Toxic Contaminants in the Chesapeake Bay and its Watershed: Extent and Severity of Occurrence and Potential Biological Effects

Scott Phillips, Vicki Blazer, Mike Focazio, Barnett Rattner (USGS), Greg Allen (USEPA),

Fred Pinkney (USFWS), Jamie Mitchell (Hampton Roads Sanitation District)

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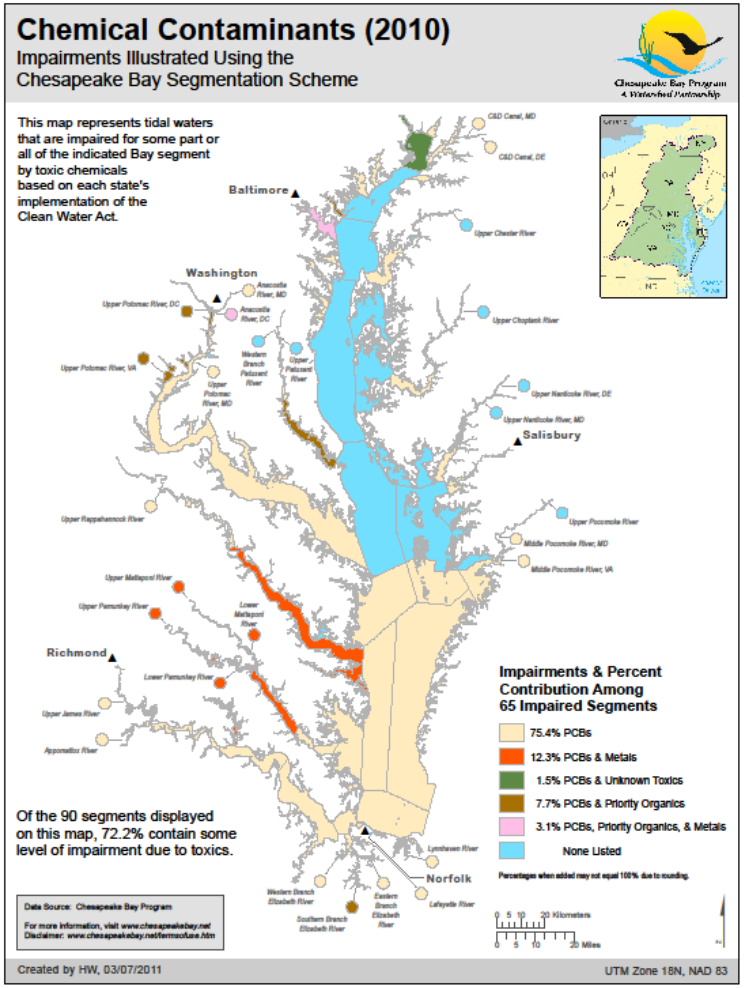
Report and Objectives

- Contaminant effects on fish and wildlife led to Toxics 2000
- Executive Order had toxics directives including report
- Report will be used by CBP to consider:
  - Goals for reducing contaminants
  - Monitoring and research

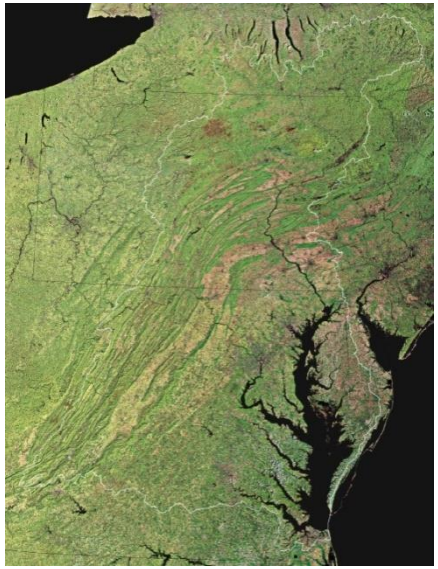


Contaminant Groups

- Polychlorinated biphenyls
- Dioxins and Furans
- Polycyclic aromatic hydrocarbons
- Petroleum hydrocarbons
- Pesticides
- Pharmaceuticals
- Household and Personal Care Products
- Polybrominated diphenyl ether Flame Retardants
- Biogenic hormones
- Metals and Metalloids

