

## PROJECT STATUS REPORT

<b>REPORT DATE:</b>	1 September 2009	<b>REPORT PERIOD:</b>	August 2009
<b>BOA NO:</b>	743586-60049	<b>TASK ORDER:</b>	746192-60007
<b>GMI NUMBER:</b>	30217.01.07	<b>GMI PROJECT MGR:</b>	Jason See
<b>CLIENT NAME:</b>	Parsons Infrastructure and Technology Group, Inc.	<b>PARSONS MGR:</b>	Stephen Buss
<b>PROJECT NAME:</b>	Marine protected species monitoring for the Proposed UnderSea Warfare Training Range (USWTR)		

### 1.0 WORK PERFORMED THIS REPORT PERIOD

During the month of August both shipboard and aerial surveys were conducted in Onslow Bay. The aerial team surveyed all tracklines twice, and favorable weather conditions allowed the shipboard team to survey five days in Onslow Bay. On August 18<sup>th</sup> and 19<sup>th</sup> aerial and shipboard surveys were conducted concurrently.

#### A. Aerial Surveys

##### Survey Effort

The UNCW aerial survey team conducted observations on August 17<sup>th</sup>, 18<sup>th</sup>, and 19<sup>th</sup>; covering tracklines 1 through 10 twice. Table 1 summarizes the track lines surveyed and sea state conditions. Table 2 summarizes the sightings made during these aerial surveys. The aerial team observed bottlenose (*Tursiops truncatus*), spotted (*Stenella frontalis*), and Risso's (*Grampus griseus*) dolphins, as well as pilot whales (*Globicephala macrorhynchus*), loggerhead sea turtles (*Caretta caretta*), manta ray and several unidentified sharks. Figure 1 shows the locations of the sightings made during the aerial surveys.

**Table 1. Effort summary table for UNCW aerial surveys.**

Date	Line	Sea State	Kilometers flown
17-Aug-09	10	1 to 3	74.5
17-Aug-09	9	1 to 3	73.6
17-Aug-09	8	1 to 3	74.9
17-Aug-09	7	1 to 3	74.7
18-Aug-09	1	1 to 3	75.0
18-Aug-09	2	1 to 3	73.6
18-Aug-09	3	1 to 2	73.5
18-Aug-09	4	1 to 2	68.4
18-Aug-09	5	1 to 2	72.9
18-Aug-09	6	1 to 2	74.3
18-Aug-09	7	1 to 2	74.3
18-Aug-09	8	1 to 2	75.0
18-Aug-09	9	1 to 2	73.5
18-Aug-09	10	1 to 2	73.7
19-Aug-09	6	1 to 2	74.5
19-Aug-09	5	1 to 2	74.2
19-Aug-09	4	1 to 2	74.8

19-Aug-09	3	1	74.5
19-Aug-09	2	1	72.9
19-Aug-09	1	1	74.9

**Table 2. Sighting summary table for UNCW aerial surveys.**

Date	Time	Effort	Latitude	Longitude	Track	Species	Group Size
17-Aug-09	15:21	On	34.258671	-76.589011	10	<i>Unid. Sea Turtle</i>	1
17-Aug-09	15:23	On	34.215023	-76.532874	10	<i>Unid. Sea Turtle</i>	1
17-Aug-09	15:27	On	34.160575	-76.468974	10	<i>Stenella frontalis</i>	35
17-Aug-09	15:43	On	34.057868	-76.330946	10	<i>Unid. Sea Turtle</i>	1
17-Aug-09	15:46	On	33.991071	-76.245475	10	<i>Caretta caretta</i>	1
17-Aug-09	15:48	On	33.943945	-76.185304	10	<i>Caretta caretta</i>	1
17-Aug-09	16:00	On	33.808016	-76.141633	9	<i>Caretta caretta</i>	1
17-Aug-09	16:08	On	34.006983	-76.398432	9	<i>Caretta caretta</i>	1
17-Aug-09	16:12	On	34.085993	-76.500693	9	<i>Mola mola</i>	1
17-Aug-09	16:15	On	34.154200	-76.589502	9	<i>Caretta caretta</i>	1
17-Aug-09	16:16	On	34.183486	-76.627424	9	<i>Caretta caretta</i>	1
17-Aug-09	16:17	On	34.193935	-76.641233	9	<i>Unid. Sea Turtle</i>	2
17-Aug-09	16:18	On	34.216918	-76.673388	9	<i>Unid. Sea Turtle</i>	2
17-Aug-09	16:22	On	34.152674	-76.714152	8	<i>Caretta caretta</i>	1
17-Aug-09	16:23	On	34.117362	-76.668036	8	<i>Caretta caretta</i>	1
17-Aug-09	16:26	On	34.065601	-76.599661	8	<i>Caretta caretta</i>	1
17-Aug-09	16:27	On	34.032553	-76.556431	8	<i>Caretta caretta</i>	1
17-Aug-09	16:27	On	34.043280	-76.570644	8	<i>Caretta caretta</i>	1
17-Aug-09	16:40	On	33.764413	-76.205987	8	<i>Caretta caretta</i>	1
17-Aug-09	16:40	On	33.751701	-76.189365	8	<i>Caretta caretta</i>	1
17-Aug-09	16:49	On	33.762449	-76.338879	7	<i>Caretta caretta</i>	1
17-Aug-09	16:58	On	33.965171	-76.602357	7	<i>Unid. Shark</i>	1
17-Aug-09	17:03	On	34.055212	-76.719894	7	<i>Caretta caretta</i>	1
18-Aug-09	9:27	On	33.743025	-77.099780	1	<i>Caretta caretta</i>	1
18-Aug-09	9:33	On	33.632870	-76.955154	1	<i>Unid. Sea Turtle</i>	1
18-Aug-09	9:37	Off	33.620708	-76.942240	1	<i>Tursiops truncatus</i>	1
18-Aug-09	9:44	On	33.600015	-76.919668	1	<i>Unid. Sea Turtle</i>	1
18-Aug-09	9:49	On	33.513235	-76.798926	1	<i>Caretta caretta</i>	1
18-Aug-09	9:57	On	33.358769	-76.610723	1	<i>Grampus griseus</i>	6
18-Aug-09	10:15	On	33.504820	-76.674391	2	<i>Tursiops truncatus</i>	35
18-Aug-09	10:27	On	33.671233	-76.879581	2	<i>Caretta caretta</i>	1
18-Aug-09	10:30	On	33.725727	-76.950003	2	<i>Unid. Sea Turtle</i>	1
18-Aug-09	10:42	On	33.833583	-76.957856	3	<i>Caretta caretta</i>	1
18-Aug-09	10:44	On	33.791287	-76.902571	3	<i>Caretta caretta</i>	1
18-Aug-09	10:45	On	33.770614	-76.875567	3	<i>Caretta caretta</i>	1
18-Aug-09	10:59	On	33.493955	-76.498147	3	<i>Globicephala macrorhynchus</i>	40
18-Aug-09	11:22	On	33.611807	-76.541171	4	<i>Tursiops truncatus</i>	2
18-Aug-09	11:37	On	33.727864	-76.687137	4	<i>Caretta caretta</i>	1
18-Aug-09	11:37	On	33.733042	-76.693974	4	<i>Unid. Sea Turtle</i>	1
18-Aug-09	11:38	On	33.759375	-76.728531	4	<i>Caretta caretta</i>	1

18-Aug-09	11:40	On	33.784330	-76.761268	4	<i>Tursiops truncatus</i>	3
18-Aug-09	11:46	On	33.840069	-76.835571	4	<i>Caretta caretta</i>	1
18-Aug-09	11:50	On	33.886683	-76.898185	4	<i>Stenella frontalis</i>	2
18-Aug-09	12:00	On	33.931810	-76.957381	4	<i>Unid. Shark</i>	1
18-Aug-09	12:02	On	33.966525	-76.999787	4	<i>Unid. Sea Turtle</i>	1
18-Aug-09	14:21	On	33.761505	-76.599899	5	<i>Stenella frontalis</i>	65
18-Aug-09	14:56	On	33.991932	-76.775291	6	<i>Caretta caretta</i>	1
18-Aug-09	15:02	On	34.070793	-76.872859	6	<i>Stenella frontalis</i>	9
18-Aug-09	15:13	On	34.088615	-76.758118	7	<i>Caretta caretta</i>	1
18-Aug-09	15:16	On	34.020482	-76.668820	7	<i>Caretta caretta</i>	1
18-Aug-09	15:18	On	33.974456	-76.608827	7	<i>Caretta caretta</i>	1
18-Aug-09	15:46	On	33.943606	-76.445136	8	<i>Unid. Sea Turtle</i>	1
18-Aug-09	16:06	On	34.082670	-76.491323	9	<i>Unid. Sea Turtle</i>	1
18-Aug-09	16:09	On	34.028738	-76.421312	9	<i>Caretta caretta</i>	1
18-Aug-09	16:36	On	34.089557	-76.377171	10	<i>Unid. Sea Turtle</i>	1
19-Aug-09	9:22	On	34.031991	-76.823887	6	<i>Manta birostris</i>	1
19-Aug-09	9:31	On	33.839874	-76.570116	6	<i>Caretta caretta</i>	1
19-Aug-09	9:55	On	33.777906	-76.624098	5	<i>Unid. Sea Turtle</i>	1
19-Aug-09	9:59	On	33.870794	-76.746317	5	<i>Unid. Sea Turtle</i>	1
19-Aug-09	9:59	On	33.865322	-76.739106	5	<i>Unid. Sea Turtle</i>	1
19-Aug-09	10:03	On	33.960298	-76.864501	5	<i>Caretta caretta</i>	1
19-Aug-09	10:11	On	33.933344	-76.954704	4	<i>Manta birostris</i>	1
19-Aug-09	10:15	On	33.845945	-76.838537	4	<i>Unid. Sea Turtle</i>	1
19-Aug-09	11:04	On	33.811234	-76.916236	3	<i>Tursiops truncatus</i>	3
19-Aug-09	11:20	On	33.864351	-77.003550	3	<i>Caretta caretta</i>	1
19-Aug-09	11:21	On	33.889617	-77.036512	3	<i>Caretta caretta</i>	1
19-Aug-09	11:22	On	33.904012	-77.055396	3	<i>Caretta caretta</i>	1
19-Aug-09	11:28	On	33.815988	-77.078934	2	<i>Stenella frontalis</i>	4
19-Aug-09	12:00	On	33.449196	-76.601237	2	<i>Tursiops truncatus</i>	8
19-Aug-09	12:20	Off	33.386885	-76.537104	n/a	<i>Globicephala macrorhynchus</i>	6

## B. Shipboard surveys

### Survey Effort

Shipboard surveys in Onslow bay occurred on August 8<sup>th</sup>, 9<sup>th</sup>, 16<sup>th</sup>, 17<sup>th</sup>, and 18<sup>th</sup> resulting in 30 total survey hours and 20.5 hours on effort. All tracklines in August were surveyed aboard the *R/V Sensation* and we surveyed tracklines 1, 4, 2, 5, and 3 respectively. In August we saw bottlenose (*Tursiops truncatus*), spotted (*Stenella frontalis*), and Risso's (*Grampus griseus*) dolphins, as well as pilot whales (*Globicephala macrorhynchus*), and loggerhead (*Caretta caretta*) and leatherback (*Dermochelys coriacea*) sea turtles. On August 18<sup>th</sup> we had the first shipboard sighting of Rough-toothed (*Steno bredanensis*) dolphins in Onslow Bay. Table 3 provides the details for these sightings and the locations of the sightings are presented in Figure 2.

We conducted strip transect seabird counts concurrent with the marine mammal surveys. For the month of August, 2009, 31 seabirds were observed during 4.68 hours of survey effort and the total sightings per unit effort (SPUE), or the number of seabirds recorded per hour of effort, was 6.62. Cory's Shearwaters (*Calonectris diomedea*) were the most frequently observed

seabirds, while Wilson's Storm Petrels (*Oceanites oceanicus*) and Greater Shearwaters (*Puffinus gravis*) were also observed during August surveys. Table 4 provides the details for these sightings.

**Table 3: Sighting summary table for Duke vessel-based surveys.**

Date	Trackline	Time	Latitude	Longitude	Species	Group Size	Effort
08-Aug-09	1	13:13:24	33.7590872	-77.11195124	<i>Stenella frontalis</i>	5	On
09-Aug-09	4	9:53:11	33.57024922	-76.48994458	<i>Grampus griseus</i>	24	On
09-Aug-09	4	13:53:37	33.7836684	-76.7598082	<i>Stenella frontalis</i>	5	On
09-Aug-09	4	14:44:45	33.85633223	-76.85193528	<i>Tursiops truncatus</i>	3	On
09-Aug-09	4	15:06:09	33.87853944	-76.88491823	<i>Caretta caretta</i>	1	On
16-Aug-09	2	9:20:00	33.41227852	-76.53991096	<i>Grampus griseus</i>	36	Off
16-Aug-09	2	10:11:21	33.44150215	-76.57722479	<i>Grampus griseus</i>	16	On
16-Aug-09	2	11:34:51	33.5131182	-76.67708118	<i>Tursiops truncatus</i>	6	On
16-Aug-09	2	11:59:14	33.52882185	-76.6979236	<i>Tursiops truncatus</i>	16	On
16-Aug-09	2	12:21:46	33.55464716	-76.73227968	<i>Tursiops truncatus</i>	14	On
16-Aug-09	2	13:35:08	33.68509835	-76.89152413	<i>Caretta caretta</i>	1	On
16-Aug-09	2	14:09:30	33.74745277	-76.98215858	<i>Tursiops truncatus</i>	4	On
17-Aug-09	5	9:28:45	33.61890397	-76.41385011	<i>Caretta caretta</i>	1	On
17-Aug-09	5	10:04:17	33.68321091	-76.49100768	<i>Tursiops truncatus</i>	41	On
17-Aug-09	5	13:07:38	33.94399414	-76.84646221	<i>Stenella frontalis</i>	10	On
17-Aug-09	5	13:43:04	33.96852911	-76.88216205	<i>Stenella frontalis</i>	5	On
17-Aug-09	5	14:00:26	33.98048169	-76.89331526	<i>Stenella frontalis</i>	5	On
18-Aug-09	3	9:26:43	33.48861981	-76.5129594	<i>Globicephala macrorhynchus</i>	8	Off
18-Aug-09	3	9:53:59	33.48819428	-76.52507199	<i>Globicephala macrorhynchus</i>	45	On
18-Aug-09	3	11:43:25	33.64312898	-76.70932698	<i>Steno bredanensis</i>	27	On
18-Aug-09	3	12:57:26	33.70219441	-76.77720551	<i>Tursiops truncatus</i>	10	Off
18-Aug-09	3	13:55:16	33.75787551	-76.86369747	<i>Dermochelys coriacea</i>	1	Off
18-Aug-09	3	14:06:00	33.77026033	-76.8861296	<i>Caretta caretta</i>	1	On
18-Aug-09	3	14:13:10	33.7865562	-76.90339209	<i>Caretta caretta</i>	1	On
18-Aug-09	3	14:15:04	33.78615372	-76.90853087	<i>Tursiops truncatus</i>	2	On
18-Aug-09	3	14:29:14	33.8048905	-76.9178252	<i>Tursiops truncatus</i>	4	On
18-Aug-09	3	14:48:32	33.82305646	-76.94720713	<i>Dermochelys coriacea</i>	1	On
18-Aug-09	3	14:49:42	33.8241655	-76.95326855	Unid. dolphin	1	Off
18-Aug-09	3	14:51:10	33.82750355	-76.95489798	<i>Caretta caretta</i>	1	On
18-Aug-09	3	15:13:28	33.867231	-77.01693993	<i>Tursiops truncatus</i>	12	On

**Table 4: Seabird sightings by date during August 2009 surveys in Onslow Bay**

Date	August 18, 2009
<b>Total Birds</b>	<b>31</b>
<b>Hours Effort</b>	<b>4.68</b>

<b>Total SPUE (all birds)</b>	<b>6.62</b>
Cory's Shearwaters ( <i>Calonectris diomedea</i> )	21
Greater Shearwaters ( <i>Puffinus gravis</i> )	2
Wilson's Storm Petrels ( <i>Oceanites oceanicus</i> )	5
Unidentified Storm Petrels	2
Unidentified Swallow	1

### C. Passive Acoustics

We deployed the towed array from the *F/V Sensation* on five days during August 2009. On August 8<sup>th</sup>, we deployed the hydrophone array for 4.4 hours of combined visual and acoustic survey. During this time, we made two acoustic detections. The visual team cued one group (*Stenella frontalis*), and the other was unobserved. On August 9<sup>th</sup>, we deployed the hydrophone array for 5.64 hours of combined visual and acoustic survey. During this time, we made six acoustic detections and detected three visually. Two groups (*Grampus griseus*, *Tursiops truncatus*) were cued. During the *Grampus griseus* sighting, we detected clicks with characteristics similar to those of *Physeter macrocephalus* but the species was not observed. The final group that we also detected visually was a group of *Stenella frontalis*. On August 16<sup>th</sup>, we deployed the hydrophone array for 5.77 hours of combined visual and acoustic survey and made nine acoustic detections. The visual team cued two groups (*Grampus griseus*, *Tursiops truncatus*). The remaining acoustic detections included *Grampus griseus*, *Tursiops truncatus*, two unidentified cetacean groups, and one unidentified source. On August 17<sup>th</sup>, we deployed the hydrophone array for 5.53 hours of combined visual and acoustic survey. We made five acoustic detections and the visual team cued one group (*Stenella frontalis*). The four remaining acoustic detections included one group of *Tursiops truncatus*, two groups of *Stenella frontalis*, and one unobserved group. On August 18<sup>th</sup>, we deployed the hydrophone array for 6.65 hours of combined visual and acoustic survey and detected eight groups acoustically. The visual team cued two groups (*Steno bredanensis*, *Tursiops truncatus*). The other detections consisted of two groups of *Globicephala spp.*, three groups of *Tursiops truncatus*, and one unobserved group.

### D. Oceanographic Sampling

We conducted one day of preliminary oceanographic sampling in August 2009 to examine physical regimes and distributions of marine mammal and seabird prey at depth. We conducted surveys on shelf waters on August 5, 2009 to calibrate and sync acoustic equipment (an acoustic Doppler current profiler (ADCP) and a 38 kHz fisheries acoustics transducer).

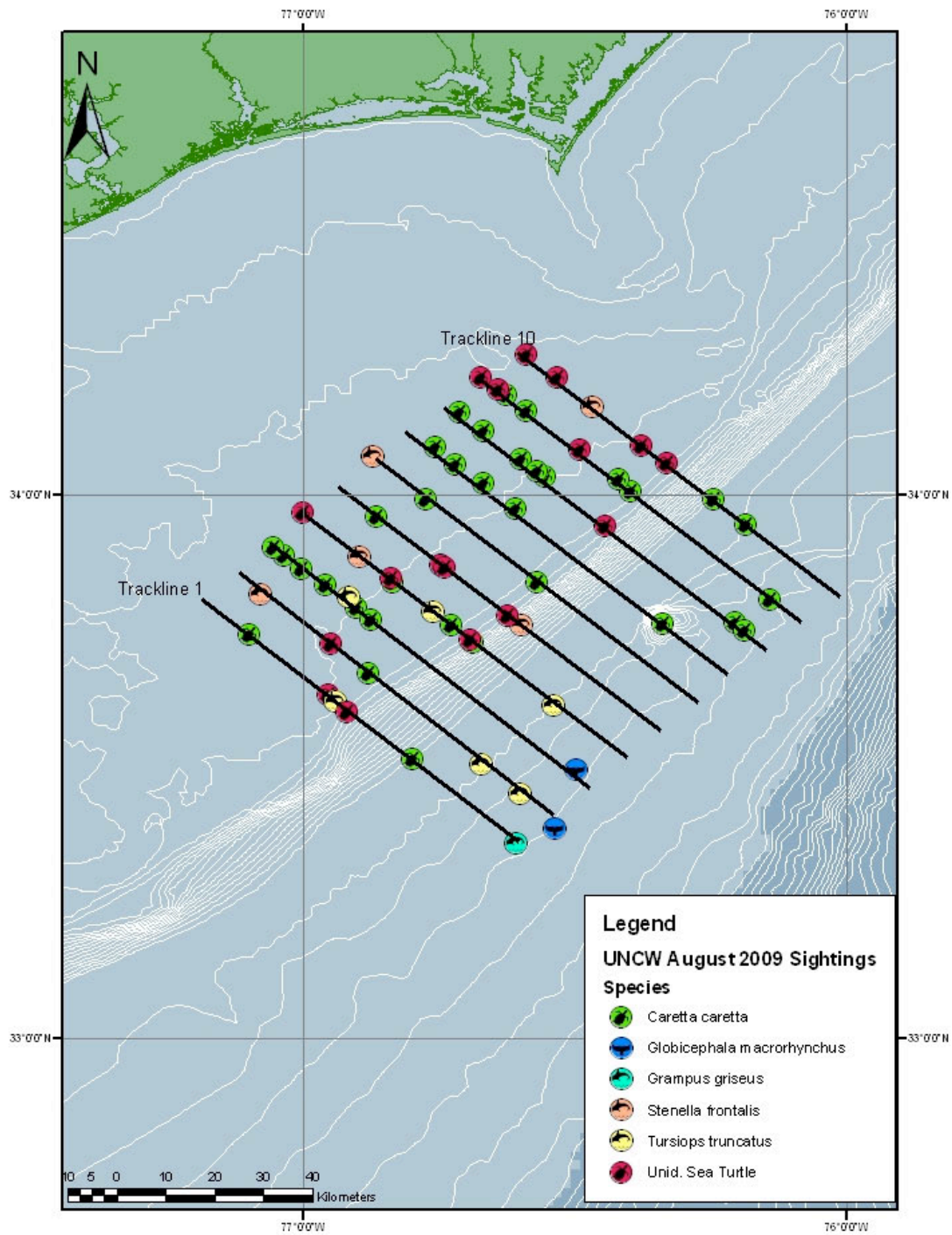


Figure 1. Location of sightings made during aerial surveys in August 2009. Refer to Tables 1 and 2.

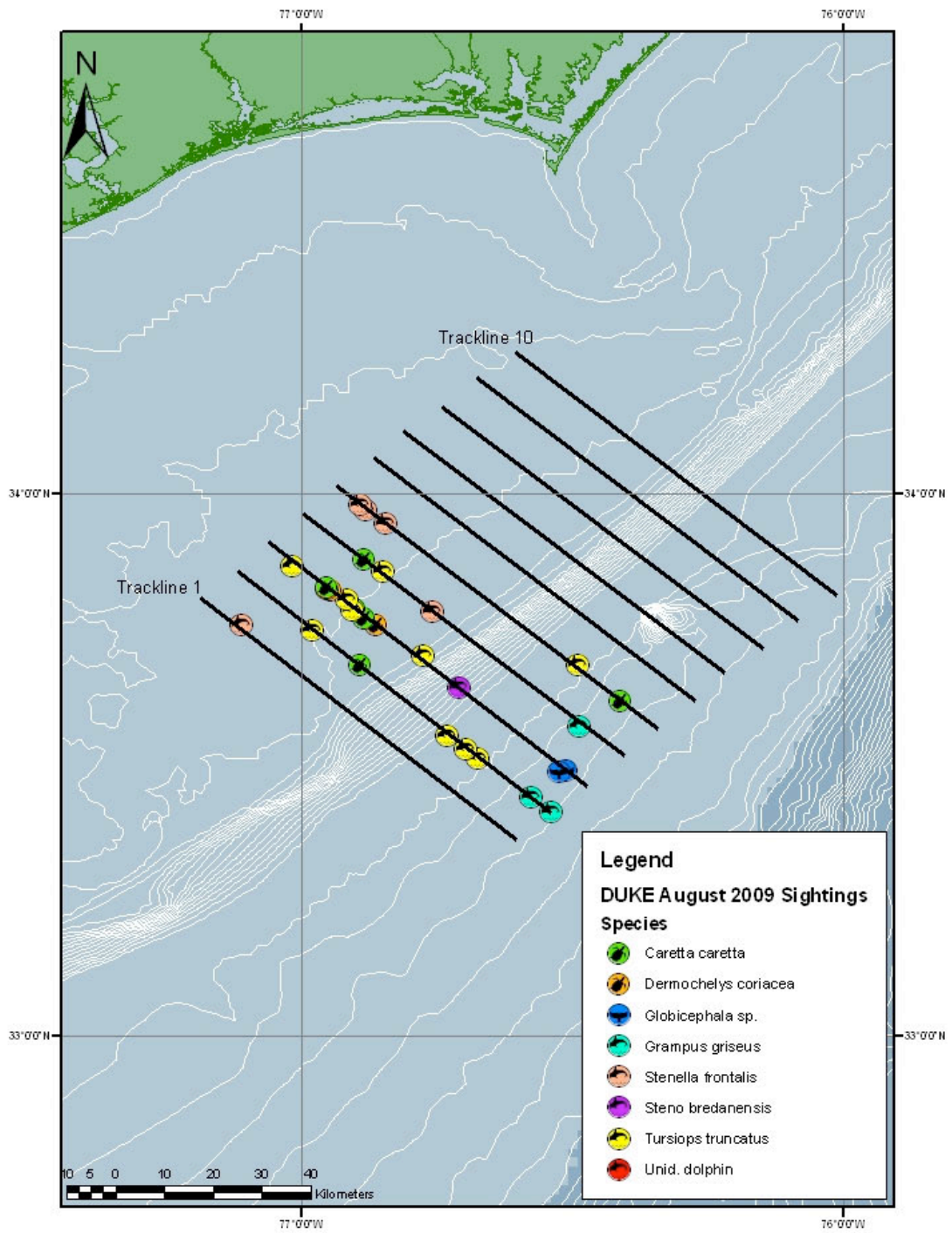


Figure 2. Location of sightings made during vessel surveys in August 2009. Refer to Table 3.

## Monitoring of Protected Species in the Proposed Jacksonville USWTR

Progress Report: July 24 through August 23, 2009

### Survey activity (Task 2)

#### Aerial Surveys

Two full sets of track lines (20 track lines) were flown for the month of August. Six lines were flown on 4 August, eight lines were flown on 5 August, and six lines were flown on 6 August. Survey conditions were acceptable (Table 1); however, survey effort was suspended on the afternoon of 5 August due to deteriorating weather conditions in the afternoon. There were eleven cetacean sightings during aerial survey effort: six encounters with *Stenella frontalis*, four encounters with *Tursiops truncatus*, and one sighting of unidentified delphinids (Table 2). Two of the encounters with *S. frontalis* yielded photo documentation of dolphins feeding on octopi as well. Multiple dolphins were documented repeatedly throwing octopi from the water. An abundance of sea turtles were seen during this survey period. *Caretta caretta* were the predominant species, along with a number of unidentified sea turtles. Turtles were most often encountered on the nearshore ends of the track lines (Table 3). The locations of cetacean encountered during aerial surveys are presented in Figure 1. Sea turtle locations are plotted in Figure 2.

#### Vessel Surveys

Three and a half track lines were surveyed on 14, 16, 18 and 19 August 2009 on the *R/V 2 Angels* – a modified 38 ft Duffy commercial/ sport fishing vessel (Table 4). There were five cetacean sightings and seven sea turtle sightings (Table 5). Four groups of *S. frontalis* and one group of *T. truncatus* were observed during survey effort. One *Lepidochelys kempii* turtle and one *Dermochelys coriacea* turtle were seen. The remaining sea turtle sightings were of *C. caretta*. The locations of cetaceans and turtles sighted during vessel surveys are presented in Figure 3.

#### Towed Passive Acoustics

The towed acoustic array was deployed from the *R/V 2 Angels* on 14, 16, and 19 August 2009. On 14 and 16 August the acoustic array was deployed for a total of 9 hours 31 minutes of simultaneous visual and acoustic detection. A total of 2 hours 42 minutes of acoustic recordings were collected, including recordings obtained during a sighting of *S. frontalis* on 16 August. On 18 August the hydrophone array was not deployed due to being short one observer. On 19 August the array was deployed with recordings collected during visual sighting events. A total of 28 minutes of acoustic recordings were taken encompassing two visual sighting events: one of *S. frontalis* and one of *T. truncatus*.



**Travel (Task 1 & 3)**

Co-PI William McLellan traveled to Fernandina Beach on August 8 & 9 to assist with the set-up effort. Observer Rachel Hardee traveled to UNC Wilmington to assist is surveys conducted in Onslow Bay. This cross-pollination of observers between teams will continue in the future.

**Purchasing (Task 1)**

A new satellite phone was purchased for the JAX survey team during this reporting period. Supplies to redeploy the JAX HARPs (chain, shackles and wire rope) were purchased during this report period.

**Planning (Task 1)**

A Navy exercise is scheduled to occur in the JAX USWTR survey area during September 2009. As such, PI Johnston and Post-doc Soldevilla initiated planning for the deployment of Cornell pop-up buoys and also planned the redeployment of HARPs in September. Pop-ups will be deployed in the JAX USWTR during the 1st week of September and recovered at the end of the month. We plan on recovering and redeploying the HARPs during 14-24 September (except the 17th, when no access to the HARP locations is permitted). PI Johnston also coordinated with Navy officials to establish proper authorization to access the JAX USWTR for the survey and HARP recovery team during the September exercises.

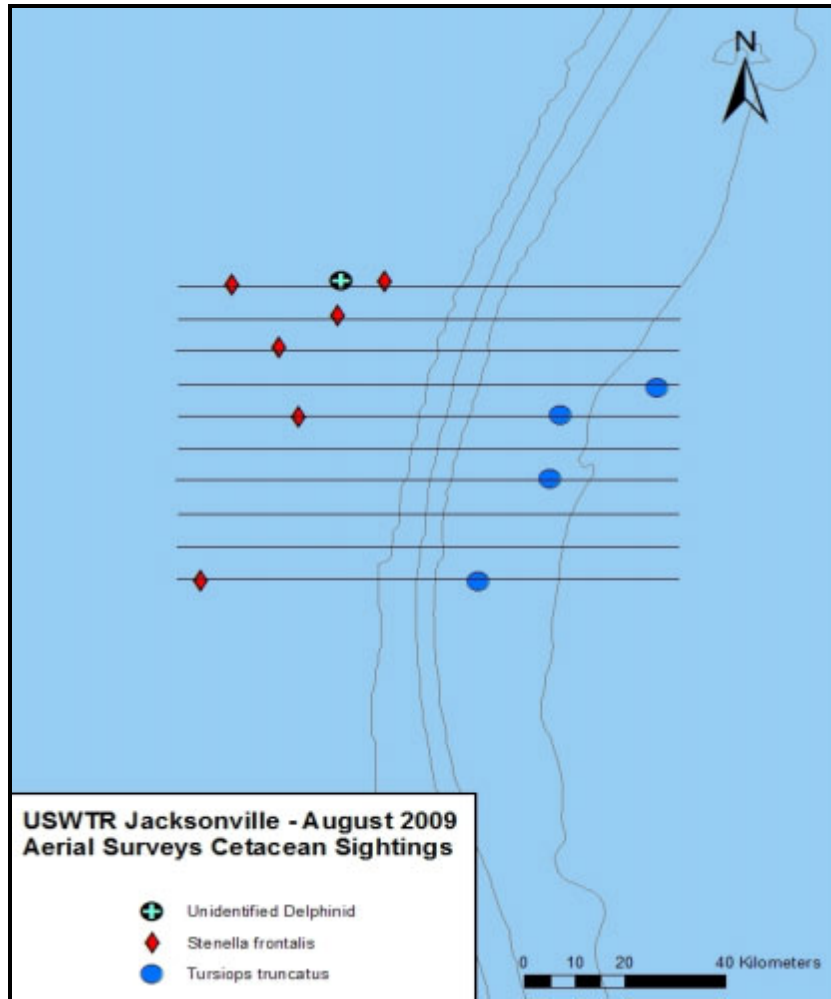


Figure 1. The locations of cetaceans sighted during aerial surveys of the JAX USWTR study region during 24 July through 23 August, 2009. Distribution represents each track line flown two times over the entire length of the line.

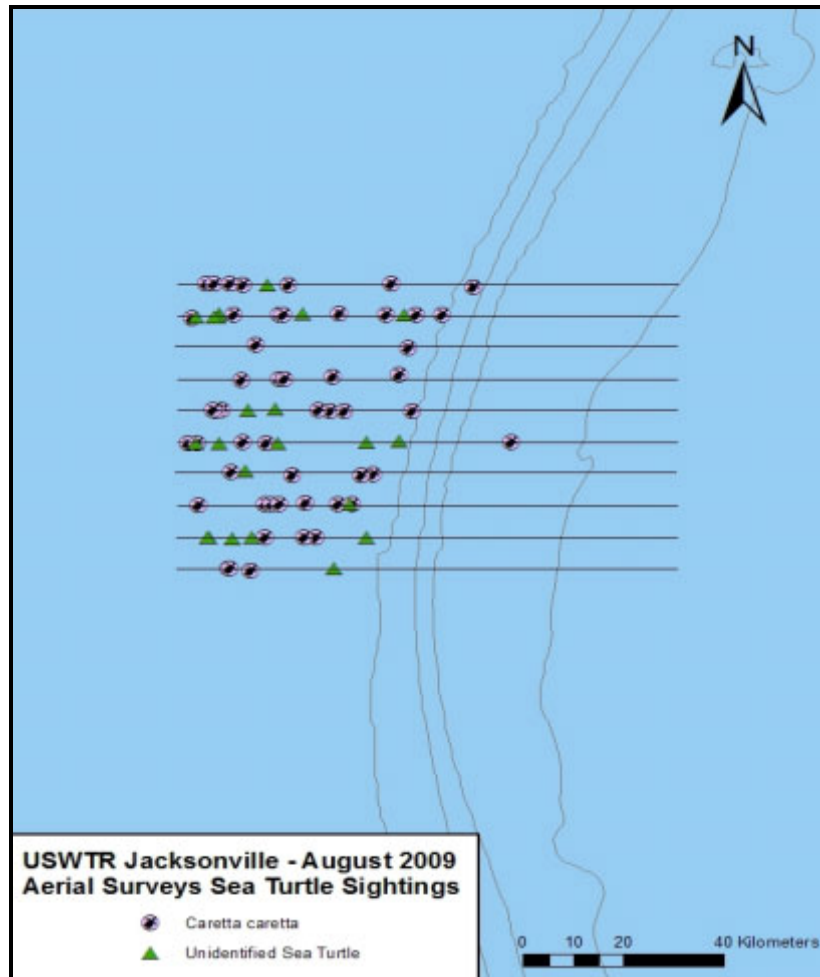


Figure 2. The locations of sea turtles sighted during aerial surveys of the JAX USWTR study region during 24 July through 23 August, 2009. Distribution represents each track line flown two times over the entire length of the line.

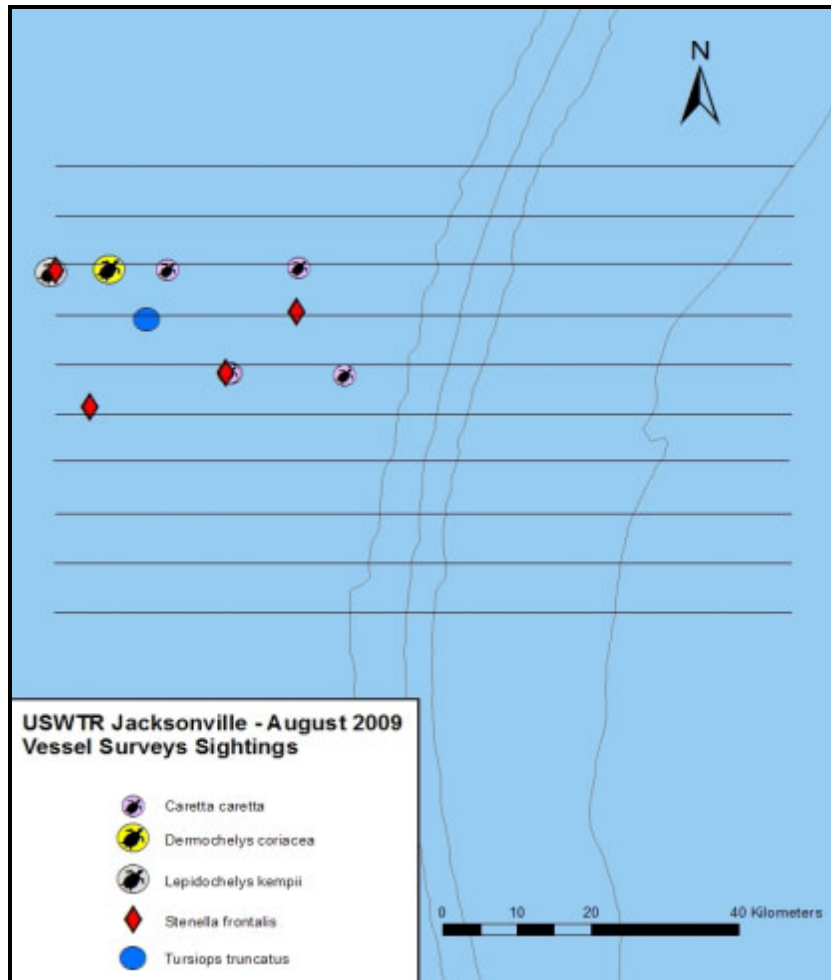


Figure 3. The locations of cetaceans and sea turtles sighted during vessel surveys of the JAX USWTR study region during 24 July through 23 August, 2009. Distribution represents surveys of track lines 8, 7, 6, and the nearshore half of track line 5.

Table 1. Aerial survey effort for the Jacksonville, FL USWTR site in August 2009.

Date	Line	Sea State	Kilometers Flown
4-Aug-09	10	1-2	86.1
4-Aug-09	9	1-2	85.5
4-Aug-09	8	1-2	80.8
4-Aug-09	7	1-3	83.4
4-Aug-09	6	0-3	84.7
4-Aug-09	5	0-3	86.6
5-Aug-09	1	1-3	86.2
5-Aug-09	2	1-3	86.6
5-Aug-09	3	1-3	86.3
5-Aug-09	4	1-3	86.3
5-Aug-09	5	1,3	86.4
5-Aug-09	6	1-3	86.3
5-Aug-09	7	3-4	86
5-Aug-09	8	2-4	85.9
6-Aug-09	1	2-3	85.7
6-Aug-09	2	2-3	86.6
6-Aug-09	3	2-3	85.8
6-Aug-09	4	1-3	82.8
6-Aug-09	9	2	86
6-Aug-09	10	2	86.5

Table 2. Cetacean sightings during aerial surveys in the JAX USWTR site in August 2009.

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Group Size
4-Aug-09	12:05	On Effort	30.57040	-80.60384	10	<i>S. frontalis</i>	4
4-Aug-09	13:03	On Effort	30.50726	-80.41370	9	<i>S. frontalis</i>	25
4-Aug-09	13:23	On Effort	30.44088	-80.52035	8	<i>S. frontalis</i>	6
4-Aug-09	13:58	On Effort	30.35985	-79.84065	7	<i>T. truncatus</i>	24
4-Aug-09	14:38	On Effort	30.29739	-80.48385	6	<i>S. frontalis</i>	7
4-Aug-09	14:56	On Effort	30.30378	-80.01414	6	<i>T. truncatus</i>	35
6-Aug-09	8:37	On Effort	29.960847	-80.659663	1	<i>S. frontalis</i>	20
6-Aug-09	9:10	On Effort	29.961709	-80.161598	1	<i>T. truncatus</i>	20
6-Aug-09	10:37	On Effort	30.172326	-80.033970	4	<i>T. truncatus</i>	17
6-Aug-09	12:08	On Effort	30.577324	-80.330336	10	<i>S. frontalis</i>	6
6-Aug-09	12:25	On Effort	30.579529	-80.408211	10	Unidentified delphinid	3

Table 3. Sea turtle sightings during aerial surveys in the JAX USWTR site in August 2009.

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Group Size
4-Aug-09	11:58	On Effort	30.567790	-80.647958	10	<i>C. caretta</i>	2
4-Aug-09	12:24	On Effort	30.566594	-80.316750	10	<i>C. caretta</i>	3
4-Aug-09	12:33	On Effort	30.560334	-80.167957	10	<i>C. caretta</i>	1
4-Aug-09	12:56	On Effort	30.502631	-80.224083	9	<i>C. caretta</i>	1
4-Aug-09	12:57	On Effort	30.500670	-80.271799	9	<i>C. caretta</i>	1
4-Aug-09	12:59	On Effort	30.501289	-80.325398	9	<i>C. caretta</i>	1
4-Aug-09	13:01	On Effort	30.504542	-80.409434	9	<i>C. caretta</i>	1
4-Aug-09	13:10	On Effort	30.500800	-80.518322	9	<i>C. caretta</i>	1
4-Aug-09	13:12	On Effort	30.501112	-80.598167	9	<i>C. caretta</i>	1
4-Aug-09	13:12	On Effort	30.503147	-80.624101	9	Uniden. turtle	1
4-Aug-09	13:20	On Effort	30.438471	-80.560492	8	<i>C. caretta</i>	3
4-Aug-09	13:39	On Effort	30.432193	-80.285353	8	<i>C. caretta</i>	1
4-Aug-09	14:12	On Effort	30.374500	-80.301723	7	<i>C. caretta</i>	2
4-Aug-09	14:16	On Effort	30.369755	-80.421294	7	<i>C. caretta</i>	1
4-Aug-09	14:18	On Effort	30.365380	-80.516626	7	<i>C. caretta</i>	1
4-Aug-09	14:20	On Effort	30.364738	-80.585105	7	<i>C. caretta</i>	1
4-Aug-09	14:33	On Effort	30.299621	-80.620791	6	<i>C. caretta</i>	1
4-Aug-09	14:33	On Effort	30.299321	-80.630179	6	<i>C. caretta</i>	1
4-Aug-09	14:35	On Effort	30.301272	-80.572978	6	Uniden. turtle	1
4-Aug-09	14:36	On Effort	30.303321	-80.525158	6	Uniden. turtle	1
4-Aug-09	14:44	On Effort	30.298889	-80.427273	6	<i>C. caretta</i>	1
4-Aug-09	14:45	On Effort	30.298179	-80.400124	6	<i>C. caretta</i>	1
4-Aug-09	14:48	On Effort	30.297485	-80.278407	6	<i>C. caretta</i>	1
4-Aug-09	15:20	On Effort	30.236193	-80.302727	5	Uniden. turtle	1
4-Aug-09	15:21	On Effort	30.233527	-80.360478	5	Uniden. turtle	1
4-Aug-09	15:25	On Effort	30.230677	-80.519806	5	Uniden. turtle	1
4-Aug-09	15:26	On Effort	30.230947	-80.541866	5	<i>C. caretta</i>	1
4-Aug-09	15:28	On Effort	30.230294	-80.624343	5	Uniden. turtle	1
4-Aug-09	15:29	On Effort	30.229411	-80.667231	5	Uniden. turtle	1
5-Aug-09	8:59	On Effort	29.966658	-80.607427	1	<i>C. caretta</i>	1
5-Aug-09	8:59	On Effort	29.966624	-80.606248	1	<i>C. caretta</i>	1
5-Aug-09	9:37	On Effort	30.032263	-80.360320	2	Uniden. turtle	1
5-Aug-09	9:40	On Effort	30.031052	-80.451696	2	<i>C. caretta</i>	1
5-Aug-09	9:42	On Effort	30.032194	-80.543009	2	<i>C. caretta</i>	1
5-Aug-09	9:45	On Effort	30.032028	-80.643513	2	Uniden. turtle	1
5-Aug-09	9:45	On Effort	30.031985	-80.645809	2	Uniden. turtle	1
5-Aug-09	9:50	On Effort	30.099232	-80.663013	3	<i>C. caretta</i>	1
5-Aug-09	9:53	On Effort	30.101678	-80.543657	3	<i>C. caretta</i>	1
5-Aug-09	9:54	On Effort	30.101754	-80.532500	3	<i>C. caretta</i>	1
5-Aug-09	9:54	On Effort	30.100723	-80.516654	3	<i>C. caretta</i>	1
5-Aug-09	9:57	On Effort	30.100903	-80.412442	3	<i>C. caretta</i>	1
5-Aug-09	10:53	On Effort	30.230984	-80.681895	5	<i>C. caretta</i>	1
5-Aug-09	10:53	On Effort	30.230914	-80.664922	5	<i>C. caretta</i>	1
5-Aug-09	10:56	On Effort	30.232822	-80.582348	5	<i>C. caretta</i>	1
5-Aug-09	11:09	On Effort	30.232308	-80.100197	5	<i>C. caretta</i>	4
5-Aug-09	11:36	On Effort	30.299509	-80.446844	6	<i>C. caretta</i>	1
5-Aug-09	11:41	On Effort	30.300757	-80.636146	6	<i>C. caretta</i>	2
5-Aug-09	13:27	On Effort	30.365963	-80.508112	7	<i>C. caretta</i>	1

6-Aug-09	8:58	On Effort	29.962288	-80.569651	1	<i>C. caretta</i>	1
6-Aug-09	9:02	On Effort	29.965529	-80.419336	1	Uniden. turtle	1
6-Aug-09	9:58	On Effort	30.031892	-80.472325	2	<i>C. caretta</i>	1
6-Aug-09	10:01	On Effort	30.031778	-80.567179	2	Uniden. turtle	1
6-Aug-09	10:01	On Effort	30.029295	-80.602454	2	Uniden. turtle	1
6-Aug-09	10:11	On Effort	30.103335	-80.469843	3	<i>C. caretta</i>	1
6-Aug-09	10:13	On Effort	30.101228	-80.385927	3	<i>C. caretta</i>	1
6-Aug-09	10:13	On Effort	30.102396	-80.391621	3	Uniden. turtle	1
6-Aug-09	11:07	On Effort	30.164081	-80.348063	4	<i>C. caretta</i>	1
6-Aug-09	11:08	On Effort	30.162811	-80.369395	4	<i>C. caretta</i>	1
6-Aug-09	11:11	On Effort	30.163070	-80.492969	4	<i>C. caretta</i>	2
6-Aug-09	11:13	On Effort	30.170337	-80.604644	4	<i>C. caretta</i>	1
6-Aug-09	11:13	On Effort	30.171472	-80.578094	4	Uniden. turtle	1
6-Aug-09	11:25	On Effort	30.494894	-80.675080	9	<i>C. caretta</i>	1
6-Aug-09	11:26	On Effort	30.496165	-80.628339	9	Uniden. turtle	1
6-Aug-09	11:26	On Effort	30.496919	-80.667802	9	Uniden. turtle	1
6-Aug-09	11:26	On Effort	30.497821	-80.633398	9	Uniden. turtle	1
6-Aug-09	11:30	On Effort	30.501326	-80.510776	9	<i>C. caretta</i>	1
6-Aug-09	11:30	On Effort	30.503659	-80.474301	9	Uniden. turtle	1
6-Aug-09	11:35	On Effort	30.502688	-80.292746	9	Uniden. turtle	1
6-Aug-09	12:28	On Effort	30.565246	-80.502121	10	<i>C. caretta</i>	2
6-Aug-09	12:29	On Effort	30.564465	-80.537486	10	Uniden. turtle	1
6-Aug-09	12:30	On Effort	30.565472	-80.582332	10	<i>C. caretta</i>	3
6-Aug-09	12:30	On Effort	30.565444	-80.582338	10	<i>C. caretta</i>	1
6-Aug-09	12:31	On Effort	30.566159	-80.606290	10	<i>C. caretta</i>	2
6-Aug-09	12:32	On Effort	30.567010	-80.635041	10	<i>C. caretta</i>	1

Table 4. Effort for vessel surveys in the JAX USWTR site during August 2009.

Date	Line	Sea State	Kilometers Surveyed
14-Aug-09	6	2-4	61.9
16-Aug-09	8	2-3	85.3
18-Aug-09	5	3	34.4
19-Aug-09	7	1-3	81.5

Table 5. Cetacean and sea turtle sightings during vessel surveys in the JAX USWTR site during August 2009.

Date	Time	On/Off Effort	Latitude	Longitude	Line	Species	Group Size
16-Aug-09	9:58	Off effort	30.422987	-80.705815	8	<i>L. kempii</i>	1
16-Aug-09	10:08	On effort	30.425092	-80.699873	8	<i>S. frontalis</i>	5
16-Aug-09	10:31	On effort	30.427164	-80.634801	8	<i>D. coriacea</i>	1
16-Aug-09	10:54	On effort	30.427785	-80.563746	8	<i>C. caretta</i>	1
16-Aug-09	11:47	On effort	30.430309	-80.404033	8	<i>C. caretta</i>	1
18-Aug-09	11:23	On effort	30.285429	-80.348503	5	<i>C. caretta</i>	1
18-Aug-09	12:14	On effort	30.287930	-80.486021	5	<i>C. caretta</i>	1

<b>18-Aug-09</b>	12:15	On effort	30.288535	-80.488625	5	<i>C. caretta</i>	1
<b>18-Aug-09</b>	12:23	On effort	30.287994	-80.492955	5	<i>S. frontalis</i>	3
<b>18-Aug-09</b>	13:26	On effort	30.242230	-80.658233	5	<i>S. frontalis</i>	6
<b>19-Aug-09</b>	16:29	On effort	30.369685	-80.406607	7	<i>S. frontalis</i>	4
<b>19-Aug-09</b>	17:23	On effort	30.359725	-80.589176	7	<i>T. truncatus</i>	4

Approximately 80 hours of actual in field time was conducted in August 2009.

No injuries occurred during the reporting period.



## **Monitoring of Protected Species in the Proposed Onslow Bay and Jacksonville USWTRs**

Progress Report: August 24 through September 23, 2009

### **Planning (for Task 1, 2 & 3)**

Co-PIs Johnston and McLellan and the JAX USWTR team, at the request of the Navy, planned a series of surveys to coincide with military exercises in the JAX USWTR study region during the week of September 14, 2009. This included coordinating with Navy personnel by phone and email to obtain event codes for each survey operation that would occur during the period. Event codes were provided by Ron Filipowicz (U.S. Fleet Forces Command) for aerial surveys during September 14-16 and 18, as well as for vessel surveys on September 17.

### **Purchasing (Task 1)**

During this reporting period we purchased supplies to redeploy HARPs in the Onslow Bay and JAX USWTR study regions. A satellite phone for JAX (waited to purchase current model) and added minutes were purchased for Onslow. Monthly observer station bills were paid.

### **Travel (Task 1 & 3)**

Co-PI David Johnston and post-doctoral fellow Melissa Soldevilla traveled to Fernandina Beach during Sept 14-17 to recover and redeploy 2 HARPs in the JAX USWTR Study region. Co-PI Johnston returned to Fernandina Beach during September 22-24 to redeploy the remaining JAX HARP. Ryan McAlarney and Erin Walters of the Onslow Bay USWTR team traveled to Fernandina Beach on September 17<sup>th</sup> 2009 to conduct aerial surveys on September 18<sup>th</sup> 2009. This movement of personnel was helpful given the late night return scheduled for vessel survey team on September 17<sup>th</sup>.

### **JAX Survey activity (Task 2)**

#### Aerial Surveys

Three full sets (30 track lines) of tracklines were flown during September (Table 1). The survey plane, N1275M, arrived midday on 14 September and four tracklines were flown that afternoon. A full set of ten tracklines was flown on 15 September and six lines were flown 16 September. Another full set of lines were flown on 18 September. Weather conditions for the surveys were good with the exception of 14 September when conditions were fair. There were a total of 39 encounters with cetaceans during aerial survey effort. Species encountered during aerial surveys were *Stenella frontalis* (20 sightings), *Tursiops truncatus* (10 sightings), *Grampus griseus* (3 sightings), *Steno bredanensis* (1 sighting), and 5 sightings of unidentified delphinids (Table 2). September aerial surveys also yielded high numbers of sea turtle sightings (Table 3). *Caretta caretta* and *Dermochelys coriacea* were the most observed. In addition several unidentified sea turtles were observed and recorded. As in previous months, sea turtles were encountered predominantly in relatively shallow shelf waters on the nearshore

end of the track lines. Refer to Figure 1 for the location of cetacean sightings during aerial survey effort and Figure 2 for locations of sea turtle sightings.

### Vessel Surveys

One full track line (9) was surveyed on 17 September. On 20 September tracklines 1 and 2 were attempted; however, due to rain and increasing sea state only about 32 and 33 kilometers respectively were surveyed on the inshore portion of each line. A vessel survey was attempted on 9 September but was called off after engine trouble forced a return to the dock. Another survey was attempted the following day but increasing winds and sea state caused the vessel to turn back after about a two hour transit offshore. The *R/V Volute* (formerly *R/V 2 Angels*) was used for all survey effort (Table 4). There were five cetacean sightings and eight sea turtle sightings during vessel survey effort (Table 5). Cetacean sightings include *S. frontalis*, *G. griseus*, as well as two brief encounters with unidentified delphinids. Sea turtle sightings included seven *C. caretta* and one *D. coriacea* (Table 5). Cetacean and sea turtle sighting locations are plotted on Figure 3.

On 13 September two members of the Jacksonville USWTR team conducted off effort visual surveys from the *R/V Stellwagen* during the deployment of nine pop-up buoys on the JAX USWTR site. Visual surveys commenced at 7:30 and ended off of the study area at 19:30. Observation occurred primarily from the top of the wheelhouse except for brief periods inside the wheelhouse due to passing rain squalls. There were five cetacean sightings and no sea turtle sightings during the survey. Cetaceans seen were *S. frontalis*, *T. truncatus*, and one encounter with unidentified delphinids (Appendix 1).

### Towed Passive Acoustics

On 17 and 20 September 2009 the towed acoustic array was deployed from the *R/V Volute*. On 17 September the array was deployed without dedicated acoustic monitoring. During periods of visual encounters with marine mammals the acoustic system was set to record mode for the entire duration of the encounter. Twenty-five minutes of recordings were acquired encompassing two sighting events, *S. frontalis* and *G. griseus*. On 20 September the array was deployed for a total of 4 hours and 36 minutes. This includes a 25 minute period where visual observation was not possible due to poor survey conditions. A total of 58 minutes of recordings were collected which included three sightings, *S. frontalis* and two unidentified delphinids.

### **JAX HARPs (Task 3)**

Both HARPs deployed in the JAX USWTR study area were retrieved during September 15 and 16 from the *R/V Stellwagen*. Both recovered HARPs had full hard disks and appeared to have finished recording sometime on September 10<sup>th</sup>. One HARP was redeployed at the offshore location during this time (Figure 4). One of the recovered HARP units suffered a failure in a memory board sometime during the deployment. The data from this unit are being assessed by

Scripps scientists to determine if any data were lost. Because of this equipment failure, the second unit was not redeployed during September 15-16, but instead will be redeployed September 23 with a new memory board at the inshore location (Figure 4).

## **Onslow Bay Survey activity (Task 5)**

### Aerial Surveys

A single set of tracklines was completed on September 12<sup>th</sup> 2009 during a period of low Beaufort Sea State resulting in good survey conditions for most of the survey period (Table 6). A total of nine cetacean sightings were made consisting of five groups of *S. frontalis*, three sightings of *T. truncatus* and one group of animals where clear photographs could not be collected and are listed as unidentified delphinids (Figure 5, Table 7). Other sightings included 11 sea turtles, seven of which were identified as *C. caretta* (Figure 5, Table 8). The Onslow Bay USWTR team also assisted in aerial surveys in Jacksonville, FL flying six lines on September 18<sup>th</sup> 2009.

