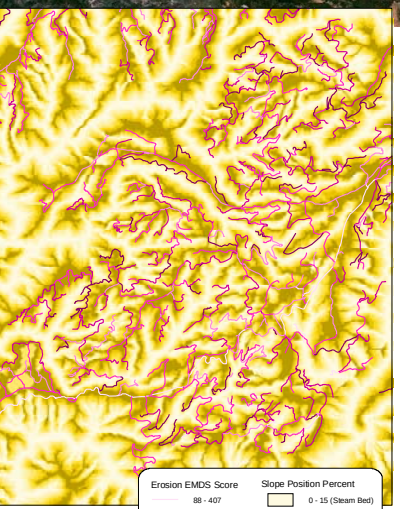
Examples of SAB indicators for attributes

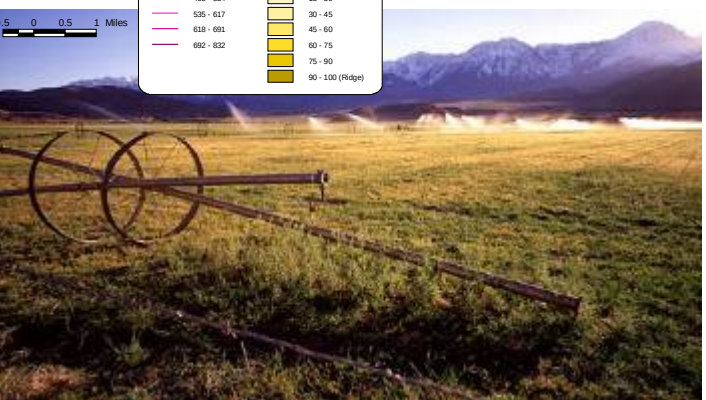
Hydrology and Geomorphology			
	Surface and Groundwater Flows		
		Pattern of Surface Flows	changes in streamflows nationwide; number and duration of no-flow periods in grass- and shrublands

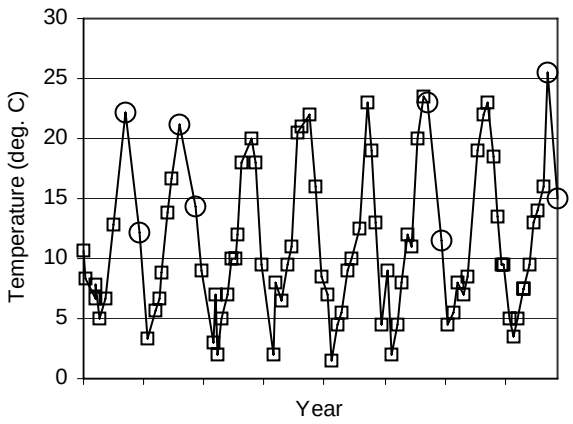
2) Measuring Effectiveness (Indicators)

