



Colorado River, Texas 2011

“...rivers famous in history and song have shrunk to humble brooklets...and the rivulets ...ceased to exist as perennial currents....”

George Perkins Marsh, 1864

Physical Geography as Modified by Human Action



Colorado River, Mexico, by Dale Turner, The Nature Conservancy
Published in the Arizona Daily Star, March 20, 2014

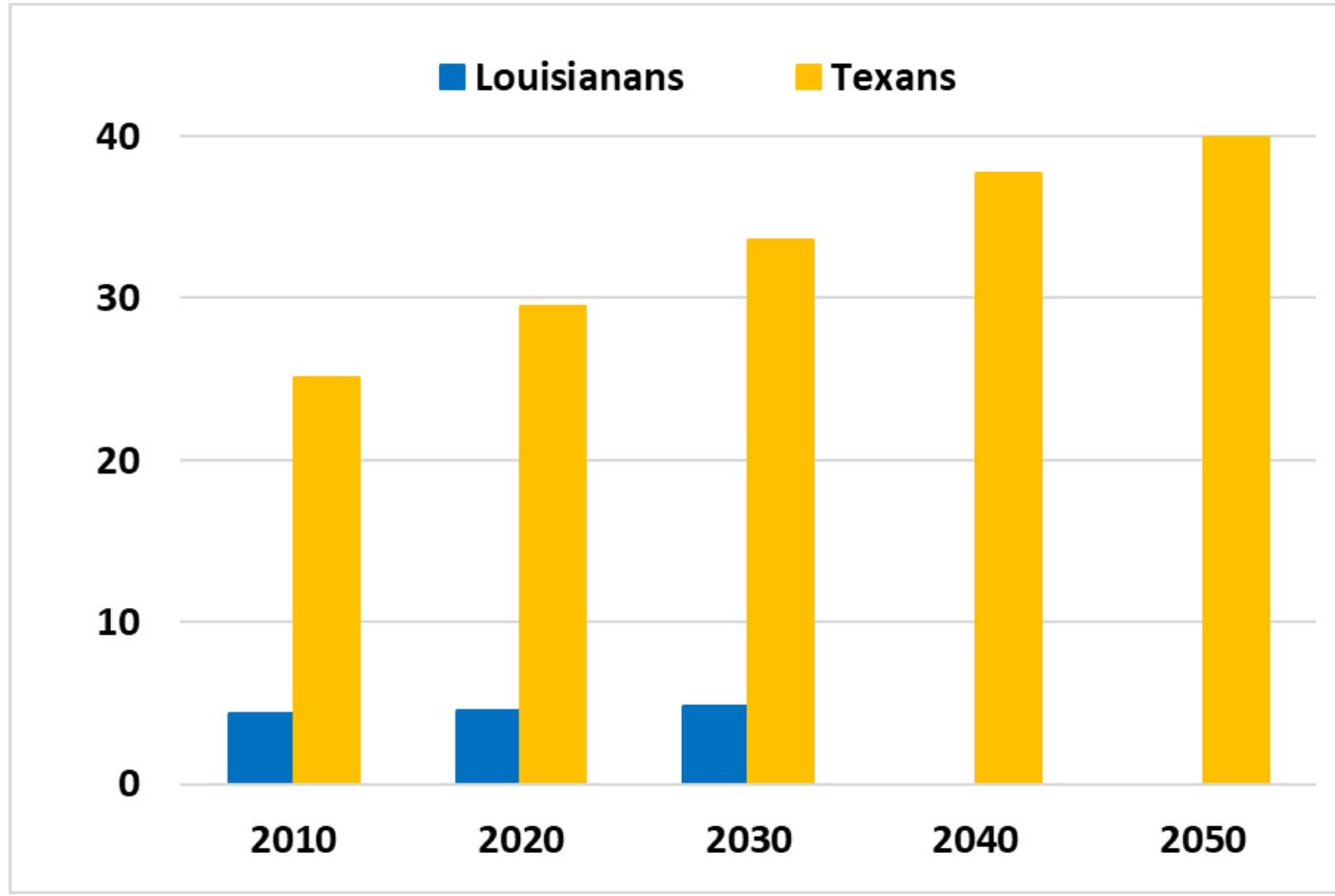
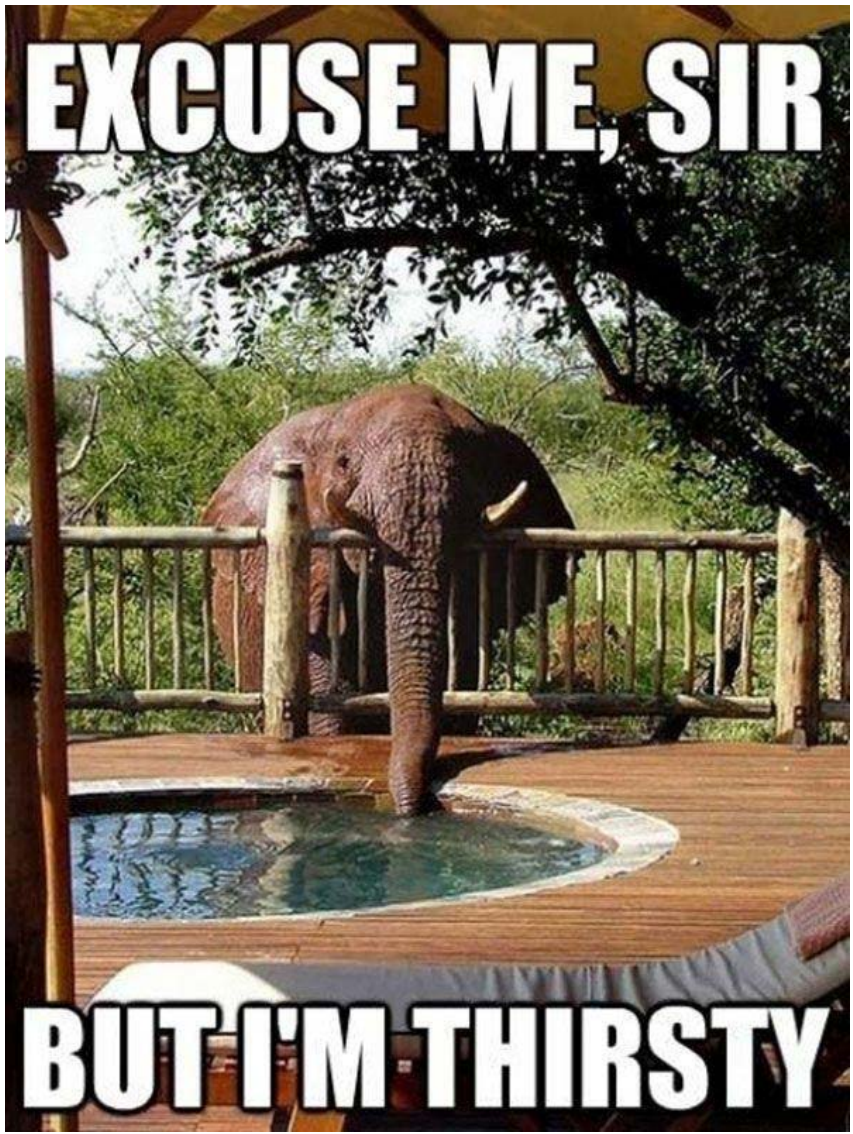
Creating Environmental Flow Standards in Texas

