

Spatial and Temporal Patterns of the Prohibited Atlantic Angel Shark, *Squatina dumeril*, Within the Mid-Atlantic Bight

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Introduction

- Angel sharks (*Squatina* spp.), are one of the most threatened genus of sharks.
- Atlantic angel sharks (*Squatina dumeril*) are federally protected from being harvested.
- Classified as "data deficient", which prohibits proper evaluation of the species due to lack of information.



Purpose

Assess spatial and temporal distribution of Atlantic angel sharks within the Mid-Atlantic Bight through long-term coast wide bottom trawl surveys, as well as gain insight on behavior through acoustic telemetry.



Figure 1. Measuring length of Atlantic angel shark on NJDEP bottom trawl survey.

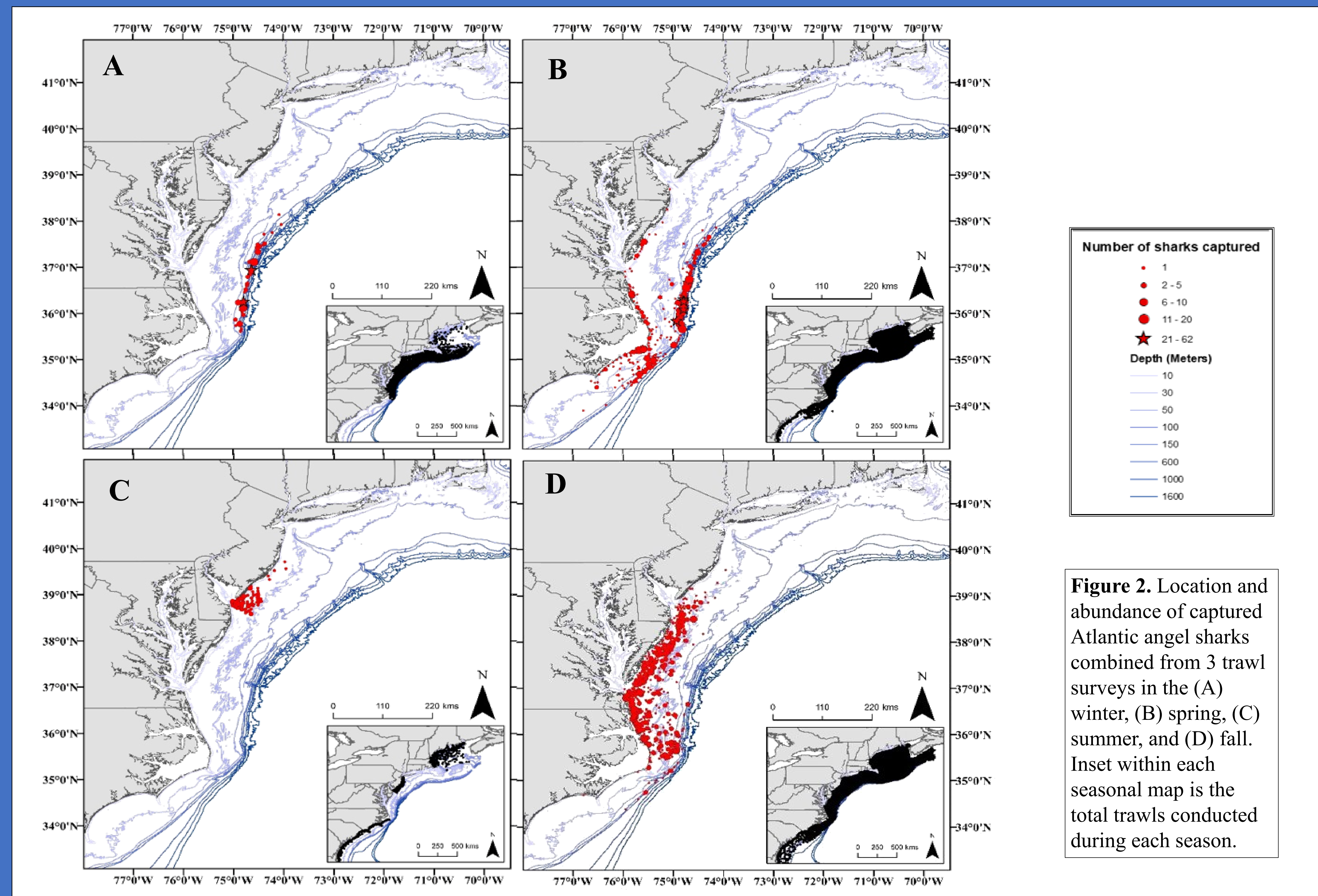


Figure 2. Location and abundance of captured Atlantic angel sharks combined from 3 trawl surveys in the (A) winter, (B) spring, (C) summer, and (D) fall. Inset within each seasonal map is the total trawls conducted during each season.

