


RiverWare™ Model of Dallas Water Supply System

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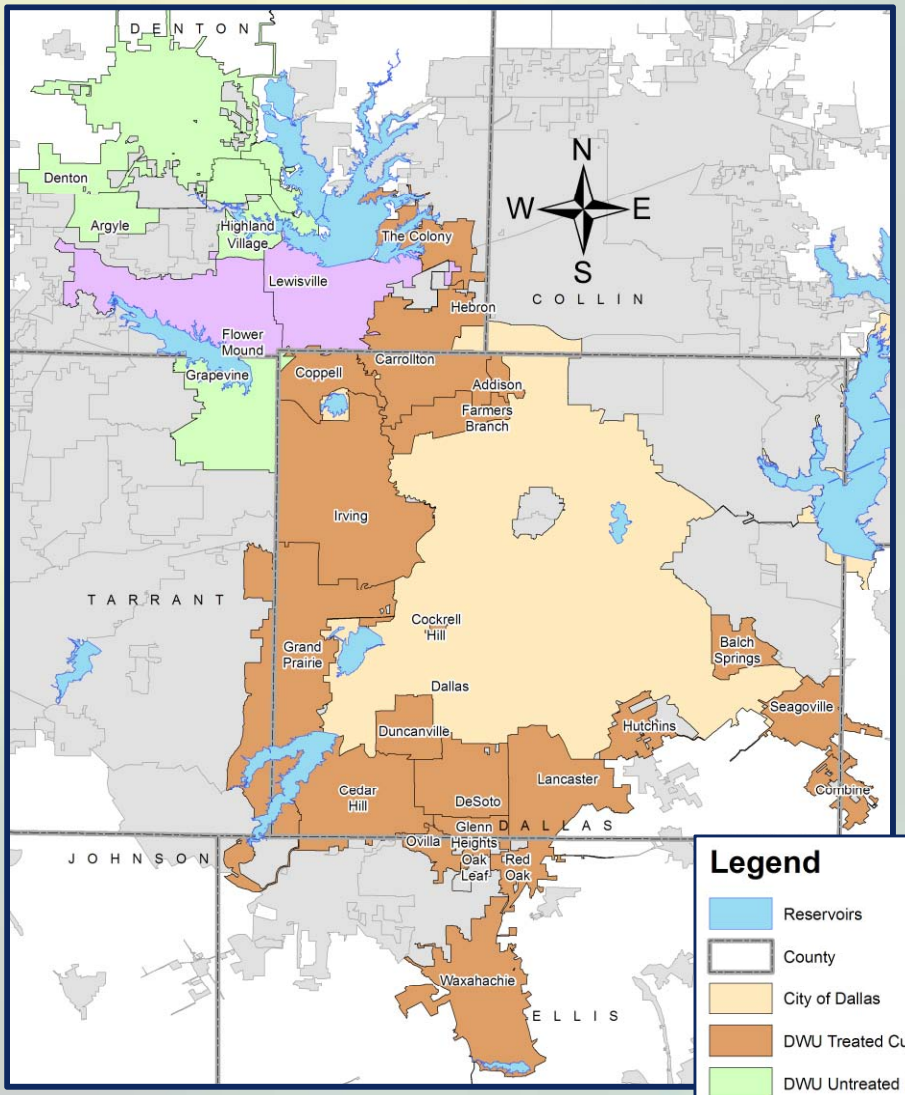
City of Dallas Water Utilities (DWU)

- The Water Department was founded in 1881
- DWU is funded from water and wastewater revenues, and does not receive tax dollars
- Approximately 1,500 employees
- Population served
  - 1.26 million - Dallas
  - 1.06 million in 28 wholesale customer cities
  - 2.32 million total
- 699 square mile service area



