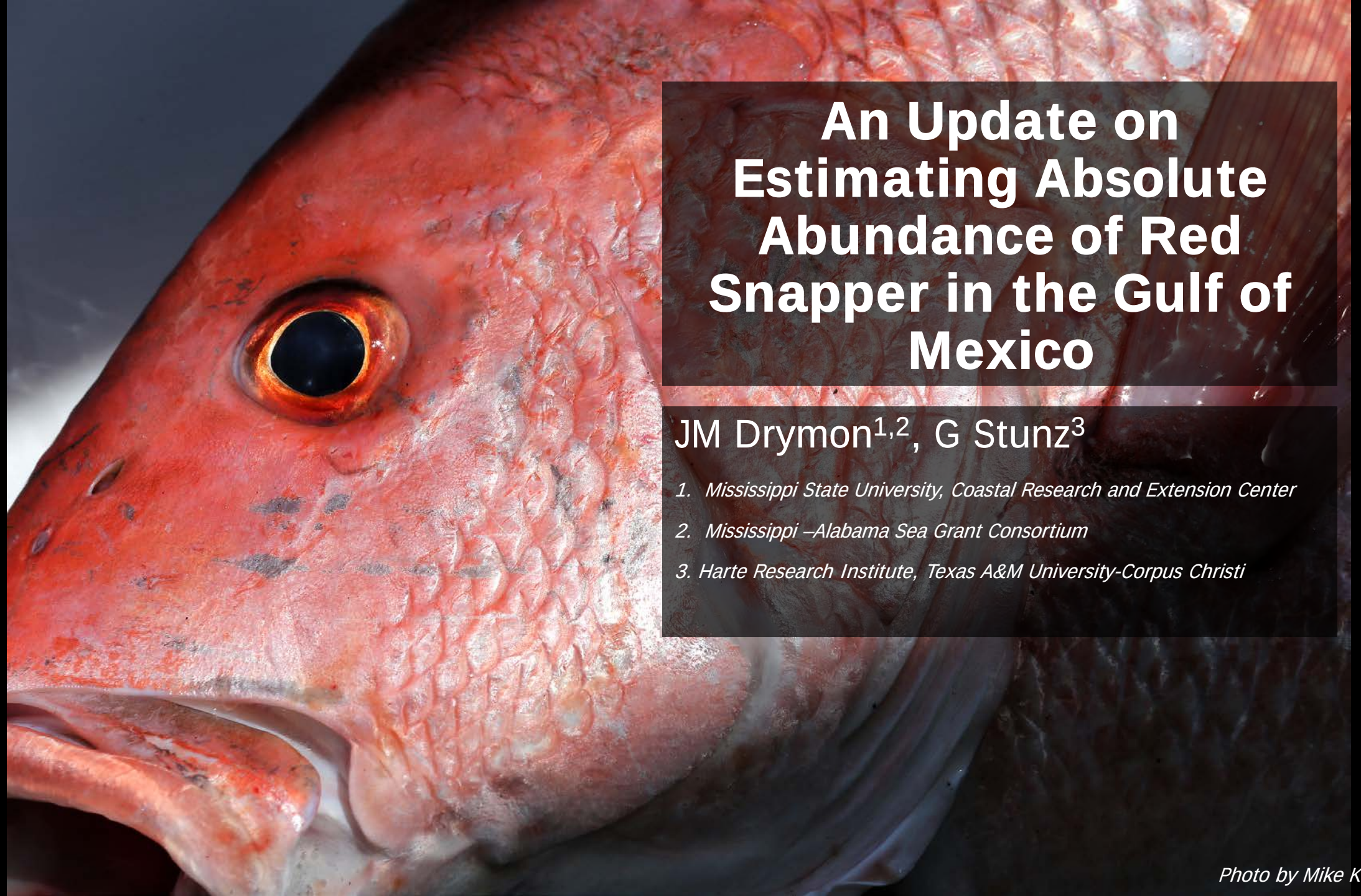


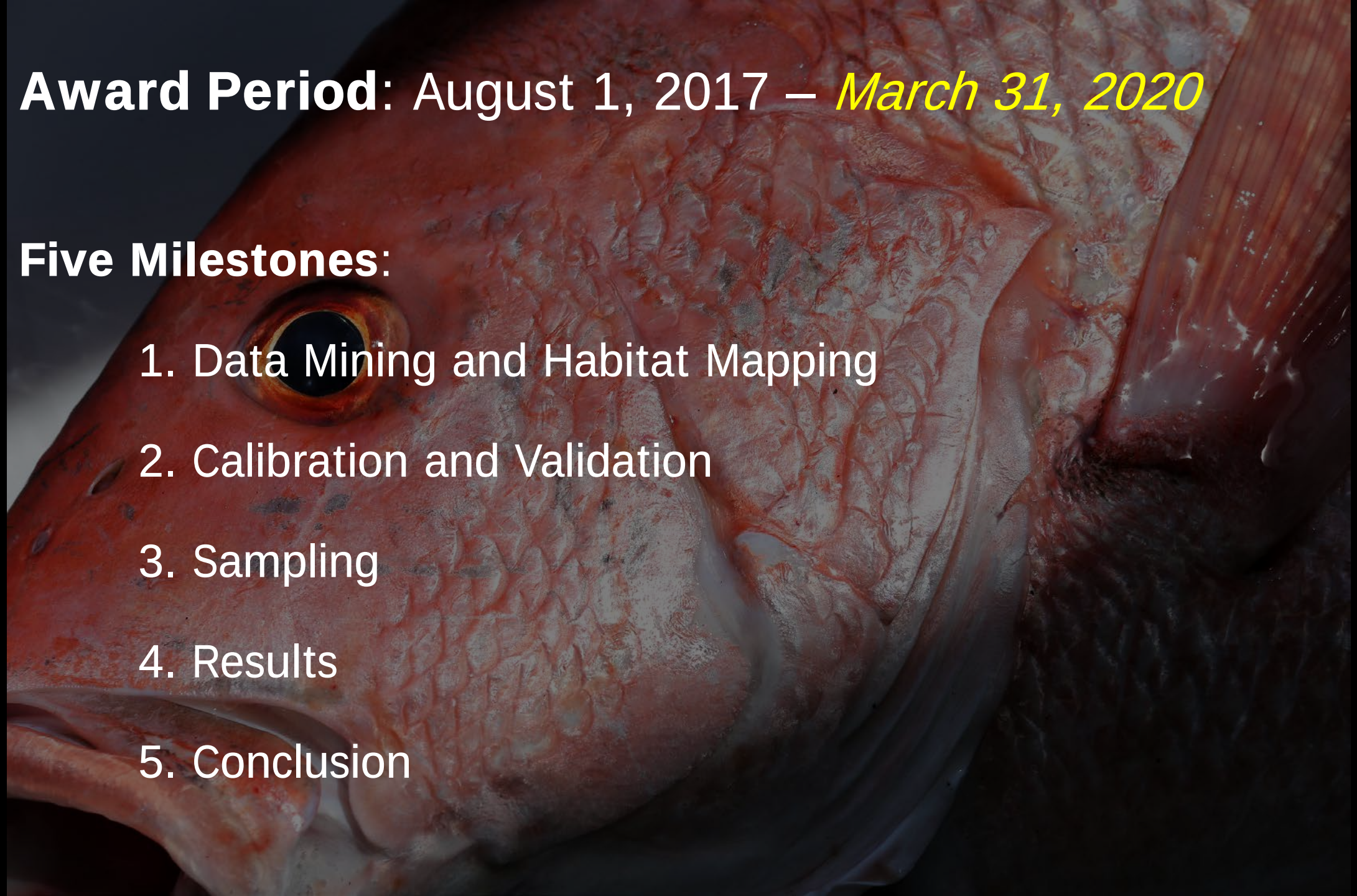
An Update on Estimating Absolute Abundance of Red Snapper in the Gulf of Mexico

JM Drymon[1,2], G Stunz[3]

1. *Mississippi State University, Coastal Research and Extension Center*
2. *Mississippi –Alabama Sea Grant Consortium*
3. *Harte Research Institute, Texas A&M University-Corpus Christi*

Photo by Mike Kittrell

Award Period: August 1, 2017 – *March 31, 2020*



Award Period: August 1, 2017 – *March 31, 2020*

Five Milestones:

1. Data Mining and Habitat Mapping
2. Calibration and Validation
3. Sampling
4. Results
5. Conclusion

Award Period: August 1, 2017 – *March 31, 2020*

Five Milestones:

