

# Freshwater Inflows to the Nueces Estuary

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Freshwater Inflow Workgroup  
Meeting—April 6, 2006

# Background

- Choke Canyon Water Rights Permit-October 12, 1976
- Construction Completed 1982
- Inundation Occurred 1987
- Letter of Inquiry Received December 1989

# "SPECIAL" CONDITION 5.B.

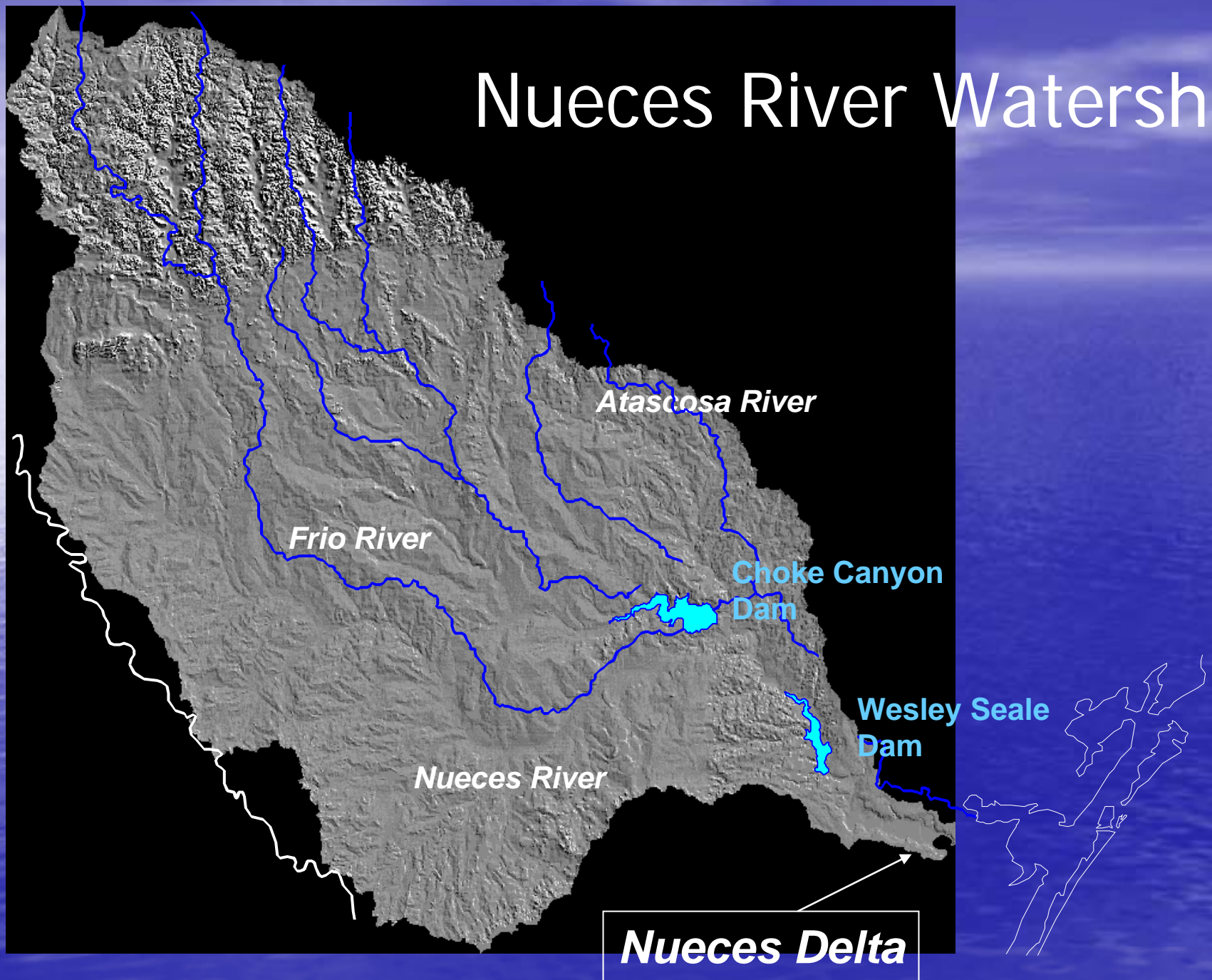
- "Following completion and filling of Choke Canyon Dam and Reservoir, scheduled releases shall be made from the reservoir system at Lake Corpus Christi Dam together with return flows to the estuaries for the proper ecological environment and health of related living marine resources therein. Water provided to the estuaries from the reservoir system under this paragraph shall be released in such quantities and in accordance with such operational procedures as may be ordered by the Commission.



