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# Dredged Material Evaluation and Testing Overview

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# **Guidance Documents for Management of Dredged Material**

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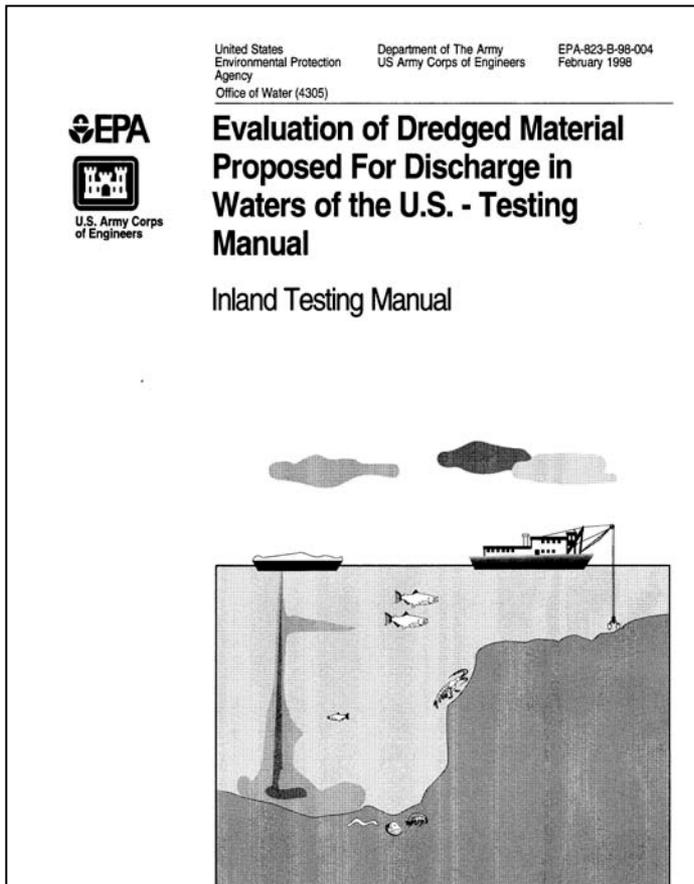
## **Technical Guidance**

- **Technical Framework**
- **Inland Testing Manual**
- **Ocean Testing Manual**
- **Upland Testing Manual**
- **Ocean Site Designation Manual**
- **Site Management & Monitoring**

