

# Western Gulf of Mexico: A Synopsis of Research on Recreational Fishing Practices and Discard Mortality

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*Center for*  
**SPORTFISH SCIENCE  
& CONSERVATION**






# Overarching Research Objectives

1. Estimate survival of discarded Red Snapper using acoustic telemetry
2. Compare performance of release tools in reducing discard mortality
3. Partner with the local recreational fishing community to facilitate use

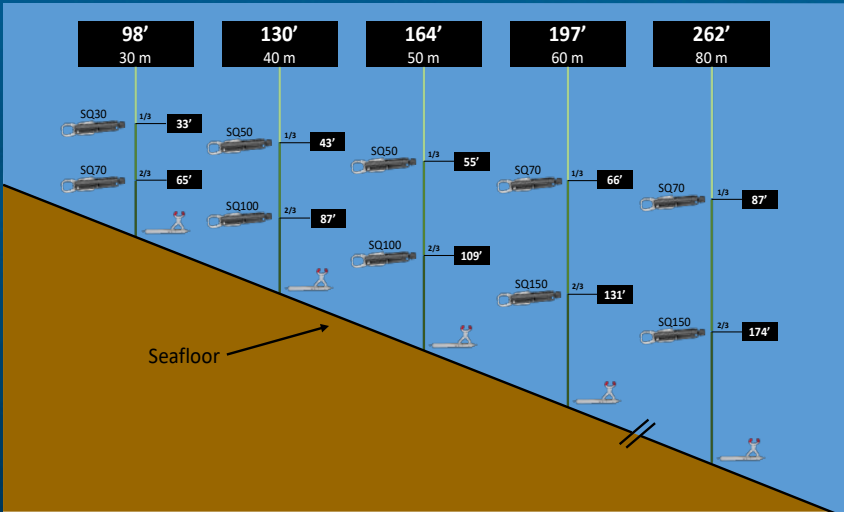
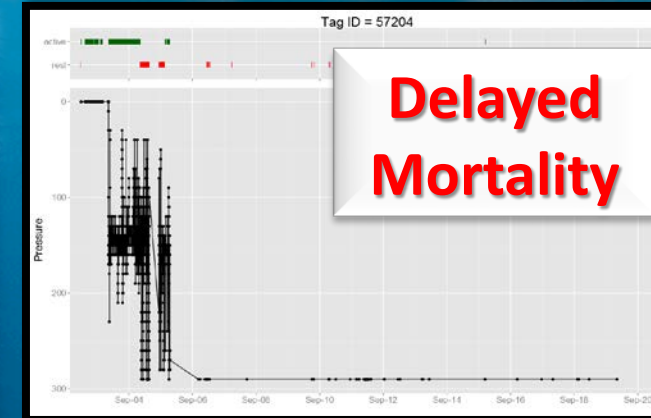
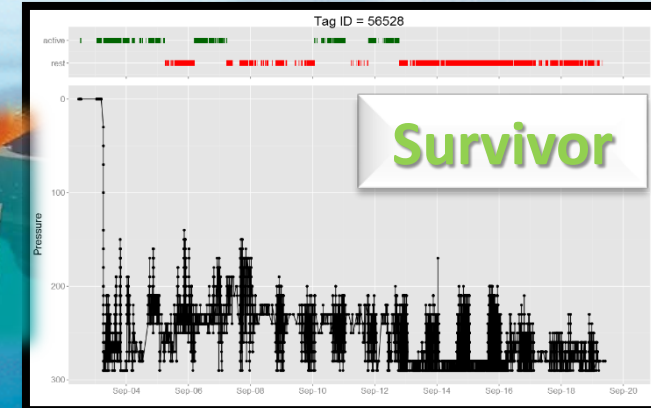


<p><b><u>DESCEND IT!</u></b></p> <p>Some questions to keep in mind while testing your SeaQualizer™:</p> <ul style="list-style-type: none"><li>• How feasible is it to use this device to release every fish suffering from barotrauma?</li><li>• Does the use of this device distract you from other important activities such as fishing or tending to clients?</li><li>• Does the device take too long to use? Could it be improved?</li><li>• At what depth do you believe descender devices are no longer beneficial to the fish's survival?</li></ul> <p>For more information on best release practices, visit <a href="http://www.fishsmart.org">www.fishsmart.org</a></p> <p>For more information on discard mortality, visit <a href="http://www.sportfishresearch.org">www.sportfishresearch.org</a></p>	<p><b>RECREATIONAL FISHERMEN: WE NEED YOUR HELP!</b></p>  <p>The Center for Sportfish Science &amp; Conservation is partnering with FishSmart to reduce discard mortality in federally managed reef fish through the use of descender devices.</p> <p>FishSmart is providing willing recreational fishermen with a <b>FREE</b> SeaQualizer™ to test on their vessel! All we ask is that you provide your honest feedback on your opinions of the device.</p> <p><b>FishSmart</b> Center for Sportfish Science &amp; Conservation</p> <p><b>HARTE</b> RESEARCH INSTITUTE FOR GULF OF MEXICO STUDIES</p>
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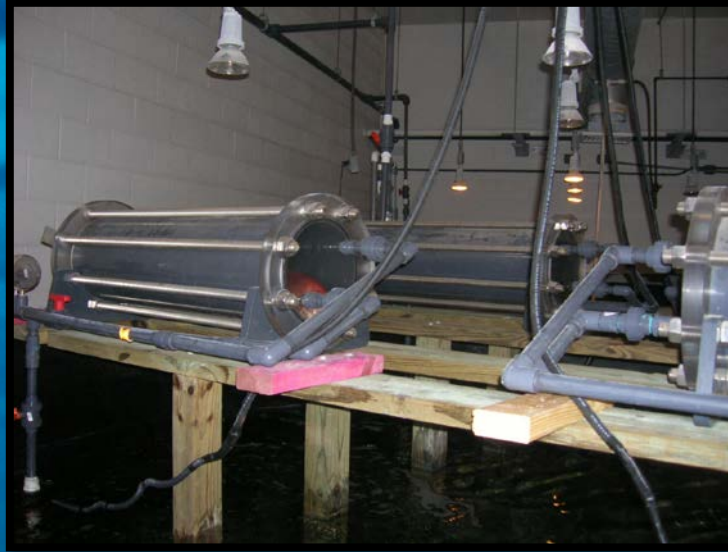
# Scientific Tagging Key Points

1. Acoustic tagging useful tool for determining delayed mortality in discarded fish
2. Rapid recompression strategies using descender devices increase survival compared to venting/nonventing
3. Submergence to seafloor not necessary for recompression effects to be beneficial





