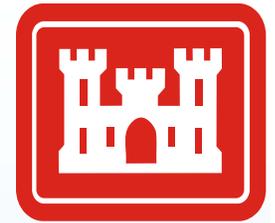
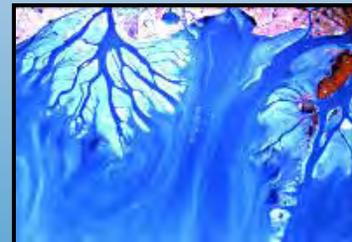




System-Wide Water Resources Program



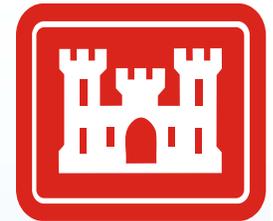
- Major GI R&D Program to address CE Watershed Approach, CW Strategic Goals, and EOPs
- Highly interactive Multi-Lab, IWR/HEC, Field Offices, and CE Partners



POC: Steven.L.Ashby@erdc.usace.army.mil
<https://swwrp.usace.army.mil>



Program Goals



Provide the Corps and its partners the capabilities to:

- Balance development with ecosystem requirements
- Restore and manage water resources over multiple spatial and temporal scales
- Achieve environmental sustainability

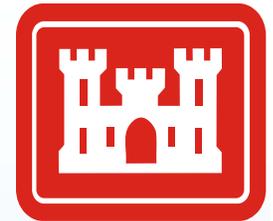


