



State Texas Master Naturalist Meeting
The Search for American Eel – We Need You!

Stephen Curtis & Kevin Mayes

Outline

- Introduction to the American Eel
- Project description
- How you can help
- Eel mops: how to deploy, check, record data & build

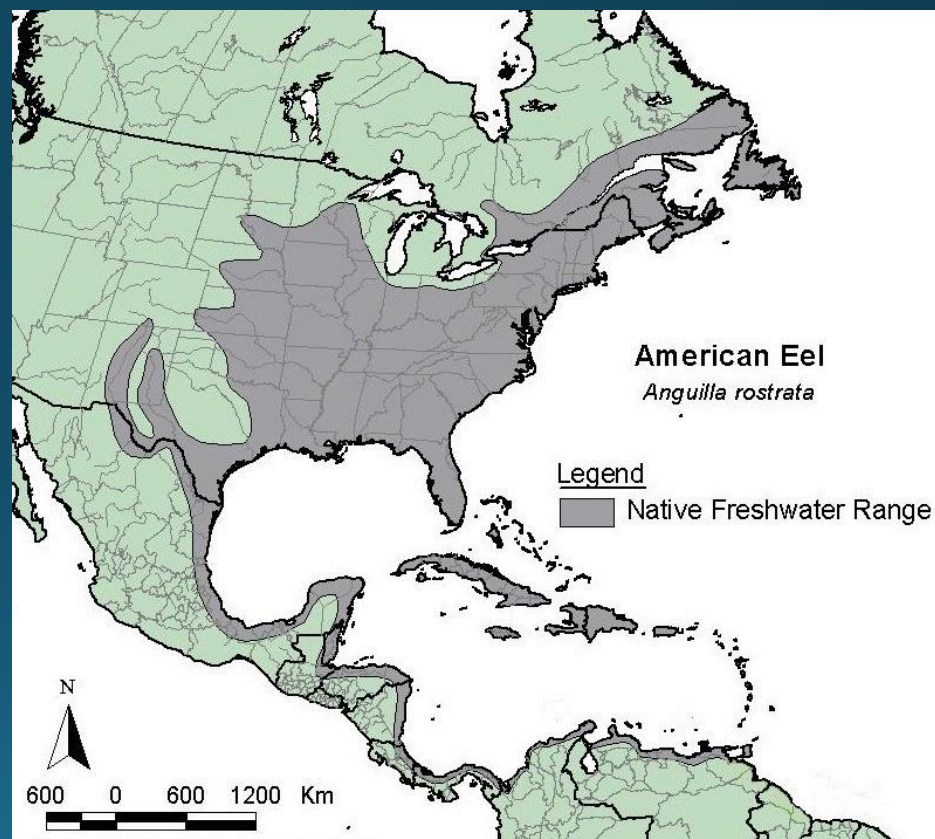
Meet the American Eel

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

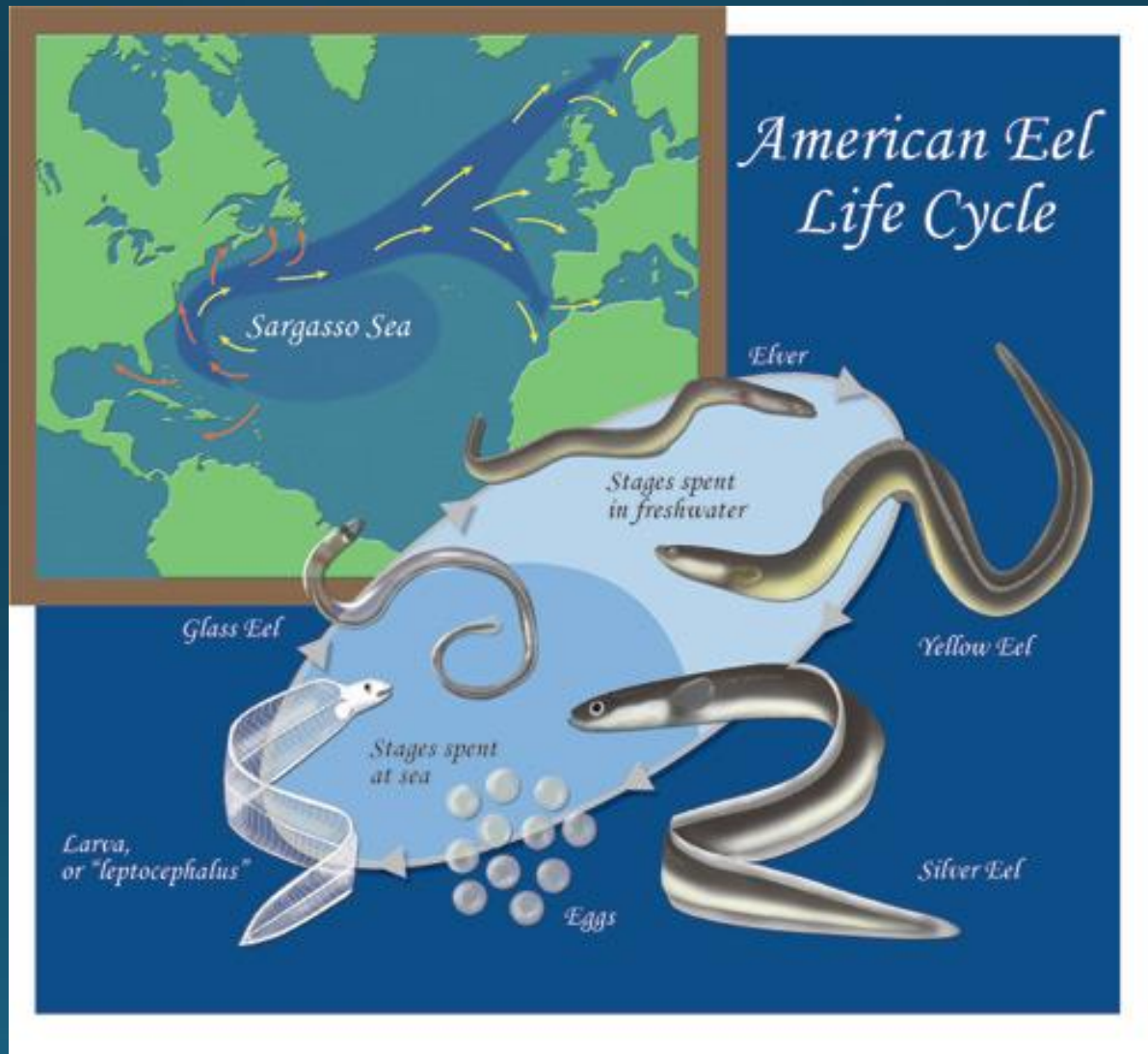


