



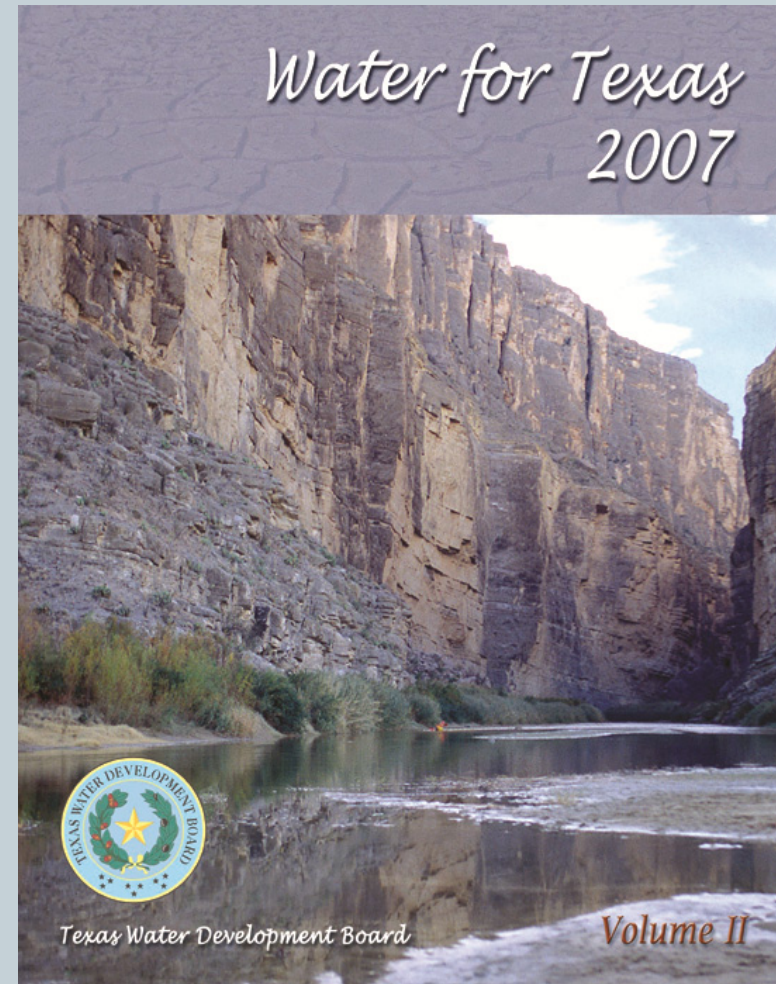
BRACKISH GROUNDWATER DESALINATION IN TEXAS