National Conference on
Ecosystem Restoration
2018



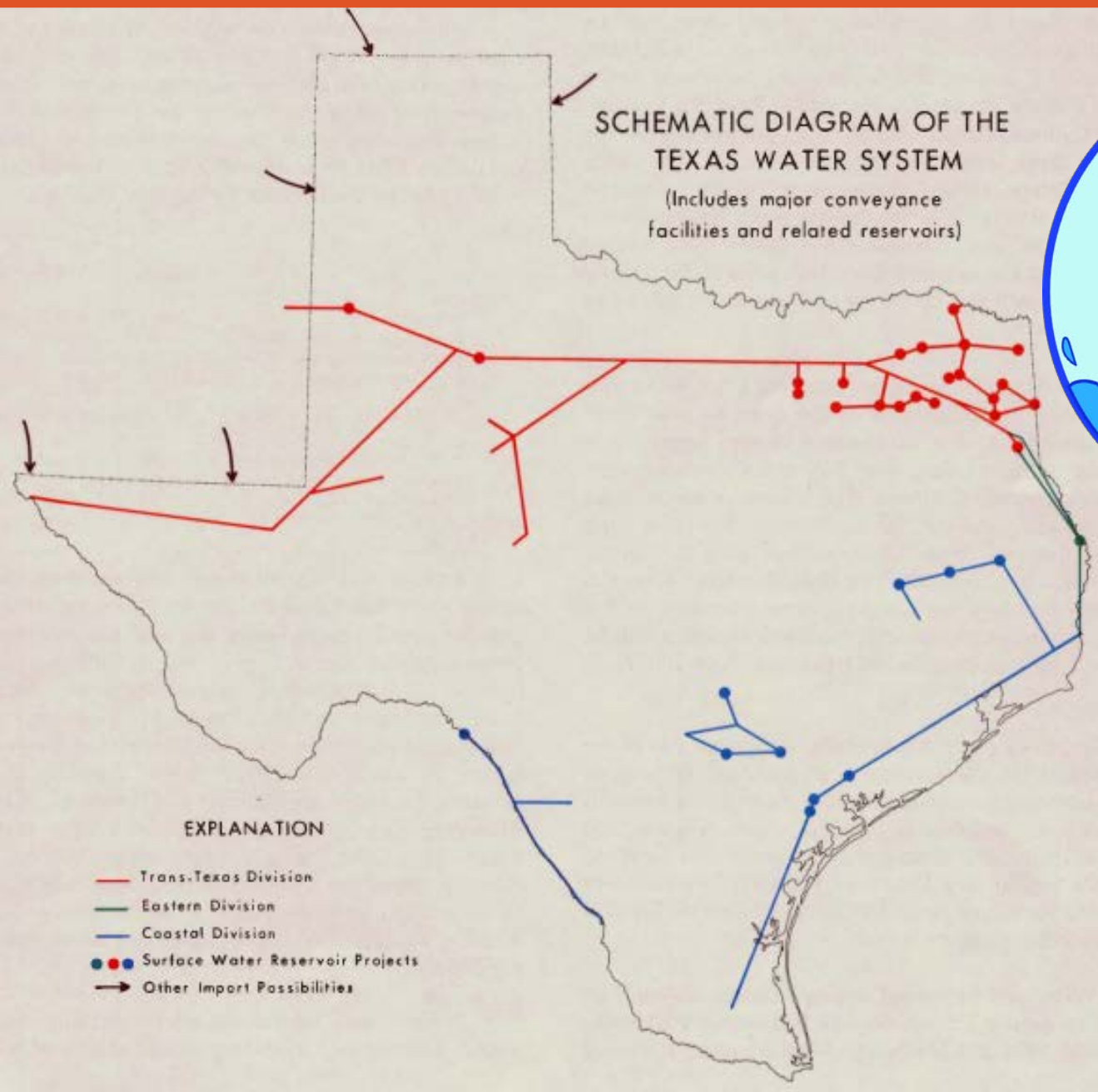
 **FREESE
AND
NICHOLS**

David Buzan and Jason Shackelford
August 30, 2018



SCHEMATIC DIAGRAM OF THE TEXAS WATER SYSTEM

(Includes major conveyance facilities and related reservoirs)



