



**Chesapeake Bay Program**  
**SCIENTIFIC AND TECHNICAL ADVISORY COMMITTEE**  
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The Honorable Joe Gill, Chair  
Principal Staff Committee, Chesapeake Bay Partnership

May 14, 2014

Nicholas DiPasquale, Chair  
Management Board, Chesapeake Bay Partnership  
Director, EPA Chesapeake Bay Program

Dear Secretary Gill and Director DiPasquale,

The attached white paper, *Criteria for Science-based Restoration and Management*, from the Scientific and Technical Advisory Committee was produced to help inform policy makers and the public on the utilization of science in major restoration efforts. The role of science in the Chesapeake Bay Partnership is approaching a critical crossroads. Over the last 30 years, the Chesapeake Bay Program partnership has been guided, motivated, and inspired by a data-driven, evidence-based scientific and technical approach to understanding and managing precious natural resources in human dominated landscapes. This has been propelled by decades of sustained investment and active engagement with the scientific community.

Moving forward, the Chesapeake Bay Partnership has developed a new agreement that will chart the course of management and restoration over the next decade. It is critical for the success of the program that this new plan be fully informed by the available science and we encourage the use of the *Criteria* as a guide as outcomes, management strategies, and monitoring strategies are developed and refined over the next year. We seek to enable use of scientific information and approaches to set realistic expectations, as well as to appreciate the limits of our current understanding. Toward this end, offering a set of essential criteria will enable effective, science-based outcomes, management actions, and monitoring and assessment strategies. As always, STAC is committed to assisting decision makers to achieve their expressed goals using an iterative, evidence-based management process and to offer assistance in following the *Criteria* to the Goal Implementation Teams.

Using the *Criteria* as a framework in conjunction with the PSC approved *Adaptive Management Framework*, STAC is going to convene local, regional, and national stakeholders to understand, monitor, and learn from the Bay Partnership's approach to science-based management. We expect this to include high profile meetings and technical reports. We welcome and encourage the Partnership's participation in this effort to provide accountability and transparency regarding the scientific basis for Bay restoration and management and we will keep you informed as the process develops. It is our intent that the effort culminate in a symposium highlighting lessons learned from a number of large environmental management programs around the country and identifies effective protocols for, or potential barriers to, fully utilizing science in restoration programs.

Sincerely,

Kirk Havens  
Chair, Chesapeake Bay Program's Scientific and Technical Advisory Committee

CC: Principal Staff Committee members, Management Board members, Advisory Committee Chairs, and Goal Implementation Committee Chairs.

# Criteria for Science-Based Restoration and Management

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A Scientific and Technical Advisory Committee White Paper, May 2014

***Criterion #1: Programmatic goals are clearly specified and explicitly based on relevant scientific information.***

There should always be some identifiable technical basis for program goals. Belief that a goal is realistic and attainable should be founded on knowledge of system processes and trajectory. This is essential for defensible formulation of management strategies and for practical implementation of adaptive management. Such understanding also includes an appreciation of the sources of uncertainty and randomness that may contribute to real world outcomes.

***Criterion #2: Verifiable outcomes are linked to programmatic goals.***

A clear and direct link between goals and measurable outcomes is critical for any meaningful assessment of management efficacy. It is a hallmark of evidence-based management and provides the foundation for adaptive management. We appreciate that not every desired outcome can be directly measured, but we believe that it is possible to provide some kind of measurement, verification, and analysis to any goal worth stating.

***Criterion #3: Management actions are explicitly linked to verifiable outcomes.***

All management actions should be justified by the program's intended outcomes. The collection of planned management actions should also reflect current understanding of what is necessary to achieve an intended outcome. This is the construct that provides the foundation for scientific evaluation and the basis for adaptive management.

***Criterion #4: The intended effect of each management action is described with respect to the direction and magnitude of the expected impact.***

No management action should be undertaken without the specification of expectations for impacts on the system. These expectations must be made explicit so that they can be assessed through a strategically designed monitoring program.

***Criterion #5: Monitoring processes are explicitly designed to detect and attribute changes expected from management actions.***

Monitoring should be designed and conducted to gather evidence as to whether or not the set of management actions is leading to the desired outcome and whether to continue, modify, or change a management action. This is also necessary for model calibration and verification and is the basis of the adaptive management process that ensures continued learning and increased certainty of management actions. Consequently, monitoring programs must be explicitly and consciously designed and operated to provide insights into overall, system-level outcomes and the performance of individual management actions.

***Criterion #6: Management goals, actions, and observed outcomes are subject to periodic evaluation through rigorous, independent processes with timely and accessible communications.***

Data specific to the actions undertaken to reach a desired outcome must be systematically subjected to rigorous review and an interdisciplinary, integrative analysis by qualified, independent scientists. This is the information necessary to reduce uncertainties in current understandings of system behavior, and to improve the efficacy of management actions. Specific attention should be paid to making information broadly accessible and actionable for multiple audiences.

## **Conclusion**

In summary, STAC offers these criteria as practical elements to guide and, in some cases, evaluate prospective agreements among the Bay Program Partners. STAC believes that agreements and plans that consider these criteria will be best able to credibly claim to be science-based and ultimately have the best chance of achieving their long-term goals. Without these elements, determining practical and effective management approaches and realizing a restored Bay will be unlikely.