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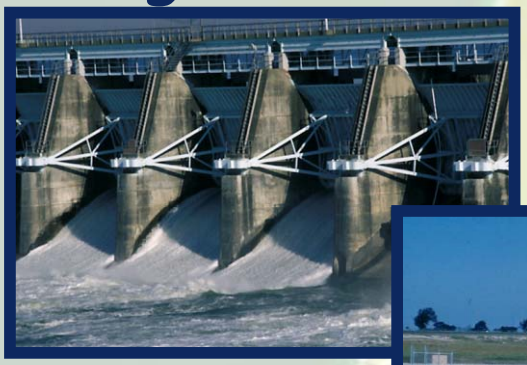
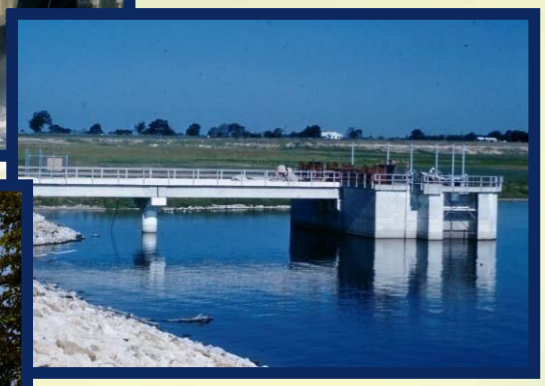
City of Dallas Water Assets





- 7 reservoirs (5 connected and 2 currently not connected)
- 4,800 miles of water mains
- 4,200 miles of wastewater mains
- 3 Water treatment plants with a combined capacity of 900 MGD
- 23 pump stations
- 9 elevated and 12 ground storage tanks
- Value of water assets $1.856 Billion in 2008
- Combined water and wastewater system outstanding debt $2.258 Billion in 2008

