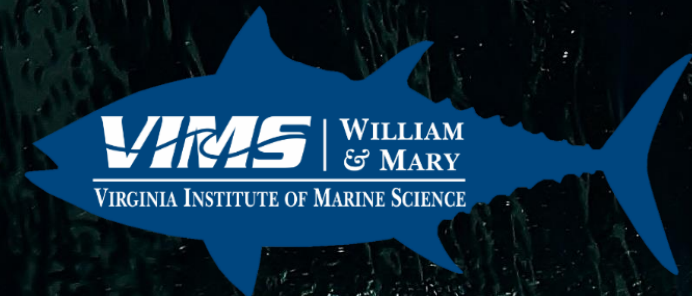


Virginia's saltwater recreational fisheries: An introduction

Willy Goldsmith
PhD Candidate

Virginia Institute of Marine Science
College of William & Mary



Who I am...and *what* I am

MA → VA

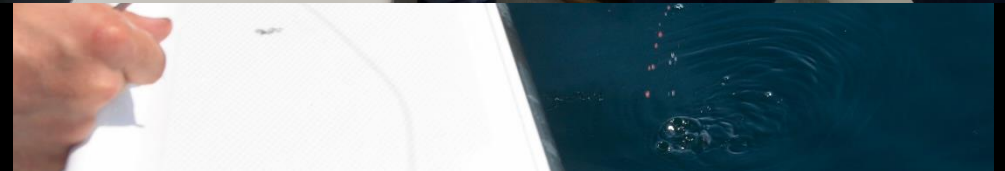
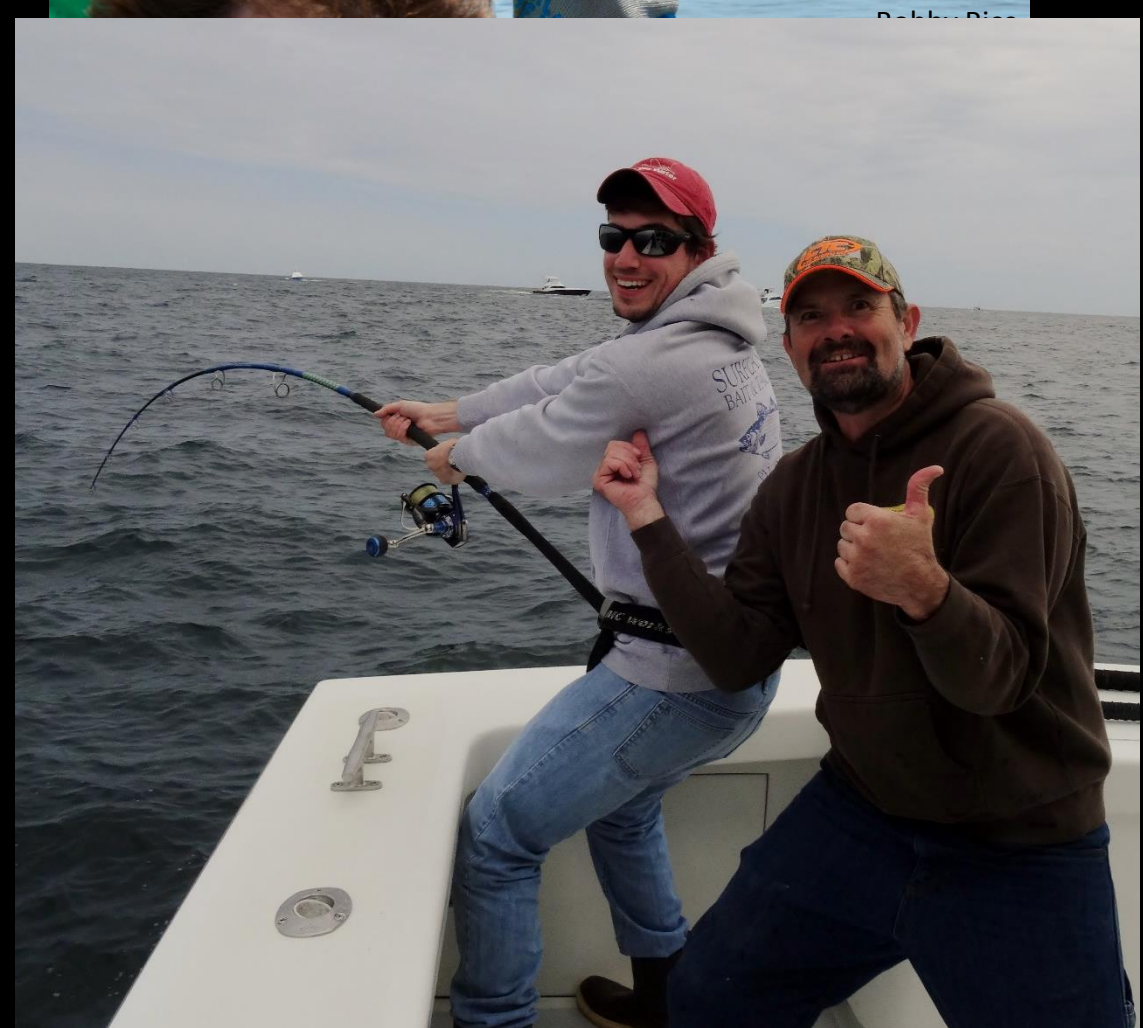


