

Developing Interim Milestones & Criteria to Measure Progress

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*“We Cannot Solve The Problems
That We Have Created With The
Same Thinking That Created
Them”*

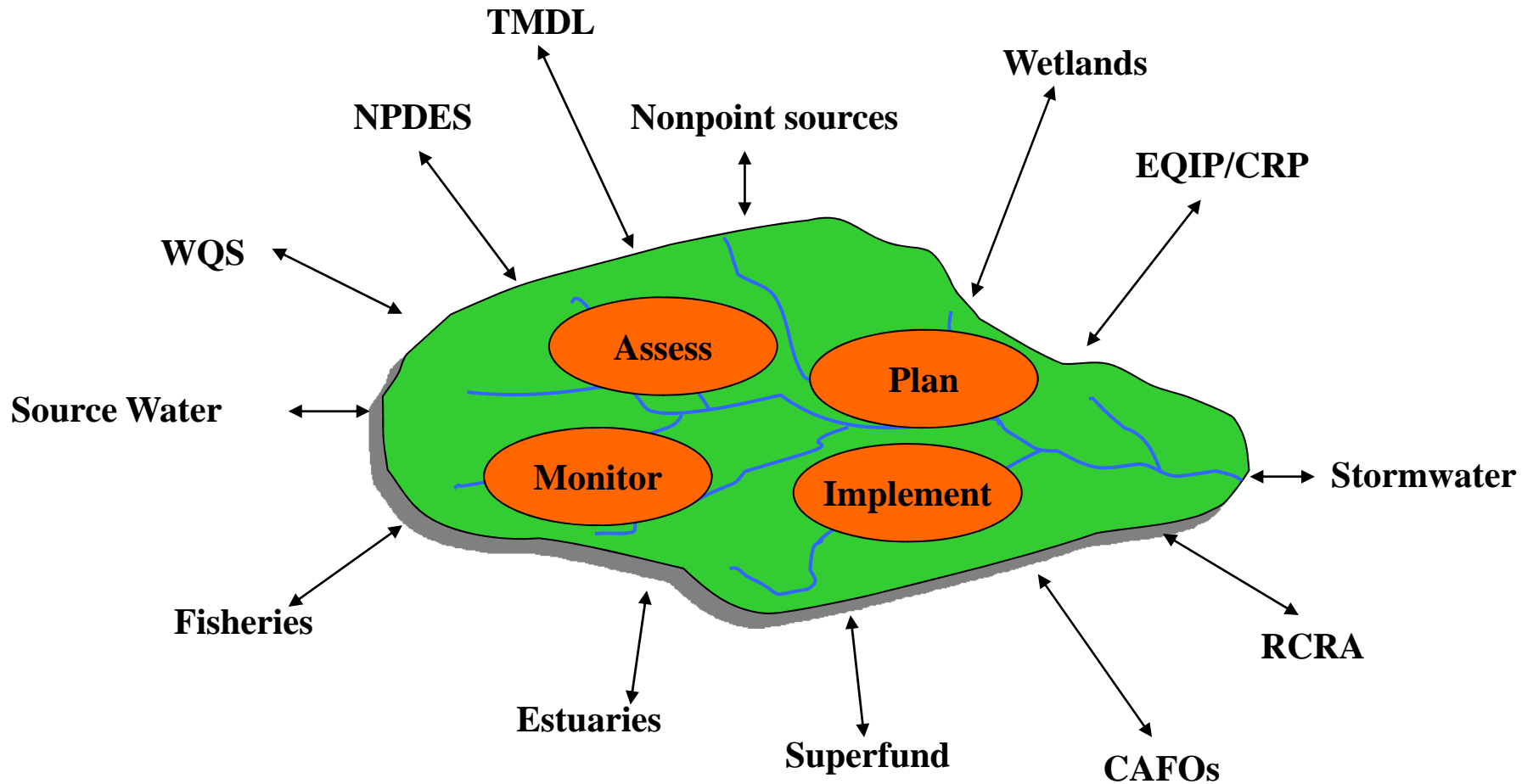
--Albert Einstein--

Administrative vs. Resource Outcomes Based Management

	Administrative Outcome Approach	Resource Outcomes Approach
Goal	Program Performance	Environmental Performance
Measures	Administrative Actions	Indicator End-points
Results	Improve Programs	Programs are Tools to Improve the Environment



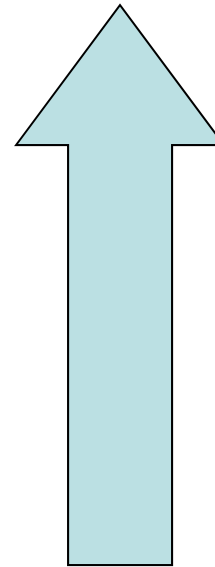
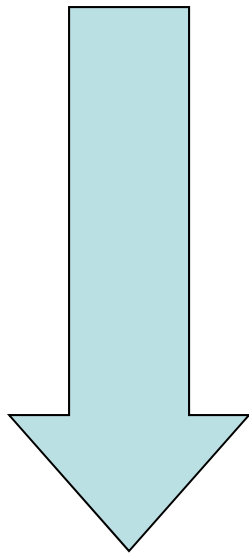
Integrated Watershed Planning



Sharing Your Data...What We Want to Show

NPS Loadings

Water Quality



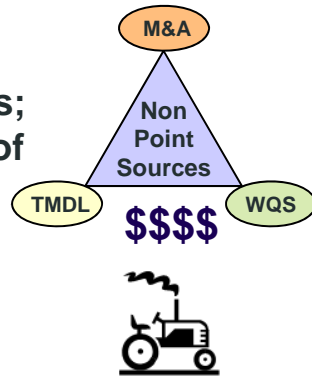
Dollars Spent



ADMINISTRATIVE INDICATORS

LEVEL 1:

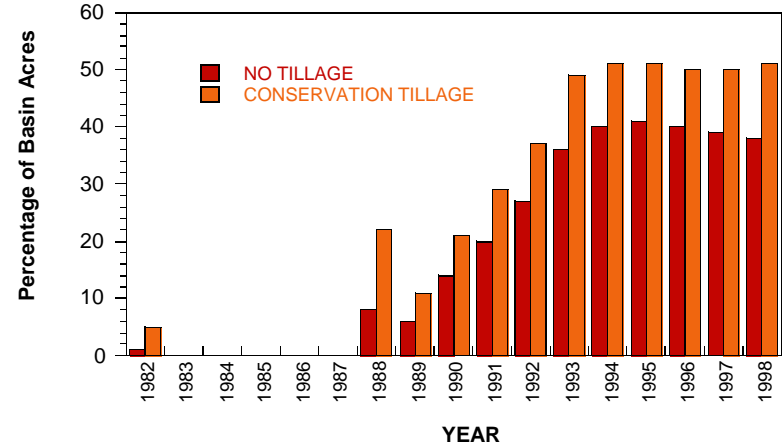
Ohio EPA awards 319 grants; goal is achieve restoration of impaired uses (meet WQS); Ohio DNR & NRCS develop NPS management & abatement strategies