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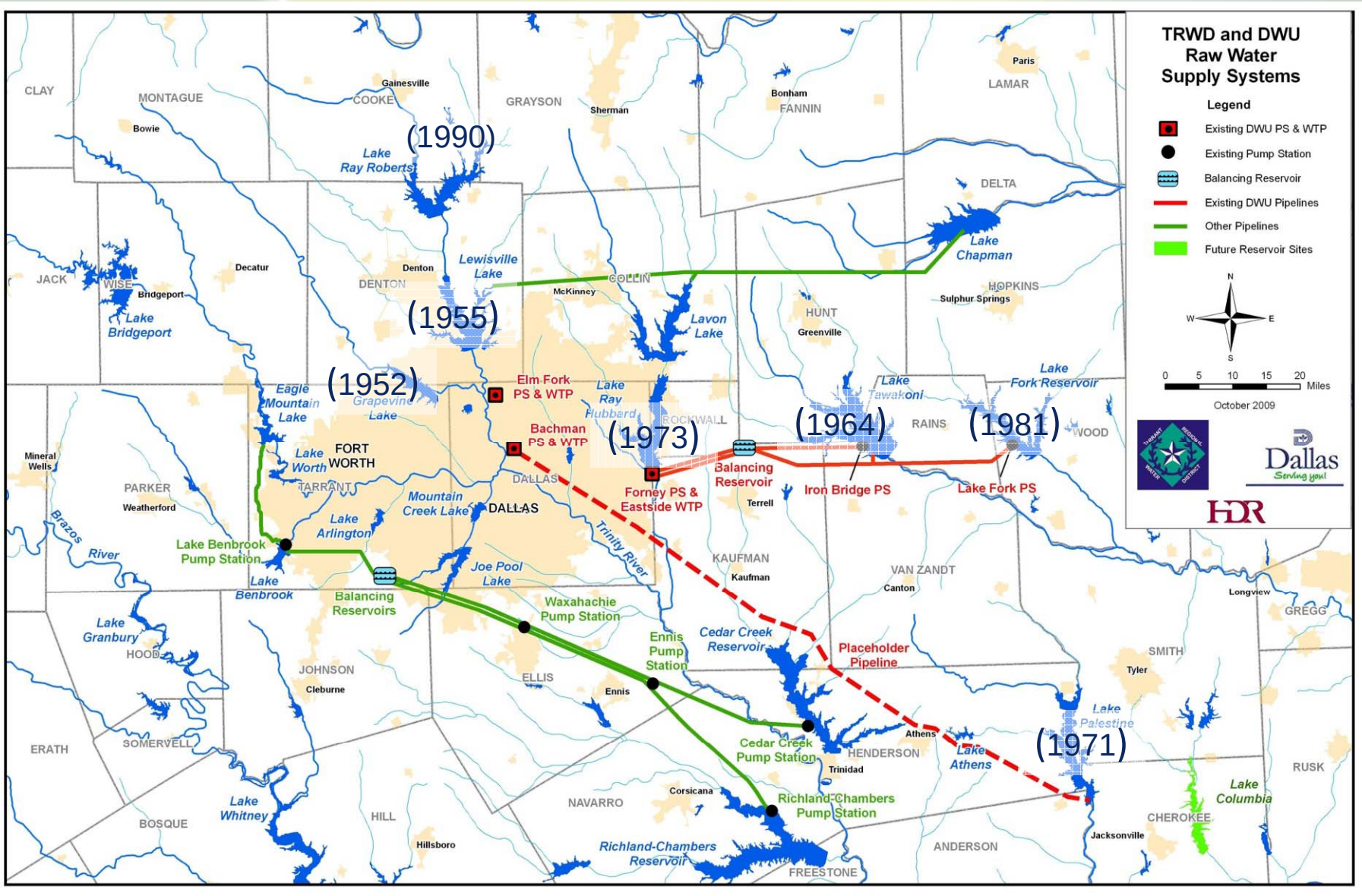
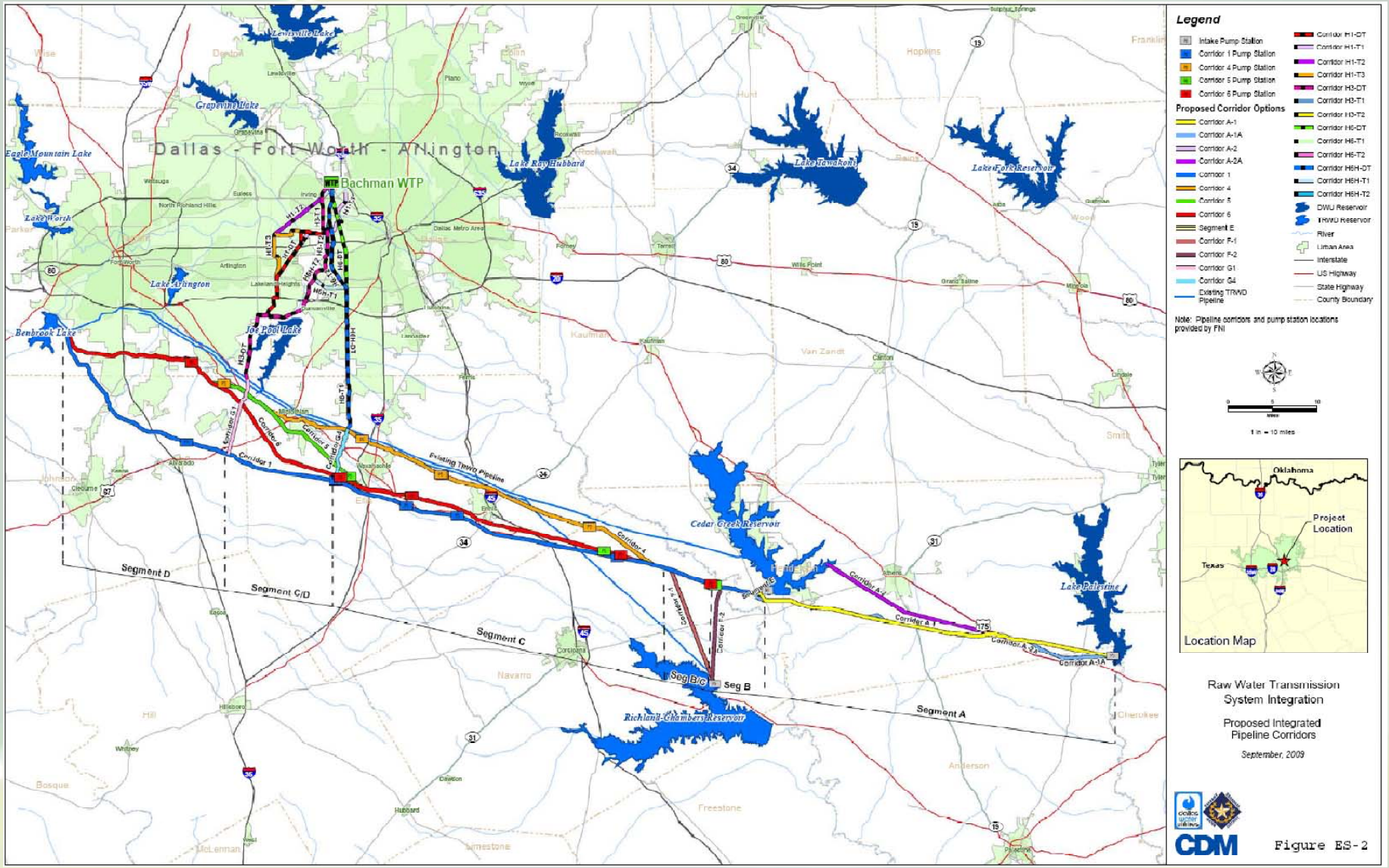
Supply System Map