**Found at:**

**[el.erdcl.usace.army.mil/dots/guidance.html](http://el.erdcl.usace.army.mil/dots/guidance.html)**

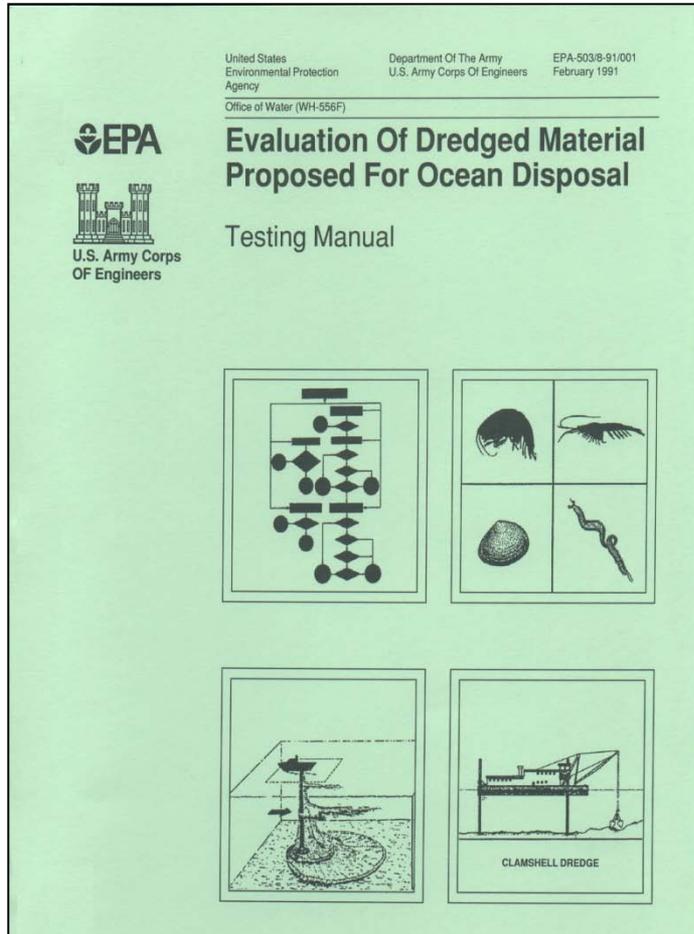
# Inland Testing Manual



- Addresses CWA
- Interim guidance in 1976, updated in 1998
- Included:
  - Effects-based testing
  - Sequenced > Tiered

DM placement ***“will not cause “an unacceptable adverse impact”***

# Ocean Testing Manual



- Addresses MPRSA
- Originally developed in 1977, updated in 1991
- Included:
  - Effects-based testing
  - Bioaccumulation
  - Sequenced > Tiered

DM placement in ocean will not ***“unreasonably degrade or endanger: human health, welfare, or amenities, marine environment, ecological systems, or economic potentialities”***

# MPRSA/CWA Differences

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## MPRSA

**Water Quality Criteria**  
**Mixing Specified**  
**Exclusions Restricted**  
**Reference Comparison**  
**Bioassays Mandatory**  
**Trace Contaminants**  
**No Physical Isolation**  
**1977 Regulation**

## CWA

**Water Quality Standards**  
**Mixing Variable**  
**Exclusions Broad**  
**Disposal Comparison**  
**Bioassays Optional**  
**No Trace Contaminants**  
**Physical Isolation**  
**1980 Regulation**

# Upland Testing Manual



- **Addresses management of DM in confined disposal facilities (CDF)**
- **Published in 2003**
- **Included:**
  - **Tiered approach to assess contaminant releases**
  - **Focused on contaminant pathways and use of a conceptual model**
  - **Goal is to determine need/extent of contaminant controls**

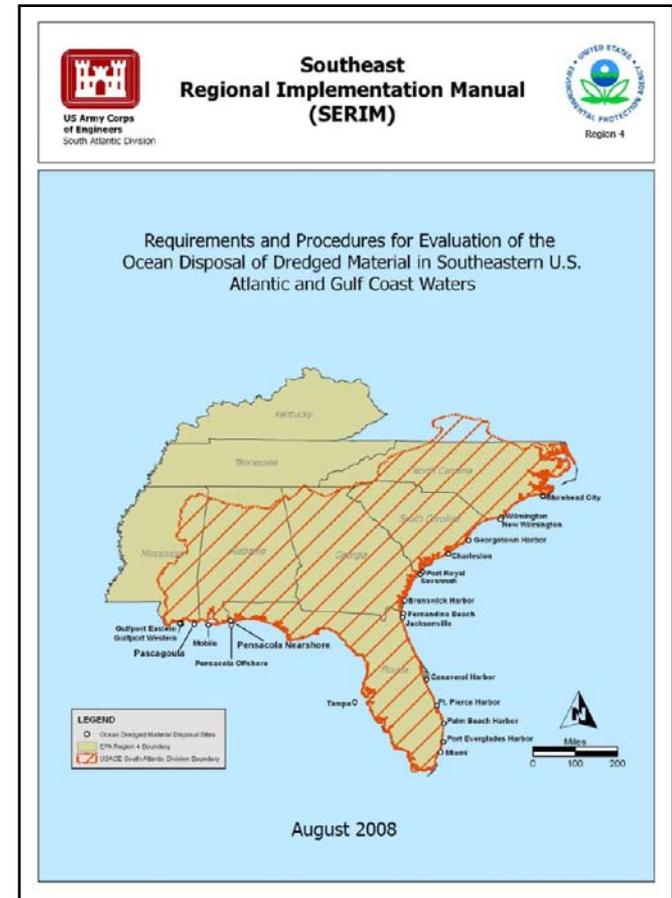
# Dredged Material Testing Manuals

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- Tiered testing and evaluation
- Testing procedures (elutriate, benthic, and bioaccumulation)
- Computer models for mixing
- Statistical tools, QA/QC, and data interpretation
- Case-specific evaluations

