



# Current Research to Assess the Status of American Eel in Gulf Coast Drainages of Texas

2019 CRP Basin Steering Committee Meeting  
Guadalupe Blanco River Authority – Seguin, TX  
March 19, 2019



Stephen Curtis  
Inland Fisheries – River Studies Program

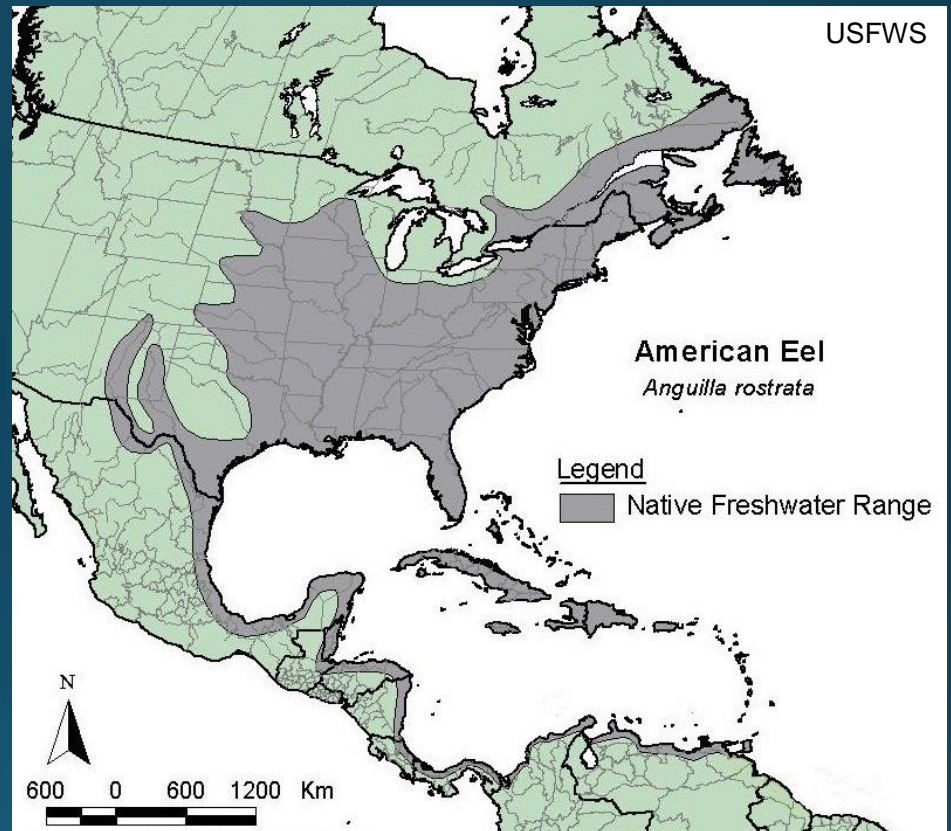
# Meet the American Eel

- Long, snake-like body
- Length: Females up to 5 feet; males up to 3 feet
- Age: 3-40+ years
- Diet: fish, mollusks, crustaceans & carrion



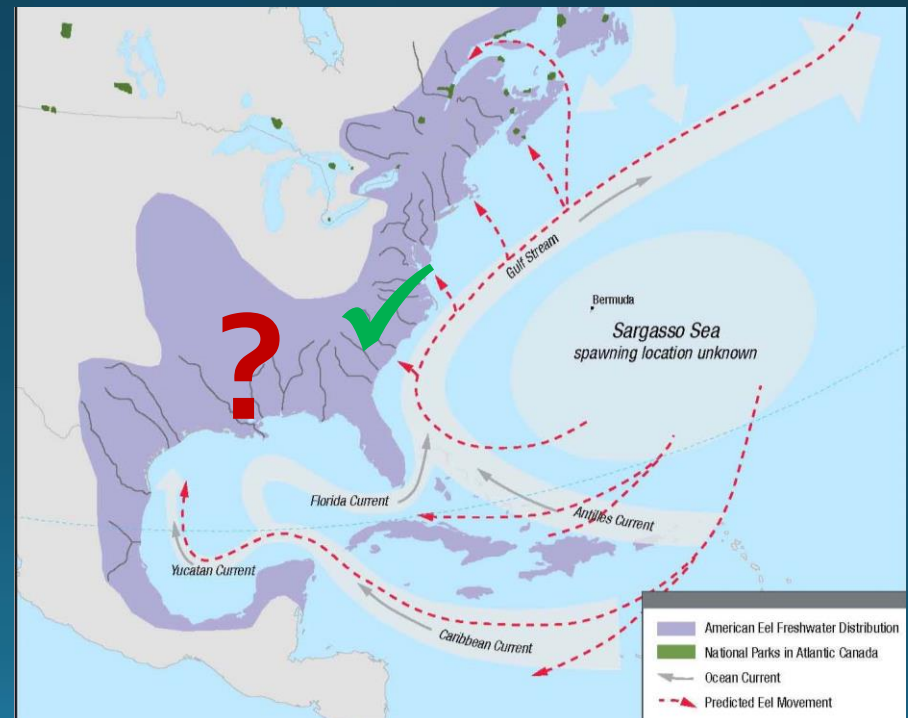
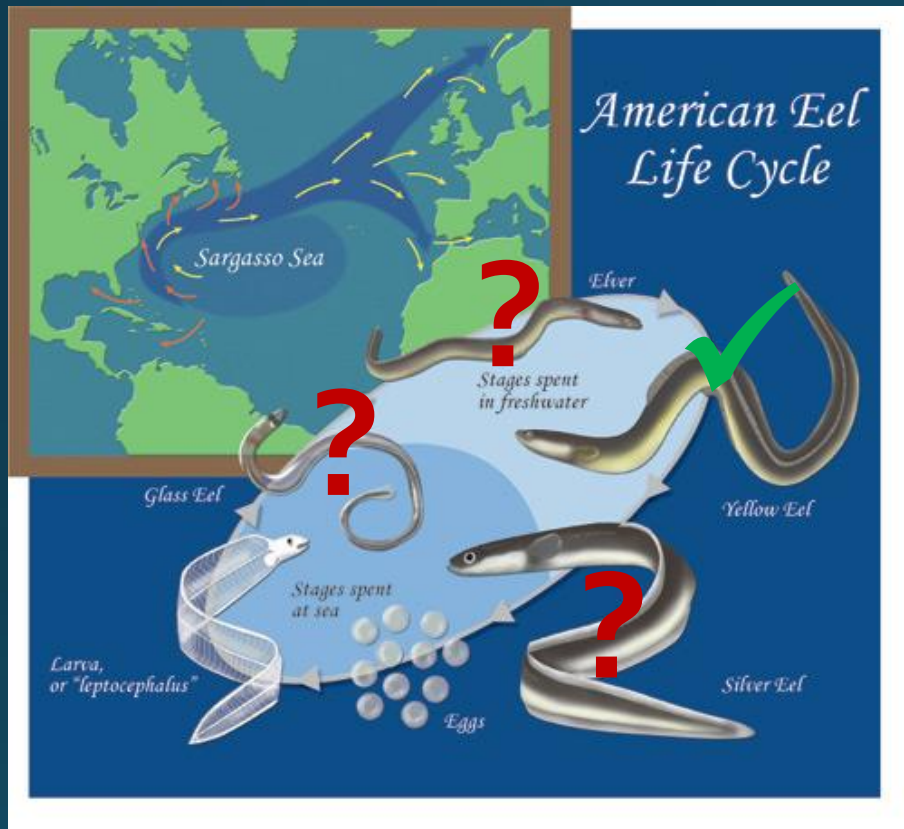
# American Eel