- Effects on fish and wildlife

Assessment Approach



- Define extent and severity
  - Widespread, localized, or uncertain
  - Information used and limitations
- Extent
  - Widespread: throughout watershed
  - Localized: limited watersheds
- Severity
  - Widespread: impairments listed at many locations
  - Localized: few locations
- Uncertain: lack of monitoring or standards

Extent

- 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

Severity

Widespread: PCBs and mercury

Localized:

– dioxins/furans, PAHs, petroleum,

– Insecticides: aldrin, chlordane, dieldrin, DDT/DDE, heptachlor epoxide, mirex

– Metals: Al, Cr, Fe, Pb, Mn, Zn

Uncertain:

– pharmaceuticals, care products, flame retardants, biogenic hormones

– herbicides (atrazine, simazine, metochlor, and their degradation products)

Impairments/Advisories: PCBs

- 72% of 90 tidal segments have some level of impairment due to toxic chemicals

- Three quarters of the impairments in tidal waters are due to PCBs, resulting in fish consumption advisories

Biological Effects

- Degraded fish health
  - Fish kills and diseases
  - Feminization (intersex)
  - Reduced reproduction
  - Tumors
- Wildlife: Some evidence of reproductive impairment in water birds
  - Eggshell thinning (DDE)
  - Embryo lethality (pesticides)
  - Hatching success (PCBs)

Next Steps and Discussion

- Report released
  - CBP partner briefings
- EPA and CBP consider how to address toxic contaminants during alignment process
  - What: (Process to consider goals)
  - Who: (GITs?)
- Science to address monitoring and research gaps
- Examples of effective tools to control toxic chemicals

Hickey Run Oil and Grease TMDL: Washington, DC

History of oil pollution from automobile repair shops and other transportation-related facilities in watershed

In 1998, DC Department of Health (DOH), Environmental Health Administration, developed TMDL for oil and grease calling for a reduction of 77 percent of existing oil and grease loads.

Joint effort EPA and DC: Environmental Education Compliance of Auto Repair Shops program + floating traps and oil and grease removal system

Monitoring in 2002 and 2003 showed that there was an 88% Reduction, water quality standard was met and Hickey Run was removed from the impaired waters list in 2004

PCB Total Maximum Daily Loads (TMDLs) in the Delaware Estuary

Thomas J. Fikslin (thomas.fikslin@drbc.state.nj.us)

Chair of Toxics Advisory Committee for Delaware Watershed

Gregory Cavallo (gregory.cavallo@drbc.state.nj.us)
Modeling, Monitoring, and Assessment Branch

Point Sources

Stage 1 TMDLs Implementation:
Monitoring for 209 PCB congeners using Method 1668A (low level detection)

Requirement for the development and implementation of
Pollutant Minimization Plans or PMPs.

