A man with short blonde hair and sunglasses is smiling while holding a large, dark-colored fish (likely a Gag grouper) on a boat. The fish has a green lure in its mouth. The background shows the ocean and a clear sky.

# Effects of recreational catch and release angling on the survival of Gag grouper on the west Florida shelf

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Award Period: September 1, 2013 – April 30, 2017

As presented to the Gulf Council SSC, Sept. 27 – 28, 2023





# Rationale

Regulations are effective only if fish survive release

Stakeholders question the accuracy of C&R mortality estimates currently used in assessments

- Short term studies
- Rely on tag/recapture data
- Laboratory studies do not always mimic what is happening in the field





# Response

Engage in cooperative research to better identify effects of recreational C & R (regulatory discards) in the eastern Gulf of Mexico (where the highest landings occur)

Utilize acoustic telemetry to provide robust, long-term data after the C&R event

Evaluate the effectiveness of tactics used to return fish to depth (venting v. descending)

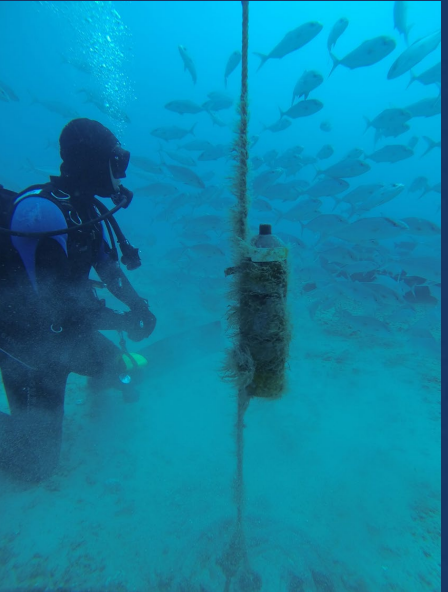






Study area  
and  
acoustic  
array

2014 – 2017





# Methods

Recreational anglers (rod & reel) to 40 m

Assess barotrauma , measure, photos, DNA

External tags

Pinger (rate: every 1 – 3 minutes; with pressure sensor)

ID Tag (ongoing visual surveys, recap hotline for anglers)





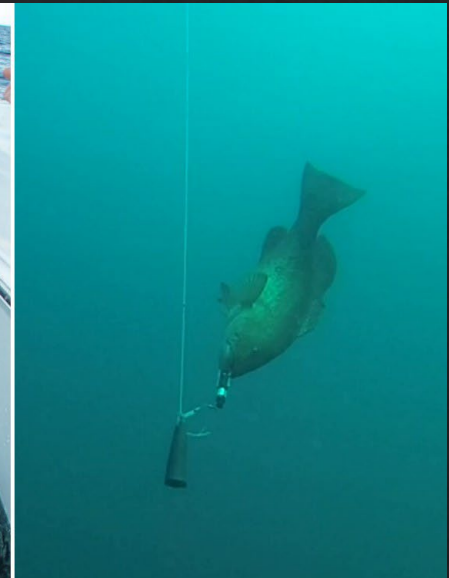
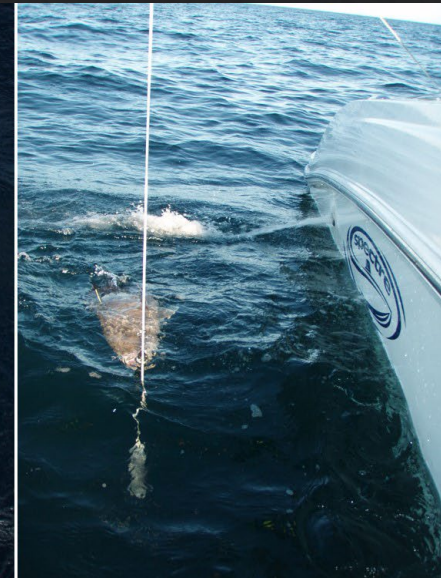
# Barotrauma mitigation



Fish evaluated for signs of barotrauma and scored by severity (0 – 3)

*If needed, Gag were either*

- Vented (traditional) *or*
- Descended (alternative)





