



Municipal Reuse

Phil Spitzer, PE, BCEE

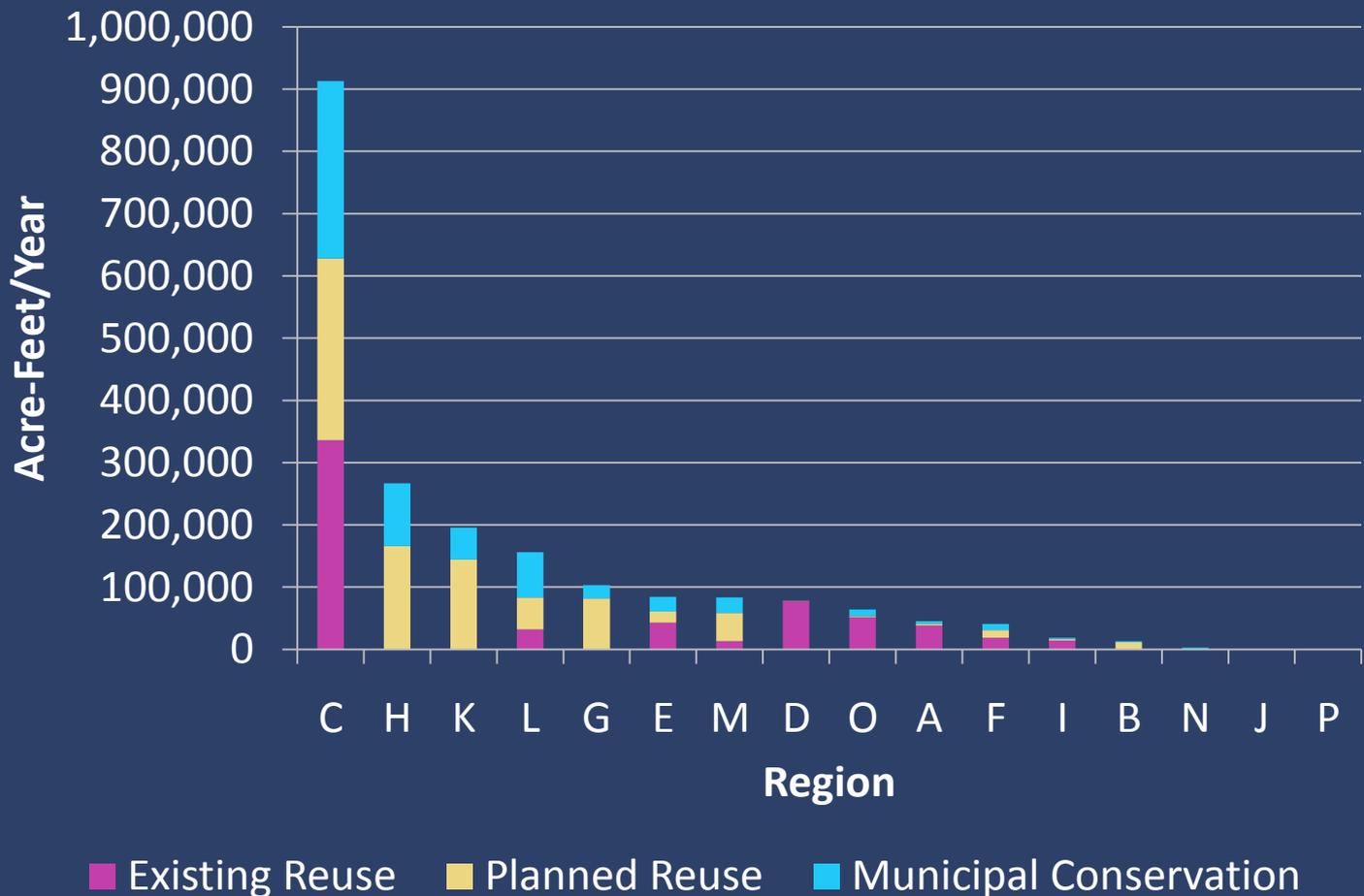
Alan Plummer Associates, Inc.