PhD Candidate, Fisheries Science

Research focus: Atlantic bluefin tuna

Science → Management

Extensive engagement with the recreational fishing community



What is recreational fishing?

- Primary purpose is not obtaining food or selling fish-related products
- Conducted during free time
- Defined by the participant as being leisure (not work!)



Recreational fishing: It's popular!

- Only 8% of total U.S. harvest...

In 2015, along the Atlantic coast:

- **5.2 million anglers took 34 million trips and caught over 188 million fish**

Virginia: 2 million trips (600,000 anglers)

- **6 million fish harvested, 8 million released**



Recreational fishing: Big business!

Anglers in 2015:

- Spent \$4.5 billion on fishing trips (bait, fuel, ice)
- Spent \$24 billion on durable goods (boats, tackle)
- Supported 440,000 jobs

Virginia:

- Over \$500 million in recreational fishing-related sales in 2015 → \$200 million in income supporting > 5,000 jobs



© Tommy Thompson

Virginia's recreational fish species: Inshore



Virginia's recreational fish species: Offshore



What are the most popular species?

Largest catch (harvest & release , by number):

Atlantic croaker (13 million!) > Black Sea Bass > Summer Flounder > Bluefish > Striped Bass

Largest harvest (by weight):

Striped bass (17 million pounds!) > Bluefish > Dolphinfish > Summer flounder > Scup



Catch and release in recreational fisheries

In 2015, U.S. recreational anglers caught 351 million fish

- 57 % (200 million) were released alive! (regulations, voluntary)

BUT, do released fish survive?

- Understand recreational fishery impacts
- Evaluate management effectiveness
- Inform best practices



Post-release survival research at VIMS

Fisheries Genetics and Pelagic Fishes Program



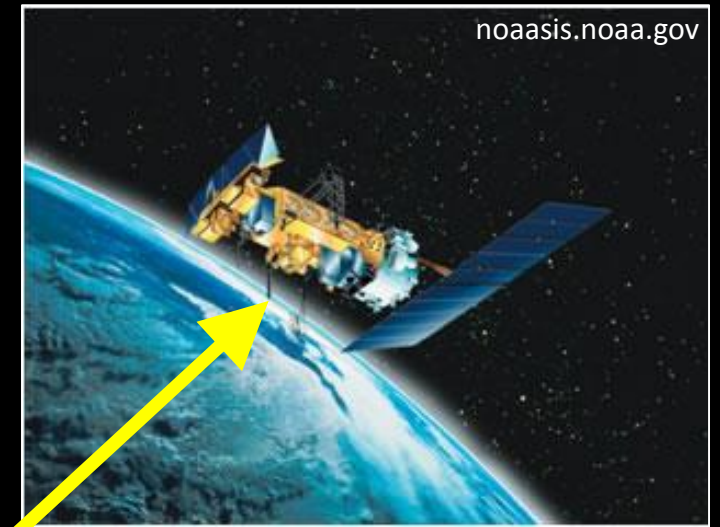
Recent and current projects:



Pop-up Satellite Archival Tags (PSATs)

Record environmental data (depth, temperature, light)

10-day to 2-year deployments (typically < 30 days for post-release survival studies)