Proposed Palestine Pipeline Corridors



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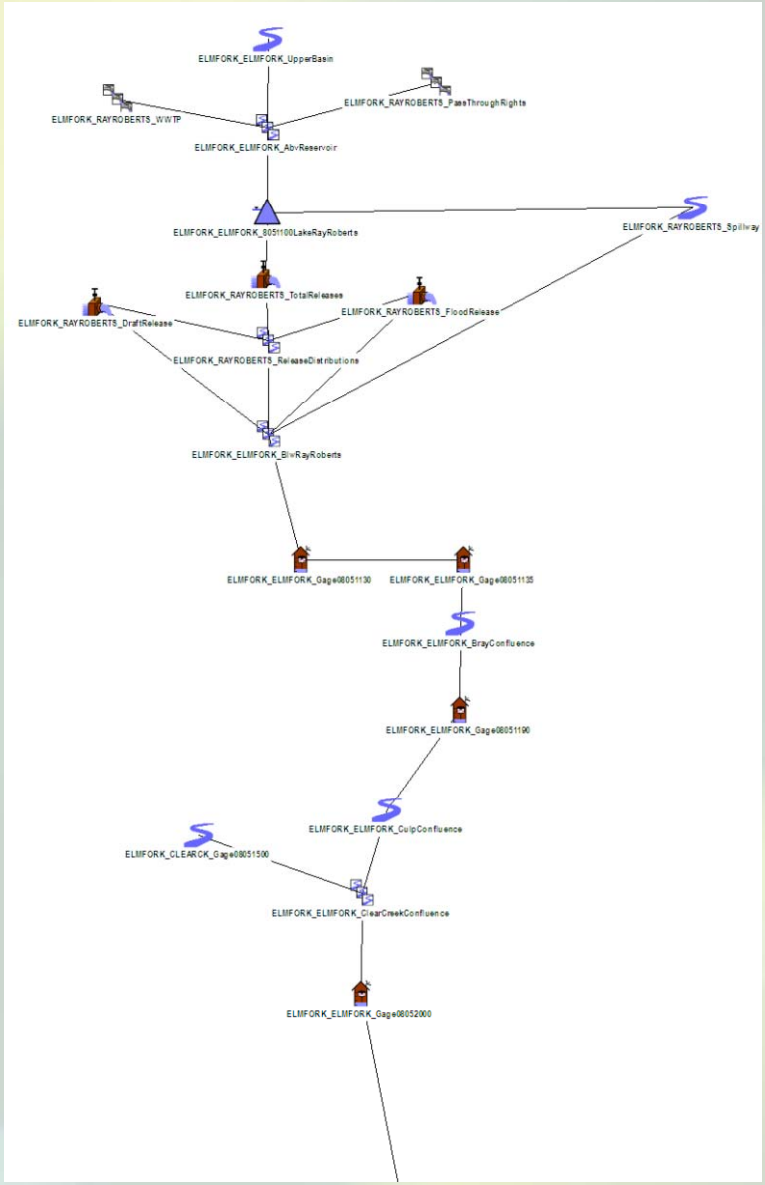
Future Supplies/Pipelines