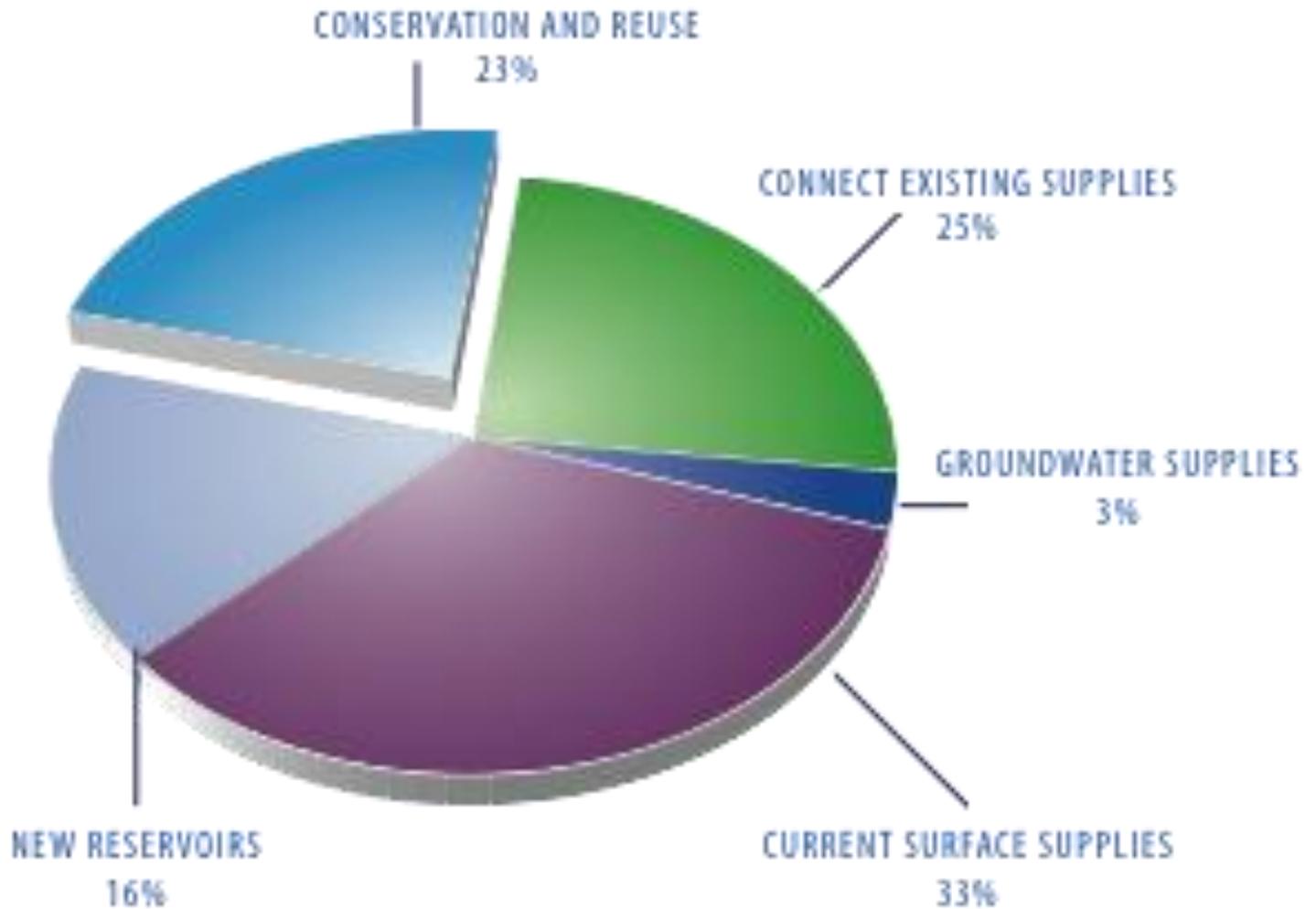
Reuse and Conservation by Region in Texas

