SEDIMENT MANAGEMENT WORK GROUP

Presented by

Steven C. Nadeau

Coordinator, SMWG

Interstate Technology and Regulatory Cooperation Work Group (ITRC)

Washington, DC

April 5, 2000

WHY ARE SEDIMENT ISSUES RISING TO THE FOREFRONT?

- Complex scientific issues pertaining to human health and ecological risk are involved
- Remediation technologies are different and difficult to evaluate due to the underwater construction issues
- Costs are staggering - the cost of remediation could run into the trillions if current EPA impacted sediment volumes turn out to be correct
- No unified statutory or regulatory approach currently is being followed

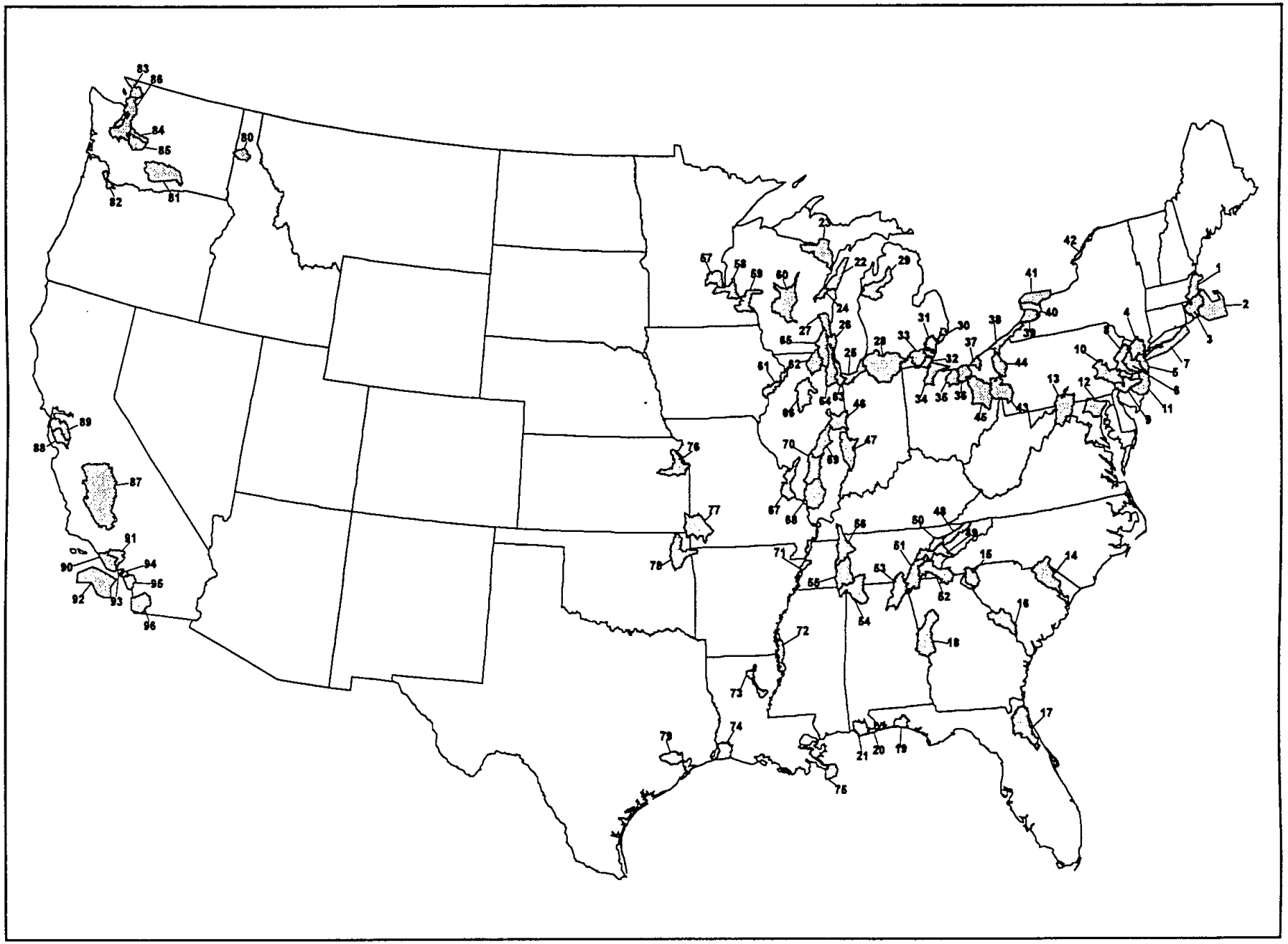

Figure 2. Watersheds Containing Areas of Probable Concern for Sediment Contamination (APCs).