Meet the American Eel

- 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



Life History of American Eel

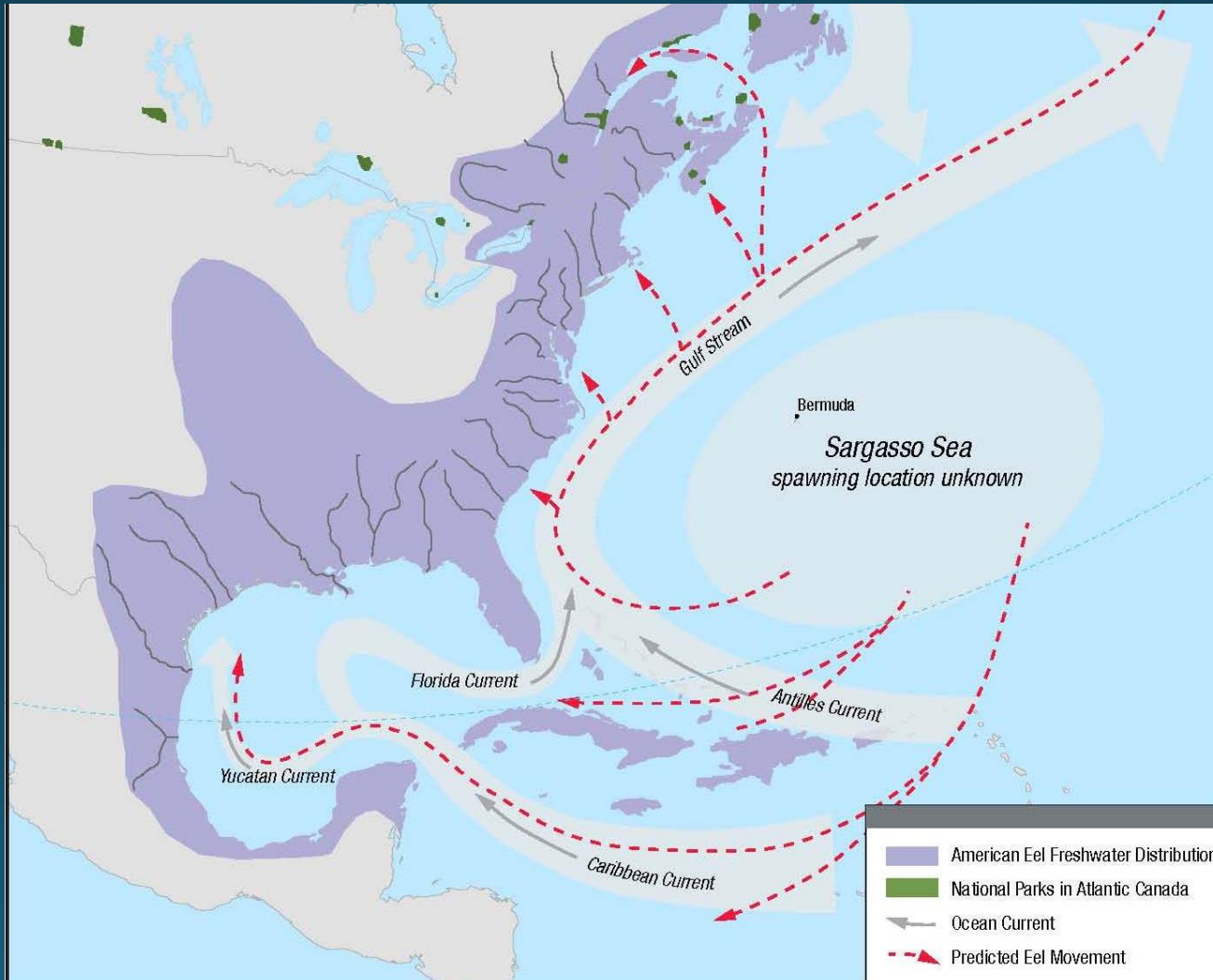


Glass Eel (Leptocephalus)

