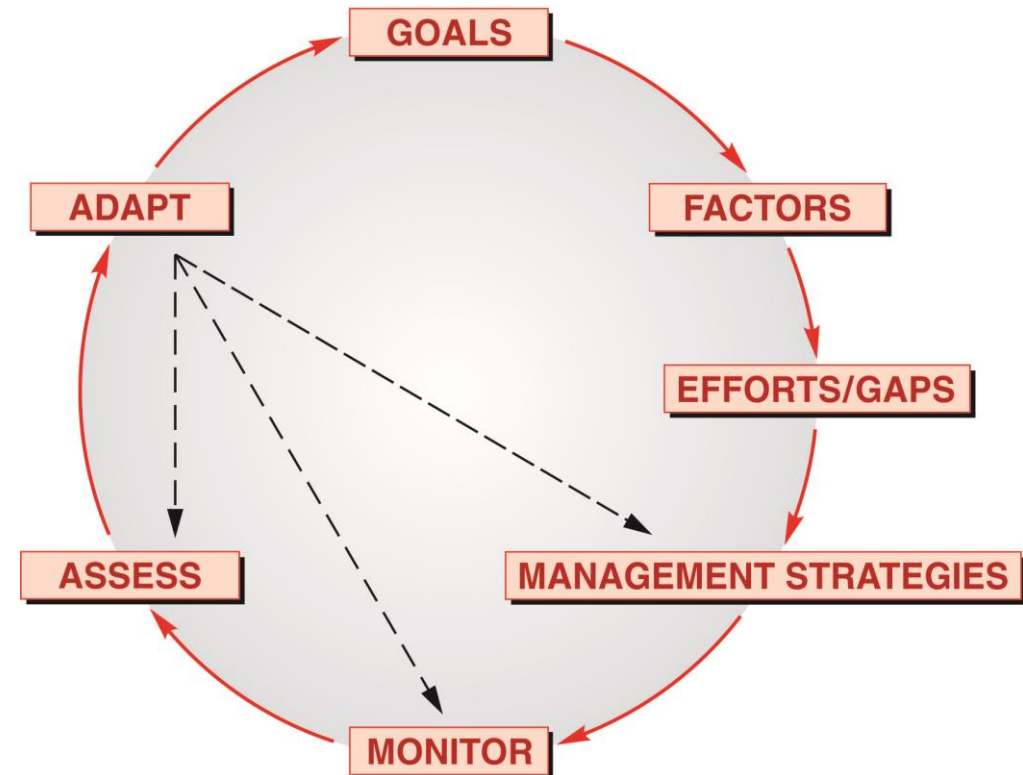


- Findings from “Summary Report”
- Goal and outcomes
 - Policy and prevention outcome
 - Research outcome
- Potential help from STAC

**ADAPTIVE MANAGEMENT FOR
THE CHESAPEAKE BAY PROGRAM**
(CBP, 2011)



Summary Report

- “Extent and Severity of Toxic Contaminants in Chesapeake Bay and the Watershed”
 - EPA, USGS, FWS (2012)
- Polychlorinated biphenyls
- Polycyclic aromatic hydrocarbons
- Pesticides
- Flame retardants
- Biogenic hormones
- Household and personal care products
- Dioxins and Furans
- Petroleum hydrocarbons
- Pharmaceuticals
- Metals and metalloids

- Widespread:
 - PCBs, PAHs, Mercury
 - some herbicides (atrazine, simazine, metochlor, and their degradation products)
- Localized:
 - Dioxins/furans, petroleum hydrocarbons
 - Insecticides (aldrin, chlordane, dieldrin, DDT/DDE, heptachlor epoxide, mirex)
 - Metals: Al, Cr, Fe, Pb, Mn, Zn
- Uncertain: pharmaceuticals, care products, flame retardants, some pesticides, hormones

