

# Water Conservation, Water Reuse & Water Quality versus Big Drought

## Texas Water Resource Strategies



Roger E. Schenk, Jr.  
Principal Scientist  
CDM Smith Inc.  
Austin, Texas

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# Presentation Overview

- Major Historical Droughts of Texas
- Texas Water Management Practices
  - Water Conservation
  - Water Reuse
- Drought Water Quality Impacts
- Regional Water Plans
- State Water Plan



# Most Severe Droughts in Texas

- 1909-1912 Drought
- 1916-1918 Drought
- 1923-1925 Drought
- 1937-1939 Drought
- 1950-1956 Drought\*
- 2008-2014 Drought

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\*-Drought of Record in Texas



# 1950-1956 Drought

- In Texas, the 1950-1956 period is considered as the “Drought of Record”
  - 1950-1952 Drought
  - 1954-1956 Drought
- Texas Water Development Board established in 1957
- Farmers decline by half
- 1957-70: 69 dams built

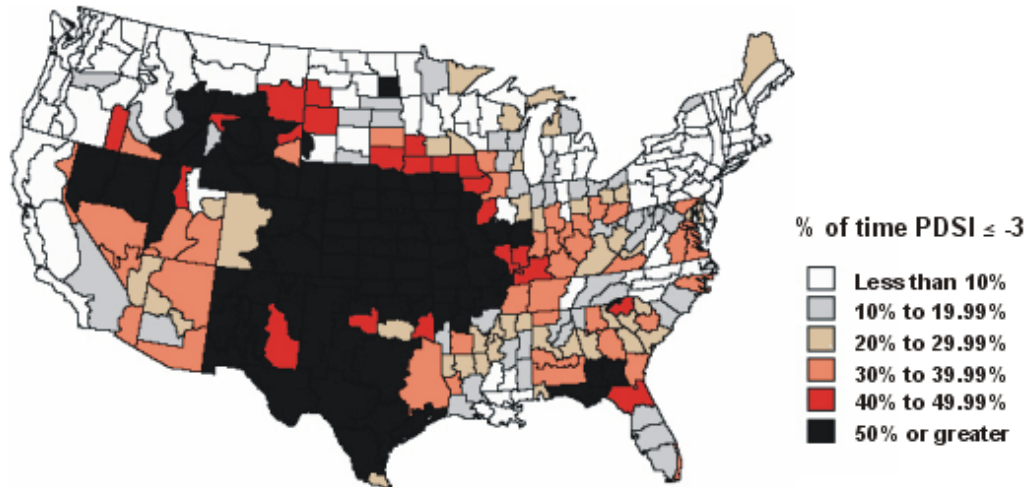


# 1954 - 1956 Palmer Drought Severity Index

## Palmer Drought Severity Index

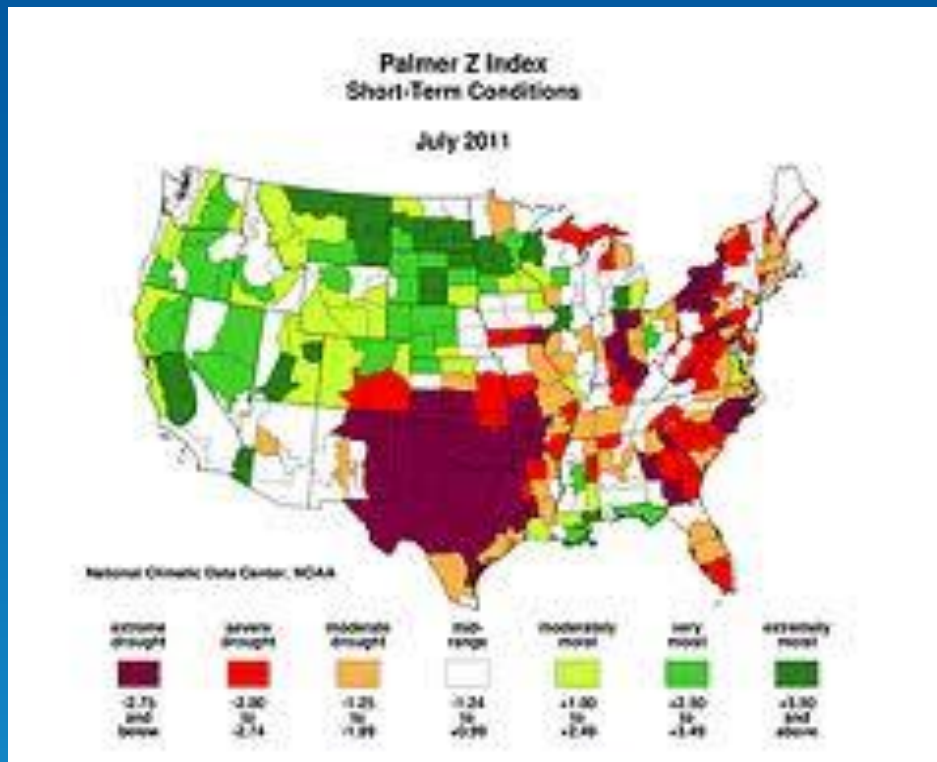
1954-1956

Percent of time in severe and extreme drought



SOURCE: McKee et al. (1993); NOAA (1990); High Plains Regional Climate Center (1996)  
Albers Equal Area Projection; Map prepared at the National Drought Mitigation Center

