

Ground-Water Science and Policy: The Search for a National Perspective

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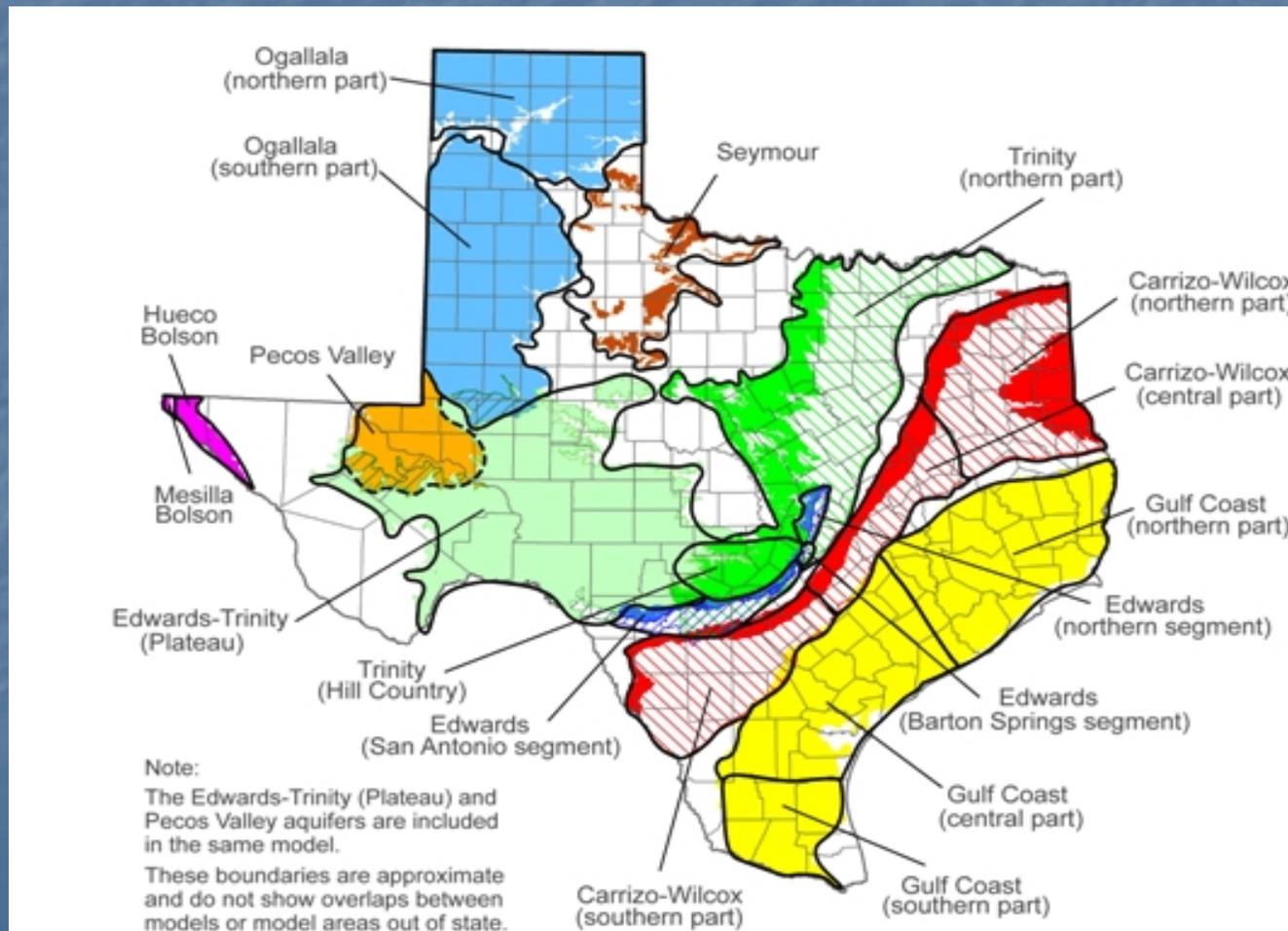
The Culture