# Laboratory Trials



Vent/Recompress

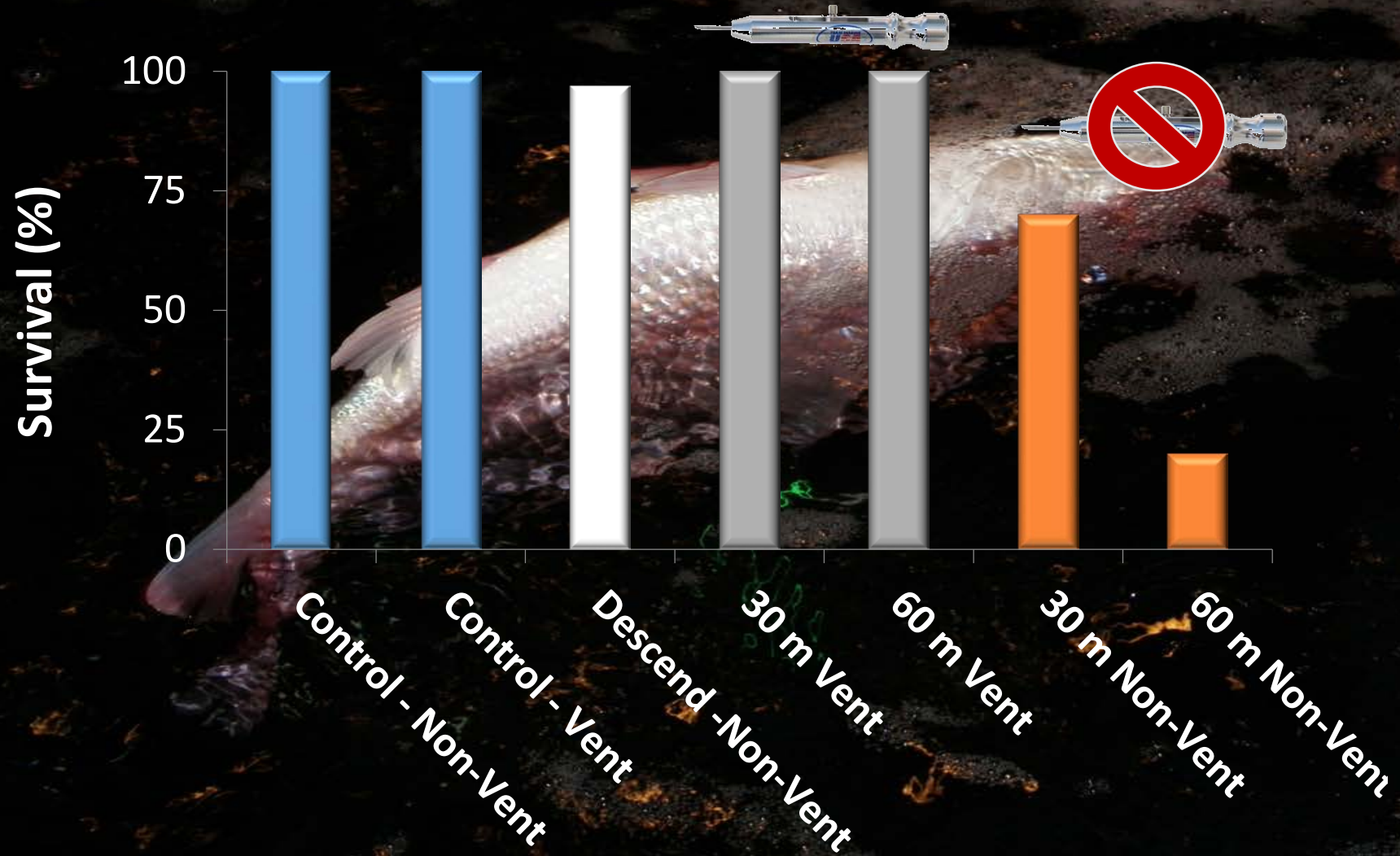


Non-Vented

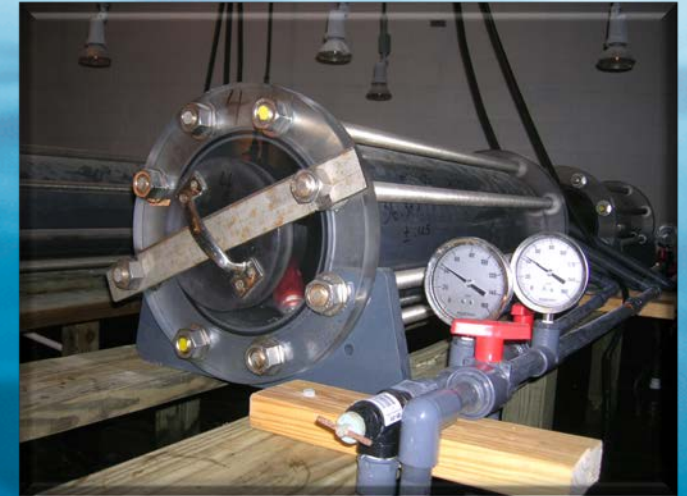
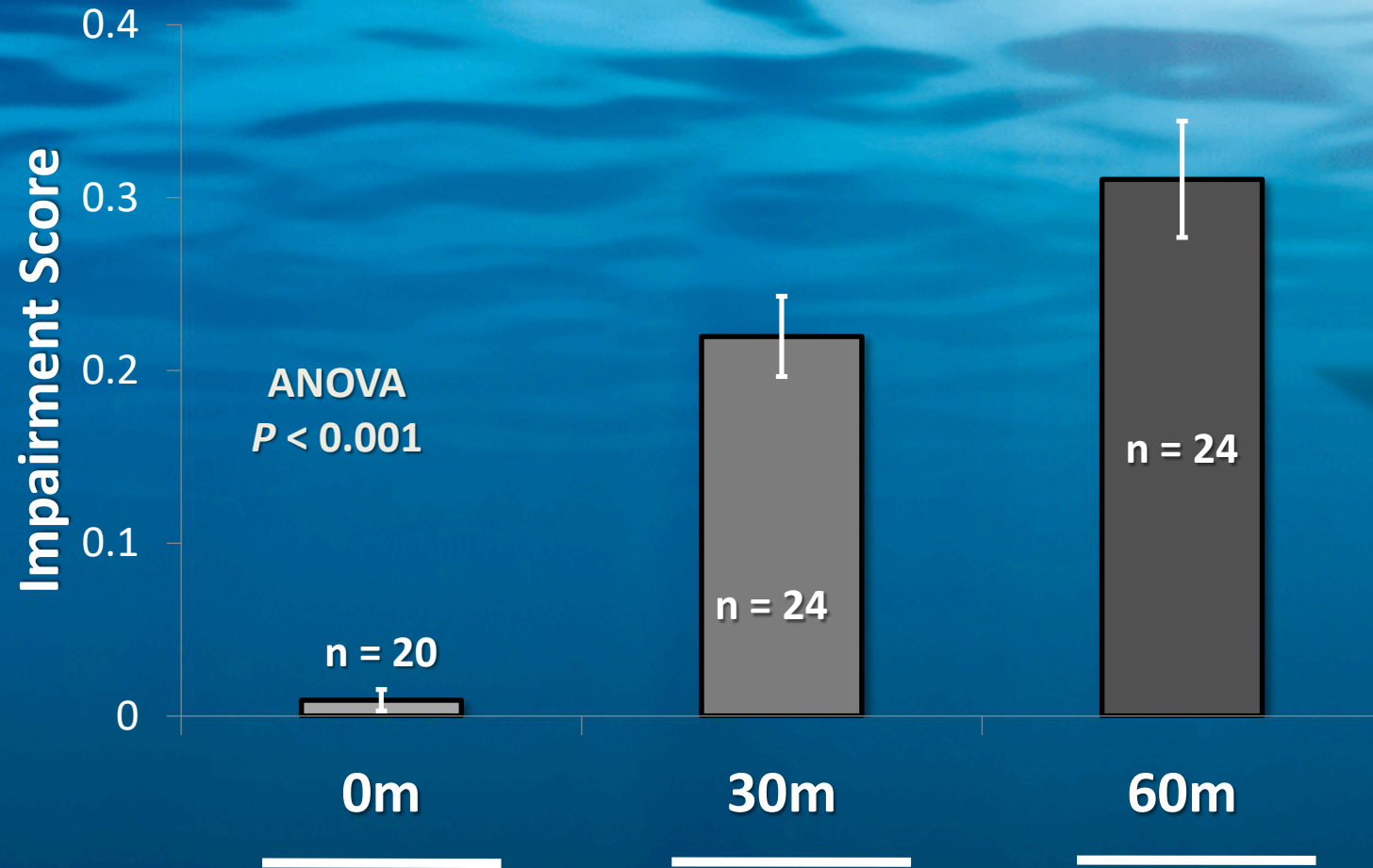




# Laboratory Survival



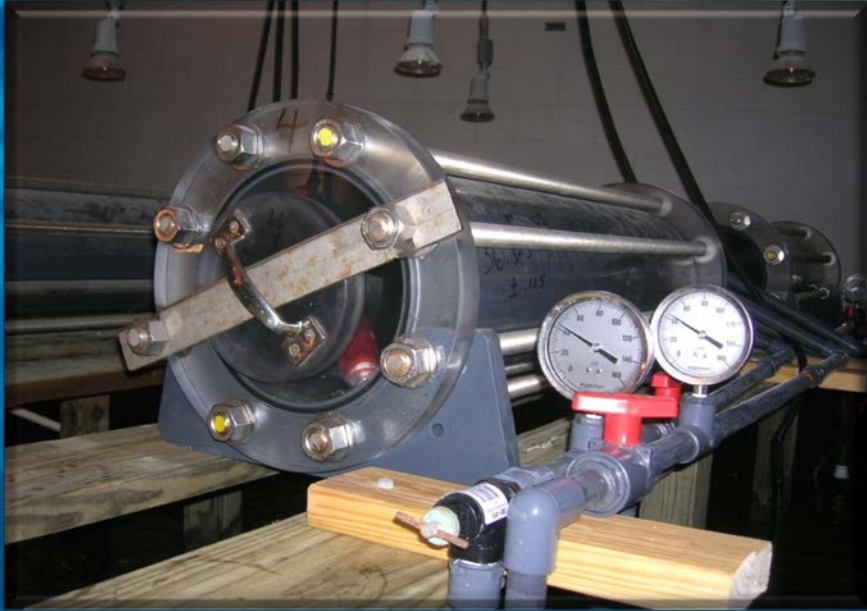
# Barotrauma Impairment



Drumhiller et al. 2014 - NOAA-MARFIN



# Moving Offshore



Laboratory Studies

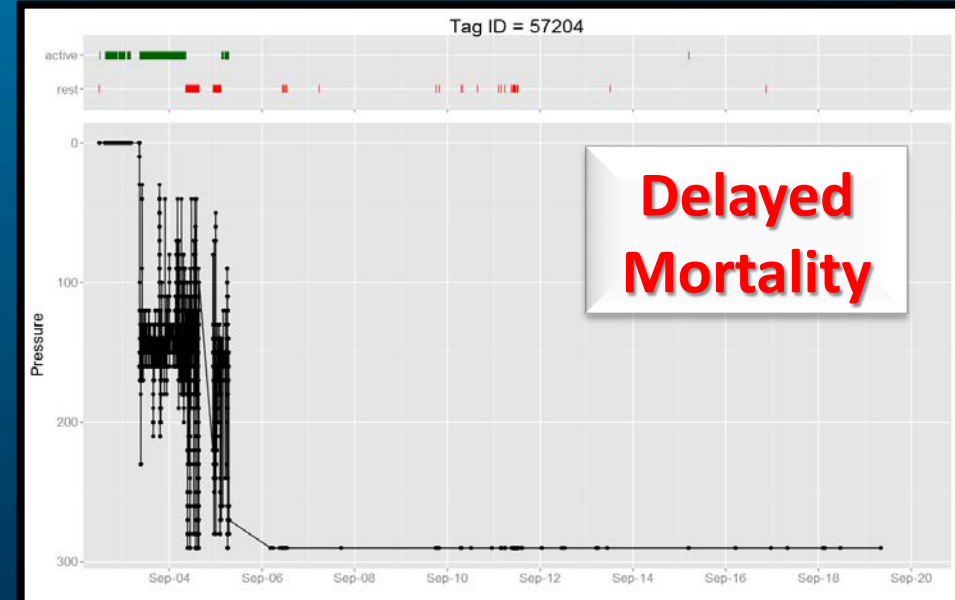
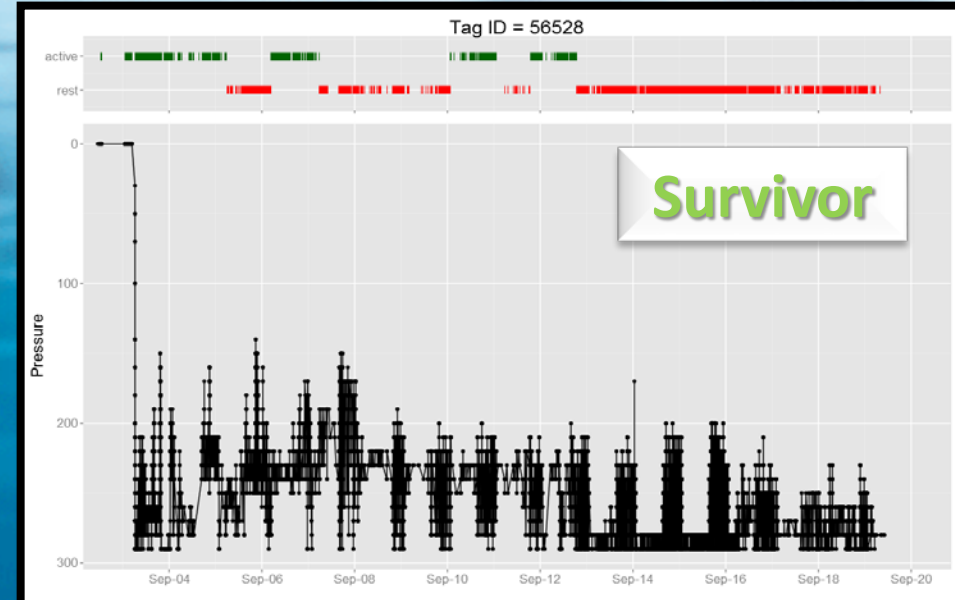


