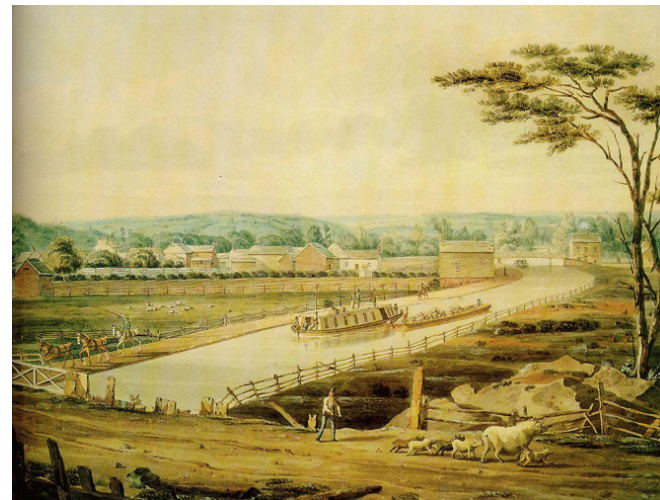


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Infrastructure R&D Activities and Opportunities



Sandra Knight
Technical Director, ERDC
July 27, 2005
St. Paul, MN

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A Time for Innovation

“The world will not evolve past its current state of crisis by using the same thinking that created the situation.”

Albert Einstein



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Technology Challenges on the Waterway system for the 21st Century

- **Energy/Resources**
- **Climate Changes**
- **Environmental constraints**
- **Global Economy**
- **Social Paradigm**



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Corps Initiatives in Infrastructure R&D

Innovation concepts:

Design

Materials

Construction Methods

Rapid Repair

Monitoring/Management:

Condition Indices

Project Monitoring/Inspection

Asset Management

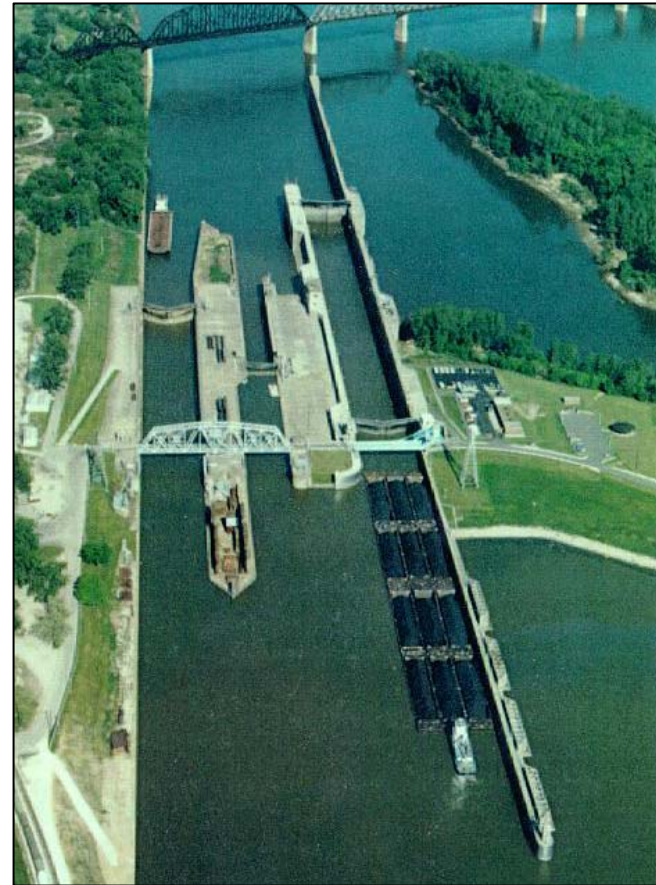
Performance-based budgeting

Modeling:

Hydrodynamic

Structural

Navigability



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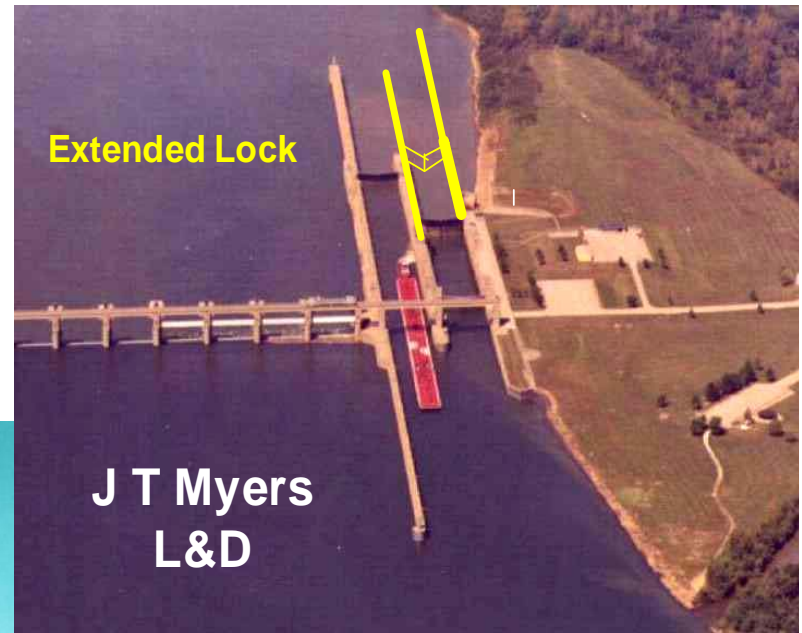
INNOVATIONS in NAVIGATION PROJECTS



