

Chesapeake Governance Study: Report of 2021 Decision-Maker Interview Results

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Executive Summary

This report summarizes data collected as part of the National Science Foundation-Funded Project CNH2-L: Modeling the dynamics of human and estuarine systems with regulatory feedbacks (Award Abstract # 2009248; https://www.nsf.gov/awardsearch/showAward?AWD_ID=2009248). Fifty-nine key participants in the Chesapeake policy process were interviewed between June-December 2021. The primary purpose of these interviews was to collect data to aid with the development of a multi-level computational model of the policy process for nutrient management in the Chesapeake Bay watershed. A secondary purpose was to help guide exploration of potential future scenarios once the policy model is coupled with models of other components of this social-ecological system.

Respondents provided the research team with a wealth of information about all aspects of the policy process for the Chesapeake watershed. In order to make the most of these data we used a systematic approach to code responses (see Appendix A: Detailed Methods). Three main policy-relevant findings emerged from the interviews:

- The CBP has helped to improve Bay water quality since 2010, but progress toward the 2025 TMDL has been stymied by three main factors:
 - Loading amplifiers (e.g., population growth, climate change)
 - Increasing marginal costs of reducing nutrient loads
 - Institutional constraints within and outside the CBP
- Water quality governance in the region is a highly contested process; this is a necessity given legal and sociopolitical constraints on CBP activities, but it has also undermines the legitimacy of the CBP and the computer models that it relies on to guide policy
- Reducing nutrient loading is likely to be more difficult in future, so to improve water quality governance the Chesapeake Bay Program (CBP), jurisdictional leaders, and others will need to address a number of challenges, but they can do this by taking advantage of internal and external opportunities.

The rest of this executive summary provides additional detail on these and other insights from our interview data. We start by describing how respondents perceive the effectiveness of water quality governance in the Chesapeake watershed and how those perceptions interact with perceptions of the legitimacy of the CBP. Then we describe the top challenges and opportunities identified by our respondents and highlight important synergies among key opportunities. Lastly, we review respondents' thoughts about the future of governance in the region, including their concerns about the viability of the CBP post-2025.

Effectiveness and Legitimacy

An overwhelming majority of respondents indicated that water quality governance in the Chesapeake watershed has been partially effective in terms of **goal attainment**. This is not surprising, given that current estimates suggest that the total maximum daily load (TMDL) will not be reached for the Bay by

the 2025 deadline. On the other hand, over half of the 58 statements on goal attainment indicated that the CBP had improved water quality and/or that water quality was better than it would have been without the CBP. Evaluation depended heavily on the counterfactual considered by the respondent; those who compared current conditions to pre-2010 conditions tended to evaluate goal attainment more favorably while those who compared current conditions to the goal for 2025 or related environmental criteria tended to evaluate goal attainment more negatively.

Many respondents also indicated that the CBP is partially effective or ineffective in its **institutional design** and most of these cited procedural failures as limits on goal attainment. Bureaucratic inefficiency, lack of engagement with local-level stakeholders, lack of resources, and politicization of multiple components of the policy process were most often described as limitations on institutional effectiveness. There was not agreement on the strengths and weaknesses of CBP institutions, however. Respondents were particularly divided over the role of science and models and the level of collaboration across the CBP. What is clear, however, is that the majority of respondents viewed CBP governance as a political exercise and they generally do not view politicization as a positive component of the process.

Interestingly, few respondents evaluated the effectiveness of the CBP in terms of **equity**, either among states or at the local level, but of those who did mention it, most evaluated it as partially effective or ineffective. Overall, equity was not mentioned very often in any context, and when it was, it was more likely to refer to concerns over allocation of loading goals among state-level jurisdictions than equity for stakeholders at the local level. This does not mean that equity—or diversity, equity, and inclusion more broadly—was not important to respondents, but rather that few of our respondents viewed equity as a central to the governance process. That is, they might view equity as important in its own right, but if it was mentioned, it was primarily described as a separate goal for the CBP; only a few respondents indicated that greater equity for local stakeholders was an opportunity to improve water quality (goal attainment) or CBP procedures (institutional design).

