



US Army Corps of Engineers



# U.S. Army Corps of Engineers and RiverWare

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# USACE Overview

- 38 district/division offices for civil works for water resources and environmental
- 37,000 employees
- \$5 billion annual civil works mission
- Military design/construction domestic and international
- Emergency response to disasters
- Design/construction for other agencies



# USACE Water Resource Mission

## Water management

Flood control - 383 Reservoirs (27 SWF), 11,750 miles of levees

Over \$20 Billion in Flood Damages Prevented Each Year, \$2 Billion+ SWF)

Hydrologic network partner (\$27 mil)

Navigation – 195 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, 54k miles shoreline

370 Million Visits

## Restoration of aquatic ecosystems

## Environmental protection and permitting



# USACE Modeling Needs

- Reservoir systems simulations
  - Period of record
  - Operational
  - RiverWare
  - RESSIM
  - Home grown systems (legacy)
- Forecasting rainfall runoff events
  - CWMS – HMS, RiverWare, RAS, FIA
  - Home grown systems
- Planning studies
  - HMS, RAS, RiverWare, FIA, statistical analysis, misc.

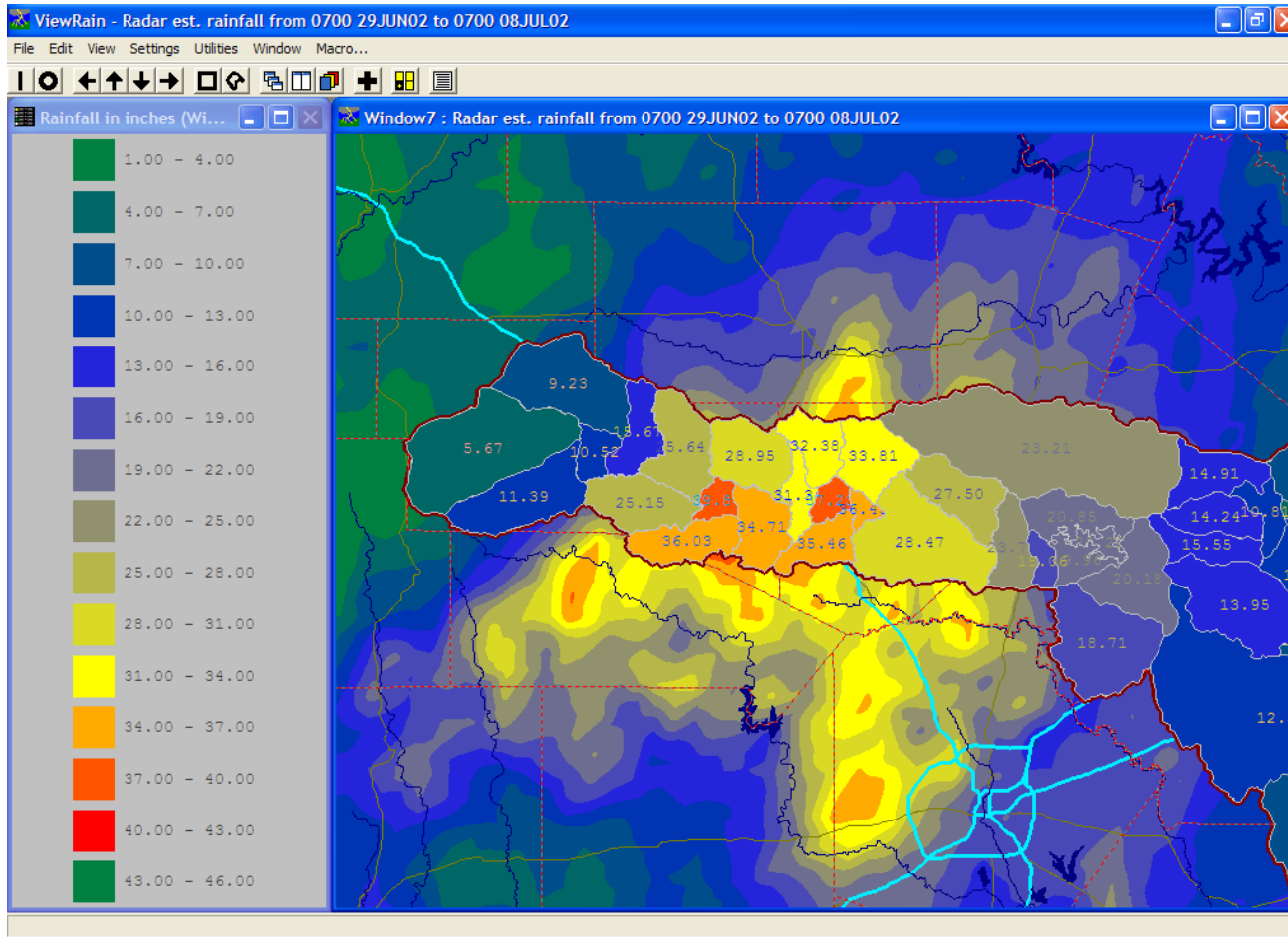


# CWMS

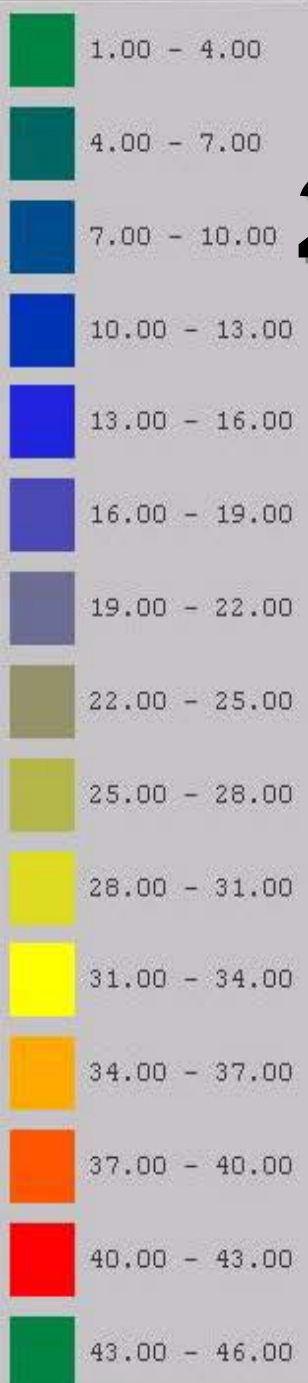
- Corps Water Management System (CWMS) by HEC
- Oracle and DSS databases
- Forecast and operational modeling
  - CAVI-NMI (workflow)
  - HMS, RAS, RiverWare, RESSIM
  - Meteorological parameters GIS tool
- Data management, decision support



