Draft outline: Summary of Progress for the Toxic Contaminant Research Outcome

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:

To be added, but most states, DC, Chesapeake Bay Commission, and several Federal agencies (EPA, USGS, FWS, and NOAA)

Overview ("compelling narrative")

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.

However…

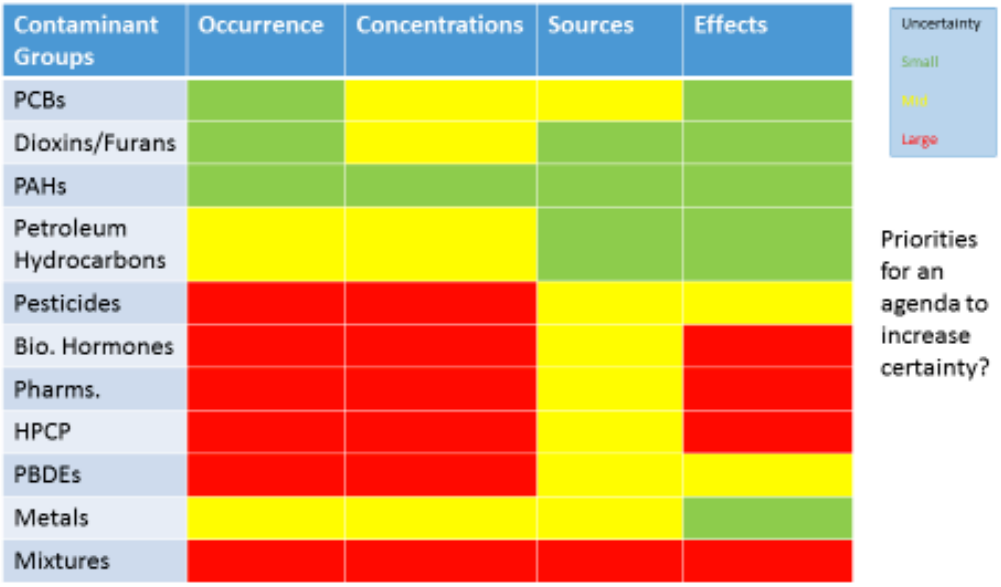
- Toxic contaminants have made some fish and wildlife unsafe for human consumption, threaten the ecological health of living resources, and the economic value of the Bay and watershed.
- Fish consumption advisors exist primarily for mercury and PCBs. The advisories are a threat to human health and can 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.

Therefore…. a 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.

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 below)

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



Five major issues were identified to be addressed in the management strategy:

- 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 microplastics).

For each issue, we (1) identified factors that may hinder progress toward the outcome, (2) current efforts, (3) gaps, and (4) approaches to address the gaps.

Factors Influencing Success" that were originally identified in your Management Strategy

There were several cross-cutting factors identified in the Management Strategy including: (1) resource constraints, (2) lack of consolidated information system of existing data, and (3) different monitoring and analytical approaches that limit comparability of information. The primary factors influencing each major issue identified in the management strategy are presented below.

Consumption advisories

- The jurisdictions have different assumptions about human exposure through fish consumption, which can limit comparability across the watershed.
- There are also resource constraints to collect and analyze fish and associated samples every year.

Fish and wildlife health

- 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.
- There is no watershed-wide monitoring program on the condition of fish and wildlife that is integrated with water and sediment sampling.

Occurrence of contaminants

- 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.

Relative Risk and Management strategies

- Development of strategies can be hindered by lack of toxicity thresholds for many pollutants to allow assessment of their effects on fish and wildlife.
- A companion factor is the difficulties in assessing the relative risk groups of contaminants and their mixtures.

Emerging issues

- Limited knowledge to assess importance and implications of emerging issues.

What has been accomplished

The approaches and primary activities specified in the research agenda, and 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)

■ 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 (limited progress)

■ Gather information on issues of emerging concern (including microplastics).
-Microplactics review (adequate progress)

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

- Assessing individual groups of chemicals, or their associated mixtures, is extremely difficult
- Developing an approach for relative risk is more difficult than anticipated
- Therefore we evolved 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
    -

Which of your management actions will be the most critical to your progress in the future? Why?

- The ability to summarize vast amounts of information and findings into a format for decision makers to consider policy and prevention management approaches.
- Need to increase coordination and overcome resources constraints to summarize findings.
- Ability of States to use co-benefit information in developing and implementing Phase 3 WIPs

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

- We have improved our knowledge of the sources, occurrence, and effects of toxic contaminants.
- Information was developed on the co-benefits on nutrient and sediment practices and reducing toxic contaminants in urban and agricultural settings.
- However, the ability of the states to use the findings is limited due to its descriptive nature. The states would like more quantitative information (in tools liked CAST) to develop their Phase 3 WIPs
- We also should consider focusing relative risk activities on "source sectors" and not groups of compounds.

What will we ask the MB?

- Identify additional ways we can effectively summarize and deliver information to inform development approaches to achieve co-benefits for toxic contaminants in the Phase 3 WIPs
- Identify resources to increase the capacity to summarize information and provide management implications.