# Results

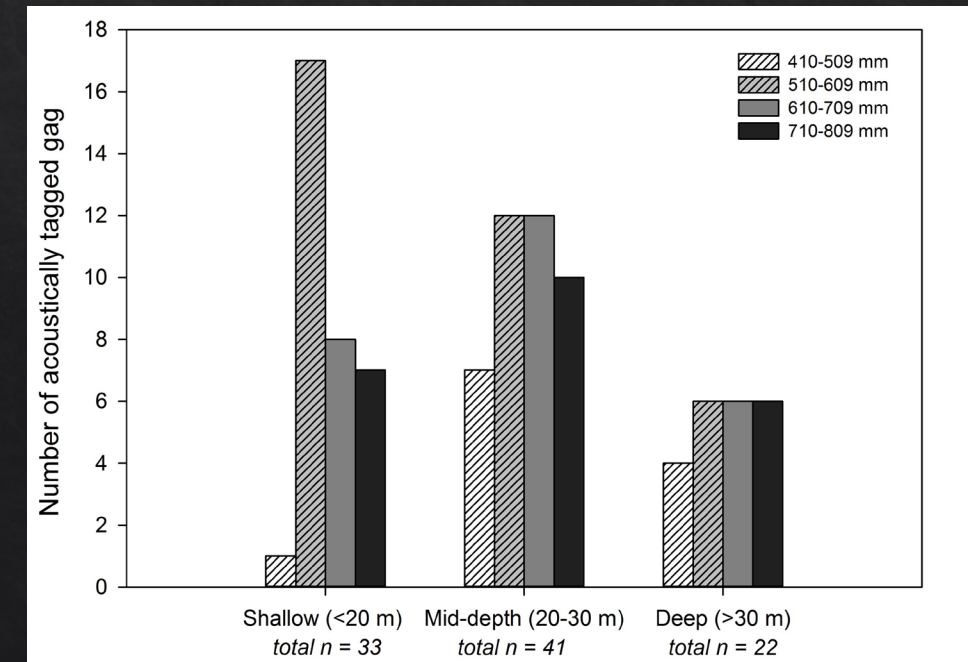
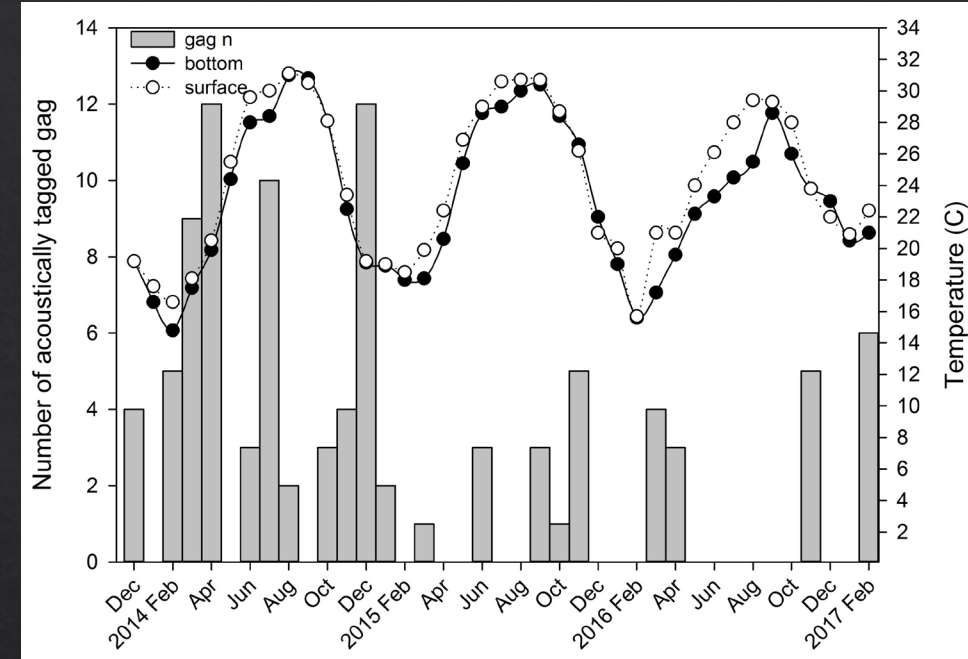


Jan 2014 – Jul 2017  
18 sites (5 – 37 m)

90 Gag were acoustically tagged  
(to 40 m)

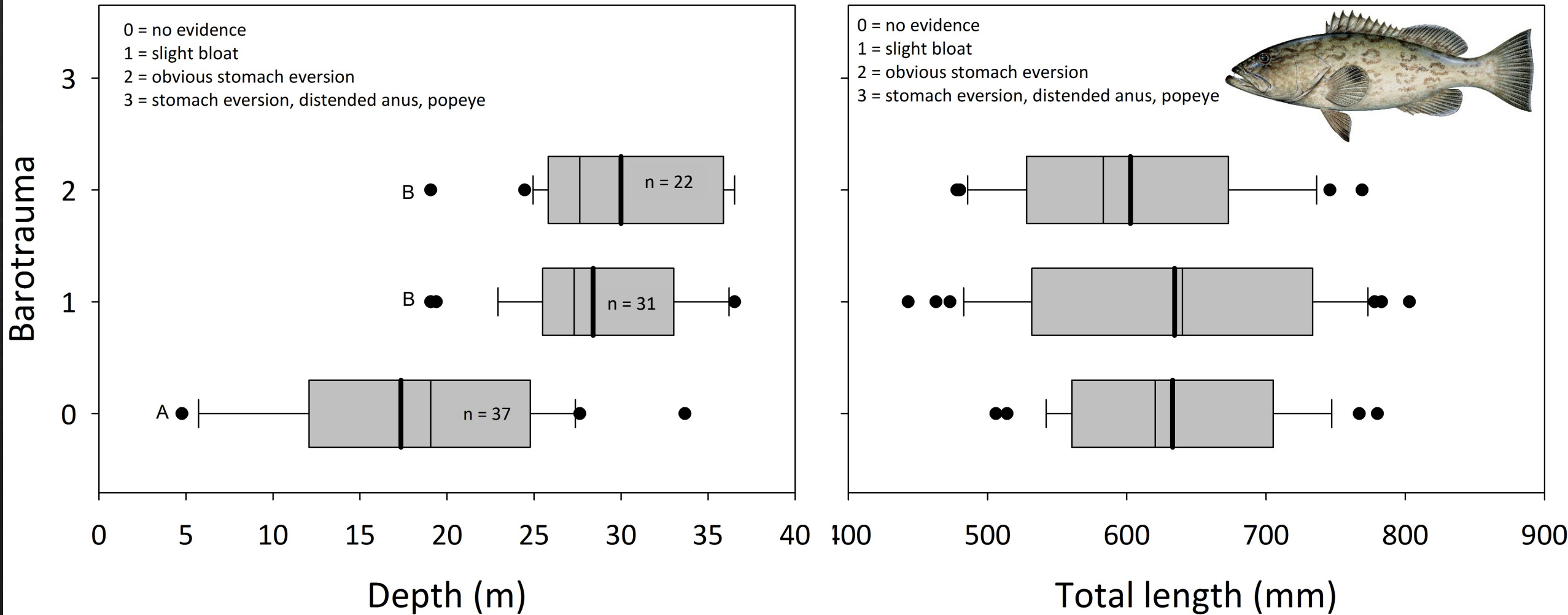
Size range 443 – 803 mm TL  
(17 – 32 inches TL; note 24" = 610 mm)

