Pamlico Sound Barge Sinking Event

Long Shoal Naval Ordnance Target and Scoring Tower Replacement

Marine Species Monitoring

VESSEL MONITORING SURVEYS

TRIP REPORT

16-17 November 2011

ACRONYMS AND ABBREVIATIONS

ft	foot/feet
ICMP	Integrated Comprehensive Monitoring Program
km	kilometer(s)
m	meter(s)
MMO	Marine Mammal Observer
NM	nautical mile(s)
OPAREA	operating area

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Section 1 Introduction

Boat-based surveys for marine species monitoring occurred within the Cherry Point Range Complex on 16 and 17 November 2011 for the Pamlico barge sinking event that occurred as part of the Long Shoal Target and Scoring Tower Replacement off the eastern coast of North Carolina.

As part of the compliance requirements of the Marine Mammal Protection Act of 1972 and the Endangered Species Act of 1973, the U.S. Navy developed the Integrated Comprehensive Monitoring Program (ICMP). The ICMP applies by regulation to those activities on U.S. Navy training ranges and operating areas (OPAREAs) for which the U.S. Navy sought and received incidental take authorizations. In order to support the U.S. Navy in meeting regulatory requirements for monitoring established under the Final Rules and to provide a mechanism to assist with coordination of program objectives under the ICMP, monitoring of marine mammals and sea turtles during this exercise included boat based surveys prior to and following the barge sinking procedures.

The results of marine mammal monitoring reported here are part of a long-term monitoring effort under the U.S. Navy's Marine Species Monitoring Program **(**Contract # N62470-10-D-3011) issued to HDR.

Section 2 Methods

Study Area

The U.S. Navy's Long Shoals Naval Ordnance area is located off the eastern coast of North Carolina in the Pamlico Sound. Protected marine species monitoring conducted during the Pamlico Sound barge sinking event was focused on the buffer zone (1000 meters [m]) surrounding the barge (see **Figure 1**). The Pamlico Sound is approximately 129 kilometers [km] long (70 nautical miles [NM]) and 24 to 48 km wide (13 to 26 NM), and is separated from the Atlantic Ocean by the Outer Banks. The barge sinking event was conducted at an approximate latitude of N 35° 32.214 and longitude W 75° 40.301.

Boat-Based and Snorkeler Monitoring

Boat-based monitoring efforts were performed prior to, during, and after the barge sinking event within the Pamlico Sound on 16 and 17 November 2011 (see **Figures 1** through **3, Table 1**). Boat-based surveys were conducted by a trained Marine Mammal Observer (MMO) within 1,000-m from the barge sinking 2 hours after sunrise and 2 hours before sunset, and during conditions of optimal visibility. These conditions were established as greater than 75-m visibility. In addition to the visual survey effort, a snorkeler surveyed the area surrounding the barge twice prior to the actual sinking event to monitor for marine mammals and sea turtles.

