Summary of Progress for the Toxic Contaminant Research Outcome

(Updated April 27, 2018)

Overview

The Chesapeake Bay Agreement has a goal to ensure that the Bay and its rivers are free of effects of toxic contaminants on living resources and human health. There are two outcomes (1) Policy and Prevention, and (2) Research. The efforts will help address:

- Toxic contaminants have made some fish and wildlife unsafe for human consumption, threaten the ecological health of living resources, and the economic value of the Bay and watershed.
- Fish consumption advisors exist primarily for mercury and PCBs. The advisories are a threat to human health and can reduce the $5 billion annual value of commercial fishing in the Bay
- Poor fish health related to toxic contaminants has occurred throughout the Bay watershed. This has had negatively impact on the tourist and recreational industry, which is valued at $20 Billion per year.

The toxic contaminant research agenda was developed, and is being implemented, to provide information about the occurrence, concentrations, sources and effects of toxic contaminants on fish and wildlife. The information will be used by CBP to consider policy and prevention approaches to reduce the effects of contaminants on living resources in the Bay watershed and make them safer for human consumption.

Research Outcome:

"Continually increase our understanding of the impacts and mitigation options for toxic contaminants. Develop a research agenda and further characterize the occurrence, concentrations, sources and effects of mercury, PCBs and other contaminants of emerging and widespread concern. In addition, identify which best management practices might provide multiple benefits of reducing nutrient and sediment pollution as well as toxic contaminants in waterways."

Lead and Supporting Goal Implementation Teams (GITs):

Water-Quality Goal Team, carried out by the Toxic Contaminant Work Group

Participating Partners:

Chesapeake Bay Watershed Agreement Signatories

- Maryland Department of the Environment
- Maryland Department of Natural Resources
- Virginia Department of Environmental Quality
- DC Department of the Environment
- Pennsylvania Department of Environmental Protection
- Delaware Department of Natural Resources and Environmental Control

- New York Department of Environmental Conservation
- West Virginia Department of Environmental Protection
- Chesapeake Bay Commission (CBC)
- U.S. Environmental Protection Agency
- U.S. Geological Survey
- U.S. Fish and Wildlife Service
- U.S Department of Homeland Security
- National Oceanic and Atmospheric Administration

