

Tab B, No. 5

“The Great Red Snapper Count”

Estimating the absolute abundance of Red Snapper
in the U.S. Gulf of Mexico.

What is the problem/goal?

- Absolute abundance estimate leads to most informed mgmt.

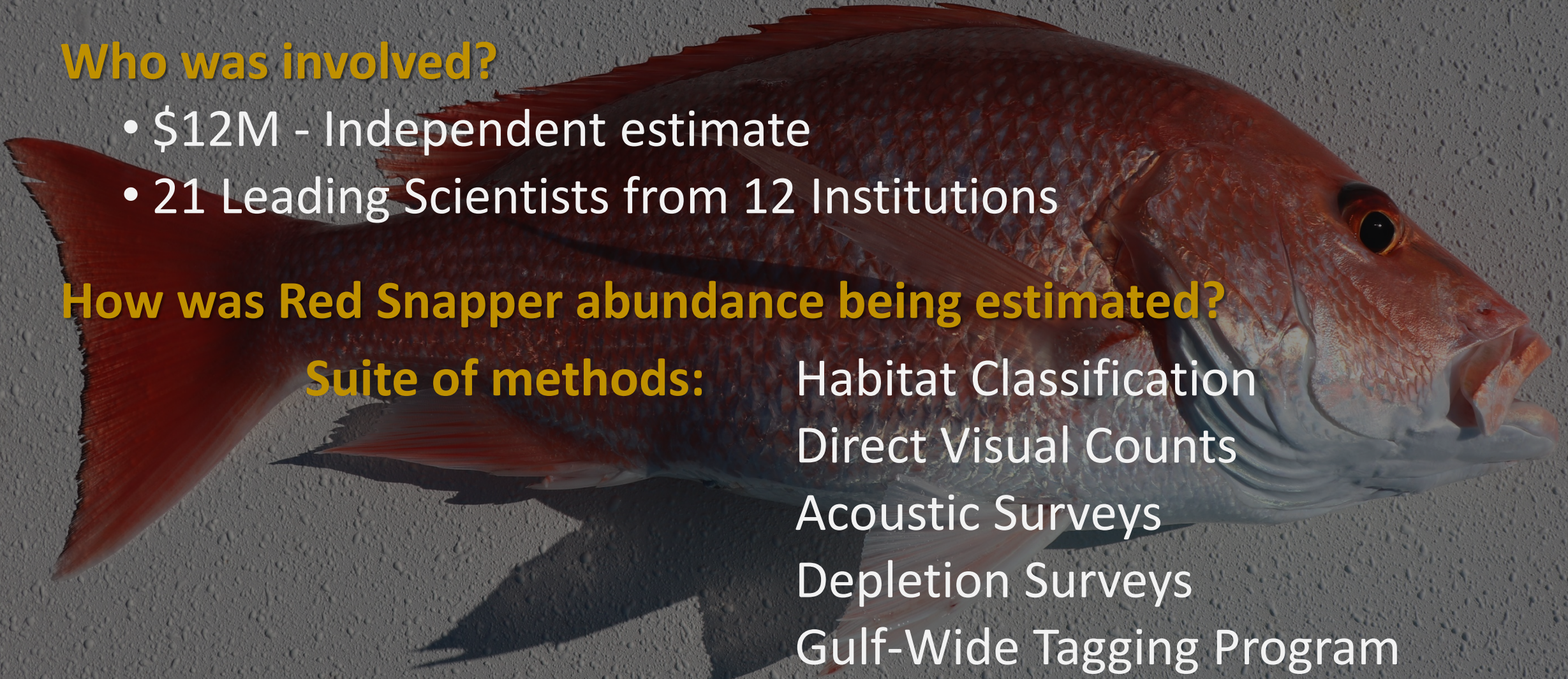
Who was involved?

- \$12M - Independent estimate
- 21 Leading Scientists from 12 Institutions

How was Red Snapper abundance being estimated?

Suite of methods:

Habitat Classification
Direct Visual Counts
Acoustic Surveys
Depletion Surveys
Gulf-Wide Tagging Program