- Replace existing Tawakoni pipelines to allow full utilization of Lake Fork supply
- Connect Lake Palestine (2018)
  - Integration study in partnership with Tarrant County Regional District (TRWD)
  - Dallas System (150 MGD capacity)
  - TRWD System (197 MGD Capacity)
- STELLA model (CDM, 2010) - feasibility study
- RiverWare™ Model (HDR, 2010) – future operations/planning

DWU RiverWare Model Overview

- Goals:
  - Firm yield
  - Operational planning
  - Operational optimization
  - Forecasting/Annual operation planning
- Monthly timestep with
  daily step out capability
- Key Components
  - Reservoirs (13)
  - Pipelines/ Pump Stations
  - Hydrology (1907 – 2007)
  - Water Demands (2010 to 2060)
  - Demand Management Options
  - Climate Change Options
  - Water Rights Options
  - Return Flow Options



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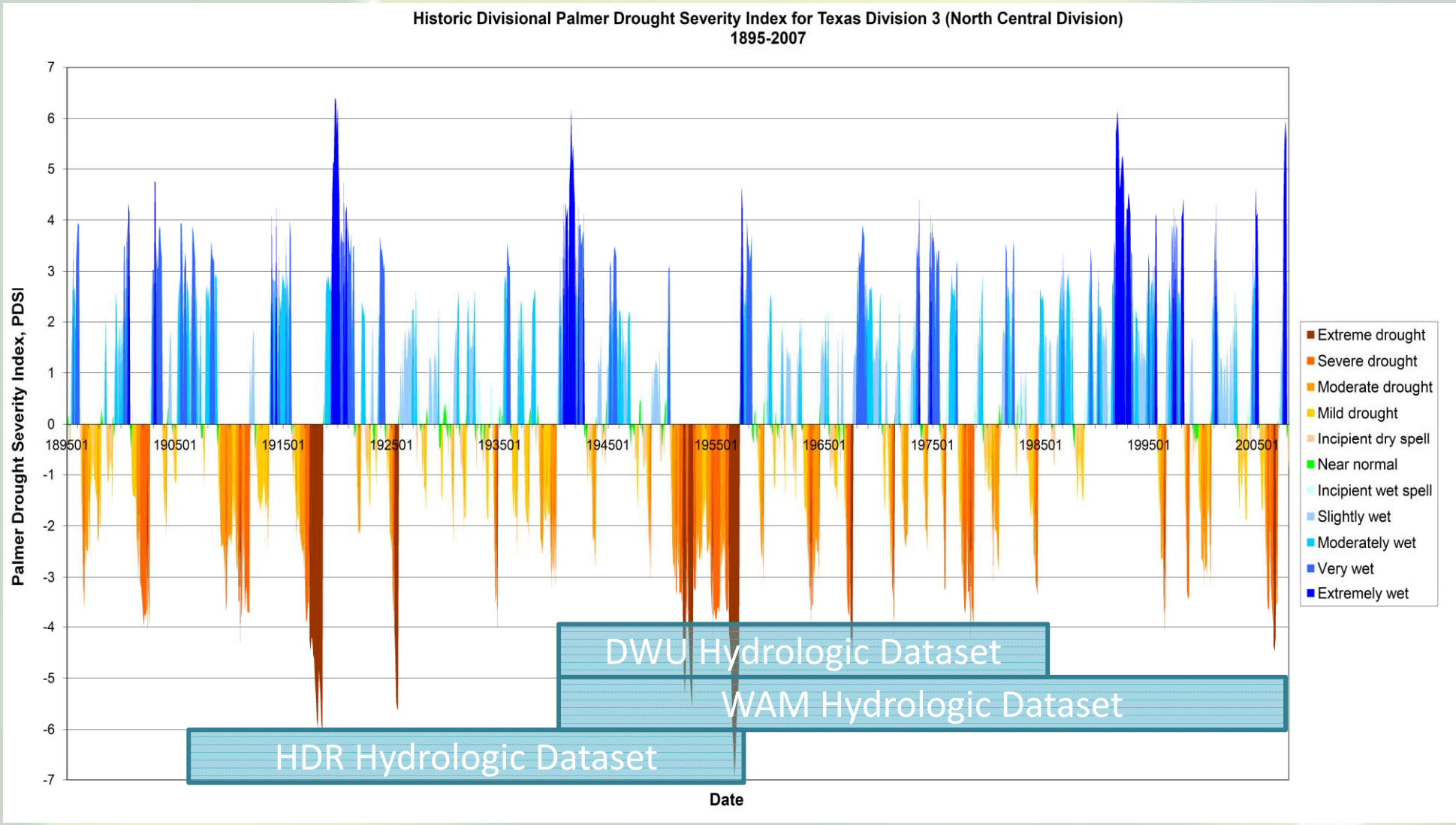
Hydrology – Period of Record