KEVIN WARD
2011 MULTI-STATE SALINITY COALITION SUMMIT
FEBRUARY 17, 2011
SAN ANTONIO, TX

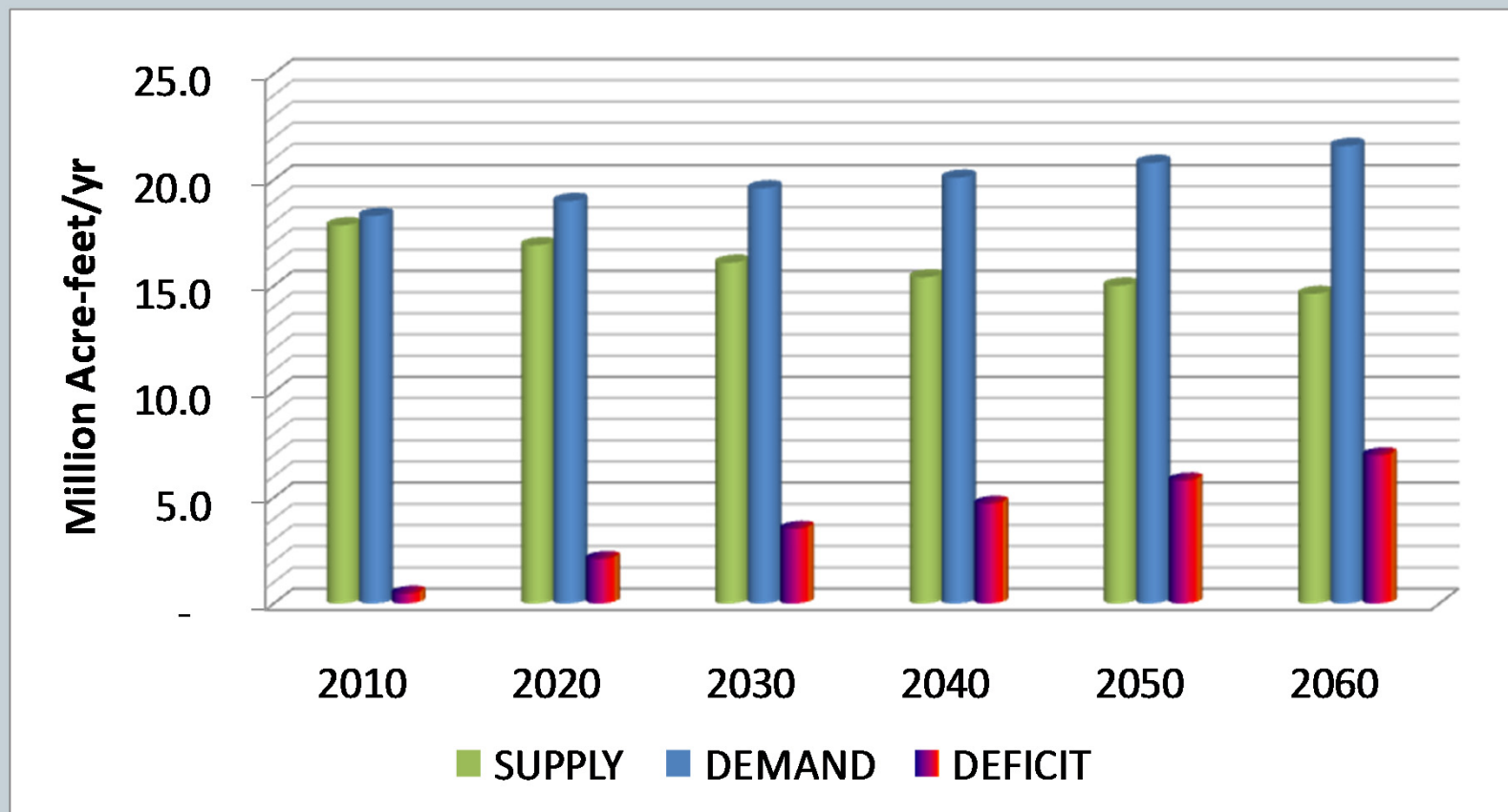
Texas Water Development Board's Planning Role

Texas Water Development Board

To provide leadership, planning, financial assistance, information, and education for the conservation and responsible development of water for Texas

