Water For Texas:

Challenges and Opportunities in Developing Water Supplies

2012 TSPE Annual Conference

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Overview:

- The Challenge at Hand
- Regulatory Framework
  - Water Law 101
  - Political Landscape
- Supply Options
- Water Supply Development Challenges
- The Cost of Doing Nothing

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The Challenge at Hand

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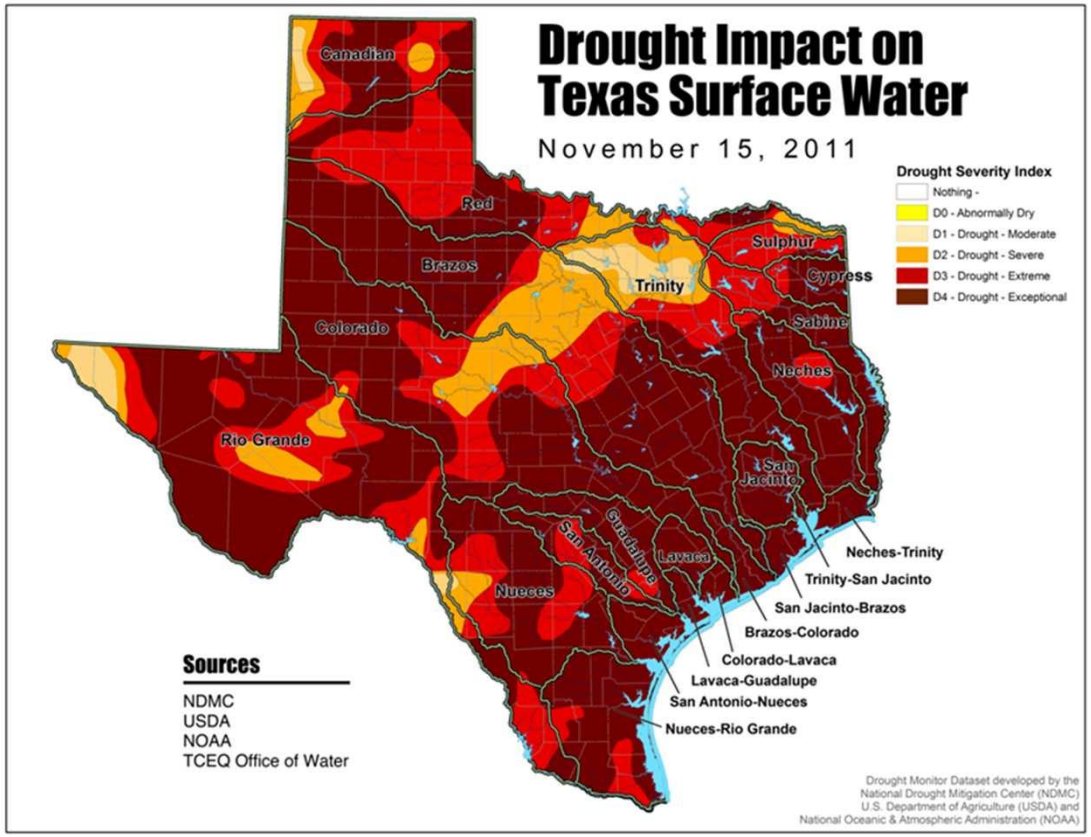
Recurring Drought

- Hydrological impacts of recurring drought on current water supplies throughout Texas.
- State climatologist: drought cycle expected to continue for several years.



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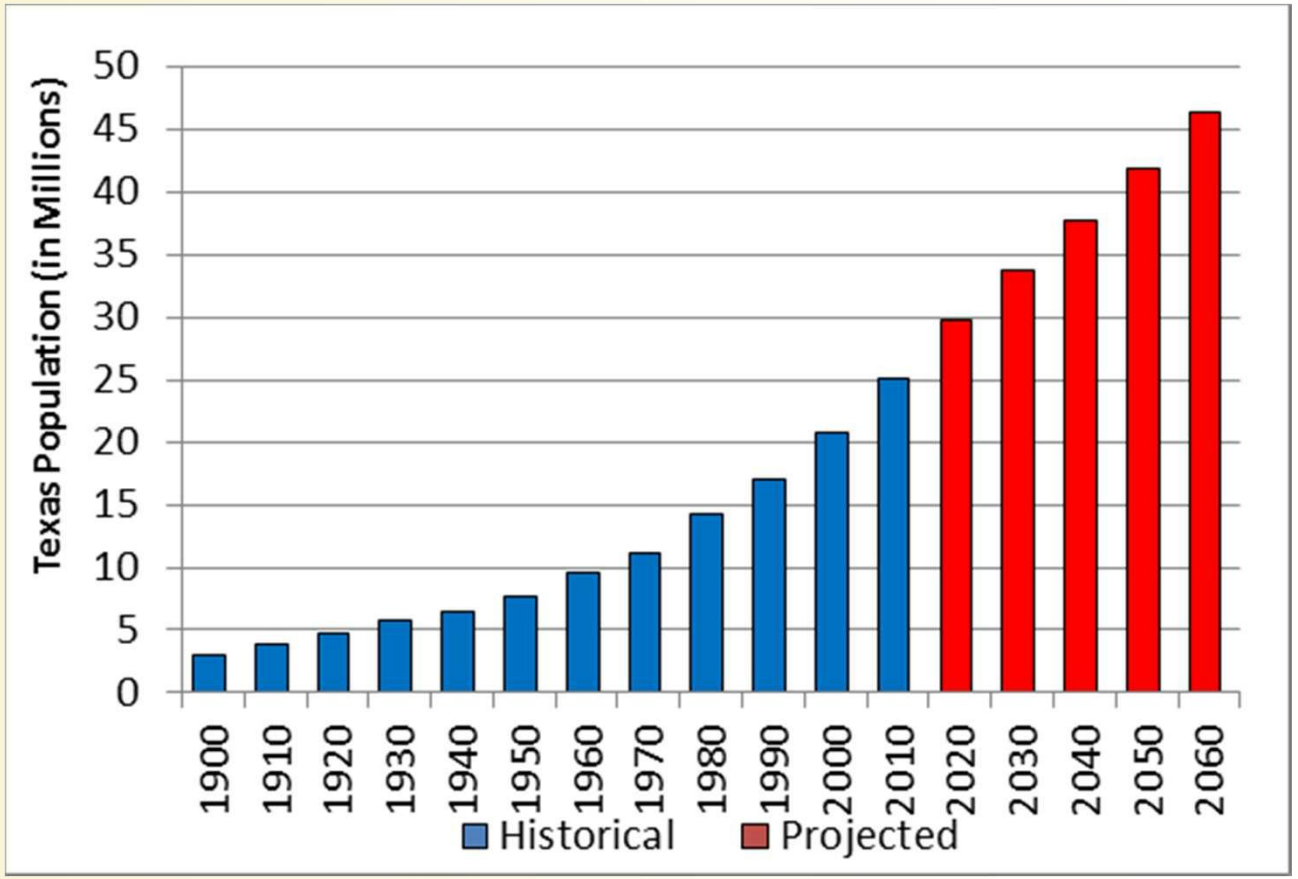
Statewide Growth



