Understanding the Effectiveness of BMPs: Synthesizing Lessons Learned from Water Quality Monitoring Studies

Chesapeake Bay Program
A Watershed Partnership

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Background

- Synthesizing the state of knowledge from monitoring studies that look at the effectiveness of BMPs
  - 2009 MRAT recommendations
  - April 2011 STAR topical meeting with WQGIT
  - WIPs and verification of practices
  - Aid in the decision framework

Process

COMPLETED

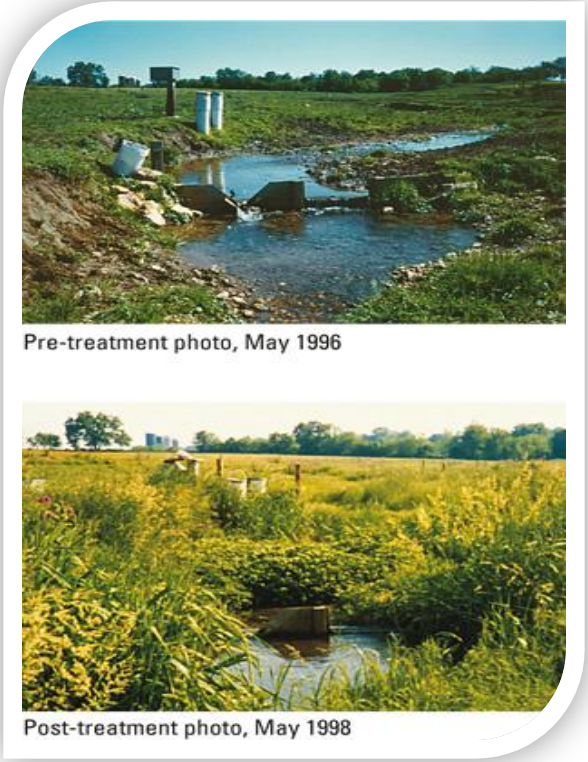
- Literature Review
  - ~30 Chesapeake Bay Watershed (CBW) studies
  - ~20 National and International studies
- "Synthesis" workshop
- Storyboarding session

CURRENT AND UPCOMING

- Writing phase
- Review
  - Synthesis Team → NTWG/TMAW → STAR → WQGIT → edit → WQGIT → MB → CBP publication

Synthesis, Part 1

- 1) Are BMPs working?
  - 4 Lessons
  - 4 Recommendations



Big Spring Run : Riparian areas pre- and post-cattle stream exclusion and riparian replanting (Galeone et al. 2006).

Lesson 1

LESSON

- At the scale of the CBW, the quickest and most obvious improvements in water quality have been from wastewater treatment facility upgrades.

RECOMMENDATION

- WWTP have substantially reduced their loads via upgrades, however, continuing established practices and making improvements is crucial to the continuance of progress toward reducing loads and offsetting population growth.

Lesson 2

LESSON

- Practices which focus on reducing the initial input of nutrients into the system through on-the-ground actions that target water and air quality improvements have shown to be effective at reducing nutrient transport.

RECOMMENDATION

- Comprehensive plans and innovative technologies are necessary to reduce fertilizer use (for residential and agricultural sources), solids (biosolids and animal manure), and air emissions.

Lesson 3

LESSON

- Many nonpoint source BMPs will take years to decades to improve water quality in the watershed; once water quality improvements reach the estuary, the response can be rapid (years).

