ToxicsofConcern

Prioritizing Organic Pollutants that Threaten the Chesapeake Bay

Toxics in the Chesapeake

Toxic substances are chemicals in Bay water, sediment, and fish tissues that can adversely affect animal reproduction and development, as well as human health. These pollutants in the Chesapeake come from both manmade and natural sources and vary in their toxicity and ability to concentrate in the food web.

Those pollutants most worrisome to the Bay's living resources are known as Toxics of Concern; the organic Toxics of Concern are all manmade. The Toxics Subcommittee has been revising and prioritizing the organic contaminants on this list based on new data and better science to focus pollution prevention and restoration efforts more effectively on those chemicals having the greatest potential for harm. In May 2006, the Chesapeake Bay Program's Scientific and Technical Advisory Committee (STAC) sponsored a workshop to hammer out the details concerning the methodology, selection, and ranking of these toxic substances.

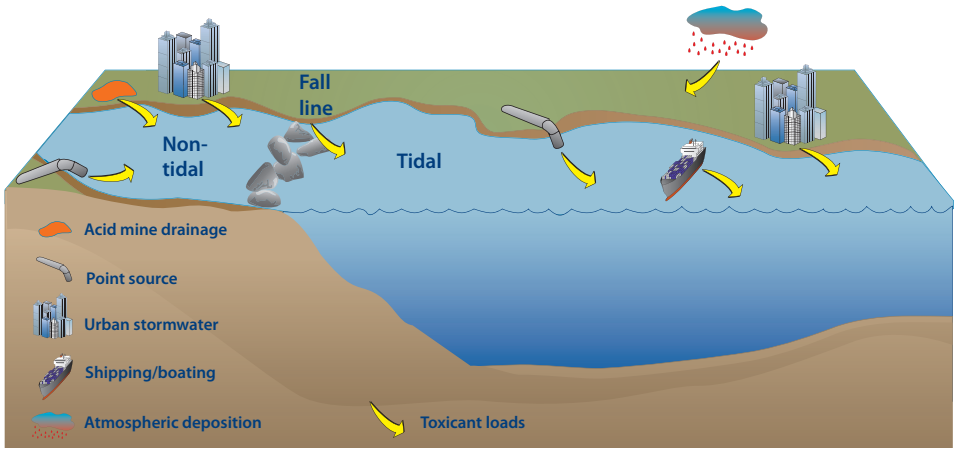
Prioritizing Organic Toxics of Concern in the Bay

Prioritizing the chemical contaminants entering the Chesapeake Bay is a daunting, but necessary, task. Historically, the Toxics of Concern list has proved valuable as a strategic tool in guiding the efforts and allocating the resources of the Chesapeake Bay Program's Toxics Subcommittee. By continually refining this list as new data and more accurate detection methods emerge, scientists and managers will be better able to narrow the focus on the organic toxic substances of greatest concern.

To review and refine the developing list, STAC held a workshop in mid-May to review and refine the draft document "Prioritized Chesapeake Bay Toxics of Concern: Method and Assessment," proposing changes to make the document more effective, timely, and useful in tackling the Bay's toxics problems.