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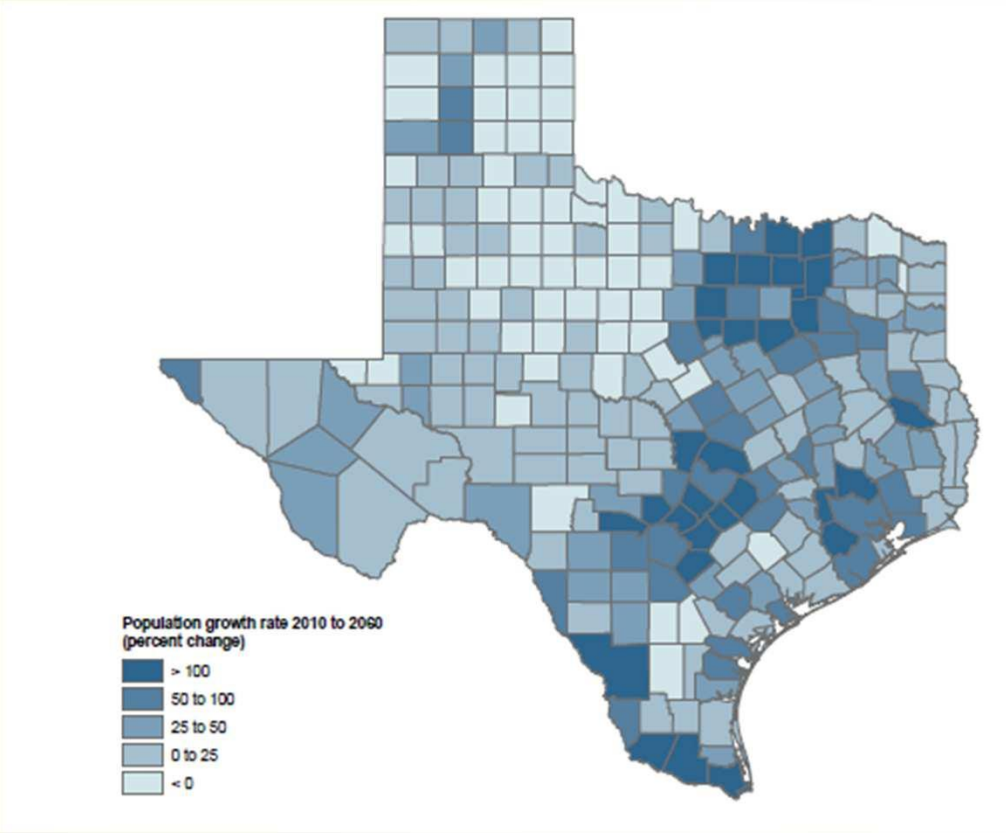
Population Growth by County



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State Climate

FIGURE 4.4. AVERAGE ANNUAL PRECIPITATION FOR 1981 TO 2010 (INCHES) (SOURCE DATA FROM TWDB, 2005 AND PRISM CLIMATE GROUP, 2011).

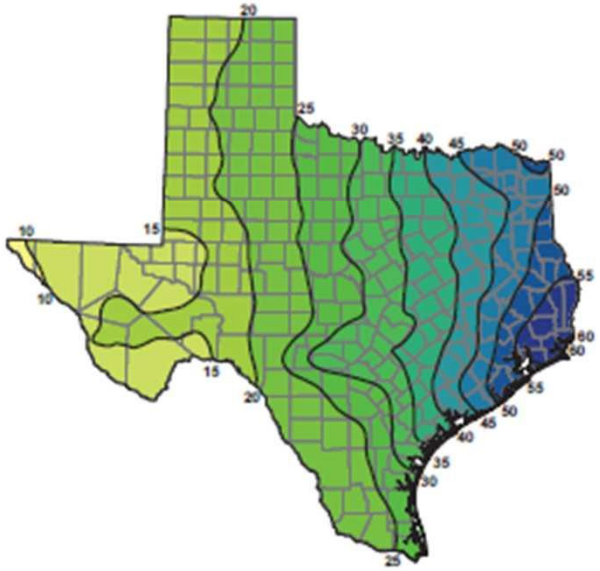
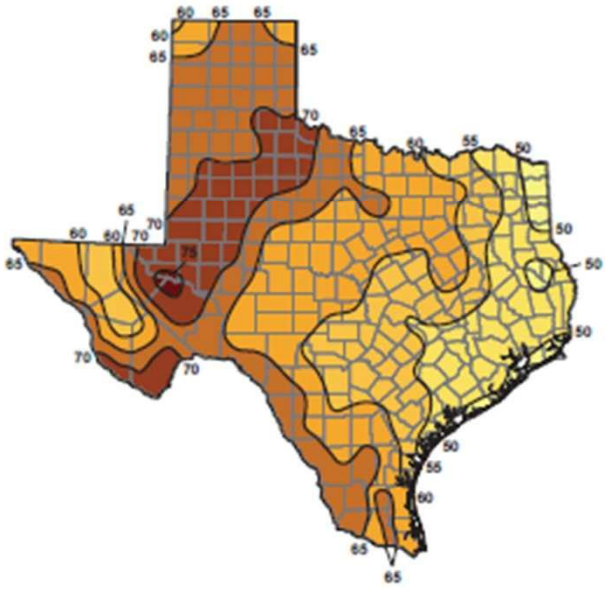


FIGURE 4.5. AVERAGE ANNUAL GROSS LAKE EVAPORATION FOR 1971 TO 2000 (INCHES) (SOURCE DATA FROM TWDB, 2005).



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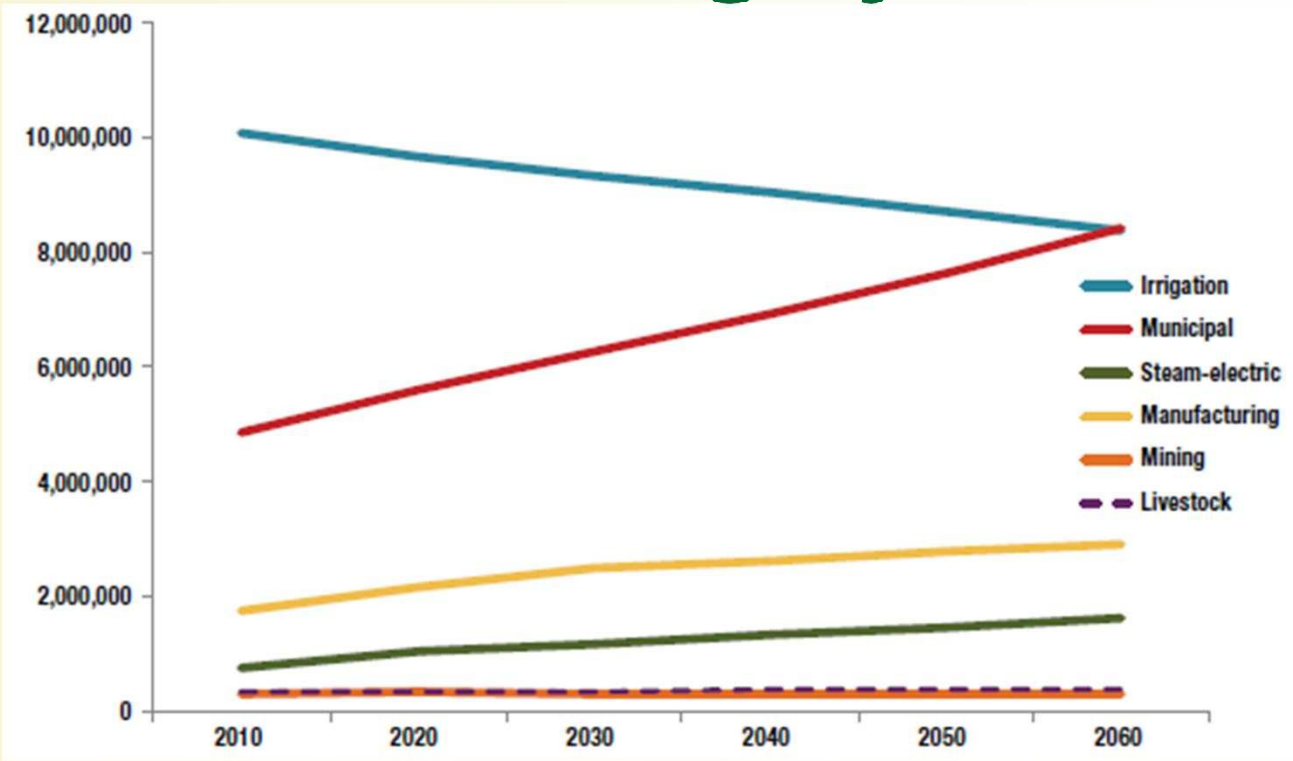
Projected Water Demand by Use Category



