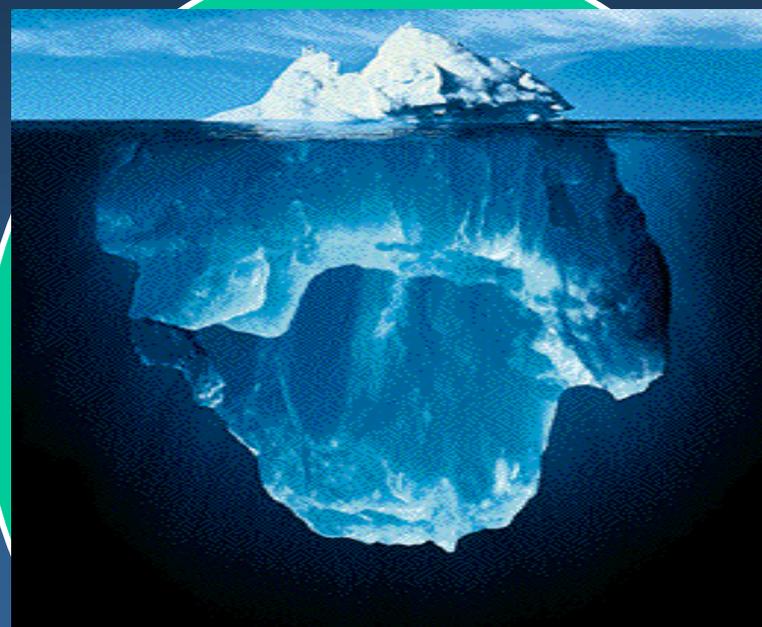


# Infrastructure Engineering & Management Overview

**Business  
Practices**



**Decisions**

*Integrated Solution  
Environment*

Infrastructure R&D  
MSC Workshop  
13 March 2001

# Infrastructure

# Infrastructure Engineering & Management R&D

- High Performance Materials and Systems
- Risk analysis for Dam Safety
- Geotechnical Engineering
- Concrete & Structural Engineering
- Earthquake Engineering
- R&D Breakthrough - Liquefaction Initiative
- FY03 New Start - Seismic Evaluation and Rehabilitation of Dams

# Civil Works Mission:

“...Provide the Nation with responsive:

- Development and management of **water resources infrastructure**
- Protection, restoration and management of the environment
- Disaster response and recovery
- Engineering and technical services

...in an environmentally, economically, and technically sound manner”

*Message from the Chief, January 2001*

# Strategic Plan:

## Water Resources Challenges

1. Balancing water resources demands and environmental quality concerns
2. Repairing damage to our environment from past development
3. Addressing the performance and safety implications of an aging water resources infrastructure
4. Ensuring the capability to respond to natural disasters
5. Minimizing institutional inhibitors of efficient and effective water resources decision making and management

# Strategic Plan:

## Water Resources Challenges

*“We are operating and maintaining an **aging water resources infrastructure that is nearing or surpassing its 50-year planned design life.***

*Ensuring expected performance levels requires rebuilding or replacing existing locks and dams, recreation facilities, hydropower facilities, and water supply facilities. But these demands must compete with other social and entitlement programs and investments.”*

*draft CW Strategic Plan, 2001*

# Strategic Plan: Key Concerns/Challenges

- Stress on the national marine transportation system:

*Our nation's water highway system may not be able to meet 21<sup>st</sup> century demands.*

- Continued development of flood prone areas:

*Flooding continues to threaten our nation's communities.*

*draft CW Strategic Plan, 2001*

# Strategic Plan: Key Concerns/Challenges

- An aging national resources infrastructure:  
*America's water resources infrastructure may not support future generations.*
- Environmental consequences of past development:  
*Our environment has been damaged and needs to be repaired to offer future generations sustainability of natural and cultural resources.*

*draft CW Strategic Plan, 2001*

# Strategic Plan: Key Concerns/Challenges

1. Opportunities to leverage water resources for smart growth:

*Many communities lack adequate water and sewer systems necessary for their sustained development.*

1. A need to ensure the capability to respond to disasters:

*Our nation's capability to respond to disasters is being stretched.*

# Desired End State

## Water Resources Infrastructure\*

Sustainable water resources infrastructure:

- Fully capable of supporting national requirements,
- Positioned for effective water resources decision making and management

*\* extracted across all business areas, draft CW Strategic Plan 2001 and Murder Board 2000*

# Desired End State \*

Sustainable water resources infrastructure:

- anticipates water resource needs,
- integrated, innovative, sustainable approaches and materials,
- incorporates risk management
- effective life-cycle management and planning processes
- closely collaborated and coordinated at local, regional and national levels

*\* extracted across all business areas, draft CW Strategic Plan 2001 and Murder Board 2000*

Identifying Present and Future  
Water Resources Infrastructure  
R&D Needs

# “Needs” Identification for Business Programs & Infrastructure

- 2000 Innovative Flood Damage Reduction FOC Workshop
- 2001 Seismic Evaluation and Rehabilitation FOC Workshop
- 2001 Innovations for Navigation Workshop
- 2001 Liquefaction at Depth Peer Review
- 2001 Environmental Strategic Workshop
- **2001 Infrastructure Area Review**
- 2001 Navigation & Flood Damage Reduction Business Program R&D Review
- 2001 Dam Safety - Innovations in Instrumentation and Monitoring
- 2001 Infrastructure Conference

# Civil Works & Research Thrusts Business Programs

- Navigation
- Hydropower

Nav...

- Flood & Storm Damage Reduction
- Emergency Management
- Recreation

Flood...

- Environmental Protection,  
Restoration, and Management
- Water Supply

Env...

