CBP Expert Panel Protocol History: An Overview

Chesapeake Bay Program Scientific and Technical Advisory Committee (STAC)

March Quarterly Meeting

March 8, 2022

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CBP Expert Panel Protocol History: An Overview

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  - Mid-Atlantic Water Program (MAWP) BMP Project – (2007-2009)
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Nutrient Subcommittee

CBP Expert Panel Protocol History: An Overview

- Nutrient Subcommittee –
  - In the 1990's, the CBP partnership began using model estimates of reductions in nutrient loads as surrogates for reporting progress in water quality improvement.
  - Modeled progress overestimated actual progress as BMP effectiveness estimates were based on research scale data where implementation of BMPs, and their operation and maintenance, were assumed to be accurate or properly done.
  - The inconsistency between modeled progress and actual water quality resulted in negative press which drove federal programmatic reviews that emphasized the need for the Chesapeake Bay Program to revise BMP effectiveness estimates based on the latest science and knowledge of how the practices operate in the watershed.

CBP Expert Panel Protocol History: An Overview

- Nutrient Subcommittee –
  - BMP reduction efficiency estimates were assigned using limited science from controlled research sites that were highly managed and maintained by a BMP expert.
  - Best professional judgment was used extensively in developing these estimates as performance data on BMP effectiveness was limited.
  - BMP definitions and reference documentation was limited at best.

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- Nutrient Subcommittee –
  - The resulting estimates were not reflective of the variability of effectiveness estimates in real-world conditions where farmers or local government staff, not BMP scientists, are implementing and maintaining a BMP across wide spatial and temporal scales with various hydrologic flow regimes, soil conditions, climates, management intensities, vegetation, and BMP designs.

CBP Expert Panel Protocol History: An Overview

- Nutrient Subcommittee –
  - The definitions and values used for both loading and effectiveness estimates have important implications for the CBP and the various partners.
  - BMP definitions and effectiveness values were not developed in a process that was consistent, transparent, and scientifically defensible.

MAWP BMP Project

CBP Expert Panel Protocol History: An Overview

- MAWP BMP Project –
  - December 2009
  - "DEVELOPING BEST MANAGEMENT PRACTICE DEFINITIONS AND EFFECTIVENESS ESTIMATES FOR NITROGEN, PHOSPHORUS AND SEDIMENT IN THE CHESAPEAKE BAY WATERSHED"

DEVELOPING BEST MANAGEMENT PRACTICE DEFINITIONS AND EFFECTIVENESS ESTIMATES FOR NITROGEN, PHOSPHORUS AND SEDIMENT IN THE CHESAPEAKE BAY WATERSHED

Final Report
December 2009

Dr. Thomas Simpson and Sarah Weammert
University of Maryland Mid-Atlantic Water Program

CBP Expert Panel Protocol History: An Overview

- MAWP BMP Project –
  - The Mid-Atlantic Water Program (MAWP) led a project commissioned and funded by the EPA/CBPO to develop the definitions and effectiveness estimates of select BMPs that states were implementing or proposing to implement as part of the Tributary Strategies.
  - The objective was to scientifically-rigorous approach for development of definitions and effectiveness estimates by reflecting the average operational condition representative of the entire Chesapeake Bay Watershed.

CBP Expert Panel Protocol History: An Overview

- MAWP BMP Project –
  - Process Overview:
  - There were four main steps,
    - Scientific literature search,
    - Development of BMP definition and effectiveness estimates,
    - CBP review and approval,
    - Documentation and reporting.

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- MAWP BMP Project –
  - BMPs were evaluated and their effectiveness estimates revised to better reflect current research and knowledge, providing more realistic, science-based estimates of expected pollution reduction levels.
  - UMD/MAWP searched for data on spatial and temporal factors that affect effectiveness estimates such as BMP design, BMP age and time to maturity, phased in implementation, soil type, surface and subsurface flow patterns, climate and other natural conditions.

