Tag and recapture data for Atlantic sharpnose, *Rhizoprionodon terraenovae*, and bonnethead shark, *Sphyrna tiburo*, in the Gulf of Mexico and US South Atlantic: 1998-2011

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SEDAR34-WP-04

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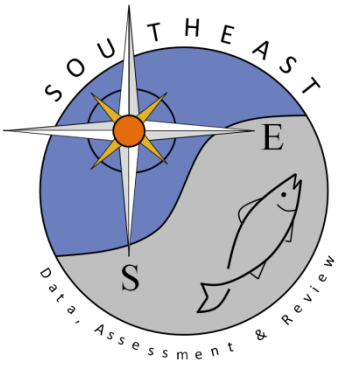

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Summary

Tag and recapture information for Atlantic sharpnose, *Rhizoprionodon terraenovae*, and bonnethead shark, *Sphyrna tiburo*, is summarized from the NOAA Fisheries Southeast Fisheries Science Center Elasmobranch Tagging Management System, 1998-2011. Summary information includes numbers of sharks tagged by species, sex, and life stage, numbers of sharks recaptured by species and sex, recapture rates, time at liberty, distance traveled, and change in length for recaptured individuals.

Background

The NOAA Fisheries Southeast Fisheries Science Center (SEFSC) Panama City Laboratory and Mississippi Laboratories (hereafter referred to as Panama City Laboratory and Mississippi Labs) and the NOAA Northeast Fisheries Science Center (NEFSC) Cooperative Shark Tagging Program (CSTP) (hereafter referred to as NEFSC-CSTP) have tagged over twelve-thousand elasmobranchs in the Gulf of Mexico and US southeast Atlantic Ocean since 1994.

The creation of the Gulf of Mexico State Shark Pupping and Nursery (GULFSPAN) survey in 2003 greatly expanded the elasmobranch tagging effort in the Gulf of Mexico. Because GULFSPAN was headed by the Shark Population Assessment Group at the Panama City Laboratory, the contact information on tags was directed to the Panama City Laboratory. Also in 2003, Mississippi Labs ceased tagging sharks with tags whose contact information was directed to NEFSC-CSTP and began tagging elasmobranchs with tags whose contact information is directed to Panama City Laboratory. By 2006, GULFSPAN collaborators (the Florida Museum of Natural History at the University of Florida, Alabama's Dauphin Island Sea Laboratory, and

the Florida State University Coastal and Marine Laboratory), the two NOAA Fisheries Observer Programs housed at Panama City Laboratory (Shark Bottom Longline and Southeast Gillnet), and all Mississippi Labs research cruises were supplied with tags whose contact information was directed to Panama City Laboratory. In 2009, Texas Parks and Wildlife Department began a survey modeled after the Mississippi Labs Bottom Longline Survey (Coastal Sharks – Red Snapper) and was supplied with tags. Also in 2009, Panama City Laboratory began a fishery-independent Smalltooth Sawfish Abundance Survey (SSAS) in southwest Florida (Everglades National Park and Ten Thousand Islands National Wildlife Refuge; permit ESA-13330). Tags are not given to recreational or commercial fisherman to avoid species identification and measurement errors. The primary goal of this ongoing tagging cooperative is to gain information on migration routes, growth rates, stock identity, and population dynamics of elasmobranch species in the Gulf of Mexico and southeast Atlantic Ocean.

Recognizing the need to standardize data collection, Panama City Laboratory developed the NOAA Fisheries Southeast Fisheries Science Center Elasmobranch Tagging Management System. The ultimate goal of the database is to provide managers, researchers, and the public involved in elasmobranch research in the Gulf of Mexico and southeast Atlantic Ocean with a system to archive and recall elasmobranch tagging and recapture data. Currently, the database holds encounter data on 12,264 elasmobranchs (updated 5 June 2013).

Materials and Methods

The purpose of this document is to summarize tagging and recapture information for Atlantic sharpnose and bonnethead sharks from NOAA Fisheries Southeast Fisheries Science Center

Elasmobranch Tagging Management System, 1998-2011. Data includes 1) numbers of sharks tagged by species, sex, and life stage, 2) numbers of sharks recaptured by species and sex, 3) recapture rates as well as 4) time at liberty, 5) distance traveled, and 6) change in length for recaptured individuals.