# July 2011 Palmer Drought Index



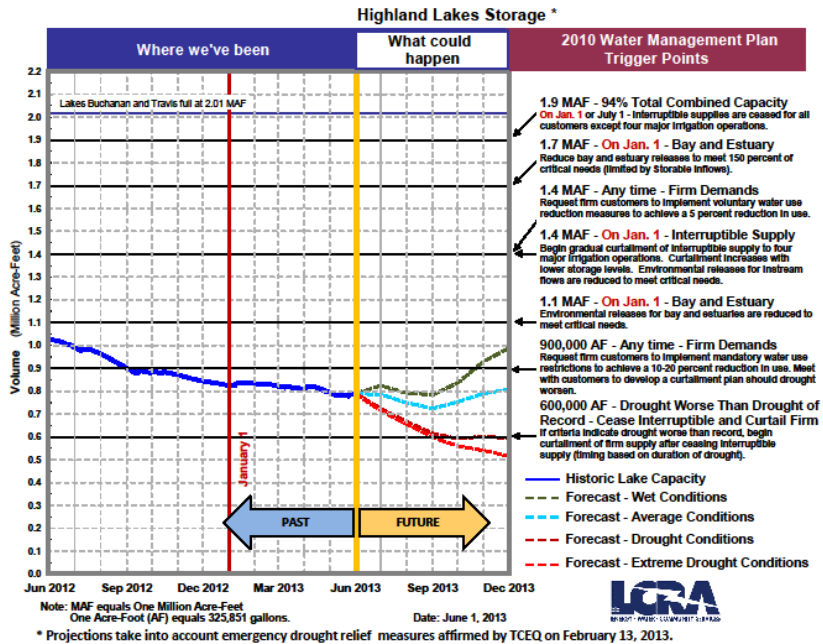
# TWDB Water Management Strategies

## Water Management Strategies (2012-2060):

1. **Water Conservation Practices** – 23.9% of supply
2. Surface Water Strategies – 16.7% of supply
3. **Water Reuse Applications** – 10.2% of supply
4. Groundwater /ASR– 8.9% of supply
5. Brackish Groundwater Desalination – 2.0% of supply



# Highland Lakes – LCRA Water Management Plan





# Edwards Aquifer Levels at San Antonio: 1981-2012



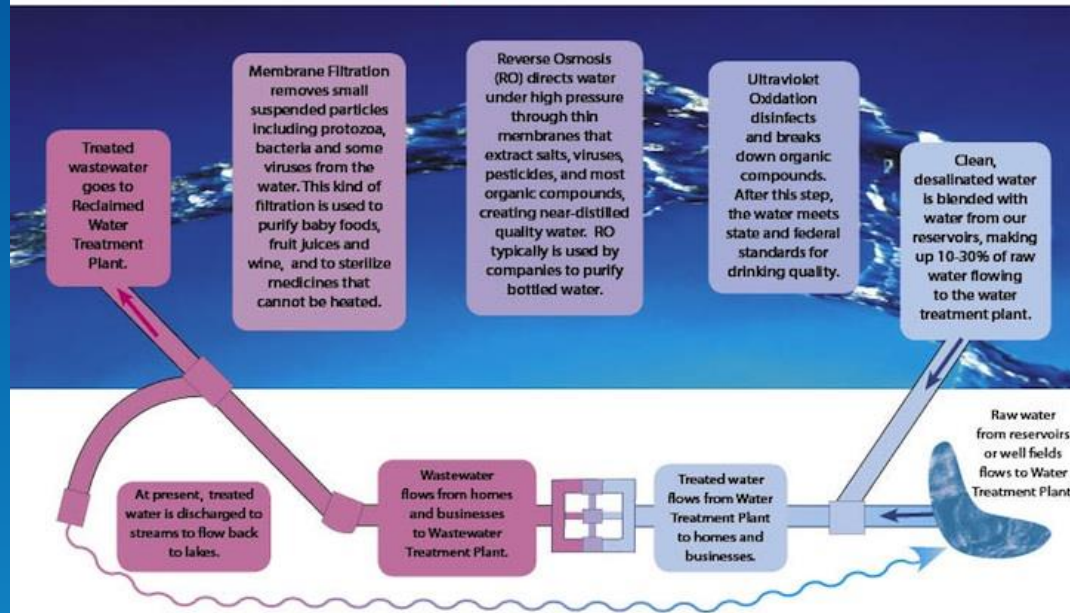
San Antonio Water System is now in Stage 3 Restrictions: at 640 feet amsl. Outdoor watering every other week