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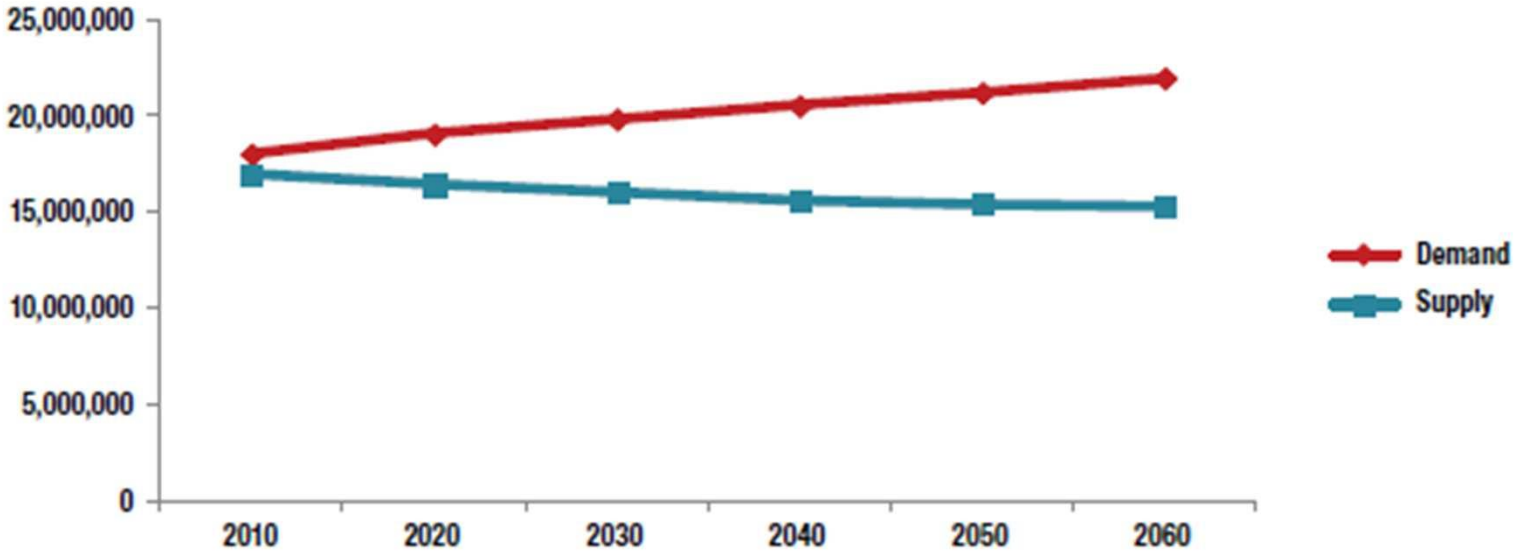
Supply and Demand through 2060

FIGURE ES.2. PROJECTED WATER DEMAND AND EXISTING SUPPLIES (ACRE-FEET PER YEAR).



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Regulatory Framework

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Water Law 101:

- Texas Surface Water Law
  - Chapter 11 of the Texas Water Code
- Texas Groundwater Law
  - Chapter 36 of the Texas Water Code
- Relevant State Agencies
- Planning

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Texas Surface Water Law

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Texas Surface Water Law:

Evolved from Two Doctrines of Water Law

- Riparian Doctrine
  - Private water rights are tied to the ownership of land bordering a natural stream or river
- Doctrine of Prior Appropriation
  - Water rights are acquired through express appropriation from sovereign and by compliance with statutory requirements

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Texas Surface Water Law

Water Rights Adjudication Act

- Enacted in 1967
- Act reduced all existing water rights and permits, including claims under riparian rights, to Certificates of Adjudication ("COA")
- Excepted "domestic and livestock" rights
- A "COA" is a type of water rights document issued to regulate the use of state water

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Texas Surface Water Law

Currently…

- Anyone seeking a surface water right must comply with the Texas Water Code (the "TWC") and the Texas prior appropriation system in allocating water rights.

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Chapter 11 of the TWC

- Provides the foundation for surface water rights in Texas.
- Outlines the requirements to apply for a surface water right and establishes the prior appropriation doctrine.
- TWC Section 11.002 defines a “water right” as a right to “impound, divert, or use state water.”

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TWC Section 11.021(a)

- "State water" defined:
  - The water of the ordinary flow, underflow, and tides of every flowing river, natural stream, and lake, and of every bay or arm of the Gulf of Mexico, and the storm water, floodwater, and rainwater of every river, natural stream, canyon, ravine, depression, and watershed in the state is the ***property of the state***.

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TWC Section 11.023

Purposes for which water may be **appropriated, stored or diverted**:

- Domestic and municipal
- Agricultural and industrial
- Mining and recovery of minerals
- Hydroelectric power and navigation
- Recreation and pleasure, public parks and game preserves
- Or for any other beneficial use.

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TWC Section 11.121

Permit Required

- No person may appropriate any state water or begin construction of any work designed for the storage, taking, or diversion of water **without first obtaining a permit** from the commission.

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Water Rights Permit Exemptions
TWC Sections 11.142, 11.1421, 11.1422

1. 200 acre feet (or less) dam or reservoir for domestic and livestock purposes
2. 200 acre feet (or less) dam or reservoir for fish and wildlife purposes
3. Using water from the Gulf of Mexico for drilling and producing petroleum
4. Constructing a reservoir for sediment control as part of a surface coal mining operation
5. Using water from the Gulf of Mexico for mariculture activities
6. Using water to irrigate historic cemeteries

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TWC Section 11.134

Requirements for Obtaining a Water Right

- Unappropriated Water Available
- Beneficial Use Requirement
- Impairment of Existing Water Rights
- Not Harmful to the Public Welfare (social, economic, environmental)
- Environmental Impacts
- Consistency with Regional and State Plans
- Conservation and Drought Contingency Plans

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- Direct Reuse
  - Water Code 11.046(c) – Water appropriated may be beneficially used and reused
  - Treated effluent never reaches a state watercourse (i.e., flange-to-flange, or drain-to-faucet)
  - Quality regulated by TWC Chapter 26 and 30 TAC Chapter 210
  - Primarily used for agriculture or landscape irrigation or for industrial supplies, but some cities looking to direct reuse of effluent for municipal water supplies

