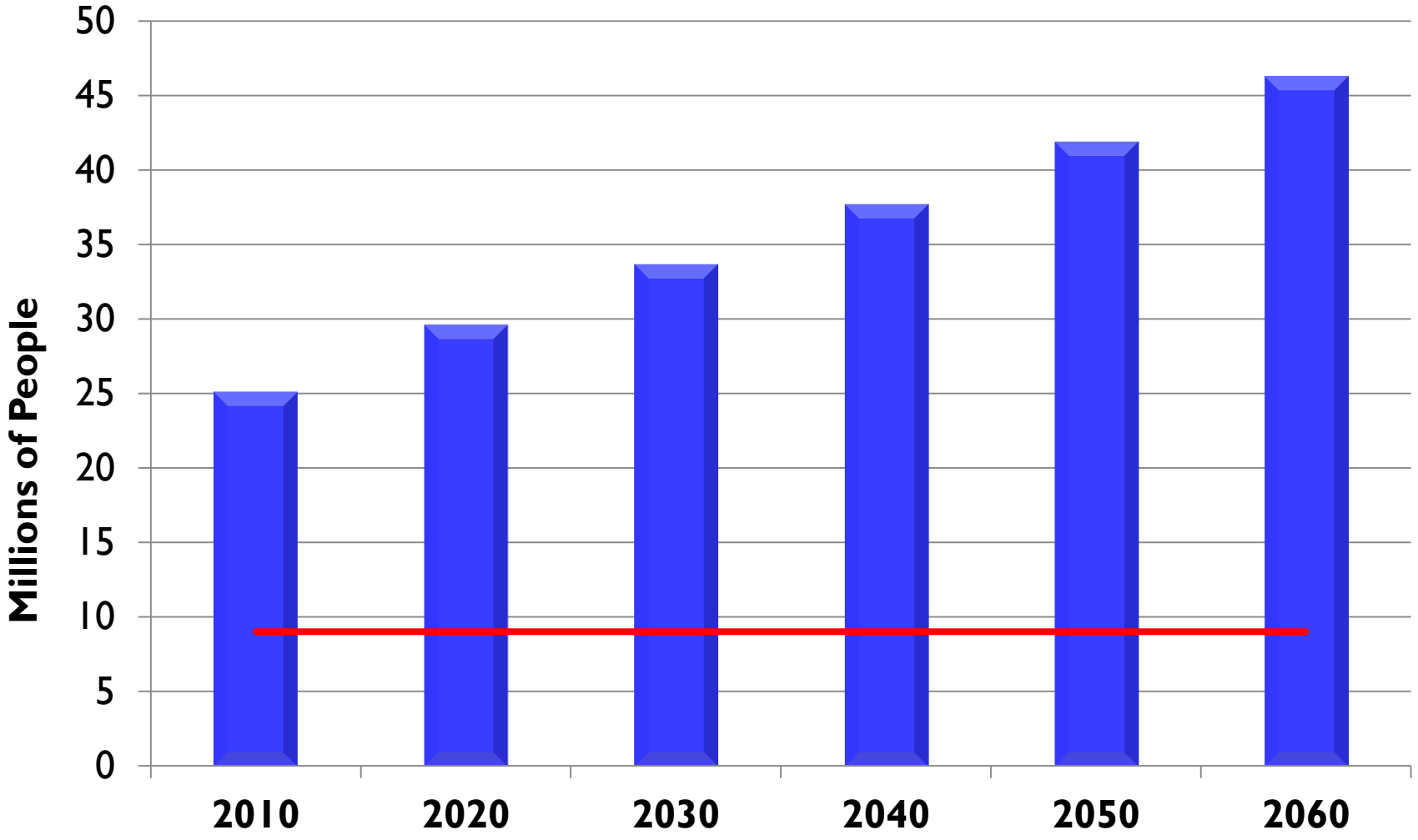
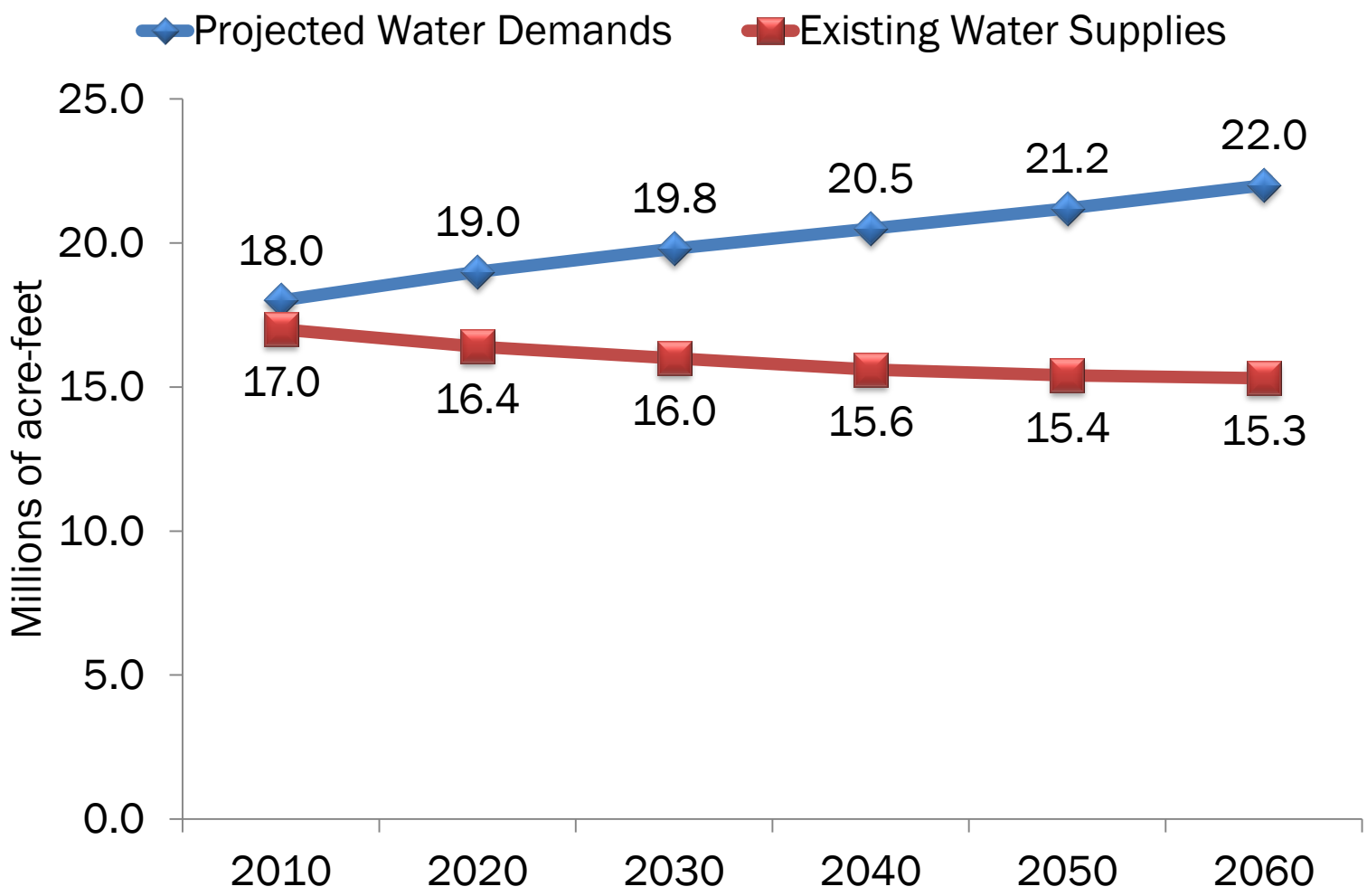
Guadalupe-Blanco River Authority

Projected Texas Population

The Redline represents the **Texas population of the 1950's**, when the existing water supply projects we rely on today were conceived and undertaken.