- Greenland to South America
- Facultative catadromous species
  - Spawn in saltwater
  - Migrate to estuarine or freshwater
- Panmictic population
  - One single population
  - Ability to breed with every individual



M. Wagner

# Life History of American Eel



# Commercial Harvest



# Economic Value

- Maine Fishery in 2017
  - Quota: 9,600 pounds of glass/elver eel
  - Sold for ~\$1,300 per pound (2015: ~\$2,100)
  - 12 million dollar industry (2012: 40.3 M)



# Northern Gulf of Mexico Status

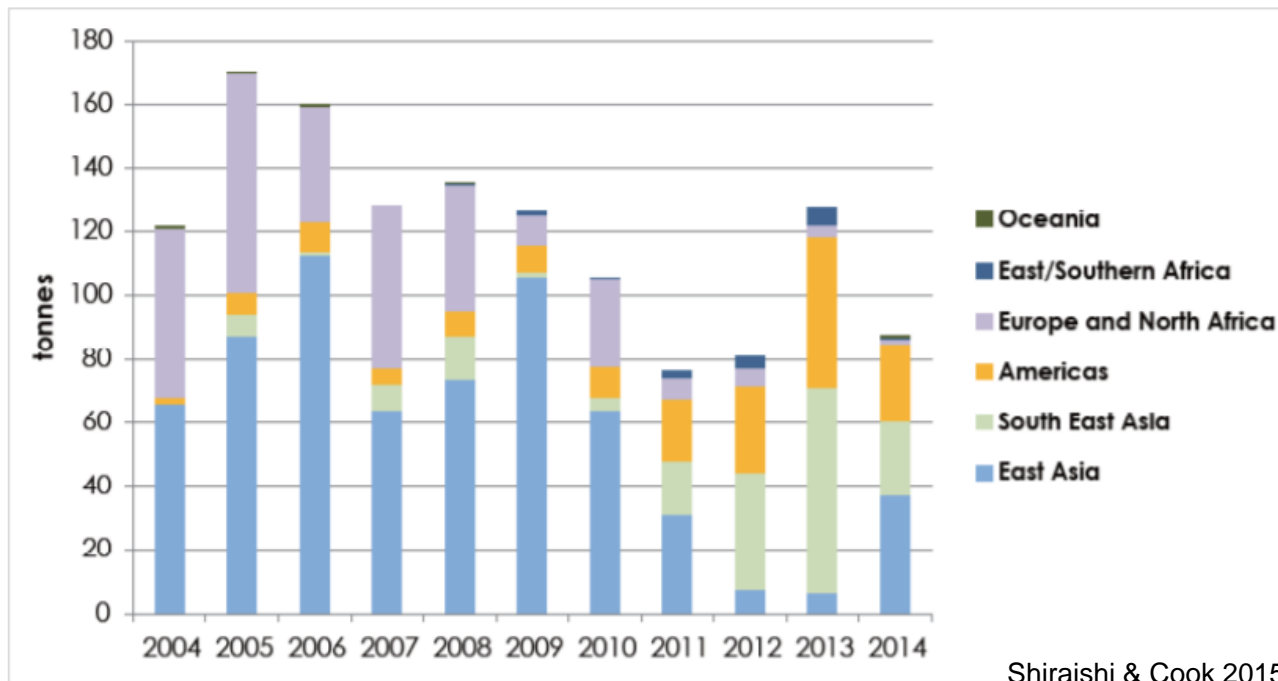
- Commercial species
  - YES – Louisiana, Mississippi & Florida
  - NO – Texas & Alabama
  - Petitioned for listing in Texas (2014)
- Conservation status
  - Not federally listed as Threatened or Endangered
  - Species of Greatest Conservation Need (TX, LA & FL)
- Research & Monitoring
  - All Northern GOM states
  - Caribbean & Central America



# Need

- Population is depleted in US waters (ASMFC 2012 & 2017)
- Demand for American Eel is increasing
- Effective management recommendations = DATA
- Coordinated effort in the GOM

Imports of live eel fry for farming (all sizes) into mainland China, Hong Kong, Japan, South Korea and Taiwan by source, 2004–2014, tonnes.