- Putting “ground water” and “national” in the same sentence can start a fight
 - If all politics are local, ground water policies, management, and politics traditionally fit the this mold
- States deal with each other on ground water issues when they have to, generally not because they want to
 - Texas – New Mexico: a tale of the courts

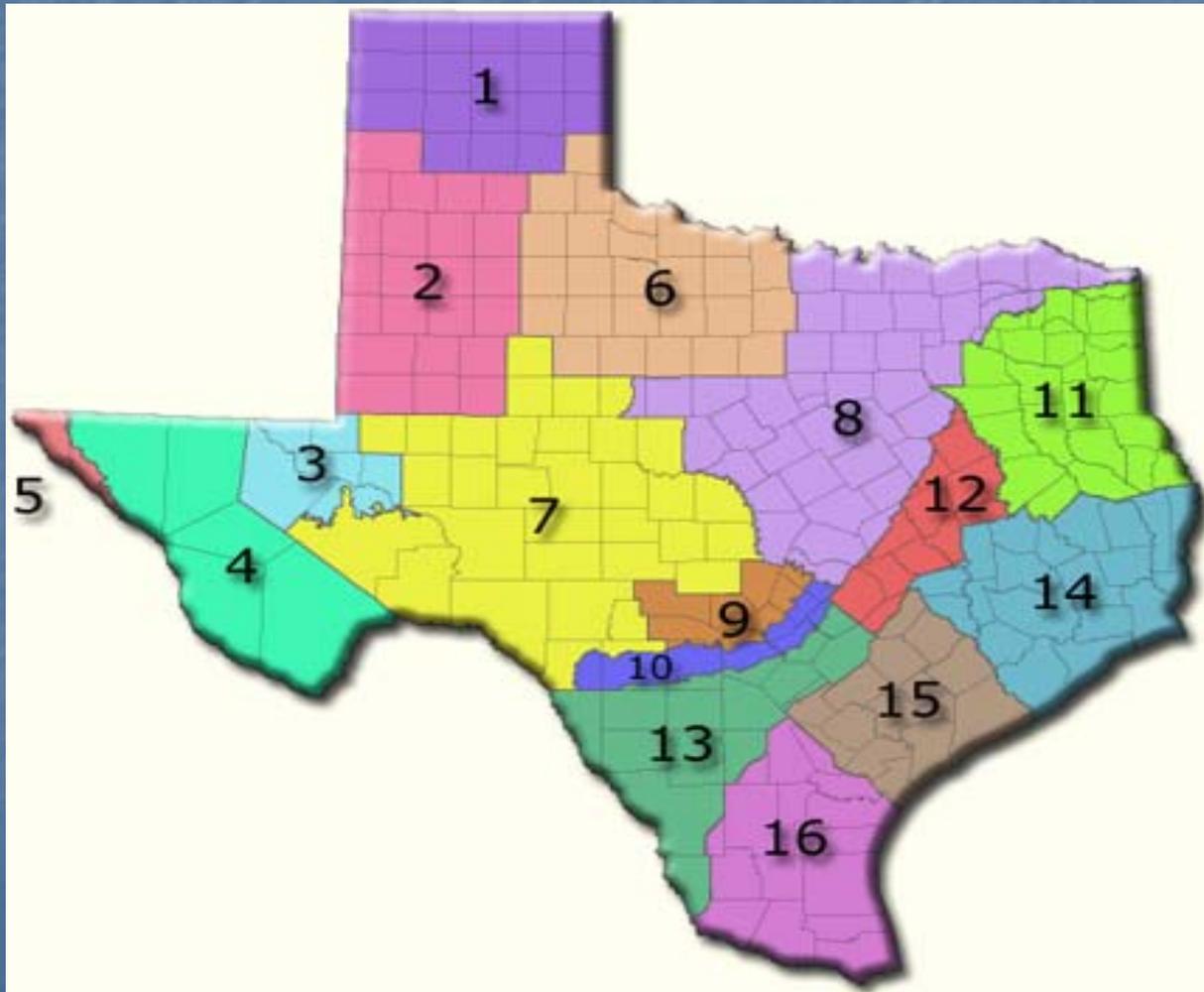
The Challenge

- Very few aquifer systems honor ground-water conservation district, county, or state boundaries
 - To what political boundary level do you have to go to manage an aquifer?
 - Do we ever manage at this natural system boundary level?
- What would facilitate or encourage a more natural systems or scientific approach to ground water management?
- How can the science to support this approach be defined and funded?