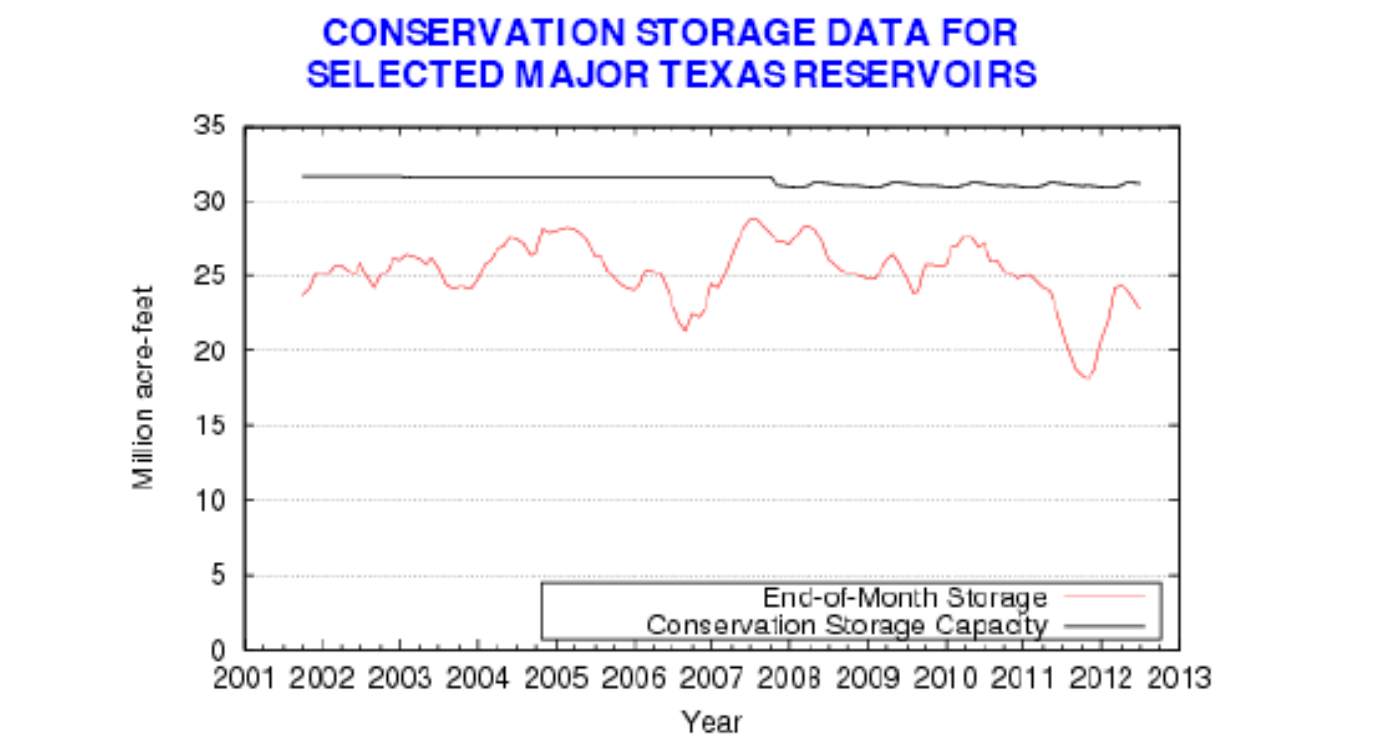


Projected Water Demands and Existing Supplies

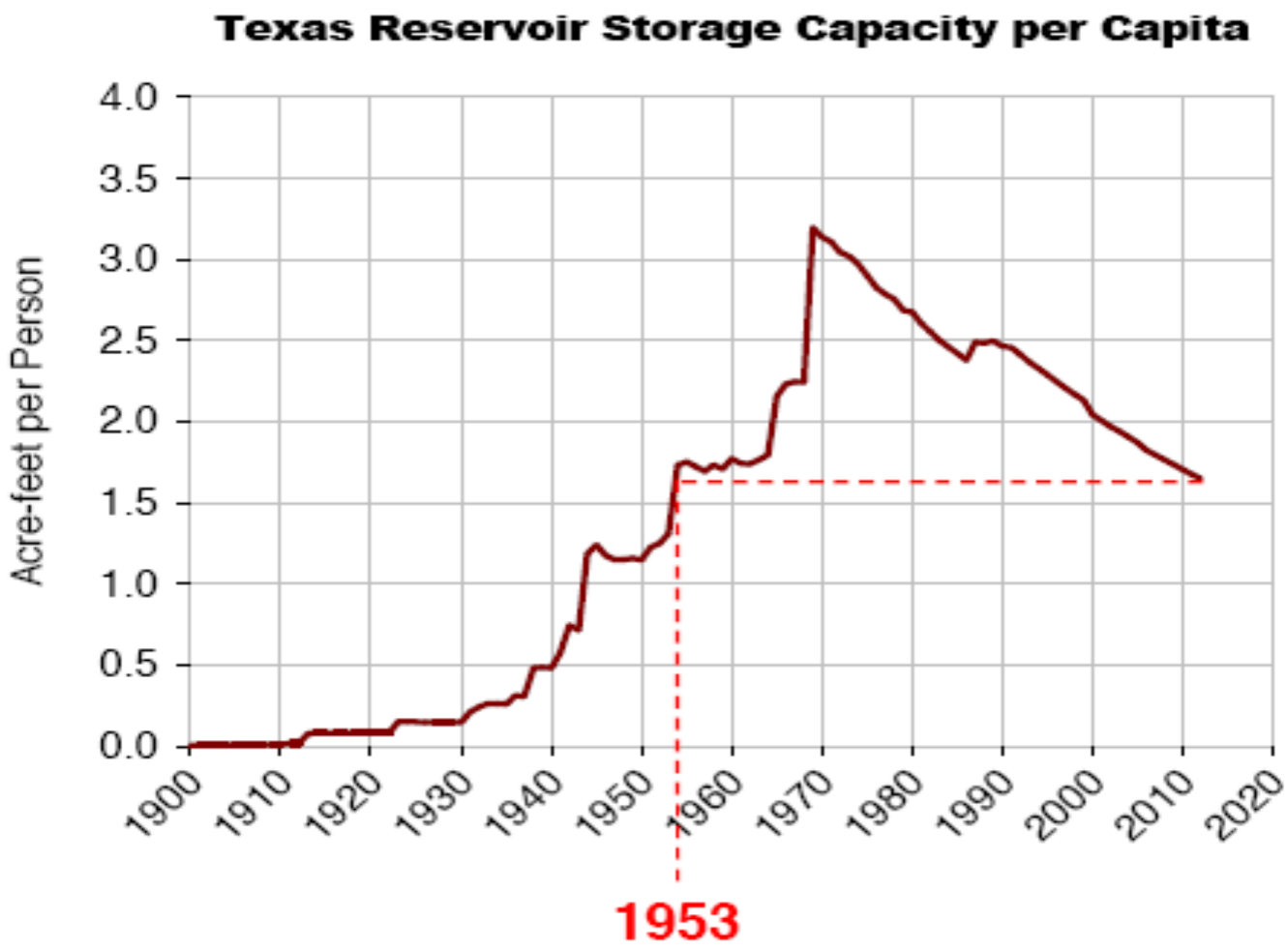


Current Texas Reservoir Storage

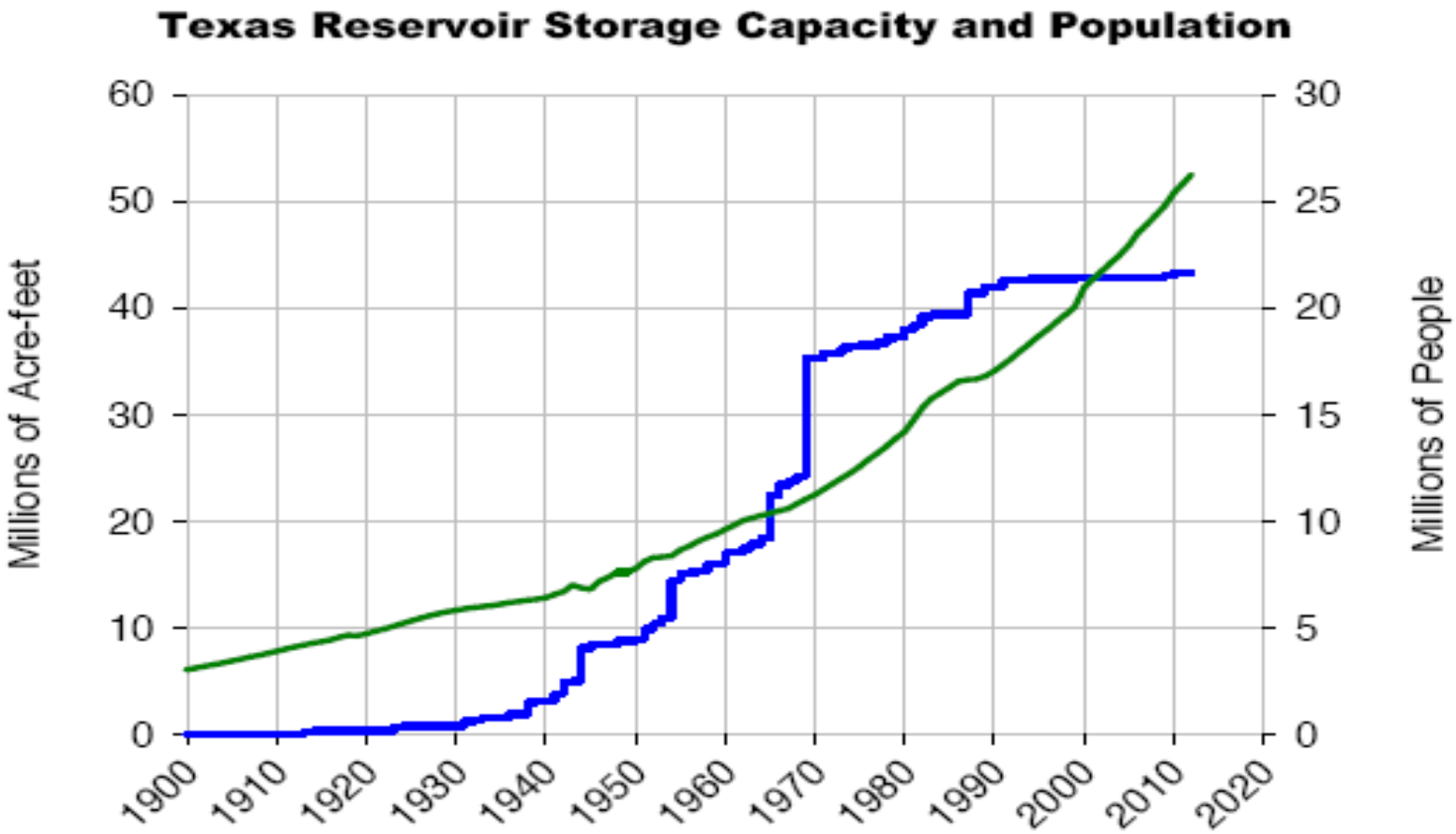
In July total storage in 109 of the state's major water supply reservoirs was 23 million acft*, or 73% of total conservation storage capacity.



Source: TWDB


Texas Reservoir Storage Capacity per Capita
Acre-feet per Person
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
2010
2020
1953

Source: NRS


Texas Reservoir Storage Capacity and Population
Millions of Acre-feet
Millions of People
60
50
40
30
20
10
0
30
25
20
15
10
5
0
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
2010
2020