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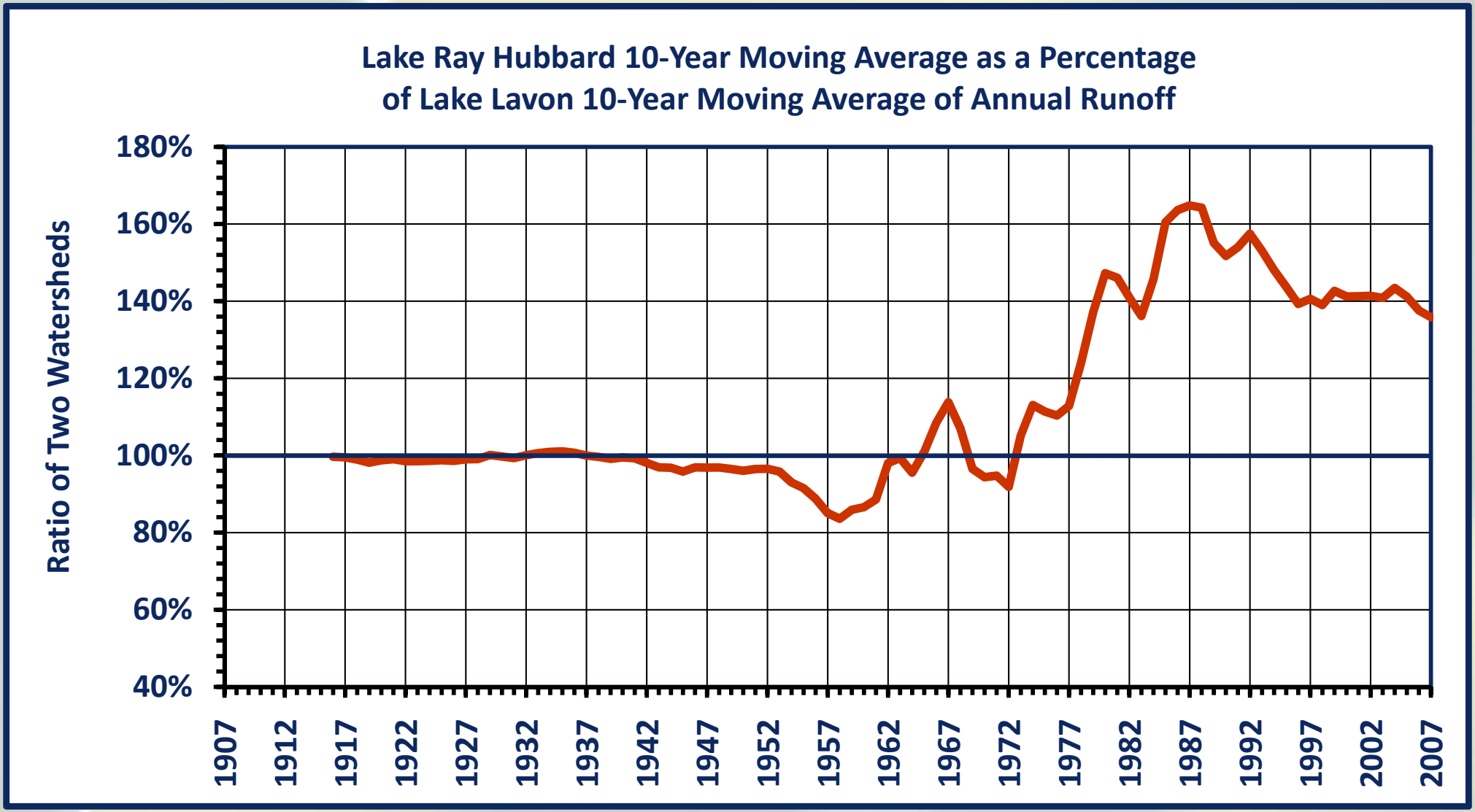
Hydrologic Trends