STRESSORS

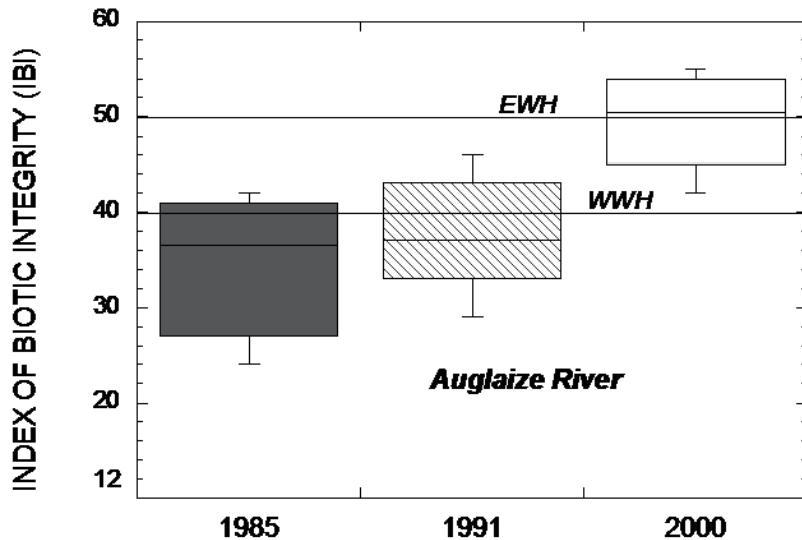
LEVEL 2: Agricultural Producers Implement Conservation Practices

Auglaize Basin Tillage Practices



RESPONSE

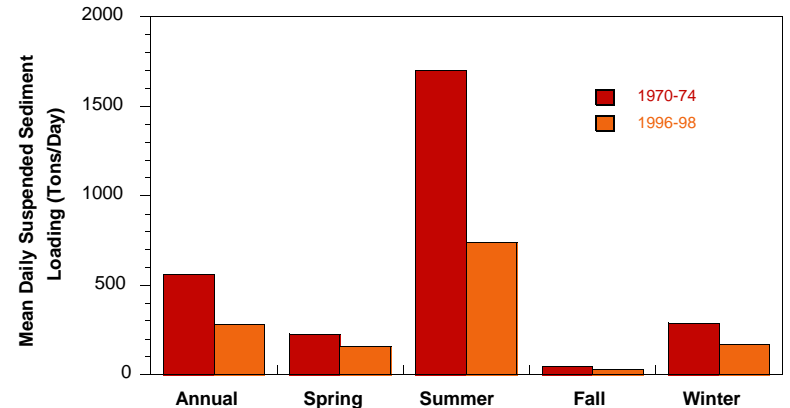
LEVEL 6: Biological assemblage improves



STRESS & EXPOSURE

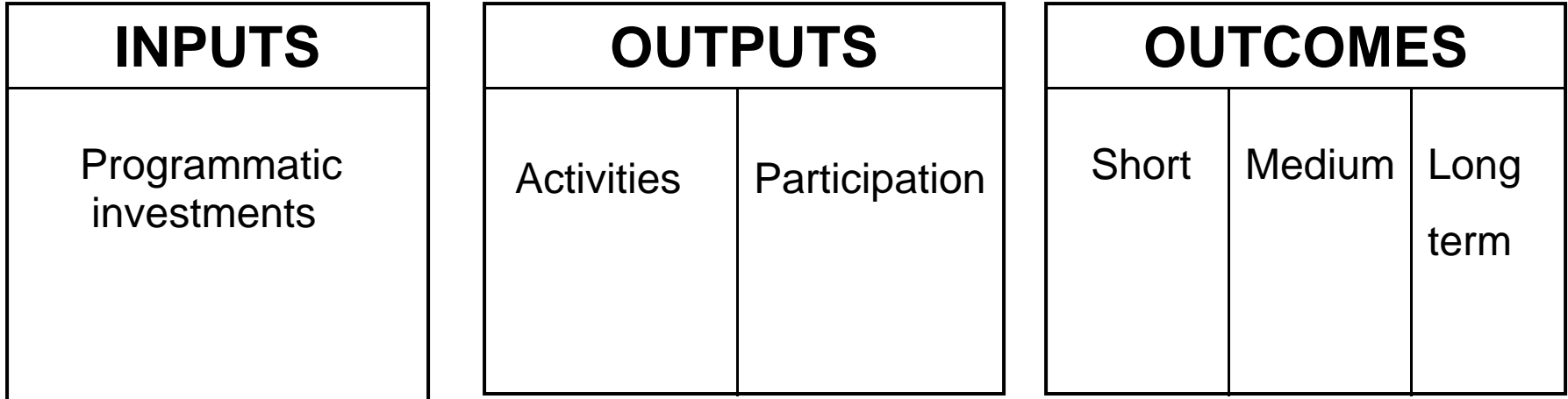
LEVELS 3-5: BMPs Produce Reduced NPS loadings