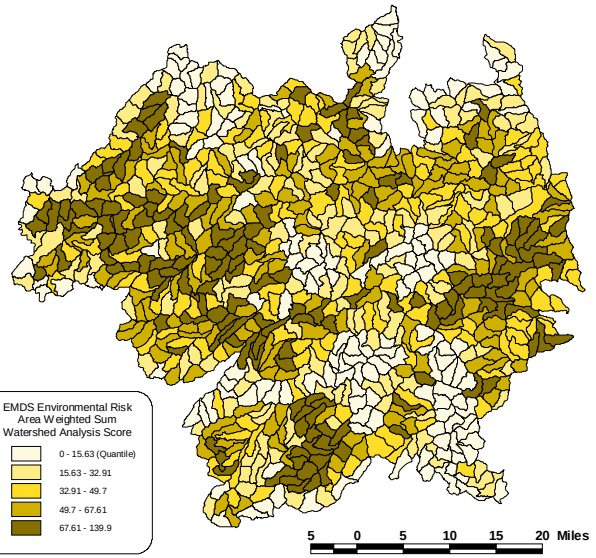
Geography

3) Developing a Watershed Management Plan









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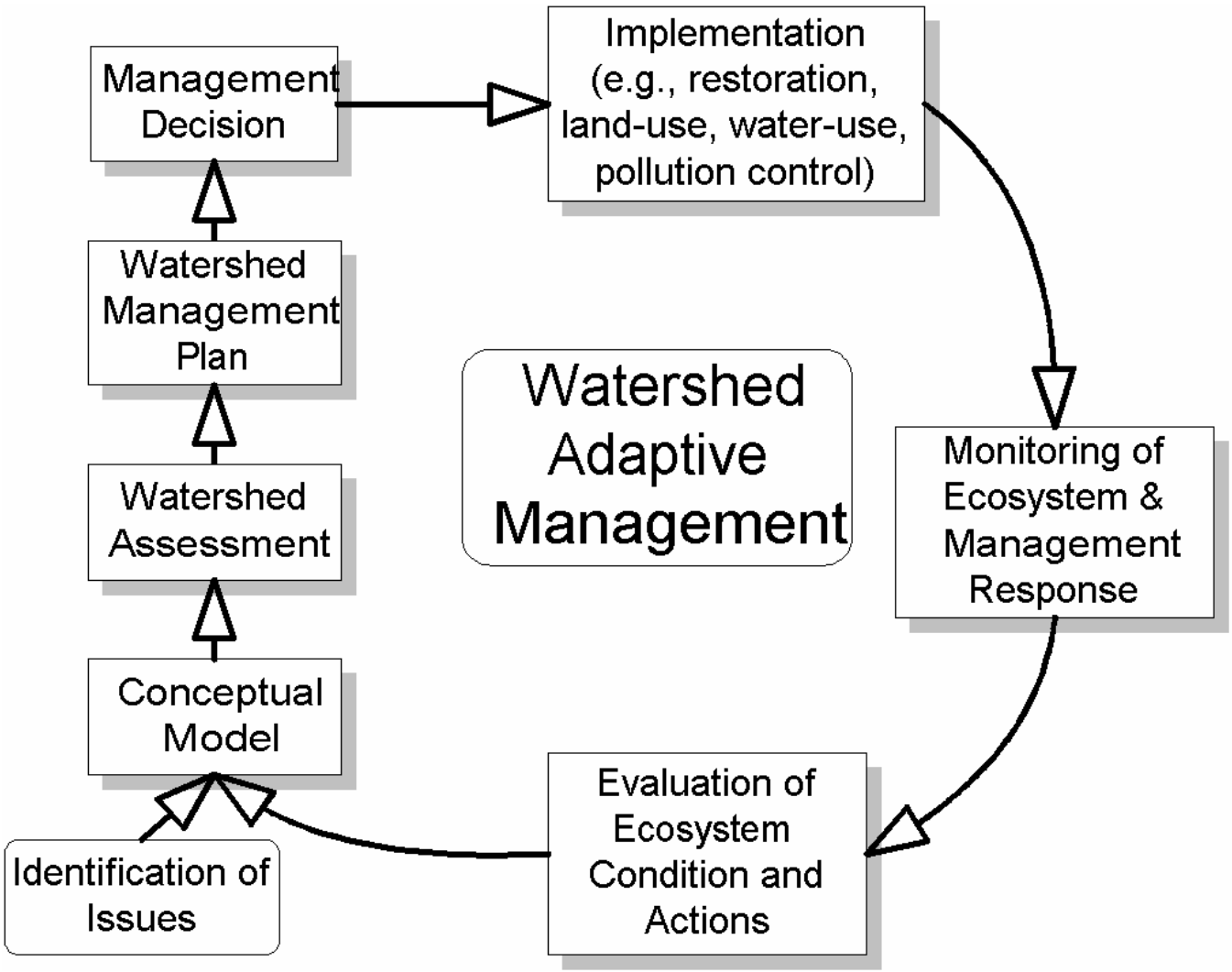
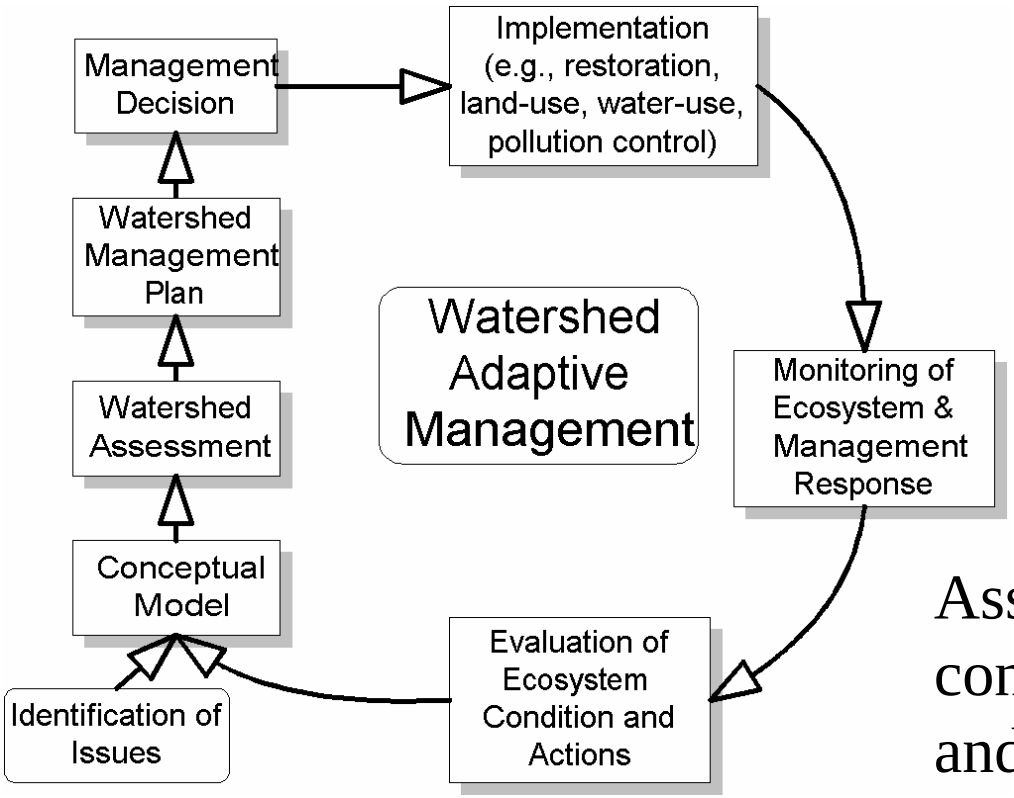