# Southeast RIM

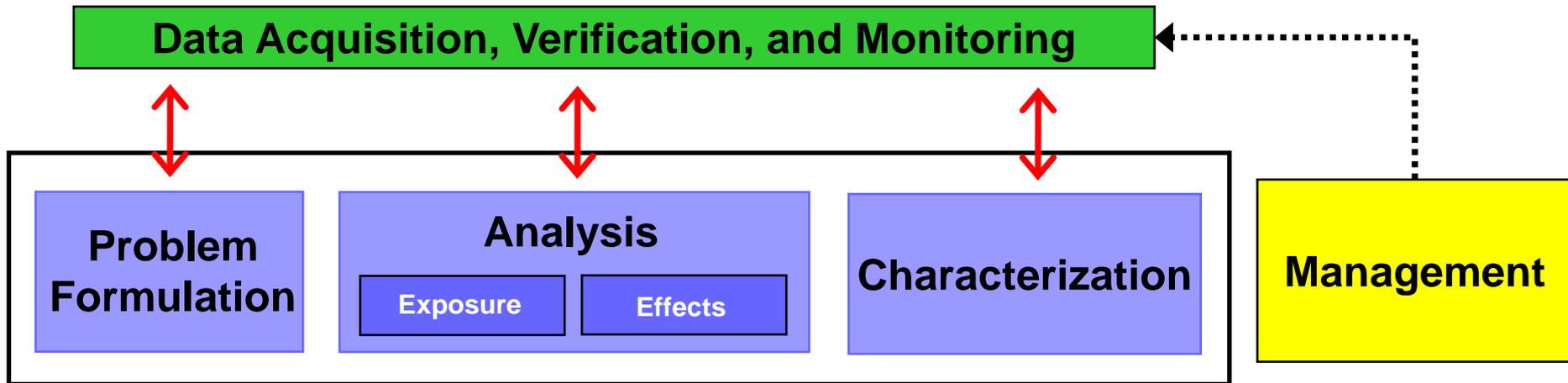
- **Completed in 2008**
- **Region specific guidance**
  - **Process**
  - **Sampling (DMMU size)**
  - **SAP/QAPP**
  - **Grain size (sand)**
  - **Acceptable bioassays**
  - **Screening levels**
  - **Examples of SAP/QAPPs**



[www.epa.gov/region4/water/oceans/documents/SERIM\\_Final\\_August%202008.pdf](http://www.epa.gov/region4/water/oceans/documents/SERIM_Final_August%202008.pdf)

# Risk Assessment and Management Process

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- Process that evaluates the likelihood that adverse effects may occur or are occurring as a result of exposure to one or more stressors (USEPA 1997).
- Risk management is an approach to consider the outcome and uncertainty of an assessment and mitigate risk through a range of alternatives.

# Features of Risk Assessment

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- Evaluate risk to different levels of ecological organization (ecosystems, communities, species, populations)
- Important planning components of RA
  - Problem formulation stage
  - Conceptual model
- Evaluate exposure and potential effects
- Result in a characterization of risk
- May determine levels of unacceptable risk/suitability of management options

