

Sharks in the Sound

Coastal Shark Habitat and Ecology Within the Pamlico Sound Estuarine System

Charles Bangley

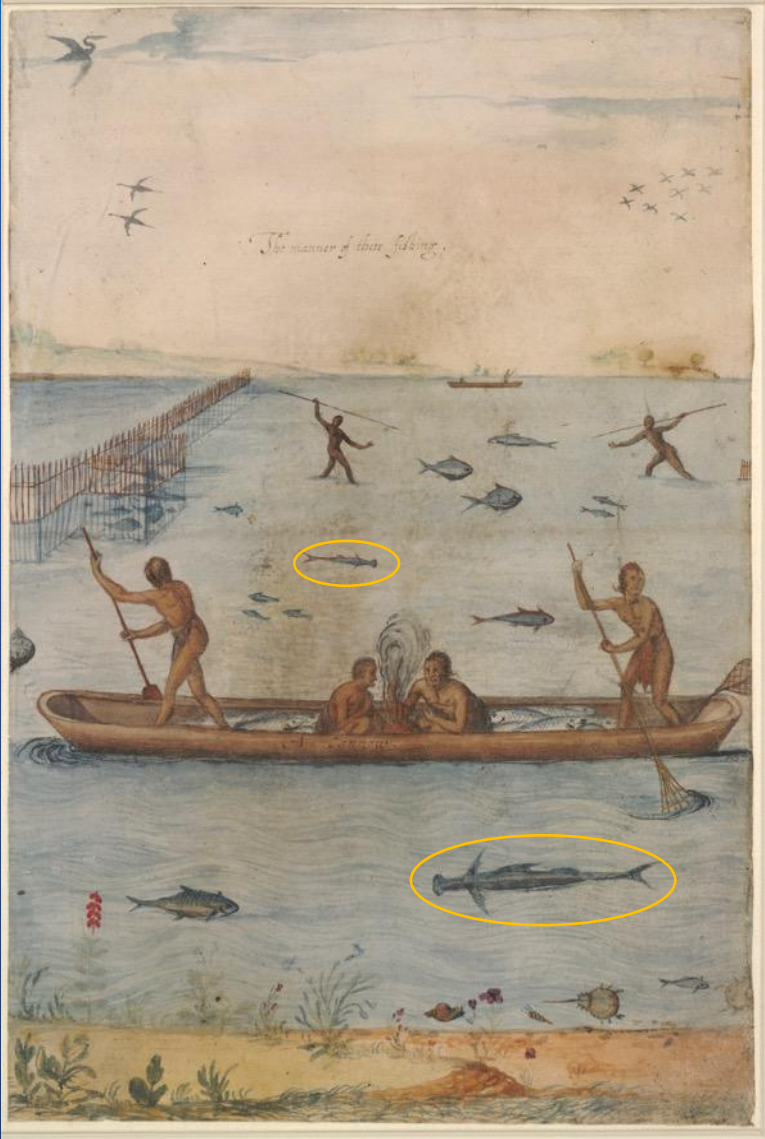
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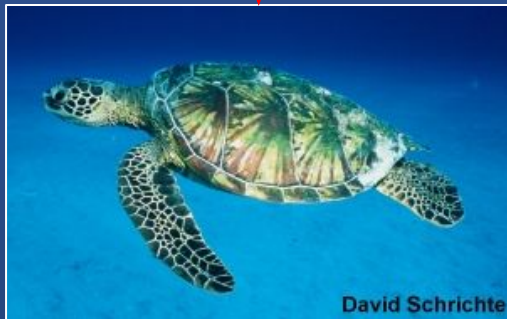
Jaws