CBP Expert Panel Protocol History: An Overview

- MAWP BMP Project –
  - Scientists with expertise on specific BMPs took the lead in drafting practice definitions and proposing effectiveness estimates based on the latest science and research applicable to the Chesapeake Bay watershed's natural conditions.
  - Further review of the accuracy of the definition and effectiveness estimates was provided by additional scientists and program managers.

CBP Expert Panel Protocol History: An Overview

- MAWP BMP Project –
  - The Chesapeake Bay Program reviewed definition and effectiveness estimates to determine if tracking and reporting data needed to receive credit is available in each jurisdiction and also ensure all pollution reduction mechanisms the BMP provides is captured by the definition and effectiveness estimate.
  - By assigning effectiveness estimates that more closely align with operational, average conditions, modeling scenarios will serve as a better management tool as they more directly reflect on the ground loads.

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- MAWP BMP Project –
  - The incorporation of the "Data Source Characterization Matrix" recommended by STAC.

Table 1. Data source characterization matrix

	High confidence	Medium confidence	Lowest confidence
Applicability [a]	Definition matches technical specifications	Generally representative	Somewhat representative
Study location [b]	Very representative of soils and hydrology	Generally representative	Somewhat representative
Variability [c]	Relatively Low	Medium	Relatively High
Number of studies [d]	Many	Moderate	Few
Scientific support [e]	Operational scale research (peer reviewed)	Research scale (peer reviewed)	Not peer reviewed ("gray" literature)

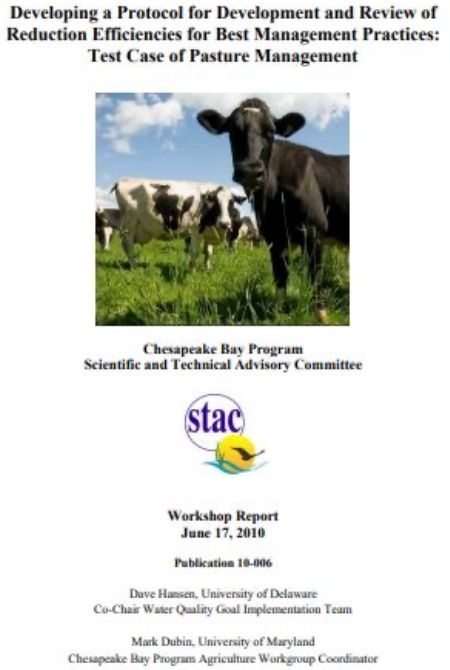
CBP Expert Panel Protocol History: An Overview

- MAWP BMP Project –
  - MAWP report published in December 2009.
  - Report co-authors:
    - Dr. Thomas Simpson – Project Manager, University of Maryland Mid-Atlantic Water Program
    - Ms. Sarah Weammert – Project Leader, University of Maryland Mid-Atlantic Water Program


STAC Pilot Protocol Project

CBP Expert Panel Protocol History: An Overview

- STAC Pilot Protocol Project –
  - June 16, 2009
  - "Developing a Protocol for Development and Review of Reduction Efficiencies for Best Management Practices: Test Case of Pasture Management"



Developing a Protocol for Development and Review of Reduction Efficiencies for Best Management Practices: Test Case of Pasture Management

Chesapeake Bay Program
Scientific and Technical Advisory Committee

Workshop Report
June 17, 2010

Publication 10-006

Dave Hansen, University of Delaware
Co-Chair Water Quality Goal Implementation Team

Mark Dubin, University of Maryland
Chesapeake Bay Program Agriculture Workgroup Coordinator

CBP Expert Panel Protocol History: An Overview

- STAC Pilot Protocol Project –
  - The steering committee for this proposal was:
    - Dr. Dave Hansen, STAC representative and WQGIT Chair- UD
    - Mr. William Keeling, WTWG Chair- VA-DCR
    - Mr. Mark Dubin, AgWG Coordinator- UMD
    - Mr. Elmer Dengler, USDA-NRCS
    - Ms. Victoria Kilbert, CRC Fellow
    - Ms. Elizabeth Van Dolah, STAC Coordinator- CRC

CBP Expert Panel Protocol History: An Overview

- STAC Pilot Protocol Project –
  - The purposes of the proposal were:
    - Develop a protocol for development and review of reduction efficiencies (effectiveness estimates) for agricultural best management practices (BMPs),
    - Use this new protocol to improve effectiveness estimates for pasture management practices to be used in the Chesapeake Bay Program watershed model (ver. 5.3).
  - STAC approved $10,000 for this project.