### Vessel Surveys

Two track lines were completed on September 15<sup>th</sup> and September 16<sup>th</sup> 2009 on the *R/V Sensation* – a 53' sport fishing vessel (Table 9). Cetacean encounters consisted of four groups of *T. truncatus*. Additionally, two *C. caretta* were sighted (Table 10). The locations of cetaceans and turtles sighted during vessel surveys are presented in Figure 6.

### Towed Passive Acoustics

The towed acoustic array was deployed from the *F/V Sensation* on the 15<sup>th</sup> of September 2009 for 5.0 hours of simultaneous visual and acoustic survey. During that time, a total of 1.9 hours of acoustic recordings were taken. Two visual sightings occurred during the acquisition of acoustic data; both were identified as *T. truncatus*. Numerous vocalizations including clicks, burst-pulses, and whistles were recorded. Two other acoustic detections were made that day without visual observation to confirm the species.

## **Onslow Bay HARPs (Task 6)**

The HARP deployed in the Onslow Bay USWTR study area was retrieved on September 16<sup>th</sup> from the *R/V Cape Fear*. The recovered HARP had full hard disks and appeared to have finished recording on August 9<sup>th</sup>. Upon retrieval, damage was done to the hydrophone and so it was immediately shipped back to Scripps for repair. After doing a quick check of the data, it appears that the low frequency component of the hydrophone went bad sometime while writing to Disk 6, as a 2 kHz continuous tone was produced in all of the data from that point forward. Fortunately, we will be able to filter out this noise and still look for vocalizing odontocetes in the recorded data. As we are expecting our 2<sup>nd</sup> HARP for the Onslow Bay USWTR study area to be shipped sometime during the last two weeks of September, and since we also are waiting for a new CPU board (an upgraded one that will allow us to record for 6 months on a different duty cycle)

and a repaired hydrophone for our HARP we have currently, we plan on deploying both units at the same time in early October 2009.

### **Exercise Monitoring (Task 7)**

A set of 9 pop-up acoustic recorders were deployed by Cornell University scientists for exercise monitoring purposes in the JAX USWTR study area during September 11-13, 2009 from the *R/V Stellwagen* (Figure 7). All 9 units were dropped without incident and they are slated for retrieval around the 6th of October. The array of 9 instruments was deployed to provide greatest coverage in the southern portion of the JAX USWTR box (Figure 7). Three pop-up units have enhanced sampling rate capabilities (32kHz) to record higher frequencies, two of which were deployed in the outer regions of the pop-up array in the JAX USWTR box (Figure 7). The last high frequency unit was deployed centrally in the pop-up array (Figure 7).

Table 1. Aerial survey effort for the JAX USWTR study region during Aug 24-Sept 23, 2009.

Date	Line	Sea State	Kilometers Flown	Hobbs Hours
14-Sep-09	10	3 to 4	86.1	3.2
14-Sep-09	9	3 to 4	85.7	
14-Sep-09	8	2 to 4	85.5	
14-Sep-09	7	2 to 4	86.2	
15-Sep-09	1	2 to 3	86.4	8
15-Sep-09	2	2 to 3	85.5	
15-Sep-09	3	1 to 3	84.8	
15-Sep-09	4	2	83.3	
15-Sep-09	5	2 to 3	85.7	
15-Sep-09	6	1 to 2	86.2	
15-Sep-09	7	1 to 2	87.7	
15-Sep-09	8	1 to 2	85.4	
15-Sep-09	9	1 to 2	85.4	
15-Sep-09	10	1 to 2	83.6	
16-Sep-09	1	1	87.0	6.4
16-Sep-09	2	1	89.2	
16-Sep-09	3	1	85.3	
16-Sep-09	4	1	83.3	
16-Sep-09	5	1 to 3	83.0	
16-Sep-09	6	1 to 2	84.4	
18-Sep-09	10	2 to 3	85.5	8.1
18-Sep-09	9	2 to 3	85.8	
18-Sep-09	8	2 to 3	84.5	
18-Sep-09	7	2 to 3	86.4	
18-Sep-09	6	2 to 3	87.0	
18-Sep-09	5	2	85.8	
18-Sep-09	4	2	84.6	
18-Sep-09	3	1 to 2	86.5	
18-Sep-09	2	1 to 2	85.3	
18-Sep-09	1	1 to 2	85.4	

Table 2. Cetacean sightings during aerial surveys in the JAX USWTR study region during Aug 24-Sept 23, 2009.

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Group Size
14-Sep-09	12:51	On effort	30.502628	80.365528	9	<i>S. frontalis</i>	9
14-Sep-09	13:46	On effort	30.370925	-80.071616	7	Unidentified delphinids	4
15-Sep-09	9:57	On effort	29.962785	-79.982730	1	<i>T. truncatus</i>	3
15-Sep-09	10:40	On effort	30.028446	-80.584039	2	Unidentified delphinids	7
15-Sep-09	10:57	On effort	30.102567	-80.662731	3	<i>S. bredanensis</i>	50
15-Sep-09	11:56	On effort	30.155112	-80.468606	4	<i>S. frontalis</i>	45
15-Sep-09	12:27	On effort	30.235518	-80.357595	5	<i>S. frontalis</i>	36
15-Sep-09	13:13	On effort	30.302087	-80.586596	6	<i>S. frontalis</i>	10
15-Sep-09	15:21	On effort	30.358729	-80.501714	7	<i>S. frontalis</i>	6
15-Sep-09	16:17	On effort	30.429269	-80.558831	8	<i>T. truncatus</i>	2
15-Sep-09	16:32	On effort	30.492564	-80.550183	9	<i>T. truncatus</i>	8
15-Sep-09	17:12	On effort	30.571831	-80.067951	10	<i>G. griseus</i>	36
16-Sep-09	10:22	On effort	29.954849	-80.593794	1	<i>T. truncatus</i>	9
16-Sep-09	10:37	On effort	29.972613	-80.436649	1	<i>S. frontalis</i>	25
16-Sep-09	11:26	On effort	30.036121	-80.595111	2	<i>S. frontalis</i>	12
16-Sep-09	11:40	On effort	30.098577	-80.630170	3	<i>S. frontalis</i>	37
16-Sep-09	11:51	On effort	30.097543	-80.397718	3	<i>T. truncatus</i>	10
16-Sep-09	12:05	On effort	30.109295	-80.326179	3	<i>T. truncatus</i>	4
16-Sep-09	12:52	On effort	30.164620	-80.426851	4	<i>S. frontalis</i>	12
16-Sep-09	12:56	On effort	30.149300	-80.473643	4	<i>T. truncatus</i>	6
16-Sep-09	13:12	On effort	30.174440	-80.501961	4	<i>S. frontalis</i>	7
16-Sep-09	13:26	On effort	30.170953	-80.685147	4	<i>S. frontalis</i>	16
16-Sep-09	14:59	On effort	30.234286	-80.638299	5	Unidentified delphinids	11
16-Sep-09	15:18	On effort	30.223357	-80.357840	5	<i>S. frontalis</i>	23
16-Sep-09	15:42	On effort	30.303848	-79.787409	6	<i>G. griseus</i>	4
16-Sep-09	16:07	On effort	30.298897	-80.554275	6	<i>S. frontalis</i>	36
18-Sep-09	8:56	On effort	30.564918	-80.519261	10	<i>S. frontalis</i>	17
18-Sep-09	9:10	On effort	30.571772	-80.382930	10	<i>S. frontalis</i>	24
18-Sep-09	9:51	On effort	30.500495	-80.387744	9	<i>S. frontalis</i>	12
18-Sep-09	10:22	On effort	30.441061	-80.427384	8	<i>S. frontalis</i>	50
18-Sep-09	11:20	On effort	30.291406	-80.650391	6	Unidentified delphinids	2
18-Sep-09	12:19	On effort	30.238101	-80.415326	5	<i>T. truncatus</i>	16
18-Sep-09	14:33	On effort	30.160878	-80.563221	4	<i>S. frontalis</i>	5
18-Sep-09	14:38	On effort	30.168336	-80.505832	4	<i>T. truncatus</i>	5
18-Sep-09	15:29	On effort	30.100683	-80.694371	3	<i>S. frontalis</i>	7
18-Sep-09	15:41	On effort	30.032023	-80.699443	2	<i>T. truncatus</i>	15
18-Sep-09	15:52	On effort	30.039557	-80.636833	2	<i>T. truncatus</i>	4
18-Sep-09	16:10	On effort	30.026112	-80.183865	2	<i>G. griseus</i>	5
18-Sep-09	16:51	On effort	29.962245	-80.672895	1	Unidentified delphinids	5

Table 3. Sea turtle sightings during aerial surveys in the JAX USWTR study region during Aug 24-Sept 23, 2009.

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Group Size
14-Sep-09	12:16	On effort	30.565153	-80.070534	10	<i>C. caretta</i>	1
14-Sep-09	14:16	On effort	30.365129	-80.600418	7	TURT	1
15-Sep-09	9:38	On effort	29.966616	-80.608965	1	<i>C. caretta</i>	1
15-Sep-09	9:38	On effort	29.966575	-80.612117	1	<i>C. caretta</i>	1
15-Sep-09	9:40	On effort	29.966192	-80.518688	1	<i>C. caretta</i>	1
15-Sep-09	10:29	On effort	30.033682	-80.363872	2	<i>C. caretta</i>	1
15-Sep-09	10:35	On effort	30.031333	-80.555969	2	<i>C. caretta</i>	1
15-Sep-09	11:13	On effort	30.101363	-80.512162	3	<i>C. caretta</i>	1
15-Sep-09	11:14	On effort	30.105616	-80.473886	3	TURT	1
15-Sep-09	11:18	On effort	30.104384	-80.337510	3	TURT	1
15-Sep-09	11:24	On effort	30.102473	-80.141565	3	<i>D. coriacea</i>	1
15-Sep-09	11:54	On effort	30.162316	-80.437389	4	<i>C. caretta</i>	1
15-Sep-09	12:16	On effort	30.232158	-80.649082	5	<i>C. caretta</i>	1
15-Sep-09	12:20	On effort	30.233227	-80.522698	5	<i>C. caretta</i>	1
15-Sep-09	12:24	On effort	30.231676	-80.388550	5	<i>C. caretta</i>	1
15-Sep-09	12:24	On effort	30.231731	-80.386280	5	<i>C. caretta</i>	1
15-Sep-09	12:25	On effort	30.232784	-80.363975	5	<i>C. caretta</i>	1
15-Sep-09	13:07	On effort	30.300245	-80.436785	6	<i>C. caretta</i>	2
15-Sep-09	15:18	On effort	30.365265	-80.567799	7	<i>C. caretta</i>	1
15-Sep-09	15:18	On effort	30.365213	-80.565675	7	<i>C. caretta</i>	1
15-Sep-09	15:19	On effort	30.365253	-80.547139	7	<i>D. coriacea</i>	1
15-Sep-09	15:31	On effort	30.365664	-80.459110	7	TURT	1
15-Sep-09	15:32	On effort	30.365124	-80.418794	7	<i>C. caretta</i>	1
15-Sep-09	15:32	On effort	30.364638	-80.394295	7	<i>C. caretta</i>	1
15-Sep-09	15:32	On effort	30.364985	-80.411069	7	<i>C. caretta</i>	1
15-Sep-09	15:35	On effort	30.364647	-80.307711	7	<i>D. coriacea</i>	1
15-Sep-09	15:40	On effort	30.362933	-80.223799	7	<i>D. coriacea</i>	1
15-Sep-09	15:43	On effort	30.366484	-80.114936	7	<i>D. coriacea</i>	1
15-Sep-09	16:07	On effort	30.431987	-80.319924	8	<i>D. coriacea</i>	1
15-Sep-09	16:10	On effort	30.433524	-80.427422	8	<i>D. coriacea</i>	1
15-Sep-09	16:10	On effort	30.433175	-80.401972	8	TURT	1
15-Sep-09	16:29	On effort	30.496631	-80.605218	9	<i>C. caretta</i>	1
15-Sep-09	16:41	On effort	30.501491	-80.458835	9	<i>C. caretta</i>	1
15-Sep-09	16:44	On effort	30.501598	-80.331004	9	<i>D. coriacea</i>	1
15-Sep-09	16:53	On effort	30.499167	-80.131070	9	<i>D. coriacea</i>	1
15-Sep-09	17:10	On effort	30.570570	-80.041129	10	<i>D. coriacea</i>	1
15-Sep-09	17:25	On effort	30.566566	-80.132323	10	TURT	1
15-Sep-09	17:32	On effort	30.551724	-80.335036	10	TURT	1
15-Sep-09	17:40	On effort	30.547411	-80.633760	10	<i>C. caretta</i>	1
15-Sep-09	17:41	On effort	30.547037	-80.677651	10	TURT	1
16-Sep-09	10:18	On effort	29.962952	-80.679307	1	<i>C. caretta</i>	1
16-Sep-09	10:19	On effort	29.963136	-80.640004	1	<i>C. caretta</i>	1
16-Sep-09	10:32	On effort	29.964361	-80.527422	1	<i>C. caretta</i>	1
16-Sep-09	10:33	On effort	29.963691	-80.482406	1	<i>C. caretta</i>	3
16-Sep-09	10:34	On effort	29.963633	-80.442474	1	<i>C. caretta</i>	1
16-Sep-09	10:35	On effort	29.964026	-80.427463	1	<i>D. coriacea</i>	1

16-Sep-09	10:42	On effort	29.965542	-80.386811	1	<i>C. caretta</i>	4
16-Sep-09	10:43	On effort	29.965225	-80.349425	1	<i>C. caretta</i>	1
16-Sep-09	10:45	On effort	29.964320	-80.274704	1	<i>C. caretta</i>	1
16-Sep-09	10:47	On effort	29.966112	-80.189186	1	<i>D. coriacea</i>	1
16-Sep-09	11:16	On effort	30.033119	-80.293579	2	<i>C. caretta</i>	1
16-Sep-09	11:18	On effort	30.033457	-80.352897	2	<i>C. caretta</i>	2
16-Sep-09	11:19	On effort	30.032924	-80.396245	2	<i>C. caretta</i>	1
16-Sep-09	11:19	On effort	30.032525	-80.403183	2	<i>D. coriacea</i>	1
16-Sep-09	11:20	On effort	30.032091	-80.424508	2	<i>C. caretta</i>	1
16-Sep-09	11:20	On effort	30.031687	-80.436201	2	<i>C. caretta</i>	3
16-Sep-09	11:21	On effort	30.031317	-80.452960	2	<i>C. caretta</i>	1
16-Sep-09	11:22	On effort	30.030559	-80.494821	2	<i>D. coriacea</i>	1
16-Sep-09	11:23	On effort	30.030109	-80.526666	2	<i>C. caretta</i>	1
16-Sep-09	11:24	On effort	30.031128	-80.575448	2	<i>C. caretta</i>	1
16-Sep-09	11:24	On effort	30.031034	-80.566742	2	<i>C. caretta</i>	1
16-Sep-09	11:25	On effort	30.031977	-80.595213	2	<i>D. coriacea</i>	1
16-Sep-09	11:32	On effort	30.033978	-80.627837	2	<i>C. caretta</i>	1
16-Sep-09	11:34	On effort	30.029878	-80.702953	2	<i>C. caretta</i>	1
16-Sep-09	11:39	On effort	30.098525	-80.629402	3	<i>C. caretta</i>	1
16-Sep-09	11:49	On effort	30.100532	-80.442080	3	<i>C. caretta</i>	1
16-Sep-09	11:50	On effort	30.100228	-80.409473	3	<i>C. caretta</i>	1
16-Sep-09	12:31	On effort	30.100315	-79.800106	3	<i>C. caretta</i>	1
16-Sep-09	12:49	On effort	30.168093	-80.357524	4	<i>C. caretta</i>	1
16-Sep-09	12:51	On effort	30.165650	-80.433371	4	<i>C. caretta</i>	1
16-Sep-09	12:55	On effort	30.162456	-80.458258	4	<i>C. caretta</i>	3
16-Sep-09	15:09	On effort	30.234530	-80.529314	5	<i>C. caretta</i>	3
16-Sep-09	15:09	On effort	30.234497	-80.529988	5	<i>C. caretta</i>	1
16-Sep-09	15:10	On effort	30.237682	-80.470385	5	<i>C. caretta</i>	3
16-Sep-09	15:10	On effort	30.236559	-80.490840	5	<i>C. caretta</i>	2
16-Sep-09	15:11	On effort	30.236684	-80.438196	5	<i>C. caretta</i>	2
16-Sep-09	15:11	On effort	30.237844	-80.457926	5	<i>C. caretta</i>	3
16-Sep-09	15:17	On effort	30.233124	-80.355071	5	<i>C. caretta</i>	2
16-Sep-09	15:17	On effort	30.233735	-80.371003	5	<i>C. caretta</i>	2
16-Sep-09	15:26	On effort	30.231630	-80.244055	5	<i>C. caretta</i>	1
16-Sep-09	15:33	On effort	30.231419	-79.996132	5	<i>D. coriacea</i>	1
16-Sep-09	16:03	On effort	30.296087	-80.461053	6	<i>C. caretta</i>	2
16-Sep-09	16:03	On effort	30.296061	-80.461976	6	<i>D. coriacea</i>	1
16-Sep-09	16:06	On effort	30.300613	-80.565902	6	<i>D. coriacea</i>	1
16-Sep-09	16:14	On effort	30.296617	-80.649919	6	<i>C. caretta</i>	1
16-Sep-09	16:14	On effort	30.299006	-80.619675	6	TURT	1
18-Sep-09	8:51	On effort	30.561739	-80.661433	10	<i>C. caretta</i>	1
18-Sep-09	9:43	On effort	30.501625	-80.113564	9	TURT	1
18-Sep-09	10:04	On effort	30.499988	-80.464967	9	<i>C. caretta</i>	1
18-Sep-09	10:10	On effort	30.496916	-80.695673	9	TURT	1
18-Sep-09	10:14	On effort	30.434453	-80.661408	8	<i>D. coriacea</i>	1
18-Sep-09	10:15	On effort	30.431682	-80.608594	8	<i>C. caretta</i>	1
18-Sep-09	10:16	On effort	30.430317	-80.584241	8	<i>D. coriacea</i>	1



18-Sep-09	10:18	On effort	30.437069	-80.533298	8	<i>C. caretta</i>	1
18-Sep-09	10:20	On effort	30.43425	-80.460581	8	<i>C. caretta</i>	1
18-Sep-09	10:33	On effort	30.433431	-80.318742	8	<i>C. caretta</i>	1
18-Sep-09	10:33	On effort	30.433761	-80.342940	8	TURT	1
18-Sep-09	10:38	On effort	30.432652	-80.158687	8	<i>C. caretta</i>	1
18-Sep-09	10:39	On effort	30.432713	-80.128712	8	<i>D. coriacea</i>	1
18-Sep-09	11:07	On effort	30.364844	-80.42939	7	<i>C. caretta</i>	1
18-Sep-09	11:09	On effort	30.366865	-80.511661	7	<i>C. caretta</i>	1
18-Sep-09	11:13	On effort	30.366308	-80.651260	7	TURT	1
18-Sep-09	11:15	On effort	30.365529	-80.703672	7	<i>C. caretta</i>	1
18-Sep-09	11:38	On effort	30.297314	-80.608639	6	<i>C. caretta</i>	1
18-Sep-09	11:40	On effort	30.298683	-80.533877	6	<i>C. caretta</i>	1
18-Sep-09	11:41	On effort	30.300876	-80.486997	6	TURT	1
18-Sep-09	11:43	On effort	30.300722	-80.430700	6	<i>C. caretta</i>	1
18-Sep-09	11:45	On effort	30.299695	-80.340926	6	<i>C. caretta</i>	1
18-Sep-09	12:13	On effort	30.23175	-80.209874	5	<i>D. coriacea</i>	1
18-Sep-09	12:14	On effort	30.231522	-80.281195	5	<i>C. caretta</i>	1
18-Sep-09	12:17	On effort	30.232775	-80.379031	5	<i>C. caretta</i>	1
18-Sep-09	12:36	On effort	30.234353	-80.519232	5	<i>C. caretta</i>	1
18-Sep-09	14:26	On effort	30.165496	-80.683391	4	<i>C. caretta</i>	1
18-Sep-09	14:27	On effort	30.164268	-80.639883	4	<i>C. caretta</i>	1
18-Sep-09	14:27	On effort	30.164437	-80.658348	4	<i>C. caretta</i>	2
18-Sep-09	14:28	On effort	30.163966	-80.626539	4	TURT	2
18-Sep-09	14:29	On effort	30.162705	-80.591365	4	<i>C. caretta</i>	2
18-Sep-09	14:29	On effort	30.162814	-80.596902	4	<i>C. caretta</i>	1
18-Sep-09	14:36	On effort	30.166013	-80.532243	4	<i>C. caretta</i>	2
18-Sep-09	14:37	On effort	30.165299	-80.524536	4	<i>C. caretta</i>	2
18-Sep-09	14:42	On effort	30.167596	-80.431073	4	<i>C. caretta</i>	5
18-Sep-09	14:42	On effort	30.167280	-80.424156	4	<i>C. caretta</i>	3
18-Sep-09	14:44	On effort	30.164391	-80.358584	4	<i>C. caretta</i>	1
18-Sep-09	14:44	On effort	30.164822	-80.363408	4	<i>D. coriacea</i>	1
18-Sep-09	14:45	On effort	30.166106	-80.330274	4	<i>C. caretta</i>	2
18-Sep-09	14:45	On effort	30.166101	-80.329726	4	TURT	1
18-Sep-09	15:20	On effort	30.101937	-80.460164	3	TURT	1
18-Sep-09	15:21	On effort	30.101097	-80.502033	3	TURT	1
18-Sep-09	15:21	On effort	30.102618	-80.529827	3	TURT	1
18-Sep-09	15:22	On effort	30.101020	-80.546629	3	<i>C. caretta</i>	1
18-Sep-09	15:22	On effort	30.100280	-80.569734	3	<i>C. caretta</i>	1
18-Sep-09	15:24	On effort	30.097174	-80.610830	3	<i>C. caretta</i>	1
18-Sep-09	15:25	On effort	30.098737	-80.649298	3	<i>C. caretta</i>	1
18-Sep-09	15:46	On effort	30.032513	-80.645667	2	TURT	1
18-Sep-09	15:57	On effort	30.029878	-80.576983	2	<i>C. caretta</i>	1
18-Sep-09	15:58	On effort	30.029101	-80.558675	2	TURT	1
18-Sep-09	15:59	On effort	30.030705	-80.501454	2	<i>D. coriacea</i>	1
18-Sep-09	16:02	On effort	30.035378	-80.394552	2	<i>C. caretta</i>	1
18-Sep-09	16:04	On effort	30.034808	-80.346286	2	<i>C. caretta</i>	1
18-Sep-09	16:40	On effort	29.964603	-80.366836	1	<i>D. coriacea</i>	1

18-Sep-09	16:41	On effort	29.964455	-80.388545	1	<i>C. caretta</i>	1
18-Sep-09	16:42	On effort	29.963596	-80.428651	1	<i>C. caretta</i>	1
18-Sep-09	16:42	On effort	29.964730	-80.454091	1	TURT	1
18-Sep-09	16:44	On effort	29.964234	-80.527287	1	<i>C. caretta</i>	1
18-Sep-09	16:45	On effort	29.963995	-80.566872	1	TURT	1
18-Sep-09	16:46	On effort	29.960694	-80.608005	1	<i>C. caretta</i>	1
18-Sep-09	16:46	On effort	29.962595	-80.590207	1	<i>C. caretta</i>	1
18-Sep-09	16:47	On effort	29.960179	-80.624267	1	<i>C. caretta</i>	1
18-Sep-09	16:48	On effort	29.961944	-80.678821	1	TURT	2

Table 4. Effort for vessel surveys in the JAX USWTR study region during Aug 24-Sept 23, 2009.

Date	Line	Sea State	Kilometers surveyed
17-Sep-09	9	2 to 3	80.4
20-Sep-09	2	2 to 3	33.3
20-Sep-09	1	2 to 3	32.4

Table 5. Cetacean and sea turtle sightings during vessel surveys in the JAX USWTR site during Aug 24-Sept 23, 2009.

Date	Time	On/Off Effort	Latitude	Longitude	Line	Species	Group Size
17-Sep-09	10:44	On effort	30.506465	-80.607440	9	<i>S. frontalis</i>	2
17-Sep-09	12:44	On effort	30.506844	-80.237128	9	<i>C. caretta</i>	1
17-Sep-09	12:53	On effort	30.505059	-80.210338	9	<i>C. caretta</i>	1
17-Sep-09	13:10	On effort	30.506082	-80.157305	9	<i>D. coriacea</i>	1
17-Sep-09	14:03	On effort	30.506904	-80.012645	9	<i>G. griseus</i>	35
20-Sep-09	11:41	On effort	30.015321	-80.598513	2	<i>S. frontalis</i>	4
20-Sep-09	11:43	Off effort	30.016014	-80.594325	2	<i>C. caretta</i>	1
20-Sep-09	11:56	On effort	30.017311	-80.552788	2	Unidentified delphinids	1
20-Sep-09	12:07	On effort	30.017009	-80.522811	2	<i>C. caretta</i>	1
20-Sep-09	12:10	Off effort	30.018587	-80.513920	2	<i>C. caretta</i>	1
20-Sep-09	13:05	On effort	30.021941	-80.364973	2	<i>C. caretta</i>	1
20-Sep-09	15:10	On effort	29.967412	-80.586441	1	Unidentified delphinids	2
20-Sep-09	15:40	On effort	29.968891	-80.678701	1	<i>C. caretta</i>	1

Table 6. Aerial survey effort for the Onslow Bay USWTR study region during Aug 24-Sept 23, 2009.

Date	Line	Sea State	Kilometers Flown	Hobbs Hours
12-Sep-09	1	2 to 3	70.2	7.3
12-Sep-09	2	2 to 3	72.7	
12-Sep-09	3	2 to 3	74.3	
12-Sep-09	4	2 to 3	74.8	
12-Sep-09	5	2 to 3	74.5	
12-Sep-09	6	2	73.1	
12-Sep-09	10	2	72.5	
12-Sep-09	9	2	73.0	
12-Sep-09	8	2	68.2	
12-Sep-09	7	2	74.7	

Table 7. Cetacean sightings during aerial surveys in the Onslow Bay USWTR study region during Aug 24-Sept 23, 2009.

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Group Size
12-Sep-09	9:08	On	33.494854	-76.785000	1	Unidentified delphinids	3
12-Sep-09	9:51	On	33.811053	-77.063150	2	<i>S. frontalis</i>	7
12-Sep-09	10:50	On	33.943367	-76.958318	4	<i>S. frontalis</i>	12
12-Sep-09	11:29	On	33.681102	-76.350511	6	<i>T. truncatus</i>	1
12-Sep-09	11:36	On	33.705709	-76.415980	6	<i>T. truncatus</i>	3
12-Sep-09	14:08	On	34.173510	-76.478967	10	<i>S. frontalis</i>	14
12-Sep-09	15:03	On	34.164627	-76.722763	8	<i>S. frontalis</i>	4
12-Sep-09	15:14	On	34.110018	-76.648676	8	<i>S. frontalis</i>	4
12-Sep-09	15:35	On	33.788579	-76.219790	8	<i>T. truncatus</i>	19

Table 8. Sea turtle sightings during aerial surveys in the Onslow Bay USWTR study region during Aug 24-Sept 23, 2009.

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Group Size
12-Sep-09	8:47	On	33.742486	-77.106245	1	<i>C. caretta</i>	1
12-Sep-09	10:02	On	33.859967	-77.118067	2	<i>C. caretta</i>	1
12-Sep-09	10:15	On	33.698725	-76.779526	3	<i>C. caretta</i>	1
12-Sep-09	11:01	On	33.994148	-76.908442	5	<i>C. caretta</i>	1
12-Sep-09	11:48	On	33.877798	-76.623473	6	TURT	1
12-Sep-09	11:52	On	33.973903	-76.750209	6	TURT	1
12-Sep-09	14:01	On	34.265715	-76.593059	10	TURT	1
12-Sep-09	14:50	On	34.061652	-76.474511	9	TURT	1
12-Sep-09	14:54	On	34.139652	-76.576097	9	<i>C. caretta</i>	1
12-Sep-09	15:11	On	34.122552	-76.674267	8	<i>C. caretta</i>	1
12-Sep-09	15:32	On	33.811576	-76.267942	8	<i>C. caretta</i>	1

Table 9. Effort for vessel surveys in the Onslow Bay USWTR study region during Aug 24-Sept 23, 2009.

Date	Line	Sea State	Kilometers Surveyed
15-Sep-09	8	0 to 3	64.4
16-Sep-09	6	2 to 3	62.8

Table 10. Cetacean and sea turtle sightings during vessel surveys in the Onslow Bay USWTR study region during Aug 24-Sept 23, 2009.

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Group Size
15-Sep-09	10:17	On	33.80749	-76.26993	8	<i>T. truncatus</i>	5
15-Sep-09	10:43	Off	33.81972	-76.28296	8	<i>T. truncatus</i>	9
15-Sep-09	13:25	Off	34.06463	-76.60540	8	<i>C. caretta</i>	1
15-Sep-09	14:04	Off	34.12994	-76.68276	8	<i>C. caretta</i>	1
16-Sep-09	10:26	On	33.71166	-76.40773	6	<i>T. truncatus</i>	15
16-Sep-09	11:04	Off	33.74195	-76.44634	6	<i>T. truncatus</i>	9

Figure 1. The locations of cetaceans sighted during aerial surveys of the JAX USWTR study region during Aug 24-Sept 23, 2009.

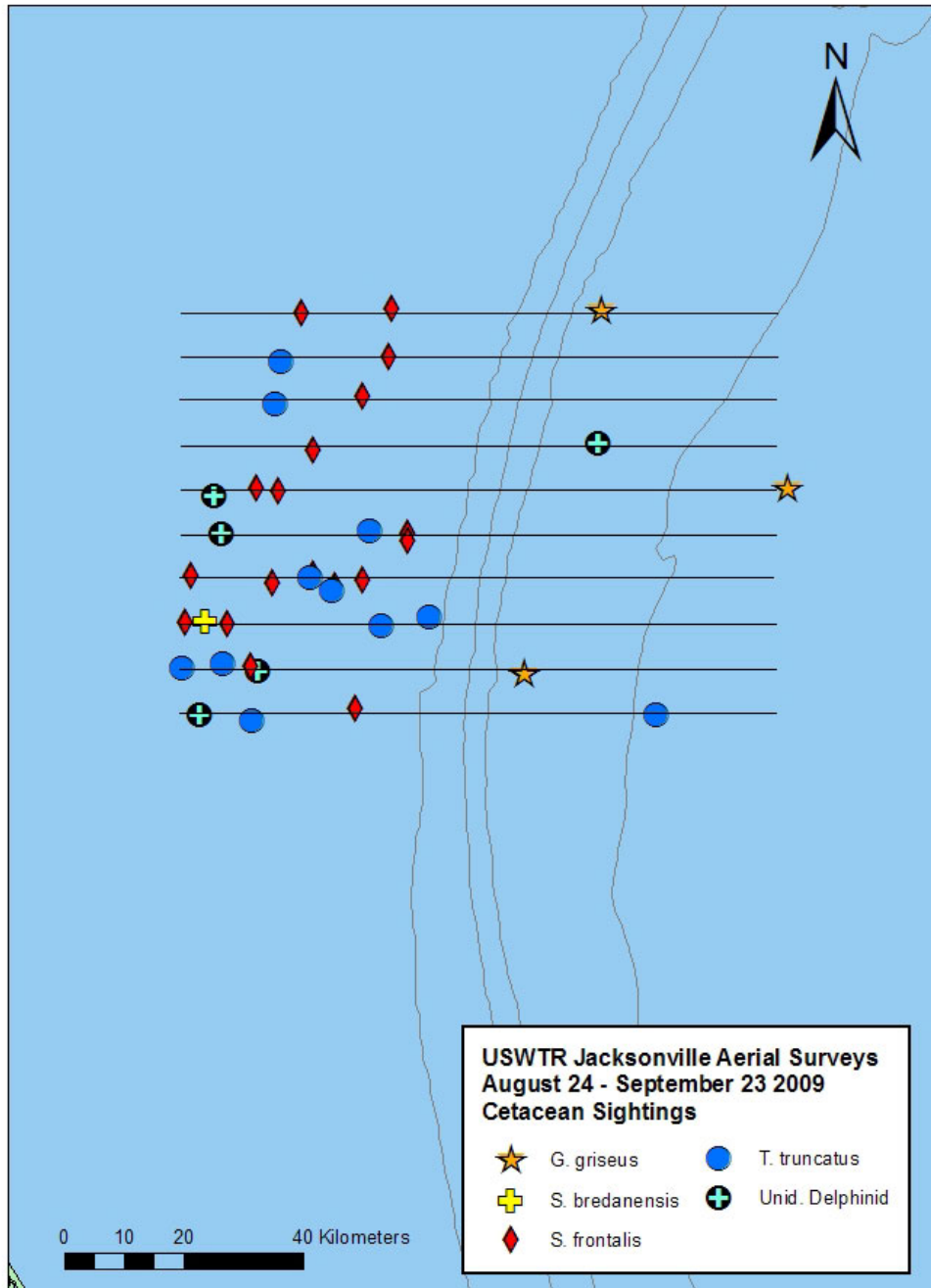


Figure 2. The locations of sea turtles sighted during aerial surveys of the JAX USWTR study region during Aug 24-Sept 23, 2009.

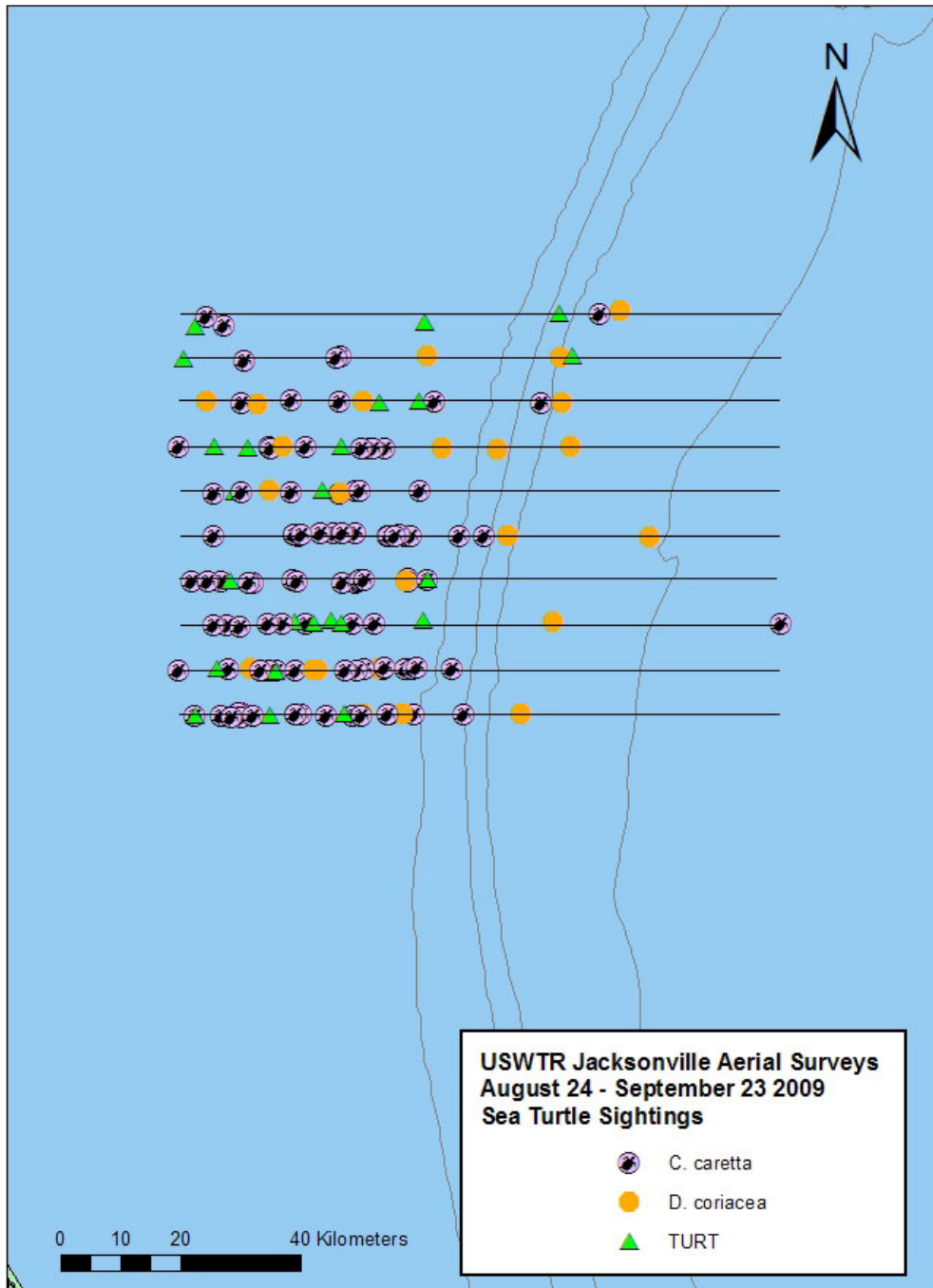


Figure 3. The locations of cetaceans and turtles sighted during vessel surveys of the JAX USWTR study region during Aug 24-Sept 23, 2009.

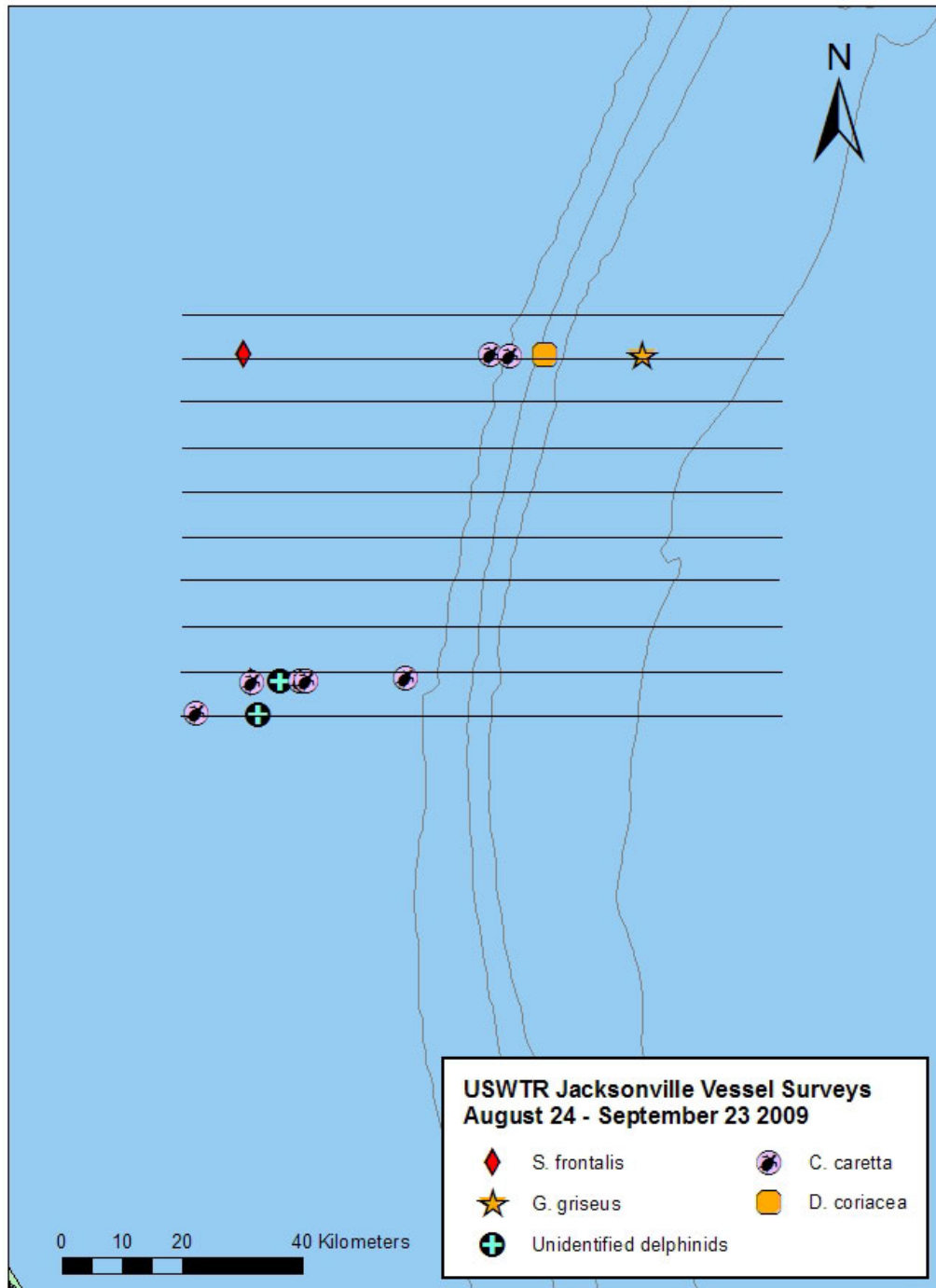


Figure 4. Location of HARP redeployments in JAX USWTR study region during Aug 24-Sept 23, 2009.

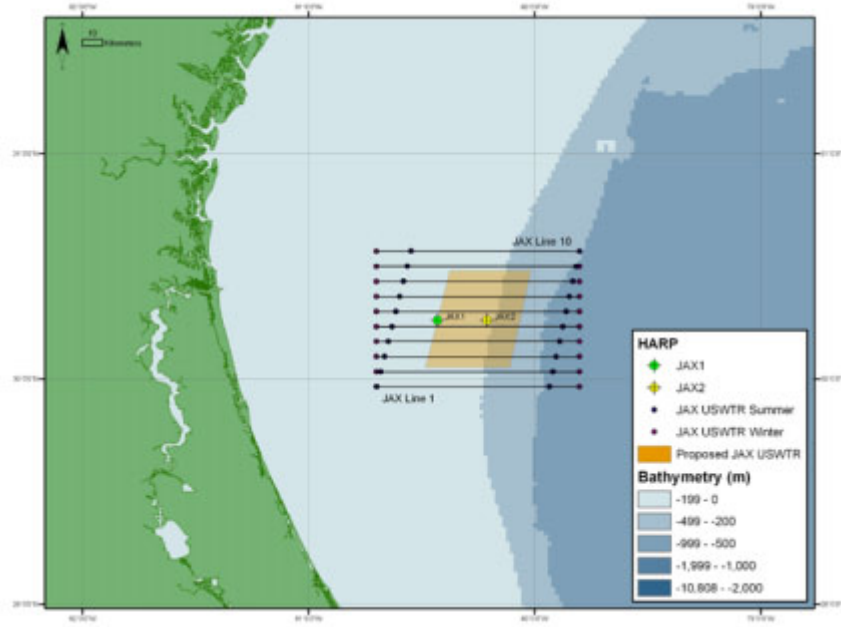


Figure 5. The locations of cetaceans and turtles sighted during aerial surveys of the Onslow USWTR study region during Aug 24-Sept 23, 2009.

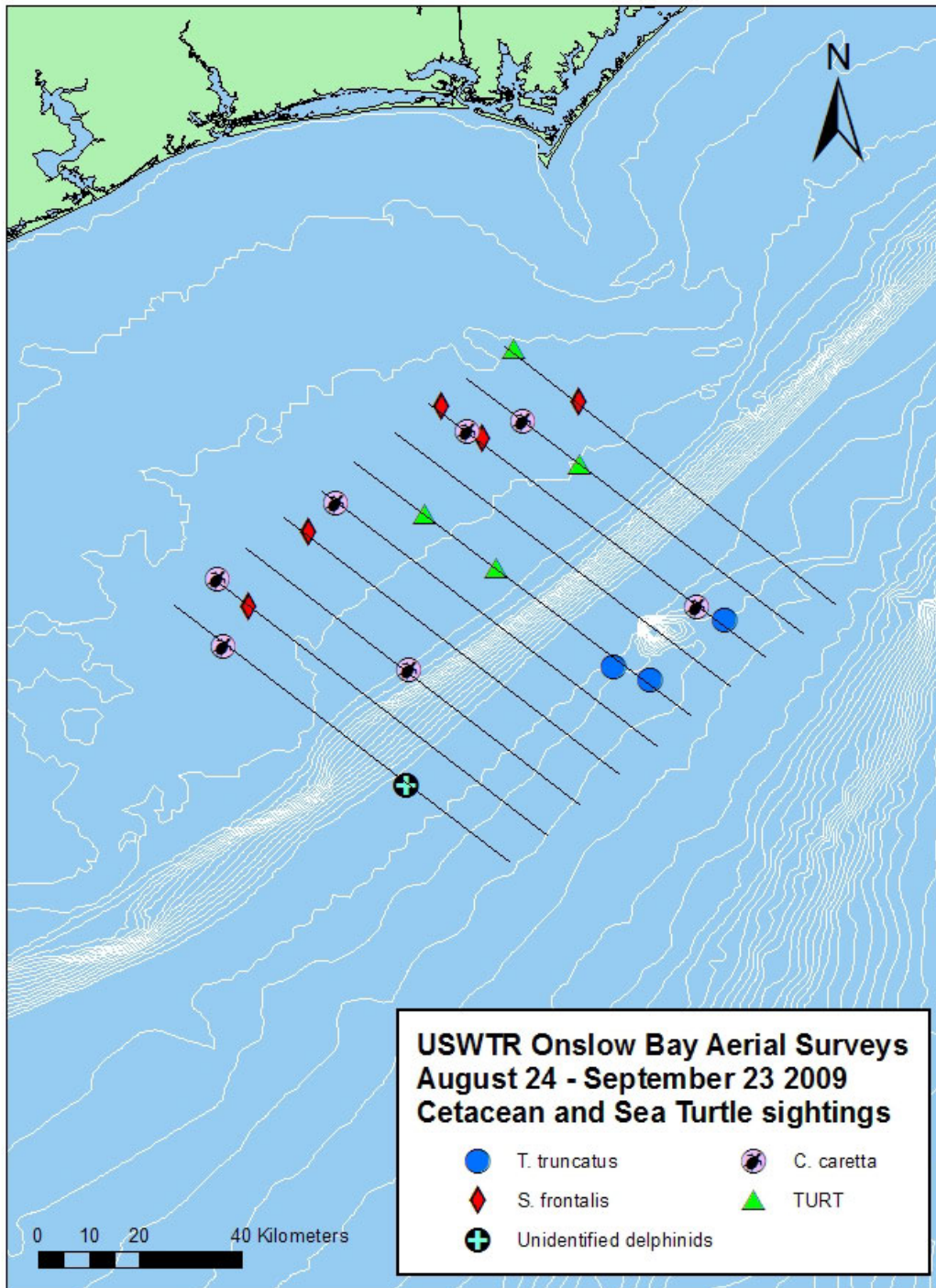




Figure 6. The locations of cetaceans and turtles sighted during vessel surveys of the Onslow Bay USWTR study region during Aug 24-Sept 23, 2009.

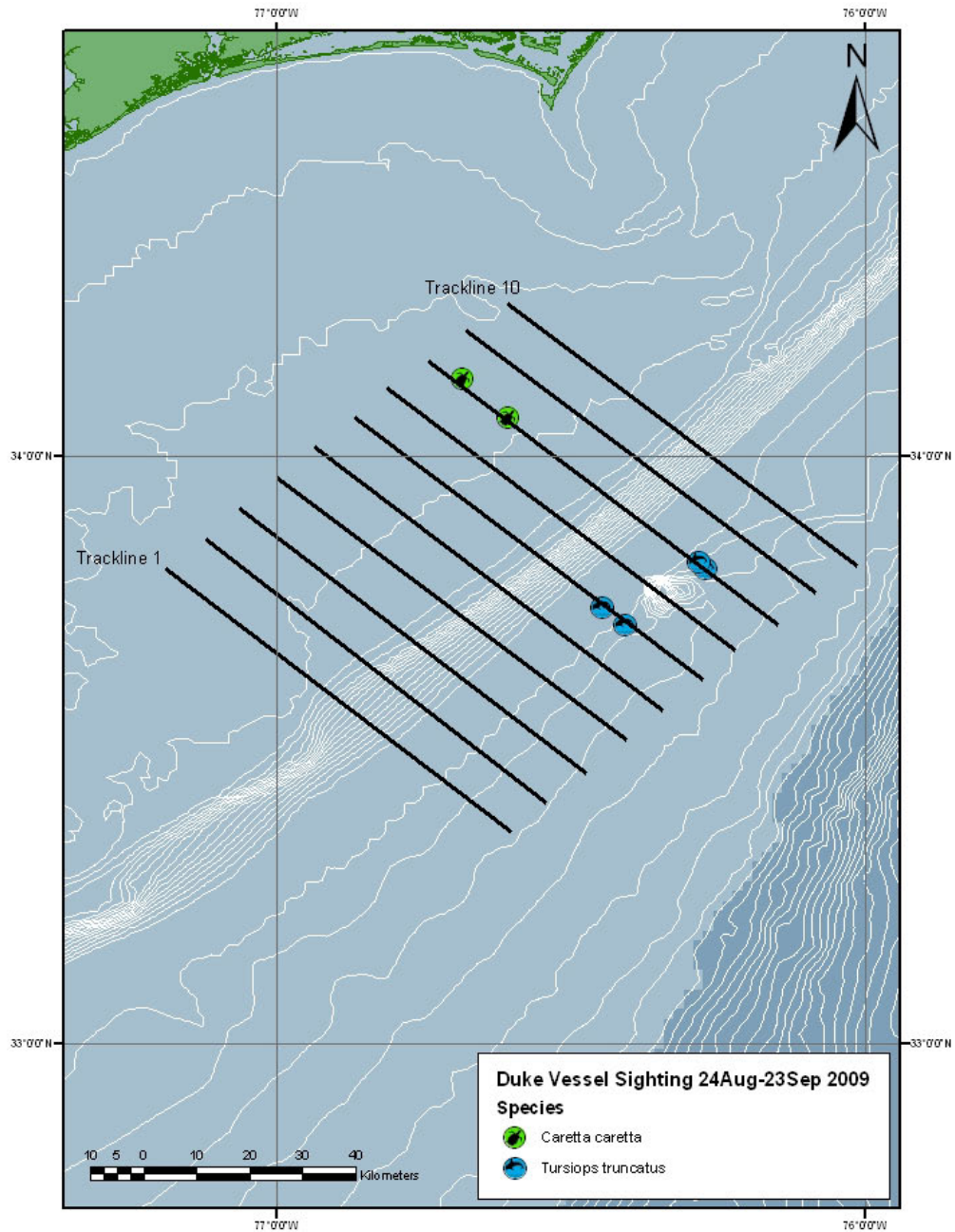
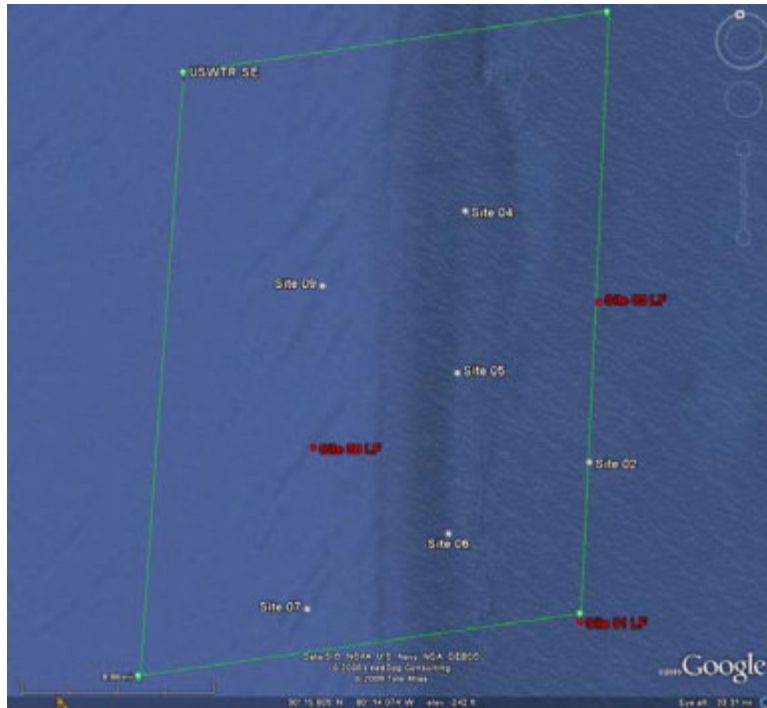


Figure 7. Locations of pop-up acoustic recorders deployed during exercise monitoring in the JAX USWTR study region during Aug 24-Sept 23, 2009.



Appendix 1. Pop-up deployment on *R/V Stellwagen* off effort sightings on September 13, 2009.

<b>Date</b>	<b>Time</b>	<b>On/Off Effort</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Line</b>	<b>Species</b>	<b>Group Size</b>
<b>13-Sep-09</b>	9:21	Off Effort	30.280952	80.056225	N/A	<i>T. truncatus</i>	4
<b>13-Sep-09</b>	15:47	Off Effort	30.326319	80.304850	N/A	<i>S. frontalis</i>	3
<b>13-Sep-09</b>	17:11	Off Effort	30.405833	80.510833	N/A	Unidentified delphinids	2
<b>13-Sep-09</b>	17:26	Off Effort	30.413401	80.532626	N/A	<i>S. frontalis</i>	3
<b>13-Sep-09</b>	19:04	Off Effort	30.498930	80.778985	N/A	<i>S. frontalis</i>	10

## **Monitoring of Protected Species in the Proposed Onslow Bay and Jacksonville USWTRs**

Progress Report: September 24 through October 23, 2009

### **Planning (Task 1, 2 & 3)**

Project Co-PI Johnston and postdoctoral fellow Soldevilla began planning the recovery and redeployment of both JAX HARPs for early January. This includes refining the protocol used for a single recovery and redeployment cruise, and establishing methods to address the significant biofouling that occurs at this location.

### **Purchasing (Task 1)**

The final pieces of JAX oceanographic survey equipment were purchased and installed during this reporting period. Funding for aerial survey vendor has been extended through Feb 2010. JAX housing and utilities were paid for this month.

### **Travel (Task 1 & 3)**

Peter Nilsson and Ryan McAlarney had support for travel to the Marine Mammal Society meetings in Quebec City, Canada and presented results of the aerial and vessel surveys conducted in Onslow Bay from June 2007 through March 2009.

### **JAX Survey activity (Task 2)**

#### Aerial Surveys

Aerial surveys were conducted on 30 September and 1 October, with all ten tracklines attempted each day. Weather conditions during survey effort were fair to good (Table 1). Due to aircraft carrier flight exercises in the survey area, four lines were truncated to avoid interference. There were 11 cetacean encounters each day for a total of 22 sightings. *Stenella frontalis* was observed 17 times, *Grampus griseus* two times, *Tursiops truncatus* twice, along with a pod of unidentified delphinids (Table 2; Figure 1). Sea turtles were plentiful on the USWTR range during this survey period. *Caretta caretta* was the most prevalent species, accounting for 79 of the 97 sightings. *Dermodochelys coriacea* was spotted on 13 instances, as well as five turtles that could not be identified definitively (Table 3; Figure 2).

