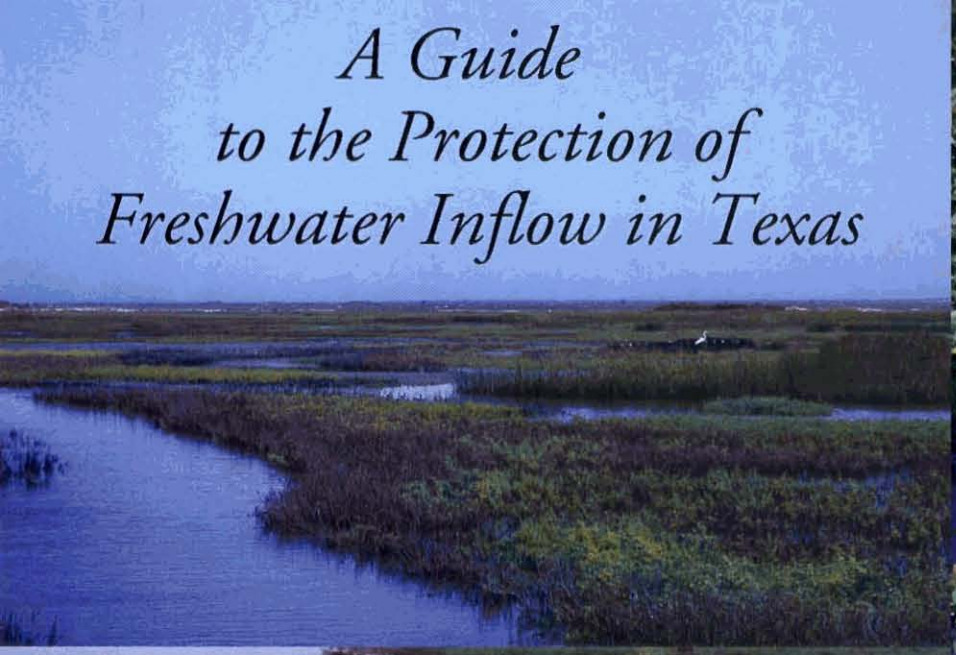
A Guide to the Protection of Freshwater Inflow in Texas