Field Studies

- 1) Field conditions inherently more variable*
- 2) Depth effects in field?*
- 3) Temperature, Release Interactions?*

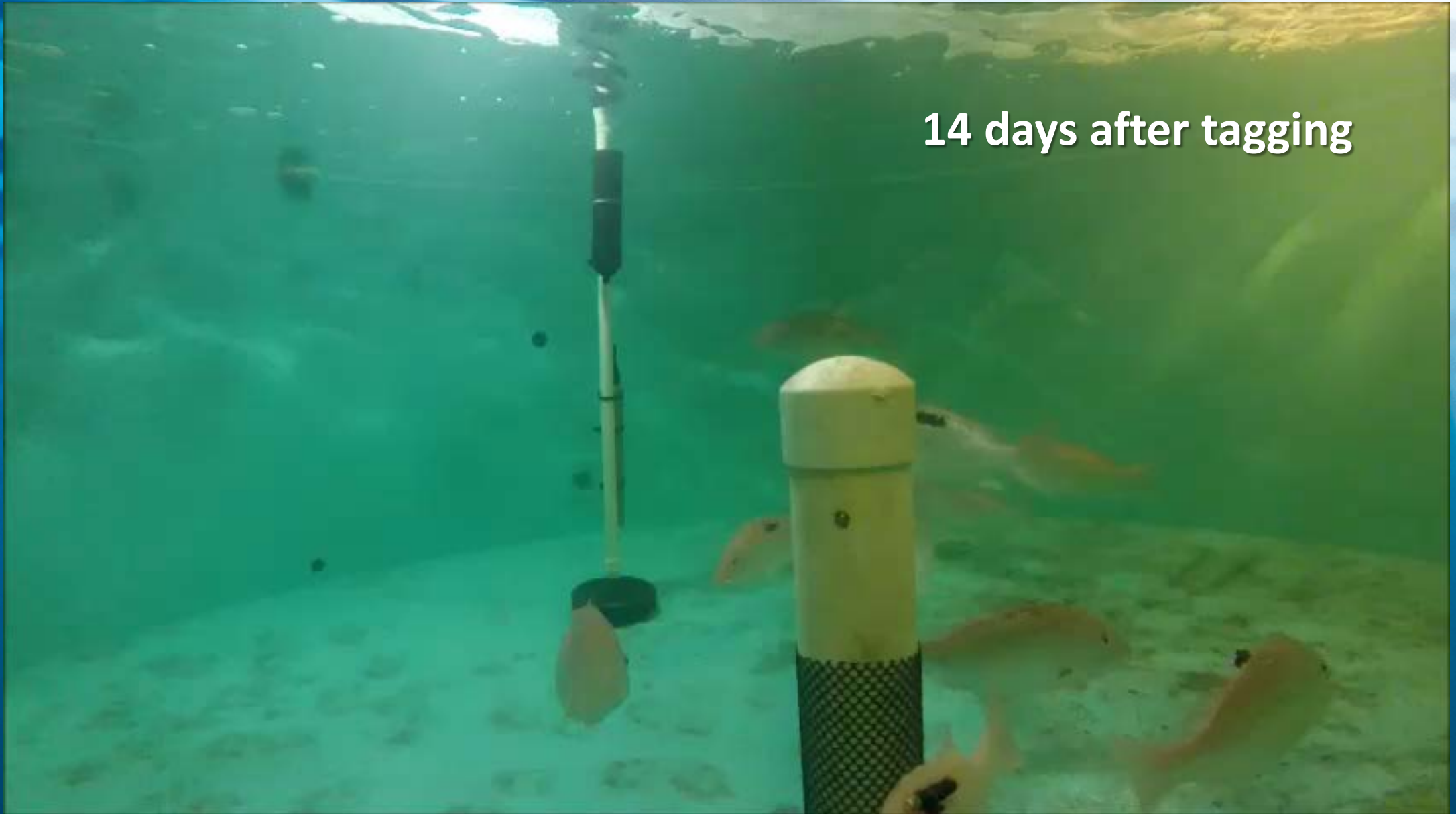


# Acoustic Telemetry





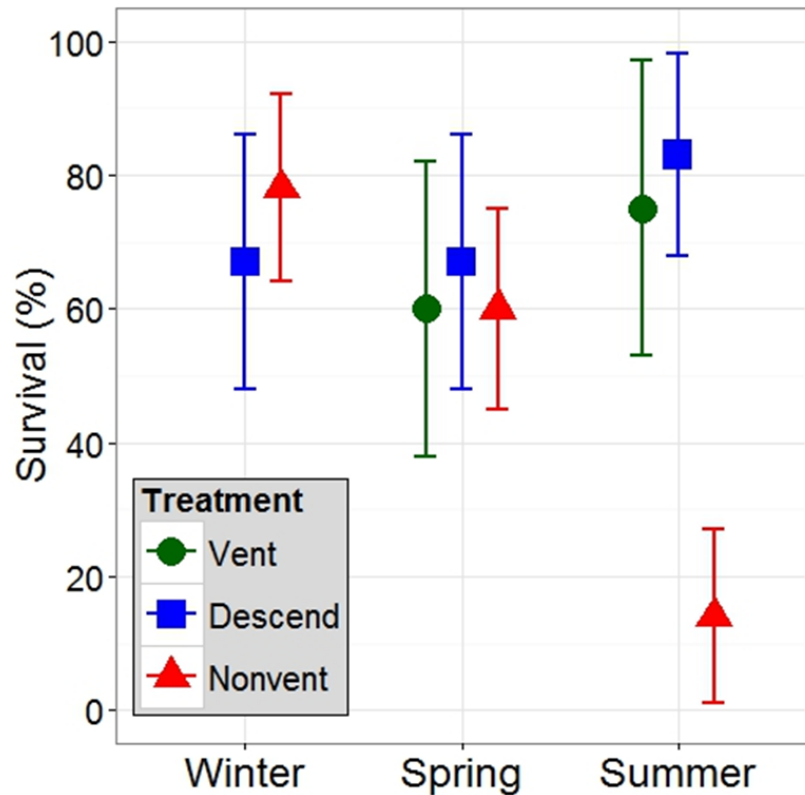
14 days after tagging



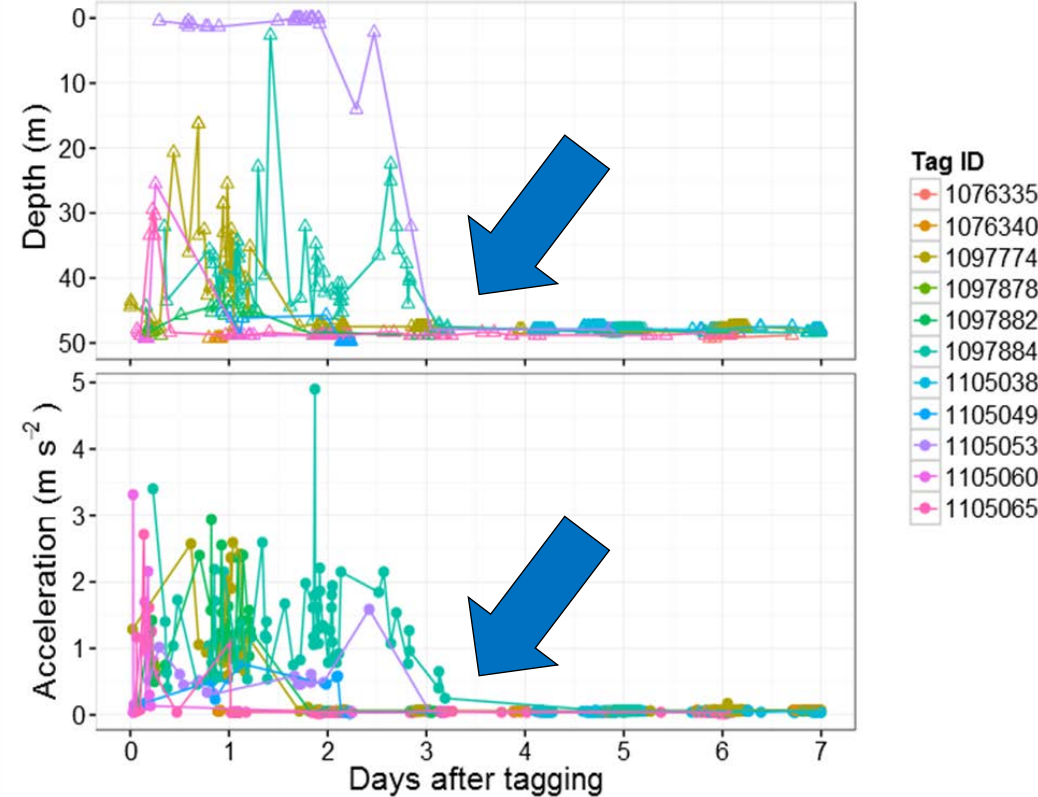


# Field Survival

## Seasonal Effects



## Delayed Mortality Signature



- 72-hour critical threshold

Curtis et al. 2015 – NOAA-MARFIN



# Summary 1<sup>st</sup> Field Trials

- Small sample sizes → Large variances
- Extent of Temperature x Release x Depth Interactions still uncertain



*Need more replication*

- Venting and Recompression > Non-venting
- 72-hr threshold for delayed mortality determined using acoustic telemetry