TWDB Groundwater Availability Modeling – Major Aquifers



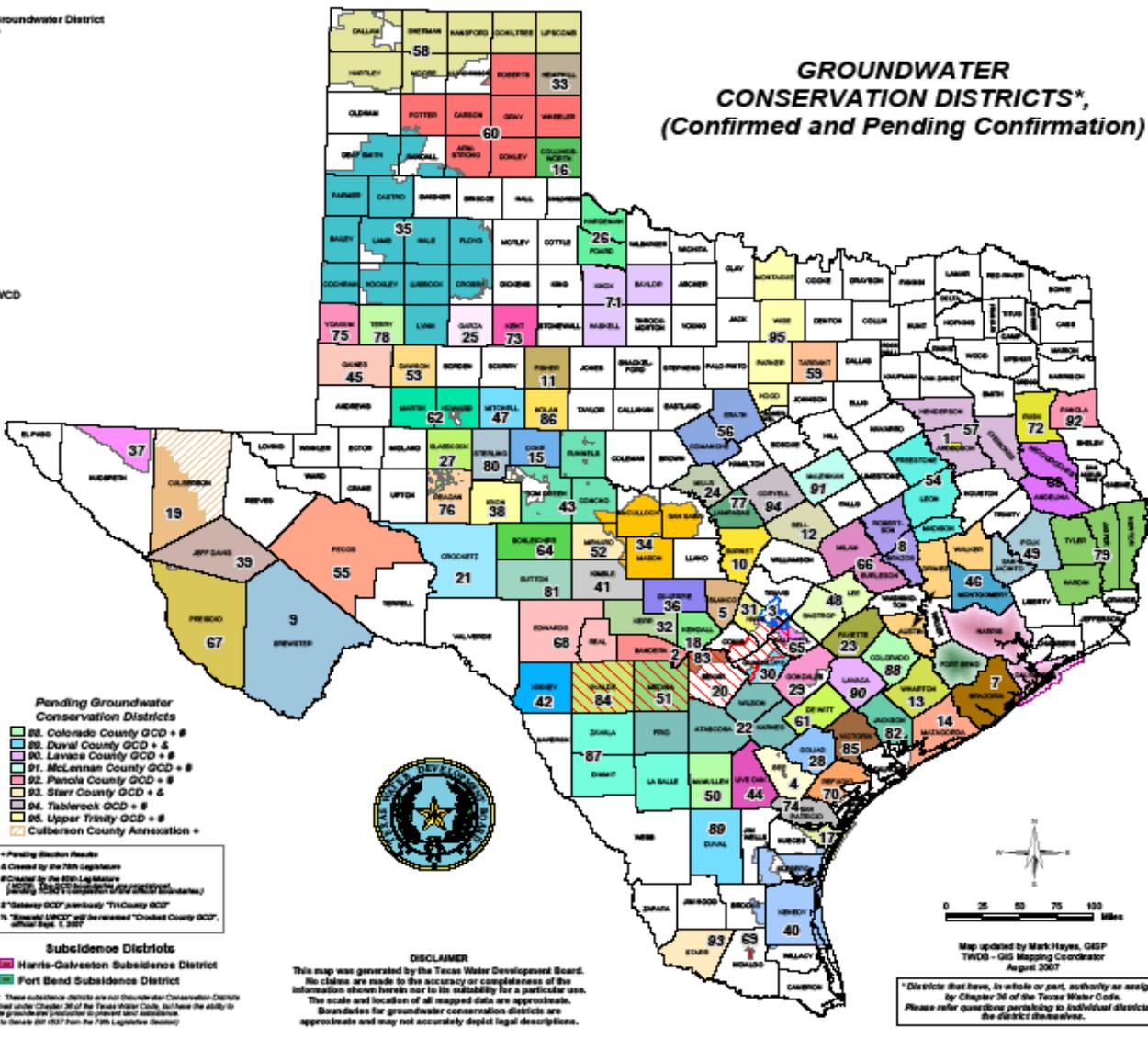
Texas Ground Water Management Areas



Confirmed Groundwater

Conservation Districts

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



GROUNDWATER CONSERVATION DISTRICTS*, (Confirmed and Pending Confirmation)