Concerns about effectiveness in all three guises appeared in our more detailed analysis of the policy process as well, mainly in conjunction with the WIP Design Process and the Modeling Process. In both cases, respondents expressed concerns about the legitimacy of these processes, and some linked factors that reduced legitimacy to factors that reduced effectiveness. Specifically, WIPs were described as “paper processes” or “good on paper but not in practice” 44 times and, of these, about half indicated that this undermined the legitimacy of the entire process. Some respondents indicated that designing WIPs that were “good on paper” was the best that could be done given legal, political, and resource constraints, but none put a more positive spin on this issue. The WIP Design process was defended for specific states 12 times, however, including Pennsylvania, West Virginia, and New York.

Questions about the Chesapeake Assessment Scenario Tool (CAST) or related “Bay Models” and the legitimacy of the modeling process also arose, with 29 of 31 statements about the model indicating that it was not accurate or acceptable and 30 of 31 statements about the legitimacy of the modeling process indicating that it is not considered legitimate. Positive statements about the models or modeling process were much less numerous (< 5), but we did not ask about the modeling process specifically, so the results may be biased towards respondents who are dissatisfied with this aspect of the CBP.

Respondents also indicated that the model was not accurately accounting for changes in nutrient loading, with 33 statements indicating that BMPs are under-credited in CAST, 2 indicating that credits from CAST were about right, and 4 indicating that BMPs are over-credited in CAST. In other words, many

more respondents believed that the model is under-estimating the effects that WIPs have had on loads in the Chesapeake Bay (thereby underestimating goal attainment) than felt that the estimates were either accurate or overestimated (thereby overestimating goal attainment). As described below, these questions about accounting using the model were seen as a major challenge for the CBP, but we also note that model development and specification was largely viewed as a political process, and that this, combined with lack of transparency, generated concerns about the legitimacy of the models and the CBP as a whole among a number of respondents.

Challenges and Opportunities

Respondents identified 42 types of **challenges**, or things that make governance of Chesapeake water quality more difficult, and 21 types of **opportunities**, or things that might make governance of Chesapeake water quality easier. Challenges and opportunities mentioned most often are summarized in Figure E. 1, which also shows how respondents often talked about top challenges and opportunities together. It was clear that most respondents saw water quality governance as a complex problem where challenges were inter-related to each other, meaning that some opportunities were viewed as methods to address multiple problems at the same time. Identifying these synergies is important both for understanding the history of the CBP and anticipating its future.