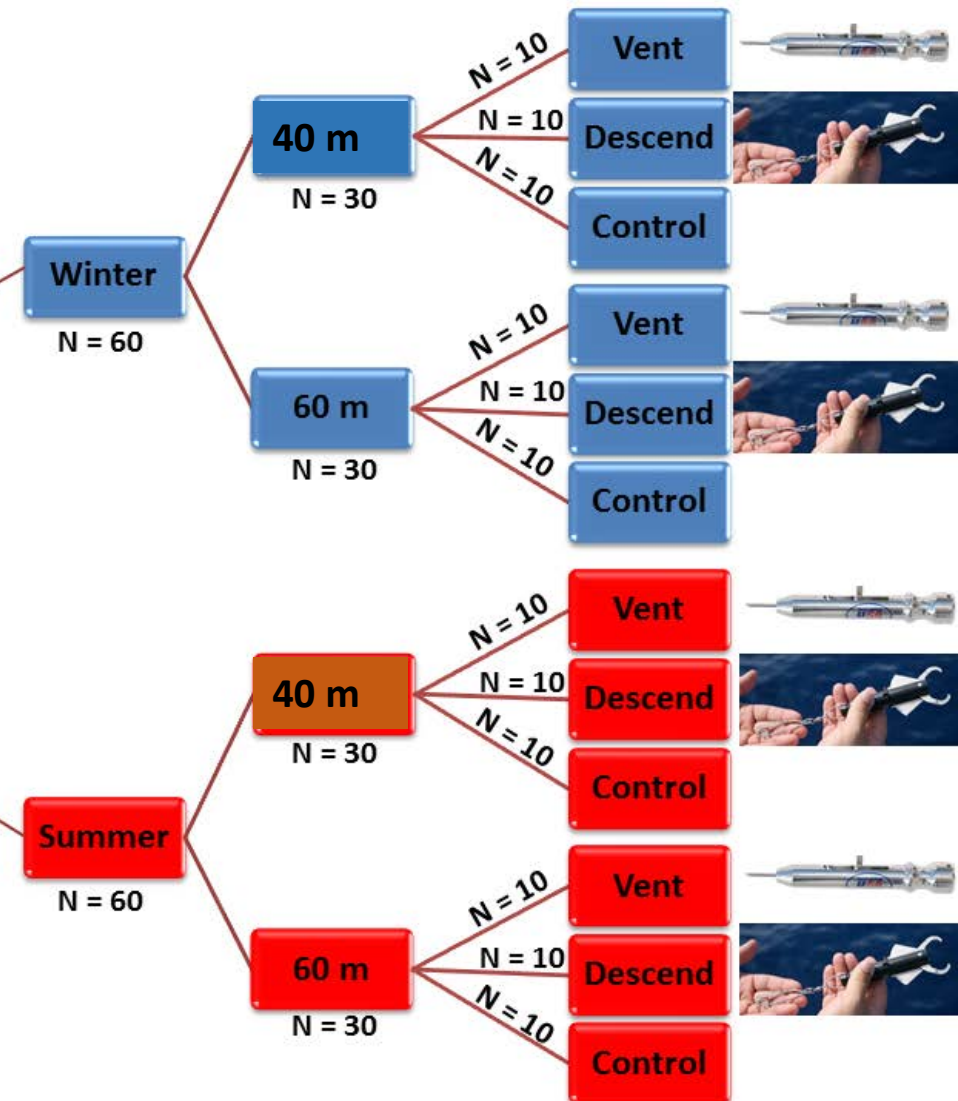
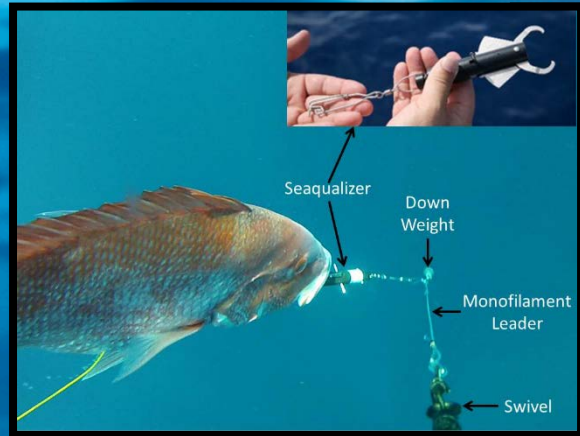
*Certain release treatments appear better*



