US Army Corps
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USACE – SWF
RiverWare Enhancements

One Corps Serving The Army and the Nation

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U.S. Army Corps of Engineers (USACE)

- 38 District/Division Offices for Civil Works
- 7 Laboratories
- 35,000 Employees
- $5 Billion Annual Civil Works Budget
- Military Design/Construction
- Contract Administration (Billions)
- Design/Construction for Other Agencies

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Key Mission Elements

- Water management
  - Flood control - 383 Dams/Reservoirs (27 SWF)
  - Over $20 Billion in Flood Damages Prevented Each Year, $1 Billion+ SWF
    - Hydrologic network ($40 million)
  - Navigation – 235 Locks/Dams
  - 12,000 Miles of Waterway
  - 300 Commercial Harbors
  - Water supply – 10 Million People In 115 Cites Plus Agriculture
  - Hydro Power – 75 Sites w/ 25% of Hydroelectric or 3% of Energy
- Recreation
  - Nation's Largest Outdoor Recreation Supplier
  - 2,500 COE Operated Plus 1,800 Leased Areas
  - 360 Million Visits, 600,000 Jobs Directly Related
- Environmental restoration
- Emergency response (hurricanes, tornados, etc), Military Construction & Contracts, Iraq, Afghanistan

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Reservoir Control

- BUDGET
  - $4 – 5 million
- PEOPLE
  - 14 full time employees
    - Engineers, hydrologists, technicians, support
  - 1 On-site contractor

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Reservoir Control Branch Projects

- Red
  - Cooper (Jim Chapman), Wright Patman, Lake O' Pines
- Neches
  - Sam Rayburn, Dam B (B.A. Steinhagen)
- Trinity
  - Benbrook, Joe Pool, Ray Roberts, Lewisville, Grapevine, Lavon, Navarro Mills, Bardwell
- Brazos
  - Whitney, Aquilla, Waco, Proctor, Belton, Stillhouse Hollow, Georgetown, Granger, Somerville
- Colorado
  - O.C. Fisher
  - Hords Creek
  - Twin Buttes*
  - Marshall Ford*
- Guadalupe
  - Canyon

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* Section 7 Projects (COE responsible for flood control operations only)

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Mission Elements

- Flood control operations (RiverWare)
  - 10.7 million AC-FT flood storage
  - Prevented $42 billion in cumulative damages
- Water supply (RiverWare)
  - 6 Million AC-FT water supply storage
- Hydropower (RiverWare)
  - 370,000 total MWH/year @ 5 locations
- Planning studies (RiverWare)
- Supplying data to the public
- Water quality sampling and reporting
- Sedimentation monitoring and reporting

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Why RiverWare

- Reallocation studies
- Changes in operation to accommodate:
  - Flooding issues
  - Recreation interests
  - Users with conflicting needs
  - Environmental needs
- Risk assessments
- Evaluate litigant claims
- What if scenarios
  - Flooding
  - Drought

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Phases 1 - 3
(Starting FY2001)

- Flood control algorithm
  - Develop control point objects & workspace flood control configuration
  - Add operating level data to reservoirs
  - Add mandatory release methods to reservoirs
  - Add forecasted hydrology methods to reservoirs, reaches & control points
  - Develop regulation discharge & space hydrograph methods on control point objects
  - Computational sub-basin object
- Developed flood release dispatch method slots

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Phases 4 - 6

- Flood control algorithm testing & documentation
- Integration into CWMS
- Integrated DSS DMI
- Critical dependable yield
- Hydropower methods
- Conditional probabilities
- Post-processing statistical methods
- Performance tuning

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Phase 7

- Runtime performance improvements (COE methods)
- Statistical post processing
- Alternative routing coefficients
- Integrated DSS DMI enhancements
- Critical dependable yield (controlled multiple runs)
  - Joint with USBR
- Water accounting capabilities (WAM)
- Transit losses
- GIS capabilities

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What We Are Currently Doing w/ RiverWare

- Current models (planning)
  - Red
  - Neches River
  - Brazos River
  - Trinity River (under development)
  - Guadalupe
- Studies
  - Neches River basin rule curve for Sam Rayburn
  - Reallocation/yield studies for Brazos River basin projects
  - Operational model for Red River

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Questions?