# Reclaimed Water Applications (DPR & IPR)

- **Direct Potable Reuse (DPR) Applications**
  - Reclaimed water piped from WWTP to Water Treatment Plant
  - Permitting is handled through TCEQ on a site-specific basis
  - Colorado River MWD's Raw Water Production Facility in Big Spring
- **Indirect Potable Reuse (IPR) Applications**
  - IPR extends Drinking Water Supply with blend of high-quality effluent
  - IPR uses environmental barrier (reservoir) as a treatment component
  - City of Wichita Falls is designing an IPR system at Lake Arrowhead

# Reclaimed Water Applications (IPR)

## *Water for Our Future:* 5 Steps to Reclaimed Water



# Lake Travis, Texas – 2011-2013



# Drought Water Quality Impacts - Riverine

- Drought Impacts on Rivers and Streams
  - Lower water levels cause concentrated salinity and sediment levels
  - Loss and destruction of fish and wildlife habitat
  - Losses to on-channel wetlands
  - Greater potential for wildfires
  - Increased stress on endangered species and critical habitats
  - Greater wind and water erosion of soils
  - Fewer recreational activities
  - Flash floods scour shallow waters



# Drought Water Quality Impacts - Palustrine

- Drought Impacts on Reservoirs, Lakes, and Ponds
  - Lower water levels cause salinity and sediment level increases
  - Loss and destruction of fish and wildlife habitat
  - Losses to lake-based palustrine wetlands
  - Greater potential for wildfires
  - Increased stress on endangered species and critical habitats
  - Fewer recreational activities; major economic impacts
  - More dangerous for boat recreation due to uncertain bathymetry

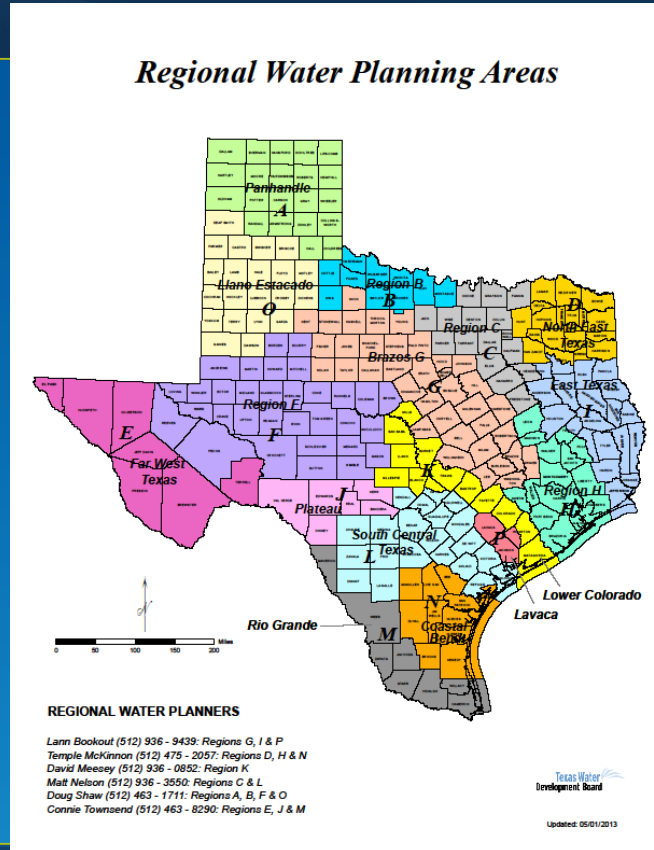


# Regional Water Plans

- Regional Water Plans
  - Developed by 16 Regional Water Planning Groups (RWPGs)
  - Each RWPG has a consistent structure of members that represent specific scientific discipline and interest groups
  - Members: agriculture, public, municipalities, business, environmental, river authorities, counties, water utilities/districts, groundwater districts
  - Regional Plans developed 2006 -2011 ; must be approved by TWDB

# Regional Water Plan – 16 Regional Water Planning Areas

- 16 Regional Water Planning Areas





# State Water Plan

- 2012 State Water Plan
  - Texas' third State Water Plan since 2002 that incorporates the 16 Regional Water Plans
  - Planning horizon is from 2010 through 2060
  - Provides long-term water supply solutions to meet water supply needs during “drought of record” conditions
  - 2012 Plan prepared from January 2006 through December 2011
  - Prepared by TWDB with assistance from TPWD, TCEQ, TDA

# Conclusions

- 2012 State Water Plan
  - Regional Water Plan and State Water Plan identify strategies
  - Water Conservation - 23.9%
  - Reclaimed Water Use – 10.2%
  - Texas is well-suited to manage drought conditions and impacts
  - Texas will not meet all water demands



Lake Travis, 1951

# Questions ??



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**Roger E. Schenk, Jr.**

**CDM Smith – Austin, Texas**

**[schenkre@cdmsmith.com](mailto:schenkre@cdmsmith.com)**