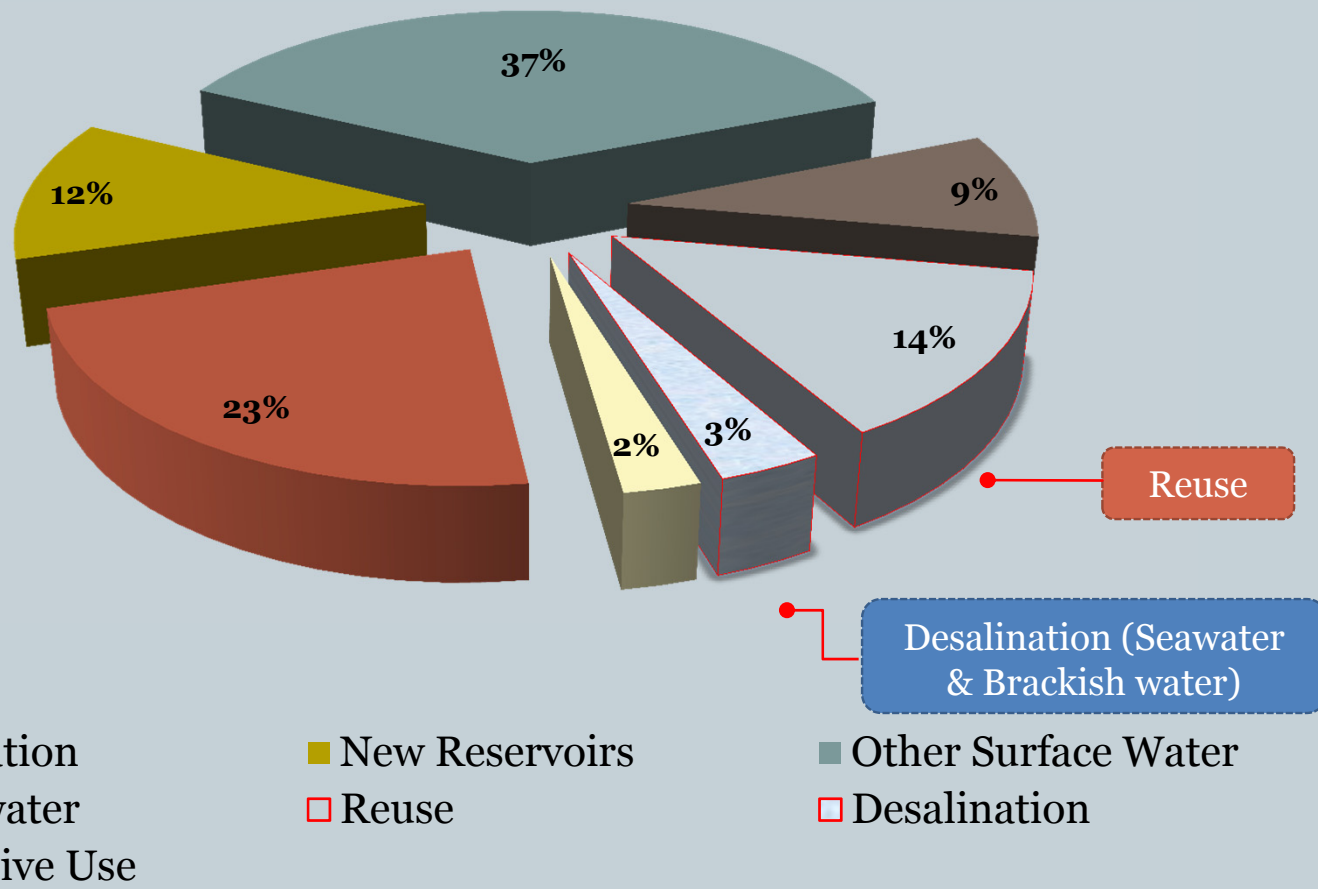


2007 State Water Plan Projections



NOTE : To be revised once 2012 Preliminary Data is available

Brackish Water Desalination As A Recommended Water Management Strategy in Texas

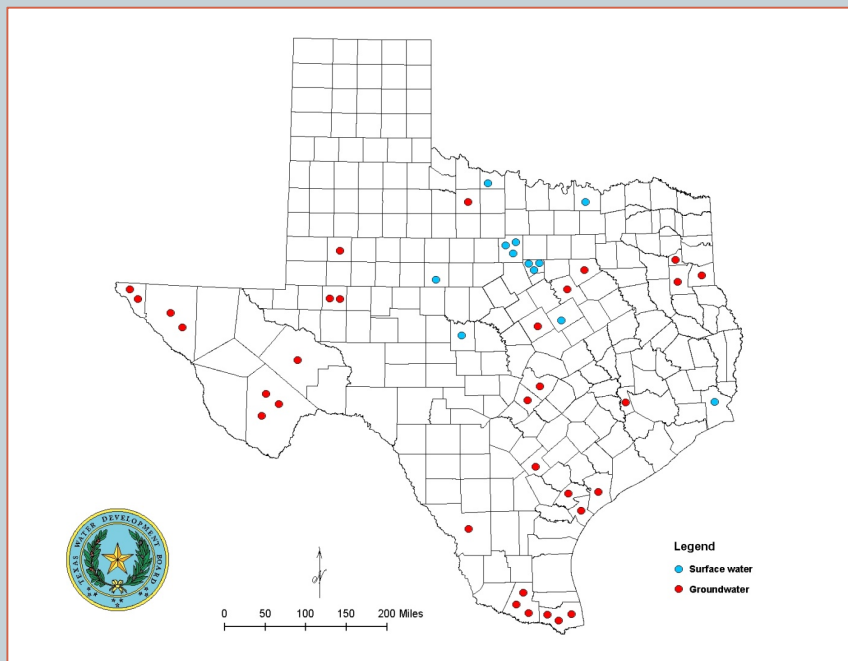


Brackish Water Desalination Facilities in Texas

Existing facilities

(design capacity \geq 25,000 gpd)

