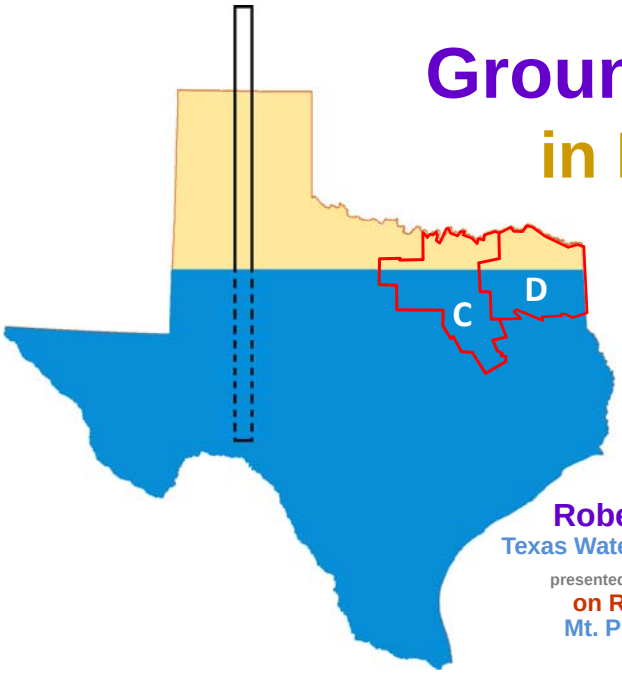

Groundwater in Regions C & D

Robert E. Mace, Ph.D., P.G.
Texas Water Development Board

presented to: **Study Commission on Region C Water Supply**
Mt. Pleasant, June 21, 2010

Outline

- Aquifers in C & D
- Groundwater availability and modeling
- Desired future conditions
- Groundwater availability in Regions C & D

Outline

- **Aquifers in C & D**
- Groundwater availability and modeling
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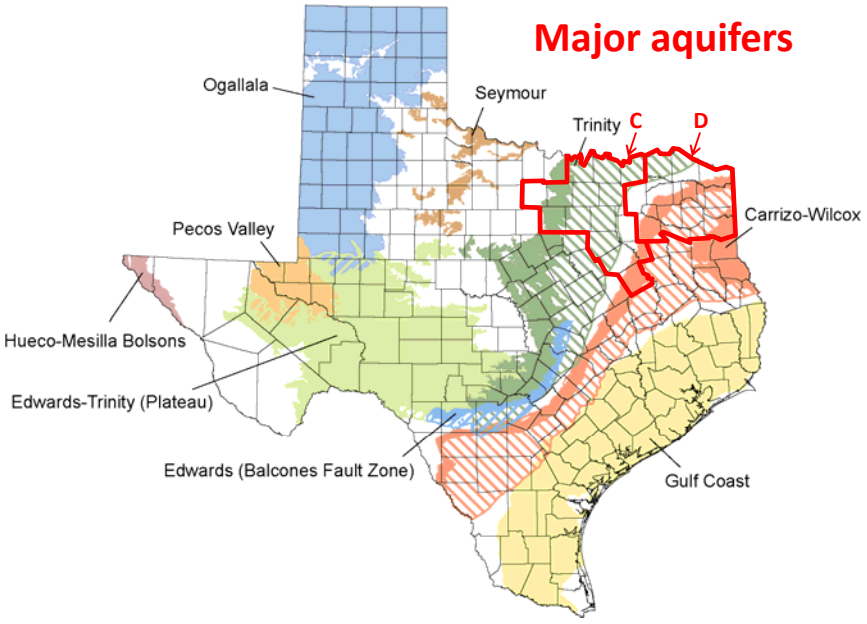
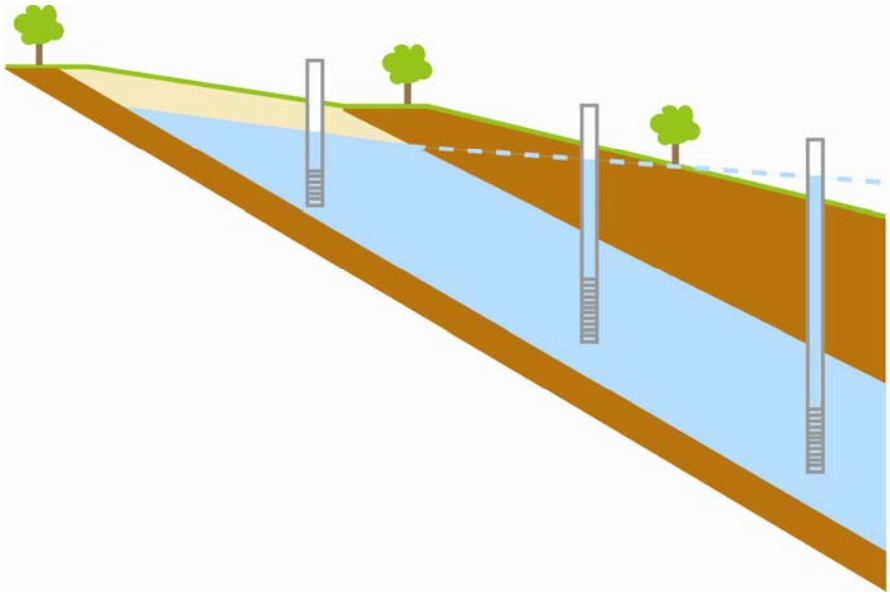
- Groundwater availability in Regions C & D