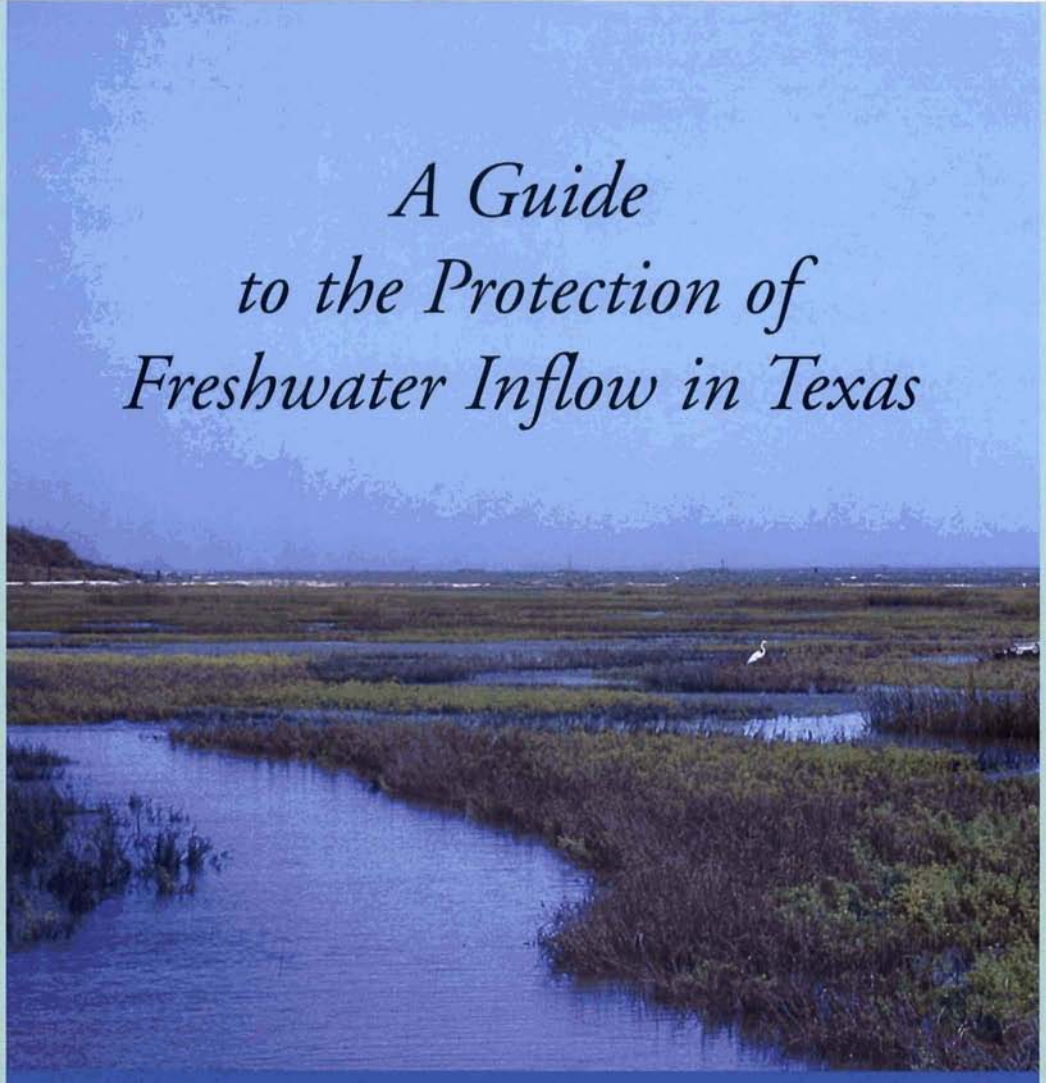


Texas State University | SAN MARCOS

A member of the Texas State University System

Table of Contents *(Detailed contents on enclosed CD)*

A Guide to the Protection of Freshwater Inflow in Texas



What is Freshwater Inflow?

Freshwater inflow is freshwater from rivers and streams that enters the bays and estuaries and mixes with the saltwater creating varying zones of salinity. Different species of plants and animals depend on these various zones of salinity for some or all of their life span.

The amount of freshwater required to maintain the productivity of the bays and estuaries in Texas and the system to preserve those flows is the subject of much discussion.

Freshwater Inflow to Bays & Estuaries

Aspects of the freshwater inflow issue:

Current laws and rules

Administrative policy and practice

Existing science

Examination of the water rights process

Effects of current water rights on freshwater inflow

Recommendations of the Scientific Advisory Committee

This document is based on a 2004 Master's Thesis by Tom Wassenich in the Department of Geography at Texas State University-San Marcos and is funded by the River Systems Institute also at Texas State. It is provided as a reference resource to aid in the discussions of freshwater inflow protection. Accompanying this introduction is a complete document on compact disk,

Significance of Freshwater Inflow

There is wide spread agreement on the importance of estuaries as biologically productive areas. Estuaries depend on freshwater inflow to provide the habitat areas that are crucial to the life cycles of many Texas commercial and sportfish species including redfish, shrimp, oysters, blue crabs, and seatrout. The United States Environmental Protection Agency estimates that estuaries provide habitat for over 75 percent of the United States commercial fish catch. Without adequate freshwater inflow, the productivity of the estuaries will decline, and some species could cease to exist, which could have major effects on the coastal economy.

Healthy estuaries, including the plants that grow in the various salinity zones, also provide incalculable functions as major filters for pollutants delivered to estuaries by rivers from cities, industry and agriculture. Were it not for this filtering capacity, Texas would have to spend millions more to treat its wastewater to meet higher standards. A third and often overlooked function of healthy estuaries and their associated plant species, oyster banks, and sediment input from freshwater inflow, is protection from hurricanes. Healthy estuaries can absorb much of the power of a hurricane saving Texans millions in storm repair expense.