- 44 facilities
- 120 mgd



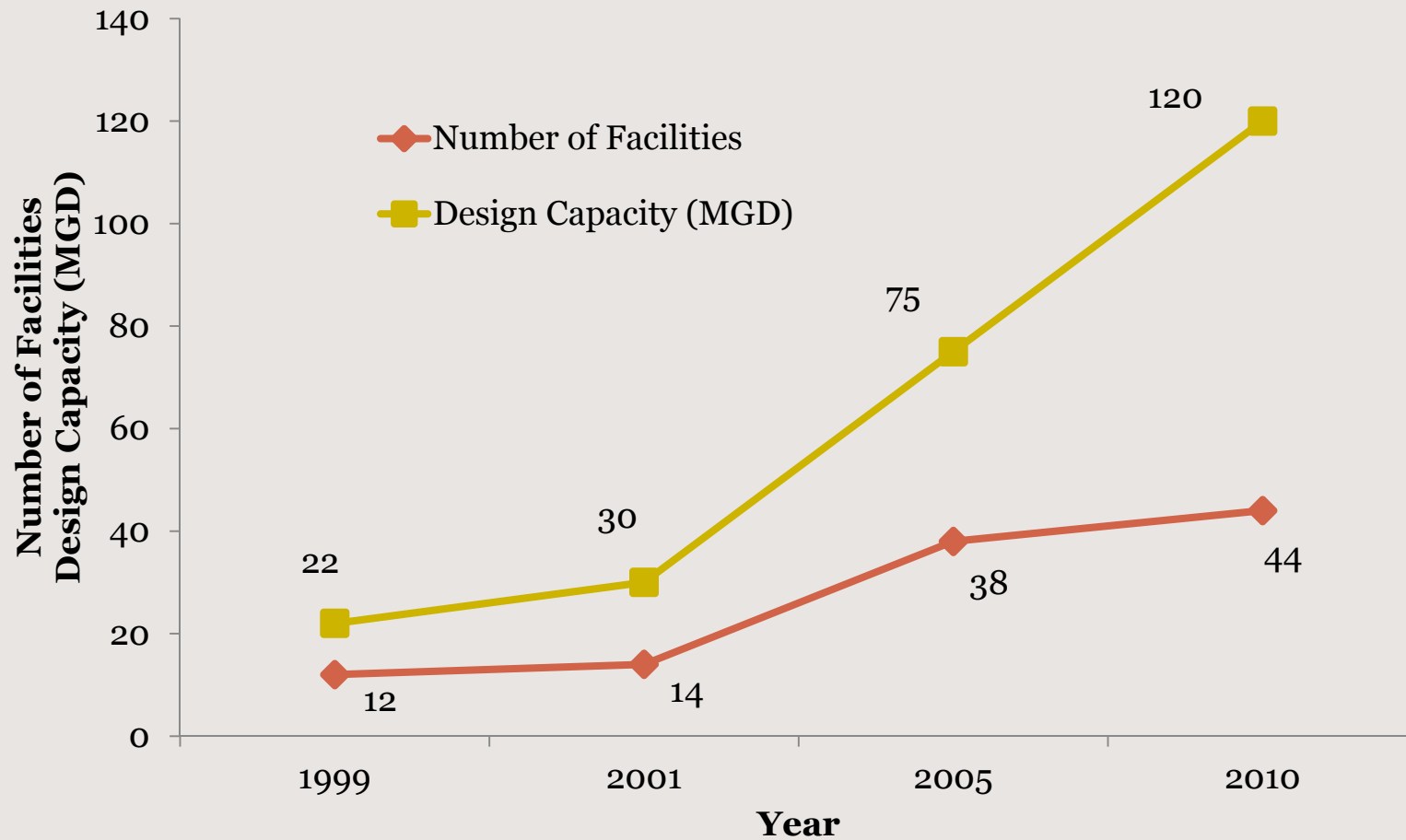
Source

- Surface water
 - 12 facilities
 - 50 mgd
- Brackish groundwater
 - 32 facilities
 - 70 mgd

Technology

- EDR
 - 2 facilities
 - 11.1 mgd
- Reverse osmosis
 - 42 facilities
 - 108.9 mgd