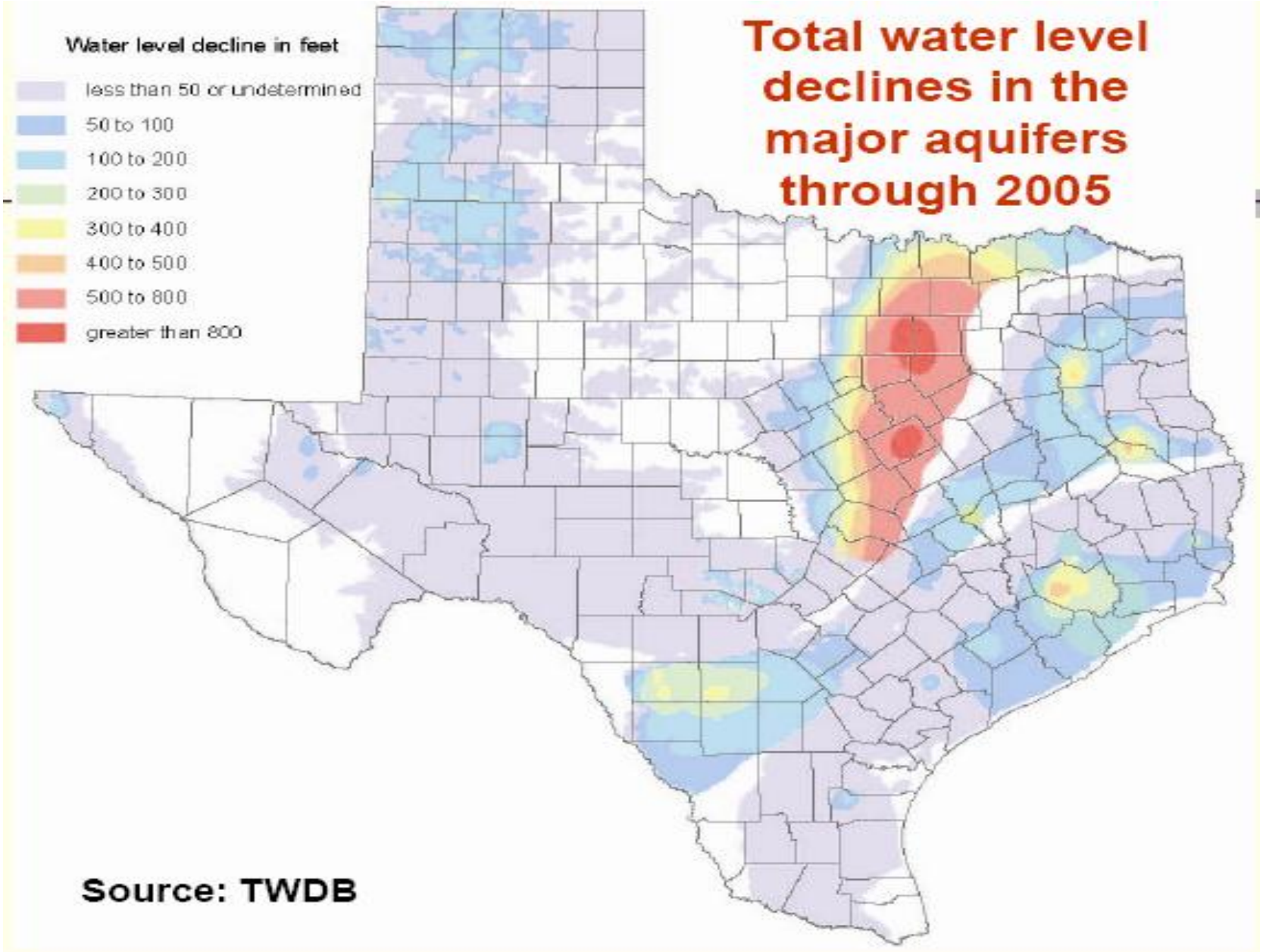
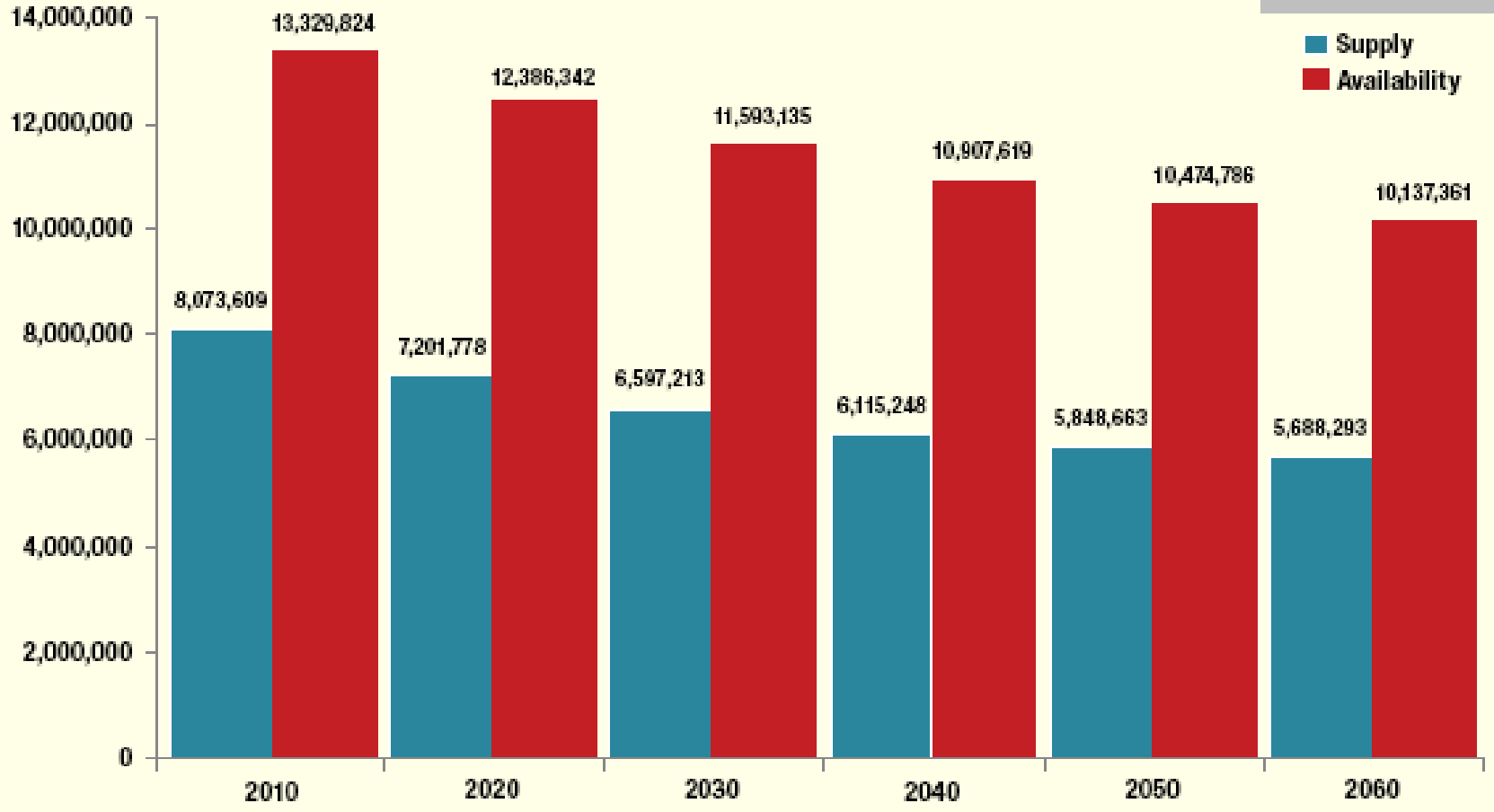
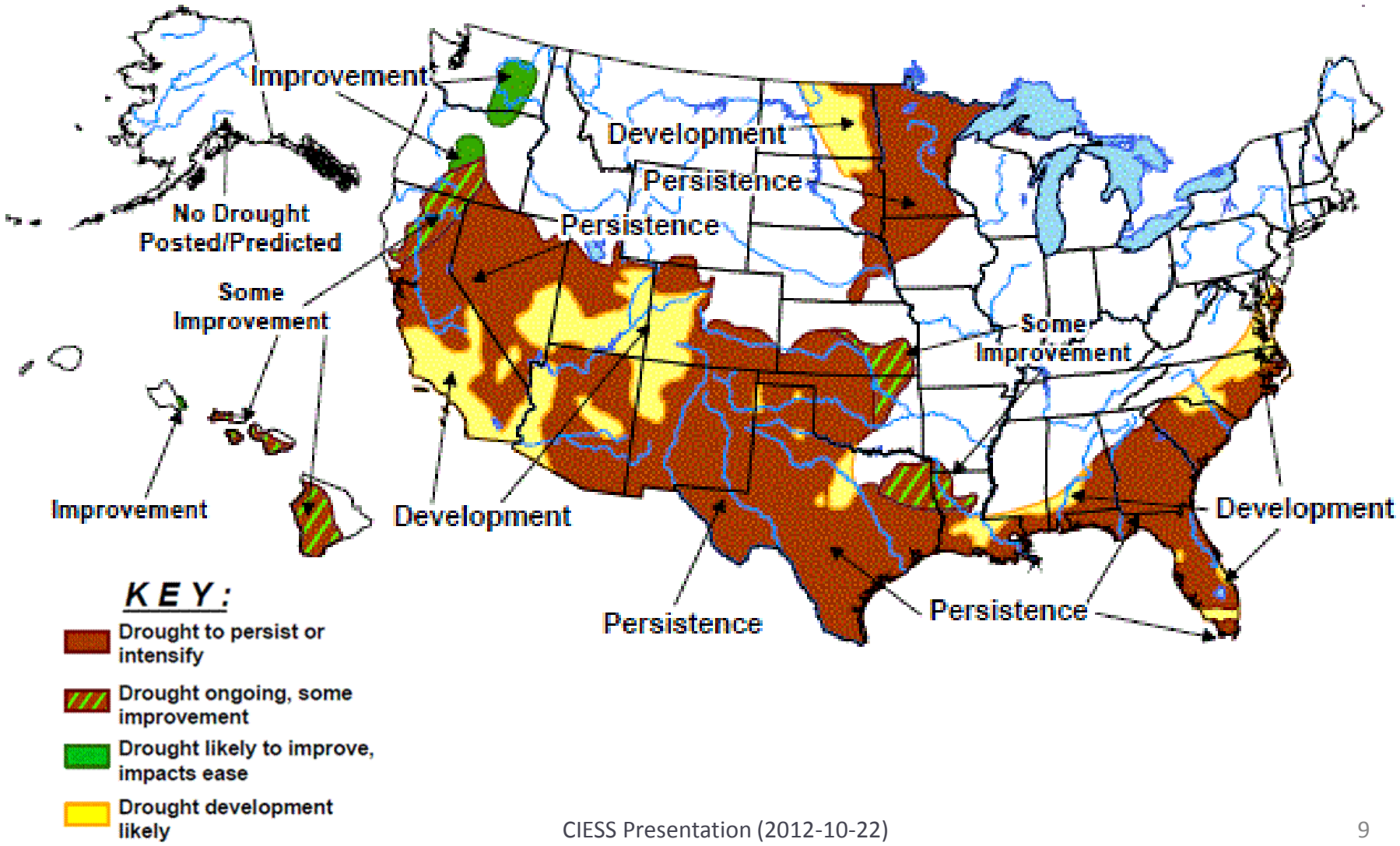

Water level decline in feet
less than 50 or undetermined
50 to 100
100 to 200
200 to 300
300 to 400
400 to 500
500 to 800
greater than 800
Total water level declines in the major aquifers through 2005
Source: TWDB

FIGURE 5.7. PROJECTED EXISTING GROUNDWATER SUPPLIES AND GROUNDWATER AVAILABILITY THOUGH 2060 (ACRE-FEET PER YEAR).

