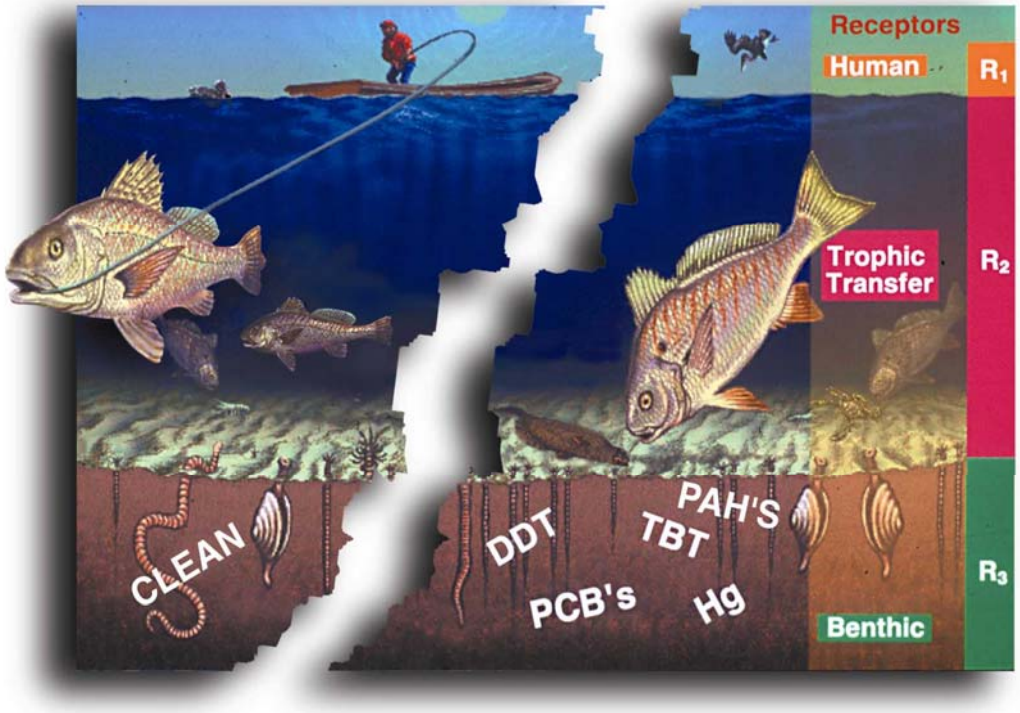
DOER Risk Focus Area

Todd S. Bridges



Purpose

- **Situation**: USACE Districts are increasingly challenged to define the environmental risks and uncertainties posed by dredging and managing contaminated sediment
- **Barriers**: Lack of fundamental descriptors for key processes controlling contaminant F&T and limitations on the ability to integrate this information in a timely fashion to make credible, risk-informed decisions that will withstand regulatory scrutiny
- **Solution**: Improve the scientific understanding of the processes contributing to risks associated with navigation dredging operations.
  - Develop a suite of peer-reviewed process models, risk models and decision analysis tools to support decisions based on a more comprehensive understanding of risk and uncertainties.

Purpose

- Develop and apply state-of-the-art risk-based tools for the assessment and management of dredging operations
- Develop structured risk-decision tools to manage uncertainty and facilitate efficient decision-making
- Focus Area consists of four topic areas
  - Exposure assessment methods and approaches
  - Effects assessment procedures and tools
  - Risk characterization approaches and methods development
  - Risk management in the dredging program
- Wide array of research projects - from required processes research to analytical test and model development

Ongoing Research Projects

- Exposure assessment methods and approaches
  - Assessing and Managing Contaminant Losses During Dredging
  - Effects of Bioturbation on Contaminant Transport and Availability
  - Simulating Contaminant Release, Transport, and Fate from Dredging Operations
  - Improved Contaminant Bioaccumulation and Exposure Modeling
  - Development of Sediment Bioaccumulation tests Using the Amphipod *Leptocheirus plumulosus*
- Effects assessment procedures and tools
  - Use of Surrogate Devices for Assessing the Bioavailability and Toxicity of Organic Compounds in Dredged Material
  - Miniaturizing Toxicity Tests for Cost and Time Optimization
- Risk characterization approaches and methods development
- Risk management in the dredging program
  - Review and Assessment of Sediment Treatment Technologies
  - Verification/Comparison of Cap Effectiveness Models

Future Research Projects

- Exposure assessment methods and approaches
  - High-Fidelity Contaminant Fate and Transport Model
  - Biotech Methods for Contaminant Analysis
  - Residuals/Fluid Mud Formation Processes
  - Testing and Predicting Water-Phase Contaminant Concentrations
- Effects assessment procedures and tools
  - Development of Risk-Based Screening Criteria
  - Assessing Mixture Effects
- Risk characterization approaches and methods development
  - Risk-Integrating Decision Tools
- Risk management in the dredging program
  - Innovative Treatment Technologies for Dredged Material Management
  - Design of Reactive Barriers and Caps for Dredged Material Management
  - Cap Design for Gas and NAPL Control
  - Rehabilitation of Caps