

DOER Program Overview Emphasizing SI and Turtles



National Dredging Meeting, June 14, 2006, Washington, DC

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DOER Details

- **Funding Source: O&M remaining Items**
- **Annual Funding: \$6M**
- **Navigation BL Manager: Angie Premo**
- **Technical Monitor: Joe Wilson**
- **Web site**
<http://el.erdc.usace.army.mil/doer>



Basis for DOER

- **Pressure to end aquatic placement is ongoing**
- **Costs are increasing**
- **Environmental standards are becoming more restrictive**
- **Future engineering and environmental innovation will be essential to keep costs within budget constraints**



Basis for DOER

- Risk-based assessment and management has become accepted basis for decision-making
- Maintain corporate technology base
- Beneficial use of dredged material a priority
- Effective technology transfer and application to stakeholders



DOER

- **Objective: Ensure a successful navigation program**
 - complex economic, engineering, and environmental challenges
 - advancing the science and engineering applied to navigation dredging operations



DOER

- Focus Areas -

- **Innovative Technologies**
- **Environmental Resource Protection**
- **Dredged Material Management**
- **Risk**



DOER

Innovative Technologies

Identify, evaluate, and develop tools, databases and software, equipment, and techniques to improve the design, operation, and management of Corps-maintained navigation projects

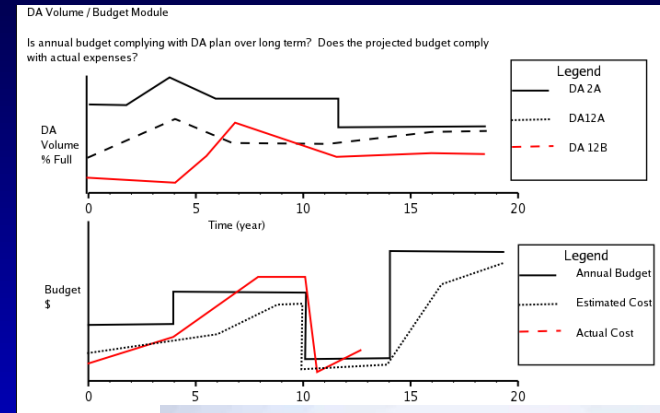
Work Units

- **Evaluations and Cooperative Demonstration**
- **Dredging Project Management (Silent Inspector (SI))**
- **Dredging Operations Decision Support System (DODSS)**
- **Fluid Mud Measurement and the Definition of Navigable Depth**

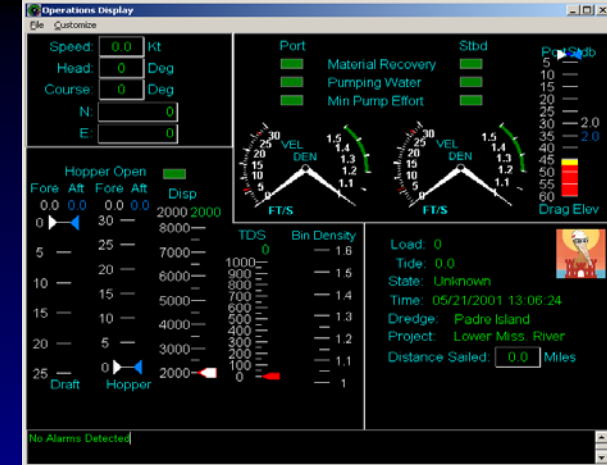


Innovative Technologies Products for FY06

- Updated SI specs and mechanism for Corps-wide implementation
- SI for pipeline dredge demo
- Decision support application for Savannah King Island Turning Basin
- Evaluations on fluid mud survey systems
- Guidance on dredging in unexploded ordnance-contaminated sediment



Silent Inspector (SI)



- **Corps-Wide Implementation in FY06**
- **Virtual Team**
 - Operations in Mobile District
 - R & D – ERDC staff
- **SI**
 - 15+ years of development
 - R&D still needed to extend capabilities
 - Integrate TES, collect data on overdepth
 - Sophisticated data analysis
 - Synergy with other data: survey, environmental forcing, financial – through DODSS