#### Vessel Surveys

Vessel surveys were conducted on 26 September, 4 October, and 6 October onboard the *R/V Volute*. Tracklines 4 and 3 were surveyed for the entire length of the line with good weather conditions; trackline 1 was cut short by approximately 22 kilometers due to concerns over deteriorating weather conditions (Table 4). There were ten encounters with delphinids during vessel surveys while on effort, along with nine sightings of turtles (Table 5; Figure 3). Four of the delphinid sightings were of *T. truncatus* and three were of *S. frontalis*. The remaining sightings were delphinids that could not be identified. Nine *C. caretta* were seen during survey effort for this reporting period. Cetacean and marine turtle sightings are illustrated in Figure 3. On 26 September, following the conclusion of a west to east survey of trackline 4, two separate pods of *Globicephala macrorhynchus* were observed during the transit back to shore. This is a new species to the

Jacksonville USWTR site. These animals were photographed extensively, both for species and individual identification.

#### Towed Passive Acoustics

On 4 and 6 October 2009 the towed acoustic array was deployed from the *R/V Volute* during visual survey effort. There were 24 acoustic files recorded on 4 October totaling 114 minutes. These recordings encompass five visual sighting events, including *T. truncatus*, *S. frontalis*, and three sightings of unidentified delphinids. Twenty acoustic files were obtained on 6 October totaling 71 minutes of recordings. These recording spanned three visual sighting events including two sightings of *T. truncatus* and one sighting of *S. frontalis*. Vessel surveys were conducted on 26 September; however, no acoustic survey was conducted due to technical problems with the generator powering the system.

#### **JAX HARPs (Task 3)**

Both JAX HARPs are deployed and recording data.

#### **Onslow Bay Survey activity (Task 5)**

##### Aerial Surveys

A total of four survey days were flown in the Onslow Bay USWTR range during the September 24 to October 23 reporting period (Table 6). On September 30<sup>th</sup> six lines were flown under fair survey conditions and resulted in one on effort *T. truncatus* sighting and 3 sea turtle sightings. On October 1<sup>st</sup> a full set of 10 tracklines were flown in good survey conditions, which resulted in 11 cetacean sightings (6 *T. truncatus* and 5 *S. frontalis*) and 12 turtle sightings including two leatherbacks (*D. coriacea*). An additional 6 tracklines were flown on October 2<sup>nd</sup> under similar survey conditions, which resulted in one on effort sighting of *T. truncatus*, and four sea turtles (including another leatherback). In addition, two off effort sightings were made of *T. truncatus* between the offshore ends of tracklines 3 and 4. For our final survey day on October 21<sup>st</sup> we began our survey effort on the offshore end of our trackline 10. This allowed us to conduct an off effort transit survey both to and from the range covering the west side of Cape Lookout Shoals. During the morning transit survey we encountered a group of pilot whales *G. macrorhynchus* and a sperm whale *P. macrocephalus* just north of the offshore end of trackline 10. Beginning and final location were obtained as well as photographs for the pilot whale sighting. The sperm whale's initial location was taken after the animal dove and was not resighted. These sightings, while off effort, represent the first visual detection of a sperm whale near the Onslow Bay USWTR range and first time pilot whales were detected outside of the summer months. The remaining 4 tracklines were conducted which resulting in 5 on effort cetacean sightings (4 *T. truncatus* and 1 *S. frontalis*) and 17 sea turtle sightings. The locations of sightings from aerial surveys are presented in Tables 7 and 8 and Figure 4. A total of 20 tracklines were flown in this reporting period fulfilling the contract requirements.

### Vessel Surveys

Three track lines were surveyed on September 24<sup>th</sup>, October 1<sup>st</sup>, October 22<sup>nd</sup> 2009 on the *R/V Sensation*, a 53' sport fishing vessel (Table 9). Cetacean encounters consisted of six groups of bottlenose dolphins (*Tursiops truncatus*), three groups of spotted dolphins (*Stenella frontalis*), and one group which was either bottlenose or spotted dolphins (could not be identified to species; Table 10). Five loggerhead sea turtles (*Caretta caretta*) also were sighted (Table 10). The locations of cetaceans and sea turtles sighted during vessel surveys are presented in Figure 5.

### Towed Passive Acoustics

The towed acoustic array was deployed from the *F/V Sensation* on the 24<sup>th</sup> of September, 2009, for 4.5 hours of simultaneous visual and acoustic survey. During that time, a total of 2.6 hours of acoustic recordings were taken. One visual sighting occurred during the acquisition of acoustic data; the group was identified as *Tursiops truncatus*. Numerous vocalizations including clicks and whistles were recorded. Three other acoustic detections were made that day without visual observation to confirm the species. The towed array also was deployed from the *F/V Sensation* on the 22<sup>nd</sup> of October, 2009, for 4.6 hours of simultaneous visual and acoustic survey. During that time, a total of 1.3 hours of acoustic recordings were taken. Four visual sightings (one off-effort, three on-effort) occurred during the acquisition of acoustic data; two groups were identified as *Tursiops truncatus* and two groups were not identified. Numerous vocalizations including clicks, burst-pulses, and whistles were recorded.

### **Onslow Bay HARPs (Task 6)**

On 7 October, we received the repaired hydrophone from our 1<sup>st</sup> HARP. We also received the 2<sup>nd</sup> HARP for Onslow Bay. We successfully performed the week-long test recommended by Scripps to ensure the new instrument would write to multiple disks. We are now waiting on a new CPU board for the 1<sup>st</sup> HARP so that it can remain in the field for longer durations. Once this new board arrives, we will deploy both HARPs as soon as the weather is favorable.

### **Exercise Monitoring (Task 7)**

All nine Cornell pop-up buoys were recovered on October 8, 2009 using the *R/V Volute*.

Table 1. Aerial survey effort table for the JAX USWTR study region during Sept 24-Oct 23 2009

Date	Line	Sea State	Kilometers Flown	Hobbs Hours
30-Sep-09	1	2 to 3	62.9	7.3
30-Sep-09	2	2 to 3	81.9	
30-Sep-09	3	2 to 3	81.3	
30-Sep-09	4	2 to 3	82.6	
30-Sep-09	5	2 to 3	84.9	
30-Sep-09	6	2 to 3	88.0	
30-Sep-09	7	2 to 3	86.0	
30-Sep-09	8	2 to 3	62.1	
30-Sep-09	10	2 to 3	85.1	
30-Sep-09	9	2 to 3	48.7	
1-Oct-09	10	2 to 4	52.1	
1-Oct-09	9	1 to 3	84.1	
1-Oct-09	8	1 to 3	82.6	
1-Oct-09	7	1 to 2	85.8	
1-Oct-09	6	1 to 2	84.9	
1-Oct-09	5	1	87.2	
1-Oct-09	4	1 to 2	85.6	
1-Oct-09	3	1 to 3	86.2	
1-Oct-09	2	1 to 3	86.6	
1-Oct-09	1	1 to 3	86.5	

Table 2. Cetacean sightings during aerial surveys in the JAX USWTR study region during Sept 24-Oct 23 2009.

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Group Size
30-Sep-09	9:12	On effort	29.960539	-80.492943	1	<i>S. frontalis</i>	5
30-Sep-09	10:00	On effort	30.034495	-80.412547	2	<i>S. frontalis</i>	10
30-Sep-09	10:19	On effort	30.109130	-80.676868	3	<i>S. frontalis</i>	12
30-Sep-09	10:33	On effort	30.095493	-80.448507	3	<i>S. frontalis</i>	5
30-Sep-09	10:40	On effort	30.089326	-80.407715	3	<i>S. frontalis</i>	24
30-Sep-09	11:06	On effort	30.169024	-80.034752	4	Unid. Del.	5
30-Sep-09	11:27	On effort	30.163869	-80.607505	4	<i>S. frontalis</i>	4
30-Sep-09	11:36	On effort	30.162798	-80.684799	4	<i>S. frontalis</i>	5
30-Sep-09	11:48	On effort	30.240264	-80.626807	5	<i>S. frontalis</i>	9
30-Sep-09	14:55	On effort	30.443106	-80.010302	8	<i>G. griseus</i>	28
30-Sep-09	15:36	On effort	30.568879	-80.340131	10	<i>S. frontalis</i>	9
1-Oct-09	9:35	On effort	30.499122	-80.404954	9	<i>S. frontalis</i>	4
1-Oct-09	9:58	On effort	30.441838	-80.454912	8	<i>S. frontalis</i>	25
1-Oct-09	10:08	On effort	30.429398	-80.324880	8	<i>S. frontalis</i>	6
1-Oct-09	10:18	On effort	30.424412	-80.257176	8	<i>S. frontalis</i>	12
1-Oct-09	11:09	On effort	30.295678	-80.592304	6	<i>S. frontalis</i>	6
1-Oct-09	11:48	On effort	30.237722	-80.092674	5	<i>G. griseus</i>	4
1-Oct-09	12:08	On effort	30.234899	-80.674308	5	<i>S. frontalis</i>	9
1-Oct-09	13:56	On effort	30.152214	-80.695794	4	<i>S. frontalis</i>	6
1-Oct-09	14:04	On effort	30.163510	-80.562485	4	<i>T. truncatus</i>	10
1-Oct-09	14:34	On effort	30.169987	-79.828164	4	<i>T. truncatus</i>	40
1-Oct-09	15:13	On effort	30.110079	-80.682445	3	<i>S. frontalis</i>	4



Table 3. Sea turtle sightings during aerial surveys in the JAX USWTR study region during Sept 24-Oct 23 2009.

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Group Size
30-Sep-09	9:06	On effort	29.966193	-80.637225	1	<i>C. caretta</i>	1
30-Sep-09	9:21	On effort	29.963353	-80.462160	1	<i>C. caretta</i>	1
30-Sep-09	9:22	On effort	29.966223	-80.423800	1	<i>C. caretta</i>	1
30-Sep-09	9:23	On effort	29.964584	-80.374881	1	<i>C. caretta</i>	1
30-Sep-09	9:24	On effort	29.961044	-80.334684	1	<i>C. caretta</i>	1
30-Sep-09	10:14	On effort	30.032227	-80.658381	2	Unid. turtle	1
30-Sep-09	10:26	On effort	30.098697	-80.639585	3	<i>C. caretta</i>	1
30-Sep-09	10:27	On effort	30.099154	-80.616774	3	<i>C. caretta</i>	1
30-Sep-09	10:28	On effort	30.099107	-80.567206	3	Unid. turtle	1
30-Sep-09	10:30	On effort	30.100864	-80.510610	3	<i>C. caretta</i>	1
30-Sep-09	10:31	On effort	30.101734	-80.460286	3	Unid. turtle	1
30-Sep-09	10:43	On effort	30.097530	-80.324259	3	<i>C. caretta</i>	2
30-Sep-09	11:15	On effort	30.168170	-80.239718	4	Unid. turtle	1
30-Sep-09	11:16	On effort	30.167334	-80.266921	4	<i>C. caretta</i>	1
30-Sep-09	11:19	On effort	30.168613	-80.378134	4	<i>C. caretta</i>	1
30-Sep-09	11:20	On effort	30.168124	-80.428213	4	<i>C. caretta</i>	1
30-Sep-09	11:20	On effort	30.168394	-80.420473	4	<i>C. caretta</i>	1
30-Sep-09	11:20	On effort	30.167662	-80.439326	4	<i>C. caretta</i>	1
30-Sep-09	11:21	On effort	30.166365	-80.466601	4	<i>C. caretta</i>	1
30-Sep-09	11:46	On effort	30.231798	-80.681592	5	<i>D. coriacea</i>	1
30-Sep-09	11:54	On effort	30.229693	-80.555072	5	<i>C. caretta</i>	2
30-Sep-09	11:54	On effort	30.229963	-80.522791	5	<i>C. caretta</i>	2
30-Sep-09	11:54	On effort	30.229693	-80.530337	5	Unid. turtle	1
30-Sep-09	12:34	On effort	30.299750	-80.489402	6	<i>C. caretta</i>	1
30-Sep-09	12:37	On effort	30.299627	-80.583138	6	<i>C. caretta</i>	1
30-Sep-09	12:38	On effort	30.299259	-80.638597	6	<i>C. caretta</i>	1
30-Sep-09	14:24	On effort	30.365876	-80.608795	7	<i>C. caretta</i>	1
30-Sep-09	15:25	On effort	30.567214	-80.685050	10	<i>C. caretta</i>	1
30-Sep-09	15:27	On effort	30.566844	-80.615918	10	<i>C. caretta</i>	1
30-Sep-09	15:29	On effort	30.564384	-80.559871	10	<i>C. caretta</i>	1
30-Sep-09	15:30	On effort	30.563252	-80.522808	10	<i>C. caretta</i>	1
30-Sep-09	15:40	On effort	30.570568	-80.279988	10	<i>C. caretta</i>	1
1-Oct-09	8:56	On effort	30.566280	-80.412261	10	<i>C. caretta</i>	1
1-Oct-09	8:59	On effort	30.566459	-80.315808	10	<i>C. caretta</i>	1
1-Oct-09	9:18	On effort	30.501690	-80.036327	9	<i>C. caretta</i>	1
1-Oct-09	9:21	On effort	30.498908	-80.147221	9	<i>C. caretta</i>	1
1-Oct-09	9:25	On effort	30.501110	-80.293383	9	<i>C. caretta</i>	2
1-Oct-09	9:26	On effort	30.500256	-80.324201	9	<i>C. caretta</i>	1
1-Oct-09	9:28	On effort	30.498443	-80.389524	9	<i>C. caretta</i>	1

1-Oct-09	9:51	On effort	30.433829	-80.626541	8	<i>C. caretta</i>	1
1-Oct-09	10:03	On effort	30.433167	-80.407868	8	<i>C. caretta</i>	1
1-Oct-09	10:51	On effort	30.365082	-80.310985	7	<i>C. caretta</i>	1
1-Oct-09	10:51	On effort	30.365015	-80.320297	7	<i>C. caretta</i>	2
1-Oct-09	10:56	On effort	30.366736	-80.494618	7	<i>C. caretta</i>	1
1-Oct-09	10:57	On effort	30.367452	-80.556508	7	<i>C. caretta</i>	1
1-Oct-09	10:58	On effort	30.367006	-80.561171	7	<i>C. caretta</i>	1
1-Oct-09	10:58	On effort	30.363842	-80.597710	7	<i>D. coriacea</i>	1
1-Oct-09	11:00	On effort	30.360800	-80.648262	7	<i>D. coriacea</i>	1
1-Oct-09	11:17	On effort	30.296286	-80.512807	6	<i>C. caretta</i>	1
1-Oct-09	11:21	On effort	30.297207	-80.357373	6	<i>C. caretta</i>	1
1-Oct-09	11:22	On effort	30.297206	-80.340285	6	<i>C. caretta</i>	1
1-Oct-09	11:44	On effort	30.233482	-80.020490	5	<i>C. caretta</i>	1
1-Oct-09	11:58	On effort	30.231068	-80.377144	5	<i>C. caretta</i>	1
1-Oct-09	12:01	On effort	30.234393	-80.492413	5	<i>C. caretta</i>	1
1-Oct-09	12:04	On effort	30.232671	-80.590933	5	<i>C. caretta</i>	1
1-Oct-09	12:05	On effort	30.232120	-80.629150	5	<i>C. caretta</i>	1
1-Oct-09	12:05	On effort	30.232097	-80.651418	5	<i>C. caretta</i>	2
1-Oct-09	12:05	On effort	30.232225	-80.619627	5	<i>D. coriacea</i>	1
1-Oct-09	12:12	On effort	30.234498	-80.693697	5	<i>D. coriacea</i>	1
1-Oct-09	14:01	On effort	30.165305	-80.590182	4	<i>C. caretta</i>	2
1-Oct-09	14:10	On effort	30.165406	-80.535760	4	<i>C. caretta</i>	1
1-Oct-09	14:11	On effort	30.166143	-80.513385	4	<i>C. caretta</i>	1
1-Oct-09	14:11	On effort	30.166431	-80.495764	4	<i>C. caretta</i>	1
1-Oct-09	14:13	On effort	30.166979	-80.446214	4	<i>D. coriacea</i>	1
1-Oct-09	14:16	On effort	30.162858	-80.399396	4	<i>C. caretta</i>	2
1-Oct-09	14:58	On effort	30.100513	-80.283820	3	<i>C. caretta</i>	1
1-Oct-09	15:04	On effort	30.101708	-80.482805	3	<i>C. caretta</i>	1
1-Oct-09	15:04	On effort	30.101724	-80.481887	3	<i>C. caretta</i>	1
1-Oct-09	15:05	On effort	30.101996	-80.502765	3	<i>C. caretta</i>	1
1-Oct-09	15:06	On effort	30.102238	-80.553790	3	<i>C. caretta</i>	1
1-Oct-09	15:08	On effort	30.101718	-80.615030	3	<i>D. coriacea</i>	1
1-Oct-09	15:09	On effort	30.101755	-80.635778	3	<i>C. caretta</i>	2
1-Oct-09	15:20	On effort	30.031617	-80.664644	2	<i>C. caretta</i>	4
1-Oct-09	15:20	On effort	30.031704	-80.650425	2	<i>D. coriacea</i>	1
1-Oct-09	15:21	On effort	30.031577	-80.617114	2	<i>D. coriacea</i>	1
1-Oct-09	15:22	On effort	30.029015	-80.561634	2	<i>D. coriacea</i>	1
1-Oct-09	15:23	On effort	30.028819	-80.539874	2	<i>C. caretta</i>	1
1-Oct-09	15:26	On effort	30.031049	-80.432883	2	<i>D. coriacea</i>	1
1-Oct-09	15:28	On effort	30.031237	-80.374363	2	<i>D. coriacea</i>	1
1-Oct-09	15:30	On effort	30.032029	-80.280653	2	<i>C. caretta</i>	1
1-Oct-09	15:33	On effort	30.031802	-80.192395	2	<i>C. caretta</i>	1
1-Oct-09	16:05	On effort	29.966803	-80.486004	1	<i>C. caretta</i>	1
1-Oct-09	16:06	On effort	29.967737	-80.528164	1	<i>C. caretta</i>	1

1-Oct-09	16:08	On effort	29.964699	-80.609571	1	<i>C. caretta</i>	1
1-Oct-09	16:09	On effort	29.963225	-80.651804	1	<i>D. coriacea</i>	1

Table 4. Effort table for vessel surveys in the JAX USWTR study region during Sept 24-Oct 23 2009.

Date	Line	Sea State	Kilometers Surveyed
26-Sep-09	4	1 to 2	81.27
4-Oct-09	3	1 to 2	81.23
6-Oct-09	1	2	59.09

Table 5. Cetacean and sea turtle sightings during vessel surveys in the JAX USWTR site during Sept 24-Oct 23 2009.

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Group Size
26-Sep-09	10:39	On effort	30.1617	-80.6161	4	<i>S. frontalis</i>	6
26-Sep-09	12:31	On effort	30.1604	-80.3184	4	<i>T. truncatus</i>	20
26-Sep-09	15:24	Off effort	30.1821	-79.9550	N/A	<i>G. macrorhynchus</i>	35
26-Sep-09	16:06	Off effort	30.2083	-80.0240	N/A	<i>G. macrorhynchus</i>	50
04-Oct-09	14:43	On effort	30.0989	-80.0296	3	<i>T. truncatus</i>	9
04-Oct-09	16:23	On effort	30.0992	-80.3258	3	<i>S. frontalis</i>	3
04-Oct-09	16:40	On effort	30.1014	-80.3508	3	Unid. delphinid	2
04-Oct-09	16:50	On effort	30.1013	-80.3734	3	Unid. delphinid	1
04-Oct-09	17:18	On effort	30.1048	-80.4644	3	<i>C. caretta</i>	1
04-Oct-09	17:32	On effort	30.1040	-80.5146	3	<i>C. caretta</i>	1
04-Oct-09	17:46	On effort	30.1020	-80.5615	3	<i>C. caretta</i>	1
04-Oct-09	17:55	On effort	30.1011	-80.5900	3	<i>C. caretta</i>	1
04-Oct-09	18:01	On effort	30.1007	-80.6107	3	<i>C. caretta</i>	1
04-Oct-09	18:04	On effort	30.1011	-80.6214	3	<i>C. caretta</i>	1
04-Oct-09	18:05	On effort	30.1012	-80.6240	3	<i>C. caretta</i>	2
04-Oct-09	18:13	On effort	30.1016	-80.6508	3	<i>C. caretta</i>	1
04-Oct-09	18:16	On effort	30.1005	-80.6633	3	<i>C. caretta</i>	1
04-Oct-09	18:20	On effort	30.0991	-80.6759	3	Unid. delphinid	2
06-Oct-09	11:08	On effort	29.9668	-80.5550	1	<i>T. truncatus</i>	2
06-Oct-09	11:35	On effort	29.9679	-80.4651	1	<i>S. frontalis</i>	1
06-Oct-09	12:02	On effort	29.9686	-80.4094	1	<i>T. truncatus</i>	1

Table 6. Aerial survey effort table for the Onslow Bay USWTR study region during Sept 24-Oct 23 2009.

Date	Line	Sea State	Kilometers Flown	Hobbs Hours
30-Sep-09	5	3 to 4	73.6	4.0
30-Sep-09	6	3 to 4	73.6	
30-Sep-09	7	3 to 4	74.2	
30-Sep-09	8	3 to 4	76.4	
30-Sep-09	9	3 to 4	73.5	
30-Sep-09	10	3 to 4	74.0	
1-Oct-09	5	2 to 3	75.1	8.4
1-Oct-09	6	2 to 3	74.3	
1-Oct-09	7	2 to 3	73.2	
1-Oct-09	8	2 to 3	71.7	
1-Oct-09	9	2 to 3	72.7	
1-Oct-09	10	2 to 3	72.1	
1-Oct-09	1	2 to 3	73.6	
1-Oct-09	2	2 to 3	74.2	
1-Oct-09	3	2 to 3	72.4	
1-Oct-09	4	2 to 3	76.9	
2-Oct-09	1	2 to 3	74.0	4.0
2-Oct-09	2	2 to 3	73.6	
2-Oct-09	3	2 to 3	74.7	
2-Oct-09	4	2 to 3	72.4	
2-Oct-09	5	2 to 3	74.4	
2-Oct-09	6	2 to 3	73.5	
21-Oct-09	10	2 to 3	73.4	5.0
21-Oct-09	9	2 to 3	73	
21-Oct-09	8	2 to 3	71.7	
21-Oct-09	7	2 to 3	73.1	

Table 7. Cetacean sightings during aerial surveys in the Onslow Bay USWTR study region during Sept 24-Oct 23 2009.

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Group Size
30-Sep-09	14:15	On	33.881552	-76.244972	9	<i>T. truncatus</i>	43
1-Oct-09	8:42	On	33.739176	-76.572540	5	<i>T. truncatus</i>	4
1-Oct-09	8:56	On	33.724444	-76.555044	5	<i>T. truncatus</i>	8
1-Oct-09	9:45	On	34.076573	-76.766611	7	<i>S. frontalis</i>	20
1-Oct-09	10:14	On	33.827829	-76.418514	7	<i>T. truncatus</i>	15
1-Oct-09	10:24	On	33.740108	-76.312358	7	<i>T. truncatus</i>	6
1-Oct-09	11:01	On	33.972348	-76.473672	8	<i>T. truncatus</i>	2
1-Oct-09	11:11	On	34.042681	-76.555923	8	<i>S. frontalis</i>	6
1-Oct-09	11:29	On	34.150825	-76.699600	8	<i>S. frontalis</i>	9
1-Oct-09	12:29	On	34.209822	-76.525553	10	<i>S. frontalis</i>	27
1-Oct-09	14:29	On	33.765256	-77.127123	1	<i>S. frontalis</i>	4
1-Oct-09	15:42	On	33.596687	-76.664434	3	<i>T. truncatus</i>	19
2-Oct-09	9:50	Off	33.475239	-76.447250	offshore 3 & 4	<i>T. truncatus</i>	11
2-Oct-09	10:01	Off	33.504595	-76.392273	offshore 3 & 4	<i>T. truncatus</i>	8
2-Oct-09	10:07	On	33.535099	-76.421927	4	<i>T. truncatus</i>	15
21-Oct-09	11:08	Off	33.823938	-75.995138	offshore 10	<i>P. macrocephalus</i>	1
21-Oct-09	11:08	Off	33.823938	-75.995138	offshore 10	<i>G. macrorhynchus</i>	12
21-Oct-09	11:32	On	33.932099	-76.176954	10	<i>T. truncatus</i>	6
21-Oct-09	12:37	On	33.756576	-76.181401	8	<i>T. truncatus</i>	2
21-Oct-09	12:43	On	33.829105	-76.279533	8	<i>T. truncatus</i>	40
21-Oct-09	13:02	On	34.079645	-76.624388	8	<i>S. frontalis</i>	4
21-Oct-09	13:47	On	33.720393	-76.290826	7	<i>T. truncatus</i>	12

Table 8. Sea turtle sightings during aerial surveys in the Onslow Bay USWTR study region during Sept 24-Oct 23 2009.

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Group Size
30-Sep-09	12:15	On	33.898165	-76.779545	5	<i>C. caretta</i>	1
30-Sep-09	12:40	On	33.727209	-76.421946	6	<i>C. caretta</i>	1
30-Sep-09	13:48	On	34.144996	-76.707060	8	<i>C. caretta</i>	1
1-Oct-09	8:33	On	33.884291	-76.761412	5	<i>C. caretta</i>	1
1-Oct-09	10:06	On	33.954023	-76.583867	7	Unid. Turtle	1
1-Oct-09	10:20	On	33.791158	-76.371512	7	Unid. Turtle	1
1-Oct-09	10:47	On	33.797331	-76.249619	8	<i>D. coriacea</i>	1
1-Oct-09	10:59	On	33.967964	-76.469564	8	<i>C. caretta</i>	1
1-Oct-09	11:58	On	33.889715	-76.246905	9	Unid. Turtle	1
1-Oct-09	12:25	On	34.158049	-76.456182	10	<i>C. caretta</i>	1
1-Oct-09	12:25	On	34.163205	-76.462239	10	<i>C. caretta</i>	1
1-Oct-09	14:44	On	33.674688	-77.017042	1	<i>C. caretta</i>	1
1-Oct-09	0.616	On	33.610435	-76.929048	1	<i>C. caretta</i>	1
1-Oct-09	0.633	On	33.616420	-76.806435	2	<i>D. coriacea</i>	1
1-Oct-09	0.639	On	33.790268	-77.028675	2	<i>C. caretta</i>	1
2-Oct-09	9:04	On	33.671246	-76.878142	2	<i>C. caretta</i>	1
2-Oct-09	9:19	On	33.852473	-76.983985	3	<i>C. caretta</i>	1
2-Oct-09	9:34	On	33.556246	-76.601330	3	<i>D. coriacea</i>	1
2-Oct-09	10:25	On	33.842027	-76.836401	4	<i>C. caretta</i>	1
21-Oct-09	11:54	On	34.196512	-76.512789	10	Unid. Turtle	1
21-Oct-09	11:56	On	34.229434	-76.555606	10	Unid. Turtle	2
21-Oct-09	12:03	On	34.173013	-76.617934	9	<i>C. caretta</i>	1
21-Oct-09	12:57	On	34.001956	-76.520666	8	Unid. Turtle	1
21-Oct-09	13:15	On	34.097636	-76.770540	7	<i>C. caretta</i>	1
21-Oct-09	13:16	On	34.066873	-76.730287	7	Unid. Turtle	1
21-Oct-09	13:23	On	33.936095	-76.558414	7	Unid. Turtle	1
21-Oct-09	11:58	On	34.271778	-76.611080	10	Unid. Turtle	1
21-Oct-09	12:02	On	34.187579	-76.638317	9	<i>C. caretta</i>	1
21-Oct-09	12:04	On	34.158849	-76.598833	9	<i>C. caretta</i>	1
21-Oct-09	12:04	On	34.145489	-76.581990	9	<i>C. caretta</i>	1
21-Oct-09	12:05	On	34.121615	-76.550240	9	Unid. Turtle	2
21-Oct-09	12:58	On	34.032365	-76.560665	8	<i>C. caretta</i>	1
21-Oct-09	13:09	On	34.125001	-76.682664	8	Unid. Turtle	1
21-Oct-09	13:10	On	34.153882	-76.720640	8	<i>C. caretta</i>	4
21-Oct-09	13:15	On	34.099198	-76.772674	7	<i>C. caretta</i>	1
21-Oct-09	13:17	On	34.058683	-76.719290	7	Unid. Turtle	1

Table 9. Effort table for vessel surveys in the Onslow Bay USWTR study region during Sept 24-Oct 23 2009.

<b>Date</b>	<b>Line</b>	<b>Sea State</b>	<b>Kilometers Surveyed</b>
24-Sep-09	10	1	74.08
01-Oct-09	7	1 to 3	74.08
22-Oct-09	9	2 to 3	74.08

Table 10. Cetacean and sea turtle sightings during vessel surveys in the Onslow Bay USWTR study region during Sept 24-Oct 23 2009.

Date	Line	On/Off Effort	Time	Latitude	Longitude	Species	Group Size
24-Sep-09	10	On Effort	11:08:38	33.982849	-76.235503	<i>T. truncatus</i>	10
24-Sep-09	10	On Effort	12:46:20	34.123636	-76.424480	<i>C. caretta</i>	1
01-Oct-09	7	On Effort	9:32:23	33.664432	-76.229127	<i>T. truncatus</i>	5
01-Oct-09	7	On Effort	9:32:23	33.664432	-76.229127	<i>T. truncatus</i>	5
01-Oct-09	7	On Effort	11:35:54	33.854490	-76.452732	<i>T. truncatus</i>	42
01-Oct-09	7	On Effort	12:41:32	33.923188	-76.540281	<i>S. frontalis</i>	103
01-Oct-09	7	On Effort	13:35:16	33.984940	-76.623289	<i>S. frontalis</i>	6
01-Oct-09	7	On Effort	14:34:44	34.057646	-76.743284	<i>S. frontalis</i>	15
22-Oct-09	9	Off Effort	9:54:20	33.797799	-76.129716	<i>T. truncatus</i>	2
22-Oct-09	9	On Effort	13:09:45	34.112597	-76.537091	<i>C. caretta</i>	1
22-Oct-09	9	On Effort	13:16:45	34.124536	-76.558528	<i>C. caretta</i>	1
22-Oct-09	9	On Effort	13:04:11	34.098492	-76.529773	<i>C. caretta</i>	1
22-Oct-09	9	On Effort	13:18:23	34.130950	-76.562160	<i>C. caretta</i>	1
22-Oct-09	9	On Effort	13:44:54	34.186433	-76.639441	<i>T. truncatus</i> or <i>S. frontalis</i>	1
22-Oct-09	9	On Effort	14:00:34	34.202096	-76.654138	<i>T. truncatus</i>	1



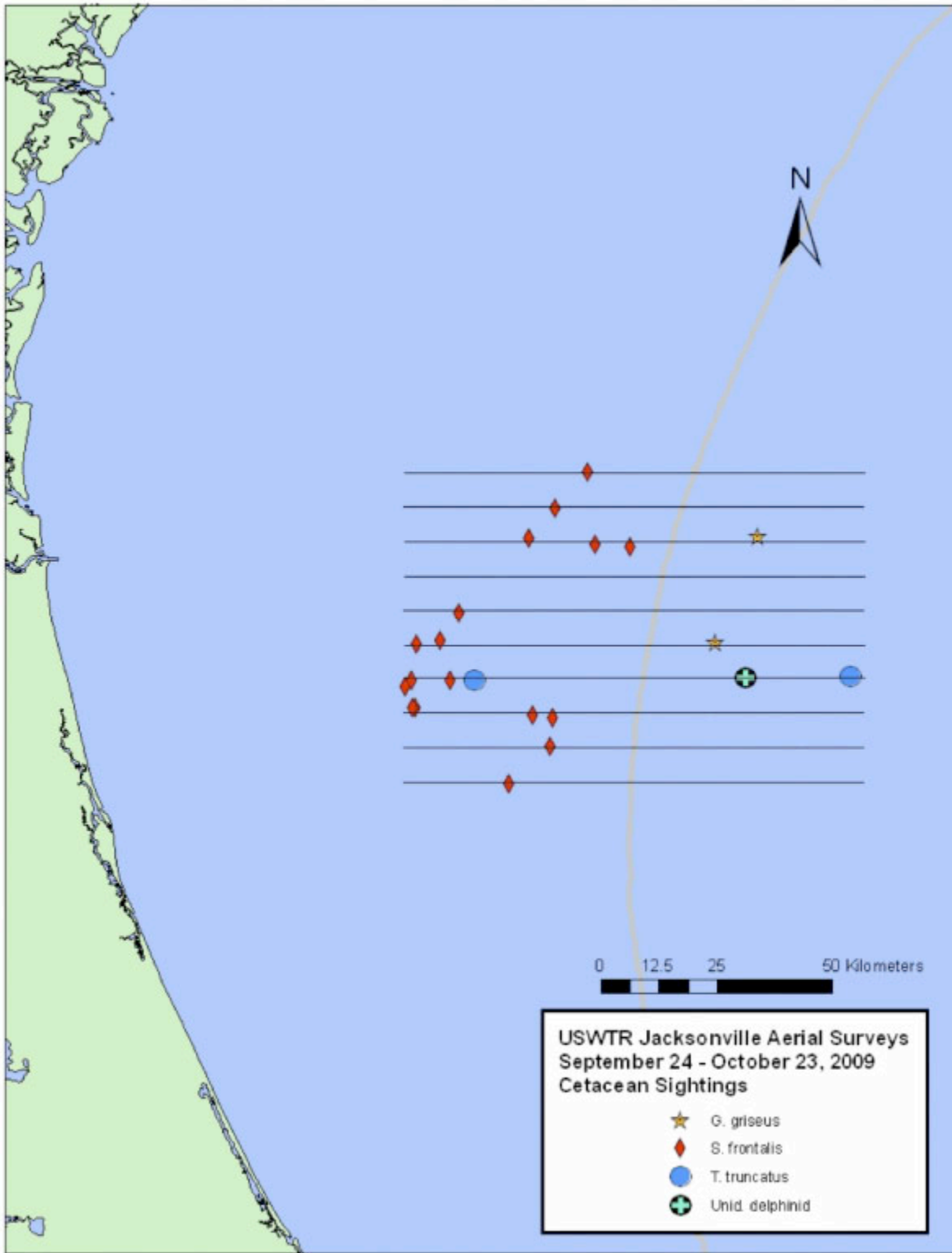


Figure 1. The locations of cetaceans sighted during aerial surveys of the JAX USWTR study region during Sept 24-Oct 23 2009.

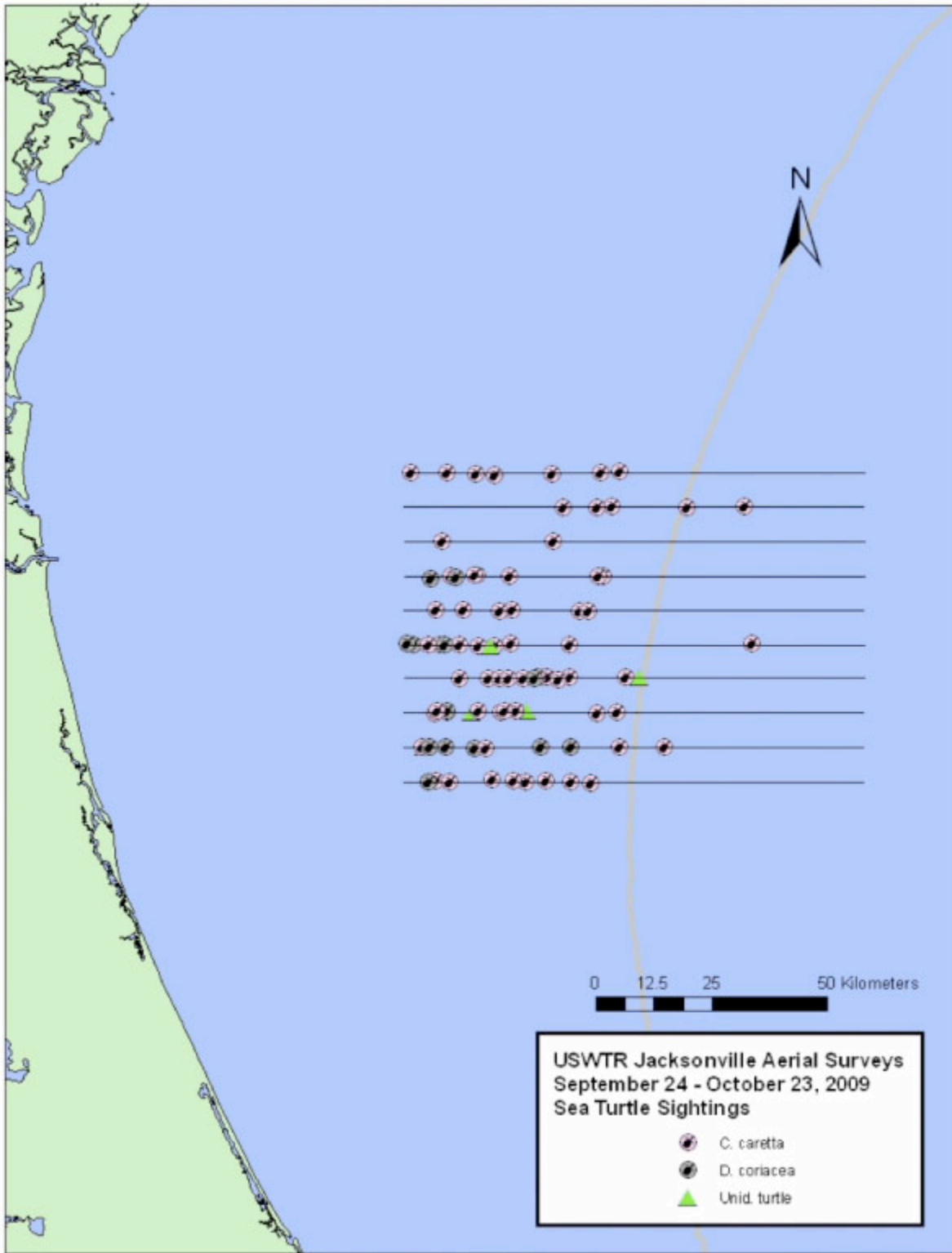


Figure 2. The locations of turtles sighted during aerial surveys of the JAX USWTR study region during Sept 24-Oct 23 2009.

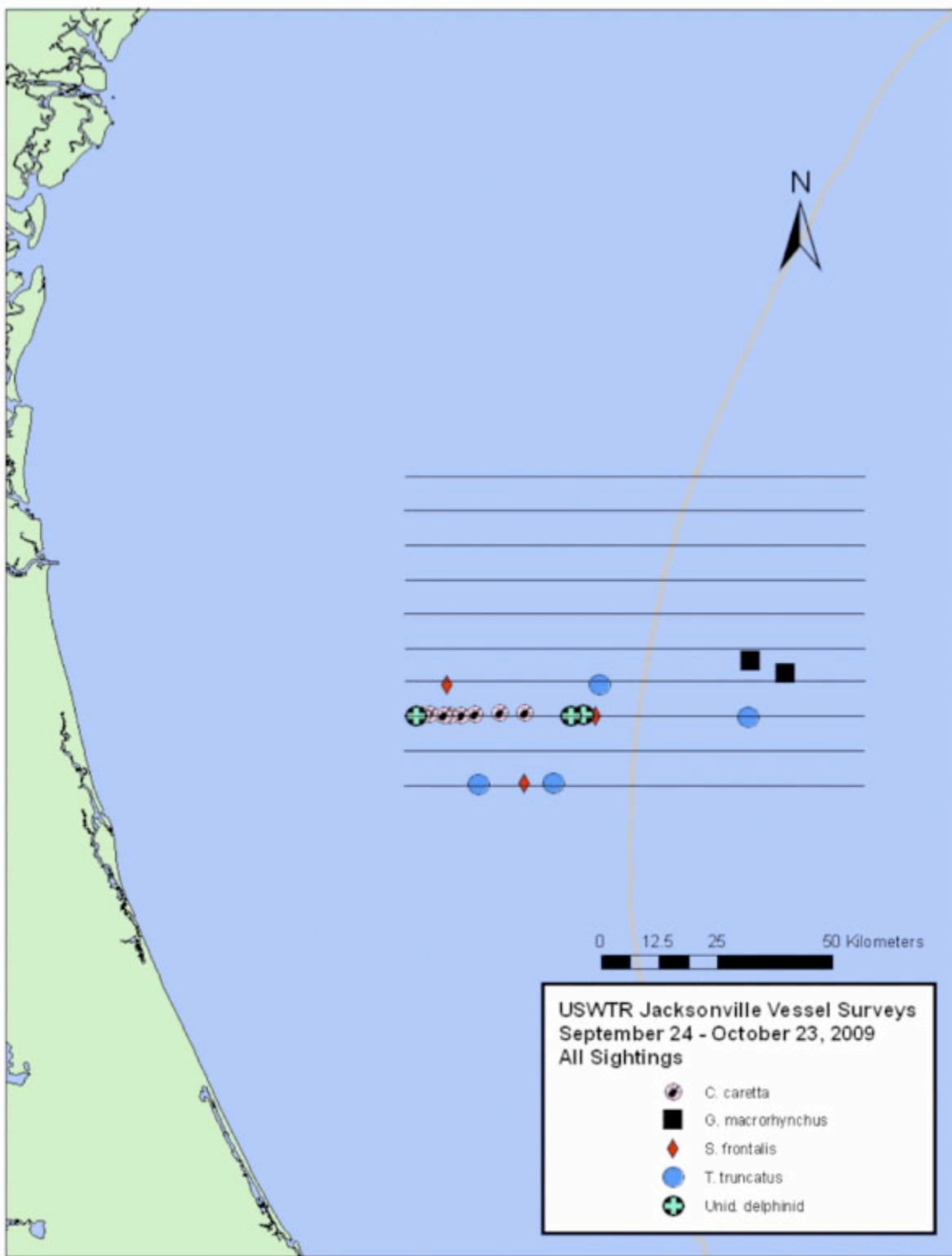


Figure 3. The locations of cetaceans and turtles sighted during vessel surveys of the JAX USWTR study region during Sept 24-Oct 23 2009.

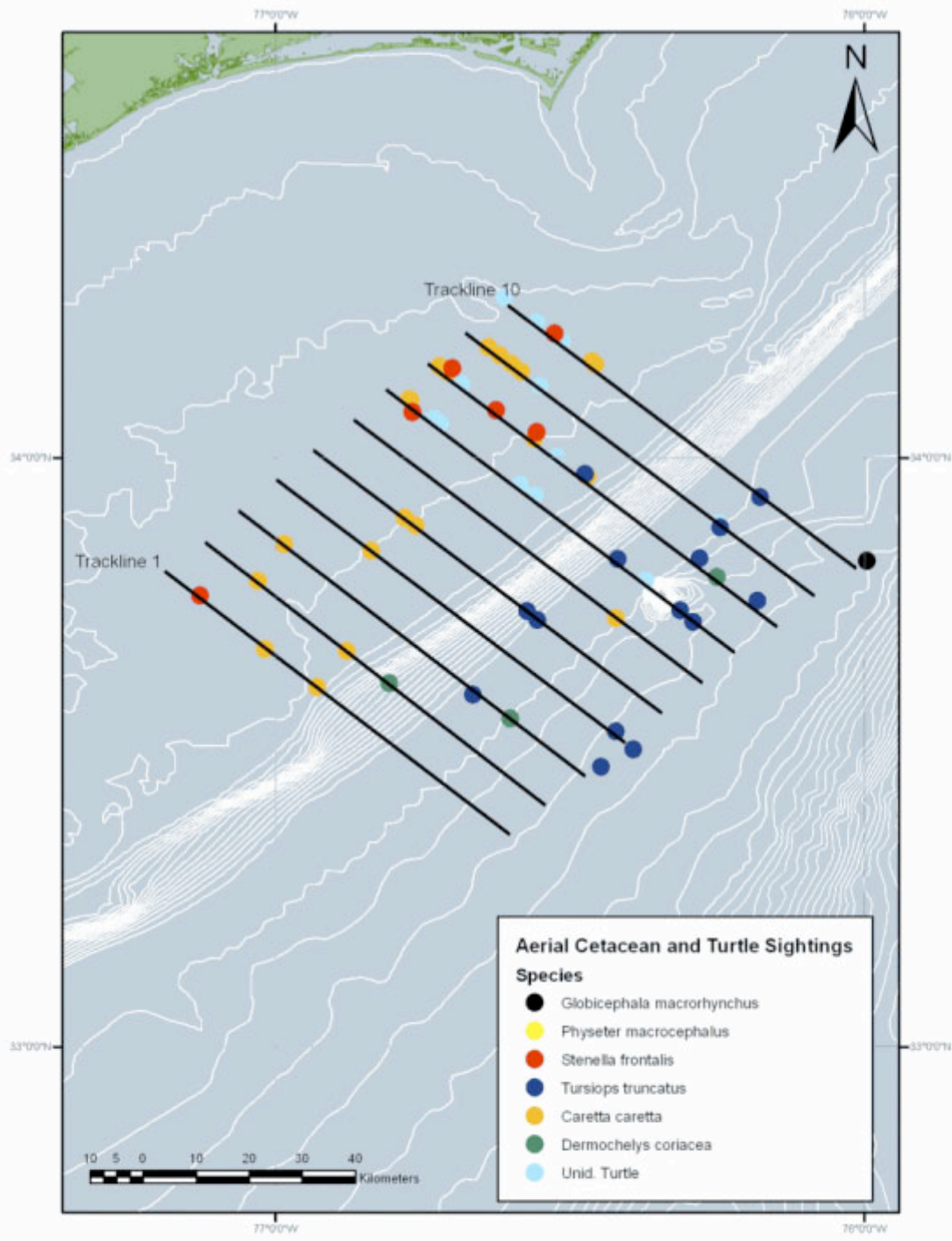


Figure 4. The locations of cetaceans and turtles sighted during aerial surveys of the Onslow Bay USWTR study region during Sept 24-Oct 23 2009.

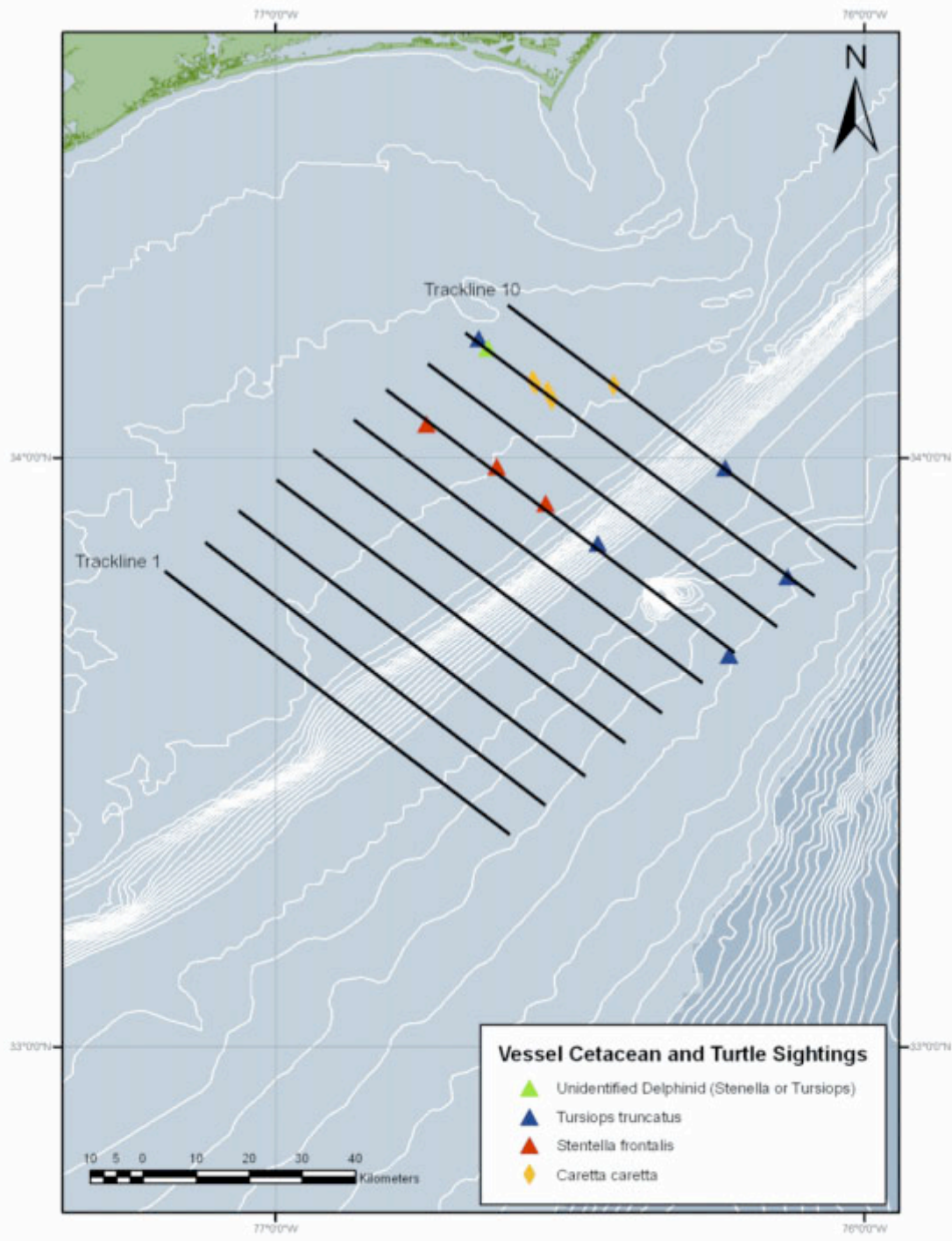


Figure 5. The locations of cetaceans and turtles sighted during vessel surveys of the Onslow Bay USWTR study region during Sept 24-Oct 23 2009.

## **Monitoring of Protected Species in the Proposed Onslow Bay and Jacksonville USWTRs**

Progress Report: October 24 through November 23, 2009

### **Planning (Task 1, 2 & 3)**

The final report meeting for Onslow Bay USWTR Year 2 was held at Duke University on November 4, 2009. This meeting was attended by Duke and UNCW staff, several Navy representatives and representatives from Parsons and GeoMarine. The meeting consisted of several presentations that summarized the work to date at both USWTR locations and plans for the future for both sites. During this reporting period PI Johnston and Postdoctoral fellow Soldevilla began planning the next round of HARP redeployments in the JAX USWTR. Planning for the deployment of Cornell pop-ups and protected species surveys during the next Navy training exercise in the JAX USWTR (December 7-11, 2009) was also initiated. A standard operating procedure (SOP) for transiting right whale calving habitat was established for the JAX USWTR survey team. A project web wiki was created to facilitate document and information sharing for the JAX USWTR project.

### **Purchasing (Task 1).**

Purchases for the next round of HARP deployments in JAX were started during this reporting period.

### **Travel (Task 1 & 3)**

William McLellan, CO-PI, attended and presented at the Southeast Implementation Team meeting in Jacksonville, Florida on 27 October. SOPs for interacting with right whale EWS flights were finalized. The focus of the meeting was the implementation of recovery plans for endangered large whales in the southeast. CO-PI McLellan also attended and presented at the Right Whale Consortium meeting held at the New Bedford Whaling Museum on Nov 17 – 18. Presentations were made on right whale sightings from USTWR surveys and right whale mortalities investigated along the US east coast.

### **JAX Survey activity (Task 2)**

#### Aerial Surveys

Aerial surveys were conducted on the 17<sup>th</sup>, 18<sup>th</sup> and 20<sup>th</sup> of November covering all ten tracklines twice. Weather conditions during the survey period ranged from moderate to poor on the 17<sup>th</sup> and the 20<sup>th</sup>, to excellent on the 18<sup>th</sup> (Table 1). The survey was cancelled on the 19<sup>th</sup> due to persistent fog. Cetacean encounters consisted of two groups of *Grampus griseus*, one single *Kogia* species, and two encounters with unidentified delphinids. The two species in the genus *Kogia* (pygmy sperm whale, *Kogia breviceps*, and dwarf sperm whale, *Kogia sima*) are very rarely observed during aerial and vessel surveys due to their elusive nature, inconspicuous behavior, and deep offshore habitat. Due to their similarity in appearance, the two can often not be identified to species. This sighting

constitutes the sole observation so far of a Kogiid in the study area. Several unidentified sea turtles were observed during the November surveys (n=16), in addition to 13 *Caretta caretta* and four *Dermochelys coriacea*. In addition, a juvenile whale shark (*Rhincodon typus*) was observed, which is the first time this species have been encountered in the USWTR range (Table 2; Figure 1).

#### Vessel Surveys

Weather conditions were not conducive to surveying during the reporting period 24 October to 22 November with the exception of one weather window (November 17<sup>th</sup> through the 20<sup>th</sup>) during which time aerial surveys were conducted. Adverse weather conditions during the remainder of the reporting period precluded any vessel surveys.

#### **JAX HARPs (Task 3)**

Both HARPs in the JAX USWTR are in place and recording.

#### **Onslow Bay Survey activity (Task 5)**

##### Aerial Surveys

The Onslow Bay USWTR team conducted two days of aerial surveys completing ten tracklines during the reporting period of October 24 to November 23, 2009 (Table 3). On November 8<sup>th</sup> prior to conducting surveys in the range the USWTR team responded to a report of a right whale seen approximately one and a half miles off the coast from Masonboro jetty. A search pattern was flown from the shore out to 5 miles beginning at Masonboro Jetty continuing south to the Fort Fisher Aquarium on Carolina Beach. Approximately 3 miles offshore from the aquarium the team encountered three right whales that were traveling south (Table 4 and Figure 2). The USWTR team contacted the US Coast Guard who then issued a notice to mariners alerting them that right whales were seen in the area and to maintain a minimum safe distance of 500 yards from the whales. The Coast Guard also relayed sighting information to the UNCW ground contacts. Photo documentation was collected of all whales to check for entanglements and record callosity patterns that can later be used to identify individual whales using the New England Aquariums Right Whale Catalogue. These whales were later identified as Egl # 3142, 3513, and 3648 and represent the first sightings in the southeast region for the 2009-2010 season. Once all animals were documented and deemed clear of entanglements the team proceeded out to the USWTR range where six tracklines were flown. Survey conditions were good and resulted in two sightings of *Tursiops truncatus* as well as 26 sea turtles (Tables 4 and 5). The following day, November 9<sup>th</sup> survey conditions had deteriorated and only 4 tracklines were flown resulting in two sea turtle sightings. All sighting locations are presented in Figure 2.

### Vessel Surveys

There was no vessel survey effort from Oct 24-Nov 23, 2009 due to a combination of poor weather conditions and prior charter commitments of the vessels used for surveys.