*Acoustic telemetry useful tool*



# Field Studies: Depth x Season

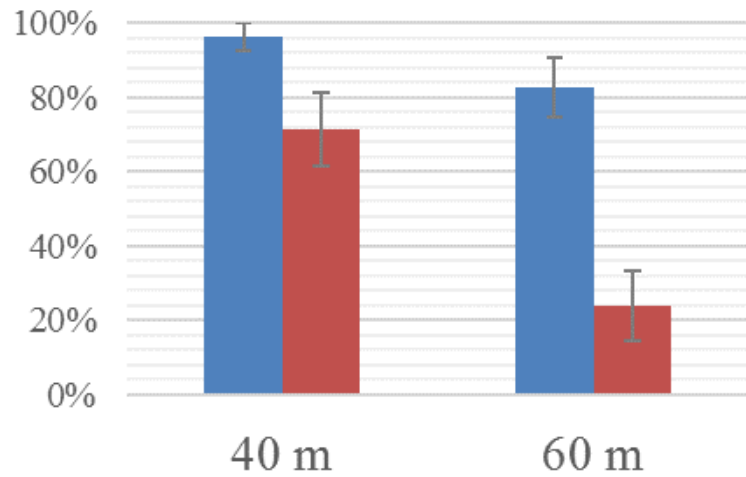




# Survival Results

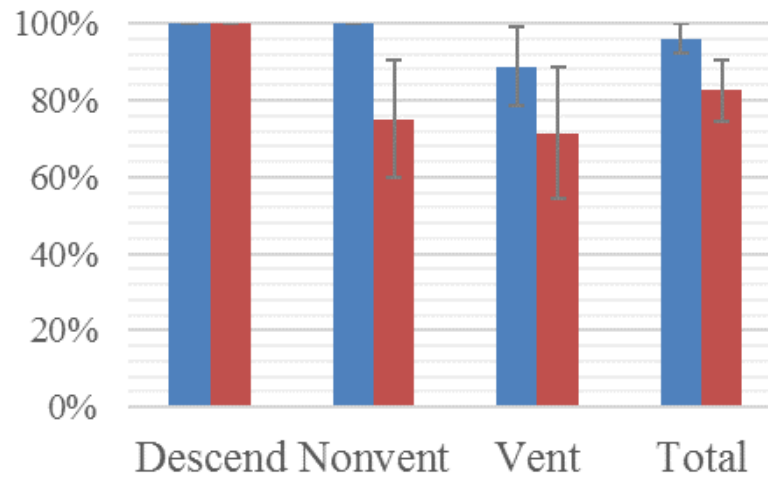
## Total Survival

■ Winter ■ Summer



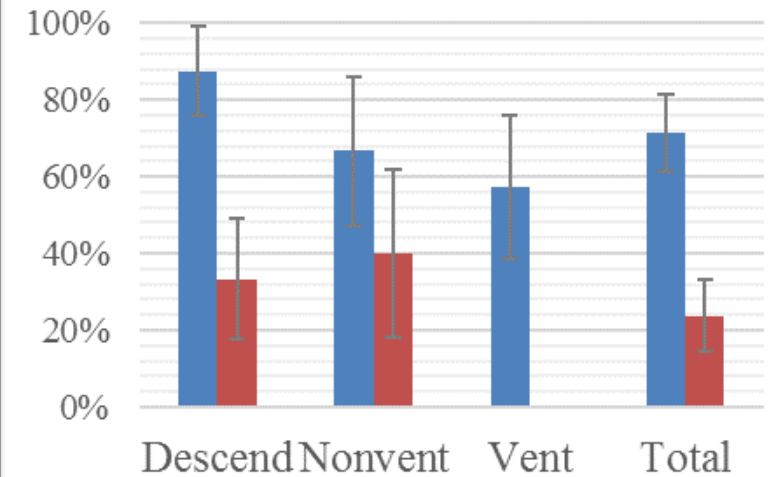
## Winter

■ 40 m ■ 60 m



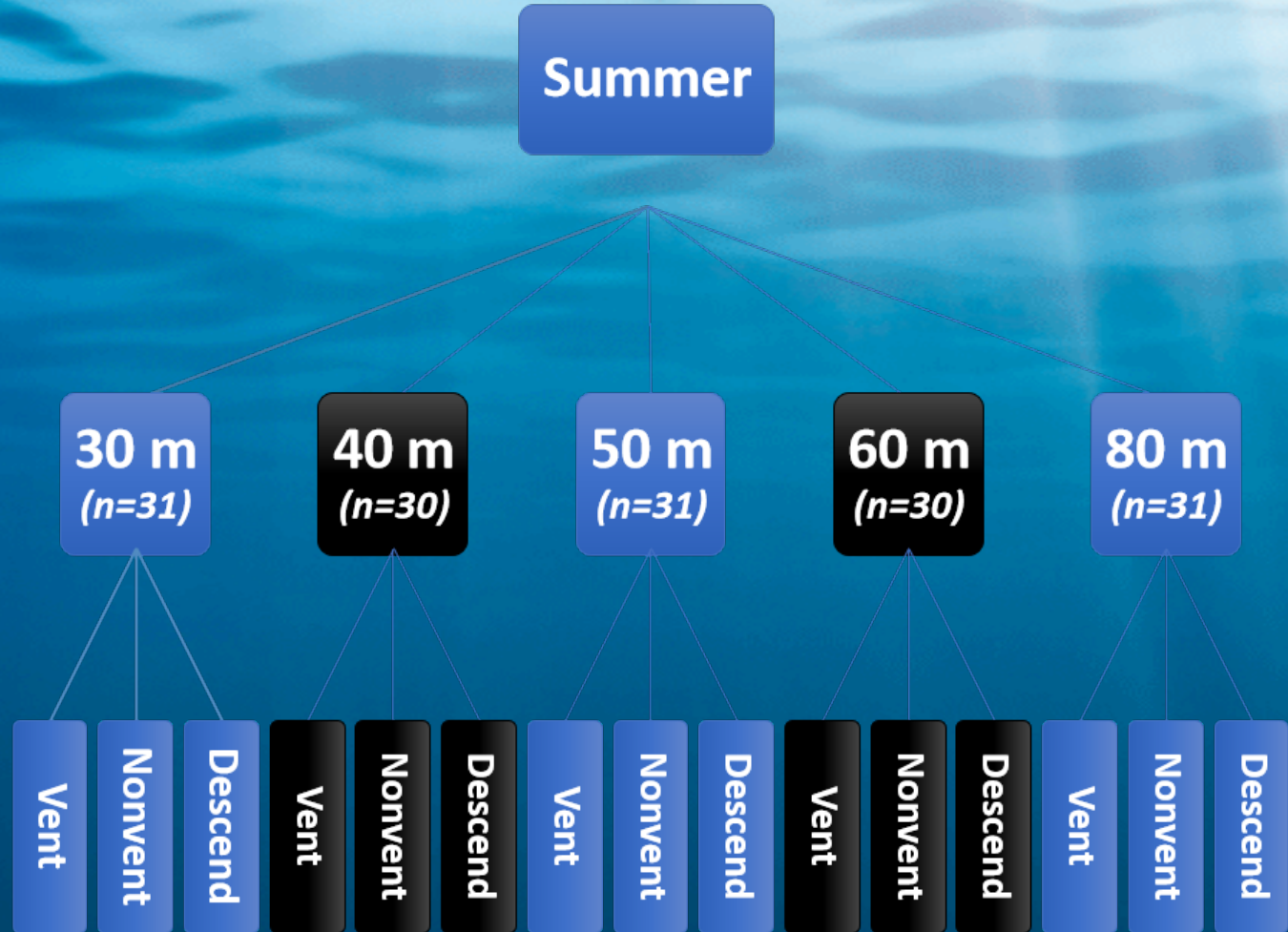
## Summer

■ 40 m ■ 60 m



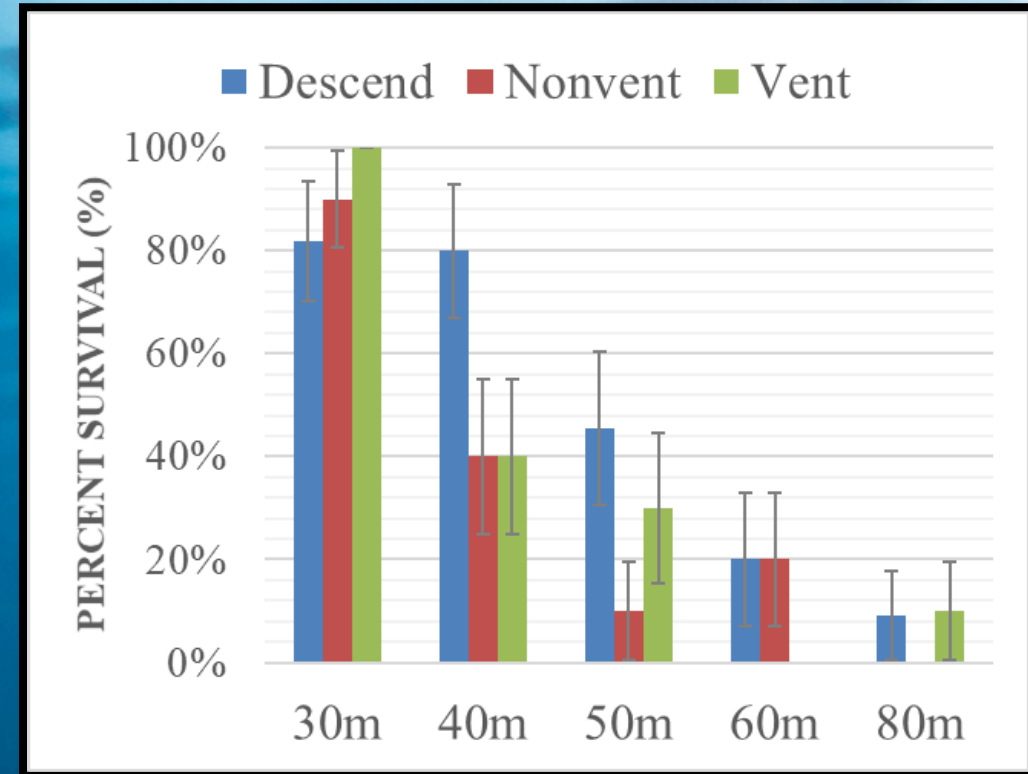
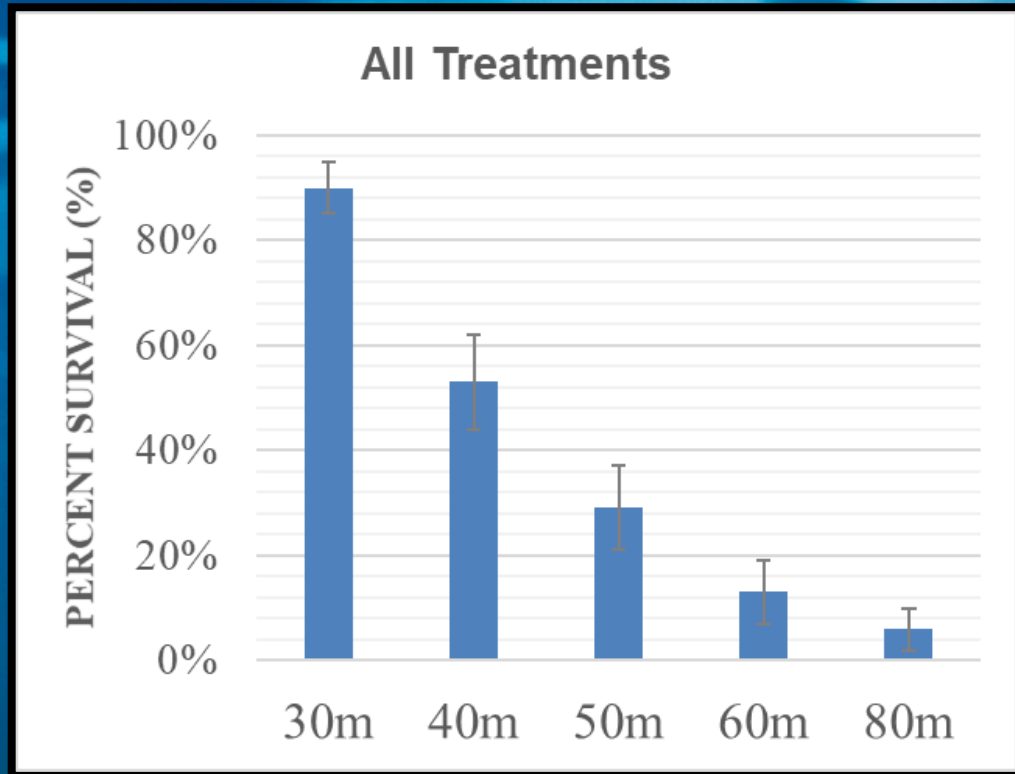


# Field Studies: Depth Effects



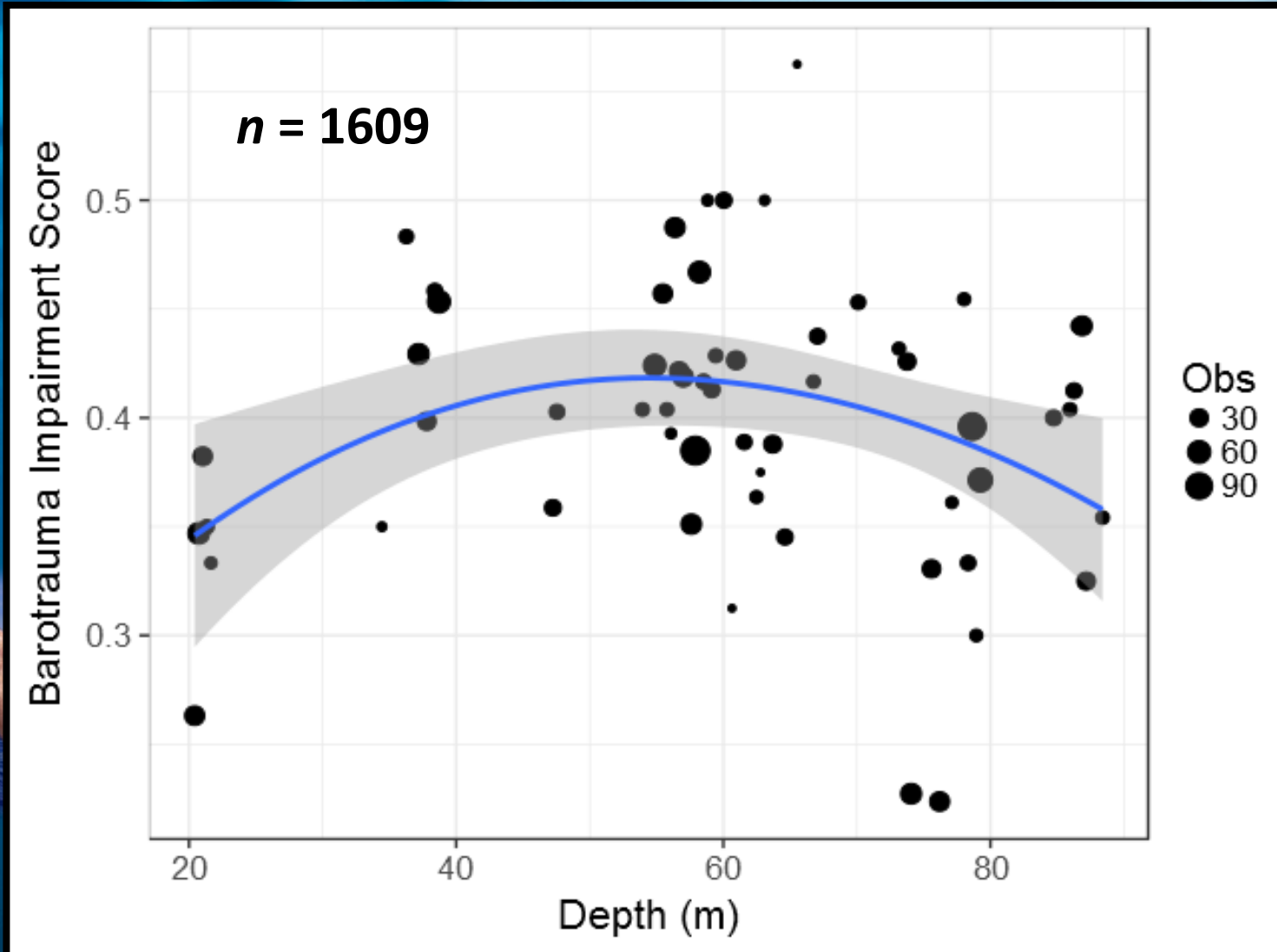


# Survival Results





# Barotrauma Impairment Index



# Catastrophic Decompression





# Field Trials

- Strong seasonal effects on mortality
- Depth major factor also



***Interactions exist***

- Release Treatments:  
Recompression > Non-venting / Venting  
But, benefits may be restricted by depth