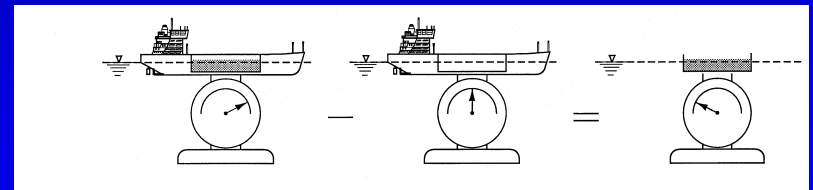
SI Research During Dredging Research Program (DRP)

- **DRP – 1988 - 1994**
 - Developed Industry Partnership
 - Defined Requirements
 - Developed Basic Concept
 - Prototype Field Tests



DOER sponsored SI Research (97- present)

- **Refine SI Implementation for Hopper Dredges**
 - Determine Sensor Accuracy
 - Refine QA Tests
 - Develop Procedures for TDS
 - Improve Data Transmission Equipment/Procedures
 - Expand/Improve database
 - Streamline Data Entry
 - Improve Contract Specifications – DPIP

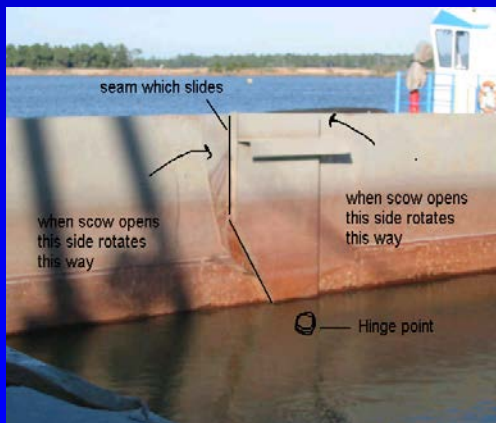


- **District Supported Development on Hopper Dredging Contracts since 1999**
 - Mobile District
 - New Orleans District
 - Portland District



Develop Scow/Mechanical Dredge Equipment/Procedures

- Specification/Profiles Developed
- SI scow initial implementation
 - Wilmington District
 - Seattle District (EPA – capping)



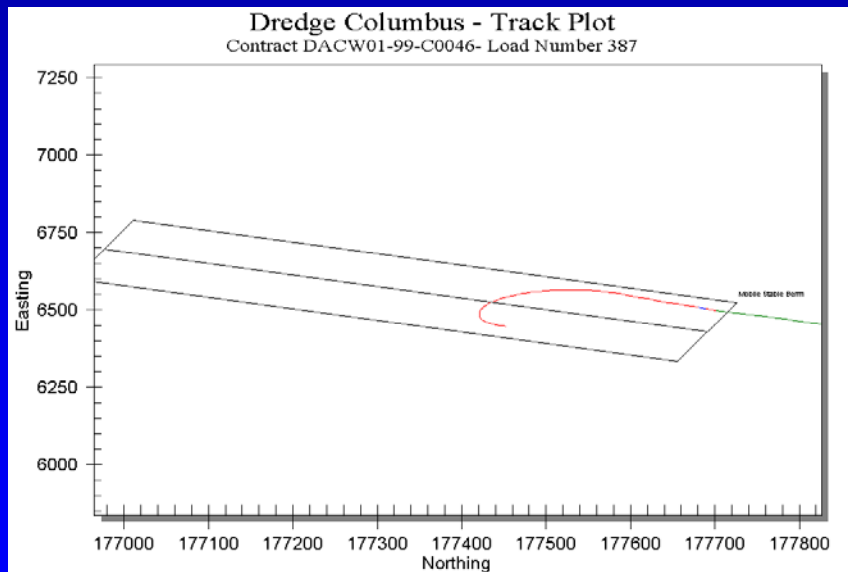
Develop Cuttersuction Dredge Equipment and Procedures

- **Initial Development**
 - Dredge Thompson (99)
- **Full Scale Test with Districts (06)**
 - Rock Island/St. Paul (Dredge Goetz)
 - Portland District (Dredge Oregon)