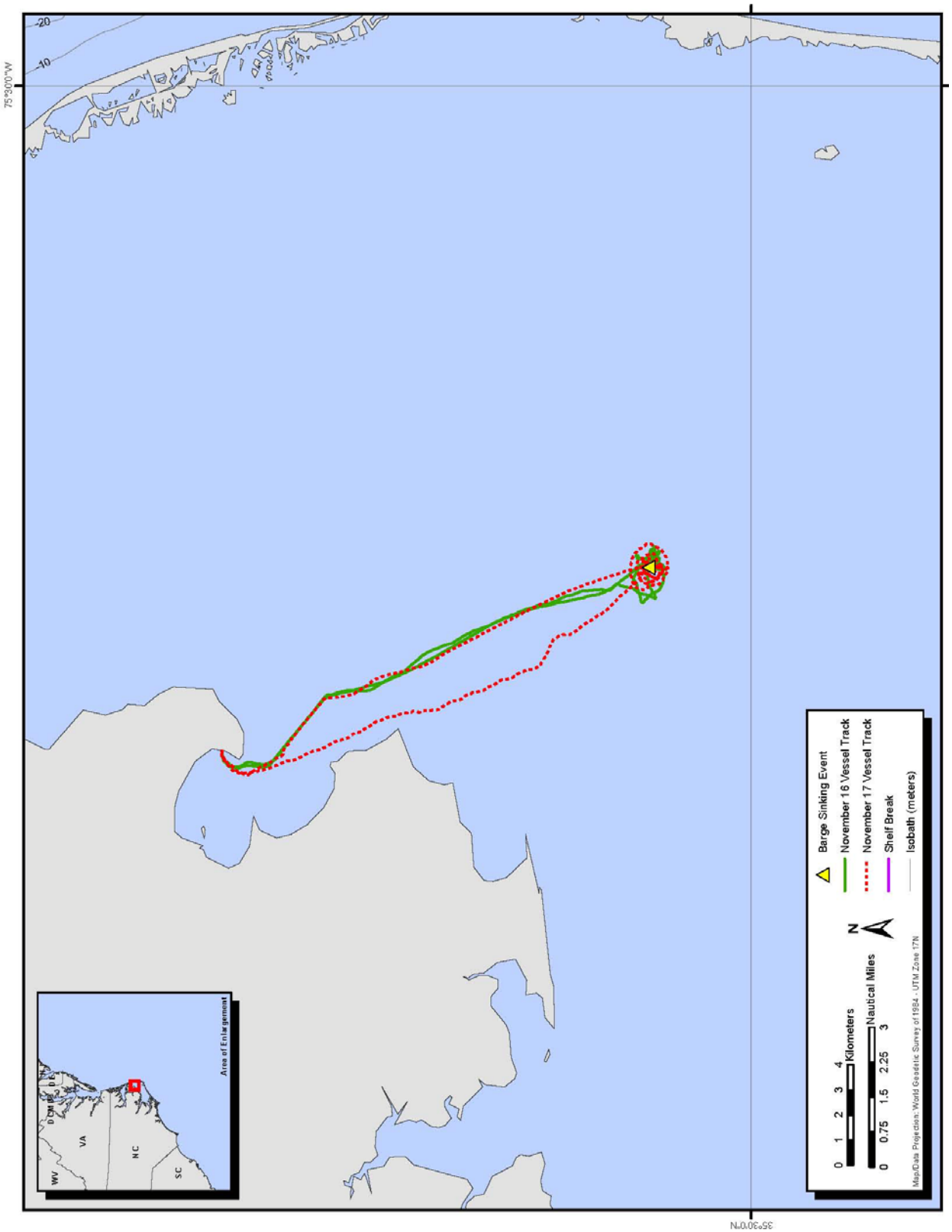

Figure 1. Tracklines for the Total Survey Effort for Pamlico Sound Barge Sinking Event Monitoring.