# Project Partners



UNIVERSITÉ  
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# Data Collection

## 1. Distribution & Abundance

## 2. Life History

- Habitat Use
- Movement Patterns
- Parasites & Diet

## 3. Population Structure

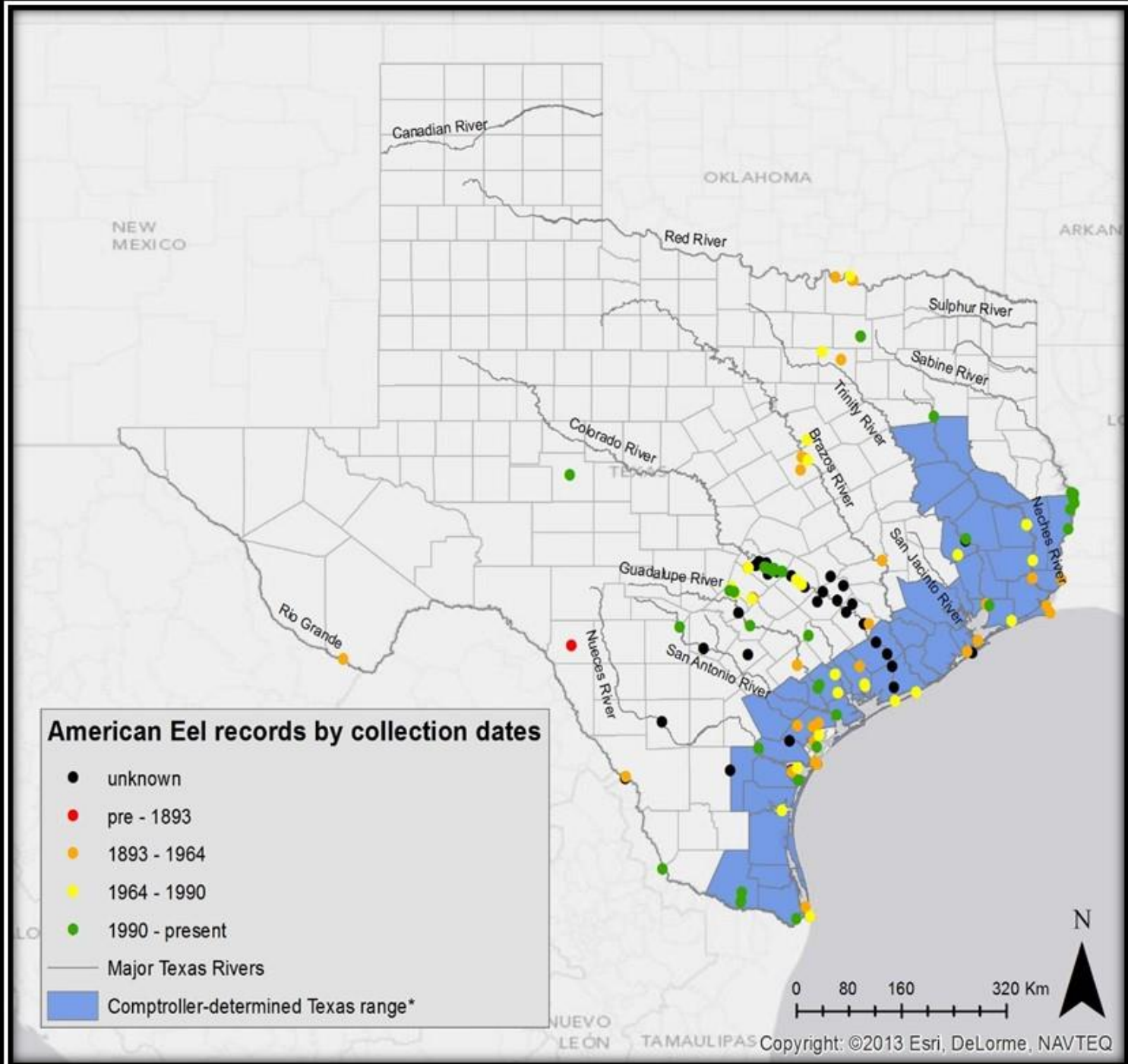
- Genetics
- Age
- Sex

## 4. Assess collection methods



*Anguillicoloides crassus*





# Project Components

1. Yellow Eel Sampling
2. Yellow Eel Processing
3. Fyke Net Sampling (glass/elvers)
4. Eel Mop Sampling (glass/elvers)

# Field Sampling: Yellow Eel

## LOCATION

- Statewide
- Below instream barriers (e.g., dams, weirs, SW barriers)

## METHODS

- Electrofishing

*Begging for donations*



# Public Outreach

- Presentations
  - Public Meetings
  - Professional Conferences & Workshops
- TPWD Press Release

## Biologists seek assistance from anglers in tracking American Eel in Texas waterways

AUSTIN — Every now and then, anglers fishing Texas waterways may reel in something unexpected: the slimy, secretive American Eel.

"[The American Eel] is just such a unique species that you don't see that often, and so when you catch one or you see one, you remember it," said Texas Parks and Wildlife Department (TPWD) aquatic biologist Stephen Curtis. "It's going to leave an impression."

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### LOOKING FOR AMERICAN EELS



Please report specimens or observations to Melissa Casarez or Adam Cohen, the Fishes of Texas Project

[fishesoftexas@gmail.com](mailto:fishesoftexas@gmail.com)

512-475-8171 (Melissa) / 512-471-8845 (Adam)

Maintain specimens alive if possible, or put on ice and give us a call. See links below for more information:



# Public Outreach

- Social Media
- News Coverage

**SUNDAY**  
**VICTORIA ADVOCATE**  
February 18, 2018 172ND YEAR NO. 267, 40 PAGES, ©2018, VICTORIA ADVOCATE PUBLISHING CO. From here. For here. Since 1846. \$1.50

**ENVIRONMENT**  
**Eels found in wastewater treatment plant**

Slippery creatures will be donated to research effort

BY JESSICA PRIEST  
J.PRIEST@VICAD.COM

At least one thing makes it out of the Bermuda Triangle alive. Sixteen American eels from there were found this week, of all places, at the wastewater treatment plant in Port Lavaca.

"There's more of them in there, probably," Interim City Manager Bill DiLibero said Friday.

The eels, squiggly creatures were living in a box where water sits before it goes through the final disinfection process with a UV light and is discharged into the Lynn Bayou.

DiLibero said the eels regularly swim up that discharge pipe but don't get much farther than that. Most of the time, plant workers simply toss them back into the bayou.

This time though, one employee saw a flyer urging them to call aquaculture biologists researching eels instead.