SI Research – EPA, TES

- EPA Requirements for Tracking Disposal Site Placement
- Incorporate TES observer forms into SI



The screenshot shows a web browser window displaying a data entry form. The form is titled "Conditions of Specimen" and includes the following fields and options:

- Sex: ☐ M ☐ F
- How Determined?:
- Age class: (Dropdown menu showing "Adult")
- Head Width:
- Pectoral Width:
- Cingulum Straight Length:
- Cingulum Curved Length:
- Ornate Sample Taken: ☐ No ☐ Yes
- Turtle tagged: ☐ No ☐ Yes
- Photo Taken: ☐ No ☐ Yes
- Field Disposition of specimen:
- Comments:

At the bottom of the form, there are two diagrams of a turtle, one showing the top view and one showing the side view. Below the diagrams are three buttons: "Return to Load Form", "Submit Take Data", and "Print This Form".



DOER

Environmental Resource Protection

**Address challenges associated
environmental resource issues using a
combination of innovative engineering and
science**

Work Units

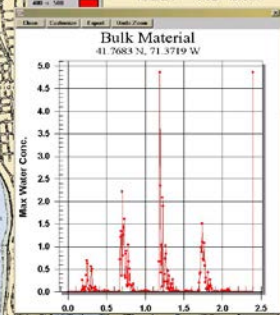
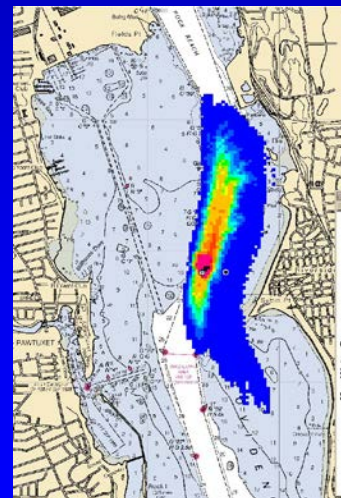
- **Threatened and Endangered Species Protection**
- **Habitat Protection**
- **Environmental Windows**



Environmental Resource Protection

Top Products for FY 06

- Deploy on-line T&E species protection management system
- Publish validation of SSFATE far-field plume model
- Complete assessments of dredging effects on seagrasses and SAV
- New guidance on effective T&E bird protection measures



Sea Turtle Research in DOER

- **Began in DOTS, Early 80s, observer program**
- **Sea Turtle Research Program 91-95**
 - Engineering and Biology
- **DOER**
 - Collect and Analyze Take Data
 - Develop database and web site
 - Electronic TES
 - Link to SI



<http://el.erdc.usace.army.mil/seaturtles/>



US Army Corps
of Engineers

USACE Sea Turtle Data Warehouse



Turtle Warehouse Title Image

Site Information

- [Home](#)
- [Introduction](#)

View Data By

- [Divisions](#)
- [Districts](#)
- [Projects](#)
- [Turtle Species](#)

Cubic Yards

- [Total Cubic Yards](#)
- [Fiscal Year Table](#)
- [Fiscal Year Graph](#)

Turtle Takes

- [Total Turtle Takes](#)
- [Takes Graphs](#)
- [Fiscal Year](#)
- [Calendar Year](#)

