Tab A, No. 7

Movement Patterns and Discard Mortality of Cobia in the Gulf of Mexico

TEXAS A&M UNIVERSITY CORPUS CHRISTI | HARTE RESEARCH INSTITUTE FOR GULF OF MEXICO STUDIES

Matt Streich, Greg Stunz, Judd Curtis

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Center for SPORTFISH SCIENCE & CONSERVATION

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GULF OF MEXICO Fishery Management Council

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Gulf Cobia Data Needs

- Evaluate potential substructure within the Gulf stock
- Conduct tagging studies to determine the southern boundary of the Gulf stock, particularly with respect to Mexican and Texas waters
- Discard mortality research – currently 5%

Project Goal

- Provide new information on movements, stock structure, and discard mortality of Cobia captured in the GOM recreational hook-and-line fishery using advanced tagging technologies

Objectives

1. Examine seasonal movement patterns of Cobia and evaluate the degree of connectivity between sub-regions in the Gulf of Mexico

2. Estimate the post-release mortality rate for Cobia captured in the U.S. recreational hook-and-line fishery

Pop-off Satellite Archival Tags

- Data retrieved from Argos satellite system
- 3 models / 17 tags for this study
- miniPATs, sPATs, and mrPATs have different sensor capabilities

Capture and Tagging

Citizen Scientists

- 18 private anglers/charter/headboat captains provided with tagging kits

Tagged Cobia

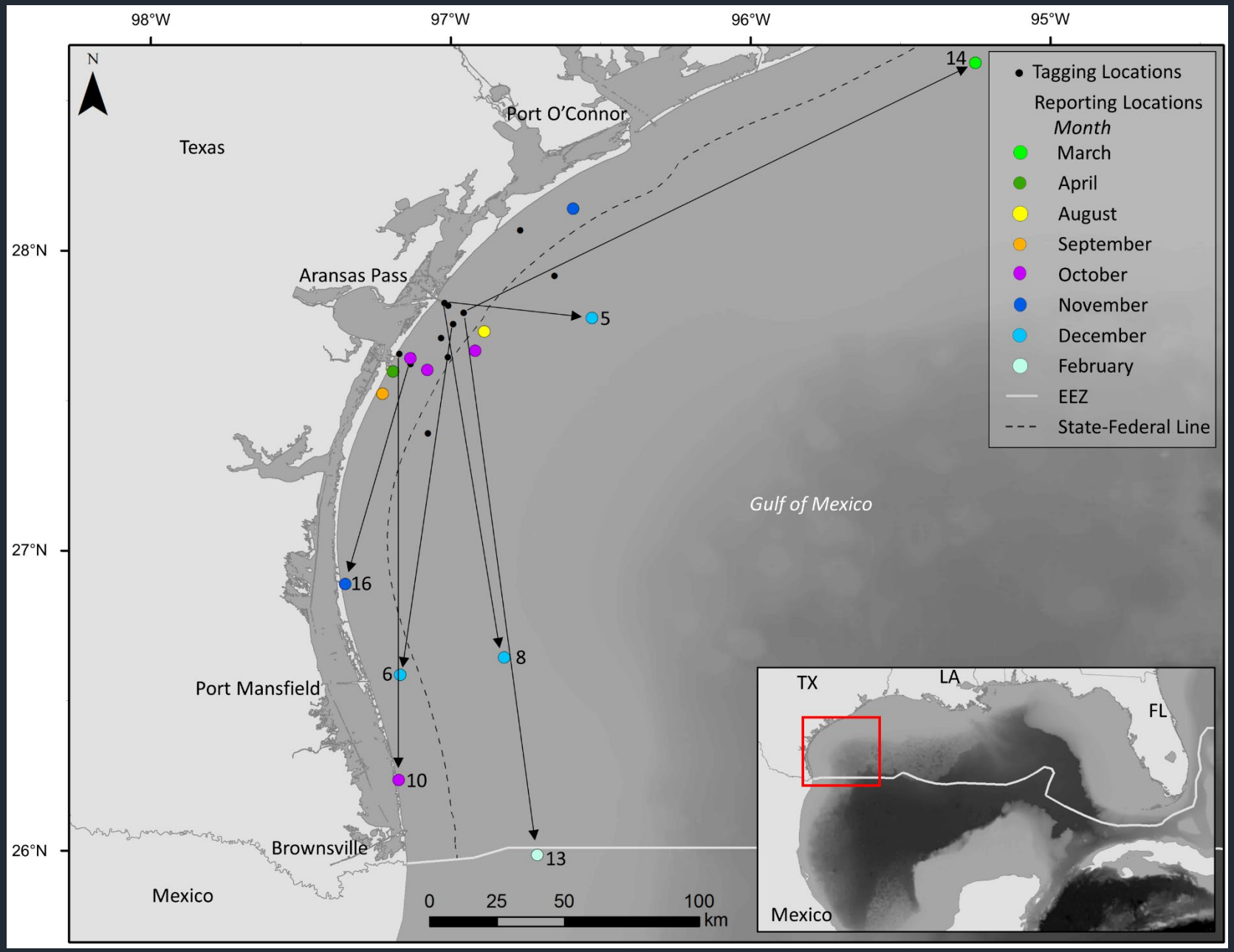
- 64 cobia tagged (47 dart only, 17 PSAT)
- All fish mean size: 31.9 in FL (range: 20.8 – 50.4 in)
- PSAT-tagged mean size: 37.4 in FL (range: 33.0 – 43.0 in)
- PSAT mean fight time: 3 min (range: <1-6 min)
- PSAT mean handling time: 4.2 min (range: 2-6 min)
- Recapture rate: 12.5% (8/64) June '20-June '21