- Pending Groundwater Conservation Districts**
- 88. Colorado County GCD + #
 - 89. Duval County GCD + #
 - 90. Lavaca County GCD + #
 - 91. McLennan County GCD + #
 - 92. Pecos County GCD + #
 - 93. Steer County GCD + #
 - 94. Tarrant GCD + #
 - 95. Upper Trinity GCD + #
 - Cullbertson County Annexation +

- Subsidence Districts**
- Harris-Galveston Subsidence District
 - Fort Bend Subsidence District

NOTES: 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. Please to locate 807-537 from the 79th Legislature (Session).



DISCLAIMER
 This map was generated by the Texas Water Development Board. 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. Boundaries for groundwater conservation districts are approximate and may not accurately depict legal descriptions.



Map updated by Mark Hayes, GSP
 TWDB - GIS Mapping Coordinator
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* 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.

An Answer (Not necessarily THE Answer)

- Federal Ground Water Policy Act
 - Provide Incentives for Science-Based Management on an Aquifer and Recharge Area Basis
 - Provide Increased Funding for Science That Supports Ground-Water Management
 - U.S. Geological Survey
 - Universities
 - State Water Agencies

Relevant USGS Programs

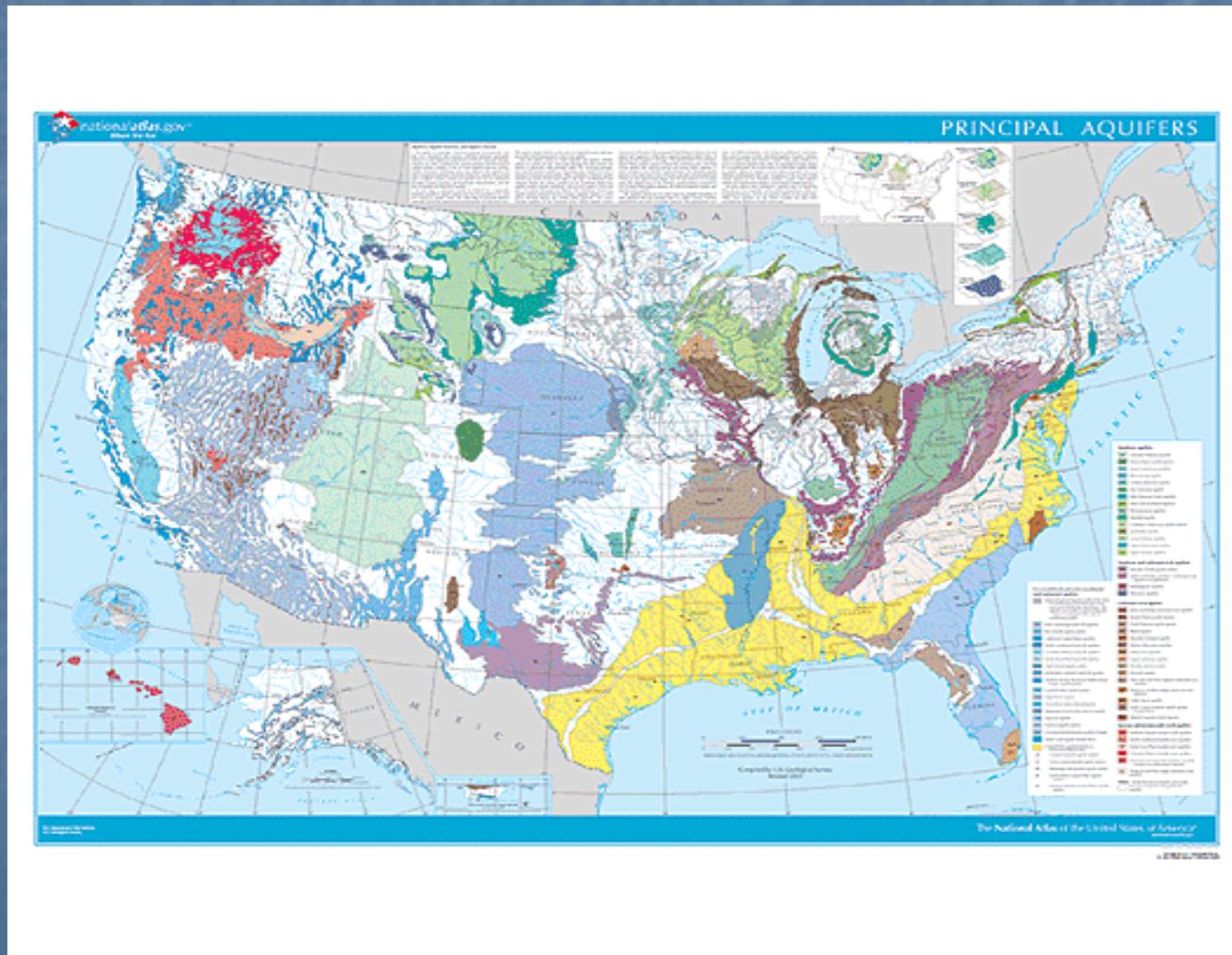
- Regional Aquifer Studies
 - RASA Program
- Ground-Water Modeling
 - Expand cooperative efforts with states
- Ground-Water Monitoring Systems
 - Expand real-time network
- Water Use
- Stream Gauging
 - Where relevant to ground-water discharge or recharge