White marlin: Background and fishery

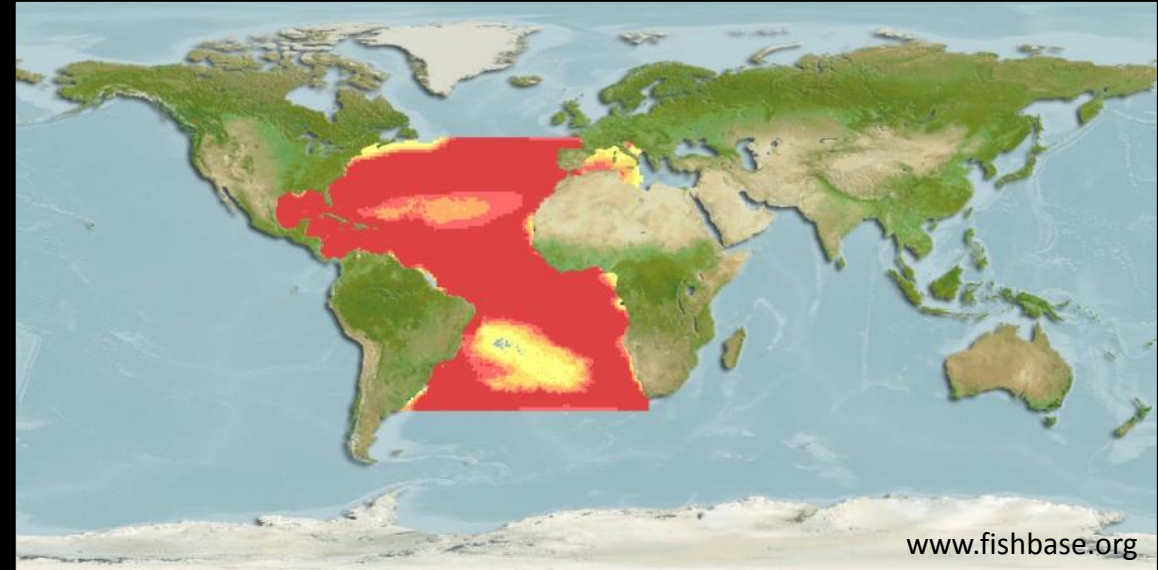
Wide-ranging!

Currently considered overfished

Large, economically valuable recreational fishery along Mid-Atlantic coast:

- **Almost exclusively catch and release (>10,000 releases per year!)**

Maximizing post-release survival is critical



What influences post-release survival?

Mid-2000s: Circle hooks versus J-hooks

- All white marlin left in the water for tagging
- J-hooks: 13 of 20 fish survived (65%)
- Circle hooks: 58 of 59 fish survived (98.3%)
- Voluntary adoption of circle hooks by recreational community



Recent work: What about air exposure?

- **Federal regulation:** Billfish that are to be released must not be removed from the water...
- **Air exposure:** Increased post-release mortality in other species
- **Recent VIMS study:** Determine effect of air exposure on white marlin post-release survival



