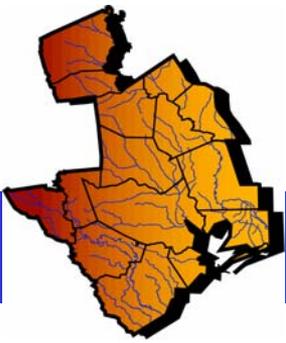


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## *Region H Demographics*

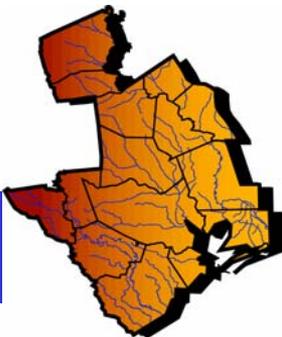
- 23% of the State's total population
- 89% growth in population by 2060
- 18% of the State's total employment
- 2/3 of the nations petrochemical production
- 1/3 of the nations petroleum industries



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## *Uniqueness of Region*

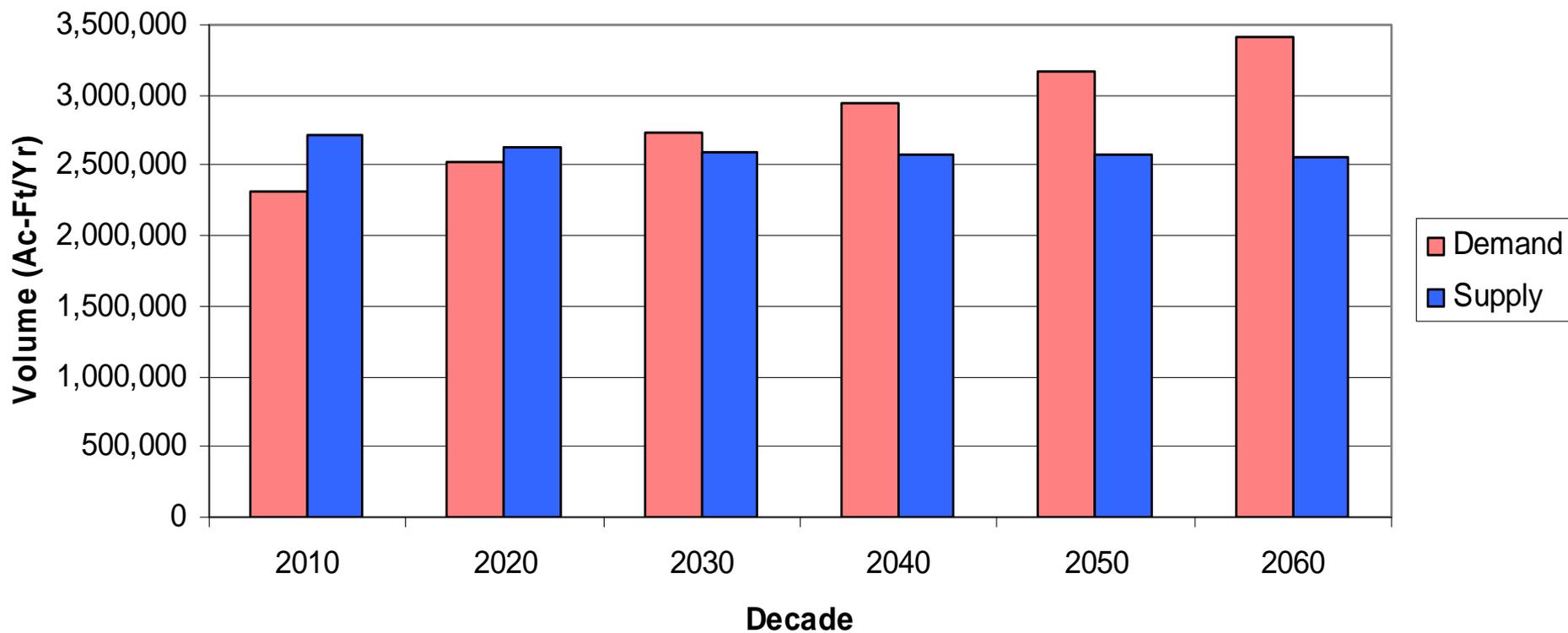
- Three major rivers and four coastal basins
- Located at the bottom and therefore highly dependent on upstream Regions G and C
- Water needs driven primarily by subsidence regulations and groundwater conversion
- Proliferation of water districts in the region resulting in significant number of WUG's (+/- 500)
- Largest projected municipal and industrial demand in the State

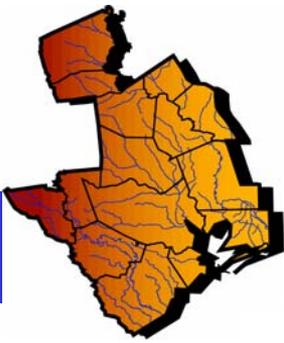


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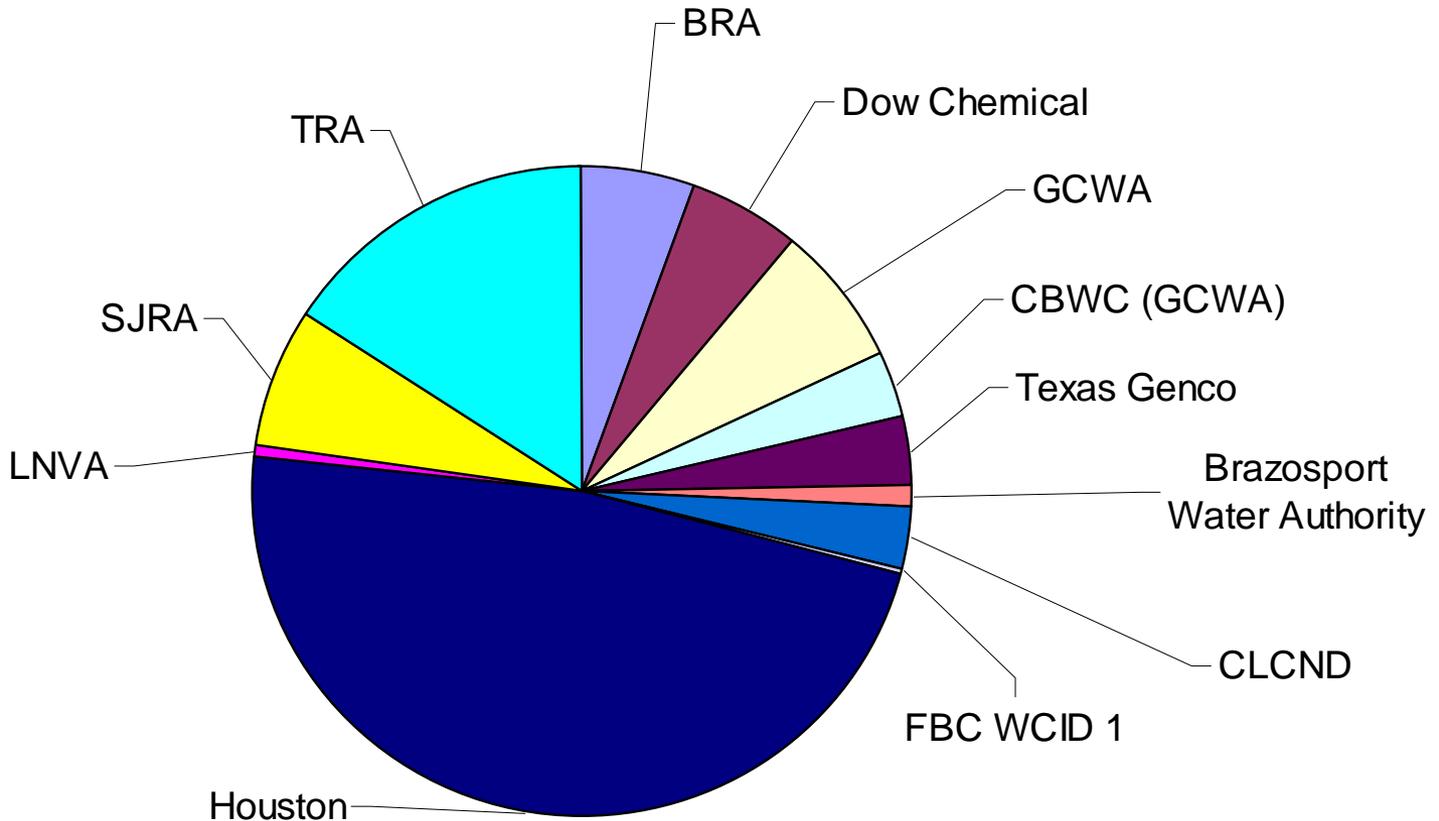
# *2006 Projected Supply and Demand*