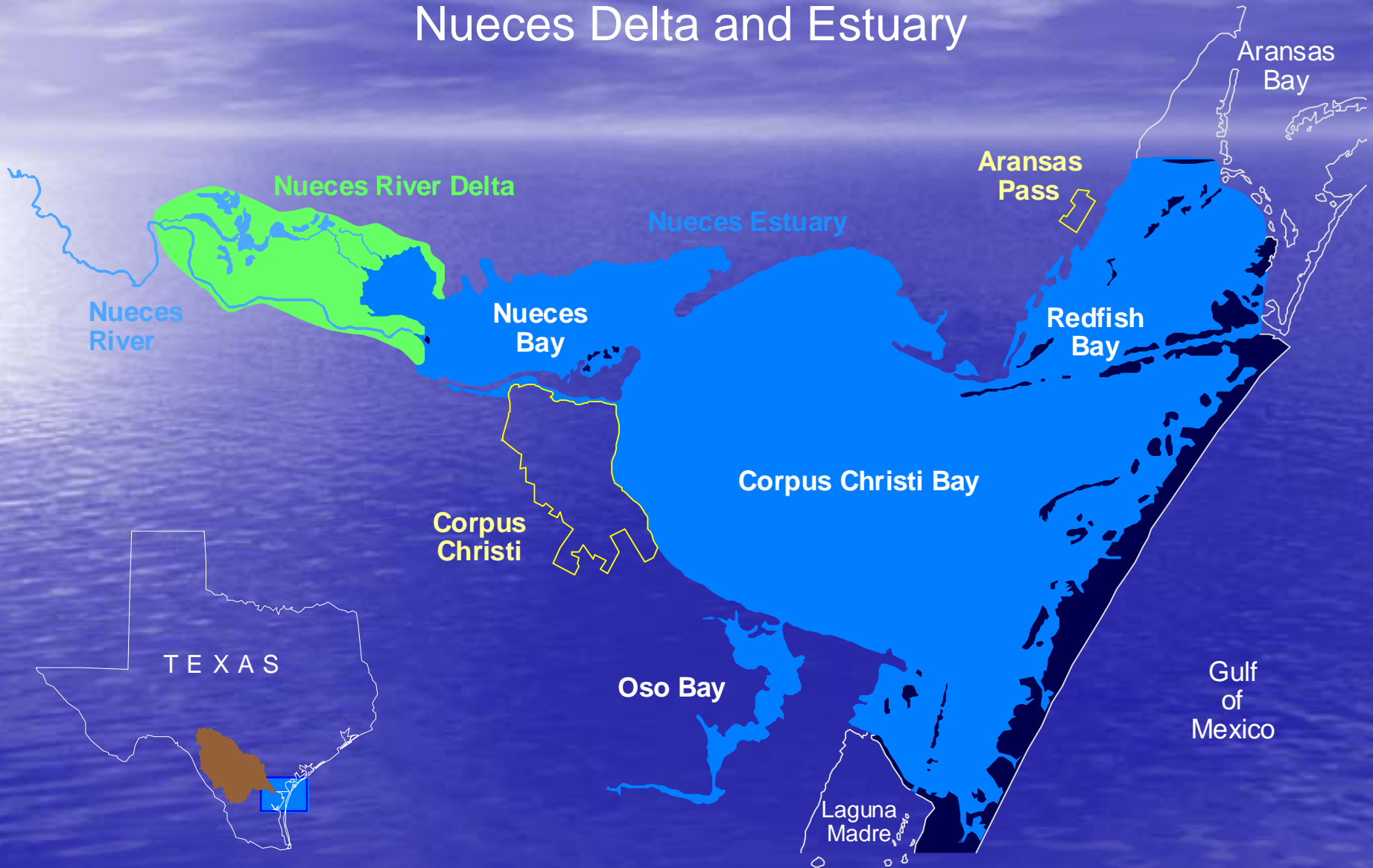
## 5.B. (Cont.)