EXPLANATION

- Trans-Texas Division
- Eastern Division
- Coastal Division
- Surface Water Reservoir Projects
- Other Import Possibilities



*“Despite Recent Floods,
Texans Fight Over Rights to
Precious Water of the
Guadalupe River”*

By Jim Yardley, July 21, 2002 , New York Times

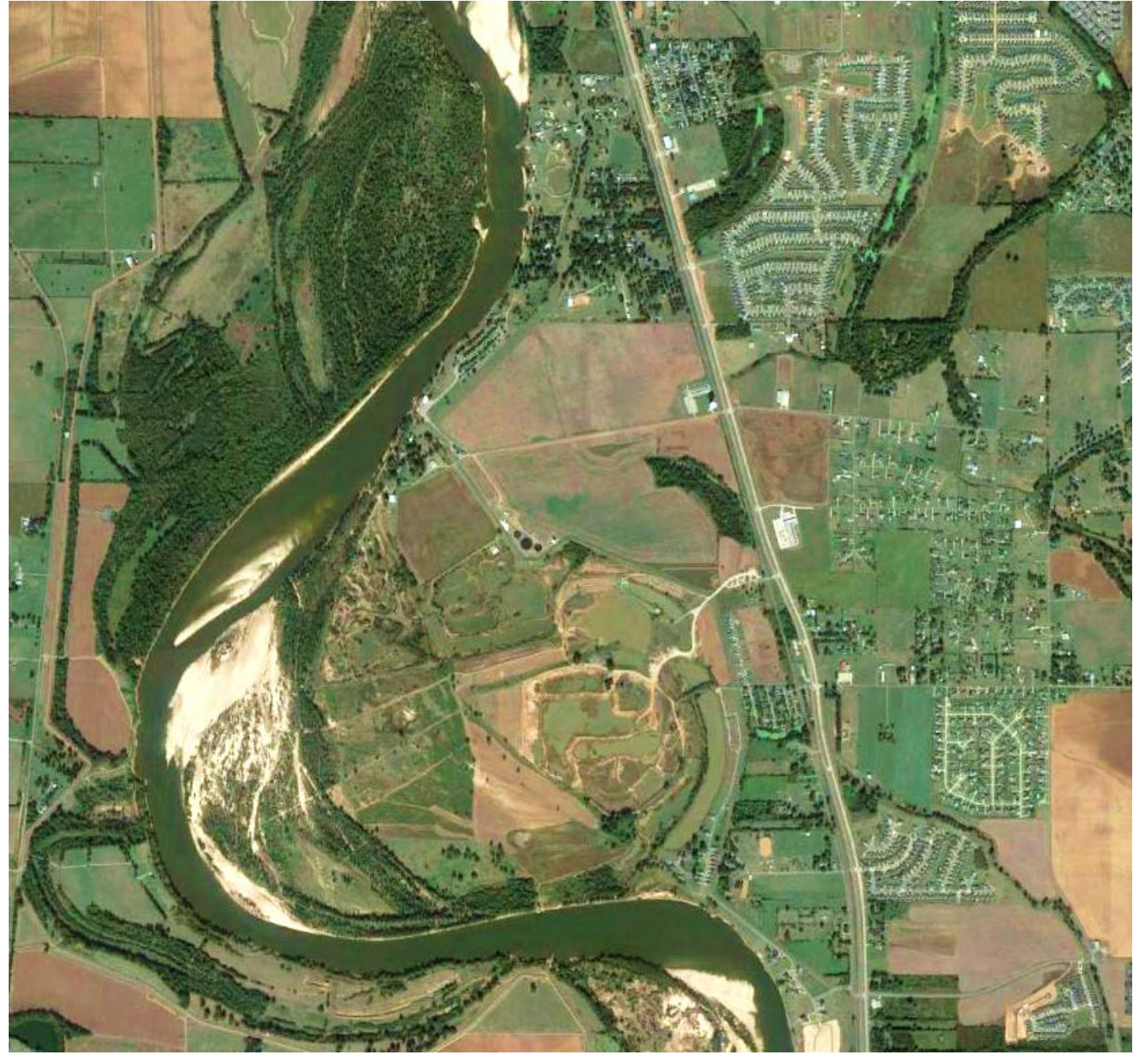


Environmental Flow

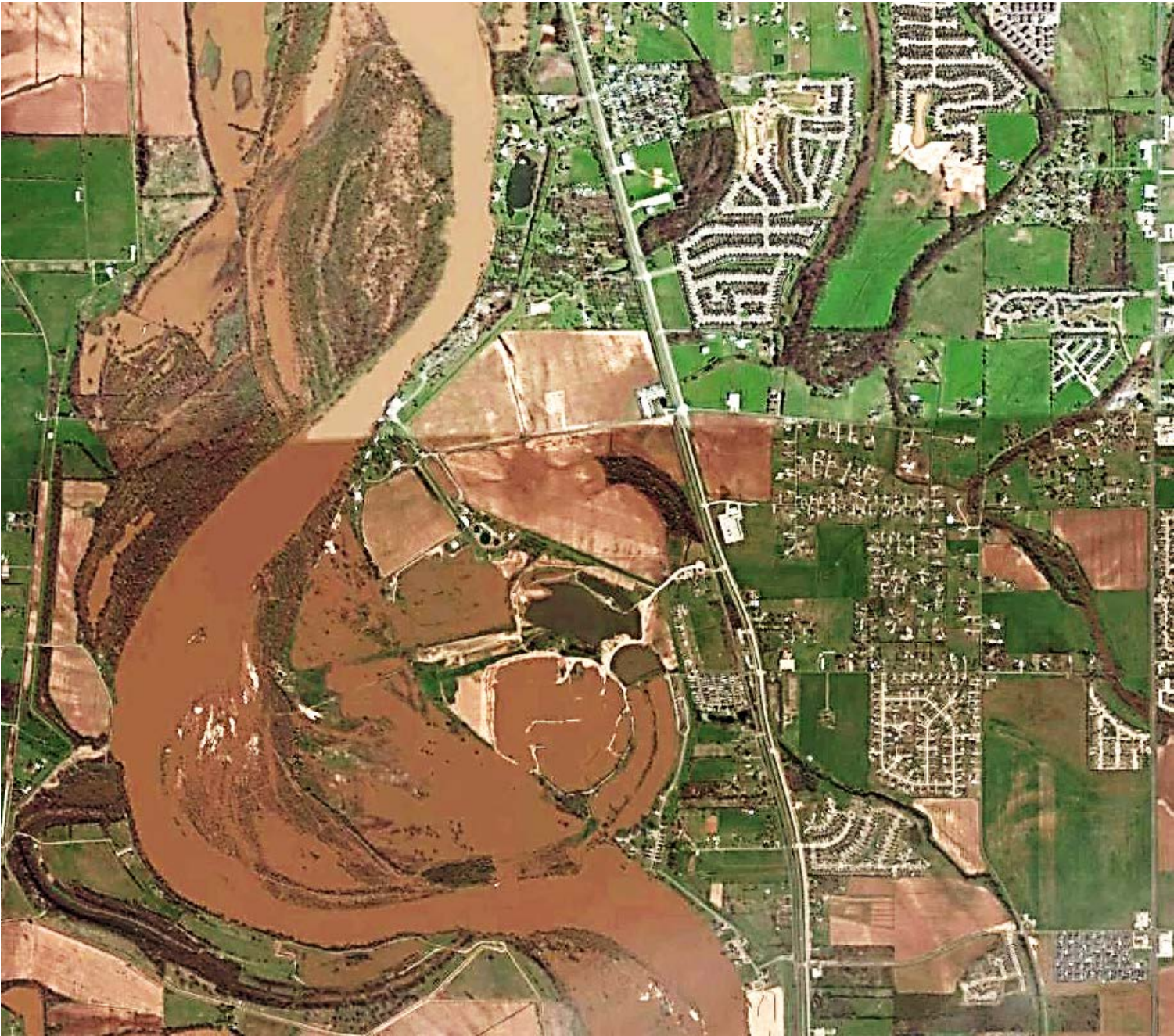
“...schedule of flow... that reflects seasonal and yearly fluctuations that...vary geographically, by specific location...,...**support a sound ecological environment**.”

“... without regard to the need for the water for other uses,....”