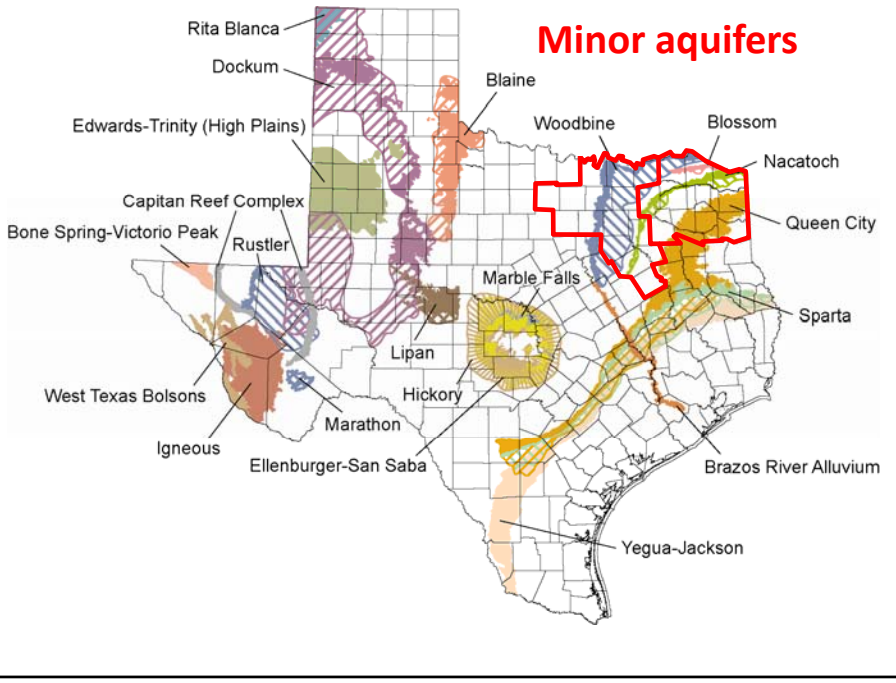
Major aquifers



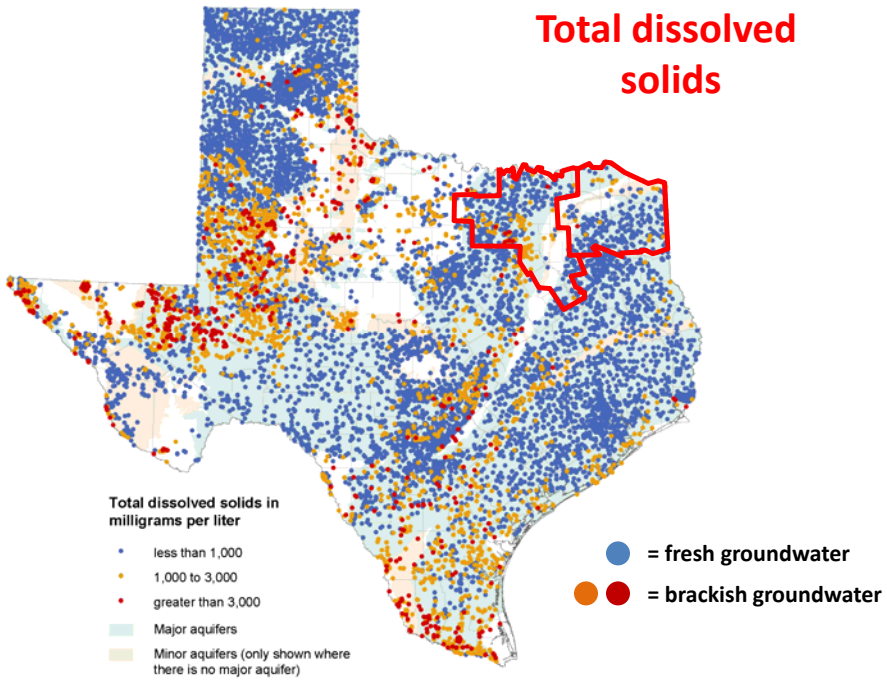
"Dipping" Aquifers

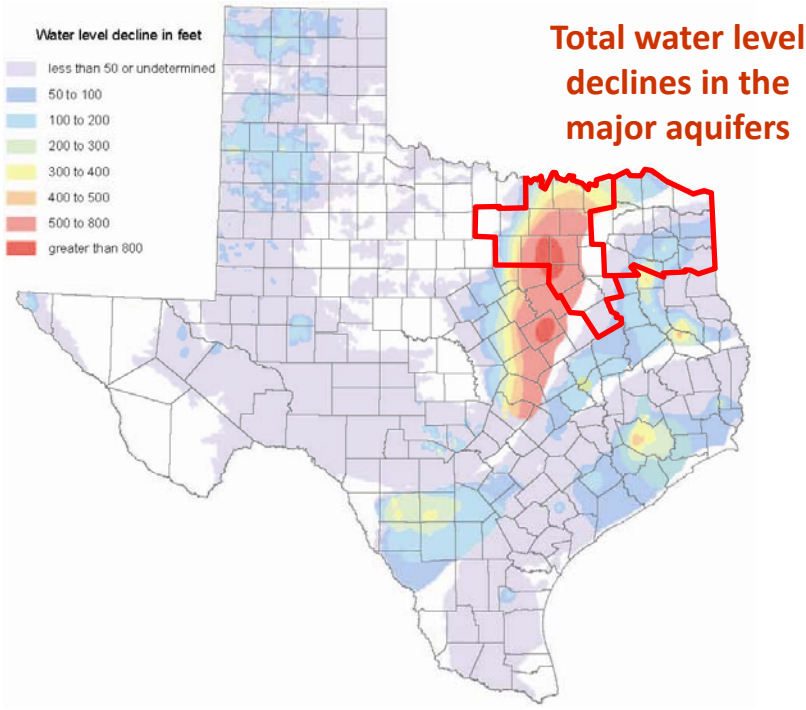


Minor aquifers



Sandstone


Total dissolved solids
Total dissolved solids in milligrams per liter
less than 1,000
1,000 to 3,000
greater than 3,000
Major aquifers
Minor aquifers (only shown where there is no major aquifer)
= fresh groundwater
= brackish groundwater



Total water level declines in the major aquifers

Outline

- Aquifers in C & D
- **Groundwater availability and modeling**
- Desired future conditions
- Groundwater availability in Regions C & D