Interagency Collaboration

Local Agencies	The Public
State Agencies	Universities

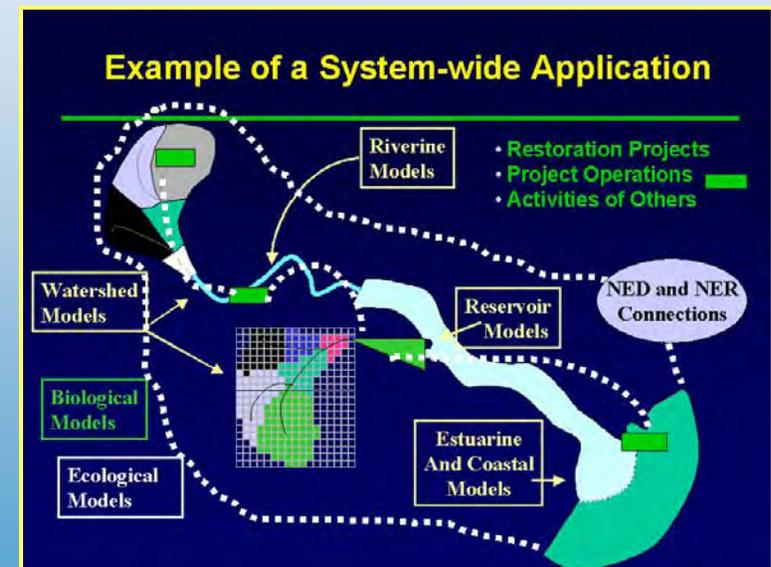


Program Objectives

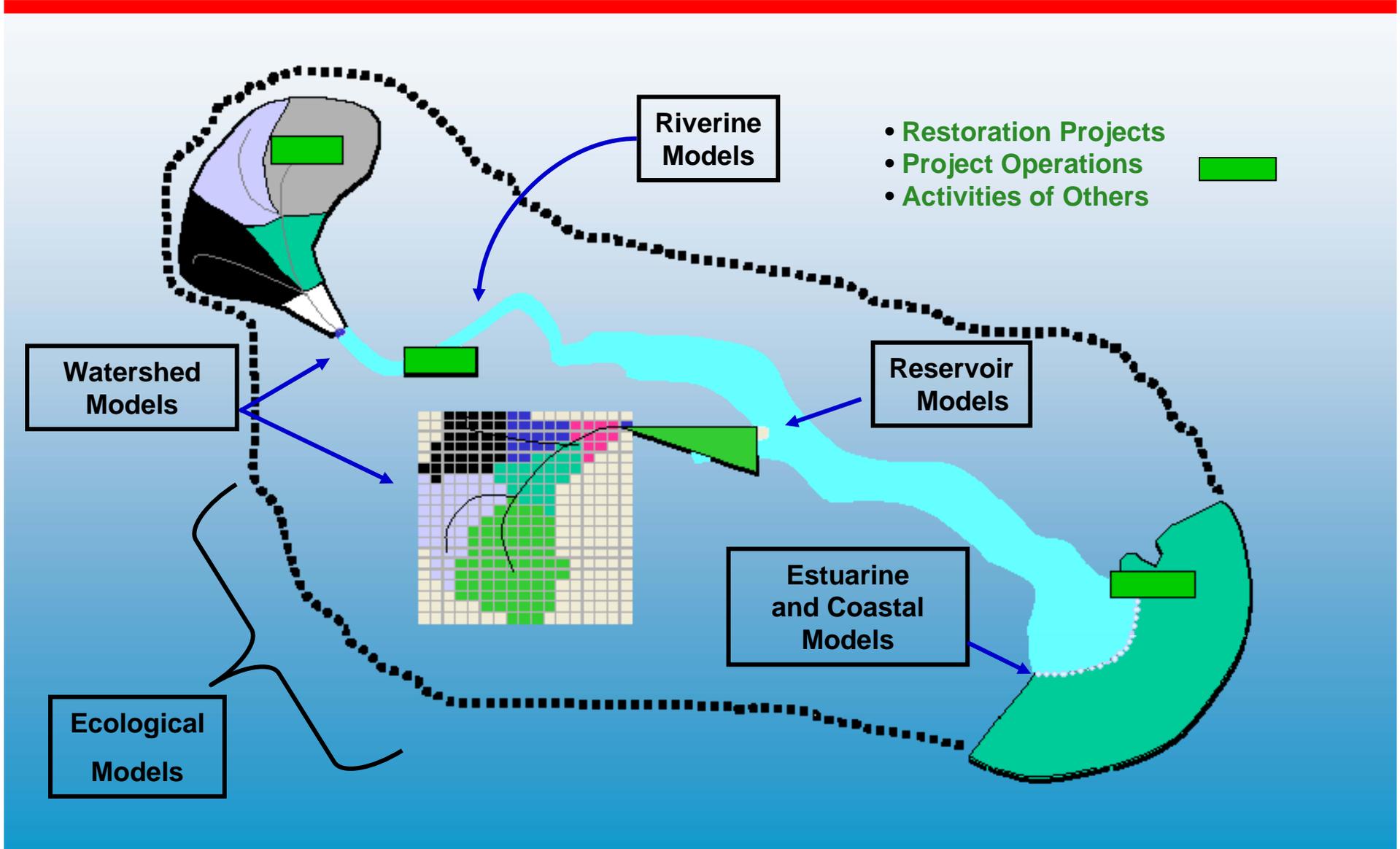
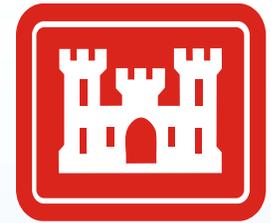


Assemble and integrate the essential components of water resources management to:

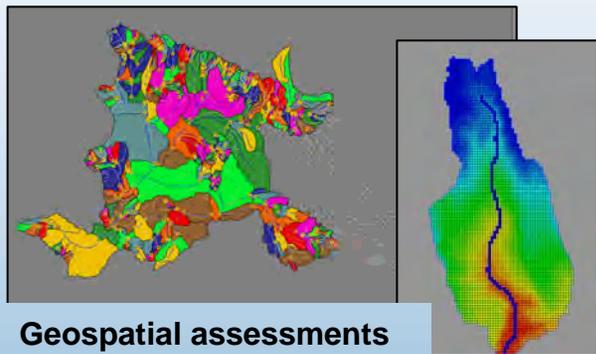
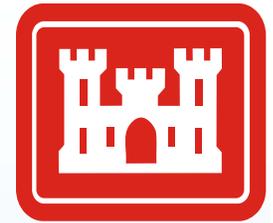
- Transition from site-specific to holistic, integrated assessment and management
- Apply current and improved approaches for forecasting system-wide outcomes of management
- Expedite alternative evaluation, tradeoff analysis, and decision support across watersheds and basins



