

TR-301

Economic, Hydrologic and Environmental Appraisal of Texas Inter-basin Water Transfers: Model Development and Initial Appraisal

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Water scarcity is becoming a pervasive and persistent problem in Texas particularly in the drier regions containing cities like San Antonio, Austin, and Corpus Christi while growth causes emerging problems in Dallas, Fort Worth and Houston. A number of options are being considered including Inter-basin water transfers (IBTs) shifting water from surplus to deficit regions. Potential water transfers can have unforeseen or negative impacts on basin of origin, regional economies, and or on the environment including water quality. The Texas water Code mandates that water transfers should consider economic, environmental and water quality impacts (in section 11.085, (K), (F)) demanding projections of impacts on water quality, aquatic and riparian habitat in all affected basins. While there are 51 proposed Texas Inter-basin water transfers in 2006 Texas Water Plan, there is no comprehensive evaluation of or even evaluation methodology proposed for these transfers.

The water models available in Texas have various limitations that affect their usefulness in evaluating IBT induced economic impacts and water quality changes. Water-related models that deal with hydrologic and environmental issues commonly focus on the quantity issues such as water supply and water flow but do not have economic or water quality dimensions (Wurbs, 2003). Models with economic considerations tend to cover only restricted areas, for example, the Edwards aquifer and Nueces, Frio and Guadalupe-Blanco basin regions (Gillig et al, 2001; Watkins Jr & McKinney, 2000). Much of the research has been localized looking at only single or a couple of basins without looking at broader statewide issues.

This research is designed to build a statewide model integrating economic, hydrologic, and environment components. Such a model will be used to examine Texas water scarcity issues and socially optimal water allocation along with the effects of inter-basin water transfers.

We developed an integrated economic, hydrologic, and environment model covering 21 Texas riverbasins: Colorado, Brazos-Colorado, Brazos, Brazos-San Jacinto, Canadian, Red, Sabine, Guadalupe, San Antonio, Sulphur, Cypress, Neches, Neches-Trinity, Trinity, Trinity-San Jacinto, San Jacinto, Colorado-Lavaca, Lavaca, Lavaca-Guadalupe, San Antonio-Nueces, and Nueces.

The model is designed to yield information to support effective public water policy making for state agencies, water management authorities and regional water planning groups.

The surface water aspects of this project are summarized in this report. Future research work will be focused on combining surface and ground water by integrating the Edwards Aquifer Groundwater and River System Simulation Model (EDSIMR).

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