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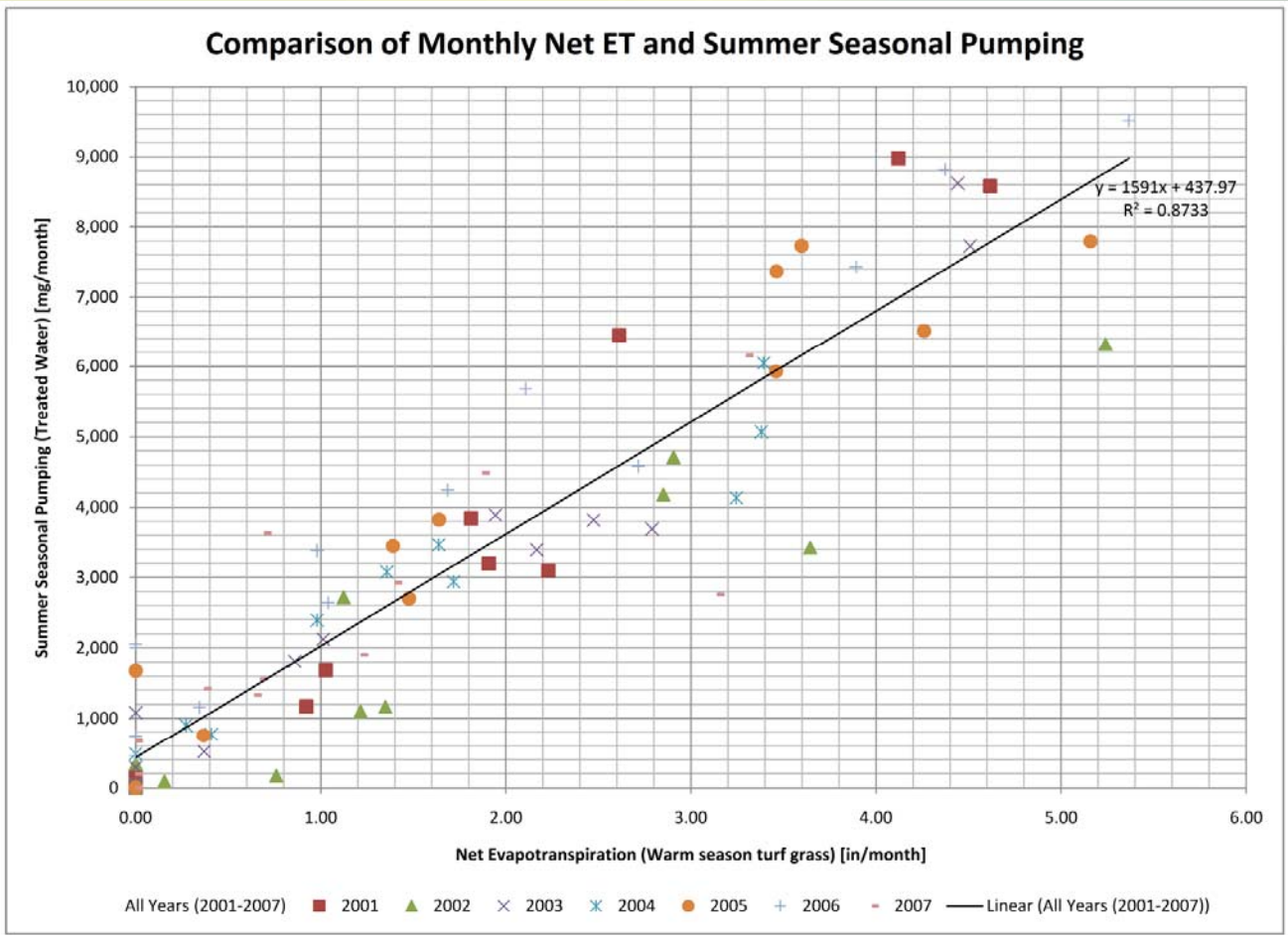
Climate Based Demands