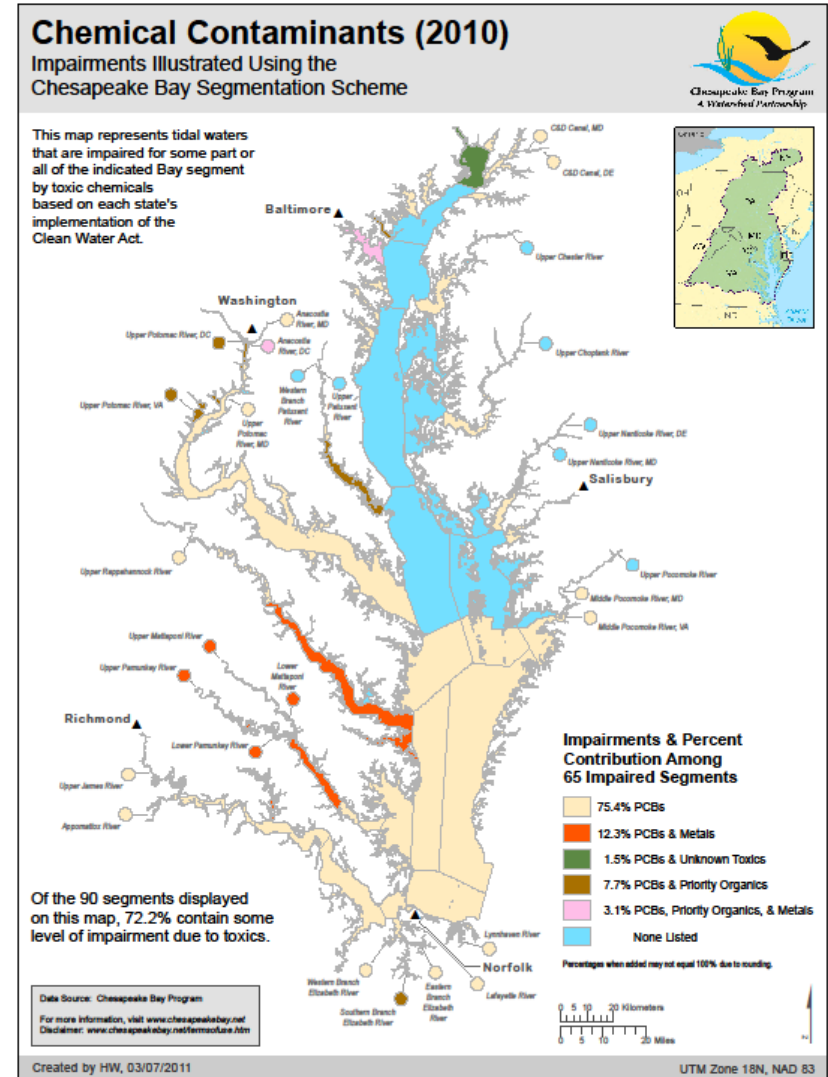
Widespread: PCBs and mercury

Localized:

- dioxins/furans, PAHs, petroleum,
- Insecticides
- Metals

Uncertain:

- pharmaceuticals, care products, flame retardants, biogenic hormones
- herbicides



Effects: People, Fish, Wildlife

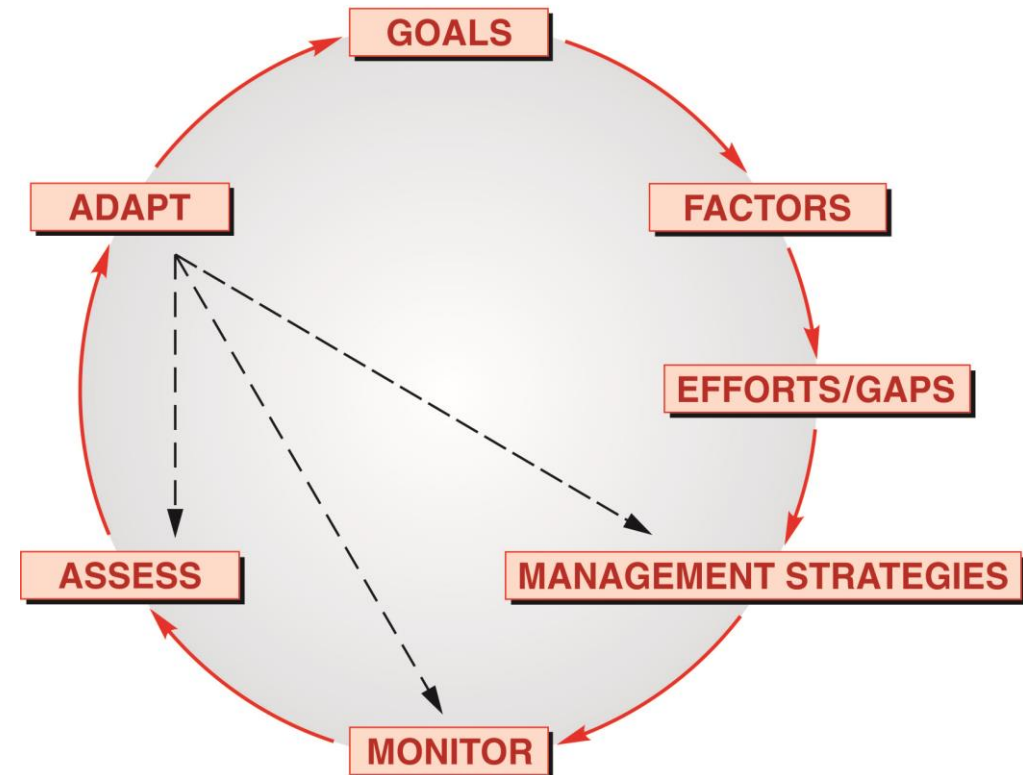
- Fish consumption
- Degraded fish health
 - Infections and parasites
 - Feminization
 - Reduced reproduction
 - Tumors
- Wildlife: Reproductive impairment in water birds
 - Eggshell thinning (DDE)
 - Embryo lethality (pesticides)
 - Hatching success (PCBs)