Tag Performance

Fish ID	FL (in)	Tag Model	Tagging Date	Scheduled Release	Release Date	Scheduled Deployment (d)	Actual Deployment (d)	Percent of Scheduled Deployment	Release Reason
1	37.2	sPAT	6/17/2020	8/16/2020	8/10/2020	60	54	90	TAF - Pin Broke
2	35.2	mrPAT	8/6/2020	11/27/2020	9/15/2020	113	40	35	TAF - Floater
3									
4									er
5									
6									
7									
8									
9									
10									er
11									
12									
13	34.1	mrPAT	10/14/2020	2/12/2021	2/12/2021	121	121	100	Scheduled
14	35.4	miniPAT	10/1/2020	3/30/2021	3/30/2021	180	180	100	Scheduled
15	39.0	miniPAT	10/13/2020	4/11/2021	10/20/2020	180	1	1	M - Depredation
16	42.0	miniPAT	10/13/2020	4/11/2021	11/20/2020	180	38	21	TAF - Pin Broke
17	36.4	miniPAT	10/13/2020	4/11/2021	4/11/2021	180	180	100	Scheduled

- Deployments shortened by TAF, mortality, and non reporting
- No TAF within the first 10 days after tagging
- Averaged 61% of scheduled deployment (exc. mort)
- 82.3% tag reporting rate