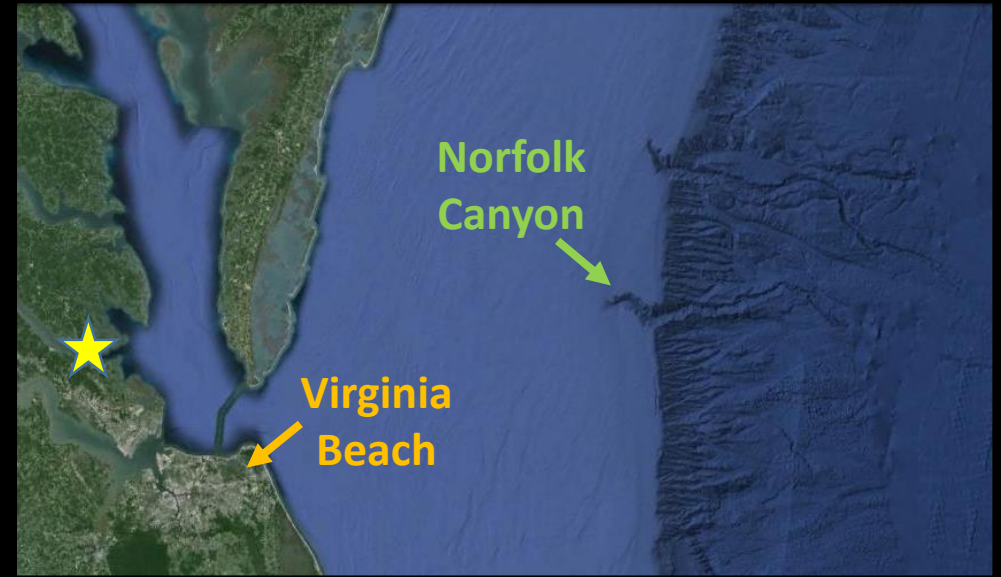
www.melontackle.com