Monitoring periods of 1 to 794 days (mean = 144 days)





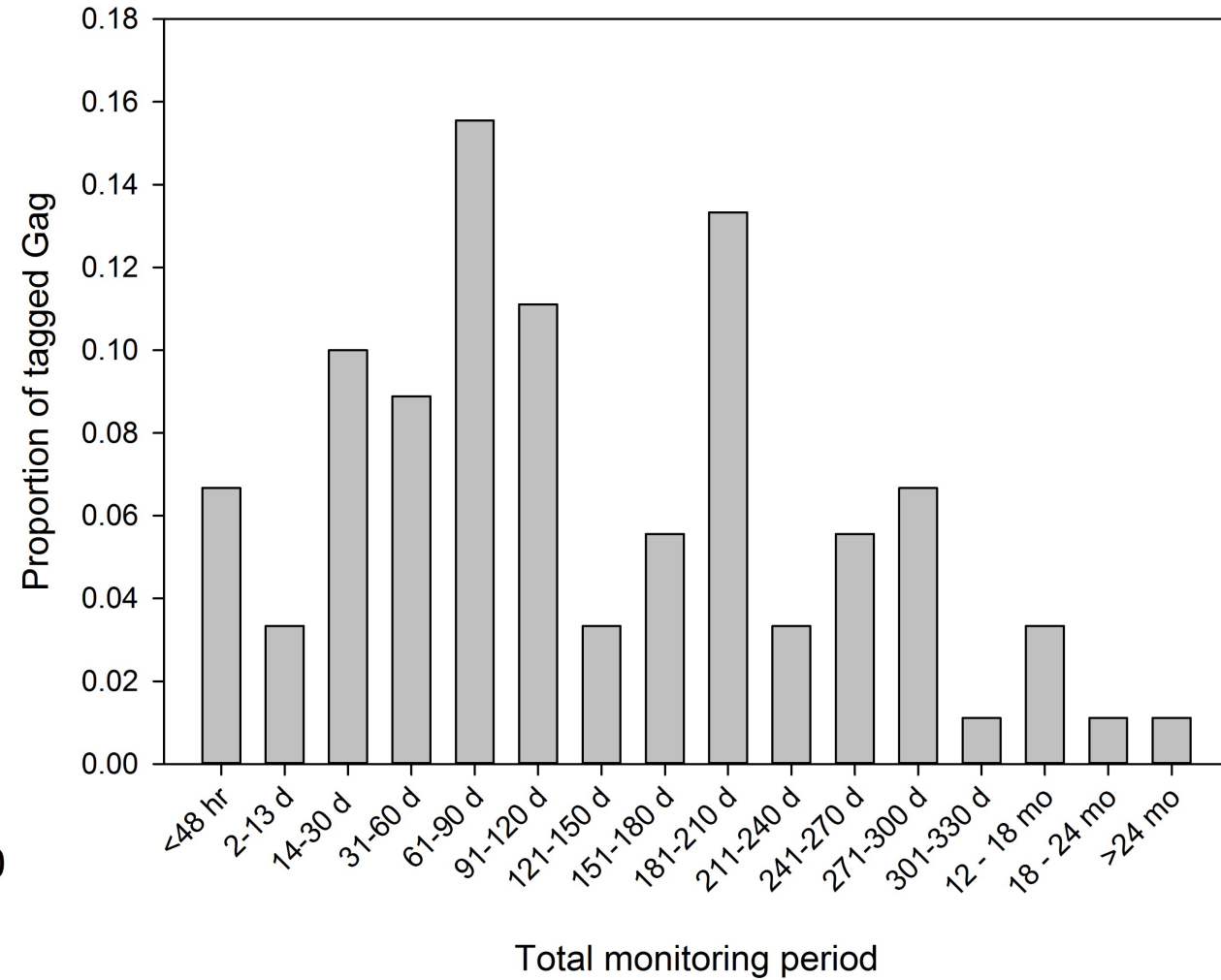
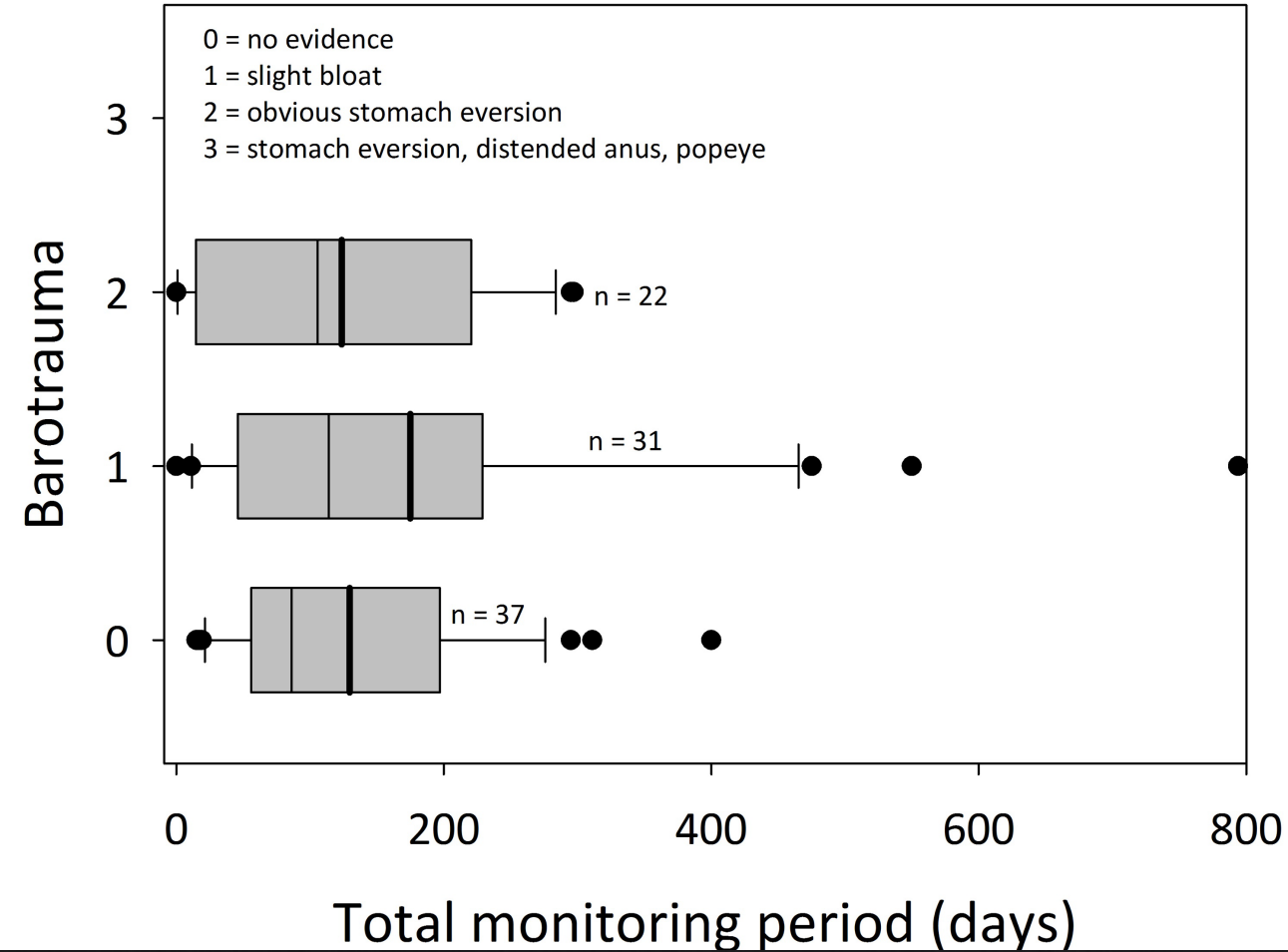
# Barotrauma increased with depth, no relationship with TL