***Descender Devices  
ARE better!***

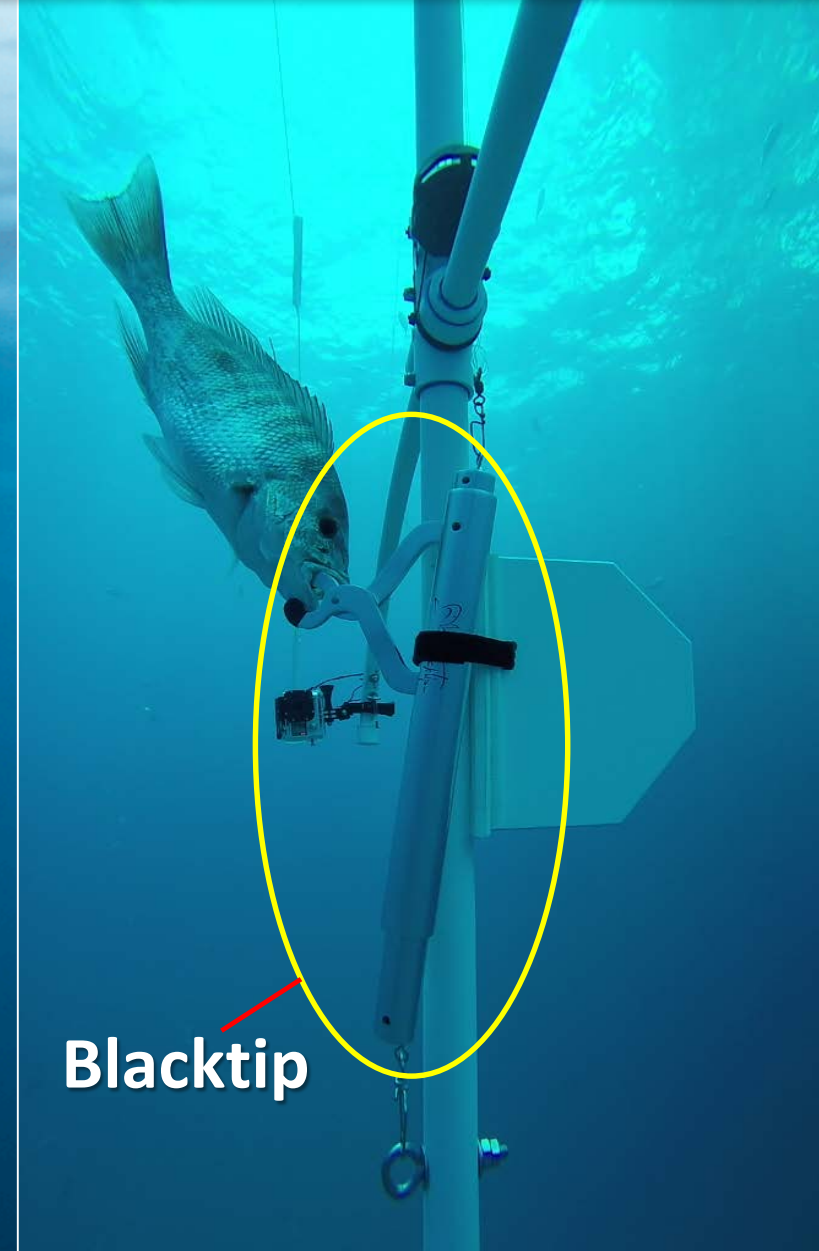
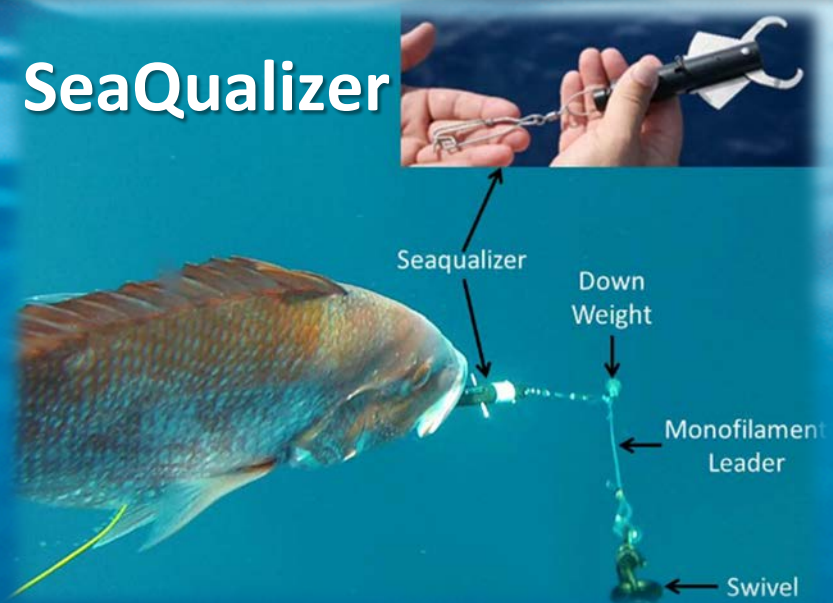
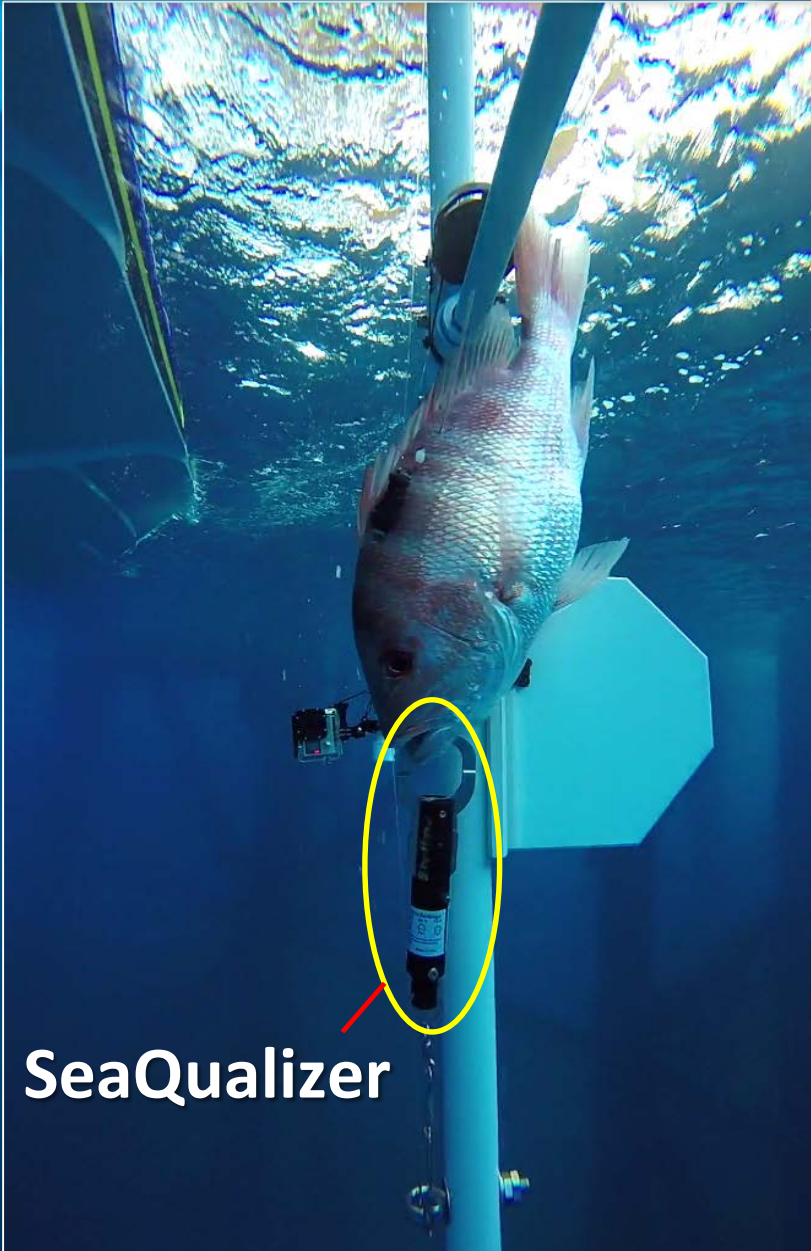
- Barotrauma visual impairment not a  
linear relationship with depth



***Video analysis to  
complement  
acoustic profiles***

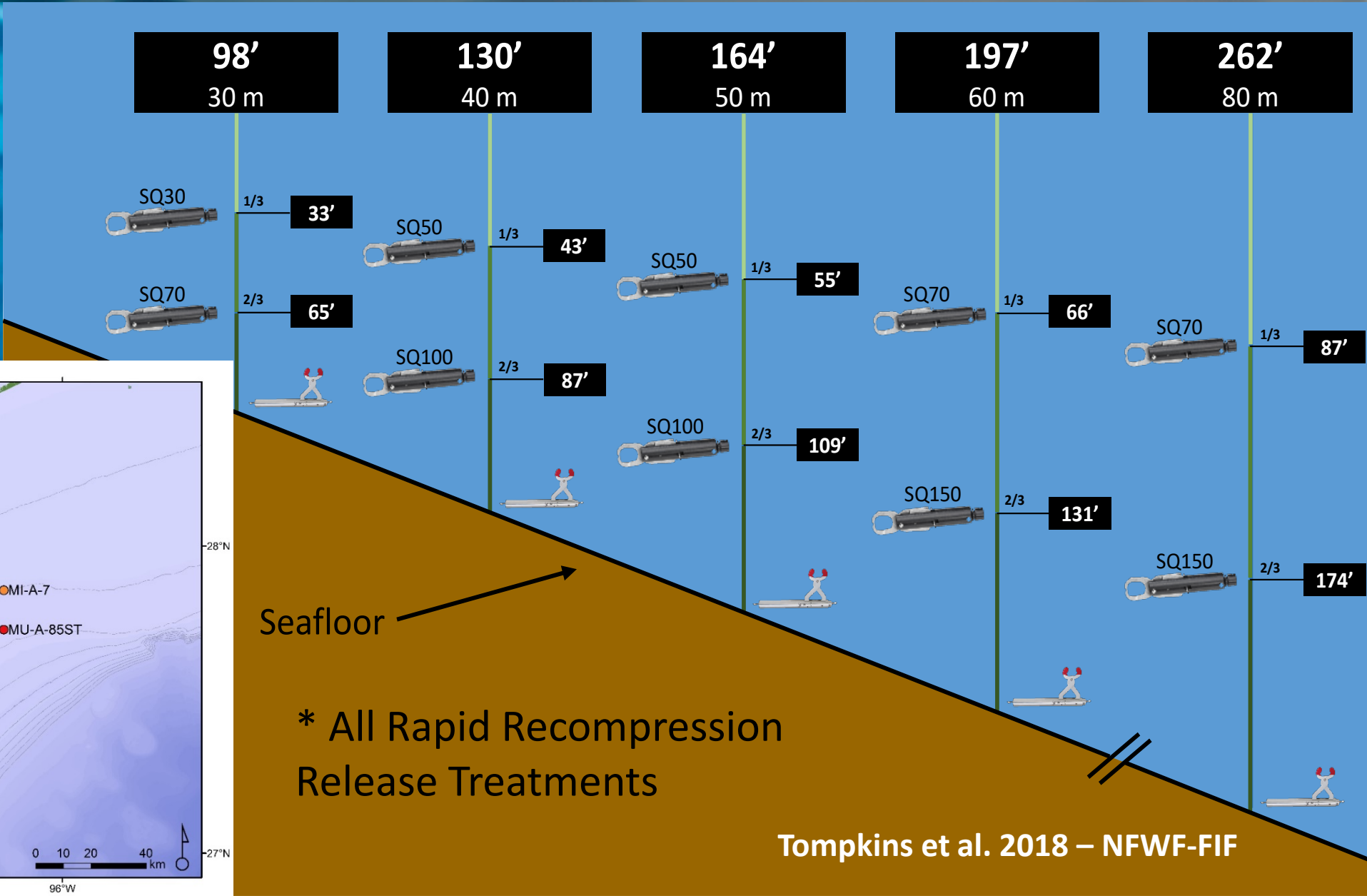
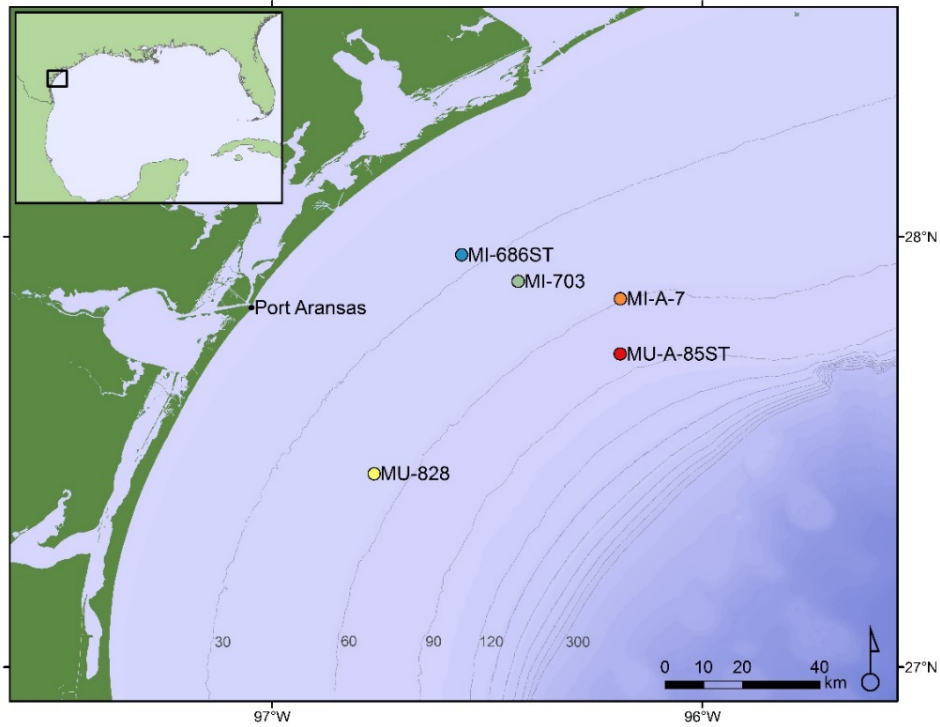