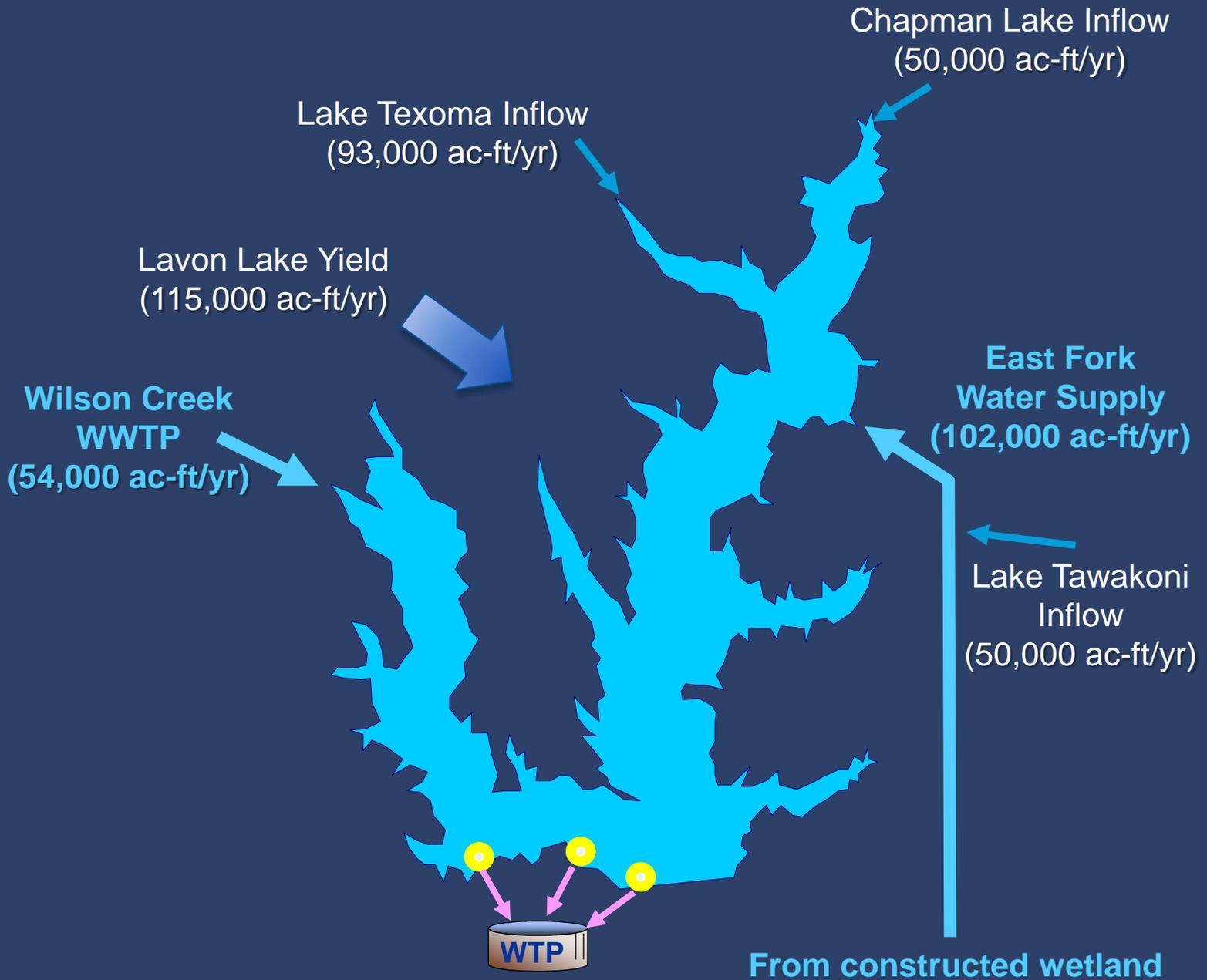
2007 State Water Plan - 2060 Projections





Region C







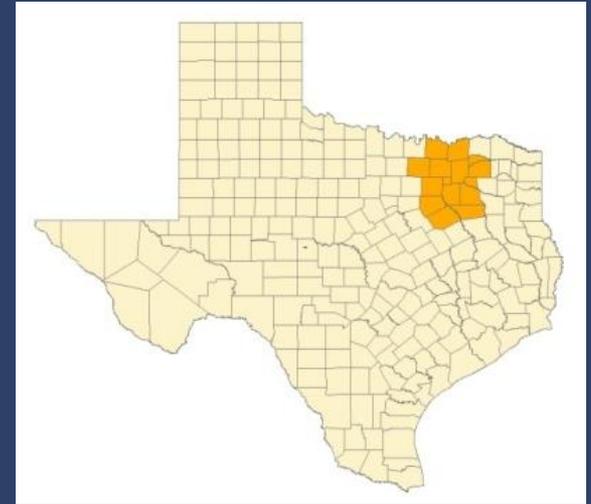
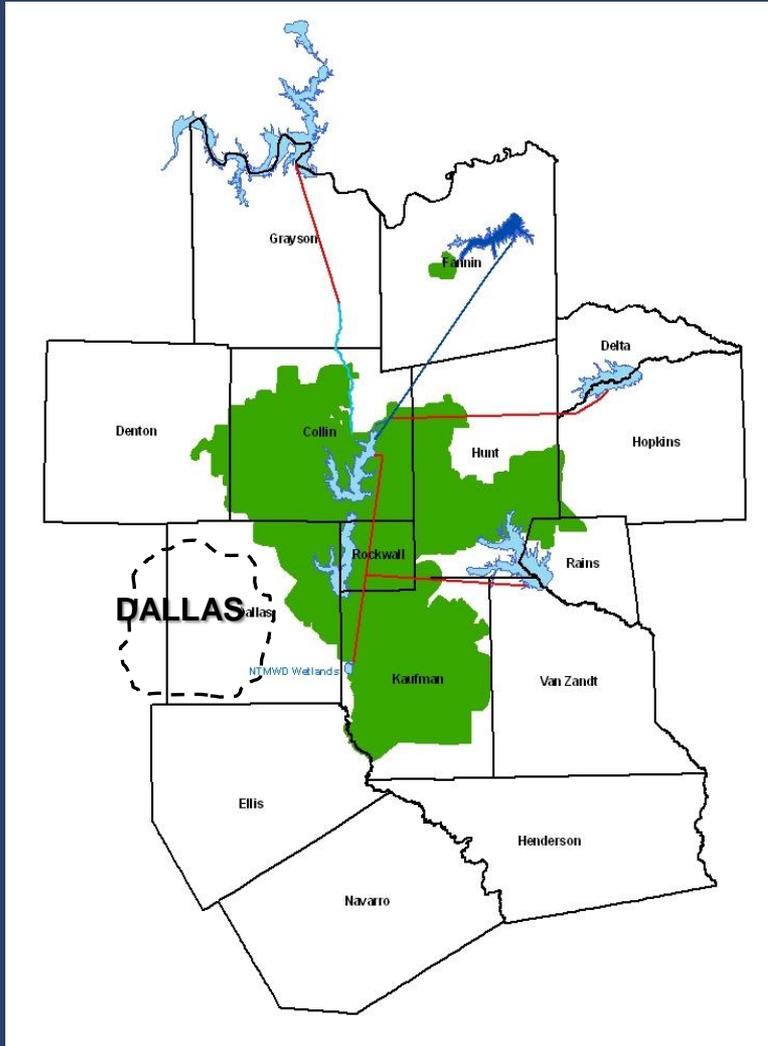
A Key Reuse Project:

The East Fork Raw Water Supply Project for the North Texas Municipal Water District (NTMWD)





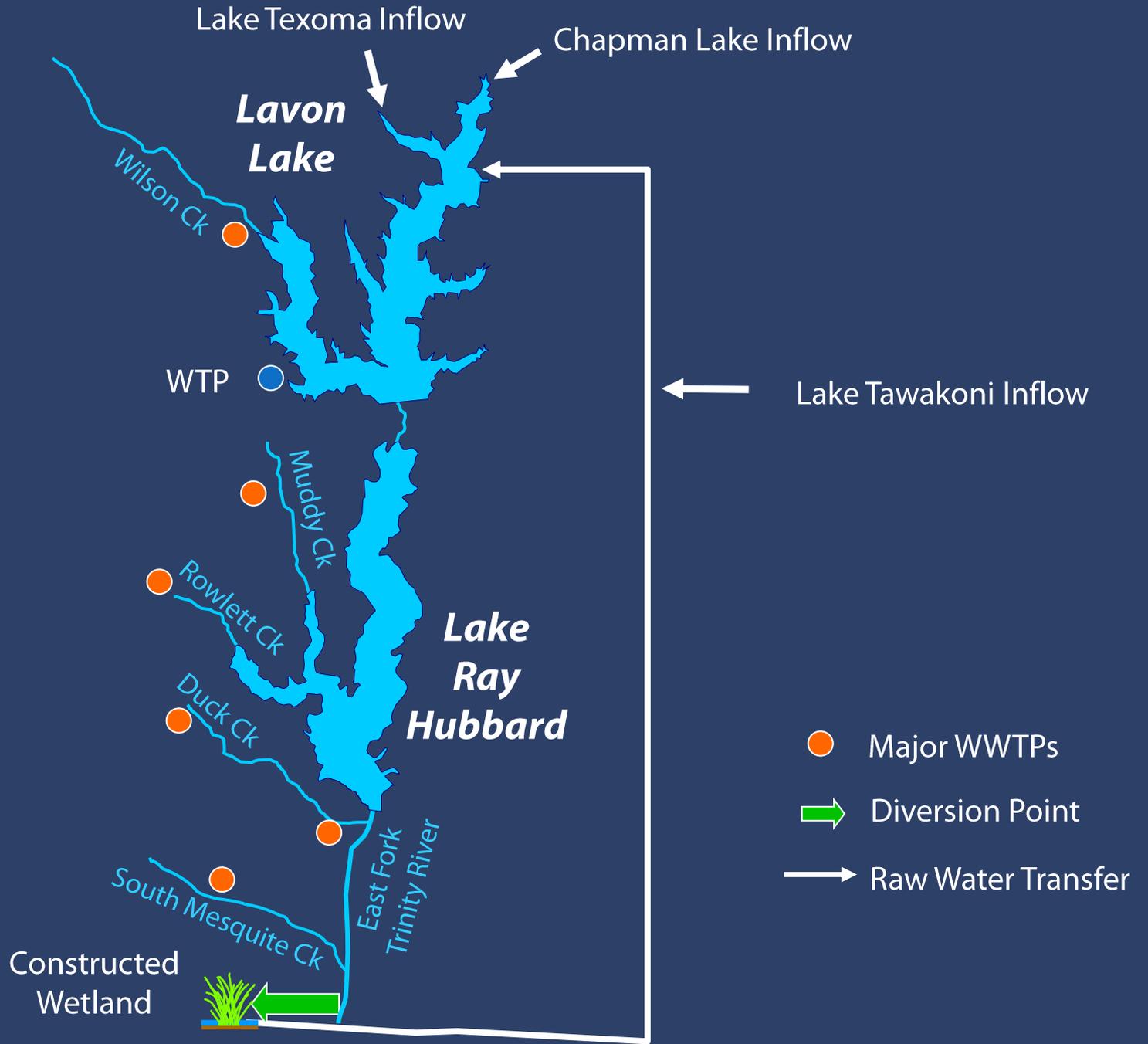
NTMWD Service Area



Population

2010 ~ 1.6 million

2060 ~ 3.5 million





Project Components

- 165 million gallons per day (mgd) peak capacity diversion pump station
- 1,840-acre constructed wetland
- 150-mgd peak capacity conveyance pump station
- Electrical substation to provide power for the conveyance pump station
- 43.5 miles of 84-inch-diameter pipeline transferring water from the wetland to Lake Lavon
- John Bunker Sands Wetland Center to provide educational opportunities