DNR PHOTO BY
ANGEL BOLINGER



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Goal and Outcomes

- Toxic Contaminants: one of 10 goals in Watershed Agreement
- Goal: Ensure that the Bay and its rivers are free of effects of toxic contaminants on living resources and fish
- Two outcomes
 - Policy and Prevention
 - Research

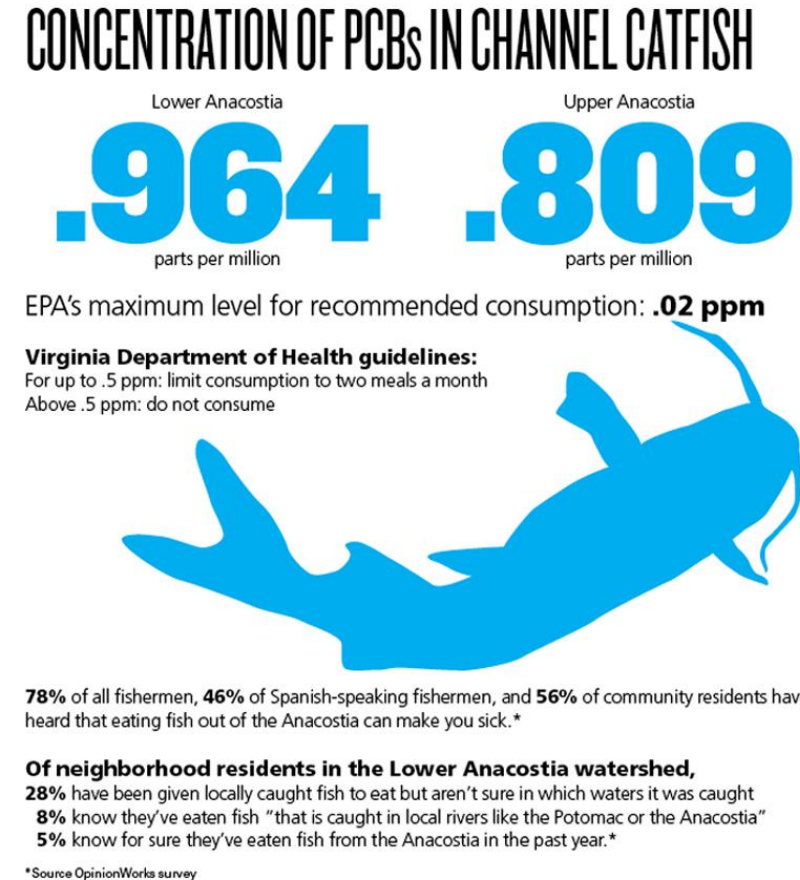




Policy and Prevention Outcome

- Continually improve practices and controls that reduce and prevent the effects of toxic contaminants below levels that harm aquatic systems and humans. Build on existing programs to reduce the amount and effects of PCBs in the Bay and watershed. Use research findings to evaluate the implementation of additional policies, programs and practices for other contaminants that need to be further reduced or eliminated.

- Widespread contamination of fish and extensive fish consumption advisories due to polychlorinated biphenyls (PCBs)
- Extensive impairments of both tidal and non-tidal waters
- Numerous existing PCB TMDLs across the Watershed as well as additional PCB TMDLs under development



- **Regulatory Approaches**
- **Education and Awareness**
- **Voluntary Programs**
- **Science**

<http://www.chesapeakebay.net/managementstrategies>

Toxic Contaminants Policy and Prevention Outcome

Management Strategy



Introduction

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. The two associated outcomes are (1) research and (2) policy and prevention. Toxic contaminants that enter the Chesapeake Bay and its watershed harm aquatic life, compromise the economic value of its living resources and present risk to human health. In the 2014 Chesapeake Watershed Agreement, the Chesapeake Bay Program identified a desired outcome to "Continually improve practices and controls that reduce and prevent the effects of toxic contaminants below levels that harm aquatic systems and humans." Because there are many contaminants of potential concern, the partners decided to identify a group of contaminants – polychlorinated biphenyls (PCBs) - for which to begin to develop a comprehensive strategy to reduce the amount that enters the Bay and watershed. PCBs are chemicals that accumulate in fish and are most often the primary reason for fish consumption advisories in the Bay. The outcome statement went on, therefore, to include "Build on existing programs to reduce the amount and effects of PCBs in the Bay and watershed." This strategy is the start of identifying management approaches that use regulatory and non-regulatory programs to advance the reduction of the amount of PCBs entering the Bay and watershed.