Point Sources

NPDES Dischargers included in PCB TMDLs

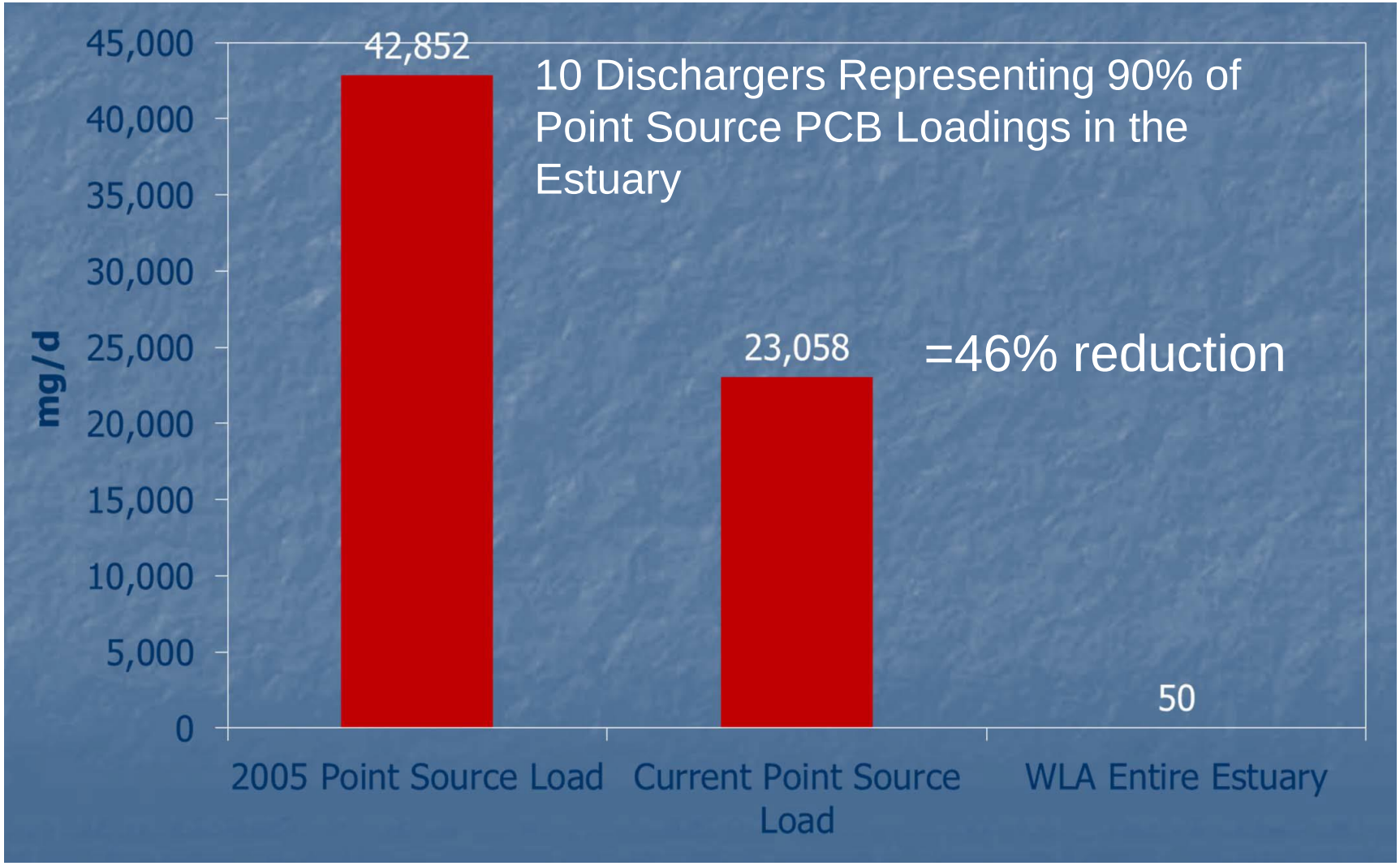
15 DE

54 NJ

33 PA

Number of Dischargers: 102

DRBC Point Source PCB Reduction 2005-2012



DRBC Pollutant Minimization Plans

Goal: Reducing PCB Loadings to the Estuary

Two groups of dischargers: some required to monitor for PCBs only, some required to monitor and develop Pollutant Minimization Plans (PMPs)

PMP Approaches:

Remove PCB transformers and capacitors

Trackdown studies to identify and remove sources

Sediment control and removal

Key Findings

Most facilities that are implementing a PMP report decreased loadings

Top 10 dischargers that produce 90% of point source loadings reduced their loadings by 46% in 5-7 years

Not only transformers and capacitors: PCBs also found in caulk, paints, and light ballasts

Effort included coordination between states, consistency in monitoring and permitting, modeling, and new water quality standards