Takes with Cubic Yards

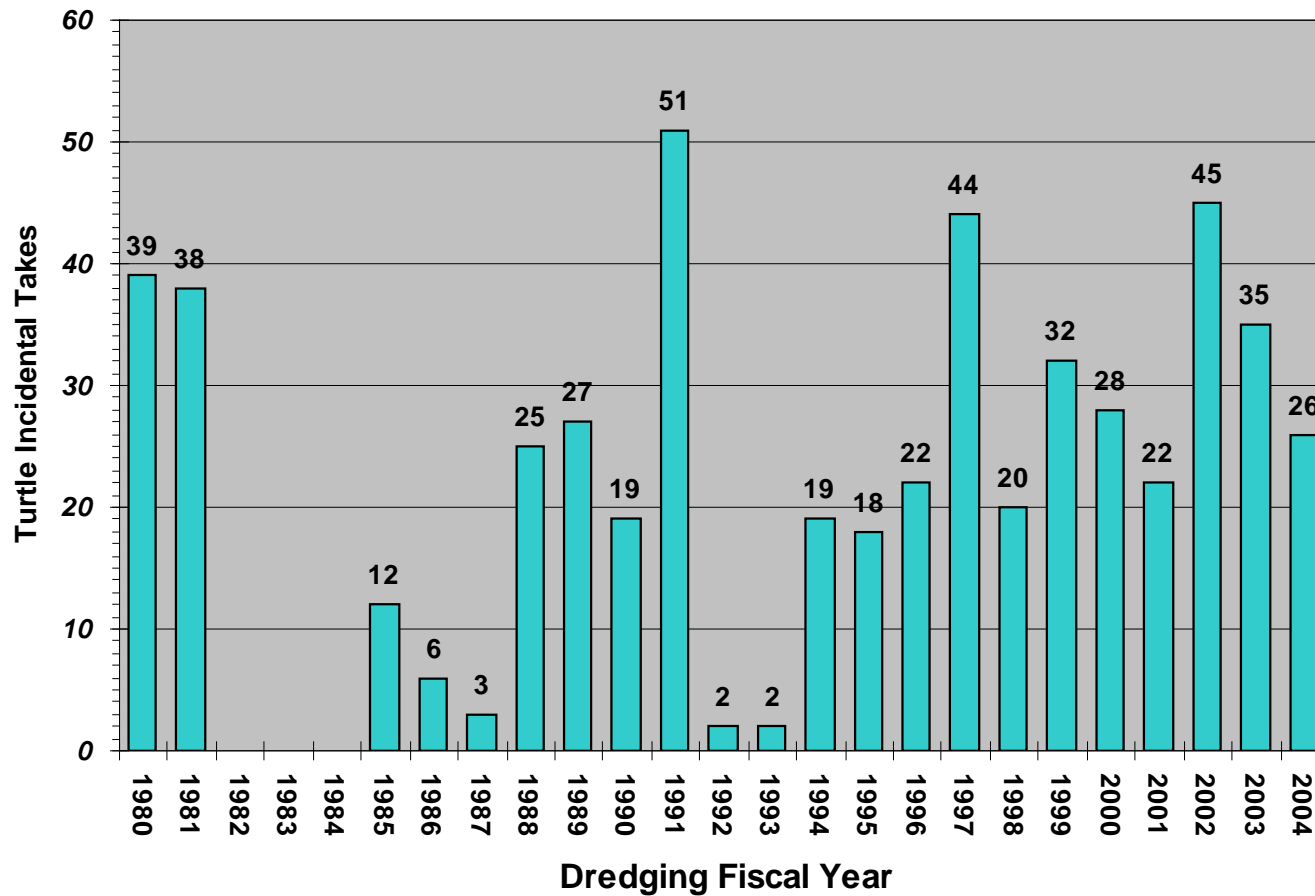
- [Fiscal Year](#)

[U.S. Army Corps of Engineers](#) | [Engineer Research and Development Center](#) | [Environmental Laboratory](#)