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Participating Institutions



Five Milestones

1. Data Mining & Habitat Characterization

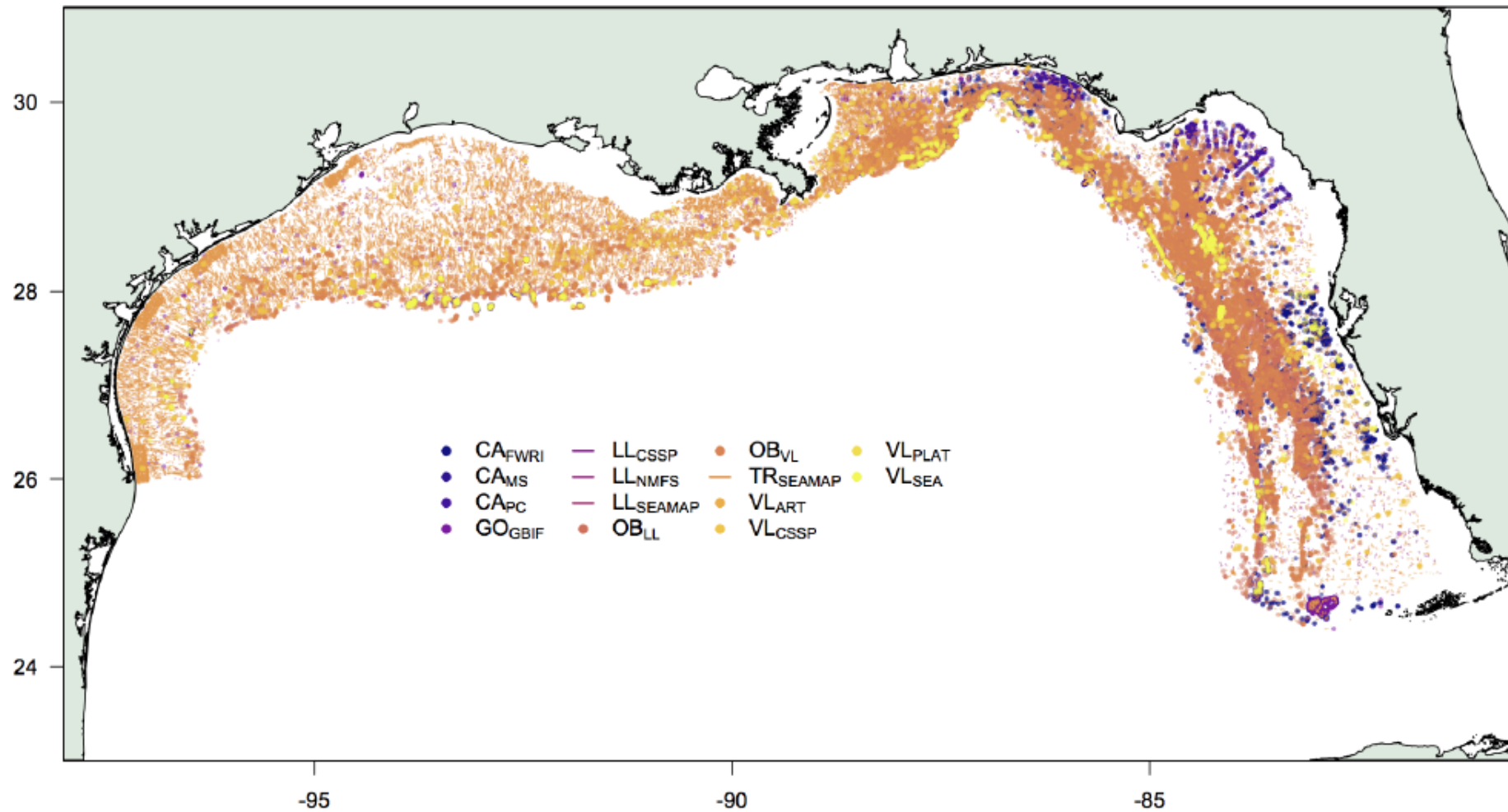
2. Calibration & Validation

3. Sampling

4. Analysis

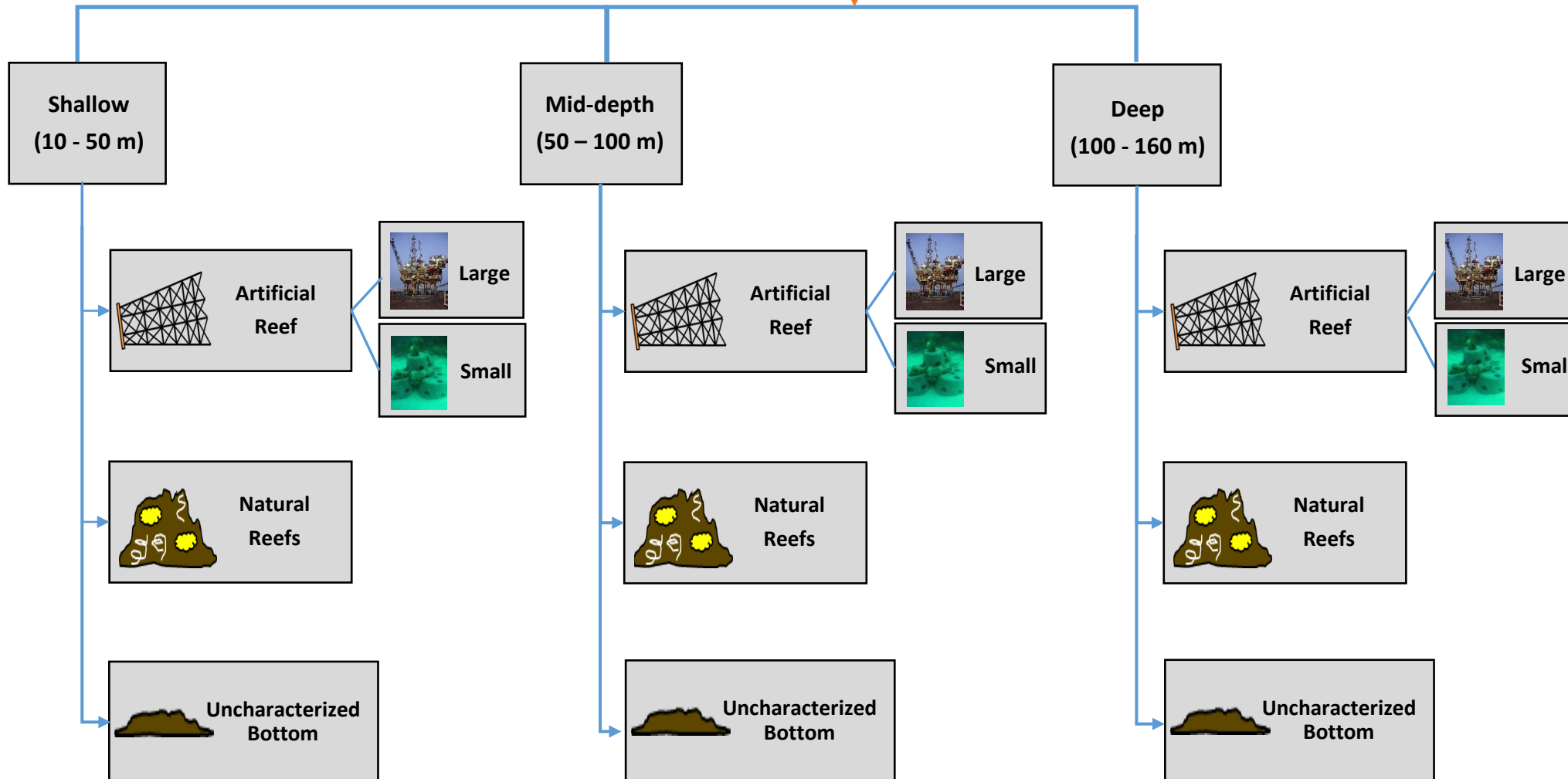
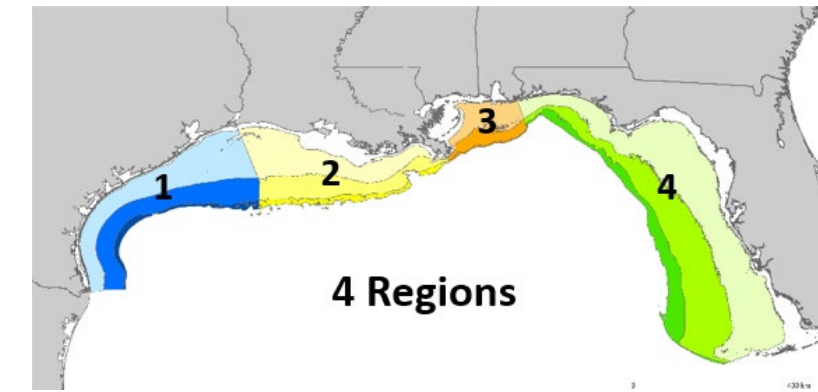
5. Final Estimation, Report, Briefings, and Stakeholder Engagement

1. Data Mining



(Above) All sampling gears used as presence-only or presence-absence points in modeling probability of presence

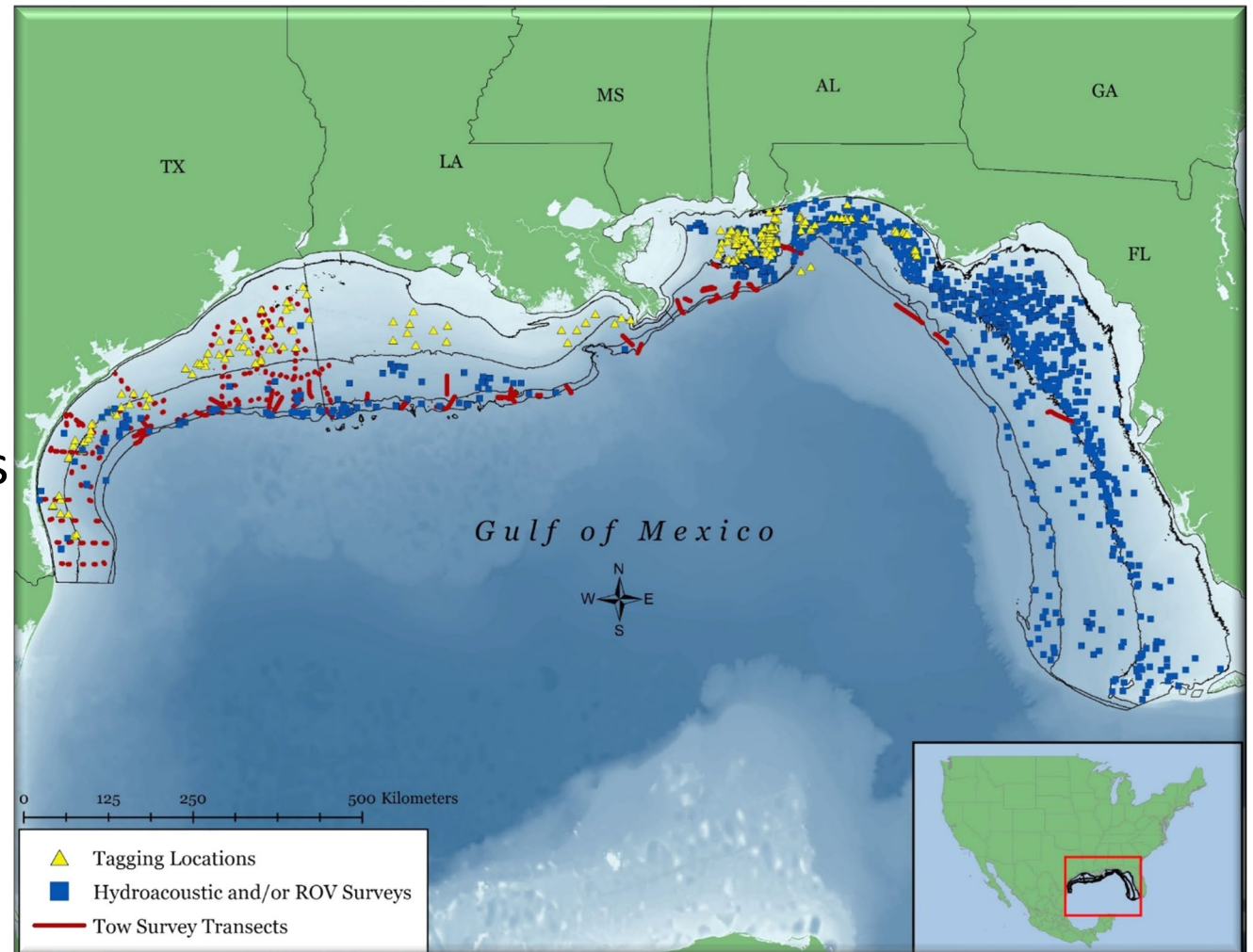
Sampling Design:



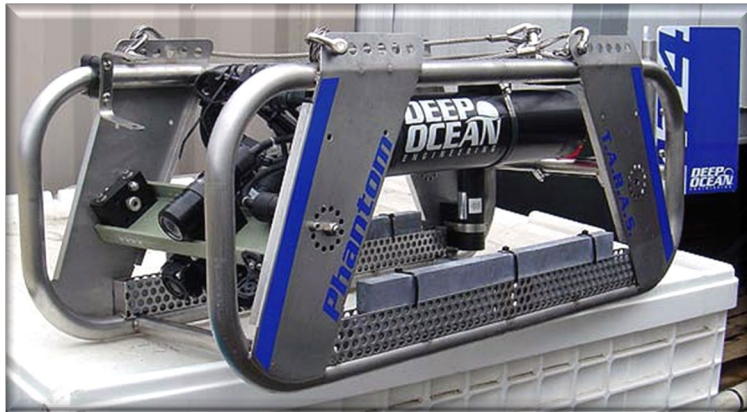
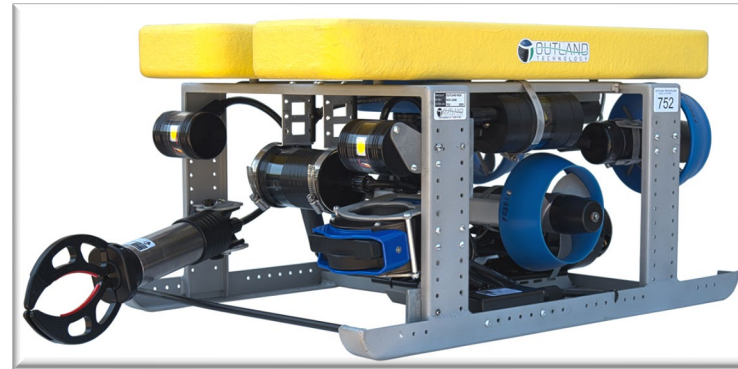
2,3. Sampling: Direct Counts, Validation, Calibration

Sampling Effort:

- 1500+ Sampling Sites
- 100s hours of ROV video
- 100s km of Transects
- 100s hours of Hydroacoustic Profiles
- Vertical Long Lines
- Extensive Tagging



3. Sampling: Direct Visual Counts



3. Sampling: Artificial Reefs and Habitat features





Visual Surveys



Visual Surveys and Calibrations

Turbid

Clear

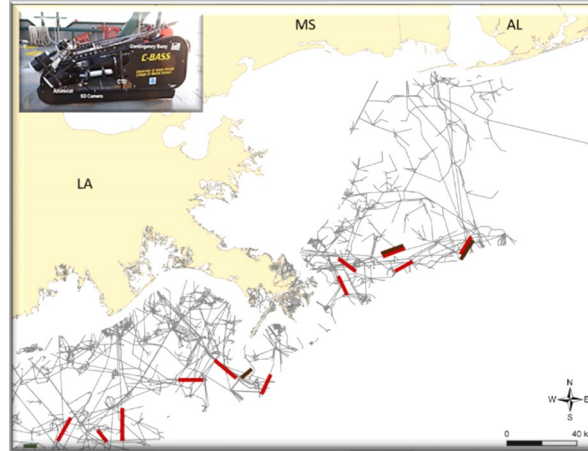
Western Gulf– LA and TX

Eastern Gulf– FL and AL

**Visibility lead to development of additional survey methodologies (Hydroacoustic).*

3. Sampling 'UCB': *C-BASS* and *TARAS*

- Pipelines
- Natural Bottom
- Uncharacterized Bottom



***42,000 Miles of Pipeline**

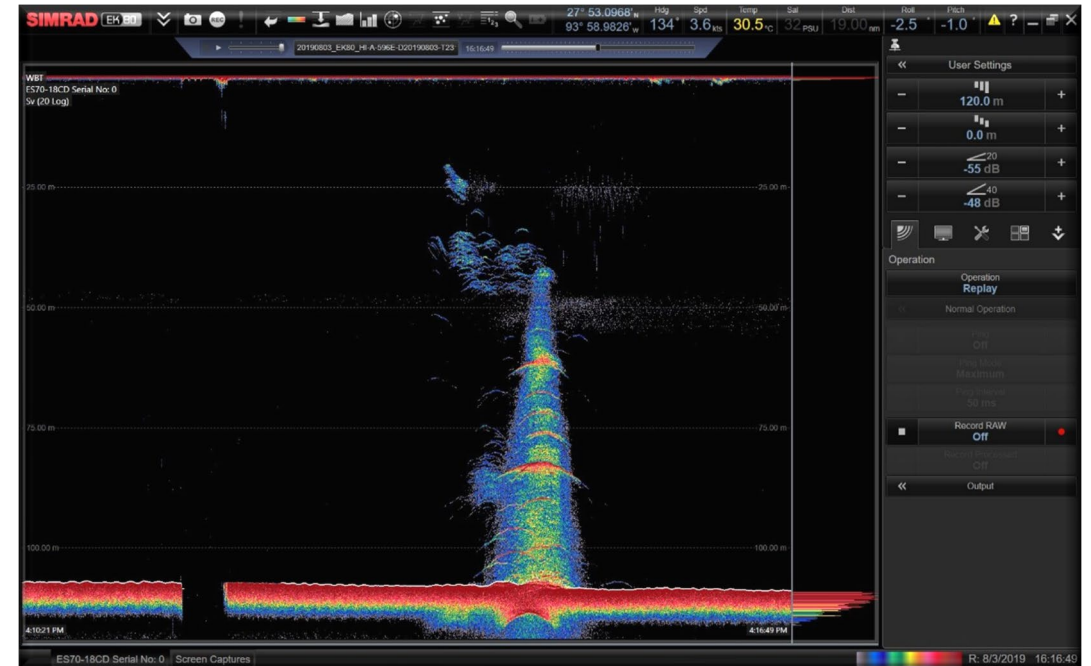
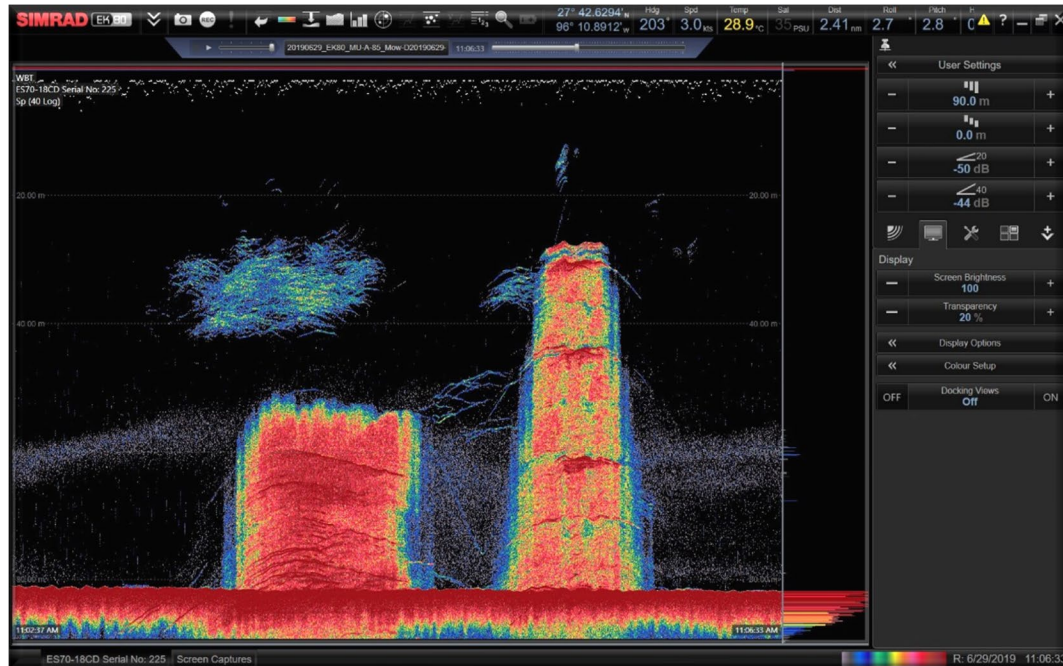
Turbid