Biologists describe this type of eel as anadromous.

"We're looking for what the patterns in migration are so that we can better understand when they come into our river systems and in what kind of numbers. We don't have

**CONTRIBUTOR PHOTO**  
Stephen Curtis, an aquatic biologist with the Texas Parks and Wildlife Department, holds an American eel that was living in the Port Lavaca wastewater treatment plant.


**SEE EELS, A4**

**ROAD TO HEALING**  
Your Life  
TODAY'S SPECIAL \$10.99, A2  
30% OFF dinner buffet at China B Super Buffet

**Texas Rivers & Streams - Texas Parks and Wildlife**  
July 14, 2017

Do you ever catch eels while fishing in Texas rivers?? TPWD could use your help gathering data that will help to conserve this unique and secretive species!

TPWD Biologists collected this fellow on the beautiful Lavaca River this week as part of a statewide life history study on American Eel. Little information exists on American Eel in Texas and TPWD could use your help in locating them to gather more data. If you catch an eel, please take a photo, record your location, and contact the River Studies Program at 512.754.6844. If possible, we would love to take the catch off your hands – feel free to freeze the eel and give us a call! Each individual can provide us with invaluable information to better understand this species.




Like Comment Share

**Texas Rivers & Streams - Texas Parks and Wildlife**  
December 3, 2017

Here are some photos of an American Eel we caught in downtown Houston this week. Have you caught an eel recently? We're still collecting data on them and would love to know! If you catch one please snap a photo, write down the date and eel length if possible, and send us a message or give our office a call at 512-754-6844.

Why eels? Eels have a complicated life history that can make them vulnerable. They hatch in the Sargasso Sea and catch ocean currents back to North America where they swim up rivers and live most of their life before returning to the sea to spawn.



Share

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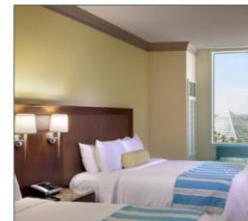
## Why was an American eel found in Brays Bayou?

By Sophia Beausoleil - Reporter

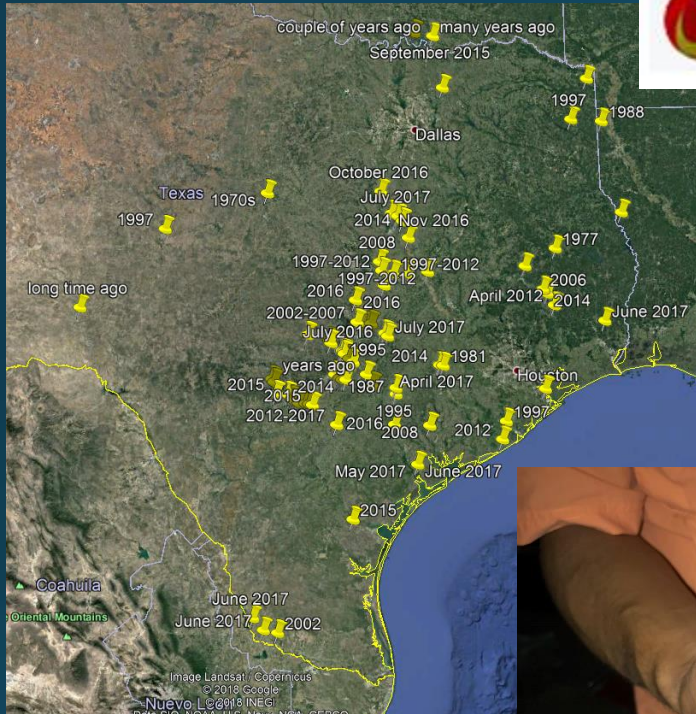
Posted: 4:57 PM, December 04, 2017

Updated: 12:42 PM, December 05, 2017

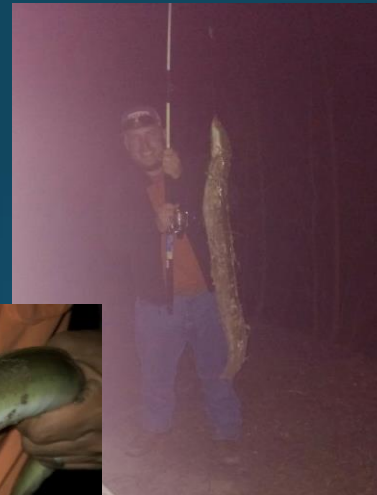
f Share Your Opinion Shares 0



# Public Response



**Doug-Tammy Isaacs** The San Bernard river, upstream of the freshwater dam in Brazoria County is loaded with them.



**Jeff Zeal Stefanoff** Talk to San Marcos city utility crews. They are always getting them.

Like · Reply · Message · 30 mins

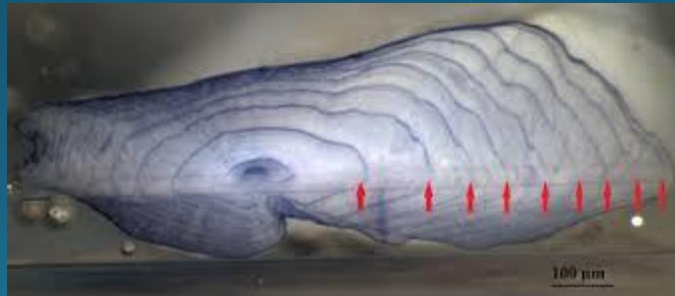
# Specimens Collected

- 101 individuals
- 31 sites
- All yellow eel (one possible silver)
- Received in various conditions



# Yellow Eel Processing

- Muscle tissue (Genetics & Mercury)
- Otoliths (Aging & Microchemistry)
- Swimbladders (Parasites)
- Stomachs (Diet)



# Yellow Eel Processing

	# of Eel
Muscle Tissue (Genetics)	101
Otoliths (Aging & Microchemistry)	101
Swimbladders (Parasites)	95
Stomachs (Diet)	82
Muscle Tissue (Mercury)	83

Total Length (mm)