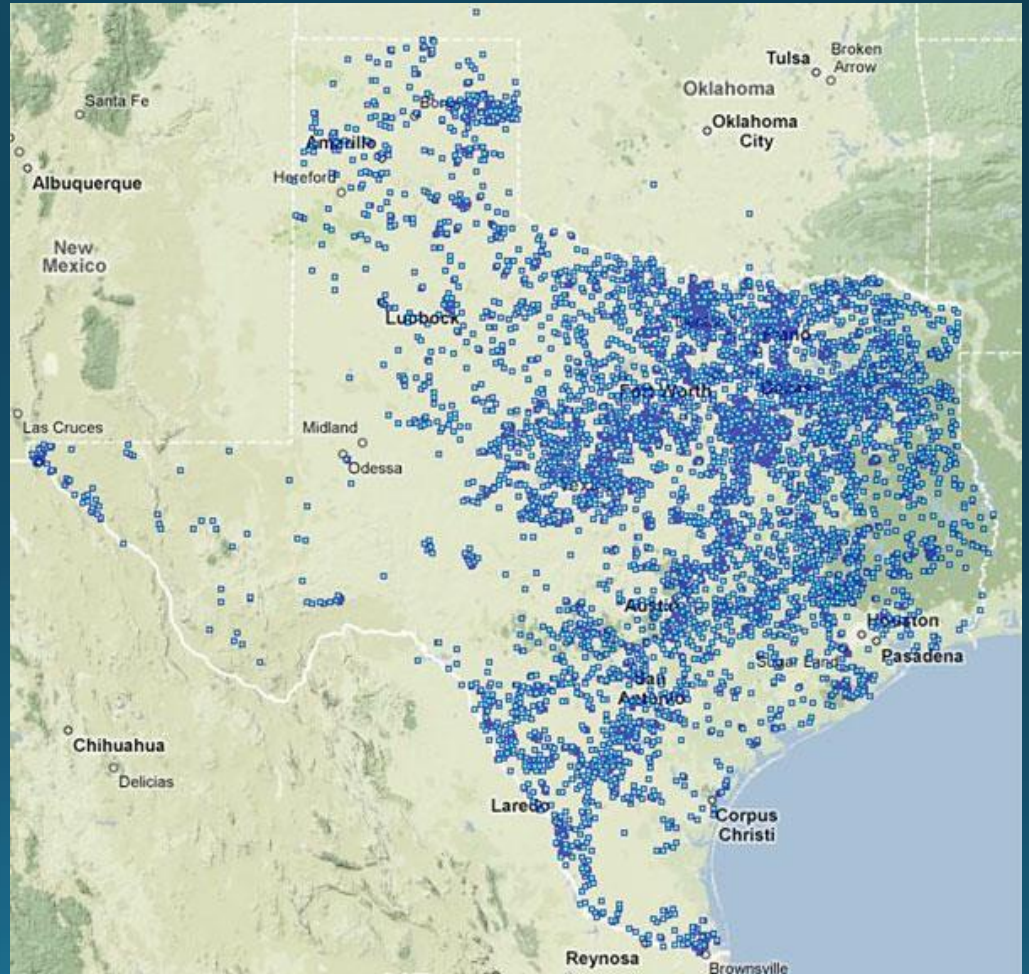


Miller, M.J. and K. Tsukamoto. 2017. The ecology of oceanic dispersal and survival of anguillid leptocephali. *CJFAS* 74:958-971.
Videography: Ritsuno Yama, Nihon University, Japan.

Life History of American Eel



Threats to American Eel



Status of American Eel

- 2007 – USFWS & NMFS reviewed status of American Eel & determined listing not warranted
- 2010 – Council for ESA Reliability called for a more extensive status review
- 2015 – USFWS determined listing not warranted
- Coastal States in Gulf of Mexico
 - Species of Greatest Conservation Need
 - Ongoing research