1. *Data Mining and Habitat Mapping*
2. *Calibration and Validation*
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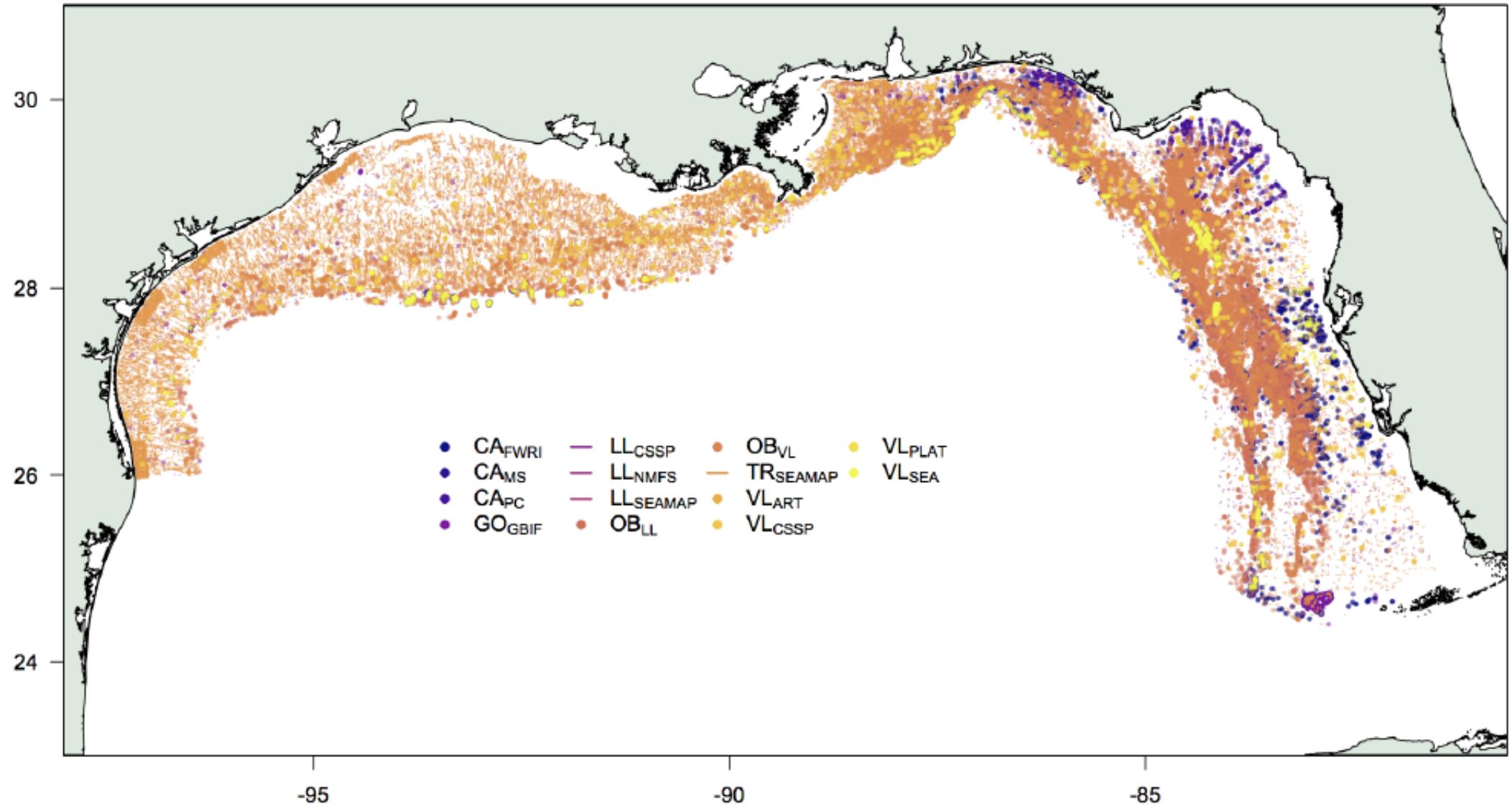
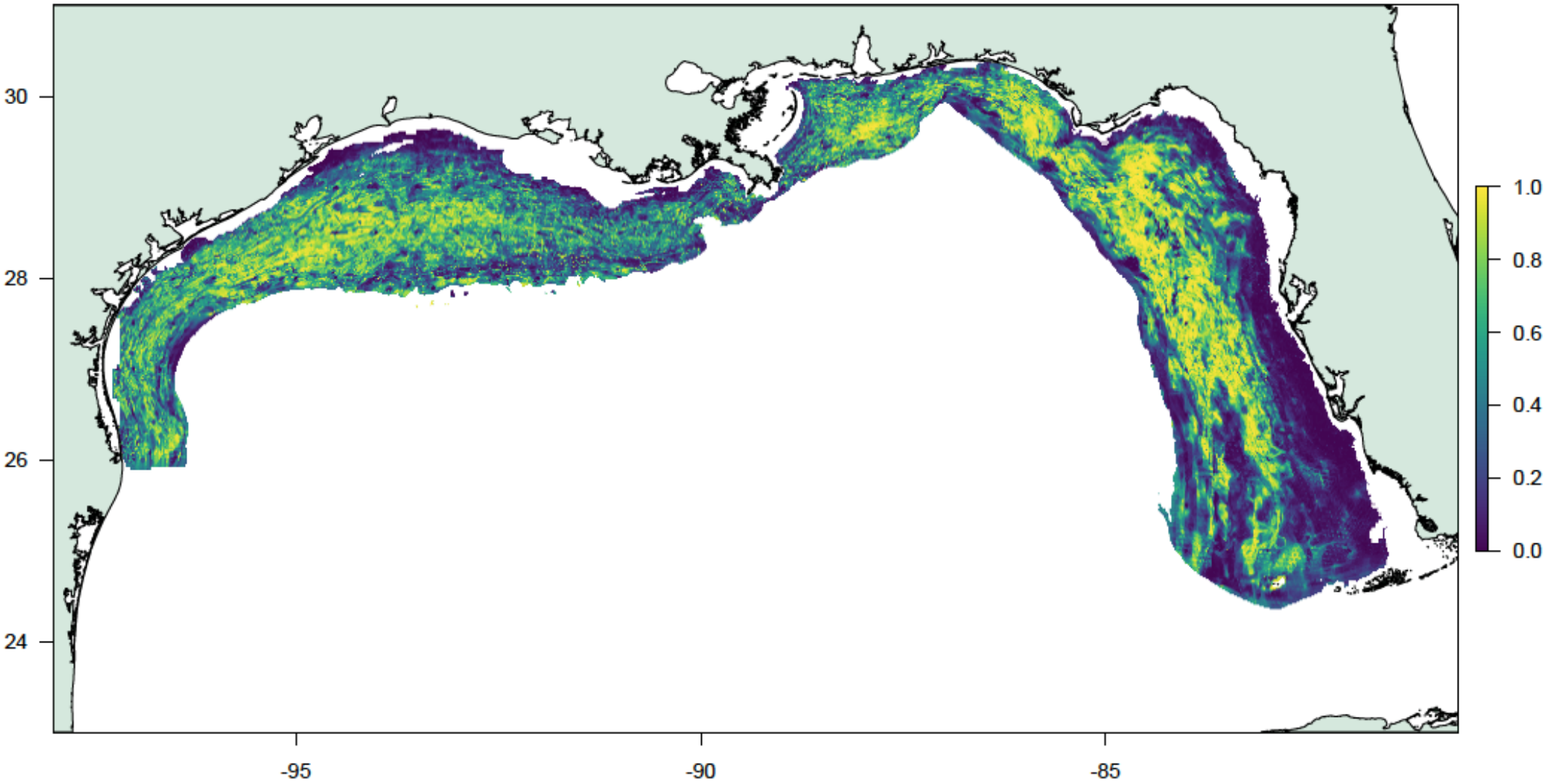
1. Data Mining and Habitat Mapping (Ahrens and Siders) - **COMPLETED**