Atlantic sharpnose and bonnethead sharks are captured through fishery-independent gillnet and longline surveys (following Simpfendorfer and Wiley, 2005; Carlson and Brusher, 1999; Grace and Henwood, 1997). Summary information can be found in Bethea et al. (2011a and 2011b and references therein), Mississippi Labs cruise reports OT-04-04 (260), OT-05-02 (263), OT-05-05 (266), OT-05-06 (267), 0T-06-02 (269), 0T-06-04 (272), 0T-07-04 (277), 0T-08-05 (283), R2-09-04 (288), 09-05 (56), 72/0403, 72/0404, and R2-11-02 (291), and Texas Parks and Wildlife Department SEAMAP cruise reports 2008-2011 (Martinez-Andrade, 2008 2009 2010 and 2011).

Three basic types of tags are applied to sharks: 1) dart tags (plastic-tipped 7 and 10 cm or metal-tipped 18 cm long; ©Floy Tag & Mfg., Inc.), placed in the cartilage at the base of the first dorsal fin, 2) roto-tags (4.5 cm long; ©Premier1Supplies), punched through the cartilage of the first dorsal fin, and 3) electronic tags (PIT tags, ©Digital Angel, placed in the muscle at the base of the second dorsal fin; satellite tags, ©Wildlife Computers, and acoustic tags, ©VEMCO, placed in the cartilage at the base of the first dorsal fin or punched through the cartilage of the first dorsal fin, depending on species). Some animals are tagged with more than one type of tag. Atlantic sharpnose and bonnethead sharks are typically tagged with either 7 or 10 cm dart or 4.5 cm roto-tags.

Upon tagging, captured sharks are measured (pre-caudal, PCL, fork, FL, total, TL, or stretched-total, STL in cm), sexed, and assigned a life stage (based on scientific observation and published life history information). The tag number and location of the tagging event (latitude, longitude) is recorded. Similar information is recorded when a tagged shark is recaptured. For this report, time at liberty is calculated as the number of days between initial tagging and recapture, including the day of recapture. Distance traveled is measured in kilometers and calculated as a straight line between tagging and recapture sites if over open water or straight line following the coastline (assuming the earth is a perfect sphere with a radius of 6378.0 km). Herein, lengths are reported in cm FL.

Results

Tagging Data – Atlantic sharpnose shark

A total of 3,743 Atlantic sharpnose shark are in the database, 1998-2011. Of those, 2,876 (76.8%) are male, 853 (22.8%) are female, and 14 (0.4%) have no recorded sex.

In cases where a maturity state is not recorded or recorded as “unknown,” maturity state was assigned *post hoc* based on length (following Carlson and Baremore, 2003). For males (Table 1a), 21 (0.7%) are neonate, 395 (13.7%) are young-of-the-year, 704 (24.5%) are juvenile, and 1751 (60.9%) are mature. Fives males are “unknown” (0.2%) because no length information is recorded. For females (Table 1b), 21 (2.5%) are neonate, 258 (30.2%) are young-of-the-year, 346 (40.5%) are juvenile, and 227 (26.7%) are mature. One female is “unknown” (0.1%) because no length information is recorded.

In cases where FL was not recorded upon either tagging or recapture event, FL was reconstructed from TL using regression analysis (n = 2,173 tagged males, range 31-109 cm TL; FL = 0.8425*TL – 0.4558, R^2 = 0.9777; n= 655 tagged females, 31-118 cm TL; FL = 0.8337*TL – 0.0583, R^2 = 0.9865).

Recapture Data – Atlantic sharpnose shark

There are 73 Atlantic sharpnose shark recaptures (66 male, 7 female) from 2003-2011 for an overall recapture rate of 1.9% (Table 1). Data is returned by recreational anglers using hook and line and GULFSPAN collaborators using gillnets (Table 2).

The Atlantic sharpnose shark at liberty the longest is a male (Fish# 2258) tagged 15 May 2003 in St. Joseph Bay, FL, and recaptured 1839 days later on 27 May 2008 in Crooked Island Sound, FL, traveling 28 km west (Table 2). The shark was 51 cm FL when tagged and 71 cm FL (measured) at recapture. The recapture information is reported from the Panama City Laboratory GULFSPAN Survey.

