

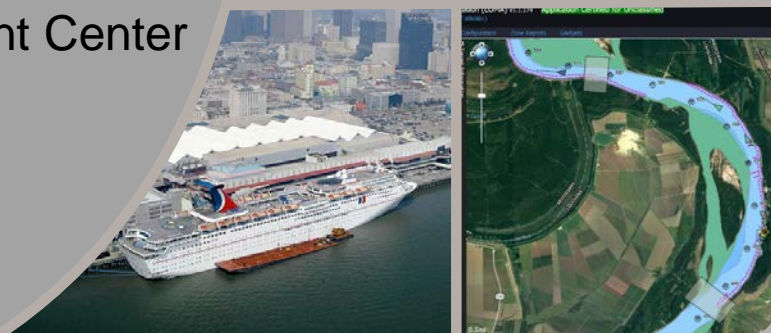


# DREDGING OPERATIONS ENVIRONMENTAL RESEARCH (DOER) PROGRAM

Todd S. Bridges, Ph.D.  
Senior Research Scientist (ST), Environmental Science  
Program Manager, DOER

U.S. Army Corps of Engineers  
U.S. Army Engineer Research and Development Center

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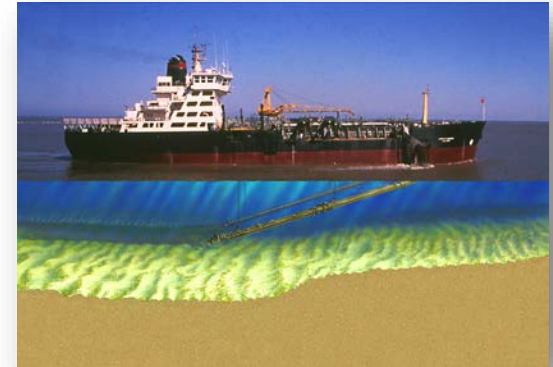


US Army Corps  
of Engineers

**ERDC**  
Engineer Research and  
Development Center

# NAVIGATION DREDGING: PRESENT AND FUTURE

- Operational efficiency is an imperative
- Environmental issues present both constraints and opportunities
- Risk management is a critical aspect of solution development
- Innovation is critical to the future success of the Navigation Program



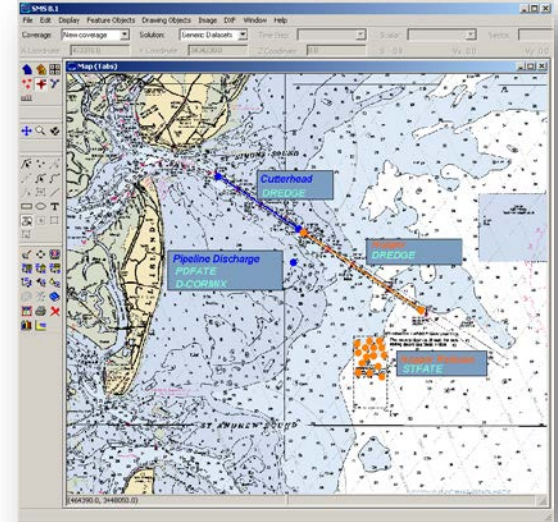
# DOER'S MISSION

Advance science, engineering and technology to support efficient and technically sound operations and environmental practice for navigation dredging.



# DOER'S STRATEGIC FOCUS

- Increase understanding of key, fundamental processes
- Enhance data and modeling capability to support engineering design and operations
- Science that reduces environmental testing burden and operational restrictions
- Economical solutions for T&E species and Environmental Windows
- Engineering With Nature for sustainable practice



# DOER PROGRAMMATICS

- Continuing program in O&M
  - Operating for 20 years
- Organized around Focus Areas
  - Sediment and Dredging Processes
  - Dredged Material Management
  - Environmental Resource Management
  - Risk Management
- Finite-term research projects, e.g. 1-3 years in length
  - About 40 projects active in a given year
- R&D that proactively shapes debate and practice





# DOER MANAGEMENT

## Program Management

- Todd Bridges, PM
- Daniel Farrar, Assistant PM

## HQ Oversight

- Joe Wilson, Technical Monitor and Proponent

## Focus Area Leaders

- Joe Gailani, SDP
- Tim Welp, DMM
- Todd Swannack, ERM
- David Moore, RM



# SEDIMENT AND DREDGING PROCESSES

**Situation**: Challenges posed by fiscal/manpower limitations, dredging cost increases, the goal of sustainable dredging and beneficial use, and evolving environmental standards. These issues must be addressed in a timely, cost-effective manner.