Start with a plan for how actions are based on goals for the watershed and how the actions will be evaluated to inform future decision-making. This is the essence of adaptive management.

3) Developing a Watershed Management Plan

Management – using knowledge gained during monitoring and assessment to inform decisions



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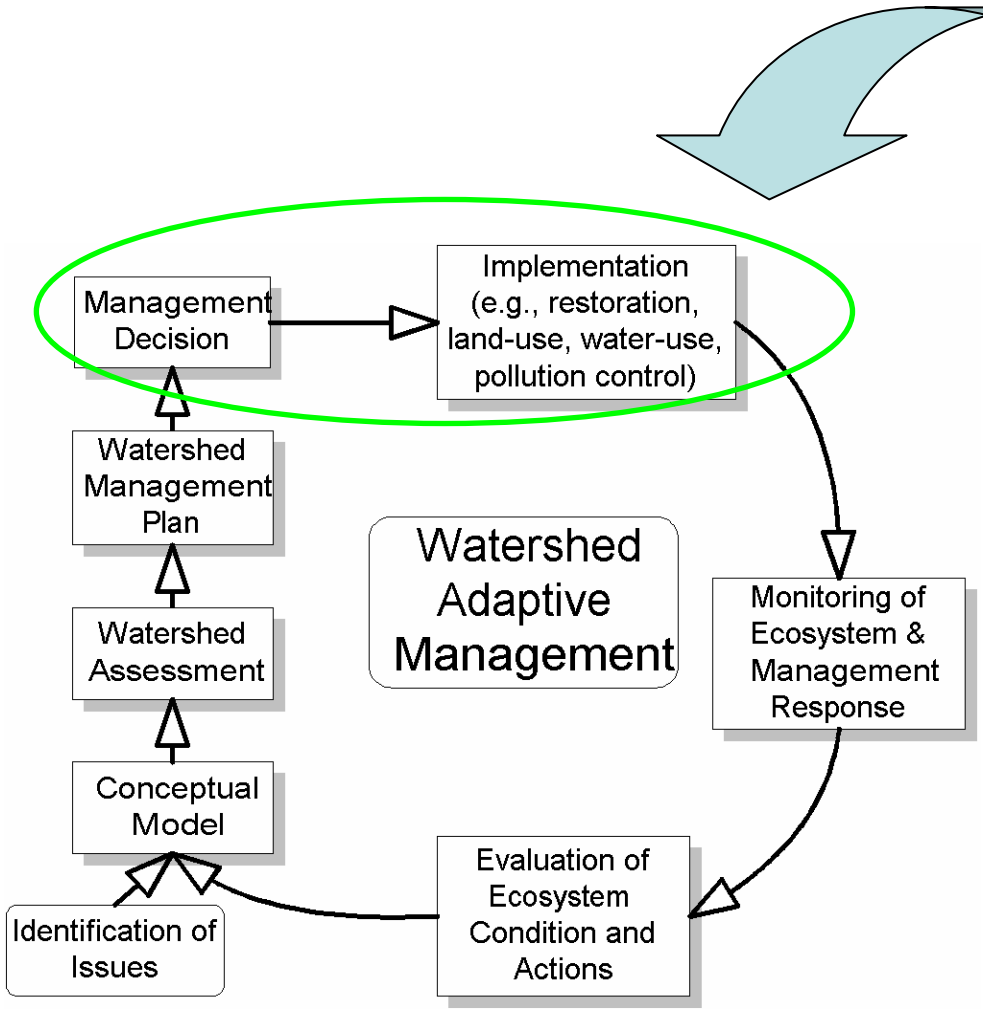
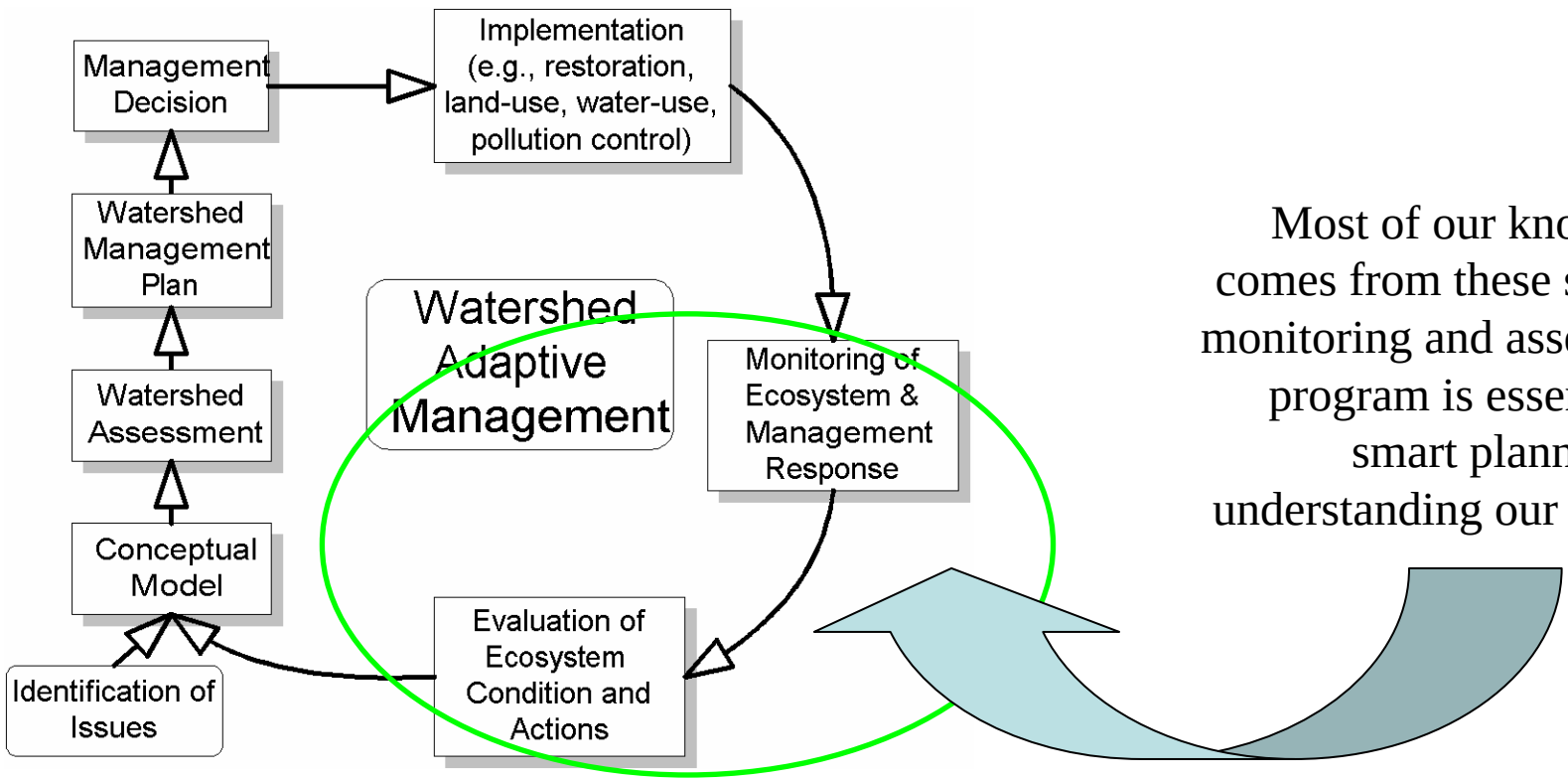