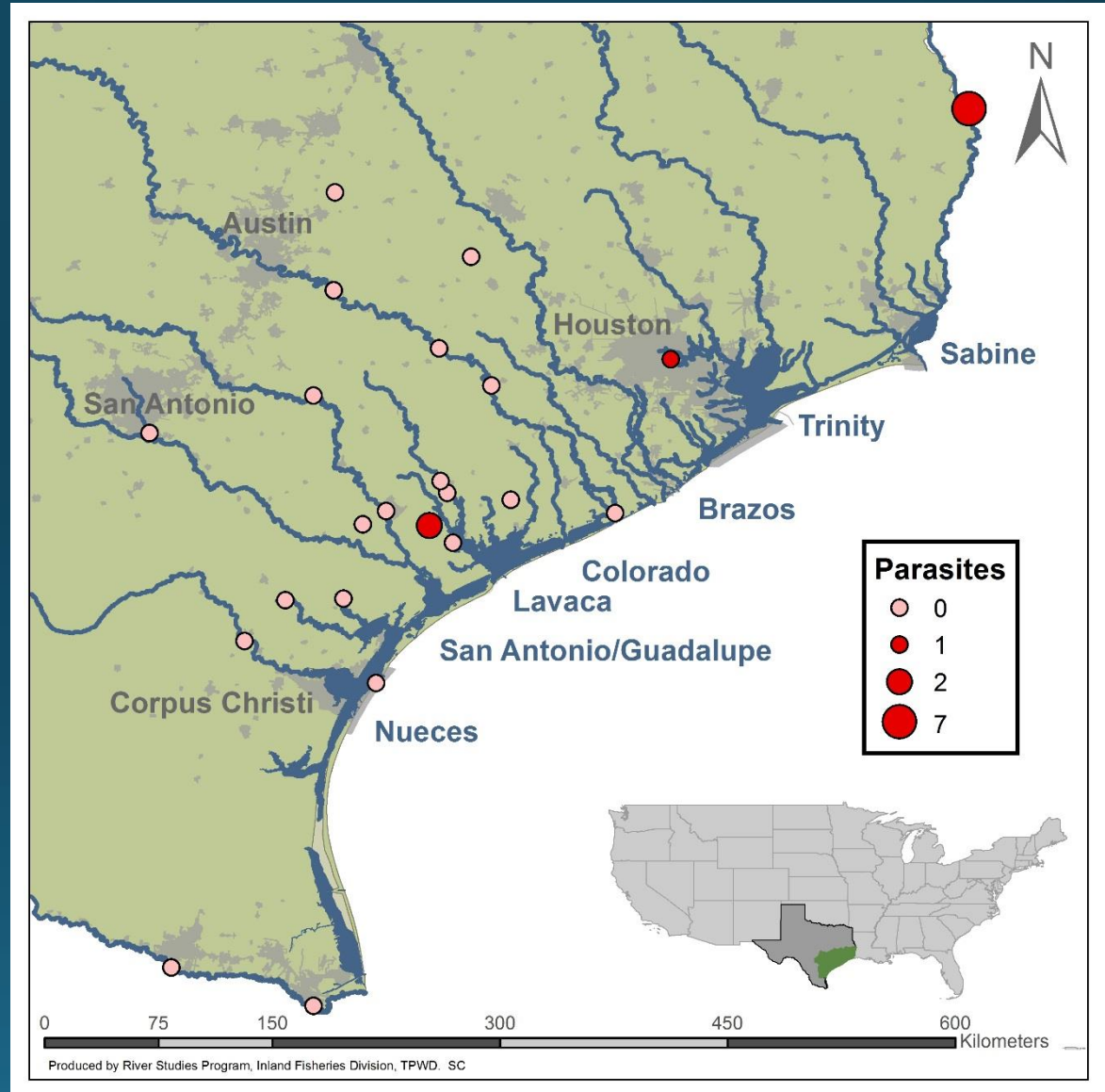
Min = 157 (6.2 in)

Max = 1,054 (41.5 in)



# Parasites

- 10 infected eels (out of 95)
- Site infection rates:
  - 66% - (2/3)
  - 100% - (1/1)
  - 70% - (7/10)