**River
Intake**

**Diversion
Pump
Station**

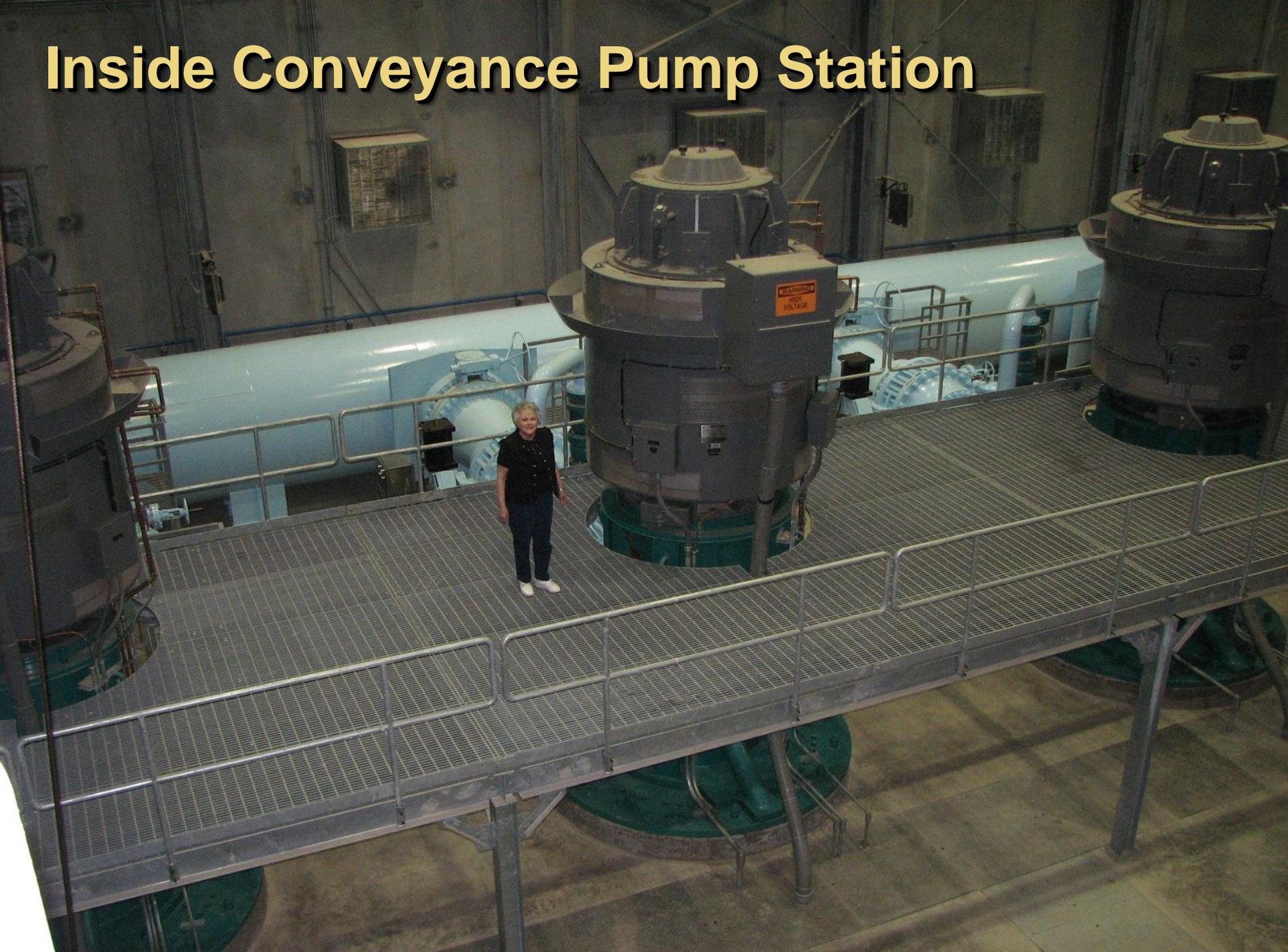
Constructed Wetland



Conveyance Pump Station



Inside Conveyance Pump Station



Conveyance Pipeline

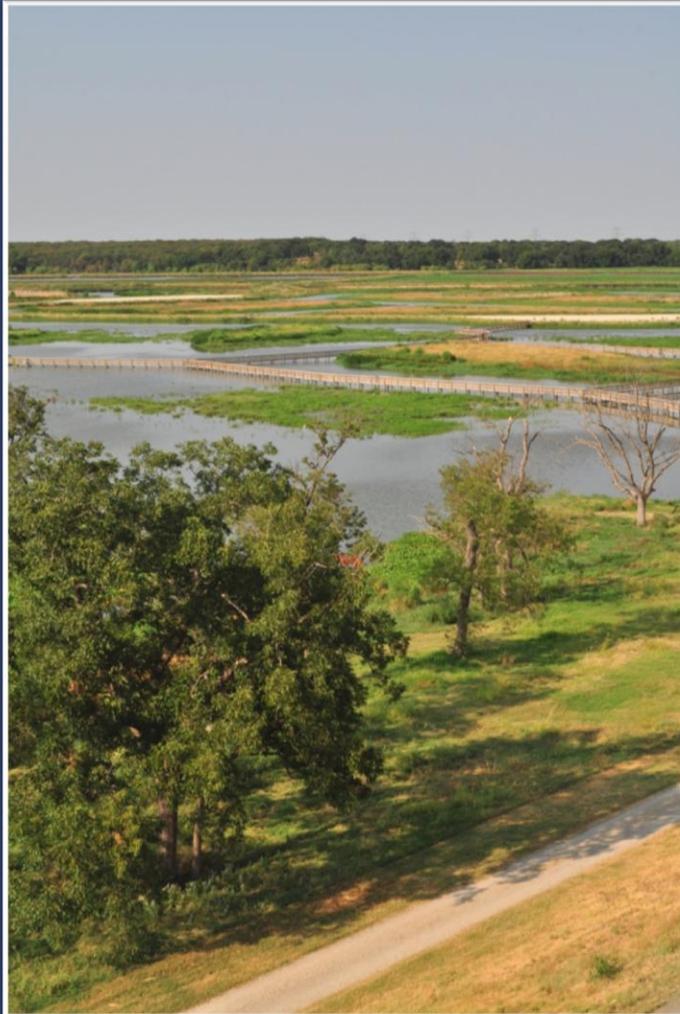


Lavon Lake Outfall





John Bunker Sands Wetland Center





Multiple Benefits of the Wetland



Development of Wetland Habitat Areas



Outreach and Educational Opportunities



Water Quality Improvement



Preservation of Green Space



Research Opportunities





Project Facts

- Provides over 102,000 acre-feet of water per year, enough water to serve 500,000 people
- Compared to developing a new reservoir
 - cost of less than 25%
 - in about 20% of the time





Project Facts

- Fast-tracked – 4 years from the beginning of design to project start-up
- Total project cost \$264M
- Wetland was hand-planted with 1.8 million plant plugs
- 225 different bird species at the facility from 1/1/07 to 2/21/09
- 27.88 billion gallons of water conveyed through wetlands to Lavon Lake from January 2009 to October 16, 2011





Another Perspective...

Lake Lavon Yield:
104,000 ac-ft/yr
(128,270,000 cu m/yr)

+

East Fork Water
Supply Project:
102,000 ac-ft/yr
(125,800,000 cu m/yr)



+



Total Yield: 206,000 ac-ft/yr
(254,070,000 cu m/yr)





Chapter 210 Authorizations in Texas

- 213 reuse permits in Texas
- Significant permittees include:
 - City of Dallas
 - City of Denton
 - City of Fort Worth
 - City of Garland
 - North Texas Municipal Water District
 - Trinity River Authority of Texas





Questions?