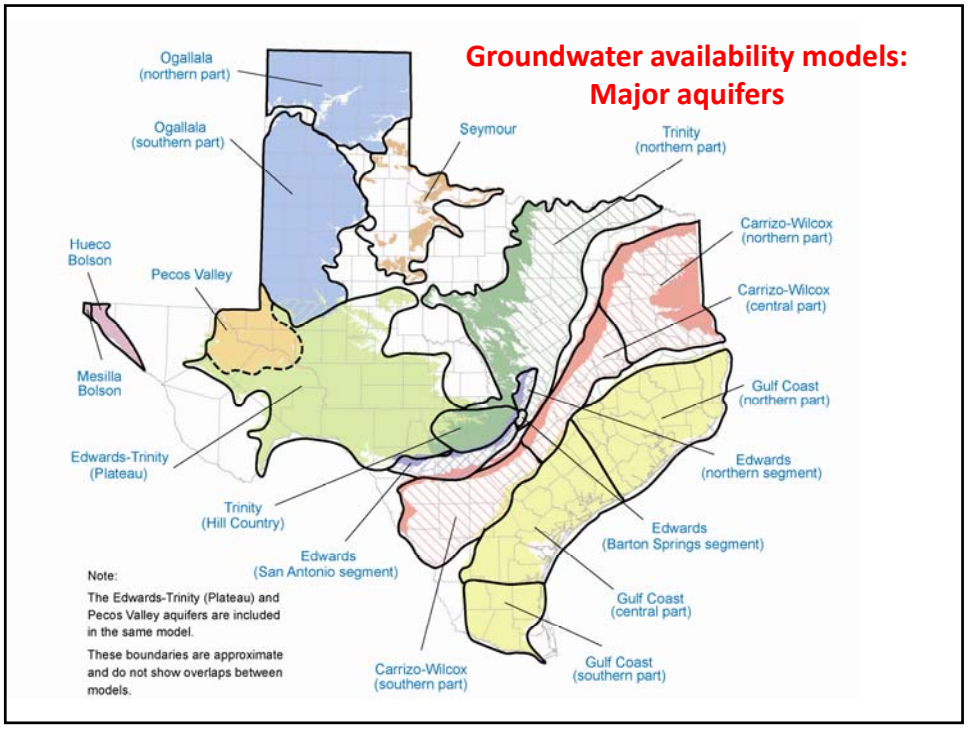
(policy) +

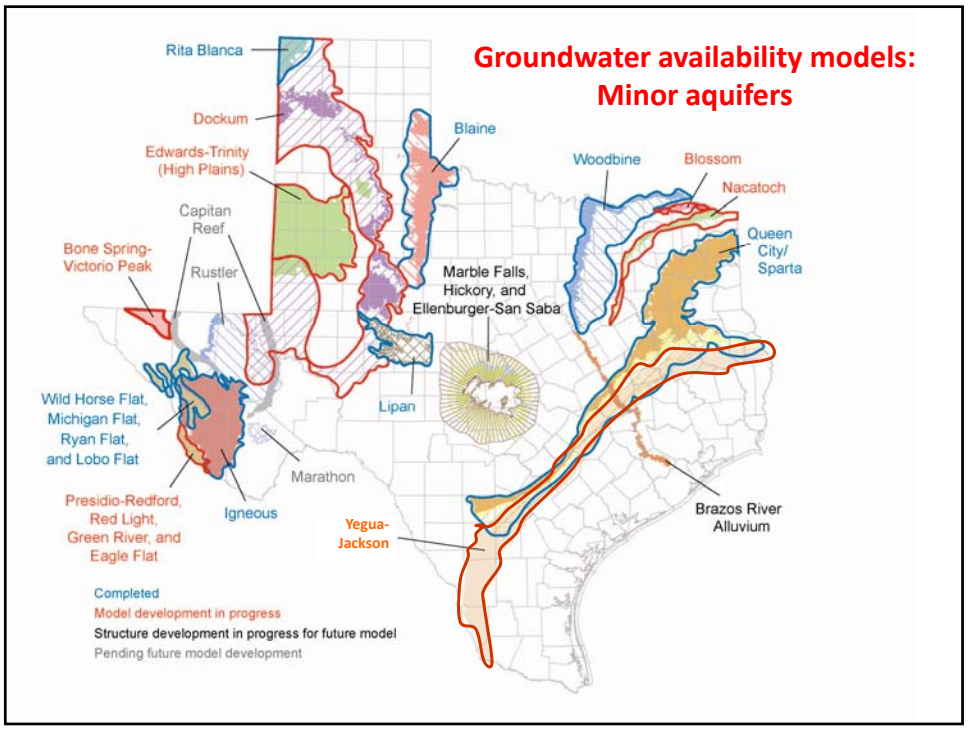
(science) =

groundwater availability

What is a Numerical Groundwater Flow Model?