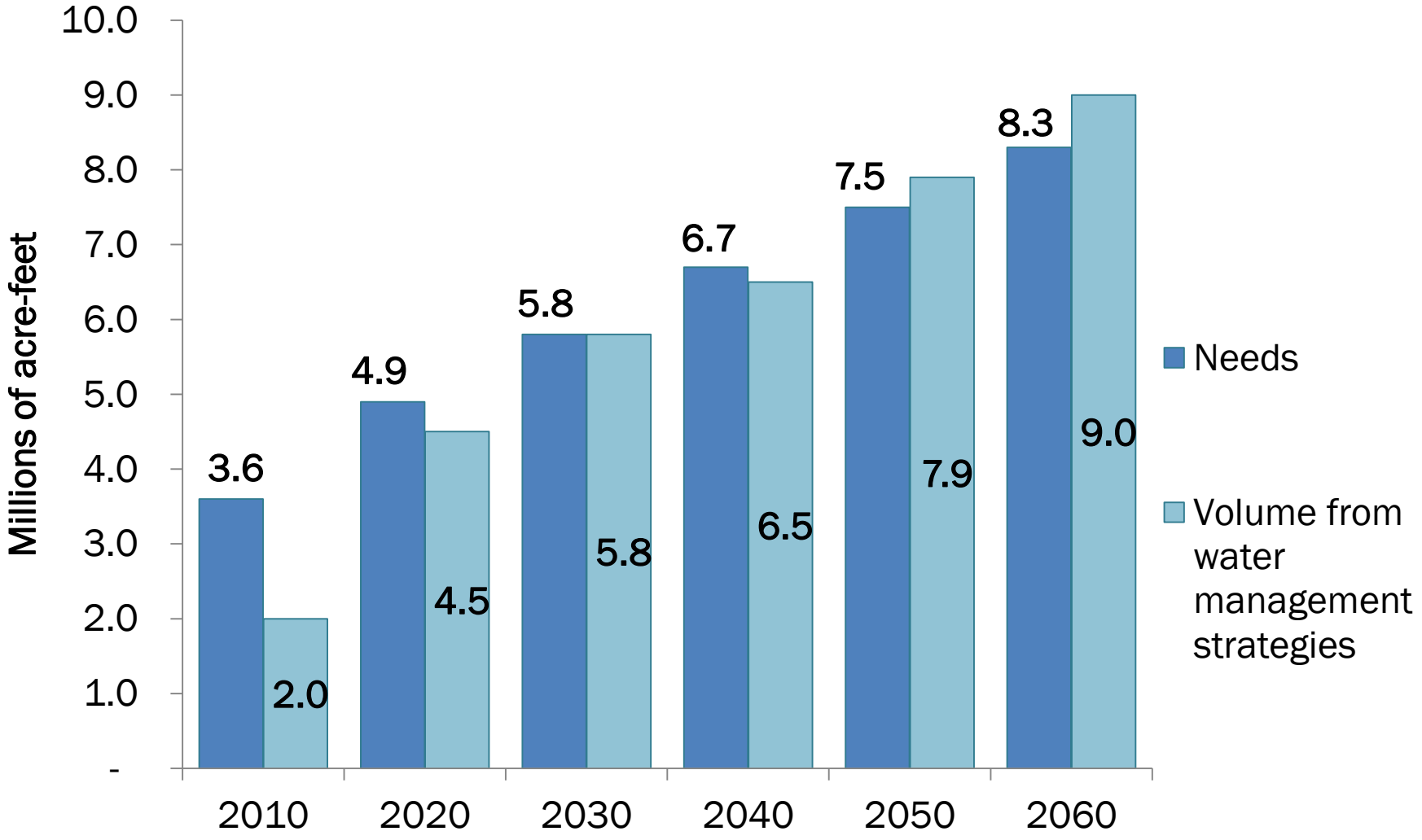


Source: TWDB

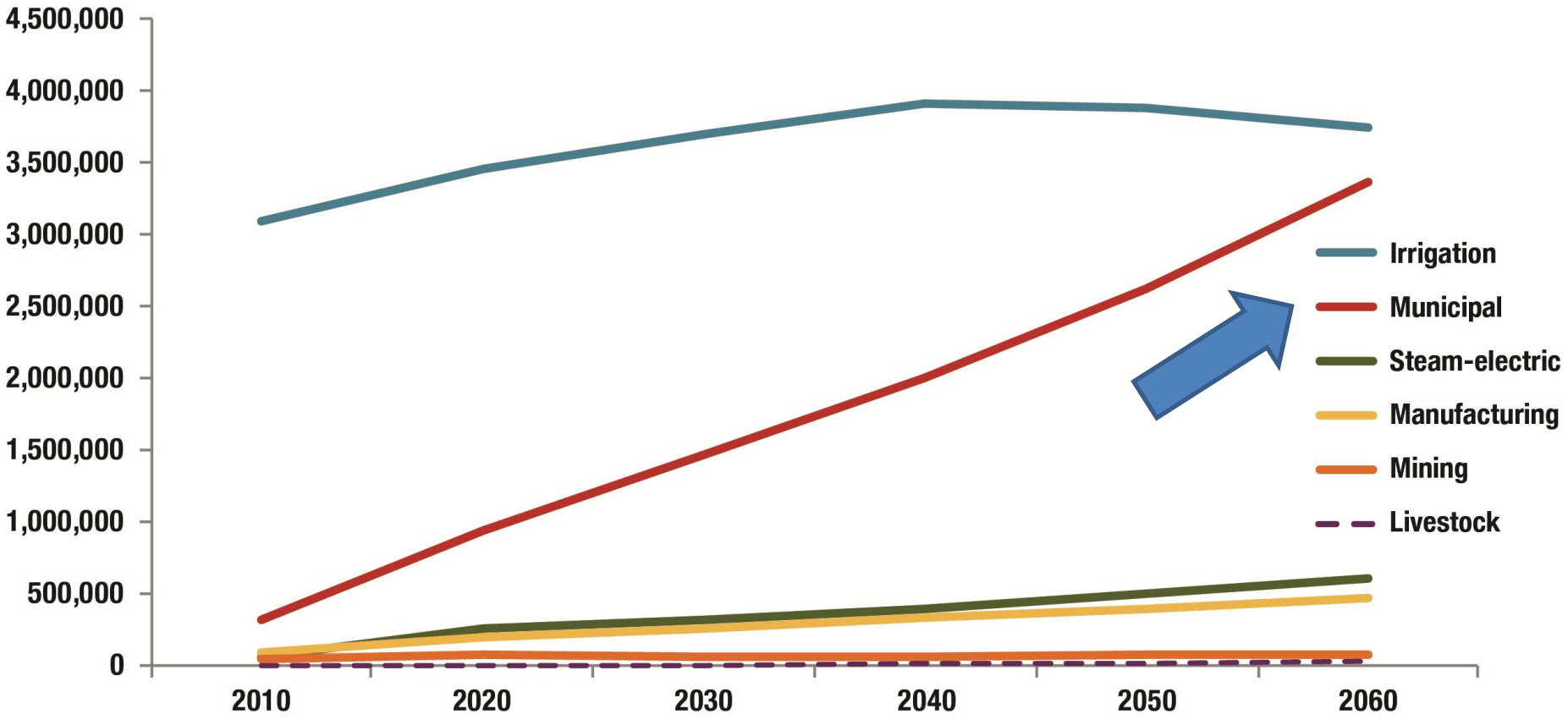
U. S. Seasonal Drought Outlook



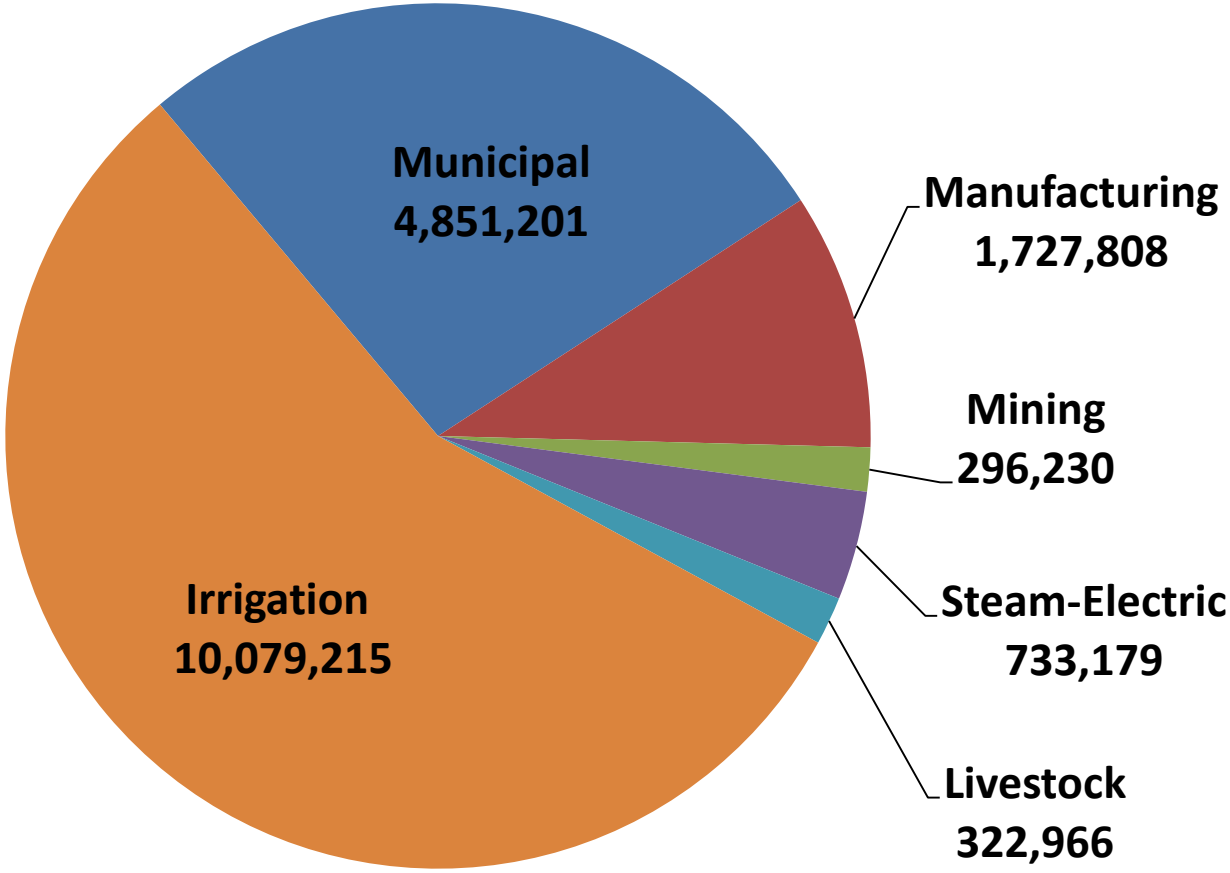
Projected Needs for Additional Water and Water Supplies from Water Management Strategies