# Stressor

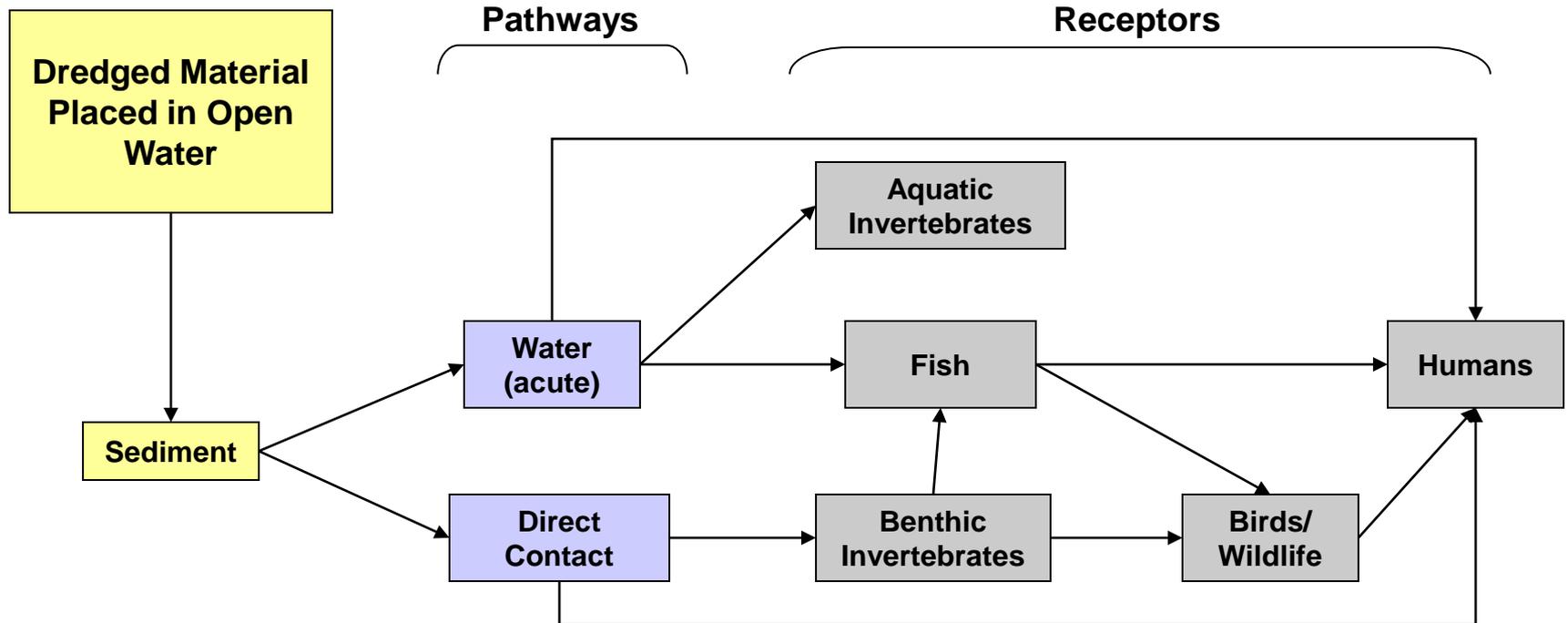
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A stressor is any physical, chemical, or biological entity that can induce an adverse response