- **'The aquifer in a computer!'**

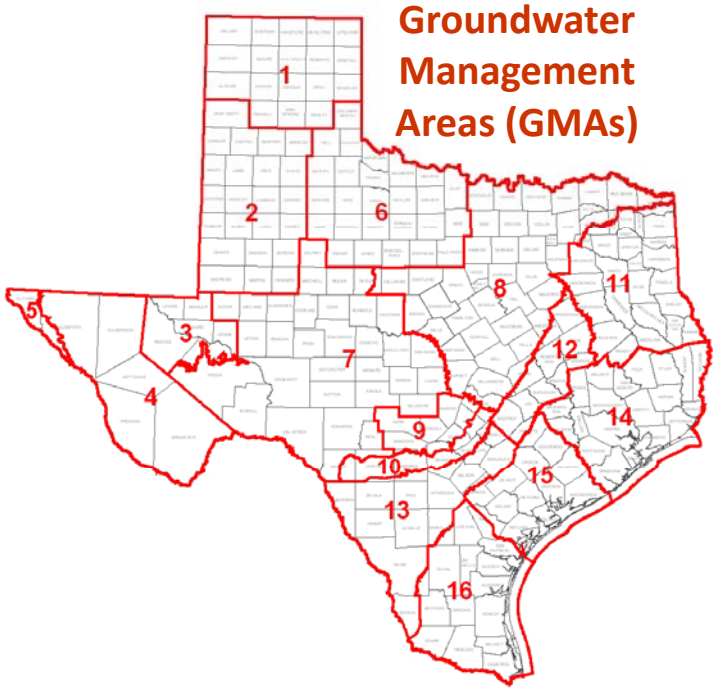

Groundwater availability models:
Major aquifers
Ogallala
(northern part)
Ogallala
(southern part)
Seymour
Trinity
(northern part)
Carrizo-Wilcox
(northern part)
Carrizo-Wilcox
(central part)
Hueco
Bolson
Pecos Valley
Mesilla
Bolson
Gulf Coast
(northern part)
Edwards-Trinity
(Plateau)
Edwards
(northern segment)
Trinity
(Hill Country)
Edwards
(Barton Springs segment)
Edwards
(San Antonio segment)
Gulf Coast
(central part)
Carrizo-Wilcox
(southern part)
Gulf Coast
(southern part)
Note:
The Edwards-Trinity (Plateau) and Pecos Valley aquifers are included in the same model.
These boundaries are approximate and do not show overlaps between models.