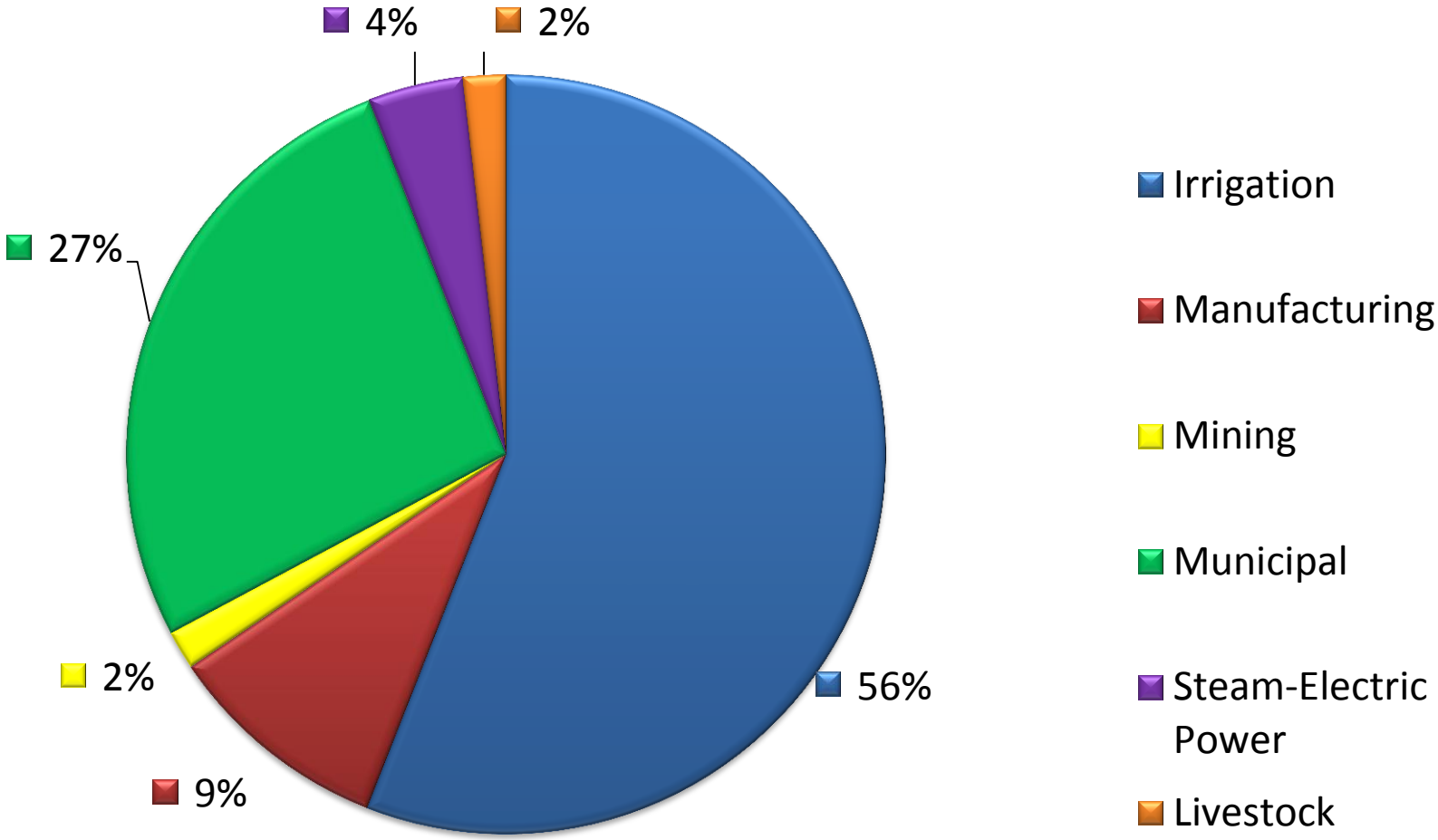
Projected Water Needs By Use Category (Acre-Feet Per Year)



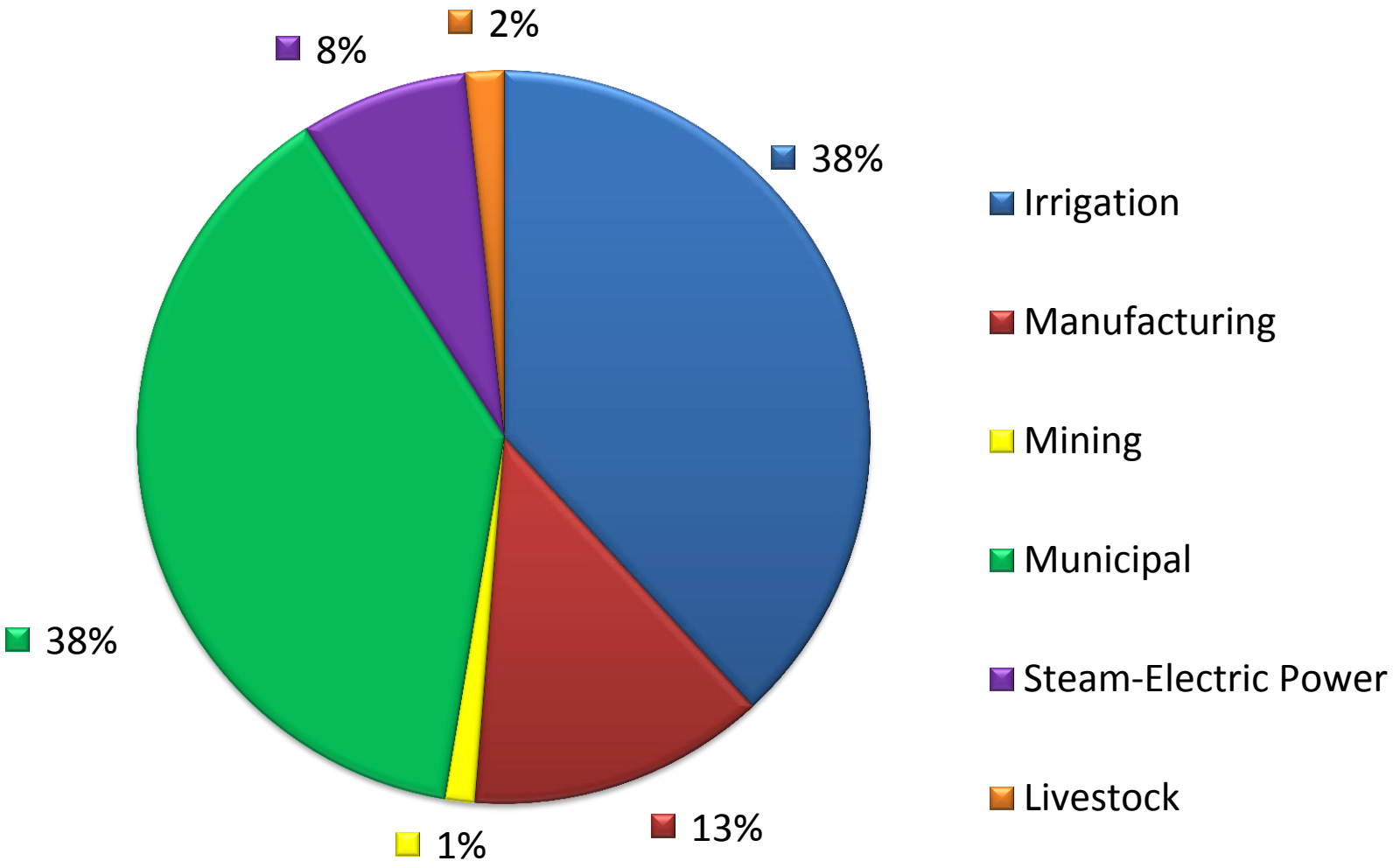
2010 Water Demand Projections by Use Category (Acre-Feet Per Year)



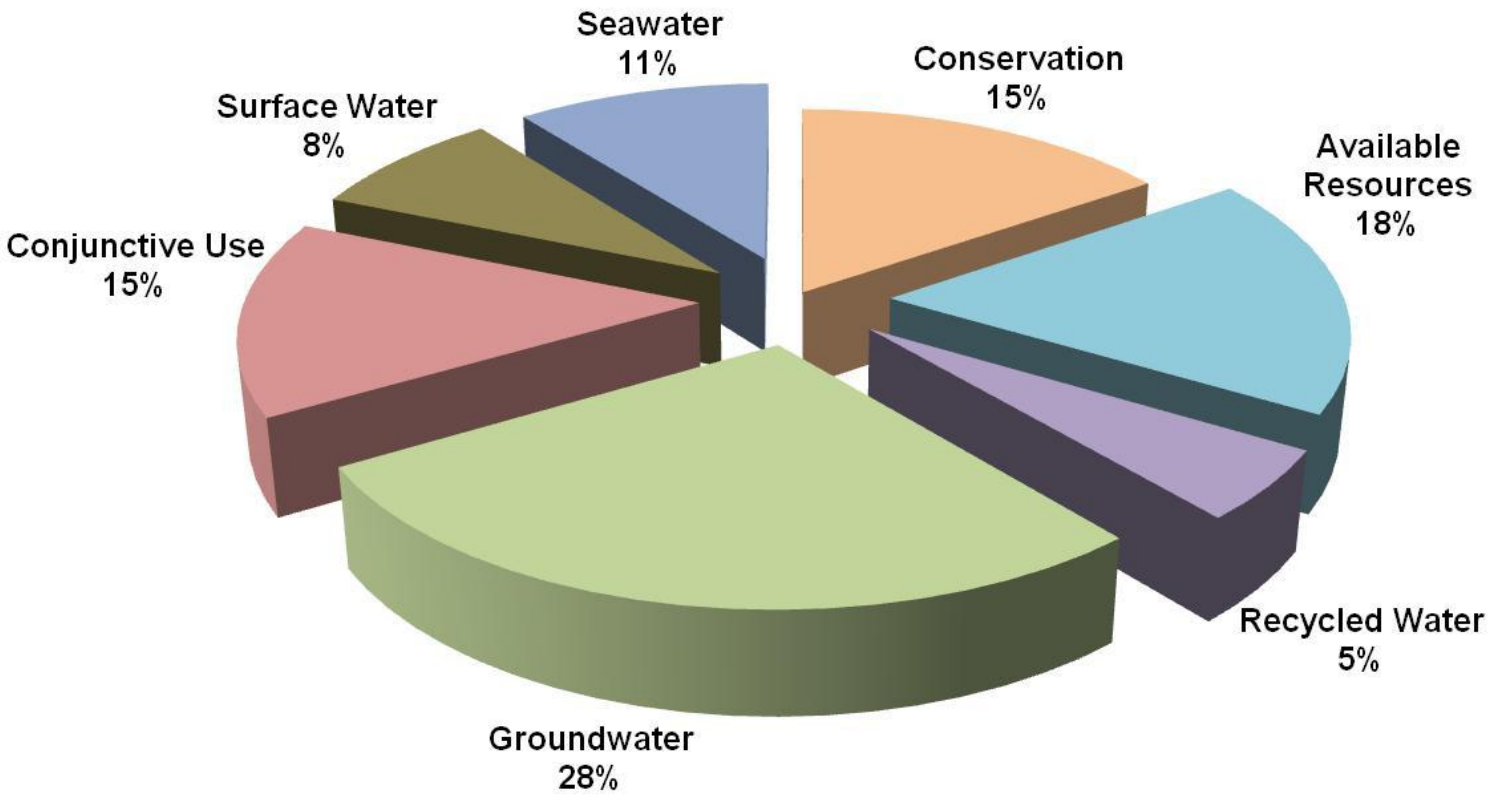
2010 Water Demand Projections by Use Category (By Percentage)