Red River - Subsistence



Red River – Large flood



Video from the Field: Alligator Gar Spawning at Richland Creek

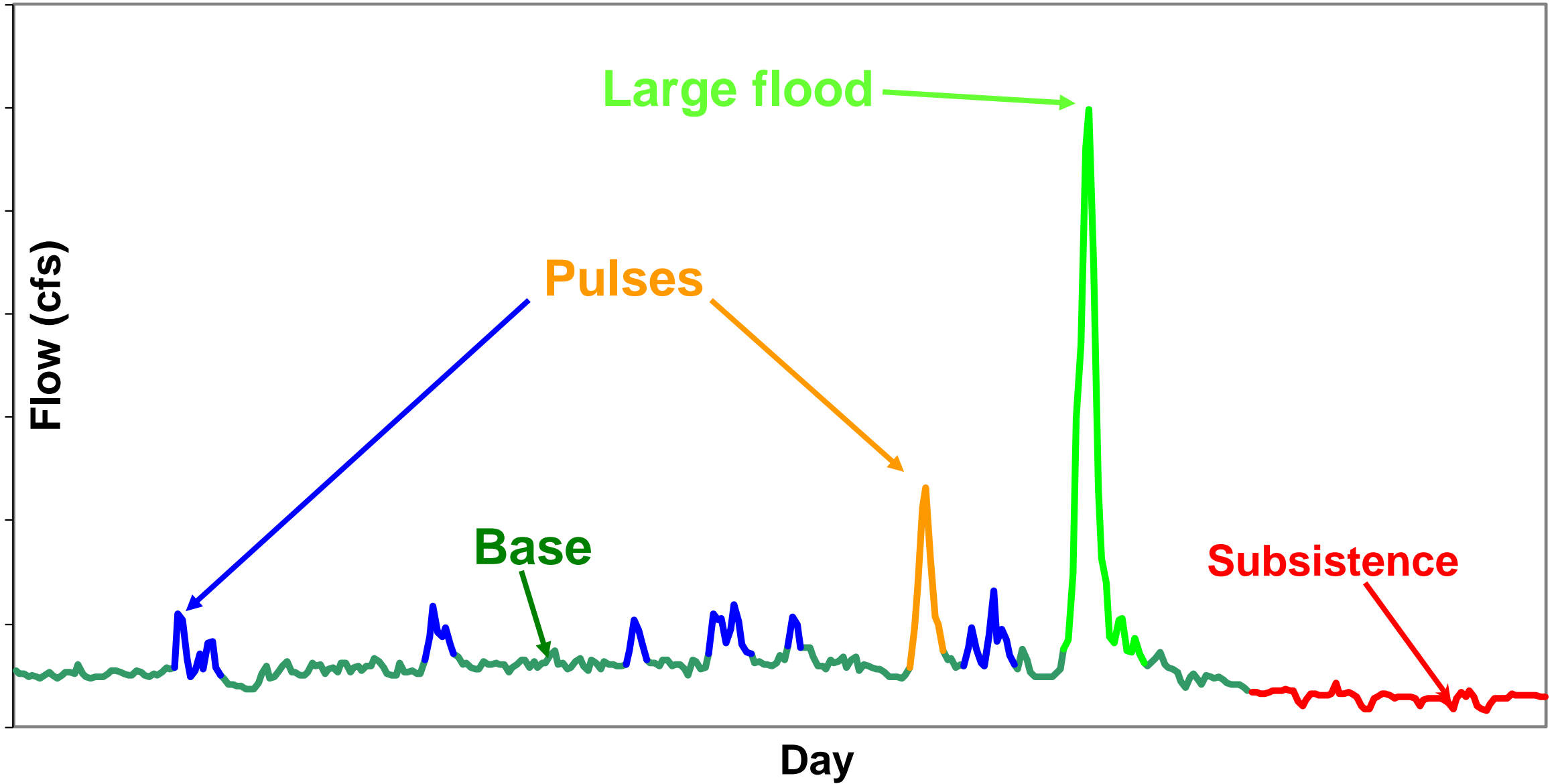


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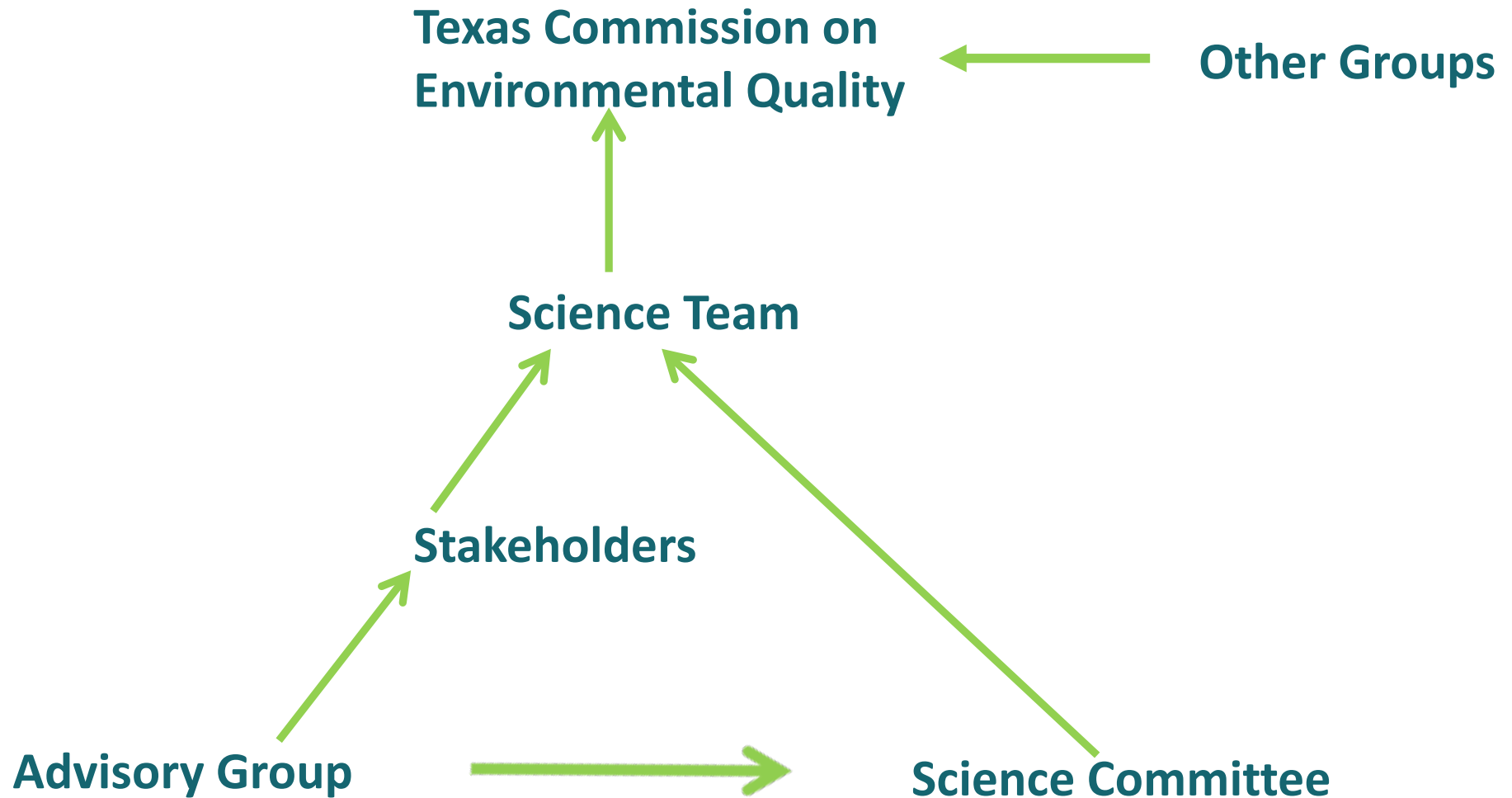