### **Onslow Bay HARPs (Task 6)**

We received the new CPU board for the 1<sup>st</sup> HARP at the beginning of November. Shortly after this, on November 8<sup>th</sup>, we (Lynne Williams, Melissa Soldevilla, and Danielle Waples) were able to deploy the two HARPs in Onslow Bay from the *R/V Cape Fear*. We deployed one HARP in the same location as from our first and third deployments (at 171-m depth) and put the second HARP farther out at 335-m depth (Figure 3). Both locations are detailed in Figure 3. Although we are still sampling at 200 kHz, we have changed the duty cycle of the instruments so that they will record for 5 minutes out of every 15 minutes. This change will allow us to record for up to six months.

### **Exercise Monitoring (Task 7)**

Planning for the next exercise in the JAX USWTR was initiated.



Table 1. Aerial survey effort table for the JAX USWTR study region during Oct 24-Nov 23 2009

Date	Line	Sea State	Kilometers Flown	Hobbs Hours
17-Nov-09	10	1 to 4	86.0	4.0
17-Nov-09	9	1 to 4	87.9	
17-Nov-09	8	1 to 3	86.8	
17-Nov-09	7	1 to 3	83.4	
17-Nov-09	6	1 to 3	86.9	
17-Nov-09	5	1 to 3	86.4	
18-Nov-09	1	1 to 2	86.6	7.5
18-Nov-09	2	1 to 2	84.3	
18-Nov-09	3	1 to 2	85.8	
18-Nov-09	4	2	86.7	
18-Nov-09	5	1 to 3	86.0	
18-Nov-09	6	1 to 3	86.3	
18-Nov-09	10	2 to 3	86.1	
18-Nov-09	9	1 to 2	85.8	
18-Nov-09	8	1 to 3	87.2	
18-Nov-09	7	1 to 3	85.9	
20-Nov-09	1	3 to 4	86.4	3.2
20-Nov-09	2	3 to 4	86.5	
20-Nov-09	3	3 to 4	86.4	
20-Nov-09	4	2 to 4	85.8	

Table 2. Cetacean, sea turtle and large shark sightings during aerial surveys in the JAX USWTR study region during Oct 24-Nov 23 2009.

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Observer	Species	Group Size
17-Nov-09	13:46	On Effort	30.498	-80.609	9	Right	<i>C. caretta</i>	1
17-Nov-09	15:25	On Effort	30.232	-80.152	5	Right	<i>D. coriacea</i>	1
18-Nov-09	9:03	On Effort	29.966	-79.895	1	Left	Unidentified turtle	1
18-Nov-09	9:13	On Effort	30.037	-79.944	2	Right	<i>Kogia</i> species	1
18-Nov-09	9:24	On Effort	30.032	-80.281	2	Left	<i>C. caretta</i>	1
18-Nov-09	9:25	On Effort	30.031	-80.321	2	Left	<i>C. caretta</i>	1
18-Nov-09	9:29	On Effort	30.031	-80.449	2	Right	Unidentified turtle	1
18-Nov-09	9:33	On Effort	30.031	-80.597	2	Right	Unidentified turtle	1
18-Nov-09	9:40	On Effort	30.100	-80.632	3	Left	<i>C. caretta</i>	1
18-Nov-09	9:41	On Effort	30.100	-80.622	3	Right	<i>D. coriacea</i>	1
18-Nov-09	9:41	On Effort	30.100	-80.600	3	Right	<i>C. caretta</i>	1
18-Nov-09	9:44	On Effort	30.113	-80.556	3	Left	Unidentified delphinid	3
18-Nov-09	9:57	On Effort	30.100	-80.481	3	Left	<i>C. caretta</i>	2
18-Nov-09	10:02	On Effort	30.101	-80.274	3	Right	Unidentified turtle	1
18-Nov-09	10:10	On Effort	30.101	-79.994	3	Left	<i>C. caretta</i>	4
18-Nov-09	10:11	On Effort	30.100	-79.928	3	Right	Unidentified turtle	1
18-Nov-09	10:12	On Effort	30.101	-79.916	3	Left	<i>C. caretta</i>	2
18-Nov-09	10:41	On Effort	30.166	-80.535	4	Right	Unidentified turtle	1
18-Nov-09	10:49	On Effort	30.234	-80.689	5	Right	<i>R. typus</i>	1
18-Nov-09	10:57	On Effort	30.233	-80.497	5	Left	<i>C. caretta</i>	2
18-Nov-09	11:40	On Effort	30.309	-80.475	6	Right	Unidentified delphinid	1
18-Nov-09	13:46	On Effort	30.568	-80.606	10	Left	<i>C. caretta</i>	2
18-Nov-09	13:48	On Effort	30.568	-80.553	10	Right	Unidentified turtle	1
18-Nov-09	13:49	On Effort	30.568	-80.494	10	Right	Unidentified turtle	1
18-Nov-09	13:51	On Effort	30.568	-80.448	10	Right	Unidentified turtle	1
18-Nov-09	13:51	On Effort	30.568	-80.426	10	Right	Unidentified turtle	1
18-Nov-09	14:28	On Effort	30.499	-80.395	9	Right	Unidentified turtle	1
18-Nov-09	14:29	On Effort	30.499	-80.437	9	Right	Unidentified turtle	1
18-Nov-09	14:31	On Effort	30.499	-80.502	9	Right	Unidentified turtle	1
18-Nov-09	14:32	On Effort	30.499	-80.549	9	Left	<i>C. caretta</i>	1
18-Nov-09	14:33	On Effort	30.499	-80.584	9	Left	<i>C. caretta</i>	2
18-Nov-09	14:33	On Effort	30.499	-80.589	9	Right	Unidentified turtle	1
18-Nov-09	14:34	On Effort	30.499	-80.623	9	Right	Unidentified turtle	1
18-Nov-09	14:40	On Effort	30.434	-80.649	8	Left	<i>D. coriacea</i>	1
18-Nov-09	14:42	On Effort	30.434	-80.579	8	Left	<i>C. caretta</i>	3
18-Nov-09	15:02	On Effort	30.429	-79.897	8	Right	<i>G. griseus</i>	40
18-Nov-09	15:31	On Effort	30.365	-80.517	7	Right	Unidentified turtle	1
18-Nov-09	15:36	On Effort	30.365	-80.706	7	Right	<i>D. coriacea</i>	1
20-Nov-09	9:11	On Effort	29.967	-80.601	1	Right	<i>C. caretta</i>	1
20-Nov-09	9:48	On Effort	30.032	-80.180	2	Right	<i>G. griseus</i>	20

Table 3. Aerial survey effort table for the Onslow Bay USWTR study region during Oct 24-Nov 23 2009

Date	Line	Sea State	Kilometers Flown	Hobbs Hours
8-Nov-09	1	1 to 2	75.0	4.5
8-Nov-09	2	1 to 3	74.6	
8-Nov-09	3	1 to 2	74.2	
8-Nov-09	4	1 to 3	74.0	
8-Nov-09	5	1 to 2	74.4	
8-Nov-09	6	1 to 3	74.3	
9-Nov-09	7	3	74.2	3.4
9-Nov-09	8	3	74.9	
9-Nov-09	9	3	73.0	
9-Nov-09	10	3	74.1	

Table 4. Cetacean sightings during aerial surveys in the Onslow Bay USWTR study region during Oct 24-Nov 23 2009.

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Group Size
8-Nov-09	12:39	Off Effort	33.966810	-77.875979		<i>E. glacialis</i>	3
8-Nov-09	13:51	On Effort	33.407155	-76.643227	1	<i>T.truncatus</i>	38
8-Nov-09	14:55	On Effort	33.623729	-76.540808	4	<i>T.truncatus</i>	4

Table 5. Sea turtle and shark sightings during aerial surveys in the Onslow Bay USWTR study region during Oct 24-Nov 23 2009.

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Group Size
8-Nov-09	13:28	On Effort	33.647821	-76.972049	1	<i>C. caretta</i>	2
8-Nov-09	14:08	On Effort	33.665816	-76.871465	2	<i>C. caretta</i>	1
8-Nov-09	14:08	On Effort	33.645901	-76.845813	2	Unid. turtle	1
8-Nov-09	14:09	On Effort	33.679399	-76.888699	2	<i>C. caretta</i>	1
8-Nov-09	14:13	On Effort	33.756276	-76.988613	2	<i>C. caretta</i>	2
8-Nov-09	14:15	On Effort	33.804874	-77.051340	2	<i>C. caretta</i>	1
8-Nov-09	14:21	On Effort	33.899431	-77.049546	3	<i>C. caretta</i>	1
8-Nov-09	14:21	On Effort	33.894745	-77.041877	3	<i>C. caretta</i>	2
8-Nov-09	14:22	On Effort	33.887182	-77.030274	3	Unid. turtle	1
8-Nov-09	14:24	On Effort	33.840048	-76.967916	3	<i>C. caretta</i>	2
8-Nov-09	14:27	On Effort	33.770925	-76.877474	3	Unid. turtle	1
8-Nov-09	14:30	On Effort	33.708602	-76.796400	3	<i>C. caretta</i>	3
8-Nov-09	15:26	On Effort	34.007062	-76.924330	5	<i>C. caretta</i>	3
8-Nov-09	15:36	On Effort	33.799470	-76.648673	5	<i>C. caretta</i>	1
8-Nov-09	16:00	On Effort	33.846249	-76.582095	6	<i>C. caretta</i>	1
8-Nov-09	16:09	On Effort	34.034573	-76.830253	6	<i>C. caretta</i>	3
9-Nov-09	9:48	On Effort	34.020247	-76.544867	8	<i>C. caretta</i>	1
9-Nov-09	10:01	On Effort	34.135681	-76.570197	9	Unid. turtle	1

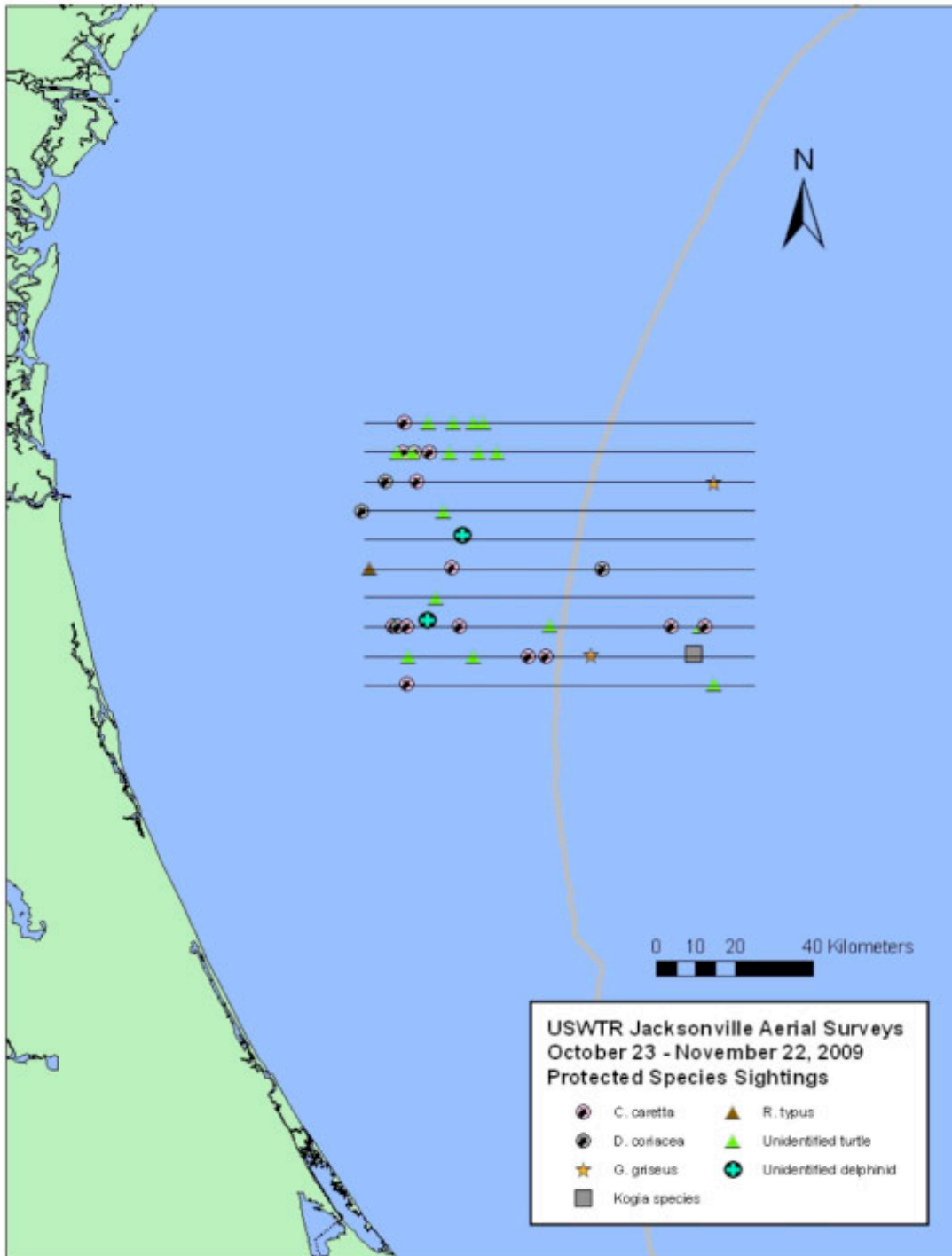


Figure 1. The locations of cetaceans, turtles and sharks sighted during aerial and vessel surveys of the JAX USWTR study region during Oct 24-Nov 23 2009.

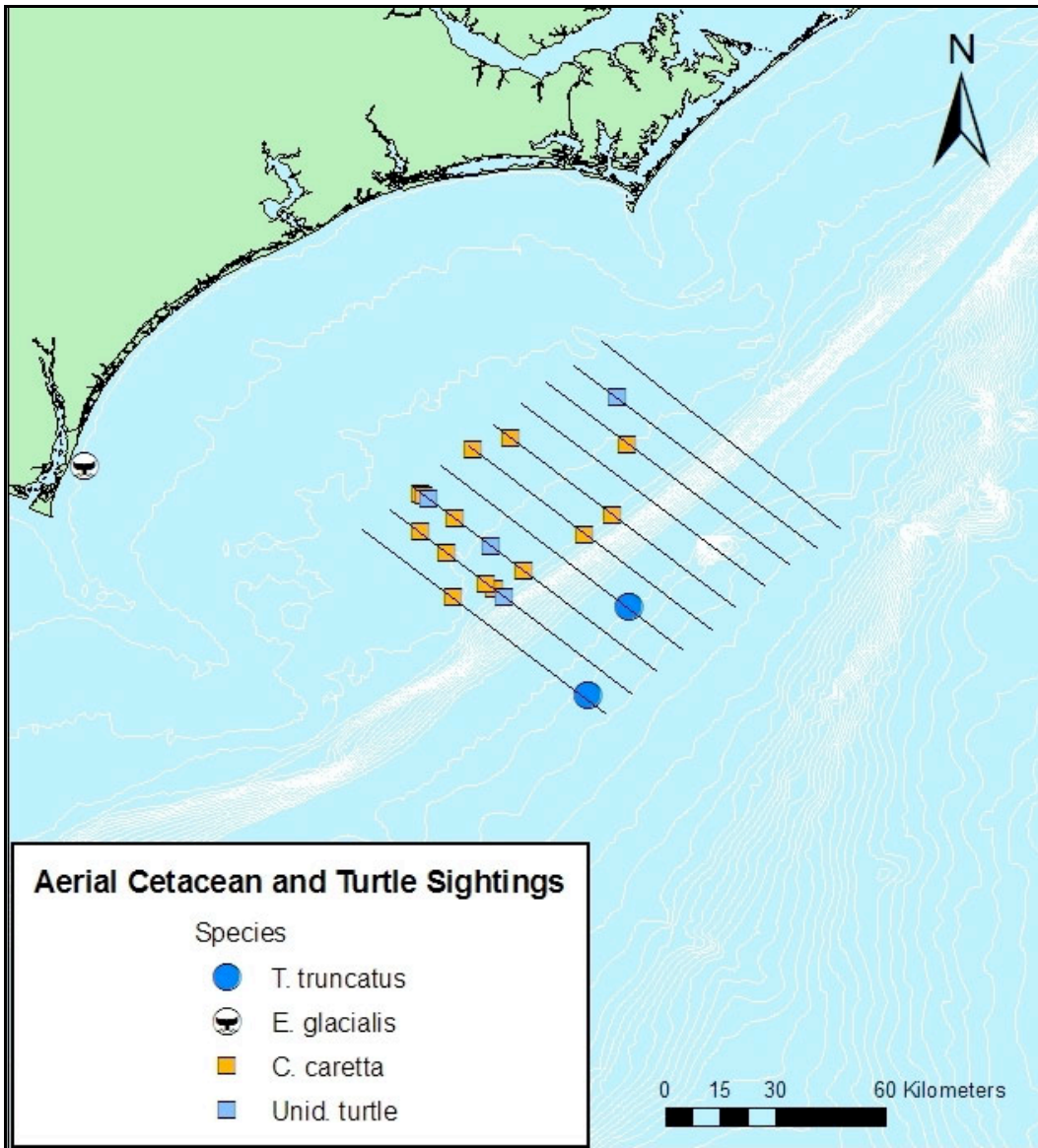


Figure 2. The locations of cetaceans and turtles sighted during aerial and vessel surveys of the Onslow Bay USWTR study region during Oct 24-Nov 23 2009.

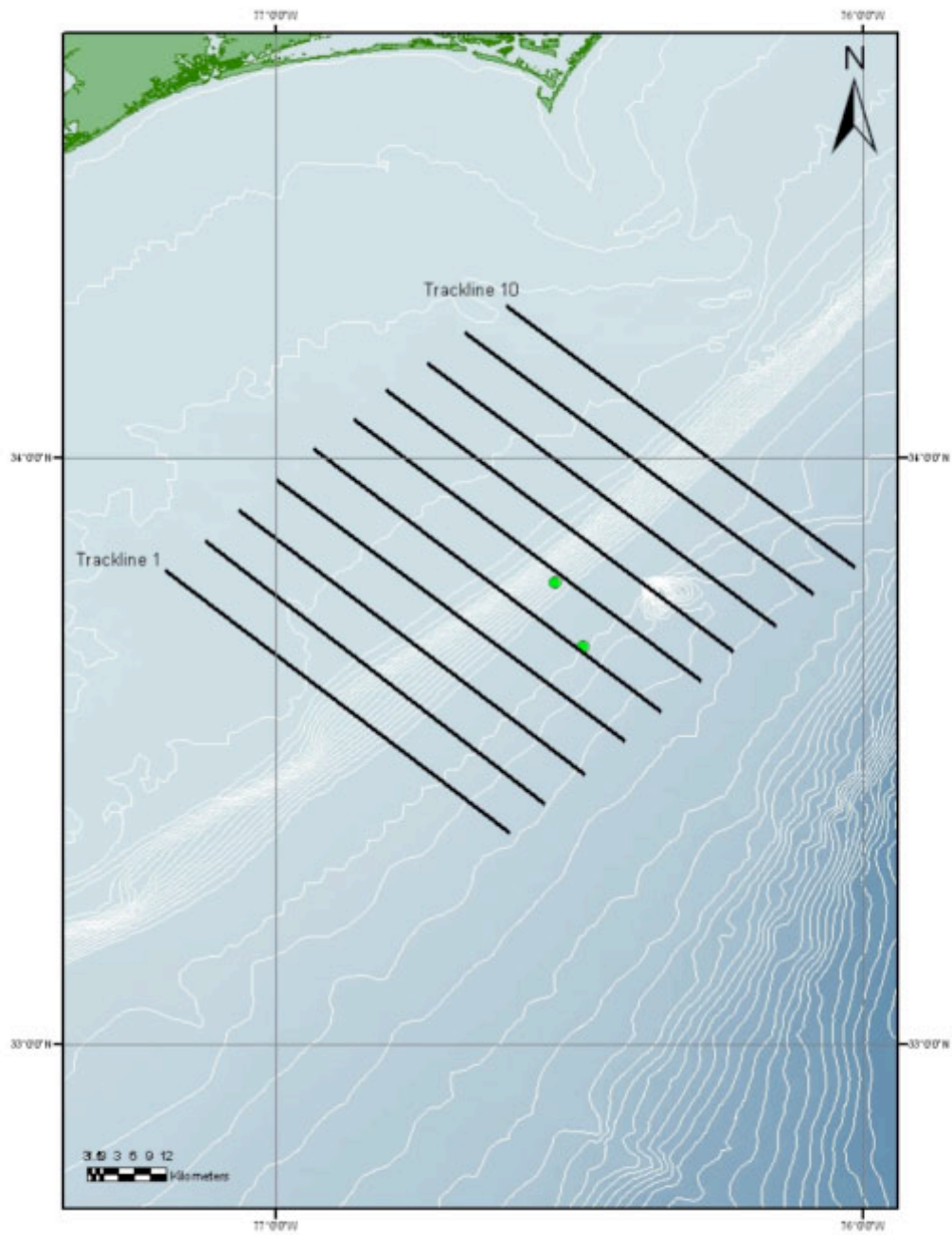


Figure 3. Locations of HARPs deployed in the Onslow Bay USWTR study area.

## **Monitoring of Protected Species in the Proposed Onslow Bay and Jacksonville USWTRs**

Progress Report: November 24 through December 23, 2009

### **Planning (Task 1, 2 & 3)**

During this period UNCW and Duke scientists finalized plans for 1.) the deployment of pop-ups and 2.) aerial surveys during a Navy training exercise in the JAX USWTR (December 7-11, 2009). PI Johnston and Postdoctoral fellow Soldevilla continued planning the next round of HARP redeployments in the JAX USWTR, likely to occur in February 2010.

### **Purchasing (Task 1).**

Purchases for the next round of HARP deployments in JAX were completed during this reporting period. This month two CellSet communication systems were purchased. These allow aerial observers to communicate through their headsets via the satellite phone with land-based teams. One of these units has been delivered to both survey teams as of the end of this month.

### **Travel (Task 1 & 3)**

No project travel was undertaken during this reporting period.

### **JAX Survey activity (Task 2)**

#### Aerial Surveys

Several storm systems passing through the area during the reporting period resulted in sub-optimal survey conditions (Table 1). Aerial surveys were conducted on December 8<sup>th</sup> and 10<sup>th</sup>. Ten survey lines were flown on December 8<sup>th</sup> in sub-optimal weather conditions and two lines were completed on December 10<sup>th</sup> before the survey was aborted due to very poor sea state and visibility (Table 1). A survey attempt on the 14<sup>th</sup> was cancelled just prior to mobilization due to dense, persistent fog in the survey area. Three loggerhead sea turtles (*Caretta caretta*) were observed; however, no cetaceans were encountered during the surveys (Table 2; Figure 1).

#### Vessel Surveys

A vessel survey onboard the *R/V Volute* was attempted on 15<sup>th</sup> December in a lull in the persistently high winds which plagued the area during the reporting period. The survey was cancelled, however, during transit to the USWTR range due to fouling of the propeller. The weather throughout the remainder of the reporting period was not conducive to vessel surveys.

On 4 December two members of the Jacksonville USWTR team conducted off effort visual surveys from the *R/V Stellwagen* during the deployment of the nine pop-up buoys in the JAX USWTR site. Visual surveys commenced at 8:58 with the first buoy deployment and ended at 17:07 with the final buoy deployment. When possible, observation occurred from the top of the wheelhouse; however,

due to deteriorating sea state and persistent rain after 12:25 the observers moved to the wheelhouse for the remainder of the day. One sea turtle, *C. caretta*, and one pod of dolphins, *Stenella frontalis*, were observed during the survey.

#### Towed Passive Acoustics

There was no towed passive acoustic survey effort from Nov 24-Dec 23, 2009

### **Onslow Bay Survey activity (Task 5)**

#### Aerial Surveys

On December 17, 2009 we conducted our only survey day for this reporting period. Seasonally high seas and rapidly changing forecasts made it difficult to identify suitable survey conditions. A total of 10 tracklines were flown in a Beaufort Sea State 3 to 4 (Table 3) during which two groups of dolphins were encountered. High seas prevented photo documentation of either group and both groups are listed as unidentified delphinids (Table 4, Figure 2). There were also five sea turtle sightings in the range, two identified as loggerheads and three unidentified sea turtles (Table 5, Figure 2).

#### Vessel Surveys

There was no vessel survey effort from Nov 24-Dec 23, 2009 due to persistent inclement weather conditions.

#### Towed Passive Acoustics

There was no towed passive acoustic survey effort from Nov 24-Dec 23, 2009 due to persistent inclement weather conditions.

### **Exercise Monitoring (Task 7)**

Nine pop-up acoustic recorders were deployed from the R/V Stellwagen in the JAX USWTR study location on December 4<sup>th</sup>, 2009. They are slated for recovery in early January 2010. Aerial surveys were conducted on December 8<sup>th</sup> and 10<sup>th</sup> coincident with the SEASWITI exercise held off the coast of northern Florida (including the USWTR range) between December 7<sup>th</sup> and 11<sup>th</sup>.



Table 1. Aerial survey effort table for the JAX USWTR study region during Nov 24-Dec 23, 2009

Date	Line	Sea State	Kilometers Flown	Hobbs Hours
8-Dec-09	10	3 to 4	88.4	5.3
8-Dec-09	9	3 to 4	86.0	
8-Dec-09	8	3 to 4	86.6	
8-Dec-09	7	3 to 4	86.3	
8-Dec-09	6	3	86.3	
8-Dec-09	5	3	86.1	
8-Dec-09	4	3 to 4	87.1	
8-Dec-09	3	3 to 4	86.0	
8-Dec-09	2	3 to 4	86.7	
8-Dec-09	1	2 to 4	86.4	
10-Dec-09	1	5	86.3	
10-Dec-09	2	5	86.6	

Table 2. Sea turtle sightings during aerial surveys in the JAX USWTR study region during Nov 24-Dec 23, 2009.

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Observer	Species	Group Size
8-Dec-09	12:35	On effort	30.166432	-80.261243	4	Left	<i>C. caretta</i>	1
8-Dec-09	13:10	On effort	30.100306	-80.534221	3	Left	<i>C. caretta</i>	1
8-Dec-09	13:47	On effort	29.965570	-79.823295	2	Right	<i>C. caretta</i>	1

Table 3. Aerial survey effort table for the Onslow Bay USWTR study region during Nov 24-Dec 23, 2009

Date	Line	Sea State	Kilometers Flown	Hobbs Hours
17-Dec-09	5	3 to 4	74.3	6.4
17-Dec-09	6	3 to 4	74.8	
17-Dec-09	7	3 to 4	74.4	
17-Dec-09	8	3 to 4	75.3	
17-Dec-09	9	3 to 4	73.0	
17-Dec-09	10	3 to 4	71.6	
17-Dec-09	4	3 to 4	74.8	
17-Dec-09	3	3 to 4	74.9	
17-Dec-09	2	3	74.4	
17-Dec-09	1	3	73.6	

Table 4. Cetacean sightings during aerial surveys in the Onslow Bay USWTR study region during Nov 24-Dec 23, 2009.

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Group Size
17-Dec-09	10:56	On Effort	33.862939	-76.343101	8	Unidentified delphinid	2
17-Dec-09	11:56	On Effort	34.135101	-76.433447	10	Unidentified delphinid	15

Table 5. Sea turtle sightings during aerial surveys in the Onslow Bay USWTR study region during Nov 24-Dec 23, 2009.

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Group Size
17-Dec-09	11:19	On Effort	34.124850	-76.557451	9	Unidentified turtle	1
17-Dec-09	12:13	On Effort	34.189596	-76.502615	10	<i>C. caretta</i>	1
17-Dec-09	14:59	On Effort	33.773244	-77.010398	2	Unidentified turtle	1
17-Dec-09	15:06	On Effort	33.606821	-76.793782	2	Unidentified turtle	1
17-Dec-09	15:37	On Effort	33.780631	-77.151036	1	<i>C. caretta</i>	1

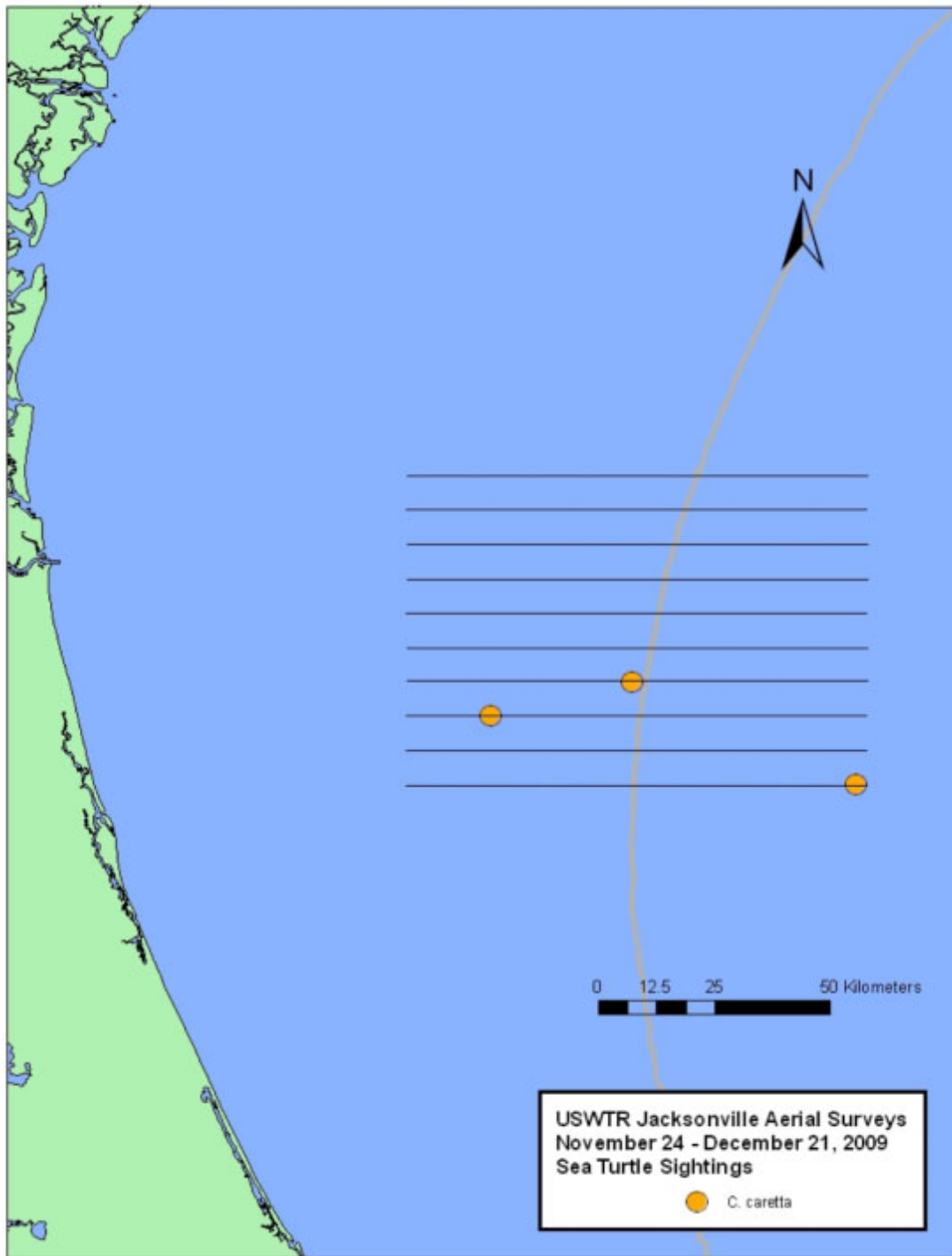


Figure 1. The locations of cetaceans, turtles and sharks sighted during aerial surveys of the JAX USWTR study region during Nov 24-Dec 23 2009.

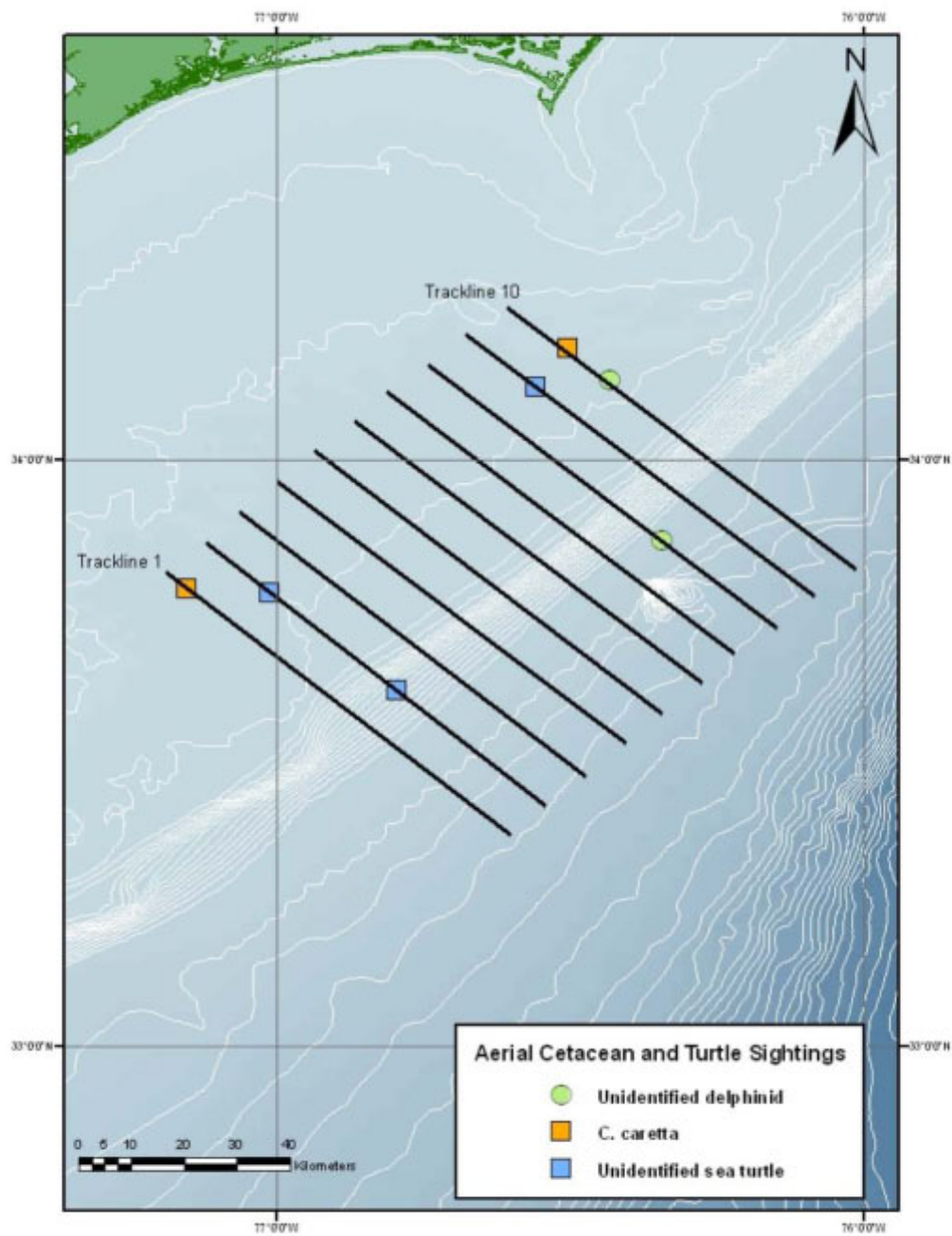


Figure 2. The locations of cetaceans and turtles sighted during aerial surveys of the Onslow Bay USWTR study region during Nov 24-Dec 23, 2009.

## **Monitoring of Protected Species in the Proposed Onslow Bay and Jacksonville USWTRs**

Progress Report: December 24, 2009 through January 18, 2010

### **Planning (Task 1, 2 & 3)**

During this period UNCW and Duke finalized budgets for continuation of both the Onslow & JAX USWTR ranges through June 2010. The housing contract for the JAX observers was extended through June 2010.

### **Purchasing (Task 1).**

One Dell desktop CPU was purchased at UNCW to replace a failing older machine. The twin monitors were kept from past purchases. Environmental float coats were purchased for the JAX team to conduct winter vessel surveys. Two Garmin GPS were purchased to replace aging (non-functional) units for Onslow Bay aerial surveys.

### **Travel (Task 1 & 3)**

No project travel was undertaken during this reporting period.

### **JAX Survey Activity (Task 2)**

#### Aerial Surveys

Two full sets of aerial surveys have been flown since the last reporting period. All ten survey lines were flown both on 22 December and 7 January. Weather conditions for the surveys were moderate on 22 December and moderate to good on 7 January (**Table 1**). There were eleven cetacean sightings over the two survey days; *Tursiops truncatus* were encountered six times, *Stenella frontalis* were spotted once while off effort investigating a large splash, and four unidentified delphinids were recorded (**Table 2; Figure 1**). Marine turtle sightings consisted of 39 *Caretta caretta* and four unidentified turtles (**Table 3; Figure 2**).

#### Vessel Surveys

Two complete tracklines were surveyed from the *R/V Volute* during the reporting period. On 13 and 14 January tracklines 10 and 8 were surveyed respectively. Weather conditions ranged from moderate to good (**Table 4**). There were eight cetacean sightings during the two days, comprised of three *T. truncatus*, two *S. frontalis*, and three brief unidentified delphinid encounters. There were also four marine turtles spotted while surveying, including one *Dermochelys coriacea* and three *C. caretta* (**Table 5; Figure 3**).

On 7 January one member of the Jacksonville USWTR team conducted off effort visual surveys from the *R/V Volute* during the retrieval of the nine pop-up buoys in the JAX USWTR site. Visual surveys commenced at 7:00 for the transit through *Eubalaena glacialis* habitat and ended at 18:35 with sunset. Two marine turtles, *Chelonia mydas*, and one pod of dolphins, *T. truncatus*, were observed during the survey (**Table 6**).

### Towed Passive Acoustics

On 14 January the towed acoustic array was deployed from the *R/V Volute* during visual survey effort. The towed array was deployed at 11:29 local time. Due to technical problems with the generator powering the system the array was recovered at 12:52 local time. During this time three acoustic files were recorded totaling 15 minutes 50 seconds. These recordings encompass one visual sighting of an unidentified dolphin species.

## **Onslow Bay Survey Activity (Task 5)**

### Aerial Surveys

Prior to this month's aerial surveys there had been no sightings of marine mammals for the month of January which had only seen ten tracklines flown in a Beaufort Sea State 3 to 4 in 2009. Survey conditions this month were much better and as a result the probability of detecting marine mammals was greatly increased. A total of 20 tracklines were flown over two days with a total of 14.5 Hobbs hours with a Beaufort Sea State 2 dominating both days (**Table 7**). On January 14<sup>th</sup> ten tracklines were flown during which five *T. truncatus* sightings were made as well as a single *S. frontalis* sighting (**Table 8 and Figure 4**). On January 15<sup>th</sup> ten tracklines were again flown with eight *T. truncatus* sightings (one was off effort), three *S. frontalis* sightings and a single *Grampus griseus* sighting which was seen while off effort between tracklines 7 and 8. This last sighting represents the first visual detection of this species outside of the summer months. Both days also produced a number of sea turtle sightings that were dominated by loggerheads (**Table 9 and Figure 4**). The data collected during this month gives us the first clear look at the presence of cetaceans in the Onslow Bay USWTR range and will be beneficial in estimating species abundance.

### Vessel Surveys

Two track lines were surveyed on January 15<sup>th</sup> and January 16<sup>th</sup> 2010 aboard the *R/V Sensation*, a 53' sport fishing vessel (**Table 10**). Six groups of cetacean were encountered; one group of bottlenose dolphins (*T. truncatus*), four groups of spotted dolphins (*S. frontalis*), and one group which was either bottlenose or spotted dolphins (could not be identified to species; **Table 11**). Ten loggerhead sea turtles (*C. caretta*) also were sighted (**Table 11**). The locations of cetaceans and sea turtles sighted during vessel surveys are presented in **Figure 5**.

### Towed Passive Acoustics

The towed acoustic array was deployed from the *F/V Sensation* on the 15<sup>th</sup> of January, 2010, for 4.97 hours of simultaneous visual and acoustic survey. During that time, a total of 1.48 hours of acoustic recordings were taken. Three visual sightings occurred during the acquisition of acoustic data; one group was identified as *T. truncatus* and two were identified as *S. frontalis*. Numerous vocalizations including clicks, whistles, and burst-pulses were recorded. One other acoustic detection was made that day without visual observation to confirm the species. The towed array also was deployed from the *F/V Sensation* on the

16<sup>th</sup> of January, 2010, for 5.42 hours of simultaneous visual and acoustic survey. During that time, a total of 2.38 hours of acoustic recordings were taken. Three visual sightings occurred during the acquisition of acoustic data; two groups were identified as *S. frontalis* and one group was either *T. truncatus* or *S. frontalis*. Numerous vocalizations including clicks, burst-pulses, and whistles were recorded. Two other acoustic detections were made that day without visual observation to confirm the species.

**Exercise Monitoring (Task 7)**

On 7 January one member of the Jacksonville USWTR went out the R/V Volute team to retrieve the nine pop-up buoys in the JAX USWTR site.

No injuries to staff were recorded during this reporting period.

No problems currently exist that hamper progress of the projects.

**Table 1.** Aerial survey effort table for the JAX USWTR study region during Dec 24, 2009- Jan 18, 2010.

Date	Line	Sea State	Kilometers Flown	HOBBS Hours
22-Dec-09	1	2-3	86.59	7.8
22-Dec-09	2	2-3	86.78	
22-Dec-09	3	2-3	85.31	
22-Dec-09	4	2-3	85.63	
22-Dec-09	5	2-3	86.44	
22-Dec-09	6	2-3	86.67	
22-Dec-09	7	2-3	85.36	
22-Dec-09	8	2-3	85.68	
22-Dec-09	9	2-3	86.23	
22-Dec-09	10	2-3	85.25	
7-Jan-10	1	3	86.04	7.7
7-Jan-10	2	3	86.36	
7-Jan-10	3	2-3	87.81	
7-Jan-10	4	2-3	84.81	
7-Jan-10	5	2-3	86.82	
7-Jan-10	6	2-3	86.40	
7-Jan-10	7	2	85.37	
7-Jan-10	8	2	87.31	
7-Jan-10	9	2	85.48	
7-Jan-10	10	2	86.04	

**Table 2.** Cetacean sightings during aerial surveys in the JAX USWTR study region during Dec 24, 2009- Jan 18, 2010.

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Group Size
22-Dec-09	10:27	On	30.097936	-80.611650	3	Unid. Delphinid	1
22-Dec-09	11:17	On	30.166376	-80.683375	4	Unid. Delphinid	3
22-Dec-09	12:12	On	30.297574	-80.405397	6	Unid. Delphinid	3
22-Dec-09	14:16	On	30.363803	-80.206578	7	<i>T. truncatus</i>	50
22-Dec-09	15:23	On	30.499372	-80.249891	9	<i>T. truncatus</i>	4
22-Dec-09	15:45	On	30.497783	-79.816314	9	<i>T. truncatus</i>	3
22-Dec-09	16:13	On	30.564581	-80.305144	10	Unid. Delphinid	1
7-Jan-10	10:50	On	30.028720	-80.690989	2	<i>T. truncatus</i>	1
7-Jan-10	12:02	On	30.164537	-80.559666	4	<i>T. truncatus</i>	2
7-Jan-10	15:17	Off	30.349972	-80.619776	7	<i>S. frontalis</i>	65
7-Jan-10	15:54	On	30.439802	-79.890082	8	<i>T. truncatus</i>	45

**Table 3 (2x pages).** Sea turtle sightings during aerial surveys in the JAX USWTR study region during Dec 24, 2009- Jan 18, 2010.

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Group Size
22-Dec-09	8:54	On	29.965498	-80.401568	1	<i>C. caretta</i>	1
22-Dec-09	8:58	On	29.965947	-80.244734	1	<i>C. caretta</i>	1
22-Dec-09	9:18	On	30.031820	-79.988273	2	<i>C. caretta</i>	1
22-Dec-09	9:32	On	30.031990	-80.516822	2	<i>C. caretta</i>	1
22-Dec-09	9:35	On	30.031993	-80.622506	2	<i>C. caretta</i>	1
22-Dec-09	10:35	On	30.100800	-80.324777	3	<i>C. caretta</i>	1
22-Dec-09	10:36	On	30.100410	-80.283564	3	<i>C. caretta</i>	1
22-Dec-09	11:31	On	30.232466	-80.545990	5	<i>C. caretta</i>	1
22-Dec-09	11:33	On	30.232962	-80.468077	5	<i>C. caretta</i>	1
22-Dec-09	11:36	On	30.233110	-80.332826	5	<i>C. caretta</i>	1
22-Dec-09	12:06	On	30.300739	-80.258858	6	<i>C. caretta</i>	1
22-Dec-09	12:06	On	30.300584	-80.275585	6	<i>C. caretta</i>	1
22-Dec-09	12:07	On	30.300488	-80.291179	6	<i>C. caretta</i>	1
22-Dec-09	14:05	On	30.365169	-80.549155	7	<i>C. caretta</i>	1
22-Dec-09	14:07	On	30.365643	-80.485548	7	<i>C. caretta</i>	1
22-Dec-09	14:49	On	30.433780	-80.375603	8	<i>C. caretta</i>	2
22-Dec-09	15:09	On	30.499047	-80.505264	9	<i>C. caretta</i>	1
22-Dec-09	15:11	On	30.499153	-80.430882	9	Unid. sea turtle	1
22-Dec-09	15:14	On	30.499460	-80.302333	9	<i>C. caretta</i>	1



Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Group Size
22-Dec-09	15:15	On	30.499046	-80.270865	9	<i>C. caretta</i>	1
22-Dec-09	16:11	On	30.567508	-80.285777	10	<i>C. caretta</i>	1
22-Dec-09	16:23	On	30.567339	-80.424851	10	<i>C. caretta</i>	1
22-Dec-09	16:28	On	30.566978	-80.598099	10	Unid. sea turtle	1
7-Jan-10	10:32	On	30.030968	-80.257298	2	<i>C. caretta</i>	1
7-Jan-10	10:39	On	30.030648	-80.491165	2	<i>C. caretta</i>	1
7-Jan-10	11:57	On	30.165740	-80.441015	4	<i>C. caretta</i>	1
7-Jan-10	13:14	On	30.299153	-80.557557	6	<i>C. caretta</i>	1
7-Jan-10	14:59	On	30.366124	-80.667015	7	<i>C. caretta</i>	1
7-Jan-10	15:25	On	30.368561	-80.481447	7	<i>C. caretta</i>	1
7-Jan-10	15:30	On	30.367835	-80.287313	7	<i>C. caretta</i>	1
7-Jan-10	16:09	On	30.431476	-80.159948	8	Unid. sea turtle	1
7-Jan-10	16:12	On	30.432876	-80.266783	8	Unid. sea turtle	1
7-Jan-10	16:16	On	30.432587	-80.392421	8	<i>C. caretta</i>	1
7-Jan-10	16:25	On	30.432106	-80.493542	8	<i>C. caretta</i>	2
7-Jan-10	16:27	On	30.432251	-80.551611	8	<i>C. caretta</i>	1
7-Jan-10	16:35	On	30.496968	-80.652018	9	<i>C. caretta</i>	1
7-Jan-10	16:37	On	30.499251	-80.585836	9	<i>C. caretta</i>	1
7-Jan-10	16:37	On	30.499347	-80.583876	9	<i>C. caretta</i>	1
7-Jan-10	16:38	On	30.500025	-80.538136	9	<i>C. caretta</i>	1
7-Jan-10	16:40	On	30.500468	-80.474392	9	<i>C. caretta</i>	1
7-Jan-10	17:26	On	30.565993	-80.585532	10	<i>C. caretta</i>	1

**Table 4.** Vessel survey effort table for the JAX USWTR study region during Dec 24, 2009- Jan 18, 2010.

Date	Line	Sea State	Kilometers Surveyed
13-Jan-09	10	2 to 3	86.03
14-Jan-09	8	2 to3	86.08

**Table 5.** Cetacean and sea turtle sightings for vessel surveys in JAX study region during Dec 23, 2009- Jan 18, 2010.

Date	Time	On/Off Effort	Latitude	Longitude	Line	Species	Group Size
13-Jan-10	10:29	On	30.567982	-80.628400	10	<i>T. truncatus</i>	5
13-Jan-10	11:06	Off	30.564430	-80.512458	10	<i>C. caretta</i>	1
13-Jan-10	11:35	On	30.564930	-80.432060	10	<i>T. truncatus</i>	2
13-Jan-10	11:53	On	30.569257	-80.395757	10	<i>T. truncatus</i>	2
13-Jan-10	12:45	On	30.572975	-80.254310	10	Unid. delphinid	1
13-Jan-10	13:05	On	30.573375	-80.194413	10	<i>D. coriacea</i>	1
13-Jan-10	14:51	On	30.569478	-79.858819	10	<i>Stenella sp.</i>	1
14-Jan-10	12:47	On	30.441682	-80.398922	8	Unid. delphinid	3
14-Jan-10	12:52	On	30.441505	-80.379987	8	<i>C. caretta</i>	1
14-Jan-10	13:13	Off	30.430632	-80.362470	8	<i>S. frontalis</i>	8
14-Jan-10	13:25	On	30.427455	-80.338912	8	<i>S. frontalis</i>	7
14-Jan-10	14:04	On	30.441954	-80.205903	8	<i>C. caretta</i>	1

**Table 6.** Cetacean and sea turtle sightings during pop-up buoy recovery on January 7, 2010 in the JAX USWTR study region.

Date	Time	On/Off Effort	Latitude	Longitude	Line	Species	Group Size
10-Jan-10	11:21	Off Effort	30.324103	-80.639342	N/A	<i>T. truncatus</i>	4
10-Jan-10	11:59	Off Effort	30.250613	-80.492775	N/A	<i>C. mydas</i>	1
10-Jan-10	12:59	Off Effort	30.137303	-80.275460	N/A	<i>C. mydas</i>	1

**Table 7.** Aerial survey effort table for the Onslow Bay USWTR study region during Dec 23, 2009- Jan 18, 2010.

Date	Line	Sea State	Kilometers Flown	Hobbs Hours	
14-Jan-10	5	1 to 2	74.3	6.7	
14-Jan-10	6	1 to 3	72.0		
14-Jan-10	7	1 to 2	72.6		
14-Jan-10	8	1 to 3	74.3		
14-Jan-10	9	1 to 2	71.0		
14-Jan-10	10	1 to 2	73.4		
14-Jan-10	4	2 to 3	74.9		
14-Jan-10	3	2 to 3	74.7		
14-Jan-10	2	2	76.4		
14-Jan-10	1	2	73.8		
15-Jan-10	1	2 to 3	77.6		7.8
15-Jan-10	2	2 to 3	73.4		
15-Jan-10	3	2 to 3	75.0		
15-Jan-10	4	2 to 3	72.6		
15-Jan-10	5	2 to 3	72.6		
15-Jan-10	6	2 to 3	73.6		
15-Jan-10	7	2	65.9		
15-Jan-10	8	2	74.9		
15-Jan-10	9	2	73.8		
15-Jan-10	10	2	73.1		

**Table 8.** Cetacean sightings during aerial surveys in the Onslow Bay USWTR study region during Dec 24, 2009- Jan 18, 2010.

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Group Size
14-Jan-10	10:34	On Effort	33.668686	-76.355825	6	<i>T. truncatus</i>	5
14-Jan-10	10:44	On Effort	33.740090	-76.452193	6	<i>T. truncatus</i>	5
14-Jan-10	11:33	On Effort	33.805552	-76.393617	7	<i>T. truncatus</i>	3
14-Jan-10	11:51	On Effort	33.746017	-76.176662	8	<i>T. truncatus</i>	15
14-Jan-10	13:01	On Effort	33.829063	-76.035037	10	<i>T. truncatus</i>	1
14-Jan-10	13:25	On Effort	34.276465	-76.603520	10	<i>S. frontalis</i>	37
15-Jan-10	9:45	On Effort	33.558281	-76.738722	2	<i>T. truncatus</i>	8
15-Jan-10	10:39	On Effort	33.602597	-76.529002	4	<i>T. truncatus</i>	20
15-Jan-10	11:25	On Effort	33.698764	-76.511070	5	<i>T. truncatus</i>	22
15-Jan-10	11:44	Off Effort	33.601521	-76.270769	5	<i>T. truncatus</i>	8
15-Jan-10	12:02	On Effort	33.725468	-76.420365	6	<i>T. truncatus</i>	14
15-Jan-10	12:23	On Effort	34.041882	-76.828397	6	<i>T. truncatus</i>	3
15-Jan-10	12:35	On Effort	34.061379	-76.860277	6	<i>T. truncatus</i>	46
15-Jan-10	14:27	On Effort	34.074558	-76.731663	7	<i>S. frontalis</i>	30
15-Jan-10	14:43	On Effort	33.917354	-76.538055	7	<i>S. frontalis</i>	28
15-Jan-10	15:02	On Effort	33.709471	-76.265296	7	<i>T. truncatus</i>	27
15-Jan-10	15:09	Off Effort	33.663290	-76.193747	7 & 8	<i>G. griseus</i>	5
15-Jan-10	16:29	On Effort	34.156027	-76.457154	10	<i>S. frontalis</i>	47

**Table 9 (2x pages).** Sea turtle sightings during aerial surveys in the Onslow Bay USWTR study region during Dec 23, 2009-Jan 18, 2010.