Auglaize River near Ft. Jennings, Ohio



TSS decreased, water quality & habitat improved

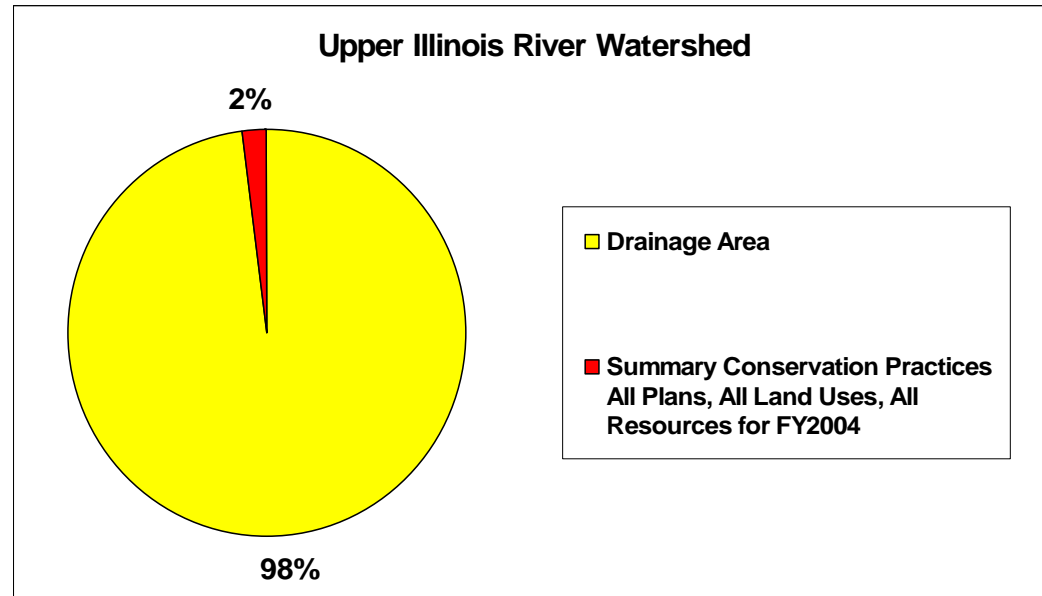
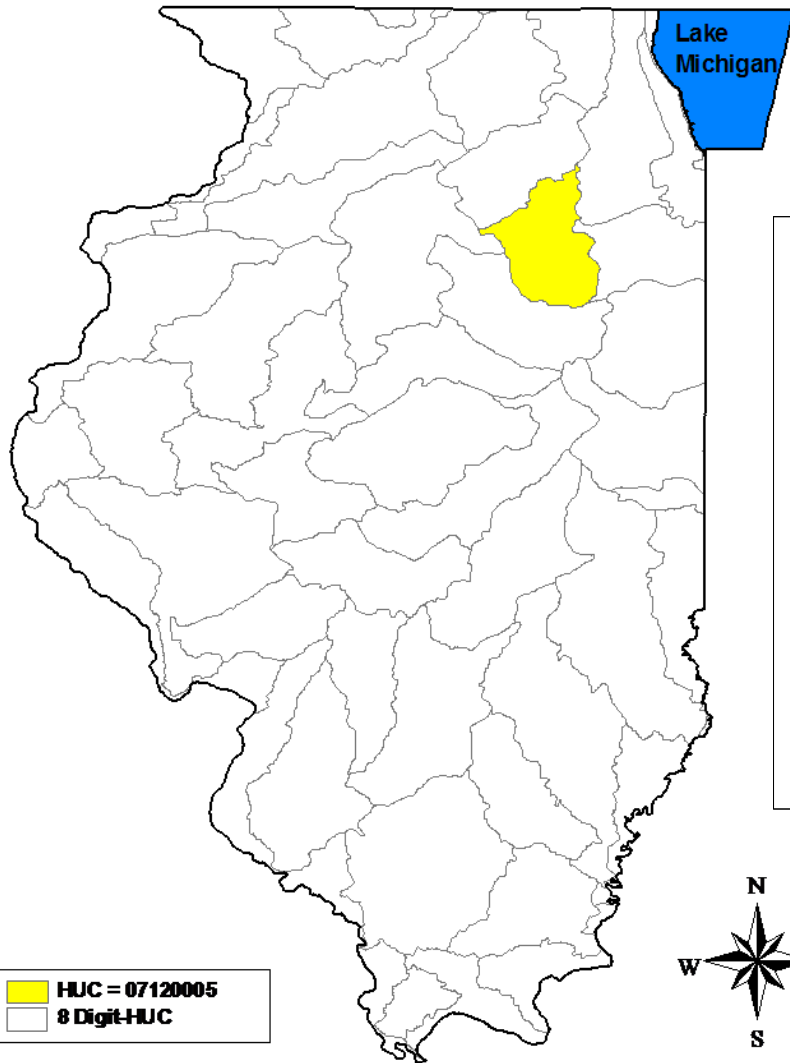
PLANNING