Estuarine Elasmobranchs in North Carolina



“The Manner of their Fishing” – John White

Ecological Importance



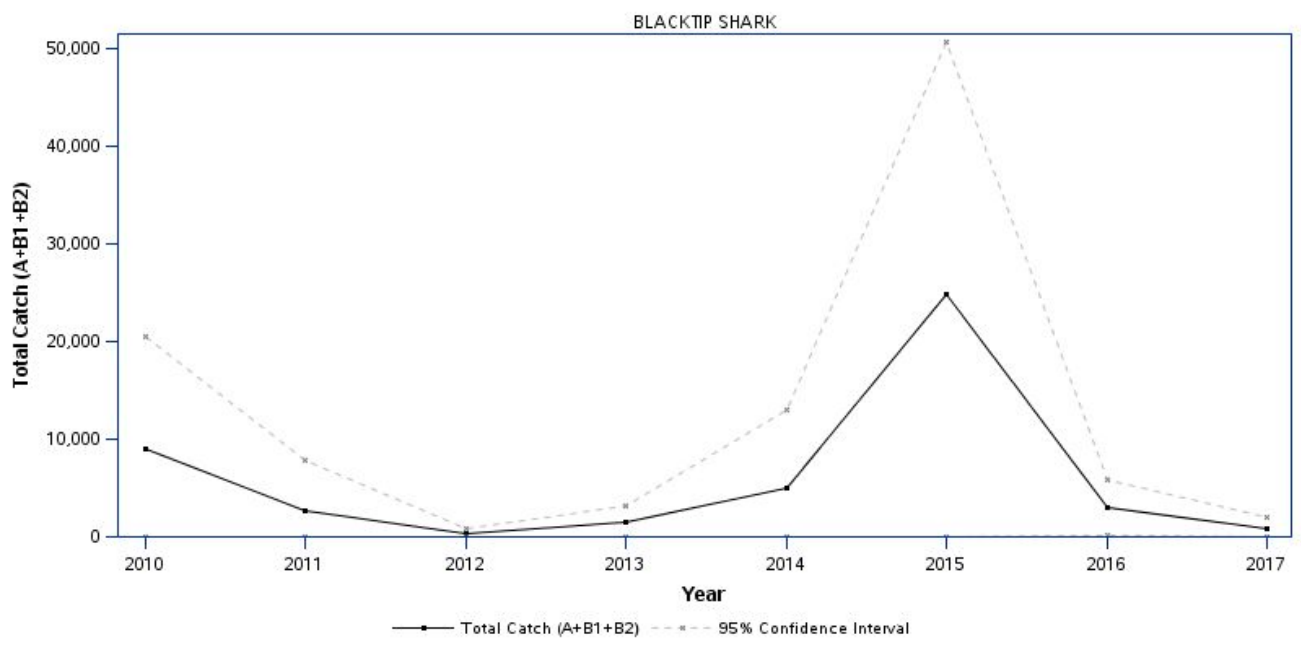
Predation
Intimidation



Predation
release



Fisheries Importance



NMFS MRIP



Interactions with Humans

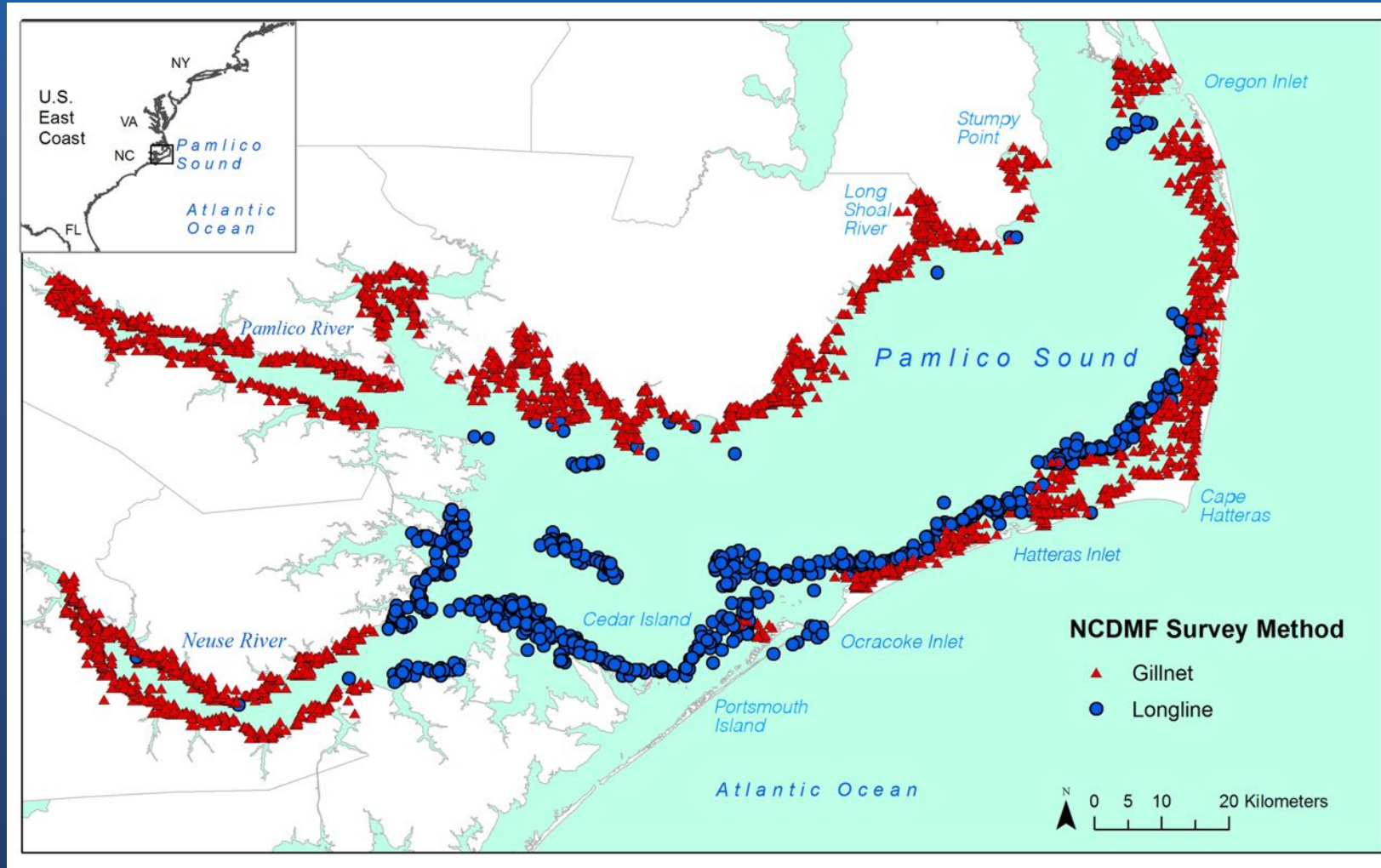


Objectives

1. Identify environmental preferences of coastal sharks in Pamlico Sound.
2. Determine the extent of coastal shark habitat available.