Clear

Survey:

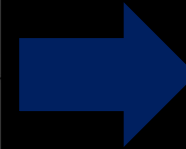
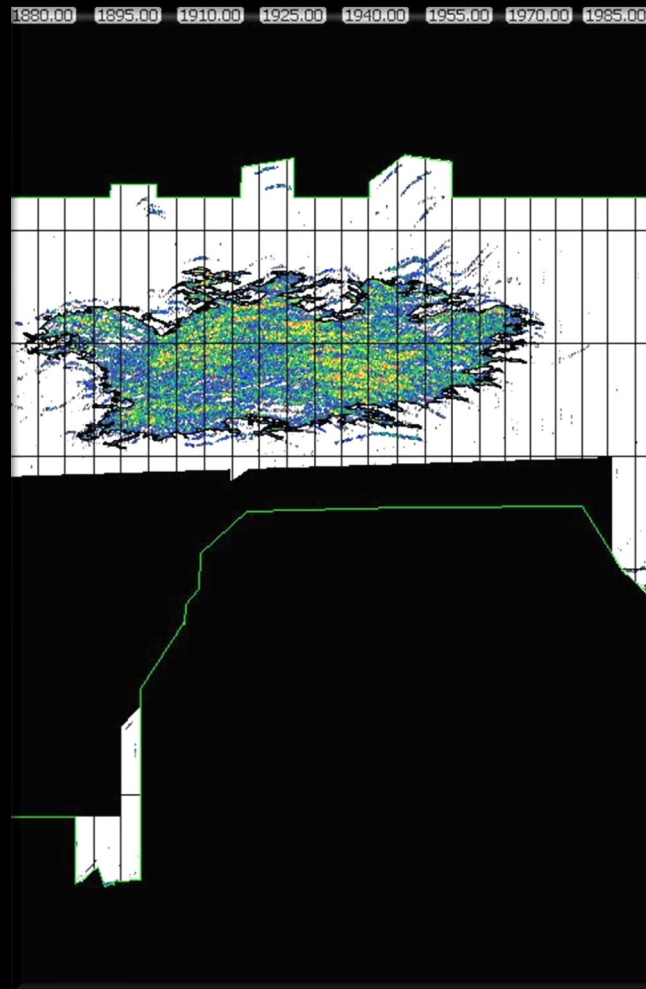
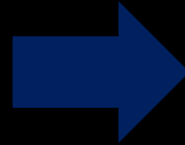
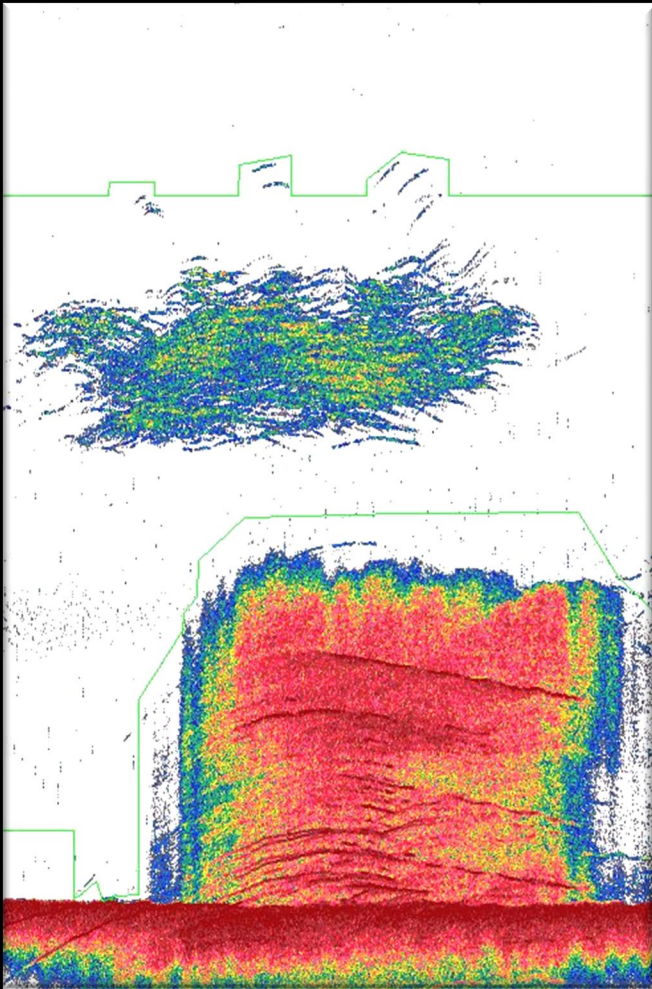
Pipeline, Natural Bank, and Uncharacterized Bottom

3. Sampling: *Hydroacoustics*



Why do we need bioacoustics?

Estimating Abundance



Total Red
Snapper
abundance

3. Sampling: *Depletion*

- Powers, Hoenig and Carleton (VIMS)
- Depletion can provide overall abundance estimate (# fish/m²): ROV-Depletion-ROV
- Successful abundance estimates



3. Tagging



Catalano (AU)



