Extent and Severity of Toxic Contaminants in Chesapeake Bay and the Watershed

Scott Phillips
U.S. Geological Survey
Outline

• What contaminants are in the Chesapeake watershed?
  – Extent
  – Severity

• What are the threats?
  – People
  – Fish and wildlife

• What is being done?
  – CBP
  – Management strategies
Nation’s Largest Estuary

- What it provides...
  - Biodiversity
  - 18 M people
  - $1 Trillion value

- Degraded ecosystem

- Restoration effort
  - CBP
  - Bay Agreements
  - Toxic contaminants
What is in the water?

- CBP Report: Extent and Severity
- Pesticides
- Petroleum products
- Polycyclic aromatic hydrocarbons
- Metals
- Polychlorinated biphenyls
- Dioxins and Furans
- Pharmaceuticals
- Household and Personal Care Products
- Flame Retardants
- Biogenic hormones
Extent

• **Widespread:**
  – PCBs, PAHs, Mercury
  – Some herbicides

• **Localized:**
  – Petroleum products
  – Insecticides
  – Metals
  – Dioxins/furans,

• **Uncertain:** Pharmaceuticals, care products, flame retardants, some pesticides, hormones
Severity

- **Widespread**: PCBs and mercury
- **Localized**:  
  - Petroleum products, PAHs,  
  - Insecticides, metals  
  - Dioxins/furans,  
- **Uncertain**:  
  - Pharmaceuticals, care products, flame retardants, biogenic hormones, herbicides
Effects: People, Fish, Wildlife

- Fish consumption
- Degraded fish health
  - Reduced reproduction
  - Feminization
  - Tumors
  - Mortality
- Wildlife: Reproductive impairment in water birds
  - Eggshell thinning (DDE)
  - Embryo lethality (pesticides)
  - Hatching success (PCBs)
What is being done?

- Chesapeake 2000
  - Nutrients and sediment
  - Toxics
    - Lower priority
- New concerns
- Executive Order
- New Agreement
  - 10 goals
  - Contaminants
  - Management strategies
Contaminant Goal

- Free of contaminant effects
- Outcomes
  - Policy and Prevention
  - Research
- Fish safe to eat
- Fish and wildlife
- Widespread contaminants
- Science based
### Management strategies

**Widespread**
- PCBs: Reduction
- Mercury: Air regulations
- Dioxin, Petroleum, Insecticides, Metals, PAHs

**Localized**
- Pesticides, Herbicides, Pharmaceuticals, Hshld/Personal Care, Flame Retardants, Biogenic Hormones
  - Existing regulations and local approaches

**Uncertain**
- Monitoring and research strategy
Managing PCBs

CBP management approaches
• Coordination with regulatory programs
• Contaminated sediment remediation
• Voluntary removal of PCB fluids
• Reductions from nutrient/sediment TMDL

Laws and regulations
• TSCA
• CWA
• RCRA
• CERCLA
• CAA
Next Steps and Challenges

- CBP coordination
  - Complete strategies
  - Adaptive management
  - Regulation and voluntary
- Special interest groups
  - Lobbying and litigation
- Implementing actions
  - Costs
  - Slow improvements
- Monitoring and research
  - Support decision making