Pamlico Sound – Survey Data

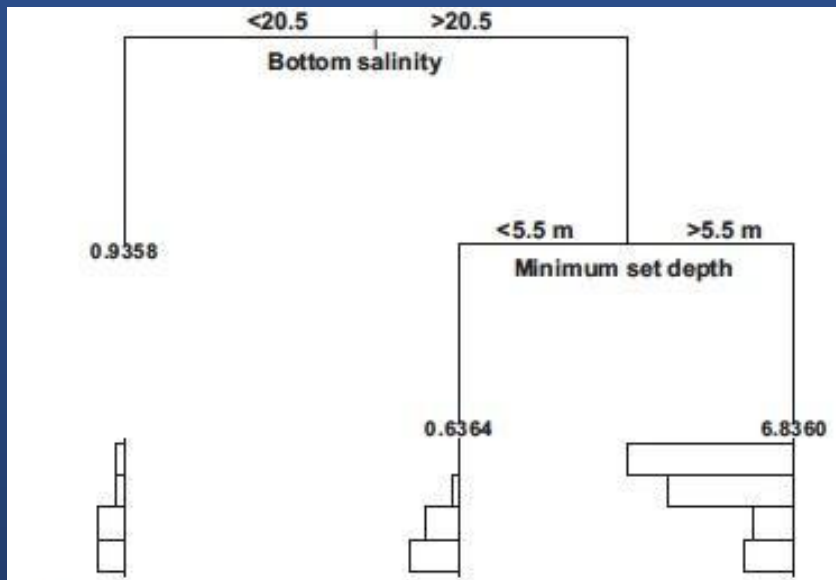


Pamlico Sound – Habitat Modeling

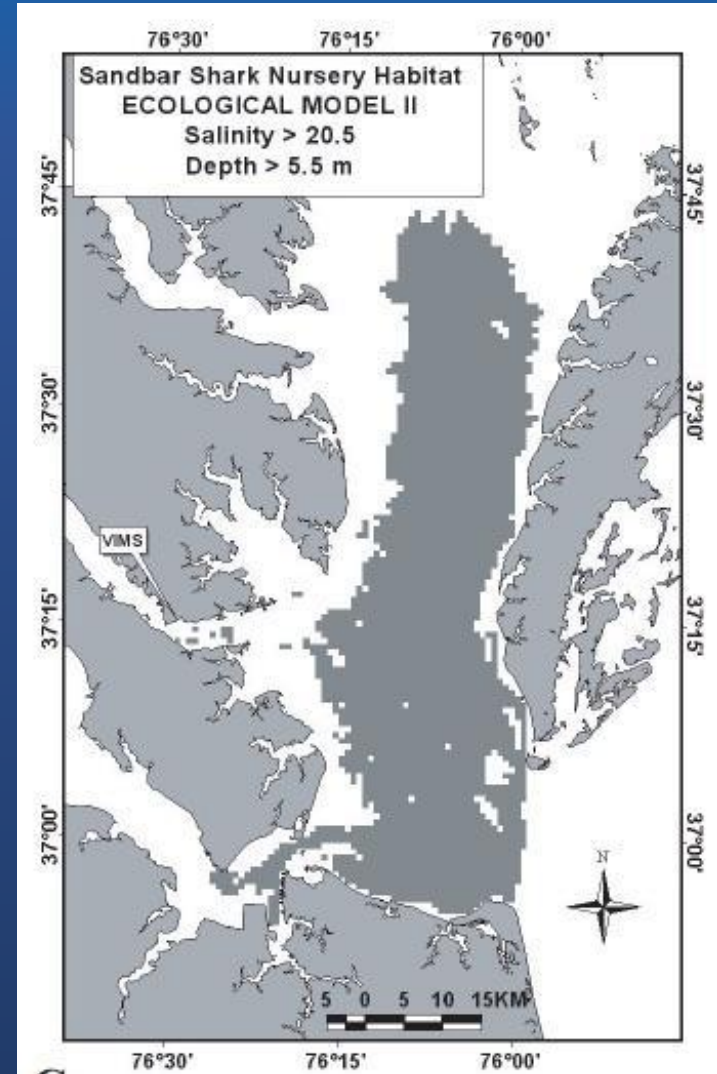
Boosted regression tree modeling

R package in development – gbm.auto (Dedman et al. 2016)

Habitat factors – depth, temperature, salinity, dissolved O₂, inlet distance, SAV distance



Grubbs and Musick (2007)



Grubbs and Musick (2007)

Pamlico Sound – Shark Catch

Atlantic Sharpnose Shark



Bull Shark



Smooth Dogfish



Species	Total N	N GN	N LL
Atlantic Sharpnose Shark <i>Rhizoprionodon terraenovae</i>	98	50	48
Blacktip Shark <i>Carcharhinus limbatus</i>	52	10	42
Bonnethead Shark <i>Sphyrna tiburo</i>	21	21	0
Bull Shark <i>Carcharhinus leucas</i>	48	45	3
Finetooth Shark <i>Carcharhinus isodon</i>	9	8	1
Unknown/Misidentified <i>Carcharhinus</i> sp.	44	44	0
Sand Tiger Shark <i>Carcharias taurus</i>	2	1	1
Sandbar Shark <i>Carcharhinus plumbeus</i>	49	27	22
Scalloped Hammerhead <i>Sphyrna lewini</i>	1	1	0
Smooth Dogfish <i>Mustelus canis</i>	1582	1570	12
Spinner Shark <i>Carcharhinus brevipinna</i>	3	1	2
Spiny Dogfish <i>Squalus acanthias</i>	499	499	0