Float-in Construction

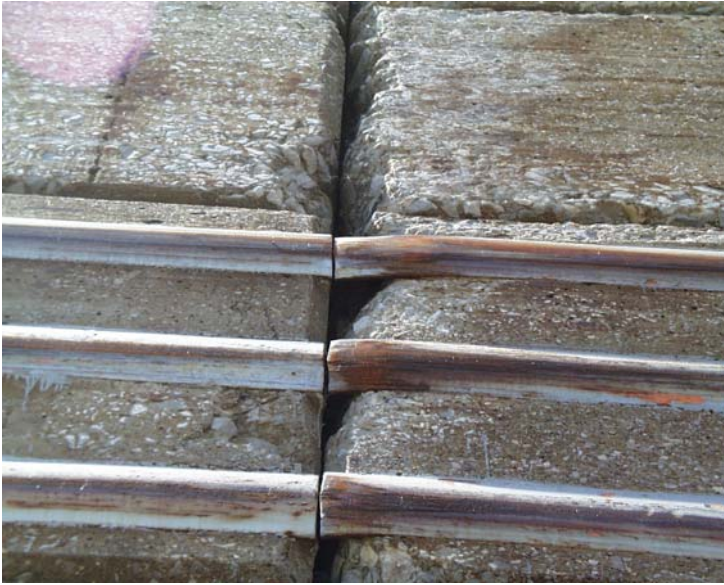


Lift-in Construction

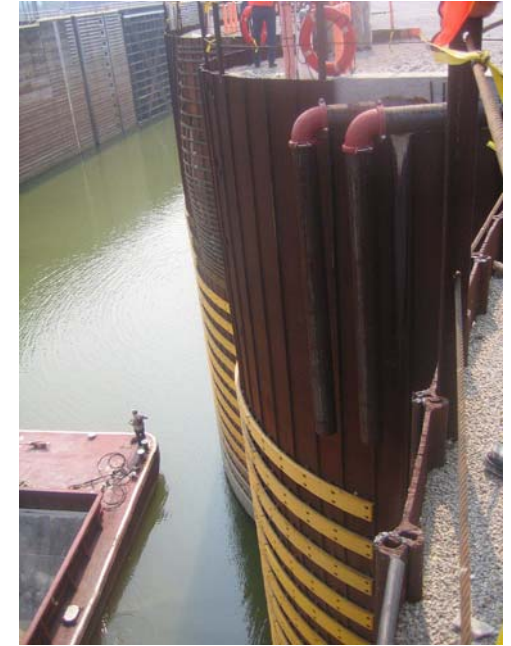


Innovative Fill/Empty Systems

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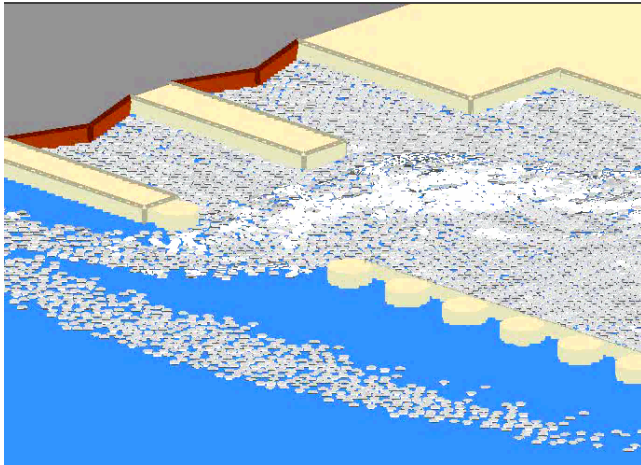
Wall Armour



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Computing and Science Breaking Developments