EVALUATION



Upper Illinois River Watershed










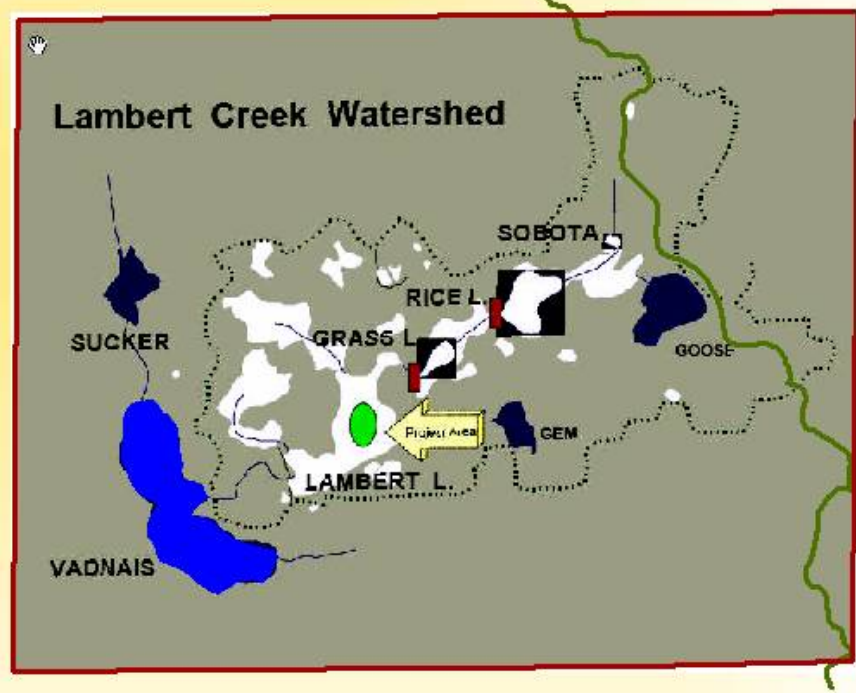
Draft

Lambert Creek Water Quality Improvement Project

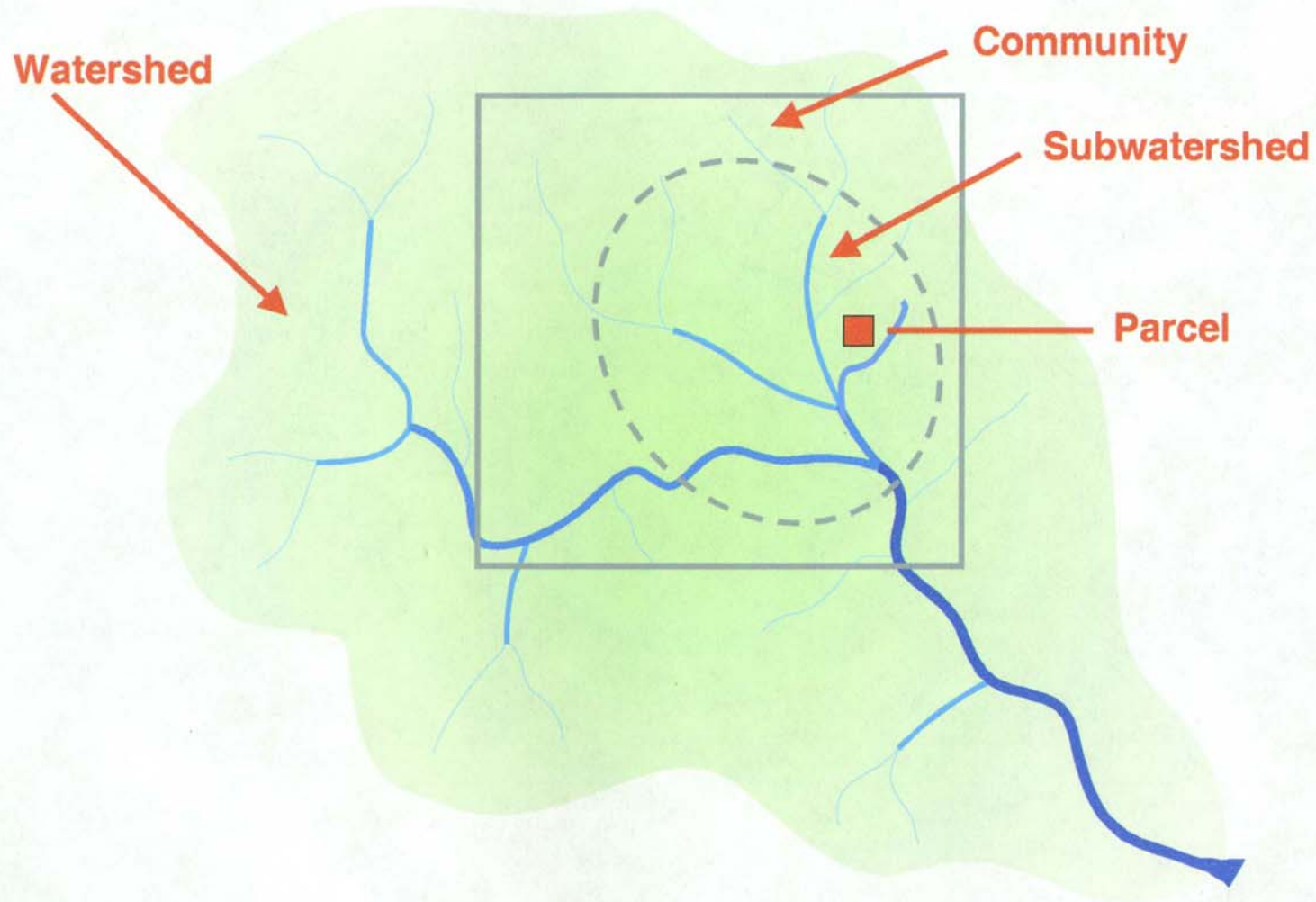


Legend

-  Lake Vadnais
-  Lakes
-  11 Digit HUC Boundary
-  HUC 07010206
-  8 Digit HUC Boundary
-  Rivers/Streams
-  InsetArea