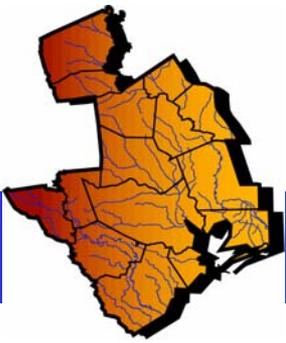
## Region H Demands and Supplies





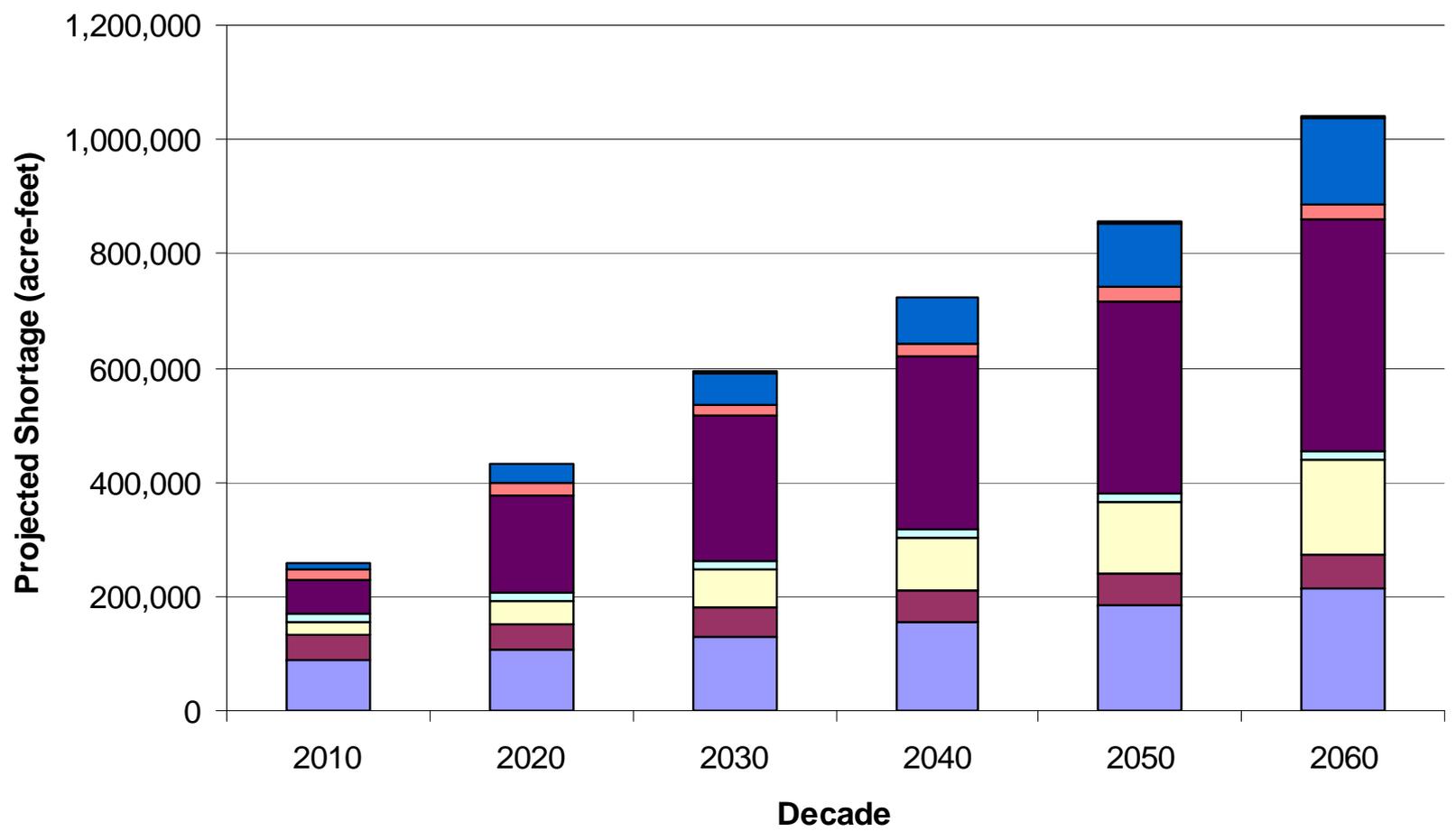
## Major Surface Water Providers Year 2060 Supplies



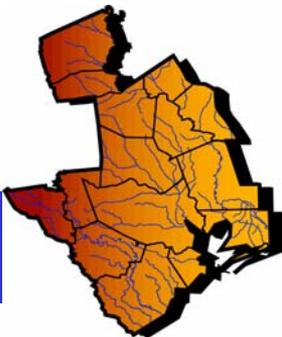


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# *2006 Projected Shortages*

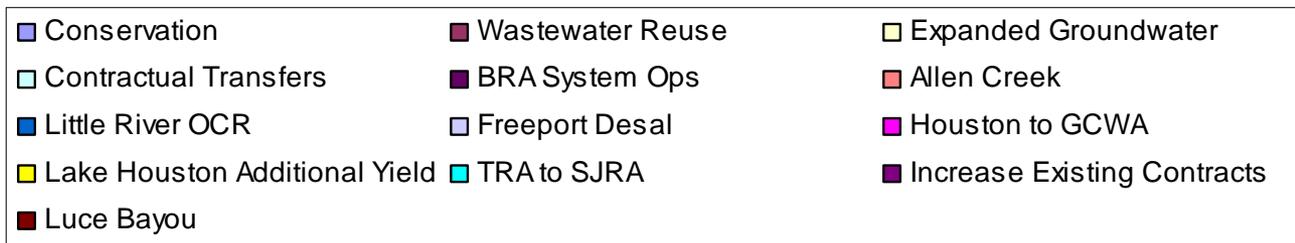
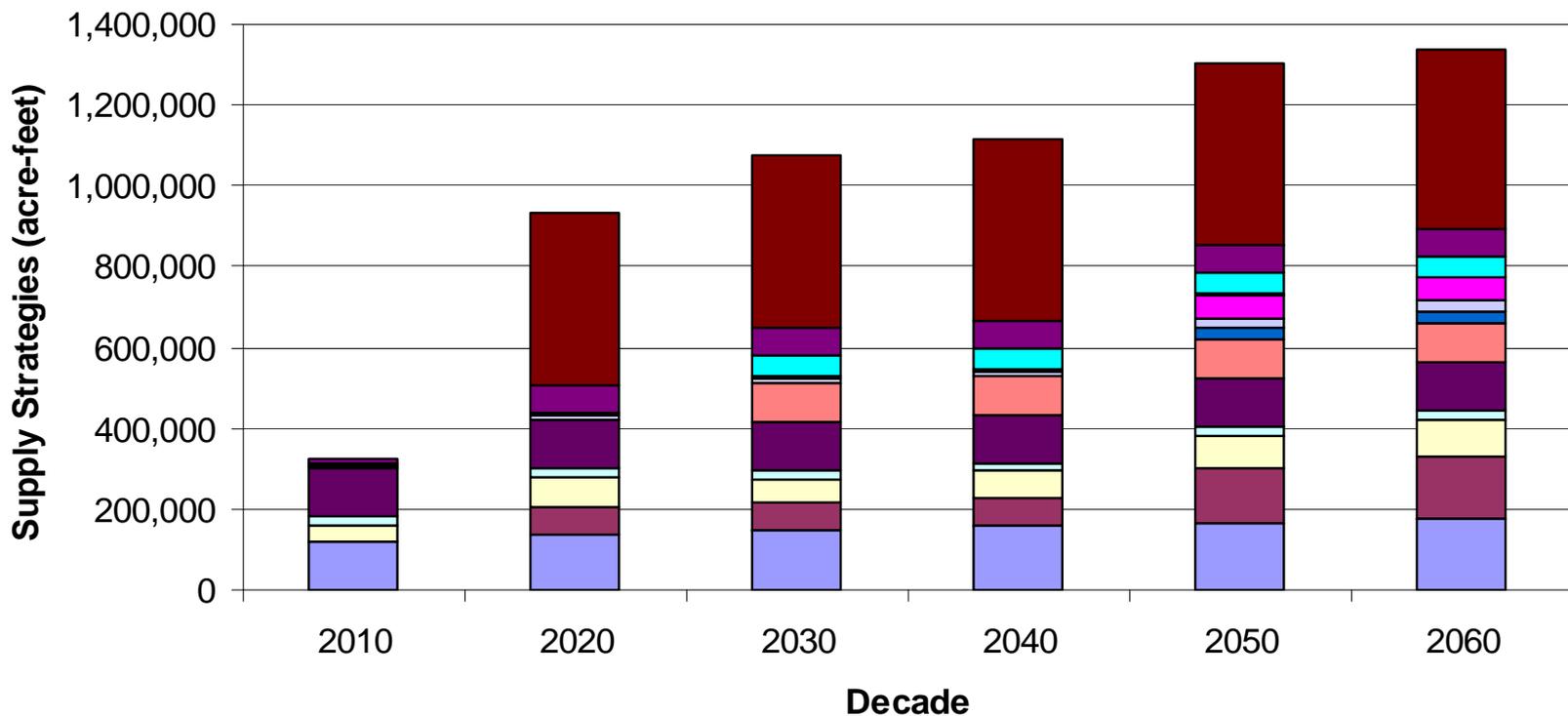


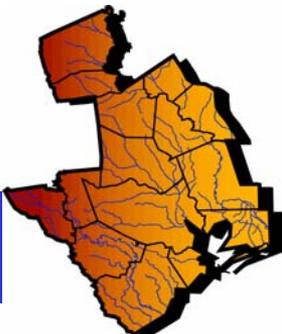
■ Brazoria ■ Chambers ■ Fort Bend ■ Galveston ■ Harris ■ Liberty ■ Montgomery ■ San Jacinto ■ Waller