Commercial Harvest



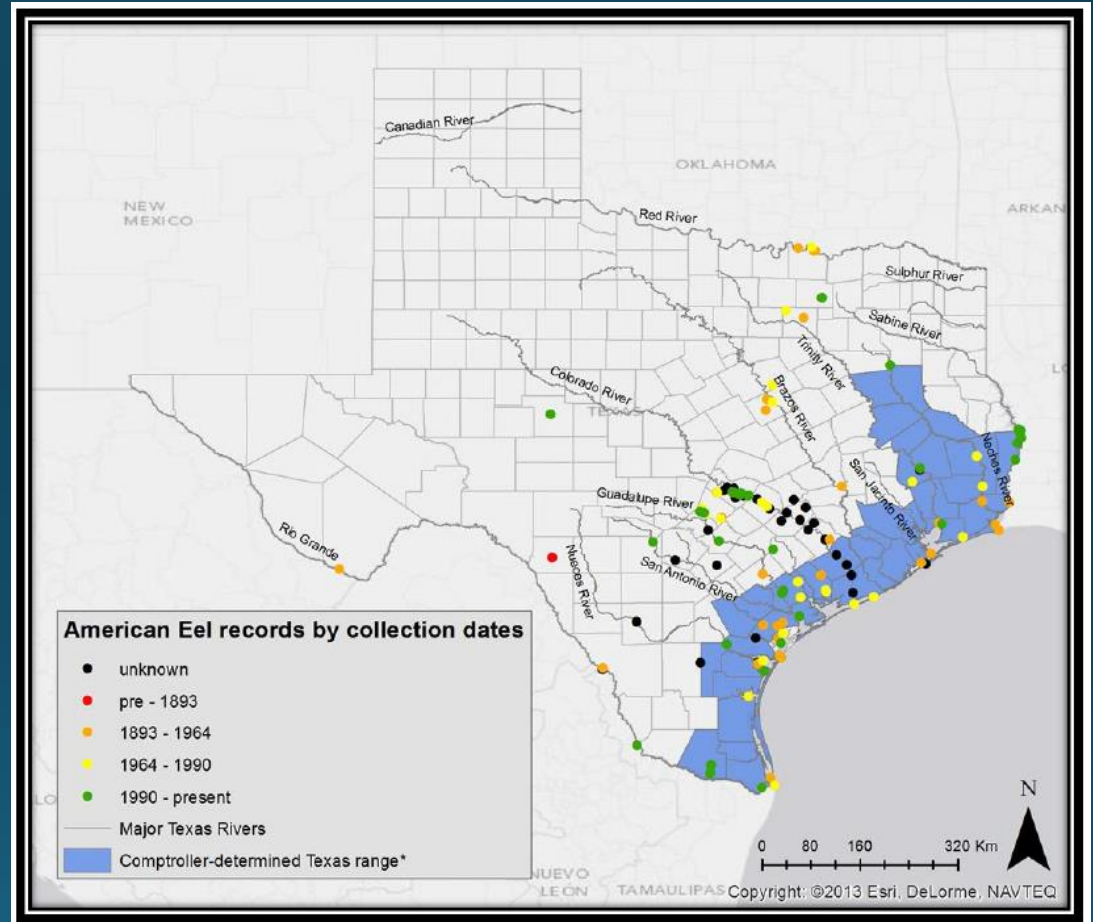
Economic Value

- 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)



Study Area

- Historical records statewide
- Target drainages
 - Sabine
 - Colorado
 - Guadalupe
 - Minor Coastal



Project Description

1. Distribution & Abundance
2. Life History
 - Habitat Use
 - Movement Patterns (Otolith Microchemistry)
 - Parasites & Diet
3. Population Structure
 - Genetics
 - Age
 - Sex
4. Assess collection methods to optimize capture efficiency

WHY IS THIS IMPORTANT??

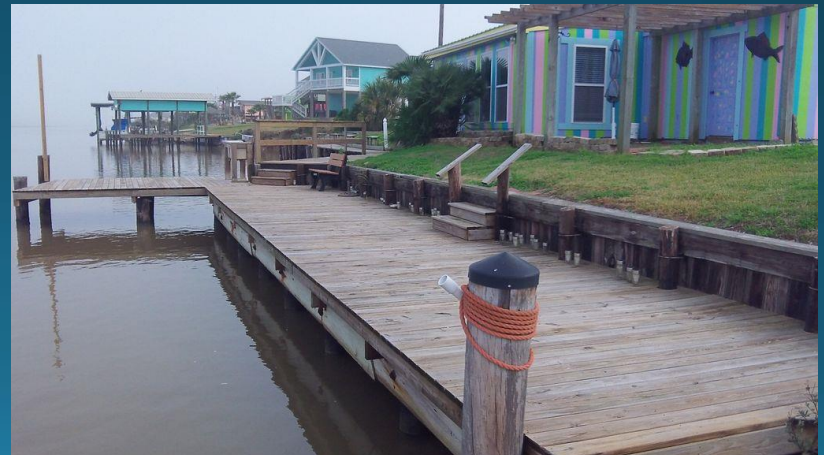
Adult & Juvenile Eel Sampling

- Who: Texas Parks & Wildlife Department
- Where: (a) Below dams in target drainages
(b) Supplemental sampling in coastal drainages
- How: (a) Electrofishing, trot lines, minnow traps, etc.
(b) Dip nets, modified fyke nets, etc.
- When: 2017 – 2019 → Opportunistically