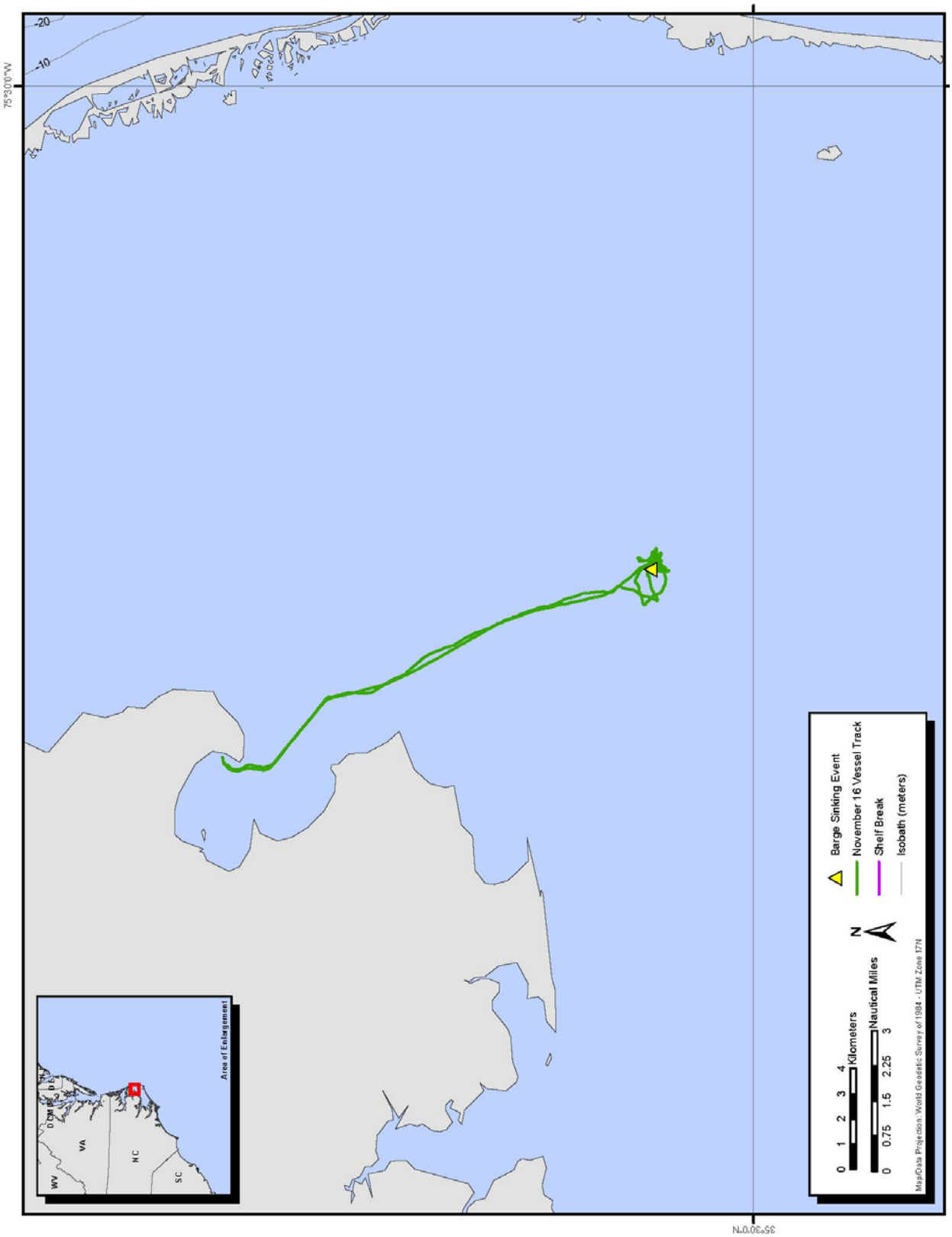

Figure 2. Tracklines for 16 November 2011 Survey Effort for Pamlico Sound Barge Sinking Event Monitoring.