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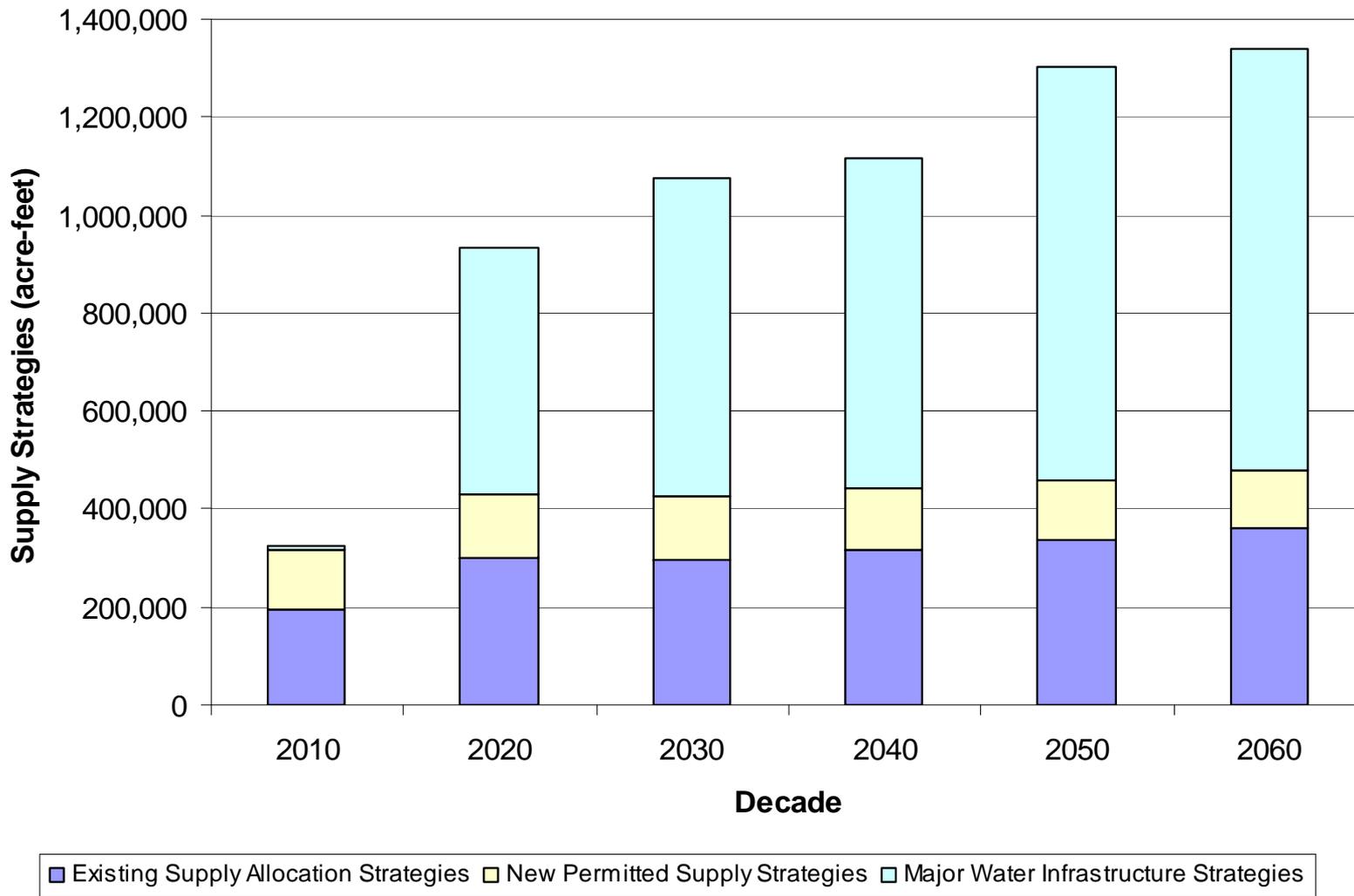
# 2006 Water Management Strategies

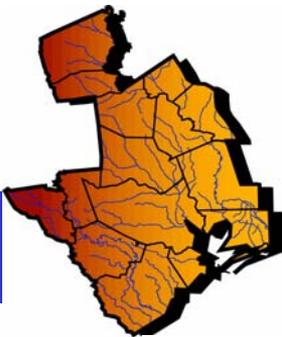




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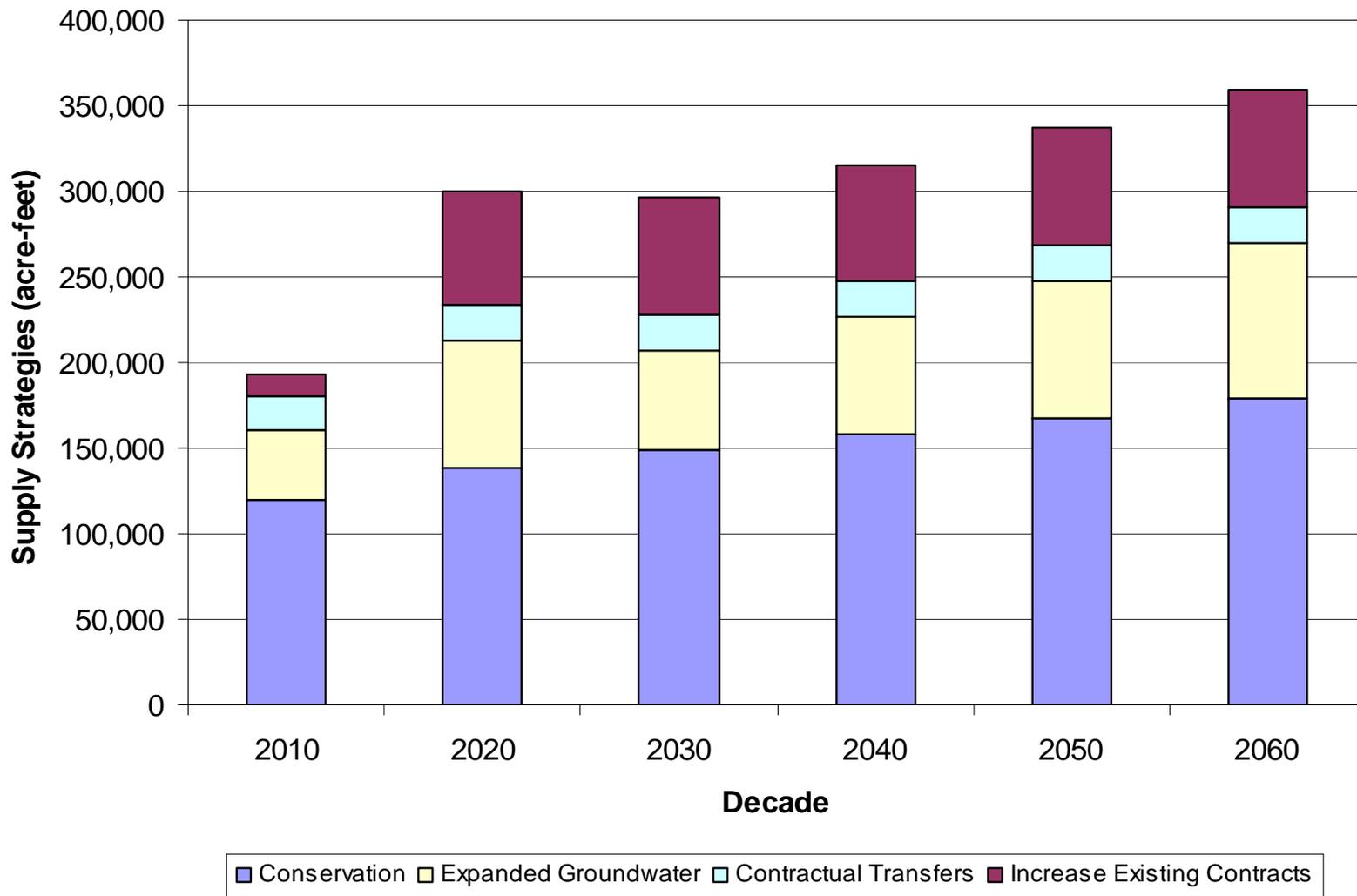
# *2006 Water Management Strategy Types*

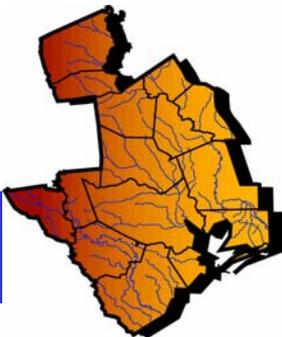




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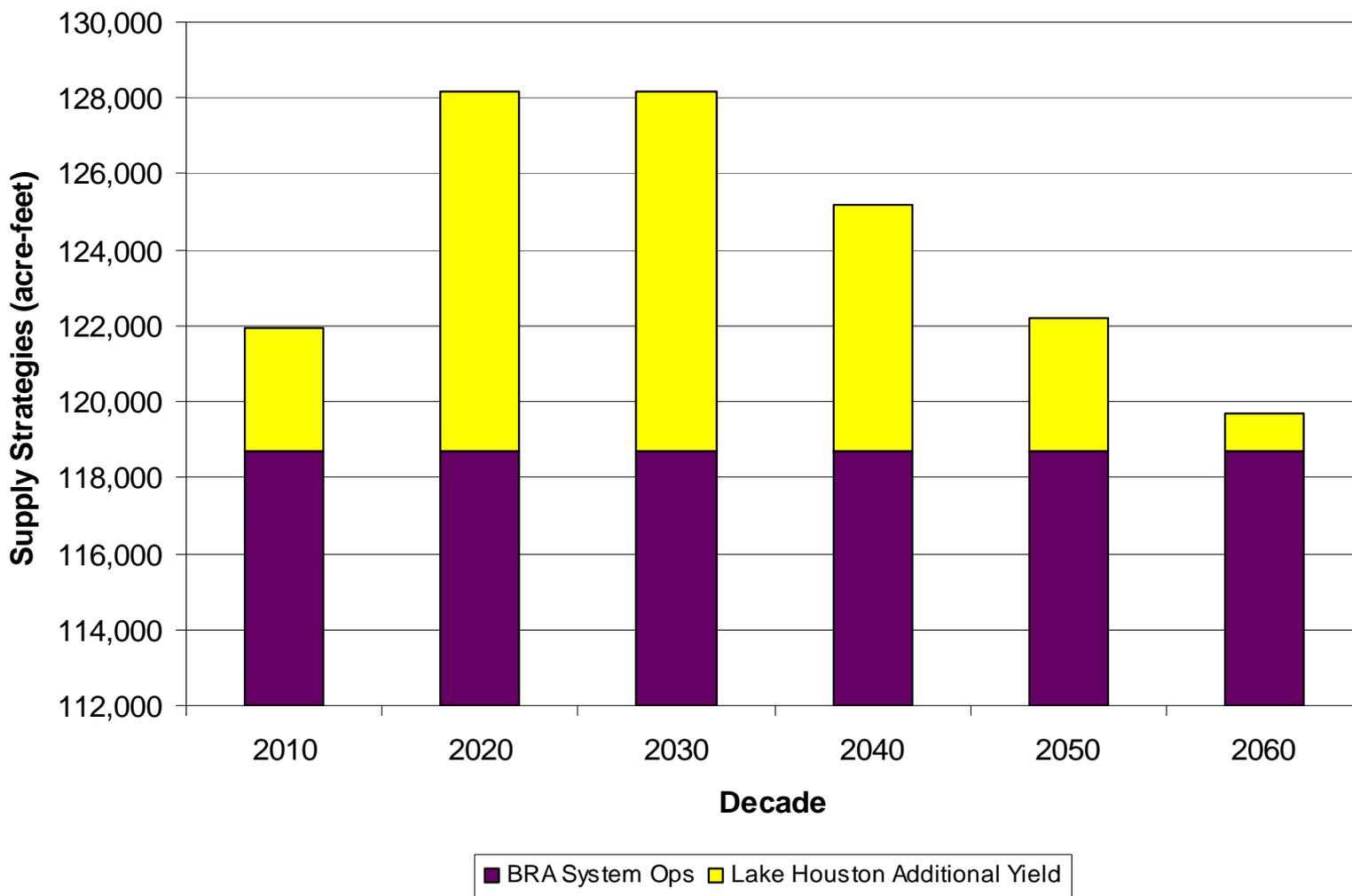
# *2006 Existing Supply Allocation Strategies*