Glass & Elver Eel Sampling

- Who: Texas Master Naturalists
- Where: Fishing piers, bulkheads, boat ramps
Coastal drainages from CC Bay to Sabine Lake
- How: Eel mops & minnow traps
- When: Nov 2017 – Nov 2018 → Bi-weekly
Spring-Summer 2019 → Weekly



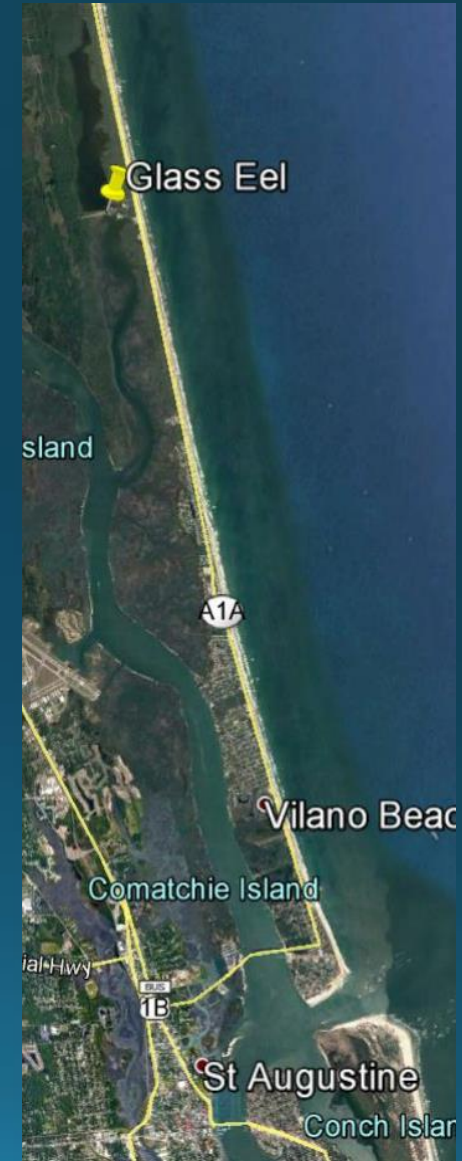
Florida Examples

- Elvers
 - Distance from tidal influence: 17.6 rkm (10.9 rmi)
 - Distance from ocean: 184 rkm (114 rmi)
 - Collected using a lift net