Other Key Participants

- Non-Governmental Organizations

– Bluewater Baltimore

– Metropolitan Washington Council of Governments

– MD Pesticide Network

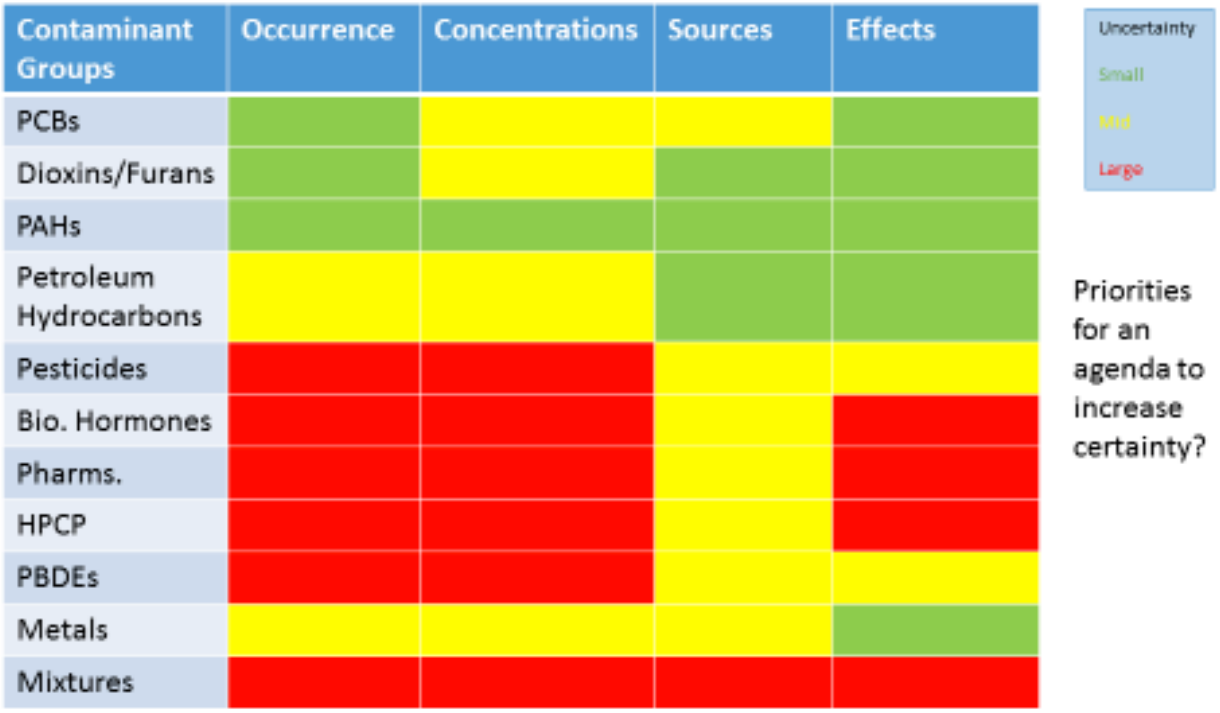
- Private sector organizations
- University of Maryland, Baltimore County
- Virginia Polytechnic Institute and State University
- Virginia Institute of Marine Science
- CBP Local Government Advisory Committee
- CBP Water Quality Goal Implementation Team Workgroups

Review questions for the Outcome

What are our assumptions?

The assumption was for findings from the research outcome to provide an improved understanding of the sources, occurrence, and effects toxic contaminants so that policies could be developed to prevent or reduce their impacts. We summarized the information from the Toxic Contaminant Report (2012) to assess our current understanding of different contaminant groups (see figure)

Concept for Determining Highest Priorities for Research to Increase Understanding Impacts and Mitigation Options for Toxic Contaminants (Color codes are examples)



What "Factors Influencing Success" were originally identified in your Management Strategy?

There were several factors identified in the Management Strategy (and the associated gaps) which include:

- Different assumptions about fish consumption: The jurisdictions have different assumptions about human exposure through fish consumption, which can limit comparability across the watershed.
- Causes of the degradation to fish and wildlife: Ability to determine which pollutants and additional factors are causing the degradation (and mortality) of fish and wildlife due to their exposure to varying mixtures of compounds. Also, there is no watershed-wide monitoring program on the condition of fish and wildlife that is integrated with water and sediment sampling.
- Lack of consistent information: Lack of consistent information (both spatial and temporal) on the occurrence and concentrations of toxic contaminants. Some of this is due to the high cost of generating new data on toxic contaminants. Additionally, there are few laboratories that have the capabilities to conduct analysis for all of the contaminant groups.
- Lack of toxicity thresholds: Development of strategies can be hindered by lack of toxicity thresholds for many pollutants to allow assessment of their effects on fish and wildlife.
- Prioritizing contaminants and addressing mixtures: The difficulties in assessing the relative risk groups of contaminants and their mixtures.

- Resource constraints: There are resource constraints to collect and analyze fish and associated water and sediment samples every year.
- NEW FACTOR: overwhelming amount of information but lack of summaries and implications for management options.

What were the "Management Approaches" you chose to include in your Management Strategy and Two-Year Work Plan in order to address those gaps?

- Supply information to make fish and shellfish safer for human consumption;
- Understand the influence of contaminants degrading the health, and contributing to mortality, of fish and wildlife;
- Document the occurrence, concentrations and sources of contaminants causing fish and wildlife degradation;
- Assess relative risk of contaminants, and options for mitigation, to inform policy and prevention strategies,
- Gather information on issues of emerging concern (including micro plastics).

Are you on track to achieve your Outcome by the identified date?