Permittees shall provide not less than 151,000 acre-feet of water per annum for the estuaries by a combination of releases and spills from the reservoir system at Lake Corpus Christi Dam and return flows to Nueces and Corpus Christi Bays and other receiving estuaries."

# Nueces River Watershed



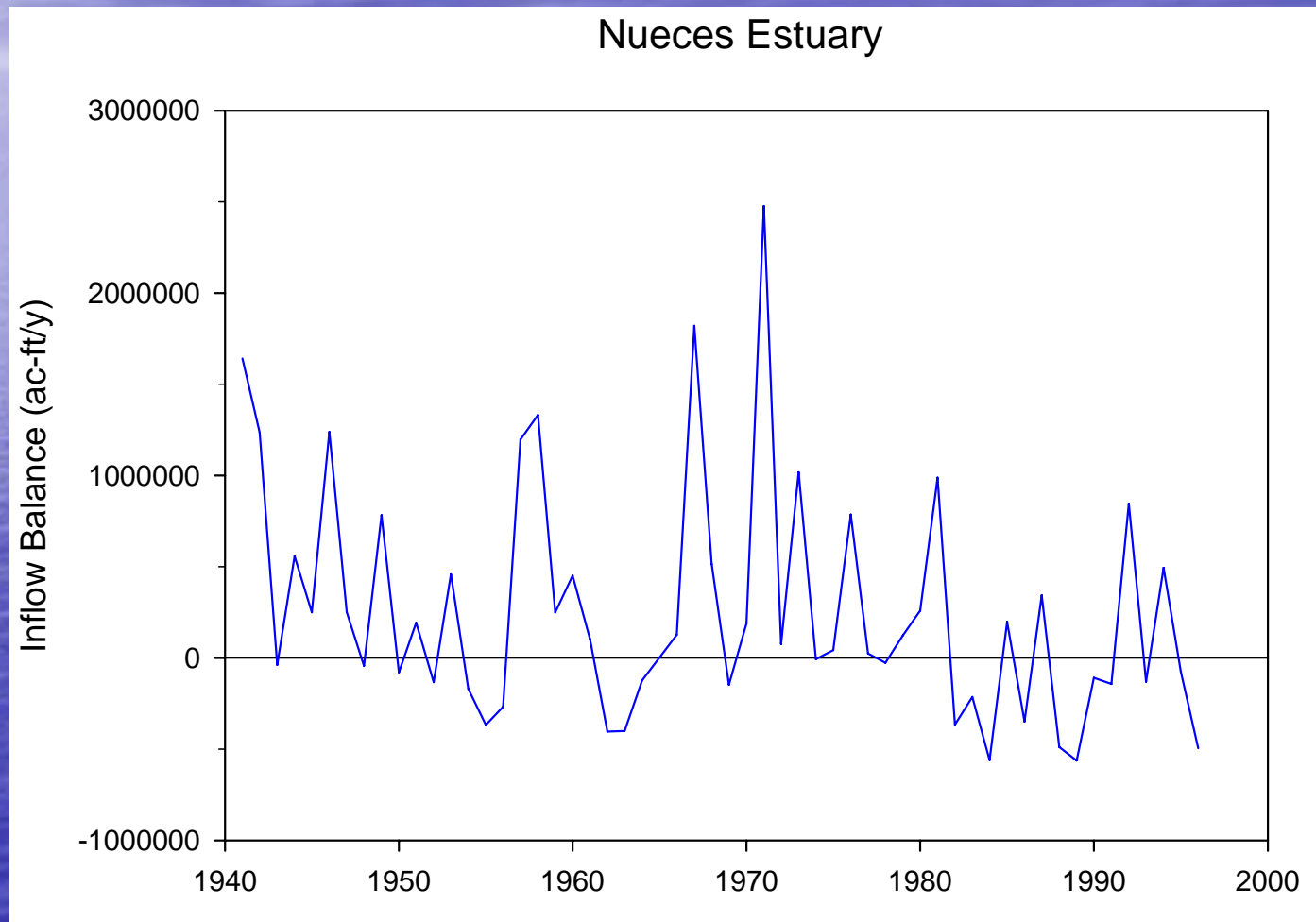
# Nueces Delta and Estuary







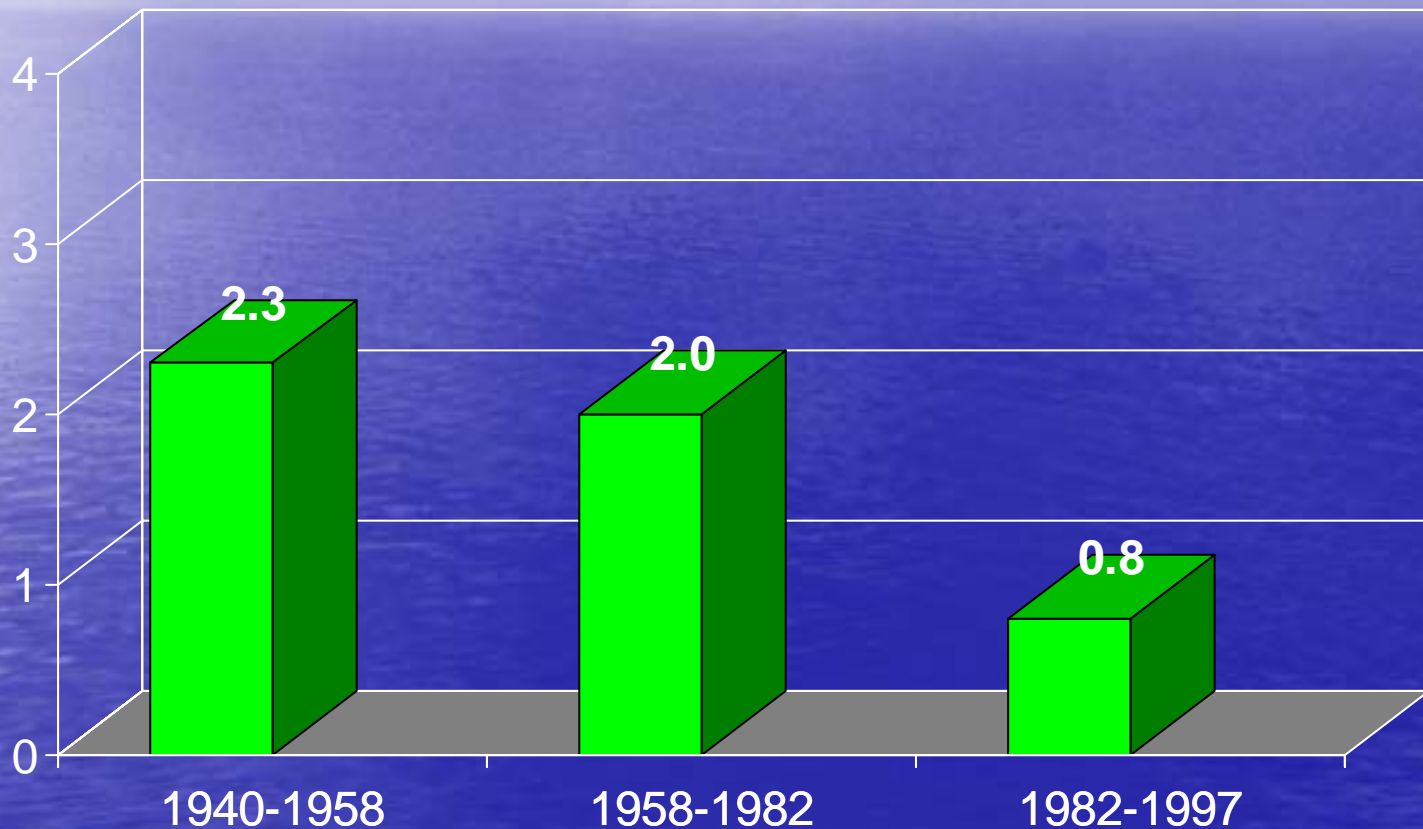
# Extreme Annual Variability





# Flooding Frequency

(Average number of flood events per year)



# Commission Actions

- May 1, 1990—First Commission Order
  - Provided for Immediate Release of Specified Environmental Flows
  - Established Advisory Committee to: "...to assist the Commission with the formulation of a permanent operating procedure for the reservoir system."\*

\* Advisory Committee Completed Their Assessment and Submitted Their Report to the Commission in August 1991.

# TAC Recommendations

- Provide Not Less Than 151,000 acft W/97,000 Delivered to Nueces System
- Measured at Calallen Dam