PCB Story Map

<http://gis.chesapeakebay.net/pcbstorymap/>

PCBs in the Chesapeake Bay Watershed (DRAFT - 8/16/16)

1 PCB Impairments

Polychlorinated biphenyls (PCBs) are a class of pollutants that are widely distributed in the Chesapeake Bay watershed. PCBs are very persistent and accumulate in fish, which can make fish unsafe to eat. This map shows areas of the watershed where PCBs have been found at levels that the states believe impair ecological health or make fish unsafe to eat.



2 PCB TMDLs as of 2015

3 PCB TMDLs Planned for Development

4 PCB Impairments without Existing or Planned TMDLs

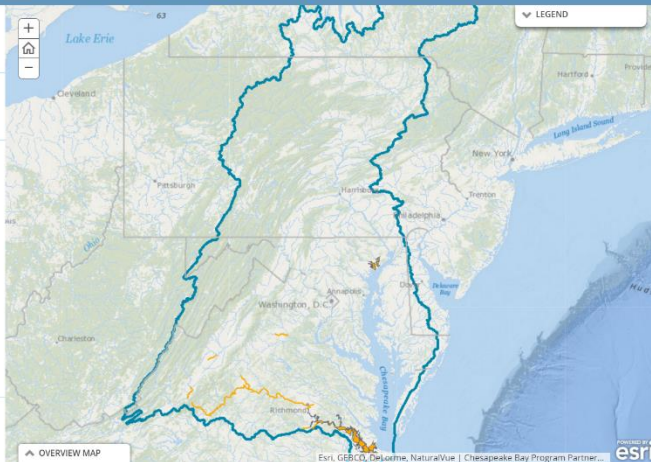
PCBs in the Chesapeake Bay Watershed (DRAFT - 8/16/16)

1 PCB Impairments

2 PCB TMDLs as of 2015

3 PCB TMDLs Planned for Development

The development of a TMDL is a lengthy process. This map shows where PCB TMDLs are currently being developed.



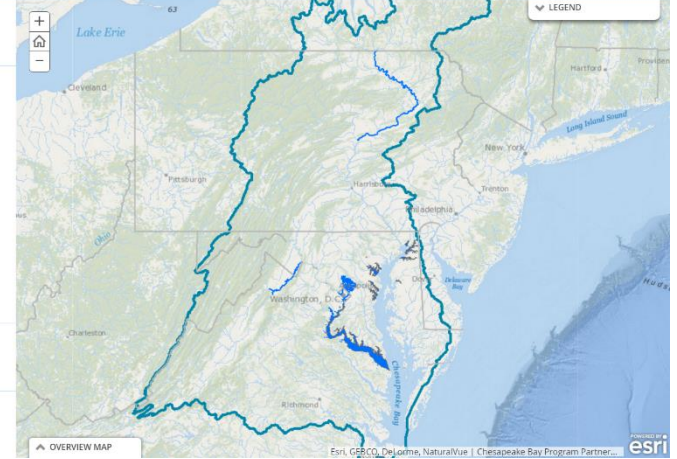
4 PCB Impairments without Existing or Planned TMDLs

PCBs in the Chesapeake Bay Watershed (DRAFT - 8/16/16)

1 PCB Impairments

2 PCB TMDLs as of 2015

When the states determine that a waterbody is impaired, they are required by the Clean Water Act to make a plan to reduce pollution. Such a plan is called a Total Maximum Daily Load (TMDL). This map shows where the states have developed TMDLs for PCBs.