# Precipitation Visualization

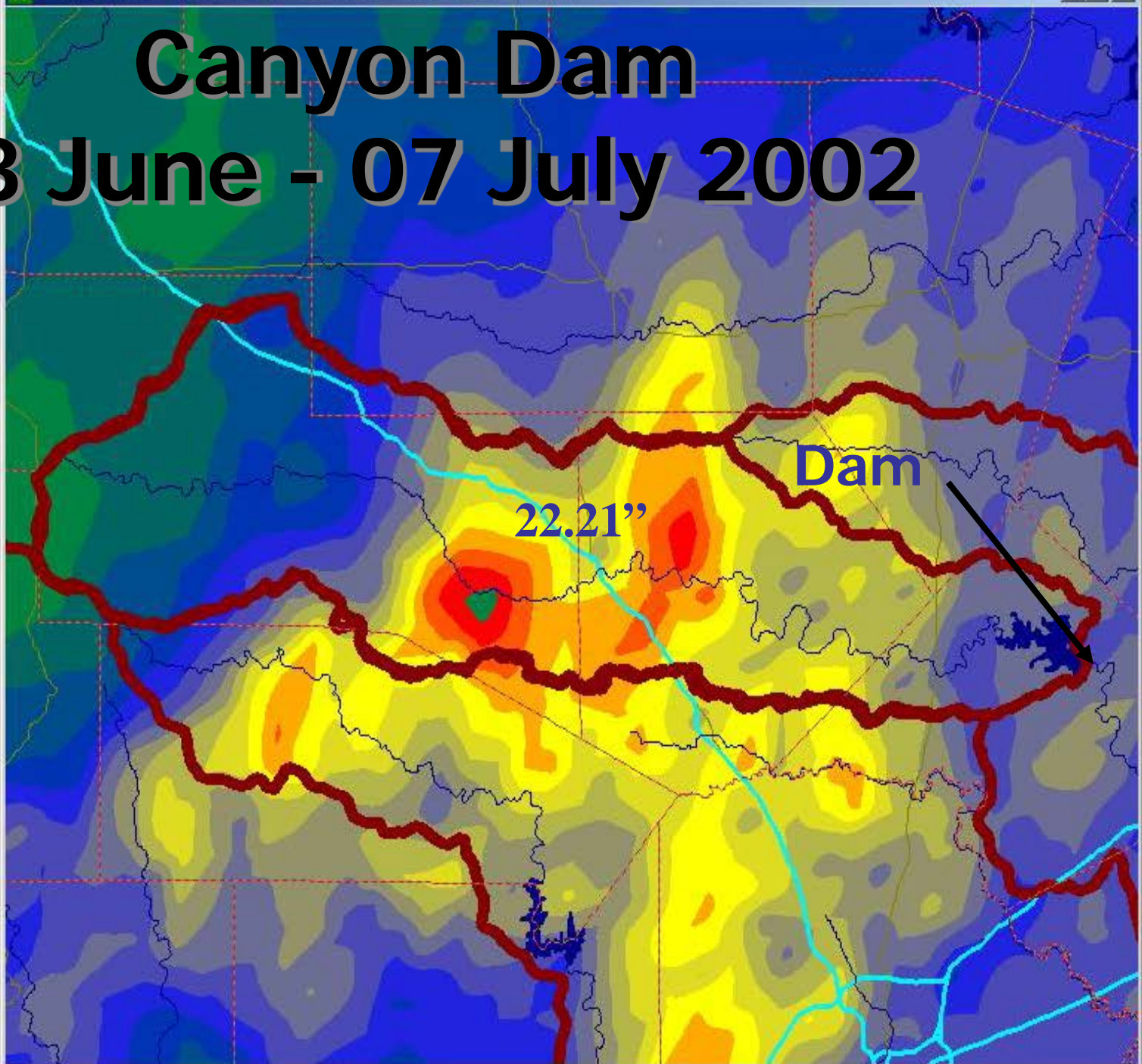


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# Canyon Dam

## 28 June - 07 July 2002





# Canyon Dam Spillway



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# RiverWare Program Overview

- USACE program began 2000
- Partnership between multiple USACE offices, other government agencies (USBR & TVA) plus some independent USACE efforts
- RiverWare was adopted to perform:
  - Flood control operations and analysis
  - Conservation analysis/water accounting
  - Hydropower analysis
  - Dam safety evaluations
  - Environmental analysis
  - Both planning and operational analysis



# Highlights

- \$2.4 million USACE expenditure
- Partnering with other USACE offices and USBR
  - DSS DMI
  - URGWOM
  - Reports
  - Graphics (plot templates)
  - Usability
- 10 USACE offices plus partners
- Statewide growth of RiverWare program use (all basins modeled)
- Legacy systems discontinued
- Inclusion into Corps Water Management System (CWMS)
- Decreased run times
- Report and graphic enhancements



# SWF Reservoir Projects



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# SWF Specific Projects

- Dallas floodway levee stage durations
- Lewisville and Ray Roberts dam safety evaluations
  - Duration analysis and frequency curves
- Proctor Lake – regulation plan revision & DS pool restrictions
- BRA – basin wide reallocation study
- Wright Patman Lake – reallocation study
- Lake O' The Pines – environmental flows study
  - Adopted 5 yr environmental flows with triggers
- Sam Rayburn Lake – water availability study
- Neches River – environmental flows study
- Lewisville/Ray Roberts Lakes – DWU operational plan/seasonal pool raise
- Joe Pool Lake – terminal storage evaluation
- Drought scenarios on Whitney and Sam Rayburn