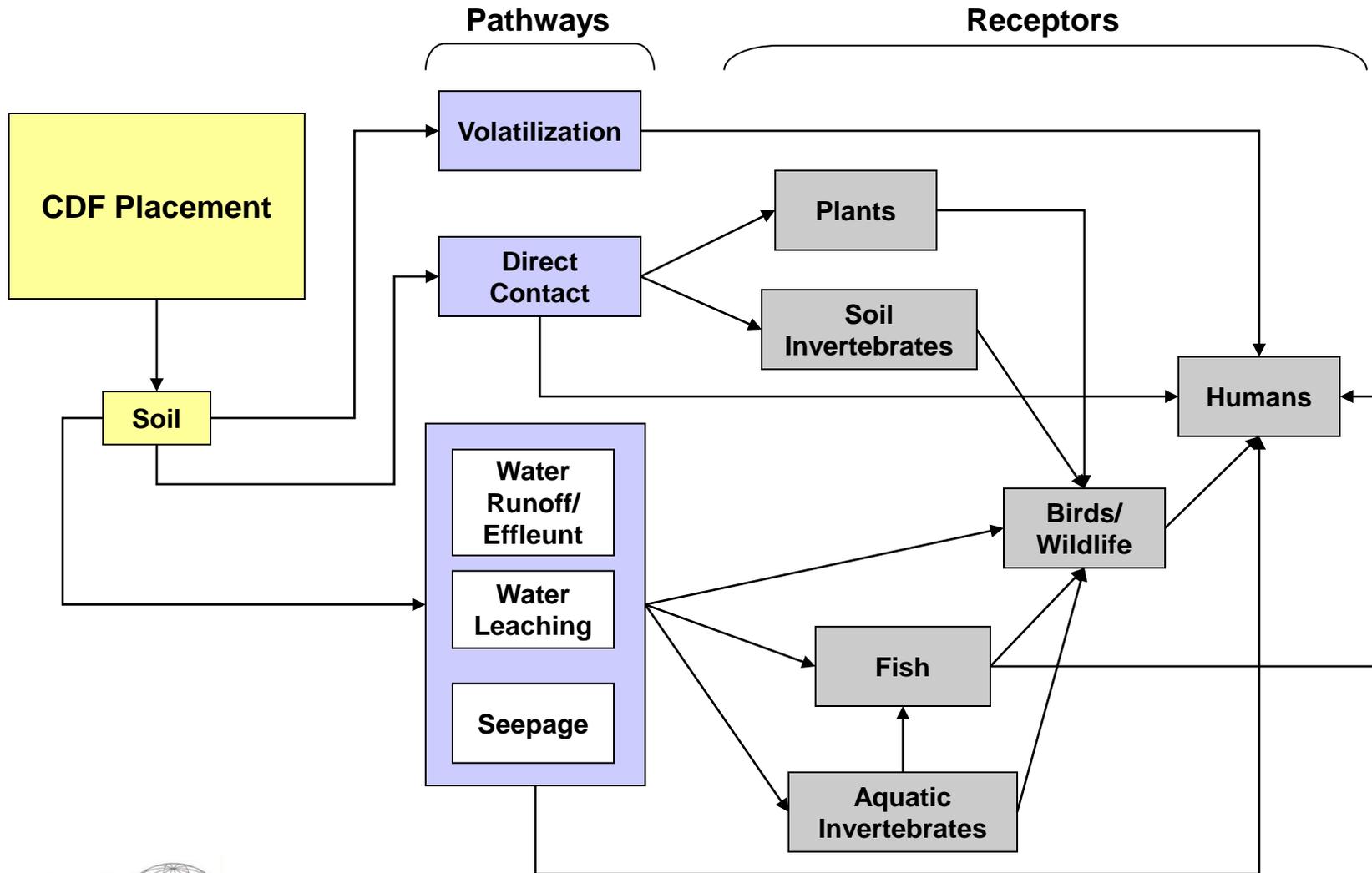
## Dredging Stressors:

- Chemicals in sediment
- Chemicals released into surface waters from dredging activities
- Resuspension
- Physical activities (e.g., noise) associated with dredging