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- Indirect Reuse
  - Effluent is discharged into a state watercourse pursuant to TPDES permit and diverted downstream for reuse
  - Quantity regulated by TWC Chapter 11 and 30 TAC Chapters 295 and 297
  - Developed water-based return flows vs. in-basin surface water-based return flows
  - Historical return flows vs. future return flows

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Texas Groundwater Law

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Texas Groundwater Law

- Rule of Capture
  - English common law doctrine
  - First adopted by Texas Supreme Court in 1904
  - Texas Supreme Court reaffirmed rule of capture several times since
  - Surface estate owner has the right to pump groundwater from beneath the surface of his or her surface estate
  - Rule of the “biggest pump”

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Texas Groundwater Law

Rule of Capture

- One cannot sue his or her neighbor for injunctive relief or damages resulting from the neighbor's depletion of the groundwater resources, except for:
  - Wasteful pumping
  - Pumping with malicious intent to injure neighbor
  - Negligent pumping that causes subsidence

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Texas Groundwater Law

- Chapters 35 and 36 of the Texas Water Code regulate groundwater law and groundwater conservation districts
- TWC Section 36.002:
- "Sec. 36.002. OWNERSHIP OF GROUNDWATER
- (a) The legislature recognizes that a landowner owns the groundwater below the surface of the landowner's land as real property.
- (d) This section does not…affect the ability of a district to regulate groundwater production as authorized by this chapter."

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Texas Groundwater Law

- *Edwards Aquifer Authority v. Day* (Tex. 2012)
  - Texas Supreme Court held that landowners own "groundwater in place," identical to the ownership of oil and gas in place.
  - Whether there is a compensable taking of a groundwater right depends upon a complex analysis under the takings tests established by the U.S. Supreme Court and Texas Supreme Court.

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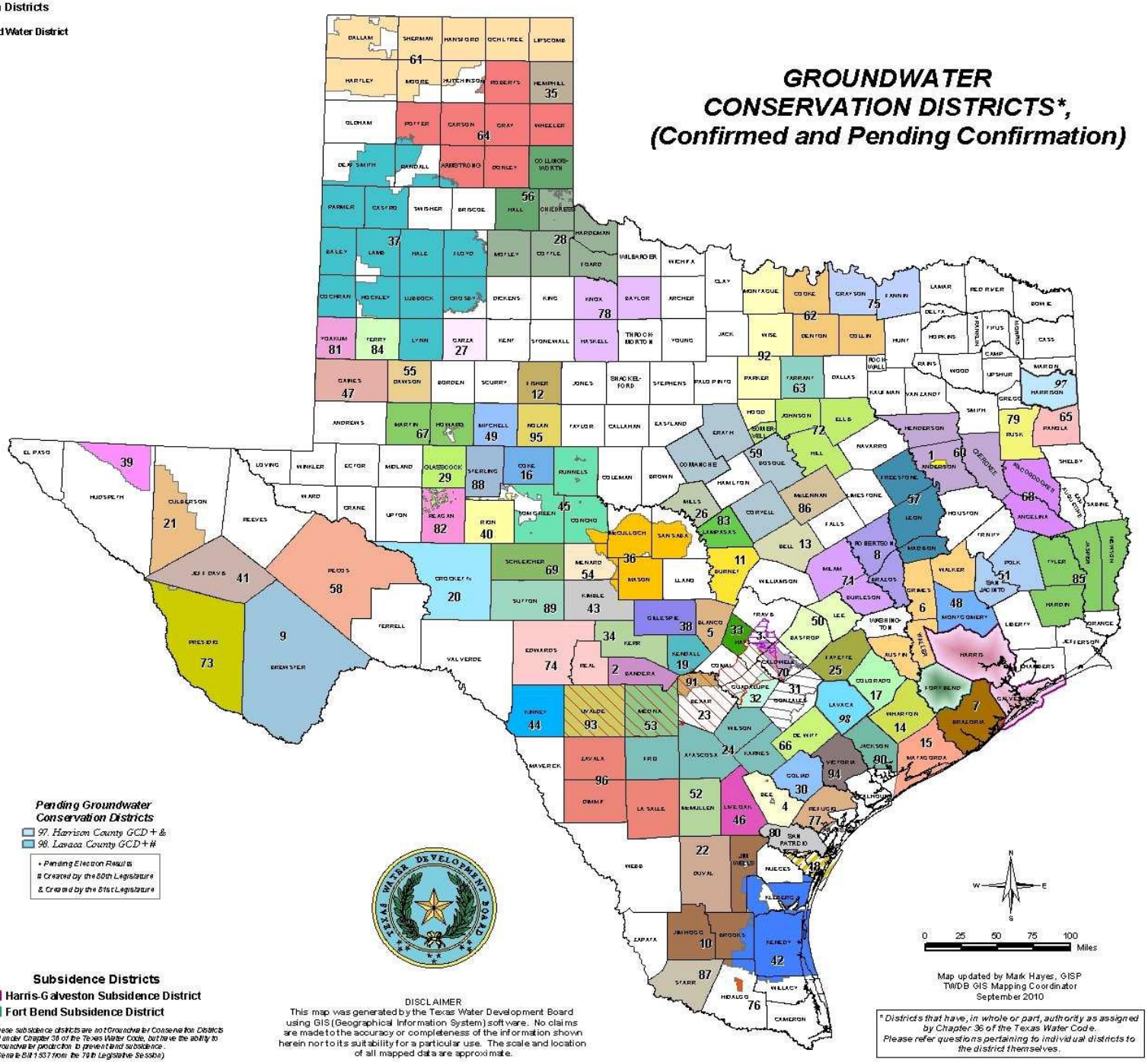
TWC Section 36.0015

- In order to provide for the conservation, preservation, protection, recharging, and prevention of waste of groundwater, and of groundwater reservoirs or their subdivisions, and to control subsidence caused by withdrawal of water from those groundwater reservoirs or their subdivisions, consistent with the objectives of Section 59, Article XVI, Texas Constitution, groundwater conservation districts may be created as provided by this chapter. **Groundwater conservation districts** created as provided by this chapter are the **state's preferred method of groundwater management** through rules developed, adopted, and promulgated by a district in accordance with the provisions of this chapter.