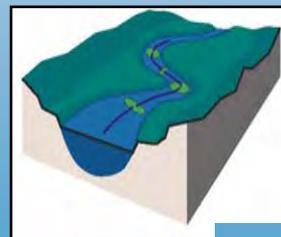
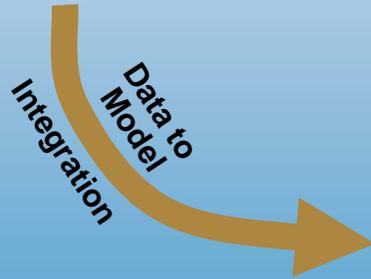
Comprehensive Water Resources Management



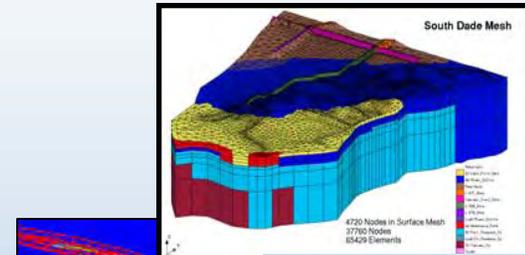
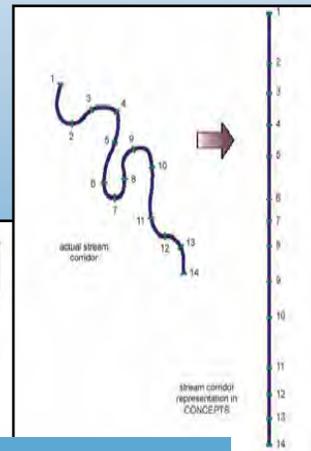
Hierarchical Approach to Water Resources Management



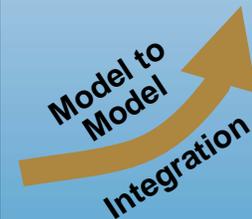
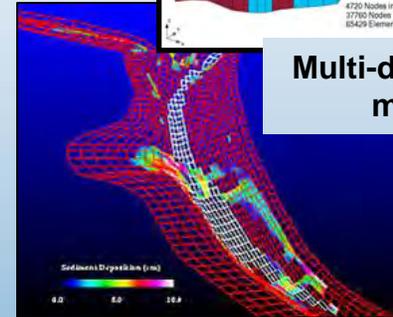
Geospatial assessments