Forty-Two Areas of Concern in the Great Lakes Basin

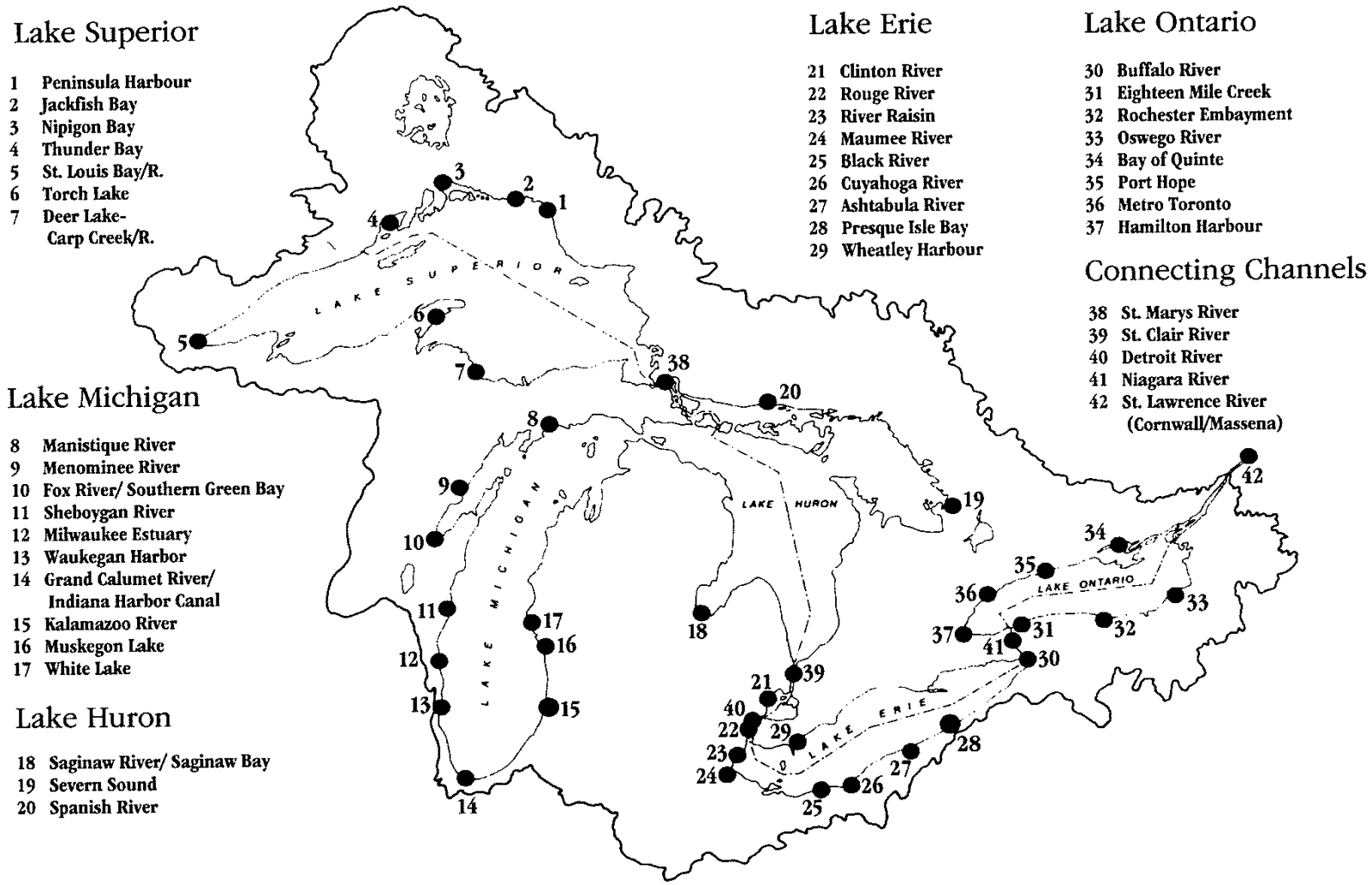

Figure 1. Great Lakes Basin Areas of Concern

KEY SEDIMENT-RELATED ACTIVITIES

- EPA's issuance of the Contaminated Sediment Management Strategy (CSMS) (April, 1998)
- EPA guidance development process - Contaminated Aquatic Sediments Remedial Guidance Workgroup (CASRGW)
- National Academy of Science Committee on Remediation of Contaminated Sediments - Independent review committee evaluating sediment management issues

KEY SEDIMENT-RELATED ACTIVITIES (cont.)

