

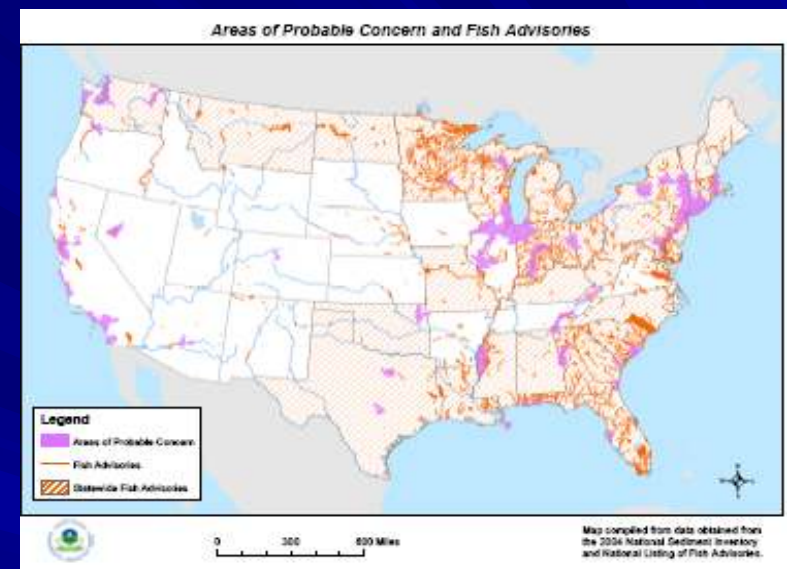
How Does EPA Manage Contaminated Sediment Sites?