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Group Size
14-Jan-10	10:07	On Effort	33.965648	-76.867731	5	Unidentified turtle	2
14-Jan-10	10:09	On Effort	33.923697	-76.811427	5	C. caretta	1
14-Jan-10	10:12	On Effort	33.840001	-76.702502	5	Unidentified turtle	1
14-Jan-10	10:14	On Effort	33.814917	-76.669130	5	C. caretta	1
14-Jan-10	10:17	On Effort	33.746442	-76.579315	5	Unidentified turtle	3
14-Jan-10	10:30	On Effort	33.646098	-76.317713	6	C. caretta	2
14-Jan-10	10:30	On Effort	33.638825	-76.306292	6	C. caretta	1
14-Jan-10	10:31	On Effort	33.670578	-76.352304	6	C. caretta	1
14-Jan-10	11:04	On Effort	33.874559	-76.619818	6	C. caretta	1
14-Jan-10	11:04	On Effort	33.872254	-76.616934	6	C. caretta	1
14-Jan-10	11:06	On Effort	33.909722	-76.665854	6	C. caretta	2
14-Jan-10	11:06	On Effort	33.914810	-76.672279	6	C. caretta	1
14-Jan-10	11:07	On Effort	33.944545	-76.712111	6	Unidentified turtle	1
14-Jan-10	11:08	On Effort	33.966343	-76.740460	6	Unidentified turtle	6
14-Jan-10	11:09	On Effort	33.985336	-76.765886	6	C. caretta	1
14-Jan-10	11:10	On Effort	33.995354	-76.779329	6	Unidentified turtle	1
14-Jan-10	11:11	On Effort	34.024434	-76.817598	6	C. caretta	4
14-Jan-10	11:18	On Effort	34.092177	-76.764066	7	C. caretta	1
14-Jan-10	11:19	On Effort	34.059438	-76.720813	7	Unidentified turtle	3
14-Jan-10	11:20	On Effort	34.045413	-76.702587	7	Unidentified turtle	1
14-Jan-10	11:21	On Effort	34.012311	-76.659354	7	C. caretta	4
14-Jan-10	11:21	On Effort	34.005927	-76.650882	7	Unidentified turtle	1
14-Jan-10	11:23	On Effort	33.977871	-76.613812	7	C. caretta	4
14-Jan-10	11:23	On Effort	33.967905	-76.601169	7	C. caretta	1
14-Jan-10	11:24	On Effort	33.946586	-76.573009	7	Unidentified turtle	3
14-Jan-10	12:08	On Effort	33.916353	-76.408430	8	Unidentified turtle	1
14-Jan-10	12:09	On Effort	33.928146	-76.423492	8	C. caretta	2
14-Jan-10	12:12	On Effort	33.993659	-76.508969	8	Unidentified turtle	3
14-Jan-10	12:12	On Effort	33.993358	-76.508537	8	Unidentified turtle	1
14-Jan-10	12:13	On Effort	34.023472	-76.548059	8	Unidentified turtle	2
14-Jan-10	12:14	On Effort	34.036416	-76.565283	8	Unidentified turtle	2
14-Jan-10	12:15	On Effort	34.051552	-76.585052	8	Unidentified turtle	3
14-Jan-10	12:17	On Effort	34.100200	-76.649405	8	C. caretta	2
14-Jan-10	12:27	On Effort	34.139535	-76.575368	9	Unidentified turtle	1
14-Jan-10	12:28	On Effort	34.117338	-76.545862	9	C. caretta	6
14-Jan-10	12:28	On Effort	34.106038	-76.531052	9	C. caretta	3
14-Jan-10	12:30	On Effort	34.071325	-76.485160	9	C. caretta	2
14-Jan-10	13:15	On Effort	34.082984	-76.367326	10	Unidentified turtle	1
14-Jan-10	13:18	On Effort	34.144279	-76.446622	10	C. caretta	1

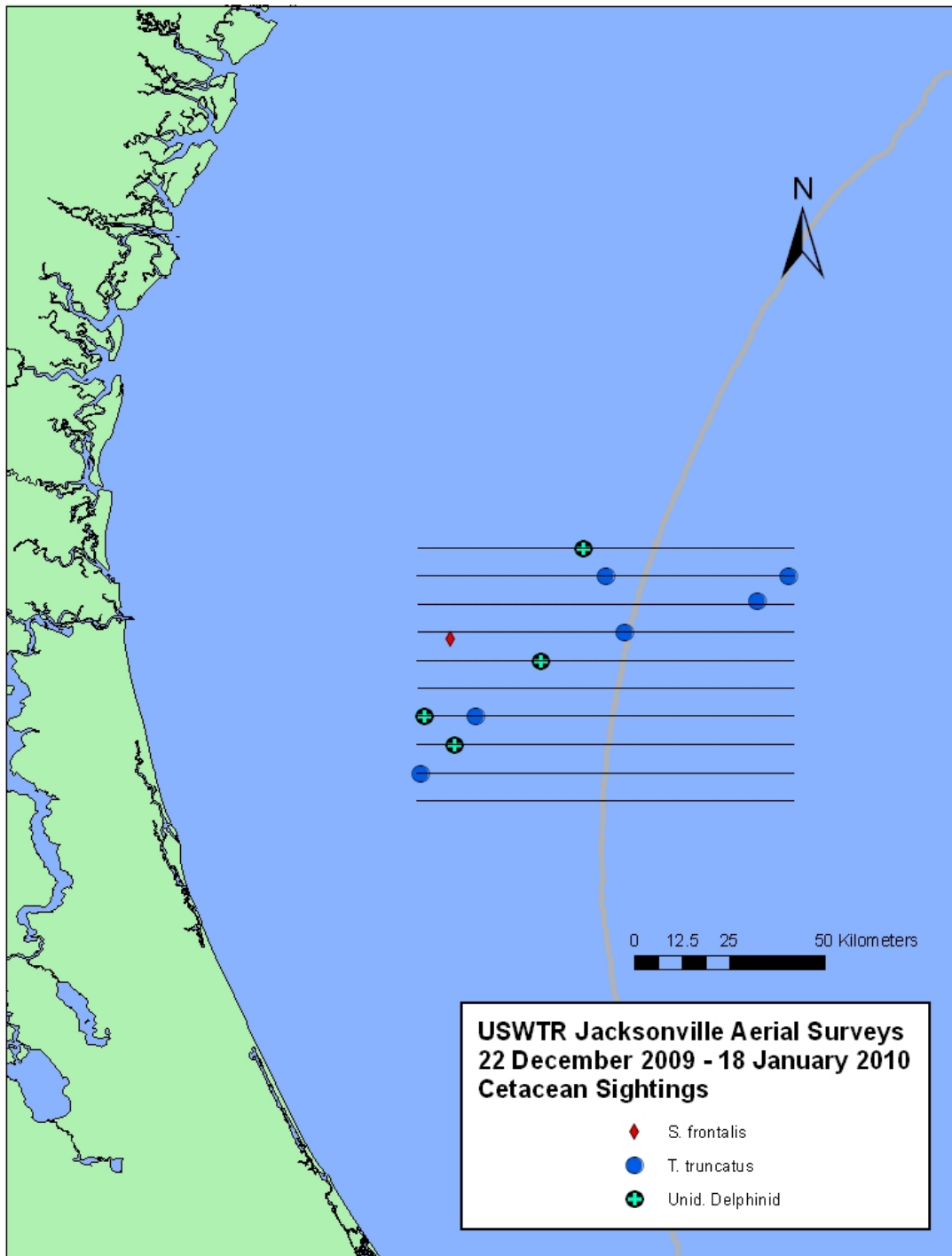
Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Group Size
14-Jan-10	13:20	On Effort	34.189273	-76.504534	10	C. caretta	1
14-Jan-10	15:02	On Effort	33.665026	-76.598966	4	Unidentified turtle	1
14-Jan-10	15:25	On Effort	33.715429	-76.805102	3	Unidentified turtle	1
14-Jan-10	15:30	On Effort	33.821663	-76.946388	3	Unidentified turtle	1
14-Jan-10	15:40	On Effort	33.789380	-77.028498	2	Unidentified turtle	1
14-Jan-10	16:12	On Effort	33.607468	-76.925138	1	C. caretta	1
14-Jan-10	16:16	On Effort	33.691822	-77.036045	1	C. caretta	1
15-Jan-10	9:14	On Effort	33.641101	-76.967232	1	Unidentified turtle	1
15-Jan-10	9:15	On Effort	33.604474	-76.919300	1	C. caretta	1
15-Jan-10	9:17	On Effort	33.576127	-76.881928	1	C. caretta	1
15-Jan-10	9:17	On Effort	33.579637	-76.886918	1	C. caretta	1
15-Jan-10	9:55	On Effort	33.630946	-76.825886	2	C. caretta	1
15-Jan-10	9:55	On Effort	33.639060	-76.836189	2	Unidentified turtle	1
15-Jan-10	9:57	On Effort	33.666273	-76.872060	2	C. caretta	1
15-Jan-10	9:59	On Effort	33.712078	-76.931008	2	Unidentified turtle	1
15-Jan-10	10:02	On Effort	33.771174	-77.007343	2	Unidentified turtle	1
15-Jan-10	10:13	On Effort	33.830949	-76.955997	3	C. caretta	2
15-Jan-10	10:18	On Effort	33.711685	-76.801000	3	C. caretta	1
15-Jan-10	10:18	On Effort	33.710213	-76.799080	3	C. caretta	5
15-Jan-10	10:55	On Effort	33.741221	-76.702998	4	C. caretta	2
15-Jan-10	10:56	On Effort	33.773269	-76.745160	4	C. caretta	1
15-Jan-10	11:00	On Effort	33.847695	-76.843923	4	C. caretta	3
15-Jan-10	11:05	On Effort	33.952166	-76.982796	4	C. caretta	1
15-Jan-10	11:05	On Effort	33.948782	-76.978225	4	C. caretta	1
15-Jan-10	11:10	On Effort	33.990576	-76.898168	5	Unidentified turtle	1
15-Jan-10	11:12	On Effort	33.948889	-76.846308	5	C. caretta	1
15-Jan-10	11:20	On Effort	33.761875	-76.599828	5	C. caretta	1
15-Jan-10	12:10	On Effort	33.863797	-76.604394	6	C. caretta	5
15-Jan-10	12:11	On Effort	33.874170	-76.618101	6	C. caretta	2
15-Jan-10	12:12	On Effort	33.907346	-76.661745	6	C. caretta	2
15-Jan-10	12:15	On Effort	33.959703	-76.731066	6	C. caretta	3
15-Jan-10	12:15	On Effort	33.978821	-76.756144	6	C. caretta	2
15-Jan-10	12:16	On Effort	33.990441	-76.771721	6	C. caretta	2
15-Jan-10	12:17	On Effort	34.012474	-76.800743	6	C. caretta	1
15-Jan-10	14:25	On Effort	34.087031	-76.757116	7	C. caretta	2
15-Jan-10	14:37	On Effort	34.042827	-76.702060	7	C. caretta	1
15-Jan-10	14:39	On Effort	33.985401	-76.623156	7	C. caretta	2
15-Jan-10	14:40	On Effort	33.973712	-76.608101	7	C. caretta	1
15-Jan-10	15:31	On Effort	33.943784	-76.445273	8	C. caretta	1
15-Jan-10	15:32	On Effort	33.970031	-76.479706	8	Unidentified turtle	3
15-Jan-10	15:34	On Effort	34.022094	-76.547805	8	C. caretta	4
15-Jan-10	15:37	On Effort	34.087611	-76.633540	8	C. caretta	3
15-Jan-10	15:48	On Effort	34.116694	-76.541219	9	C. caretta	1
15-Jan-10	15:51	On Effort	34.041217	-76.444075	9	C. caretta	1
15-Jan-10	15:55	On Effort	34.014760	-76.408320	9	Unidentified turtle	1
15-Jan-10	16:18	On Effort	34.040514	-76.314311	10	C. caretta	1

**Table 10.** Effort table for vessel surveys in the Onslow Bay USWTR study region Dec. 24, 2009-Jan. 20, 2010.

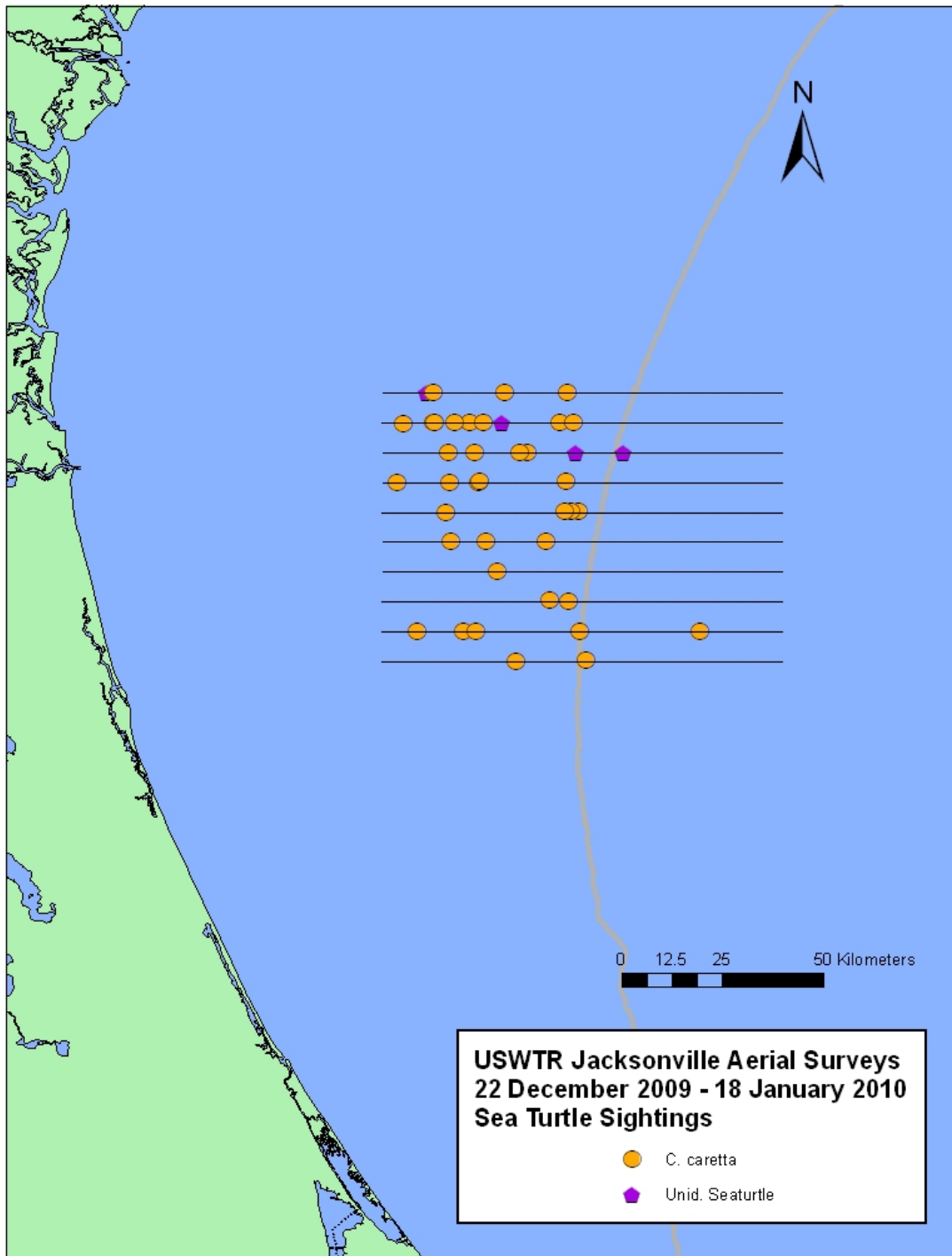
Date	Line	Sea State	Kilometers Surveyed
15-Jan-10	8	1 to 3	74.08
16-Jan-10	10	1 to 2	74.08

**Table 11.** Cetacean and sea turtle sightings during vessel surveys in the Onslow Bay USWTR study region Dec. 24, 2009-Jan. 20, 2010.

Date	Line	On/Off Effort	Time	Latitude	Longitude	Species	Group Size
15-Jan-10	8	On Effort	10:49:25	33.87121232	-76.35241463	<i>Tursiops truncatus</i>	3
15-Jan-10	8	On Effort	11:51:52	33.97257913	-76.48418642	<i>Caretta caretta</i>	1
15-Jan-10	8	On Effort	12:16:06	34.02118207	-76.54131083	<i>Caretta caretta</i>	1
15-Jan-10	8	On Effort	12:18:54	34.02904596	-76.54650791	<i>Caretta caretta</i>	1
15-Jan-10	8	On Effort	12:21:52	34.03573287	-76.56105396	<i>Caretta caretta</i>	1
15-Jan-10	8	On Effort	12:23:24	34.03721781	76.55807427	<i>Caretta caretta</i>	1
15-Jan-10	8	Off Effort	12:25:32	34.04200124	-76.55425806	<i>Caretta caretta</i>	1
15-Jan-10	8	On Effort	13:07:06	34.11310593	-76.65615506	<i>Caretta caretta</i>	1
15-Jan-10	8	On Effort	13:08:02	34.10988122	-76.65978769	<i>Caretta caretta</i>	1
15-Jan-10	8	On Effort	13:14:16	34.11967611	-76.69020911	<i>Stenella frontalis</i>	143
15-Jan-10	8	On Effort	14:01:58	34.16424703	-76.73084802	<i>Stenella frontalis</i>	24
15-Jan-10	8	Off Effort	14:12:48	34.16560371	-76.734773	<i>Caretta caretta</i>	1
16-Jan-10	10	On Effort	11:21:06	34.05210751	-76.33090789	<i>Stenella frontalis</i>	8
16-Jan-10	10	Off Effort	11:46:14	34.05775883	-76.33603748	<i>Caretta caretta</i>	1
16-Jan-10	10	On Effort	12:25:58	34.13519674	-76.43269955	<i>Stenella frontalis</i>	127
16-Jan-10	10	On Effort	14:06:16	34.2643833	-76.59539949	<i>Tusiops truncatus</i> or <i>Stenella frontalis</i>	10

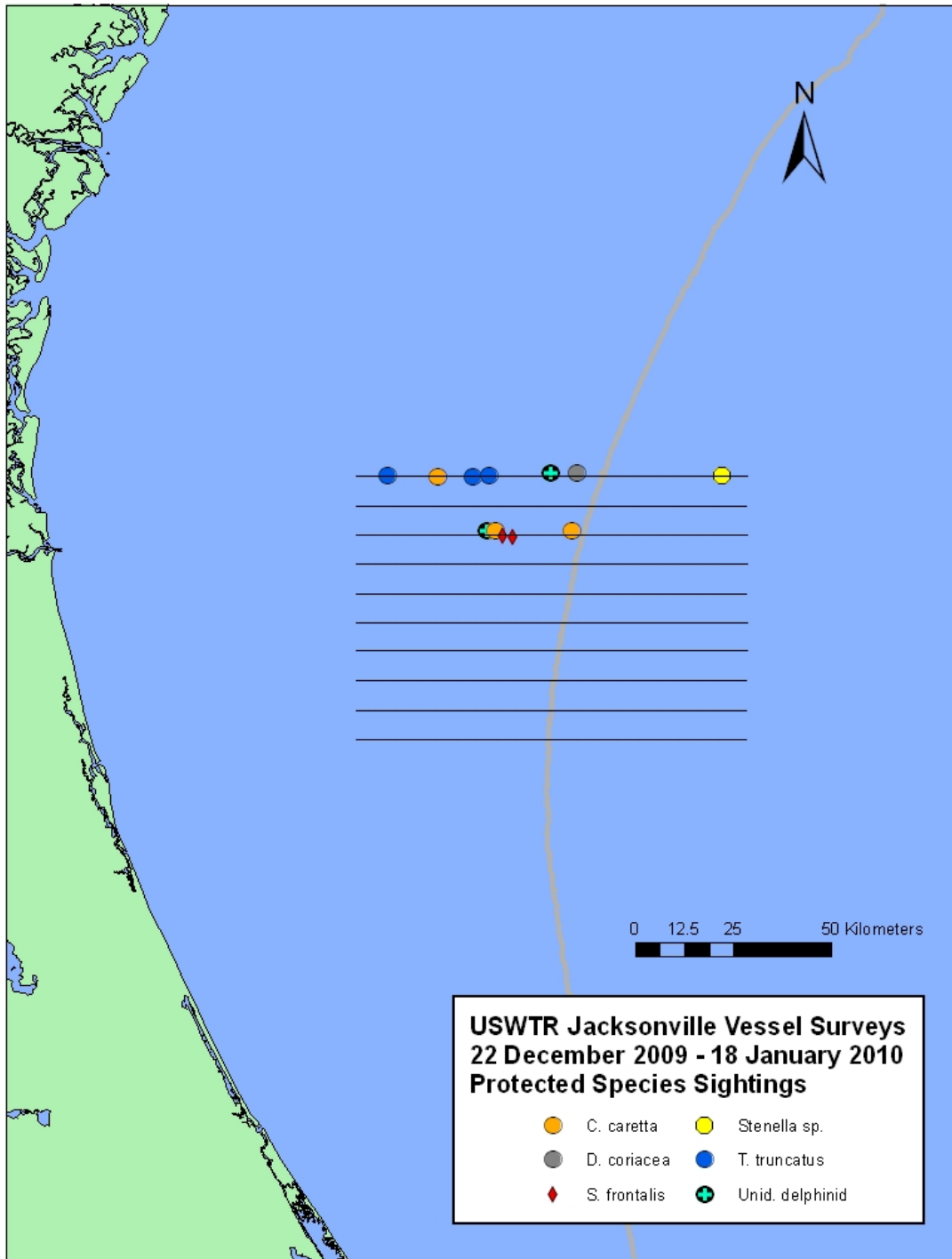


**Figure 1.** The locations of cetaceans sighted during aerial surveys on 22 Dec, 2009 and 11 Jan, 2010 of the JAX USWTR study region.

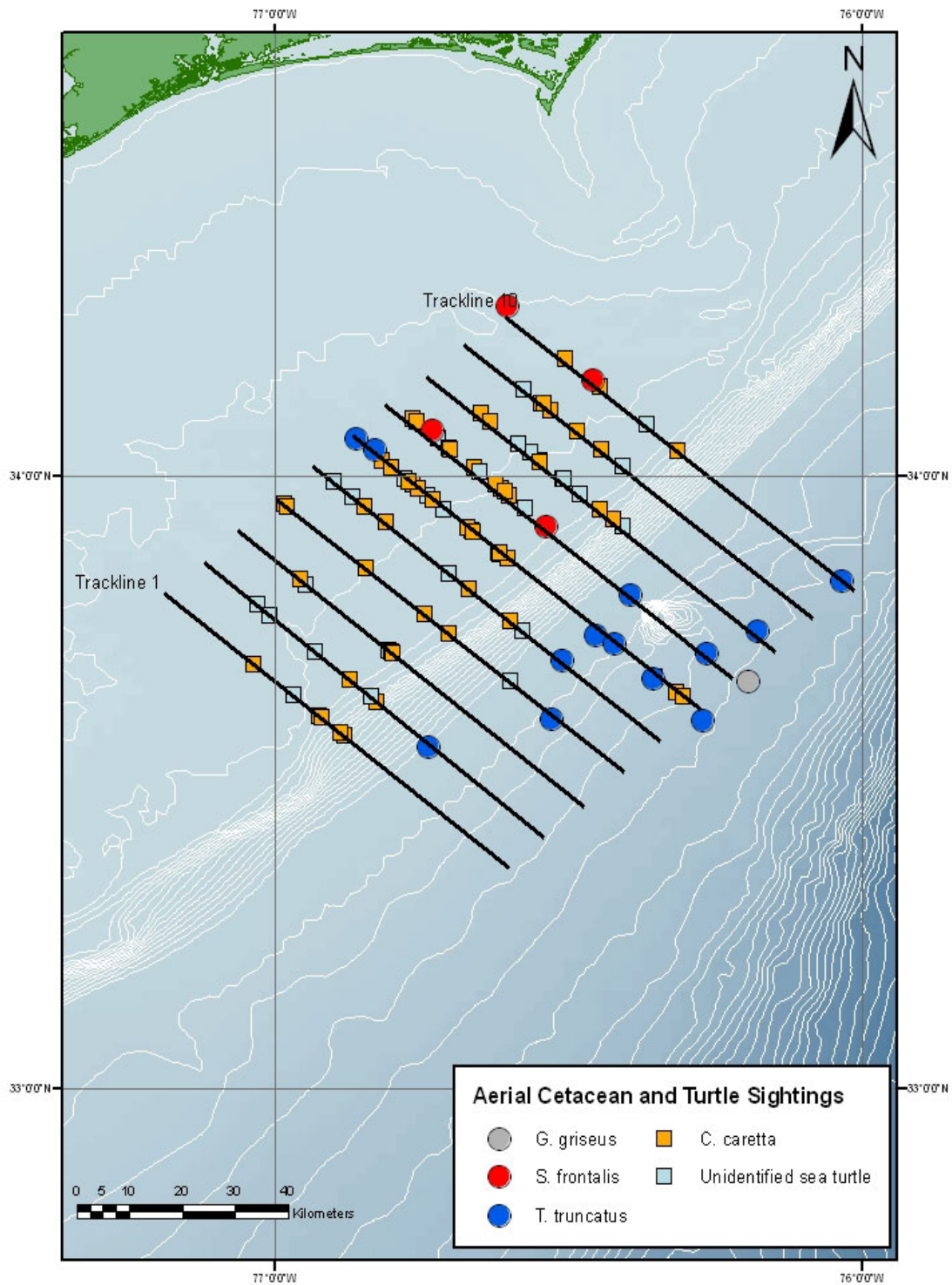


**Figure 2.** The locations of sea turtles sighted during aerial surveys on 22 Dec, 2009 and 11 Jan, 2010 of the JAX USWTR study region.

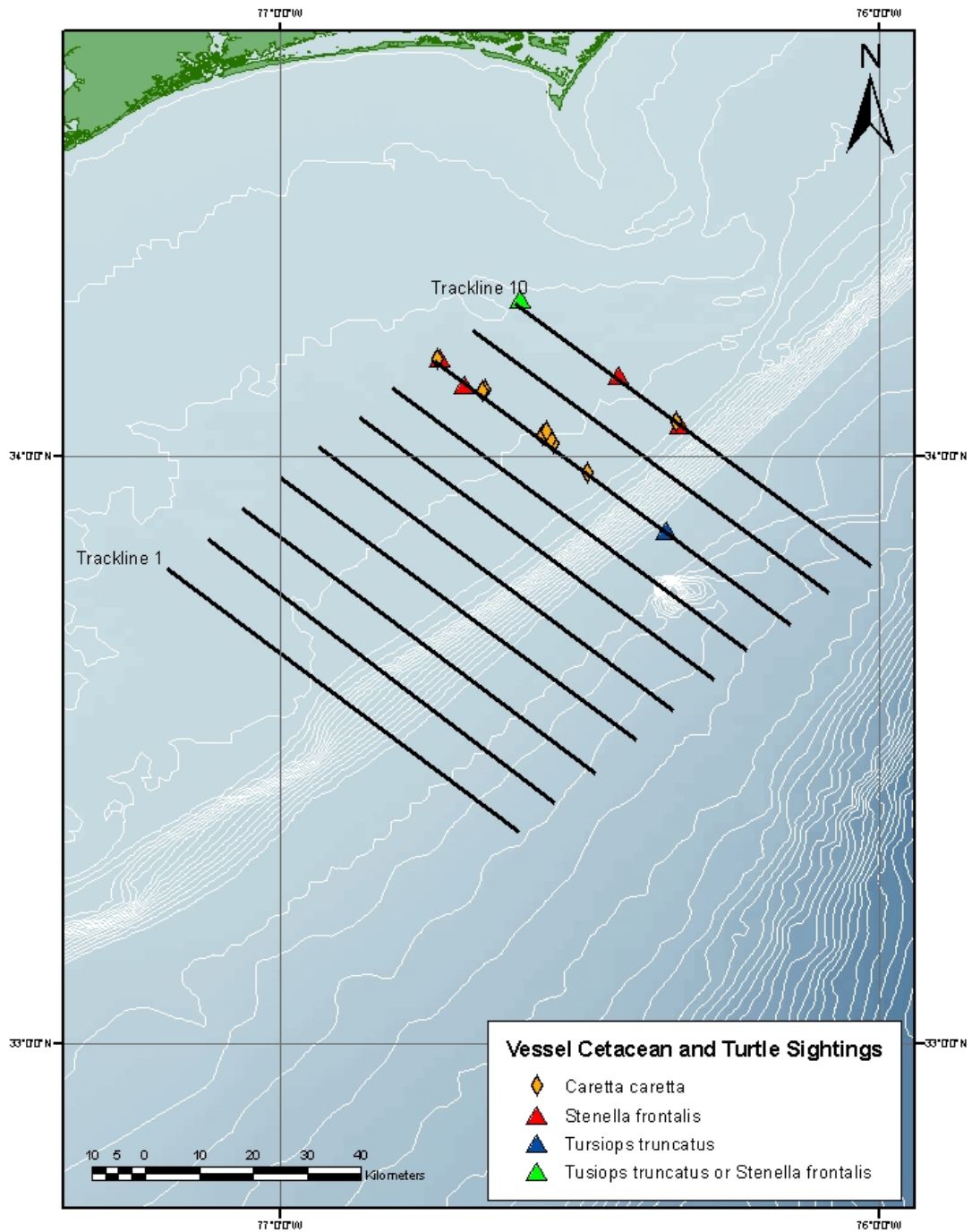




**Figure 3.** The locations of cetaceans and sea turtles sighted during vessel surveys on 13 and 14 Jan, 2010 of the JAX USWTR study region.



**Figure 4.** The locations of cetaceans and turtles sighted during aerial surveys on 14 and 15 Jan, 2010 of the Onslow Bay USWTR study region.



**Figure 5.** The locations of cetaceans and turtles sighted during vessel surveys on 15 and 16 Jan, 2010 of the Onslow Bay USWTR study region.

## **Monitoring of Protected Species in the Proposed Onslow Bay and Jacksonville USWTRs**

Progress Report: January 19, 2010 through February 23, 2010

### **Planning (Task 1, 2 & 3)**

During this reporting period Duke and UNCW project PIs and team members developed a proposal for a second modification to the Parsons contract in response to further Navy monitoring needs in both Onslow Bay and Jacksonville USWTR study regions. This included the development of a revised cost estimate and technical proposal, and a detailed review and submission of cost backup documentation to accompany the proposal. Jen Dunn coordinated the rapid development of this proposal and collated detailed cost backup information for the proposal.

### **Purchasing (Task 1).**

One pair of headsets originally purchased at the beginning of this project was sent back to David Clark for refurbishment to replace ear cups and wiring which cost  $\frac{1}{4}$  of the original purchase price. Office staples were purchased to re-supply the Fernandina office. Consumable supplies for HARP redeployments (tape, batteries, cable ties) were also purchased.

### **Travel (Task 1 & 3)**

D. Ann Pabst and William McLellan (Co-PIs) traveled to Fernandina Beach on a re-supply trip and to conduct performance evaluations with UNCW staff members. Co-PI Johnston traveled to Fernandina Beach with Scripps engineer Chris Garsha to help refurbish HARP units in the JAX USWTR study region. Ryan McAlarney and Erin Cummings, UNCW Onslow Bay observers, traveled to Fernandina Beach where they joined the JAX team in conducting dual platform aerial and vessel surveys in the Jacksonville USWTR site. This represents the first effort where both aerial and vessel surveys were conducted simultaneously at the Jacksonville site.

### **JAX Survey Activity (Task 2)**

#### Aerial Surveys

A total of 66 track lines were flown during the current reporting period. Ten lines were flown on January 19<sup>th</sup>, 20<sup>th</sup>, 27<sup>th</sup>, February 19<sup>th</sup>, 20<sup>th</sup>, 21<sup>st</sup> and 6 lines on January 28<sup>th</sup>. Weather conditions for the surveys (Table 1) ranged from fair to excellent. There were a total of 76 cetacean encounters during aerial surveys for this period. Species observed were *Tursiops truncatus* (37 sightings), *Stenella frontalis* (26 sightings), *Grampus griseus* (2 sightings), *Balaenoptera acutorostrata* (2 sightings), *Stenella* sp. (1 sighting) and 8 sightings of unidentified delphinids (Table 2). Numerous sea turtles were noted during this reporting period. *Caretta caretta* and *Dermochelys coriacea* were seen regularly along with many unidentified sea turtles (Table 3). Please see Figure 1 for the locations of cetacean sightings and Figure 2 for the locations of sea turtle sightings during aerial surveys.

### Vessel Surveys

Two vessel surveys were attempted from the *R/V Volute* during this reporting period; however, the survey for 27 January was aborted at the nearshore end of the survey area due to seas higher than forecasted. A survey of trackline 6 was completed the next day, and was truncated by 21 kilometers due to an aircraft carrier at the offshore end of the line that closed vessel traffic on the site (Table 4). There were three cetacean sightings (one *S. frontalis*, one *T. truncatus* and one unidentified delphinid) and three sea turtle encounters (two *C. caretta* and one *D. coriacea*) during the survey (Table 5; Figure 3).

### Towed Passive Acoustics

On 28 January the towed acoustic array was deployed from the *R/V Volute* for a total of 283 minutes. Forty-six minutes of recordings were acquired encompassing three visual sighting events, one *S. frontalis*, one *T. truncatus* and one unidentified delphinid.

### **JAX HARPs (Task 3)**

The JAX HARPs were refurbished during this reporting period. We recovered both instruments without any issues, and have developed a smooth system for launch and recovery with Alex Loer and the *R/V Stellwagen*. After retrieval, it was discovered that the inshore HARP did not initialize after deployment. It remains unclear why. The batteries were found drained and one connection within the Ethernet communications system was found disconnected. The instrument was thoroughly tested, refurbished and deployed in the offshore site. The second HARP was also recovered without issues and appears to have functioned normally for over half the deployment period. An initial inspection of the hydrophone revealed that it had been flooded with seawater at some point during the deployment. A quick review of the disks revealed that sometime at the end of the year (during December 2009) the data stream was compromised by this saltwater invasion. A further inspection of the hydrophone casing revealed several small scratches beside a clean sigmoidal gash about an inch long that penetrated the hydrophone casing. All indications suggest that a marine mammal or shark had chewed on the hydrophone. This second instrument had a CPU and memory board upgrade and it is ready to be redeployed when a new hydrophone is ready. The redeployment of the second unit is tentatively scheduled to occur between March 2 and 14. Scripps personnel will return to install and verify the new hydrophone and finish the redeployment.

### **Onslow Bay Survey Activity (Task 5)**

#### Aerial Surveys

Aerial survey effort was conducted during this reporting period in which all ten lines were covered once. Survey conditions were good with most of the effort being conducted in a BSS 2-3 (Table 6). There were four cetacean sightings: two *S. frontalis*, one *T. truncatus* and one *Globicephala macrorhynchus* (Table 7, Figure 4). For this last species this month marks the first on effort sighting within the range in winter months. This species was also seen in October during an on

effort survey leg transiting out to the USWTR range. There were also a number of sea turtle sightings recorded within the range this month with *C. caretta* being the dominant species (Table 8, Figure 4).

#### Vessel Surveys

There was no vessel survey effort from Jan 24-Feb 23, 2010 due to persistent inclement weather conditions.

#### Towed Passive Acoustics

There was no towed passive acoustics effort from Jan 24-Feb 23, 2010 due to persistent inclement weather conditions.

#### **Onslow HARPs (Task 6)**

Onslow HARPs are slated for refurbishment in April 2010.

#### **Exercise Monitoring (Task 7)**

No exercise monitoring was conducted during this reporting period.

#### **Additional Project Information**

No injuries were sustained during the reporting period.

No problems were encountered that precluded data collection.

**Table 1. (2x pages)** Aerial survey effort table for the JAX USWTR study region during Jan 19, 2010 - Feb 23, 2010.

Date	Line	Sea State	Kilometers Flown	HOBBS Hours
19-Jan-10	10	1-2	85.5	7.3
19-Jan-10	9	1-2	86.5	
19-Jan-10	8	1-2	86.3	
19-Jan-10	7	1-2	86.9	
19-Jan-10	6	2-3	85.6	
19-Jan-10	5	2	86.5	
19-Jan-10	4	1-2	87.2	
19-Jan-10	3	1-2	86.0	
19-Jan-10	2	1-3	78.2	
19-Jan-10	1	1-3	87.3	
20-Jan-10	1	2-3	85.4	7.3
20-Jan-10	2	2	83.0	
20-Jan-10	3	2	83.9	
20-Jan-10	4	1-2	86.6	
20-Jan-10	5	1-2	86.3	
20-Jan-10	6	1-2	83.0	
20-Jan-10	7	1-2	77.1	
20-Jan-10	8	1-2	83.6	
20-Jan-10	9	1-2	82.8	
20-Jan-10	10	1-2	81.3	
27-Jan-10	10	3-4	85.2	7.1
27-Jan-10	9	3-4	87.0	
27-Jan-10	8	3-4	86.3	
27-Jan-10	7	2-4	86.5	
27-Jan-10	6	3-4	86.5	
27-Jan-10	5	2-4	86.4	
27-Jan-10	4	2-4	86.4	
27-Jan-10	3	2-4	86.2	
27-Jan-10	2	2-4	86.5	
27-Jan-10	1	2-4	85.3	
28-Jan-10	1	2-3	82.0	5.8
28-Jan-10	2	1-3	86.2	
28-Jan-10	3	1-3	84.4	
28-Jan-10	4	1-3	87.0	
28-Jan-10	5	2-3	83.2	
28-Jan-10	6	2-3	84.8	
19-Feb-10	1	3-4	86.6	6.5
19-Feb-10	2	3	86.6	
19-Feb-10	3	3	86.3	
19-Feb-10	4	2-3	86.5	
19-Feb-10	5	3	86.1	
19-Feb-10	6	2-3	86.3	
19-Feb-10	7	1-3	86.1	
19-Feb-10	8	1-3	87.4	
19-Feb-10	9	1-3	86.0	
19-Feb-10	10	1-3	85.9	

Date	Line	Sea State	Kilometers Flown	HOBBS Hours
20-Feb-10	10	1-2	85.5	8.0
20-Feb-10	9	1-2	86.3	
20-Feb-10	8	1-2	85.0	
20-Feb-10	7	1-2	86.3	
20-Feb-10	6	1-3	81.5	
20-Feb-10	5	1-3	83.9	
20-Feb-10	4	1-3	85.7	
20-Feb-10	3	1-3	83.9	
20-Feb-10	2	1-3	84.4	
20-Feb-10	1	1-3	84.0	
21-Feb-10	1	1-2	86.5	
21-Feb-10	2	1-2	85.2	
21-Feb-10	3	1-2	83.5	
21-Feb-10	4	1-2	84.8	
21-Feb-10	5	1-2	81.7	
21-Feb-10	6	1	80.8	
21-Feb-10	7	1	77.4	
21-Feb-10	8	1	85.3	
21-Feb-10	9	1-2	85.4	
21-Feb-10	10	1-2	85.0	



**Table 2 (2x pages).** Cetacean sightings during aerial surveys in the JAX USWTR study region during Jan 19, 2010 - Feb 23, 2010.

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Group Size
19-Jan-10	10:18	On Effort	30.368094	-79.839967	7	<i>T. truncatus</i>	10
19-Jan-10	10:23	On Effort	30.362928	-79.864591	7	<i>T. truncatus</i>	5
19-Jan-10	11:20	On Effort	30.300247	-79.821877	6	<i>T. truncatus</i>	11
19-Jan-10	14:27	On Effort	30.091970	-80.385131	3	<i>T. truncatus</i>	4
19-Jan-10	14:54	On Effort	30.035396	-80.486387	2	<i>T. truncatus</i>	24
19-Jan-10	15:02	On Effort	30.034382	-80.374406	2	<i>T. truncatus</i>	2
19-Jan-10	15:23	On Effort	30.026904	-79.988553	2	<i>T. truncatus</i>	5
20-Jan-10	9:55	On Effort	30.035027	-80.409063	2	<i>S. frontalis</i>	3
20-Jan-10	10:03	On Effort	30.030747	-80.479153	2	<i>T. truncatus</i>	3
20-Jan-10	10:26	On Effort	30.098657	-80.691225	3	<i>T. truncatus</i>	3
20-Jan-10	10:48	On Effort	30.101009	-80.116509	3	<i>T. truncatus</i>	40
20-Jan-10	10:57	On Effort	30.104286	-79.992491	3	<i>T. truncatus</i>	5
20-Jan-10	12:07	On Effort	30.298620	-79.858260	6	<i>T. truncatus</i>	30
20-Jan-10	12:26	On Effort	30.301264	-80.488315	6	Unid. delphinid	1
20-Jan-10	14:07	On Effort	30.368279	-80.678521	7	<i>S. frontalis</i>	30
20-Jan-10	14:15	On Effort	30.363624	-80.499746	7	<i>S. frontalis</i>	15
20-Jan-10	14:23	On Effort	30.372688	-80.289967	7	<i>T. truncatus</i>	3
20-Jan-10	14:34	On Effort	30.361459	-80.084967	7	<i>T. truncatus</i>	14
20-Jan-10	15:06	On Effort	30.436033	-80.506570	8	<i>T. truncatus</i>	7
20-Jan-10	15:22	On Effort	30.501224	-80.530414	9	<i>S. frontalis</i>	7
20-Jan-10	15:48	On Effort	30.567242	-79.818377	10	<i>T. truncatus</i>	16
20-Jan-10	16:08	On Effort	30.562322	-80.363101	10	Unid. delphinid	14
27-Jan-10	15:26	On Effort	30.099334	-79.828985	3	Unid. delphinid	1
27-Jan-10	17:02	On Effort	29.965491	-80.641395	1	<i>Stenella sp.</i>	9
28-Jan-10	9:32	On Effort	29.959962	-80.573048	1	<i>T. truncatus</i>	5
28-Jan-10	9:52	On Effort	29.970192	-80.259753	1	Unid. delphinid	18
28-Jan-10	10:17	On Effort	29.968545	-80.057141	1	Unid. delphinid	1
28-Jan-10	11:04	On Effort	30.028005	-80.366154	2	<i>S. frontalis</i>	11
28-Jan-10	11:18	On Effort	30.030443	-80.658599	2	<i>T. truncatus</i>	2
28-Jan-10	11:41	On Effort	30.101081	-80.585021	3	<i>S. frontalis</i>	10
28-Jan-10	12:02	On Effort	30.096646	-80.444014	3	<i>S. frontalis</i>	8
28-Jan-10	12:59	On Effort	30.163580	-80.684992	4	<i>T. truncatus</i>	2
28-Jan-10	15:08	On Effort	30.230264	-80.524258	5	<i>T. truncatus</i>	3
28-Jan-10	15:23	On Effort	30.238250	-80.398262	5	<i>T. truncatus</i>	3
28-Jan-10	16:02	On Effort	30.302032	-80.120480	6	<i>G. griseus</i>	7
28-Jan-10	16:14	On Effort	30.300036	-80.337468	6	<i>T. truncatus</i>	3
20-Feb-10	10:33	On Effort	30.499955	-80.396613	9	<i>S. frontalis</i>	17
20-Feb-10	10:48	On Effort	30.500891	-80.618709	9	<i>S. frontalis</i>	2
20-Feb-10	10:56	On Effort	30.432762	-80.620269	8	Unid. delphinid	3
20-Feb-10	12:05	On Effort	30.368241	-80.652563	7	<i>S. frontalis</i>	10
20-Feb-10	12:18	Off Effort	30.295976	-80.599638	6	<i>S. frontalis</i>	2
20-Feb-10	12:27	On Effort	30.303476	-80.516636	6	<i>T. truncatus</i>	12
20-Feb-10	12:36	On Effort	30.298273	-80.473435	6	<i>S. frontalis</i>	3
20-Feb-10	12:42	On Effort	30.307844	-80.346851	6	<i>S. frontalis</i>	45
20-Feb-10	13:15	On Effort	30.234682	-80.064016	5	<i>B. acutorostrata</i>	1
20-Feb-10	13:35	On Effort	30.220544	-80.489406	5	<i>S. frontalis</i>	60
20-Feb-10	13:45	On Effort	30.238398	-80.693274	5	<i>T. truncatus</i>	1
20-Feb-10	15:26	On Effort	30.169151	-80.521569	4	<i>S. frontalis</i>	2
20-Feb-10	15:46	On Effort	30.163147	-79.885885	4	<i>T. truncatus</i>	3
20-Feb-10	16:17	On Effort	30.103998	-80.545810	3	<i>S. frontalis</i>	4

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Group Size
20-Feb-10	16:35	On Effort	30.037500	-80.374863	2	Unid. delphinid	5
20-Feb-10	16:59	On Effort	29.973820	-79.925572	1	Unid. delphinid	5
21-Feb-10	9:00	On Effort	30.034156	-79.805427	2	<i>T. truncatus</i>	4
21-Feb-10	9:10	On Effort	30.033649	-79.848469	2	<i>T. truncatus</i>	20
21-Feb-10	9:55	On Effort	30.090595	-80.509092	3	<i>T. truncatus</i>	8
21-Feb-10	10:02	On Effort	30.085494	-80.414333	3	<i>S. frontalis</i>	50
21-Feb-10	10:23	On Effort	30.104639	-79.864820	3	<i>T. truncatus</i>	26
21-Feb-10	10:43	On Effort	30.168803	-80.153954	4	<i>G. griseus</i>	7
21-Feb-10	11:01	On Effort	30.175268	-80.557259	4	<i>T. truncatus</i>	6
21-Feb-10	11:18	On Effort	30.228045	-80.672911	5	<i>T. truncatus</i>	1
21-Feb-10	11:27	On Effort	30.237415	-80.561136	5	<i>T. truncatus</i>	3
21-Feb-10	11:35	On Effort	30.236873	-80.491644	5	<i>T. truncatus</i>	3
21-Feb-10	11:47	On Effort	30.238243	-80.348145	5	<i>S. frontalis</i>	7
21-Feb-10	11:52	On Effort	30.236288	-80.292178	5	<i>T. truncatus</i>	8
21-Feb-10	12:16	On Effort	30.303635	-79.999596	6	<i>B. acutorostrata</i>	1
21-Feb-10	12:37	On Effort	30.307680	-80.465500	6	<i>S. frontalis</i>	40
21-Feb-10	14:26	On Effort	30.350682	-80.618624	7	<i>S. frontalis</i>	70
21-Feb-10	14:36	On Effort	30.370790	-80.462578	7	<i>S. frontalis</i>	18
21-Feb-10	14:42	On Effort	30.368036	-80.389323	7	<i>S. frontalis</i>	40
21-Feb-10	14:50	On Effort	30.354268	-80.344896	7	<i>T. truncatus</i>	6
21-Feb-10	15:10	On Effort	30.364399	-79.885563	7	<i>T. truncatus</i>	3
21-Feb-10	15:23	On Effort	30.430170	-80.025826	8	<i>T. truncatus</i>	13
21-Feb-10	15:43	On Effort	30.440175	-80.456014	8	<i>S. frontalis</i>	12
21-Feb-10	16:04	On Effort	30.493992	-80.358464	9	<i>S. frontalis</i>	30
21-Feb-10	16:36	On Effort	30.572472	-80.277572	10	<i>S. frontalis</i>	18
21-Feb-10	16:48	On Effort	30.566559	-80.608603	10	<i>S. frontalis</i>	18

**Table 3 (4x pages).** Sea turtle sightings during aerial surveys in the JAX USWTR study region during Jan 19, 2010 - Feb 23, 2010.

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Group Size
19-Jan-10	9:56	On	30.434127	-80.352844	8	<i>C. caretta</i>	1
19-Jan-10	10:00	On	30.434214	-80.209340	8	<i>C. caretta</i>	1
19-Jan-10	11:39	On	30.232290	-80.274277	5	<i>C. caretta</i>	1
19-Jan-10	13:35	On	30.166912	-80.625587	4	<i>C. caretta</i>	1
19-Jan-10	13:38	On	30.167246	-80.536419	4	<i>C. caretta</i>	1
19-Jan-10	13:39	On	30.167200	-80.494497	4	<i>C. caretta</i>	2
19-Jan-10	13:45	On	30.168020	-80.272495	4	<i>C. caretta</i>	1
19-Jan-10	13:46	On	30.167973	-80.262807	4	<i>C. caretta</i>	1
19-Jan-10	14:41	On	30.099499	-80.368873	3	<i>C. caretta</i>	1
19-Jan-10	14:46	On	30.032010	-80.643162	2	<i>D. coriacea</i>	1
19-Jan-10	15:57	On	29.964911	-80.644896	1	<i>C. caretta</i>	1
20-Jan-10	9:06	On	29.966060	-80.596401	1	<i>C. caretta</i>	1
20-Jan-10	9:11	On	29.966406	-80.371544	1	Unid. Seaturtle	1
20-Jan-10	9:13	On	29.966369	-80.295468	1	<i>C. caretta</i>	2
20-Jan-10	9:50	On	30.030892	-80.271656	2	Unid. Seaturtle	1
20-Jan-10	9:53	On	30.031389	-80.358517	2	<i>C. caretta</i>	1
20-Jan-10	9:53	On	30.031303	-80.368874	2	Unid. Seaturtle	1
20-Jan-10	9:53	On	30.031389	-80.385767	2	Unid. Seaturtle	1
20-Jan-10	10:19	On	30.030901	-80.637721	2	<i>C. caretta</i>	1
20-Jan-10	10:20	On	30.030491	-80.694715	2	<i>C. caretta</i>	1
20-Jan-10	10:20	On	30.030468	-80.697535	2	<i>C. caretta</i>	1
20-Jan-10	10:35	On	30.100388	-80.625006	3	Unid. Seaturtle	1
20-Jan-10	10:37	On	30.100492	-80.548021	3	Unid. Seaturtle	2
20-Jan-10	10:40	On	30.100783	-80.408151	3	<i>C. caretta</i>	1
20-Jan-10	10:43	On	30.100923	-80.321203	3	<i>C. caretta</i>	1
20-Jan-10	10:44	On	30.100972	-80.272217	3	<i>C. caretta</i>	1
20-Jan-10	10:44	On	30.100979	-80.270201	3	<i>C. caretta</i>	1
20-Jan-10	11:24	On	30.166170	-80.355583	4	Unid. Seaturtle	1
20-Jan-10	11:25	On	30.166121	-80.409776	4	Unid. Seaturtle	1
20-Jan-10	11:26	On	30.168326	-80.424652	4	<i>D. coriacea</i>	2
20-Jan-10	11:32	On	30.165784	-80.588996	4	<i>C. caretta</i>	1
20-Jan-10	11:33	On	30.165797	-80.615828	4	<i>C. caretta</i>	1
20-Jan-10	11:45	On	30.233285	-80.401017	5	Unid. Seaturtle	1
20-Jan-10	11:50	On	30.233216	-80.289355	5	<i>C. caretta</i>	1
20-Jan-10	12:23	On	30.299760	-80.405974	6	Unid. Seaturtle	1
20-Jan-10	14:12	On	30.364375	-80.602241	7	<i>C. caretta</i>	1
20-Jan-10	14:13	On	30.367083	-80.571071	7	<i>C. caretta</i>	1
20-Jan-10	14:13	On	30.366684	-80.540792	7	<i>D. coriacea</i>	1
20-Jan-10	14:14	On	30.366801	-80.512023	7	Unid. Seaturtle	1
20-Jan-10	14:18	On	30.366792	-80.434054	7	<i>C. caretta</i>	1
20-Jan-10	14:18	On	30.366906	-80.421697	7	<i>C. caretta</i>	1
20-Jan-10	14:19	On	30.366845	-80.383708	7	<i>C. caretta</i>	1
20-Jan-10	14:58	On	30.432392	-80.231867	8	<i>C. caretta</i>	1
20-Jan-10	15:00	On	30.432475	-80.324133	8	<i>C. caretta</i>	1
20-Jan-10	15:03	On	30.432418	-80.412123	8	<i>C. caretta</i>	2
20-Jan-10	15:04	On	30.431974	-80.464450	8	<i>C. caretta</i>	1
20-Jan-10	15:10	On	30.431516	-80.586286	8	<i>C. caretta</i>	2
20-Jan-10	15:17	On	30.499211	-80.645100	9	<i>C. caretta</i>	1
20-Jan-10	15:18	On	30.500477	-80.614815	9	Unid. Seaturtle	2
20-Jan-10	15:18	On	30.500534	-80.595852	9	Unid. Seaturtle	4
27-Jan-10	10:50	On	30.497974	-80.588156	9	<i>C. caretta</i>	1
27-Jan-10	11:41	On	30.365127	-80.337588	7	<i>C. caretta</i>	1
27-Jan-10	14:58	On	30.167814	-80.655985	4	<i>C. caretta</i>	1
27-Jan-10	15:03	On	30.167399	-80.480802	4	<i>C. caretta</i>	1
27-Jan-10	15:04	On	30.167142	-80.434641	4	Unid. Seaturtle	1
27-Jan-10	16:12	On	30.033084	-80.504018	2	Unid. Seaturtle	1
27-Jan-10	16:56	On	29.964212	-80.519861	1	<i>C. caretta</i>	1
27-Jan-10	16:58	On	29.963735	-80.612545	1	<i>C. caretta</i>	1
28-Jan-10	9:28	On	29.965874	80.645810	1	Unid. Seaturtle	1
28-Jan-10	9:31	Off	29.962802	-80.599122	1	<i>D. coriacea</i>	1
28-Jan-10	9:44	On	29.966246	80.443662	1	<i>C. caretta</i>	1
28-Jan-10	9:44	On	29.966243	-80.444693	1	<i>C. caretta</i>	1

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Group Size
28-Jan-10	9:46	On	29.966443	-80.375928	1	<i>C. caretta</i>	1
28-Jan-10	9:46	On	29.966357	80.387729	1	Unid. Seaturtle	1
28-Jan-10	11:09	On	30.031518	80.408018	2	Unid. Seaturtle	1
28-Jan-10	11:11	On	30.031393	-80.473511	2	<i>C. caretta</i>	1
28-Jan-10	11:11	On	30.031356	80.483605	2	Unid. Seaturtle	1
28-Jan-10	11:12	On	30.031482	-80.498770	2	<i>C. caretta</i>	1
28-Jan-10	11:12	On	30.031421	-80.510538	2	<i>C. caretta</i>	1
28-Jan-10	11:12	On	30.031395	80.514661	2	Unid. Seaturtle	1
28-Jan-10	11:14	2.7	30.031067	-80.570732	2	Unid. Seaturtle	1
28-Jan-10	11:15	On	30.030842	-80.627892	2	<i>C. caretta</i>	1
28-Jan-10	11:39	On	30.100337	80.608193	3	Unid. Seaturtle	3
28-Jan-10	11:58	On	30.098813	80.523909	3	Unid. Seaturtle	1
28-Jan-10	12:00	On	30.100546	80.472517	3	<i>C. caretta</i>	1
28-Jan-10	12:00	On	30.100648	-80.451952	3	<i>C. caretta</i>	1
28-Jan-10	12:38	On	30.166299	80.236667	4	<i>C. caretta</i>	1
28-Jan-10	12:43	On	30.166211	-80.416667	4	<i>C. caretta</i>	1
28-Jan-10	12:48	On	30.166066	-80.545775	4	<i>C. caretta</i>	1
28-Jan-10	12:50	Off	30.165367	-80.603724	4	<i>D. coriacea</i>	1
28-Jan-10	12:51	On	30.166625	80.597649	4	<i>D. coriacea</i>	1
28-Jan-10	15:12	On	30.233323	-80.463677	5	<i>C. caretta</i>	1
28-Jan-10	15:13	On	30.233811	80.436111	5	<i>C. caretta</i>	2
28-Jan-10	15:13	On	30.233805	-80.436569	5	<i>C. caretta</i>	1
28-Jan-10	15:14	On	30.233810	-80.407492	5	<i>C. caretta</i>	1
28-Jan-10	15:29	On	30.233469	80.350920	5	<i>C. caretta</i>	2
28-Jan-10	15:31	On	30.234176	80.287473	5	<i>C. caretta</i>	1
28-Jan-10	15:31	On	30.233991	-80.276257	5	<i>C. caretta</i>	1
28-Jan-10	16:11	On	30.299000	80.283856	6	Unid. Seaturtle	1
28-Jan-10	16:22	On	30.299338	-80.402664	6	<i>C. caretta</i>	1
28-Jan-10	16:25	On	30.299149	80.527143	6	Unid. Seaturtle	1
28-Jan-10	16:29	On	30.299004	-80.637224	6	<i>C. caretta</i>	1
19-Feb-10	10:18	On	30.099968	-80.614461	3	<i>C. caretta</i>	1
19-Feb-10	11:58	On	30.300214	-80.500372	6	<i>C. caretta</i>	1
19-Feb-10	12:02	On	30.300069	-80.611535	6	<i>C. caretta</i>	1
19-Feb-10	13:44	On	30.365414	-80.562004	7	<i>C. caretta</i>	1
19-Feb-10	13:47	On	30.365483	-80.477107	7	<i>C. caretta</i>	1
19-Feb-10	13:54	On	30.366759	-80.328203	7	<i>C. caretta</i>	1
19-Feb-10	14:29	On	30.433916	-80.255053	8	<i>D. coriacea</i>	1
19-Feb-10	14:38	On	30.433555	-80.472532	8	<i>C. caretta</i>	2
19-Feb-10	14:49	On	30.498968	-80.626622	9	<i>C. caretta</i>	1
19-Feb-10	14:51	On	30.499062	-80.577891	9	<i>C. caretta</i>	1
19-Feb-10	14:52	On	30.499250	-80.514702	9	<i>C. caretta</i>	1
19-Feb-10	15:31	On	30.567223	-80.365963	10	<i>C. caretta</i>	2
19-Feb-10	15:37	On	30.566714	-80.603203	10	<i>C. caretta</i>	1
19-Feb-10	15:39	On	30.566545	-80.666463	10	<i>C. caretta</i>	2
20-Feb-10	9:44	On	30.565864	-80.625436	10	<i>C. caretta</i>	3
20-Feb-10	9:44	On	30.565775	-80.623834	10	<i>C. caretta</i>	1
20-Feb-10	9:45	On	30.566162	-80.585383	10	<i>C. caretta</i>	1
20-Feb-10	9:53	On	30.566702	-80.321080	10	<i>C. caretta</i>	1
20-Feb-10	9:54	On	30.566794	-80.266321	10	<i>C. caretta</i>	1
20-Feb-10	10:22	On	30.499951	-80.217201	9	<i>C. caretta</i>	1
20-Feb-10	10:22	On	30.499932	-80.225575	9	Unid. seaturtle	1
20-Feb-10	10:23	On	30.499918	-80.260149	9	<i>C. caretta</i>	2
20-Feb-10	10:24	On	30.499748	-80.303568	9	<i>C. caretta</i>	2
20-Feb-10	10:24	On	30.499839	-80.278145	9	<i>C. caretta</i>	1
20-Feb-10	10:30	On	30.499763	-80.377635	9	<i>C. caretta</i>	1
20-Feb-10	10:31	On	30.499840	-80.399430	9	<i>C. caretta</i>	1
20-Feb-10	10:39	On	30.499597	-80.485433	9	<i>C. caretta</i>	1
20-Feb-10	10:40	On	30.499557	-80.537593	9	<i>C. caretta</i>	1
20-Feb-10	10:41	On	30.499539	-80.580633	9	<i>C. caretta</i>	5
20-Feb-10	10:41	On	30.499540	-80.585648	9	<i>C. caretta</i>	2
20-Feb-10	10:42	On	30.499498	-80.595415	9	<i>C. caretta</i>	3
20-Feb-10	10:49	On	30.499951	-80.646232	9	<i>C. caretta</i>	2
20-Feb-10	10:50	On	30.499167	-80.684272	9	<i>C. caretta</i>	1