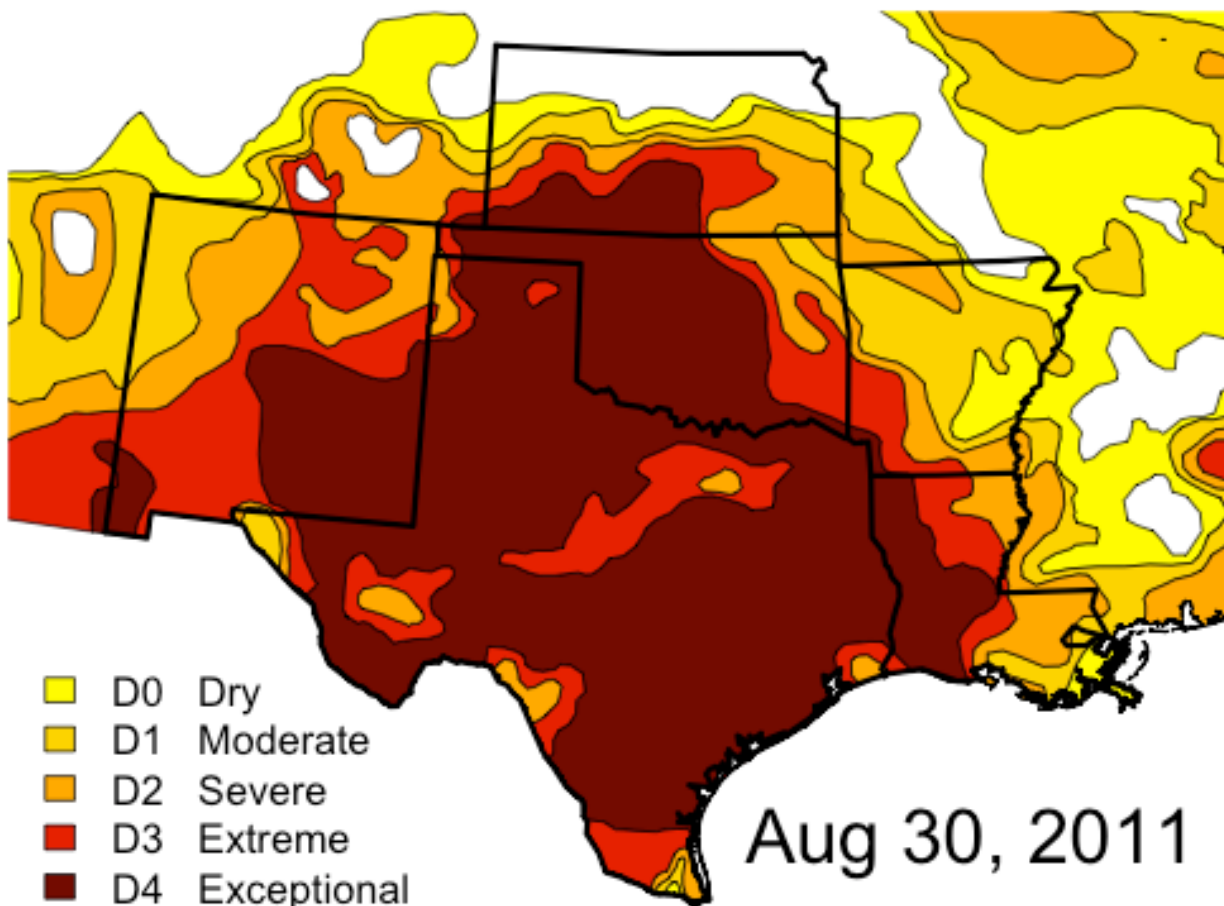
# Dallas Floodway



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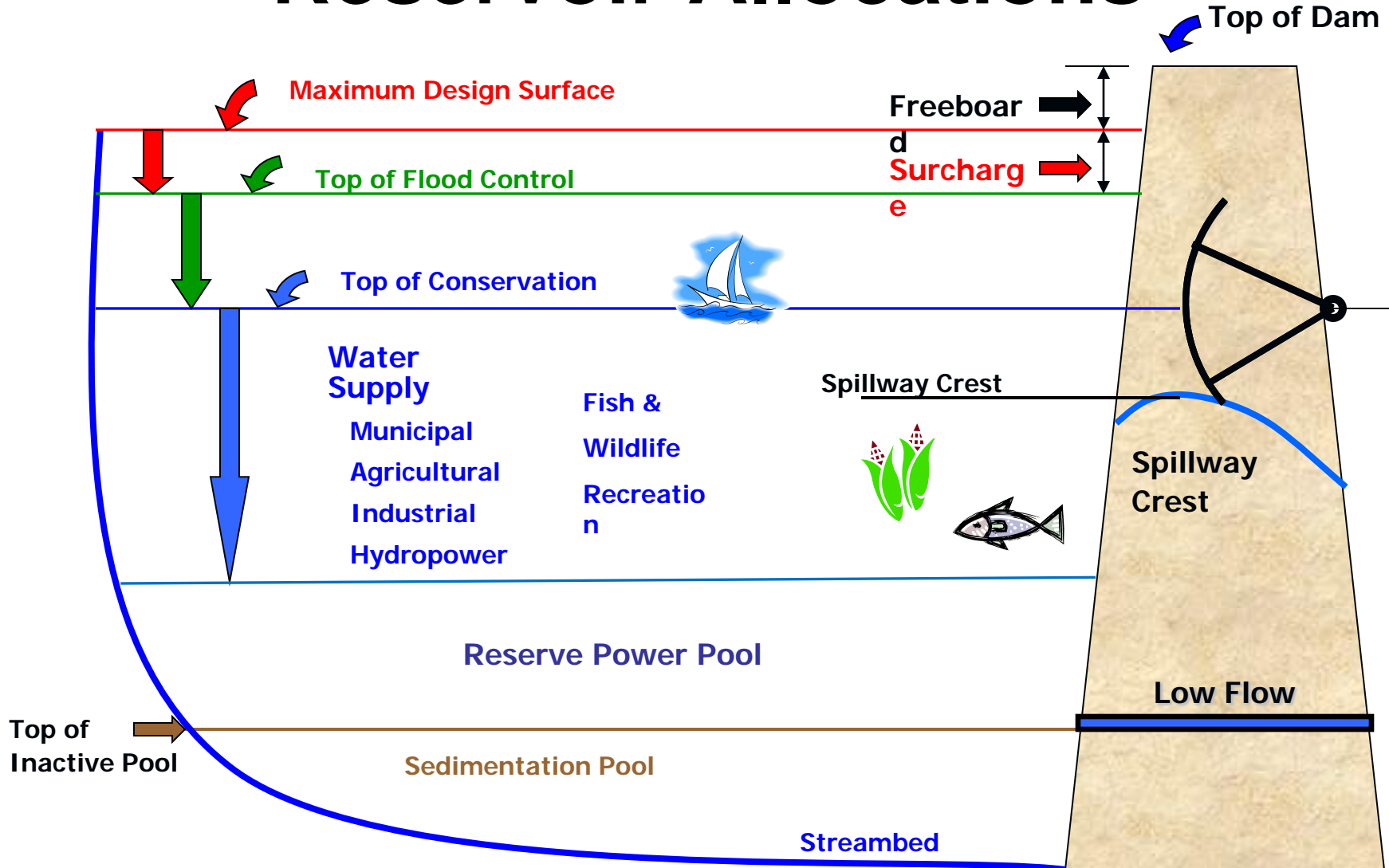
# August 2011 Drought Status



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# Reservoir Allocations



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# Future Activities

- CWMS CAVI-NMI integration
- CWMS database DMI
- NWS-RFC CHIPS integration
- GIS
- Climate change/watershed change/es
- Collaboration btw CADSWES, NWS, HEC
- 5 yr, \$5 mil contract





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# Questions?

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