Mary P. Logan – U.S. EPA
CAG Meeting – June 21, 2010

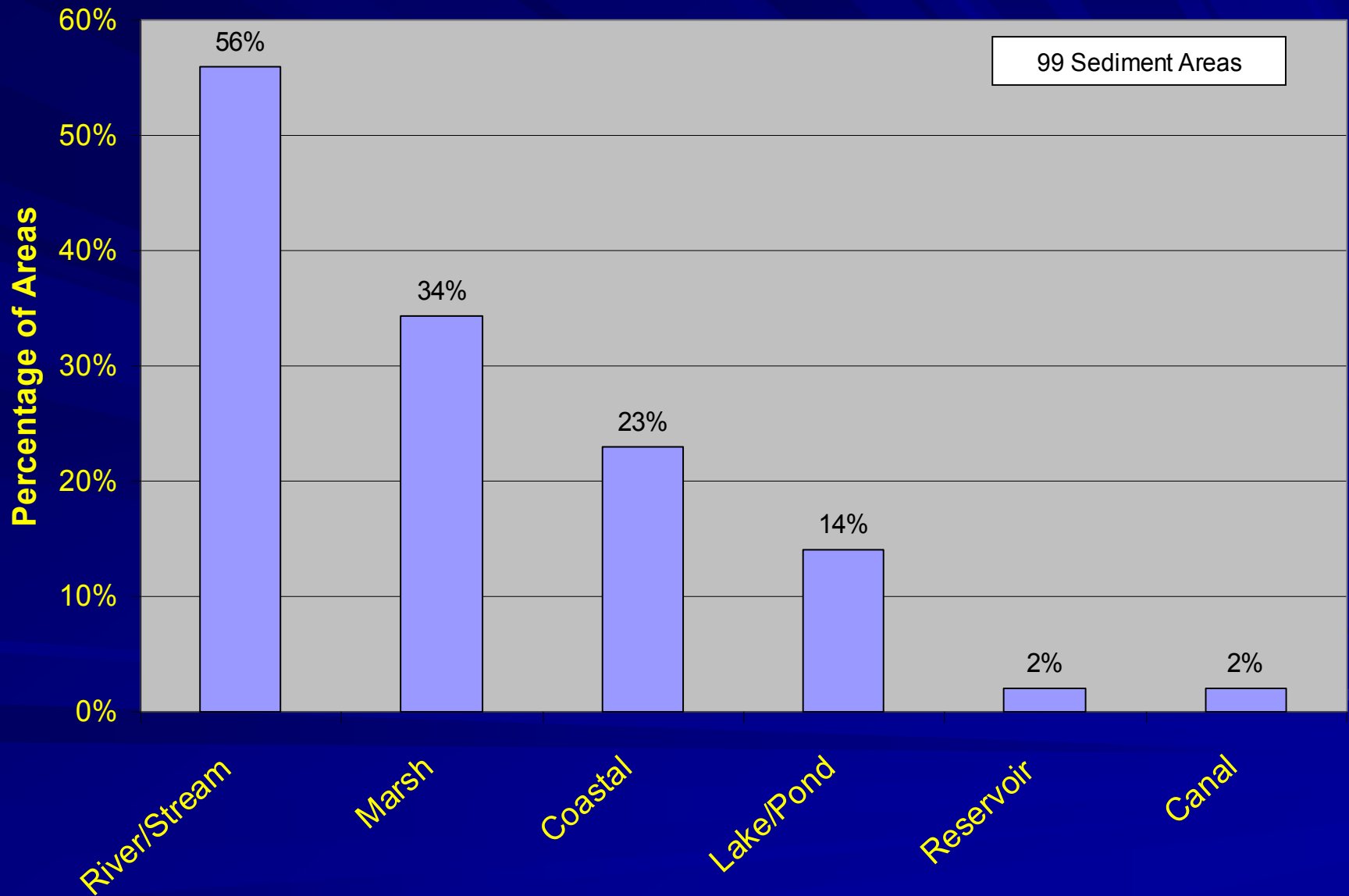


Sediment Contamination is a Nationwide Problem

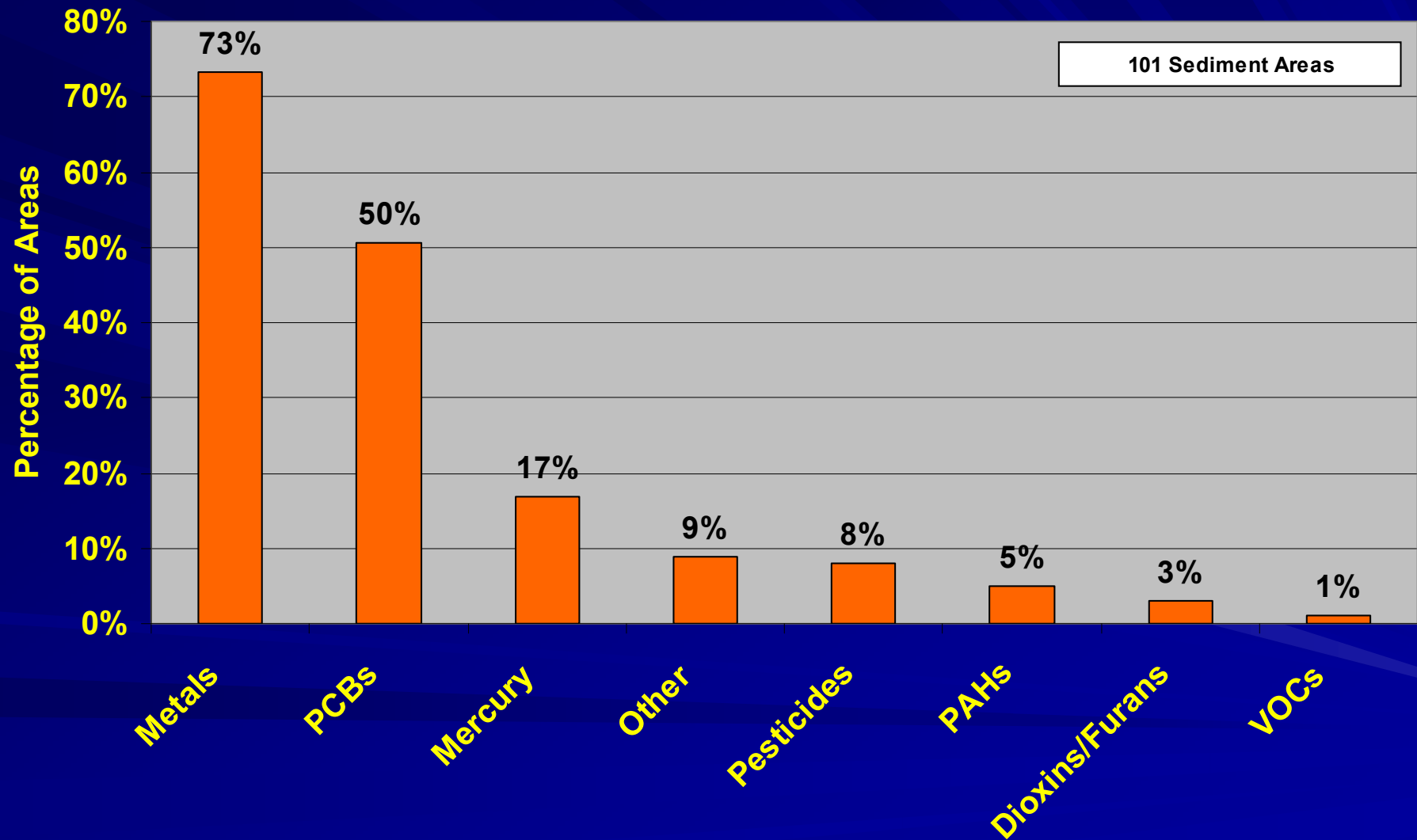
- 3,200+ consumption advisories
- 35% of lake acreage (excluding Great Lakes)
- 100% of the Great Lakes
- 24% of river miles
- Significantly impaired navigational and recreational uses of rivers and harbors