2060 Water Demand Projections by Use Category (By Percentage)



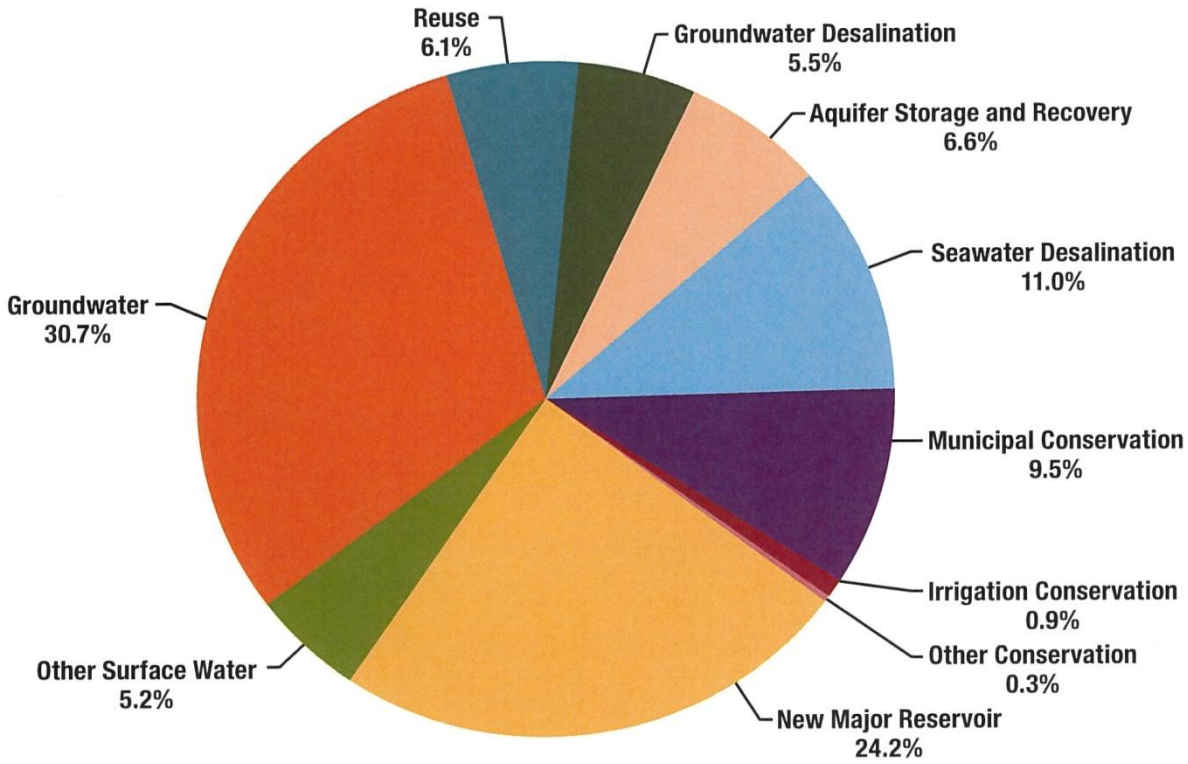
Region L -Sources of New Supply



53% of the New Supply is Based on Hope in Conservation Strategies.

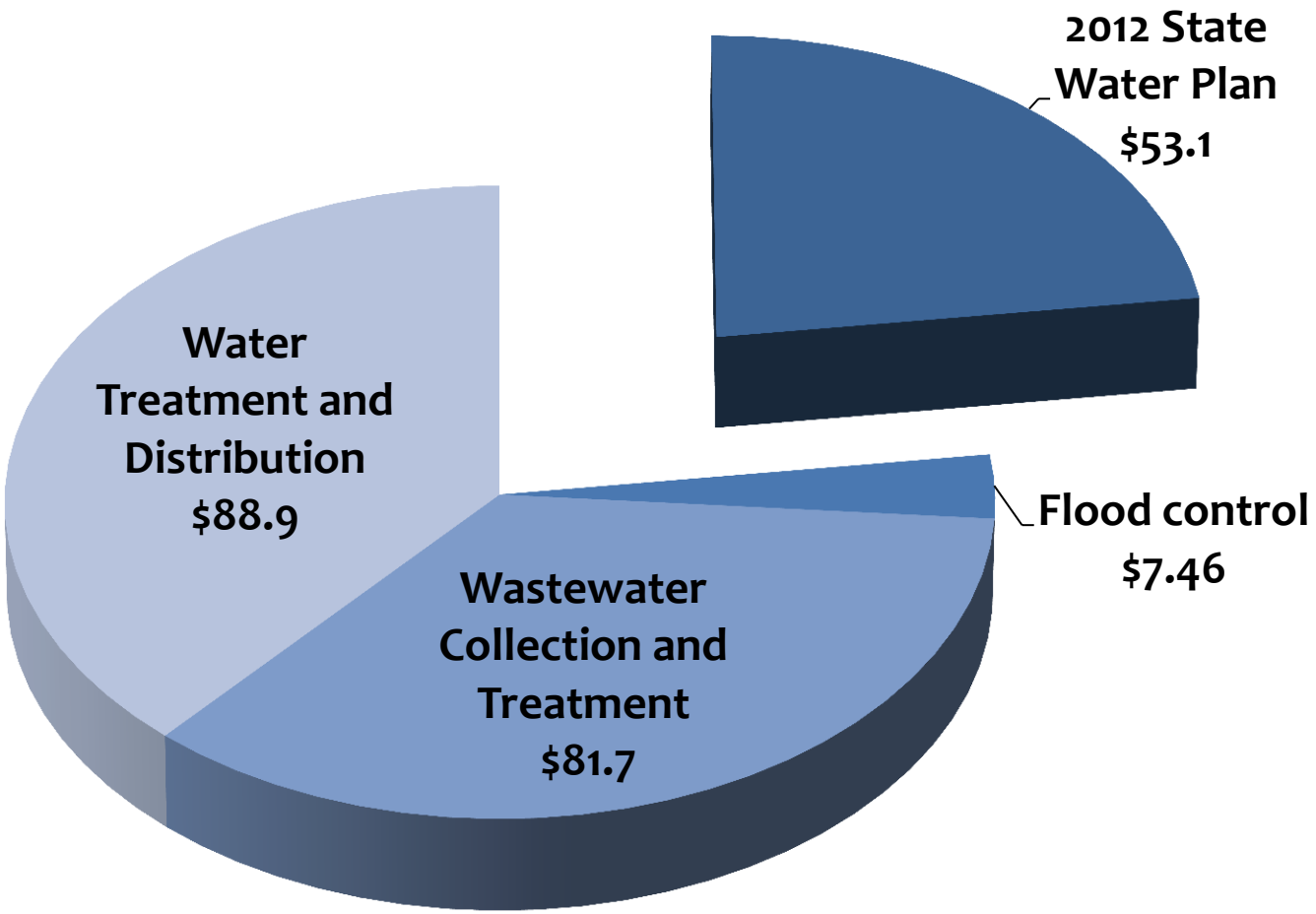
Region L – Management Strategies

FIGURE L.4. 2060 RECOMMENDED WATER MANAGEMENT STRATEGIES–RELATIVE SHARE OF SUPPLY.



24% of the Strategy is Based on a New Major Reservoir that Cannot be Permitted under TCEQ's Recently Adopted Environmental Flows.

Total Capital Costs for Texas Water Infrastructure: **$231 Billion**



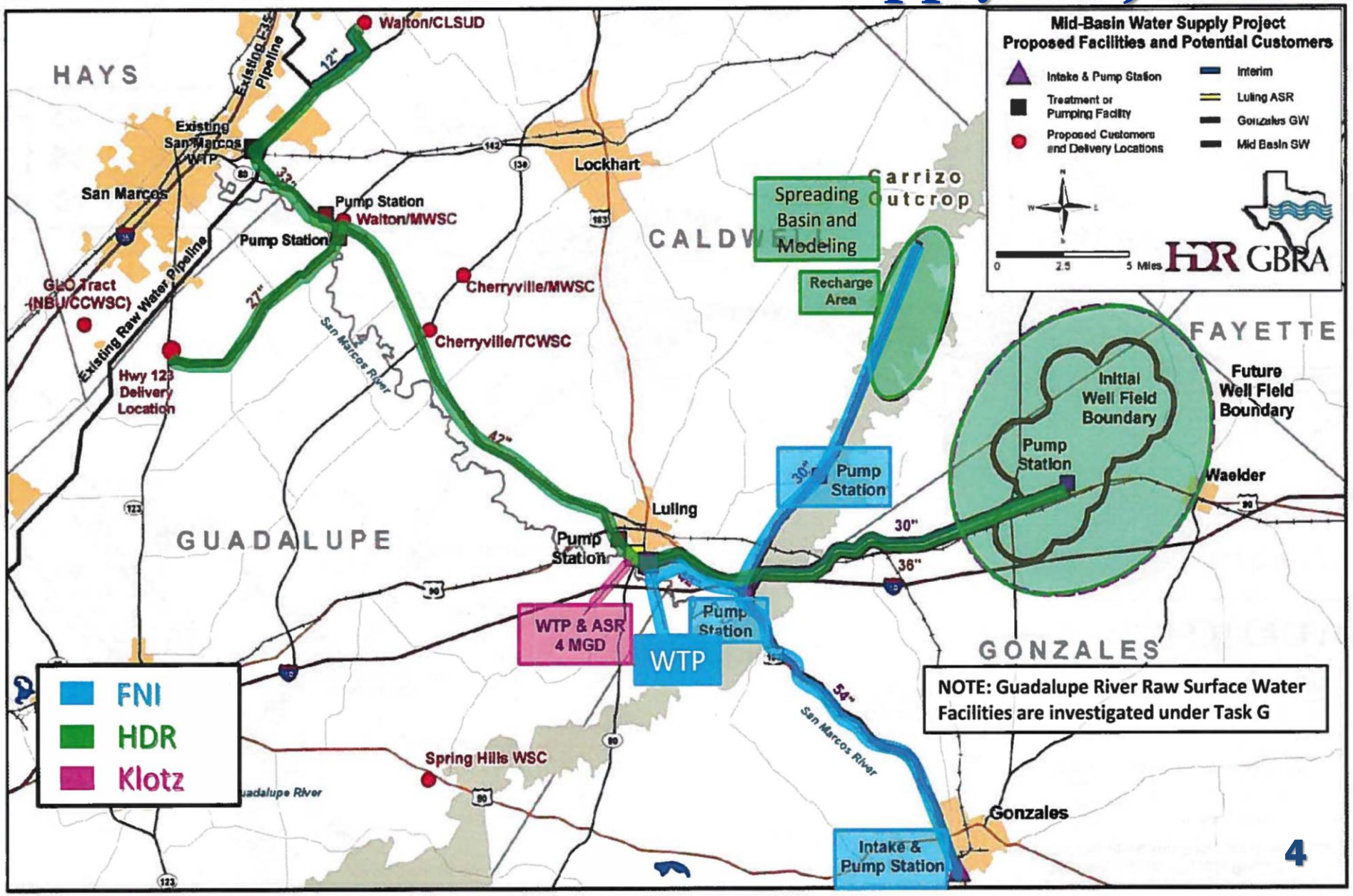
What if we do nothing?