YouTube





Environmental Flow Standards Process



Flow Regime: Description not Prescription

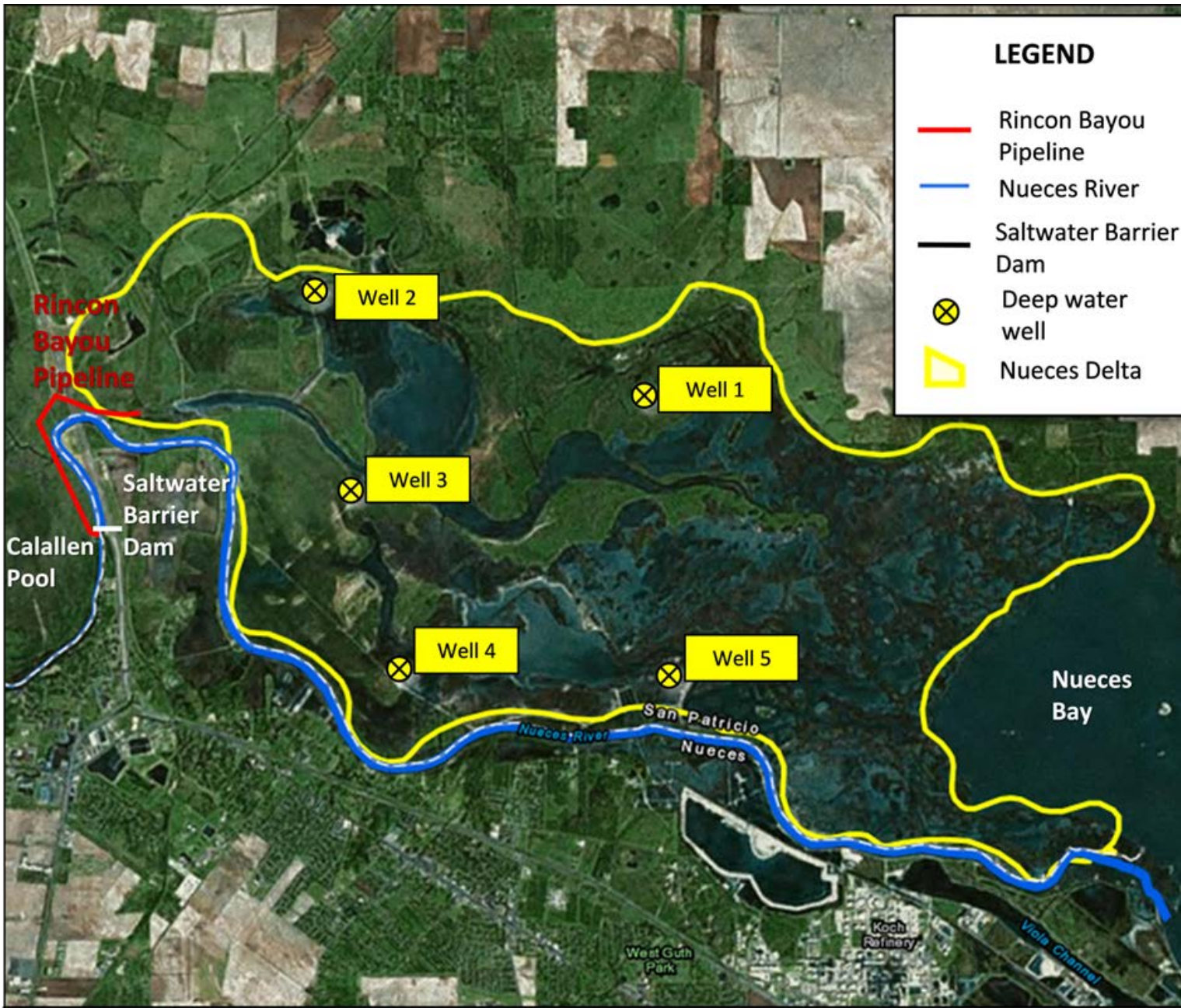
Not –creating a new ecosystem or one that existed historically