Severity was significantly higher ( $p < 0.001$ , KW one-way Anova) at capture depths greater than 25 m. Boxes indicate 25 – 75 qt, whiskers 95% CI. Means and medians are indicated by the bold and thin lines, respectively.

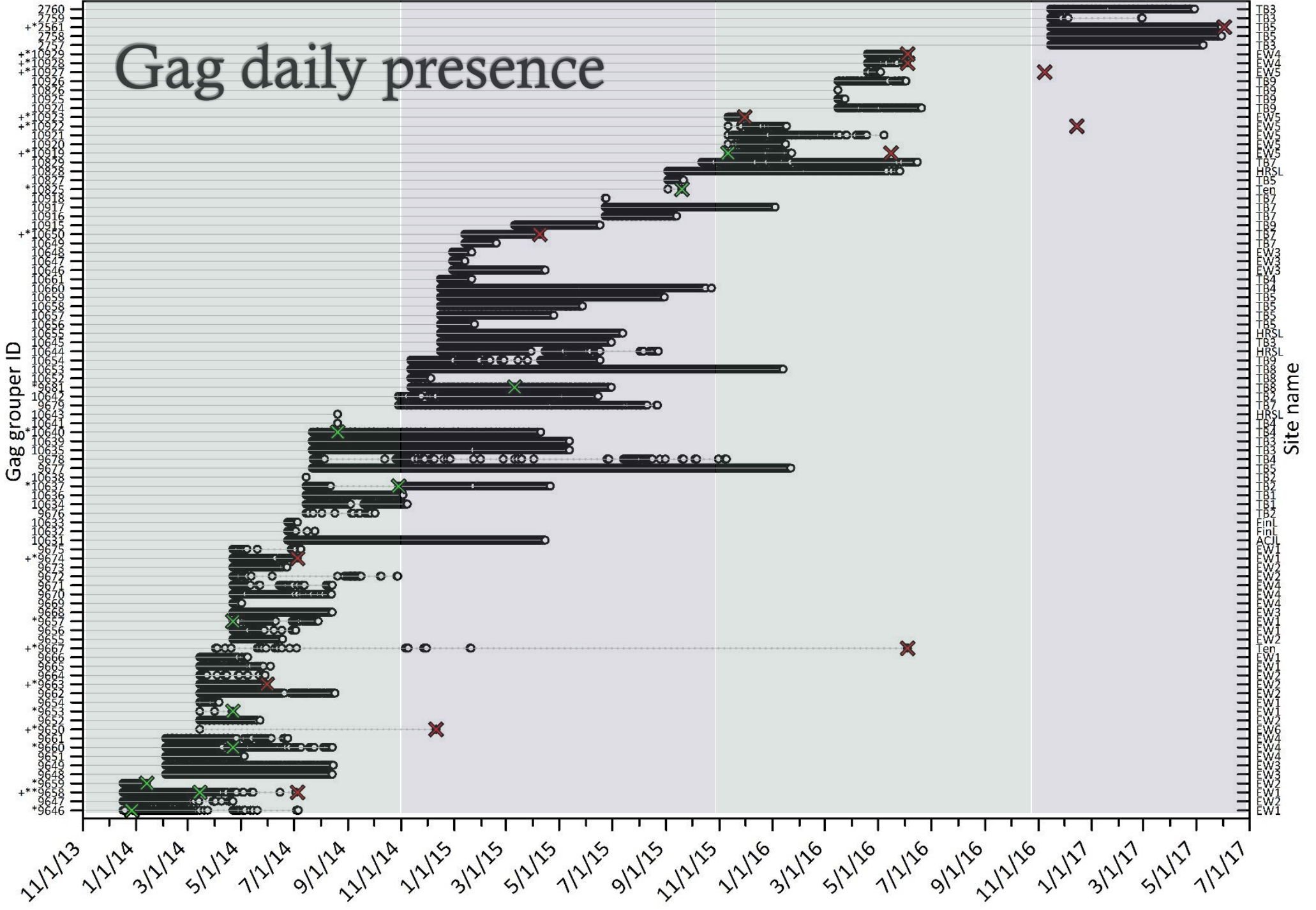


# Total monitoring period





# Gag daily presence





# Recaptures



22 recaptures:

(15/22 by private anglers)

2 fish were recaptured more than once

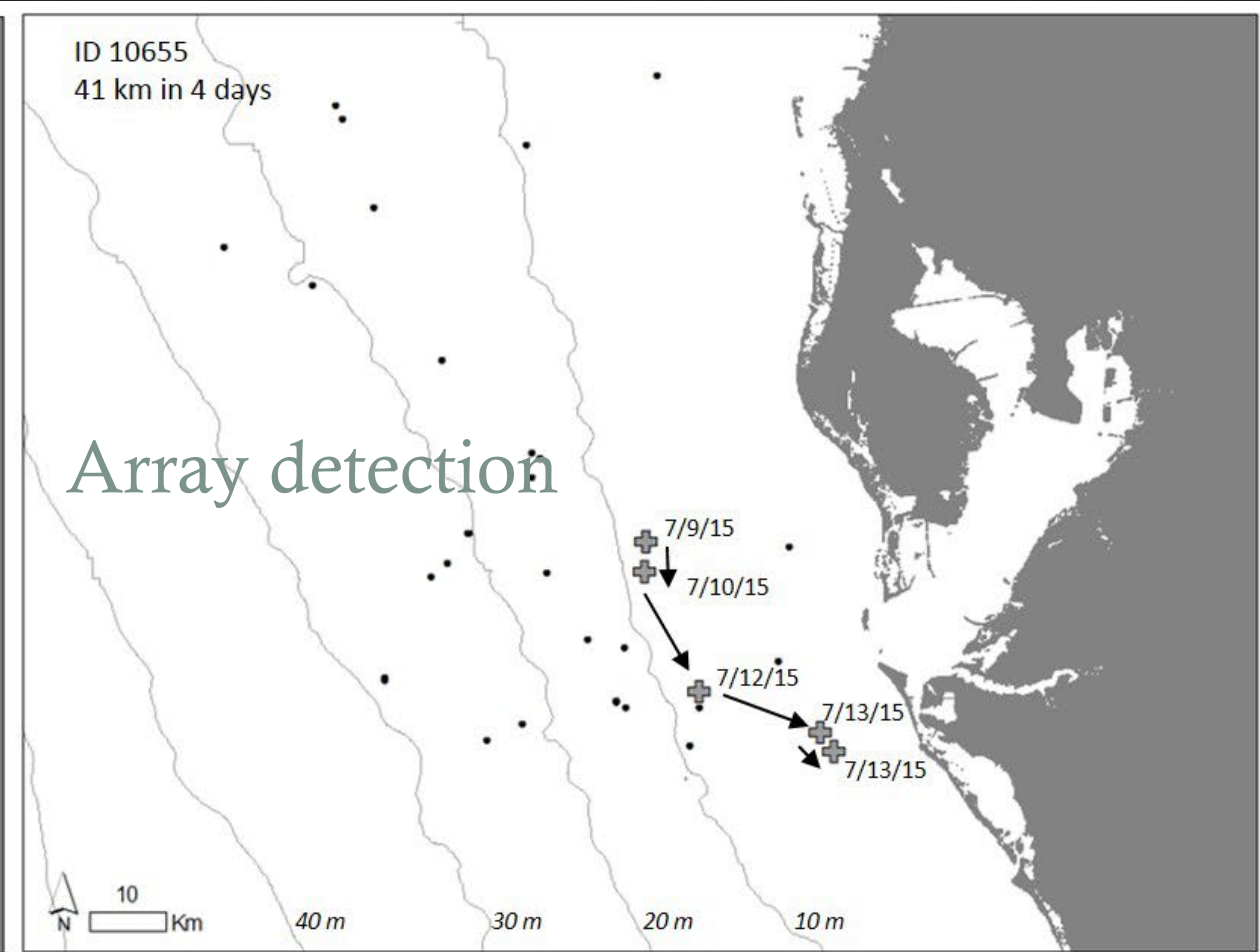
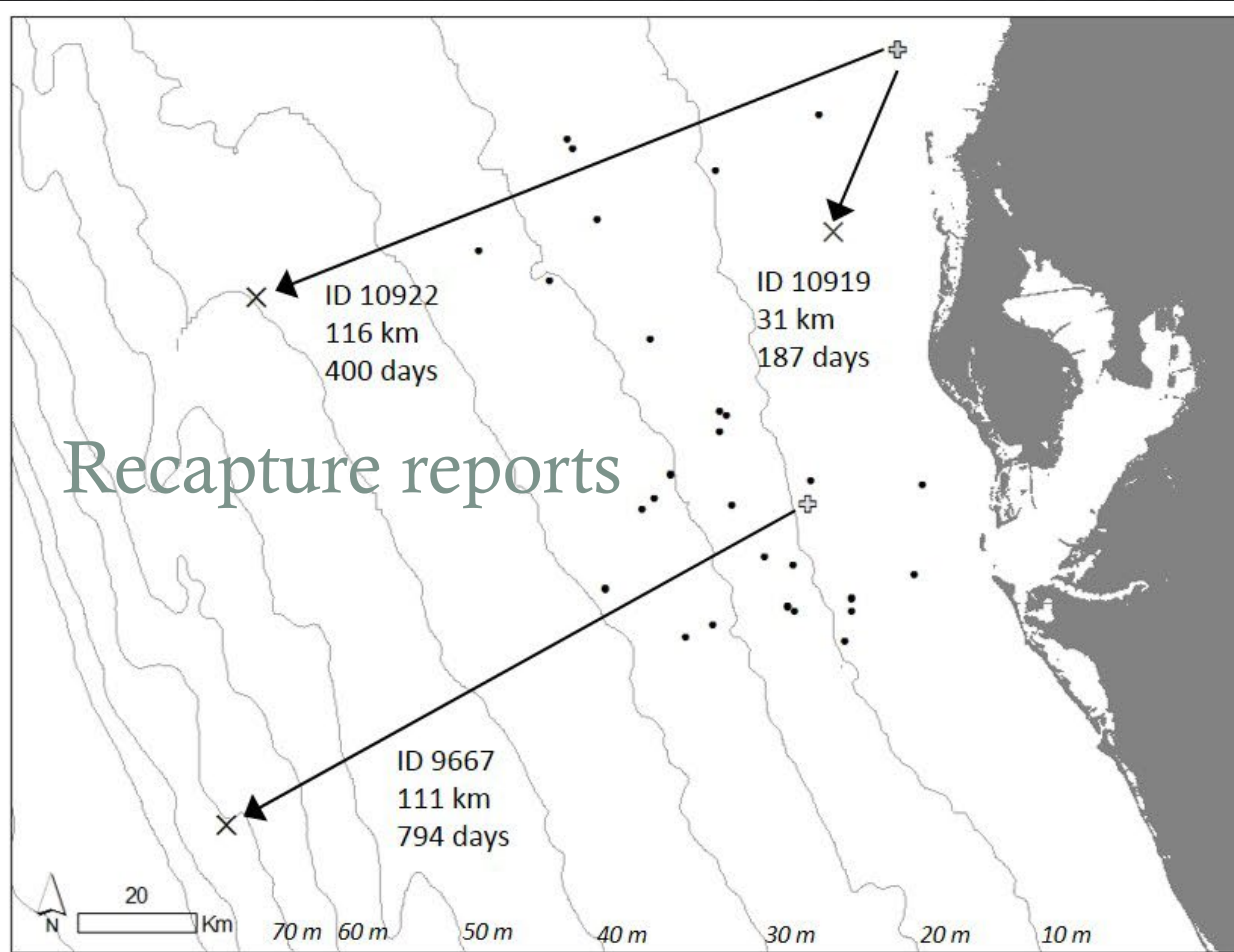
Recap locations ranged to 116 km away from initial sites n=3