1-D river models



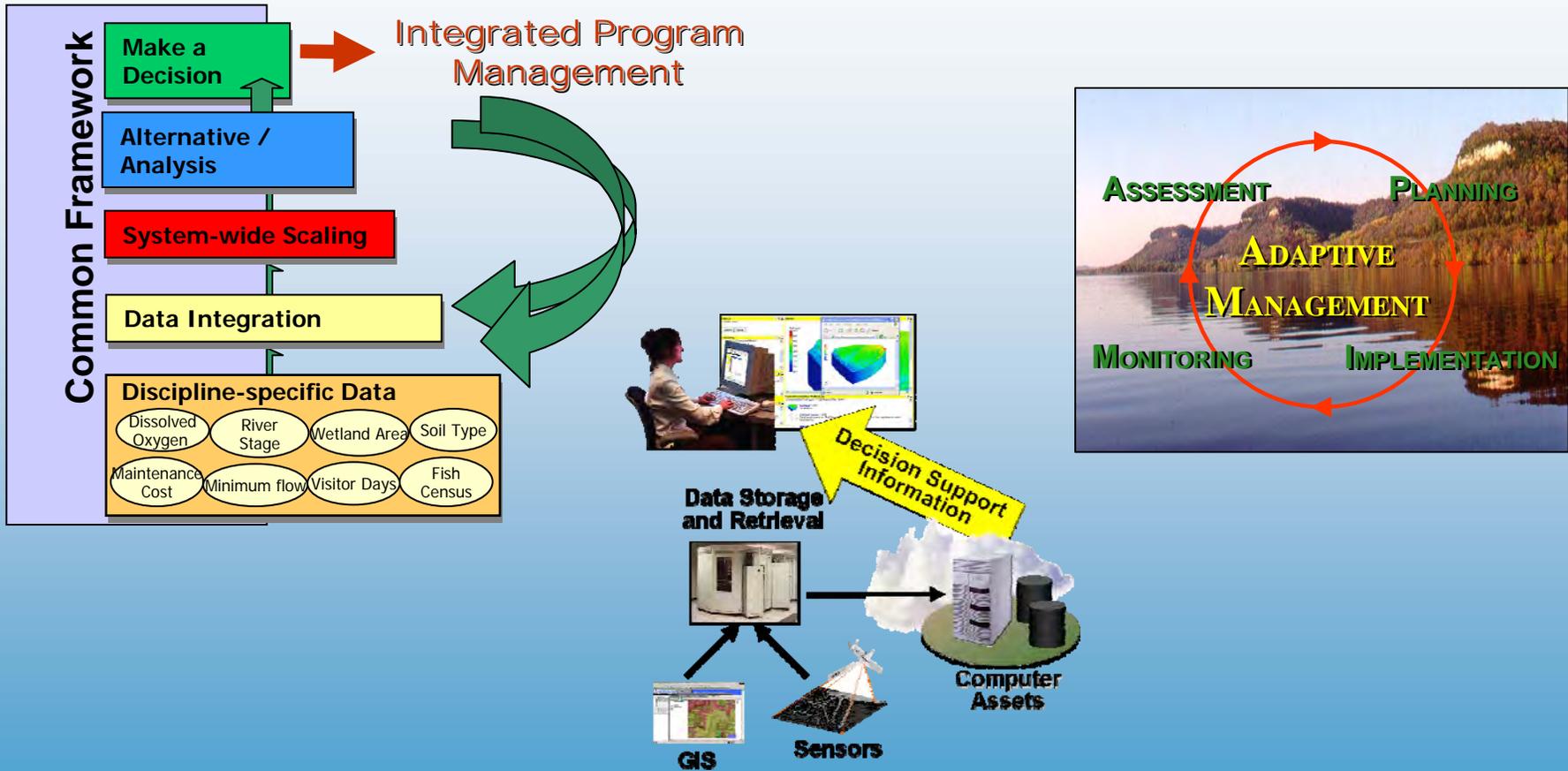
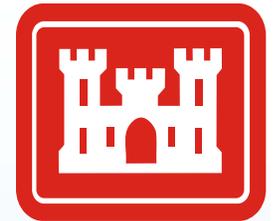
Multi-dimensional models



Allows assessments at various levels of tool “fidelity” to meet stakeholder requirements with consideration for available capabilities and resources.