Majority of Atlantic sharpnose shark recaptures occurred in the same bay system as where the animal was tagged; only eighteen are recaptured greater than 10 km from where they are tagged. The Atlantic sharpnose shark that traveled the longest distances is female. Fish# 1602 was tagged 23 June 2005 in Crooked Island Sound, FL, and recaptured 438 days later on 3 September 2006 between Sackett Bank and Breton Spur (offshore Louisiana, 28.5 N 89.0 W), travelling 376.6 km west (Table 2, Figure 1). The shark was 48 cm FL when tagged and 63.5 cm FL

(measured) when recaptured. The recapture information was reported from a recreational angler using hook and line.

No Atlantic sharpnose shark travelled from the Gulf of Mexico to the Atlantic Ocean or vice versa.

One Atlantic sharpnose shark (Fish# 1129) was tagged on 24 August 2006 in St. Joseph Bay, FL, and recaptured twice in that same bay. First, 352 days later on 10 August 2007 and then again 9 days later on 18 August 2007. The shark was 38 cm FL when tagged, 55.2 cm FL (estimated) upon initial recapture, and 50.9 cm FL (estimated) on final recapture. Both recapture events were reported from recreational anglers using hook and line.

Tagging Data – Bonnethead shark

A total of 901 bonnethead shark are in the database, 1998-2011. Of those, 393 (43.6%) are male, 506 (56.2%) are female, and 2 (0.2%) have no recorded sex.

Maturity states assigned in the field are based on scientific observation and Lombardi-Carlson et. al (2003). In cases where a maturity state is not recorded or recorded as "unknown," maturity state was assigned *post hoc* based on fork length (following Lombardi-Carlson et. al, 2003). For males (Table 3a), 0 are neonate, 56 (14.3 %) are young-of-the-year, 195 (49.6%) are juvenile, and 142 (36.1%) are mature. For females (Table 3b), 1 (0.2%) is neonate, 51 (10%) are young-of-the-year, 229 (45.3%) are juvenile, and 225 (44.5%) are mature.

Fork lengths were not reconstructed from total length for bonnethead shark.

Recpature Data – Bonnethead shark

There are 9 bonnethead shark recaptures (2 male, 6 female, 1 unknown sex) from 2000-2011 for an overall recapture rate of 1.0% (Table 3). Data was returned by recreational anglers using hook and line, commercial gillnet, and GULFSPAN collaborators using gillnets (Table 4).

The bonnethead shark at liberty the longest is a female (Fish# 4233) tagged 25 September 2008 in St. George Sound, FL, recaptured 958 days later on 10 May 2011 and recaptured a second time 133 days later on 19 September 2011. Both recapture events are less than 1 km from the initial tagging location (Figure 2). The shark was 60 cm FL when tagged, 72 cm FL (measured) upon initial recapture, and 74 cm FL (measured) on final recapture. Both recapture events are reported from the Florida State University Coastal and Marine Laboratory GULFSPAN survey.

All but one bonnethead shark recapture occurred in the same bay system as where the animal was tagged. The bonnethead shark that traveled the longest distance is a female (Fish #3241) tagged on 16 September 2008 48 km south of Petite Bois Island, MS (29.764 N 88.490 W), and recaptured 206 days later on 9 April 2009 at the mouth of Mobile Bay, traveling 60.1 km northeast (Figure 3). The shark was 74 cm FL when tagged and 74.9 cm FL (measured) upon recapture. Recapture information is reported from a commercial gillnet vessel.

No bonnethead shark traveled from the Gulf of Mexico to the Atlantic Ocean or vice versa.

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-- 07/19/2004 - 09/22/2004 Atlantic Coastal Shark Red Snapper Cruise NOAA Ship RV GANDY, Cruise 72/0403

-- 07/27/2004 - 09/29/2004 Bottom Longline Survey Coastal Sharks – Red Snapper NOAA Ship OREGON II, Cruise OT-05-02 (263)

--10/06/2004 - 10/23/2004 Atlantic Coastal Shark Red Snapper Cruise NOAA Ship RV GANDY, Cruise 72/0404

-- 03/08/2005 - 04/06/2005 Bottom Longline Survey Coastal Sharks – Red Snapper NOAA Ship OREGON II, Cruise OT-05-02 (263)

-- 08/02/2005 – 11/16/2005 Pelagic Fish Longline Survey NOAA Ship OREGON II, Cruise OT-05-05 (266) and OT-05-06 (267)

-- 02/01/2006 – 03/21/2006 Longline Survey Pelagic Sharks and Finfish NOAA Ship OREGON II Cruise OT-06-02 (269)

