USACE INNOVATION SUMMIT

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Mississippi River & Tributaries project: floodways and backwater areas
INNOVATION SUCCESSES — INLAND NAVIGATION DESIGN CENTER

- Hurricane and Storm Damage Risk Reduction System
  - Spiral welded pipe piles
  - Innovative delivery
  - Steel piles
  - Ground improvement
  - Past successes with academia
- Geospatial/St. Louis GIS remote sensing
- Miter gate rotary actuators for La Grange lock and dam
- Composite wicket gates
- Soo locks miter gate anchorage
- Discontinuous miter gate contact blocks
- Composite miter gate contact blocks
- Jack-and-shim miter gate diagonal tensioning mechanism
- Trunnion girder anchor rod tension testing methods
- Remote operation of locks
- MMC innovations
- Armor one, bank grading unit, automated mat casting, innovative computer software
- MATOC contracts of rock work
- Other transaction authority
- Strategic placement of woody debris

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INNOVATION SUCCESSES - HURRICANE AND STORM DAMAGE RISK REDUCTION SYSTEM

GIWW West Closure Complex
Contractor: Gulf Intracoastal Constructors (Kiewit-Traylor Brothers)

Ground improvement Contractor: Archer Western/Alberici

Lake Borgne Surge Barrier Contractor: Shaw Group

Wick drains Contractor: Archer Western

Permanent Canal Closures & Pumps

Contractors: Kiewit, Traylor Brothers, MR Pittman

Colorado State / Armoring
INNOVATION SUCCESSES - SHEET PILE INTERLOCK

Aerial pic 17th Street – Oct 2014 – installation of open cell cofferdam for pump station prior to excavation

Rendering of section of pump station at 17th St – to show scale/size of structure
INNOVATION SUCCESSES – ARMOR ONE
INNOVATION SUCCESSES

Soo Locks miter gate anchorage

1" crack (3S) & 1" inclusion (1N)
1.5" crack (3S)
1" crack (3N)

Primary Anchorage

1" inclusion x 3 (1S)
1" inclusion (3S)
1.5"crack x 3 (1S)

Secondary Anchorage

Composite wicket gate

Miter gate rotary actuator

Top of Lock Wall Structural Platform

Sector Arm to be connected to Strut Arm and Miter Gate

U.S. ARMY

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INNOVATION SUCCESSES - MODELING, MAPPING & CONSEQUENCES PRODUCTION CENTER

Real time inundation maps for flood events

Dam and levee safety search engine

Maximum Inundation:
- 0.1 - 2 ft
- 2 ft - 6 ft
- 6 ft - 15 ft
- > 15 ft
INNOVATION SUCCESSES - MINI ROBOTIC SUBMERSIBLE DREDGE

Excavator Pump Attachment

MRS-D

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INNOVATION SUCCESSES – UNMANNED CRAFT

- SenseFly Albris
- SenseFly eBee RTK
- Harris H6 HE+
- Z-Boat 1800
INNOVATIONS NEEDED

- More impermeable concrete mixes
- Systems to monitor movement and stresses on infrastructure
- Improved pile-to-slab connection details
- Robotic dredging
- 3D printing
- Automated bathymetric data collection
- Measuring water movement under levees
- New lock wall materials
- Material to replace steel on hydraulic structures
- Characterization of sediment sizes in the bottom of the river
- Statistical framework for combining flooding risks
- Extracting sediment from the water column without dredging
- Cost-efficient levee raises with a smaller footprint
- Imaging through turbid water
- Rapid, cost-efficient water slope and water discharge measurements
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