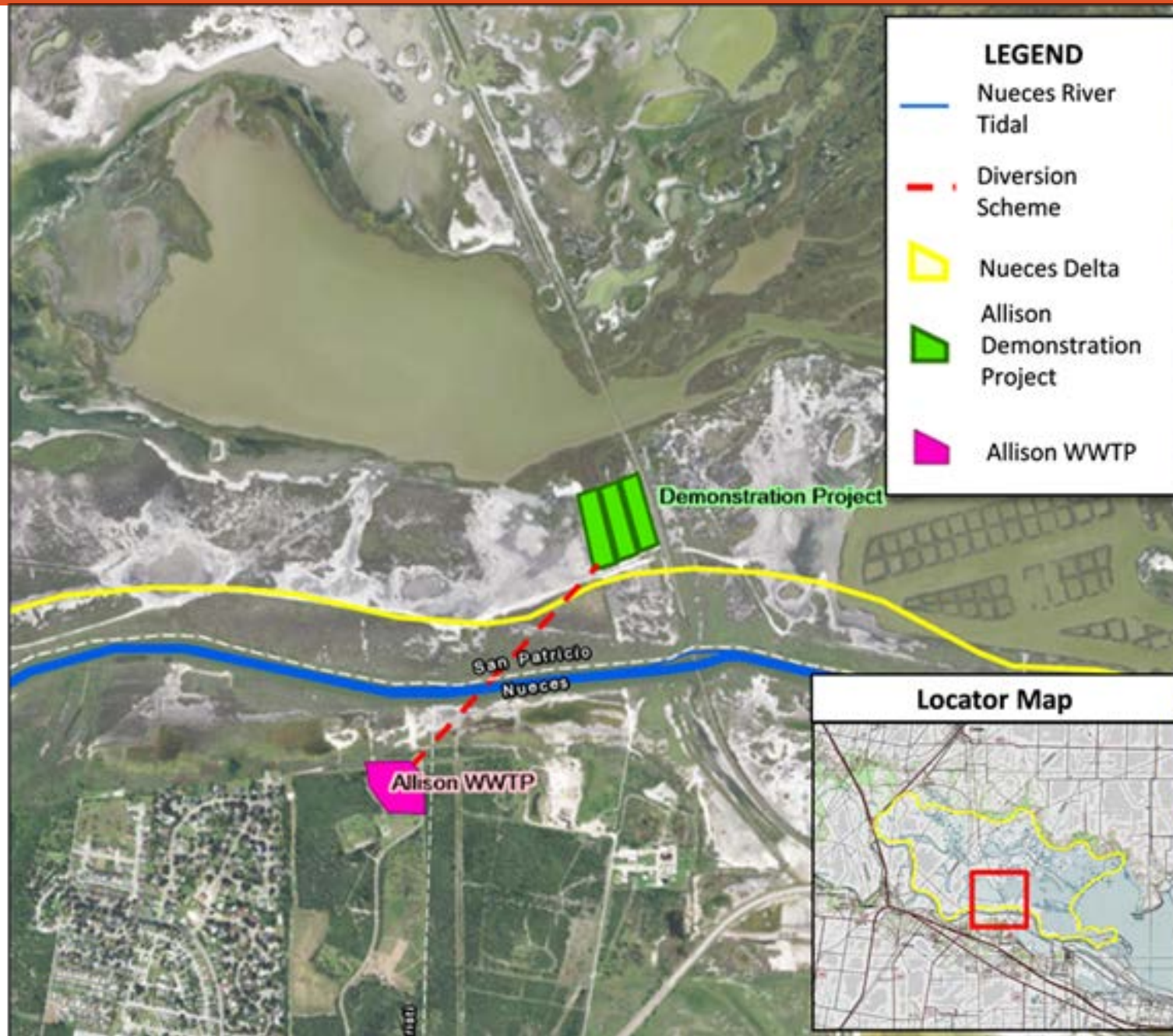
Flow standards \neq flow regime

Not –values that should never be changed