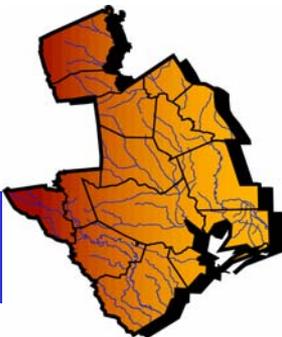




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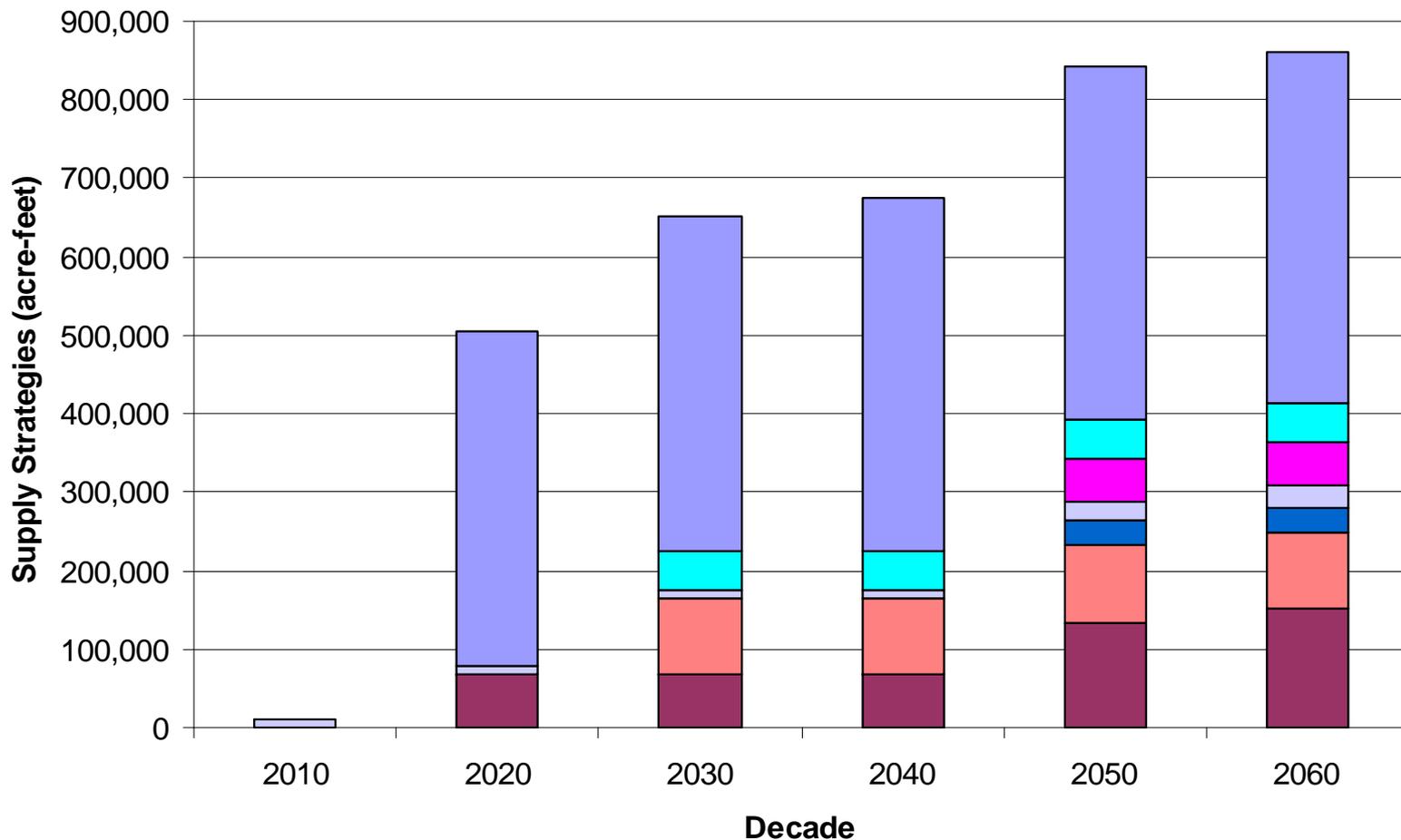
# *2006 New Permitted Supply Strategies*



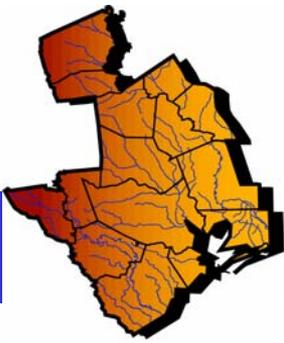


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# *2006 Major Water Infrastructure Strategies*



■ Wastewater Reuse ■ Allen Creek ■ Little River OCR ■ Freeport Desal ■ Houston to GCWA ■ TRA to SJRA ■ Luce Bayou

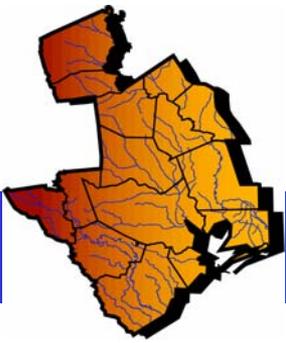


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# *Luce Bayou Interbasin Transfer*

- 20-mile transfer of water from Trinity River to Lake Houston
- \$300 million project cost
- 450 mgd capacity at ultimate project
- Harris, Fort Bend, and Montgomery Counties
- 2020 implementation date