Desalination History in Texas

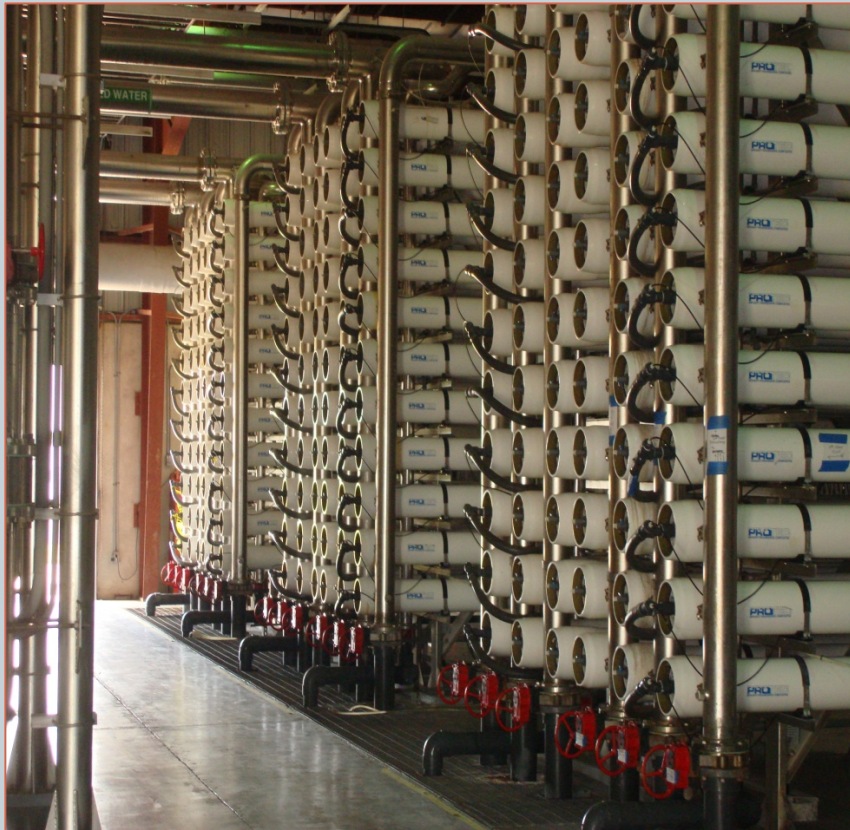


Key challenges to brackish groundwater desalination in Texas

- Concentrate
- Energy
- Cost
- Permitting and regulations
- Source characterization



TWDB's Brackish Groundwater Desalination Program



Courtesy: Southmost Regional WSC

Purpose

- Identify challenges to implementing brackish groundwater desalination
- develop and demonstrate practical solutions

Funding

- ~\$1,800,000 specific for brackish demonstration projects
- ~\$800,000 for brackish groundwater characterization
- Other funds: Research & Planning Program

Projects funded



Funded organizations

- **Operational Challenges**
 - City of Kenedy & San Antonio River Authority
 - Texas Tech University
- **Concentrate Management**
 - San Antonio Water System
 - El Paso Water Utilities
 - University of Texas at Austin
 - CH2M Hill
 - Bureau of Economic Geology
- **Energy Recovery**
 - Affordable Desalination Collaboration

Scopes of projects -examples

- **Operational Challenges**
 - Economics of replacing aging technology with modern equipment (Kenedy/SARA)
- **Concentrate Management**
 - Increase recovery/reduce concentrate volume (EPWU, SAWS, UT Austin)
 - Self-sealing mechanisms of evaporation ponds
- **Energy Recovery**
 - Assessing and optimizing energy management in reverse osmosis desalination of brackish sources

Projects funded



Funded organizations

- Technology and outreach
 - North Cameron Regional WSC
 - Bureau of Economic Geology
- Source Characterization
 - San Angelo
 - City of Seminole
- Post-treatment
 - Carollo Engineers
- Regulation and permitting issues
 - CDM
 - North Alamo WSC

Scopes of projects - examples

- Technology and outreach
 - Desal Guidance Manual
 - TWDB Desal Database
- Source Characterization
 - Guidance Manual
 - Dockum aquifer data
- Post-treatment
 - Calcite contactor beds
- Regulation and permitting issues
 - Use of Class II well for disposal
 - Fiberglass casing of brackish wells