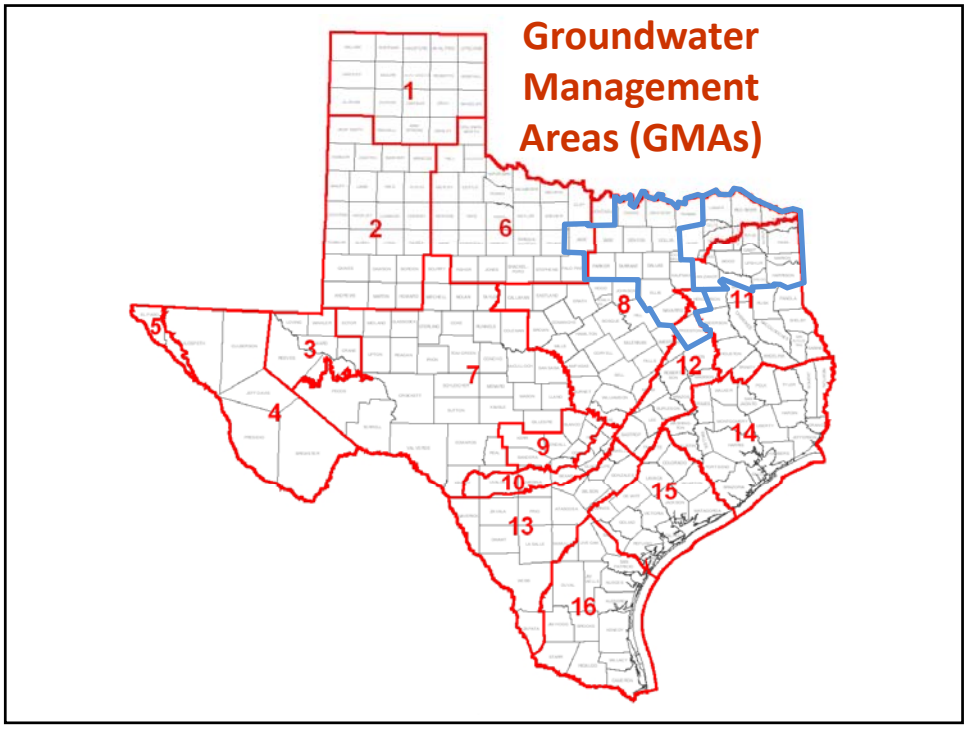

Groundwater availability models:
Minor aquifers
Rita Blanca
Dockum
Blaine
Edwards-Trinity
(High Plains)
Woodbine
Blossom
Nacatoch
Capitan
Reef
Queen
City/
Sparta
Bone Spring-
Victorio Peak
Rustler
Marble Falls,
Hickory, and
Ellenburger-San Saba
Wild Horse Flat,
Michigan Flat,
Ryan Flat,
and Lobo Flat
Lipan
Marathon
Presidio-Redford,
Red Light,
Green River, and
Eagle Flat
Igneous
Yegua-
Jackson
Brazos River
Alluvium
Completed
Model development in progress
Structure development in progress for future model
Pending future model development

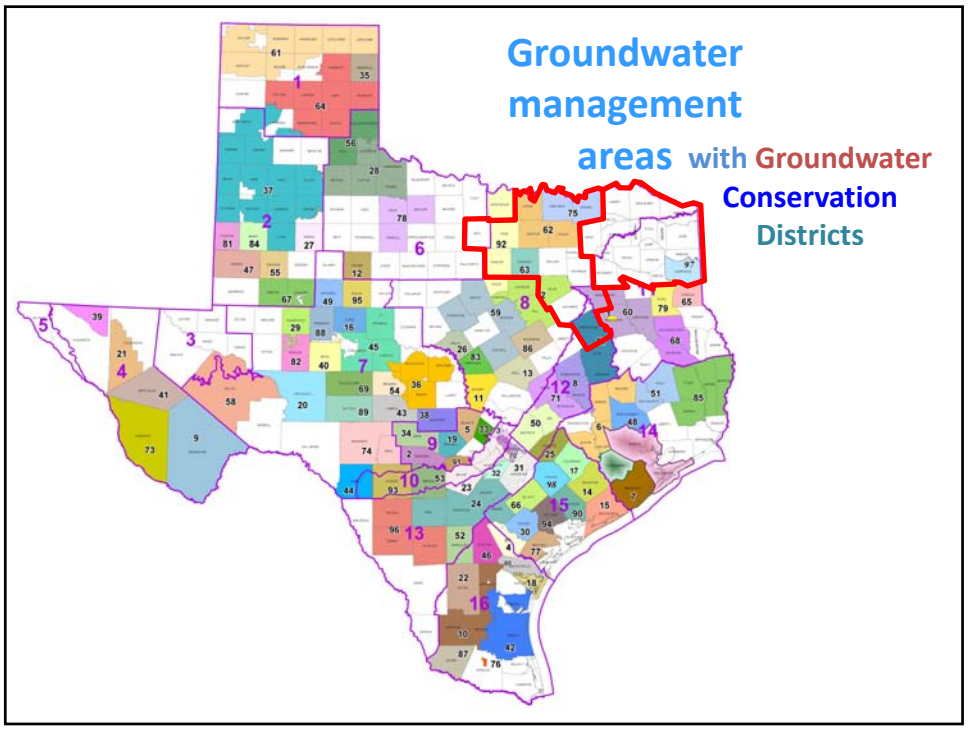
Outline

- Aquifers in C & D
- Groundwater availability and modeling
- **Desired future conditions**
- Groundwater availability in Regions C & D

Groundwater Management Areas (GMAs)




Groundwater
Management
Areas (GMAs)
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16


Groundwater
management
areas with Groundwater
Conservation
Districts

Districts in GMAs
decide Desired Future Conditions
and deliver to TWDB

TWDB provides estimates
of Managed Available Groundwater
to districts and regions