n=4

Time at large: 0 – 794 days

ID	Tagged	Recaptured	Days at large	Distance moved (km)	Barotrauma severity, release method
2561	11/15/16	06/02/17†	199	0	2, DD
9646	12/17/13	12/27/13	10	0	0, none
9650	03/15/14	12/11/14†	271	1.7	0,V, dropped on deck
9653	03/15/14	04/22/14	38	0	0, V, dropped on deck
9658	12/17/13	03/15/14 07/05/14†	88 200	0 2.2	0, none
9659	12/17/13	01/13/14	27	0	0, none
9660	02/04/14	04/22/14	77	0	1, none
9663	03/15/14	05/31/14†	77	3.2	0, V, dropped on deck
9667	04/02/14	06/04/16†	794	111	1, V
9674	04/22/14	07/05/14†	74	2.2	0, none, bleeding at tag
9681	11/12/14	03/11/15	119	0	2, V
10637	07/15/14	10/29/14	106	0	1, V
10640	07/22/14	08/20/14	29	0	1, DD
10650	01/13/15	04/09/15†	86	0.3	0, none
10825	09/03/15	09/19/15	16	0	2, DD
10919	11/11/15	11/11/15 05/16/16†	0 187	0 30.6	0, none
10922	11/11/15	12/15/16†	400	116	0, none
10923	11/11/15	11/30/15†	19	0	0, none
10927	04/19/16	11/08/16†	203	0	0, none
10928	04/19/16	06/04/16†	46	0	2, V
10929	04/19/16	06/04/16†	46	0	1, DD
9657	12/17/13	04/22/14	126	0	0, none