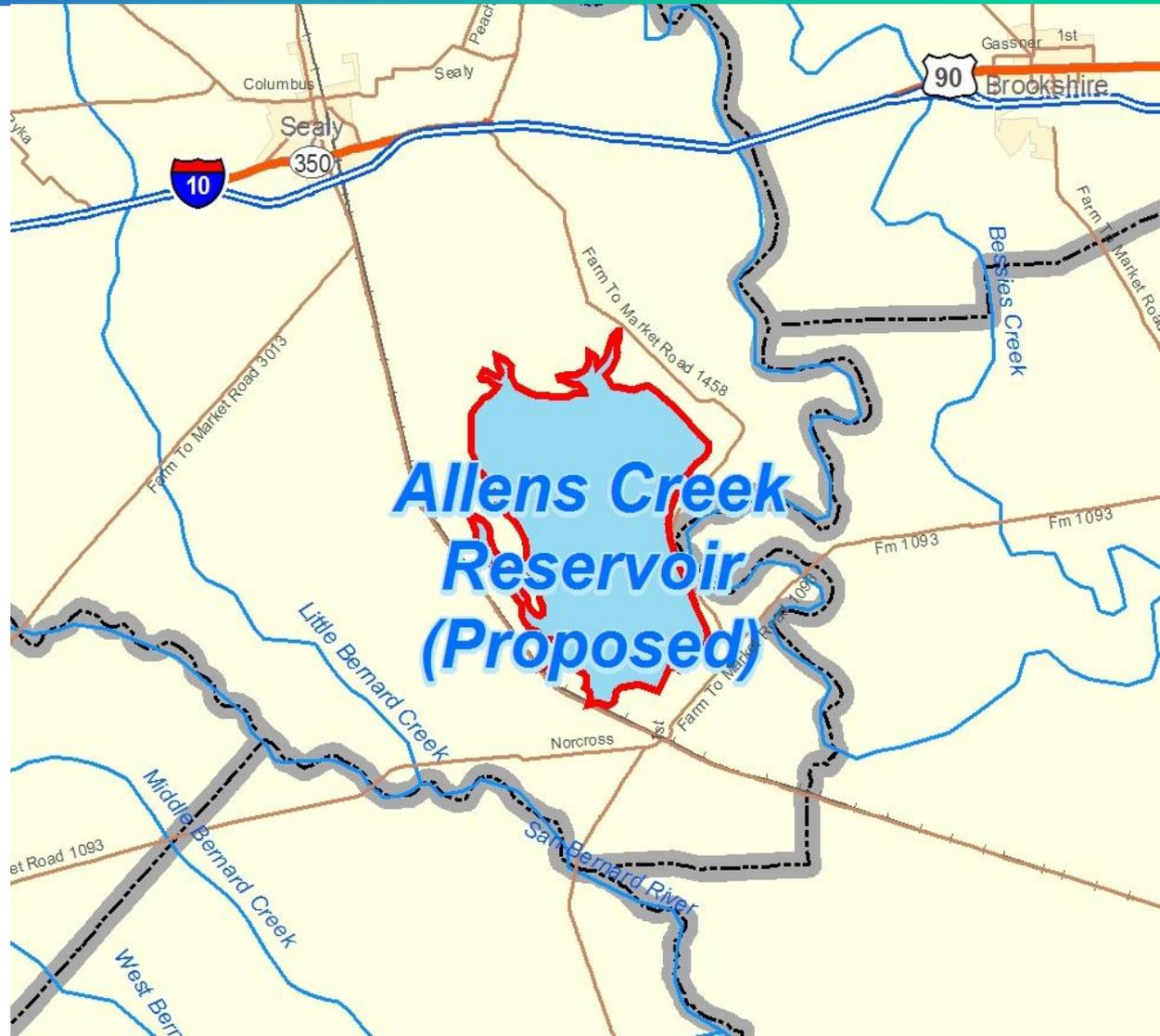


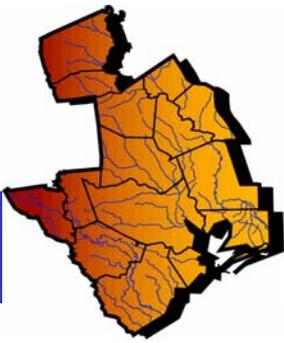


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# *Allen Creek Reservoir*

- Off-Channel reservoir in Brazos River basin
- \$170 million cost
- 99,650 acre-feet annual yield
- Primarily allocated to Fort Bend and Brazoria Counties
- 2030 implementation date

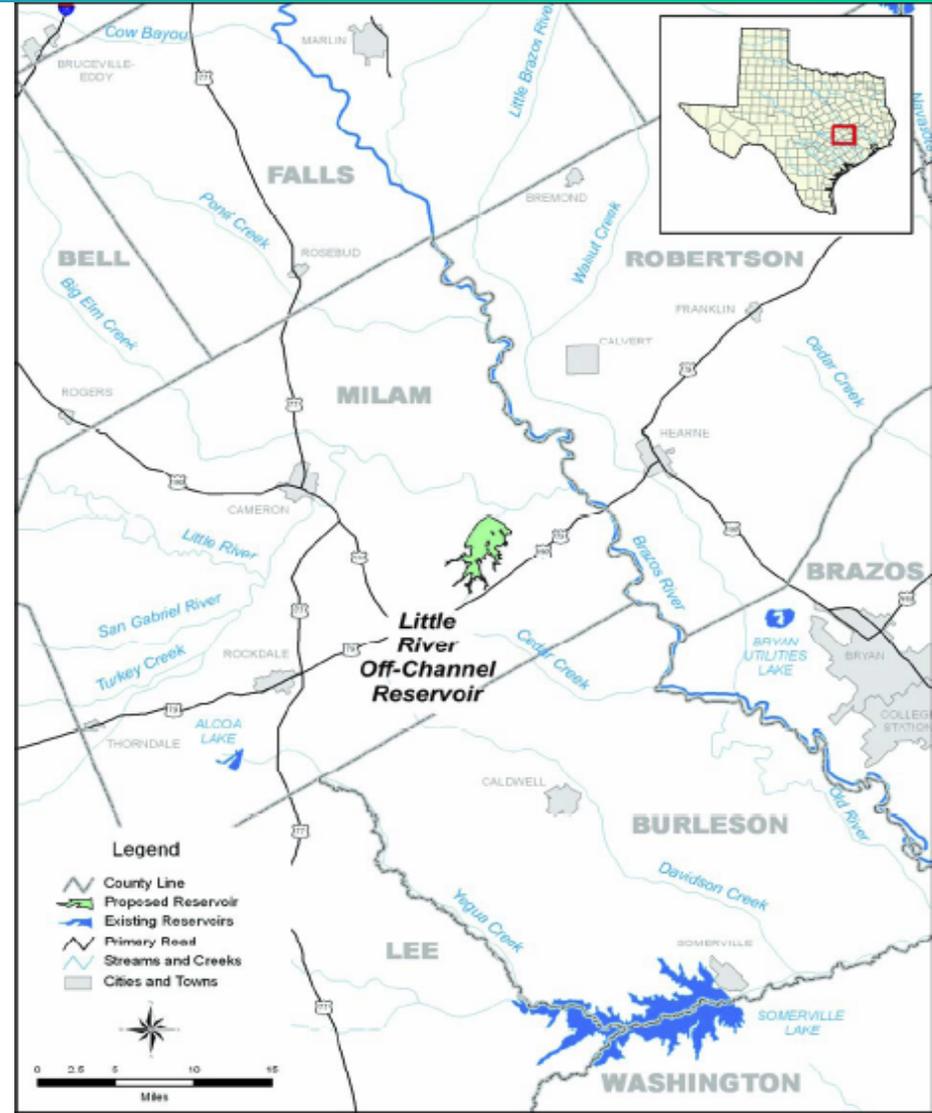


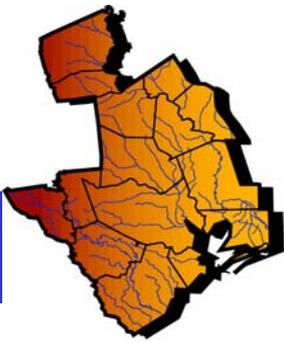


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# *Little River Off-Channel Reservoir*

- Off-channel reservoir in the Brazos River basin
- \$96 million cost
- 32,110 acre-feet annual yield
- Allocated to Fort Bend County
- 2050 implementation date

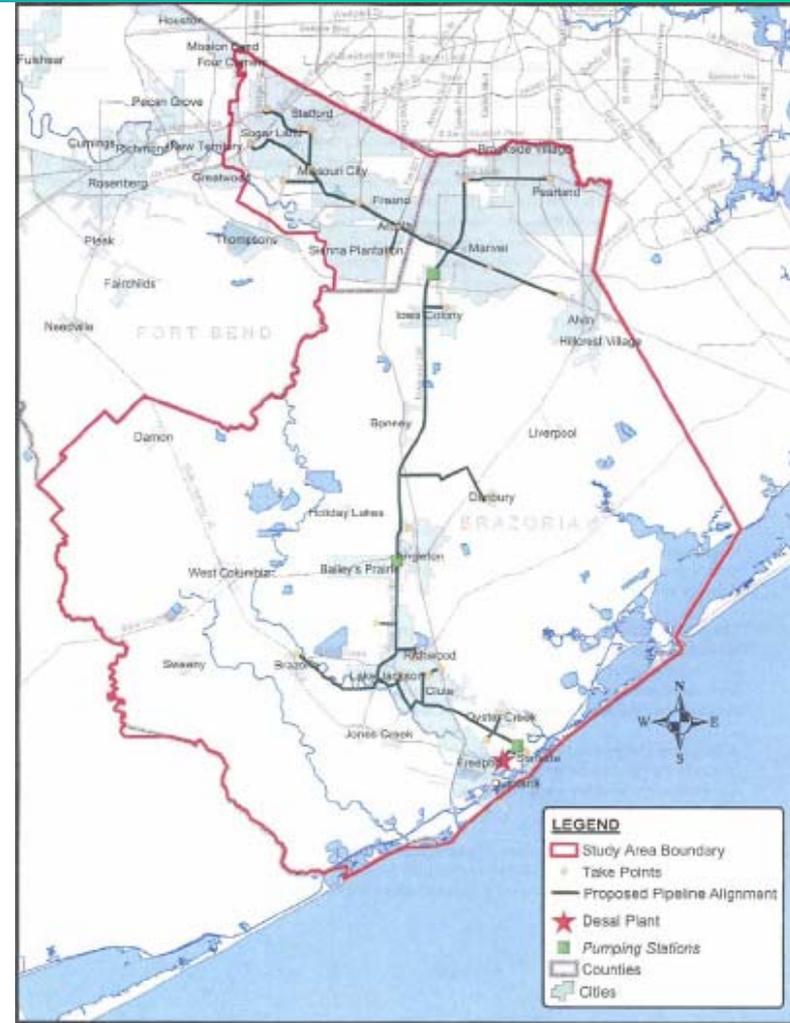


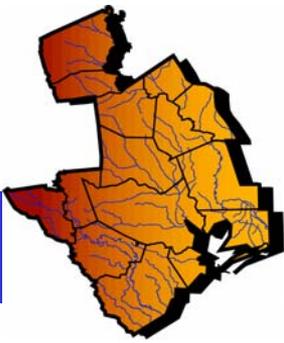


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# *Freeport Desalination*

- TWDB Desalination Demonstration Project
- \$746 to \$960 million cost
- 11,200 to 33,600 acre-feet annual supply
- Allocated to Brazoria County
- Implementation date 2010
- Demonstration project not selected by TWDB for further study. Questionable inclusion in the 2011 Regional Plan.