**Thousands of fish
tagged Gulf-wide**

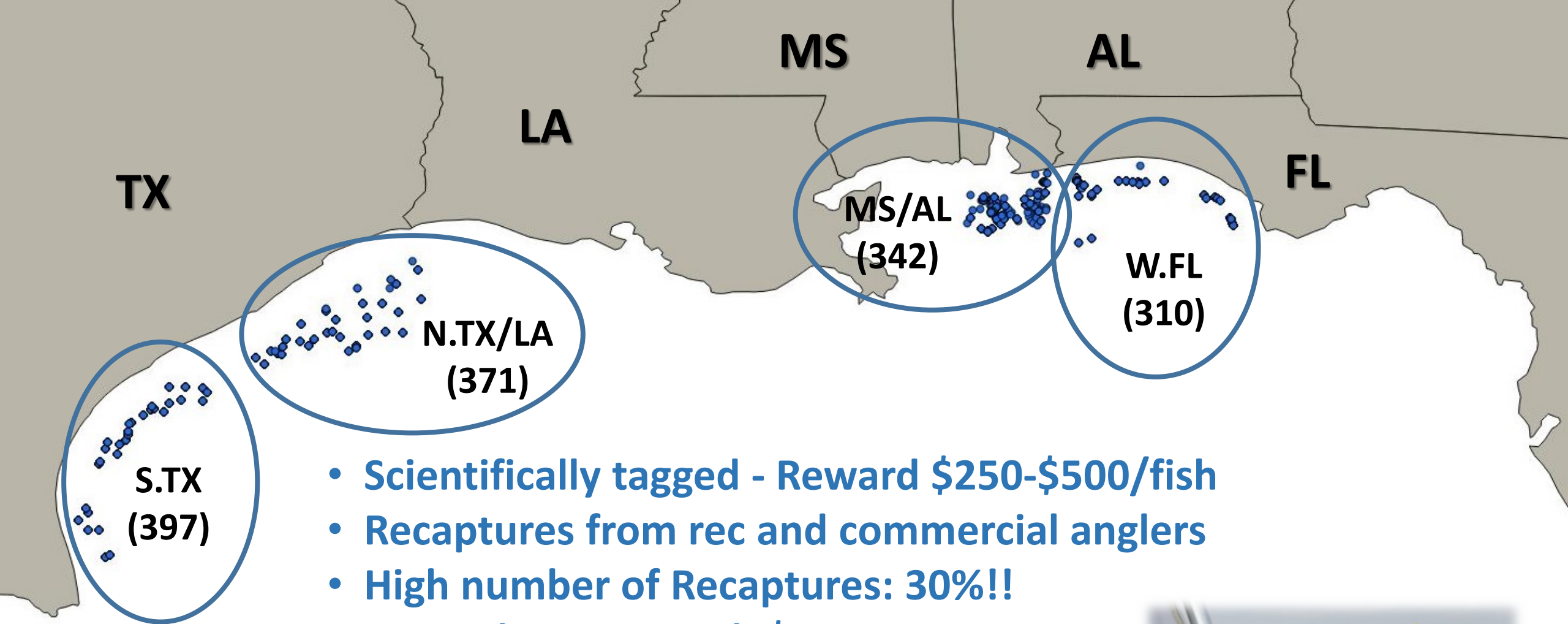


**Archived genetic
samples**



**Angler
Engagement**



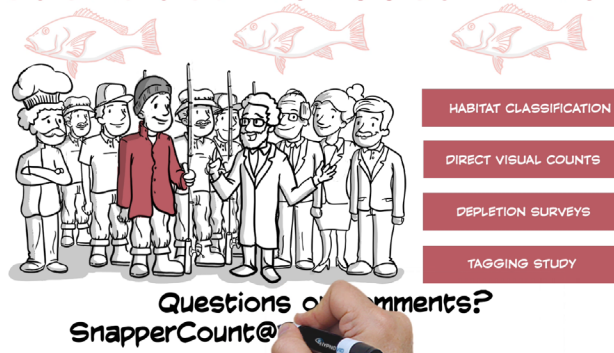


- Scientifically tagged - Reward \$250-\$500/fish
- Recaptures from rec and commercial anglers
- High number of Recaptures: 30%!!
- Reward money paid: \$100,000+
- Exploitation rates on Artificial Reefs

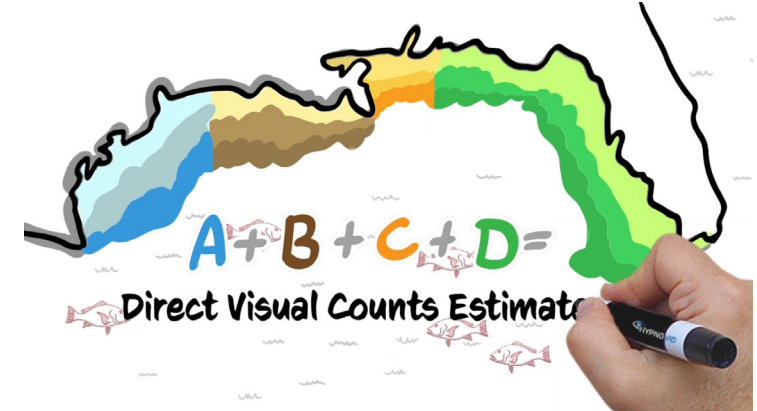
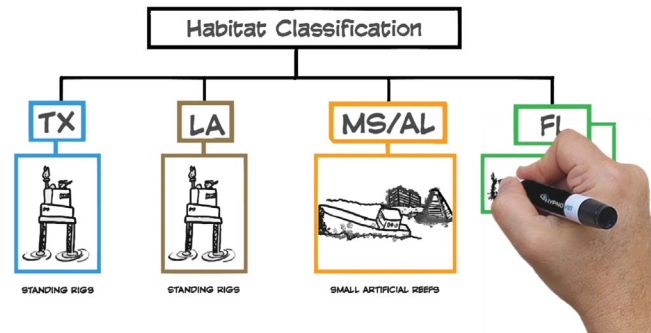


5. Stakeholder Engagement

GREAT RED SNAPPER COUNT



GREAT RED SNAPPER COUNT



The Great Red Snapper Count

PROJECT OVERVIEW

This project overview describes the Great Red Snapper Count, which is a two-year research project to estimate the abundance of red snapper in the U.S. Gulf of Mexico.

Why is this study important?

- Red snapper comprise an economically valuable and culturally relevant fishery in the Gulf of Mexico.
- The stock is currently under a rebuilding plan.
- Although the red snapper fishery is showing signs of recovery, anglers are frustrated by restrictions, such as shortened seasons.
- Stakeholders collectively desire a healthy, well-managed red snapper stock.
- A lack of abundance data hinders the best possible stock management.

Who is funding the study?

- Congress made the money in funding available for research projects designed to independently estimate red snapper abundance.
- After a competitive review process, Mississippi-Alabama Sea Grant awarded the \$10 million for a 2-year (2017-2019) project.

What is the goal of the study?

The central objective of this study is to independently and separately from NOAA fisheries estimate the abundance of red snapper in the U.S. Gulf of Mexico.

Who is involved in the study?

A well-integrated, multidisciplinary team of investigators, which includes leading fisheries experts from the Gulf region and beyond, is leading the project.

Questions or comments? Contact the project team at snappercount@hattermaninstitute.org. For more information, visit snappercount.org.

The Great Red Snapper Count - PROJECT OVERVIEW

How will scientists develop the abundance estimate?

Scientists will use a suite of methods, including habitat classification, direct visual counts, depletion surveys, and a tagging study, across the entire U.S. Gulf of Mexico.

What are the expected outcomes of the study?

- Legislators and fishery managers will review the abundance estimate from this project and use it to make more informed management decisions.
- This will lead to:
 - Calibration of the current stock assessment
 - Increased confidence in the status of the stock
 - Maximum fishery access for stakeholders

How will scientists collect fish count data from the video footage?

Scientists use remotely operated vehicles (ROVs) to collect video footage to conduct direct visual counts and estimate the number of fish inhabiting artificial reef. Photos to capture have been taken by ROVs at various depths and locations.

How will scientists collect fish count data from the video footage?

The videos from the two types of cameras will be transferred to laboratory computers and analyzed.

- First, scientists will count the number of red snapper in each ROV and towed camera videos.
- Then, these counts will be converted to density estimates, which will yield abundance estimates.
- In areas with poor visibility or very large structures, the towed camera footage will be used with ROV surveys to confirm red snapper abundance estimates.

How will scientists collect fish count data from the video footage?

An ROV (the towed camera) shows gear snapper along the Gulf of Mexico. An ROV (the towed camera) shows gear snapper along the Gulf of Mexico. An ROV (the towed camera) shows gear snapper along the Gulf of Mexico.

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The Great Red Snapper Count

HABITAT CLASSIFICATION

This fact sheet describes the habitat classification phase of the Great Red Snapper Count, which is a two-year research project to estimate the abundance of red snapper in the U.S. Gulf of Mexico.

Where do red snapper live in the U.S. Gulf of Mexico?

- Red snapper are distributed across a variety of habitats.
- The snapper counts primarily of sand and mud, along with natural reefs, these areas provide habitat for red snapper.
- Concentrated areas of artificial structures also serve as red snapper habitat.
- The coverage of sediments, natural reefs, and artificial structures differs drastically across the Gulf.

What types of artificial structures exist in the Gulf?

- Large oil and gas platforms are common in the western Gulf.
- Smaller structures include lease transport cages, piers, military tanks, pilings, car bodies, and others are deliberately placed on the seafloor to create fish habitat.

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The Great Red Snapper Count - HABITAT CLASSIFICATION

What is habitat classification?

Habitat classification is "Phase 1" of the Great Red Snapper Count.

- This phase involves determining where each of the various habitat types exist across the Gulf.

How did scientists approach the habitat classification process?

- U.S. Gulf waters were separated into four regions: Texas, Louisiana, Mississippi-Alabama, and Florida.
- Each region was divided into three depth zones, creating 12 unique sections.

What did scientists learn from this process?

- Scientists calculated the amount of the U.S. Gulf of Mexico that is covered by sand, mud, and natural reefs.
- Scientists also determined the quantity of existing artificial reef structures.

Why is this information useful?

- Based on the distribution and number of different habitat types, scientists developed a sampling approach, or "gear types," to use in the Great Red Snapper Count.
- This will allow us to best possible estimate of red snapper abundance in each section of the U.S. Gulf of Mexico.

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The Great Red Snapper Count

DIRECT VISUAL COUNTS

This fact sheet describes the direct visual counts phase of the Great Red Snapper Count, which is a two-year research project to estimate the abundance of red snapper in the U.S. Gulf of Mexico.

Where will scientists count red snapper?

Counts will be performed across the U.S. Gulf of Mexico at various habitat types (see more details, see our "Habitat Classification" video and fact sheet).

What types of equipment will scientists use onboard research vessels?

- Scientists will use two types of camera equipment: remotely operated vehicles (ROVs) and towed cameras.
- An ROV is deployed from a stationary vessel and driven by an operator in a specific platform, much like the operation of a remote-controlled car.
- A towed camera is pulled behind a research vessel at a constant speed and altitude above the seafloor, along a predetermined path.
- Both camera types will record video footage to be analyzed later.