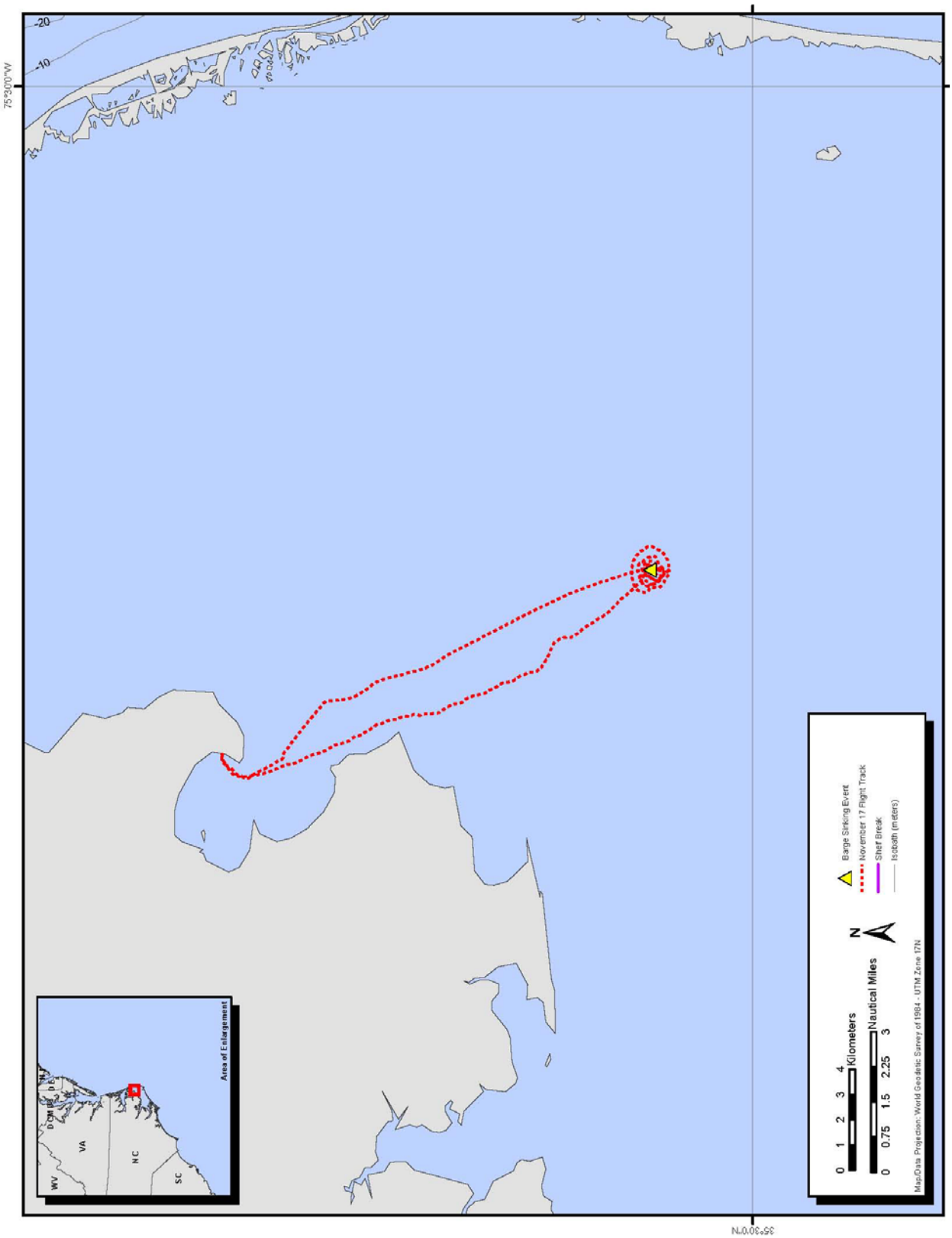

Figure 3. Tracklines for 17 November 2011 Survey Effort for Pamlico Sound Barge Sinking Event Monitoring.

Table 1. Summary of Monitoring Effort for the Pamlico Sound Barge Sinking Event.

Date	Description	Start Time	Stop Time	Total Survey Minutes*	Total On-Effort Minutes
16 November	Vessel Survey During Event	7:26	13:01	335	252
17 November	Vessel Survey During Event	7:15	12:50	335	335
17 November	Snorkeler Survey During Event	9:30	9:37	7	7
17 November	Snorkeler Survey During Event	9:39	9:50	11	11
Total boat monitoring time				**670**	
Total on-effort minutes					**587**
Total on-effort snorkeler survey time				**18**	**18**

Note: * Total Survey Minutes reflect minutes occupied in the general range/area of interest and include both on-effort (systematic) and off-effort (transit and standby) total minutes.

The observation vessel *Tom Cat* was a 26-ft long twin engine trailerable catamaran. Surveys were conducted around the pre-planned area surrounding the barge sinking site (see **Table 1**, **Figures 1** through **3**).

The MMO on board and snorkeler (see **Table 2**) were experienced in identification of Atlantic marine mammal and sea turtle species, and were knowledgeable of marine mammal and sea turtle biology and behavior.

Table 2. Observers and Roles.