**Barriers**: Complex interactions between sediment and dredging processes. Limited understanding to predict the effectiveness of engineering measures and sediment handling methods. Uncertainties regarding the efficacy of innovative practices.

**Solution**:

- Expand understanding of critical sediment and dredging processes to improve operational efficiency
- Develop improved engineering tools and models to support multiple project objectives, e.g., cost-efficient engineering, resolve environmental conflicts, expand opportunities for BU
- Evaluate and facilitate transition of new technologies and practices



# DREDGED MATERIAL MANAGEMENT

**Situation**: Costs for managing dredged material continue to increase. Numerous barriers impede BU for dredged sediments. Increasing demands for operational data to support management decisions. Cost-efficient, long-term management solutions for DM needed.

**Barriers**: Uncertainties regarding the performance of engineering and operational processes. Insufficient tools for collecting and managing critical operational data. Ineffective and/or unsubstantiated practices to address environmental issues.

**Solution**: Develop and transition methods and technologies to the field that are designed to not only optimize dredged material placement operations and management, but also provide enhanced capabilities to enable more beneficial use of dredged material.





# ENVIRONMENTAL RESOURCE MANAGEMENT

**Situation:** Stringent restrictions on dredging operations “in the name of” resource protection, inflating O&M costs. Limited or no scientific evidence to justify or refute the need for restrictions. Restrictions are “codified” by habit and precedent.

**Barriers:** Precautionary principle dominates current approaches. Uncertainties regarding natural resources and T&E species interactions with dredging operations. Negative perceptions about dredging. Managing risks requires quantifiable, scientific evidence.

**Solutions:**

- Fill critical knowledge gaps for effective risk management
- Develop innovative, quantitative approaches that will support determining actual risks associated with dredging with regards to T&E species
- Demonstrate the effectiveness of less obstructive management practices that represent alternatives to currently imposed restrictions.
- Promote collaboration and partnering with state and federal regulators



# RISK MANAGEMENT

**Situation:** USACE Districts are increasingly challenged to define the environmental risks and uncertainties posed by dredging, as well as the risks to the navigation program that are posed by environmental issues and constraints

**Barriers:** Lack of fundamental descriptors for key processes.  
Limitations on the ability to integrate 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 the risks relevant to the navigation dredging program

- 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, uncertainties, and benefits



# Engineering With Nature®

*...the intentional alignment of natural and engineering processes to efficiently and sustainably deliver economic, environmental and social benefits through collaboration.*

## Key Elements:

- Science and engineering that produces operational efficiencies
- Using natural process to maximum benefit
- Broaden and extend the benefits provided by projects
- Science-based collaborative processes to organize and focus interests, stakeholders, and partners



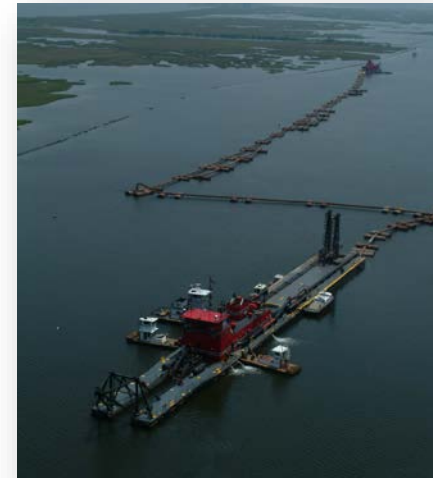
[www.engineeringwithnature.org](http://www.engineeringwithnature.org)

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# TECHNICAL THEMES

- Enhancing operational efficiency
- Expanding options for placement, disposal, and management
- Beneficial use engineering
- Reducing environmental and regulatory risks and constraints
- Engineering with Nature®



# CREATING VALUE FOR THE NATION

- Correcting the hyper-focus on risk is achieved by giving more attention to compensating benefits
  - ...Not by giving more attention to risk
- Value arguments resonate
  - Must take assertive control of the dialogue
- There are potentially valuable allies in “unlikely” places
- Our projects produce multiple benefit streams, but you have to claim them!