Goal: chose stratified random sampling locations

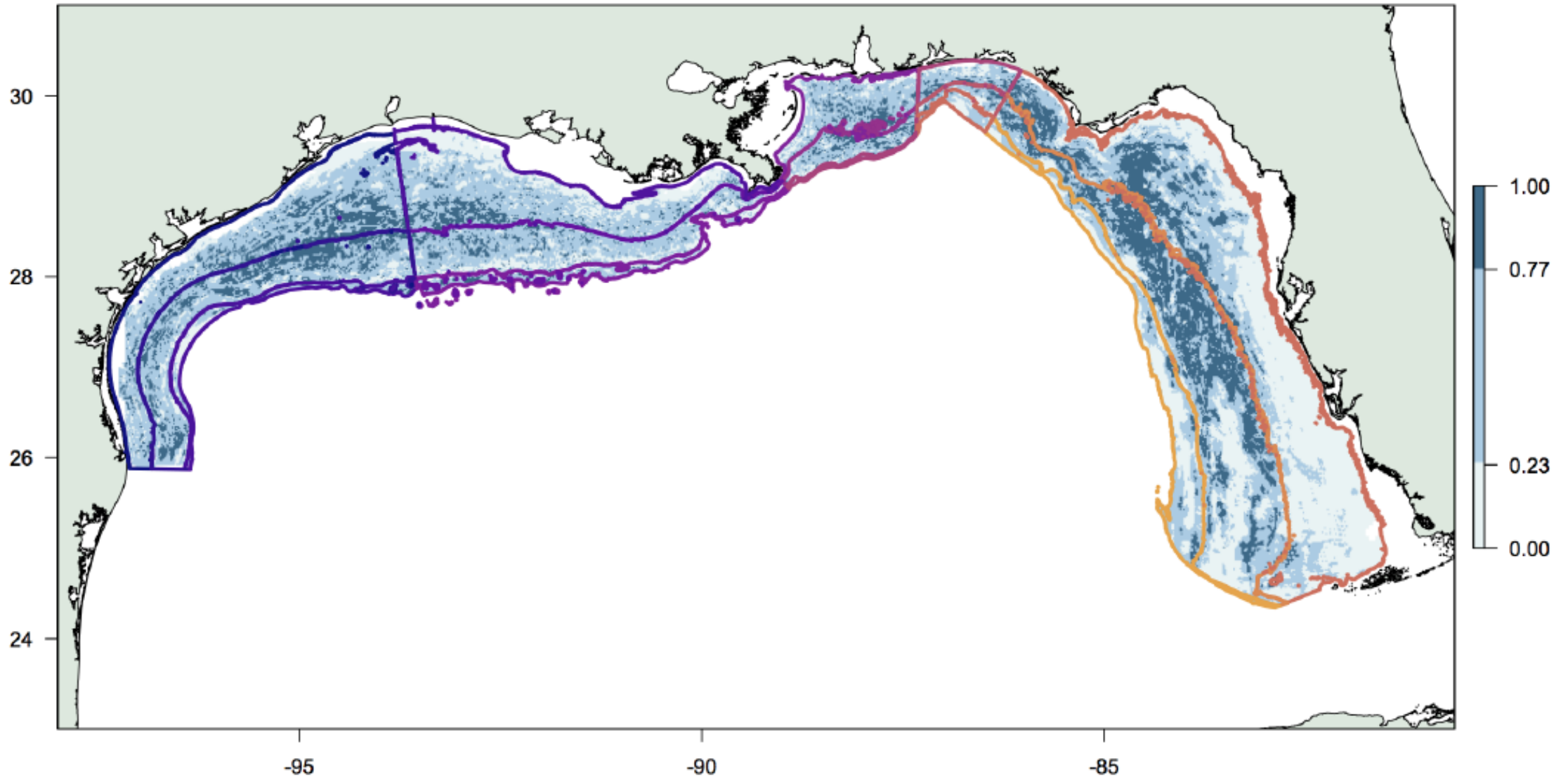
Accomplished by: Combining known red snapper locations from fisheries-independent and fisheries-dependent data sources with environmental covariates to predict probability of presence (high, medium, low) using a random forest model. Stratified random sampling locations were then chosen from this prediction grid.