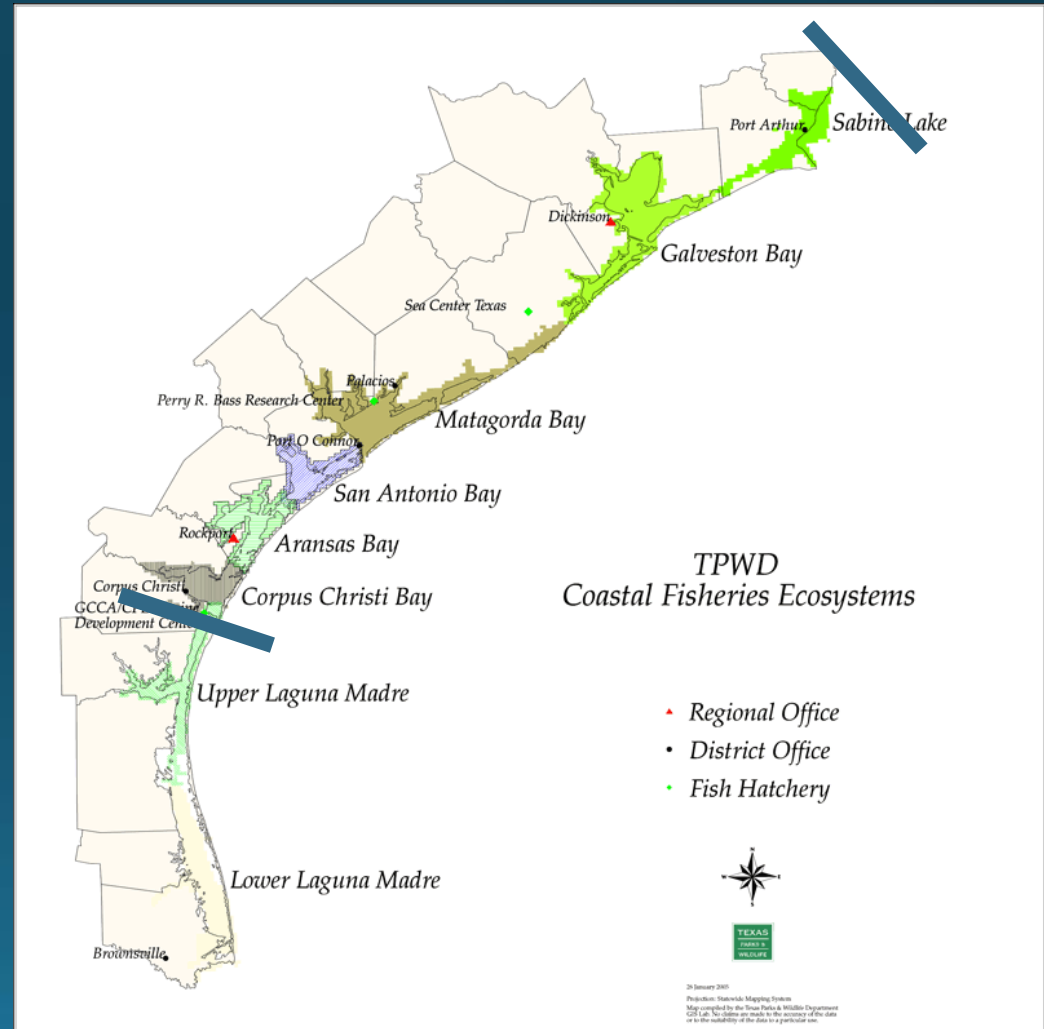
# Project Components

1. Yellow Eel Sampling
2. Yellow Eel Processing
3. Fyke Net Sampling (glass/elvers)
4. Eel Mop Sampling (glass/elvers)

# Field Sampling: Elver & Glass

## LOCATION

- Mid-Upper Coast
- Site Characteristics
  - Tidally influenced
  - Freshwater inflow



