

**World Water Congress XV**  
**International Water Resources Association**  
**Edinburgh, Scotland**  
**25 – 29 May 2015**

**Track: Revisiting Water Paradigms**

***A Texas Case Study on Water: Paradigms Lost***

***Abstract***

**Introduction**

Because of its size, the far western portion of Texas can be experiencing severe drought while the far eastern portion can be experiencing heavy flooding.

New infrastructure in the growing suburbs around Austin is being built, while 100-year-old pipes and transportation canals lose up to 15-25% of available water in Galveston.

Rights to groundwater are owned by the property owner, while surface water is owned by the State of Texas. Thus, there are river authorities, subsidence districts, water districts, wastewater treatment authorities, and others that are involved in water management in Texas.

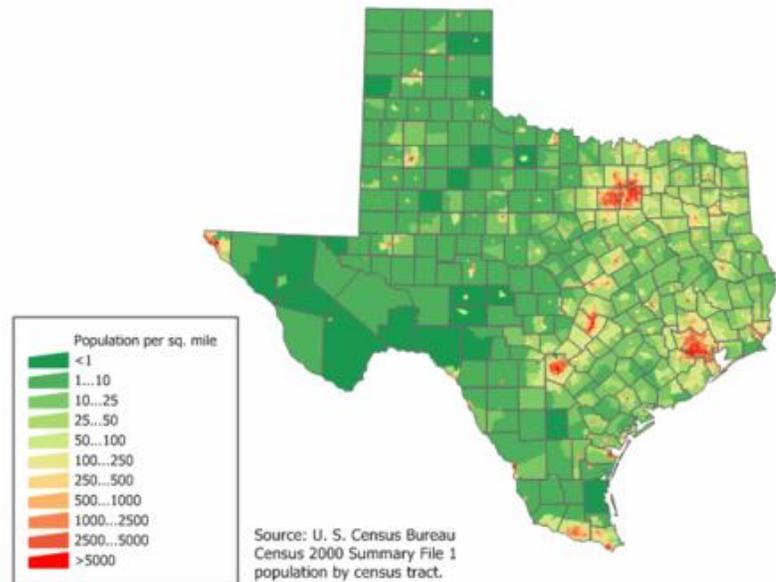
These are just a few examples of why water management in Texas has become a large and complex set of rules, regulations, requirements, demands, plans and systems.

The authors have worked to clarify this complexity and influence legislation around water planning for the last three years. Their research has been published in newspapers across southeastern Texas to inform Texans of the kinds of challenges to water supply and demand that the future holds.

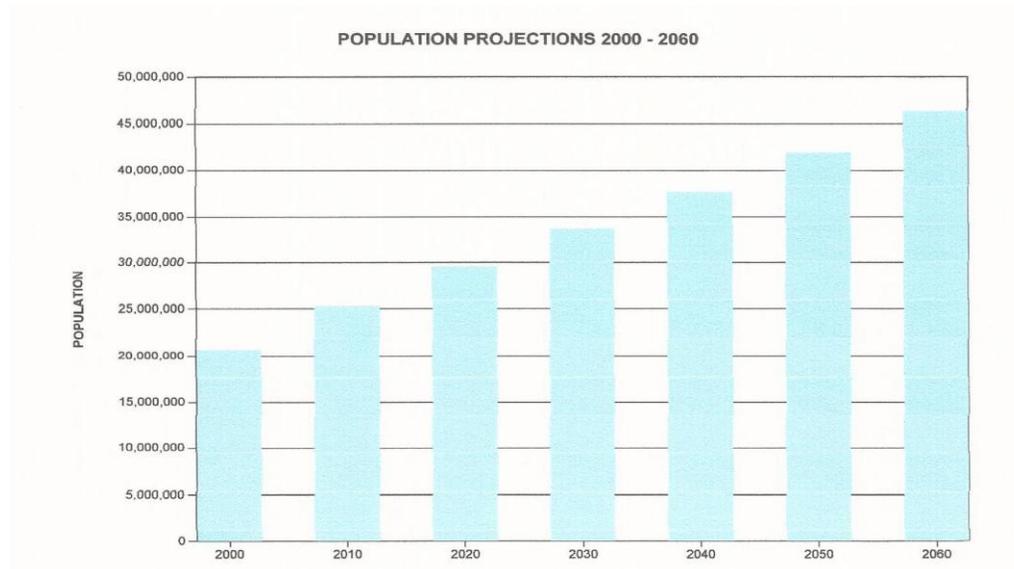
This presentation will describe a number of water management techniques/procedures that are a result of a shifting emphasis on water conservation and protection across Texas. It will also highlight the need for integrated water resource management (IWRM) as water must be shared across wet and dry sections of this large state.