Observer	Role(s)	Participation Dates
Dana Spontak	MMO	16-17 November
John Alexander	MMO/Snorkeler	16-17 November
Eric Diaddorio	Boat Captain	16-17 November

The following describe the general survey approach as implemented by the Navy's Environmental Assessment Measures:

1. Observers will survey the buffer zone, a 1,000-m radius from the barge location, for marine mammals and sea turtles from all participating vessels during the sinking procedure. A survey of the buffer zone will be conducted at the sinking location 2 hours after sunrise and 2 hours before sunset and during conditions of optimal visibility. These conditions were agreed on prior to the barge sinking event and were defined as greater than 75-m visibility. Survey efforts will be conducted both prior to and following the sinking event.

2. A snorkeler will survey the area in close proximity (approximately within 50-m) to the barge prior to the actual sinking event to monitor the presence of marine mammals and sea turtles.
3. If a sea turtle or marine mammal is sighted within the buffer zone, the animal will be allowed to leave of its own volition. The Navy will suspend the sinking event and ensure the area is clear for a full 30 minutes prior to resuming sinking procedure.
4. Personnel will record any protected species observations during the sinking procedures as well as measures taken if species are detected within the buffer zone.

Section 3 Results

Survey Effort

Observers visually surveyed during 2 survey days (~11 hours) for approximately 9.75 hours of on-effort status (see **Table 1**). Beaufort sea state ranged from 2 to 4 and no sightings were made within the buffer zone of the barge sinking site. Monitoring was interrupted for 1 hour, 17 minutes at the beginning of the monitoring effort and prior to the barge arrival due to poor visibility. Cloud coverage was 100 percent for the entire duration of the survey, and visibility ranged from poor to good with a glare ranging from 0 to 10 percent. Visibility in the water during snorkeling operations was minimal at best with a maximum visibility of only 0.5-m. **Appendix A** contains a detailed description of effort, environmental, oceanographic, and sighting conditions. The barge was eventually sunk at approximately 12:32 pm on 17 November. Soon after sinking, sea conditions deteriorated and Beaufort sea state increased from a 2 to a 4 which forced the survey vessel to return to shore.

Sightings

No sightings of marine mammals or sea turtles were reported during the Pamlico Sound barge sinking event. Only one sighting of four dolphins on the first day was reported within 200 m of the Stumpy Point boat ramp, which was approximately 9 NM outside of the defined survey area and therefore not included as a sighting.

Section 4 Acknowledgements

We would like to thank skipper Eric Diaddorio and East Carolina University. These data were obtained under National Marine Fisheries Service permit no. 14451 issued to Joseph R. Mobley, Jr.

APPENDIX A

Effort, Environmental, Oceanographic, and Sighting Conditions

Table A-1 shows the environmental, oceanographic, and sighting conditions encountered throughout the Pamlico Sound barge sinking event.

Time	Effort	Event*	Ship Latitude	Ship Longitude	Water Temp (°F)	Sea State	Barge Activity	Construction Activity	Visibility	Cloud Coverage	% Glare	Comments
16 November 2011												
7:26	on	1	N 35 32.168	W 75 40.280	61	2	off	NA	Poor	10	100	4 dolphins about 200 m due west from the boat ramp at Stumpy Point in 8 ft of water; at site overcast extreme fog visibility about 75 m
7:43	off	2	N 35 32.094	W 75 40.146	61	2	off	NA	Poor	10	100	Visibility is less than 75 m; monitoring will continue when visibility improves; barge is not in area yet
9:06	on	1	N 35 32.011	W 75 40.250	61	2	off	NA	Marginal	10	100	Visibility got much better about 350 m; barge is still not in the area; once positioned, will start monitoring survey about 50 m around site
9:31	on	1	N 35 32.048	W 75 40.119	61	2	off	NA	Poor	10	100	Visibility declined about 70 m; barge not in area; moving buoy marker to position; end of surveying around site