- Anticipated release by U.S. EPA of Sediment Quality Criteria based on Equilibrium Partitioning
- Sediment Management Work Group (SMWG)
- Sediments Remediation Technology Development Forum (RTDF)

IMPETUS FOR SMWG

- Critical Crossroad in Contaminated Sediment Management Decisions
  - Emerging National Issue
  - Focus of Regulatory Review/Scientific Study
- Necessity for Objective Scientific Foundation to Ensure Sound Decision-Making
- Review of Existing Data Suggests Key Gaps in Knowledge Base
- Coordinated Perspective is Key to Success

SMWG MISSION AND OBJECTIVES

- OUR MISSION ... To Advance Risk-Based, Scientifically Sound Approaches for Evaluation of Sediment Management Decisions
- OUR OBJECTIVES ... To Collect, Develop, Analyze and Share Data and Information on the Effectiveness of Sediment Management Technologies and Approaches

SMWG BACKGROUND

- SMWG Formation - May 1998
- Coordinated Approach by Parties Responsible for Developing/Implementing Contaminated Sediment Management Strategies
- Current Membership > 34 Entities

SMWG STEERING COMMITTEE

- Alcoa, Inc.
- ASARCO Incorporated
- BASF Corporation
- Boeing Company
- Chemical Land Holdings, Inc.
- Dow Chemical Company
- E.I. du Pont de Nemours and Company
- Exxon Company, U.S.A.
- General Electric Company
- Honeywell International
- P.H. Glatfelter Company

SMWG GENERAL MEMBERS

- Appleton Papers, Inc.
- Beazer East, Inc.
- CBS Corporation
- Consolidated Papers, Inc.
- Consumers Energy
- General Motors Corporation
- Georgia-Pacific Corporation
- Glenn Springs Holdings, Inc.
- Mead
- PPG Industries
- Weyerhaeuser Company
- WTM I Company

SMWG ASSOCIATE MEMBERS

- American Forest & Paper Association (AF&PA)
- Chemical Manufacturers Association (CMA)
- EPRI
- Gas Research Institute (GRI)
- Lead Industries Association
- International Lead Zinc Research Organization (ILZRO)
- National Counsel of Paper Industry for Air and Stream Improvement (NCASI)
- Naval Facilities Engineering Service Center (NFESC)
- Naval Surface Warfare Center Carderock
- Space and Naval Warfare Systems Center, San Diego
- U.S. Army Corps of Engineers, Waterways Experiment Station

SMWG MESSAGE

An Effective Contaminated Sediment Management Strategy Must be Founded in Sound Science, and Have Access to Appropriate Tools for

1) Site Characterization

2) Risk Assessment

3) Evaluation of Risk Management Options in Forming Remedial Active Objectives

4) Understanding Capabilities and Limitations of All Potential Remedial Techniques

5) Appropriate Follow-up and Monitoring

SMWG INITIATIVES

- Development of a web site (http:www.smwg.org)
  - Efficient communication with all of our members
  - Information on new developments on sediment issues
  - Interactive exchange of information and ideas on various sediment management topics
  - Dissemination of information to both regulators and the regulated community

SMWG INITIATIVES (cont.)

- Publication of nine technical papers
  - The technical papers establish a framework for making sediment management decisions based on a risk-based methodology
  - These include an interactive decision tree for evaluating sediment sites

SMWG INITIATIVES (cont.)

- Decision Tree Tool
  - Integrates and Draws Support from Technical Papers
  - Format for Development of Effective Strategy
  - Follows General Strategic Approach
    - Begin with Sufficient Site Knowledge
    - Develop Baseline and Temporal Models
    - Move Forward in Consideration of Risk Management Principles
    - Fully Consider Management Options for any Removed Sediments
    - Monitor and Revise Strategy as Appropriate
    - Use Appropriate Metrics to Assess Effectiveness

SMWG INITIATIVES (cont.)

- Other papers include:
  - Assessment and Modeling
    - Effective Decision-Making Models for Evaluating Sediment Management Options
    - Risk-Based Management Principles for Evaluating Sediment Management Options
  - Natural Processes and Sediment Stability
    - Natural Processes to Define Exposure from Sediments in Managing Contaminated Sediments
    - The Role of Natural Attenuation/Recovery Processes
    - Sediment Stability at Contaminated Sediment Sites

SMWG INITIATIVES (cont.)