## A Texas Case Study on Water

In recent years, Texas has experienced strong population growth, even when other states are working to recover from the recent recession. The 2010 US Census recorded the population of Texas at 25.1 million, an increase of 4.3 million since the year 2000<sup>1</sup>. Much of the state's population is located in the four large metropolitan areas of Houston, San Antonio, Dallas/Fort Worth, and Austin.<sup>2</sup>



In the 2012 Texas State Water Plan, population growth projections indicate steady and significant growth during each census period through 2060 – when the population is estimated to be over 50 million – an increase of almost 100%!<sup>3,4</sup>



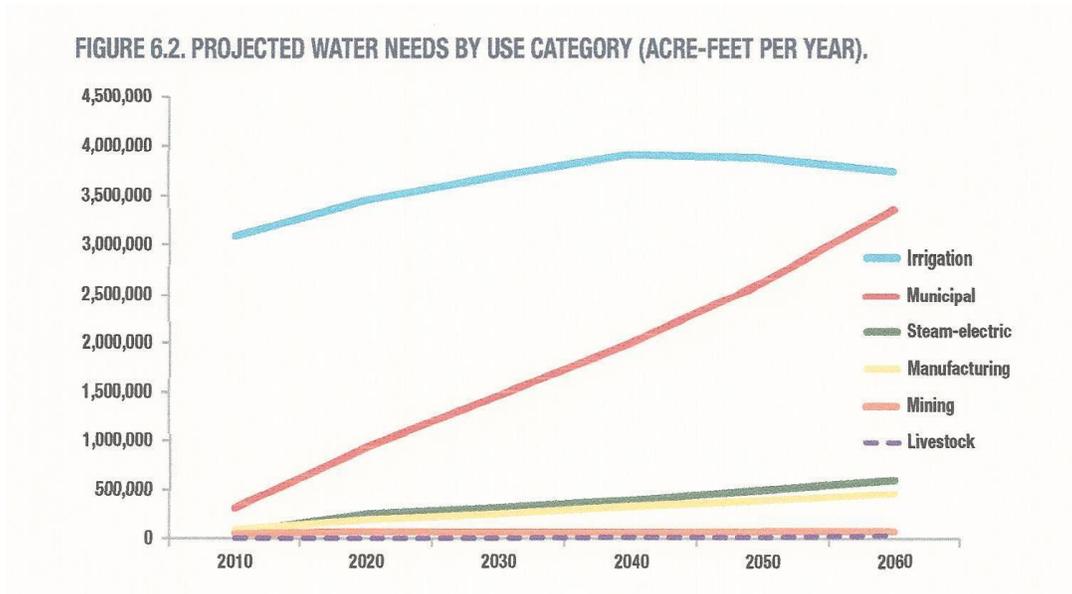
<sup>1</sup> [www.en.wikipedia.org/wiki/Demographics\\_of\\_Texas](http://www.en.wikipedia.org/wiki/Demographics_of_Texas)

<sup>2</sup> [www.en.wikipedia.org/wiki/Demographics](http://www.en.wikipedia.org/wiki/Demographics)

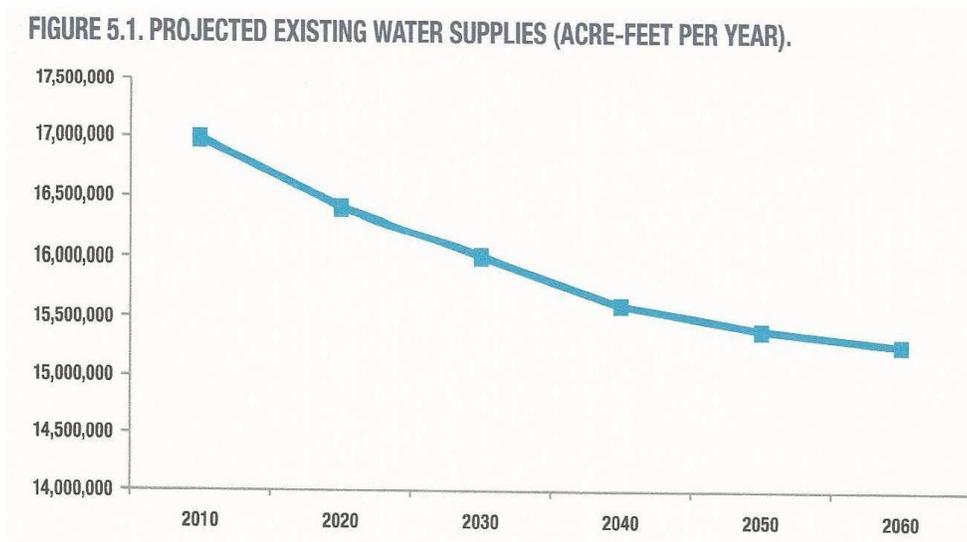
<sup>3</sup> <http://www.twdb.texas.gov>

<sup>4</sup> Initial projections for the 2017 Texas State Water Plan reflect even greater population growth and water demand than the 2012 plan. That data is still subject to change, however, and is not quoted here.

