



# THE IMPORTANCE OF REUSE WATER IN INSTREAM AND FRESHWATER INFLOWS: THE CASE OF TEXAS

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**Increased water demands require improved water management since upland changes can have serious impacts on estuary systems.**



# How can increasing water reuse strategies be balanced with environmental inflow needs?



# INFLOWS, POPULATION, AND REUSE

- **Bays and estuaries depend on freshwater inflows to sustain a healthy ecosystem**
- **However, increased water demands due to growing upstream populations put the bays and estuaries at risk**
- **Continued expansion of reuse projects potentially diminishes fresh water supply to the bays**

# WHY EXAMINE INFLOWS NOW?

## *Projections, Legislation, and Lawsuit*

- **2004 - National Wildlife Federation, *Bays in Peril***
- **2007 - Senate Bill 3, 80<sup>th</sup> Legislature, authorized creation of Environmental Flows Advisory Group**



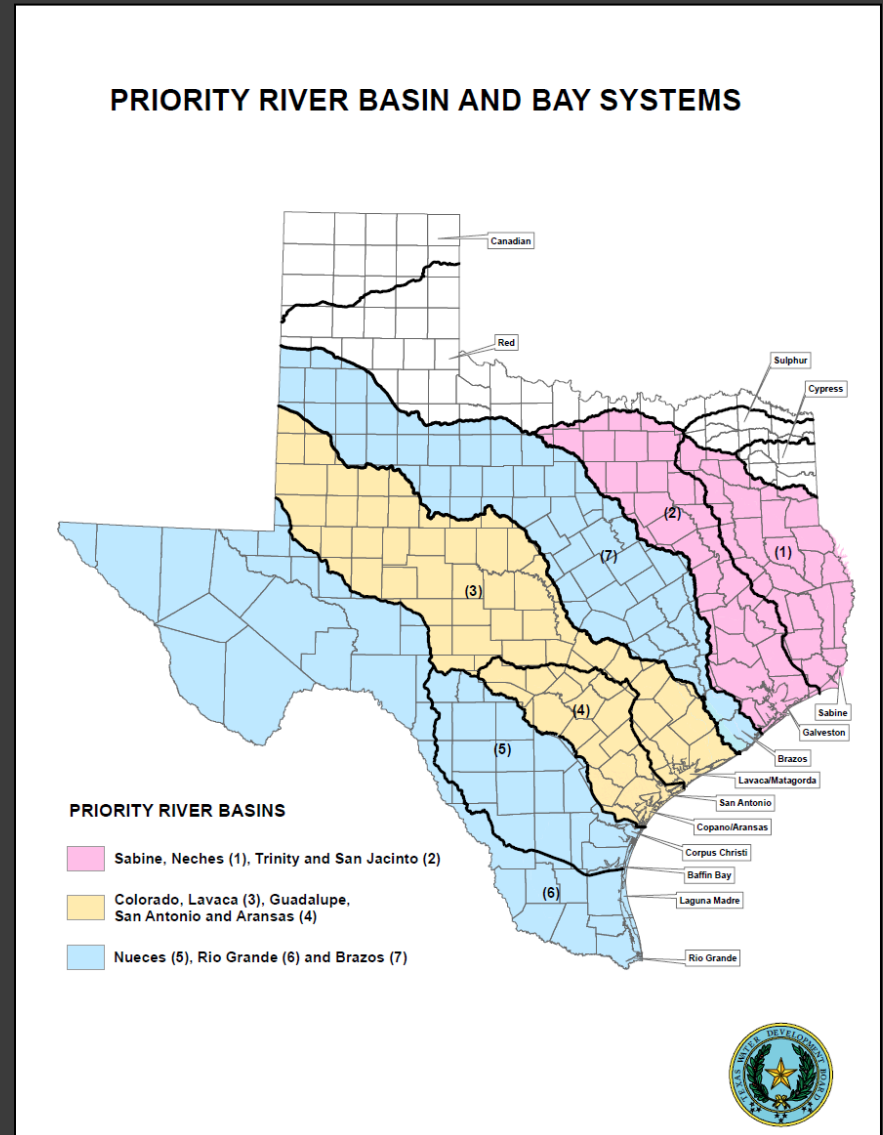


- **2010 – The Aransas Project filed suit against 5 Texas Commission on Environmental Quality (TCEQ) employees**