We do not have an environmental indicator so our progress is measured by assessing completion of actions in our 2-year work plan. An assessment of progress for the 2-year period includes:

- Supply information to make fish and shellfish safer for human consumption;

-support information on sources for PCBs (adequate progress)

-Mercury as next pollutant for a management strategy (lack of progress)

- Understand the influence of contaminants degrading the health, and contributing to mortality, of fish and wildlife;

-fish health studies and EDCs (adequate progress)

-causes of fish health problems (limited progress)

- Document the occurrence, concentrations and sources of contaminants causing fish and wildlife degradation;

-EDC studies (adequate progress)

-Other contaminants (adequate progress)

- Assess relative risk of contaminants, and options for mitigation, to inform policy and prevention strategies,

-Co-benefits for TMDL (adequate)

-Relative risk (lack of progress)

- Gather information on issues of emerging concern (including micro plastics).

-STAC Microplactics review (adequate progress)

Which management actions have been most critical and what do we learn?

The management approaches have provided critical information:

- Science to support the PCB policy and prevention strategy (Approach 1)
- Have more information on the impacts on fish and wildlife (approach 2) with a focus on endocrine-disrupting compounds (EDCs) and smallmouth bass in the watershed. A review of the impacts on wildlife was also completed.
- Improved our knowledge of the sources, occurrence, and effects of toxic contaminants, with a focus on EDCs and using jurisdictional monitoring (approach 3).
- Initial efforts conducted to identify the co-benefits on nutrient and sediment practices and reducing toxic contaminants in urban and agricultural settings (approach 4).
- Had STAC do a review of micro plastics (Approach 5).

However, we are learning that aspects of some management approaches needed to be modified:

- Assessing the effects of individual groups of chemicals, or their associated mixtures, on the health of fish and wildlife has been difficult. This same issue makes it very difficult to develop an approach for relative risk and prioritizing contaminant groups.
- Therefore we are evolving to take more of a "source" sector approach with a focus on agricultural and urban settings and potential connections to nutrient and sediment reduction practices. The new information generated includes:
    - Summary documents on occurrence of toxic contaminants in urban and ag areas (GIT funding)
    - Assessment of nutrient and sediment BMPs and effects on toxic contaminants (GIT funding)
    - Used all of the information to prepare fact sheet on co-benefits between nutrient and sediment practices and mitigating toxic contaminants
    - GIS analysis of different toxic contaminant sources and occurrence
- The ability of the states to use many findings is limited due to its descriptive nature. The states would like more quantitative information (in tools liked CAST) to consider co-benefits with toxic contaminants

Are our actions having the expected effect? How should we adapt?

Some potential ways to adapt during the next work plan include:

- Do not attempt to prioritize contaminant groups (relative risk) but focus more on the sources, transport, and impacts of mixtures of toxic contaminants from three primary sources: wastewater, storm water, and agricultural.
- Increase use and collaboration between jurisdictional monitoring programs and academic research to help overcome resource constraints.
- Provide enhanced information on the co-benefits between implementing nutrient and sediment reduction practices and those for toxic contaminants for the three primary sources.
- Increase coordination within the WQ GIT to discuss findings and implications with the associated "source sector" work groups.
- Increase our ability to summarize vast amounts of information and findings into a format for decision makers to consider policy and prevention management approaches.

What will we ask the MB?

- Develop actions for Co-benefits: Next steps on co-benefits for 12 outcomes. Suggest we have the current step of outcomes add a management approach to list actions for co-benefits.
- More emphasis on contaminants in source sectors: Nutrients, sediment, and toxic contaminants. Have the storm water, agricultural and wastewater workgroups put a greater emphasis on toxic contaminants over the next two years.
- Mercury: We want to determine the amount of effort the MB would like to see towards reducing the effects of mercury, which are currently based on plans to reduce air emissions. However, concerns that mercury already in the environment will not be addressed with this approach. Options include:
    - Trend analysis to see changes
    - Synthesis on recycling in watershed
    - Implications