Questions or comments? Contact the project team at snappercount@hattermaninstitute.org. For more information, visit snappercount.org.

The Great Red Snapper Count - DIRECT VISUAL COUNTS

Why do scientists need to use two different types of equipment?

- ROVs are best for surveying discrete artificial and natural habitats.
- Towed cameras are best for surveying large expanses of sand and mud bottom.

How will scientists collect fish count data from the video footage?

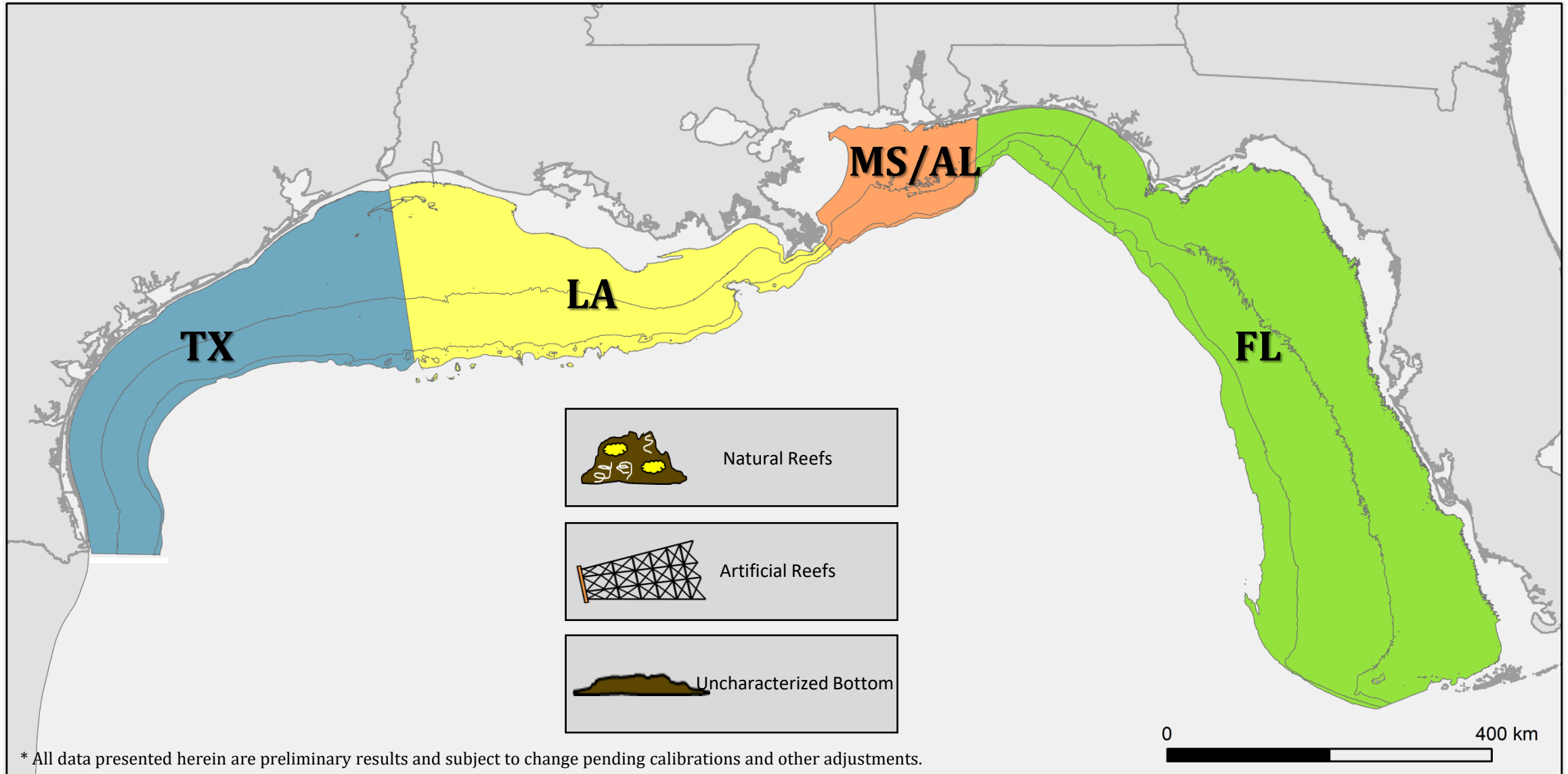
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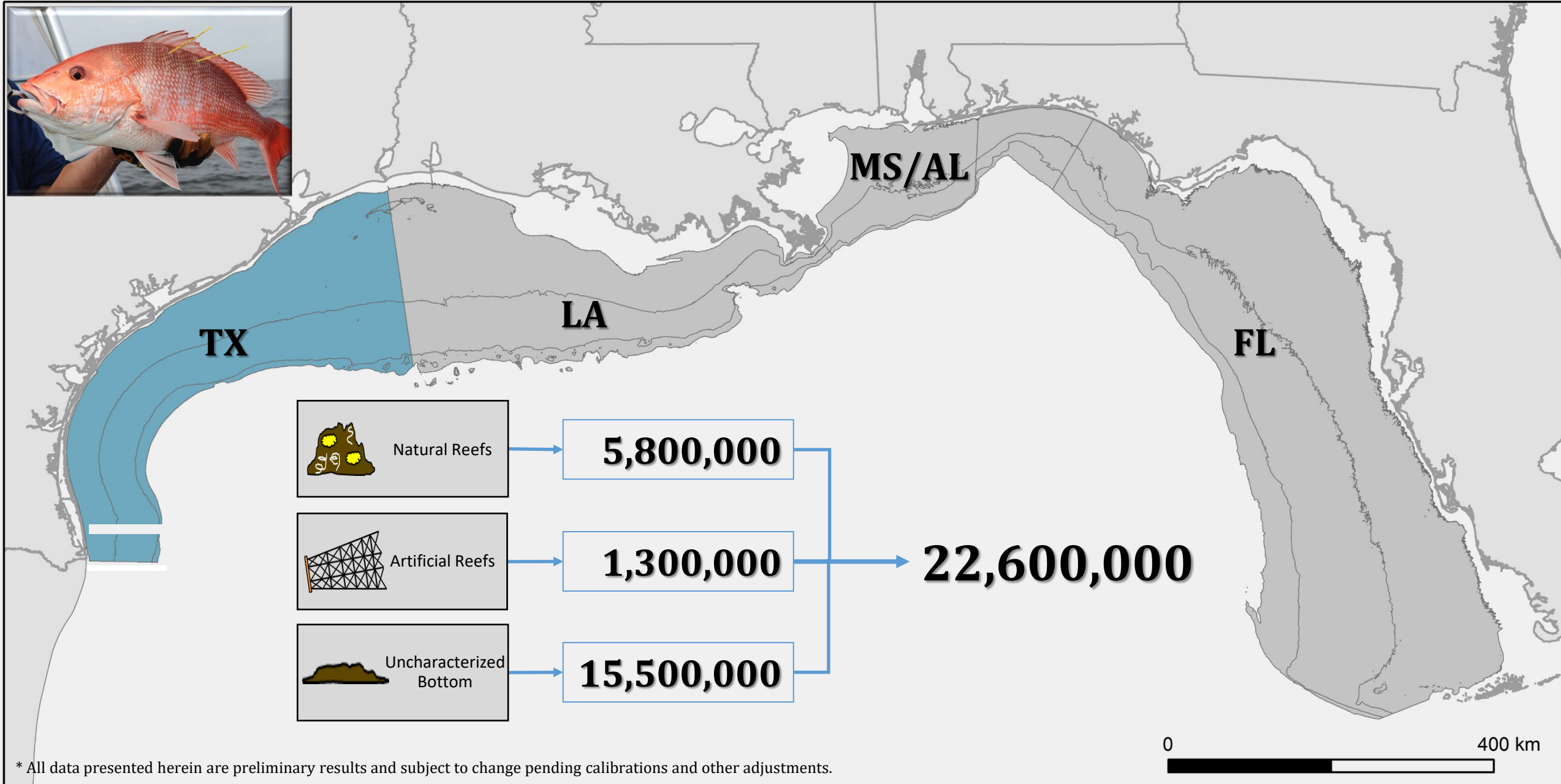
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www.snappercount.org