Study Commission on Water for Environmental Flows

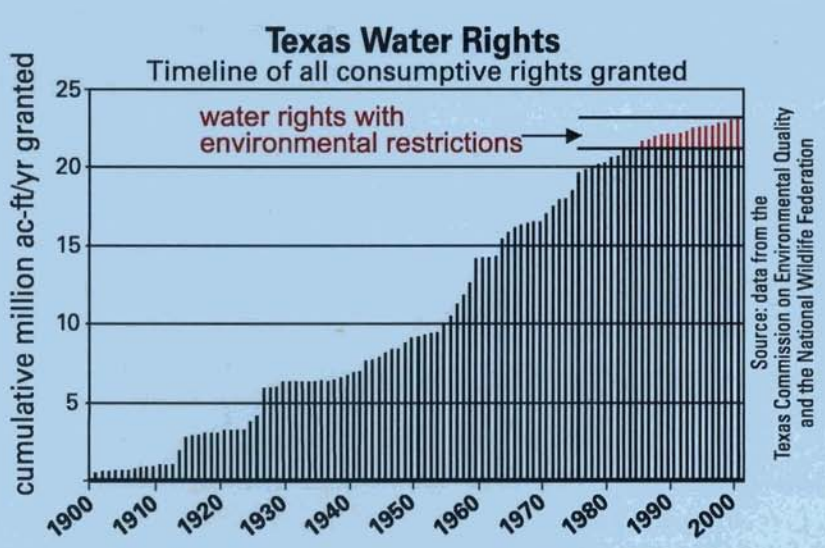
The importance and critical nature of freshwater inflow in Texas is evidenced by the fact that the 2003 legislature passed Senate Bill 1639 that called for the establishment of the Study

Doesn't the TCEQ protect environmental flows in water rights?

Since 1985 there have been requirements that environmental flows be protected when new water rights are granted. However, the protection measures were not well defined and the numbers provided by the studies were not applied. Water rights granted before 1985 had no environmental restrictions. The accompanying chart titled " Texas Water Rights" displays the proportion of existing water rights that were granted before 1985 without restrictions and the amount of rights since 1985 that have some restrictions. As you can see, only a small portion of the over 20 million acre-feet of rights granted contain environmental restrictions.

Don't our current studies tell us how much flow the bays need?

According to the SAC conclusions, the present study system for environmental flow needs to bays and estuaries has several problems, and one of the most important questions about freshwater inflow goes unanswered – "what inflows must a bay receive to maintain its ecosystem over the long term?" (SAC Report p. 8-3).



Commission on Water for Environmental Flows. Section 11.0235(b) of SB 1639 states:

> *Maintaining the biological soundness of the state's rivers, lakes, bays, and estuaries is of great importance to the public's economic health and general well-being.*

Among the duties of the Study Commission was to conduct public hearings to study policy implications for balancing water resources for a growing population with the environmental needs of the estuaries.

"In evaluating the options for providing adequate environmental flows, the study commission shall take notice of the strong public policy imperative that exists in this state recognizing that environmental flows are important to the biological health of our parks, game preserves, and bay and estuary systems and are high priorities in the permitting process. The study commission shall specifically address ways that the ecological soundness of these systems will be ensured in the water allocation process." [SB1639, Sec. 11.0235(j)]

SB 1639 also called for the Study Commission to establish a Scientific Advisory Committee (SAC). This 9-member committee consisted of expert engineers, attorneys, biologists, hydrologists and economists from Texas. The SAC report, completed in December 2004, is discussed in the accompanying CD. Some of the main points of the SAC report include:

Concern that the present bay studies are not adequate and do not provide the flow information needed for the Texas Commission on Environmental Quality (TCEQ) to protect freshwater inflow in new water rights.

Due to the variety of climatology and hydrology in Texas, different bays need different scientific approaches – not the current one-size-fits-all method.