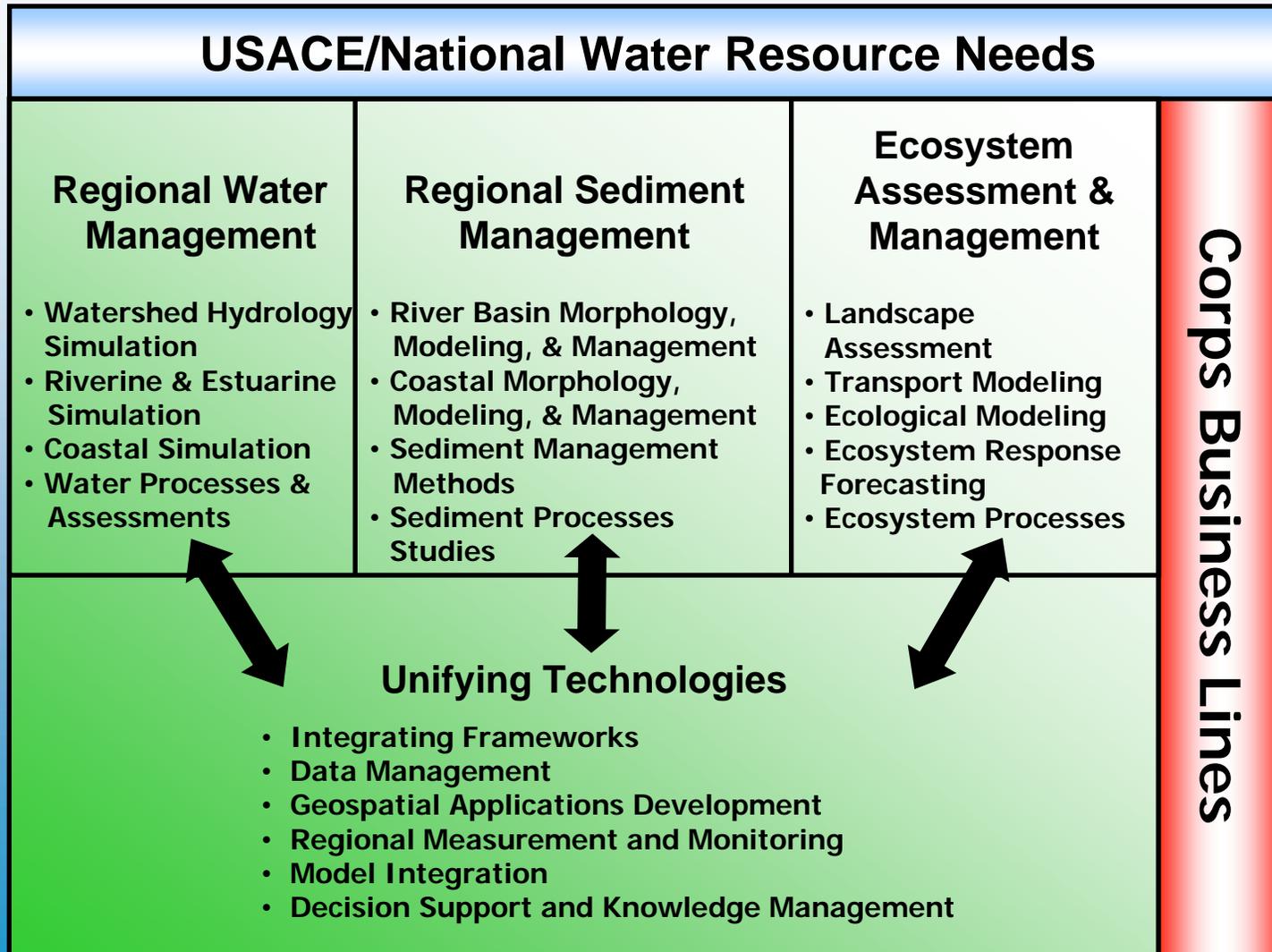
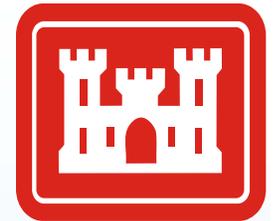
Decision-Support for Ecosystem Management



Combines – scientific assessments – stakeholder review and principles of adaptive management in an iterative process for addressing desired future conditions.