Water Body Types



Contaminants Driving Risk



U.S. EPA's Superfund Sediment Guidance

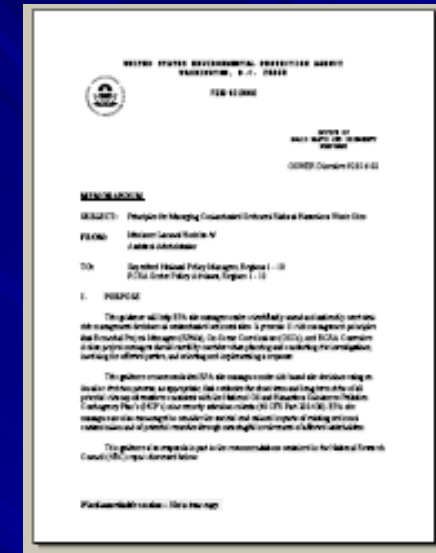
■ Directive:

- Principles for managing contaminated sediment risks (2002)



● Guidance:

- Contaminated Sediment Remediation Guidance for Hazardous Waste Sites (2005)



All available at:

www.epa.gov/superfund/health/conmedia/sediment

EPA's 11 Risk-Management Principles for Contaminated Sediment

1. Control sources early
2. Involve the community early and often
3. Coordinate with states, local governments, tribes, and natural resource trustees
4. Develop and refine a conceptual site model that considers sediment stability
5. Use an iterative approach in a risk-based framework
6. Carefully evaluate the assumptions and uncertainties associated with site characterization data and site models

11 Principles (cont.)

7. Select site-specific, project-specific, and sediment-specific risk management approaches that will achieve risk-based goals
8. Ensure that sediment cleanup levels are clearly tied to risk management goals
9. Maximize the effectiveness of institutional controls and recognize their limitations
10. Design remedies to minimize short-term risks while achieving long-term protection
11. Monitor during and after sediment remediation to assess and document remedy effectiveness

EPA Policy Statements on Remedy Selection... (2005 Guidance)