- The current methods to protect freshwater inflow used by TCEQ in water rights applications need improvement. Any new policies should be adaptive and capable of being altered as science improves.
- Water is underpriced and the price does not reflect the value of environmental flows.

Examination of market-based environmental flow strategies such as incentives to place water in the Water Trust or state acquisition of water rights to be placed in the Trust.

Isn't there plenty of water left if we start regulating now?

According to the Texas Water Development Board, in a record drought situation, which is the basis for the State Water Plan, there is only 8.59 million acre-feet of surface water available in Texas. As can be seen in the above graph, over 20 million acre-feet of water rights have been granted, most without environmental flow restrictions. Actual surface water use in 1997 was 6.03 million acre-k t , but previously unused existing rights are rapidly being converted from irrigation to municipal use. In addition, as of December 2004, almost 3 million acre-feet of water right applications were pending at TCEQ. Individual river basins are already overappropriated, such as the Rio Grande which ceased flowing to the Gulf of Mexico in 2001. Without some means of utilizing portions of these previously granted water rights for use as freshwater inflow, there is not enough water to

maintain healthy estuaries. The Scientific Advisory Committee discussed several programs to set aside needed environmental flows, including incentives to place water in the Water Trust and state acquisition of water rights to be placed in the trust. However, due to the magnitude of rights already granted and the volume needed to protect the estuaries, there will have to be more significant measures taken.

The Water Trust

The Water Trust was created by Senate Bill 1 in 1997 to provide a place for water rights to be held to preserve environmental flows. Normally a water right that is not used is subject to cancellation after ten years, although cancellation has been extremely rare By placing a water right in the Trust, the owner *can* maintain ownership without having to divert the water and at the same time provide water for environmental flows. The Trust has received a lot of attention lately from the SAC and the Committee on Environmental Flows as a mechanism for providing freshwater inflow and flows in rivers. The Trust has several limitations that prevent it from being the cure-all for preserving adequate flows to the bays.

- There is no monetary incentive to place a water right in the Trust except to avoid the rare cancellation procedure.
- There is no state funding to purchase water rights for environmental purposes to be placed in the Trust.
- A water right donated to the Trust only preserves flow to the original point where that water right was diverted or permitted. From that point downstream the donated water could be applied for and used by anyone else; therefore, the flow would not be protected to the bay unless it was the most downstream water right on the river.
- Only one water right has been donated to the Trust. In 2003, 1236 acre-feet was donated on the Rio Grande upstream of Big Bend National Park.

What about Groundwuter?

Groundwater is unregulated in Texas except to varying degrees in mainly recently created ground-water districts. Groundwater use in 1977 was 9.3 million acre-feet compared to 6.03 million acre-feet of surface water used. The State Water Plan states there is only 8.83 million acre-feet of ground water available in a record drought.

There is not enough space in this document for an in-depth discussion of the relationship between groundwater and surface water, but it is addressed in the accompanying document on CD. This is a complex issue and is the subject of ongoing debate, especially in the State Water Planning Regions. However, there is no doubt that increased pumping of groundwater will reduce the flows of many rivers which will mean less surface water available for environmental flows. The models used by the state to this point are not able to accurately predict the effects of groundwater pumping on streamflow; however, the studies continue on groundwater modeling. The lack of groundwater modeling capability and the varied and sometimes non-existent rules on groundwater make water planning for environmental flows even more difficult.

How to use the enclosed document on CD

This summary only highlights the main issues in the protection of freshwater inflow. On the enclosed CD are extensive analyses of the science, policy, law and practice of freshwater inflow protection in Texas. There is a detailed table of contents to help you find the subject in which you are interested. The last chapter analyzes the report of the Scientific Advisory Committee and its recommendations to the Committee on Environmental Flows. Some of the analyses reflect opinions by the author which are not necessarily the opinions of the publisher or Texas State.

Texas State University | SAN MARCOS
A member of the Texas State University System