*(Aransas Project v. Bryan Shaw, Buddy Garcia, Carlos Rubenstein, Mark Vickery, and Al Segovia)*

# THE SB3 PROCESS

- Each region has stakeholder committee and science team
- Recommendations from each given to TCEQ
- TCEQ adopts minimum inflow standards





Guadalupe River Basin



Trinity River Basin



# POPULATION GROWTH

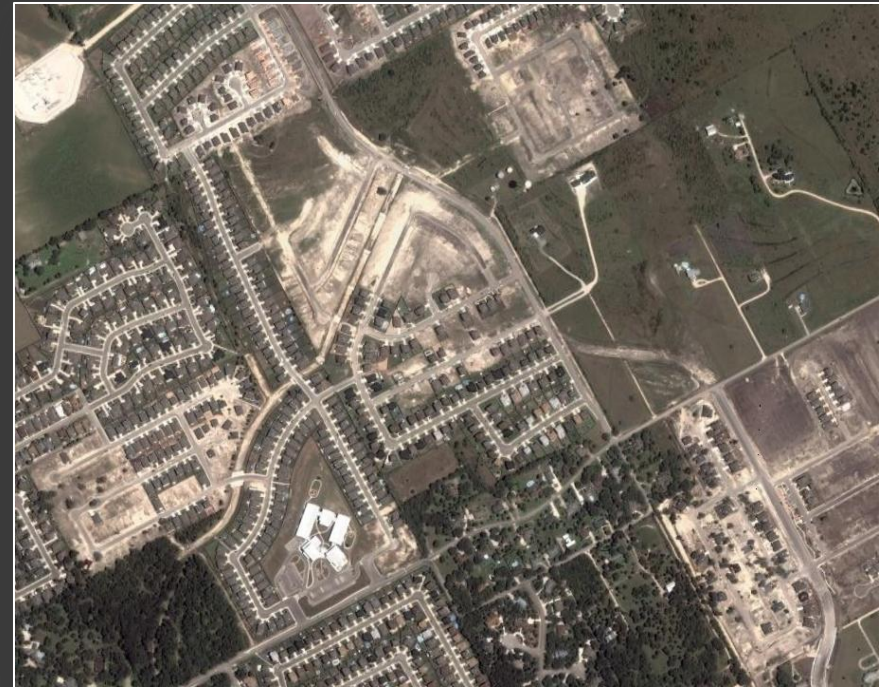
*According to the Texas Water Development Board, demand for water will increase 27% by 2060.*



# POPULATION GROWTH

- Central Texas has some of the USA's highest population growth rates.

– Williamson	27.2%
– Hays	22.3%
– Bastrop	18.8%
– Burnet	18.0%
– Comal	17.7%



Sprawl near Cibolo, TX

- Source, Texas Almanac (2000-07)

# TEXAS WATER PLANNING

- Purview of the Texas Water Development Board
  - *If demand for water is not met, it is estimated to cost businesses and workers in the state approximately \$9.1 billion per year in 2010 and \$98.4 billion per year by 2060 (Combs 2009).*