CBP Expert Panel Protocol History: An Overview

- STAC Pilot Protocol Project –
  - The proposed protocol was a continuation of an effort started by the Mid-Atlantic Water Program (MAWP) in 2007.
  - In June 2007, the MAWP requested that STAC review the process that had been developed to produce loading reduction efficiencies associated with best management practices.
  - Effectiveness estimates (formerly referred to as reduction efficiencies) for pasture management were included in a two-year effort by the MAWP that generated a number of estimates for best management practices in both urban and agricultural settings.

CBP Expert Panel Protocol History: An Overview

- STAC Pilot Protocol Project –
  - However, new information was available which suggested that the pasture estimates should be re-evaluated.
  - There was concern on the part of states such as Virginia, which has the largest pasture acreage in the Chesapeake Bay watershed, that their management practices were not fully represented.

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- STAC Pilot Protocol Project –
  - STAC, WQGIT, and the MAWP sponsored a series of two Pasture Management Workshops to provide a scientific forum for:
    - Evaluation of pasture and livestock management practices,
    - Implementation and tracking issues,
    - Account for current assistance programs throughout the Chesapeake Bay watershed.

CBP Expert Panel Protocol History: An Overview

- STAC Pilot Protocol Project –
  - Effectiveness Estimates for Pasture Management Practices:
  - The first workshop was held on October 27-28, 2009, and a second workshop was held on March 10-11, 2010.
  - Five pasture management BMPs were evaluated:
    - Alternative Watering Facilities
    - Stream Access Control with Fencing
    - Prescribed Grazing
    - Precision Intensive Rotational Grazing
    - Horse Pasture Management

CBP Expert Panel Protocol History: An Overview

- STAC Pilot Protocol Project –
  - Workshop attendees included representatives from:
    - USDA Agricultural Research Service (PA, MD, NC, OH)
    - USDA Natural Resources Conservation Service (DE, MD, PA, VA)
    - Environmental Defense Fund
    - University of Delaware
    - Virginia Tech
    - University of Maryland
    - Pennsylvania State University
    - West Virginia University
    - Maryland Department of Agriculture
    - Maryland Department of Natural Resources
    - Virginia Department of Conservation and Recreation
    - University of South Carolina

CBP Expert Panel Protocol History: An Overview

- STAC Pilot Protocol Project –
  - STAC report recommendations:
  - The WQGIT considered, and adopted, the effectiveness estimates for pasture management practices on May 10, 2010, in terms of:
    - total nitrogen (TN),
    - total phosphorus (TP),
    - and sediment (TSS).

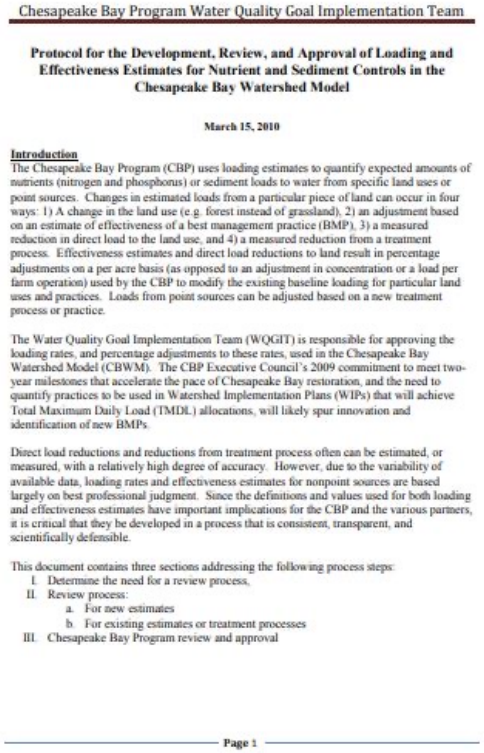
CBP Expert Panel Protocol History: An Overview