Time	Effort	Event*	Ship Latitude	Ship Longitude	Water Temp (°F)	Sea State	Barge Activity	Construction Activity	Visibility	Cloud Coverage	% Glare	Comments
16 November 2011 (continued)												
11:30	on	1	N 35 32.122	W 75 40.118	61	2	off	NA	Poor	10	100	Barge arrived in area; positioning it
11:50	on	1	N 35 32.079	W 75 40.218	61	2	on	Deploying Anchor (DA)	Poor	10	100	Barge anchor deployed starboard bow anchor
12:01	on	1	N 35 32.256	W 75 40.342	61	2	on	Deploying Anchor (DA)	Poor	10	100	Bare anchor deployed port bow
12:42	on	4	N 35 32.220	W 75 40.232	61	3	on	Deploying Anchor (DA)	Poor	10	100	Sea state change and third anchor deployed; waves about 2-3 ft
12:53	on	1	N 35 32.180	W 75 40.734	61	3	on	Deploying Anchor (DA)	Marginal	10	100	Begin sweep
13:01	off	2	N 35 32.365	W 75 40.902	61	3	on	Unknown Activity (UA)	Marginal	10	100	End of day; water pump barge not available
17 November 2011												
7:15	on	1	-	-	63	2	off	NA	Good	0	100	Left boat ramp; started observations for the day; in route; will record sightings when within 1,000 m for barge
7:56	on	1	N 35 32.682	W 75 40.413	63	3	off	NA	Good	0	100	Overcast; on site; start sweep; can see about 500 m
8:19	on	1	N 35 32.559	W 75 40.566	63	3	off	NA	Good	0	100	112 degrees at 235 m potential school of fish; birds in area; Navy boat arrive on site
8:36	on	1	N 35 31.902	W 75 40.445	63	3	off	NA	Good	0	100	Finished first sweep between 800 and 700 m

Time	Effort	Event*	Ship Latitude	Ship Longitude	Water Temp (°F)	Sea State	Barge Activity	Construction Activity	Visibility	Cloud Coverage	% Glare	Comments
17 November 2011 (continued)												
8:59	on	1	N 35 32.121	W 75 40.441	63	3	off	NA	Good	0	100	Finished second sweep between 450 and 550 m; visibility about 500 m; preparing the water boat
9:10	on	1	N 35 32.119	W 75 40.263	63	3	off	NA	Good	0	100	Finished 1,000 m zone; area cleared; will keep monitoring away from ops.
9:30	on	1	N 35 32.241	W 75 40.298	63	3	off	NA	Good	0	100	Diver splashed; 1.5 feet visibility under water; preparing operations
9:37	on	1	-	-	63	3	off	NA	Good	0	100	Retrieved diver
9:39	on	1	N 35 32.232	W 75 40.296	63	3	off	NA	Good	0	100	Splashed diver second sweep
9:50	on	1	N 35 32.109	W 75 40.304	63	3	off	NA	Good	10	100	Pulled Diver and continued circling the barge
10:06	on	1	-	-	63	3	on	Water On	Good	10	100	Start pumping water
10:16	on	1	N 35 32.246	W 75 40.325	63	3	off	Water Off	Good	10	100	Water off
10:17	on	1	-	-	63	3	on	Water On	Good	10	100	Water on
12:32	on	1	N 35 32.234	W 75 40.287	63	3	on	Barge Sank	Good	10	100	Barge sank; light rain and overcast; start post survey; visibility about 500 m monitor at 500 m from barge

Time	Effort	Event*	Ship Latitude	Ship Longitude	Water Temp (°F)	Sea State	Barge Activity	Construction Activity	Visibility	Cloud Coverage	% Glare	Comments
17 November 2011 (continued)												
12:40	on	1	-	-	63	4	off	NA	Marginal	10	100	Wind and waves starting to pick up; 4 ft seas closing circle to about 300 m just to complete survey
12:50	off	2	N 35 32.217	W 75 40.425	63	4	off	NA	Marginal	10	100	

*Event: 1 – begin effort; 2 – end effort; 3 – observer rotation; 4 – weather change; 5 – waypoint (mark in GPS); 6 – high density area; 7 – back to normal.