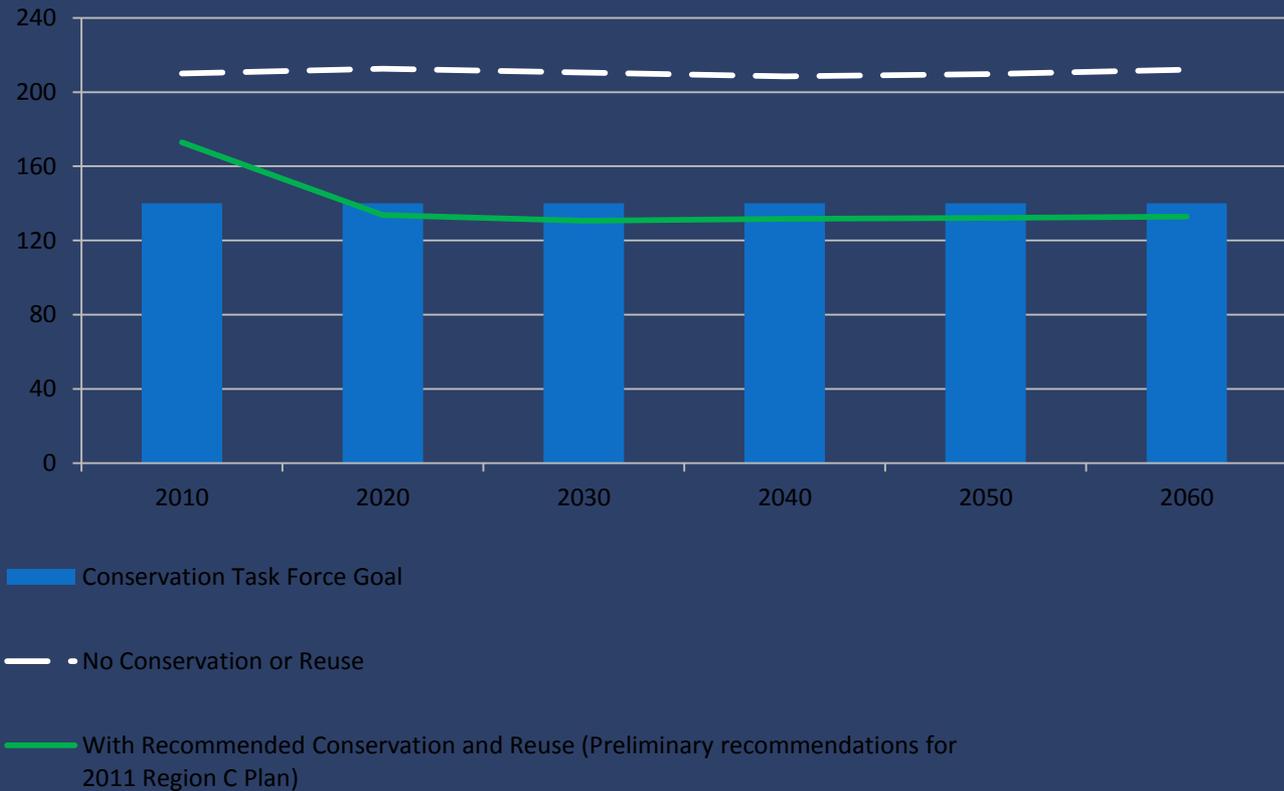


Region C Updated 2011 Municipal GPCD

Condition	Projections (municipal gpcd)					
	2010	2020	2030	2040	2050	2060
No Conservation or Reuse	210	213	210	208	210	212
With Recommended Conservation and Reuse	173	134	130	132	132	133



Region C Municipal GPCD Projections





Region C Expected Water Savings (Preliminary 2011 Region C Plan)

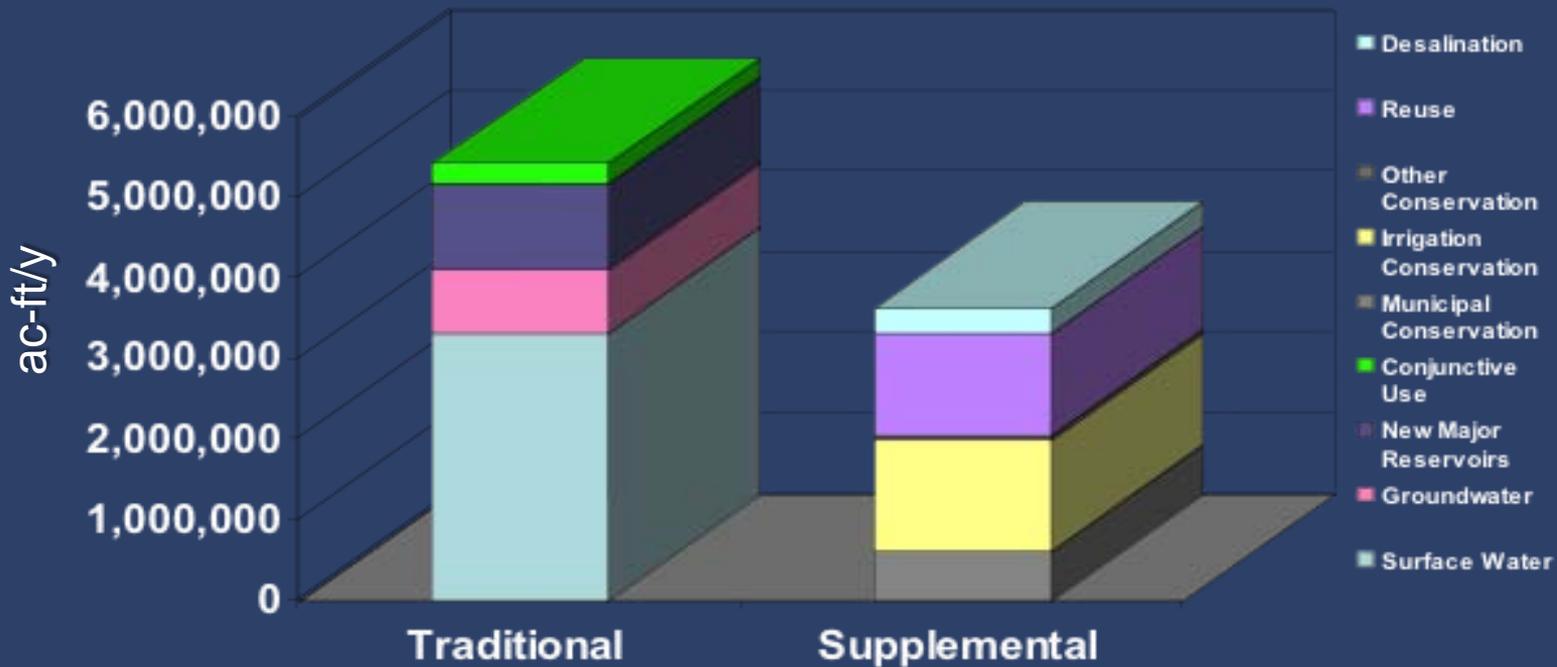
- Municipal GPCD Reduction⁽¹⁾

2010	210 GPCD
2060	133 GPCD
- Reduction of municipal water demand
Reduction = 30 to 35%