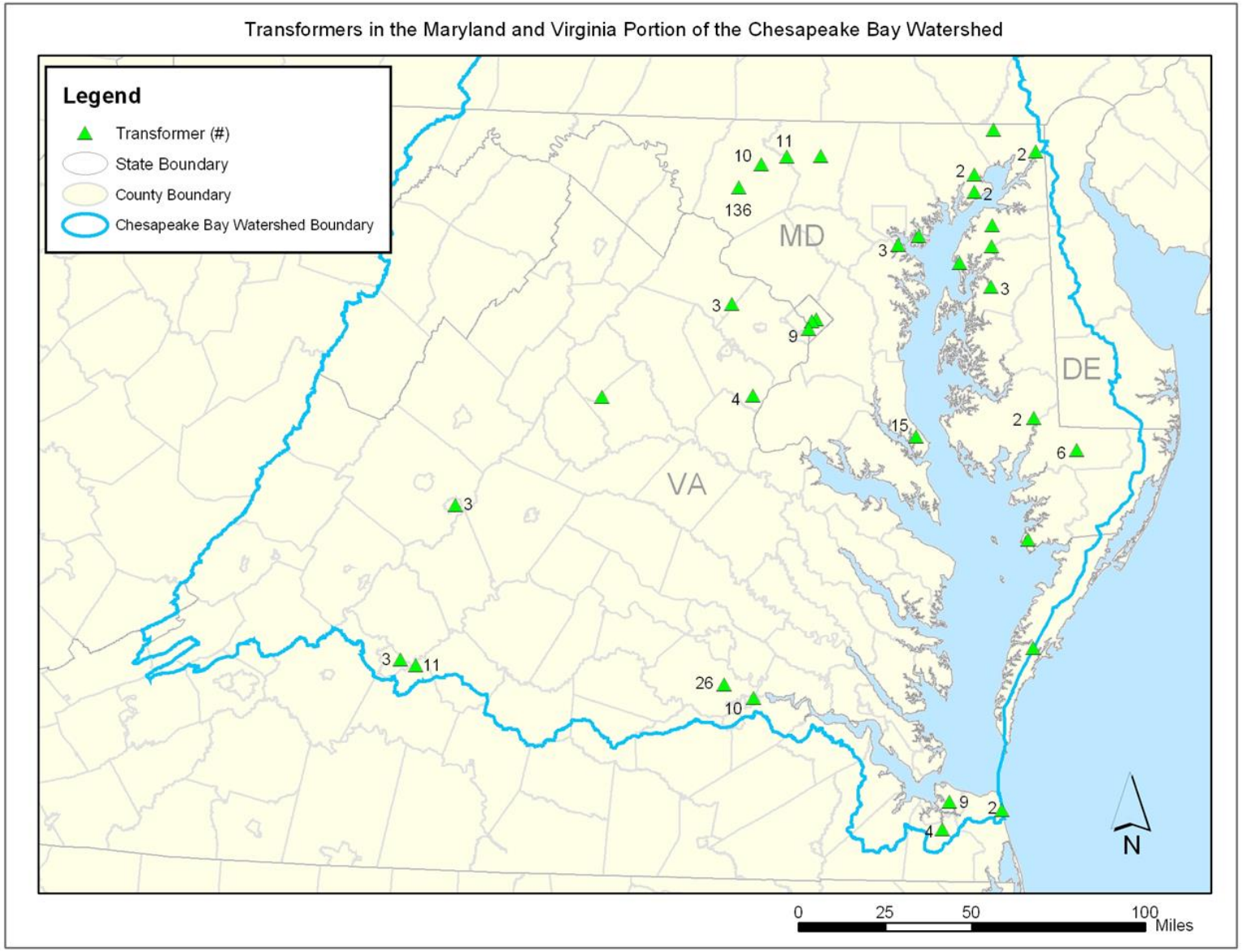
DRBC also addressing non-point sources

Great Lakes Binational Toxics Strategy

Challenge was to seek by 2006 a 90% reduction of high level PCBs (>500 ppm)

Workgroup gathers data and works with industries on voluntary phase out of PCB-containing equipment

PCB transformers in use (from EPA database)



Questions???

Fred Pinkney
US Fish and Wildlife Service
Annapolis, MD
410-573-4544
Fred_pinkney@fws.gov