- Credit for Diverted Stormwater Runoff
- Credit for Excess Monthly Flows



# TAC Recommendations (Cont.)

- Drought Contingency Plan—Relief
- Relief Based on Bay Salinities
- Development of Monitoring Plan
- Create Oversight Committee

# 1992– Interim Agreed Order

- Implemented the Interim Reservoir System Operational Plan for freshwater inflows.
- Called for the Creation of an Estuarine Advisory Council (Nueces Estuary Advisory Council)

Established to: "...consider such additional information and related issues and to formulate recommendations for the Commission's review and action..."

# 1995-Final Agreed Order

- KEY change from 1992 Order included a switch to the "Pass-Thru" approach (rather than releases from storage) and implementation of drought-contingency measures
- Continued the NEAC...to monitor implementation of the Order and to prepare recommendations, as needed, relating to any future changes to the Order



# Agreed Order

- The City of Corpus Christi, as Operator of the Reservoir System, shall provide not less than 151, 000 acft of water per annum for the estuaries

>70% storage capacity—138,000 acft target  
>40% but less than 70%--97,000 acft target  
>30% but less than 40%-- 1,200 acft target\*  
<30%-- Total suspension of Pass-thrus\*

\* Implementation of Lawn Watering Restrictions

# Target f.w. Inflow Regime (acft) for the Nueces Estuary

MONTH	>70%	>40-<70%	>30-<40%	<30%
January	2,500	2,500	1,200	0
February	2,500	2,500	1,200	0
March	3,500	3,500	1,200	0
April	3,500	3,500	1,200	0
May	25,500	23,500	1,200	0
June	25,500	23,000	1,200	0
July	6,500	4,500	1,200	0
August	6,500	5,000	1,200	0
September	28,500	11,500	1,200	0
October	20,000	9,000	1,200	0
November	9,000	4,000	1,200	0
December	4,500	4,500	1,200	0
TOTAL	138,000	97,000	14,400	0

# Freshwater Inflow Recommendation—Sep 2002

- TPWD staff recommends as a FWI target, that a total April thru July cumulative monthly Max H inflow( 89,200 acft) be delivered during the spring/summer season (Apr. thru Jul.). In all other months, Max H monthly target flows would be sufficient.