Blacktip Shark



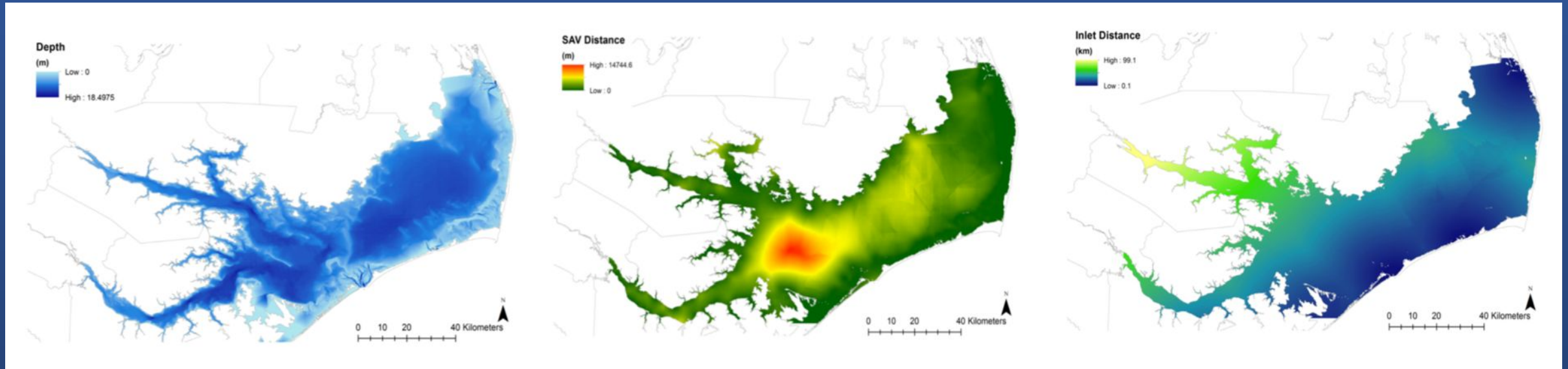
Sandbar Shark



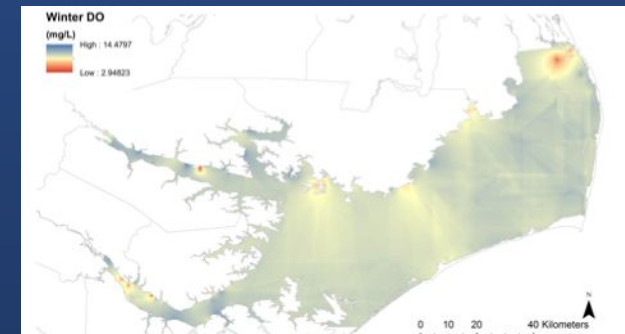
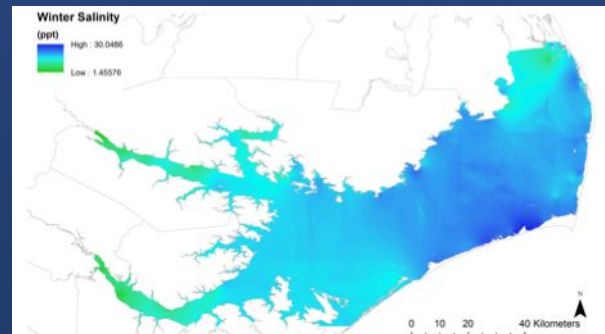
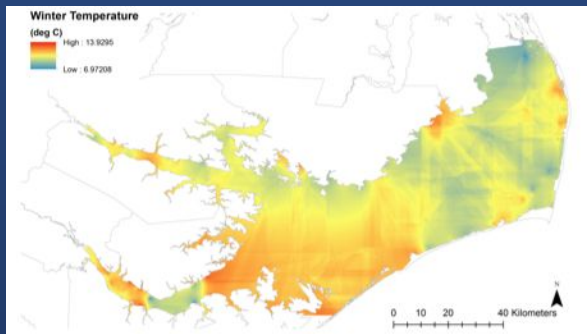
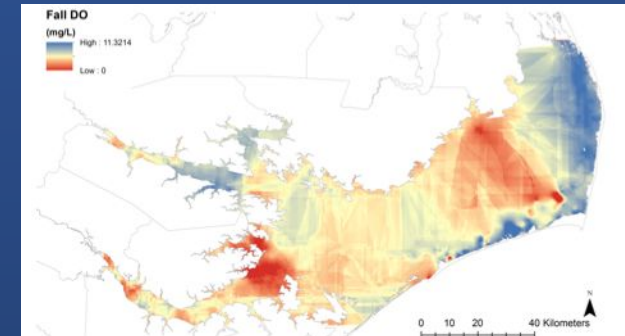
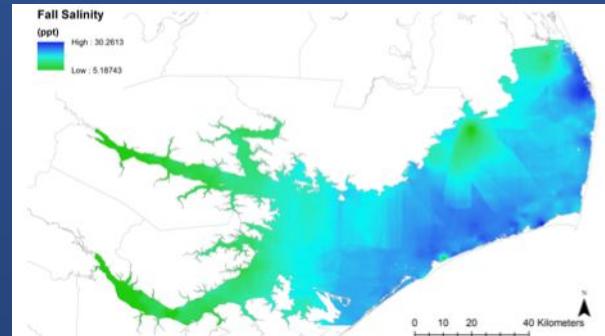
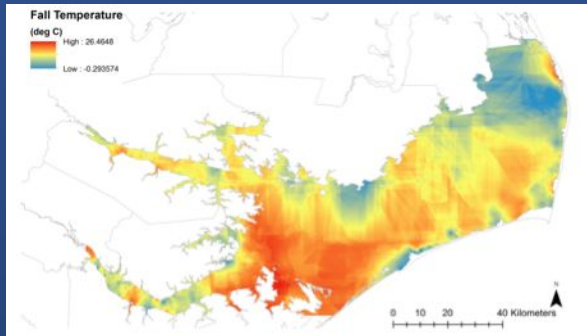
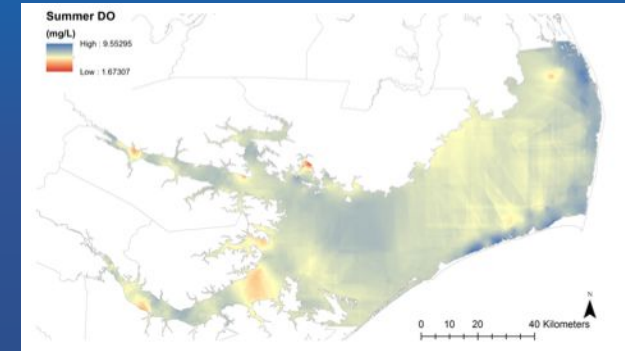
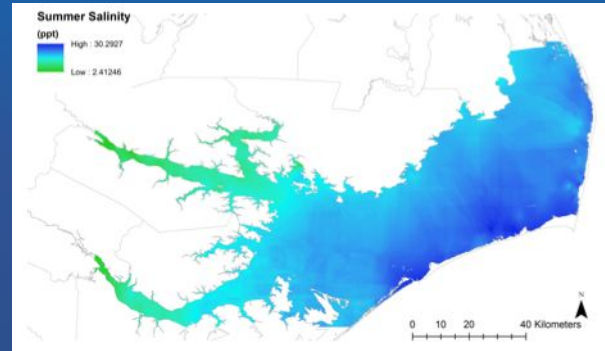
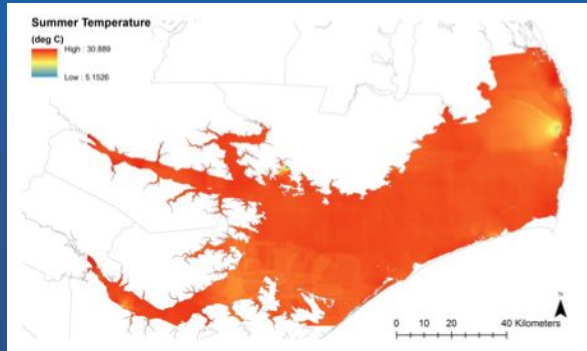
Spiny Dogfish