# Conceptual Model: Open Water Placement of DM



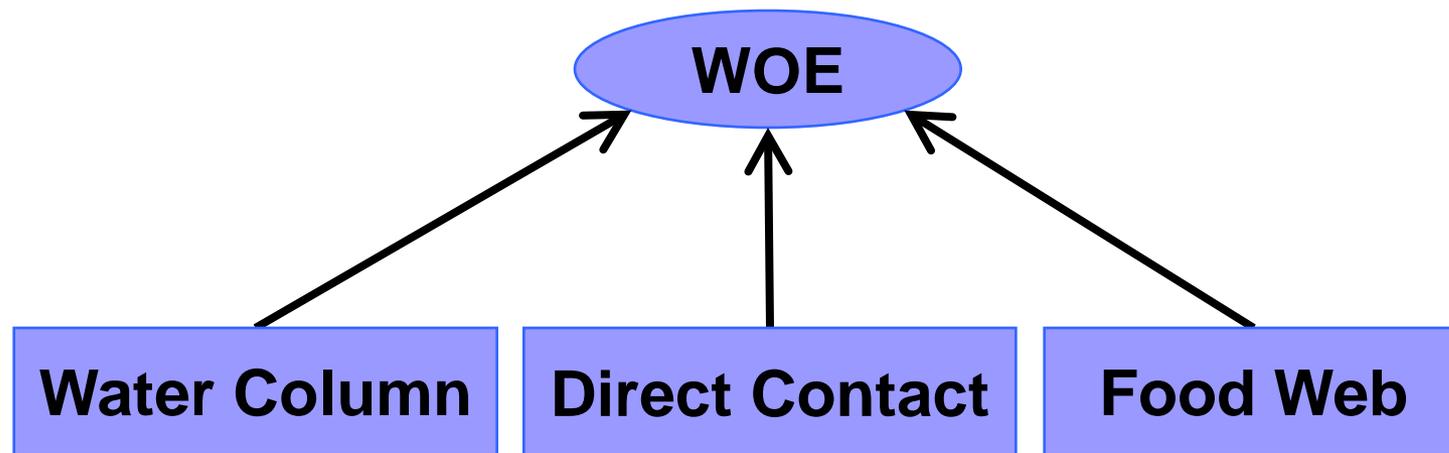
# Conceptual Model: Upland (CDF) Placement of DM



# Weight of Evidence

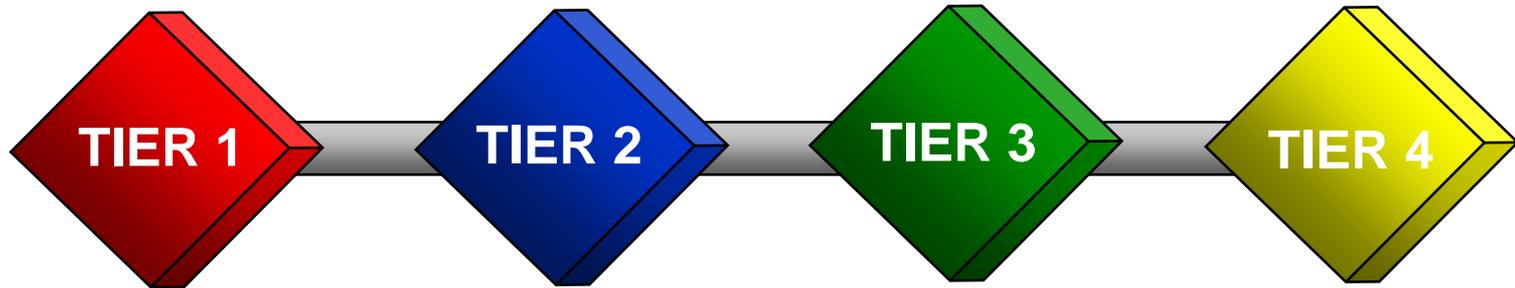
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- Relies on multiple lines-of-evidence (LOE)
- Reach conclusions regarding the potential risks to receptors identified within the CM
- Three main lines-of-evidence