GROUNDWATER CONSERVATION DISTRICTS*, (Confirmed and Pending Confirmation)



Confirmed Groundwater Conservation Districts

1. Anderson County UWCD
2. Bandera County River Authority & Ground Water District
3. Barton Springs/Edwards Aquifer CD
4. Bee GCD
5. Blanco-Pedernales GCD
6. Bluebonnet GCD
7. Brazoria County GCD
8. Brazos Valley GCD
9. Brewster County GCD
10. Brush Country GCD
11. Central Texas GCD
12. Clear Fork GCD
13. Clearwater UWCD
14. Coastal Bend GCD
15. Coastal Plains GCD
16. Coke County UWCD
17. Colorado County GCD
18. Corpus Christi ASRCD
19. Cow Creek GCD
20. Crockett County GCD
21. Culberson County GCD
22. Duval County GCD
23. Edwards Aquifer Authority
24. Evergreen UWCD
25. Fayette County GCD
26. Fox Crossing Water District
27. Garza County UWCD
28. Gateway GCD
29. Glasscock GCD
30. Goliad County GCD
31. Gonzales County UWCD
32. Guadalupe County GCD
33. Hays Trinity GCD
34. Headwaters GCD
35. Hemphill County UWCD
36. Hickory UWCD No. 1
37. High Plains UWCD No.1
38. Hill Country UWCD
39. Hudspeth County UWCD No. 1
40. Irion County WCD
41. Jeff Davis County UWCD
42. Kenedy County GCD
43. Kimble County GCD
44. Kinney County GCD
45. Lipan-Kickapoo WCD
46. Live Oak UWCD
47. Llano Estacado UWCD
48. Lone Star GCD
49. Lone Wolf GCD
50. Lost Pines GCD
51. Lower Trinity GCD
52. McMullen GCD
53. Medina County GCD
54. Menard County UWD
55. Mesa UWCD
56. Mesquite GCD
57. Mid-East Texas GCD
58. Middle Pecos GCD
59. Middle Trinity GCD
60. Neches & Trinity Valleys GCD
61. North Plains GCD
62. North Texas GCD
63. Northern Trinity GCD
64. Panhandle GCD
65. Panola County GCD
66. Pecan Valley GCD
67. Permian Basin UWCD
68. Pineywoods GCD
69. Plateau UWC and Supply District
70. Plum Creek CD
71. Post Oak Savannah GCD
72. Prairielands GCD
73. Presidio County UWCD
74. Real-Edwards C and R District
75. Red River GCD
76. Red Sands GCD
77. Refugio GCD
78. Rolling Plains GCD
79. Rusk County GCD
80. San Patricio County GCD
81. Sandy Land UWCD
82. Santa Rita UWCD
83. Saratoga UWCD
84. South Plains UWCD
85. Southeast Texas GCD
86. Southern Trinity GCD
87. Starr County GCD
88. Sterling County UWCD
89. Sutton County UWCD
90. Texana GCD
91. Trinity Glen Rose GCD
92. Upper Trinity GCD
93. Uvalde County UWCD
94. Victoria County GCD
95. Wes-Tex GCD
96. Wintergarden GCD

Pending Groundwater Conservation Districts

97. Harrison County GCD + &
98. Lavaca County GCD + #

\+ Pending Election Results
\# Created by the 80th Legislature
& Created by the 81st Legislature

Subsidence Districts

- Harris-Galveston Subsidence District
- Fort Bend Subsidence District

NOTE: These subsidence districts are not Groundwater Conservation Districts as defined under Chapter 36 of the Texas Water Code, but have the ability to regulate groundwater production to prevent land subsidence. (Refer to Senate Bill 1337 from the 79th Legislative Session)

DISCLAIMER
This map was generated by the Texas Water Development Board using GIS (Geographical Information System) software. No claims are made to the accuracy or completeness of the information shown herein nor to its suitability for a particular use. The scale and location of all mapped data are approximate.

0 25 50 75 100 Miles

Map updated by Mark Hayes, GISP
TWDB GIS Mapping Coordinator
September 2010

** Districts that have, in whole or part, authority as assigned by Chapter 36 of the Texas Water Code. Please refer questions pertaining to individual districts to the district themselves.*

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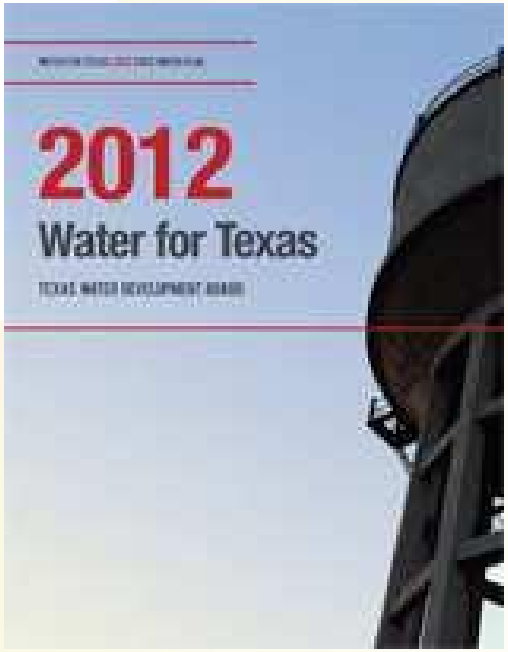
Water-Related State Agencies and State Water Planning



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Texas Commission on Environmental Quality

- Primary agency oversight for Texas surface water law and almost all water quality matters
  - Drinking water
  - Water Availability
  - Water Quality Issues
- Responsible for surface water and water quality permitting and enforcement
- Implements curtailment of water rights during times of drought

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Texas Water Development Board

- Responsibilities:
  - Support of regional water planning process
  - Generation of the State Water Plan
  - Provision of grants and loans for water supply and water quality-related projects, as well as groundwater conservation district creation expenses
  - Data collection and technical assistance
  - Review and approve groundwater district management plans and participate in the establishment of Desired Future Conditions for aquifers

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State and Regional Planning

- 16 Regional Water Planning Areas
- Representation on RWPGs by various interests
- Project 50-year demand
- Identify Supplies to meet demand
- TWDB melds RWPs into SWP and resolves any conflicts

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Political Landscape

- Who's In Charge at the Capitol
- Major Water Initiatives from the 82nd Legislature
- Regulatory Initiatives
  - Drought Curtailment Rules
  - Water Use Reporting
- What's in Store for the 83rd Legislature

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Water-Related Issues at the Capitol

- Natural Resources Committee
  - House and Senate
  - All water-related legislation, in addition to oil and gas and other issues
- Environmental Regulation Committee
  - House and Senate
  - Air quality, solid waste, environmental compliance
- Sunset Advisory Commission
  - TCEQ and TWDB Oversight

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Major Water Initiatives from the 82nd

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Water Usage/Conservation Legislation

- **SB 181** (Shapiro)
  - Amends Chapter 16, Water Code, to require the TWDB to work with TCEQ to develop a uniform way to calculate and report municipal water use
  - Also authorizes TWDB to develop a data collection and reporting program for utilities and municipalities with 3,300 or more connections and requires the TWDB to submit a biennial report to the legislature on the data collected

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Groundwater Ownership

- **SB 332** (Fraser)
  - Provides for ownership interest in groundwater by a landowner beneath the surface as real property and the right of the landowner to drill and produce groundwater, but not in a specific amount

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Water Use Curtailment During Drought

- **HB 2694** (Wayne Smith / Huffman)
  - Gives TCEQ Executive Director the authority to take steps to address drought conditions, such as temporarily suspending the right to divert and/or adjust the allocation of water between water rights holders in light of their respective priority and purpose of use
  - Rulemaking in progress to implement protocol for the issuance of suspension or adjustment orders

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Drought Curtailment Rules

- Authorizes the Executive Director of the TCEQ to issue an order curtailing water rights during times of "drought or other emergency water shortage"
- Curtailment to be made in accordance with Texas' prior appropriation system and "to the greatest extent possible" conform to the preferences for water use established in the Texas Water Code.
- Stakeholder group underway at TCEQ to implement the rules.

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SB 181 – Water Use Reporting Rulemaking

- Mandated by Senate Bill 181 and part of the Texas Water Development Board Sunset Bill
- New water use measurement protocol that accounts for water use among sectors (residential, industrial, institutional, etc.) and moves away from the traditional *gallons per capita per day* measurement.
- New water use reporting requirements for certain sized water suppliers.
- Guidance document for use by water suppliers in measuring water use and conservation.