Florida Examples

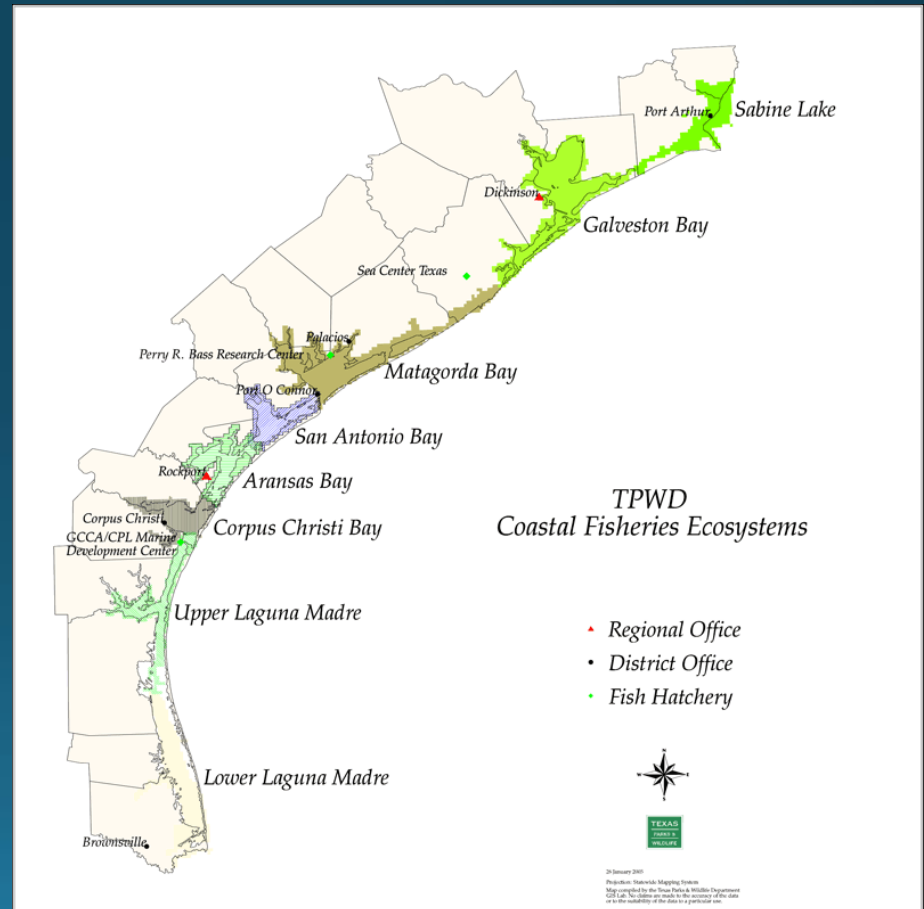
- Glass Eel
 - Distance from tidal influence: 0 rkm (0 rmi)
 - Distance from ocean: 16 rkm (9.9 rmi)
 - Collected using a dip net



Site Characteristics

TARGET: Within 40 rkm (~25 rmi) of the Gulf of Mexico

1. Tidally influenced
2. Freshwater inflow



Site Logistics



1. Easy access
2. Private vs. Public
3. Constricted channel



Overview of TX Coast

- Focal Area Includes
 - > 22 counties
 - > 48 tidal rivers and estuaries
- Potential Sites
 - 80 for eel mops
 - 29 for supplemental sampling
- Additional Sites??