# Testing Release Depth





# Approach and Design

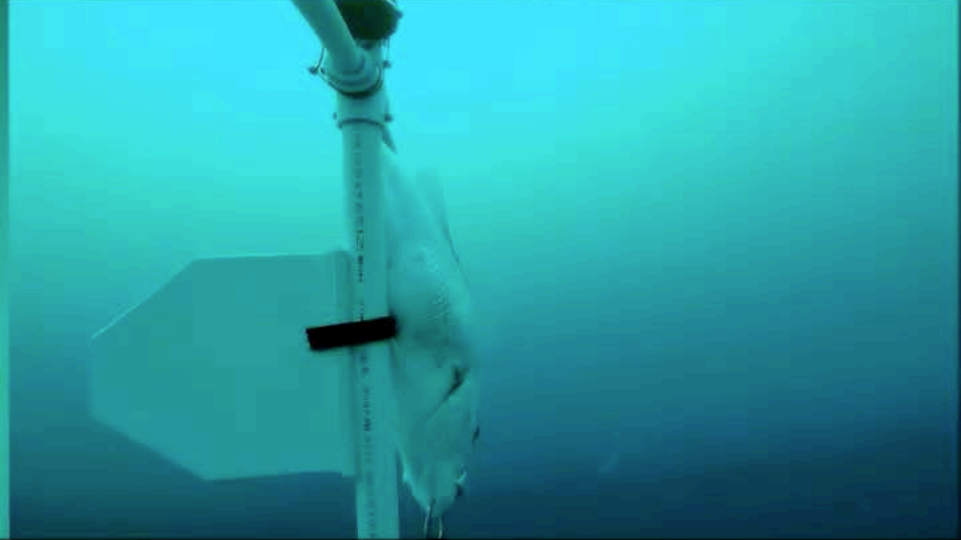
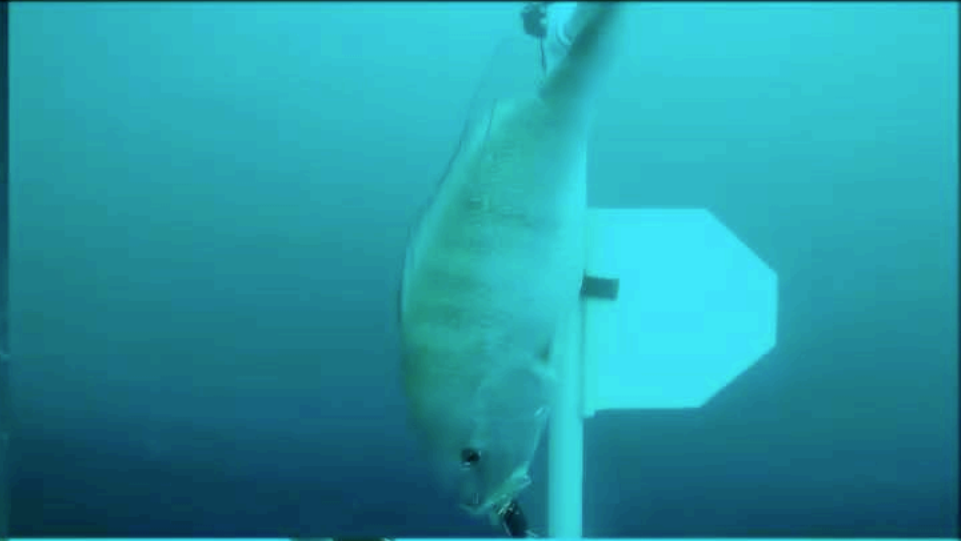
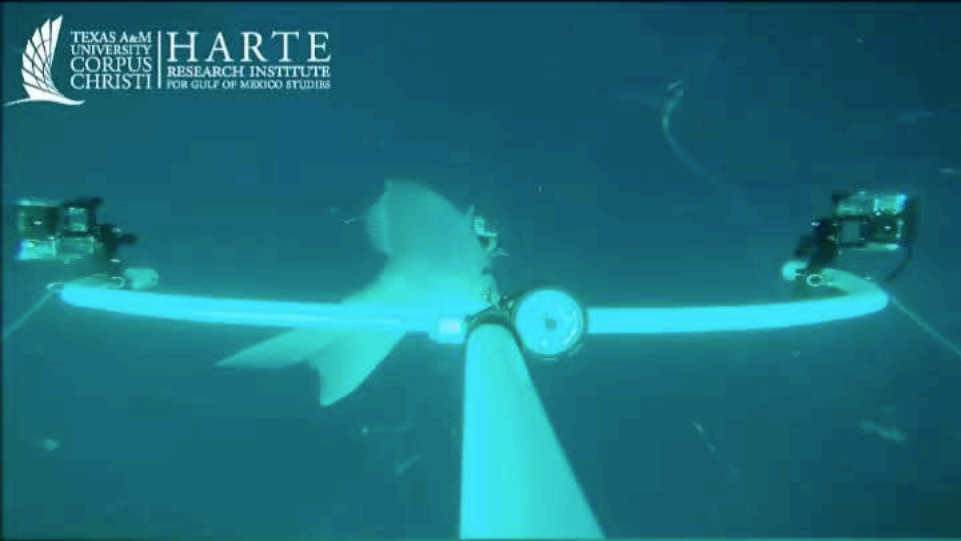