# Inflow Targets (in Acft)

Month	Min Q-Sal	Min Q	Max H
Jan	2,230	2,230	2,230
Feb	2,780	2,780	2,780
Mar	4,410	4,410	4,920
Apr	5,180	5,180	5,180*
May	32,130	32,140	37,770*
Jun	9,280	19,990	36,430*
Jul	9,820	6,980	9,820*
Aug	9,750	9,750	9,750
Sep	9,600	11,040*	9,600
Oct	4,380	8,690*	7,560
Nov	6,410	7,780*	7,780
Dec	4,670	4,670	4,670
Total	100,640	115,640	138,490



# Rincon Bayou Demonstration Project

Restoring Freshwater  
to the upper Nueces Estuary

U.S. Bureau of Reclamation



# Rincon Bayou Demonstration Project

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- To increase the opportunity for freshwater flow events into upper Nueces Delta via Rincon Bayou
- Restore estuarine conditions, increase productivity







Nueces  
Overflow  
Channel

Rincon  
Overflow  
Channel



# A Permanent Diversion Project

- Filled in Fall 2000.
- Rebuilt by City of Corpus Christi Fall 2001 for rule changes.
- Conservation groups trying to buy land.
- New monitoring program.
- Ecological credits?



# Environmental Flow Protection in TCEQ Permitting



# State Requirements for Protecting Bays and Estuaries

*Beneficial inflows* means a salinity, nutrient, and sediment loading regime adequate to maintain an ecologically sound environment in the receiving bay and estuary system that is necessary for the maintenance of productivity of economically important and ecologically characteristic sport or commercial fish and shellfish species and estuarine life upon which such fish and shellfish are dependent. Texas Water Code §11.147(a)

# State Requirements for Protecting Bays and Estuaries (continued . . )

For permits issued within 200 river miles from the coast, . . . the commission *shall include* in the permit *to the extent practicable* when considering all public interests, . . . those conditions considered necessary to maintain beneficial inflows to any affected bay and estuary system. Texas Water Code §11.147(b)

The statute goes on to list several factors that shall be considered by the commission in making this determination.

# State Requirements for Protecting Bays and Estuaries (continued . . )

Those factors include:

The need for freshwater inflows to preserve the sound environment of the bay or estuary;

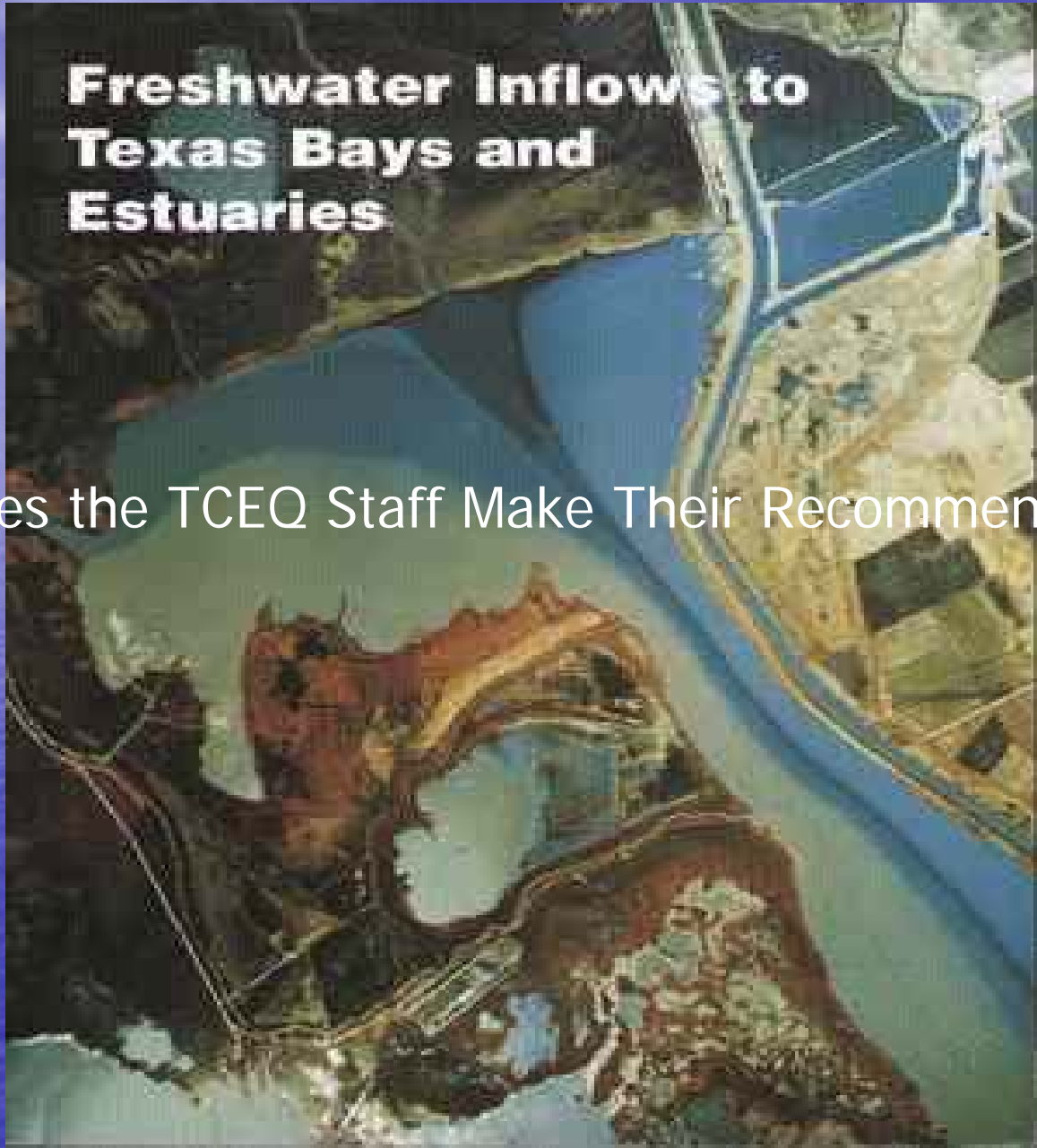
The quantity of water and the needs of the applicant and those that would be served by the applicant;