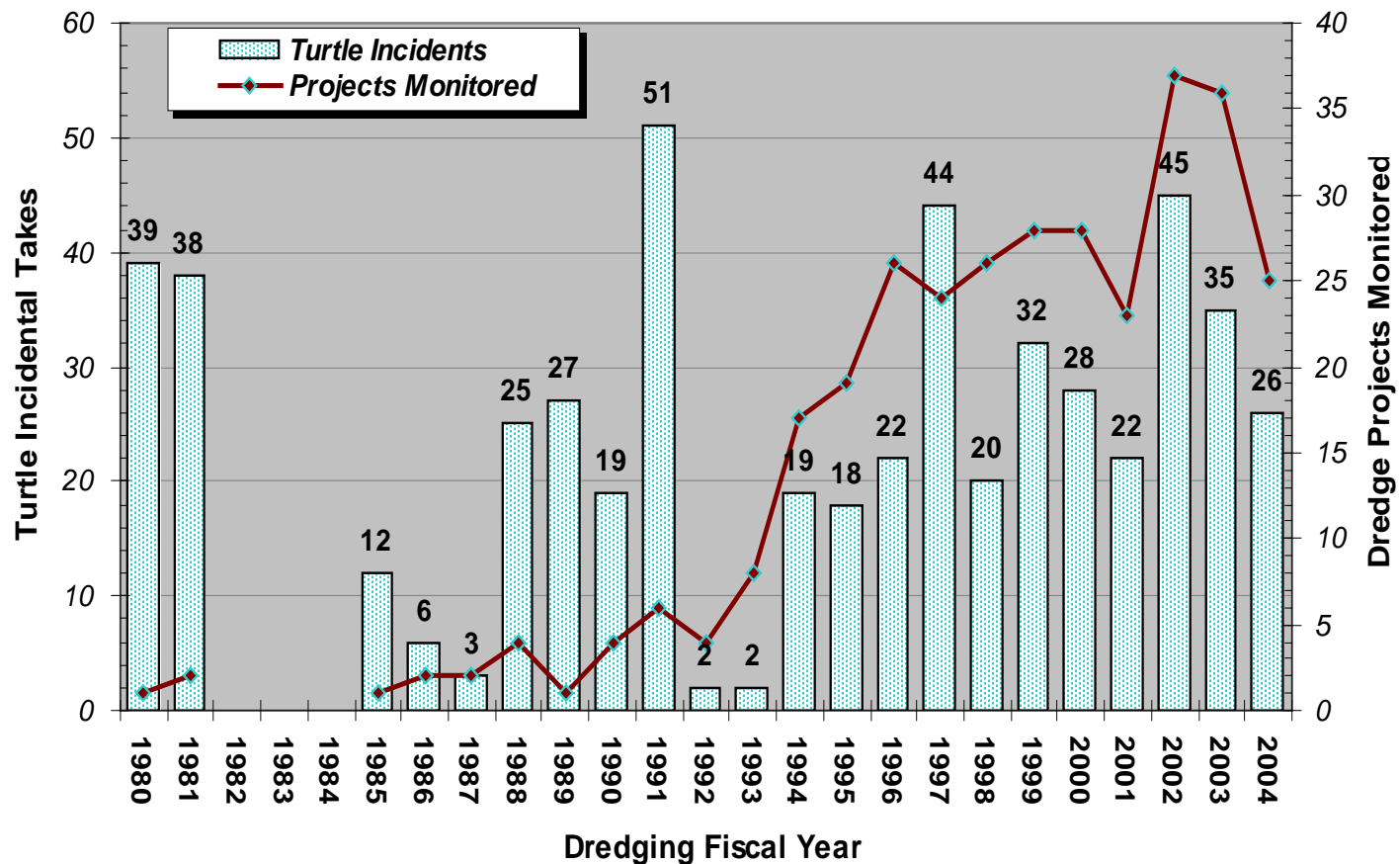


Research and Development

Annual Sea Turtle Takes 1980-2004



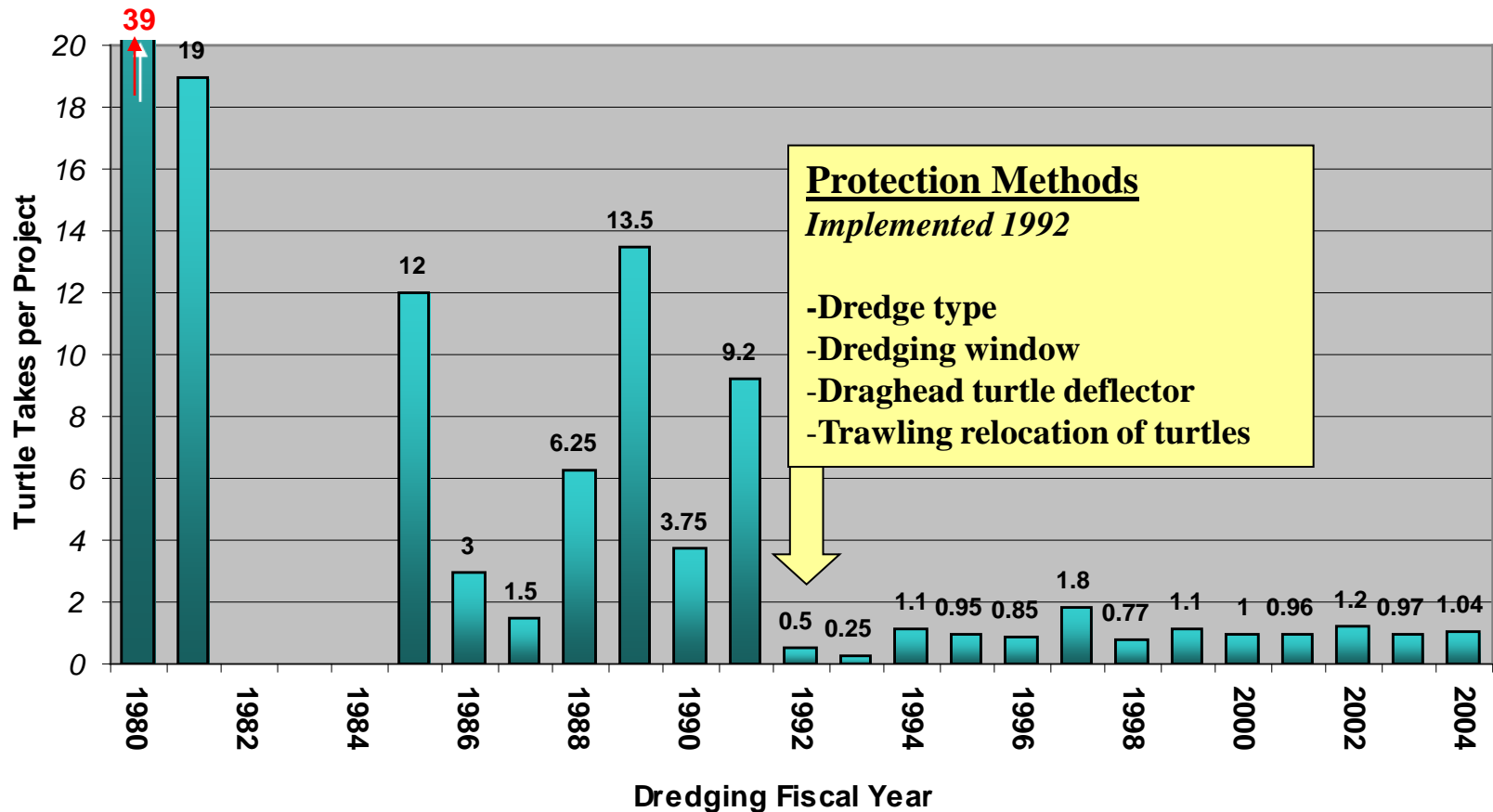
Annual Sea Turtle Takes and Dredge Projects Monitored 1980-2004



Annual CPUE

Sea Turtle Takes per Monitored Projects

1980-2004



DOER Sea Turtle Research

- **Continue to populate/improve database**
 - 1.5 M hits/per year!
 - Improved communication w/ Corps, Industry, and resource agencies
- **Allows more sophisticated analysis**
 - Takes by dredge, location, per project, cy dredged, etc.
 - Helps Districts to know which dredges are more turtle friendly
 - Helps Districts/Contractor with “turtle swapping”
- **Electronic version of TES forms (jointly with observers)**
- **Ultimately link with SI, auto population of database**
- **Different Regional Biological Opinions, makes reporting data challenging**



Dredged Material Management

- Dredged material handling, transport, and placement options
 - operationally efficient, environmentally sound,
 - cost-effective