- There is no presumptive remedy for any contaminated sediment site, regardless of the contaminant or level of risk
- Generally, should evaluate dredging, capping and monitored natural recovery (MNR) at every site – or a combination
- Both in-situ and ex-situ approaches may reach acceptable levels of effectiveness and permanence
- Must consider both risk reduction associated with reduced exposure to contaminants, and also risks introduced by implementing alternatives



Dredging/ Excavation

Dredging/Excavation

- Dredging/excavation remove contaminated sediment from the water body
 - Dredging occurs on submerged sediment
 - Excavation occurs after water has been diverted or drained
- Materials must be transported for treatment and/or disposal
- Water treatment usually is needed for dewatered sediment

Best Used When:

- Suitable staging, handling and disposal sites available
- Existing shoreline and infrastructure can accommodate construction needs
- High contaminant levels cover discrete areas
- Contaminated sediment overlies clean sediment (allows overdredging)
- Low incidence of debris
- Water management practical, to reduce resuspension and downstream transport
- Navigational dredging is planned



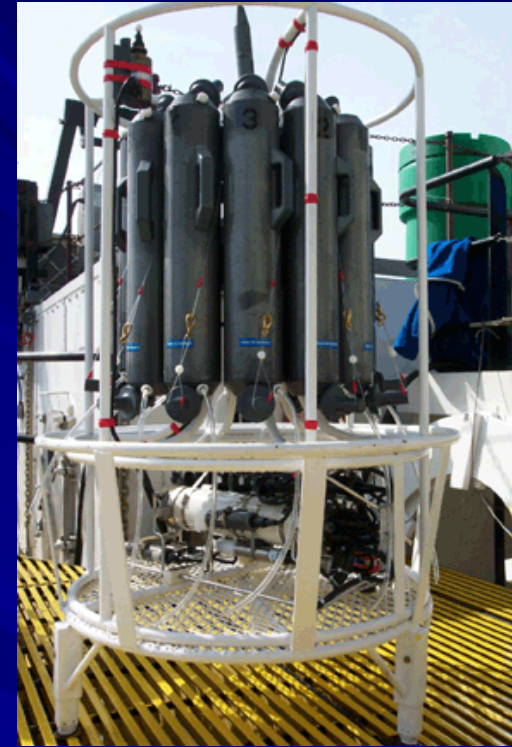
Capping

Sediment Capping

- Placement of an underwater covering (cap) of clean material over contaminated sediment
- Works by:
 - Stabilizes sediments
 - Physically isolates sediment contaminants
 - Reduces contaminant flux
- Can be designed with different layers to perform different functions

Best Used When:

- Water depth adequate
- Hydrodynamic conditions suitable, or can be accommodated in design
- Available cap material
- Transport of contaminants through cap relatively low
- Sediment strength sufficient to support cap
- Compatible with waterbody use
- Contaminated areas relatively contiguous



Monitored Natural Recovery

Monitored Natural Recovery (MNR)

- Uses ongoing, naturally occurring processes to contain, destroy, or reduce the bioavailability or toxicity of contaminants in sediment
- Placement of a thin cover – enhanced monitored natural recovery (EMNR)
- Most frequently a component of a combined remedial approach

Best Used When:

- Concentrations are relatively low and cover diffuse areas
- Low ability of contaminants to bioaccumulate
- Natural recovery already occurring
- Sediment is reasonably stable
- Human exposure is low, or reasonably controlled
- Anticipated land use compatible

Technologies are Limited

- Technologies to address contaminated sediments are limited
 - New approaches are being investigated
- Goals at some sites may not be attainable with any technology
- Meeting risk goals will take time
 - The relationship between sediment levels and fish tissue levels is complex
 - Setting short-term and long-term goals may be useful

EPA's View

- There is no presumptive remedial approach for complex sediment sites
 - EPA believes all approaches may successfully reduce risk under the right site conditions
 - All options will have risk trade-offs
- Large sediment sites often involve lengthy study and clean up
 - Source control early
 - Consider opportunities for interim risk reduction
 - Phased approach may be useful
 - Combined approaches may be best

QUESTIONS ?