# Field Sampling: Elver & Glass

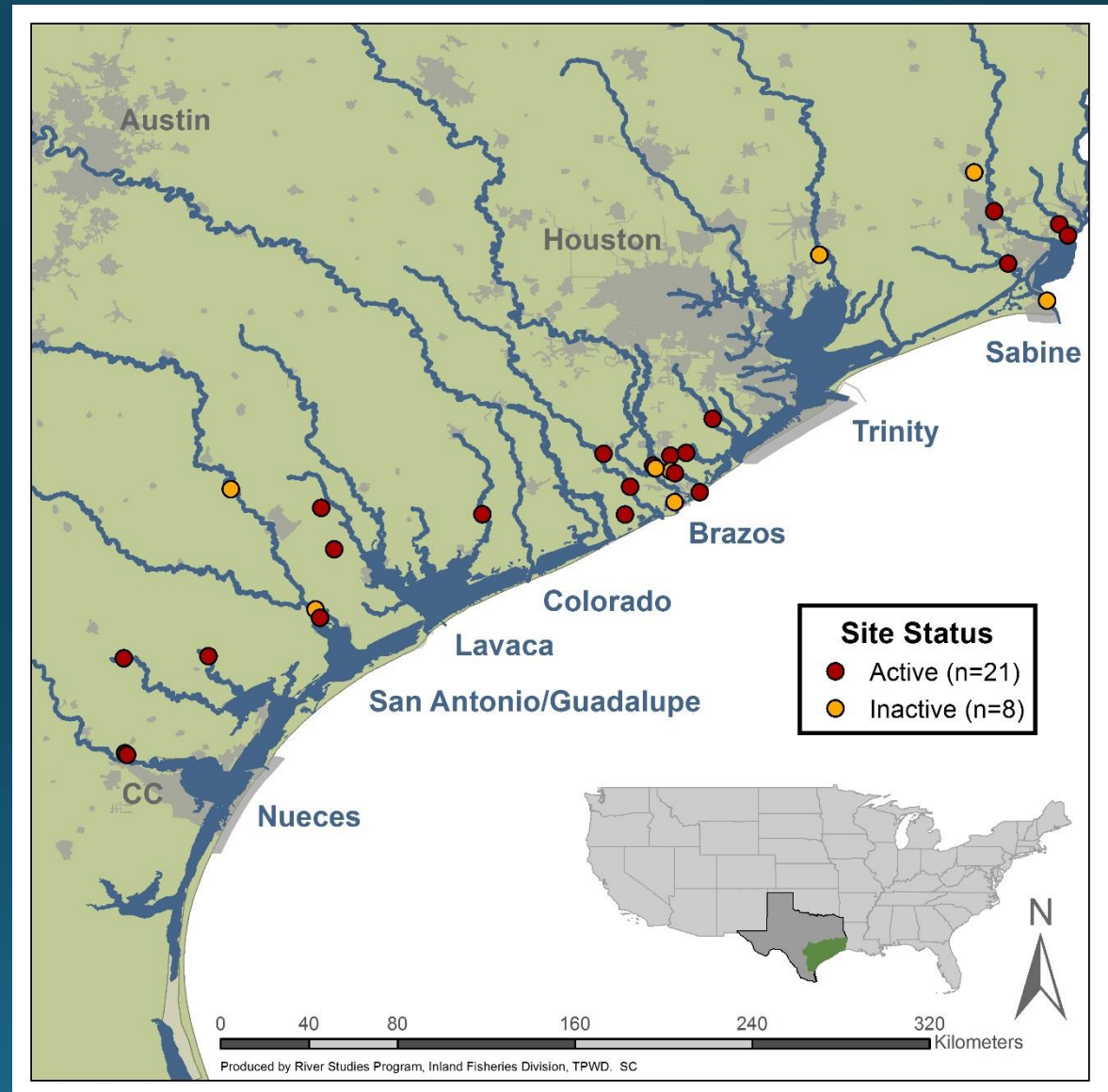
## METHODS

- Eel Mops
- Small-mesh fyke nets



# Eel Mop Sampling

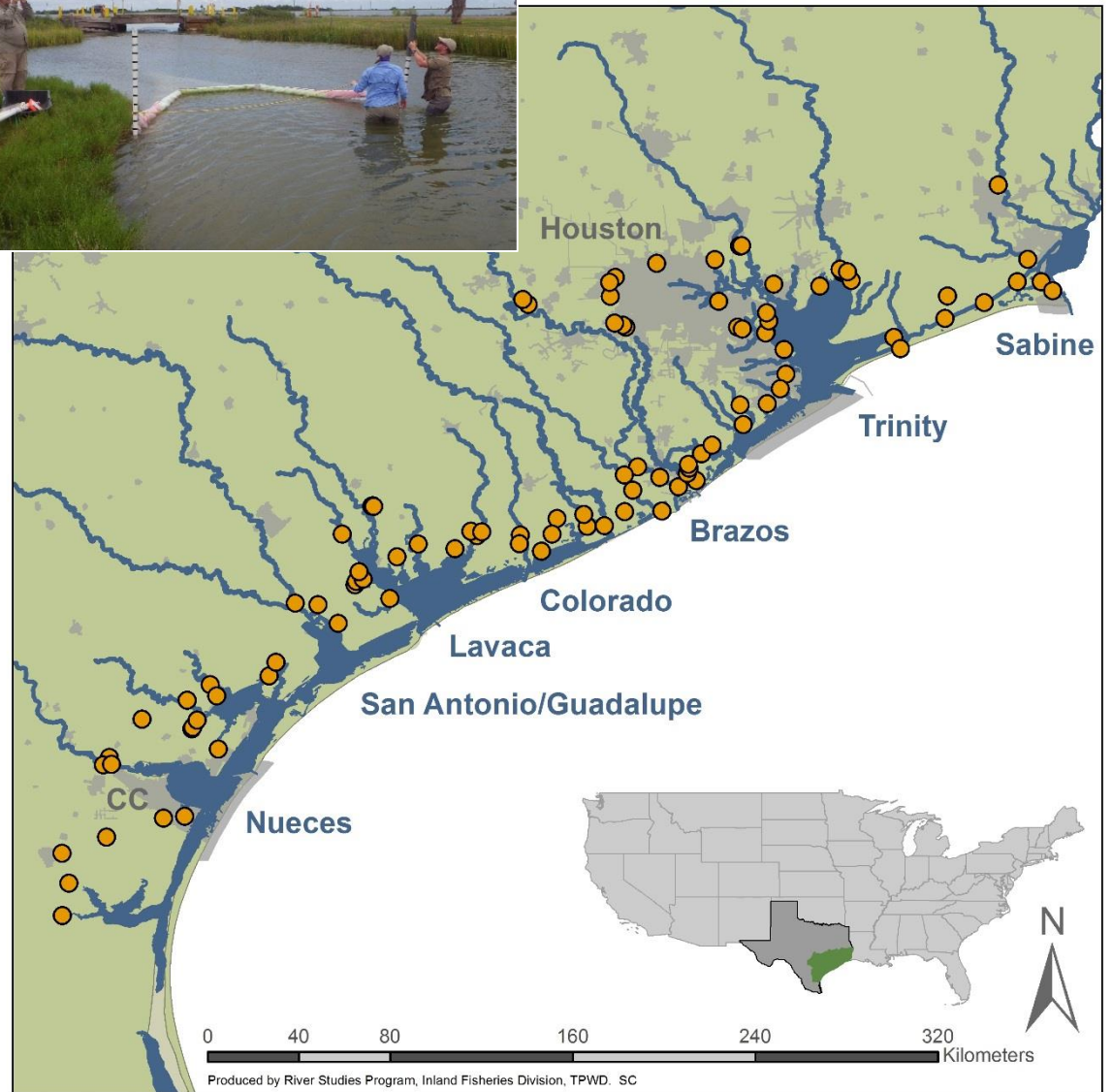
- Sampling since Feb 2018
- Continuous deployment
- Checked every two weeks at a minimum
- Data reported via field datasheet or Google Form





# Fyke Net Sampling

- Sampling since July 2018
- Deploy nets at night; fish incoming tide
- Conduct sampling events every 2 weeks