Pamlico Sound – Static Habitat Factors

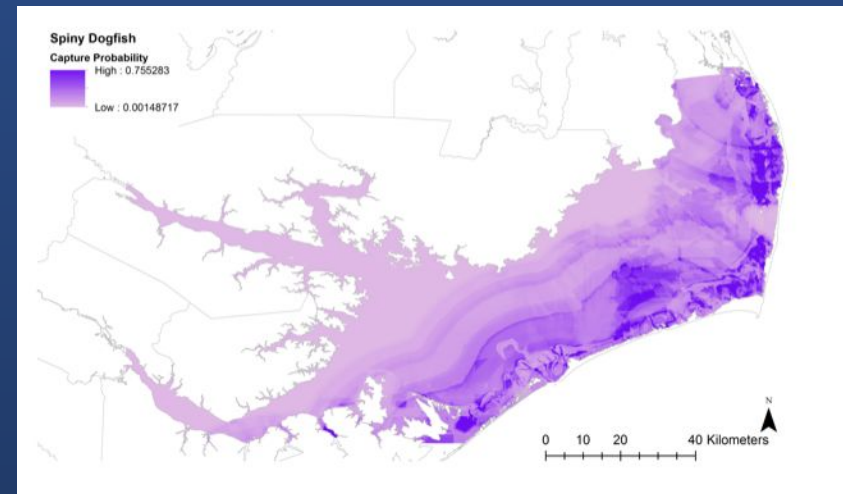
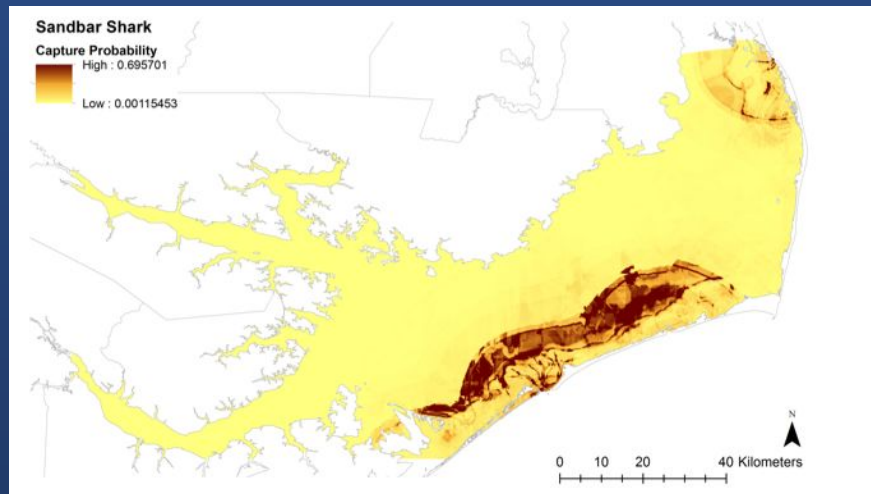
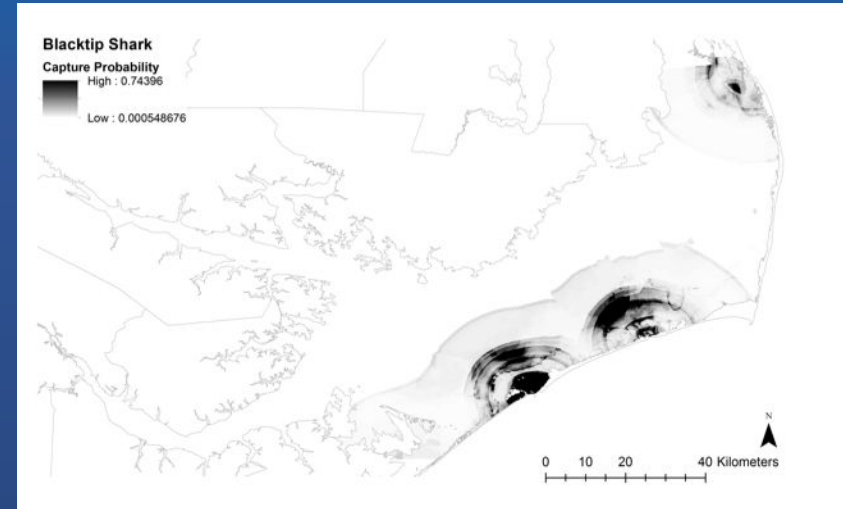
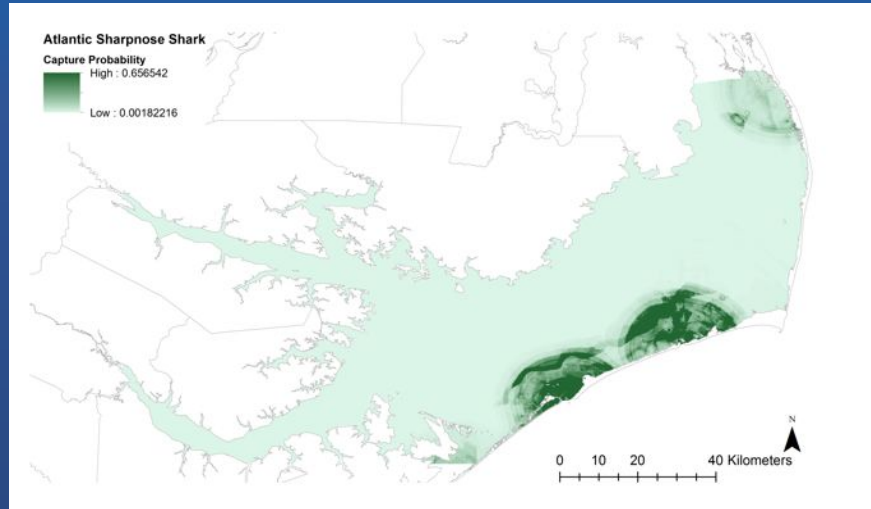