-- 07/29/2006 – 09/25/2006 Bottom Longline Survey Coastal Sharks – Red Snapper NOAA Ship OREGON II, cruise 0T-06-04 (272)

-- 08/10/2007 – 09/27/2007 Bottom Longline Survey Coastal Sharks – Red Snapper NOAA Ship OREGON II, Cruise 0T-07-04 (277)

-- 07/29/2008 – 09/30/2008 Bottom Longline Survey Coastal Sharks – Red Snapper NOAA Ship OREGON II, Cruise 0T-08-05 (283)

-- 07/27/2009 – 09/30/2009 Bottom Longline Survey Coastal Sharks – Red Snapper NOAA Ship OREGON II, Cruise R2-09-04 (288)

-- 10/12/2009 – 11/23/2009 Small Pelagics Cruise NOAA Ship GORDON GUNTER, Cruise 09-05 (56)

-- 08/07/2010 – 09/29/2010 Bottom Longline Survey Coastal Sharks – Red Snapper NOAA Ship OREGON II, Cruise R2-10-02 (291)

-- 07/25/2011– 09/29/2011 Bottom Longline Survey Coastal Sharks – Red Snapper NOAA Ship OREGON II, Cruise R2 11-04 (296)

Table 1. Recapture rates for Atlantic sharpnose shark, *Rhizoprionodon terraenovae*, using the NOAA Southeast Fisheries Elasmobranch Tagging Management System, 1998-2011.

Sex	**Life Stage**	**Number Tagged**	**Number Recaptured**	**Recapture Rate**
(a) Male	Neonate	21		
	Young-of-the-year	395		
	Juvenile	704		
	Adult	1,751		
	Unknown	5		
	n	*2,876*	*66*	*2.3%*
(b) Female	Neonate	21		
	Young-of-the-year	258		
	Juvenile	346		
	Adult	227		
	Unknown	1		
	n	*853*	*7*	*0.8%*
	Total	***3,743***	***73***	***1.9%***

Table 2. Recapture information for Atlantic sharpnose shark, *Rhizoprionodon terraenovae*, using the NOAA Southeast Fisheries Elasmobranch Tagging Management System, 1998-2011 (n=73). Animals are listed in descending number of days at liberty. *Indicates measurement estimated. – indicates tag and recapture event less than 10 km apart.

Fish #	Sex	Mode of Recapture	Days at Liberty	Δ FL (cm)	Distance Moved (km), Direction	Location Tagged	Location Recaptured
2258	F	GULFSPAN	1,839	+7	28, W	St. Joseph Bay, FL	Crooked Island Sound, FL
1041	M	Recreational	1,439	+2*	-	St. Joseph Bay, FL	St. Joseph Bay, FL
2528	M	GULFSPAN	1,386	0	58, E	St. Joseph Bay, FL	Gulf-side St. Vincent Island, FL
3519	M	GULFSPAN	1,353	+19	-	Crooked Island Sound, FL	Crooked Island Sound, FL
2746	M	GUFLSPAN	1,259	0	-	Crooked Island Sound, FL	Crooked Island Sound, FL
4647	M	Recreational	1,147	-2*	-	Crooked Island Sound, FL	Crooked Island Sound, FL
3795	M	GULFSPAN	1,109	+1	-	Crooked Island Sound, FL	Crooked Island Sound, FL
4532	M	GULFSPAN	863	0	-	Crooked Island Sound, FL	Crooked Island Sound, FL
1800	M	Recreational	794	0	-	Crooked Island Sound, FL	Crooked Island Sound, FL
1523	M	Recreational	763	+8	50, W	St. Joseph Bay, FL	Panama City Beach, FL
2059	M	GULFSPAN	751	+20	-	Crooked Island Sound, FL	Crooked Island Sound, FL
228	M	Recreational	722	-4	-	St. Joseph Bay, FL	St. Joseph Bay, FL
3534	M	Recreational	697	+0.6	-	Crooked Island Sound, FL	Crooked Island Sound, FL
1170	M	Recreational	641	-7	-	Crooked Island Sound, FL	Crooked Island Sound, FL
1040	M	Recreational	613	-3	-	St. Joseph Bay, FL	St. Joseph Bay, FL
1602	F	Recreational	763	+15	376.6, W	Crooked Island Sound, FL	Sackett Bank/Breton Spur, LA
4282	M	Recreational	418	0	-	Dauphin Island, AL	Mouth of Mobile Bay, AL
2347	M	GULFSPAN	411	+5	-	Crooked Island Sound, FL	Crooked Island Sound, FL
816	M	Recreational	409	0	170, E	St. Joseph Bay, FL	Mouth of St. Marks River, FL
897	M	Recreational	388	0	-	St. Joseph Bay, FL	St. Joseph Bay, FL
981	M	Recreational	381	0	-	Crooked Island Sound, FL	Crooked Island Sound, FL
983	M	GULFSPAN	380	-1	-	Crooked Island Sound, FL	Crooked Island Sound, FL
6585	M	Recreational	369	+16	25, E	Apalachee Bay, FL	Keaton Beach, FL
4483	M	Recreational	362	+15	-	Crooked Island Sound, FL	Crooked Island Sound, FL
1129	M	Recreational	352	+17	-	St. Joseph Bay, FL	St. Joseph Bay, FL
6433	M	Recreational	329	-1	63, N	7 km offshore Sheepshead Key, FL	Cedar Key, FL
5783	M	Recreational	317	-2	-	Cedar Key, FL	Cedar Key, FL
1038	M	Recreational	316	+1*	-	Crooked Island Sound, FL	Crooked Island Sound, FL
2776	M	Recreational	315	+17*	-	Crooked Island Sound, FL	Crooked Island Sound, FL
2506	F	Recreational	299	-	316, W	Crooked Island Sound, FL	Gulfport, MS