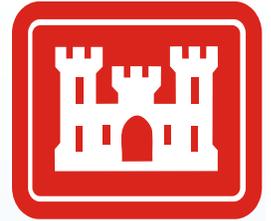


Program Structure

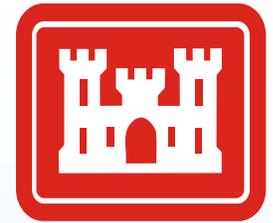




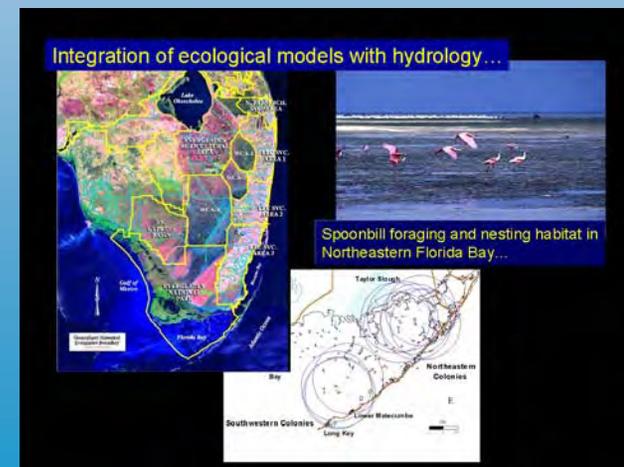
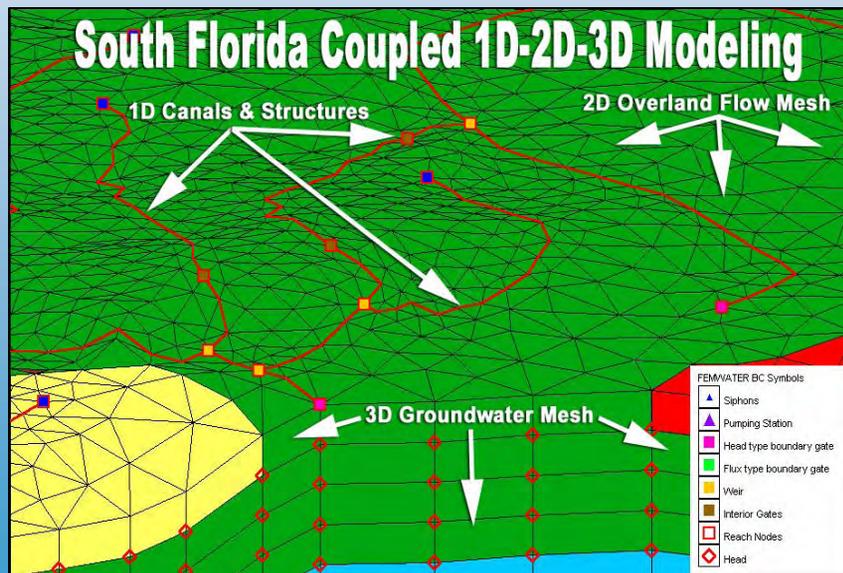
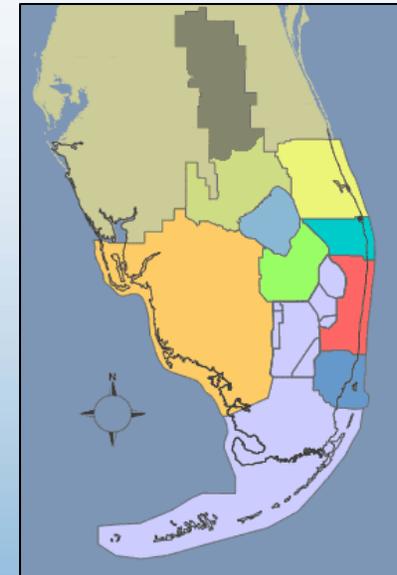
Program Benefits



- **Improved science/engineering in water resources management**
 - Right level of sophistication
 - At the correct scale(s)
 - With the right features
 - All operating efficiently and productively
- **Improved linkages between watershed activities and O&M**
- **Improved forecasting and adaptive management approaches keyed to alternative analysis**
- **Products that empower USACE to engage multiple stakeholders through a collaborative decision support environment**