3 PCB TMDLs Planned for Development

4 PCB Impairments without Existing or Planned TMDLs

PCBs in the Chesapeake Bay Watershed (DRAFT - 8/16/16)

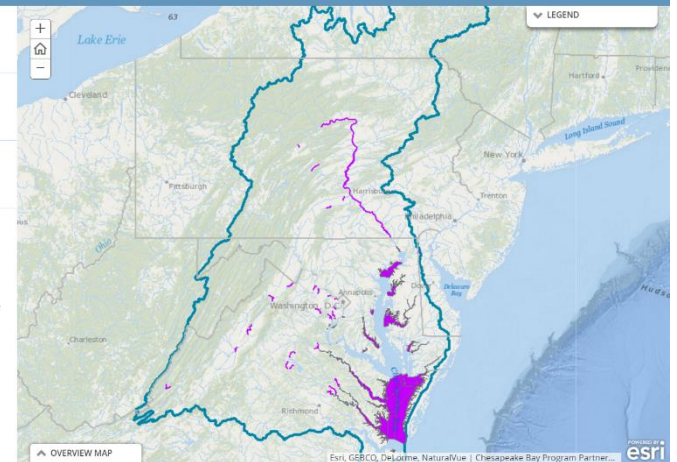
1 PCB Impairments

2 PCB TMDLs as of 2015

3 PCB TMDLs Planned for Development

4 PCB Impairments without Existing or Planned TMDLs

There are areas in the Chesapeake Bay watershed that do not have TMDLs in place or under development to address PCBs. This map shows those areas. These are the places where the Chesapeake Bay Program partnership can work together to develop TMDLs and reduce the amount of PCBs in the environment including the PCBs that accumulate in fish.



PCB Strategy - Regulatory Approaches

- Monitoring
- Jurisdiction TMDL Implementation
- EPA TMDL Support
- Program Integration
- Enhance TMDL Progress Monitoring
- Data Compilation for Enhanced Regulatory Programs
- Permits and Enforcement
- TSCA PCB Program and Enforcement
- PCB Clean-Ups and Middle River, MD
- Drinking Water Source Protection



- Guidance Development
 - Pollution Minimization Plan Guidance
 - Track-down Study Guidance
- Education and Awareness Activities
 - Inform the public regarding risks from consuming contaminated fish
 - Existing procedures and best practices for containment and prevention of release



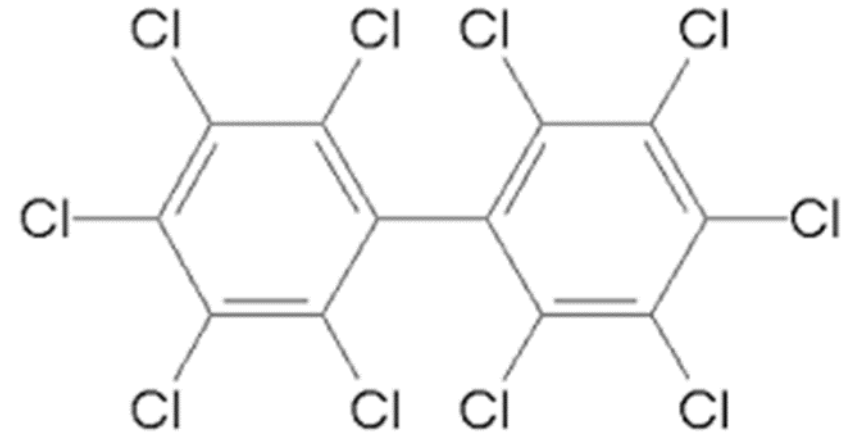
PCB Strategy -Voluntary Programs

- Program to reduce transformers and other PCB containing equipment (e.g., fluorescent light ballasts).
- Include those classified as PCB free (less than 50 ppm) Provide information on remediating PCB contamination historical releases of these transformers
- Use EPA's EJ SCREEN tool to help identify where such equipment is located in areas with diverse populations.