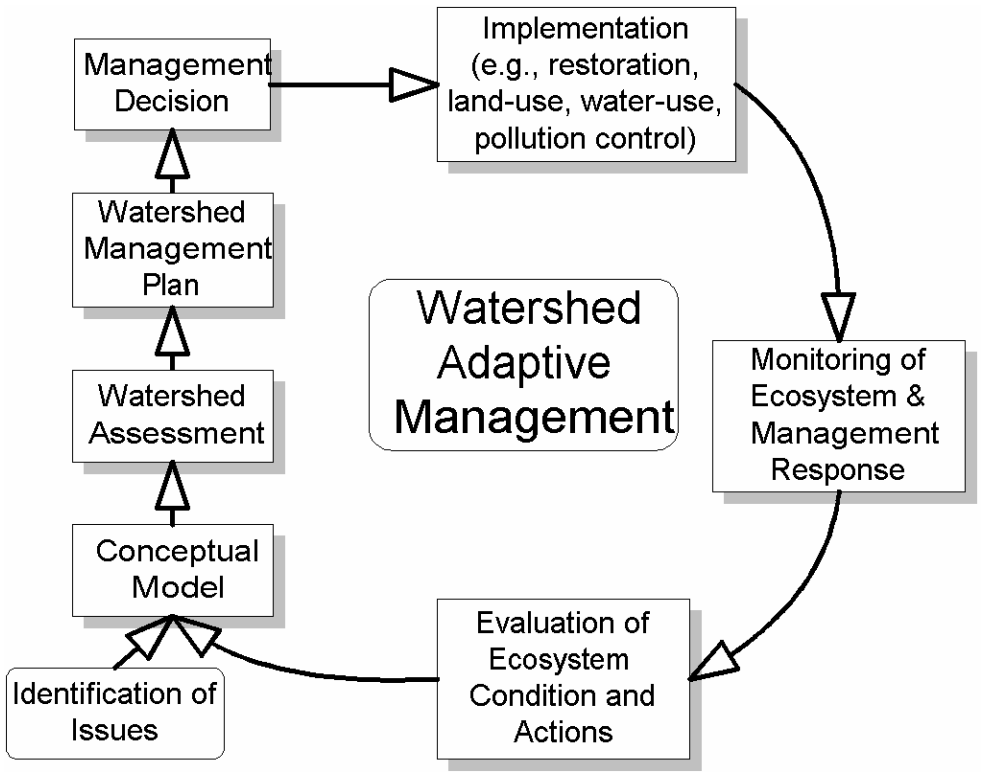
Most of the actions take place here that affect watershed processes and conditions. These decisions should be explicitly based on knowledge of the system, including how the system is integrated.

3) Developing a Watershed Management Plan



Most of our knowledge comes from these steps. A monitoring and assessment program is essential for smart planning and understanding our actions.

3) Developing a Watershed Management Plan



What would this look like on the ground?

There are many examples of watershed management plans, but few that have covered all of the bases laid out here.

