Working and Building with Nature

Dr. Todd S. Bridges, ST
Senior Research Scientist, Environmental Science
Engineering Research and Development Center
U.S. Army Corps of Engineers

Mobile, AL
18-20 January 2011

US Army Corps of Engineers
BUILDING STRONG®

The USACE Navigation Mission

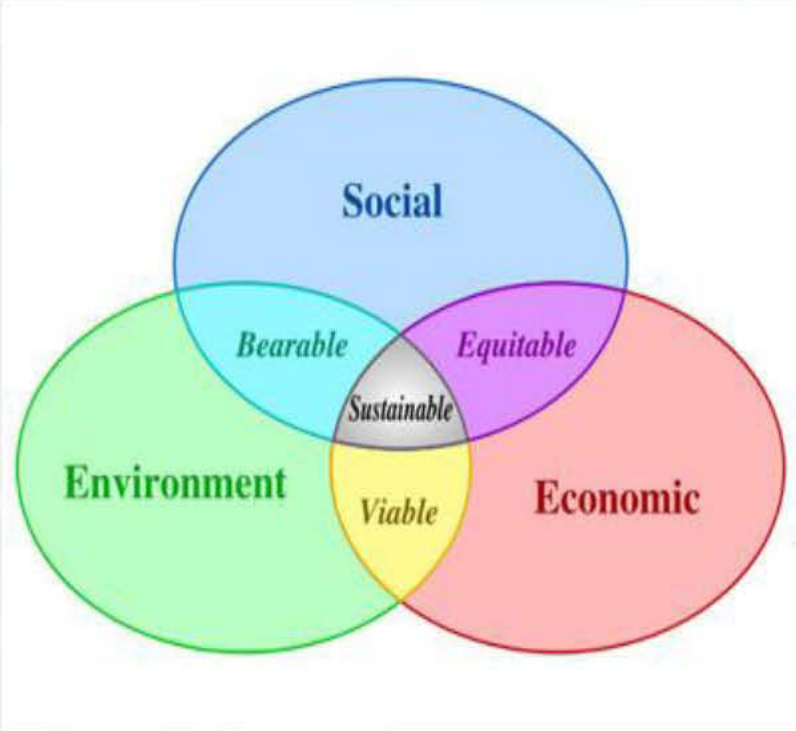
To provide safe, reliable, efficient, effective and environmentally sustainable waterborne transportation systems for movement of commerce, national security needs, and recreation

Past and Present

- Ruling paradigm: economic development occurs at the cost of damage to the environment
  - The basis of relevant environmental laws and regulations
    - National Environmental Policy Act
    - Clean Water Act
    - Marine Protection, Research, and Sanctuaries Act
    - Endangered Species Act
    - Etc.
  - Federal Standard: least costly environmentally acceptable alternative

The Future: Sustainability

- Past: maximize economic benefits while minimizing environmental damage
- Future: expand and optimize benefits across all three sustainability domains



Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.
Brundtland Commission

Our W&BwN Objective

- Synergize navigation infrastructure, operations and environmental processes to expand, grow and sustain economic, social, and environmental benefits
  - ► Benefits are established through sound scientific methods and practice
  - ► Investments are optimized in a manner consistent with national policy

Looking Forward: Big Picture

- Developing strategic objectives, 5 years +
  - More proactive/offensive posture, rather than reactive/defensive
    - Shape the debate rather than react to it
    - “Getting in front of” environmental challenges
  - Environment is an import driver
    - Environmental quality is a valued by the public
    - Environment is priority with Administration
    - CEQ power and influence growing
      - Focus on climate change, energy, carbon budgets and footprints
    - Environmental agencies exercising greater role in decision making

USA Today/Gallup Poll. May 24-25, 2010. N=1,049 adults nationwide. MoE ± 4.

"With which one of these statements about the environment and the economy do you most agree? Protection of the environment should be given priority, even at the risk of curbing economic growth. OR, Economic growth should be given priority, even if the environment suffers to some extent." Options rotated

	Environment	Economic growth	Equal priority (vol.)	Unsure
	%	%	%	%
5/24-25/10	50	43	4	3
3/4-7/10	38	53	4	5
3/5-8/09	42	51	5	3
3/6-9/08	49	42	5	3
3/11-14/07	55	37	4	4
3/13-16/06	52	37	6	4
3/7-10/05	53	36	7	4
3/8-11/04	49	44	4	3
3/3-5/03	47	42	7	4
3/4-7/02	54	36	5	5
3/5-7/01	57	33	6	4
4/3-9/00	67	28	2	3
1/13-16/00	70	23	-	7
4/13-14/99	67	28	-	5
3/12-14/99	65	30	-	5
4/5-8/90	71	19	-	10
9/28 - 10/1/84	61	28	-	11

Programmatic Benefits

- Reduced costs and delays
  - Environmental agencies retain considerable flexibility and latitude in pursuing their mandates
    - Sustainability model (expanding benefits) will incentive cooperative behavior
  - Beneficial alignment of physical processes serving navigation
    - E.g., using environmental features to reduce channel in-filling
- Expanded benefits leading to broad support for the program
  - E.g., using navigation infrastructure to feed habitat restoration
- Sustained benefits
  - Developed through a strategic, forward-looking posture that maximizes long-term returns on investment

Looking Forward: Sustainability

- How do we apply the principles of sustainability to navigation dredging
  - For example:
    - Extending the life of CDFs by keeping material out of CDFs provides a tangible economic benefit from applying DM to restoration
    - Constructing habitat and other features that reduce sedimentation in channels
    - Reducing energy usage and carbon footprint associated with operations
    - Life-cycle analysis applied to navigation dredging

Looking Forward: Beneficial Uses of DM

- National strategy and plan for beneficial use of dredged material
  - ► Develop national, science-based objectives
  - ► Address critical science and engineering needs to inform implementation plan
    - Innovative engineering practice to expand opportunities and reduce costs
    - Science for documenting benefits, impacts and costs

Looking Forward: Address Constraints

- More strategic approach to T&E species and Environmental Windows
  - The Environmental Windows problem is getting worse not better
  - What are the costs and benefits associated with operational constraints?
    - Concentrated focus on prioritized problems (e.g., based on economic impact) rather than shotgun approach where we make incremental progress on several problems

Future Research Directions: BU

- Science and engineering of BU
  - Scientific foundation for documenting the environmental benefits and impacts of BU
  - Economic benefits/costs of BU
    - Use in calculating BC wrt Federal Standard
  - Engineering for reducing costs of environmental BU (e.g., long distance conveyance, etc.)
  - R&D concerned with developing new ways of using dredged material beneficially

Future Research Directions: Prevention

- Science, engineering, technology to minimize the need for dredging
  - Reducing soil erosion
    - E.g., collaboration with USDA's Natural Resources Conservation Service
  - Innovative use of created habitats
  - Navigation structures
  - Sediment diversions
  - Etc.

Path Forward

- Working and Building with Nature Workshop
  - Think “outside the box”
  - Identify opportunities and constraints
  - Develop inputs to a vision
  - Identify science, engineering, policy needed to act on that vision
- Publish findings and outcomes of the workshop
  - 1 page of text from each presenter summarizing their presentation and related discussion points, by Friday
  - Publish as DOER report (with presentations) on website
- Develop a strategy and implementation plan