Districts and regions include
Managed Available Groundwater
in plans

(policy) + (science) = groundwater availability

desired future conditions

managed available groundwater

permitting and planning

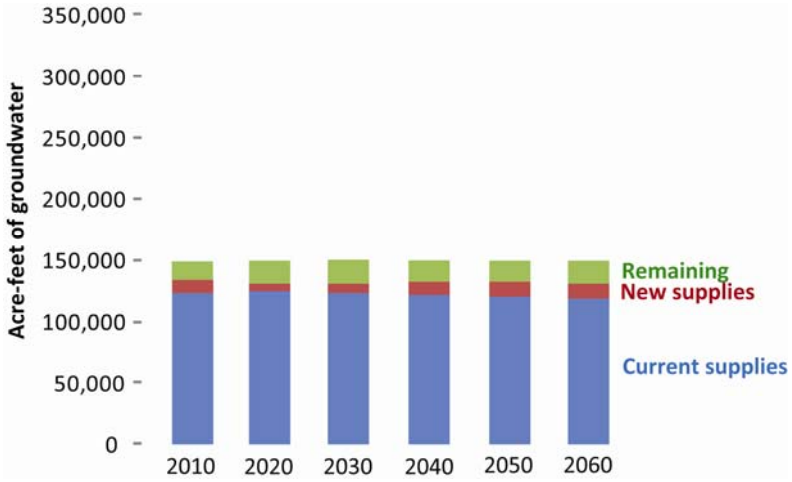
Desired Future Conditions:

- **Statutory deadline: September 1, 2010**
- **Not in regional or state water plans unless earlier deadlines were met**

Outline

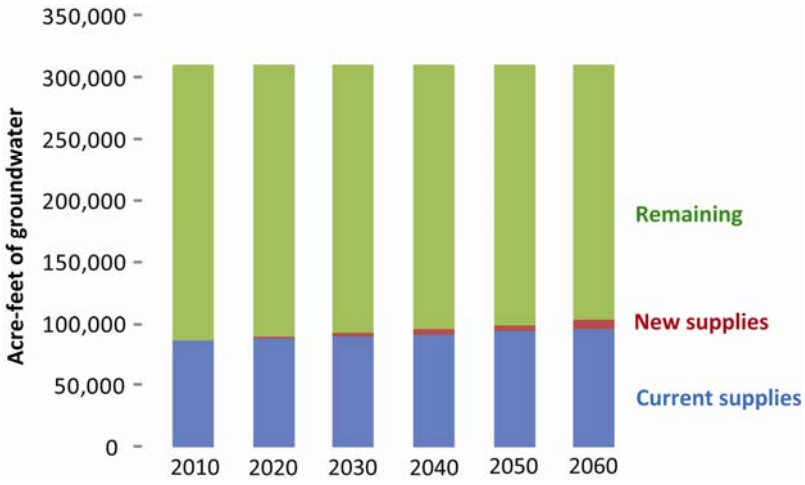
- Aquifers in C & D
- Groundwater availability and modeling
- Desired future conditions
- **Groundwater availability in Regions C & D**

Groundwater Availability and Supplies in Region C



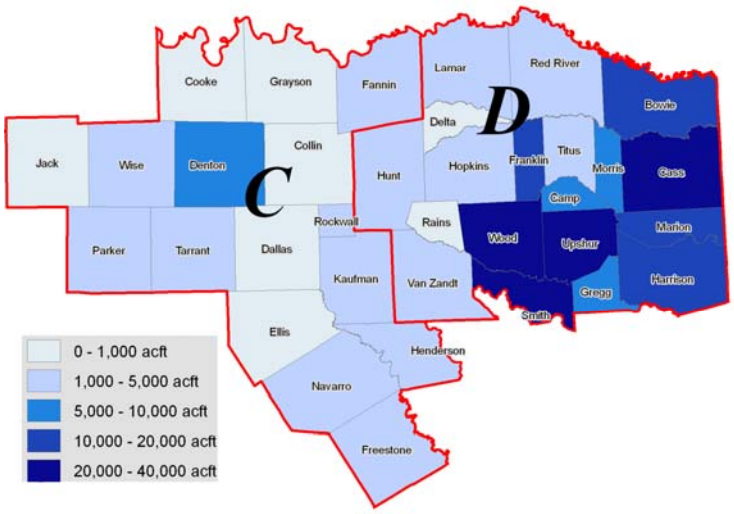
Data from 2010 Initially Prepared Plans

Groundwater Availability and Supplies in Region D



Data from 2010 Initially Prepared Plans

Distribution of Remaining Groundwater



More about groundwater in Texas

Groundwater in Texas:

www.twdb.state.tx.us/groundwater

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(512) 936-0861

robert.mace@twdb.state.tx.us

TEXAS WATER DEVELOPMENT BOARD