Needed Improved Understandings

- Surface-Water/Ground-Water Interactions
 - Understanding key to effective water resource system management
 - San Antonio a prime example
- Saline Water Resources Assessment
 - Desalination system design benefits from resource characterization
- Artificial Recharge and Aquifer Storage and Recovery

U.S. Principal Aquifers

Source: National Atlas

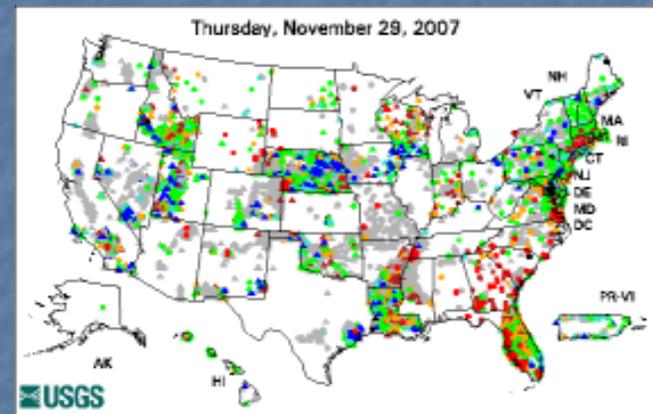


USGS Ground-Water Monitoring

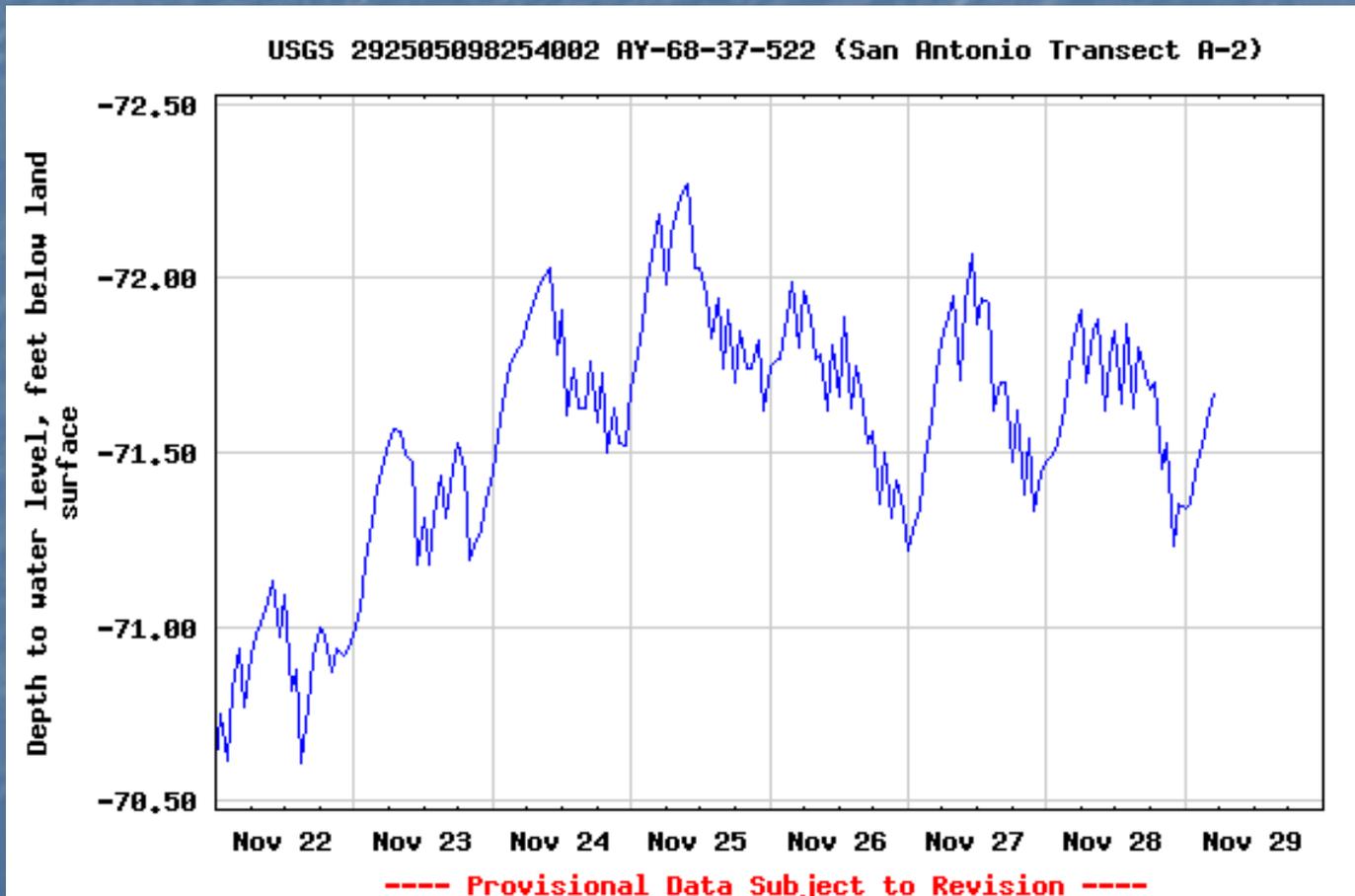
Active Water-Level Network

Real-Time Ground-Water
Level Network

(Based on locally managed
networks)



Real-Time Ground-Water Monitoring



Resistivity Survey

Source: USGS



2000 Water Use Report

“Fresh ground-water withdrawals (83.3 B gal/day) during 2000 were 14 percent more than during 1985.”

USGS

National Ground-Water Policy Act

- Perspectives
 - Historical and growing importance of ground water
 - Uses
 - Competition
 - State of our understanding
 - Factors impacting quantity and quality
 - Responsibility for management and regulation
 - States
 - Federal

National Ground-Water Policy Act

■ Goals

- Improve our scientific understanding of the occurrence and behavior of ground-water systems
- Improve management effectiveness by utilizing natural system-based approaches
- Increase the use of scientific and engineering understanding of ground-water systems in management programs

National Ground-Water Policy Act

■ Approach

- Management responsibility lies principally with the states and their subdivisions
- Therefore the federal approach should be to provide incentives that accomplish the policy goals
- Incentives that encourage states to cooperate in dealing with systems that cross state boundaries

National Ground-Water Policy Act

■ Funding

- Appropriations to the USGS to support cooperative research and monitoring programs with the states
- Grant program, administered by the USGS, supporting relevant university research
- Funding to states for developing management approaches that meet program policy goals

Broader Approach

- National Water Resources Policy Act
 - Include both surface and ground water
 - Retain incentives-based approach
 - Model roughly after Energy Policy Act of 2005
 - General goals
 - Titles addressing various elements