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# *Houston to GCWA Transfer*

- 16-mile pipeline between Bayport Reservoir and Texas City Reservoir
- Contract of raw water between City of Houston and GCWA
- \$84 million project cost
- 28,000 acre-feet annual supply
- Allocated to Fort Bend County
- Implementation date 2050

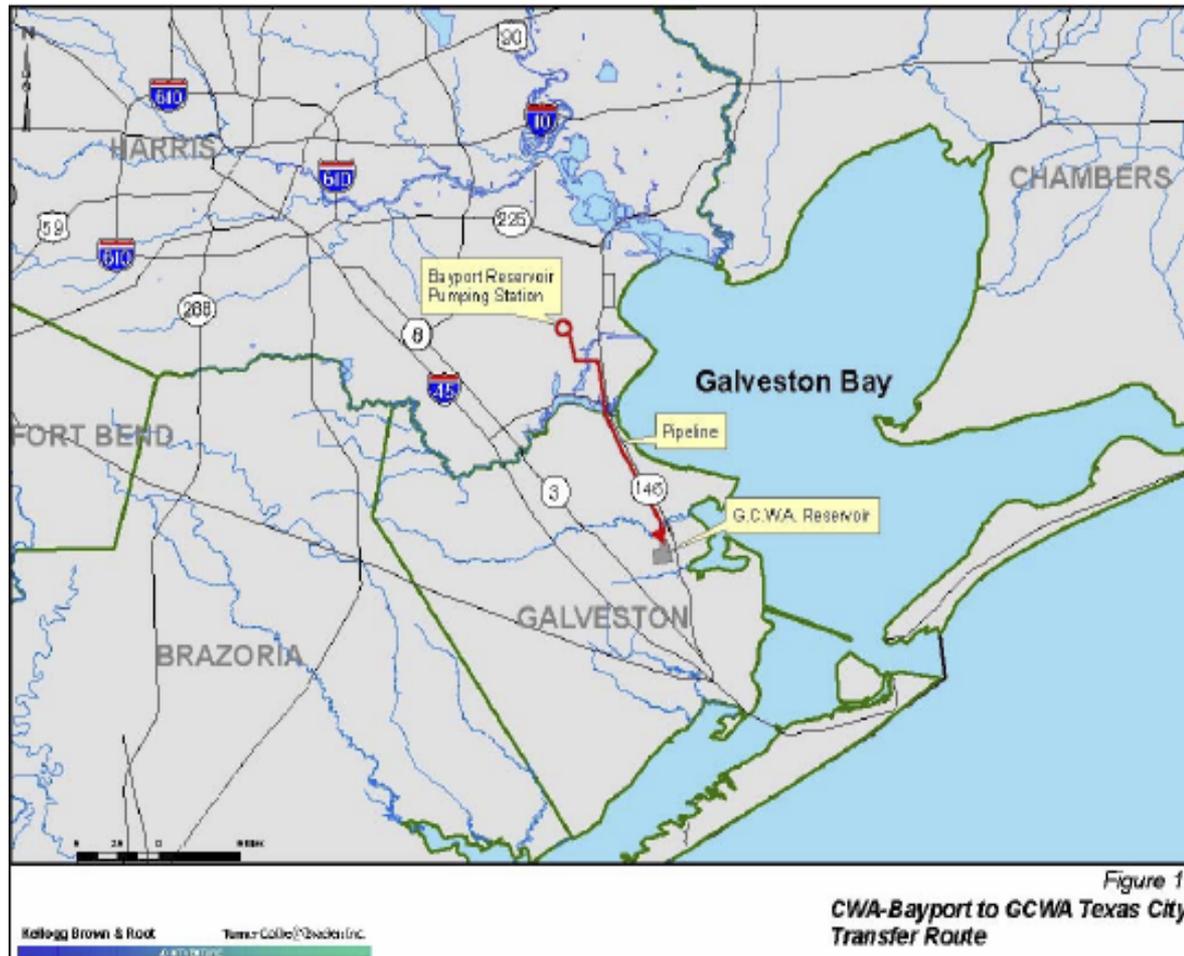
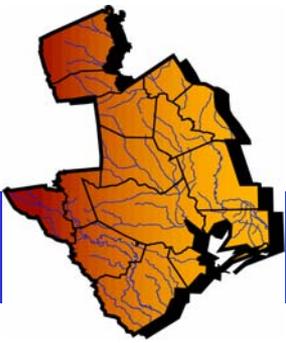


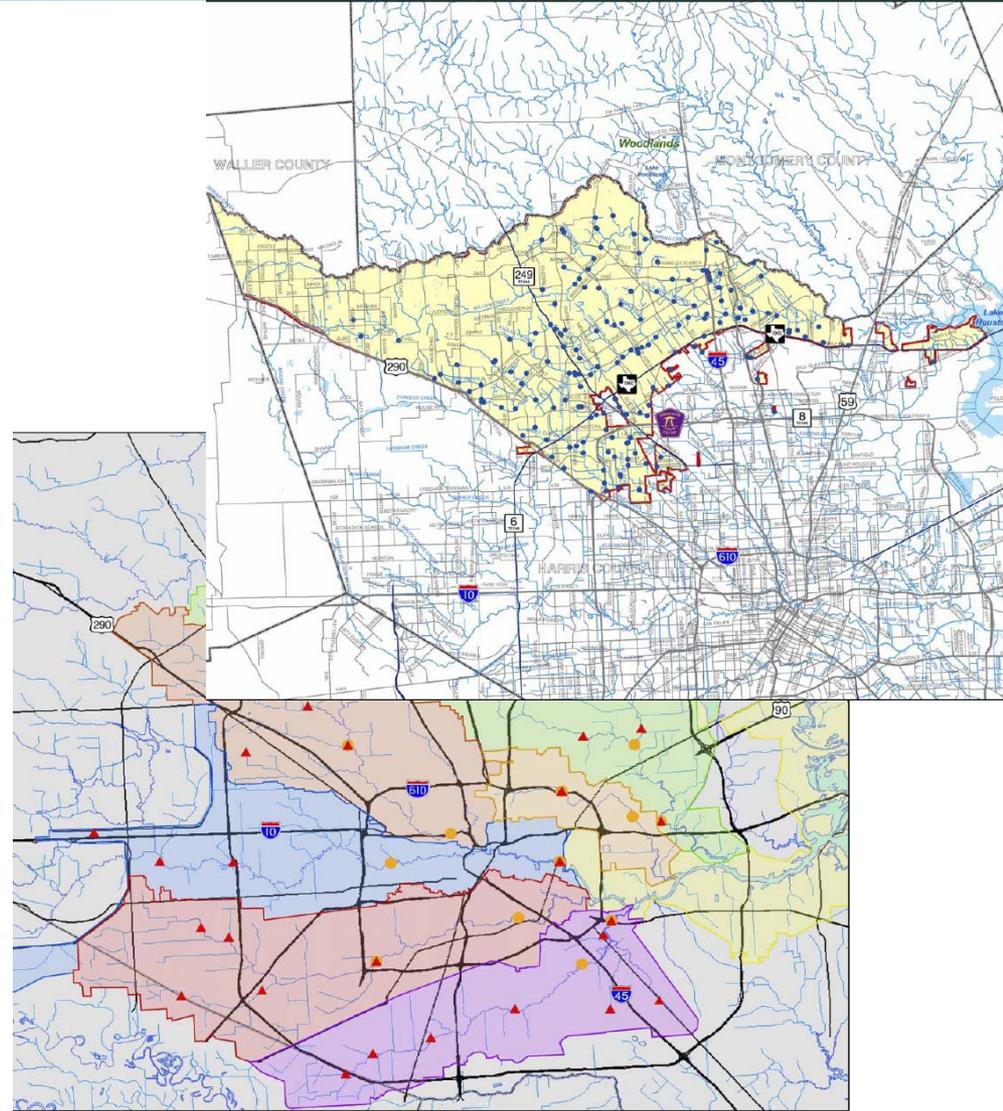
Figure 1  
CWA-Bayport to GCWA Texas City  
Transfer Route

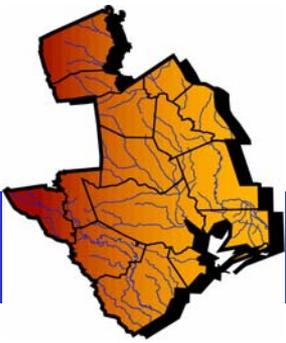


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# *Wastewater Reuse*

- 31,400 acre-feet municipal reuse supply for NHCRWA in 2060
- 98,045 acre-feet municipal reuse supply for City of Houston in 2060
- Allocated supply volumes represent only 20% of the estimated available supply
- Reuse from 163 WWTP's in NHCRWA and 35 WWTP's in City of Houston
- Another 100,000 acre-feet of reuse for industrial and municipal supply identified in 2006 plan

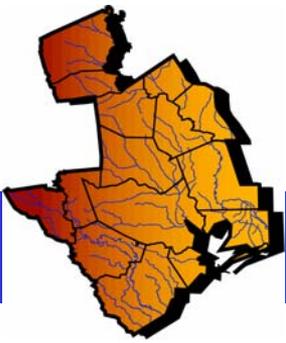




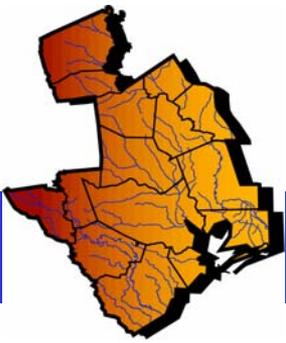
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## *Key 2011 Planning Initiatives*

- Population and Water Demand Projections
- Evolving Groundwater Conversion Plans / Source Water Allocation
- Supply Constraints
- Water Conservation / Drought Management / Supply Management
- Environmental Flows