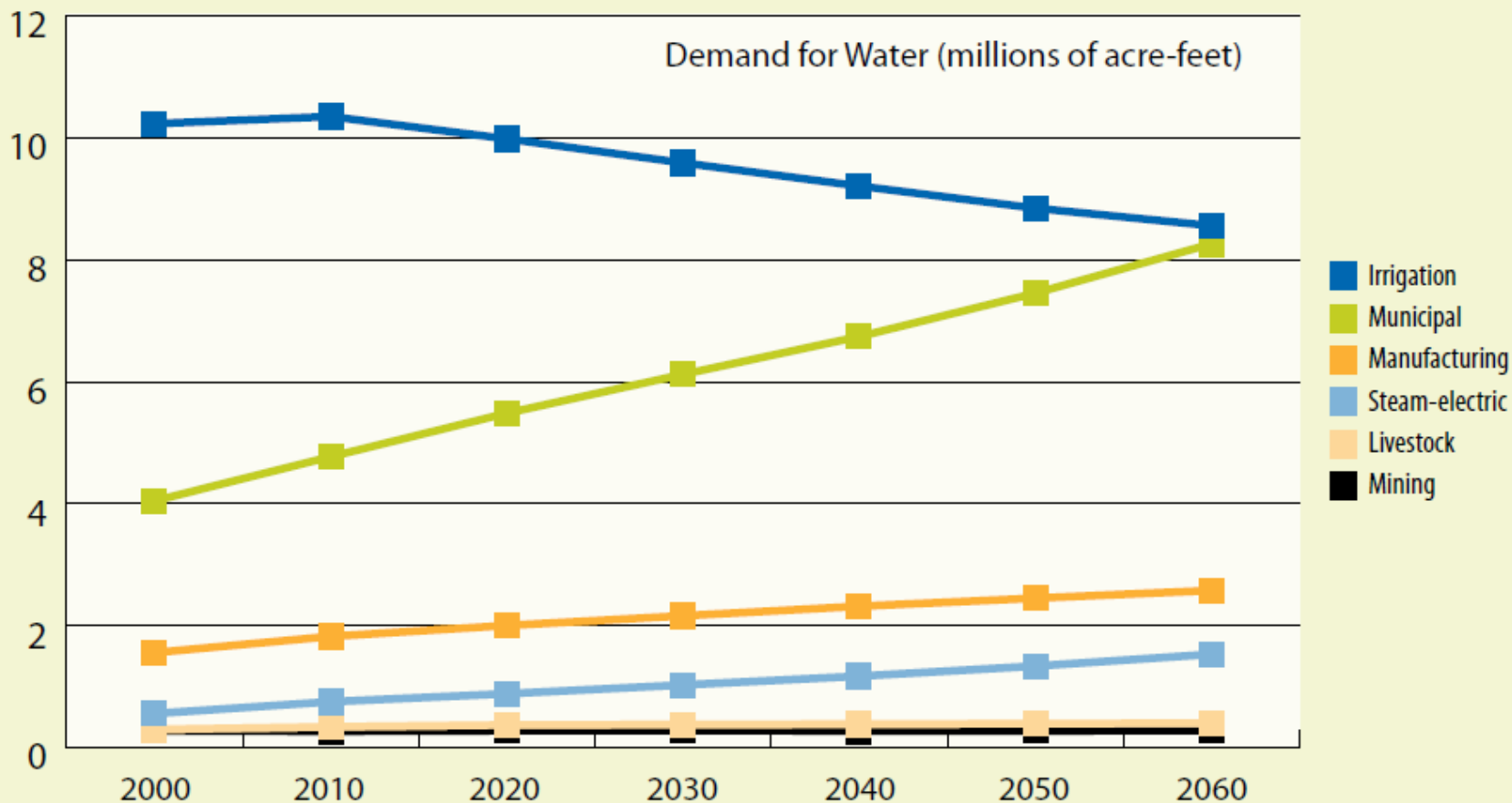
Georgetown, Texas

# TEXAS IS BOTH A RIPARIAN AND PRIOR APPROPRIATION STATE? DISASTER!

## Historical Context

- Originally, acequias system, more like Riparian and PA
- European settlers moved from the East: Riparian
- Riparian rights became impractical in a dry climate: PA
- Prior Appropriation Rights converted to permits by 2003, but landowners can divert a maximum 246,700 m<sup>3</sup>/year (200 af/year) for domestic and livestock use if property is adjacent to stream (still Riparian?) Note: This is an undocumented quantity.

## Texas Projected Water Demand by Category, 2000-2060



Sources: Texas Water Development Board.



# FORMS OF REUSE

## DIRECT

- **Cooling water for power generation**
- **Processing water of petrochemical companies**
- **Ornamental ponds and fountains**