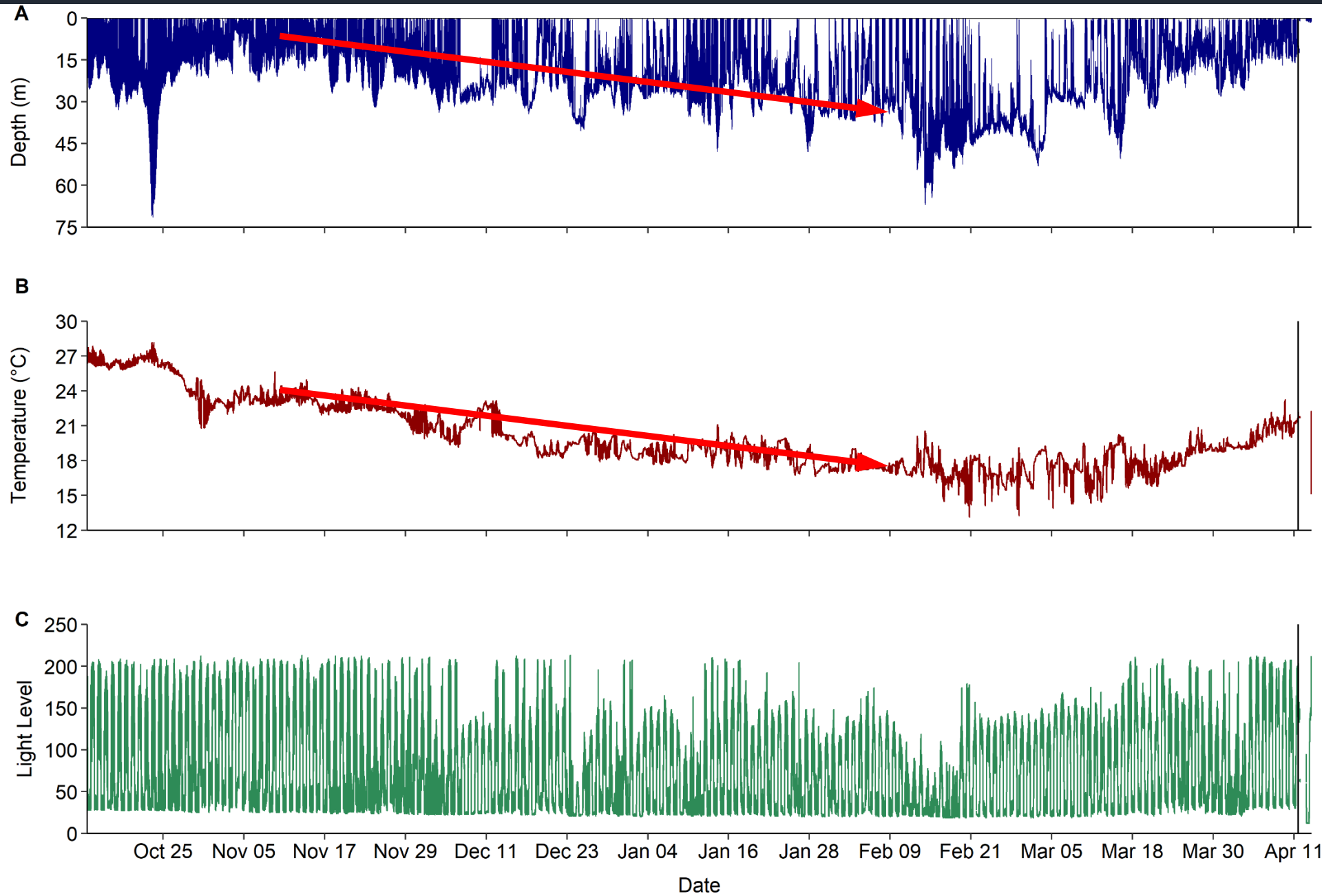
Net Movements



Fish 4 40.7” FL 8/4/20 – 10/12/21

Fish 17 36.4” FL 10/13/20 – 4/11/21

Fish 17 10/13/20 – 4/11/21

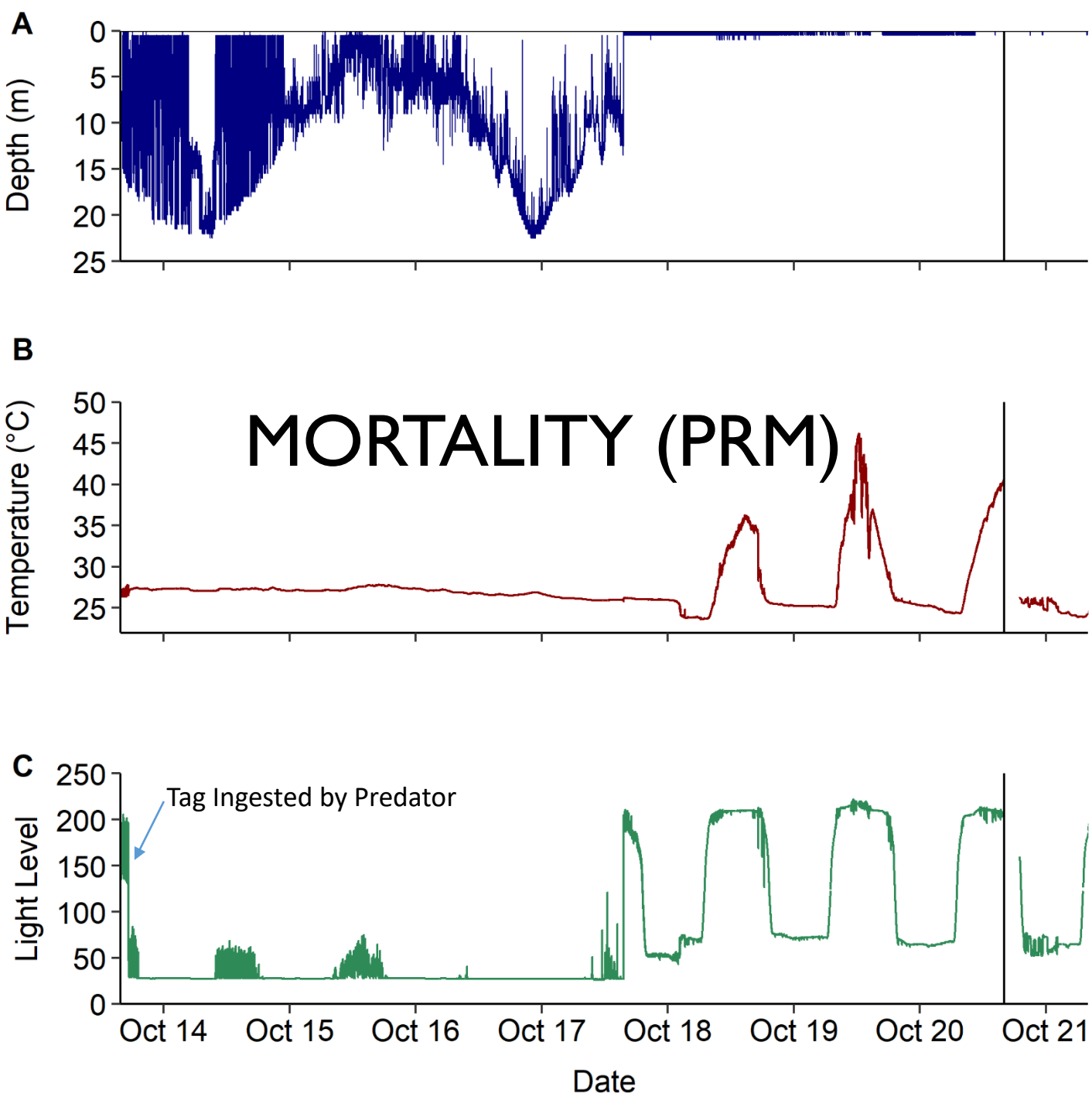


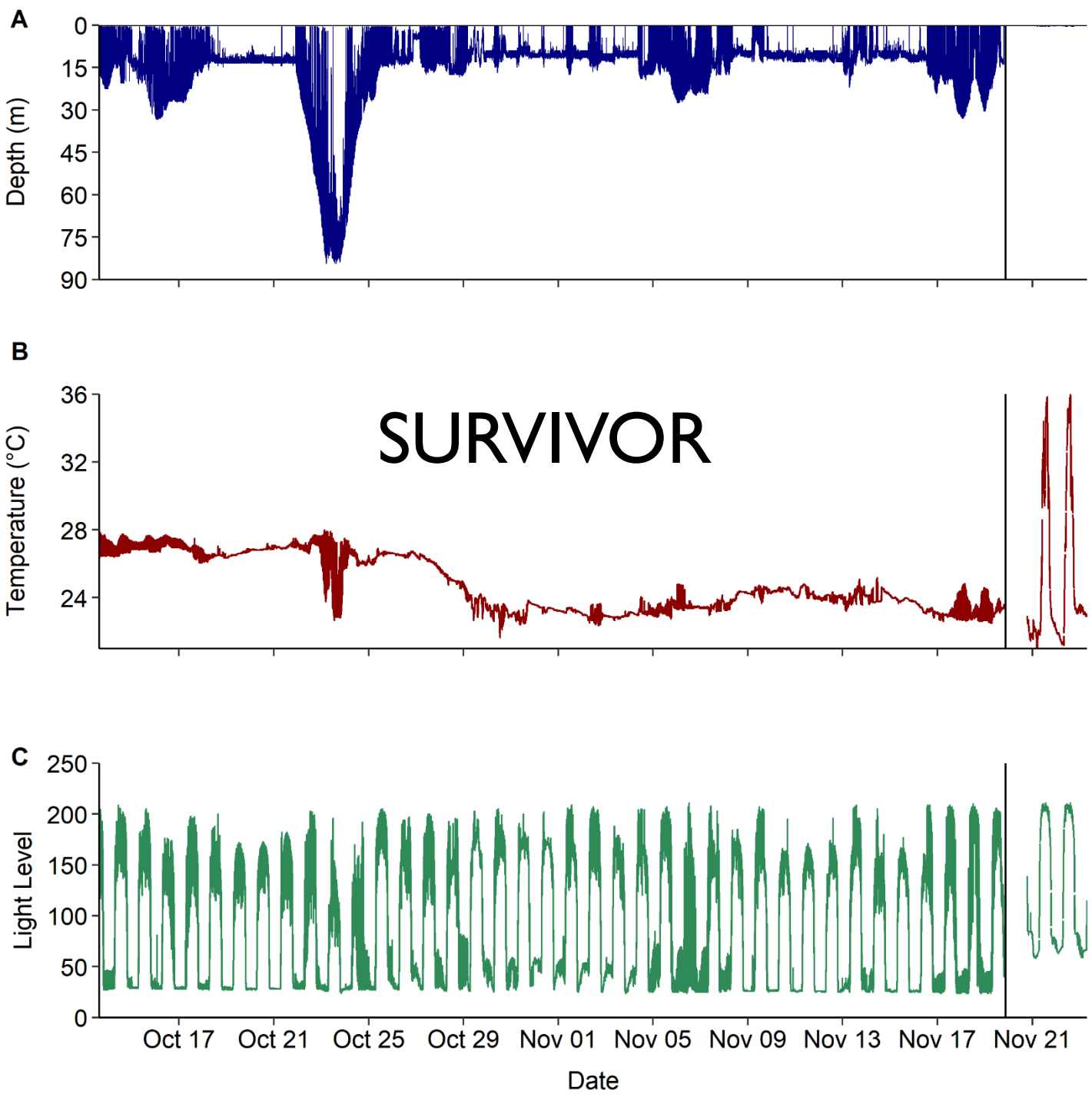
Post-Release Mortality Estimation

- Survival / mortality inferred from tag sensors / angler confirmed
- Mortality within 10 days post tagging → PRM
- Post-release mortality PRM estimated using two methods

Method I → only mortalities definitively inferred from tag data

Method II → tag attachment failures within 10 d and DNR are mortalities


A
Depth (m)
0
5
10
15
20
25
B
Temperature (°C)
50
45
40
35
30
25
MORTALITY (PRM)
C
Light Level
250
200
150
100
50
0
Tag Ingested by Predator
Oct 14
Oct 15
Oct 16
Oct 17
Oct 18
Oct 19
Oct 20
Oct 21
Date


A
Depth (m)
0
15
30
45
60
75
90
B
Temperature (°C)
36
32
28
24
SURVIVOR
C
Light Level
250
200
150
100
50
0
Oct 17
Oct 21
Oct 25
Oct 29
Nov 01
Nov 05
Nov 09
Nov 13
Nov 17
Nov 21
Date