Nueces Delta, Corpus Christi, Texas





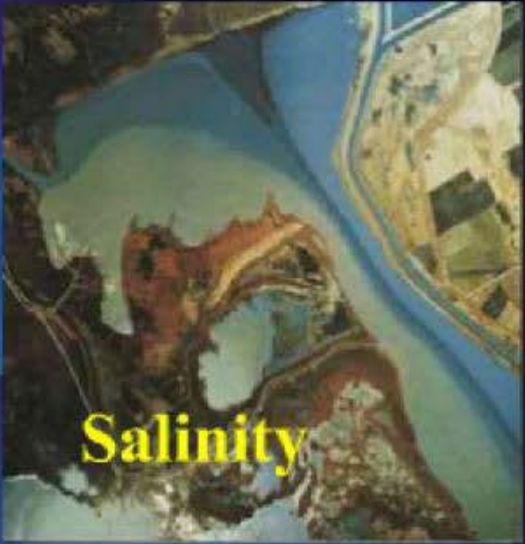
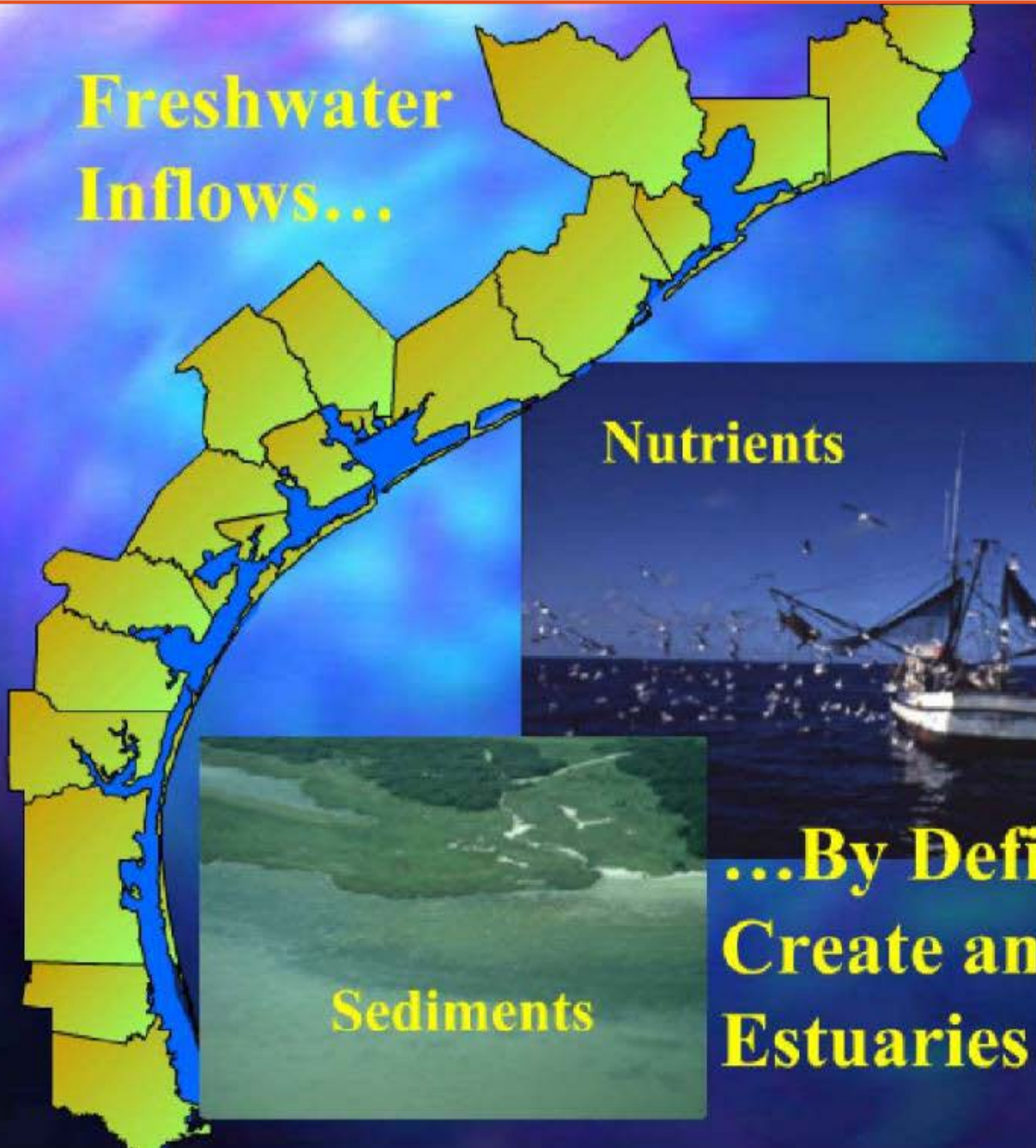