If drought of record conditions recur and water management strategies are not implemented, in 2060 the state could face

- water needs of 8.3 million acre-feet
- 83% of population short of water in drought
- $116 billion in lost income
- $9.8 billion in lost state and local business taxes
- 1.1 million lost jobs
- 1.4 million reduced population
- 403,000 fewer students in Texas schools

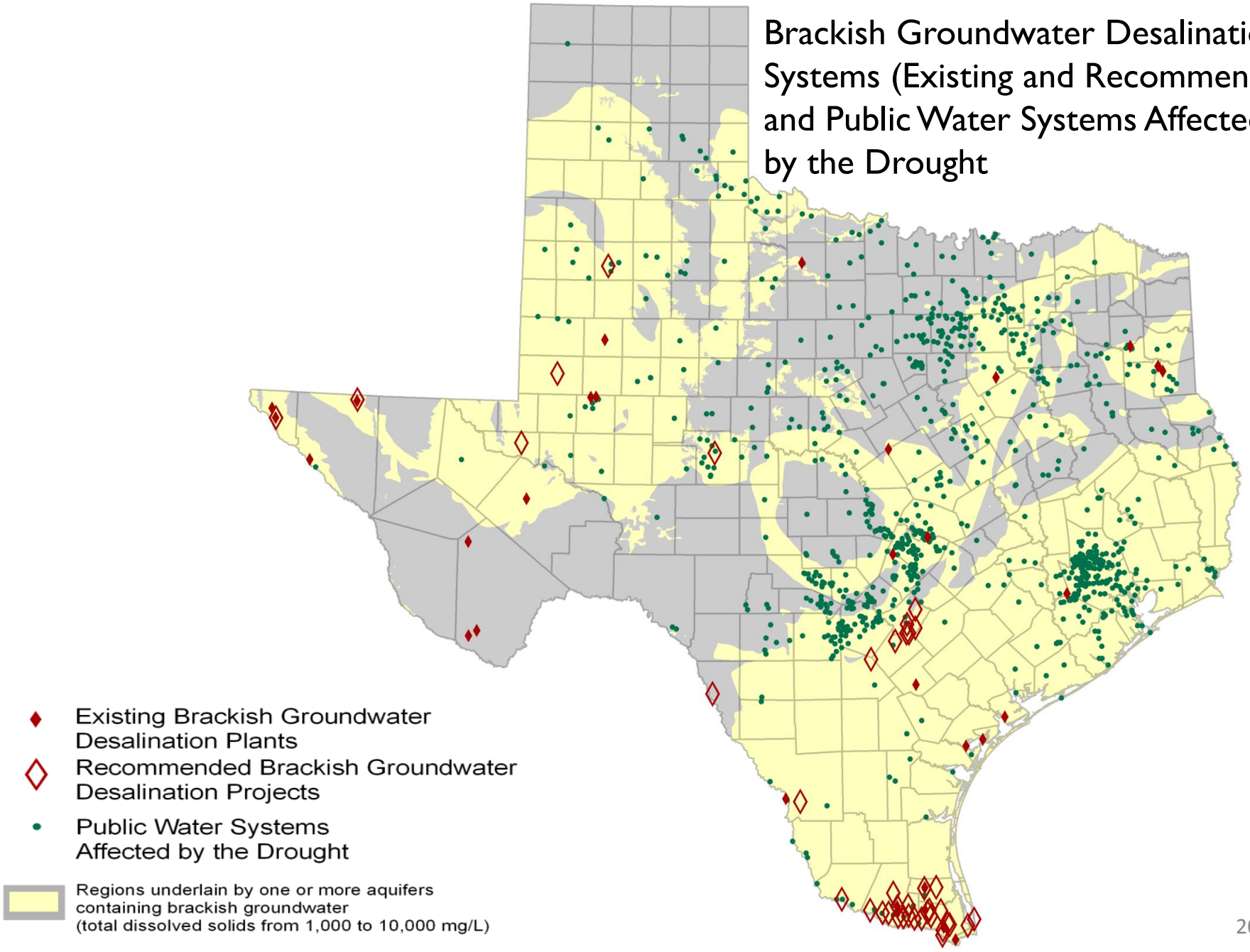
So What are we doing?

GBRA Mid-Basin Water Supply Project

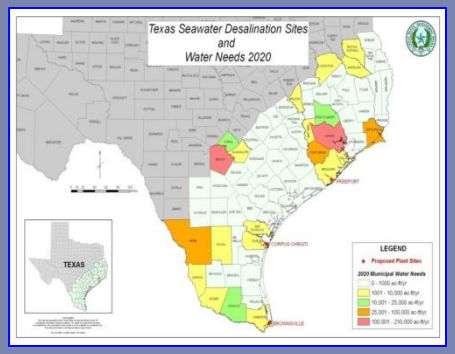


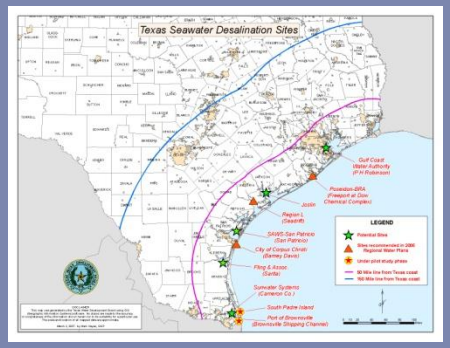
Note: Location of WTP will be determined during individual water supply option studies.

Brackish Groundwater Desalination Systems (Existing and Recommended) and Public Water Systems Affected by the Drought



Opportunities for seawater desalination



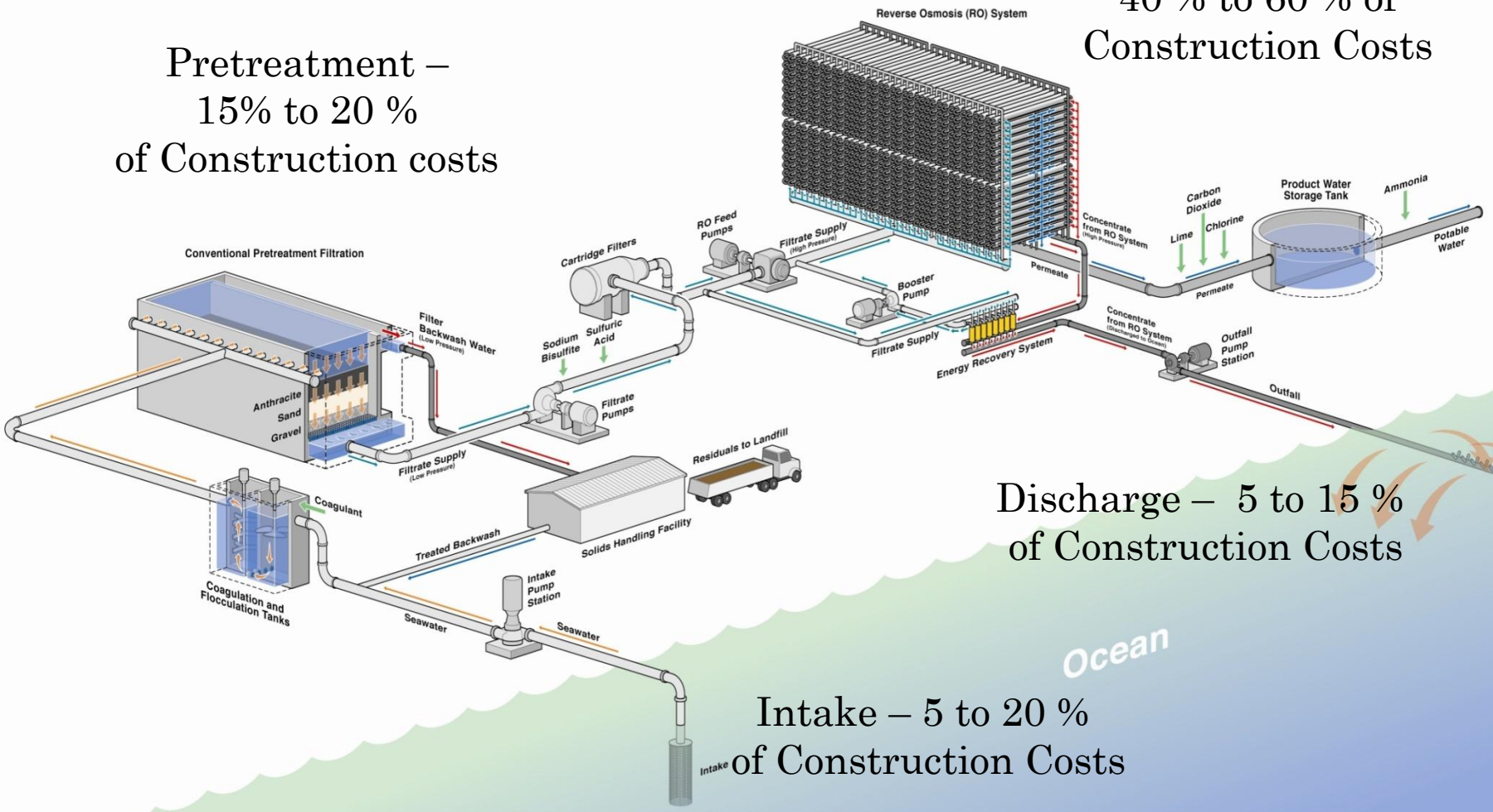


- Access to a plentiful source
  - 367 miles of coast
  - Multiple sites for locating desalination plants
- Proximity to [large] demand centers
  - ~ 2/3 of the state's population located within 150 miles of the coast
- Need for supply diversity
  - Vulnerability of existing sources
- Cost-effective technology
  - New water