- STAC Pilot Protocol Project –
  - STAC report published on June 17, 2010.
  - Report co-authors:
    - Dr. Dave Hansen, STAC representative and WQGIT Chair- UD
    - Mr. Mark Dubin, AgWG Coordinator- UMD


WQGIT “BMP Protocol”

CBP Expert Panel Protocol History: An Overview

- WQGIT "BMP Protocol" –
  - March 15, 2010
  - "Protocol for the Development, Review, and Approval of Loading and Effectiveness Estimates for Nutrient and Sediment Controls in the Chesapeake Bay Watershed Model"



Chesapeake Bay Program Water Quality Goal Implementation Team

Protocol for the Development, Review, and Approval of Loading and Effectiveness Estimates for Nutrient and Sediment Controls in the Chesapeake Bay Watershed Model

March 15, 2010

Introduction

The Chesapeake Bay Program (CBP) uses loading estimates to quantify expected amounts of nutrients (nitrogen and phosphorus) or sediment loads to water from specific land uses or point sources. Changes in estimated loads from a particular piece of land can occur in four ways: 1) A change in the land use (e.g. forest instead of grassland), 2) an adjustment based on an estimate of effectiveness of a best management practice (BMP), 3) a measured reduction in direct load to the land use, and 4) a measured reduction from a treatment process. Effectiveness estimates and direct load reductions to land result in percentage adjustments on a per acre basis (as opposed to an adjustment in concentration or a load per farm operation) used by the CBP to modify the existing baseline loading for particular land uses and practices. Loads from point sources can be adjusted based on a new treatment process or practice.

The Water Quality Goal Implementation Team (WQGIT) is responsible for approving the loading rates, and percentage adjustments to these rates, used in the Chesapeake Bay Watershed Model (CBWM). The CBP Executive Council's 2009 commitment to meet two-year milestones that accelerate the pace of Chesapeake Bay restoration, and the need to quantify practices to be used in Watershed Implementation Plans (WIPs) that will achieve Total Maximum Daily Load (TMDL) allocations, will likely spur innovation and identification of new BMPs.

Direct load reductions and reductions from treatment process often can be estimated, or measured, with a relatively high degree of accuracy. However, due to the variability of available data, loading rates and effectiveness estimates for nonpoint sources are based largely on best professional judgment. Since the definitions and values used for both loading and effectiveness estimates have important implications for the CBP and the various partners, it is critical that they be developed in a process that is consistent, transparent, and scientifically defensible.

This document contains three sections addressing the following process steps:

I. Determine the need for a review process,
II. Review process:
   a. For new estimates
   b. For existing estimates or treatment processes
III. Chesapeake Bay Program review and approval

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CBP Expert Panel Protocol History: An Overview

- WQGIT "BMP Protocol" –
  - Direct load reductions and reductions from treatment process often can be estimated, or measured, with a relatively high degree of accuracy.
  - Due to the variability of available data, loading rates and effectiveness estimates for nonpoint sources are based largely on best professional judgment.
  - Since the definitions and values used for both loading and effectiveness estimates have important implications for the CBP and the various partners, it is critical that they be developed in a process that is consistent, transparent, and scientifically defensible.

CBP Expert Panel Protocol History: An Overview

- WQGIT "BMP Protocol" –
  - The "BMP Protocol" contains three sections addressing the following process steps:
    - Determine the need for a review process,
    - Review process:
      - a. For new estimates
      - b. For existing estimates or treatment processes
    - Chesapeake Bay Program review and approval