Pamlico Sound – Dynamic Habitat Factors



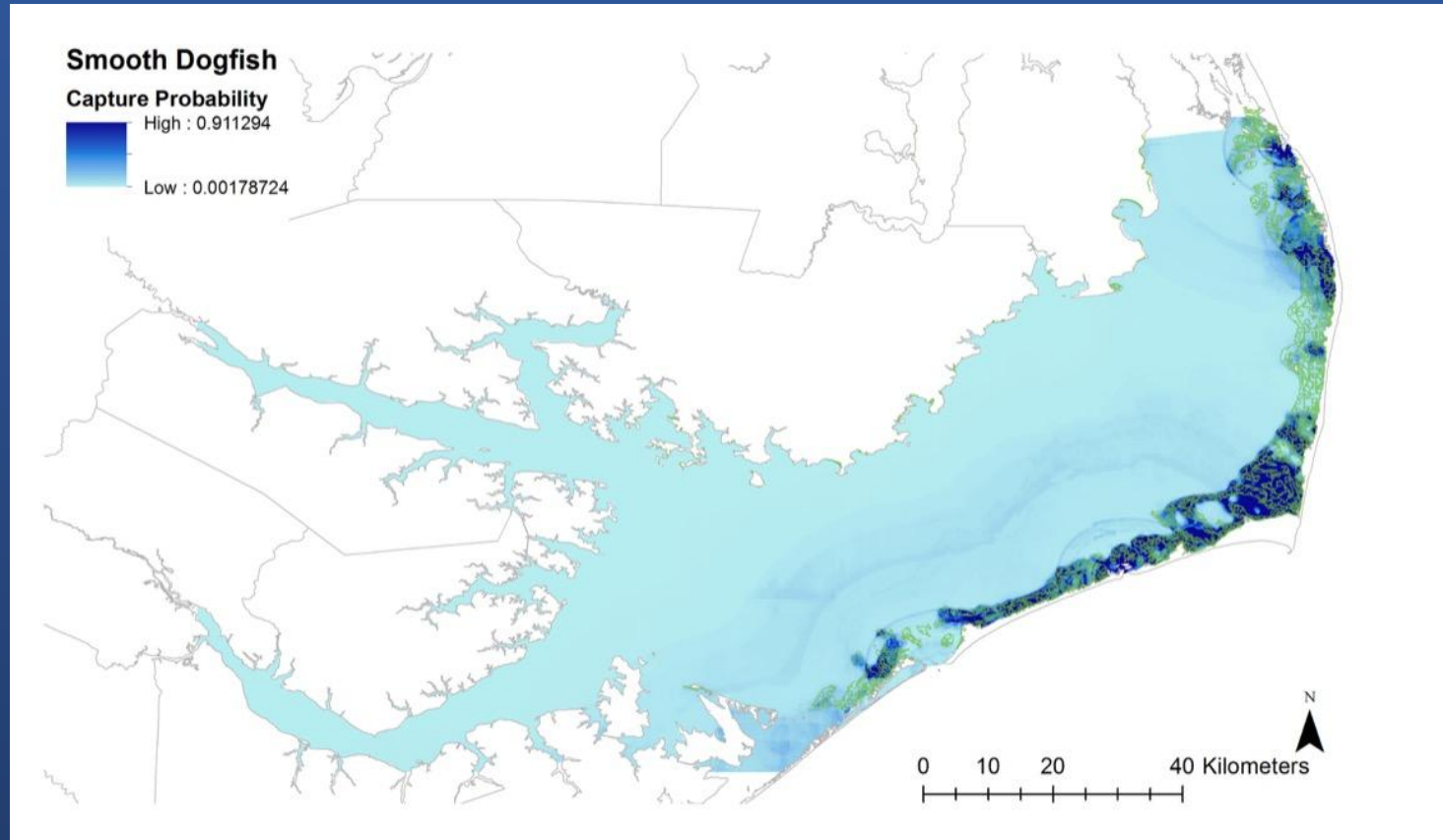
Pamlico Sound – Shark Habitat Maps

“Inlet Huggers”