⁽¹⁾ Based on preliminary recommendations of conservation measures, including reuse, being considered by Region C Regional Planning Group.

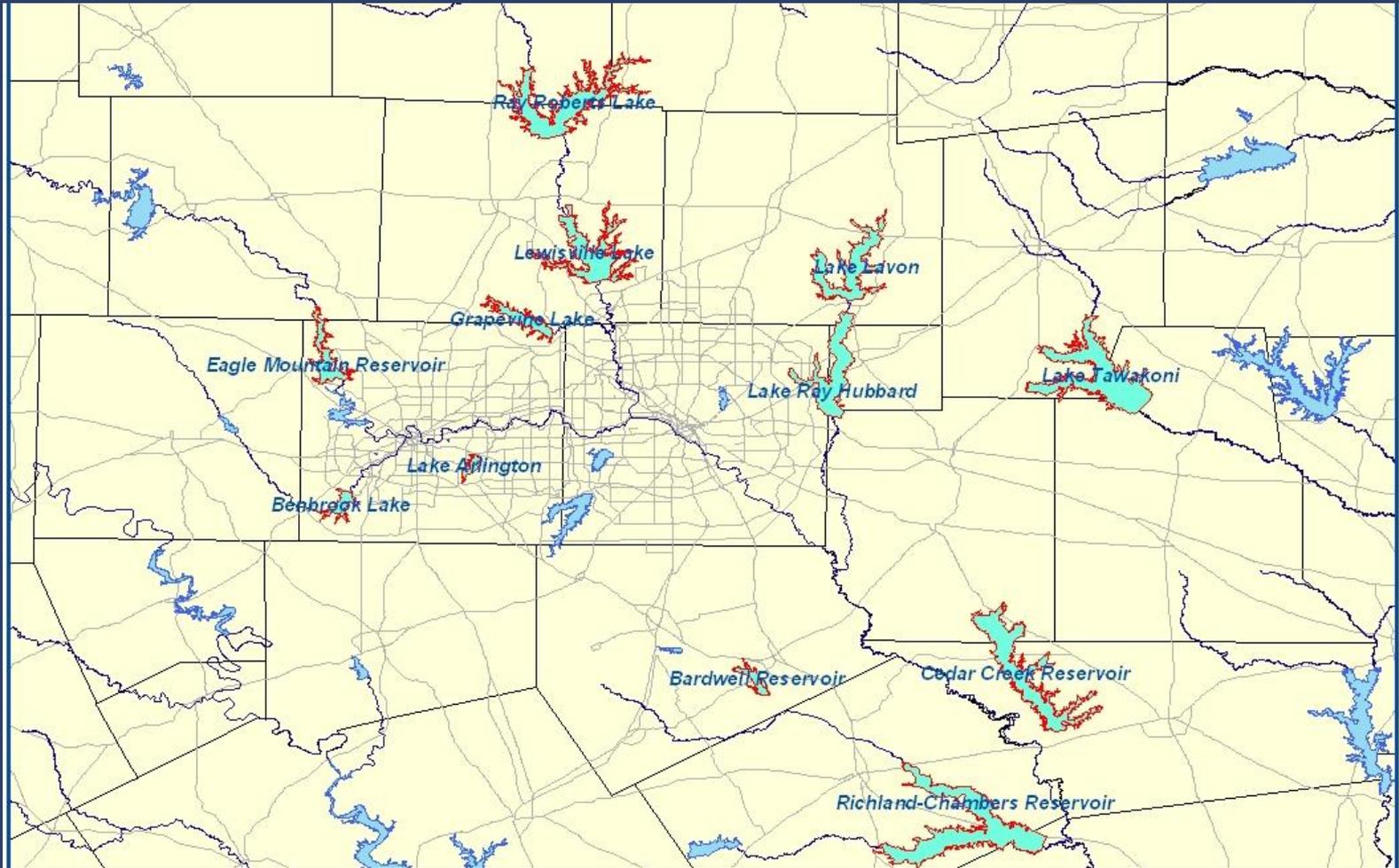


Strategies in Texas



* It's important to recognize the interrelationship between traditional strategies and supplemental strategies.

Source: Texas Water Development Board, *Water for Texas 2007*



Natural Treatment Systems/Wetlands