Legend

-  Eel Mop
-  Supplemental Sampling

Google Earth

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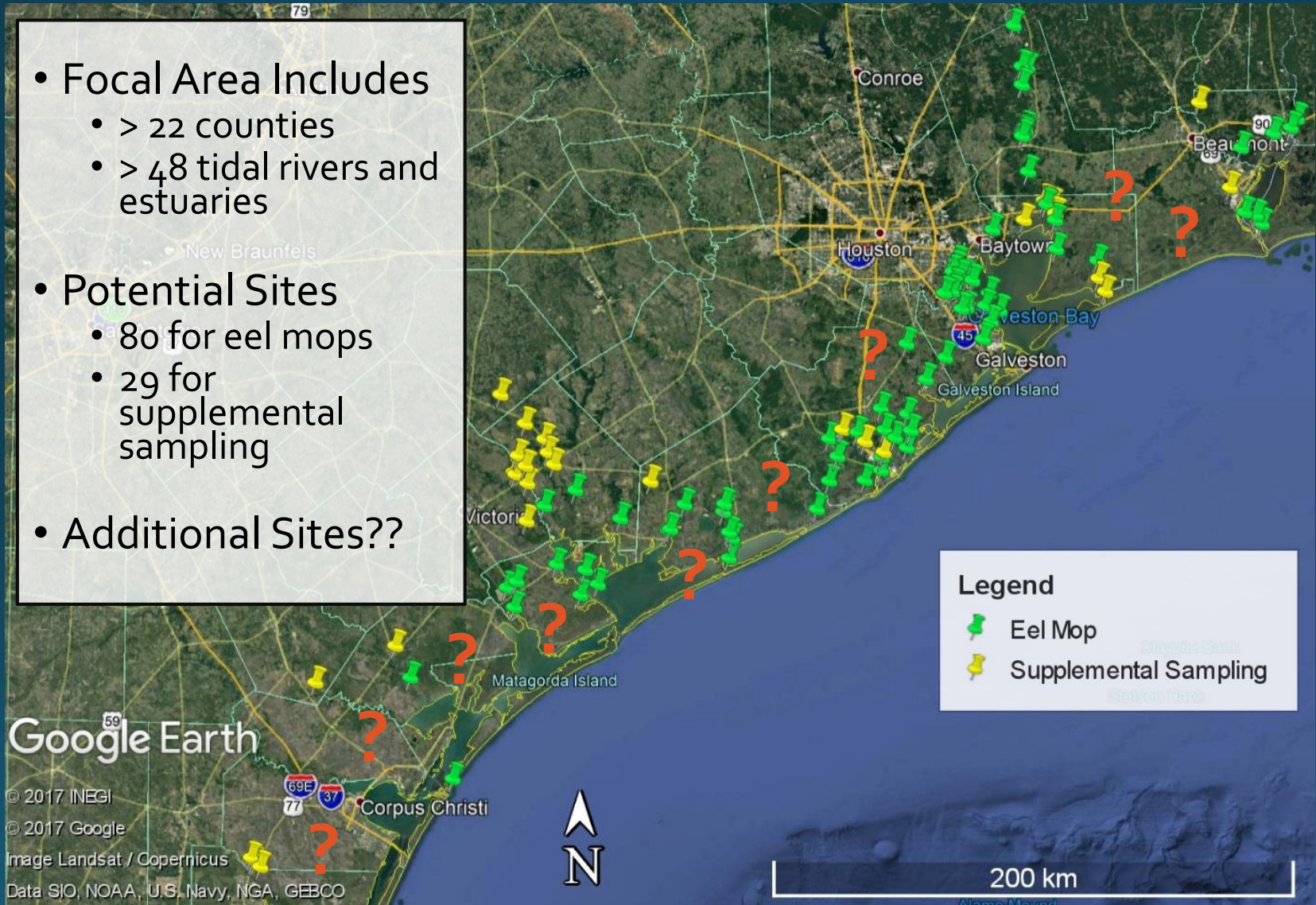
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Image Landsat / Copernicus

Data SIO, NOAA, U.S. Navy, NGA, GEBCO



200 km



Eel Mop: Gear Description

- Used to catch glass/elver eel
- Designed to provide shelter during upstream movement



Eel Mop: How to Deploy

- Secure loose end of rope to pylon (fishing pier, bulkhead, boat ramp, etc.)
- Lower eel mop into the water
- Record date & time deployed



Eel Mop: How to Check

1. Fill tote with site water
2. Invert eel mop and place in the tote of water
3. Shake the eel mop 25x into the tote
4. Examine eel mop for catch still in the rope
5. Slowly pour water from tote into aquarium net
6. Bag any eel-like catch; release bycatch
7. Record catch on datasheet
8. Record date & time – redeploy!

*****CHECK AT LEAST EVERY TWO WEEKS!!*****

Catch

- Target Catch
 - Anything eel-like!!
 - **Motto: If it looks like an eel, bag it!**
 - Include a label & freeze the bag
- Potential Bycatch
 - Crabs (e.g., blue crab, lesser blue crab)
 - Benthic fish (e.g., goby, drum)
 - Invertebrates



How to Record the Data

- Options to report data
 - Datasheet
 - Online reporting form
- Data collected
 - Location of eel mop
 - Description of site
 - Collector
 - Date & time deployed/checked
 - Catch



Stay tuned...

https://www.youtube.com/watch?v=G1nQ6_Mlpuo

Coastal TMN Chapters

- Aug 1 Lower Trinity Basin
- Oct 5 Galveston Bay Area
- Oct 20 State TMN Meeting
- Oct 26 Sabine-Neches
- Nov 2 Gulf Coast **TBA**
- Feb 10 Mid-Coast
- Feb 14 Cradle of TX



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