Fish #	Sex	Mode of Recapture	Days at Liberty	Δ FL (cm)	Distance Moved (km), Direction	Location Tagged	Location Recaptured
574	M	Recreational	298	-20*	-	Crooked Island Sound, FL	Crooked Island Sound, FL
7957	M	Recreational	285	+1	-	Dauphin Island, AL	Dauphin Island, AL
5385	M	Recreational	250	-7*	-	Crooked Island Sound, FL	Crooked Island Sound, FL
1191	M	Recreational	229	+4	50, W	St. Joseph Bay, FL	Panama City Beach, FL
3566	M	Recreational	220	+9	-	Gulf-side St. Vincent Island, FL	St. George Island, FL
2752	M	Recreational	219	+3	-	Crooked Island Sound, FL	Crooked Island Sound, FL
469	M	Recreational	158	+3	174, E	Crooked Island Sound, FL	Mouth of St. Marks River, FL
142	M	Recreational	94	-1*	-	Crooked Island Sound, FL	Crooked Island Sound, FL
5735	M	Recreational	83	+13	-	Waccasassa Bay, FL	Waccasassa Bay, FL
1728	M	Recreational	80	+3	-	Gulf-side St. Vincent Island, FL	Apalachicola Bay, FL
3779	M	Recreational	76	-1.6	29, E	Crooked Island Sound, FL	St. Andrew Bay, FL
3782	M	Recreational	68	+6	32, E	Crooked Island Sound, FL	Panama City Beach, FL
2883	F	Recreational	67	+23*	-	Crooked Island Sound, FL	Crooked Island Sound, FL
7269	M	Recreational	65	-	132, W	Dauphin Island, AL	Lake Borgne, LA
954	M	Recreational	61	+13	-	St. Joseph Bay, FL	St. Joseph Bay, FL
110	M	Recreational	41	+17	174, E	Crooked Island Sound, FL	Mouth of St. Marks River, FL
2795	M	GULFSPAN	39	0	-	Gulf-side St. Vincent Island, FL	Gulf-side St. Vincent Island, FL
2842	M	Recreational	37	+1.4	-	Crooked Island Sound, FL	Crooked Island Sound, FL
664	M	Recreational	36	+5	-	St. Joseph Bay, FL	Cape San Blas, FL
1431	M	Recreational	36	0	158, W	Crooked Island Sound, FL	Pensacola Beach, FL
2956	M	GULFSPAN	35	+1	-	Crooked Island Sound, FL	Crooked Island Sound, FL
3930	F	Recreational	33	0	32, W	Crooked Island Sound, FL	Panama City Beach, FL
461	M	Recreational	32	-5*	-	Crooked Island Sound, FL	Crooked Island Sound, FL
2380	M	GULFSPAN	31	0	-	Crooked Island Sound, FL	Crooked Island Sound, FL
901	M	Recreational	21	0	-	St. Joseph Bay, FL	St. Joseph Bay, FL
5687	M	Recreational	20	-	-	Crooked Island Sound, FL	Crooked Island Sound, FL
5524	M	Recreational	18	+6*	15, E	Crooked Island Sound, FL	Mexico Beach, FL
24	M	Recreational	17	+6	-	St. Joseph Bay, FL	St. Joseph Bay, FL
3481	F	Recreational	13	0	28, E	Crooked Island Sound, FL	St. Joseph Bay, FL
440	M	Recreational	12	-2*	-	Crooked Island Sound, FL	Crooked Island Sound, FL
1438	M	Recreational	11	-8*	-	Crooked Island Sound, FL	Crooked Island Sound, FL
835	F	Recreational	10	0	-	Apalachicola Bay, FL	Apalachicola Bay, FL
1466	M	Recreational	10	-6*	-	St. Joseph Bay, FL	St. Joseph Bay, FL
1129	M	Recreational	9	-5	-	St. Joseph Bay, FL	St. Joseph Bay, FL