- Reservoir Evaporation
  - Historic
  - Climate change scenarios
- System Demands
  - Incorporate water conservation
  - Historic past droughts
  - Climate change scenario impacts



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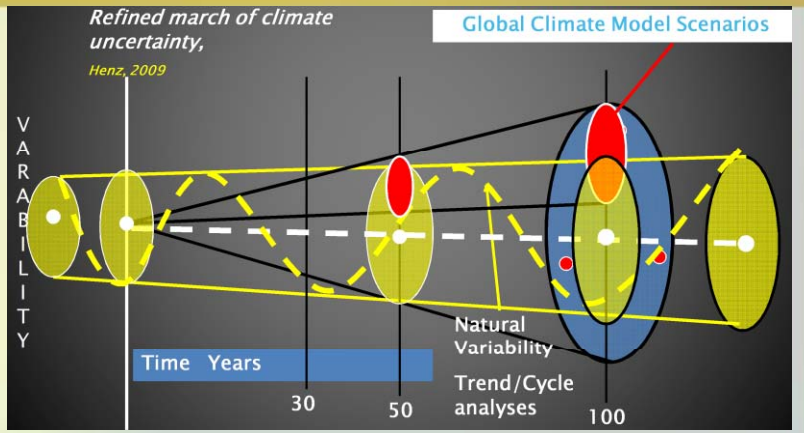
Climate Change

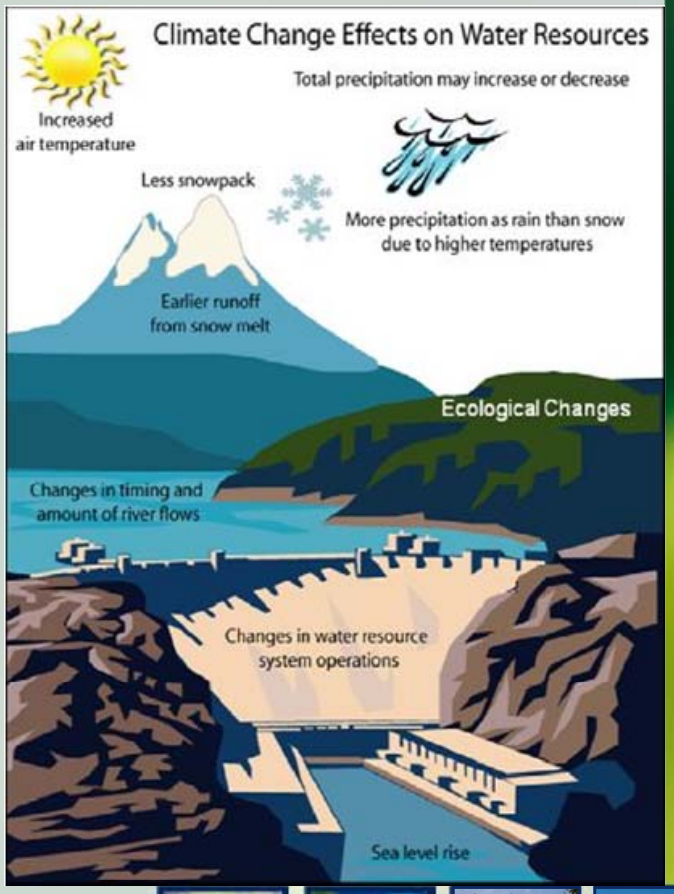


HDR Atmospheric Sciences Group

- Water Supply Planning and Prediction
  - Hydro-climate Indices (HCI)
  - Hydro-Climate Atmospheric Indexed Runoff Prediction (HARP)
  - Paleo-Climatology Records (Tree-Rings)

- Climate Change Impact Assessment
  - Cyclical-Trending Analyses (CTA)
  - Hydro-Climate Change Utilization Prediction tools (HYCCUP)
  - GCM Model Output Scenario Modeling
  - GCM-Downscaling Gridded Output using Statistical and/or Dynamic (MM-5) s

- Sustainable Return on Investments (SROI)



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Thank you. Questions?

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