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What's In Store for the 83rd…

- Potential Hot Topics:
  - Water and energy nexus
  - State Water Plan funding
  - Interbasin transfer requirements
  - Streamlining of reservoir permitting process

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2012 SWP Major Initiatives

1. Reservoir site and stream segment designation
2. Reservoir site acquisition
3. Interbasin transfers of surface water
4. Petition process on the reasonableness of desired future conditions
5. Water loss
6. Financing the state water plan

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Water Supply Options

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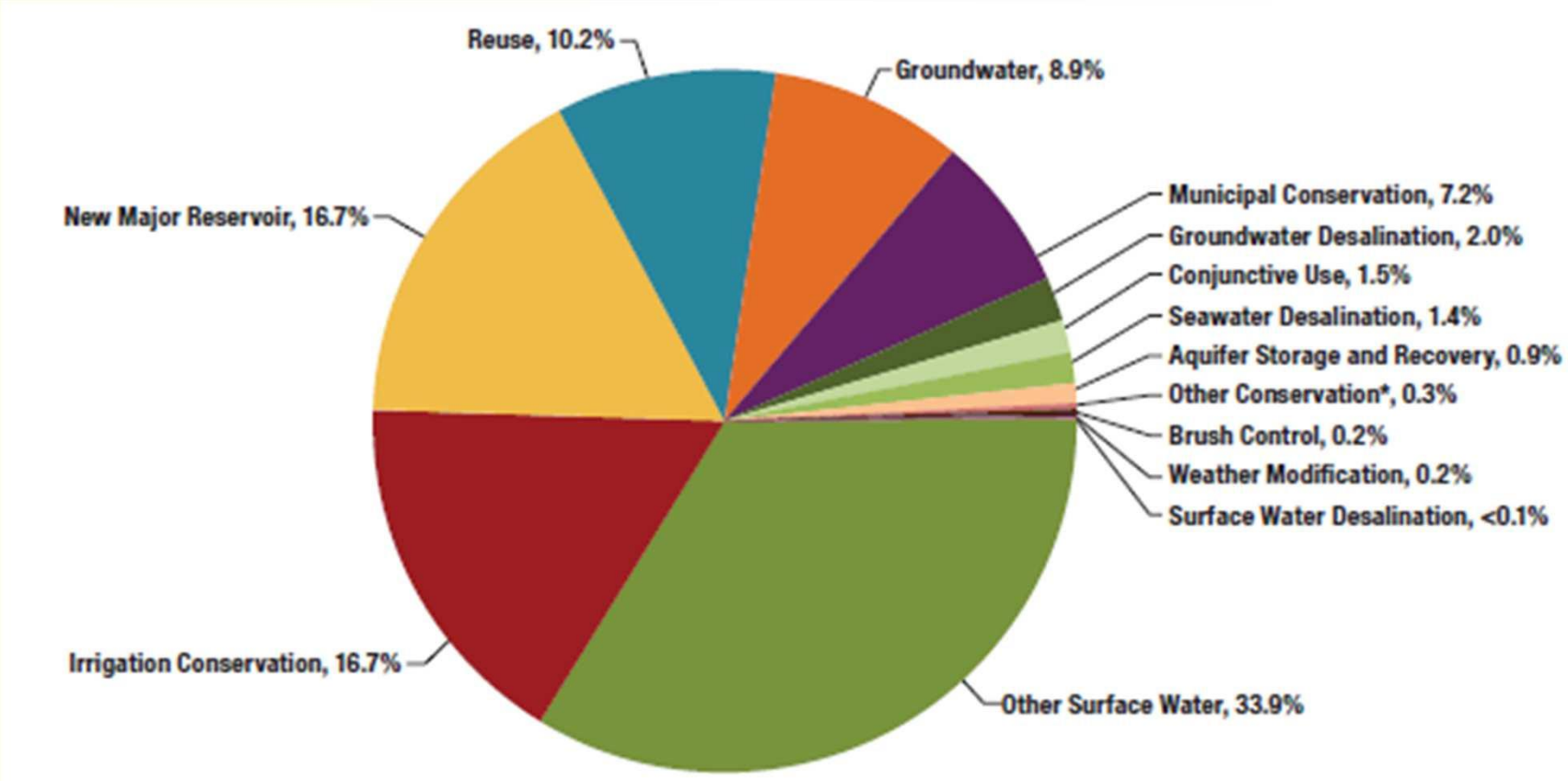
SWP Recommended Water Management Strategies



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Water Conservation

- Focuses on efficiency of use and reduction of demands on existing supplies.
- Strategies:
  - Water-efficient appliances
  - Education programs
  - More water efficiency in daily activities
  - Irrigation practices

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Water Conservation, Contd.

- Supplies to be Generated:
  - Statewide, municipal conservation strategies are expected to result in approximately 650,000 acre-feet of supply by 2060.
  - Statewide, irrigation and other conservation strategies are projected to result in approximately 1.5 million acre-feet per year of additional supply by 2060.

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Groundwater

- Groundwater supplies include:
  - Installation of new freshwater wells
  - Increased production from existing wells
  - Temporarily overdrafting aquifers to supplement supplies
  - *Desalination of brackish groundwater*
- Groundwater strategies identified in the State Water Plan are projected to result in about 800,000 additional acre-feet per year in 2060.

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Desalination

- Includes desalination of brackish groundwater and seawater.
- Currently, desalination facilities throughout Texas produce approximately 138 million gallons of water per day.