Fish #	Sex	Mode of Recapture	Days at Liberty	Δ FL (cm)	Distance Moved (km), Direction	Location Tagged	Location Recaptured
3780	M	Recreational	9	-2*	-	Crooked Island Sound, FL	Crooked Island Sound, FL
5704	M	Recreational	9	-	-	Crooked Island Sound, FL	Crooked Island Sound, FL
1597	M	Recreational	8	-14*	-	Crooked Island Sound, FL	Crooked Island Sound, FL
5823	M	Recreational	8	+9	-	St. Joseph Bay, FL	Cape San Blas, FL
7033	M	Recreational	8	-2	-	Waccasassa Bay, FL	Waccasassa Bay, FL
7270	M	Recreational	7	-	-	Dauphin Island, AL	Dauphin Island, FL
1075	M	Recreational	6	0	-	Crooked Island Sound, FL	Crooked Island Sound, FL
3408	M	Recreational	6	-3	-	St. Andrew Bay, FL	St. Andrew Bay, FL
8207	M	Recreational	5	-	-	Crooked Island Sound, FL	Crooked Island Sound, FL
2884	F	Recreational	4	+1.6	-	Crooked Island Sound, FL	Crooked Island Sound, FL

Figure 1. The Atlantic sharpnose shark that travelled the longest distance between tagging and recapture events was tagged 23 June 2005 in Crooked Island Sound, FL, and recaptured 438 days later on 3 September 2006 between Sackett Bank and Breton Spur (28.5 N 89.0 W), travelling 376.6 km west (Fish #1602).