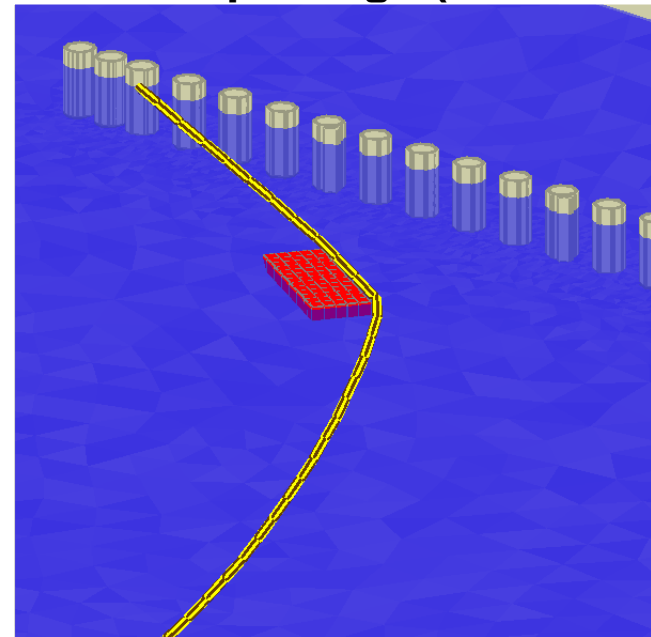
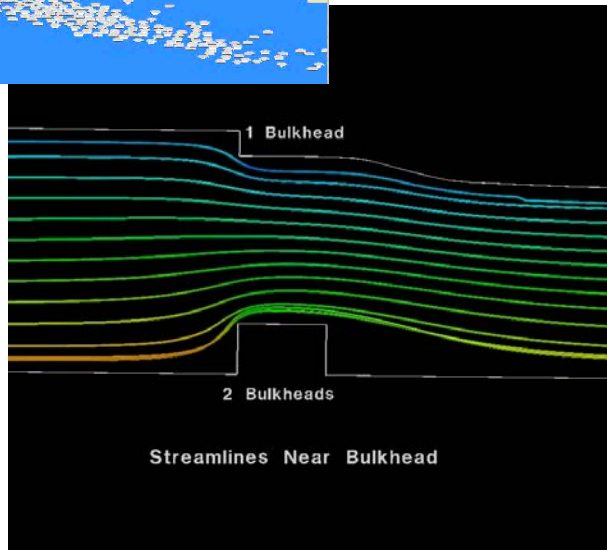
ADaptive Hydraulics (ADH) Plus Discrete Element Model (DEM)



So What?!



- bulkhead design
- ice/debris management
- barge impact
- fish passage (ADH-NFS)



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Industry Partnering Opportunities- Quick list

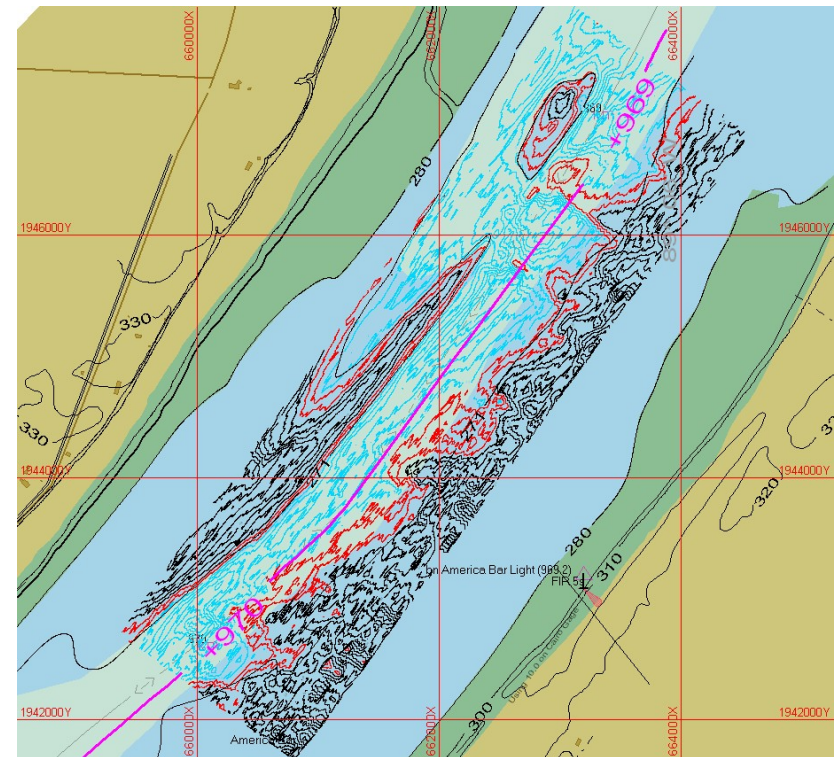
- **“SMARTLOCK” Plus**
- **River Information Systems**
- **Remote operations**
- **Innovative Vessel Design**
- **Innovative Fendering**
- **Barge Lashing**
- **Others??**



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Industry Partnering Opportunities

- **“SMARTLOCK” Plus**
 - Currents
 - Ice
 - Wind
 - Detailed IENC
 - “Smartbridge”
 - Real-time UKC