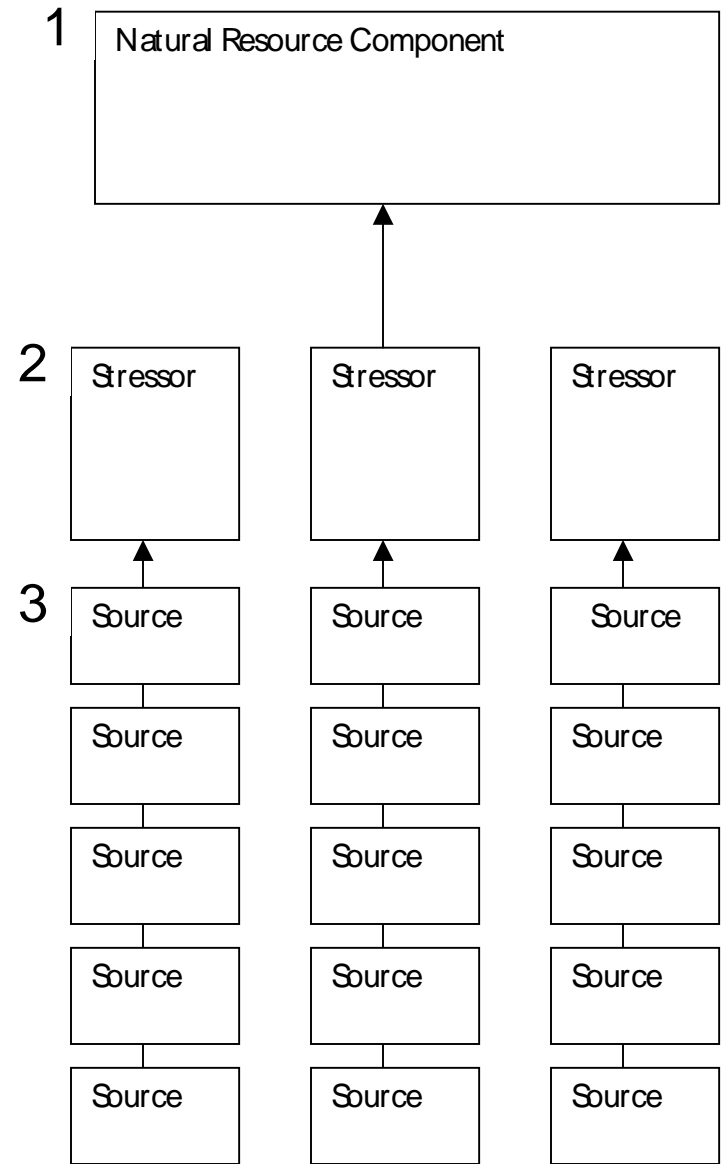
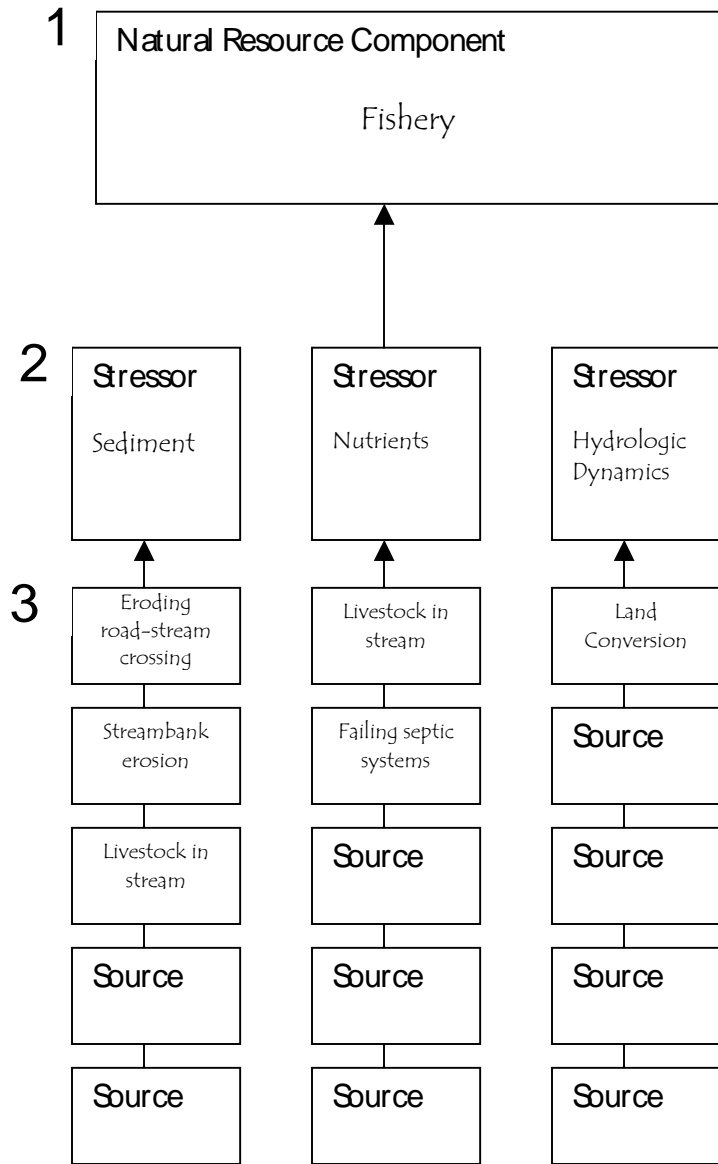


A Hierarchy of Implementation



Source: EPA Office of Water, Protecting Natural Wetlands: A Guide to Stormwater Best Management Practices

For each natural resource component in your watershed, identify the stressors acting to degrade or impair that component. Then, identify the sources that contribute to the stressors.



Natural Resource Component

Fishery

Goal

Restore the cold water fishery

Objective

Reduce the amount of sediment by *_amount_* by *_date_*

Objective

Reduce the amount of nutrients by *_amount_* by *_date_*

Objective

Reduce hydrologic impacts by *_amount_* by *_date_*

Objective

Natural Resource Component

Goal

Objective

Objective

Objective

Objective

Natural Resource Component

Goal

Objective

Objective

Objective

Objective

Formulate Alternatives

Objective

Reduce the amount of sediment by:

Alternative

Stabilizing
eroding road-
stream
crossings

Alternative

Change design
criteria for
future road-
stream crossing

Alternative

Remove road-
stream
crossings

Alternative

Manage land
use conversion

Lake Sarah Watershed Management Plan Turbidity Objective

Objective	Activity	Action	Responsibility	Time Frame	Cost Estimate
Reduce turbidity in lake by 15 % by June 2004	Install riparian buffers	Involve local land-owners	Partner group	July 2001 – July 2002	XXXX

Milestones/Adaptive Management

Project water quality goals are not modified based on lack of progress –

Implementation, monitoring, O&M activities are modified to achieve water quality goals –

Milestones help tell you when

Milestones

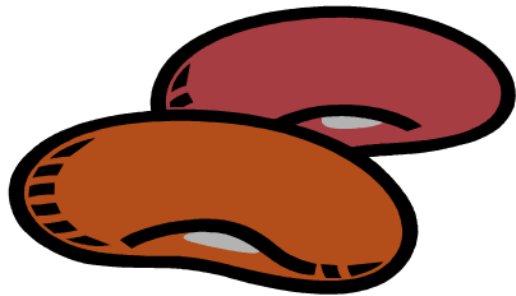
- Indicator and temporally based
- Stakeholders can relate to the time frame and measure.
- Specific to work plan activities and priorities.
- Milestones with water quality goals form the bases of the projects monitoring effort

Types of Milestones

- Tracking milestones (process –track BMPs, # of permits, etc against workplan expectations)
- Interim milestones (process/outcome – training completed prior to BMP installation)
- Critical milestones (outcome/impact – without this achievement the project will succeed must make changes)