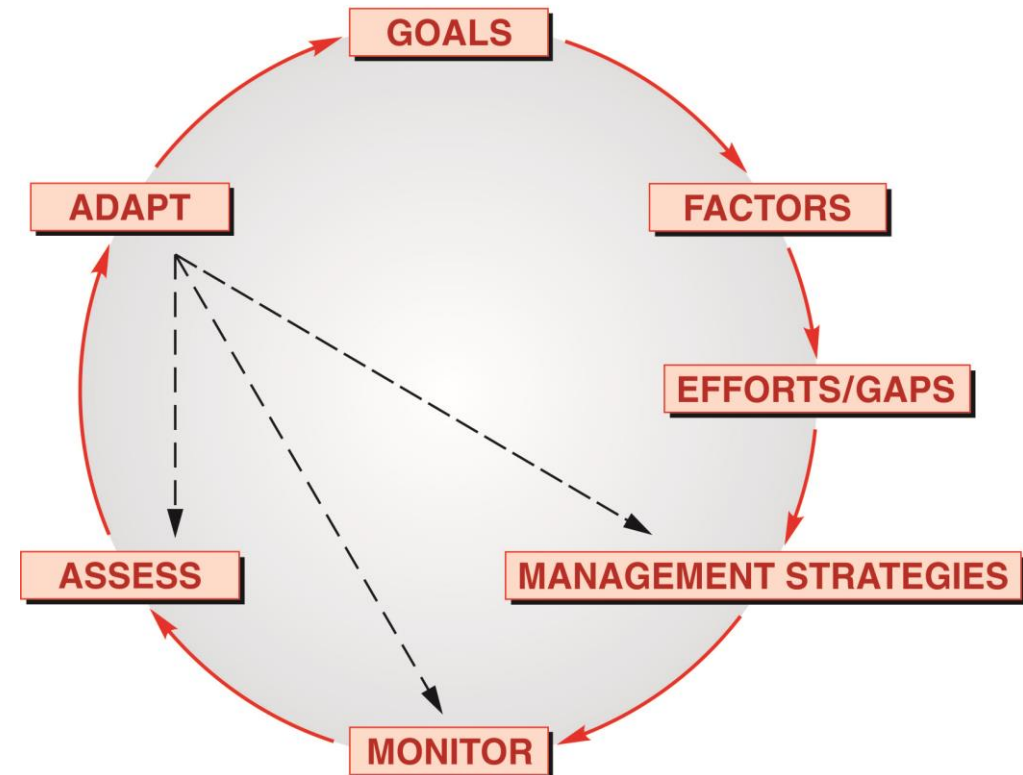
PCB Strategy - Science

- Identify barriers and opportunities related to more frequent use of high-sensitivity test methods
- Determine the relative amount of PCB reduction that might occur across the range of BMPs implemented for the Chesapeake Bay nutrient and sediment TMDL
- Review the 2015 EPA report to determine the need for further investigation of atmospheric sources of PCBs



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ADAPTIVE MANAGEMENT FOR
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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



Management Strategy: Themes

- Fish and shellfish safer for human consumption;
- Contaminants degrading the health, and contributing to mortality, of fish and wildlife;
- Occurrence, concentrations and sources;
- Assess relative risk of contaminants, and options for mitigation, to inform policy and prevention strategies,
- Issues of emerging concern