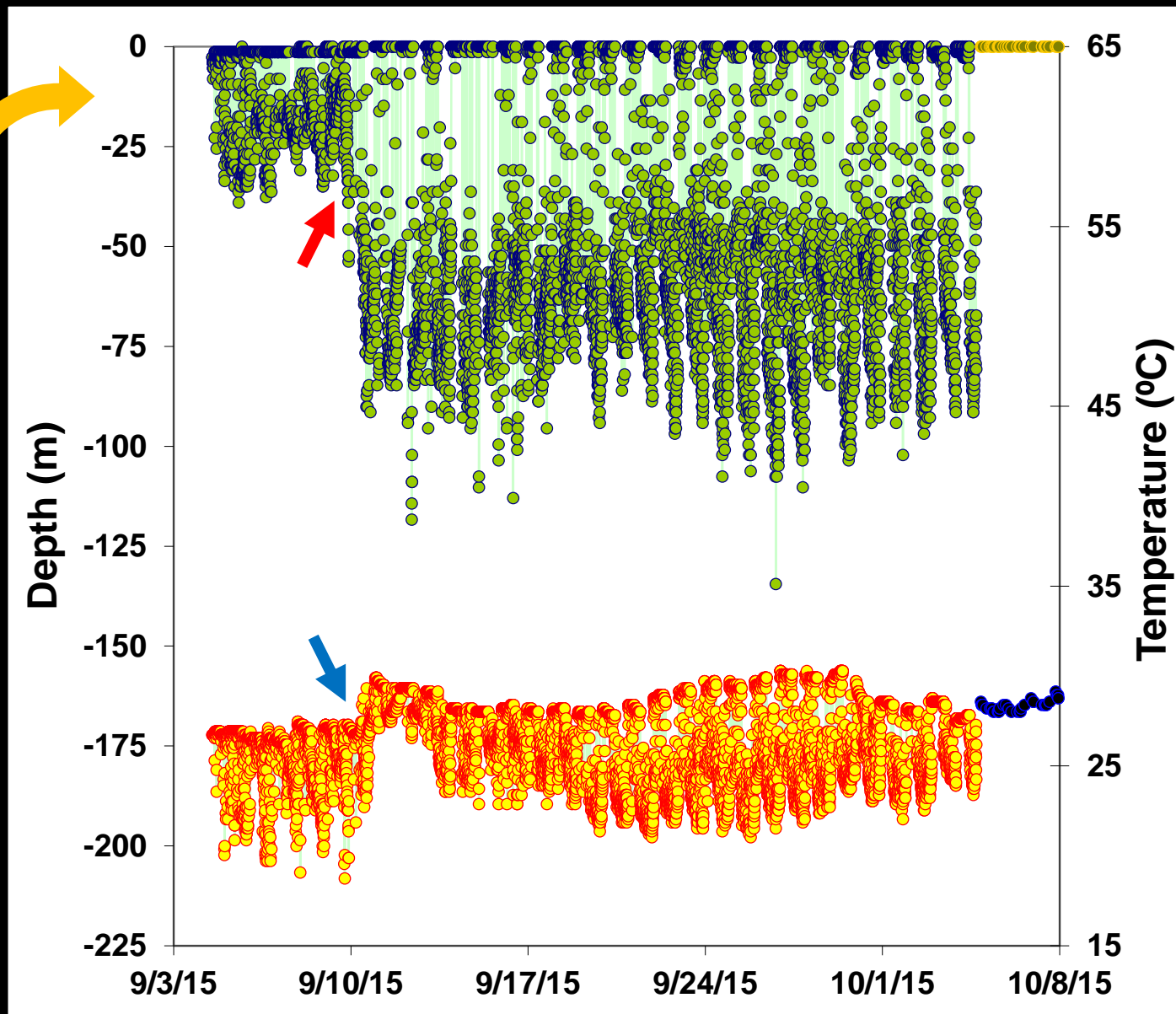
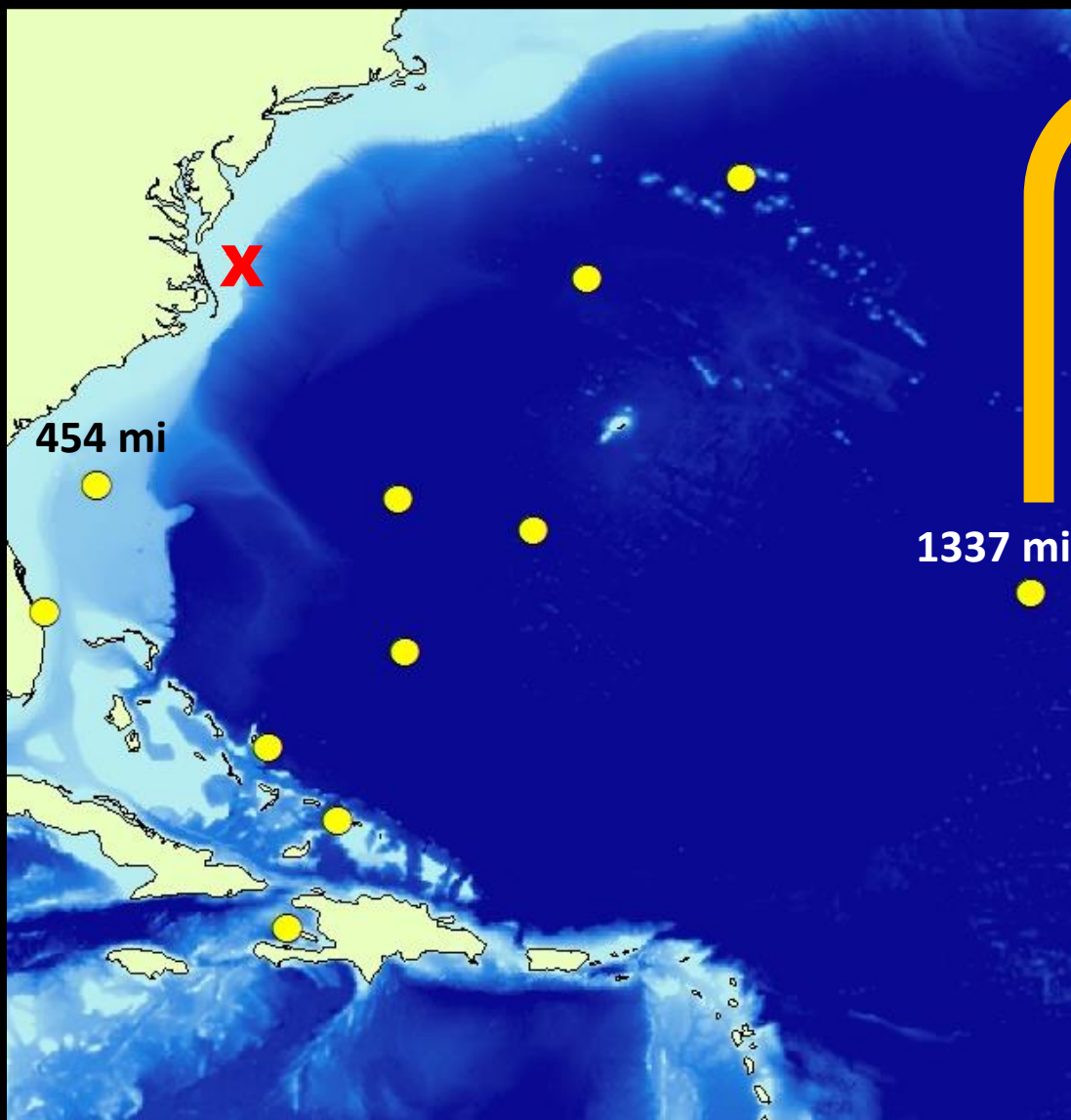
www.tripadvisor.com