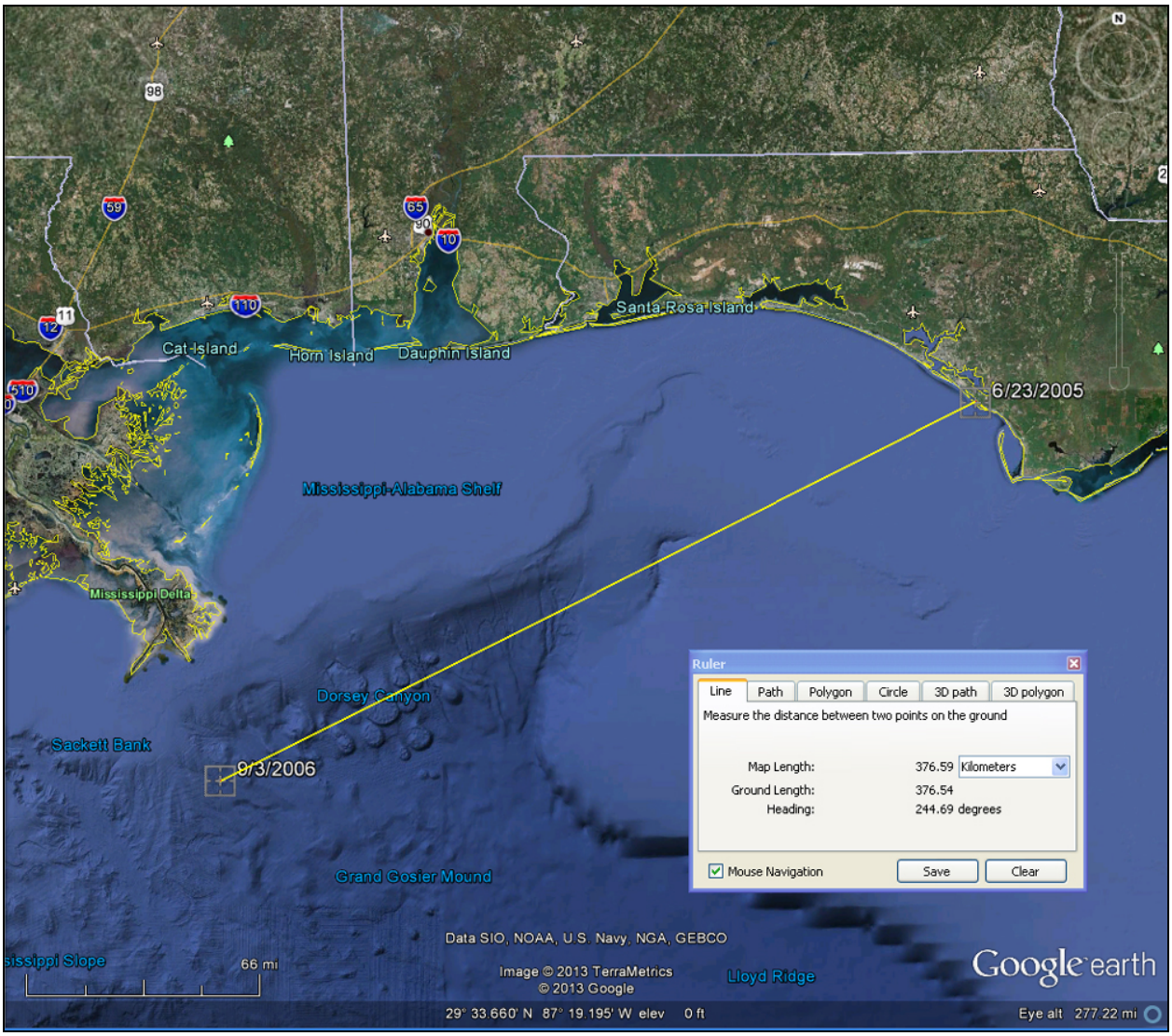

Table 3. Recapture rates for bonnethead shark, *Sphyrna tiburo*, using the NOAA Southeast Fisheries Elasmobranch Tagging Management System, 1998-2011.

Sex	Life Stage	Number Tagged	Number Recaptured	Recapture Rate
(a) Male	Neonate	0		
	Young-of-the-year	0		
	Juvenile	56		
	Adult	195		
	Unknown	142		
	n	*393*	*2*	*0.5%*
(b) Female	Neonate	0		
	Young-of-the-year	0		
	Juvenile	51		
	Adult	229		
	Unknown	225		
	n	*506*	*6*	*1.2%*
	Total	***901***	***9***	***1.0%***

Table 4. Recapture information for bonnethead shark, *Sphyrna tiburo*, using the NOAA Southeast Fisheries Elasmobranch Tagging Management System, 1998-2011 (n=9). Animals are listed in descending number of days at liberty. *Indicates measurement estimated. – indicates tag and recapture events are less than 10 km apart.

Fish #	Sex	Mode of Recapture	Days at Liberty	Δ FL (cm)	Distance Moved (km), Direction	Location Tagged	Location Recaptured
4233	F	GULFSPAN	958	+12	-	St. George Sound, FL	St. George Sound, FL
1411	M	GULFSPAN	732	-0.5	-	Crooked Island Sound, FL	Crooked Island Sound, FL
640	M	GULFSPAN	365	+7	-	Crooked Island Sound, FL	Crooked Island Sound, FL
3241	F	Commercial	206	+0.9*	60.1, N	48 km S Petite Bois Island, MS	Mouth of Mobile Bay, AL
4233	F	GULFSPAN	133	+2	-	St. George Sound, FL	St. George Sound, FL
3765	F	Recreational	82	-	-	Crooked Island Sound, FL	Crooked Island Sound, FL
430	U	GULFSPAN	36	-1.5	-	Crooked Island Sound, FL	Crooked Island Sound, FL
1077	F	Recreational	11	-	-	Crooked Island Sound, FL	Crooked Island Sound, FL
7594	F	SSAS	0	0	-	Chokoloskee Bay, FL	Chokoloskee Bay, FL

Figure 2. The bonnethead shark at liberty the longest was tagged 25 September 2008 in St. George Sound, FL, and recaptured 958 days later on 10 May 201l. This animal was recaptured a second time 133 days later on 19 September 2011 (Fish #4233). Both recapture events are less than 1 km from the initial tagging location.