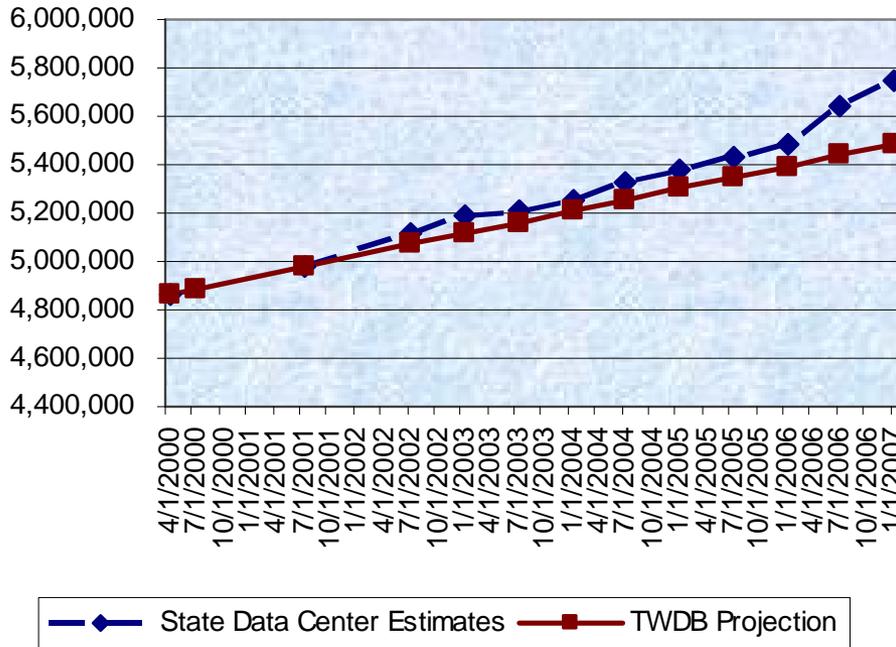
- 9 of the 15 Counties under-projected based on TWDB mid-census figures
- Two of the fastest growing Counties in the region, Fort Bend and Montgomery, under-projected by 12% and 9%, respectively.
- Historically under-projected in the more urban and developing counties in Region H
- Overall region population not as much an issue
- Due to conversion issues, location of demand and supply very critical to Region H



**Region H  
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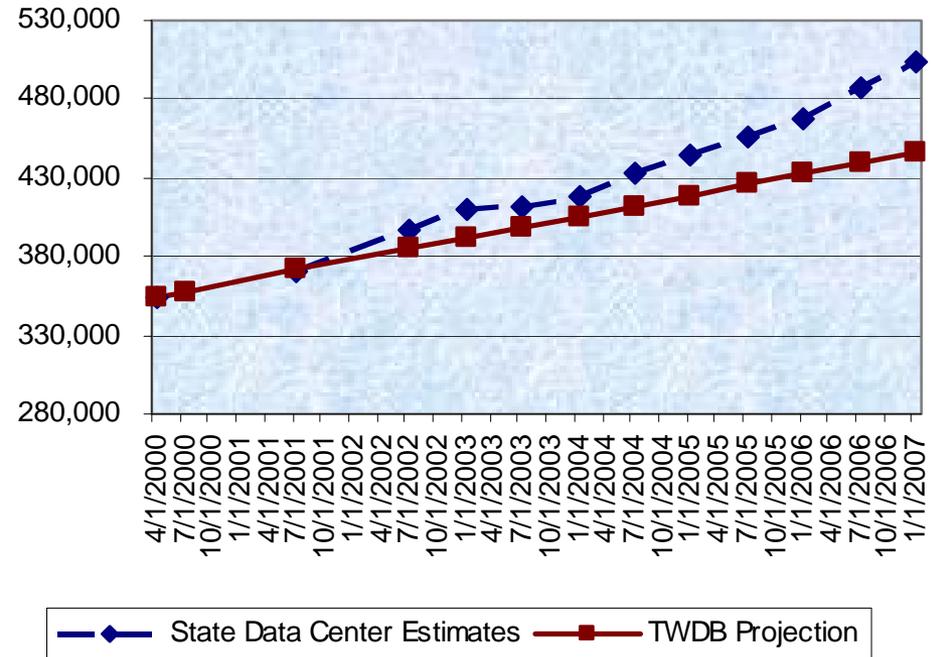
# Population and Water Demand Projections

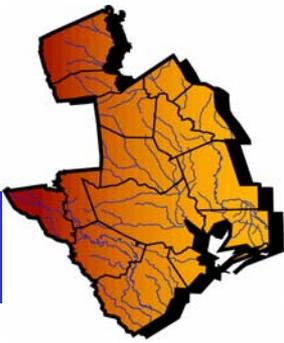
**Region H**



How is this discrepancy carried forward to 2060?

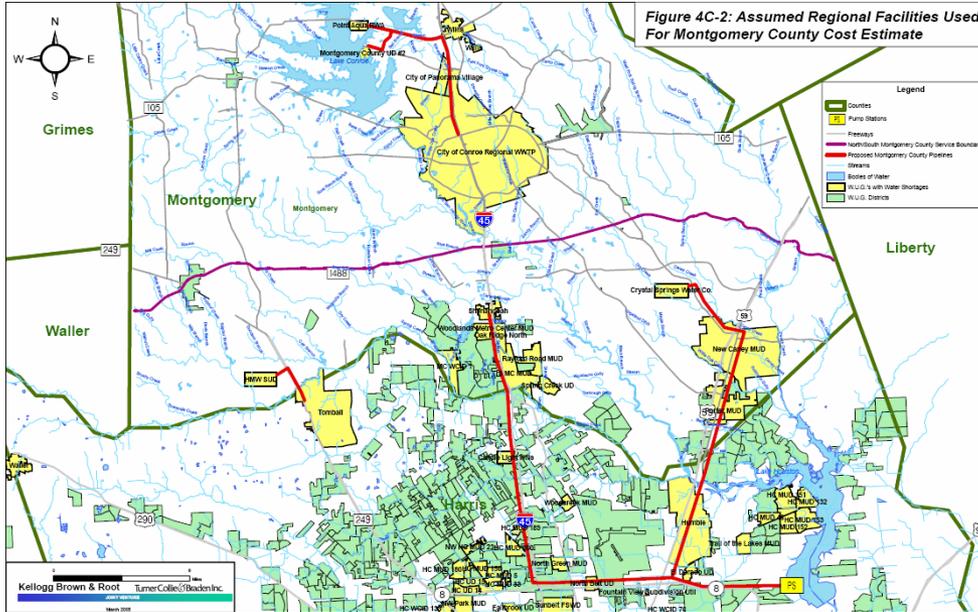
**Fort Bend County**





## Region H Water Planning Group

# Evolving Groundwater Conversion Plans / Source Water Allocation



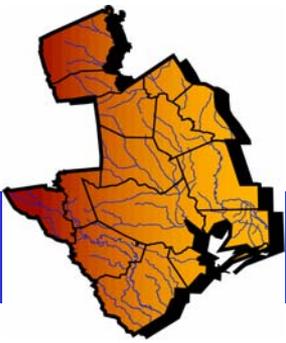
Difficult to accurately reflect sources of water and strategies for individual WUG's

TWDB funding issues and multiple plan amendments

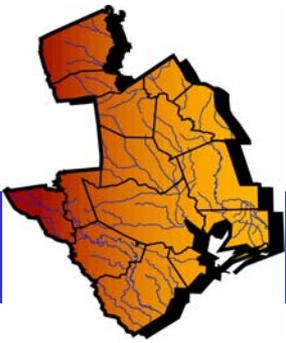


Fort Bend County conversion strategies and alternative supply options still developing

Montgomery County conversion rules still developing



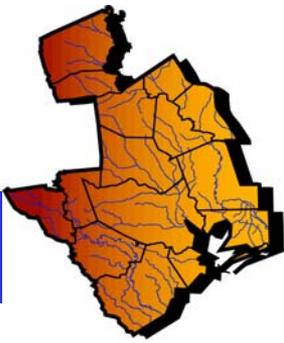
- Variable reliability of run-of-river supplies in the Brazos River
- Yields for some existing supplies may be adjusted downward during 2011 plan development
- Lake Livingston dependent on upstream return flows to firm yield
- Brazoria and Fort Bend County relying heavily (120,000 acre-feet) on future supplies developed by BRA System Operations Permit
- 2011 Regional Plan has scope elements to address these issues



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## *Water Conservation/ Drought Management/ Supply Management*

- Conservation (beyond the prescribed TWDB amounts) strategies account for approximately 167,000 acre-feet of new supply in 2060
- Reuse strategies account for approximately 233,000 acre-feet of new supply in 2060
- Conservation and reuse strategies together account for over 30% of the new supply in 2060



*Region H  
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# *Water Conservation/ Drought Management/ Supply Management*