Atlantic Angel Sharks Exhibit Strong Spatial and Temporal Seasonal Migratory Movements

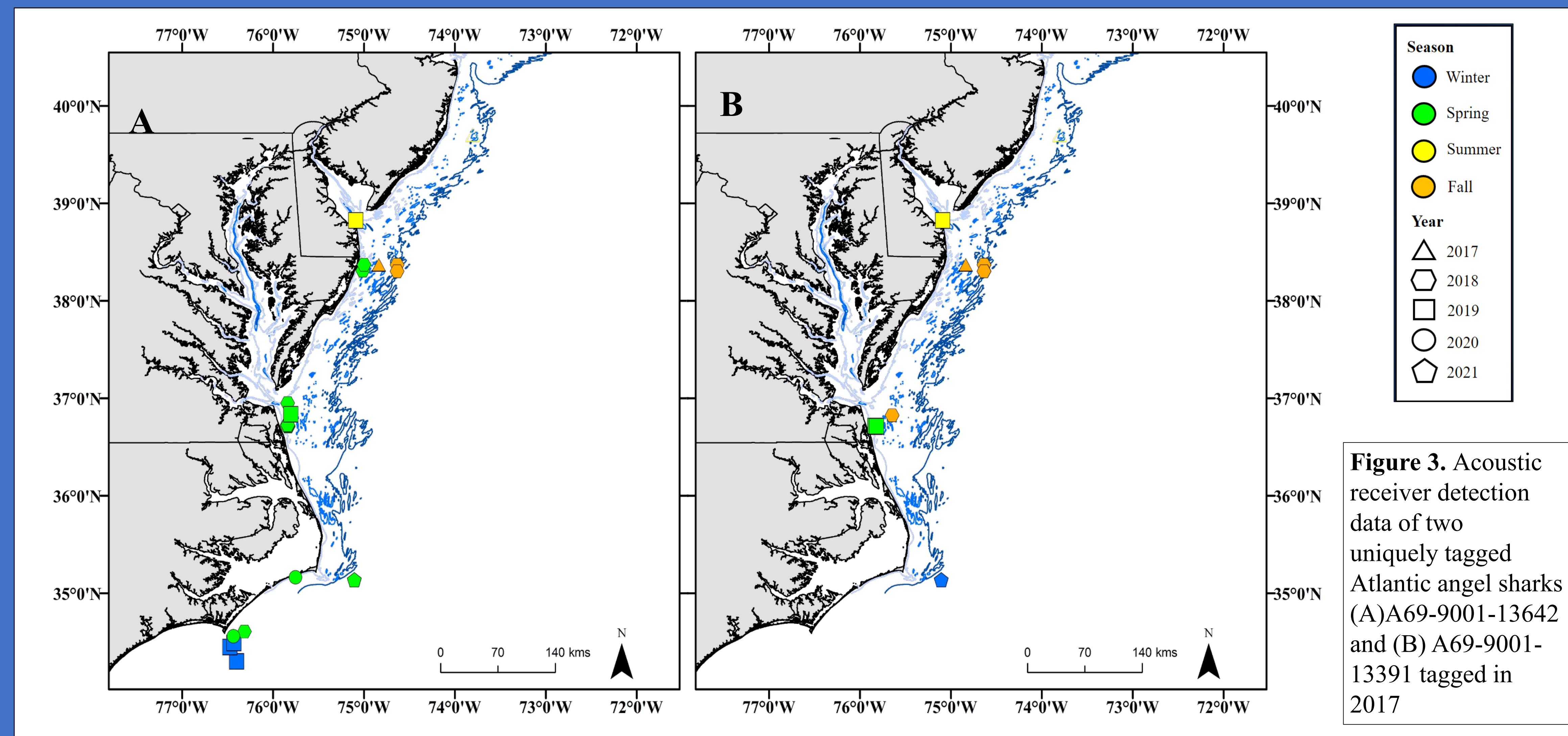


Figure 3. Acoustic receiver detection data of two uniquely tagged Atlantic angel sharks (A) A69-9001-13642 and (B) A69-9001-13391 tagged in 2017

Acknowledgements

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Methods

- Analyzed 4 fishery independent trawl surveys for Atlantic angel shark captures.
- Evaluated the spatial and temporal trends of shark captures and evaluated through ArcMAP.
- A subset (n= 5) Atlantic angel sharks were surgically implanted with Innovasea V16-6H acoustic transmitters to evaluate movements.