CBP Expert Panel Protocol History: An Overview

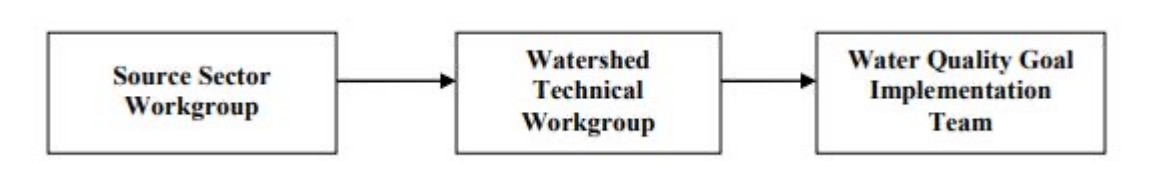
- WQGIT "BMP Protocol" –
  - For new estimates - Convene a review panel:
  - The source sector Workgroup, in consultation with the WTWG and WQGIT Chair, will identify and convene a panel of experts on the relevant topic.
  - Each request for review should include suggestions for such panel members.
  - The panel must include at least six individuals; three recognized topic experts and three individuals with expertise in environmental and water quality-related issues.
  - It is also important that the review panel has appropriate geographic representation.

CBP Expert Panel Protocol History: An Overview

- WQGIT "BMP Protocol" –
  - For existing estimates or treatment processes:
  - The WQGIT will evaluate existing loading and effectiveness estimates on a three-year schedule, or as appropriate, to determine if a review is warranted.
  - Such reviews can be prompted by the availability of new information, such as a new treatment process.
  - Reviews can also be initiated if current estimates produce illogical model outputs or if there is reason to believe that they were developed using inaccurate information.

CBP Expert Panel Protocol History: An Overview

- WQGIT "BMP Protocol" –
  - Chesapeake Bay Program review and approval:
  - Review panel recommendations will follow a specific procedure through the CBP.
  - Each recommendation must first receive approval from the indicated group before it can be reviewed by the next group listed in the process.



CBP Expert Panel Protocol History: An Overview

- WQGIT "BMP Protocol" –
  - The "BMP Protocol" incorporates the "Data Source Characterization Matrix".

Table 1. Data source characterization matrix

	High confidence	Medium confidence	Lowest confidence
Applicability [a]	Definition matches technical specifications	Generally representative	Somewhat representative
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WQGIT “BMP Protocol” Updates

CBP Expert Panel Protocol History: An Overview

- WQGIT "BMP Protocol" Updates –
  - The CBP partnership's "BMP Protocol" has undergone multiple updates since the first version adopted by the WQGIT in 2010.
  - The latest version of the "BMP Protocol" currently in use was approved by the WQBIT on July 13, 2015.
  - Multiple additional expert panel considerations have been included over time to increase consistency, transparency, and scientifically defensibility, as well as address additional water quality concerns.

CBP Expert Panel Protocol History: An Overview

- WQGIT "BMP Protocol" Updates – Examples
  - The proposed list of Panelists, as well as the draft scope and charge of the Panel, the panelist credentials, CVs, and associated conflict of interest disclosures, will be sent via email to the source sector Workgroups, the WTWG, the GITs, and the Advisory Committees for their review and comment.
  - The Panel Chair or Panel Coordinator will routinely update the hosting source sector Workgroup or GIT on the Panel's progress; preliminary findings; and any information or logistical gaps/needs that require input from those beyond the Panel membership.

CBP Expert Panel Protocol History: An Overview

- WQGIT "BMP Protocol" Updates – Examples
  - The Panel will recommend a "credit duration" for each practice. This determines the time the practice will receive credit in the CBP modeling tools.
  - Guidance on BMP Verification:
    - Description of the BMP verification guidance must be consistent with the CBP partnership's Chesapeake Bay basinwide BMP Verification Framework
    - Panels are expected to provide only their recommendations as to how verification might be considered.

Summary

Commercial Poultry Production Data Research

- Summary
  - The CBP's many agreements, commitments, and the EPA TMDL have each accelerated the pace of Chesapeake Bay restoration, and the need to quantify practices to be used in Watershed Implementation Plans (WIPs) that will achieve Total Maximum Daily Load (TMDL) allocations.
  - The definitions and values used for both loading and effectiveness estimates have important implications for the CBP and the various partners.
  - It is critical that they be developed in a process that is consistent, transparent, and scientifically defensible.


For More Information go to
https://www.chesapeakebay.net/