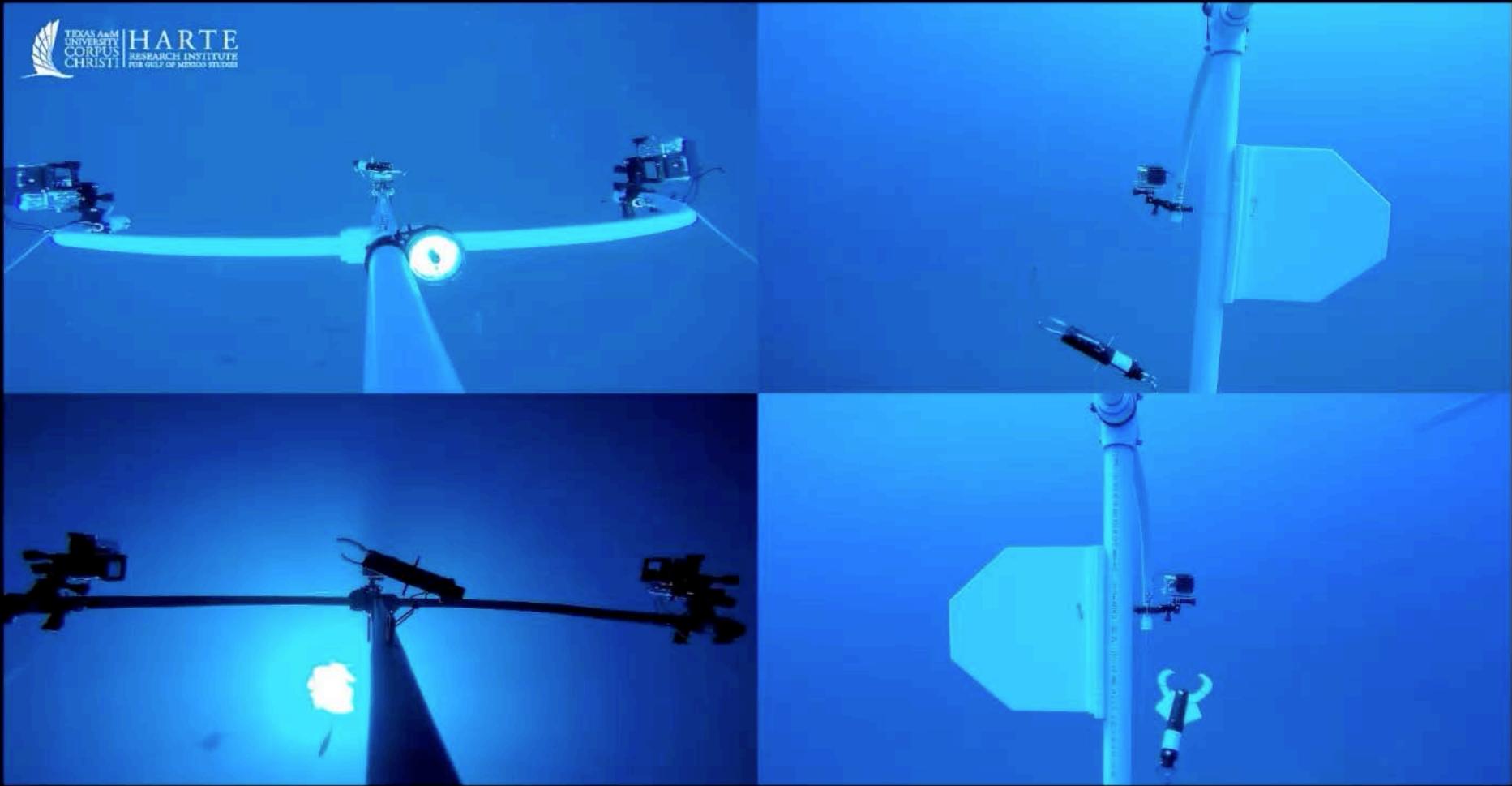
# Telemetry + Cameras

Catch and Release System for Scoring  
Barotrauma Outcomes  
**CRSSBO**





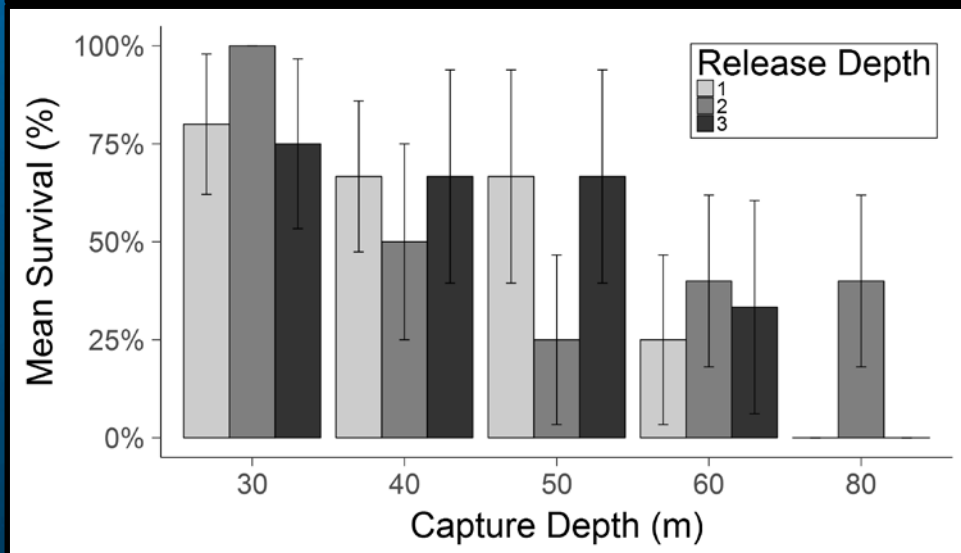
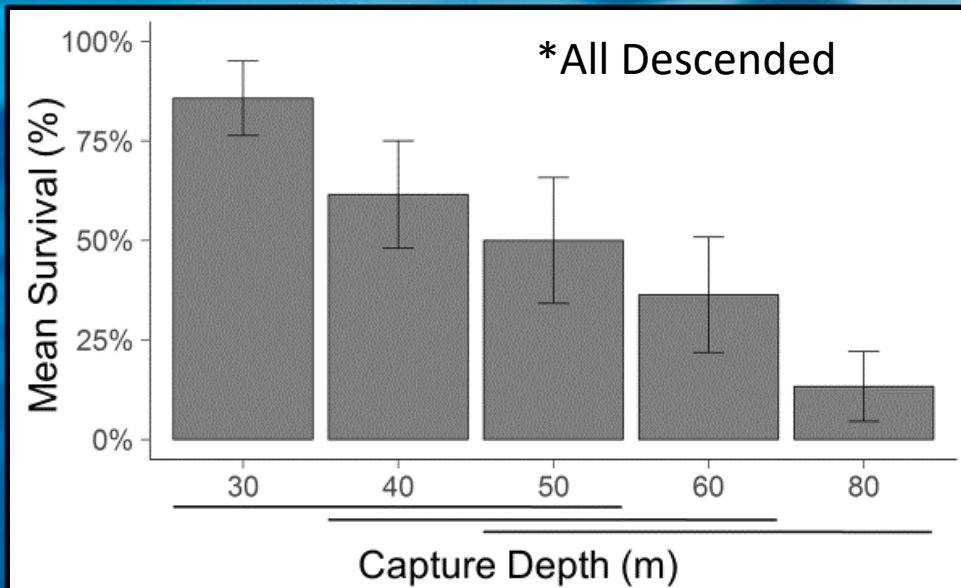








# Survival Results



Survival Predictor	$\beta$	SE	df	Wald	P	OR
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## Initial Model

Capture Depth (m)	-0.0631	0.0185	1	11.6197	0.0007	0.9389
<del>Barotrauma Impairment</del>	<del>0.1201</del>	<del>2.3057</del>	<del>1</del>	<del>0.0027</del>	<del>0.9585</del>	<del>1.1276</del>
<del>Deck Time</del>	<del>0.0111</del>	<del>0.0110</del>	<del>1</del>	<del>1.0180</del>	<del>0.3130</del>	<del>1.0111</del>
<del>Fish Total Length</del>	<del>-0.0063</del>	<del>0.0047</del>	<del>1</del>	<del>1.8252</del>	<del>0.1767</del>	<del>0.9937</del>
<del>Release Treatment</del>	<del>-0.0569</del>	<del>0.4034</del>	<del>1</del>	<del>0.0199</del>	<del>0.8879</del>	<del>0.9447</del>

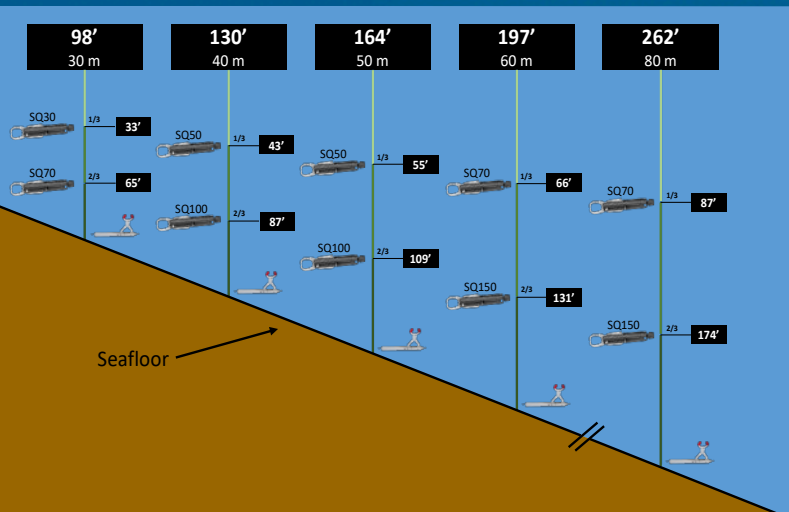
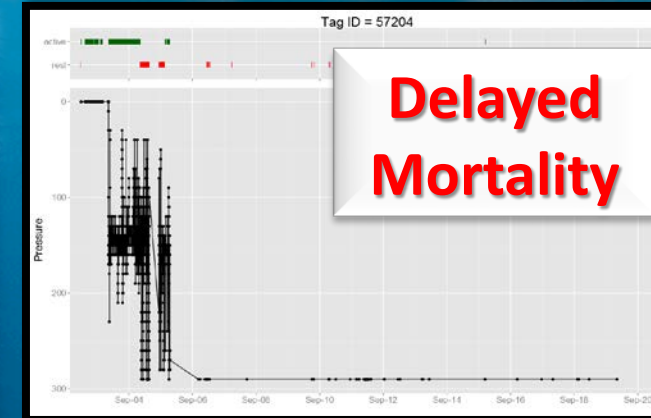
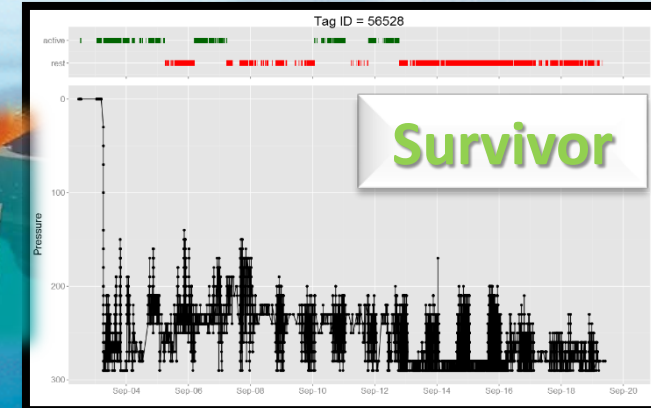
## Reduced Model

Capture Depth (m)	-0.0651	0.0187	1	12.1173	0.0005	0.9370
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3. Submergence to seafloor not necessary for recompression effects to be beneficial





# Next Steps...

## Integrating release tools and methods into the recreational fishery

### Building partnerships

- SeaQualizer Distribution with FishSmart/Am. Sportfishing Assoc.
- iTAG telemetry network for tracking long range movements post-release
- Shark discard mortality through citizen science engagement



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RESEARCH INSTITUTE  
FOR GULF OF MEXICO STUDIES

### The 'Great Red Snapper Count' Tagging Study

- Charter captains participation
- 25% recapture rate using descending devices for release
- Several charter organizations "informal requirement" to use





# Acknowledgements

- NFWF - Fisheries Innovation Fund
- NOAA - Bycatch Reduction Engineering Program
- FishSmart and American Sportfishing Association
- Acoustic telemetry vendors: Vemco, Lotek Wireless
- Fisheries & Ocean Health Lab
- Harte Research Institute for Gulf of Mexico Studies
- Center for Sportfish Science and Conservation
- Texas A&M University-Corpus Christi
- Texas Parks & Wildlife Department Marine Development Center

<http://www.harteresearchinstitute.org>

<http://www.sportfishresearch.org>



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