Brackish Resources Aquifer Characterization System

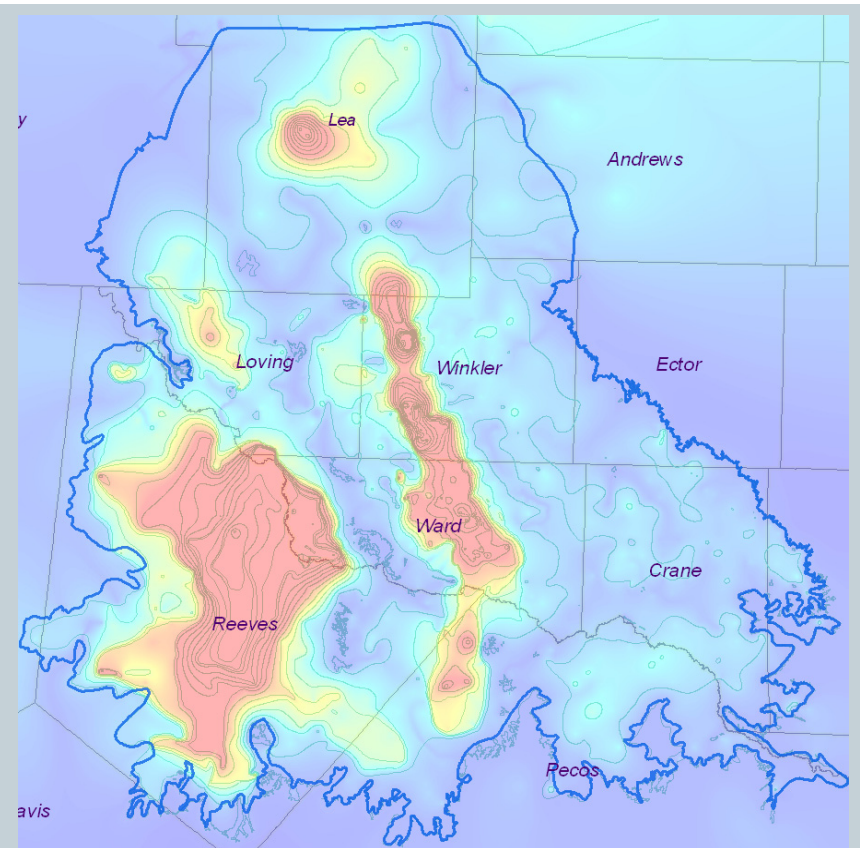


Program Focus:

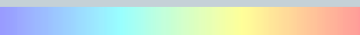
- Characterize the brackish waters in much greater detail (to 10,000 mg/L total dissolved solids)
- Design database and GIS to process this new information
- Collect comprehensive well information statewide
- Research and develop methods of data analysis
- Document results in reports
- Provide access to raw and processed information
- Build replicable numerical groundwater flow models to estimate aquifer productivity
- Develop parameter-screening tool to help communities assess the viability of brackish groundwater desalination supplies
- Present study results nationwide

Brackish Resources Aquifer Characterization System

- Technical Review Panel to provide technical guidance
- Pecos Valley Aquifer chosen as pilot study area
- Three contracts awarded for data collection and model support