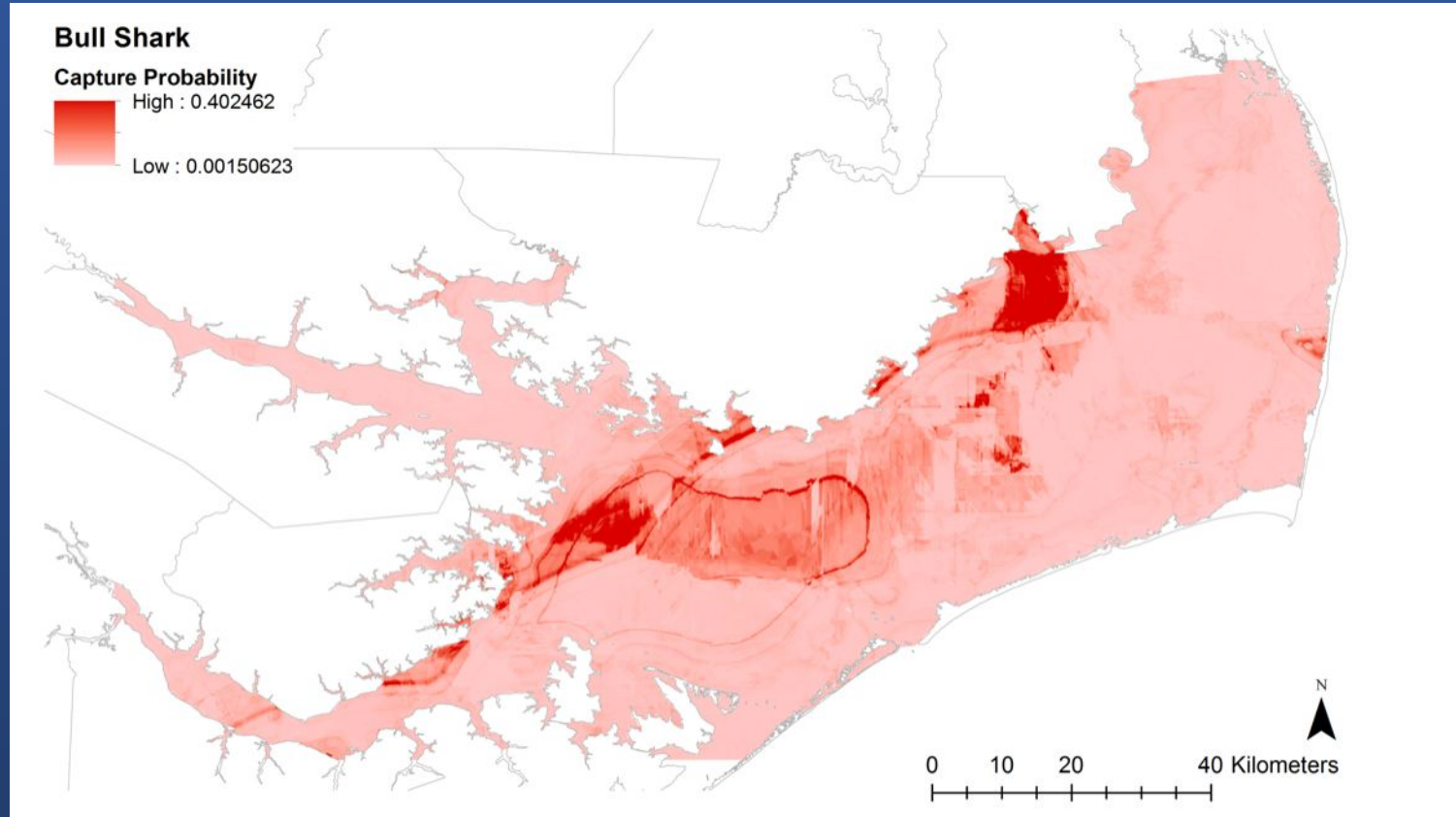
Pamlico Sound – Shark Habitat Maps

Potential seagrass association



Pamlico Sound – Shark Habitat Maps

Mid-Estuarine Specialist



Pamlico Sound - Conclusions

Presence and distribution within Pamlico Sound driven by temperature and salinity/inlet distance

Seasonal differences in shark community – summer, winter, and fall sharks

Little spatial or temporal overlap except Atlantic Sharpnose and Blacktip Sharks



Cecilia Krahforst

Next Steps – What Are They Doing?



Next Steps – Acoustic Telemetry



Tyler Hill

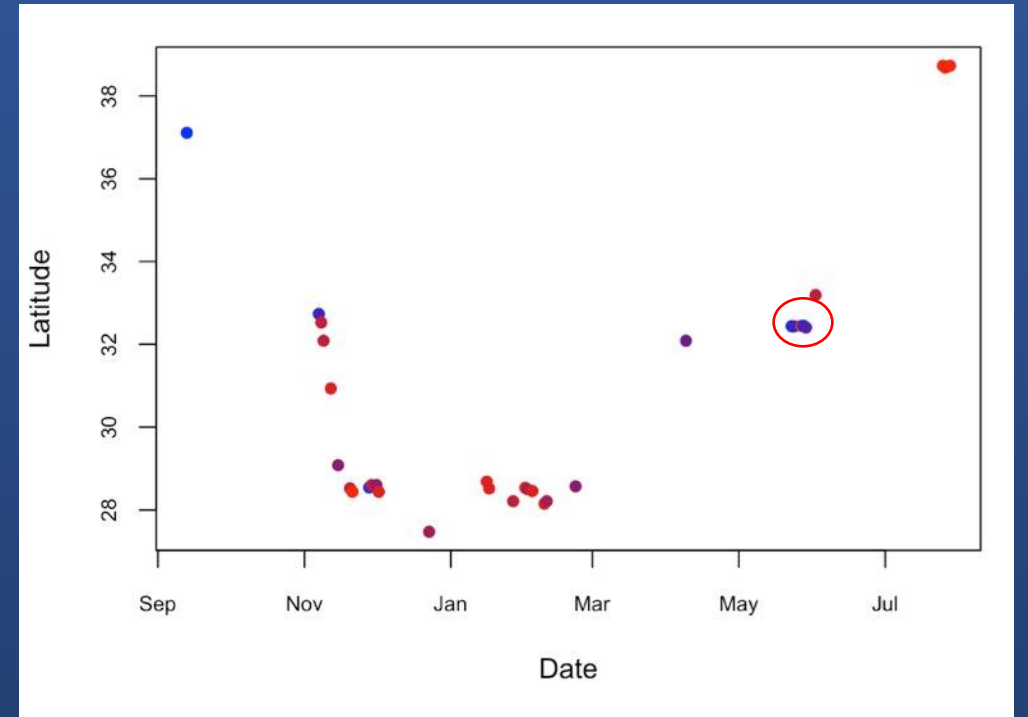
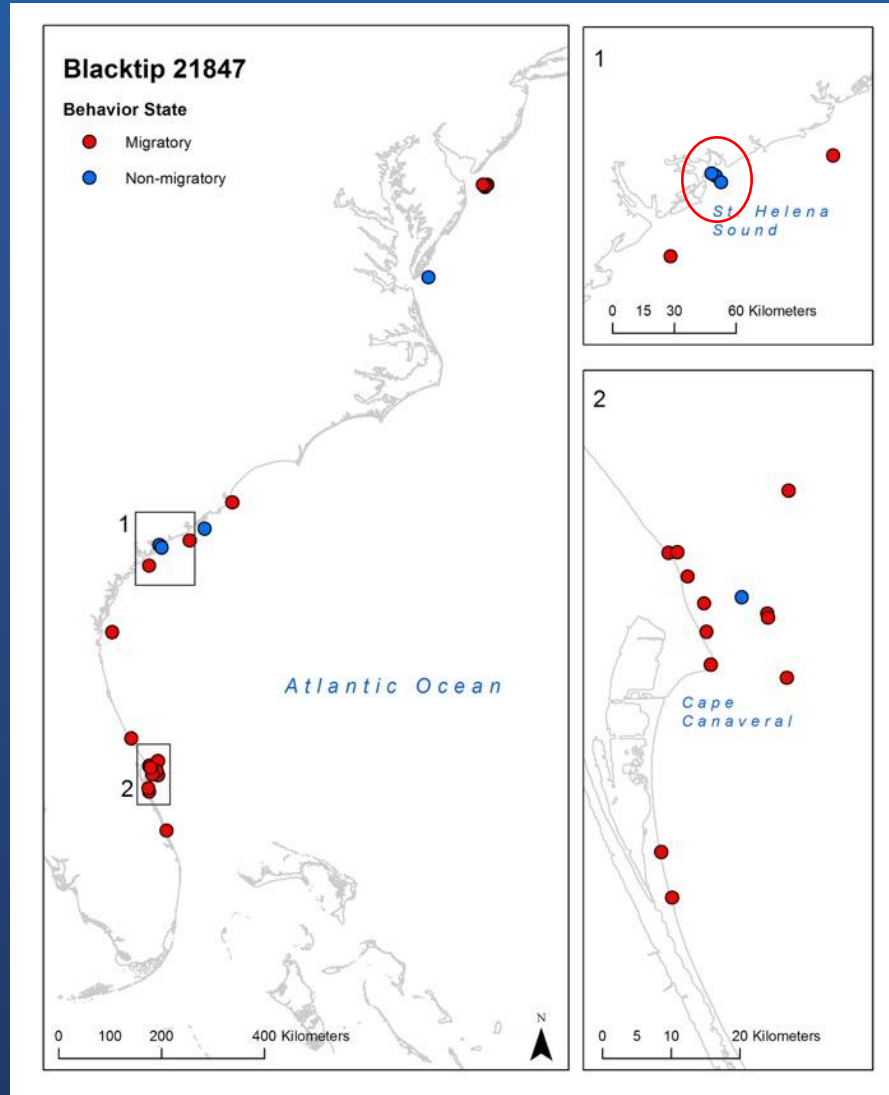
Target Species - Cownose Ray, Blacktip Shark, Bull Shark, Dusky Shark, Smooth Dogfish