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Industry Partnering Opportunities

- **River Information Systems**
 - **Safety**
 - **Traffic optimization**
 - **Logistics**
 - **Reduced reporting**



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Industry Partnering Opportunities

•Remote Operations- PIANC WG 28

Finland- Saimaa Canal

- 8 locks (5 in Russia)
- 7 bridges
- 1 operational location
- 4 operators



Operator is front line contact with customer

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Innovations in the Fleet

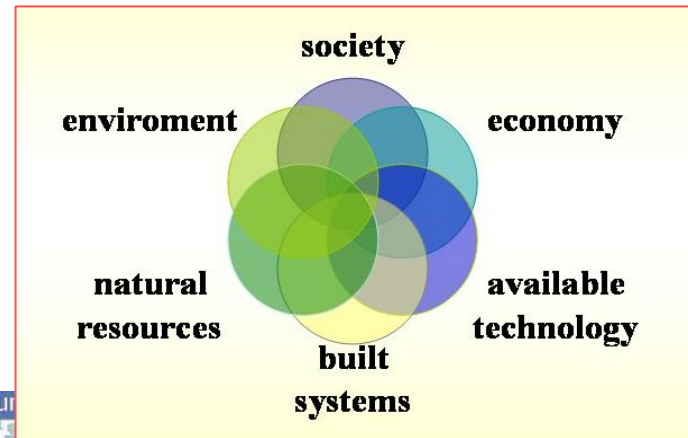
“Flexibility and reliability are core concepts in inland shipping...
There is a right vessel for almost any type of cargo
and each destination...”



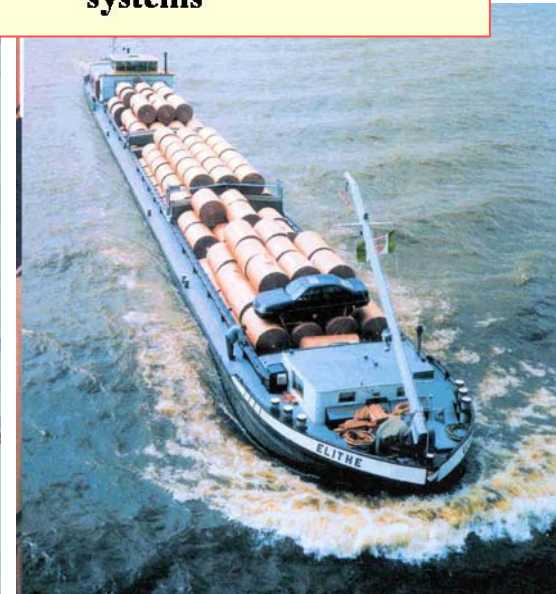
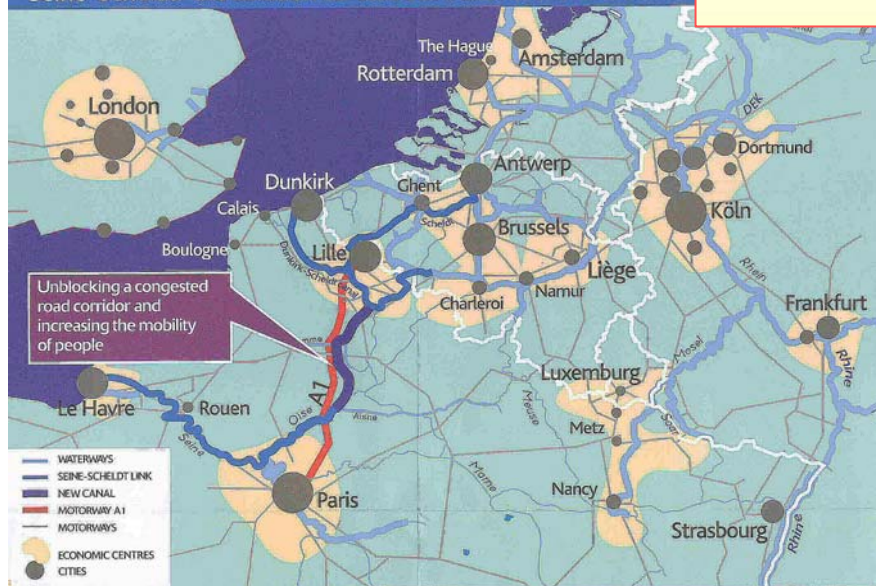
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CREATING – Inland Shipping- EC funded

- Economically driven
- Sustainable Development
 - STPI
- Vessel Design
- Logistics
- Fuel Economy
- Technology



Seine-Scheldt: the solution for smooth traffic in the heart of Europe



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The Way Ahead?



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The Way Ahead

- R&D community of practice for Inland Waterways
- Development of “best” practices and technologies
- Partnering on Projects/ Demo Technology