Types of Indicators

- Administrative



- Social



- Environmental

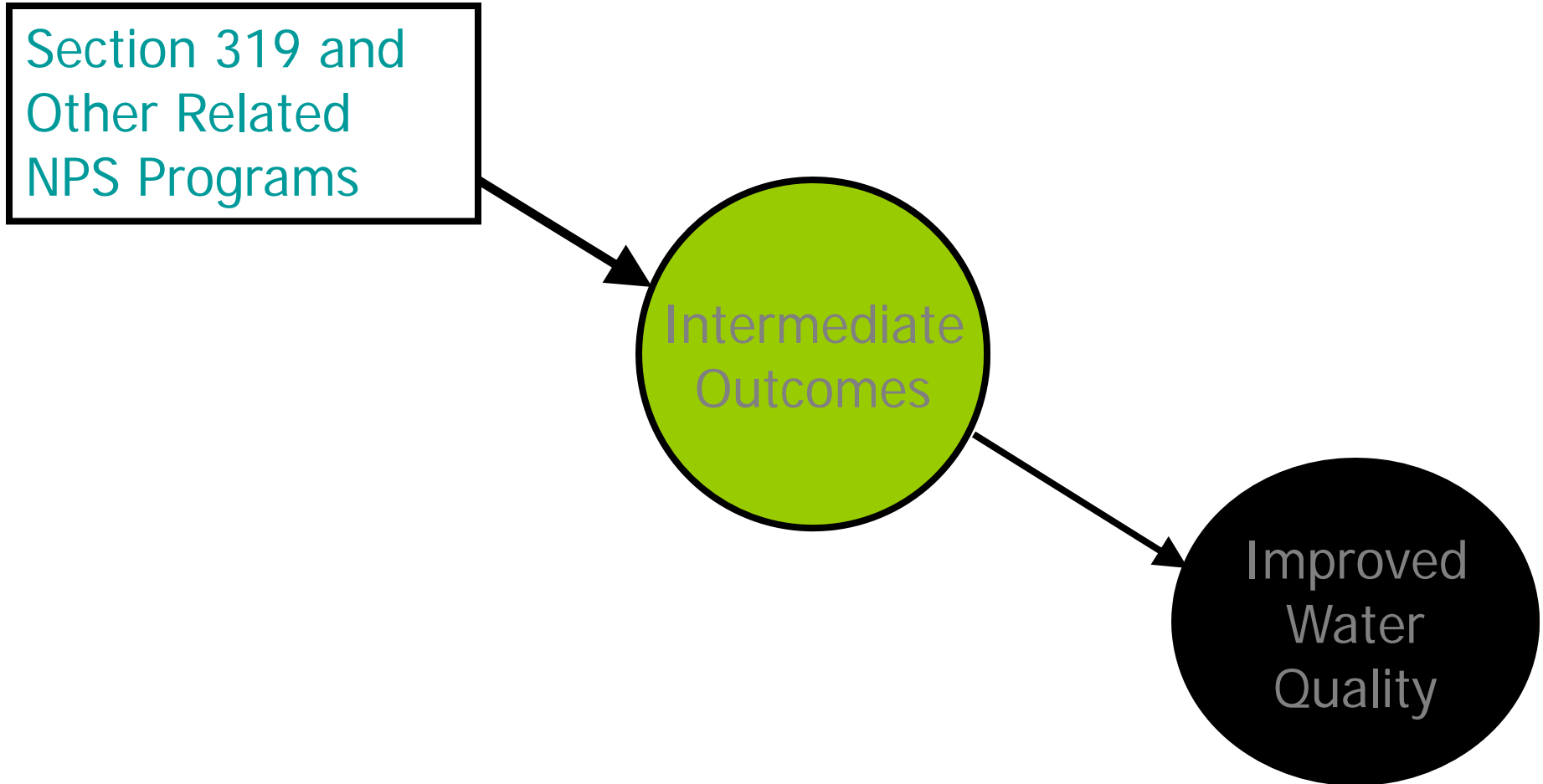


Why are Social Indicators Important?

Section 319 and
Other Related
NPS Programs

Intermediate
Outcomes

Improved
Water
Quality



Evaluation Measurements

Type/Time frame	Indicator
Administrative “Beans” (early)	\$ spent BMPs installed
Environmental (end)	Loading reductions IBI changes
Social (early-end)	# participants KSA changes

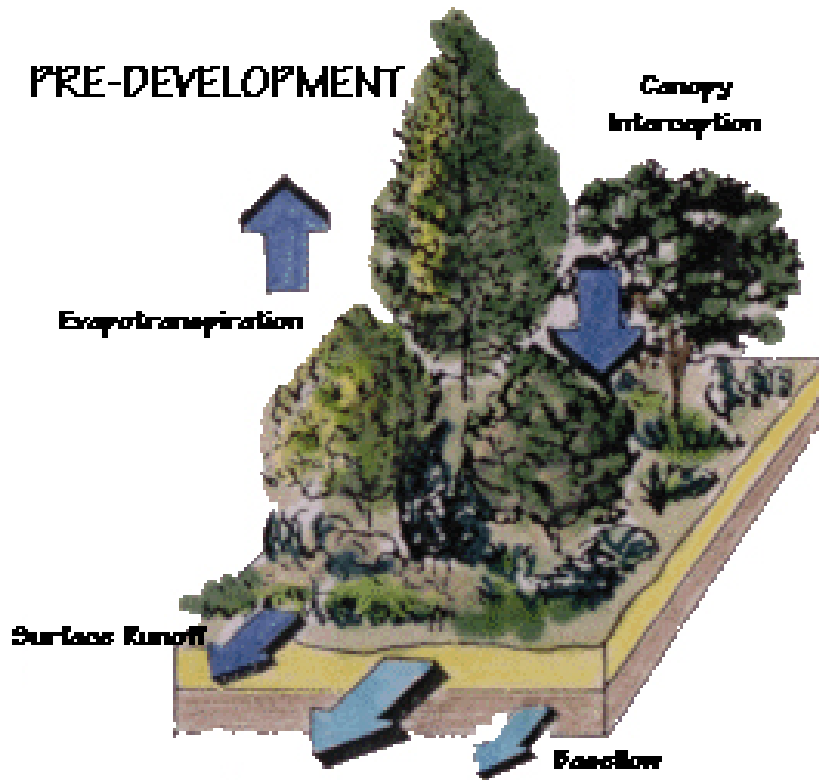
Critical milestone

- Lower Big Rib Priority Watershed project established a critical milestone to trigger management focus:
“after 5 years of implementation, the calculated sediment reduction based on cost share agreements, is less than 60% of the total cropland sediment reduction goal. Additional cropland fields will be classified as critical and eligible for assistance.”