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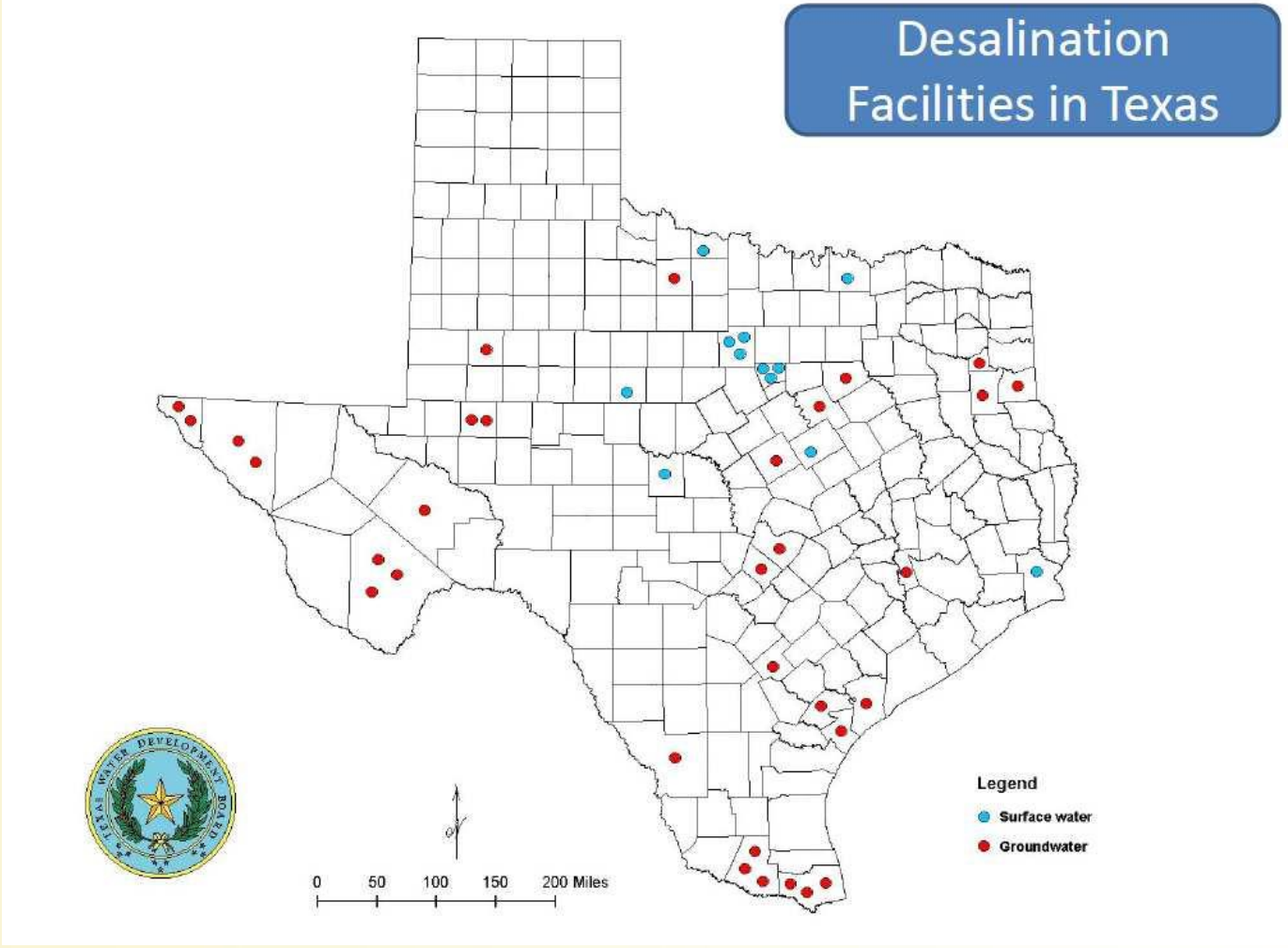
Desalination Facilities in Texas



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New Surface Water Supplies

- Includes:
  - Stream diversions
  - New reservoirs
  - New or expanded contracts or connection of developed supplies
  - Operational changes
    - *See, e.g.* BRA System Operations Permit, currently pending at TCEQ

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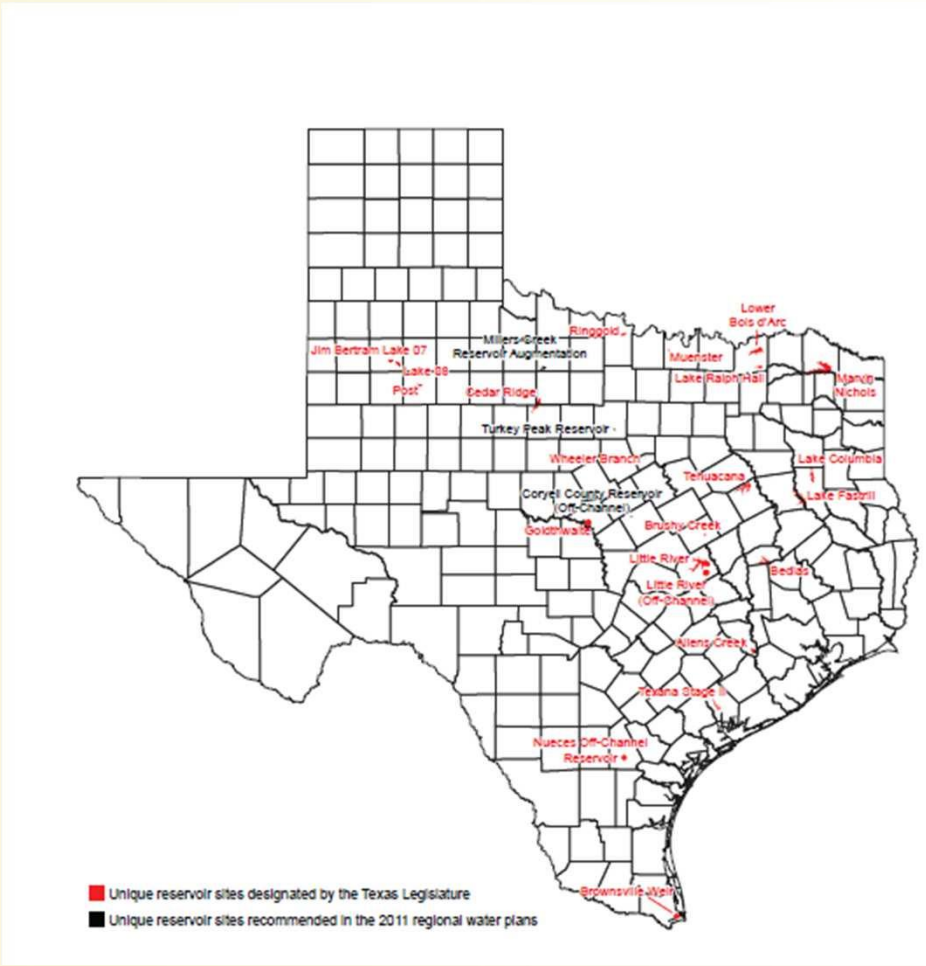
Unique Reservoir Sites



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New Surface Water Supplies, cont'd.

- Supplies to be Generated:
  - 2012 State Water Plan recommends 26 new major reservoirs, projected to generate approximately 1.5 million acre-feet per year by 2060.
  - Other surface water strategies would result in 3 million acre-feet per year.

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Reuse

- Direct reuse
  - Water conveyed directly from the wastewater treatment system through a pipeline to the point of use.
- Indirect reuse
  - Discharge of wastewater into a stream and later routing or diverting for treatment as water supply.
  - *Requires bed and banks permit from TCEQ.*

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Other Supply Options

- Conjunctive use
- Weather modification or “cloud seeding”
- Drought management
- Aquifer storage and recovery
- Brush control
- Rainwater harvesting

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Water Supply Development Challenges

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Challenges:

- Recurring Drought
- Continued Population Growth
- Development of New Sources of Supply
  - Costs (State Water Plan = $53 billion)
  - Regulatory Uncertainties
  - Impacts of Prop. 2
- Competing Interests
  - Needs of Man
  - Environment