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Group Size
20-Feb-10	11:17	On	30.433001	-80.498033	8	<i>C. caretta</i>	3
20-Feb-10	11:18	On	30.433297	-80.465422	8	<i>C. caretta</i>	3
20-Feb-10	11:18	On	30.433422	-80.455525	8	<i>C. caretta</i>	1
20-Feb-10	11:22	On	30.433410	-80.311014	8	Unid. seaturtle	1
20-Feb-10	11:25	On	30.433512	-80.212100	8	<i>C. caretta</i>	1
20-Feb-10	11:51	On	30.366200	-80.223566	7	<i>C. caretta</i>	1
20-Feb-10	11:53	On	30.366056	-80.302827	7	<i>C. caretta</i>	1
20-Feb-10	11:54	On	30.365928	-80.351623	7	<i>C. caretta</i>	1
20-Feb-10	11:58	On	30.365756	-80.482424	7	<i>C. caretta</i>	1
20-Feb-10	12:00	On	30.365752	-80.578061	7	<i>C. caretta</i>	1
20-Feb-10	12:13	On	30.298076	-80.662381	6	<i>C. caretta</i>	1
20-Feb-10	12:14	On	30.299376	-80.630461	6	<i>C. caretta</i>	1
20-Feb-10	12:14	On	30.299111	-80.644859	6	<i>C. caretta</i>	1
20-Feb-10	12:47	On	30.300131	-80.280769	6	<i>C. caretta</i>	1
20-Feb-10	13:32	On	30.232779	-80.464949	5	<i>C. caretta</i>	1
20-Feb-10	13:37	On	30.233441	-80.513720	5	<i>C. caretta</i>	1
20-Feb-10	15:29	On	30.166229	-80.399973	4	<i>C. caretta</i>	1
20-Feb-10	15:32	On	30.166474	-80.279310	4	<i>C. caretta</i>	1
20-Feb-10	15:32	On	30.166356	-80.272266	4	<i>C. caretta</i>	1
20-Feb-10	16:12	On	30.100528	-80.482959	3	<i>C. caretta</i>	1
20-Feb-10	16:28	On	30.031373	-80.592192	2	<i>C. caretta</i>	1
20-Feb-10	16:30	On	30.031640	-80.515057	2	<i>C. caretta</i>	1
20-Feb-10	16:38	On	30.031639	-80.286655	2	<i>C. caretta</i>	1
20-Feb-10	16:42	On	30.031465	-80.158169	2	Unid. seaturtle	1
21-Feb-10	8:38	On	29.965243	-80.505803	1	<i>C. caretta</i>	1
21-Feb-10	8:38	On	29.965257	-80.507573	1	Unid. seaturtle	1
21-Feb-10	8:42	On	29.965443	-80.350439	1	Unid. seaturtle	1
21-Feb-10	8:46	On	29.965437	-80.188799	1	<i>C. caretta</i>	1
21-Feb-10	8:52	On	29.965144	-79.955871	1	<i>C. caretta</i>	1
21-Feb-10	8:52	On	29.965056	-79.932900	1	<i>C. caretta</i>	1
21-Feb-10	9:29	On	30.032120	-80.389601	2	Unid. seaturtle	1
21-Feb-10	9:31	On	30.032338	-80.463837	2	<i>C. caretta</i>	1
21-Feb-10	9:31	On	30.032181	-80.492934	2	Unid. seaturtle	1
21-Feb-10	9:40	On	30.099365	-80.658357	3	Unid. seaturtle	2
21-Feb-10	10:10	On	30.100339	-80.301111	3	<i>C. caretta</i>	1
21-Feb-10	10:38	On	30.166338	-80.064786	4	<i>C. caretta</i>	1
21-Feb-10	10:52	On	30.166730	-80.268801	4	<i>C. caretta</i>	1
21-Feb-10	10:55	On	30.166745	-80.391231	4	<i>C. caretta</i>	1
21-Feb-10	10:56	On	30.166688	-80.437198	4	<i>C. caretta</i>	3
21-Feb-10	10:58	On	30.166491	-80.509623	4	<i>C. caretta</i>	2
21-Feb-10	11:11	On	30.166056	-80.683378	4	<i>C. caretta</i>	1
21-Feb-10	11:24	On	30.232575	-80.617937	5	<i>C. caretta</i>	1
21-Feb-10	11:33	On	30.232177	-80.513457	5	<i>C. caretta</i>	3
21-Feb-10	11:44	On	30.232581	-80.437825	5	<i>C. caretta</i>	1
21-Feb-10	11:46	On	30.232836	-80.372772	5	<i>C. caretta</i>	1
21-Feb-10	12:31	On	30.301000	-80.257254	6	<i>C. caretta</i>	4
21-Feb-10	12:34	On	30.300402	-80.372948	6	Unid. seaturtle	3
21-Feb-10	12:36	On	30.300284	-80.448465	6	<i>C. caretta</i>	2
21-Feb-10	14:33	On	30.365226	-80.547975	7	Unid. seaturtle	1
21-Feb-10	14:34	On	30.365615	-80.505194	7	<i>C. caretta</i>	1
21-Feb-10	14:35	On	30.365147	-80.466082	7	Unid. seaturtle	1
21-Feb-10	14:55	On	30.365954	-80.313542	7	<i>C. caretta</i>	1
21-Feb-10	14:55	On	30.365630	-80.296967	7	<i>C. caretta</i>	1
21-Feb-10	14:57	On	30.365819	-80.227714	7	Unid. seaturtle	3
21-Feb-10	15:37	On	30.433569	-80.207054	8	<i>C. caretta</i>	3
21-Feb-10	15:38	On	30.433789	-80.278162	8	<i>C. caretta</i>	1
21-Feb-10	15:41	On	30.433950	-80.390762	8	Unid. seaturtle	1
21-Feb-10	15:41	On	30.433978	-80.396392	8	Unid. seaturtle	2
21-Feb-10	15:47	On	30.433407	-80.490761	8	<i>C. caretta</i>	1
21-Feb-10	15:47	On	30.433246	-80.484685	8	<i>C. caretta</i>	1
21-Feb-10	15:50	On	30.433055	-80.626976	8	Unid. seaturtle	1
21-Feb-10	15:51	On	30.433280	-80.660645	8	Unid. seaturtle	3
21-Feb-10	15:55	On	30.497951	-80.666477	9	<i>C. caretta</i>	1

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Group Size
21-Feb-10	15:57	On	30.498829	-80.609646	9	<i>C. caretta</i>	1
21-Feb-10	15:58	On	30.499157	-80.574456	9	<i>C. caretta</i>	3
21-Feb-10	15:59	On	30.498906	-80.508135	9	<i>C. caretta</i>	2
21-Feb-10	16:01	On	30.499395	-80.435228	9	Unid. seaturtle	1
21-Feb-10	16:08	On	30.499461	-80.268270	9	<i>C. caretta</i>	1
21-Feb-10	16:10	On	30.499649	-80.219302	9	<i>C. caretta</i>	1
21-Feb-10	16:11	On	30.499532	-80.188571	9	<i>C. caretta</i>	1
21-Feb-10	16:32	On	30.567109	-80.165184	10	<i>C. caretta</i>	1
21-Feb-10	16:32	On	30.567108	-80.143254	10	Unid. seaturtle	1
21-Feb-10	16:34	On	30.567080	-80.230362	10	<i>C. caretta</i>	1
21-Feb-10	16:34	On	30.567175	-80.218925	10	Unid. seaturtle	1
21-Feb-10	16:35	On	30.567262	-80.254747	10	<i>C. caretta</i>	2
21-Feb-10	16:40	On	30.567120	-80.341537	10	<i>C. caretta</i>	1
21-Feb-10	16:47	On	30.566800	-80.579505	10	Cca	1

**Table 4.** Vessel survey effort table for the JAX USWTR study region during Jan 19, 2010 - Feb 23, 2010.

Date	Line	Sea State	Kilometers Surveyed	Survey Time (Hrs)	Total Time at Sea (Hrs)
28-Jan-10	6	1-3	63.05	3:43	13:40

**Table 5.** Cetacean and sea turtle sightings for vessel surveys in JAX study region during Jan 19, 2010 - Feb 23, 2010.

Date	Time	On/Off Effort	Latitude	Longitude	Line	Species	Group Size
28-Jan-10	14:16	On effort	30.302944	-80.353822	6	<i>S. frontalis</i>	5
28-Jan-10	14:39	On effort	30.300664	-80.406183	6	<i>T. truncatus</i>	3
28-Jan-10	15:11	On effort	30.300260	-80.486600	6	Unid. delphinid	3
28-Jan-10	14:24	On effort	30.302467	-80.377815	6	<i>C. caretta</i>	1
28-Jan-10	14:27	On effort	30.302740	-80.389045	6	<i>D. coriacea</i>	1
28-Jan-10	15:44	On effort	30.297800	-80.587080	6	<i>C. caretta</i>	1

**Table 6.** Aerial survey effort table for the Onslow Bay USWTR study region during Jan 19, 2010 - Feb 23, 2010.

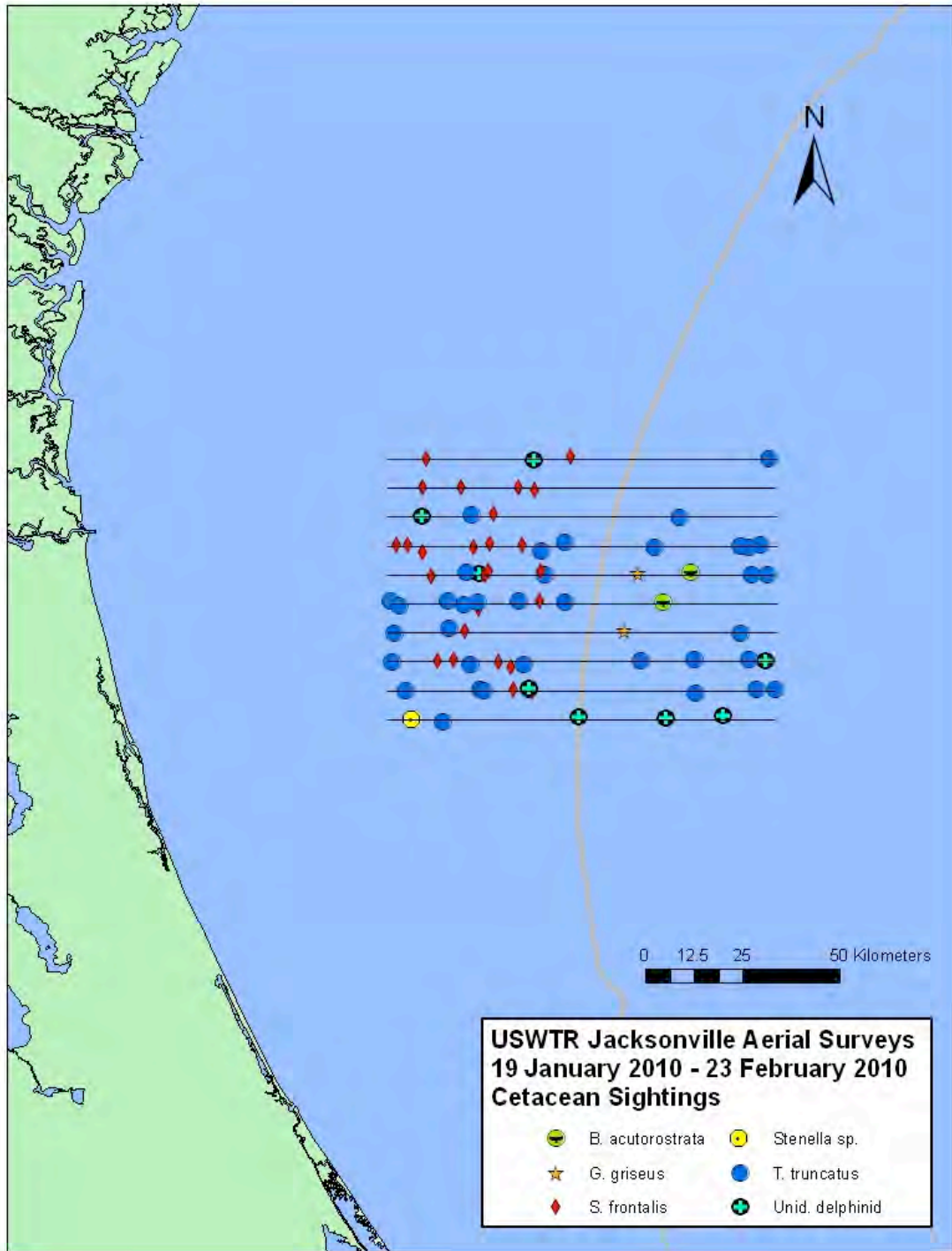
Date	Line	Sea State	Kilometers Flown	Hobbs Hours
21-Feb-10	1	2 to 3	74.5	8.0
21-Feb-10	2	3	73.5	
21-Feb-10	3	3	75.4	
21-Feb-10	4	2 to 3	75.2	
21-Feb-10	5	2 to 3	73.6	
21-Feb-10	6	2	72.0	
21-Feb-10	10	1 to 3	73.8	
21-Feb-10	9	1 to 3	72.2	
21-Feb-10	8	1 to 3	71.3	
21-Feb-10	7	1 to 2	73.3	

**Table 7.** Cetacean sightings during aerial surveys in the Onslow Bay USWTR study region during Jan 19, 2010 - Feb 23, 2010.

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Group Size
21-Feb-10	11:26	On Effort	33.924674	-76.66271	6	Sfr	18
21-Feb-10	14:41	On Effort	33.897988	-76.253719	9	Tr	11
21-Feb-10	15:17	On Effort	33.98478	-76.500092	8	Sfr	8
21-Feb-10	15:39	On Effort	33.757085	-76.19298	8	Gma	23

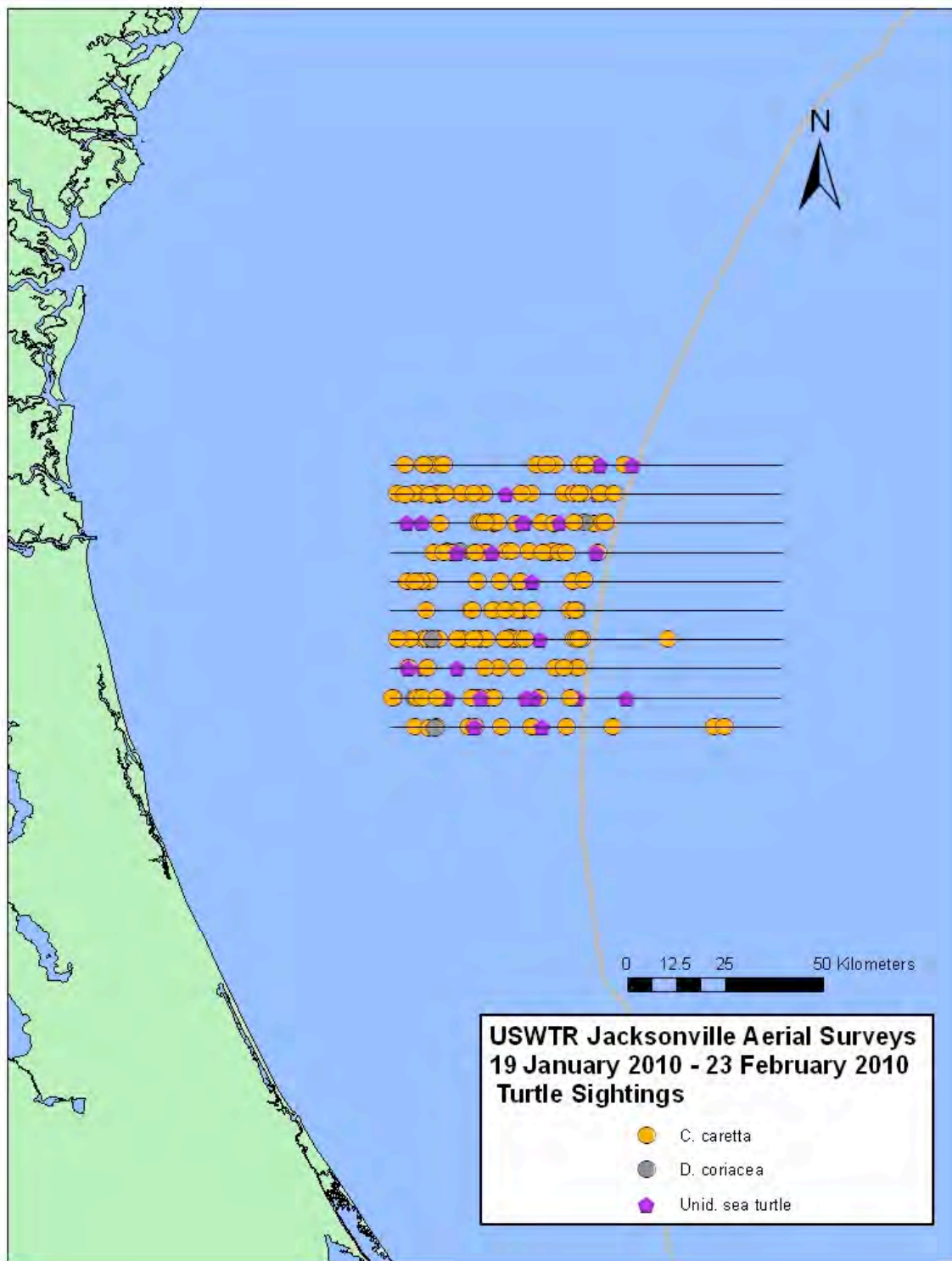
**Table 8.** Sea turtle sightings during aerial surveys in the Onslow Bay USWTR study region during Jan 19, 2010 - Feb 23, 2010.

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Group Size
21-Feb-10	9:33	On Effort	33.667997	-76.872876	2	Cca	1
21-Feb-10	9:35	On Effort	33.709395	-76.926478	2	Cca	1
21-Feb-10	11:22	On Effort	33.876367	-76.620640	6	Cca	1
21-Feb-10	11:23	On Effort	33.890604	-76.638503	6	Cca	1
21-Feb-10	12:00	On Effort	34.037150	-76.831854	6	Cca	2
21-Feb-10	12:00	On Effort	34.034801	-76.828779	6	Cca	1
21-Feb-10	12:01	On Effort	34.048215	-76.850544	6	Cca	2
21-Feb-10	14:01	On Effort	34.255498	-76.589260	10	Cca	1
21-Feb-10	14:01	On Effort	34.253342	-76.586512	10	Cca	1
21-Feb-10	14:03	On Effort	34.221560	-76.545455	10	Cca	1
21-Feb-10	14:03	On Effort	34.20881	-76.529055	10	Cca	2
21-Feb-10	14:05	On Effort	34.171494	-76.480713	10	Cca	3
21-Feb-10	14:52	On Effort	34.063529	-76.468725	9	Cca	3
21-Feb-10	14:55	On Effort	34.117065	-76.537982	9	Cca	2
21-Feb-10	14:55	On Effort	34.123505	-76.546724	9	Cca	2
21-Feb-10	14:56	On Effort	34.140015	-76.568197	9	Cca	5
21-Feb-10	14:58	On Effort	34.176295	-76.615111	9	Cca	4
21-Feb-10	15:04	On Effort	34.160274	-76.726437	8	Cca	3
21-Feb-10	15:04	On Effort	34.157408	-76.722546	8	Cca	1
21-Feb-10	15:07	On Effort	34.106766	-76.658314	8	Cca	1
21-Feb-10	15:08	On Effort	34.080735	-76.621368	8	Turt	2
21-Feb-10	15:12	On Effort	34.016392	-76.539278	8	Cca	4
21-Feb-10	15:34	On Effort	33.793947	-76.24495	8	Turt	1
21-Feb-10	16:13	On Effort	33.973686	-76.608215	7	Cca	1
21-Feb-10	16:18	On Effort	34.058254	-76.720467	7	Cca	2
21-Feb-10	16:19	On Effort	34.087095	-76.757460	7	Cca	2
21-Feb-10	16:19	On Effort	34.081816	-76.749535	7	Cca	2

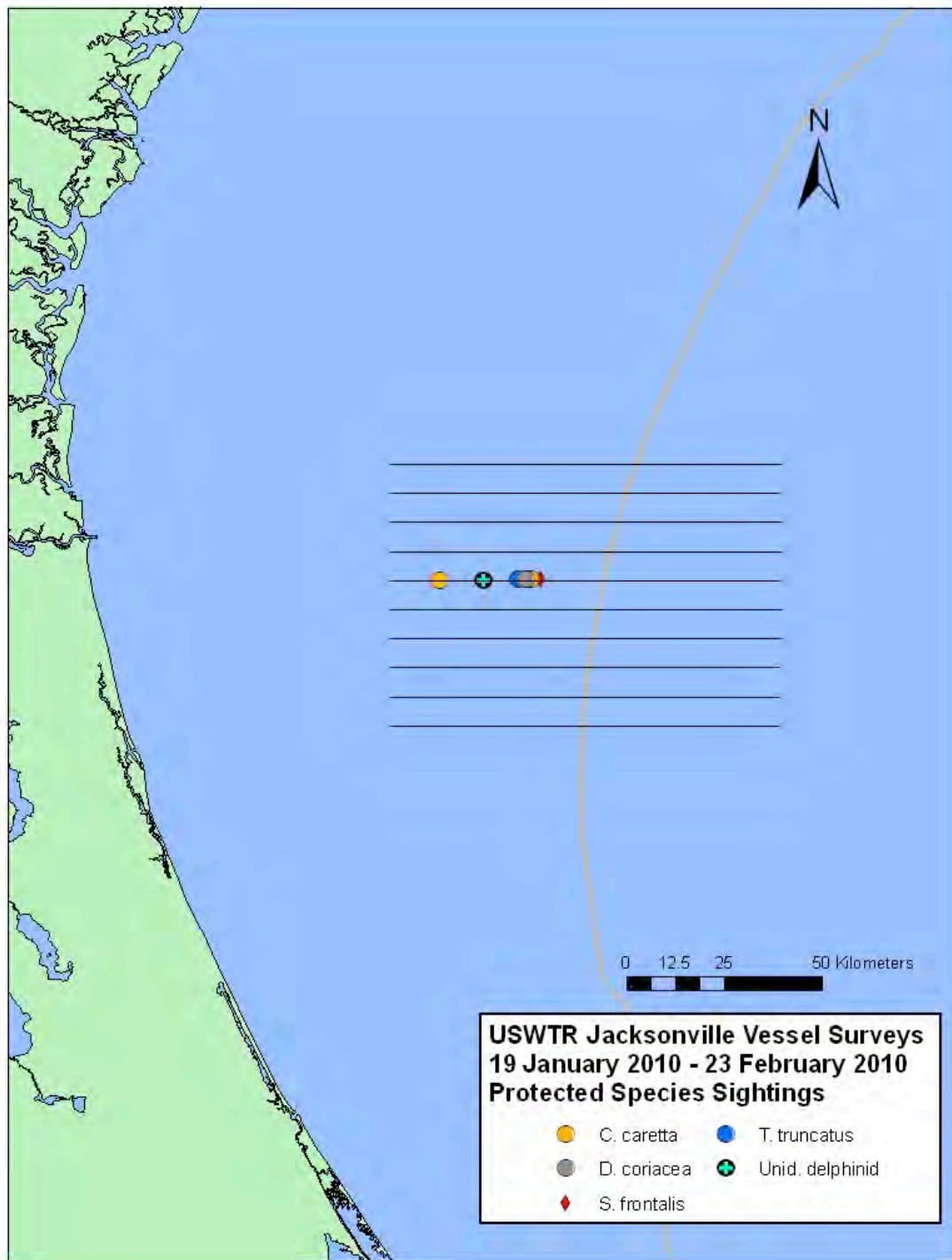


**Figure 1.** The locations of cetaceans sighted while conducting aerial surveys during the January 19<sup>th</sup> to February 23 2010 reporting period of the JAX USWTR study region.

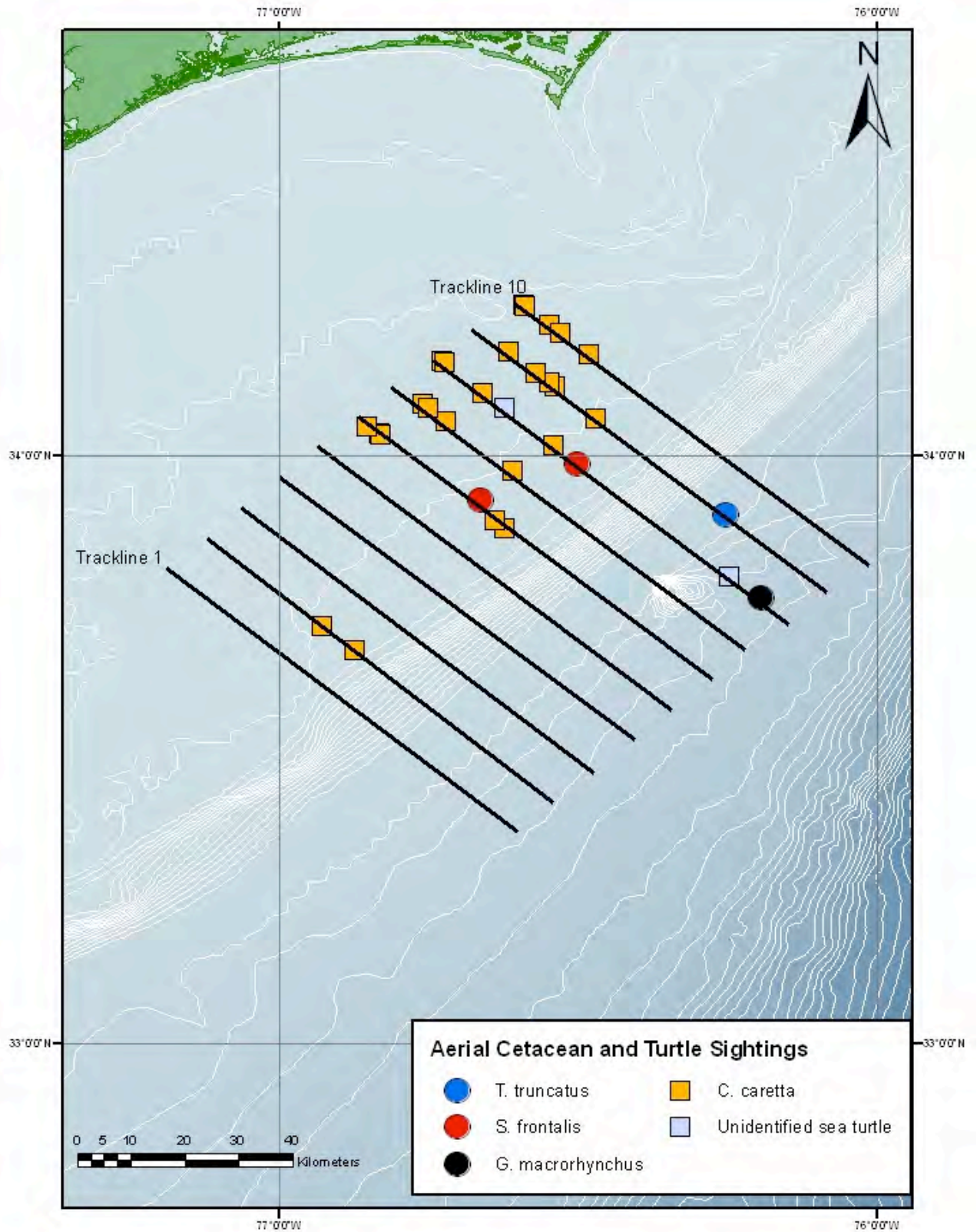




**Figure 2.** The locations of sea turtles sighted during aerial surveys between January 19<sup>th</sup> and February 23, 2010 in the JAX USWTR study region.



**Figure 3.** Cetaceans and sea turtles observed during truncated vessel surveys of the JAX USWTR study region, January 19 through February 23, 2010.



**Figure 4.** The locations of cetaceans and turtles sighted during aerial surveys on 21 Jan, 2010 of the Onslow Bay USWTR study region.

## **Monitoring of Protected Species in the Proposed Onslow Bay and Jacksonville USWTRs**

Progress Report: February 24, 2010 through March 23, 2010

### **Planning (Task 1, 2 & 3)**

During this reporting period the second contract modification with Parsons was finalized. Parsons submitted the final proposal for contract modification 2 to the Navy on Thursday February 25 2010 and it was awarded Friday the 26<sup>th</sup>.

### **Purchasing (Task 1).**

UNCW purchased an image recovery software package to grab images from un-cooperative digital compact flash cards. UNCW sent a pair of David Clark headsets out to be refurbished as a savings instead of buying a new pair.

### **Travel (Task 1 & 3)**

Scripps HARP engineer Ethan Roth traveled to the JAX study area to install a new hydrophone and deploy the inshore HARP.

### **JAX Survey Activity (Task 2)**

#### Aerial Surveys

The region was plagued by less than ideal survey conditions for the majority of the reporting period. However, eight tracklines were flown in good conditions on 20 March 2010 (Table 1). Cetaceans were encountered 15 times during the survey (Table 2, Figure 1). Spotted dolphins (*Stenella frontalis*) were the most frequently encountered species (8 sightings), followed by North Atlantic right whales (*Eubalena glacialis*; 2 sightings), one sighting each of bottlenose dolphins (*Tursiops truncatus*) and Risso's dolphins (*Grampus griseus*). In addition, delphinids which could not be identified to species were encountered three times. This was the first time during the JAX USWTR surveys that right whales have been seen in the survey area. In addition, the aerial survey team witnessed the birth of a right whale calf during the first right whale encounter of the day. Numerous sea turtles were seen during the aerial survey: loggerhead sea turtles (*Caretta caretta*; n = 48), Kemp's Ridley sea turtle (*Lepidochelys kempii*; n = 1), and 12 unidentified sea turtles (Table 3, Figure 2).

#### Vessel Surveys

Two complete tracklines were surveyed during this reporting period. Trackline 4 was surveyed on 1 March and trackline 2 completed on 10 March. For both surveys, the *R/V Volute* launched out of St. Augustine, FL. Weather conditions ranged from moderate to good for both surveys (Table 4). There were nine cetacean sightings, all of which were spotted dolphins (*S. frontalis*). There were no marine turtles seen while on effort during either survey (Table 5, Figure 3).

#### Towed Passive Acoustics

The towed acoustic array was deployed from the *R/V Volute* during two vessel surveys. On 1 March the array was deployed for a total of 256 minutes. Because

there were only three observers, recordings were only obtained during visual observation events. Ten files were recorded encompassing six sightings of *S. frontalis*, with a total recording time of 42 minutes. On 10 March the array was deployed for a total of 280 minutes. Thirty seven files, totaling 184 minutes, were recorded, which included three visual sighting events of *S. frontalis*.

### **JAX HARPs (Task 3)**

The second HARP was successfully redeployed at the inshore site on March 9, 2010. Both HARPs are now deployed in the study area.

### **Onslow Bay Survey Activity (Task 5)**

#### Aerial Surveys

Aerial surveys for the month of March were spread over three days and resulted in all ten lines being flown twice (Table 6). On March 8, 2010 all ten lines were flown under a Beaufort Sea state 3-4 covering most of the range for the morning surveys and a BSS 2-3 in the afternoon. There were two sightings of cetaceans inside the range both of which were bottlenose dolphins (Table 7, Figure 4). In addition to the surveys inside the range the team flew a coastal survey specifically from Wrightsville beach to Cape Lookout before beginning their survey lines. On March 9, 2010 survey conditions had greatly improved with BSS 1 and 2 dominating the range. Sea conditions were uniform throughout the range and no current boarder of the Gulf Stream was observed. A single sighting of a fin whale (*Balaenoptera physalis*) was seen on the offshore portion of line ten. This sighting is the first baleen whale seen within the Onslow Bay USWTR site and the first time this species has been seen by any UNCW aerial surveys south of Cape Hatteras. In addition there was a single sighting of common dolphins (*Delphinus delphis*) on the offshore half of line 7. This sighting represents the first time this species has been seen in the Onslow Bay USWTR range since the preliminary surveys in 1998 and 1999. Nine bottlenose dolphin sightings were also recorded giving a total of 11 sightings on 6 lines flown. Additional USWTR lines were not flown in the afternoon as the team responded to reports of a large whale seen off of Wrightsville beach. On March 10, 2010 the final 4 track lines were completed under fair conditions with a single cetacean sighting being recorded. The UNCW stranding network received a report from an observer on a coastal dredge of a right whale sighting approximately 2km outside of the mouth of the Cape Fear River in Long Bay. Over the three day period there were numerous sea turtles sighting the majority of which were loggerhead sea turtles followed by unidentified sea turtles and leatherback sea turtles (Figure 8, Table 5).

#### Vessel Surveys

One track line was surveyed on March 9<sup>th</sup>, 2010 aboard the *R/V Cetus*, a modified 40' offshore fishing vessel (Table 9). Two groups of bottlenose dolphins (*Tursiops Truncatus*) were the only cetacean groups encountered (Table 10). Two loggerhead sea turtles (*Caretta caretta*) were also sighted during the survey.

The locations of dolphins and sea turtles sighted along line 9 during vessel surveys are shown in Figure 6

Towed Passive Acoustics

The towed acoustic array was deployed from the *R/V Cetus* on the 9<sup>th</sup> of March, 2010, for 4.4 hours of simultaneous visual and acoustic survey. During that time, a total of 46 minutes of acoustic recordings were taken. Two visual sightings occurred during the acquisition of acoustic data; both groups were identified as *Tursiops truncatus*. Numerous vocalizations including clicks, whistles, and burst-pulses were recorded.

**Exercise Monitoring (Task 7)**

Nothing to report.

**Table 1.** Aerial survey effort table for the JAX USWTR study region during Feb 24, 2010 - Mar 23, 2010.

Date	Line	Sea State	Kilometers Flown	HOBBS Hours
20-Mar-10	1	2 to 3	86.5	7.5
20-Mar-10	2	2 to 3	85.6	
20-Mar-10	3	1 to 3	85.3	
20-Mar-10	4	2 to 3	85.5	
20-Mar-10	5	2 to 3	85.3	
20-Mar-10	6	2 to 3	85.0	
20-Mar-10	7	2 to 3	83.2	
20-Mar-10	8	2 to 3	85.3	

**Table 2.** Cetacean sightings during aerial surveys in the JAX USWTR study region during Feb 24, 2010 - Mar 23, 2010.

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Common Name	Group Size
20-Mar-10	10:02	On Effort	30.028323	-80.425266	2	<i>S. frontalis</i>	Spotted Dolphin	7
20-Mar-10	10:08	On Effort	30.036836	-80.502131	2	<i>S. frontalis</i>	Spotted Dolphin	4
20-Mar-10	10:20	On Effort	30.047163	-80.697271	2	<i>E. glacialis</i>	No. Atl. Right Whale	2
20-Mar-10	13:01	On Effort	30.099889	-80.367558	3	<i>T. truncatus</i>	Bottlenose Dolphin	2
20-Mar-10	13:12	On Effort	30.100872	-80.336616	3	<i>S. frontalis</i>	Spotted Dolphin	29
20-Mar-10	13:49	On Effort	30.174741	-80.512669	4	Unid. delphinid	Unid. delphinid	2
20-Mar-10	14:14	On Effort	30.232452	-80.270676	5	<i>S. frontalis</i>	Spotted Dolphin	34
20-Mar-10	14:41	On Effort	30.292360	-80.240354	6	<i>S. frontalis</i>	Spotted Dolphin	19
20-Mar-10	14:48	On Effort	30.308002	-80.395258	6	Unid. delphinid	Unid. delphinid	3
20-Mar-10	15:10	On Effort	30.362502	-80.432803	7	<i>S. frontalis</i>	Spotted Dolphin	20
20-Mar-10	15:16	On Effort	30.367844	-80.264885	7	Unid. delphinid	Unid. delphinid	4
20-Mar-10	15:33	On Effort	30.361425	-79.911819	7	<i>G. griseus</i>	Risso's Dolphin	6
20-Mar-10	15:55	On Effort	30.434805	-80.269575	8	<i>S. frontalis</i>	Spotted Dolphin	21
20-Mar-10	15:58	On Effort	30.442233	-80.378832	8	<i>S. frontalis</i>	Spotted Dolphin	2
20-Mar-10	16:11	On Effort	30.428521	-80.677282	8	<i>E. glacialis</i>	No. Atl. Right Whale	1

**Table 3** Sea turtle sightings during aerial surveys in the JAX USWTR study region during Feb 24, 2010 - Mar 23, 2010.

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Common Name	Group Size
20-Mar-10	9:26	On Effort	29.965475	-80.386834	1	<i>C. caretta</i>	Loggerhead Sea Turtle	1
20-Mar-10	9:26	On Effort	29.965543	-80.373441	1	<i>C. caretta</i>	Loggerhead Sea Turtle	1
20-Mar-10	9:57	On Effort	30.032581	-80.274625	2	<i>C. caretta</i>	Loggerhead Sea Turtle	1
20-Mar-10	10:05	On Effort	30.032270	-80.466821	2	<i>C. caretta</i>	Loggerhead Sea Turtle	1
20-Mar-10	10:18	On Effort	30.031629	-80.649836	2	<i>C. caretta</i>	Loggerhead Sea Turtle	1
20-Mar-10	12:52	On Effort	30.099767	-80.626413	3	<i>C. caretta</i>	Loggerhead Sea Turtle	1
20-Mar-10	13:37	On Effort	30.166559	-80.206622	4	<i>C. caretta</i>	Loggerhead Sea Turtle	1
20-Mar-10	13:38	On Effort	30.166644	-80.221309	4	<i>C. caretta</i>	Loggerhead Sea Turtle	1
20-Mar-10	13:45	On Effort	30.166394	-80.353119	4	<i>C. caretta</i>	Loggerhead Sea Turtle	1
20-Mar-10	13:47	On Effort	30.166730	-80.430771	4	<i>C. caretta</i>	Loggerhead Sea Turtle	1
20-Mar-10	13:48	On Effort	30.166579	-80.471078	4	<i>C. caretta</i>	Loggerhead Sea Turtle	1
20-Mar-10	13:57	On Effort	30.166433	-80.565088	4	<i>C. caretta</i>	Loggerhead Sea Turtle	1
20-Mar-10	14:00	On Effort	30.166079	-80.663821	4	<i>C. caretta</i>	Loggerhead Sea Turtle	1
20-Mar-10	14:00	On Effort	30.166232	-80.679204	4	<i>C. caretta</i>	Loggerhead Sea Turtle	1
20-Mar-10	14:05	On Effort	30.232255	-80.621980	5	<i>C. caretta</i>	Loggerhead Sea Turtle	1
20-Mar-10	14:07	On Effort	30.232486	-80.522047	5	<i>C. caretta</i>	Loggerhead Sea Turtle	3
20-Mar-10	14:09	On Effort	30.232586	-80.460650	5	<i>C. caretta</i>	Loggerhead Sea Turtle	3
20-Mar-10	14:11	On Effort	30.232840	-80.347943	5	<i>C. caretta</i>	Loggerhead Sea Turtle	1
20-Mar-10	14:39	On Effort	30.300439	-80.216354	6	<i>C. caretta</i>	Loggerhead Sea Turtle	1
20-Mar-10	14:45	On Effort	30.300431	-80.340154	6	Unid. seaturtle	Unid. Sea Turtle	1
20-Mar-10	14:55	On Effort	30.301162	-80.439892	6	<i>C. caretta</i>	Loggerhead Sea Turtle	1
20-Mar-10	14:56	On Effort	30.300364	-80.474801	6	<i>C. caretta</i>	Loggerhead Sea Turtle	1
20-Mar-10	14:58	On Effort	30.300091	-80.536718	6	Unid. seaturtle	Unid. Sea Turtle	1
20-Mar-10	14:59	On Effort	30.300022	-80.601604	6	<i>C. caretta</i>	Loggerhead Sea Turtle	2
20-Mar-10	15:04	On Effort	30.364085	-80.672022	7	<i>C. caretta</i>	Loggerhead Sea Turtle	1
20-Mar-10	15:04	On Effort	30.364509	-80.679275	7	<i>C. caretta</i>	Loggerhead Sea Turtle	3
20-Mar-10	15:05	On Effort	30.365132	-80.622735	7	<i>C. caretta</i>	Loggerhead Sea Turtle	1
20-Mar-10	15:06	On Effort	30.365252	-80.594722	7	<i>C. caretta</i>	Loggerhead Sea Turtle	1
20-Mar-10	15:08	On Effort	30.365387	-80.522324	7	Unid. seaturtle	Unid. Sea Turtle	1
20-Mar-10	15:09	On Effort	30.365471	-80.468543	7	<i>C. caretta</i>	Loggerhead Sea Turtle	2
20-Mar-10	15:12	On Effort	30.365617	-80.392292	7	Unid. seaturtle	Unid. Sea Turtle	1
20-Mar-10	15:14	On Effort	30.365686	-80.293390	7	<i>C. caretta</i>	Loggerhead Sea Turtle	1
20-Mar-10	15:25	On Effort	30.364523	-80.218230	7	<i>C. caretta</i>	Loggerhead Sea Turtle	1
20-Mar-10	15:26	On Effort	30.365535	-80.188521	7	<i>C. caretta</i>	Loggerhead Sea Turtle	1
20-Mar-10	15:46	On Effort	30.433636	-79.940230	8	Unid. seaturtle	Unid. Sea Turtle	1
20-Mar-10	15:51	On Effort	30.433802	-80.178189	8	<i>C. caretta</i>	Loggerhead Sea Turtle	1
20-Mar-10	15:56	On Effort	30.433446	-80.305929	8	<i>C. caretta</i>	Loggerhead Sea Turtle	1
20-Mar-10	16:03	On Effort	30.433872	-80.380367	8	<i>L. kempui</i>	Kemp's ridley Sea Turtle	1
20-Mar-10	16:05	On Effort	30.433679	-80.464695	8	<i>C. caretta</i>	Loggerhead Sea Turtle	2
20-Mar-10	16:05	On Effort	30.433720	-80.427749	8	<i>C. caretta</i>	Loggerhead Sea Turtle	1
20-Mar-10	16:06	On Effort	30.433523	-80.508589	8	<i>C. caretta</i>	Loggerhead Sea Turtle	2
20-Mar-10	16:08	On Effort	30.433309	-80.584302	8	<i>C. caretta</i>	Loggerhead Sea Turtle	2
20-Mar-10	16:08	On Effort	30.433315	-80.594983	8	Unid. seaturtle	Unid. Sea Turtle	3
20-Mar-10	16:09	On Effort	30.433194	-80.637071	8	Unid. seaturtle	Unid. Sea Turtle	4
20-Mar-10	16:10	On Effort	30.433423	-80.669506	8	<i>C. caretta</i>	Loggerhead Sea Turtle	1

**Table 4.** Vessel survey effort table for the JAX USWTR study region during Feb 24, 2010 - Mar 23, 2010.

Date	Line	Sea State	Kilometers Surveyed	Survey Time (Hrs:min)	Total Time at Sea (Hrs:min)
1-Mar-10	4	1-3	69.65	4:16	13:27
10-Mar-10	2	2-3	75.41	4:40	12:36

**Table 5.** Cetacean and sea turtle sightings for vessel surveys in JAX study region during Feb 24, 2010 - Mar 23, 2010.

Date	Time	On/Off Effort	Latitude	Longitude	Line	Species	Species	Group Size
01-Mar-10	15:05	On effort	30.169377	-80.349359	4	<i>S. frontalis</i>	Spotted Dolphin	1
01-Mar-10	16:33	On effort	30.166634	-80.589490	4	<i>S. frontalis</i>	Spotted Dolphin	2
01-Mar-10	16:45	On effort	30.166619	-80.608868	4	<i>S. frontalis</i>	Spotted Dolphin	3
01-Mar-10	17:03	On effort	30.165464	-80.648855	4	<i>S. frontalis</i>	Spotted Dolphin	9
01-Mar-10	17:09	On effort	30.167196	-80.669589	4	<i>S. frontalis</i>	Spotted Dolphin	17
01-Mar-10	17:17	On effort	30.165281	-80.679358	4	<i>S. frontalis</i>	Spotted Dolphin	5
10-Mar-10	14:21	On effort	30.034332	-80.220109	2	<i>S. frontalis</i>	Spotted Dolphin	4
10-Mar-10	15:38	On effort	30.036555	-80.441874	2	<i>S. frontalis</i>	Spotted Dolphin	4
10-Mar-10	16:42	On effort	30.032250	-80.577244	2	<i>S. frontalis</i>	Spotted Dolphin	13

**Table 6.** Aerial survey effort table for the Onslow Bay USWTR study region during Feb 24, 2010 - March 23, 2010.

Date	Line	Sea State	Kilometers Flown	Hobbs Hours
8-Mar-10	10	3 to 4	74.1	6.7
8-Mar-10	9	3 to 4	72.9	
8-Mar-10	8	3 to 4	75.0	
8-Mar-10	7	3 to 4	74.5	
8-Mar-10	6	2 to 3	74.3	
8-Mar-10	5	2 to 3	74.1	
8-Mar-10	4	2 to 3	74.5	
8-Mar-10	3	2 to 3	74.5	
8-Mar-10	2	2 to 3	70.1	
8-Mar-10	1	2 to 3	74.2	
9-Mar-10	5	1	68.7	6.5
9-Mar-10	6	1	67.9	
9-Mar-10	7	1	68.8	
9-Mar-10	8	1 to 2	70.6	
9-Mar-10	9	1	71.7	
9-Mar-10	10	1 to 2	63.8	
10-Mar-10	4	1 to 3	74.6	2.7
10-Mar-10	3	1 to 4	74.7	
10-Mar-10	2	1 to 4	72.9	
10-Mar-10	1	1 to 4	74	



**Table 7.** Cetacean sightings during aerial surveys in the Onslow Bay USWTR study region during Feb 24, 2010 - Mar 23, 2010.

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Common Name	Group Size
8-Mar-10	15:30	On	33.487350	-76.636780	2	<i>T. truncatus</i>	Bottlenose dolphin	4
8-Mar-10	15:43	On	33.410814	-76.538489	2	<i>T. truncatus</i>	Bottlenose dolphin	5
9-Mar-10	9:02	On	33.960739	-76.832647	5	<i>T. truncatus</i>	Bottlenose dolphin	15
9-Mar-10	9:17	On	33.830343	-76.706071	5	<i>T. truncatus</i>	Bottlenose dolphin	6
9-Mar-10	9:32	On	33.720726	-76.534367	5	<i>T. truncatus</i>	Bottlenose dolphin	20
9-Mar-10	9:52	On	33.743504	-76.443130	6	<i>T. truncatus</i>	Bottlenose dolphin	65
9-Mar-10	10:11	On	34.017554	-76.803091	6	<i>T. truncatus</i>	Bottlenose dolphin	5
9-Mar-10	10:42	On	33.770576	-76.346663	7	<i>D. delphis</i>	Common dolphin	20
9-Mar-10	10:57	On	33.719563	-76.280838	7	<i>T. truncatus</i>	Bottlenose dolphin	9
9-Mar-10	11:14	On	33.796304	-76.241464	8	<i>T. truncatus</i>	Bottlenose dolphin	13
9-Mar-10	12:03	On	33.871443	-76.213856	9	<i>T. truncatus</i>	Bottlenose dolphin	30
9-Mar-10	12:19	On	33.858932	-76.064517	10	<i>T. truncatus</i>	Bottlenose dolphin	4
9-Mar-10	12:30	On	33.963446	-76.221540	10	<i>B. physalis</i>	Fin whale	1
10-Mar-10	9:57	On	33.844501	-77.105389	2	Unid delphinid	Unid delphinid	3

**Table 8 (2x pages).** Sea turtle sightings during aerial surveys in the Onslow Bay USWTR study region during Feb 24, 2010 - Mar 23, 2010.