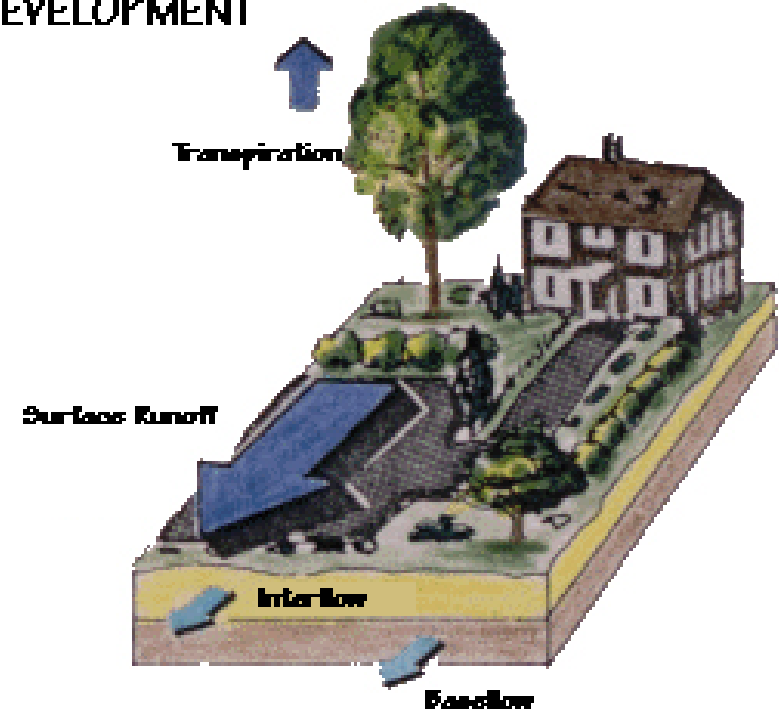
Value of Milestones

- Allows you to track actions various partners will take to achieve goals
- Relates project goals to how things are being accomplished
- Status of objectives/outputs easy to determine

WATER BALANCE

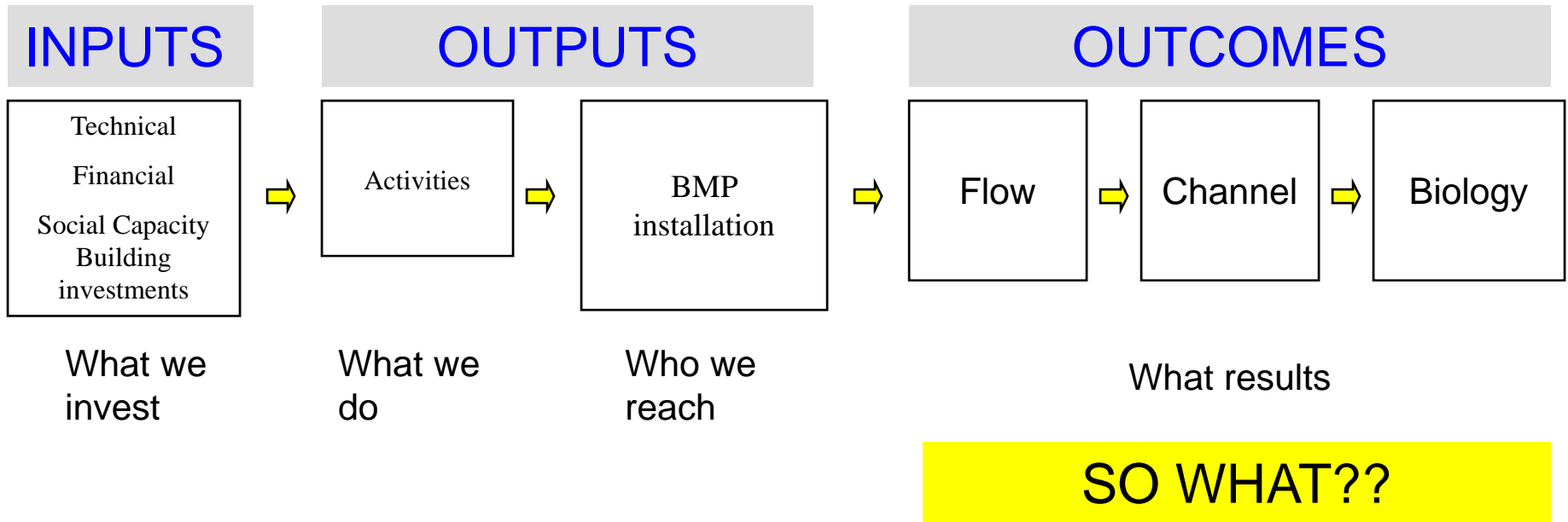


POST-DEVELOPMENT



This diagram shows how development and its corresponding increase in impervious cover disrupts the natural water balance. In the post-development setting, the amount of water running off the site is dramatically increased.

