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, 80th 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

Source: Kuru, Wikimedia Commons
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%

• Source, Texas Almanac (2000-07) Sprawl near Cibolo, TX
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).
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 m³/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

Demand for Water (millions of acre-feet)

Sources: Texas Water Development Board.
## FORMS OF REUSE

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<tr>
<th>DIRECT</th>
<th>INDIRECT</th>
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<td>• Cooling water for power generation</td>
<td>• Augmentation of potable surface water supplies</td>
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<td>• Processing water of petrochemical companies</td>
<td>• Aquifer recharge</td>
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<td>• Ornamental ponds and fountains</td>
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TEXAS WATER REUSE HISTORY

• Agricultural irrigation
  – Practiced since 1880s

• Industrial
  – Began in 1940s

• Municipal
  – 1960s

Photo sources: J. Hjort and Life.com
SAN ANTONIO REUSE INITIATIVES

• Irrigation
• Municipal
• Industrial

Photo source: wayfarer.info; SAWS
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

(Photocourtesy Alan Plummer Associates Inc., www.wetlandcenter.com)
REFERENCES

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


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


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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