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RAIN

Apathy

DROUGHT

Concern

MORE DROUGHT

Panic

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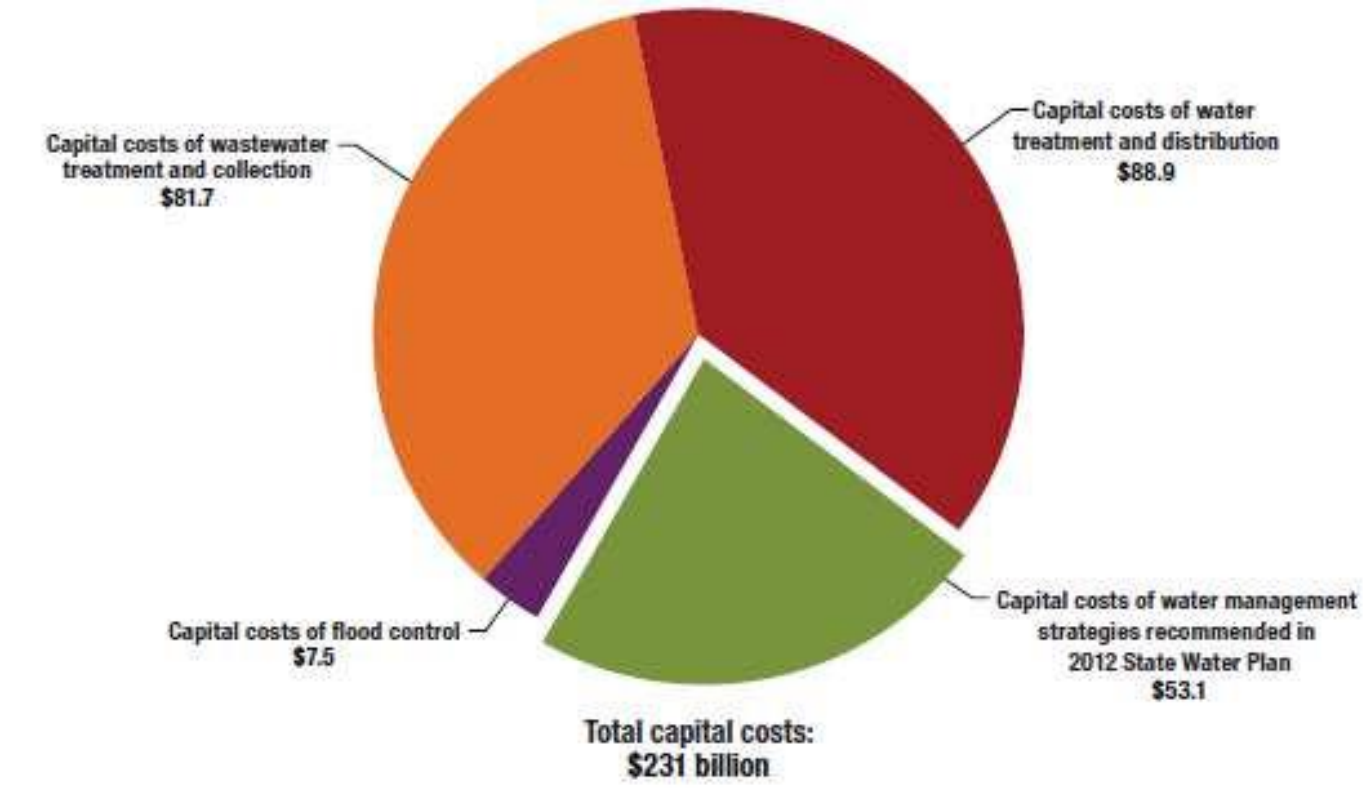
Capital Costs to Implement SWP



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Surface Water Supply Development Challenges

- State Law Challenges:
  - Interbasin transfers (notice requirements, conservation standards, junior rights provisions)
  - SB 3 E-flows standards
  - Permitting timelines

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Interbasin Transfer Statute

- Texas Water Code § 11.085:
  - No person may take or divert any state water from a river basin in this state and transfer such water to any other river basin without first applying for and receiving a water right or an amendment to a permit authorizing the transfer.
- Requires demonstration, among other things, that the applicant has achieved the "highest practicable levels of water conservation and efficiency achievable within the jurisdiction of the applicant."
- Notice requirements
- Interbasin transfer results in loss of priority for that water transferred under the Certificate of Adjudication.

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Environmental Flow Standards

- HB 3/SB 3 required TCEQ to adopt environmental flow standards for the river bay and bay systems of Texas.
- Combined science and stakeholder process which seeks to balance human and environmental water needs.
- Requirements, developed basin-by-basin, apply to new appropriations of surface water in each of the major river basins and estuary systems.

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Federal Law Challenges

- Compliance with Sections 404 and 401 of the Clean Water Act
- Endangered Species Act compliance
- NEPA compliance
- Lacey Act violations
- Permitting/EIS timelines

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Clean Water Act § 404 Permit:

- Authorizes the discharge of dredged or fill materials into 'navigable' waters
- Requires steps to avoid and minimize impacts to aquatic resources
- Requires mitigation for unavoidable impacts
- Public notice and meetings
- Reapplication allowed only if new and material evidence is offered

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EPA Veto Authority:

- Authorized under CWA § 404(c)
- Public notice and comment opportunities
- Must be for an "unacceptable adverse effect" on i) municipal water supplies, ii) fish and wildlife, or iii) recreational areas
- 12 water projects vetoed since 1981
- Arbitrary and capricious standard of review

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Clean Water Act § 401 Water Quality Certification:

- Issued by TCEQ to support issuance of 404 permit by USACE
- Ensures the proposed 'discharge' will comply with state's water quality standards
- Requires an alternatives analysis

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NEPA Process:

- Triggered for “major federal actions” impacting the environment
- In re § 404 applications, directs the USACE to prepare an Environmental Impact Statement before permit issued
- Drives an alternatives assessment based on the “purpose and need” for a project

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Lacey Act:

- Lacey Act of 1900 created civil and criminal penalties for a variety of violations regarding plants and wildlife.
- Injurious species provisions prohibit the importation, transport, and possession of injurious species of plants, wildlife and fish between the United States.
- Has been amended several times – today primarily used to prevent importation or spread of invasive, non-native species.

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Endangered Species Act:

- Requires federal agencies, in consultation with the U.S. Fish and Wildlife Service and/or the National Oceanic Atmospheric Administration Fisheries Service, to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat of such species.
- Prohibits any action that causes a “taking” of any listed species of endangered fish or wildlife.

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Endangered Species Act:

- Currently over 1,200 species listed as either endangered or threatened by U.S. Fish and Wildlife Service.
- ESA Impacts on Water Supply Projects:
  - Identification of potential species in project area.
  - Habitat assessment conducted.
  - Species surveys if habitat is present.

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Current Timeline for Water Supplies:

- CWA § 404 permitting can be major impediment to successful completion of water supply projects.
- NEPA compliance can cost millions of dollars and add years to project development process.

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Current Timeline for Water Supplies:

- Decades-long timeline for issuance of federal permits and resolution of federal issues impairs development of water supplies.
- Endangered Species Act compliance, required studies, and possible mitigation may delay project implementation and could halt project development.

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Other Surface Water Supply Development Challenges

- Cost
  - Site acquisition
  - Construction
  - Funding issues
- Public opposition
  - NIMBY
  - Environmental impacts

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Challenges Groundwater Supply Development

- Finite resource
  - Extremely slow recharge rate for most aquifers
- Increased regulation over time
  - Regulatory uncertainty as new groundwater conservation districts are created
- Desired future conditions designation as mandated by Tex. Water Code Ch. 36

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Desalination Challenges

- Availability
- Technological limitations
  - Energy required for desalination process
- Cost
- Waste disposal options

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Cost of Doing Nothing

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Economic Risk of Failure

- If the major reservoir sites recommended for construction in the 2012 State Water Plan are not developed, the State will be short 1.5 million acre-feet annually of water supply in 2060.
- Bottom line: ***Failure to meet the state's projected water supply needs in drought conditions could cost Texas businesses and workers up to $115.7 billion annually in 2060.***

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Opportunities for Impact

- Continued policy development supporting creation of new supplies
  - Permitting timelines
  - Regulatory hurdles
- Funding of State Water Plan
- Technological Advancement
  - Desalination and other alternative strategies
- Continued Water Use Efficiency

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Questions???

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Thank you for coming.

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