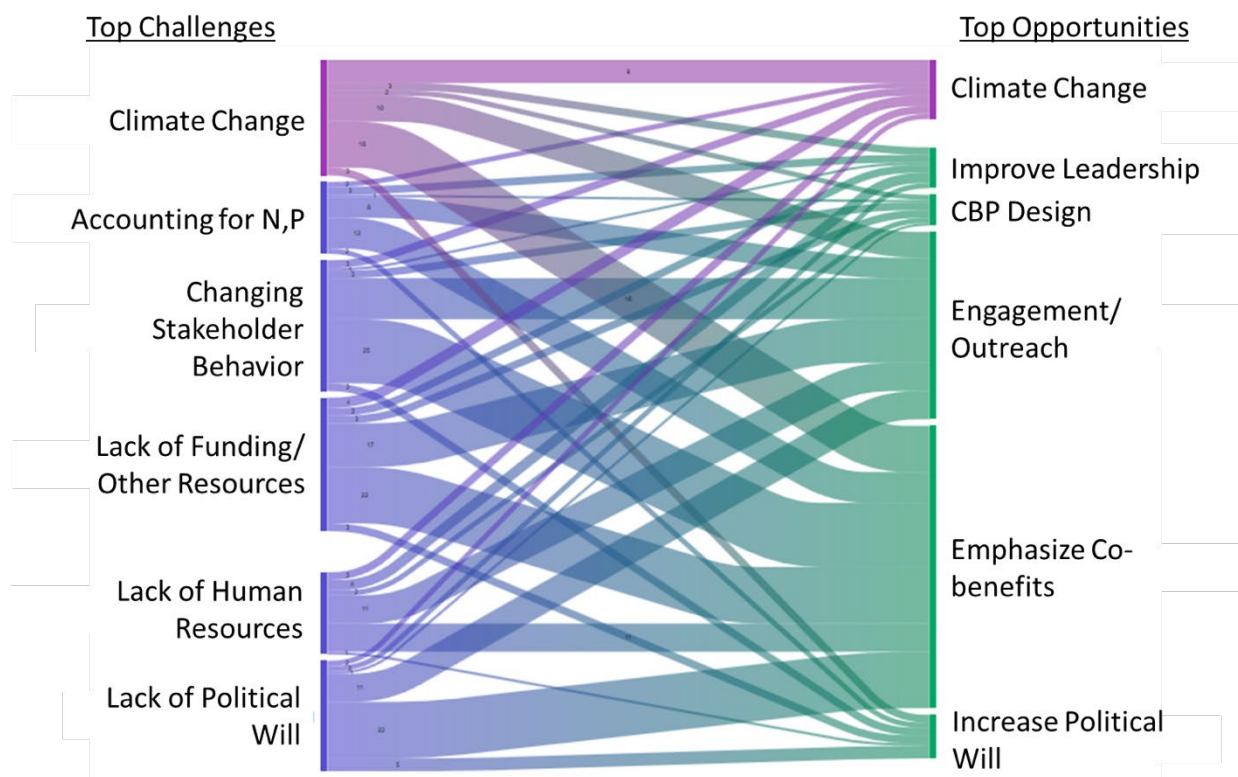


Figure E. 1 Sankey Diagram of the Most Frequently Mentioned Challenges and Opportunities. Width of lines linking Challenges on the right with Opportunities on the left indicates how often these topics were mentioned together, or co-occur, in a given interview. Co-occurrence does not always imply causal connection, but Engagement/Outreach and Emphasize Co-benefits were both frequently mentioned as methods for addressing all challenges listed here except Accounting for N,P.

Climate change was identified as a top challenge, but some respondents also saw it as an opportunity, since it could increase funding to implement BMPs that have climate-related co-benefits such as flood mitigation. Other challenges were related to respondent concerns about the models or modeling

process describe above. Difficulties accounting for N and P were primarily associated with concerns about the design and parameterization of CAST and were frequently tied to other challenges or questions about the models used by the CBP. Difficulties of data collection and verification did not make this list of top challenges but were mentioned as a separate challenge 41 times (see Section 4 Challenges and Opportunities for a more detailed look at these results). The remaining top challenges focused on barriers to BMP implementation, including difficulties changing stakeholder behavior and lack of political will, funding, or human resources. All of these challenges were seen as closely connected to each other and to other challenges that were not mentioned as frequently.

Of the top five opportunities shown in Figure E. 1, all were viewed as methods to address a wide array of challenges. Emphasis on co-benefits, in particular, was seen as way to bridge the power disconnect between people who live on the Bay and therefore benefit directly from improvements in Bay Water Quality and those who live inland and therefore have considerable control over the amount of nutrients that reach the Bay, but do not directly benefit from improvements in Bay water quality. We expected to see evidence of this disconnect at the state level but were surprised to find that, even within Bay States like Maryland and Virginia, there was a perception that people who did not either live or work on the Bay were not concerned with Bay water quality. This, in turn, contributed to the challenge of low political will, which many respondents viewed as the root of the other challenges they described.

Some of the less frequently mentioned opportunities are logical extensions of related challenges. For instance, increasing funding and human resources is an opportunity to address the challenges of lack of funding and lack of human resources. On the other hand, climate change came up as an opportunity, as well as a challenge. Often, the connection was made by the same respondent. Although climate change is generally expected to make it more difficult to achieve the TMDL due to increased precipitation and other environmental shifts, some respondents saw it as an opportunity to increase access to funding and other resources, to address the behavior change challenge, and build political will through climate-related co-benefits. Given the circularity of many of the relationships described between challenges and opportunities, there appears to be a bit of a chicken-and-egg problem for the CBP, or at least we can say that a number of respondents indicated that people (including decision makers, stakeholders, and the public) would need to address multiple challenges by taking advantage of multiple opportunities at the same time to improve CBP effectiveness.