Water demand projections in the 2012 Texas State Water Plan are tracking along with population growth, but also reflect increases needed for electric power production and manufacturing. They are offset by a reduction in irrigation and conservation efforts.



However, the 2012 Texas State Water Plan also projects that existing water supplies will decrease by about 10% during the same period.



Thus, long-range planning is clearly necessary. In recognition of this, Texas has instituted a cyclical process and created sixteen Regional Water Planning Groups to establish supply/demand projections for the next fifty years. These plans also include recommendations for projects to respond to these needs.<sup>5</sup>

So, between now and the near future, when demand will outstrip supply, the water planning process will need to develop new policies, new sources, new conservation methods, new treatment mechanisms, etc.

No longer will we be able to say “There will always be enough water to go around.”

We will look at this long-held paradigm, and others, in this presentation.

## **Methods/Materials**

The research that serves as the basis for this case study includes interviews with members of the Texas Legislature (House of Representatives – Natural Resources Committee), state agency representatives (Texas Water Development Board), local & regional water management authorities (Colorado River Authority, Brazos River Authority, Trinity River Authority), academic experts in the field, and published materials in both academic & popular publications.

The case study has grown out of four series of articles written by the presenters that were syndicated in six Texas newspapers and two electronic news services.

The first series appeared in 2011/2012 and introduced the public to the difficulties of water management in Texas, beginning with shrinking aquifers, subsidence and groundwater rights. The second series was published in 2013 and introduced the concept of changing paradigms in water management, the need for long-range planning and the spider web of groups involved in actually getting water to users.

The third series appeared in 2014/2015 and focused on new techniques that have been applied or instituted for recycling, conservation, evaporation mitigation, desalination and infrastructure upgrades.

All of the articles can be found at the following URL: <http://www.tamug.edu/linton/>

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<http://www.twdb.texas.gov/waterplanning/data/projections/2017/doc/Demand/1StateDemandByCategory.pdf>

## Results and Discussion

While it is easy to focus on the problems with water management in our diverse state, it is more productive to focus on the steps that are being taken to build water security into the future of Texas. Thus, much of the results of our research will be covered in the articles to be published during 2014/2015 in the following areas:

- Aquifer recharge/storage
- Water recycling and re-use
- Reservoir management using polymer film
- Infrastructure upgrades
- Desalination
- Rainwater collection systems
- Water conservation techniques
- Development of new surface water sources

## Conclusion

The State of Texas has long acknowledged the critical need to ensure water security for its future. In 1997, the 75<sup>th</sup> Texas Legislature created sixteen regional planning entities which have, since then, conducted the process of regional water planning.

In 2013, Senate Joint Resolution 1 created the State Water Implementation Fund for Texas (SWIFT) ---- authorizing \$2 billion for projects in the State Water Plan. Then in November of that year, Texas voters approved Proposition 6 which funded that \$2 billion as confirmation that water projects are a critical priority.<sup>6</sup>

As required by the SWIFT legislation, each of the sixteen regions have submitted a prioritized list of projects to be reviewed and approved by the Texas Water Development Board and funded by the SWIFT Advisory Committee.

In response to the regional requests, the Texas Water Development Board, on Thursday 23 July 2015, approved approximately \$3.9 billion in financial assistance from the State Water Implementation Fund for Texas (SWIFT) to develop water projects throughout the state.

Integrated water resource management must become a reality for the future of Texas, and the state planning process moves us in the right direction.

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<sup>6</sup> <http://www.texaspolicy.com/sites/default/files/documents/2013-83rdSessionRecap-ACEE.pdf>

These conversations are taking place, but slowly. Successes such as those highlighted in this presentation will continue to help drive Texas to a secure water future.

### **Updates: The World of Water**

While 2015 has brought significant recovery from drought throughout most of Texas, water resource management must remain a critical priority for the state. Severe and historic drought in the nearby State of California reminds us how vulnerable we are.

The Texas Legislature met earlier this year, concluding at the end of May, Legislators passed a number of bills on water, much of it regulatory in nature, as could be expected.

Desalination featured in a number of passed bills, but one which would have created a collaborative Technical Center for Innovative Desalination did not pass. Passed bills addressed disposal of brine/slurry or regulatory and permitting processes.

One important approved bill acknowledged the need for improved power generation and infrastructure in order to support long-term and large-scale desalination efforts. It is good to see this being addressed early on.

In the end, we in Texas learned much by our attendance at the World Water Conference this year. And our paradigms ARE changing:

- The complexity of finding solutions to water issues on a global asis was evident in the broad approach established at the World Water Conference.
- Water management and governance issues are widely applicable, including in Texas, such as use of groundwater vs surface water, public and private sector involvement in water management, and usage monitoring
- Governance models require collaboration and “transboundary” sharing of water resources, across boundaries both governmental and physical
- “Water diplomacy” reflects a common concern for water security and transboundary management
- The expression “Think globally and act locally” is well applied in water resource management.

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