NCEE's Proposal for Chesapeake Bay EJ-Related Research

At least seven federal departments or agencies in the Chesapeake Bay partnership invest significant resources toward Chesapeake Bay restoration and protection, as do six watershed states (VA, MD, DE, WV, PA, NY), the District of Columbia, numerous local governments, and non-governmental organizations. States alone commit significant resources ($1.2 billion in 2020, budgeted for the same in 2021), and the federal government appropriated $352 million across departments and agencies in 2021.

The Chesapeake Bay Program Office recently contacted NCEE about starting a project to analyze the impact of these expenditures. Discussions between the two offices highlighted a need to understand the distributional implications of Chesapeake Bay cleanup expenditures, particularly for communities with environmental justice concerns. NCEE is proposing to implement a two-stage approach to this project. An initial overview of existing data will identify potential research areas and allow consultation with CBPO and other parties before pursuing more rigorous analysis in the second stage.

Phase 1. In the first stage, we seek to leverage existing maps and data to broadly identify the degree of overlap between various measures of environmental quality or Bay-related activities/benefits and disadvantaged communities. Spatially disaggregated information on baseline water quality, ecosystem services, bay recreation, green space, and availability of monitoring will be combined with Census and other relevant sociodemographic data to create maps and allow analysis of areas of potential overlap or disconnect. To the extent there is readily available data on ways that different demographic groups access and use the Chesapeake Bay, we can also incorporate them into Phase 1. These efforts may also help identify communities of concern for future analysis and engagement under Phase 2.

Examples of specific research questions we could evaluate based on existing data include:

1. What types of Bay amenities are available to and used by disadvantaged communities? Where is Bay-related recreational and commercial activity located in relation to these communities? Do these differ across these communities?
2. How does water quality vary across these communities?
3. Based on the existing literature, to what extent do we expect improvements in Bay amenities to be capitalized into housing values? Where are disadvantaged communities located relative to areas where improvements are capitalized into housing values?

In collaboration with CBPO, we may also be able to begin to understand:

4. How have existing federal/state/local efforts engaged a diverse set of communities with regard to Bay amenities/resources?
5. What policies are used to restore the Bay, and how is their implementation spatially distributed?

Funding: Not needed for phase 1.

Expected timeline: Approximately 3-5 months, to commence in 2022.

Phase 2. Based on results from the first stage and with the aid of CBPO, this stage will focus on developing new data and assessing the extent to which projects that improve Bay water quality benefit or leave out disadvantaged communities. Community engagement in collaboration with local groups is essential to this stage. Focus groups (and a possible survey) will collect information on how

disadvantaged communities interact with the Bay. Specifically, the focus groups will concentrate on the following questions, which may then inform future research:

1. How do disadvantaged communities interact with the watershed? Does this differ across these communities?
2. How do water quality improvements impact these communities?
3. Which "endpoints" that could be affected by Bay restoration are important to Chesapeake Bay communities (e.g., property values, subsistence or recreational fishing, commercial activities, groundwater issues, recreational trips, culture)?

Depending on information available from CBPO, we may be able to use or model changes in water quality to evaluate the extent to which disadvantaged communities are likely to benefit (or not) from Bay projects:

- Begin with attempt to quantify specific benefit categories that have been analyzed in previous work: For example, property price benefits, recreational benefits, enhanced commercial activities, use and non-use values solicited from stated preference surveys.
- Identify the extent to which categories not previously quantified but identified by focus groups might be spatially delineated/quantified based on existing literature.
- When no such method exists, qualitatively discuss the degree to which specific types of cleanup activities are more/less likely to affect these endpoints (e.g., for subsistence fishers and other traditional cultural values associated with the Bay).
- Identify potential health impacts from Chesapeake Bay restoration activities.

This work would ideally focus on upcoming plans and programs in the Chesapeake Bay. CBPO identified a significant amount of funds marked for Bay restoration. This research would analyze the potential distribution of impacts arising from those plans using existing valuation techniques.
Alternatively, if plans for expenditures are not yet clear, the analysis could be backward-looking and focus on the past implementation of the TMDL. Depending on the work chosen, NCEE would ideally work with CBPO water quality and ecosystem service modelers. This research would also involve more in-depth collaboration with OW and ORD.

A final research topic could be how already overburdened communities are affected by water quality trading in the Chesapeake Bay (i.e., does it lead to different outcomes for communities).
Section 10 of the 2010 Chesapeake Bay TMDL recommends water quality trading and offsets. Two states in the watershed, Maryland and Virginia, have nutrient trading programs.

- Drawing on scoping from Phase I, this analysis could begin by evaluating baseline inequities that might be affected by trading.
- Using state data on trading, we could also evaluate how disadvantaged communities have fared under trading to-date.

Expected timeline: 8-10 months, following stage 2.