Natasha Hinojosa

Next Steps – Behavior Modeling

Shark 21847



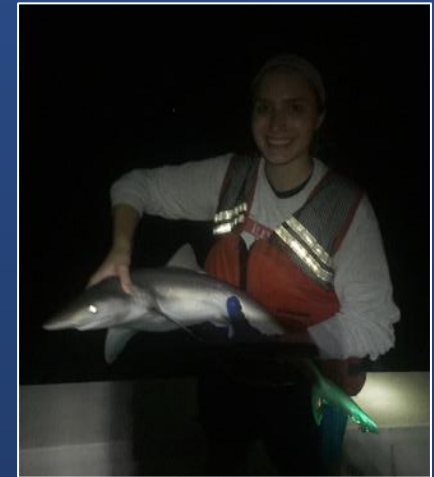
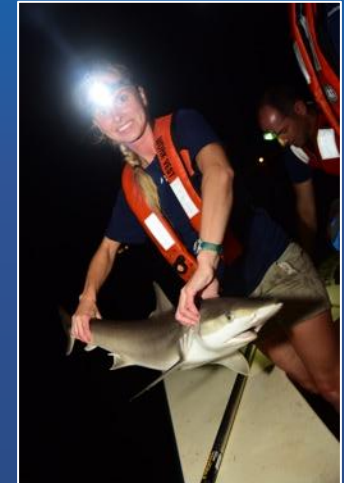
Acknowledgements



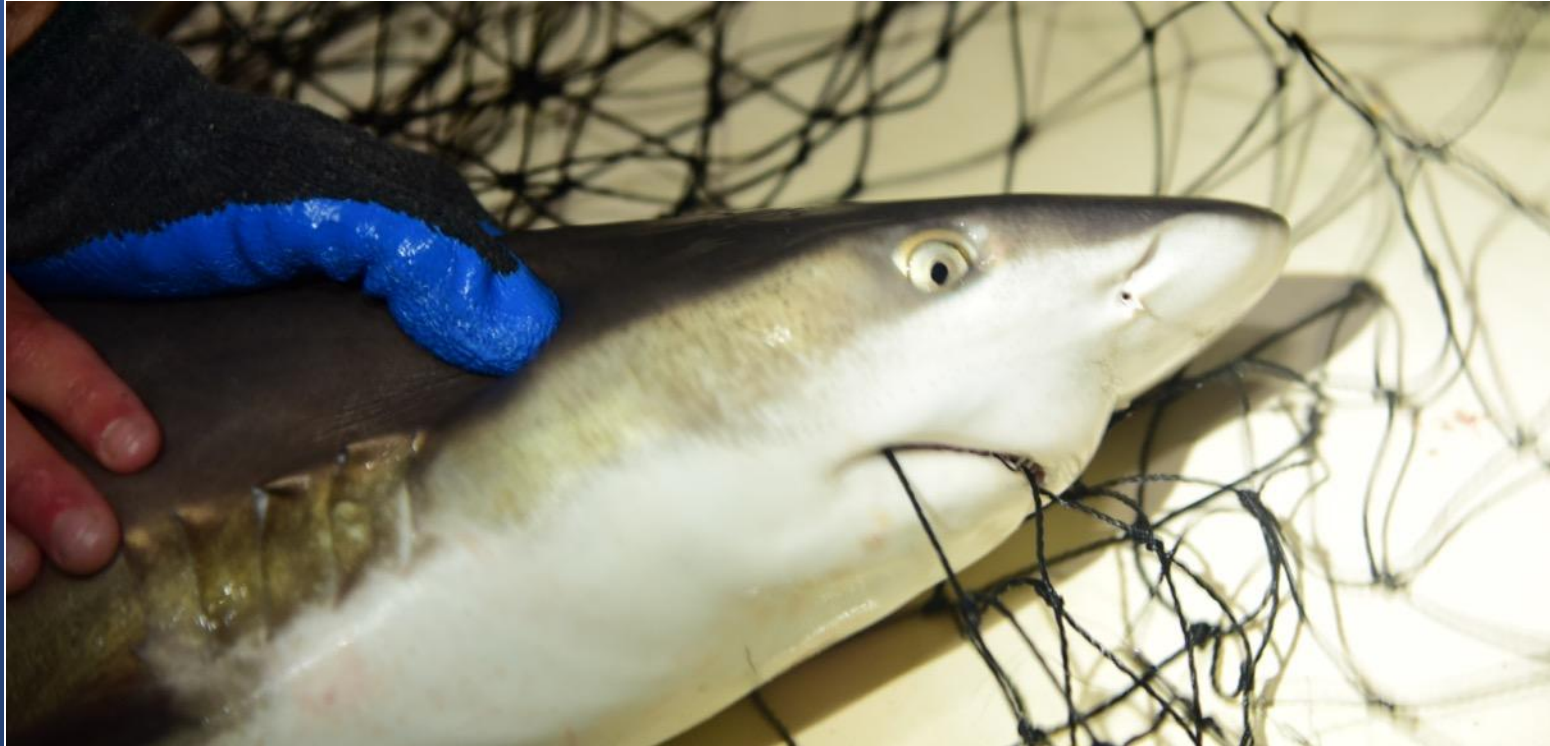
Smithsonian Environmental
Research Center



Lee Paramore
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survey crews



Questions?



Jay Fleming