Development and Implementation of Texas’ Water Shortage and Drought Planning Effort

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Texas Water Development Board
Why Plan?
Lake Lavon
-2006
Public Water Supply Systems Affected by Drought

DROUGHT 2006
Public Water Supply Systems Affected
as of September 1, 2006

- RESOLVED (1)
- WATCH - Voluntary (95)
- WATCH - Mandatory (171)

Total number of Community water systems affected: 267
Total number of active Community water systems in Texas: 4,607

Resolved: A public water supply that has corrected a production capacity deficiency, or drought conditions that caused water use restrictions have been lifted.

Watch - Voluntary: A public water supply that has reported problems with high water usage and production, but has not suffered a loss of distribution system pressure. Voluntary water use restrictions have been implemented.

Watch - Mandatory: A public water supply that has reported problems with high water usage and production, but has not suffered a loss of distribution system pressure. Mandatory water use restrictions have been implemented.
Legislative Response to Drought

• Late 1950’s Drought of Record
  – 1957: Creation of TWDB
  – $200 million Development Fund
  – 8 State Water Plans
Legislative Response to Drought

• Late 1990’s: Potential New Drought of Record
  – $6 billion estimated economic losses in 1996 - most in agriculture
  – Approximately 300 entities with threat to water supplies
  – 1997: Implementation of Senate Bill 1
What We Would Do Different

• First round of regional planning would focus on data
  – Demands
  – Supplies
    • Surface Water Availability Models
    • Groundwater Availability Models

• Expedited amendment process

• Develop mechanism to better involve small communities
Water Planning Prior to SB 1
Regional and State Water Planning Under SB 1

- Development, management, and conservation of water resources
- Drought preparation and response
- Regional Water Plans foundation for State Water Plan
- Ensure sufficient water supplies to meet needs of ALL users
Incentives to Participate

- Surface water permits for municipalities only in areas with approved regional water plans.

- TWDB loans only in areas with approved regional water plans.

- Projects must be consistent with regional and state water plans to obtain surface water permits or TWDB financial assistance.

- May waive these requirements.
Diverse Interest Groups Represented
Memberships Required by Statute

• Public
• Agricultural Interests
• County
• Small Business
• Water Utilities
• Electric Generating Utilities

• Municipal
• Industries
• Environmental Interests
• River Authorities
• Water Districts
Basic Steps in Texas Water Planning

- 50 year planning period
- Projection of population
- Projection of water demands
- Determine existing supplies
- Determine future surplus or needs
- Evaluate and select water management strategies
Basic Steps in Texas Water Planning

- TWDB resolution of interregional conflicts
- TWDB approval of regional water plans
- TWDB develops and adopts State Water Plan
2007 Texas State Water Plan
Cities

- Cities: 956
Utilities

- Cities: 956
- Utilities: 378
- Cities: 956
- Utilities: 378
- County-Others: 254
Manufacturing

- Cities: 956
- Utilities: 378
- County-Others: 254
- Manufacturing: 174
Steam Electric

- Cities: 956
- Utilities: 378
- County-Others: 254
- Manufacturing: 174
- Steam Electric: 83
Livestock

- Cities: 956
- Utilities: 378
- County-Others: 254
- Manufacturing: 174
- Steam Electric: 83

- Livestock: 254
- Cities: 956
- Utilities: 378
- County-Others: 254
- Manufacturing: 174
- Steam Electric: 83

- Livestock: 254
- Mining: 226
- Cities: 956
- Utilities: 378
- County-Others: 254
- Manufacturing: 174
- Steam Electric: 83
- Livestock: 254
- Mining: 226
- Irrigation: 239
Total = 2,564

- Cities: 956
- Utilities: 378
- County-Others: 254
- Manufacturing: 174
- Steam Electric: 83
- Livestock: 254
- Mining: 226
- Irrigation: 239
Projected Water Demand & Supply

- Water Demand
- Water Supply

Years: 2010, 2020, 2030, 2040, 2050, 2060

- Water Demand in millions of acre-feet:
  - 2010: 18.3
  - 2020: 19.0
  - 2030: 19.6
  - 2040: 20.1
  - 2050: 20.8
  - 2060: 21.6

- Water Supply in millions of acre-feet:
  - 2010: 17.9
  - 2020: 16.9
  - 2030: 16.1
  - 2040: 15.4
  - 2050: 15.0
  - 2060: 14.6
Water Volume from Recommended Water Management Strategies

4,500 Water Management Strategies
Water Needs Not Met by the Recommended Water Management Strategies

Unmet needs (millions of acre-feet)

<table>
<thead>
<tr>
<th>Year</th>
<th>Unmet Needs</th>
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<tbody>
<tr>
<td>2010</td>
<td>1.8</td>
</tr>
<tr>
<td>2020</td>
<td>2.1</td>
</tr>
<tr>
<td>2030</td>
<td>2.5</td>
</tr>
<tr>
<td>2040</td>
<td>2.7</td>
</tr>
<tr>
<td>2050</td>
<td>2.8</td>
</tr>
<tr>
<td>2060</td>
<td>2.7</td>
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Costs of Recommended Water Management Strategies

Total capital costs: $30.7 billion
Water Management Strategies

• Projected needs met with a wide variety of water management strategies including:
  – More efficient use of existing supplies,
  – New surface reservoirs,
  – New or expanded well fields,
  – Other strategies including,
## Water Conservation

### State Wide Totals

<table>
<thead>
<tr>
<th>2002 Plan</th>
<th>2007 Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>990,000 af/y</td>
<td>2 million af/y</td>
</tr>
<tr>
<td>14% of total WMS</td>
<td>23% of total WMS</td>
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</tbody>
</table>
Water Conservation

<table>
<thead>
<tr>
<th>Municipal</th>
<th>2002 Plan</th>
<th>2007 Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>68,000 AFY</td>
<td>612,000 AFY</td>
</tr>
<tr>
<td></td>
<td>&lt;1% of total WMS</td>
<td>7% of total WMS</td>
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</tbody>
</table>
Water Conservation
Irrigation
Rain Water Harvesting
Desalination

- Recommended Water Management Strategies projected to add about 320,000AFY by 2060
Reuse

2002 Plan  
0.4 Million AFY

2007 Plan  
1.3 Million AFY
Land Stewardship

A component of land stewardship that has garnered much attention is brush control.

Reduce vegetation that consumes large volumes of water and replace with native plants and maintain open space.
Successes, Challenges, and Lessons Learned
Positive Outcomes of the Regional Planning Process

• Broad-based expansion of public knowledge and understanding of water resources issues

• Fosters direct link between water planning and implementation

• Enhanced cooperation and coordination between different interest groups and regions
Positive Outcomes of the Regional Planning Process

- Improved relationships between environmental and development interests that have not had a history of working together

- Development and implementation of Water Management Strategies
Challenges

• Conflict between two or more regions
  – Conflict occurs if more than one region plans on using the same water—overallocation
  – TWDB mediates disputes

• Funding the water management strategies
What We Would Do Different

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Major River and Coastal Basins of Texas
The Major Aquifers of Texas

Solid indicates outcrop areas (the part of an aquifer that lies at the land surface).

Hatched indicates subsurface areas (the part of an aquifer that lies or dips below other formations).
The Minor Aquifers of Texas

Solid indicates outcrop areas (the part of an aquifer that lies at the land surface).

Hatched indicates subsurface areas (the part of an aquifer that lies or dips below other formations).