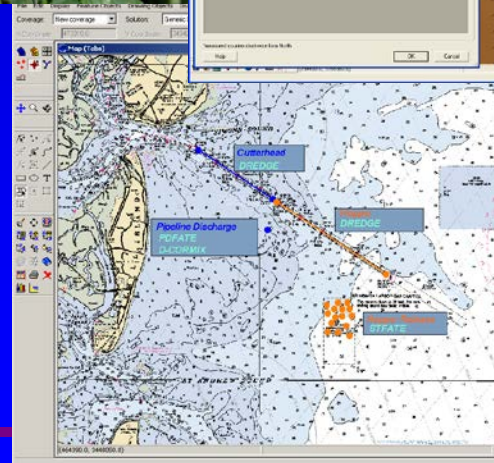
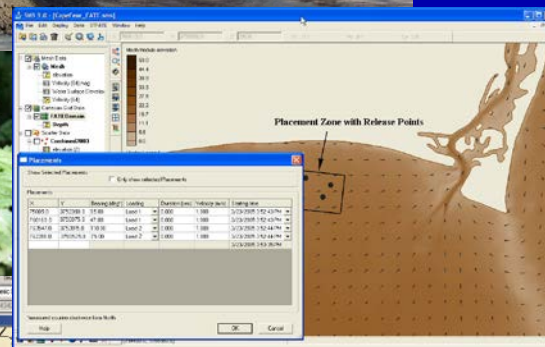
Work Units

- Dredging Model, Data, and Project Interfaces
- Dredging and Aquatic Placement Operations and Management
- Confined Disposal Facility Placement, Management, and Reclamation



Dredged Material Management Top Products for FY06

- PTM: Three-dimensional particle tracking model for dredge-induced suspended solids
- SMS Version 2 for near- and far-field dredging FATE models
- Mobile SEAWOLF flume for sediment suspension in wave-current environments
- Assessment tools for dredged material beneficial use suitability



DOER

Risk

Develop and apply a comparative risk-based approach to the assessment and management of dredged material and develop logical decision support tools to manage uncertainty and facilitate efficient decision-making

Work Units

- **Exposure Assessment Methods and Approaches**
- **Effects Assessment Procedures and Tools**
- **Risk Characterization Approaches and Methods Development**
- **Risk Management in the Dredging Program**



Risk

Products for FY06

- Quantitative screening procedures for CDF contaminant pathway evaluations
- Volatile emissions assessment and modeling guidance
- FishRand-Migration bioaccumulation modeling software
- Framework for applying multi-criteria decision analysis in dredged material management



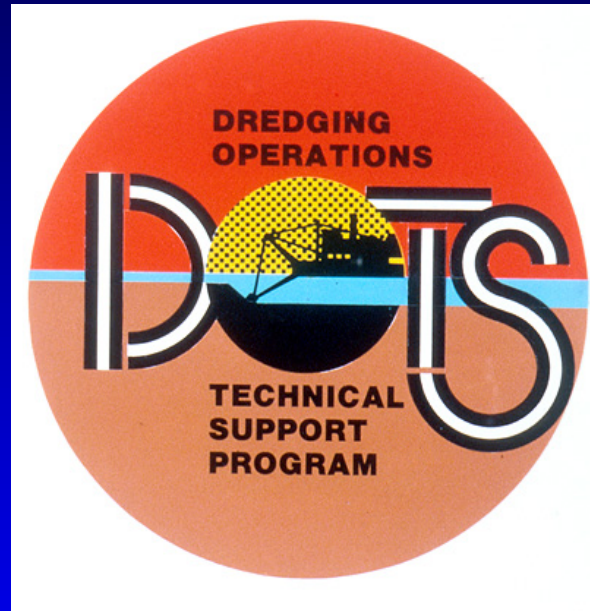
DOER

Benefits

- **Maintain viable aquatic placement alternatives**
- **Minimize risk to biological resources and their habitats**
- **Cost effective contaminated sediment management strategies**
- **Expanded beneficial use alternatives**
- **Improved information management**
- **Successful project management and contracting strategies**
- **Increase navigation dredging efficiency and production**



