

the
**Natural
Infrastructure
Initiative**



**Natural Infrastructure Initiative
National Waterways Conference
March 7, 2018**

Don M. McNeill
Strategic Growth Manager - Caterpillar Inc
Director – Natural Infrastructure Initiative



Agenda

- NII – Who we are & history
- Global Infrastructure Needs & Natural Infrastructure's Role
- Challenges & Advancing Success
- Beneficial Reuse of Dredged Materials
- Areas for potential Collaboration with NWC



Caterpillar and Natural Infrastructure

Beginning

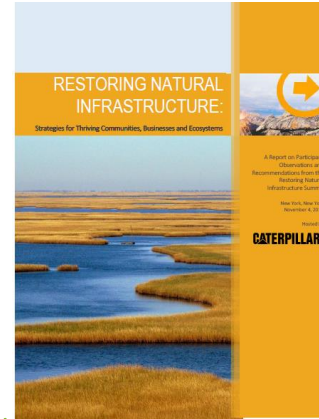
- 2015 • Restoring Natural Infrastructure Summit, NYC, November 2015
 - 150 participants representing Caterpillar, dealers, customers, NGOs, federal agencies, and private companies
 - Identified an opportunity for a coalition to help drive the changes needed to restore and develop NI

Formulating

- 2016 • Corporate Sustainability met with various companies to discuss creating a NI coalition
- Caterpillar conducted an internal study of the natural infrastructure industry

Launch

- 2017 • Caterpillar led the creation of Natural Infrastructure Initiative in 1Q 2017



Natural Infrastructure Initiative

- Natural Infrastructure Initiative is an informal grouping of companies and organizations working to promote the use of natural infrastructure
 - Initial focus on water based natural infrastructure (coasts, inland waterways) in the U.S.
- High level objectives:
 - Accelerate investment in water based natural infrastructure projects as part of a solution set for infrastructure needs
 - Embed natural infrastructure as part of ongoing discussions about improving investment in water-based infrastructure. Promote the use of natural infrastructure in general



Members of the NI Initiative

- **Michael J. Donahue, AECOM**
 - Vice President, Water Resources & Environmental Services and Director, National Coastal and Ecosystem Restoration Practice
- **William H. Hanson, Great Lakes Dredge & Dock**
 - Vice President, Government Relations & Business Development
- **Charles M. Hess, Brown & Root**
 - President, Infrastructure and Coastal Restoration
- **Robert Bendick, The Nature Conservancy**
 - Director, Gulf of Mexico Program
- **Robert A. Sinkler, Intrexon**
 - Vice President, Technology & Commercialization
 - Formerly Director North America Water Infrastructure, The Nature Conservancy & Commander, Rock Island District, USACE
- **Kathryn Spitznagle, Caterpillar**
 - Director of Corporate Sustainability
- **Janet Kirkton, Caterpillar**
 - Dredging Industry Steward



National Infrastructure Initiative Vision

- The widespread acceptance of, and increased investment, in natural infrastructure projects as a means to advance the economic vitality, environmental health and security of our nation.

This vision will be achieved by:

- promoting use of natural infrastructure and nature-based approaches
- advocating for programs and funding for increased investment in NI
- advancing new technologies and business models to expedite delivery
- informing/educating stakeholders and decision makers

Natural **AND** Built Infrastructure, not **OR**



NII Perspectives: Key Issues & Opportunities

- Flow of private capital for Natural Infrastructure projects
- Full and timely funding of critical projects
- Improved business cases or incentives to encourage the beneficial reuse of dredge material
- Demonstrate & Highlight Natural Infrastructure potential via pilot projects
- Streamline / expedite the permitting process



Why focus on Natural Infrastructure?

- Size of the natural infrastructure industry is very large globally
 - Estimated annual spend in the US is **\$40B** annually and several times that amount globally
- NI solutions can augment traditional approaches - mitigating risks, reducing funding gaps, improving environmental outcomes, and reversing degradation losses.
 - *ASCE report card (2017): **\$312B** needed over next decade.*
 - *Business Roundtable (2015): **\$2B** needed for port infrastructure alone.*
 - *National Waterways Foundation (2014): modernizing locks and dams could lead to **350K** new jobs valued at **\$14B** over the next decade.*
 - *National Research Council (2013): estimated value of USACE water-based infrastructure fell from **\$237B** to **\$164B** over last four decades.*
 - *USEPA (2017): estimated need for drinking water, wastewater and stormwater infrastructure is **\$655B** over the next two decades.*



Global Infrastructure Needs & Natural Infrastructure's Potential Role

Opportunity / Mega Trends

- 15 year capital Needs \$49T
- \$3.3T Annual Need
- **How much could / should be NI?**

\$49 Trillion
Economic
Infrastructure Need
(2016-2030)

Annual Global Infrastructure Spend
\$2.5T vs. \$3.3T Potentially Needed

Can NI help close an \$800B annual gap?

McKinsey Global Institute 2016* (2016-2030)

Key Industries Capital Needs

- Power - \$14.7T
- Roads - \$11.4T
- **Water & Ports - \$8.4T**
- Telecom - \$8.3T
- Rail - \$5.1T
- Airports - \$1.3T



Challenges & Advancing Success

Understanding & Proving Value

- Cost benefit / damage mitigation tools & analysis
- Life Cycle Cost & Value vs short term
- Quantifying environmental benefits
- NI Accepted Engineering standards



Missing the NI GAAP

Generally Accepted
Natural Infrastructure
Standards / Principles

Highlighting & Promoting Success

- Industry grows from a baseline of proven success which provides an adequate return
- NII is interested in helping **you** promote and bring awareness to your success in this space

- Private Capital
 - ...very concerned about the new/unknown, wants to feel safe, and wants a return for its efforts.

Awareness > consideration > analysis & tools > facts & data > Proven ROI > replication & growth



Dredged Material Re-Use Opportunity in the United States

- USACE navigation program manages
 - 12,000 miles of shallow-draft waterways (9-14')
 - 13,000 miles of deep draft waterways (14'+)
 - 400 ports, harbors, and turning stations
- Add the non-USACE dredging programs
- Annual dredging approximately 200M yd³ of sediment
 - Approx 50M yd³ beneficially reused
 - Approx **150M yd³** of opportunity

If Used for New Land Creation

Deposited 6' deep
 15,495 acres (24 sq. miles) / year
 42 acres / day



Hauled by Cat 797B

314 yd³ capacity
 Loaded every 2.5 minutes
 19,904 hrs (**2.27 years running 24x7**)

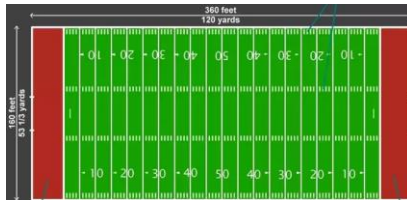


The Pentagon

6.6M sq feet
 Buried 625' deep annually

Std Football Field

120 x 53 yd
 Buried 60,000' deep annually



Areas for potential Collaboration with NWC

- Look for opportunities where NI makes sense in your projects, infrastructure, and businesses
- Identify best practices or excellent evaluation tools which support the business case
- Look for ways that NI can help improve efficiency leading to more work, funding, projects etc
- Look for ways to beneficially reuse clean dredged materials when dredging is conducted
- Identify & highlight success where NI has played a role or has complemented built infrastructure



Discussion / Comments

Thank You!