Some examples are listed on **cwam.ucdavis.edu**

3) Developing a Watershed Management Plan

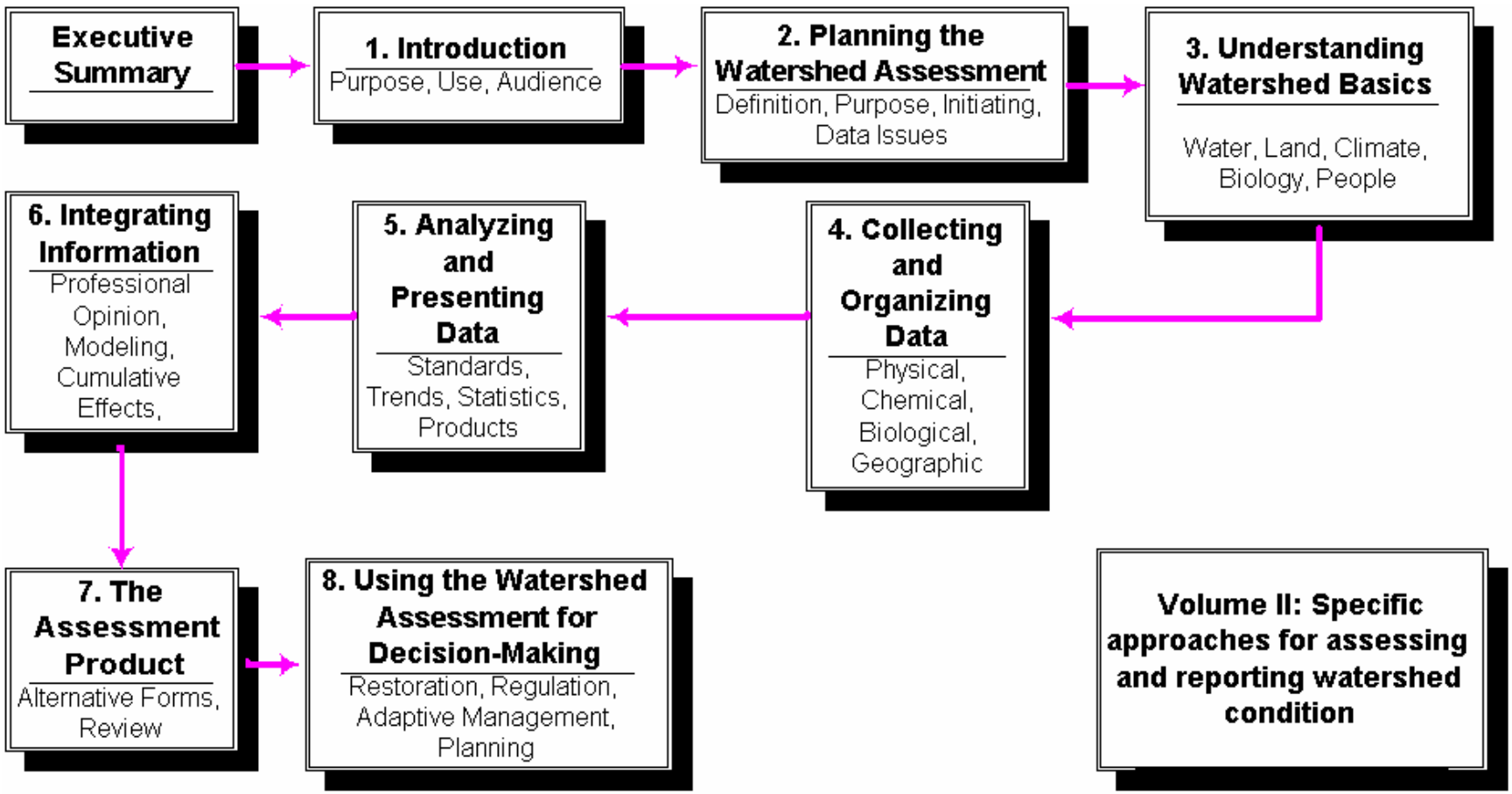
An important consideration when developing the plan: What is the watershed potential?

This is related to existing habitat and water conditions AND the desired conditions.

It has as boundaries historic conditions, timeframes, ecologically/hydrologically restorable condition, & social feasibility

Goal and trajectory toward goal are both important.

Resources


Executive Summary
1. Introduction
Purpose, Use, Audience
2. Planning the Watershed Assessment
Definition, Purpose, Initiating, Data Issues
3. Understanding Watershed Basics
Water, Land, Climate, Biology, People
4. Collecting and Organizing Data
Physical, Chemical, Biological, Geographic
5. Analyzing and Presenting Data
Standards, Trends, Statistics, Products
6. Integrating Information
Professional Opinion, Modeling, Cumulative Effects,
7. The Assessment Product
Alternative Forms, Review
8. Using the Watershed Assessment for Decision-Making
Restoration, Regulation, Adaptive Management, Planning
Volume II: Specific approaches for assessing and reporting watershed condition

Resources

http://cwam.ucdavis.edu

Handout

Contact

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