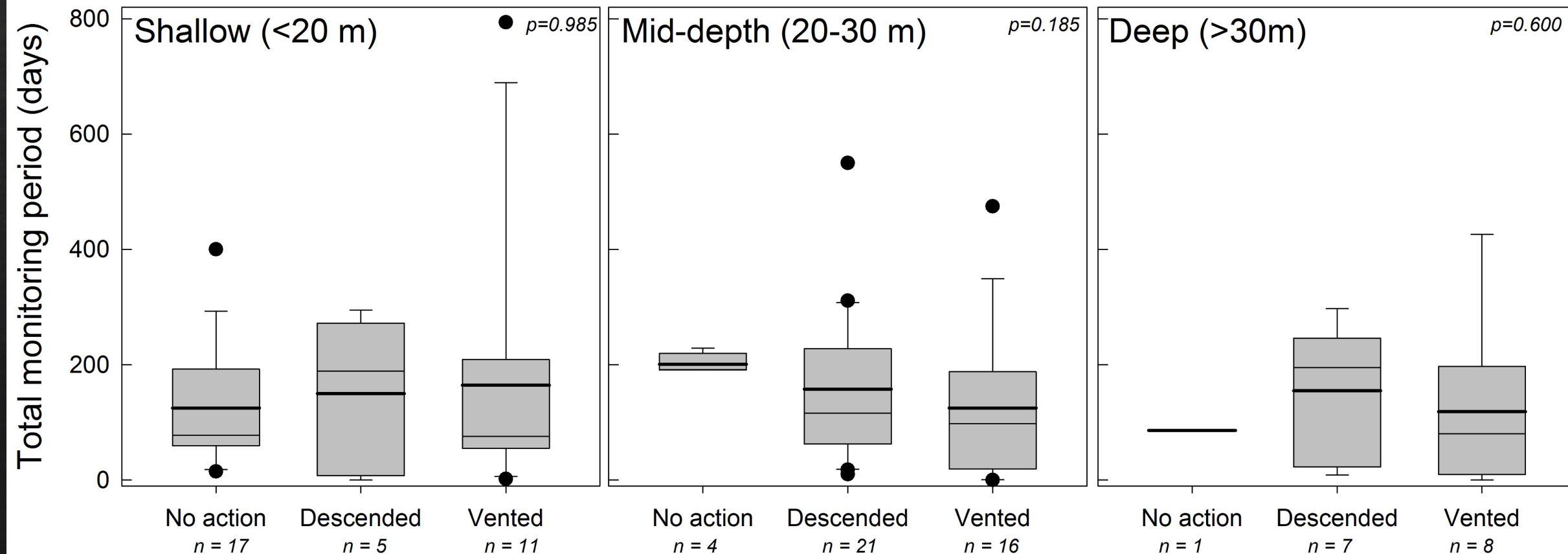
# Examples of long-distance movement





# Comparison of release methods\*

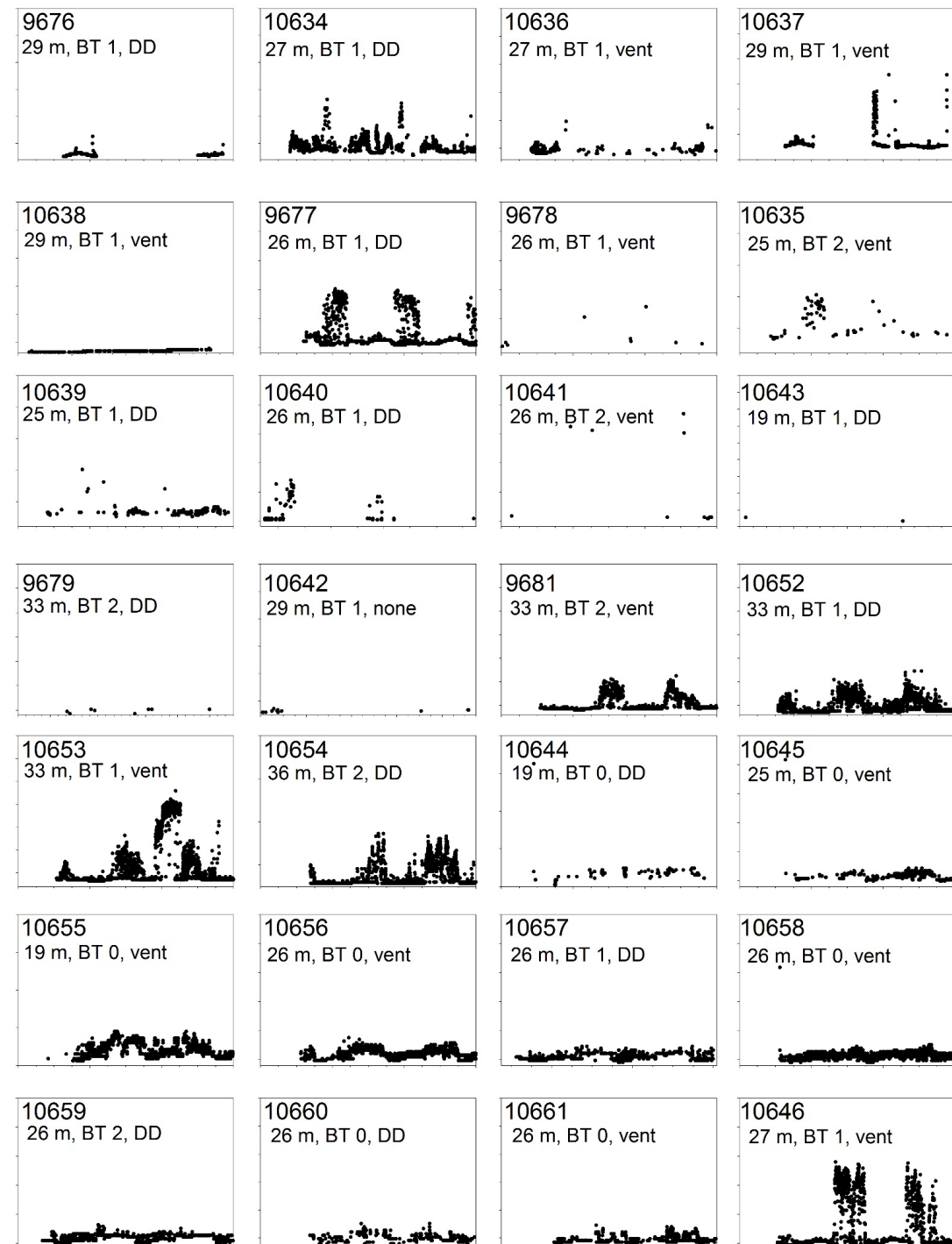
\*note the “no-action” groups for mid-depth and deep were not intentional;  
also note that venting was being performed by practiced anglers



# Behavior post-release

Pattern of little to no movement during the first few hours

6/90 fish displayed no evidence of vertical movement after 48 hours (6.3%)