Figure 4. Acoustic tag being surgically implanted into an Atlantic angel shark

Results

- Sharks showed strong seasonal spatial and temporal patterns in abundance and distribution along the Mid-Atlantic Bight.
- Two acoustic tagged sharks were detected multiple times from 2017-2022. A69-9001-13642 (n=1409 unique detections; 19 stations) and A69-9001-13391 (n=816 unique detections; 22 stations) both displayed repeated seasonal migrations.

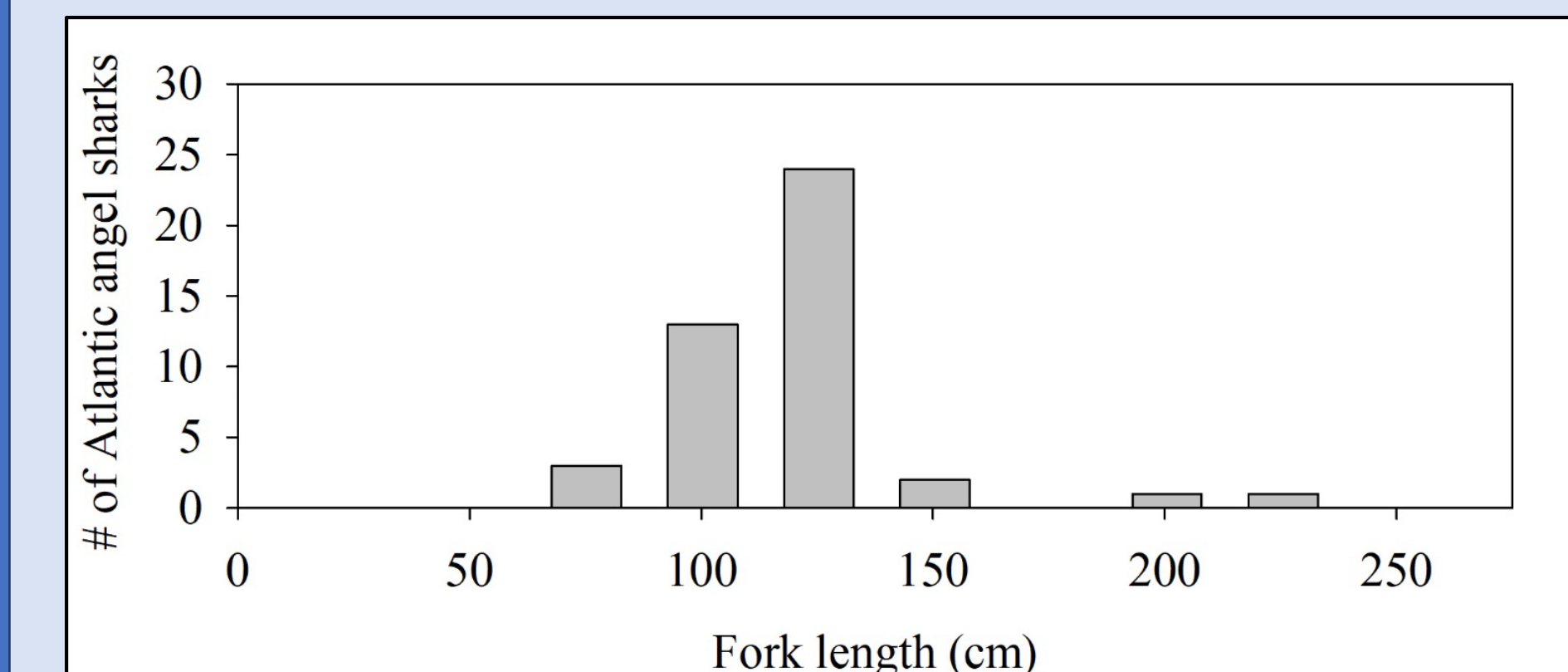


Figure 5. Length distribution of captured angel sharks in NJDEP trawl survey

Discussion

Trawl survey and acoustic tag data provide evidence of seasonal migrations, moving south during winter months (times not captured in trawl survey) and north during summer months. This information on Atlantic angel sharks is crucial to aid in the understanding and conservation of this species.