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



(Above) The predicted probability of presence of Red Snapper from a Random Forest model. Probability of presence is the probability of at least one Red Snapper being located in the cell.



(Above) Applying the high/low threshold to the probability of presence map to create three levels.

2. Calibration and Validation (All PIs) – **NEARLY COMPLETE**

Goal: Ensure accurate estimates of fish density and abundance.

Western GOM

ROV: VideoRay Defender (Stunz, TAMU-CC)
Towed Camera: TARAS Phantom (Rooker, TAMUG)

Eastern GOM

ROV: Outland Technologies (Powers, USA)
Towed Camera: C-BASS (Murawski, USF)

2. Calibration and Validation (All PIs) – **NEARLY COMPLETE**

Goal: Ensure accurate estimates of fish density and abundance.

Direct Count Calibration

Murawski and Patterson – **completed** eGOM C-BASS/ROV calibration

Rooker and Stunz – **completed** wGOM TARAS/ROV calibration

Patterson – **completed** trials in Florida to calibrate bioacoustics with visual surveys from ROV.

2. Calibration and Validation (All PIs) – **NEARLY COMPLETE**

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Direct Count Calibration

Murawski and Patterson – **completed** eGOM C-BASS/ROV calibration

Rooker and Stunz – **completed** wGOM TARAS/ROV calibration

Patterson – **completed** trials in Florida to calibrate bioacoustics with visual surveys from ROV. An additional calibration experiment will begin in September 2019 to calibrate biomass and distribution data with sonar and acoustic tags. *This will serve as the primary calibration for artificial and natural reefs across the GOM.*

2. Calibration and Validation (All PIs) - **COMPLETE**

Goal: Ensure accurate estimates of fish density and abundance

Mark-recapture Tagging

Patterson – 900 fish in Florida (2018)

Catalano, Powers, Drymon – 750, 500 and 500 fish in Alabama (2016, 2017, 2018 respectively)