PRM Estimates

Fish ID	Method I Fate	Method II Fate
1	S	S
2	S	S
3	S	S
4	S	S
5	S	S
6	S	S
7	DNR	PRM
8	S	S
9	DNR	PRM
10	S	S
11	DNR	PRM
12	FM (S)	FM (S)
13	S	S
14	S	S
15	PRM	PRM
16	S	S
17	S	S

Method I:

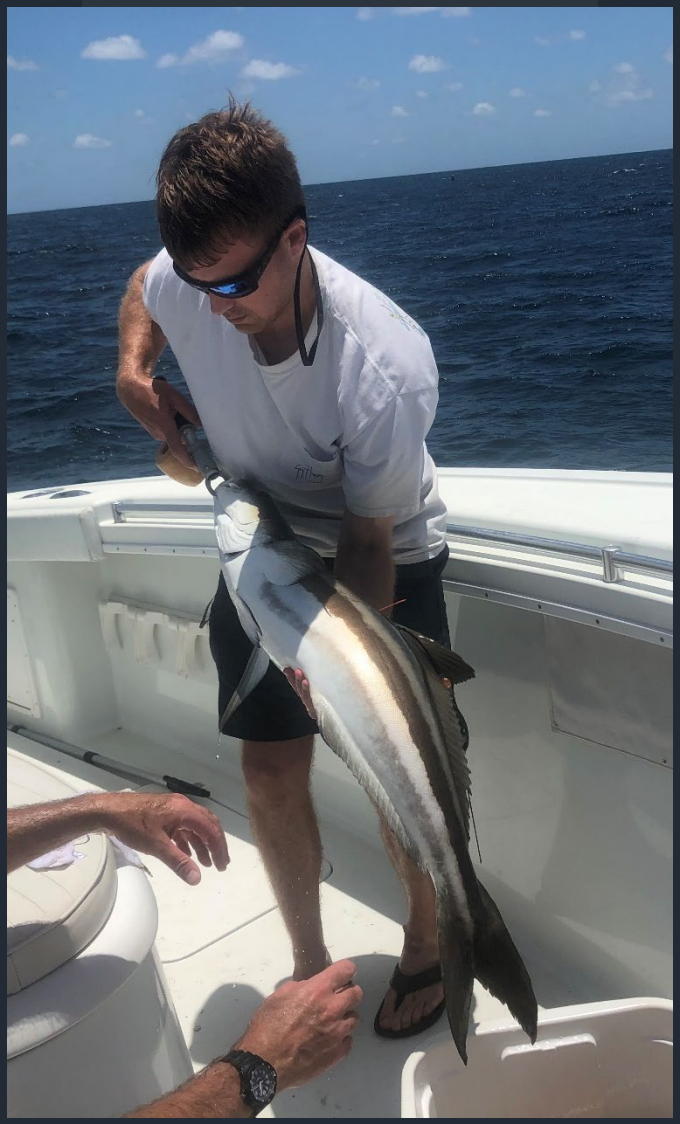
PRM = 1/14 = 7% (95% CI: 0-23%)

Method II:

PRM = 4/17 = 24% (95% CI: 6-47%)

Recaptures

6/17/20 41 in TL



6/14/21 45 in TL

Summary

- Net movement mostly south or offshore after mid-October
  - fish may remain off wGoM year round

- Significant movements into Mexican waters were not observed
  - potential MX removals not accounted for in current assessment framework
  - limited sample size

- First direct estimate of PRM for Cobia in GoM = 7% (0-23%)
  - SEDAR 5%
  - handling / higher if DNR = PRM

- Fish were netted, handled with lipping tools → low PRM
  - up to 60 in fish / no gaff ≈ calm

- More satellite and acoustic tagging ongoing

No Gaff ≈ Calm

1. Net
2. Lipping Tool
3. Photo
4. Release

matthew.streich@tamucc.edu

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