The expected effects on the public welfare. This includes both the effects of not including some or all of the conditions in the permit and the effects of failure to issue the permit.



## **Freshwater Inflows to Texas Bays and Estuaries**

How Does the TCEQ Staff Make Their Recommendations?

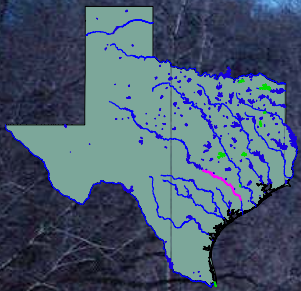


# State Requirements for Protecting Instream Flows

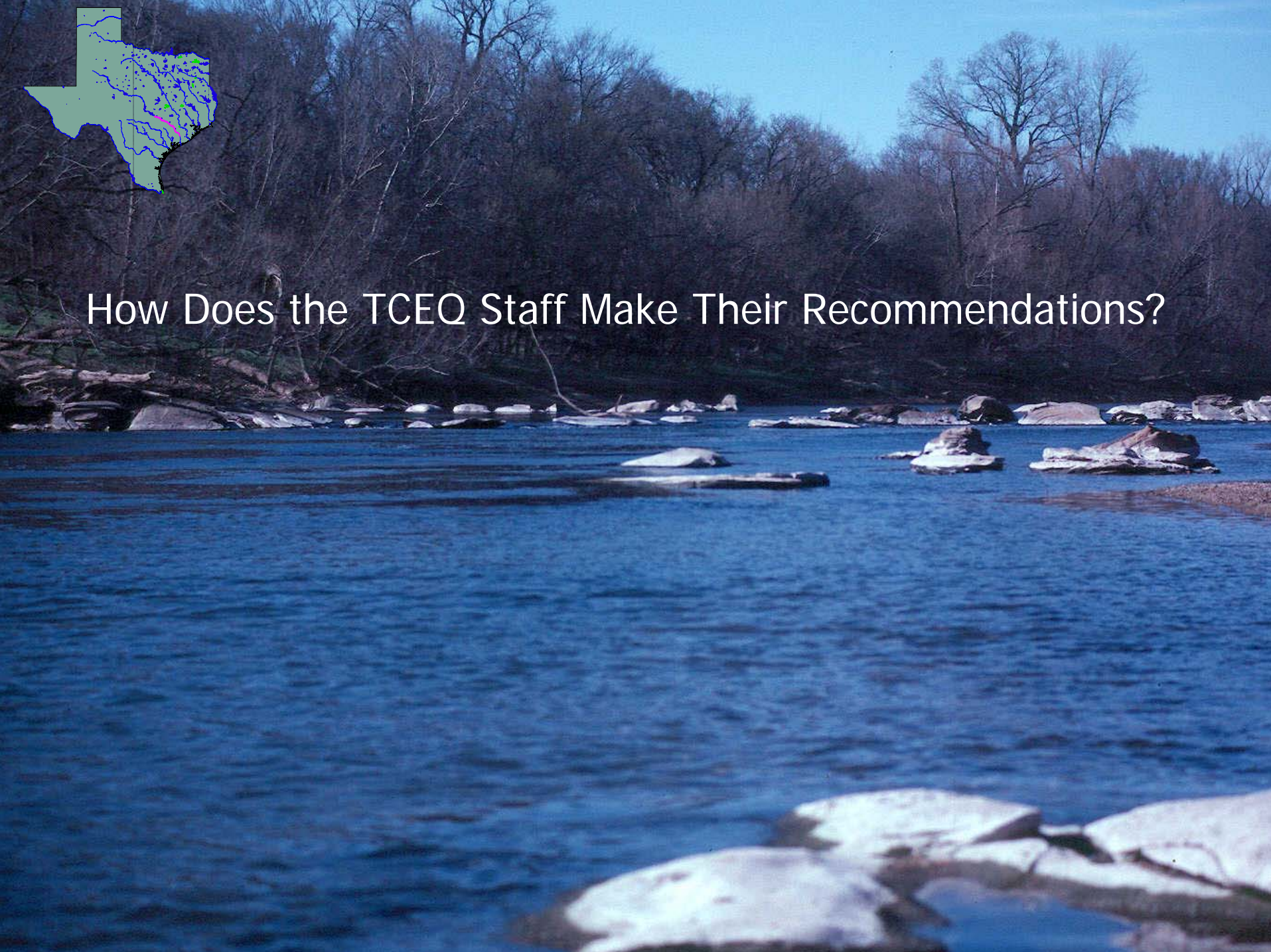
In considering a water right application, the commission shall consider the effect of the permit on existing instream uses, fish and wildlife habitats, and water quality.

Texas Water Code §§11.147(d)(e), 11.150, 11.151, 11.152





## How Does the TCEQ Staff Make Their Recommendations?





# Instream Flow Studies Completed or in Progress

- 404 Permit
- ▲ ESA Response
- FERC License
- Water Right
- Planning (TWDB)
- ▲ Limited Biology



# Default Method – Lyons Method

- Based on data and relationships from mountainous western states.
- Validated or calibrated on the Guadalupe River in Texas.
- Establishes minimum flow requirements based on 40% median daily flows in winter months and 60% of median daily flows in the summer months.
- Utilizes historic streamflow data from subject site.



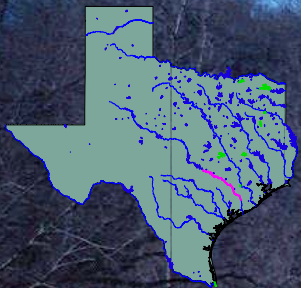
# Amendments that don't increase the amount or rate of water diverted:

- Subject to meeting all other requirements of this subchapter;
- an amendment shall be authorized if;
- the requested change will not cause adverse impacts on other water right holders or the environment . . .
- of greater magnitude than under circumstances in which the permit . . . was fully exercised according to its terms and conditions as they existed before the requested amendment.

# Amendments that increase the amount or rate of water diverted:

- Special conditions designed to protect the environment only apply to that portion of the water right that is being amended.
- For example, on an amendment that increases the amount of water to be diverted, the original diversion amount would carry the original flow restrictions, if any.
- Only the increased amount of water would carry a new flow restriction.





The End

Questions?