Co-benefits were described as an opportunity to improve water quality governance 86 times throughout our interviews and were mentioned more than any other challenge or opportunity. Because they were so important to respondents, we coded all co-benefits mentioned and organized them into 15 categories. The two most frequently mentioned co-benefits were reducing harm from flooding and improving local water quality. Reduced flooding via floodplain restoration or similar stormwater practices was mentioned as an increasing opportunity because severe rainfall events and coastal inundation are expected to increase with climate change. Local water quality was also linked to many other co-benefits that were not mentioned as often, including restored ecosystems or habitats for key species, increased recreational and real estate values, green space and livability, and healthier commercial fisheries. A number of co-benefits were specific to agriculture, including improved soil health, improved animal health, and higher profits (including through cost-share or payments for ecosystem services).

Interestingly, when we asked respondents specifically about why best management practices are either included in states' Watershed Implementation Plans or implemented on the ground, a number of statements described what we could call "co-costs" as impediments to BMP uptake. While co-benefits are positive side-effects of nutrient reduction policies, co-costs are negative side effects. Co-costs were not mentioned as challenges per se, but some are related to the difficulty of convincing stakeholders to implement voluntary BMPs. Co-costs could be agricultural (e.g., loss of crop land, increased shade), urban (e.g., less parking, reduced safety if streetlights are blocked by trees), or suburban (e.g., loss of aesthetic and reputational values associated with lawns). Potential regressive impacts of funding mechanisms like "flush taxes" were also mentioned as co-costs. That is, when a flat rate is charged to pay for things like improved wastewater treatment plants, poorer people are more affected because the fee takes up a larger proportion of their income.

Uncertainty and the Future of Chesapeake Water Quality Governance

Overall, a majority of respondents expected that water quality governance for the Chesapeake Bay Watershed will become more difficult in the future. **Uncertainties** were highlighted around climate change and other challenges, but many respondents were also unsure how the system will change once Phase III of the TMDL ends in 2025. Some even believed that the increasing difficulty of reaching the TMDL could be a threat to the Partnership, while others expected that the deadline would simply be extended. Of those who were more pessimistic, responses were further divided between those who favored more stringent load reduction requirements to provide resilience against environmental stressors (and therefore a lower goal for the post-2025 TMDL) and those who believed that load reduction requirements needed to be less stringent (higher TMDL post-2025) to make the goal more achievable given existing resources and technologies. A third group of responses indicated that changes to the TMDL itself would not be possible due to legal constraints on the CBP.

In addition to load multipliers like climate change and development, concerns about the future arose because of the **increasing difficulty** of reducing nutrient loads. Although not mentioned often as broad challenges for the CBP as a whole, detailed responses about WIP Design and Implementation both indicated that much of the "low hanging fruit" has already been harvested and that marginal costs (or cost per additional unit) of nutrient reduction are now very high for some of the most effective technologies. As noted by a number of respondents, investment in wastewater treatment plants helped states like Maryland and Virginia make large reductions in their municipal loads in early phases of the TMDL, but there is little room for additional plants in these states and further improvements in load reduction efficiency per plant will be expensive. Similarly, early adopters among farmers and other landowners have already implemented many of the more cost-effective BMPs, so the costs of expanding voluntary practices is also increasing.

This brings us back around to questions about the ability of the Partnership to overcome the challenges it will face in the future, possibly by taking advantage of some of the opportunities described by our respondents. Environmental economists generally anticipate increasing marginal costs of pollution reduction and would argue that the pollution limits should be set where the marginal costs to society equal the marginal benefits to society. As our results show, determining how society values nutrient reduction is a techno-political process that does not yield a simple solution, particularly for a social-ecological system as large and complex as the Chesapeake Bay watershed. What is clear is that the CBP has helped to improve water quality in the Bay and the rest of the watershed, but that it will need to

improve its own institutional design in order to continue to reduce loading in spite of increasing costs and environmental amplifiers. This, in turn, may require broader changes in the political and legal systems in which the CBP is embedded. For instance, increasing equity and social justice could narrow disconnects between those who benefit from water quality improvements and those who contribute to nutrient pollution, thereby improving goal attainment and design effectiveness.