2005 Tri-Service Infrastructure Conference
St. Louis, MO

Dr. Michael J. O’Connor
Director, Research & Development
System-Wide Water Resources Management

- Suite of Tools for Regional/Basin Water Resources Management
- Collaboration with Stakeholders and Partners

Interagency Collaboration

- Local Agencies
- State Agencies
- The Public
- Universities
System-Wide Water Resources Management

- Spiral Product Development and Annual Fielding
- Demonstration of Capabilities for Key Water Resources Projects

Columbia River  Upper Mississippi River  Everglades
System-Wide Water Resources Management

**Problem:** USACE requires tools and techniques to assess project alternatives and forecast project effects on regional and basin scales.
Flood Fighting Structures Demonstration Program

- **Funding:** $5 Million (Flood Control & Coastal Emergencies (FCCE))
- **Concurrent with Lab Tests, 4 Systems to be Constructed**
  - Sand bag levee
  - RDFW (mandated by Congress)
  - 2 other vendor products
  - 100' river face with up to 50’ tie back to higher ground
  - Exact location and timing dependent upon river stages
- **Monitor, Evaluate, and Document**
  - Operational criteria (resources, construction time, repair, dismantling, reusability)
  - Performance – flows, levels, seepage, stability
  - Public posting of results
- **Field PDT including POC referenced by RDFW**
  - Concur with site, test plan, and vendor selection criteria
- **Completion:** 2007
Lab and Field Tests of 3 Vendor Levee Raising Products + Sand Bags

Portadam

Sand Bags

Hesco Bastion

Rapid Deployment Flood Wall (RDFW)
Flood Fighting Structures Demonstration PILOT Program - Preliminary Findings

Pre-position material at up to 3 demonstration sites in different regions with different flood conditions, with products from 3 vendors, in cooperation with levee and drainage districts/ municipalities/ local governments, and with ERDC Guidance and Technical Support

- **Seepage**
  - Hesco Bastion leaked the most, need to redesign seam between units
  - Second highest leakage rate were for the sand bags, primarily at point of structure raising
  - Third RDFW
  - Least was Portadam after water level raised sufficiently to seal (lab performance unknown)

- **All vendor products have survived lab and field testing process (maintained structural integrity but some repairs required)**

- **Lab Tests - Sand bags failed during overtopping test, damaged during wave loading**
Support to Army Transformation

- Power Projection
- Encroachment Tools
- Installation Master Planning
- Force Projection Tools
- Facility Composer

US Army Corps of Engineers®

Directorate of Research and Development
Facility Composer

- Standard facility libraries with current and complete Army design and construction criteria/requirements
- Rapid generation of parametric construction cost estimates
- Rapidly layout facility functions and cost during planning charrettes
- Ensure DD1391 always starts with current and complete standard Army criteria/requirements
- Manage standard facility criteria and requirements in a computable format for populating industry standard (IFC) object model

**ERDC POC:** Beth Brucker (217-373-7293) or Susan Nachtigall (217-373-4579)
IMA Furniture Wizard

• Created in response to inconsistent furniture costs included in DD1391’s.
• Building Category Codes (facility types) included based on the President’s Budget through 2011.
• Furniture costs included were based on information from COE, AF & Navy designers, & Standard Facility Criteria Points of Contact.

ERDC POC: Beth Brucker (217-373-7293) or Susan Nachtigall (217-373-4579)
LRL POC: Larry Cozine (502-315-6250) or Karen Gallman (502-315-6224)
Sustainability Analysis

Sustainable Designer’s Aid

- Process tool helps teams use SPiRiT successfully
- Records SPiRiT goals, strategies and decisions
- Can reuse strategies in subsequent projects
- Generates SPiRiT goal, intermediate and final rating
- Pilot tested at Fort Stewart (UA4) & POD
- Possible DD1391 link
- Available free on the web

- https://eko.usace.army.mil/fa/sdd/

ERDC POC: Annette Stumpf 217-373-4492 Annette.L.Stumpf@erdc.usace.army.mil

US Army Corps of Engineers®

Directorate of Research and Development
SPiRiT to LEED Transition

CERL Project Objective: Support ACSIM in transitioning from SPiRiT* to LEED®** as the Army’s Green Building Rating System.

Products:
- Army Implementation Guidance for:
  - LEED® NC2.2 (New Construction)
  - LEED® H (Homes)
  - LEED® EB (Existing Buildings)
- SDD Guidance for the transition from SPiRiT to LEED

*SPiRiT = Sustainable Project Rating Tool
**LEED = Leadership in Energy and Environmental Design (by the USGBC)

https://eko.usace.army.mil/fa/sdd/

ERDC POC: Richard Schneider  217-373-6724 Richard.L.Schneider@erdc.usace.army.mil

US Army Corps of Engineers®

Directorate of Research and Development
Predicting Encroachment

Impact of Today’s Planning on Tomorrow’s Ranges

Fort Knox

Projected regional urban development

Projected loss of artillery training opportunity

- Regional planning impacts future training opportunities
  - Highways, utilities, zoning, property purchases

- LEAM tools predict …
  - Land development attractiveness
  - Future urban patterns
  - Opportunities to train within those patterns

SERM: https://eko.usace.army.mil/fa/serm/
POC: Dr. Jim Westervelt; 217 373-4530; james.d.westervelt@erdc.usace.army.mil

US Army Corps of Engineers®

Directorate of Research and Development
Force Protection Tools

- Determine infrastructure vulnerability to blast or CBR attack
- Assess impact of attack on human life and mission
- Assist in siting of new facilities

Facilities

Requirement: Meet new security threats
Minimum AT Standards for Buildings Wizard

Aids facility planners and designers to comply with UFC 4-010-01 DoD Minimum AT Standards for Buildings

- Steps user through yes/no questions
- Minimizes need to manually cross-reference UFC document
- Identifies site layout requirements
- Provides design/construction requirements and recommendations

ERDC POC: ERDC CERL Dave Bailey (217-373-6781)
Questions?