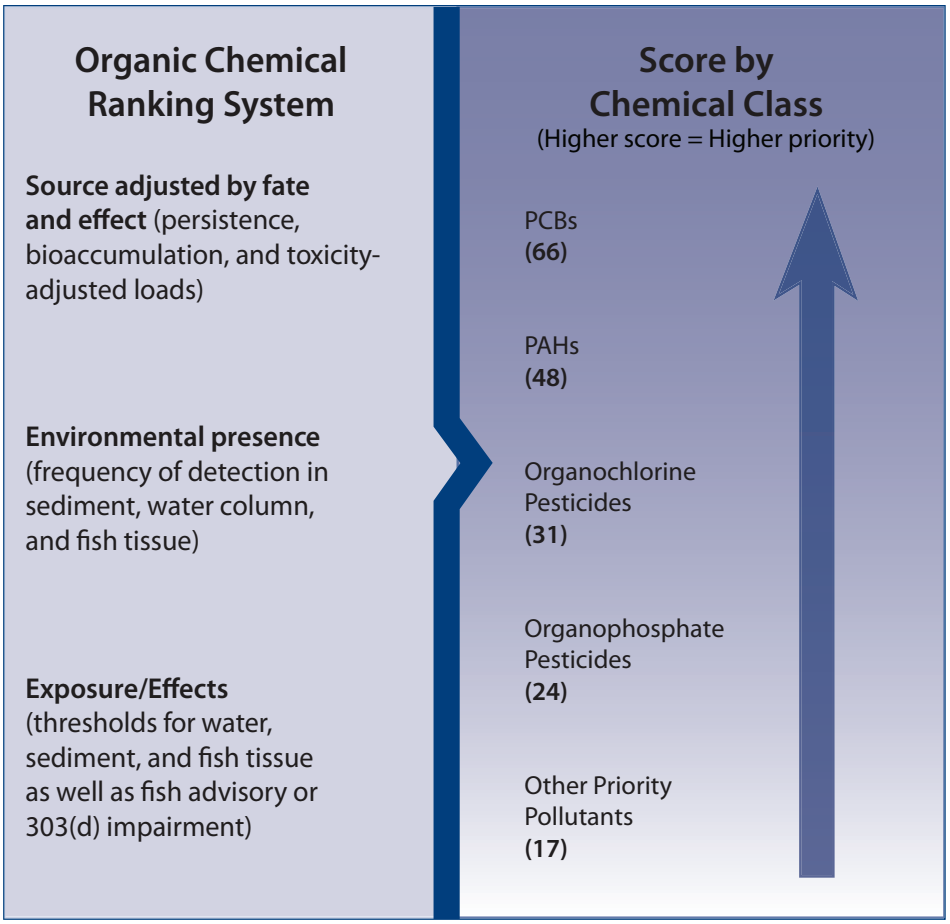
The panel reviewed several factors that influence the extent of chemical contamination. The assessment by the Toxics Subcommittee used a new ranking element called a persistence, bioaccumulation, and toxicity (PBT) factor, which accounts for those properties of a chemical that predict its effect on Bay organisms. The panel also considered the presence of contaminants in sediment, water, and fish tissue. Last, they evaluated effects criteria—sediment, water column, and fish tissue thresholds—that are useful in assessing the potential for adverse effects on organisms based on exceedance of each threshold.

Toxics Sources in the Toxics Loading and Release Inventory



Graphic elements courtesy of the Integration and Application Network

Fish consumption advisories form a subcriterion under this category.
Using this refined set of criteria, the panel scrutinized the proposed scoring system for weighting and ranking the Toxics of Concern. In sum, this list prioritizes chemicals based on load estimates to the Bay, environmental presence, ecotoxicological properties, and predicted impacts based on fish advisories or Clean Water Act Section 303(d) impairments. The chart below illustrates the final ranking based on these criteria.
Creating a Toxics of Concern list is an ongoing and evolving process. The list may never be cast in stone because better detection methodology, emerging pollutants, identification of other toxic chemicals entering the Bay, and more complete understanding of toxic impacts will bring new information to the foreground.
This list is not intended as a full risk assessment of the toxic contaminants in the Bay and its tributaries. Nor is it a complete or definitive listing of all the organic chemicals affecting the region and cannot be used alone to prioritize the listed chemicals for regulatory consideration.
On the other hand, this most recent version will provide the Toxics Subcommittee with a general guide for directing and prioritizing efforts and activities that focus on specific chemicals or chemical groups, including both point and nonpoint source loadings. It will also assist organizations that voluntarily engage in pollution prevention activities to target those organic toxic substances demonstrating the greatest harm to the Chesapeake Bay.



Recommendations of the Toxics of Concern Workshop

The panel recommended the following actions for the Toxics Subcommittee's final report—actions that are more responsive to the constantly evolving suite of information on the toxic substances of greatest concern for the Chesapeake Bay.

- Provide a thorough accounting of the contaminants listing procedure to offer better transparency and fuller accountability in the criteria-selection process.
- Identify examples of emerging pollutants, such as hormone-mimicking pharmaceuticals and personal care products, that represent a growing threat.
- Apply equal weight to all criteria: PBT (persistence, bioaccumulation, and toxicity) adjusted load; environmental presence in sediment, water, and fish tissue; sediment criteria (threshold); and programmatic concerns (fish consumption advisories).
- Add Clean Water Act Section 303(d) (the portion of the act that defines impaired waters and leads to the establishment of total maximum daily loads of a pollutant) impairments to the prioritization scoring.
- Consider metals separately from the organic toxicants and engage a different set of experts to evaluate them after new risk assessment procedures become available. When evaluating metals prioritization, use 303(d) listings and fish advisories.
- Provide an easy-to-follow, step-by-step process using an example pollutant to explain how the final prioritization scores were calculated from beginning to end.
- Make the final document as useful and self-explanatory as possible. After incorporation of the final revisions proposed by the workshop panel, the subcommittee will produce the final report by the end of summer 2006.