- Remedy Selection and Remediation
  - Advantages and Disadvantages of Remediation Technologies for Contaminated Sediments (series of fact sheets)
  - The State of the Current Contaminated Sediment Management Practices
  - Measurement of Effectiveness of Remedial Actions Against Remedial Action Objectives at Contaminated Sediment Sites
- The SMWG's web site has copies of all of the papers

SMWG INITIATIVES (cont.)

- Provide input to NAS Special Committee Evaluating Remediation Options for Contaminated Sediments
- Share technical insights and site-specific experience relative to emerging guidance, including efforts by the EPA Contaminated Aquatic Sediments Remedial Guidance Workgroup (CASRGW)
- Conducted Platform Session at the November, 1999 Society of Environmental Toxicology and Chemistry (SETAC)

SMWG INITIATIVES (cont.)

- Commissioned (by a member) a study by the Hazardous Substance Research Center of Louisiana State University on Dredging Effectiveness, which is expected to be published later this year
- Developed a database by a member (GE) consisting of a detailed national survey of completed sediment remediation projects
- Published a series of detailed reports by members of the Group on the significant problems associated with U.S. EPA's dredging remedy at Manistique Harbor

SMWG INITIATIVES (cont.)

- Interfacing with a number of national and state organizations addressing contaminated sediment issues
  - A number of members of the SMWG are actively participating in the Sediments RTDF (Remediation Technology Development Forum)
  - The SMWG expects to meet with a number of EPA Regions to spread the word on our risk-based decision-making framework
  - The SMWG expects to commence meetings with state-based organizations interested in sediment management issues and individuals states to share information and ideas about critical sediment issues

SMWG NEAR-TERM CALENDAR

- Continue Series of Information Exchange Meetings with U.S. EPA Headquarters Representatives on Sediment Issues
- Sponsor Special Session on Sediment Issues at October 16-19, 2000 Contaminated Soils, Sediments and Groundwater Conference (Sponsored by the Association for the Environmental Health of Soils)
- Fall Meeting - October 11-12, 2000 at the U.S. Army Corps Waterways Experiment Station (WES)

FOR FURTHER INFO ...

- Visit Our Website: www.smwg.org
- Contact the SMWG Coordinator
  - Steven C. Nadeau
  - Phone: 313-465-7492
  - email: SNadeau@honigman.com

WHAT REMEDIAL METHODS HAVE BEEN USED AND HOW HAVE THEY BEEN PERFORMED?

- Types of Remedies Implemented for the 44 Projects
  - Dredging 18
  - Dry Excavation 15
  - Wet Excavation 3
  - Combined Methods (4)
    - √ Dredging and Dry Excavation 2
    - √ Dredging and Capping 2
  - Permanent Diversion/Burial 1
  - Natural Recovery 2*
  - Capping 1

---

* Four others of the 44 have natural recovery as a component of the remedy.

DREDGING - AMBIGUOUS REMEDIATION ACTION OBJECTIVES (RAOs)

- Dredging can be successful in reducing the volume of contaminated sediments - successful volume reduction has occurred at a number of sites
- Controversy brewing over fish reduction levels: inconsistent and incomplete data prior to the dredging projects makes comparison difficult; in most cases, the fish levels were steadily dropping before the dredging process
- RAOs for dredging projects seldom have been stated clearly, and sometimes not at all
- Target cleanup levels sometimes are used, but with mixed results

DREDGING - AMBIGUOUS REMEDIATION ACTION OBJECTIVES (RAOs) (cont.)

- Low cleanup levels were not achieved or not verified at 14 of 23 projects (Source, AEM, 1999; GE database)
- Question of mass removal vs. risk reduction in surface sediments, water column and fish
- These objectives are not usually the same
- “Success” can depend on the selection of the RAO:
  - If RAO is volume reduction - success can be achieved
  - If RAO is reduction in fish tissue, surface sediment and water column, often the objective is not met in whole or in part, despite great expense (typically)

DREDGING DIFFICULTIES

- Re-suspension
- Cannot remove all the contaminated sediment
- Highest concentrations typically at depth
- Result often is the environment is the same or worse, because higher levels either are exposed or are less encapsulated or both (depending on the RAO)

DREDGING DIFFICULTIES (cont.)

- Reasons for Dredging Ineffectiveness
  - Underwater environment; lack of visibility
  - Contamination is often spread out and diffused
  - Ecologically - sensitive environment - slow production rates
  - Water environment mobilizes and transports contaminants during removal
  - Rocks, vegetation, debris and other obstacles get in the way
  - Floating oil
  - Massive water volume/handling