LOGIC MODEL Biological Endpoint



Situation–Excessive Soil Loss Causing WQ Impairments

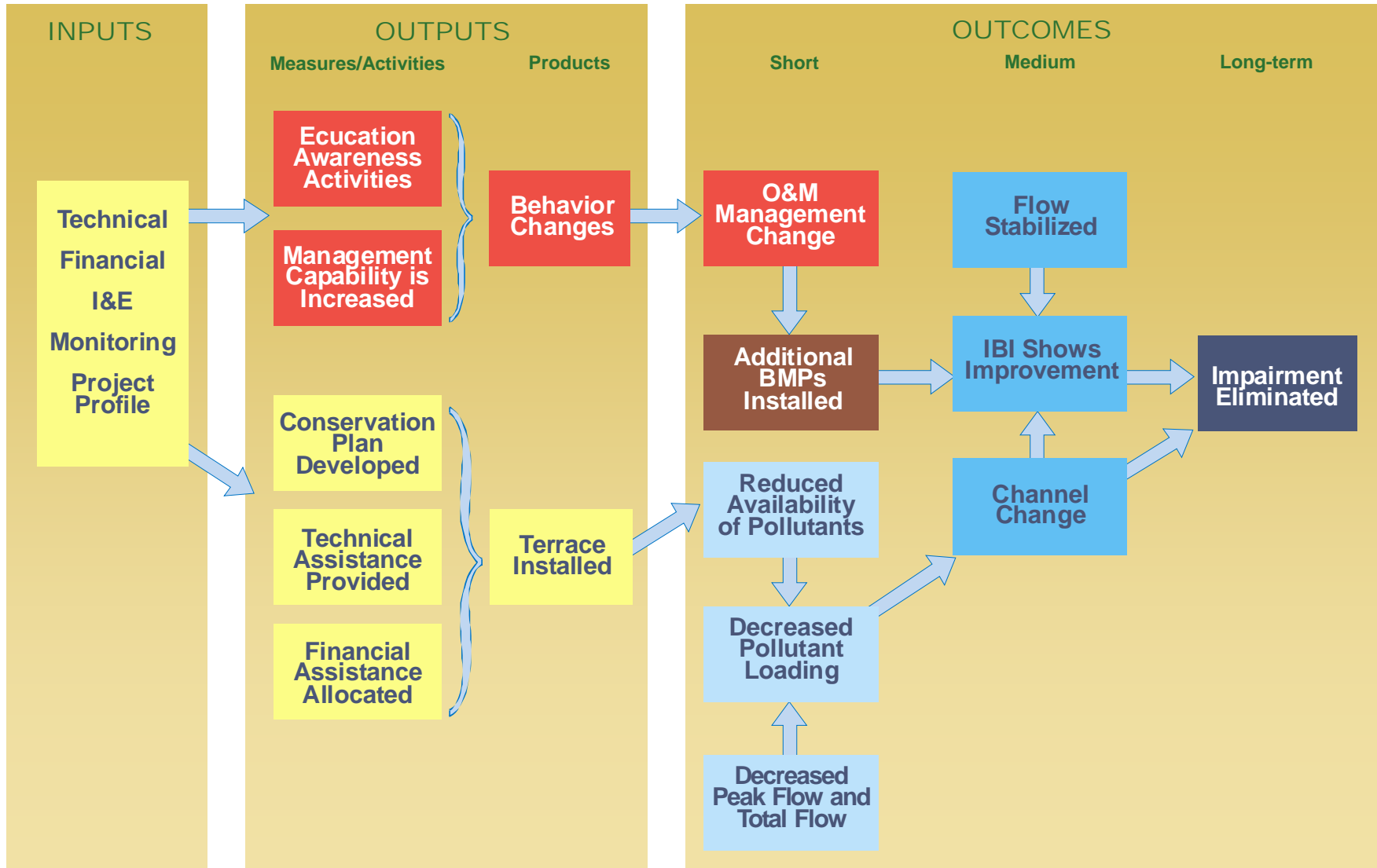
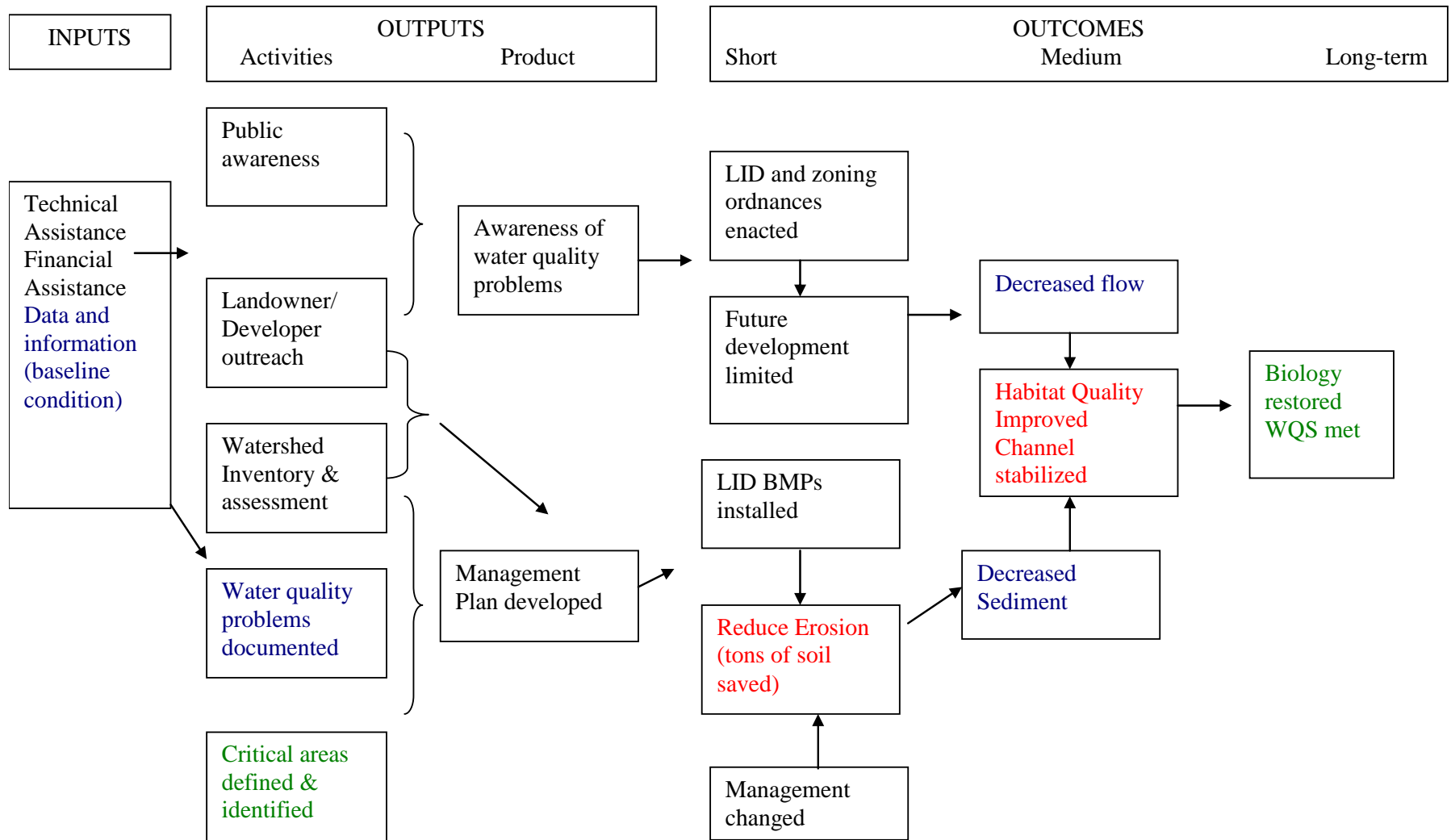


Figure 1: Logic Model. Low Impact Development (LID) channel stability example integrating modeling and monitoring (green) activities. Modeling (red) is used to help define critical areas and estimate how long until medium and long-term outcomes can be obtained. The monitoring (blue) strategy for sediment and flow strategy is based upon the model predictions.



Indicators & targets: short/long term

Worksheet 12-2

Developing Criteria to Measure Progress in Meeting Water Quality Goals

[Note: Complete one worksheet for each management objective identified.]

Management Objective: Reduce nutrient inputs into Cane Creek by 20 percent

Indicators to Measure Progress	Target Value or Goal	Interim Targets		
		Short-term	Medium-term	Long-term
P load	44 t/yr	52 t/yr	49 t/yr	44 t/yr
# of nuisance algae blooms	0	2	1	0
transparency	5.5 m	4.1 m	4.9 m	5.5 m
frequency of taste and odor problems in water supply	0	1	1	0
hypolimnetic DO	5.0 mg/L	2.5 mg/L	4.0 mg/L	5.0 mg/L

Maumee Example

3 components

number of participants

circumstances beyond projects

control

Finally...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....



Then...do it all over
again!