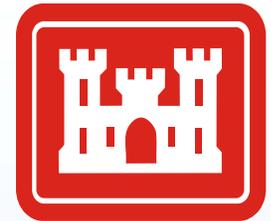


Large-scale
 Multiple-projects
 Hydrologically and ecologically complex





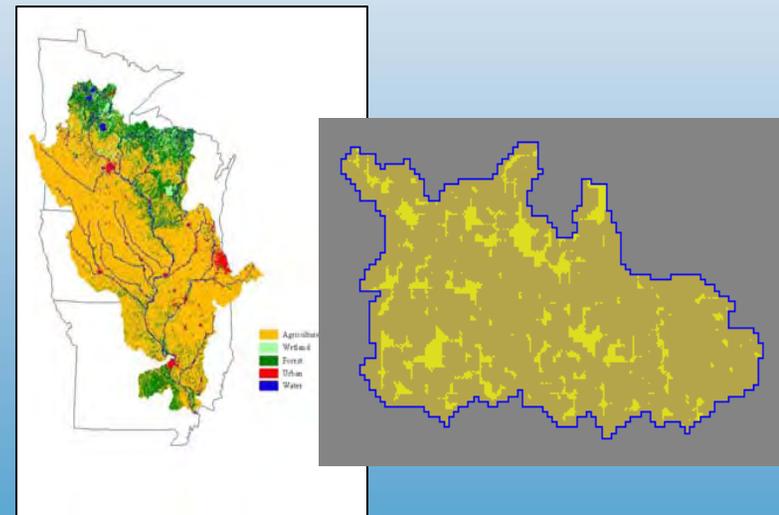
Multi-scale, tiered approaches to UMRS restoration



- Individual locations & habitat scales
- Navigation pool and reach scales
- Tributary watershed scales
- Basin scales



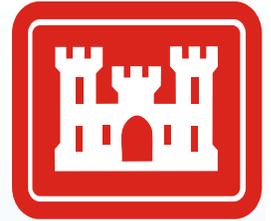
Decision Support Prototype for Restoration Alternatives – Dan Wilcox (MVP) and Upper MS Science Panel



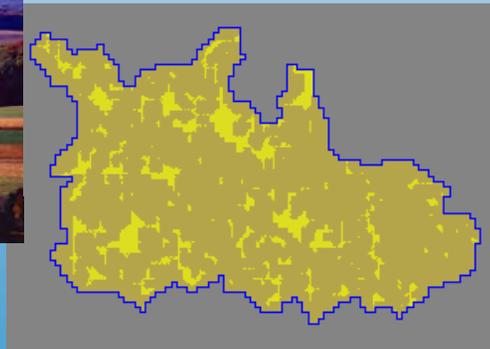
Minnesota River Watershed Study with Surface/subsurface hydrology model
Craig Evans, Terry Birkenstock, Dan Wilcox and local partners



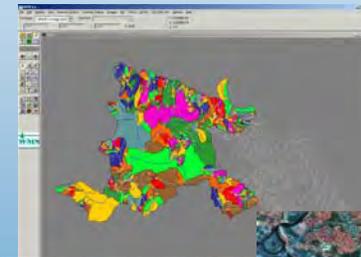
Collaborative Efforts for Technology Improvement Buffalo District



- Interagency technology development and transfer (ERDC, ARS, NRCS, EPA, HQUSACE)
- Field office and local participation in product development (LRB (Tony Friona and Christine Brayman) state NRCS, stakeholders)
- Continued field applications – transportable to other watersheds (LRB, Western Lake Erie Basin)



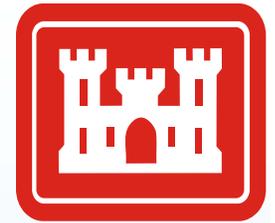
Nutrient management in complex surface and sub-surface regions – combining ARS/ NRCS nutrient kinetics with CE surface/ subsurface hydro model