## INDIRECT

- **Augmentation of potable surface water supplies**
- **Aquifer recharge**

# TEXAS WATER REUSE HISTORY

- Agricultural irrigation
  - Practiced since 1880s



- Industrial
  - Began in 1940s

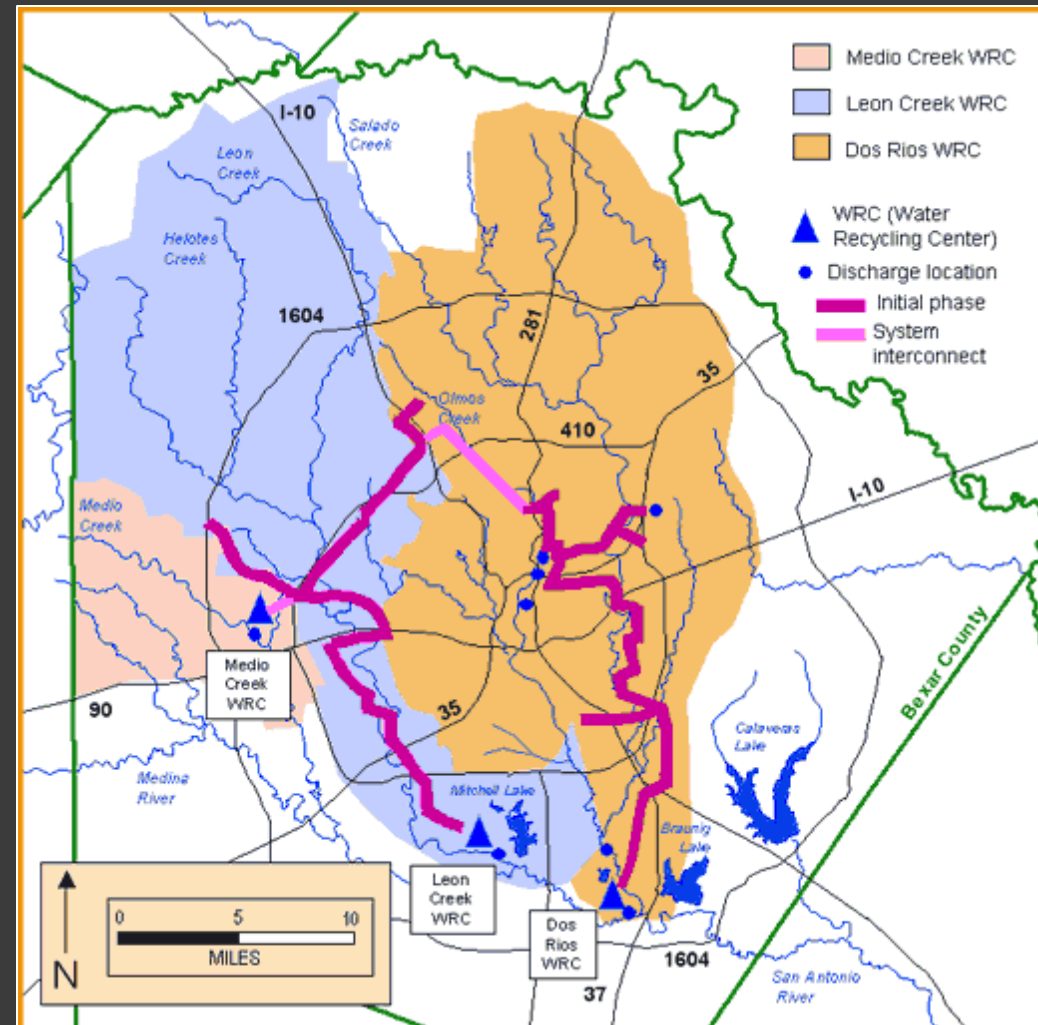


- Municipal
  - 1960s



# SAN ANTONIO REUSE INITIATIVES

- Irrigation
- Municipal
- Industrial



# REUSE AS STRATEGY

- **2007 Texas Water Plan**

- **Noted Advantages:**

- **Treated effluent is a sustainable water supply source during droughts**
    - **As population increases, so too does the amount of treated effluent**

# IMPLICATIONS AND CONCERNS

- **Expanding reuse projects without proper care could impact inflows**
- **Balancing the growing human demands with environmental needs is of major concern**
- **TCEQ standards resulting from SB3 process only affect new permits**



# CONTINUED RESEARCH

- Assess current and planned reuse projects in Texas
- Survey public perception of reuse and instream flows
- Analyze water balance – diversions vs. return flows



Trinity River Diversion Pump Station

# REFERENCES

**Aransas Project v. Bryan Shaw, Buddy Garcia, Carlos Rubenstein, Mark Vickery, and Al Segovia, 2010**

**Combs, Susan. 2009. “Liquid Assets,” Texas State Comptroller’s Office**

**Guadalupe, San Antonio, Mission, and Aransas Rivers and Mission, Copano, Aransas, and San Antonio Bays Basin and Bay Stakeholder Committee and Expert Science Team, 2010**

**Johns, Norman D., 2004. “Bays in Peril,” National Wildlife Federation**

**Texas Almanac**

**Texas Commission on Environmental Quality**

**Texas Water Development Board**

**Texas Water Matters**



**THANK YOU**

**I will be happy to answer any questions.**



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