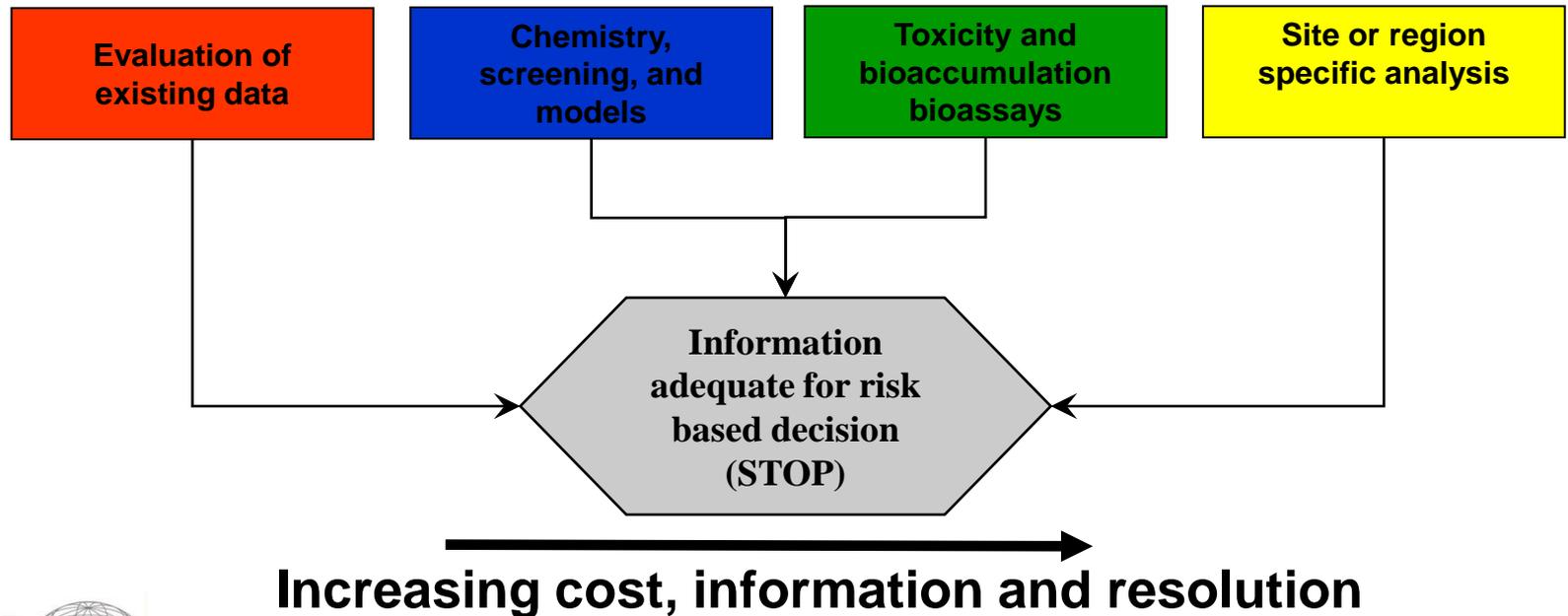


**Lines of Evidence**

# Guidance Manuals: 4 Tiered Procedure



Tiered process → follow as far as necessary to make decision



# Tier I

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- **Examine existing information**
  - **Contaminant sources**
    - Pathways of contaminant sources
    - Spill information
  - **Physical characteristics of site**
    - Bathymetry, currents, deposition, time since last dredging was required
  - **Prior physical monitoring**

# Tier I

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- **Exclusions from testing**
  - **MPRSA**
    - Primarily sand, gravel, rock and high energy environment (or)
    - Beach nourishment material (or)
    - Same as disposal and “far removed” from sources of contamination
  - **CWA**
    - Not a carrier of contaminants (e.g. sand)
    - Far removed from sources of contaminants
    - Adjacent to placement site
    - If constraints are available to manage sediments