Seawater Desalination Plant – Construction Costs

RO System – 40 % to 60 % of Construction Costs

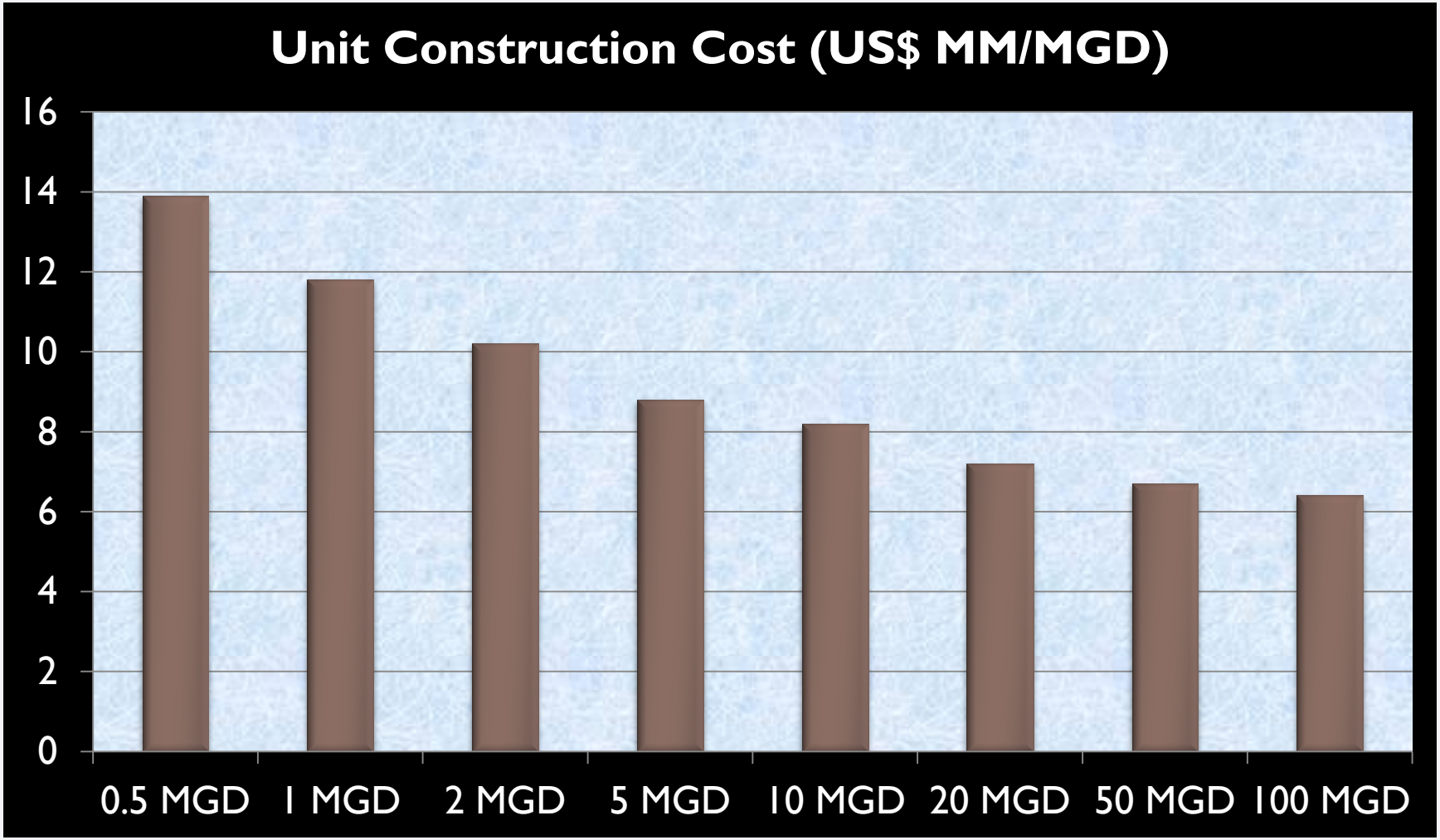
Pretreatment – 15% to 20 % of Construction costs



Discharge – 5 to 15 % of Construction Costs

Intake – 5 to 20 % of Construction Costs

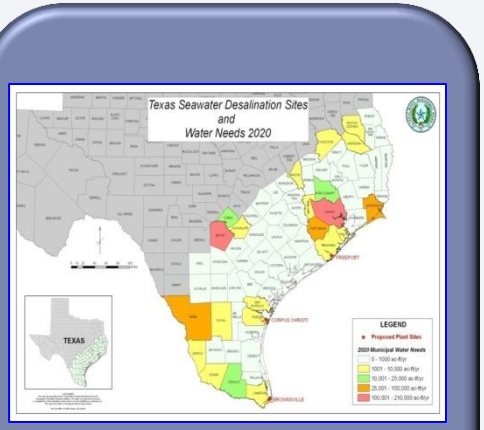
Desalination Plant Construction Cost as Function of Capacity

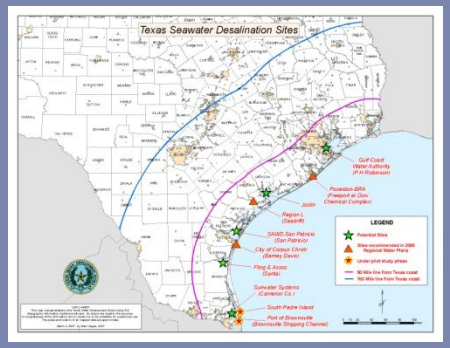


Seawater Desalination: Present Status & Future Forecasts

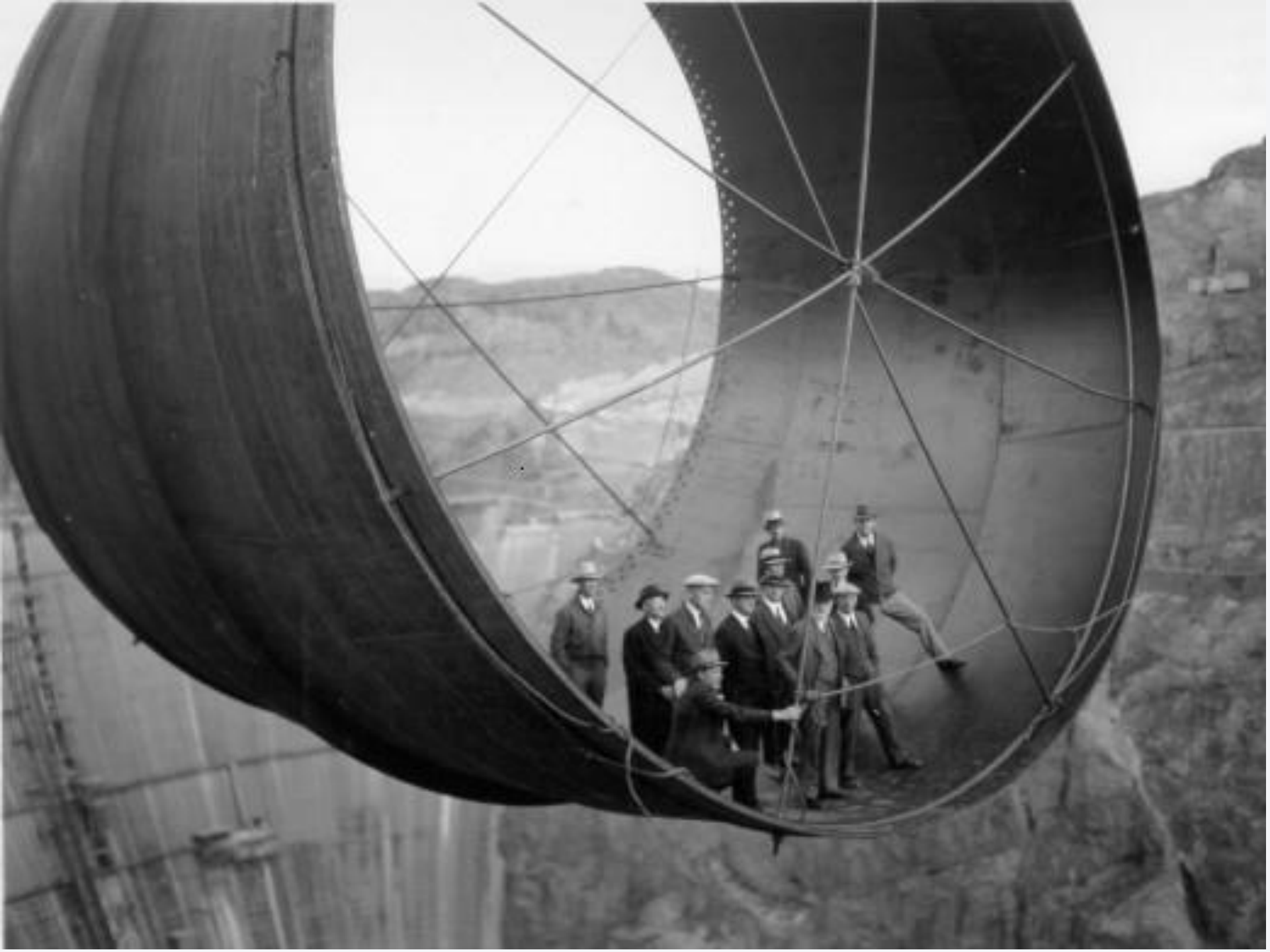
Parameter	Today	Within 5 Years	Within 20 Years
Cost of Water (2010 US$/kgal)	US$2.0-3.0	US$1.5-2.5	US$1.0-1.5
Construction Cost (Million US$/MGD)	4.5-8.0	4.0-6.5	2.0-3.5
Power Use of SWRO System (kWh/kgal)	9.5-10.5	8.0-10.0	5.0-6.5
Membrane Productivity (gallons/day/membrane)	6,500-12,500	9,000-15,000	25,000-40,000
Membrane Useful Life (years)	5-7	7-10	10-15
Plant Recovery Ratio (%)	45-50	50-55	55-65

Obstacles to Gulf Coast Desalination





- Those Invested in Other Approaches
  - Reuse, Conservation, Brackish Desal
  - Political Manipulation of Existing Resources
- Stakeholder "Buy-In"
  - May Require a Financial Model (PPP, BOO, etc.) incompatible with the traditional
  - Large Projects Require Many Participants
- Environmental & New Paradigm Sentiment
  - **However** Seawater Presents Fewer Environmental Risk Than Other Alternatives
- Challenge of New Technology
  - The Least Significant Obstacle



Guadalupe Blanco River Authority

Q & A

GBRA