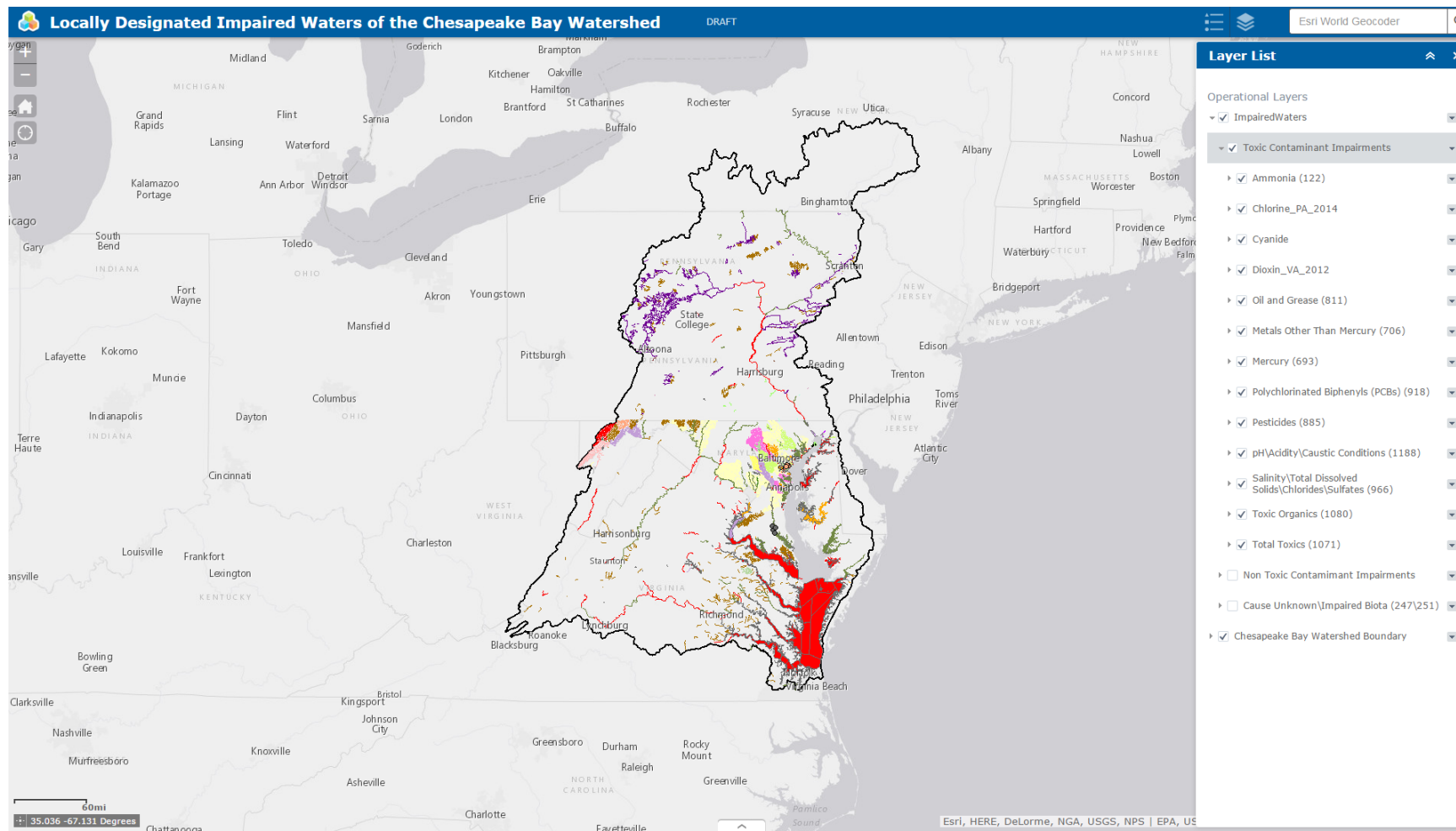


Consumption of fish/shellfish

- Supply information to make fish and shellfish safer for human consumption
- Current efforts
 - Information from State and Federal monitoring programs
- Research Gaps
 - PCB sources
 - Enhance mercury information

Impaired Waters App

- <http://gis.chesapeakebay.net/draftimpairedwaters/app>



Contaminants and fish/wildlife

- Understand the influence of contaminants degrading the health, and contributing to mortality, of fish and wildlife;
- Current Efforts:
 - Initial focus on fish health
 - USGS EDC studies
 - MD, PA, WVA, VA , FWS, and academic partners
 - USGS and FWS: summary of wildlife conditions
- Research Gaps:
 - **Contaminants and mixture affecting fisheries**



Occurrence and sources

- Document the occurrence, concentrations and sources of contaminants causing fish and wildlife degradation
- Current Efforts:
 - USGS Chesapeake EDC studies
 - Ag focus
 - States, DC, academic partners on selected topics
- Research gaps
 - Urban and suburban settings
 - Contaminants of emerging concern