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Common Name	Group Size
8-Mar-10	9:28	On	34.172064	-76.481553	10	C. caretta	Loggerhead sea turtle	1
8-Mar-10	9:28	On	34.159272	-76.465052	10	C. caretta	Loggerhead sea turtle	1
8-Mar-10	10:46	On	33.900383	-76.514606	7	C. caretta	Loggerhead sea turtle	1
8-Mar-10	13:21	On	34.034656	-76.829645	6	C. caretta	Loggerhead sea turtle	1
8-Mar-10	13:24	On	33.974706	-76.750432	6	C. caretta	Loggerhead sea turtle	2
8-Mar-10	13:25	On	33.961879	-76.733515	6	C. caretta	Loggerhead sea turtle	1
8-Mar-10	13:28	On	33.891283	-76.640286	6	C. caretta	Loggerhead sea turtle	2
8-Mar-10	13:58	On	33.84073	-76.704016	5	C. caretta	Loggerhead sea turtle	1
8-Mar-10	14:13	On	33.886270	-76.894710	4	C. caretta	Loggerhead sea turtle	2
8-Mar-10	14:15	On	33.861046	-76.861237	4	C. caretta	Loggerhead sea turtle	3
8-Mar-10	14:47	On	33.709701	-76.798452	3	C. caretta	Loggerhead sea turtle	1
8-Mar-10	14:54	On	33.859603	-76.994319	3	C. caretta	Loggerhead sea turtle	2
8-Mar-10	15:08	On	33.683007	-76.892560	2	C. caretta	Loggerhead sea turtle	1
8-Mar-10	16:00	On	33.605138	-76.921055	1	C. caretta	Loggerhead sea turtle	1
8-Mar-10	16:06	On	33.738402	-77.095697	1	C. caretta	Loggerhead sea turtle	1
8-Mar-10	14:04	On	33.976917	-76.883754	5	Unid sea turtle	Unid sea turtle	1
8-Mar-10	14:48	On	33.729017	-76.823853	3	Unid sea turtle	Unid sea turtle	1
9-Mar-10	8:57	On	33.994510	-76.907648	5	C. caretta	Loggerhead sea turtle	1
9-Mar-10	9:11	On	33.918617	-76.807588	5	C. caretta	Loggerhead sea turtle	1
9-Mar-10	9:12	On	33.898118	-76.780137	5	C. caretta	Loggerhead sea turtle	1
9-Mar-10	9:14	On	33.861196	-76.731401	5	C. caretta	Loggerhead sea turtle	1
9-Mar-10	9:25	On	33.804625	-76.656746	5	C. caretta	Loggerhead sea turtle	1
9-Mar-10	9:25	On	33.815028	-76.670268	5	C. caretta	Loggerhead sea turtle	3
9-Mar-10	9:26	On	33.777730	-76.621617	5	C. caretta	Loggerhead sea turtle	4
9-Mar-10	9:27	On	33.767922	-76.608612	5	C. caretta	Loggerhead sea turtle	1
9-Mar-10	10:01	On	33.827833	-76.556565	6	C. caretta	Loggerhead sea turtle	2
9-Mar-10	10:02	On	33.840224	-76.572808	6	C. caretta	Loggerhead sea turtle	2
9-Mar-10	10:02	On	33.829569	-76.558756	6	C. caretta	Loggerhead sea turtle	2
9-Mar-10	10:03	On	33.853433	-76.589936	6	C. caretta	Loggerhead sea turtle	6
9-Mar-10	10:03	On	33.868095	-76.609311	6	C. caretta	Loggerhead sea turtle	6
9-Mar-10	10:04	On	33.878250	-76.622588	6	C. caretta	Loggerhead sea turtle	3
9-Mar-10	10:05	On	33.910465	-76.665191	6	C. caretta	Loggerhead sea turtle	7
9-Mar-10	10:06	On	33.925011	-76.684041	6	C. caretta	Loggerhead sea turtle	1
9-Mar-10	10:06	On	33.932773	-76.694397	6	C. caretta	Loggerhead sea turtle	8
9-Mar-10	10:07	On	33.953511	-76.722034	6	C. caretta	Loggerhead sea turtle	6
9-Mar-10	10:08	On	33.967823	-76.740828	6	C. caretta	Loggerhead sea turtle	1
9-Mar-10	10:08	On	33.978584	-76.754946	6	C. caretta	Loggerhead sea turtle	9
9-Mar-10	10:09	On	33.988278	-76.767975	6	C. caretta	Loggerhead sea turtle	3
9-Mar-10	10:09	On	33.995584	-76.777413	6	C. caretta	Loggerhead sea turtle	11
9-Mar-10	10:26	On	34.062607	-76.726383	7	C. caretta	Loggerhead sea turtle	4
9-Mar-10	10:28	On	34.022386	-76.674311	7	C. caretta	Loggerhead sea turtle	4
9-Mar-10	10:28	On	34.007107	-76.654329	7	C. caretta	Loggerhead sea turtle	3
9-Mar-10	10:29	On	34.002681	-76.648498	7	C. caretta	Loggerhead sea turtle	2
9-Mar-10	10:29	On	33.988287	-76.62972	7	C. caretta	Loggerhead sea turtle	3
9-Mar-10	10:31	On	33.960023	-76.592718	7	C. caretta	Loggerhead sea turtle	5
9-Mar-10	10:31	On	33.946583	-76.575289	7	C. caretta	Loggerhead sea turtle	6
9-Mar-10	10:32	On	33.920036	-76.540688	7	C. caretta	Loggerhead sea turtle	9
9-Mar-10	11:34	On	33.988721	-76.501293	8	C. caretta	Loggerhead sea turtle	1
9-Mar-10	11:37	On	34.052926	-76.585845	8	C. caretta	Loggerhead sea turtle	1
9-Mar-10	11:37	On	34.053929	-76.587145	8	C. caretta	Loggerhead sea turtle	9
9-Mar-10	11:39	On	34.090787	-76.635594	8	C. caretta	Loggerhead sea turtle	1
9-Mar-10	11:40	On	34.111894	-76.663395	8	C. caretta	Loggerhead sea turtle	1
9-Mar-10	11:40	On	34.117421	-76.670594	8	C. caretta	Loggerhead sea turtle	4
9-Mar-10	11:41	On	34.139577	-76.699706	8	C. caretta	Loggerhead sea turtle	3
9-Mar-10	11:49	On	34.137698	-76.574108	9	C. caretta	Loggerhead sea turtle	7
9-Mar-10	11:53	On	34.037500	-76.441284	9	C. caretta	Loggerhead sea turtle	3
9-Mar-10	12:50	On	34.095748	-76.382541	10	C. caretta	Loggerhead sea turtle	4
9-Mar-10	12:56	On	34.243997	-76.573399	10	C. caretta	Loggerhead sea turtle	8
9-Mar-10	11:47	On	34.176778	-76.625806	9	D. coriacea	Leatherback sea turtle	1
9-Mar-10	8:58	On	33.965190	-76.868758	5	Unid sea turtle	Unid sea turtle	1
9-Mar-10	9:15	On	33.848781	-76.715022	5	Unid sea turtle	Unid sea turtle	4
9-Mar-10	9:28	On	33.747555	-76.582032	5	Unid sea turtle	Unid sea turtle	3
9-Mar-10	10:25	On	34.075464	-76.746079	7	Unid sea turtle	Unid sea turtle	1
9-Mar-10	11:49	On	34.135153	-76.570658	9	Unid sea turtle	Unid sea turtle	2

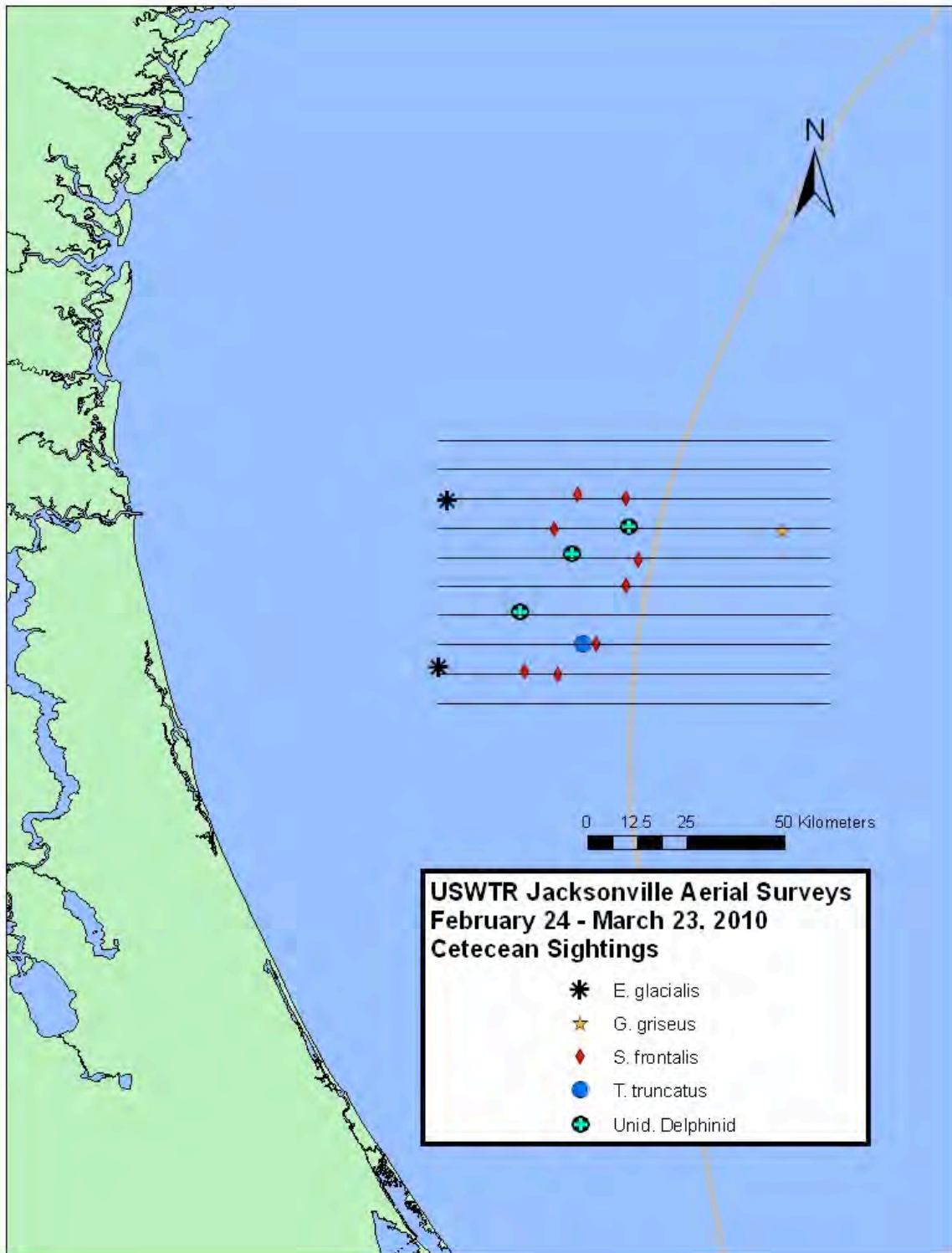
Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Common Name	Group Size
10-Mar-10	9:06	On	33.948010	-76.977026	4	C. caretta	Loggerhead sea turtle	3
10-Mar-10	9:11	On	33.834044	-76.825617	4	C. caretta	Loggerhead sea turtle	1
10-Mar-10	9:16	On	33.730928	-76.689260	4	C. caretta	Loggerhead sea turtle	1
10-Mar-10	9:44	On	33.749665	-76.850862	3	C. caretta	Loggerhead sea turtle	1
10-Mar-10	9:49	On	33.861604	-76.996910	3	C. caretta	Loggerhead sea turtle	1
10-Mar-10	9:51	On	33.903755	-77.052064	3	C. caretta	Loggerhead sea turtle	3
10-Mar-10	10:10	On	33.748703	-76.977710	2	C. caretta	Loggerhead sea turtle	1
10-Mar-10	10:14	On	33.658099	-76.860420	2	C. caretta	Loggerhead sea turtle	1
10-Mar-10	10:15	On	33.656404	-76.858287	2	C. caretta	Loggerhead sea turtle	1
10-Mar-10	10:41	On	33.606329	-76.921889	1	C. caretta	Loggerhead sea turtle	2
10-Mar-10	10:48	On	33.763636	-77.128773	1	C. caretta	Loggerhead sea turtle	3
10-Mar-10	9:08	On	33.912517	-76.929805	4	Unid sea turtle	Unid sea turtle	1
10-Mar-10	9:45	On	33.768800	-76.875785	3	Unid sea turtle	Unid sea turtle	1
10-Mar-10	9:48	On	33.837673	-76.965543	3	Unid sea turtle	Unid sea turtle	1
10-Mar-10	9:49	On	33.853603	-76.986306	3	Unid sea turtle	Unid sea turtle	2
10-Mar-10	9:51	On	33.902847	-77.050866	3	Unid sea turtle	Unid sea turtle	3
10-Mar-10	10:10	On	33.761414	-76.994305	2	Unid sea turtle	Unid sea turtle	2
10-Mar-10	10:50	On	33.791794	-77.165896	1	Unid sea turtle	Unid sea turtle	3

**Table 9.** Effort table for vessel surveys in the Onslow Bay USWTR study region Feb 24, 2010 - Mar 23, 2010.

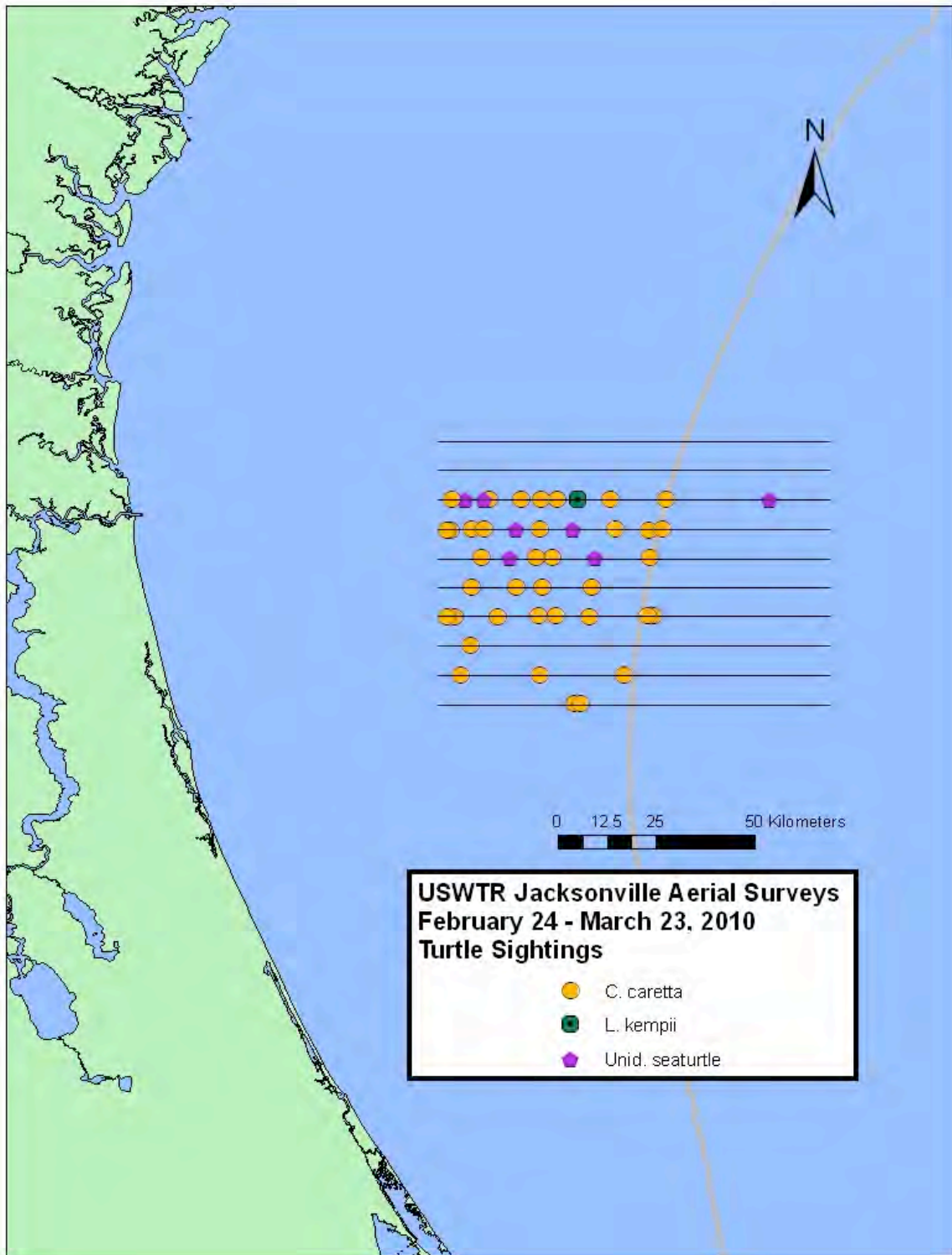
Date	Line	Sea State	Kilometers Surveyed
9-Mar-10	9	1 to 3	74.08

**Table 10.** Cetacean and sea turtle sightings during vessel surveys in the Onslow Bay USWTR study region Feb 24, 2010 - Mar 23, 2010.

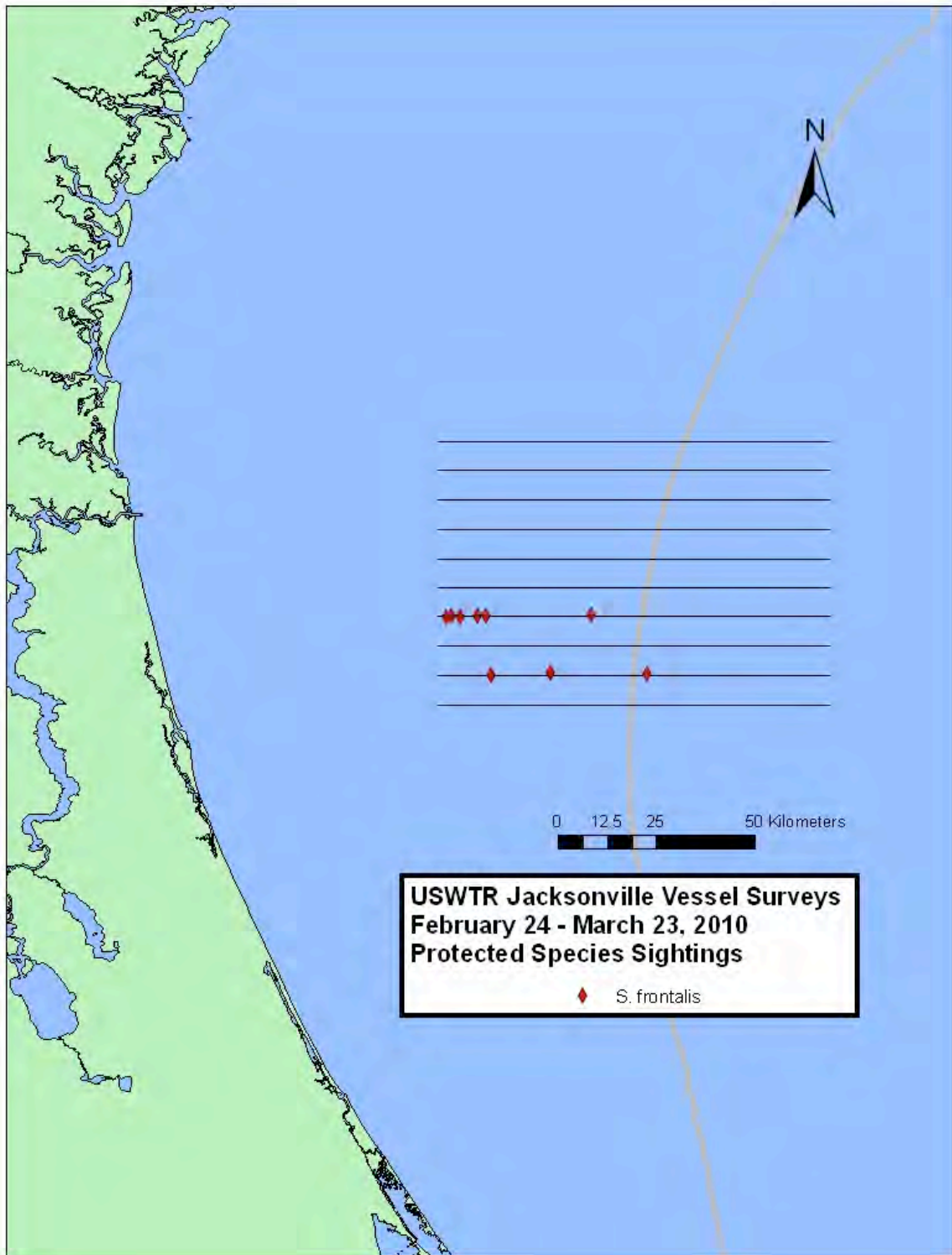
Date	Line	On/Off Effort	Time	Latitude	Longitude	Species	Group Size
9-Mar-10	9	Off	11:22:52	33.8542666	-76.19377	Bottlenose dolphins	10
9-Mar-10	9	Off	11:42:06	33.8600213	-76.2037111	Bottlenose dolphins	23
9-Mar-10	9	Off	14:36:14	34.1516478	-76.5824346	Loggerhead sea turtle	1
9-Mar-10	9	Off	14:38:34	34.1541451	-76.5851299	Loggerhead sea turtle	1



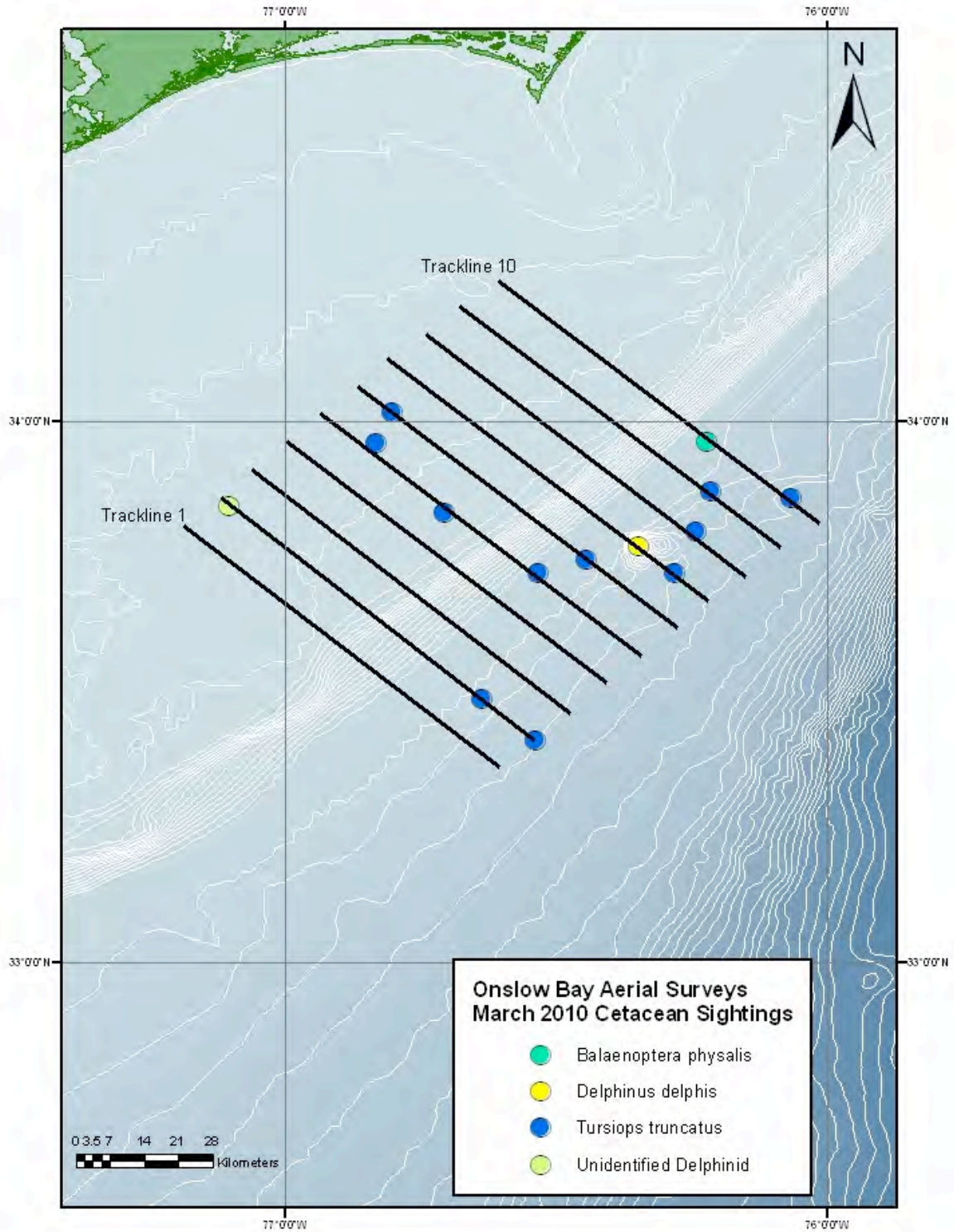
**Figure 1.** The locations of cetaceans sighted while conducting aerial surveys during the February 24, 2010 - March 23, 2010 reporting period of the JAX USWTR study region.



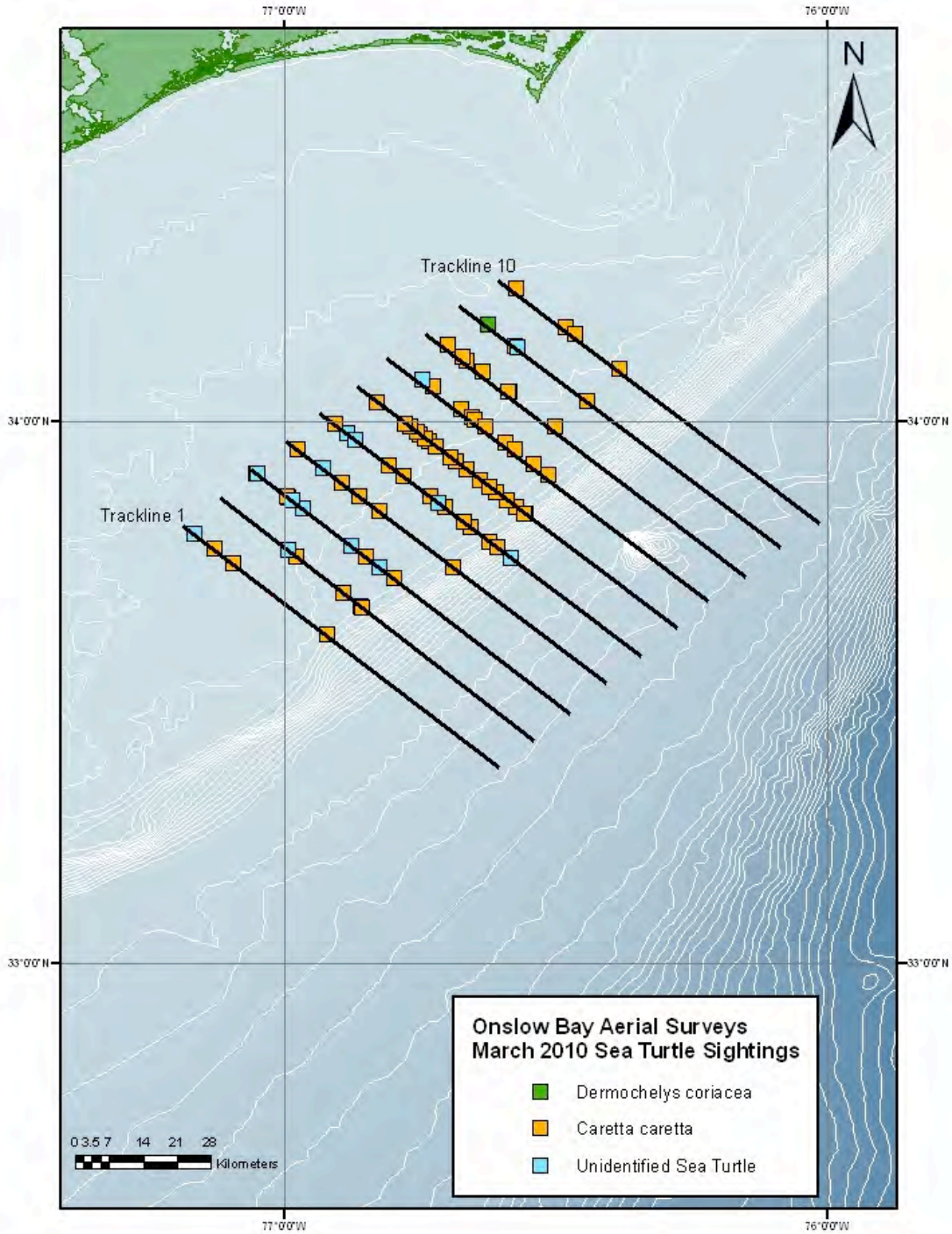
**Figure 2.** The locations of sea turtles sighted during aerial surveys between February 24, 2010 - March 23, 2010 in the JAX USWTR study region.



**Figure 3.** Cetaceans and sea turtles observed during vessel surveys of the JAX USWTR study region, February 24, 2010 - March 23, 2010.

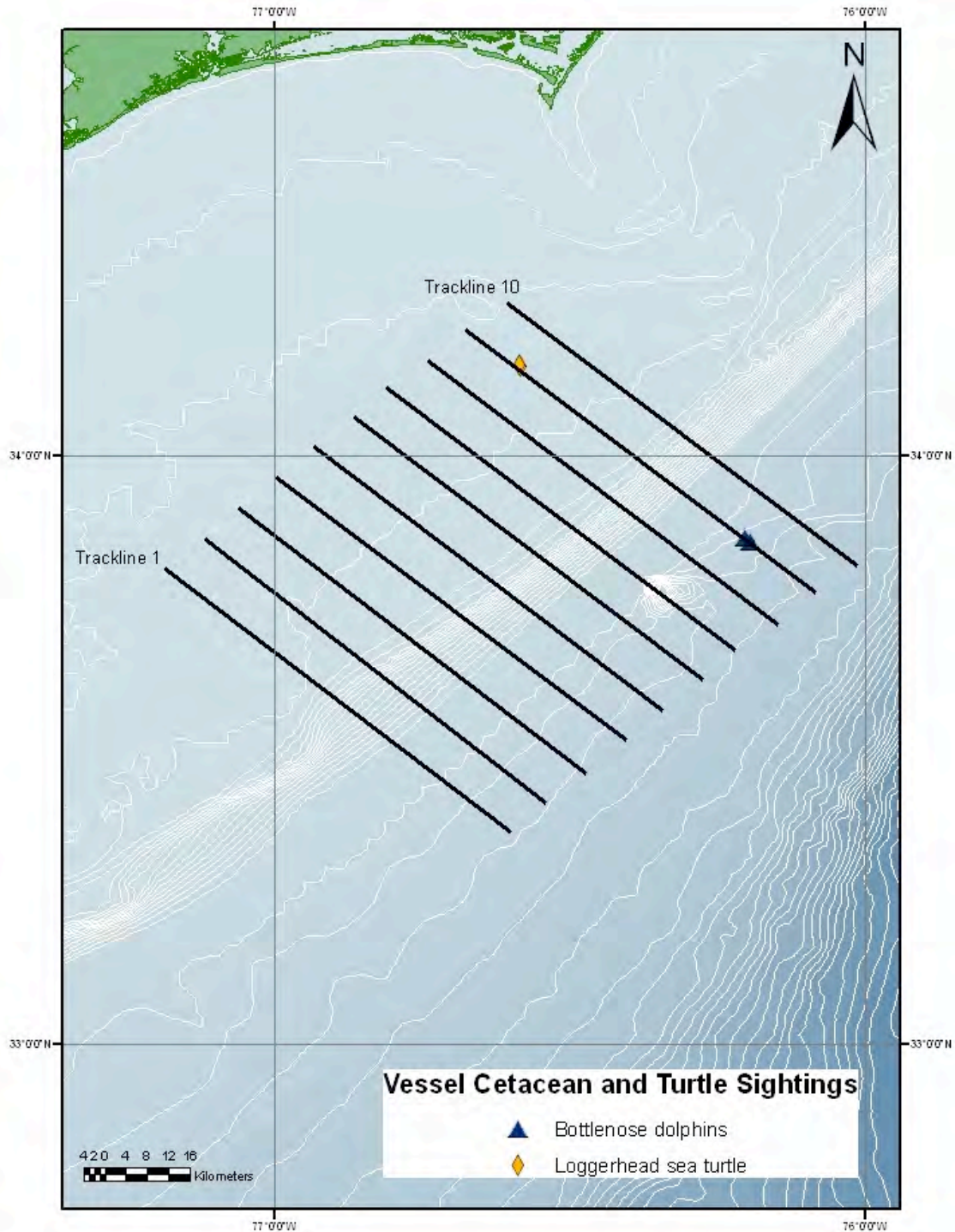


**Figure 4.** The locations of cetaceans sighted during aerial surveys from February 24, 2010 - March 23, 2010 of the Onslow Bay USWTR study region.



**Figure 5.** The locations of turtles sighted during aerial surveys from February 24, 2010 - March 23, 2010 of the Onslow Bay USWTR study region.





**Figure 6.** Locations of cetaceans and sea turtles sighted during vessel surveys on March 9, 2010 in the Onslow Bay USWTR study region. Note both bottlenose dolphin and loggerhead sea turtle sightings were very close to one another making it difficult to see two different sightings of each on the map.

## **Monitoring of Protected Species in the Proposed Onslow Bay and Jacksonville USWTRs**

Progress Report: March 24, 2010 through April 23, 2010

### **Planning (Task 1, 2 & 3)**

On 20 April 2010, all data from USTWR JAX surveys and data from USTWR Onslow Bay surveys for 2008-2010 were published on the website OBIS-SEAMAP. These survey data provide much needed sightings coverage of ocean sites that were, until recently, relatively unknown.

### **Purchasing (Task 1).**

No purchasing was undertaken during the reporting period.

### **Travel (Task 1 & 3)**

Rachel Hardee and Richard Holt from the JAX USWTR as well as Erin Cummings and Ryan McAlarney from the Onslow Bay survey team traveled to the SEAMAMMS conference in Virginia Beach, VA, to present posters on survey activity and results from their respective study areas. Lynn Williams presented a talk on results from the HARP data collected from Onslow Bay since it was deployed. Also attending SEAMAMMS was Julia Burrows, Daniel Waples, Kim Urian, Dr. Pabst, Dr. Read and William McLellan. Attached to this report are the abstracts and posters presented at SEAMAMMS, as well as a report by postdoc Melissa Soldevilla on the initial results of HARP monitoring in the JAX USWTR study site.

### **JAX Survey Activity (Task 2)**

#### Aerial Surveys

There were 37 tracklines surveyed since the last reporting period. Twenty-two lines were flown in good to excellent conditions and 15 lines were surveyed in moderate to good conditions (Table 1). There were 77 cetacean sightings during survey effort this month (Table 2, Figure 1). Bottlenose dolphins (*Tursiops truncatus*) were encountered most often with 40 sightings. Atlantic spotted dolphins (*Stenella frontalis*) were seen on 29 instances and Risso's dolphins (*Grampus griseus*) were spotted three times. A single group of short-finned pilot whales (*Globicephala macrorhynchus*) were observed on 2 April 2010. This constitutes the first time this species have been recorded during the JAX USWTR aerial surveys. Additionally, there were four cetacean sightings in which the animals could only be identified as delphinids. A right whale (*Eubalena glacialis*) cow/calf pair was photographed on 2 April 2010 during transit to the range, approximately 3 km from the western edge of the survey area. The right whale was identified as right whale ID# 3360. There were nearly 300 sea turtles seen during this reporting period (Table 3, Figure 2). Sighted most often were loggerhead sea turtles (*Caretta caretta*). There was an increase this month in the number of sightings of unidentified turtles. This is likely due to the marked increased of smaller sea turtles seen from the plane, which are typically not identifiable to species from the survey altitude (305 m) unless photographs are obtained. A Kemp's Ridley sea turtle (*Lepidochelys kempii*) was photographed incidentally during a cetacean encounter on 3 April 2010 and it is suspected that many of the smaller sea turtles observed may be Kemp's Ridley sea turtles as well.

#### Vessel Surveys

No vessel surveys were conducted during this period. A new engine is currently being installed in the R/V Volute.

### Towed Passive Acoustics

There were no passive acoustic data collected during this reporting period.

## **Onslow Bay Survey Activity (Task 5)**

### Aerial Surveys

Two days of aerial survey effort were conducted during the March 24 – April 23 2010 survey period. On April 11<sup>th</sup> all ten tracklines were surveyed during which two groups of cetacean (one bottlenose dolphin and one spotted dolphin sighting) were sighted (Table 5 and 6, Figure 3) along with a number of sea turtle sightings. The following day, April 12, 2010 all ten tracklines were again flown resulting in a single cetacean sighting of a group of bottlenose dolphin as well as a number of sea turtle sightings. In addition to the USWTR surveys the team flew coastal surveys within Onslow Bay while transiting to and from the USWTR survey area patrolling for migrating right whales. No notable sightings were recorded during coastal transits. Both survey days forecasted low winds and sea states during the days prior to our flights. Actual conditions within the range were much higher than forecasted resulting in surveys being conducted in sea states above the preferred target range (Table 4). One possible source of discrepancy between the actual and forecasted conditions is the loss of data from NOAA Buoy # 41036 which has been out of service since December 19, 2009 as it drifted north on the Gulf Stream. This buoy is normally placed 10 miles inshore of the Onslow Bay survey area and has been the main resource used at predicting weather conditions. As of yet there is no scheduled date for when this buoy will be restored. Once this buoy's data is again incorporated into the forecasting models it will greatly enhance our ability to predict the rapidly changing conditions in this offshore survey area.

### Vessel Surveys

A total of three track lines were surveyed during the study period. Line 10 was surveyed on April 2<sup>nd</sup> 2010 aboard the R/V *Cetus*, a modified 10m offshore fishing vessel, and lines 1 and 7 were surveyed on April 11<sup>th</sup> and 12<sup>th</sup> 2010, respectively, aboard the M/V *Sensation*, a 53' sport fishing vessel (Table 7). Three groups of bottlenose dolphins (*T.truncatus*) and 12 Loggerhead sea turtles (*C.caretta*) were encountered (Table 8). Locations of cetaceans and sea turtles sighted in Onslow Bay during vessel surveys are presented in Figure 4.

### Towed Passive Acoustics

The towed acoustic array was deployed from the R/V *Cetus* on the 2<sup>nd</sup> of April, 2010, for 5.33 hours of simultaneous visual and acoustic survey. During that time, a total of 1.98 hours of acoustic recordings were taken. Two visual sightings occurred during the acquisition of acoustic data; both groups were identified as *T. truncatus*. Numerous vocalizations including clicks, whistles, and burst-pulses were recorded. One other acoustic detection was made that day without visual observation to confirm the species. The towed array was also deployed from the F/V *Sensation* on the 11<sup>th</sup> and 12<sup>th</sup> of April, 2010. On April 11<sup>th</sup>, 4.5 hours of simultaneous visual and acoustic survey were performed. During that time, a total of 1.67 hours of acoustic recordings were taken. One visual sighting occurred during the acquisition of acoustic data; the group was identified as bottlenose dolphins (*T.truncatus*). Numerous vocalizations including clicks, whistles, and burst-pulses were recorded. Two other acoustic detections were made that day without visual observation to confirm species. On April 12<sup>th</sup>, 4.3 hours of simultaneous visual and acoustic survey were performed. During that time, a total of 28 minutes of acoustic recordings were taken. No visual sightings occurred during the

acquisition of data; however, two acoustic detections were made that day without visual observation to confirm species.

**Exercise Monitoring (Task 7)**

**No exercise monitoring occurred during this reporting period.**

**Table 1.** Aerial survey effort table for the JAX USWTR study region during March 24, 2010 - April 23, 2010.

Date	Line	Sea State	Kilometers Flown	HOBBS Hours
24-Mar-10	10	2 to 3	86.1	5.0
24-Mar-10	9	2 to 3	86.2	
24-Mar-10	8	2 to 3	84.2	
24-Mar-10	7	2 to 3	83.6	
24-Mar-10	6	1 to 2	80.7	
24-Mar-10	5	1 to 2	85.2	
31-Mar-10	1	2 to 4	85.0	4.7
31-Mar-10	2	2 to 4	84.8	
31-Mar-10	3	2 to 3	81.6	
31-Mar-10	4	2 to 3	86.0	
31-Mar-10	9	2 to 3	78.0	
31-Mar-10	10	2	82.3	
1-Apr-10	10	2 to 3	86.1	8.1
1-Apr-10	9	2 to 3	86.0	
1-Apr-10	8	2 to 3	86.4	
1-Apr-10	7	2 to 4	86.3	
1-Apr-10	6	2 to 4	85.2	
1-Apr-10	5	2 to 4	83.4	
1-Apr-10	4	1 to 3	75.0	
1-Apr-10	3	1 to 3	79.4	
1-Apr-10	2	1 to 3	83.5	
1-Apr-10	1	1 to 3	82.8	
2-Apr-10	1	1 to 2	82.1	
2-Apr-10	2	1 to 2	80.8	
2-Apr-10	3	1 to 2	83.6	
2-Apr-10	4	1 to 2	77.2	
2-Apr-10	5	1 to 2	86.5	
2-Apr-10	6	1 to 2	80.0	
2-Apr-10	7	1 to 2	82.8	
2-Apr-10	8	1 to 2	84.9	
2-Apr-10	9	1 to 2	84.8	
2-Apr-10	10	1 to 3	79.5	
3-Apr-10	10	1 to 2	83.2	4.2
3-Apr-10	9	1 to 2	76.6	
3-Apr-10	8	1 to 2	84.6	
3-Apr-10	7	1 to 2	82.6	
3-Apr-10	6	1 to 2	84.1	

**Table 2 (2x pages).** Cetacean sightings during aerial surveys in the JAX USWTR study region during March 24, 2010 - April 23, 2010.

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Common Name	Group Size
24-Mar-10	10:16	On effort	30.431388	-80.386431	8	<i>S. frontalis</i>	Atlantic Spotted Dolphin	10
24-Mar-10	10:36	On effort	30.429088	-80.037463	8	<i>G. griseus</i>	Risso's Dolphin	2
24-Mar-10	11:14	On effort	30.362014	-80.294141	7	<i>S. frontalis</i>	Atlantic Spotted Dolphin	12
24-Mar-10	11:25	On effort	30.370039	-80.461945	7	<i>S. frontalis</i>	Atlantic Spotted Dolphin	6
24-Mar-10	11:49	On effort	30.302538	-80.655800	6	Unid. Delphind	Unid. delphinid	3
24-Mar-10	12:11	On effort	30.302457	-80.113317	6	<i>G. griseus</i>	Risso's Dolphin	9
24-Mar-10	12:18	On effort	30.304547	-80.030007	6	Unid. Delphind	Unid. delphinid	2
31-Mar-10	14:08	On effort	30.032377	-80.325045	2	<i>S. frontalis</i>	Atlantic Spotted Dolphin	18
31-Mar-10	14:30	On effort	30.099076	-80.680099	3	<i>T. truncatus</i>	Bottlenose Dolphin	5
31-Mar-10	15:26	On effort	30.169487	-80.458317	4	<i>S. frontalis</i>	Atlantic Spotted Dolphin	2
31-Mar-10	15:36	On effort	30.171467	-80.540148	4	<i>S. frontalis</i>	Atlantic Spotted Dolphin	2
31-Mar-10	16:02	On effort	30.502046	-80.372564	9	<i>T. truncatus</i>	Bottlenose Dolphin	1
31-Mar-10	16:06	On effort	30.502116	-80.340091	9	<i>S. frontalis</i>	Atlantic Spotted Dolphin	80
31-Mar-10	16:09	On effort	30.503607	-80.291330	9	<i>T. truncatus</i>	Bottlenose Dolphin	1
31-Mar-10	16:21	On effort	30.500793	-80.151141	9	<i>T. truncatus</i>	Bottlenose Dolphin	2
31-Mar-10	16:29	On effort	30.504652	-79.895241	9	<i>T. truncatus</i>	Bottlenose Dolphin	10
31-Mar-10	16:35	On effort	30.501375	-79.831675	9	<i>T. truncatus</i>	Bottlenose Dolphin	18
31-Mar-10	16:48	On effort	30.572718	-80.122620	10	Unid. Delphind	Unid. delphinid	3
31-Mar-10	16:54	On effort	30.572921	-80.169614	10	<i>S. frontalis</i>	Atlantic Spotted Dolphin	25
31-Mar-10	17:01	On effort	30.562104	-80.212544	10	<i>T. truncatus</i>	Bottlenose Dolphin	3
31-Mar-10	17:05	On effort	30.568151	-80.309380	10	<i>S. frontalis</i>	Atlantic Spotted Dolphin	2
1-Apr-10	11:32	On effort	30.306852	-80.213772	6	<i>T. truncatus</i>	Bottlenose Dolphin	3
1-Apr-10	12:21	On effort	30.240809	-80.355085	5	<i>S. frontalis</i>	Atlantic Spotted Dolphin	11
1-Apr-10	12:36	On effort	30.239016	-80.583593	5	<i>S. frontalis</i>	Atlantic Spotted Dolphin	3
1-Apr-10	14:25	On effort	30.173926	-80.535763	4	<i>T. truncatus</i>	Bottlenose Dolphin	2
1-Apr-10	14:30	On effort	30.170693	-80.491403	4	<i>T. truncatus</i>	Bottlenose Dolphin	1
1-Apr-10	14:36	On effort	30.175791	-80.389746	4	<i>S. frontalis</i>	Atlantic Spotted Dolphin	6
1-Apr-10	14:44	On effort	30.165493	-80.270584	4	<i>T. truncatus</i>	Bottlenose Dolphin	7
1-Apr-10	15:00	On effort	30.163185	-79.962582	4	<i>T. truncatus</i>	Bottlenose Dolphin	11
1-Apr-10	15:24	On effort	30.102853	-80.187906	3	<i>G. griseus</i>	Risso's Dolphin	11
1-Apr-10	15:31	On effort	30.099932	-80.317157	3	<i>T. truncatus</i>	Bottlenose Dolphin	1
1-Apr-10	15:37	On effort	30.107272	-80.363344	3	<i>S. frontalis</i>	Atlantic Spotted Dolphin	6
1-Apr-10	16:03	On effort	30.035986	-80.485707	2	<i>T. truncatus</i>	Bottlenose Dolphin	3
1-Apr-10	16:47	On effort	29.962665	-80.435568	1	<i>S. frontalis</i>	Atlantic Spotted Dolphin	4
2-Apr-10	9:09	On effort	29.961342	-80.623578	1	<i>S. frontalis</i>	Atlantic Spotted Dolphin	8
2-Apr-10	9:15	On effort	29.959600	-80.446274	1	<i>T. truncatus</i>	Bottlenose Dolphin	3
2-Apr-10	9:40	On effort	29.961503	-80.013987	1	<i>T. truncatus</i>	Bottlenose Dolphin	2
2-Apr-10	9:48	On effort	29.963709	-79.918157	1	<i>T. truncatus</i>	Bottlenose Dolphin	8
2-Apr-10	9:53	On effort	29.958657	-79.850725	1	<i>T. truncatus</i>	Bottlenose Dolphin	5
2-Apr-10	9:56	On effort	29.964526	-79.832764	1	<i>G. macrorhynchus</i>	Short-finned pilot whale	5
2-Apr-10	10:09	On effort	30.037085	-79.894317	2	<i>T. truncatus</i>	Bottlenose Dolphin	4
2-Apr-10	10:26	On effort	30.032868	-80.373894	2	<i>T. truncatus</i>	Bottlenose Dolphin	15

2-Apr-10	10:36	On effort	30.033836	-80.482236	2	<i>S. frontalis</i>	Atlantic Spotted Dolphin	3
2-Apr-10	10:42	On effort	30.032604	-80.513773	2	<i>S. frontalis</i>	Atlantic Spotted Dolphin	12
2-Apr-10	10:58	On effort	30.092114	-80.551591	3	<i>S. frontalis</i>	Atlantic Spotted Dolphin	11
2-Apr-10	11:03	On effort	30.099114	-80.481895	3	<i>T. truncatus</i>	Bottlenose Dolphin	10
2-Apr-10	11:21	On effort	30.104917	-79.977374	3	<i>T. truncatus</i>	Bottlenose Dolphin	6
2-Apr-10	11:26	On effort	30.092008	-79.867933	3	<i>T. truncatus</i>	Bottlenose Dolphin	1
2-Apr-10	11:35	On effort	30.176137	-79.815244	4	<i>T. truncatus</i>	Bottlenose Dolphin	
2-Apr-10	11:39	On effort	30.163063	-79.889926	4	<i>T. truncatus</i>	Bottlenose Dolphin	4
2-Apr-10	12:03	On effort	30.172578	-80.512579	4	<i>S. frontalis</i>	Atlantic Spotted Dolphin	25
2-Apr-10	12:08	On effort	30.166215	-80.616192	4	<i>T. truncatus</i>	Bottlenose Dolphin	2
2-Apr-10	12:15	On effort	30.175159	-80.67196	4	<i>T. truncatus</i>	Bottlenose Dolphin	2
2-Apr-10	12:30	On effort	30.244618	-80.494633	5	<i>T. truncatus</i>	Bottlenose Dolphin	1
2-Apr-10	12:39	On effort	30.225323	-80.43902	5	<i>T. truncatus</i>	Bottlenose Dolphin	1
2-Apr-10	12:53	On effort	30.218106	-80.045485	5	<i>T. truncatus</i>	Bottlenose Dolphin	5
2-Apr-10	13:20	On effort	30.299055	-80.265751	6	<i>T. truncatus</i>	Bottlenose Dolphin	6
2-Apr-10	13:26	On effort	30.306456	-80.335262	6	<i>S. frontalis</i>	Atlantic Spotted Dolphin	18
2-Apr-10	15:30	On effort	30.365679	-80.3191	7	<i>S. frontalis</i>	Atlantic Spotted Dolphin	28
2-Apr-10	15:34	On effort	30.361301	-80.274064	7	Unid. Delphind	Unid. delphinid	1
2-Apr-10	15:54	On effort	30.365067	-79.85561	7	<i>T. truncatus</i>	Bottlenose Dolphin	10
2-Apr-10	16:11	On effort	30.435725	-80.175345	8	<i>T. truncatus</i>	Bottlenose Dolphin	12
2-Apr-10	16:44	On effort	30.498584	-80.45633	9	<i>T. truncatus</i>	Bottlenose Dolphin	4
2-Apr-10	17:21	On effort	30.567434	-80.140728	10	<i>S. frontalis</i>	Atlantic Spotted Dolphin	18
2-Apr-10	17:26	On effort	30.567027	-80.285993	10	<i>S. frontalis</i>	Atlantic Spotted Dolphin	22
2-Apr-10	17:36	On effort	30.567220	-80.489157	10	<i>S. frontalis</i>	Atlantic Spotted Dolphin	4
3-Apr-10	8:37	On effort	30.563400	-80.250618	10	<i>T. truncatus</i>	Bottlenose Dolphin	1
3-Apr-10	8:55	On effort	30.558371	-79.861974	10	<i>T. truncatus</i>	Bottlenose Dolphin	1
3-Apr-10	9:27	On effort	30.502812	-80.443168	9	<i>S. frontalis</i>	Atlantic Spotted Dolphin	12
3-Apr-10	9:32	On effort	30.498981	-80.486959	9	<i>S. frontalis</i>	Atlantic Spotted Dolphin	9
3-Apr-10	9:38	On effort	30.496229	-80.624682	9	<i>S. frontalis</i>	Atlantic Spotted Dolphin	10
3-Apr-10	9:57	On effort	30.428283	-80.241561	8	<i>T. truncatus</i>	Bottlenose Dolphin	10
3-Apr-10	10:37	On effort	30.370552	-80.507992	7	<i>S. frontalis</i>	Atlantic Spotted Dolphin	3
3-Apr-10	10:47	On effort	30.364375	-80.636263	7	<i>S. frontalis</i>	Atlantic Spotted Dolphin	24
3-Apr-10	11:01	On effort	30.293566	-80.463537	6	<i>T. truncatus</i>	Bottlenose Dolphin	1
3-Apr-10	11:10	On effort	30.294518	-80.257094	6	<i>T. truncatus</i>	Bottlenose Dolphin	3
3-Apr-10	11:30	On effort	30.296693	-79.808363	6	<i>T. truncatus</i>	Bottlenose Dolphin	12

**Table 3 (4x pages).** Sea turtle sightings during aerial surveys in the JAX USWTR study region during March 24, 2010 - April 23, 2010.