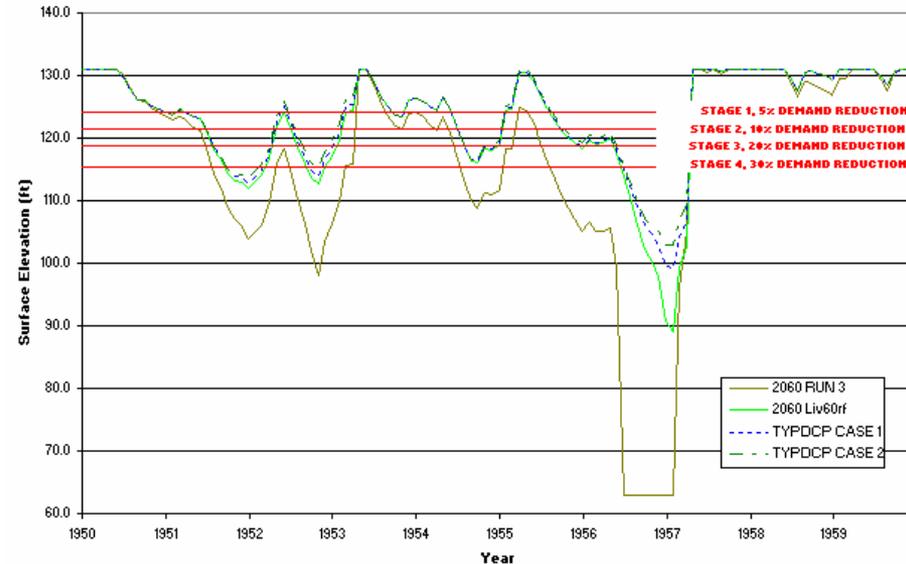
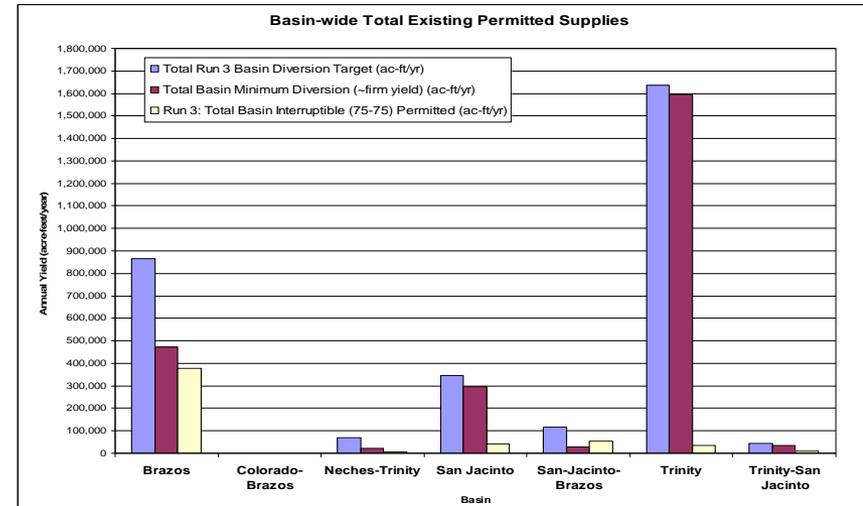
Special study on Drought Management conducted during first phase of 2011 planning

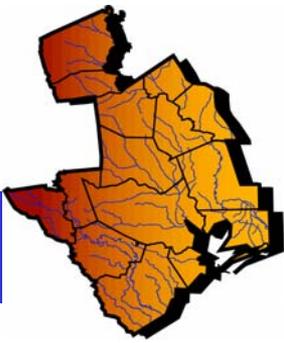
Special study on Interruptible Supply conducted during first phase of 2011 planning

Evaluated the feasibility of extending supplies during drought periods

Evaluated use of interruptible supplies for certain uses in lieu of new supplies

Evaluated the applicability of incorporating Drought Management in long-term regional planning





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# *Instream Flows Study*

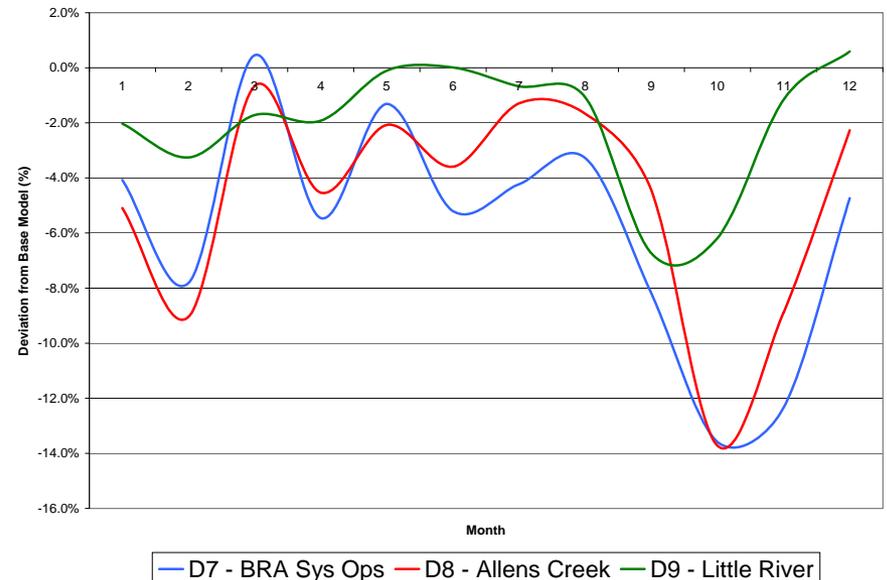
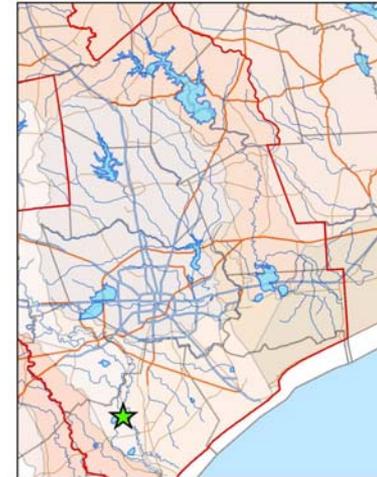
Special study conducted during first phase of 2011 planning

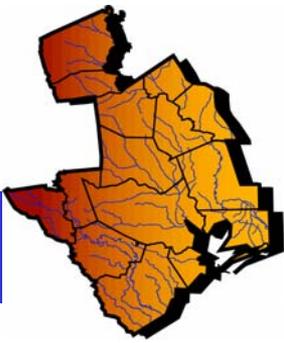
Calculation of Lyons Flows at critical segments

Field assessment of critical segments during low flow conditions

Qualitative comparison of Lyons Flows to field observations

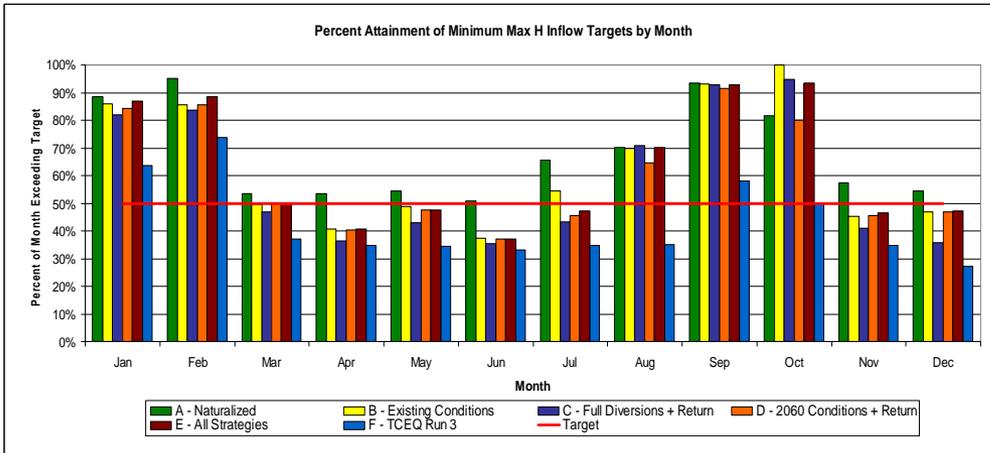
Evaluation of impacts due to water management strategies





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# B&E Flows Study



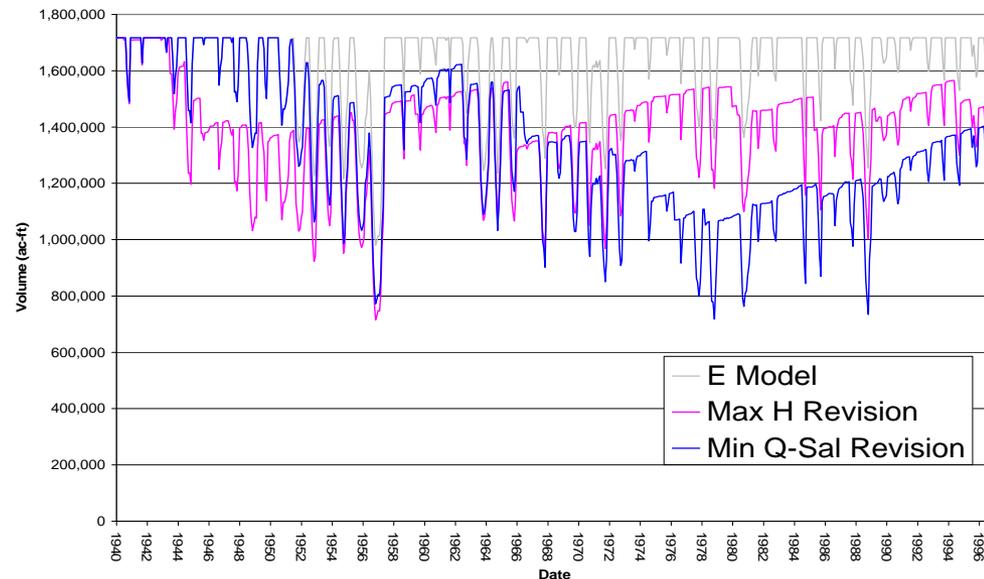
Special study conducted during first phase of 2011 planning

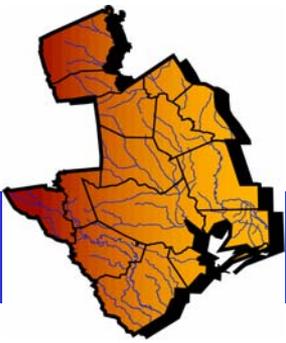
Evaluation of target frequencies during seasonal flow variation

Evaluate flow modifications to achieve recommended target frequency

Evaluate impacts to water supplies as a result of flow modifications

Additional study elements as part of the 2011 Regional Water Plan





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# **Region H Water Planning Group 2006 Regional Water Plan Summary and 2011 Regional Planning Initiatives**

## **Trinity and San Jacinto Rivers and Galveston Bay Stakeholders Committee**

*December 18, 2008*