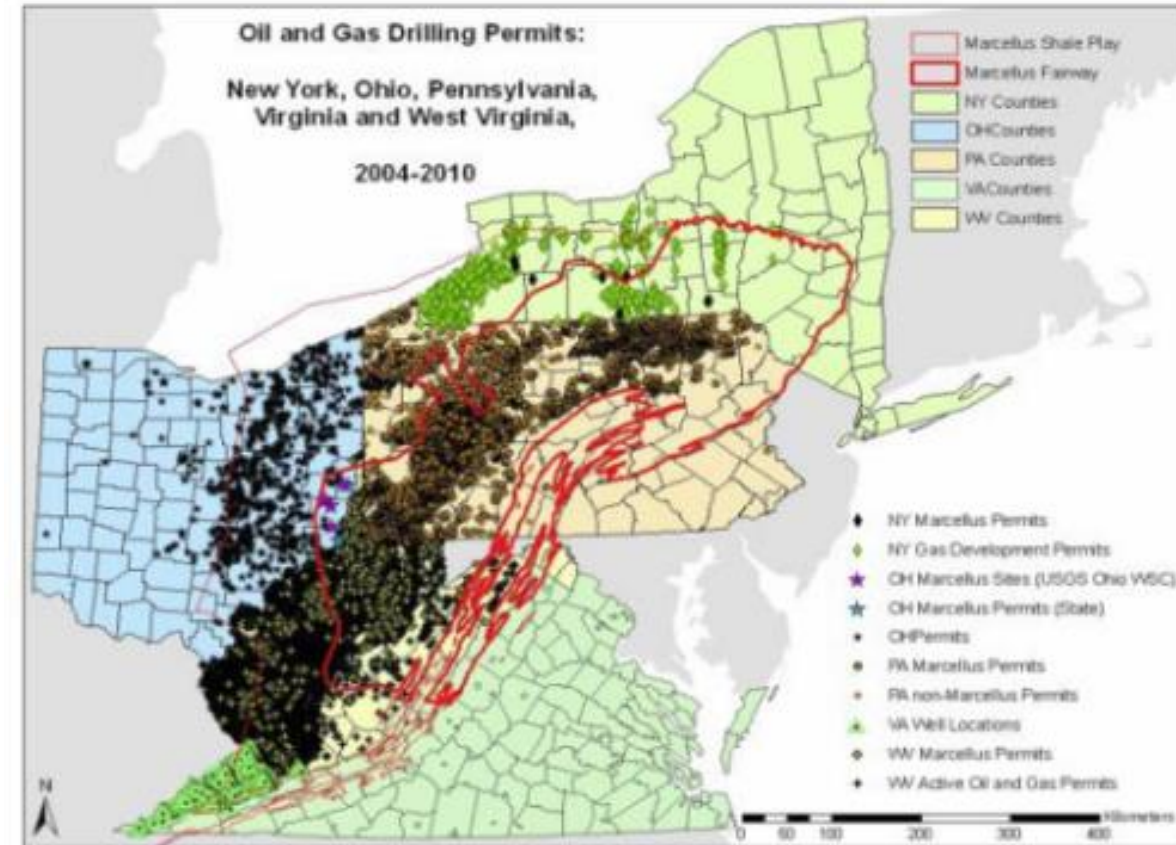


Relative Risk

- Assess relative risk of contaminants, and options for mitigation, to inform policy and prevention strategies
- Current Efforts:
 - Ag and Urban BMPs and potential relation to contaminants
 - Risk assessment for intersex conditions
- Research Gaps
 - Develop a more defined approach for relative risk
 - Getting results into decision tools for WIPs

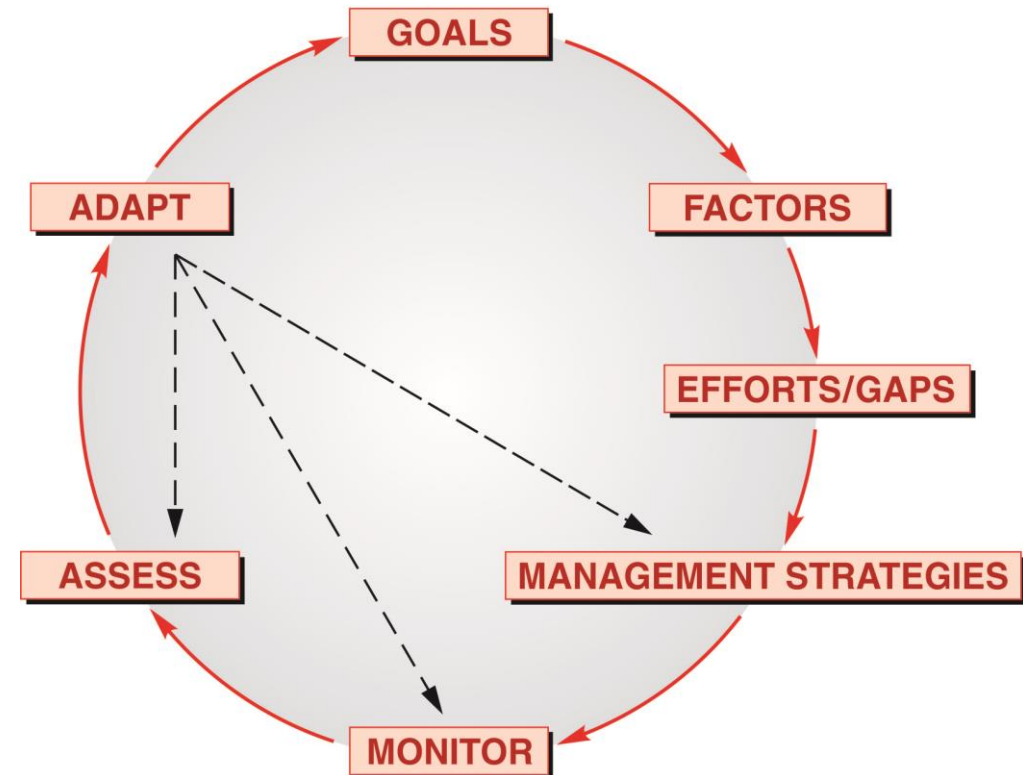
Issues of Emerging Concern

- Gather information on issues of emerging concern
- Current Efforts:
 - Microplastics (STAC review)
- Research needs:
 - Contaminant toxicity to pollinators
 - Unconventional Oil and Gas drilling



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Engaging STAC

- STAC EC item on contaminants & EDCs
- Workshop Topics
 - Relative risk of toxic contaminants
 - Co-benefits of sediment/nutrient BMPs for contaminants
 - Method and threshold comparability
 - Use of method 1668 (low detection limits)
 - Atmospheric loads of PCBs
- Reviews
 - PCB track down guidance document
 - Indicator(s)
- Partner collaboration