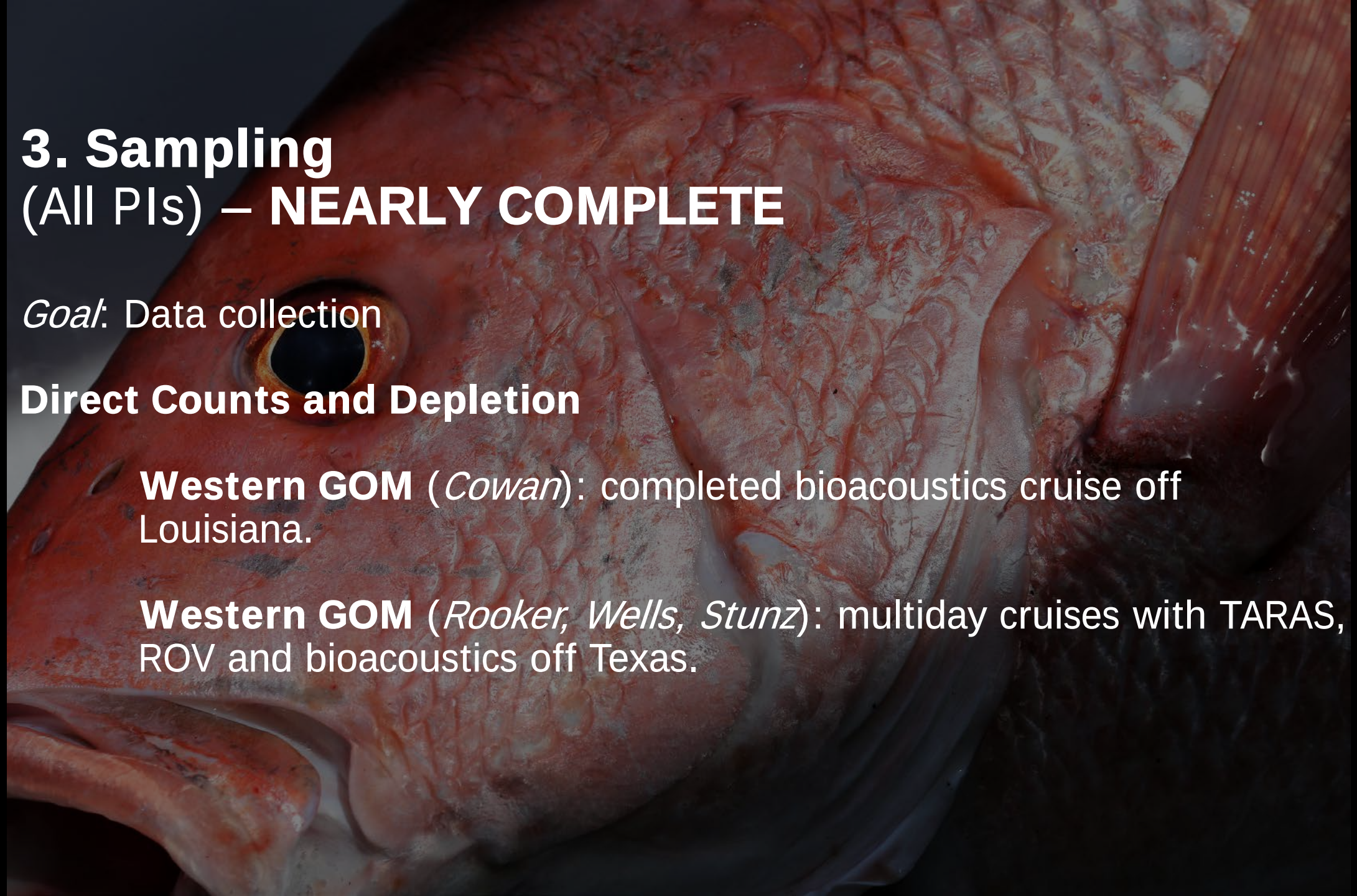
3. Sampling (All PIs) – **NEARLY COMPLETE**

Goal: Data collection

Direct Counts and Depletion

Eastern GOM (*Patterson, Murawski, Boswell*): multiday cruises completed off Florida, Alabama, Mississippi using ROV, C-BASS and bioacoustics.

Eastern GOM (*Powers, Hoenig, Drymon*): vertical longline depletion using Index Removal



3. Sampling (All PIs) – **NEARLY COMPLETE**

Goal: Data collection

Direct Counts and Depletion

Western GOM (*Cowan*): completed bioacoustics cruise off Louisiana.

Western GOM (*Rooker, Wells, Stunz*): multiday cruises with TARAS, ROV and bioacoustics off Texas.