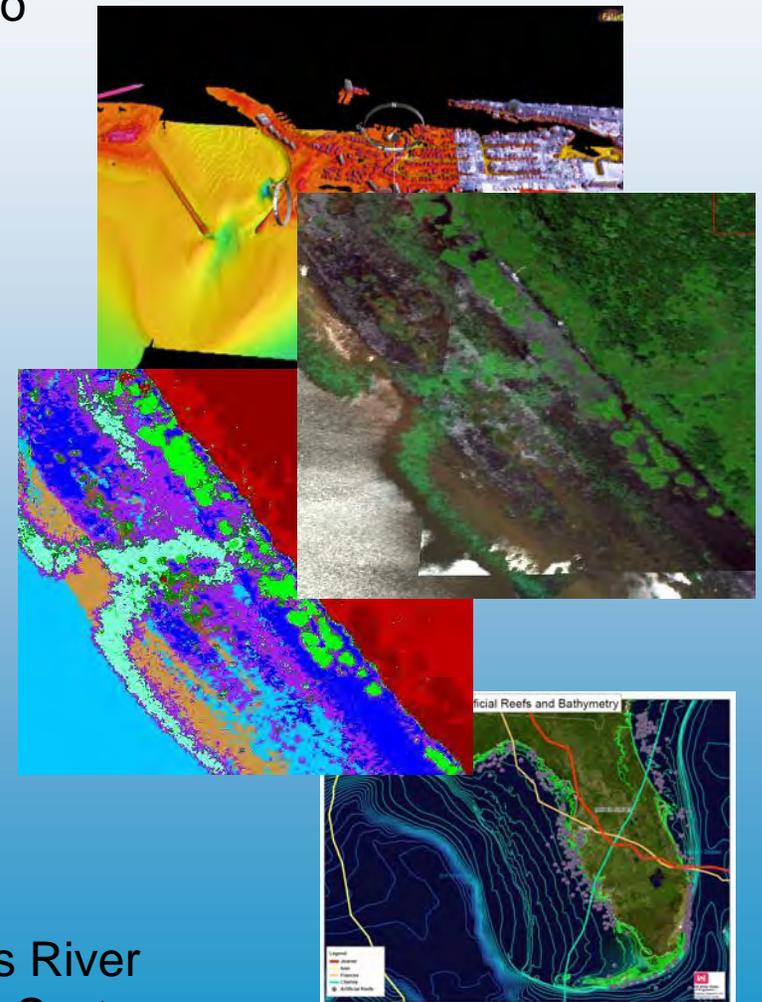
Index-based approach for watershed management – Onondaga Lake



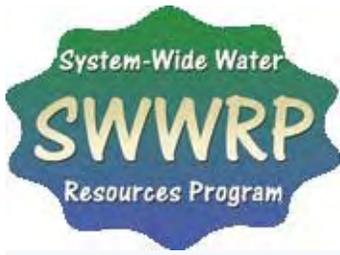
Regional Measurement Technologies for Large-scale Restoration



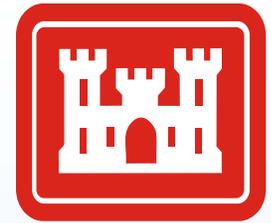
Integrating data from multiple remote sensing technologies for scalable ecological assessments and connecting to hydrodynamic codes for large – scale assessments



Coastal Louisiana and Upper Miss River
Coastal Wetlands and other River Systems



Other Interagency and Field Collaboration



- TNC and HEC – Sustainable Rivers (Ecosystem Functions Model)**
- TNC and ERDC/IWR – Bioindicators and Metrics – Environmental Benefits**
- NAB - Middle Potomac Tributaries Study – Regional Sediment Management**
- NAB - Chesapeake Bay Studies**
- MVD/MVK/MVM/MVN - Lower Mississippi River Conceptual Modeling**
- SWF – Cibola Creek (with NRCS, USGS, and locals)**
- SPD (with Desert Research Institute and HEC) – Truckee River Restoration collaborative effort with Urban and Stream Restoration Demo in Arid Regions**
- NWD – Columbia River – Numerical Fish Surrogate (Fish Passage)**

**Watershed (System-Wide)
Approach**



**Highly Interactive
Used by the Field**