RECOMMENDATION

- Now is the time to accelerate nonpoint source BMPs; detecting measureable improvements in water quality will require persistence and patience

Lesson 4

LESSON

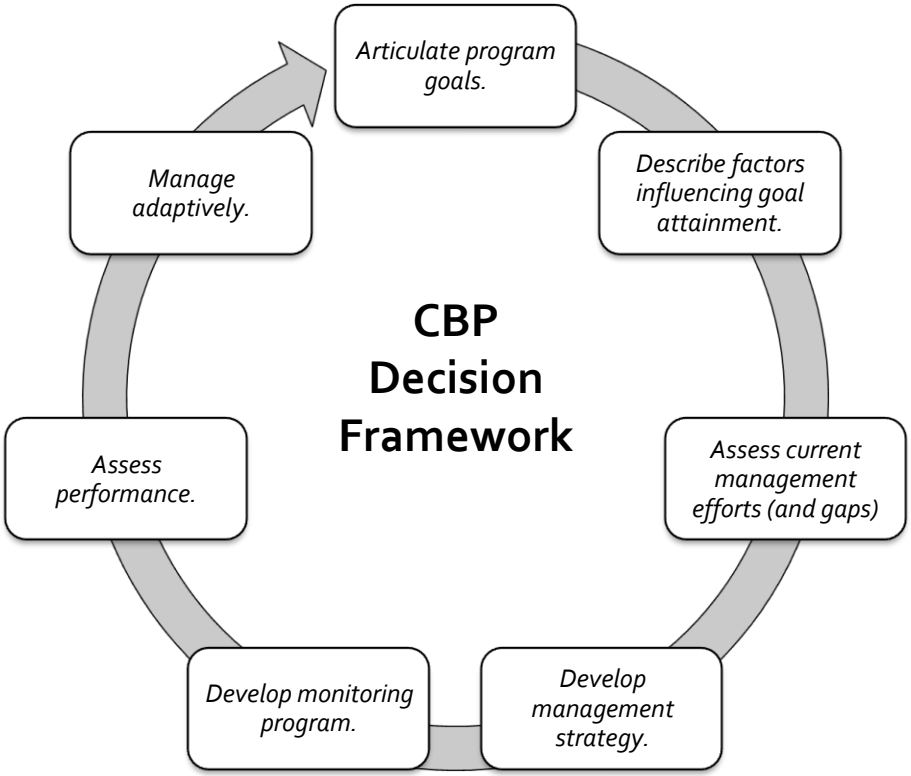
- Improvements in water quality as a result of BMPs may be offset by increasing nutrients in other sources.

RECOMMENDATION

- Restoration goals and expectations should be set knowing that the offsets are a reality and that desired outcomes from some BMPs might be eclipsed by increases in other nutrient sources.

Synthesis, Part 2

- 2) How do we design and implement BMPs to be more effective and inform the Adaptive Management Cycle?
  - 4 Lessons
  - 4 Recommendations



Lesson 5

LESSON

- In order to observe significant water quality and habitat responses, relatively large amounts of focused implementation (both type and location) are required to address the location-specific sources of pollution.

RECOMMENDATION

- Identify the sources, location, and magnitude of nutrient inputs within the project area to target the appropriate site and type(s) of implementation as well as the amount of effort needed to achieve desirable outcomes.

Lesson 6

LESSON

- Apart from point source tracking, information is limited at the sub-county scale to track BMP implementation.

RECOMMENDATION

- Improvements are needed for local tracking of voluntary and cost-share BMPs to enhance models for targeting of BMP implementation and for being able to evaluate the effectiveness of specific BMP projects.

Lesson 7

LESSON

- A very limited percentage of watershed-wide BMP projects have been monitored for their effectiveness and of those, most are not monitoring at the scale necessary to access BMP effectiveness.

RECOMMENDATION

- Improvements are needed to enhance monitoring of BMPs as well as water quality and habitat responses.

Lesson 8

LESSON

- Most BMP implementation is not designed using lessons learned from rigorous evaluation results.

RECOMMENDATION

- Evaluating the effectiveness of water quality and habitat monitoring programs and BMP projects will require a better understanding of the lessons learned from past BMP projects and the application of those lessons learned through adaptive management.

Products and Timeline

- Spring 2013
  - Technical Report

Spring/Summer 2013

- Newsletters
- Booklet
  - For targeted audiences