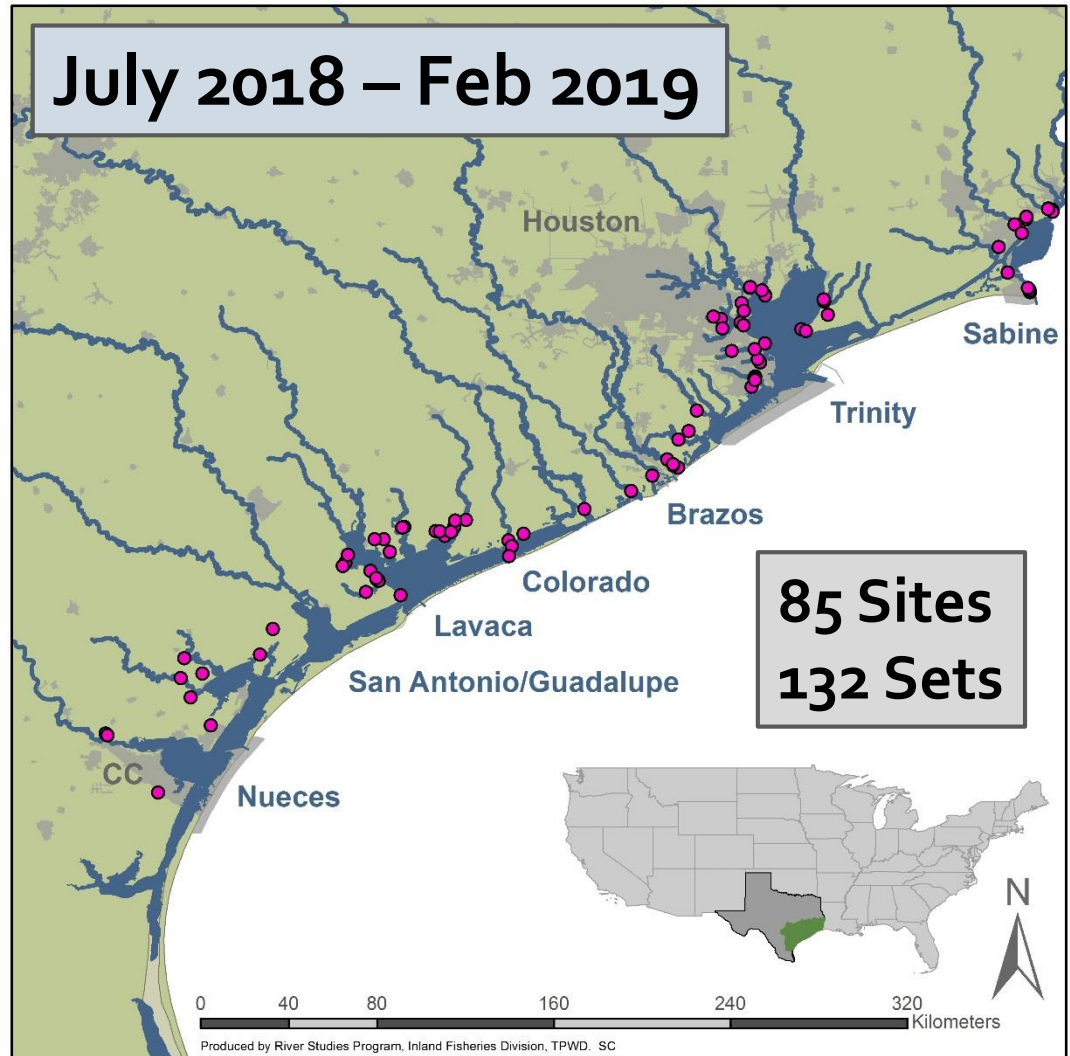




# Fyke Net Sampling Sites



**July 2018 – Feb 2019**



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**University  
of Houston  
Clear Lake**



# Expected Timeline

	2018	2019	2020
Yellow Eel Sampling	X	X	
Tissue Processing	X	X	
Tissue Analyses		X	X
Glass/Elver Eel Sampling	X	X	X
Report Writing			X

**Yellow Eel Collection → Mar 2019**

**Glass/Elver Eel Collection → Mar 2020**

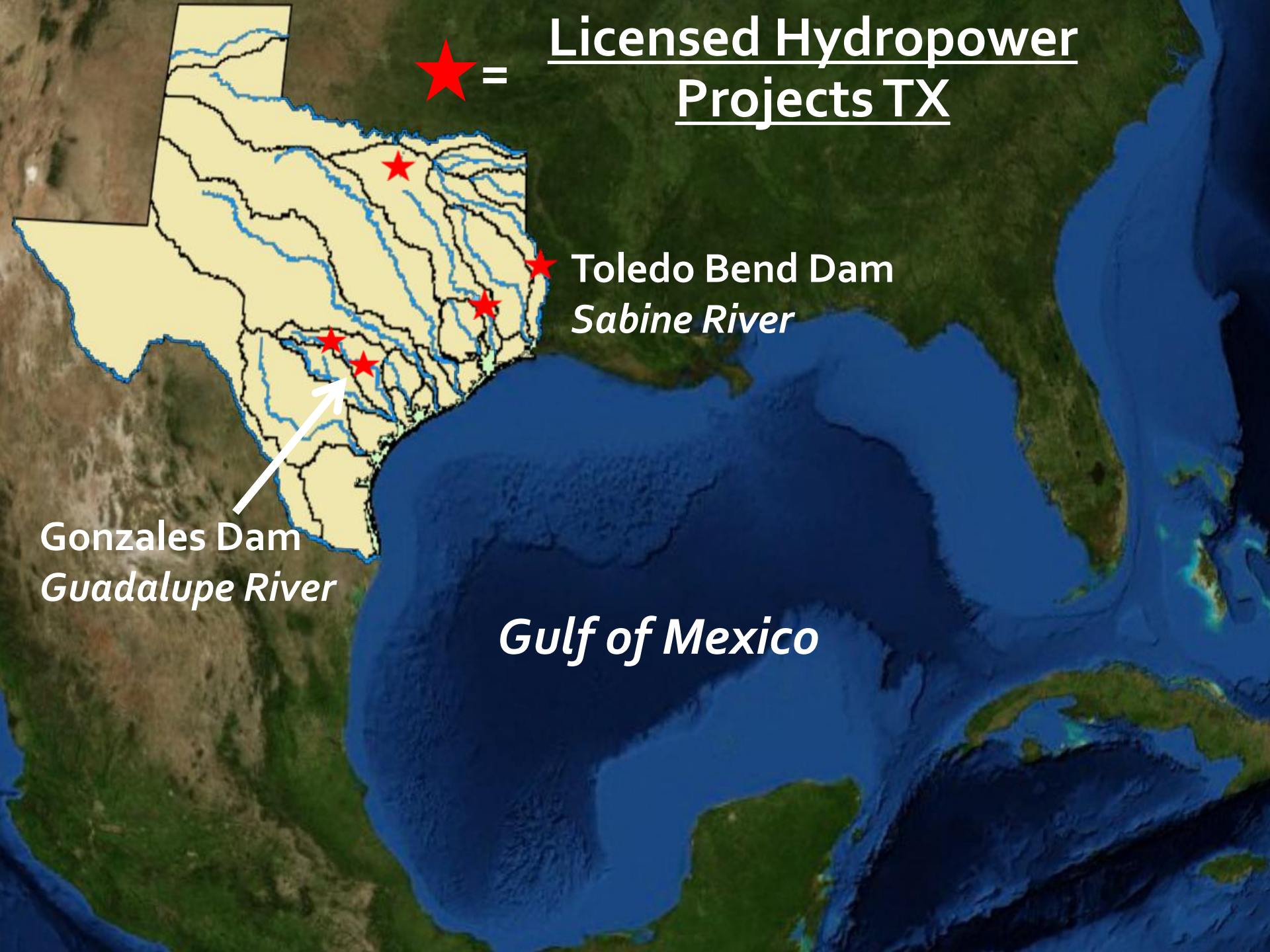
Licensed Hydropower  
Projects TX



Toledo Bend Dam  
*Sabine River*

Gonzales Dam  
*Guadalupe River*

*Gulf of Mexico*



# Gonzales Dam



Photos courtesy, Brad Littrell

# Toledo Bend Dam



*Figure 8. Toledo Bend Project Spillway, S3, trap installation*

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**Questions?**

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**(512) 754-6844 ext. 221**

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