- Regulatory
- Support for Others

# Business Areas:

# *Inventory*

- Navigation
- Hydropower

- Locks & dams, piers
- Dredged disposal sites
- Stabilized channels and banks
- Erosion control structures
- Power plants, pipelines...

- Flood & Storm Damage Reduction
- Emergency Management
- Recreation

- Dams, levees, pumping stations
- Reservoir control structures, aquifers
- Diversion structures, fuse plugs
- Visitor centers, parks, campgrounds...

- Environmental Protection, Restoration, and Management

- Erosion control structures,
- Borrows, jetties...

- Water Supply

- Wetlands, landfills,
- Offshore disposal sites...

- *Synergy with Military Programs*

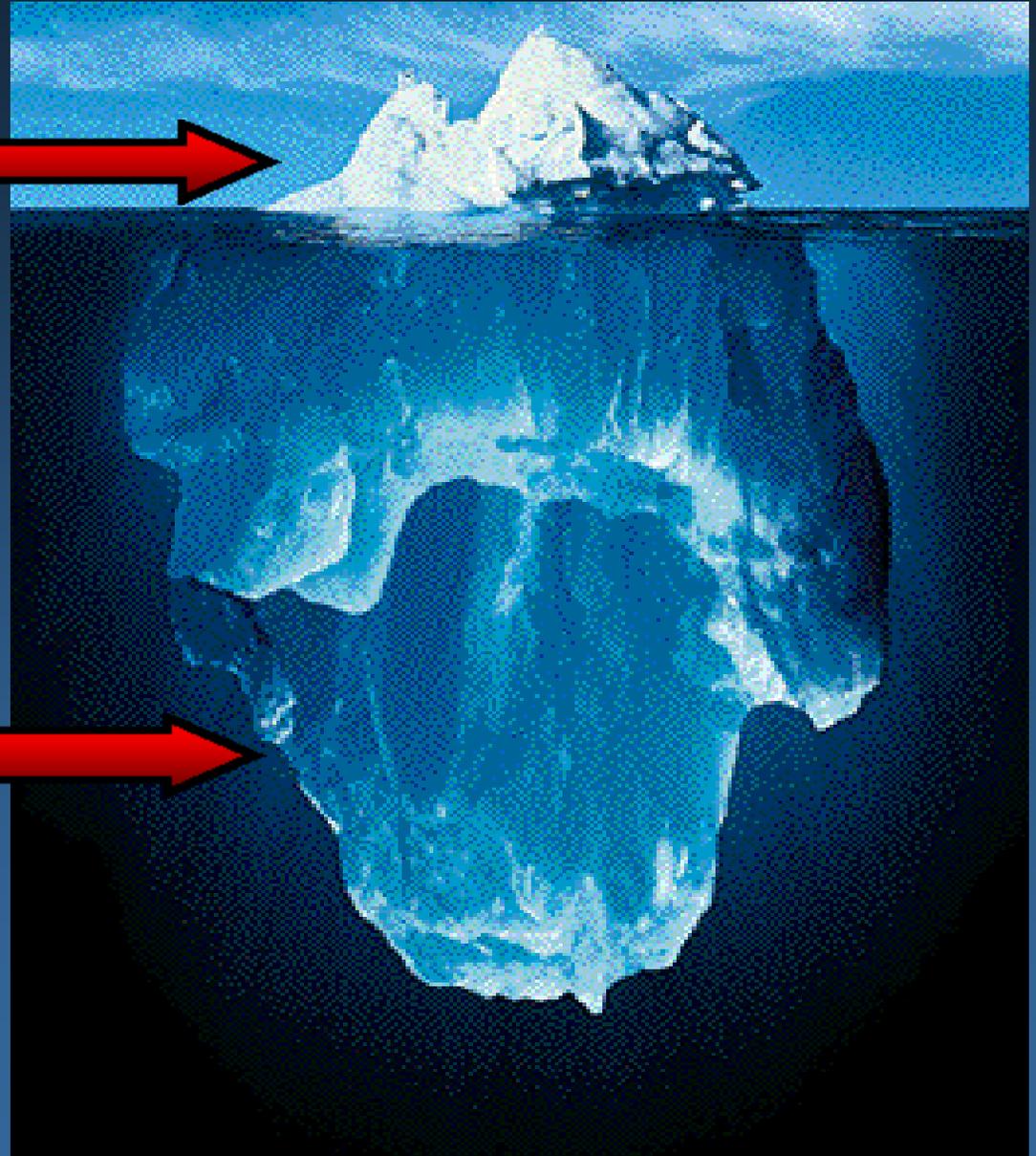
- *Real property, military installations...*

# Infrastructure R&D Products

## *Examples:*

- Innovative materials
- “Green” construction
- Systematic, realistic risk analysis
- Automated monitoring
- Nonintrusive subsurface imaging

- Underlying mechanisms & processes
  - The “physics”
- Enabling technologies



# Infrastructure Programs & Program Managers

- High Performance Materials and Systems → Jim McDonald  
*Ashok Kumar*
- Risk analysis for Dam Safety → Wayne Jones  
*Dave Moser*
- Geotechnical Engineering → Lillian Wakeley
- Concrete & Structural Engineering → Robert Hall  
Stan Woodson
- Earthquake Engineering → Don Yule, *Robert Hall*
- Liquefaction Initiative ⇨ Mike Sharp
- Seismic evaluation & Rehab ? ⇨ Don Yule, *Robert Hall*

# Infrastructure R&D

End of Overview



# Identifying Corps' CW R&D Needs

Results from Recent  
Strategic Planning Workshops



# Corps' Infrastructure R&D Needs

## Recent "NEEDS" Identification Workshops:

- 2000 Seismic Evaluation and Rehabilitation
- 2000 Innovative Flood Control
- 2001 Navigation Systems
- 2001 Environmental