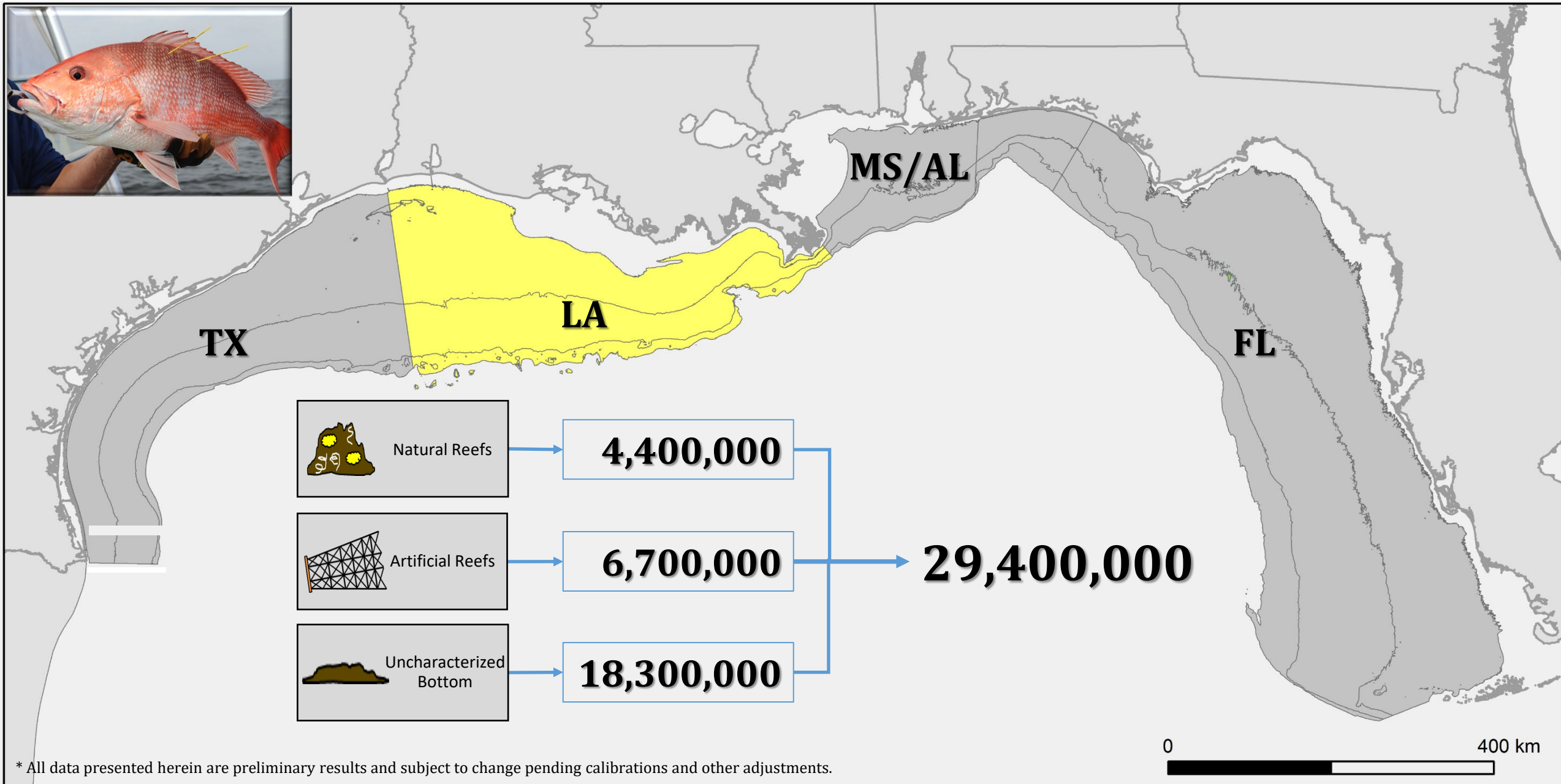
5. Estimate by Region and Habitat



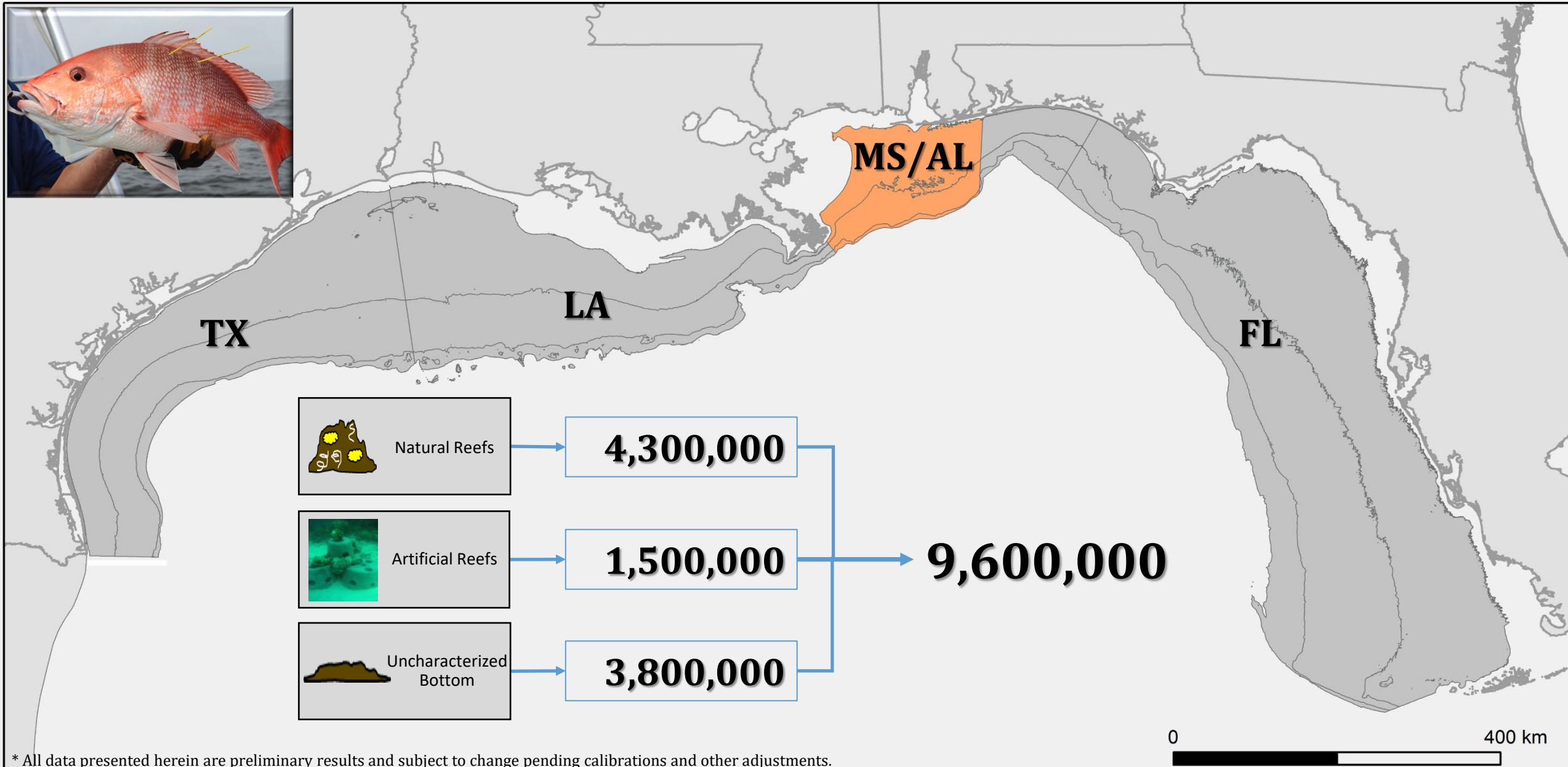
Texas



Louisiana

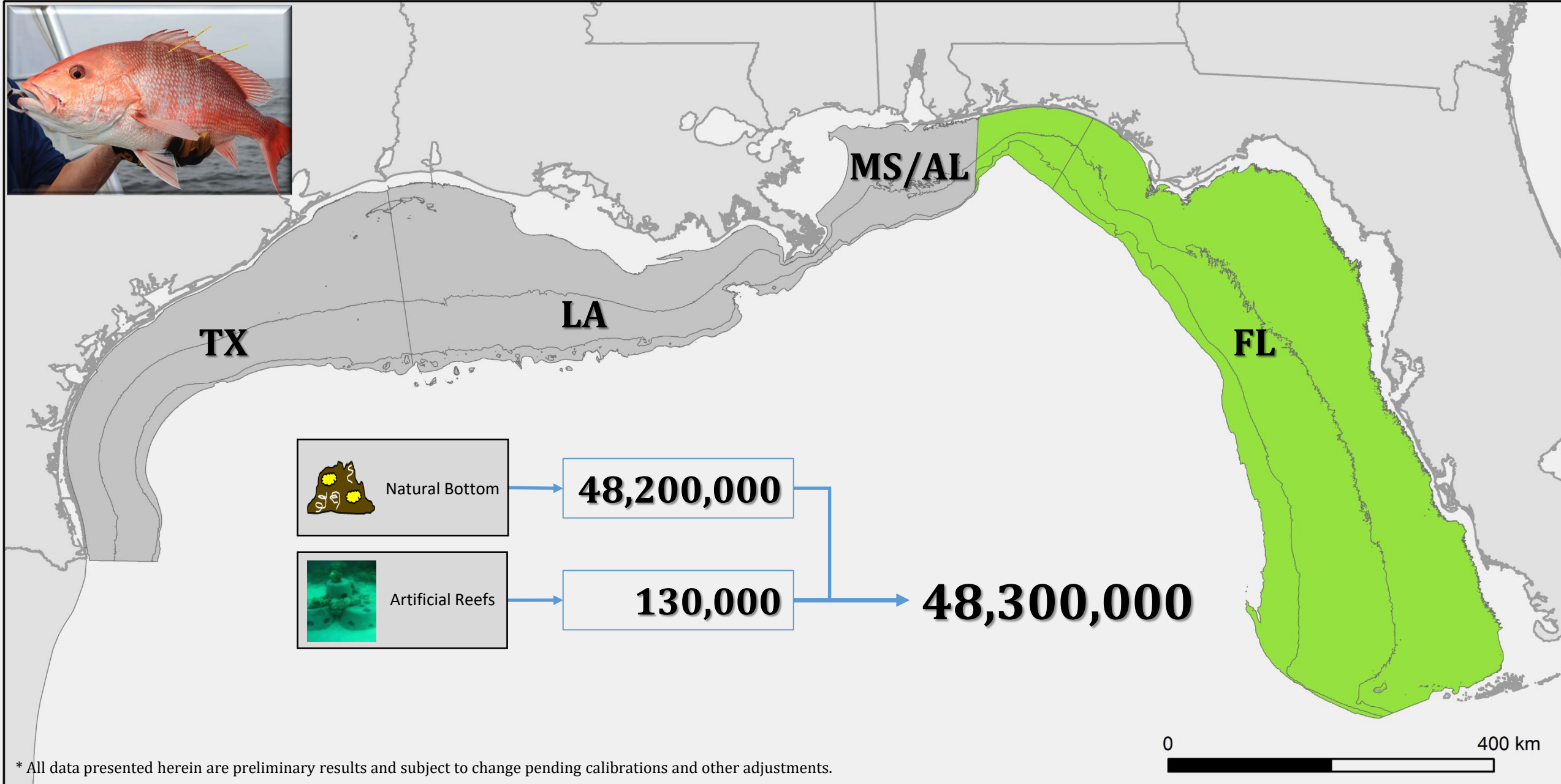


Mississippi/Alabama



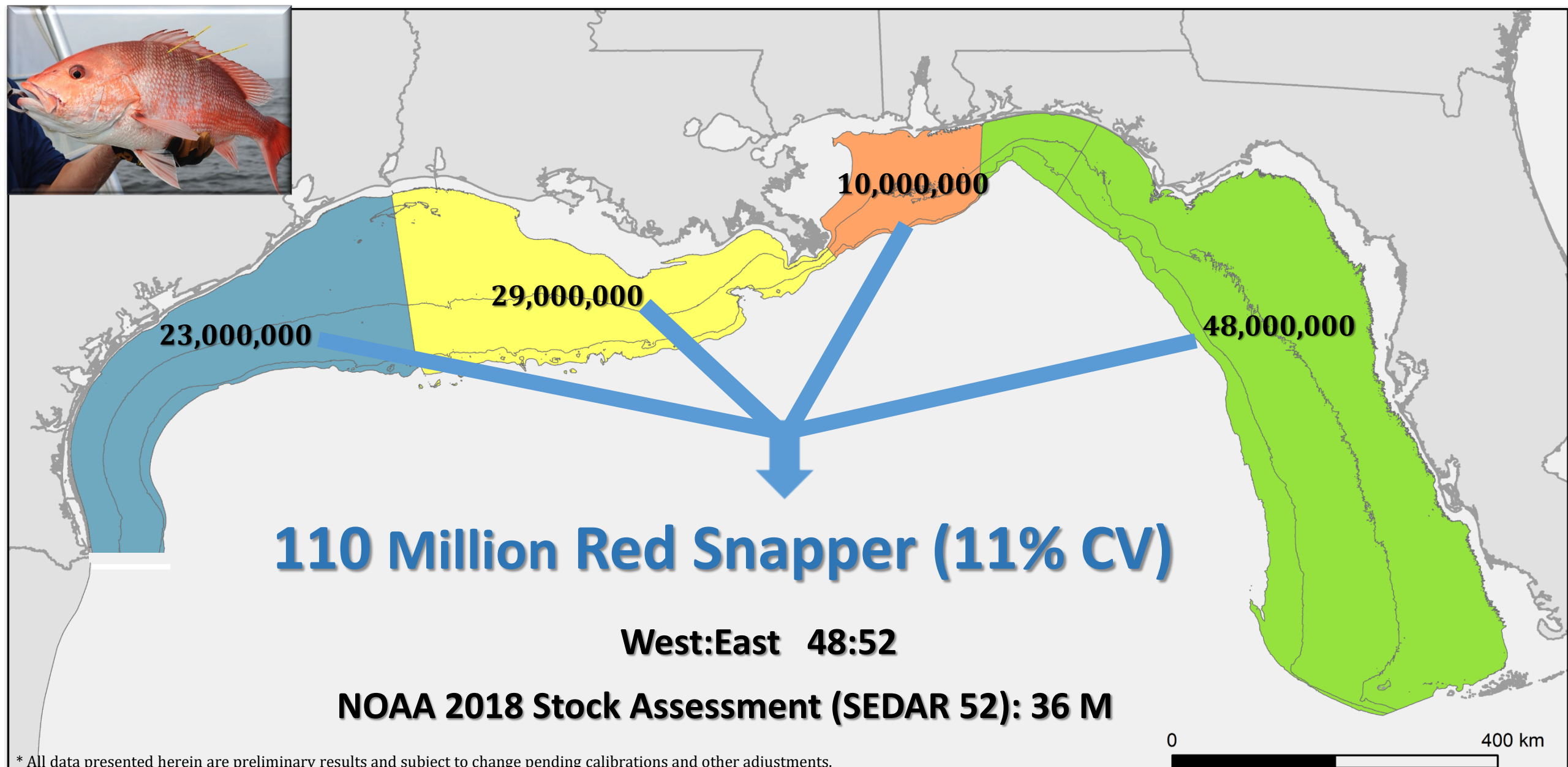
* All data presented herein are preliminary results and subject to change pending calibrations and other adjustments.

Florida



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Total Red Snapper in the U.S. Gulf of Mexico



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Key Takeaways:

- Science working - non-competitive and building process
- Fishery exploitation pattern is very important - on habitats with low abundance
- High abundance over Uncharacterized Bottom - may explain weak S-R relationship
- Effort recalibration likely reflective of these abundance in new assessment
- An astonishing 30% tagging return rate shows discard mortality low and C&R works
- Tremendous angler buy-in - direct implications - “*DESCEND Act*” (H.R. 5126) –Timely!
- Future meetings with assessment teams, this is just beginning
- Strong SSC and Gulf Council affiliations will facilitate direct management integration
- Extensive engagement plan with stakeholders this fall

Acknowledgements



- **Steering Committee**
- **Dr. LaDon Swann**
 - **Loretta Leist**
 - **Devaney Cheramie**