Air exposure and post-release survival

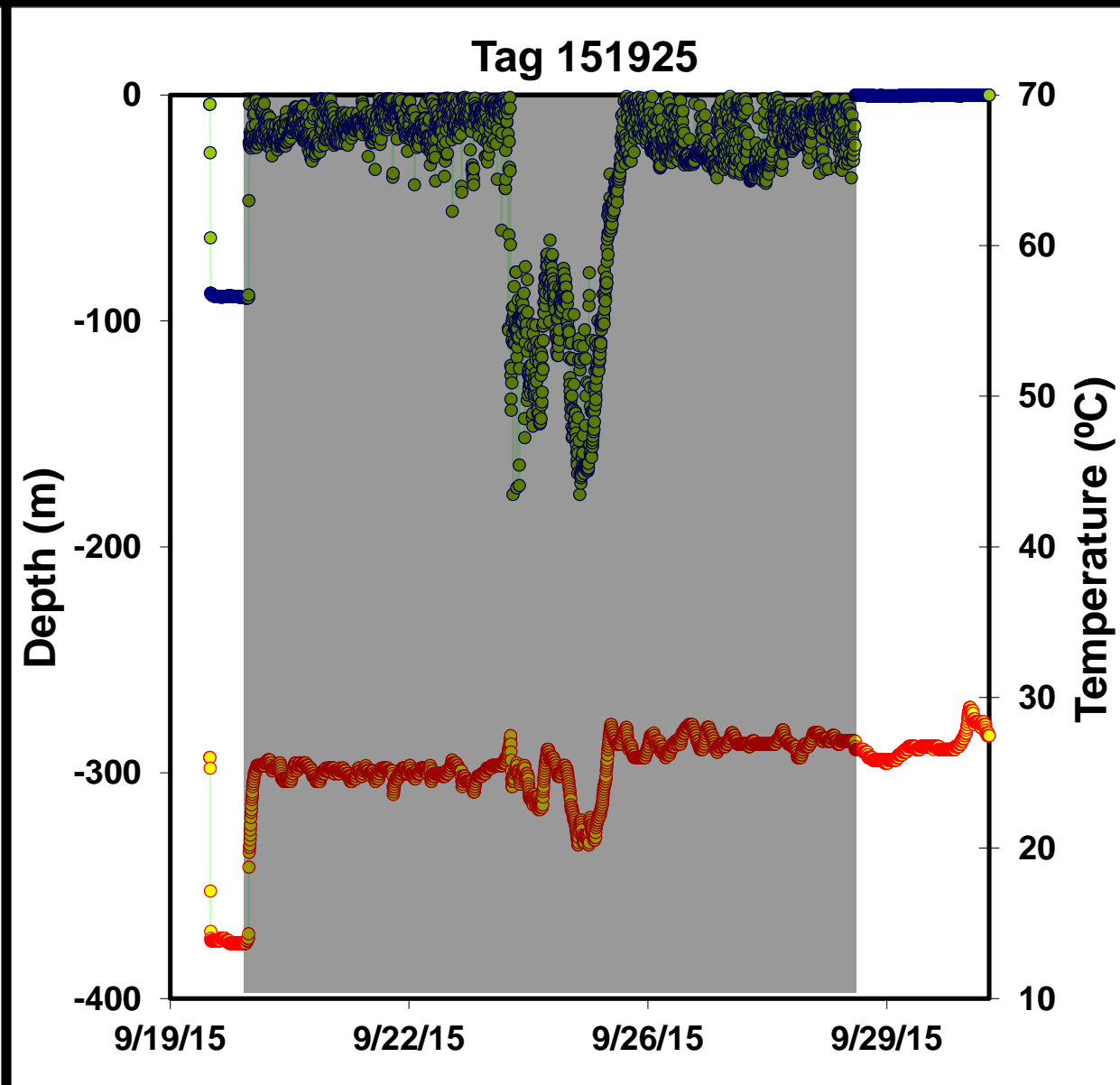
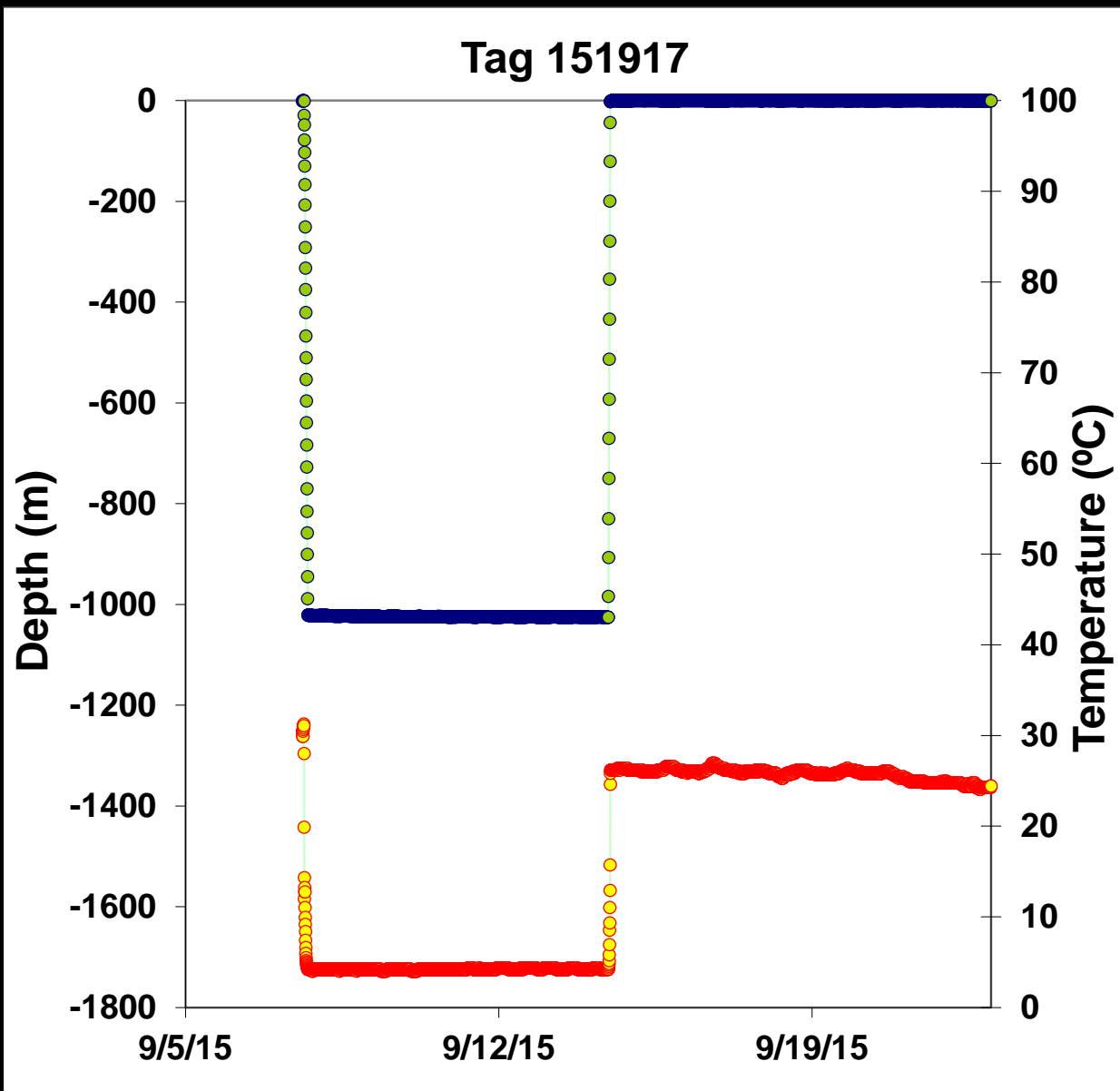
- Norfolk Canyon, 60 miles east of Virginia Beach
- 18 white marlin caught using circle hooks and typical recreational fishing methods
- Removed from water for 1, 3, or 5 minutes
- Compare survival estimates with control study (59 fish tagged with circle hooks while left in water; 58 survived)