3. Sampling (All PIs) - **ONGOING**

Goal: Data collection

High-reward Tagging

1,453 legal-sized fish have been tagged

3. Sampling (All PIs) - **ONGOING**

Goal: Data collection

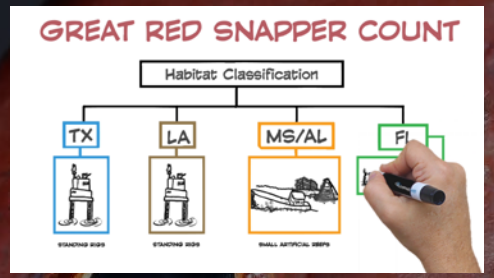
High-reward Tagging

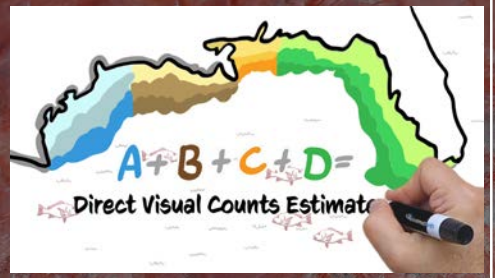
1,453 legal-sized fish have been tagged

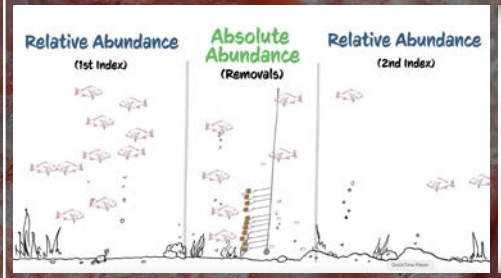
20.5% recapture rate Gulf-wide

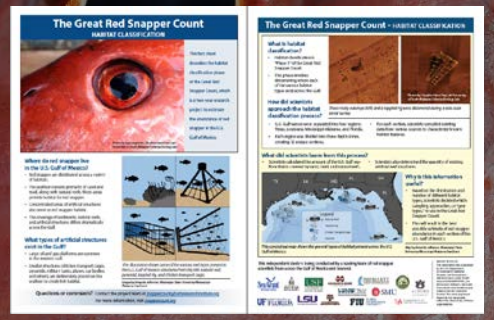
25.3% in FL, 20.3% in AL/MS, 19.6% in TX

Stakeholder Engagement: Phase 1 COMPLETE

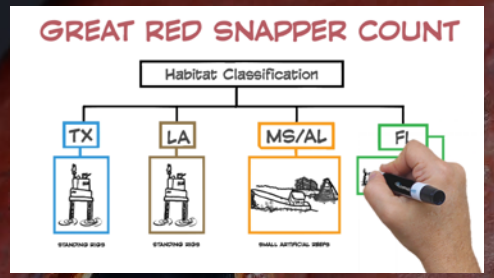


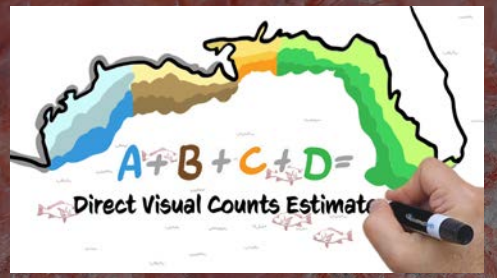


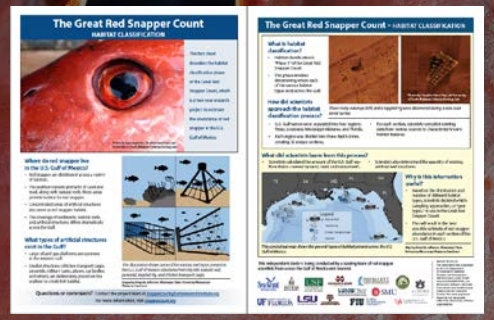


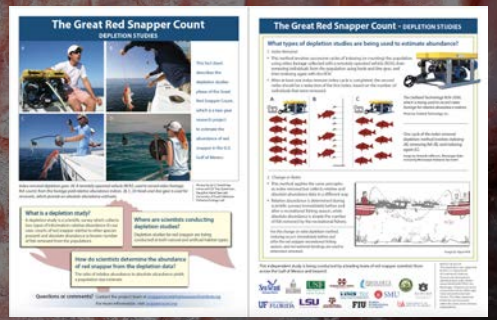


Stakeholder Engagement: Phase 1 COMPLETE









January 2019: AP reporter picked up an article from on high-reward tagging published by Mississippi State University Extension. Subsequent AP article titled "***Red snapper study to include $250 tags on fish***"

Picked up by 81 newspapers, 135.6 million unique views in 1 week.

Stakeholder Engagement: Phase 2 IN PROGRESS

Survey is designed and undergoing pretesting / review by key partners and stakeholders (S. Scyphers, Northeastern University).

Core sections of the survey are:

1) perceptions of stock status / health for red snapper and other reef fish

2) Trust/satisfaction with current and alternative management strategies

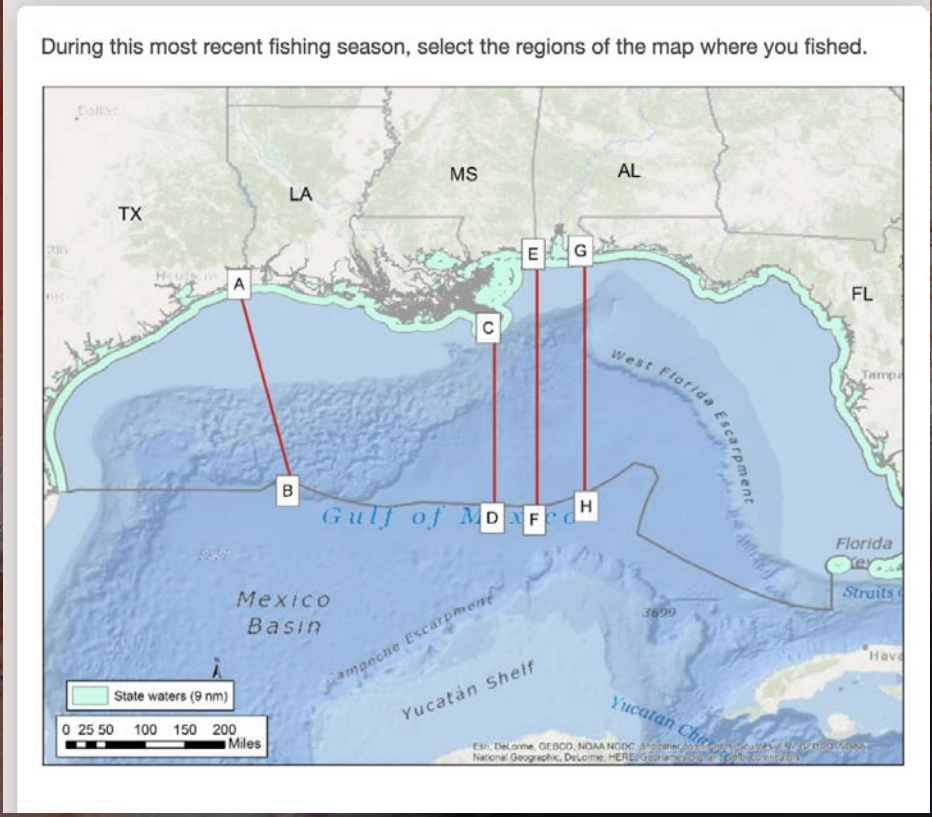
3) fishing behavior with an emphasis on recent changes in fishing effort, location, target species, and discarding

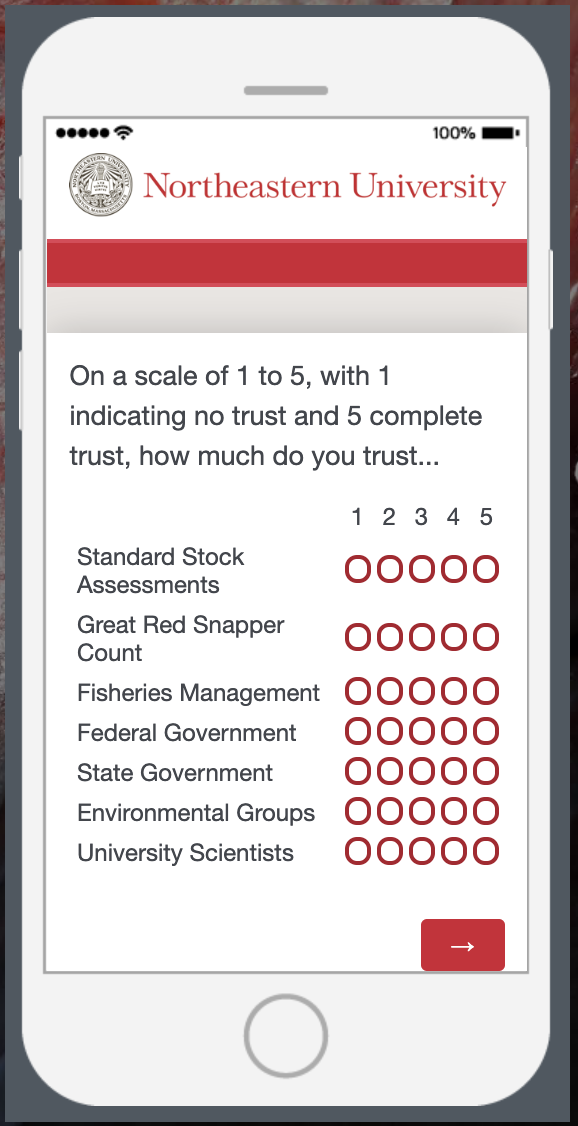
4) awareness and attitudes towards the great red snapper count

5) communication preferences for outreach and education messaging

Stakeholder Engagement: Phase 2 IN PROGRESS

Survey pretesting and refinement to continue through this month. Formal data collection first two weeks of November.





Moving Forward

2019

Regional leads to provide habitat-specific fish counts per unit area, with georeferencing, to quantitative team lead (co-PI Ahrens) by December 2019

2020

Project ends: March 31, 2020
Final report to NOAA: June 29, 2020

Questions