# Tier I

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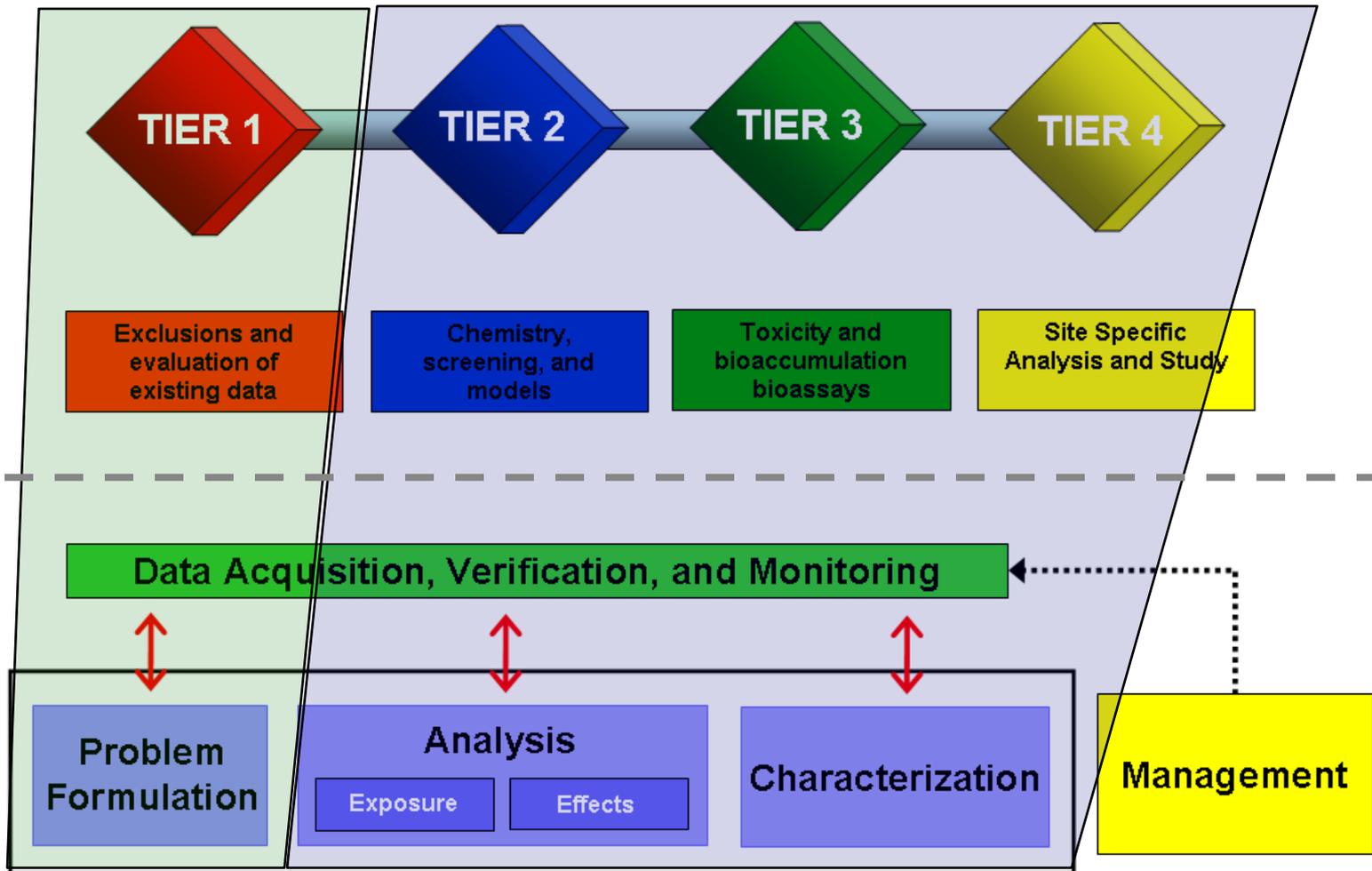
- **Identify Contaminants of Concern**
  - **Presence in sediment**
  - **Chemical properties**
    - **Water solubility**
    - **Persistence**
  - **Toxicological significance**
  - **Propensity to bioaccumulate**

# Other Tiers

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- **Tier II**
  - **Water column screen**
  - **Thermodynamically based bioaccumulation potential (TBP)**
- **Tier III**
  - **Elutriate, Sediment Toxicity, and Bioaccumulation Bioassays**
- **Tier IV**
  - **Site specific studies**

# Relation of RA Process and DM Guidance Procedures



# More Details

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- **Problem Formulation and Conceptual Model Development for Aquatic Placement - Burton Suedel**
- **Water Column Evaluation - Al Kennedy**
- **Benthic Toxicity Evaluations - Dan Farrar**
- **Bioaccumulation Evaluations - Gui Lotufo**