Fish movements

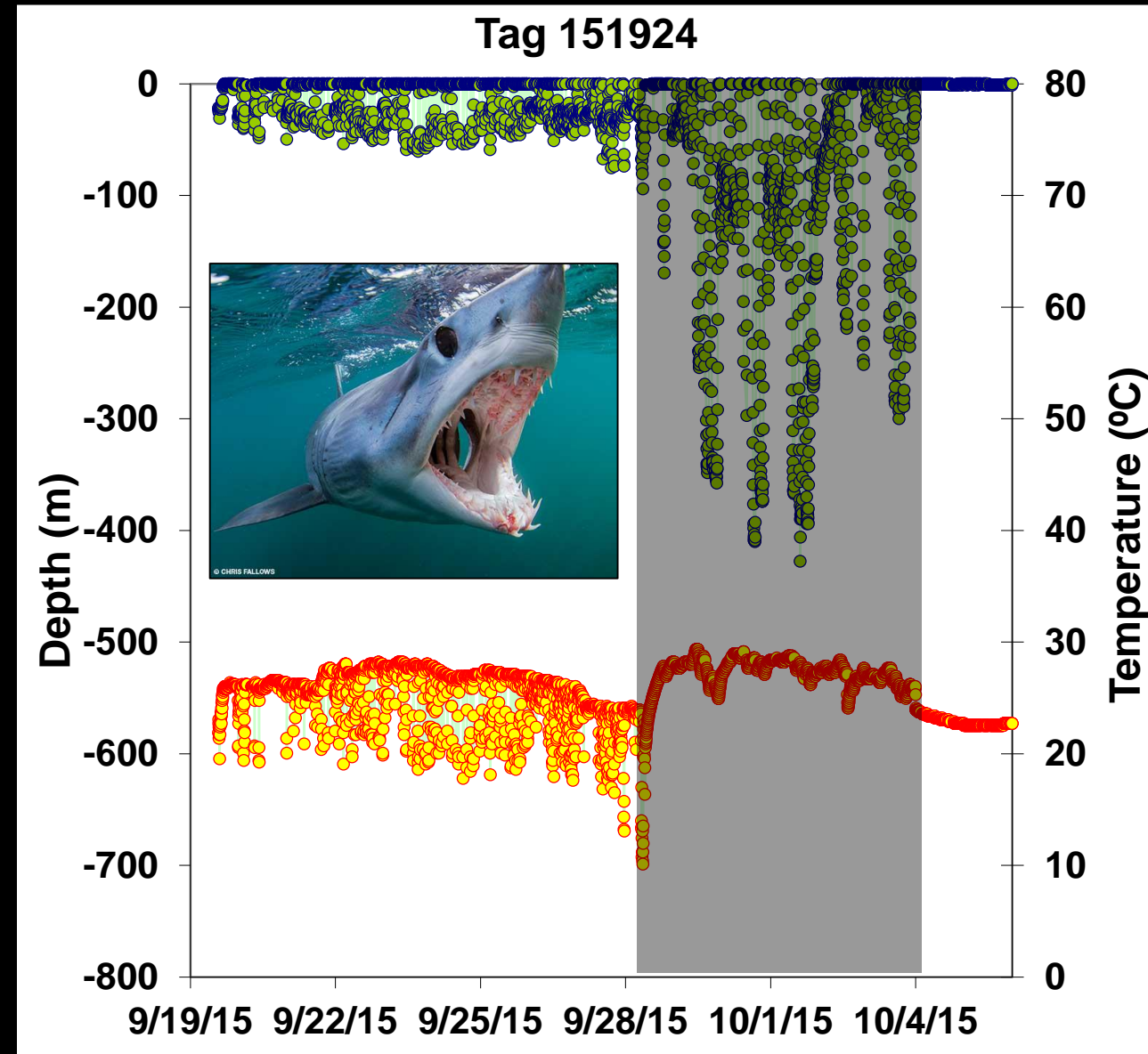
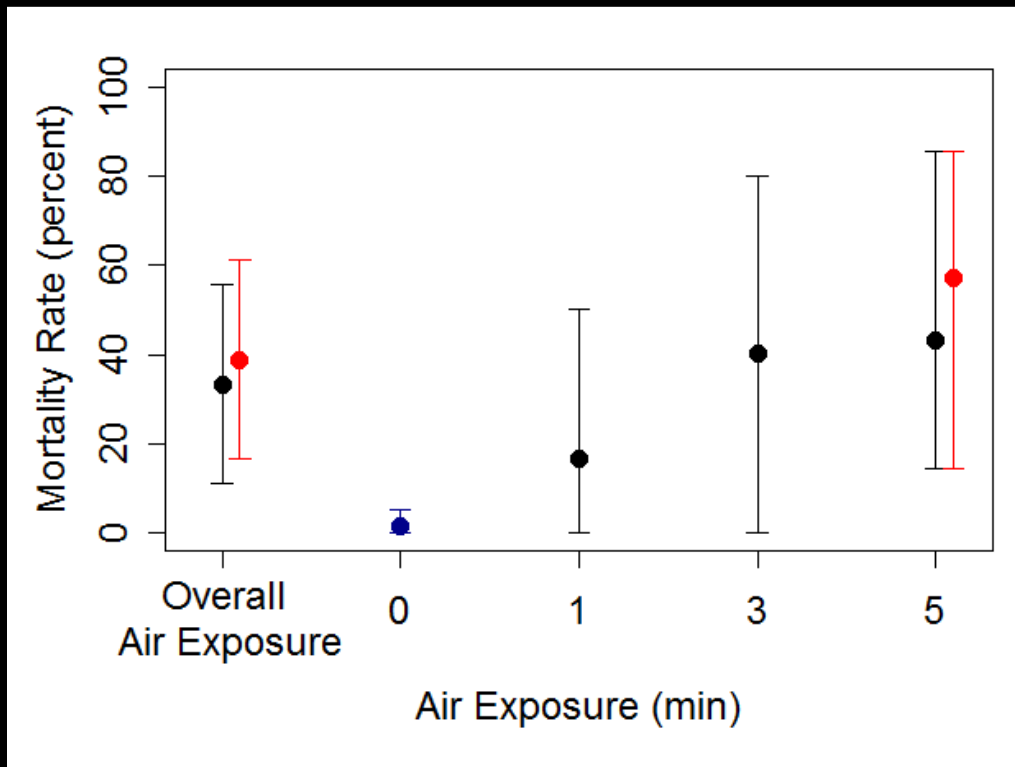


Detecting post-release mortality



Post-release mortality: Results

- 6 of 18 fish died within 30 h (33.3%)
- 1 died after 9 days
 - Natural or fishing mortality?



Air exposure: Conclusions

- Negative effects of air exposure evident
- Oxygen debt (fight) exacerbated by air exposure
- Mortality increases with air exposure duration
- Public outreach to recreational billfish community to help keep marlin in the water where they belong!



Catch and release: General advice

- 1) Use appropriate tackle to play the fish quickly—consider barbless/circle hooks
- 2) Keep the fish in the water as much as possible!
- 3) Handle the fish gently, and as little as possible
- 4) Assist in reviving the fish when necessary



Conclusions

Recreational fisheries are a popular pastime and an important part of Virginia's coastal economy

VIMS engages heavily with the recreational fishing community to conduct valuable research

Catch and release is important for conservation, but follow key guidelines!



Thank you!



Please email me if you'd like to learn more! wmgoldsmith@vims.edu