## Summary

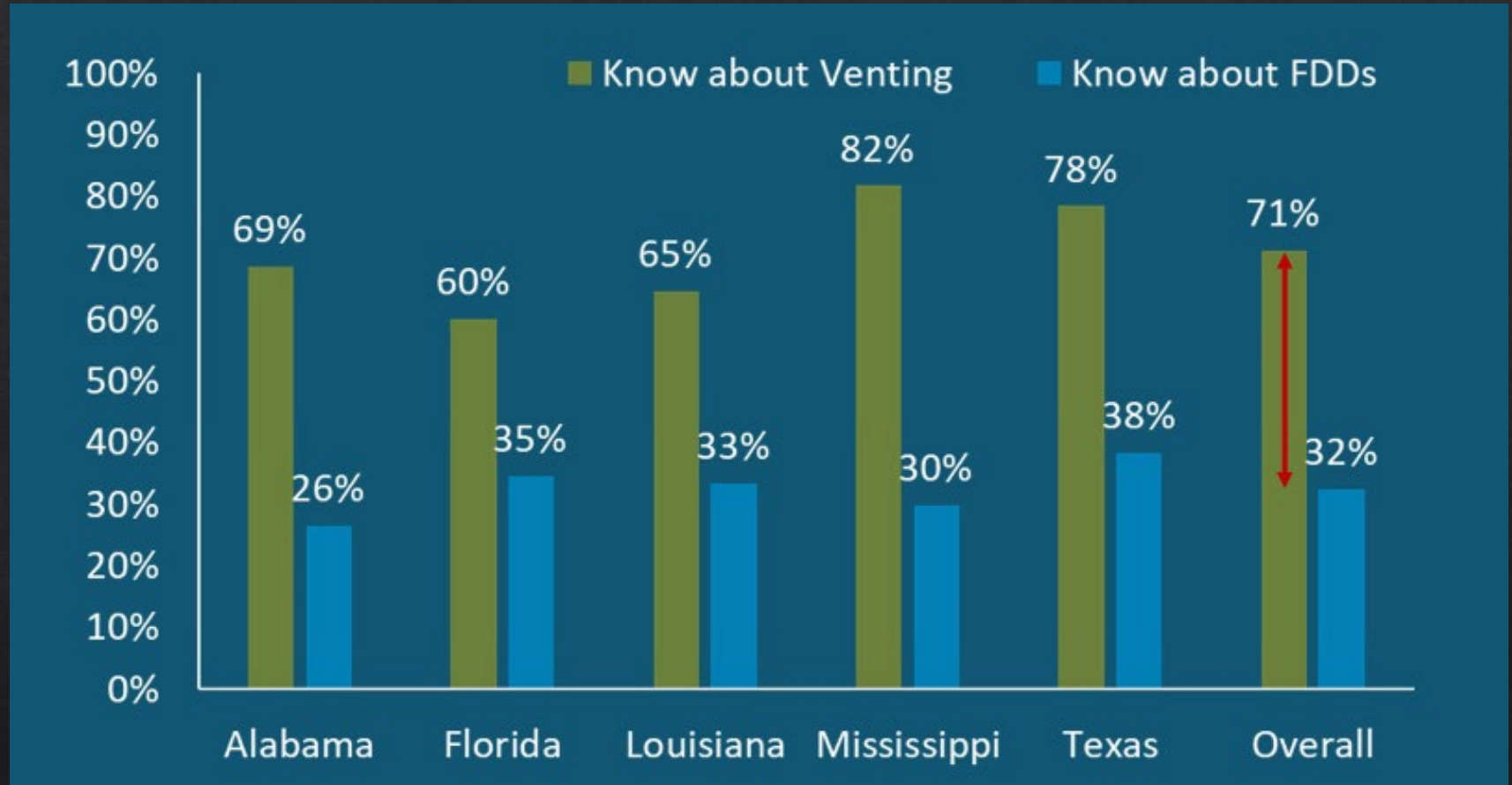
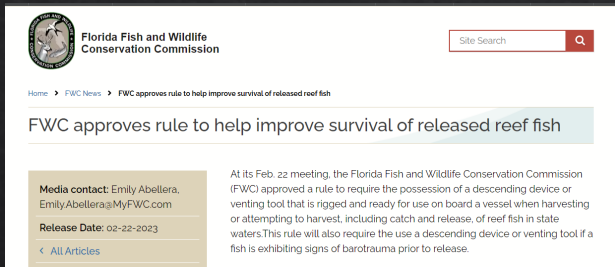
Acute mortality of Gag after C&R was <10% inside 40 m

Recaptures support tag retention and acoustic data

Site fidelity of weeks – months for tagged fish (size range 17 – 32 inches TL)

Inside 40 m (100 ft), both release methods are effective for Gag (if done properly...see next slide!)

# Angler knowledge & behavior change



Graphic credit: Charlie Robertson at GSFMC. Full report: Awareness, Attitudes, Perceptions, and Use of Best Fishing Practices by Recreational Reef Anglers in the Gulf of Mexico. 2022. Gulf States Marine Fisheries Commission.

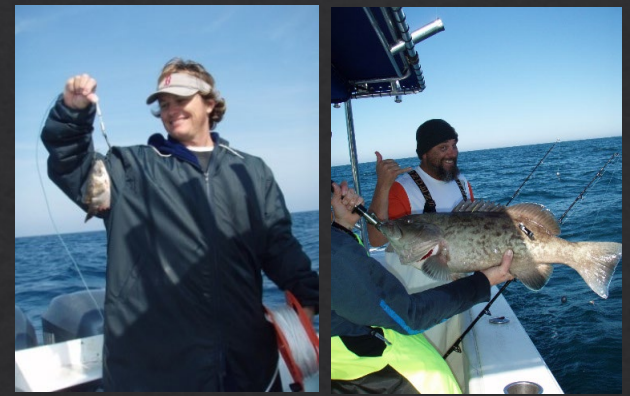
<https://www.gsmfc.org/publications/GSMFC%20Number%20312.pdf>







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Dan Foster served as the NOAA NMFS technical monitor during this work and Robert Sadler monitored project progress through NMFS progress reports.