Questions

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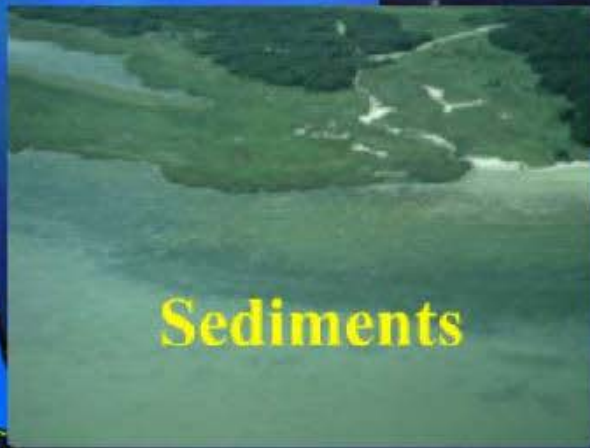
Jason Shackelford, jason.Shackelford@freese.com,
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**Freshwater
Inflows...**



Salinity

Nutrients



Sediments

**...By Definition
Create and Sustain
Estuaries**

Successes and Lessons

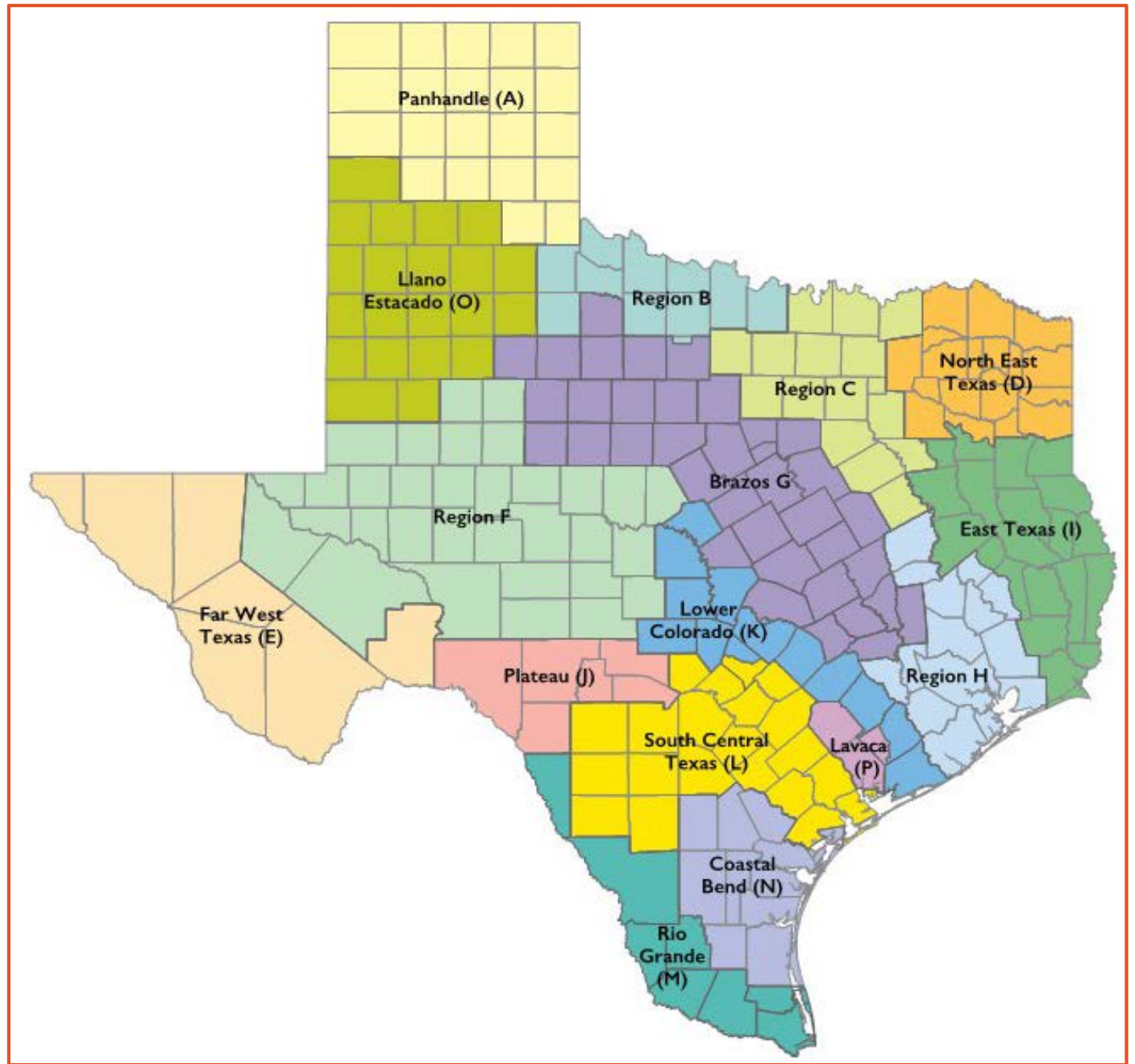
Successes

- Flow standards: 11 basins
- Adaptive management: \$6 million since 2013

Lessons

- “Whiskey is for drinking, water is for fighting”
- No play, no pay
- 1-year deadline – work done quickly
- Ecological data related to flow very limited

Water Planning Regions



Sound Ecological Environment

- **Native species**
- **Habitat**
- **Natural flow variability**
- **Ecosystem processes and services**