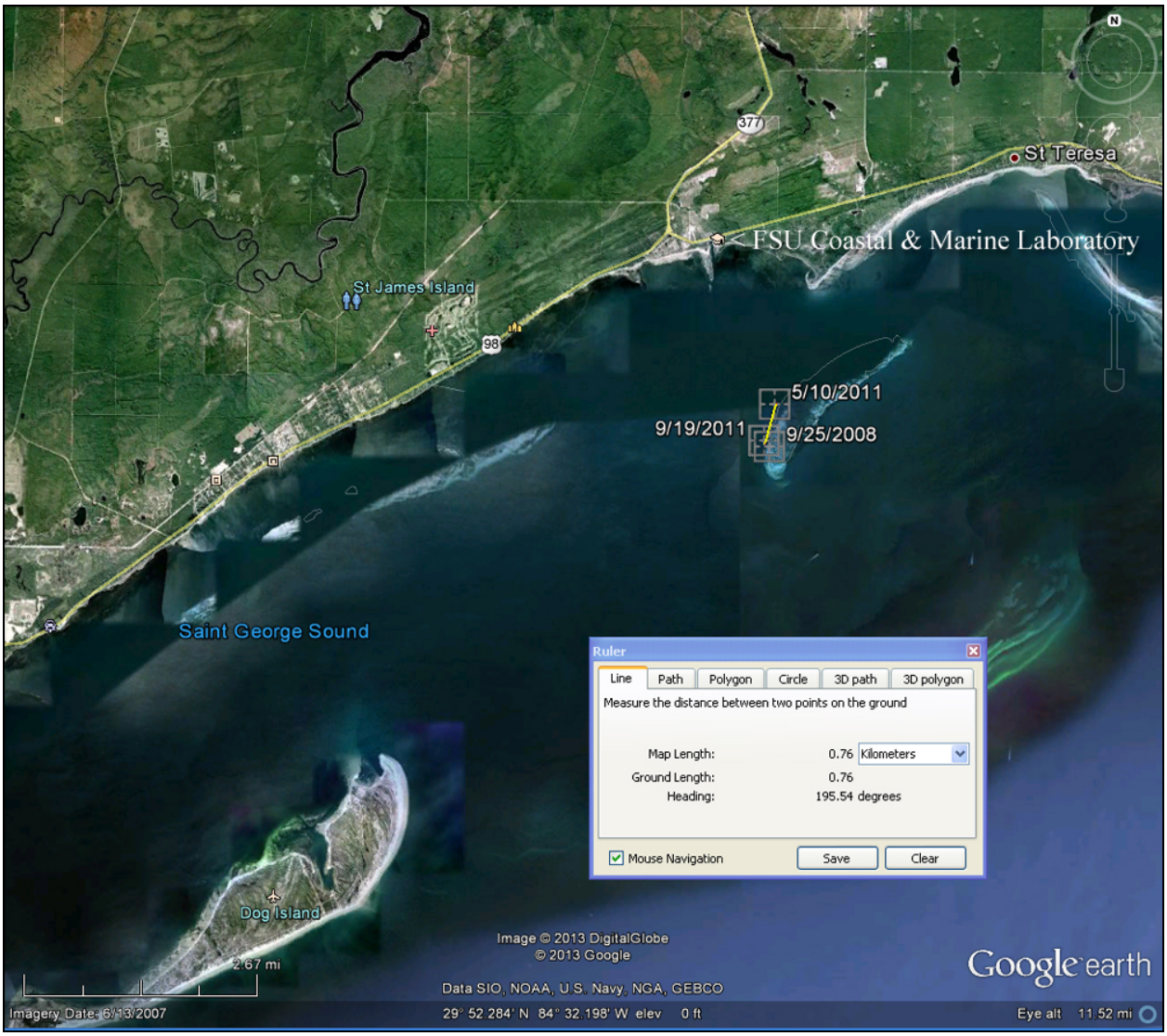

Figure 3. The bonnethead shark that traveled the longest distance between tagging and recapture locations was tagged on 16 September 2008 48 km south of Petite Bois Island, MS (29.764 N 88.490 W), and recaptured 206 days later on 9 April 2009 at the mouth of Mobile Bay, travelling 60.1 km northeast (Fish #3241).