Chesapeake Bay Program

A Watershed Partnership

Virtual Modeling Lab Approach

CBP Modeling Lab Action Team

June 21, 2012

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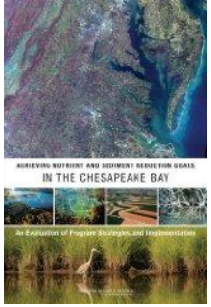
Genesis: Independent Evaluator

- GAO recommendation: establish an independent and objective reporting process (2005).
- GAO: CBP actions fell short.
- Executive Council: evaluation by independent science organization to accelerate implementation and increase level of accountability (2008).
- IE Action Team: study charge, scope, desired outcomes.
- NRC Committee (Dec. 2009).
- NRC Report (April 2011).
- IE Action Team "Key Challenges" report (Nov. 2011)

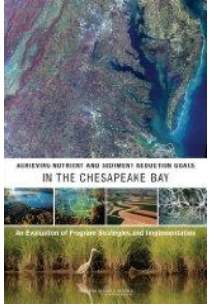
Charge Developed by IA Action Team

- Does implementation tracking appear to be reliable, accurate and consistent?
- What tracking & accounting appear to be working and not working? How can the system be improved to address gaps?
- How do gaps & inconsistencies appear to impact reported results?
- Is 2-year milestone strategy likely to result in achieving goals for this period?
- Do CBP agencies appear to have developed adaptive management approaches?
- What improvements can be made to development, implementation and accounting of strategies?



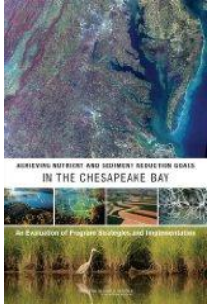
NRC: Tracking & Reporting

- Current accounting is inconsistent and cannot on the whole be viewed as accurate.
- Unable to determine reliability and accuracy of BMP data reported by jurisdictions or quantify the magnitude or direction of the error.
- Consolidated BMP program presents opportunities to improve tracking & accounting.
- Targeted monitoring would prove valuable to refine efficiency estimates & improve model predictions.
- Electronic tracking & data transfer are likely to improve quality of reporting & reduce burden.



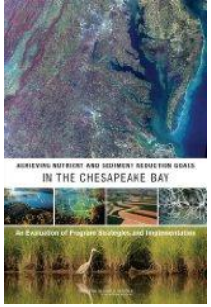
NRC: Two-Year Milestones

- 2-year milestone strategy commits the states to tangible, near-term implementation goals & improves accountability; however, it does not guarantee the goals will be met. Consequences for nonattainment are unclear.
- Jurisdictions reported mixed progress, however data insufficient to evaluate implementation or load reductions.
- The first 2-year milestones will likely be the easiest to achieve.



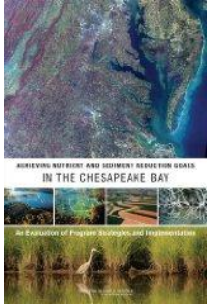
NRC: Adaptive Management

- Neither EPA nor jurisdictions exhibit a clear understanding of adaptive management or how it might be applied.
- Successful application requires careful assessment of relevant uncertainties, which have not been fully analyzed by CBP.
- Targeted monitoring will be required to support adaptive management.
- Without sufficient flexibility adaptive management may be problematic.



NRC: Strategies for Meeting Goals

- Require attention to consequences of future populations, development, agricultural production, and changing climate.
- Helping public understand and accounting for lag times & uncertainties are vital, especially if near-term Bay response does not meet expectations.
- Potential agricultural, urban and crosscutting strategies.
- Innovative funding models will be needed.
- Establish modeling laboratory to assure access to suite of models & build credibility.



Bay Modeling Laboratory

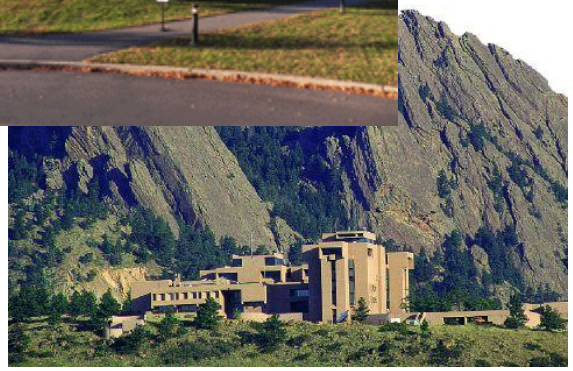
Establishing a Chesapeake Bay modeling laboratory would ensure that the CBP would have access to a suite of models that are state-of-the-art and could be used to build credibility with the scientific, engineering and management communities.

- Evaluate uncertainty & assess monitoring data needs.
- Improve predictive skill.
- Improve model credibility.
- Incorporate multiple modeling approaches.
- Emphasize open-source models.

Instead, the committee envisions a modeling laboratory as a physical location, following the examples of NCAR and GFDL.

A logical leap too far!

Bricks and Mortar Analogs



Are these appropriate solutions for the CBP?

GFDL and NCAR

Nuclear physics laboratories

GLERL, EPA labs, Everglades Interagency Modeling Center

Baltic NEST Institute

Advantages of Virtual Approach

- Tears down walls between modeling and observation and experimentation, thus better addressing pressing needs for verification, accountability, and adaptive management.
- Preserves regulatory responsibilities while ventilating with innovation.
- A more effective and efficient way to engage the world-class scientific expertise in region…and states. Takes advantage of information & communication technology.
- Assures “access to a suite of models that are state of the art.”
- Builds greater “credibility with the scientific, engineering and management communities.”

Getting to a Collaborative Modeling Approach for the CBP

- Maintain existing core modeling capability.
- Improve ability to deliver near real-time assessments.
- Build on and integrate with the Chesapeake Community Modeling Program.
- Develop more effective interface with monitoring programs to support adaptive management.
- Support: model comparison teams, solution strike teams, targeted efforts to integrate models and observations, short term exchanges.

Some Immediate Challenges

- “Lag-time” models.
- Reliably down-scaled nutrient reduction targets.
- “Now-cast” models that incorporate recent climatology for comparison with observations.
- Converting “threshold” theory into functional models.
- Effective operational structure for integrating models & observations to support adaptive management.