Dredging Operations Technical Support Program (DOTS)

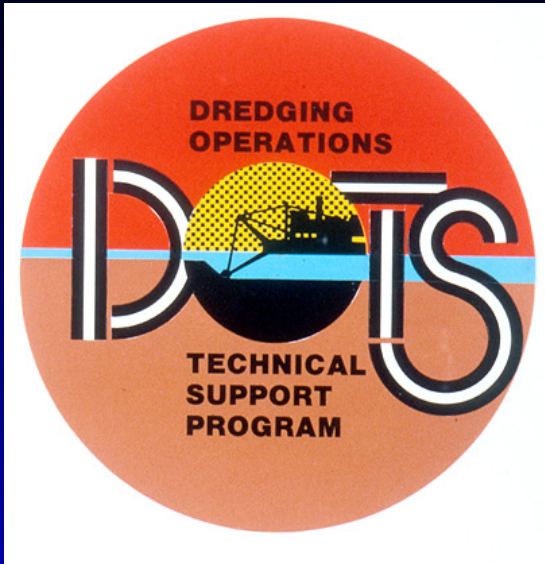


Since 1978

Dr. Doug Clarke

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DOTS FUNCTIONS

- Technology Transfer
 - Direct Technical Support
 - Training & Outreach
 - Technology Application



Dredging Operations Technical Support Program

U.S. Army Corps of Engineers | Engineer Research & Development Center | Environmental Laboratory



Program Manager: [Dr. Douglas Clarke](#)

Program Monitor: [Mr. Joseph Wilson](#)

The Dredging Operations Technical Support Program, known as DOTS, provides direct environmental and engineering technical support to the U.S. Army Corps of Engineers Operations and Maintenance (O&M) dredging mission. Technology transfer activities have supported diverse field needs for years and have directly benefited O&M dredging operations throughout the United States.



[Take a Trip Through a Dredge!](#)

500K + hits
per year

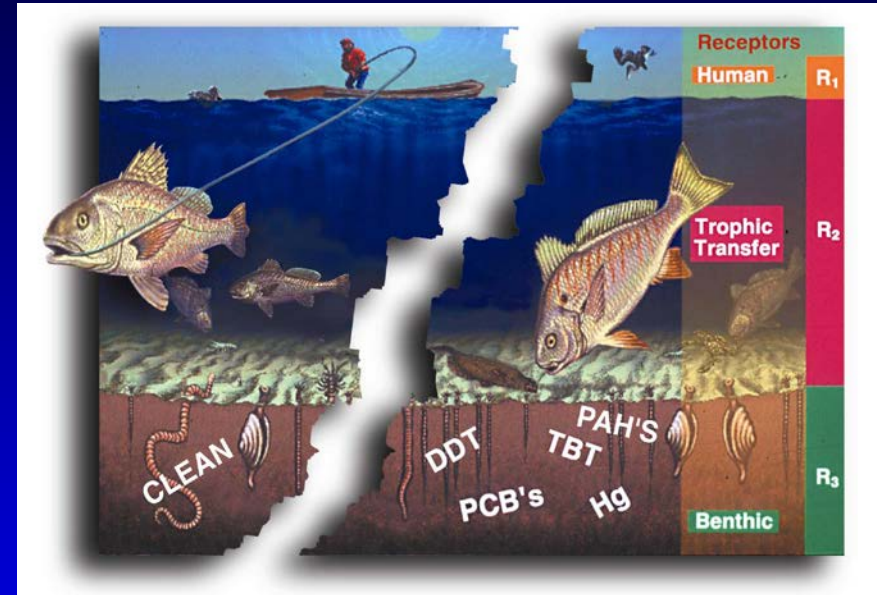
<http://el.erdc.usace.army.mil/dots>



Research and Development

DOER and DOTs

- The power of combining:
 - Advanced science and engineering
 - Technology transfer
- Sensible methods for quantifying risks and uncertainties
- Sound and cost efficient engineering technologies for managing risks and uncertainties
- Structured and defensible methods for guiding decision making



QUESTIONS