Pecos Valley Aquifer, Depth to Bottom

Shallow  Deep

Awarded contracts



Digital
Bibliography
Texas Geology

Intera

Variable Density
Modeling

Intera

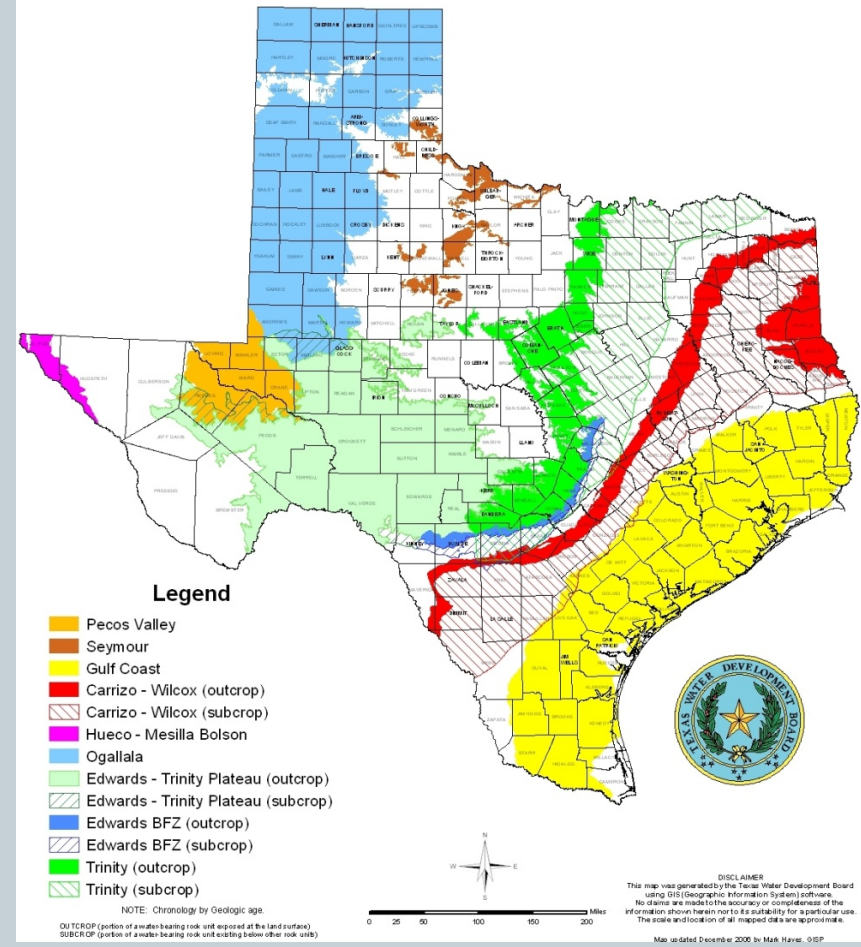
Geophysical Log
Collection

Bureau of
Economic
Geology

Future Work

- Characterize the brackish portions of all aquifers in Texas
- Integrate the BRACS database with the future groundwater database design
- Provide Web access to BRACS data
- Provide detailed methodology on BRACS characterization in written reports
- Provide more accurate estimates of the brackish resource in Texas

Major Aquifers of Texas

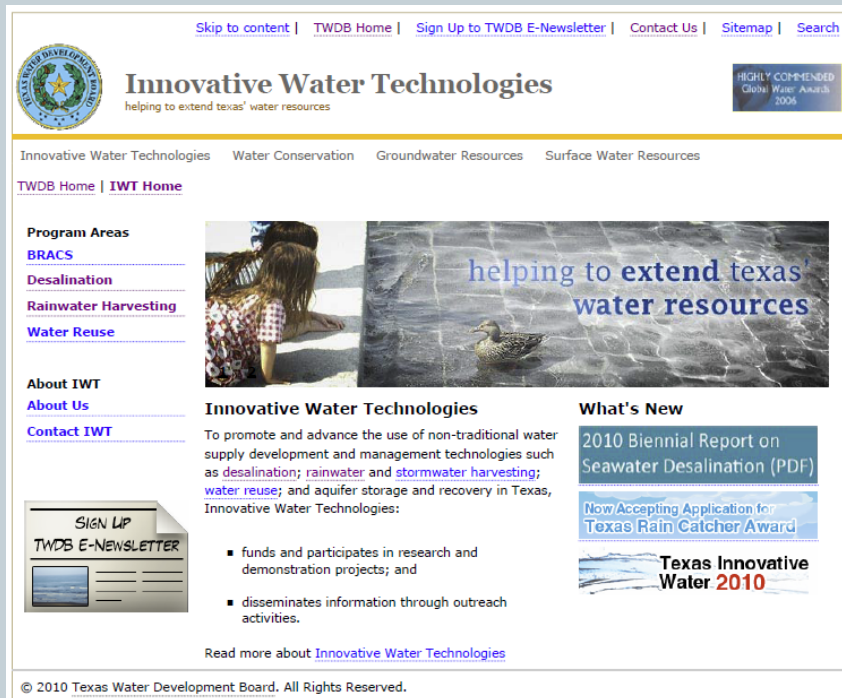


TWDB and Bureau of Reclamation Collaboration



- **Technical assistance**
 - Review of technical reports
 - Partnering in seminars and workshops
- **Funding**
 - Concentrate management (Please Pass the Salt)
- **Collaboration**
 - Variable salinity desalination process

Innovative Water Technologies -Outreach



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Innovative Water Technologies
helping to extend texas' water resources

Highly Commended
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[2010 Biennial Report on Seawater Desalination \(PDF\)](#)
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Innovative Water Technologies
To promote and advance the use of non-traditional water supply development and management technologies such as [desalination](#); [rainwater](#) and [stormwater harvesting](#); [water reuse](#); and aquifer storage and recovery in Texas, Innovative Water Technologies:

- funds and participates in research and demonstration projects; and
- disseminates information through outreach activities.

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Innovative Water Technologies

To research, develop, and disseminate information to advance the development of innovative water management strategies in Texas

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