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Common Name	Group Size
24-Mar-10	9:06	On Effort	30.567294	-80.486973	10	<i>C. caretta</i>	Loggerhead Sea Turtle	1
24-Mar-10	9:09	On Effort	30.567326	-80.379917	10	<i>C. caretta</i>	Loggerhead Sea Turtle	1
24-Mar-10	9:44	On Effort	30.498713	-80.150725	9	<i>C. caretta</i>	Loggerhead Sea Turtle	2
24-Mar-10	9:48	On Effort	30.498978	-80.314899	9	<i>C. caretta</i>	Loggerhead Sea Turtle	1
24-Mar-10	9:54	On Effort	30.498803	-80.522280	9	<i>C. caretta</i>	Loggerhead Sea Turtle	1
24-Mar-10	9:56	On Effort	30.498500	-80.589576	9	<i>C. caretta</i>	Loggerhead Sea Turtle	1
24-Mar-10	9:56	On Effort	30.498499	-80.598616	9	<i>C. caretta</i>	Loggerhead Sea Turtle	1
24-Mar-10	9:57	On Effort	30.498289	-80.649904	9	<i>C. caretta</i>	Loggerhead Sea Turtle	1
24-Mar-10	10:02	On Effort	30.426862	-80.689727	8	<i>C. caretta</i>	Loggerhead Sea Turtle	1
24-Mar-10	10:03	On Effort	30.433451	-80.632588	8	<i>C. caretta</i>	Loggerhead Sea Turtle	2
24-Mar-10	10:04	On Effort	30.433766	-80.601294	8	Unid. sea turtle	Unid. sea turtle	1
24-Mar-10	10:08	On Effort	30.434016	-80.474235	8	<i>C. caretta</i>	Loggerhead Sea Turtle	2
24-Mar-10	10:26	On Effort	30.433955	-80.313701	8	<i>C. caretta</i>	Loggerhead Sea Turtle	1
24-Mar-10	10:26	On Effort	30.434115	-80.288908	8	<i>C. caretta</i>	Loggerhead Sea Turtle	1
24-Mar-10	10:29	On Effort	30.434117	-80.202388	8	Unid. sea turtle	Unid. sea turtle	2
24-Mar-10	11:33	On Effort	30.365562	-80.522841	7	<i>C. caretta</i>	Loggerhead Sea Turtle	1
24-Mar-10	11:34	On Effort	30.364885	-80.549990	7	<i>C. caretta</i>	Loggerhead Sea Turtle	1
24-Mar-10	11:36	On Effort	30.364837	-80.626302	7	Unid. sea turtle	Unid. sea turtle	2
24-Mar-10	11:38	On Effort	30.364613	-80.688866	7	<i>C. caretta</i>	Loggerhead Sea Turtle	1
24-Mar-10	11:57	On Effort	30.300623	-80.530066	6	<i>C. caretta</i>	Loggerhead Sea Turtle	1
24-Mar-10	12:01	On Effort	30.300728	-80.401245	6	Unid. sea turtle	Unid. sea turtle	1
24-Mar-10	12:57	On Effort	30.231972	-80.378059	5	<i>C. caretta</i>	Loggerhead Sea Turtle	1
24-Mar-10	12:58	On Effort	30.232259	-80.439790	5	<i>C. caretta</i>	Loggerhead Sea Turtle	1
24-Mar-10	12:58	On Effort	30.232154	-80.443375	5	Unid. sea turtle	Unid. sea turtle	3
24-Mar-10	12:59	On Effort	30.232141	-80.461687	5	<i>C. caretta</i>	Loggerhead Sea Turtle	2
24-Mar-10	13:02	On Effort	30.231948	-80.581830	5	<i>C. caretta</i>	Loggerhead Sea Turtle	1
24-Mar-10	13:04	On Effort	30.231922	-80.642595	5	<i>C. caretta</i>	Loggerhead Sea Turtle	1
31-Mar-10	14:19	On Effort	30.032073	-80.471281	2	<i>C. caretta</i>	Loggerhead Sea Turtle	1
31-Mar-10	14:21	On Effort	30.031944	-80.530676	2	<i>C. caretta</i>	Loggerhead Sea Turtle	1
31-Mar-10	15:31	On Effort	30.166325	-80.491997	4	<i>C. caretta</i>	Loggerhead Sea Turtle	1
31-Mar-10	15:31	On Effort	30.166404	-80.511724	4	<i>C. caretta</i>	Loggerhead Sea Turtle	1
31-Mar-10	15:40	On Effort	30.166106	-80.655086	4	<i>C. caretta</i>	Loggerhead Sea Turtle	1
31-Mar-10	15:40	On Effort	30.166241	-80.673845	4	<i>C. caretta</i>	Loggerhead Sea Turtle	1
31-Mar-10	15:52	On Effort	30.498571	-80.656912	9	<i>C. caretta</i>	Loggerhead Sea Turtle	2
31-Mar-10	15:52	On Effort	30.498559	-80.656648	9	<i>C. caretta</i>	Loggerhead Sea Turtle	1
31-Mar-10	15:53	On Effort	30.498905	-80.631751	9	<i>C. caretta</i>	Loggerhead Sea Turtle	3
31-Mar-10	15:54	On Effort	30.499012	-80.597075	9	<i>C. caretta</i>	Loggerhead Sea Turtle	3
31-Mar-10	15:54	On Effort	30.499101	-80.573123	9	<i>C. caretta</i>	Loggerhead Sea Turtle	3
31-Mar-10	15:54	On Effort	30.499011	-80.592174	9	<i>C. caretta</i>	Loggerhead Sea Turtle	2
31-Mar-10	15:55	On Effort	30.499190	-80.531806	9	<i>C. caretta</i>	Loggerhead Sea Turtle	3
31-Mar-10	15:55	On Effort	30.499158	-80.537305	9	Unid. sea turtle	Unid. sea turtle	1
31-Mar-10	15:57	On Effort	30.499302	-80.456003	9	Unid. sea turtle	Unid. sea turtle	1

31-Mar-10	16:17	On Effort	30.499380	-80.221563	9	<i>C. caretta</i>	Loggerhead Sea Turtle	1
31-Mar-10	17:09	On Effort	30.567284	-80.355627	10	Unid. sea turtle	Unid. sea turtle	1
31-Mar-10	17:13	On Effort	30.566988	-80.502750	10	<i>C. caretta</i>	Loggerhead Sea Turtle	1
31-Mar-10	17:13	On Effort	30.567004	-80.499043	10	<i>C. caretta</i>	Loggerhead Sea Turtle	1
31-Mar-10	17:14	On Effort	30.566836	-80.570466	10	Unid. sea turtle	Unid. sea turtle	1
31-Mar-10	17:15	On Effort	30.566757	-80.597297	10	<i>C. caretta</i>	Loggerhead Sea Turtle	1
31-Mar-10	17:16	On Effort	30.566684	-80.619658	10	<i>C. caretta</i>	Loggerhead Sea Turtle	5
31-Mar-10	17:16	On Effort	30.566666	-80.648355	10	<i>C. caretta</i>	Loggerhead Sea Turtle	2
31-Mar-10	17:17	On Effort	30.566536	-80.685169	10	<i>C. caretta</i>	Loggerhead Sea Turtle	5
31-Mar-10	17:17	On Effort	30.566599	-80.675692	10	<i>C. caretta</i>	Loggerhead Sea Turtle	1
1-Apr-10	10:42	On Effort	30.3661360	-80.3661030	7	<i>C. caretta</i>	Loggerhead Sea Turtle	1
1-Apr-10	10:43	On Effort	30.3661550	-80.4041050	7	Unid. sea turtle	Unid. sea turtle	1
1-Apr-10	10:46	On Effort	30.3659530	-80.5163080	7	<i>C. caretta</i>	Loggerhead Sea Turtle	1
1-Apr-10	10:55	On Effort	30.297457	-80.674508	6	Unid. sea turtle	Unid. sea turtle	1
1-Apr-10	11:21	On Effort	30.299970	-80.383497	6	Unid. sea turtle	Unid. sea turtle	1
1-Apr-10	12:29	On Effort	30.2330810	-80.4445760	5	<i>C. caretta</i>	Loggerhead Sea Turtle	1
1-Apr-10	14:17	On Effort	30.165302	-80.697645	4	<i>C. caretta</i>	Loggerhead Sea Turtle	1
1-Apr-10	14:18	On Effort	30.1657320	-80.6689100	4	Unid. sea turtle	Unid. sea turtle	1
1-Apr-10	14:19	On Effort	30.165708	-80.644909	4	<i>C. caretta</i>	Loggerhead Sea Turtle	1
1-Apr-10	14:20	On Effort	30.165861	-80.583087	4	Unid. sea turtle	Unid. sea turtle	1
1-Apr-10	14:33	On Effort	30.166213	-80.433398	4	<i>C. caretta</i>	Loggerhead Sea Turtle	1
1-Apr-10	14:41	On Effort	30.1664210	-80.3116890	4	Unid. sea turtle	Unid. sea turtle	1
1-Apr-10	15:47	On Effort	30.100436	-80.498892	3	<i>C. caretta</i>	Loggerhead Sea Turtle	1
1-Apr-10	15:47	On Effort	30.1004800	-80.4744760	3	Unid. sea turtle	Unid. sea turtle	1
1-Apr-10	15:48	On Effort	30.100358	-80.529854	3	<i>C. caretta</i>	Loggerhead Sea Turtle	1
1-Apr-10	15:49	On Effort	30.100327	-80.550423	3	<i>C. caretta</i>	Loggerhead Sea Turtle	1
1-Apr-10	15:52	On Effort	30.100071	-80.682629	3	<i>C. caretta</i>	Loggerhead Sea Turtle	1
1-Apr-10	15:52	On Effort	30.099968	-80.671037	3	Unid. sea turtle	Unid. sea turtle	1
1-Apr-10	15:57	On Effort	30.031726	-80.668162	2	<i>C. caretta</i>	Loggerhead Sea Turtle	1
1-Apr-10	15:58	On Effort	30.031326	-80.635289	2	<i>C. caretta</i>	Loggerhead Sea Turtle	1
1-Apr-10	15:58	On Effort	30.031349	-80.610825	2	<i>C. caretta</i>	Loggerhead Sea Turtle	1
1-Apr-10	15:58	On Effort	30.0313400	-80.6046190	2	Unid. sea turtle	Unid. sea turtle	3
1-Apr-10	15:59	On Effort	30.031457	-80.595225	2	<i>C. caretta</i>	Loggerhead Sea Turtle	1
1-Apr-10	15:59	On Effort	30.031493	-80.569883	2	<i>C. caretta</i>	Loggerhead Sea Turtle	1
1-Apr-10	16:00	On Effort	30.0314450	-80.5540160	2	<i>C. caretta</i>	Loggerhead Sea Turtle	1
1-Apr-10	16:01	On Effort	30.0316080	-80.5057760	2	<i>C. caretta</i>	Loggerhead Sea Turtle	1
1-Apr-10	16:12	On Effort	30.031868	-80.275036	2	<i>C. caretta</i>	Loggerhead Sea Turtle	1
1-Apr-10	16:43	On Effort	29.9659210	-80.3708830	1	<i>C. caretta</i>	Loggerhead Sea Turtle	1
1-Apr-10	16:55	On Effort	29.9653460	-80.6491670	1	<i>C. caretta</i>	Loggerhead Sea Turtle	1
2-Apr-10	9:12	On Effort	29.965215	-80.545697	1	<i>C. caretta</i>	Loggerhead Sea Turtle	1
2-Apr-10	9:21	On Effort	29.965105	-80.419148	1	<i>C. caretta</i>	Loggerhead Sea Turtle	1
2-Apr-10	10:47	On Effort	30.031775	-80.581927	2	<i>C. caretta</i>	Loggerhead Sea Turtle	1
2-Apr-10	10:48	On Effort	30.031734	-80.610540	2	<i>C. caretta</i>	Loggerhead Sea Turtle	2



2-Apr-10	11:01	On Effort	30.100746	-80.532937	3	<i>C. caretta</i>	Loggerhead Sea Turtle	1
2-Apr-10	11:01	On Effort	30.100106	-80.507810	3	<i>C. caretta</i>	Loggerhead Sea Turtle	2
2-Apr-10	11:08	On Effort	30.100360	-80.433341	3	Unid. sea turtle	Unid. sea turtle	1
2-Apr-10	11:12	On Effort	30.100262	-80.274858	3	Unid. sea turtle	Unid. sea turtle	3
2-Apr-10	11:53	On Effort	30.167511	-80.259354	4	<i>C. caretta</i>	Loggerhead Sea Turtle	1
2-Apr-10	11:59	On Effort	30.166671	-80.399993	4	<i>C. caretta</i>	Loggerhead Sea Turtle	1
2-Apr-10	12:00	On Effort	30.166586	-80.454301	4	<i>C. caretta</i>	Loggerhead Sea Turtle	1
2-Apr-10	12:01	On Effort	30.166542	-80.482073	4	<i>C. caretta</i>	Loggerhead Sea Turtle	1
2-Apr-10	12:23	On Effort	30.232389	-80.671304	5	<i>C. caretta</i>	Loggerhead Sea Turtle	2
2-Apr-10	12:24	On Effort	30.232254	-80.650172	5	<i>C. caretta</i>	Loggerhead Sea Turtle	2
2-Apr-10	12:24	On Effort	30.232279	-80.627037	5	<i>C. caretta</i>	Loggerhead Sea Turtle	2
2-Apr-10	12:26	On Effort	30.232537	-80.561596	5	<i>C. caretta</i>	Loggerhead Sea Turtle	2
2-Apr-10	12:27	On Effort	30.232617	-80.510335	5	Unid. sea turtle	Unid. sea turtle	1
2-Apr-10	13:18	On Effort	30.300425	-80.218023	6	<i>C. caretta</i>	Loggerhead Sea Turtle	1
2-Apr-10	13:26	On Effort	30.304767	-80.309144	6	<i>C. caretta</i>	Loggerhead Sea Turtle	1
2-Apr-10	13:37	On Effort	30.299726	-80.674536	6	<i>C. caretta</i>	Loggerhead Sea Turtle	1
2-Apr-10	13:37	On Effort	30.299710	-80.678288	6	<i>C. caretta</i>	Loggerhead Sea Turtle	1
2-Apr-10	15:21	On Effort	30.365127	-80.652659	7	<i>C. caretta</i>	Loggerhead Sea Turtle	2
2-Apr-10	15:21	On Effort	30.365109	-80.650647	7	<i>C. caretta</i>	Loggerhead Sea Turtle	3
2-Apr-10	15:22	On Effort	30.365242	-80.611985	7	<i>C. caretta</i>	Loggerhead Sea Turtle	1
2-Apr-10	15:23	On Effort	30.365276	-80.590156	7	<i>C. caretta</i>	Loggerhead Sea Turtle	3
2-Apr-10	15:24	On Effort	30.365401	-80.545544	7	<i>C. caretta</i>	Loggerhead Sea Turtle	1
2-Apr-10	15:24	On Effort	30.365395	-80.528076	7	<i>C. caretta</i>	Loggerhead Sea Turtle	3
2-Apr-10	15:25	On Effort	30.365447	-80.515283	7	<i>C. caretta</i>	Loggerhead Sea Turtle	1
2-Apr-10	15:26	On Effort	30.365470	-80.474578	7	<i>C. caretta</i>	Loggerhead Sea Turtle	1
2-Apr-10	15:28	On Effort	30.365683	-80.384327	7	<i>C. caretta</i>	Loggerhead Sea Turtle	2
2-Apr-10	15:29	On Effort	30.365692	-80.365171	7	<i>C. caretta</i>	Loggerhead Sea Turtle	1
2-Apr-10	16:22	On Effort	30.433736	-80.248053	8	<i>C. caretta</i>	Loggerhead Sea Turtle	1
2-Apr-10	16:23	On Effort	30.433720	-80.269359	8	<i>C. caretta</i>	Loggerhead Sea Turtle	1
2-Apr-10	16:23	On Effort	30.433681	-80.289136	8	Unid. sea turtle	Unid. sea turtle	3
2-Apr-10	16:25	On Effort	30.433697	-80.339620	8	<i>C. caretta</i>	Loggerhead Sea Turtle	3
2-Apr-10	16:26	On Effort	30.433605	-80.395444	8	<i>C. caretta</i>	Loggerhead Sea Turtle	2
2-Apr-10	16:26	On Effort	30.433623	-80.388464	8	<i>C. caretta</i>	Loggerhead Sea Turtle	2
2-Apr-10	16:27	On Effort	30.433650	-80.420986	8	<i>C. caretta</i>	Loggerhead Sea Turtle	2
2-Apr-10	16:30	On Effort	30.433431	-80.536213	8	<i>C. caretta</i>	Loggerhead Sea Turtle	2
2-Apr-10	16:30	On Effort	30.433361	-80.560756	8	<i>C. caretta</i>	Loggerhead Sea Turtle	3
2-Apr-10	16:32	On Effort	30.433118	-80.640198	8	<i>C. caretta</i>	Loggerhead Sea Turtle	1
2-Apr-10	16:32	On Effort	30.433261	-80.609786	8	<i>C. caretta</i>	Loggerhead Sea Turtle	2
2-Apr-10	16:32	On Effort	30.433150	-80.638273	8	<i>C. caretta</i>	Loggerhead Sea Turtle	2
2-Apr-10	16:34	On Effort	30.433202	-80.690055	8	<i>C. caretta</i>	Loggerhead Sea Turtle	1
2-Apr-10	16:38	On Effort	30.498598	-80.660643	9	Unid. sea turtle	Unid. sea turtle	1
2-Apr-10	16:40	On Effort	30.499023	-80.604308	9	Unid. sea turtle	Unid. sea turtle	4
2-Apr-10	16:40	On Effort	30.499147	-80.571885	9	Unid. sea turtle	Unid. sea turtle	5

2-Apr-10	16:41	On Effort	30.499229	-80.547945	9	<i>C. caretta</i>	Loggerhead Sea Turtle	4
2-Apr-10	16:41	On Effort	30.499196	-80.551560	9	<i>C. caretta</i>	Loggerhead Sea Turtle	6
2-Apr-10	16:42	On Effort	30.499257	-80.509296	9	<i>C. caretta</i>	Loggerhead Sea Turtle	3
2-Apr-10	16:52	On Effort	30.499454	-80.318959	9	<i>C. caretta</i>	Loggerhead Sea Turtle	1
2-Apr-10	17:00	On Effort	30.499030	-80.133132	9	<i>C. caretta</i>	Loggerhead Sea Turtle	1
2-Apr-10	17:18	On Effort	30.567302	-80.085730	10	<i>C. caretta</i>	Loggerhead Sea Turtle	1
2-Apr-10	17:23	On Effort	30.567321	-80.195202	10	<i>C. caretta</i>	Loggerhead Sea Turtle	1
2-Apr-10	17:25	On Effort	30.567201	-80.262607	10	<i>C. caretta</i>	Loggerhead Sea Turtle	2
2-Apr-10	17:30	On Effort	30.567440	-80.336212	10	<i>C. caretta</i>	Loggerhead Sea Turtle	1
2-Apr-10	17:43	On Effort	30.566593	-80.645813	10	<i>C. caretta</i>	Loggerhead Sea Turtle	1
2-Apr-10	17:43	On Effort	30.566664	-80.642479	10	<i>C. caretta</i>	Loggerhead Sea Turtle	1
2-Apr-10	17:43	On Effort	30.566515	-80.655792	10	<i>C. caretta</i>	Loggerhead Sea Turtle	3
3-Apr-10	8:25	On Effort	30.565911	-80.681409	10	Unid. sea turtle	Unid. sea turtle	3
3-Apr-10	8:25	On Effort	30.566042	-80.670227	10	Unid. sea turtle	Unid. sea turtle	2
3-Apr-10	8:26	On Effort	30.566182	-80.643714	10	Unid. sea turtle	Unid. sea turtle	1
3-Apr-10	8:27	On Effort	30.566382	-80.608878	10	Unid. sea turtle	Unid. sea turtle	2
3-Apr-10	8:27	On Effort	30.566249	-80.619345	10	Unid. sea turtle	Unid. sea turtle	3
3-Apr-10	8:30	On Effort	30.566609	-80.497587	10	Unid. sea turtle	Unid. sea turtle	2
3-Apr-10	9:35	On Effort	30.499595	-80.545578	9	Unid. sea turtle	Unid. sea turtle	4
3-Apr-10	9:36	On Effort	30.499414	-80.583656	9	Unid. sea turtle	Unid. sea turtle	4
3-Apr-10	9:36	On Effort	30.499438	-80.590211	9	Unid. sea turtle	Unid. sea turtle	6
3-Apr-10	9:37	On Effort	30.499323	-80.623452	9	Unid. sea turtle	Unid. sea turtle	4
3-Apr-10	9:38	Off effort	30.496229	-80.624682	9	<i>L. kempii</i>	Kemp's Ridley Sea Turtle	1
3-Apr-10	9:40	On Effort	30.499813	-80.661395	9	Unid. sea turtle	Unid. sea turtle	2
3-Apr-10	9:45	On Effort	30.433353	-80.670301	8	Unid. sea turtle	Unid. sea turtle	2
3-Apr-10	9:46	On Effort	30.432876	-80.628565	8	Unid. sea turtle	Unid. sea turtle	2
3-Apr-10	9:46	On Effort	30.432850	-80.642903	8	Unid. sea turtle	Unid. sea turtle	2
3-Apr-10	9:47	On Effort	30.432965	-80.581628	8	Unid. sea turtle	Unid. sea turtle	2
3-Apr-10	9:50	On Effort	30.433172	-80.496739	8	Unid. sea turtle	Unid. sea turtle	2
3-Apr-10	9:50	On Effort	30.433160	-80.482546	8	Unid. sea turtle	Unid. sea turtle	4
3-Apr-10	9:55	On Effort	30.433354	-80.312309	8	Unid. sea turtle	Unid. sea turtle	3
3-Apr-10	10:35	On Effort	30.365981	-80.425846	7	Unid. sea turtle	Unid. sea turtle	2
3-Apr-10	10:44	On Effort	30.365786	-80.559614	7	<i>C. caretta</i>	Loggerhead Sea Turtle	1
3-Apr-10	10:46	On Effort	30.365598	-80.619618	7	Unid. sea turtle	Unid. sea turtle	1
3-Apr-10	10:51	On Effort	30.367550	-80.693420	7	<i>C. caretta</i>	Loggerhead Sea Turtle	1
3-Apr-10	10:55	On Effort	30.299524	-80.644651	6	<i>C. caretta</i>	Loggerhead Sea Turtle	1
3-Apr-10	10:56	On Effort	30.299539	-80.615208	6	Unid. sea turtle	Unid. sea turtle	4
3-Apr-10	10:58	On Effort	30.299737	-80.535776	6	<i>C. caretta</i>	Loggerhead Sea Turtle	1
3-Apr-10	10:58	On Effort	30.299651	-80.563760	6	Unid. sea turtle	Unid. sea turtle	1
3-Apr-10	10:58	On Effort	30.299645	-80.557459	6	Unid. sea turtle	Unid. sea turtle	1
3-Apr-10	10:59	On Effort	30.299811	-80.492393	6	Unid. sea turtle	Unid. sea turtle	1
3-Apr-10	11:00	On Effort	30.299817	-80.480669	6	Unid. sea turtle	Unid. sea turtle	3
3-Apr-10	11:08	On Effort	30.300065	-80.315070	6	Unid. sea turtle	Unid. sea turtle	3

**Table 4.** Aerial survey effort table for the Onslow Bay USWTR study region during March 24, 2010 - April 23, 2010.

Date	Line	Sea State	Kilometers Flown	Hobbs Hours
11-Apr-10	6	2 to 4	74.5	7.0
11-Apr-10	5	2 to 3	75.5	
11-Apr-10	4	2 to 4	75.3	
11-Apr-10	3	2 to 3	75.1	
11-Apr-10	2	2 to 4	71.9	
11-Apr-10	1	2 to 4	74.5	
11-Apr-10	7	2 to 3	74.3	
11-Apr-10	8	2 to 3	75.3	
11-Apr-10	9	2 to 3	73.0	
11-Apr-10	10	2 to 3	74.1	
12-Apr-10	10	1 to 3	72.8	6.8
12-Apr-10	9	2 to 3	73.1	
12-Apr-10	8	2 to 3	74.9	
12-Apr-10	7	2 to 3	74.8	
12-Apr-10	6	2 to 3	74.7	
12-Apr-10	5	2 to 3	72.8	
12-Apr-10	1	2 to 3	74.3	
12-Apr-10	2	2 to 3	74.5	
12-Apr-10	3	2 to 3	75.3	
12-Apr-10	4	2 to 3	74.3	

**Table 5.** Cetacean sightings during aerial surveys in the Onslow Bay USWTR study region during March 24, 2010 - April 23, 2010.

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Common Name	Group Size
11-Apr-10	9:53	On	34.010019	-76.930714	5	<i>S. frontalis</i>	Atlantic Spotted dolphin	18
11-Apr-10	11:15	On	33.484779	-76.651031	2	<i>T. truncatus</i>	Bottlenose dolphin	40
12-Apr-10	11:17	On	33.685951	-76.498036	5	<i>T. truncatus</i>	Bottlenose dolphin	9

**Table 6.** Sea turtle sightings during aerial surveys in the Onslow Bay USWTR study region during March 24, 2010 - April 23, 2010.

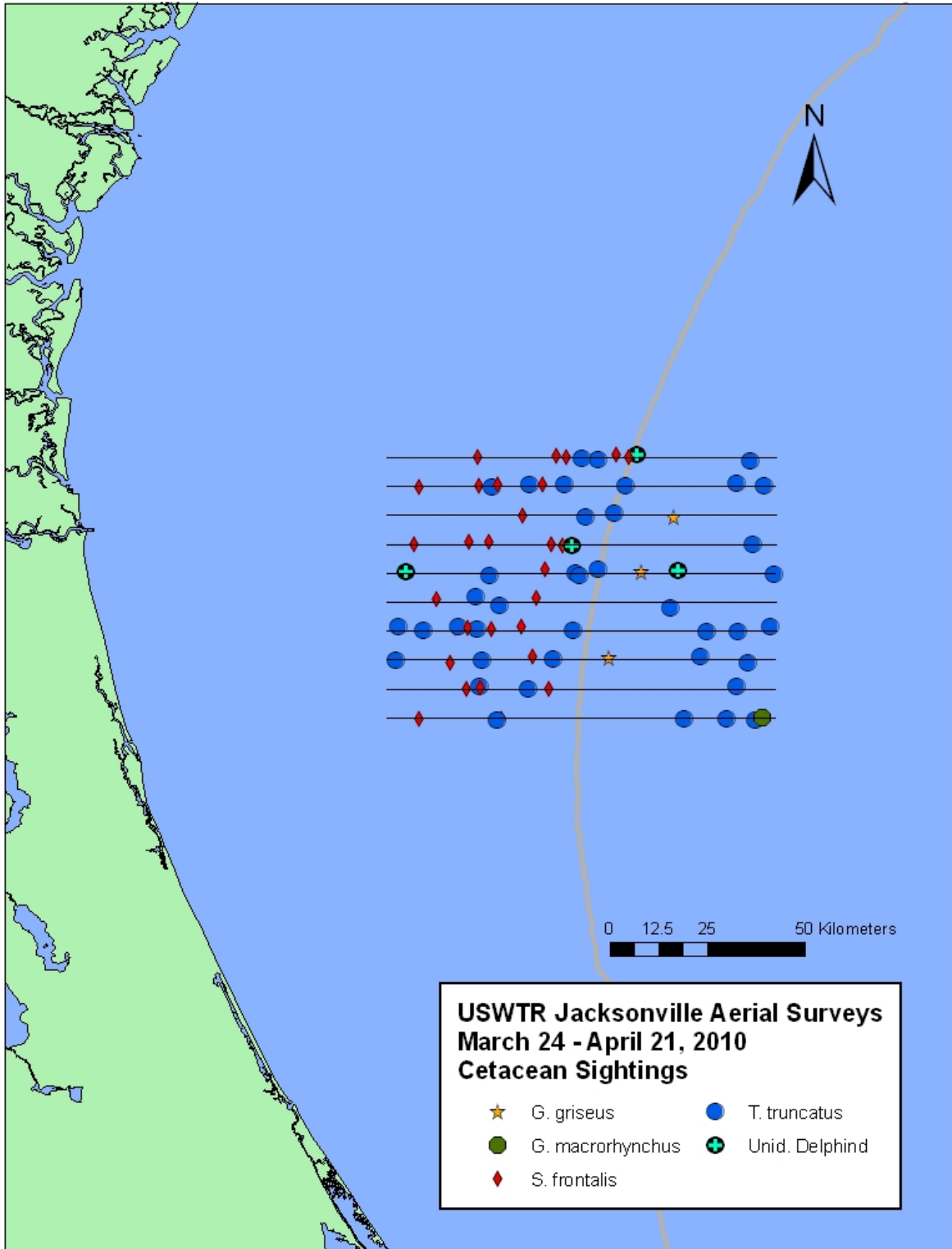
Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Common Name	Group Size
11-Apr-10	9:05	On	34.05457	-76.854696	6	C. caretta	Loggerhead sea turtle	2
11-Apr-10	9:19	On	33.753297	-76.45773	6	Unid sea turtle	Unid sea turtle	1
11-Apr-10	9:48	On	33.960538	-76.863675	5	C. caretta	Loggerhead sea turtle	1
11-Apr-10	9:50	On	34.003161	-76.920216	5	C. caretta	Loggerhead sea turtle	1
11-Apr-10	10:46	On	33.773411	-76.883261	3	C. caretta	Loggerhead sea turtle	1
11-Apr-10	10:52	On	33.900722	-77.049539	3	C. caretta	Loggerhead sea turtle	1
11-Apr-10	11:01	On	33.739419	-76.96437	2	C. caretta	Loggerhead sea turtle	1
11-Apr-10	11:05	On	33.667044	-76.870733	2	C. caretta	Loggerhead sea turtle	1
11-Apr-10	11:57	On	33.795604	-77.172689	1	C. caretta	Loggerhead sea turtle	1
11-Apr-10	14:08	On	34.022195	-76.672521	7	C. caretta	Loggerhead sea turtle	1
11-Apr-10	14:08	On	34.012545	-76.659842	7	C. caretta	Loggerhead sea turtle	1
11-Apr-10	14:40	On	34.00999	-76.530938	8	C. caretta	Loggerhead sea turtle	1
11-Apr-10	14:53	On	34.17084	-76.616313	9	C. caretta	Loggerhead sea turtle	1
11-Apr-10	14:56	On	34.114997	-76.542141	9	C. caretta	Loggerhead sea turtle	1
11-Apr-10	15:01	On	33.998321	-76.387938	9	C. caretta	Loggerhead sea turtle	1
11-Apr-10	15:31	On	34.171487	-76.481811	10	C. caretta	Loggerhead sea turtle	1
11-Apr-10	15:34	On	34.226395	-76.552354	10	C. caretta	Loggerhead sea turtle	1
12-Apr-10	9:06	On	34.260347	-76.593000	10	C. caretta	Loggerhead sea turtle	3
12-Apr-10	9:07	On	34.245283	-76.574369	10	C. caretta	Loggerhead sea turtle	2
12-Apr-10	9:08	On	34.215017	-76.535104	10	C. caretta	Loggerhead sea turtle	1
12-Apr-10	9:09	On	34.205325	-76.522603	10	C. caretta	Loggerhead sea turtle	4
12-Apr-10	9:10	On	34.169130	-76.476012	10	C. caretta	Loggerhead sea turtle	1
12-Apr-10	9:20	On	34.016787	-76.279442	10	C. caretta	Loggerhead sea turtle	1
12-Apr-10	9:44	On	34.002838	-76.396980	9	Unid sea turtle	Unid sea turtle	1
12-Apr-10	9:48	On	34.105410	-76.532150	9	C. caretta	Loggerhead sea turtle	1
12-Apr-10	9:49	On	34.111477	-76.540201	9	Unid sea turtle	Unid sea turtle	2
12-Apr-10	9:53	On	34.201625	-76.659705	9	Unid sea turtle	Unid sea turtle	2
12-Apr-10	9:58	On	34.141664	-76.701370	8	C. caretta	Loggerhead sea turtle	1
12-Apr-10	9:58	On	34.131522	-76.688228	8	C. caretta	Loggerhead sea turtle	2
12-Apr-10	10:00	On	34.101123	-76.648155	8	C. caretta	Loggerhead sea turtle	1
12-Apr-10	10:00	On	34.088152	-76.631007	8	Unid sea turtle	Unid sea turtle	3
12-Apr-10	10:01	On	34.059282	-76.593320	8	C. caretta	Loggerhead sea turtle	1
12-Apr-10	10:40	On	34.073505	-76.742117	7	Unid sea turtle	Unid sea turtle	4
12-Apr-10	10:41	On	34.110676	-76.790741	7	C. caretta	Loggerhead sea turtle	2
12-Apr-10	10:46	On	34.055040	-76.859105	6	C. caretta	Loggerhead sea turtle	4
12-Apr-10	10:46	On	34.049133	-76.849504	6	Unid sea turtle	Unid sea turtle	1
12-Apr-10	10:47	On	34.023453	-76.813501	6	C. caretta	Loggerhead sea turtle	1
12-Apr-10	10:48	On	34.003460	-76.787213	6	C. caretta	Loggerhead sea turtle	1
12-Apr-10	11:45	On	34.002549	-76.919181	5	Unid sea turtle	Unid sea turtle	1
12-Apr-10	14:35	On	33.773823	-77.011464	2	C. caretta	Loggerhead sea turtle	1
12-Apr-10	14:52	On	33.721309	-76.812493	3	Unid sea turtle	Unid sea turtle	1

Table 7. Effort table for vessel surveys in the Onslow Bay USWTR study region March 24, 2010 – April 23, 2010.

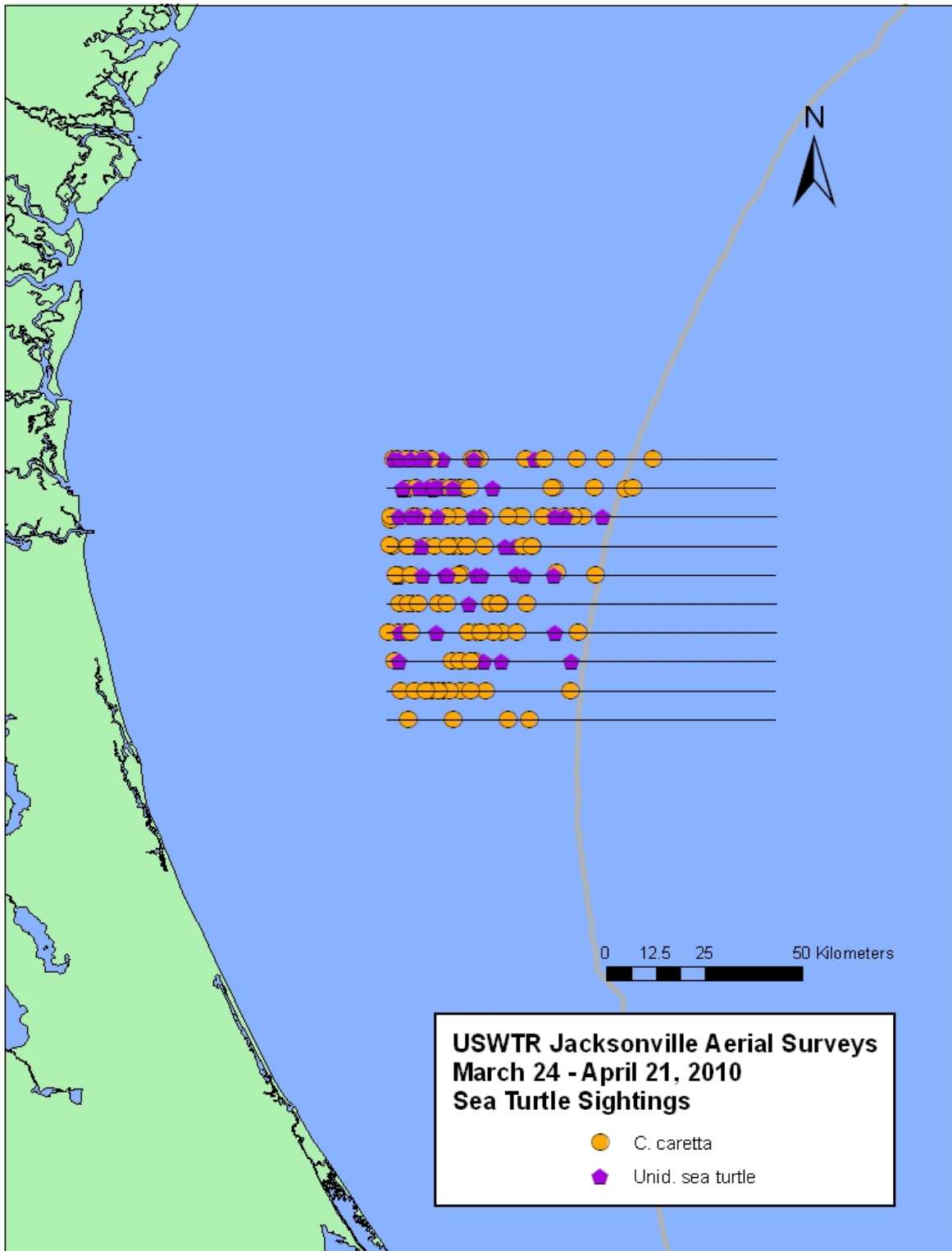
Date	Line	Sea State	Km Surveyed	Survey	At Sea	Platform
2-Apr-10	10	3-Feb	74.08	5:11	10:10	<i>R/V Cetus</i>
11-Apr-10	1	4-Feb	74.08	4:30	11:10	<i>M/V Sensation</i>
12-Apr-10	7	3-Feb	74.08	4:13	9:00	<i>M/V Sensation</i>

Table 8. Cetacean and sea turtle sightings during vessel surveys in the Onslow Bay USWTR study region March 24, 2010 – April 23, 2010. \* indicates approximate values-exact values were not obtained that day due to software problems.

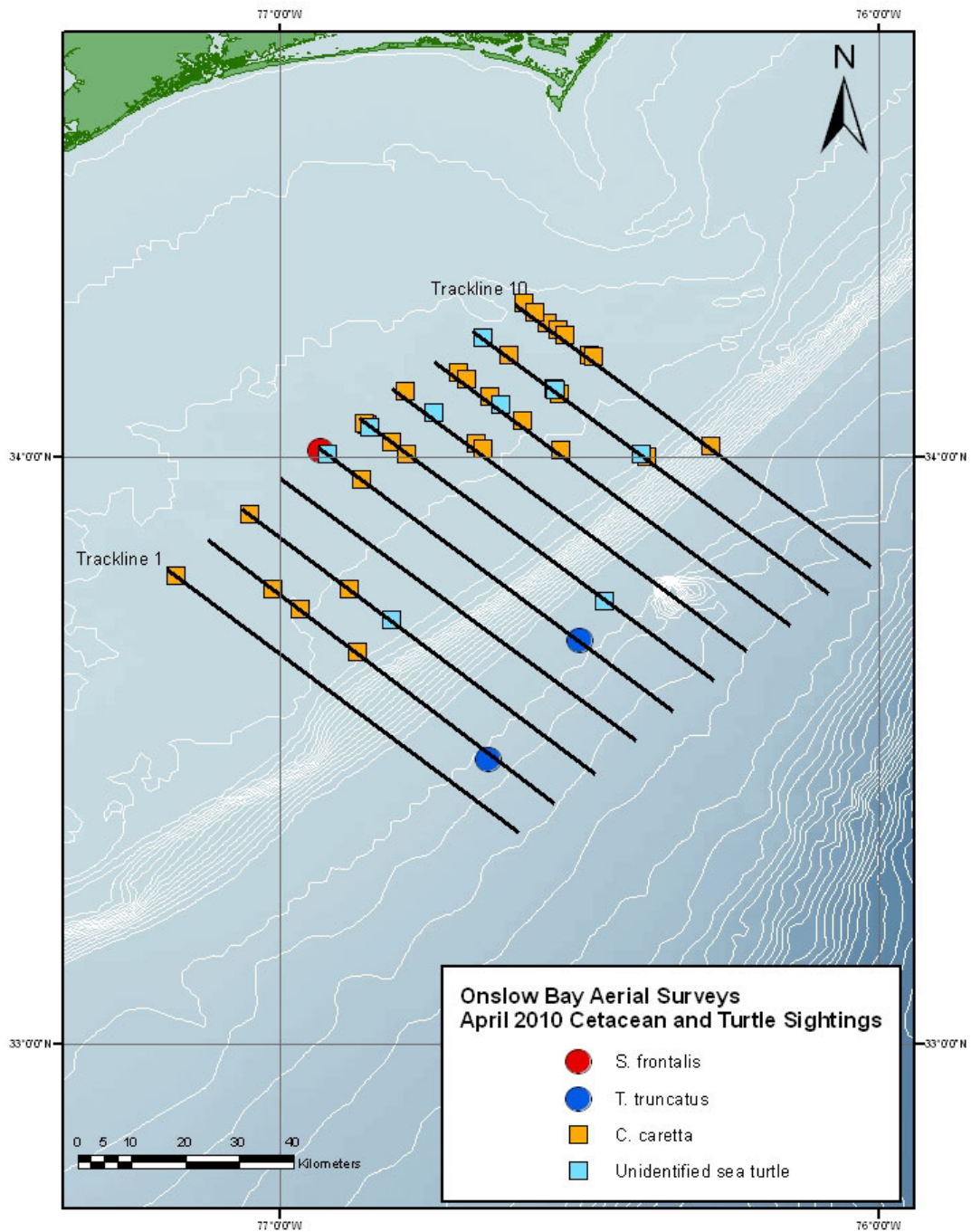
Date	Time	On/Off Effort	Latitude	Longitude	Species	Common Name	Group Size
2-Apr-10	12:20	On	34.059380	-76.333961	<i>T. truncatus</i>	Bottlenose dolphins	9
2-Apr-10	14:00	On	34.184760	-76.499986	<i>C. caretta</i>	Loggerhead sea turtle	1
2-Apr-10	14:32	On	34.245226	-76.577878	<i>T. truncatus</i>	Bottlenose dolphins	36
2-Apr-10	14:53	Off	34.247264	-76.587190	<i>C. caretta</i>	Loggerhead sea turtle	1
2-Apr-10	14:56	Off	34.249868	-76.586747	<i>C. caretta</i>	Loggerhead sea turtle	1
2-Apr-10	14:57	Off	34.247900	-76.587490	<i>C. caretta</i>	Loggerhead sea turtle	1
2-Apr-10	15:02	Off	34.247740	-76.587591	<i>C. caretta</i>	Loggerhead sea turtle	1
2-Apr-10	15:28	On	34.271450	-76.609531	<i>C. caretta</i>	Loggerhead sea turtle	1
11-Apr-10	9:00*	Off	33.35960*	-76.60170*	<i>T. truncatus</i>	Bottlenose dolphins	12
12-Apr-10	12:35	On	34.046848	-76.706958	<i>C. caretta</i>	Loggerhead sea turtle	1
12-Apr-10	12:39	On	34.053326	-76.712476	<i>C. caretta</i>	Loggerhead sea turtle	1
12-Apr-10	12:52	On	34.079756	-76.745518	<i>C. caretta</i>	Loggerhead sea turtle	1
12-Apr-10	13:00	Off	34.094514	-76.755889	<i>C. caretta</i>	Loggerhead sea turtle	1
12-Apr-10	13:19	Off	34.115588	-76.798813	<i>C. caretta</i>	Loggerhead sea turtle	1
12-Apr-10	13:21	On	34.121355	-76.803717	<i>C. caretta</i>	Loggerhead sea turtle	1



**Figure 1.** The locations of cetaceans sighted while conducting aerial surveys during the March 24, 2010 - April 23, 2010 reporting period of the JAX USWTR study region.

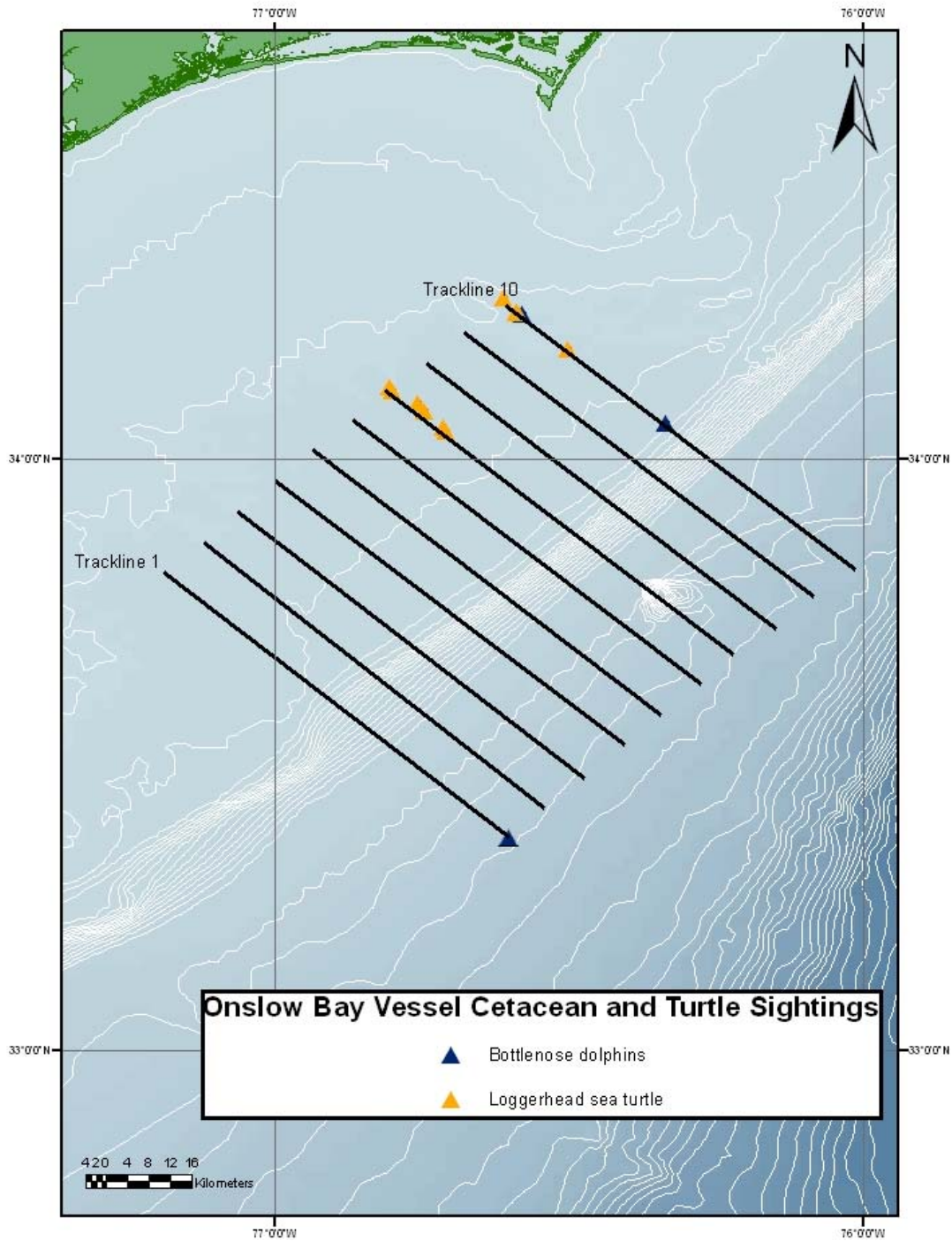


**Figure 2.** The locations of sea turtles sighted during aerial surveys between March 24, 2010 - April 23, 2010 in the JAX USWTR study region.



**Figure 3.** The locations of cetaceans and sea turtles sighted during aerial surveys from March 24, 2010 - April 23, 2010 of the Onslow Bay USWTR study region.





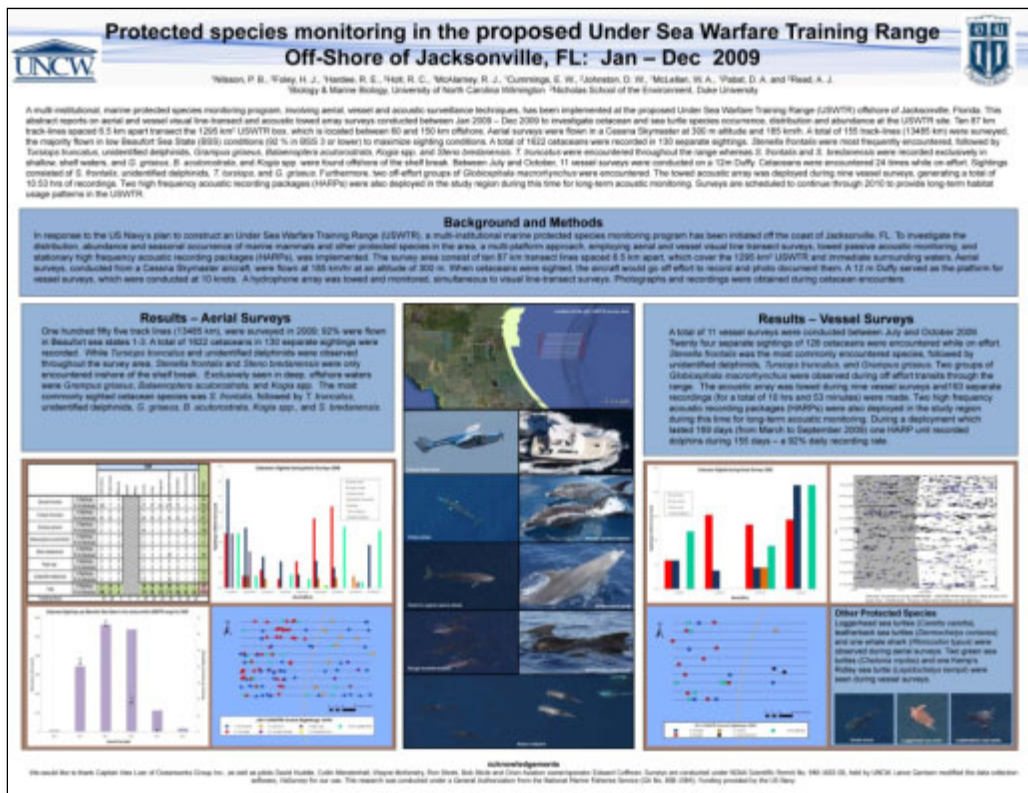
**Figure 4.** Locations of cetaceans and sea turtles sighted during vessel surveys in the Onslow Bay USWTR study region March 24, 2010 – April 20, 2010. Note the bottlenose dolphin sighting partially hidden by the loggerhead sea turtle sighting near the inshore region of line 10.

Appendix 1: Presented material at Seamamms  
**Protected species monitoring in the proposed Under Sea Warfare Training Range Off-Shore of Jacksonville, FL: Jan – Dec 2009**

<sup>1</sup>Nilsson, P.B., <sup>2</sup>Foley, H. J., <sup>1</sup>Hardee, R.E., <sup>2</sup>Holt, R. C., <sup>1</sup>McAlarney, R.J., <sup>1</sup>Cummings, E. W., <sup>2</sup>Johnston, D.W., <sup>1</sup>McLellan, W. A., <sup>1</sup>Pabst, D. A. and <sup>2</sup>Read, A.J.

<sup>1</sup>Biology & Marine Biology, University of North Carolina Wilmington  
<sup>2</sup>Nicholas School of the Environment, Duke University

A multi-institutional, marine protected species monitoring program, involving aerial, vessel and acoustic surveillance techniques, has been implemented at the proposed Under Sea Warfare Training Range (USWTR) offshore of Jacksonville, Florida. This abstract reports on aerial and vessel visual line-transect and acoustic towed array surveys conducted between Jan 2009 – Dec 2009 to investigate cetacean and sea turtle species occurrence, distribution and abundance at the USWTR site. Ten 87 km track-lines spaced 6.5 km apart transect the 1295 km<sup>2</sup> USWTR box, which is located between 60 and 150 km offshore. Aerial surveys were flown in a Cessna Skymaster at 300 m altitude and 185 km/h. A total of 155 track-lines (13485 km) were surveyed, the majority flown in low Beaufort Sea State (BSS) conditions (92 % in BSS 3 or lower) to maximize sighting conditions. A total of 1622 cetaceans were recorded in 130 separate sightings. *Stenella frontalis* were most frequently encountered, followed by *Tursiops truncatus*, unidentified delphinids, *Grampus griseus*, *Balaenoptera acutorostrata*, *Kogia* spp. and *Steno bredanensis*. *T. truncatus* were encountered throughout the range whereas *S. frontalis* and *S. bredanensis* were recorded exclusively in shallow, shelf waters, and *G. griseus*, *B. acutorostrata*, and *Kogia* spp. were found offshore of the shelf break. Between July and October, 11 vessel surveys were conducted on a 12m Duffy. Cetaceans were encountered 24 times while on-effort. Sightings consisted of *S. frontalis*, unidentified delphinids, *T. tursiops*, and *G. griseus*. Furthermore, two off-effort groups of *Globicephala macrorhynchus* were encountered. The towed acoustic array was deployed during nine vessel surveys, generating a total of 10.53 hrs of recordings. Two high frequency acoustic recording packages (HARPs) were also deployed in the study region during this time for long-term acoustic monitoring. Surveys are scheduled to continue through 2010 to provide long-term habitat usage patterns in the USWTR.



# Protected species monitoring in Onslow Bay, NC: January – December 2009

<sup>1</sup>McAlarney, R.J., <sup>1</sup>Cummings, E. W., <sup>1</sup>Nilsson, P.B., <sup>2</sup>Foley, H., <sup>1</sup>Hardee, R.E., <sup>2</sup>Holt, R., <sup>2</sup>Williams, L., <sup>2</sup>Urian, K., <sup>2</sup>Johnston, D.J. <sup>1</sup>McLellan, W. A., <sup>1</sup>Pabst, D. A. and <sup>2</sup>Read, A.J.

<sup>1</sup>Biology and Marine Biology, University of North Carolina Wilmington  
<sup>2</sup>Nicholas School of the Environment, Duke University

The protected species monitoring program, initiated in response to Onslow Bay, NC being identified as a potential site for the US Navy's Undersea Warfare Training Range (USWTR), is now into its third year. To estimate marine mammal density, distribution, and seasonality, a multi-platform approach was implemented using traditional visual line transect survey methods from aerial and vessel platforms along with passive acoustic monitoring from vessels and moored instruments. From January through December 2009, 20 aerial surveys were completed, covering 15,187 km of trackline, and 22 vessel surveys were completed, covering 1,630 km of trackline. Species sighted included *Tursiops truncatus*, *Stenella frontalis*, *Grampus griseus*, *Globicephala macrorhynchus*, *Physeter macrocephalus*, and *Steno bredanensis* in order of abundance. *T. truncatus* and *S. frontalis* comprised the majority of cetacean groups sighted in both aerial (*T. truncatus* 48 of 94, *S. frontalis* 37 of 94) and vessel (*T. truncatus* 24 of 45, *S. frontalis* 15 of 45) surveys. Approximately 1,275 digital images were taken for species ID and individual recognition during January - December 2009 from the vessel-based surveys. No individuals of any species (*T. truncatus*, *S. frontalis*, *G. griseus*, and *G. macrorhynchus*) have been re-sighted in the USWTR from photo-identification images. Passive acoustic monitoring techniques have included towing an array during vessel surveys and deploying High-frequency Acoustic Recording Packages (HARPs) in the USWTR. Towed array results during this time suggested we visually detected approximately 60% of the dolphin groups that were acoustically detected. We have found hundreds of vocal detections in the HARP data, which will provide insights into daily and longer-term vocal variability of marine mammals. This project represents a long term data set used to assess residency and abundance patterns of this offshore area in the waters off North Carolina.

**Protected species monitoring in Onslow Bay, NC: January – December 2009**

McAlarney, R.J., Cummings, E. W., Nilsson, P.B., Foley, H., Hardee, R.E., Holt, R., Williams, L., Urian, K., Johnston, D.J., McLellan, W. A., Pabst, D. A. and Read, A.J.  
 Biology and Marine Biology, University of North Carolina Wilmington, Nicholas School of the Environment, Duke University

**Methods**

The passive acoustics array in Onslow Bay, NC was deployed in January 2009 and consisted of 10 moored instruments. Aerial surveys were conducted from January through December 2009, covering 15,187 km of trackline. Vessel surveys were completed from January through December 2009, covering 1,630 km of trackline. Species sighted included *Tursiops truncatus*, *Stenella frontalis*, *Grampus griseus*, *Globicephala macrorhynchus*, *Physeter macrocephalus*, and *Steno bredanensis* in order of abundance. *T. truncatus* and *S. frontalis* comprised the majority of cetacean groups sighted in both aerial (*T. truncatus* 48 of 94, *S. frontalis* 37 of 94) and vessel (*T. truncatus* 24 of 45, *S. frontalis* 15 of 45) surveys. Approximately 1,275 digital images were taken for species ID and individual recognition during January - December 2009 from the vessel-based surveys. No individuals of any species (*T. truncatus*, *S. frontalis*, *G. griseus*, and *G. macrorhynchus*) have been re-sighted in the USWTR from photo-identification images. Passive acoustic monitoring techniques have included towing an array during vessel surveys and deploying High-frequency Acoustic Recording Packages (HARPs) in the USWTR. Towed array results during this time suggested we visually detected approximately 60% of the dolphin groups that were acoustically detected. We have found hundreds of vocal detections in the HARP data, which will provide insights into daily and longer-term vocal variability of marine mammals. This project represents a long term data set used to assess residency and abundance patterns of this offshore area in the waters off North Carolina.

**Line Transect Results**

Line transect results were analyzed using distance sampling methods. The results show the distribution and abundance of cetacean groups sighted during the surveys. The most abundant groups were *T. truncatus* and *S. frontalis*.

**Photographic Effort**

Photographic effort was conducted using digital cameras and video. The results show the number of photos taken and the number of individuals identified. The most common species identified were *T. truncatus* and *S. frontalis*.

Species	Number of Photos	Number of Individuals
<i>T. truncatus</i>	1,275	48
<i>S. frontalis</i>	1,275	37
<i>G. griseus</i>	1,275	0
<i>G. macrorhynchus</i>	1,275	0
<i>P. macrocephalus</i>	1,275	0
<i>S. bredanensis</i>	1,275	0

**Biological Observations**

Biological observations were conducted during the surveys. The results show the behavior and interactions of the cetacean groups. The most common behaviors observed were socializing and foraging.

**Passive Acoustic Monitoring**

Passive acoustic monitoring was conducted using HARPs. The results show the number of vocalizations detected and the species of the vocalizations. The most common vocalizations detected were those of *T. truncatus* and *S. frontalis*.

**Calf Observations**

Calf observations were conducted during the surveys. The results show the number of calves observed and the species of the calves. The most common species of calves observed were *T. truncatus* and *S. frontalis*.

**Acknowledgments**

The authors would like to thank the following individuals and organizations for their support and assistance during the project: US Navy, UNCW, Duke University, and the local community.

## Temporal patterns of odontocete vocalizations in Onslow Bay, North Carolina

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<sup>1</sup> Duke University Marine Lab, <sup>2</sup> Scripps Institution of Oceanography, UCSD

Stationary passive acoustic monitoring allows researchers to examine diel, seasonal, and inter-annual trends in vocalization patterns of odontocete cetaceans. We used bottom-mounted High-frequency Acoustic Recording Packages (HARPs; 0.01-100 kHz bandwidth) to examine temporal patterns of odontocete vocalizations in Onslow Bay, NC, over three deployment periods: (1) October 10, 2007 – January 16, 2008 (Site A); (2) May 30 – September 10, 2008 (Site B); and (3) April 24 – August 9, 2009 (Site A). We used Long-Term Spectral Averages (LTSAs) to locate vocal bouts within the HARP datasets and found hundreds of odontocete vocal bouts from several species, including sperm whales (*Physeter macrocephalus*), pilot whales (*Globicephala macrorhynchus*), Risso's dolphins (*Grampus griseus*), and unidentified odontocetes. The daily duration of these vocal bouts increased from mid-October 2007 to mid-January 2008, but we found no discernable pattern from June to September 2008 or from April to August 2009. When all vocal bouts were considered, there was a significant increase at dawn from October to January at Site A (Kruskal-Wallis,  $p < 0.001$ ), an increase at night from June to September at Site B (Kruskal-Wallis,  $p < 0.001$ ), and an increase at night from April to August at Site A (Kruskal-Wallis,  $p < 0.001$ ). These diel differences may represent behavioral differences among species or a seasonal change in vocal behavior within species. In addition, we found a significant nocturnal increase in the occurrence of Risso's dolphin click bouts (Kruskal-Wallis,  $p < 0.001$ ) and sperm whale click bouts (Kruskal-Wallis,  $p < 0.001$ ), perhaps because these species forage on squid that exhibit diel vertical migrations. These time series of acoustic recordings allow us to examine temporal patterns of odontocete vocalizations on monthly and daily time scales. Future deployments will occur year-round in the same locations, providing a more complete picture of the occurrence of vocalizing odontocetes in Onslow Bay.

## **Monitoring of Protected Species in the Proposed Onslow Bay and Jacksonville USWTRs**

Progress Report: 20 April 2010 through 19 May 2010

### **Planning (Task 1, 2 & 3)**

A conference call was conducted and included all members of Onslow and JAX teams. Discussions covered wrap up of three years of Onslow surveys and future survey directions for Onslow as well as one year wrap up of JAX. Potential for extending survey lines off-shore of existing range was discussed for both survey sites. Survey personnel are training to assist in oil spill cleanup operations.

### **Purchasing (Task 1)**

No purchases were made during this reporting period.

### **Travel (Task 1 & 3)**

Ryan McAlarney traveled up to the Duke Marine Lab for potential vessel survey work on May 6 and 7, 2010. Vessel surveys were only conducted on 7 May 2010 due to unfavorable survey conditions.

William McLellan planned to travel and present JAX survey data to the Southeast Implementation Team meeting on 4 May. The presentation was to include all winter sightings of large whales including right whales sighted on effort during surveys. The meeting was cancelled on 2 May due to the extensive NOAA and Southeast Region Marine Mammal Stranding Network involvement with the Louisiana oil spill response.

### **JAX Survey Activity (Task 2)**

#### Aerial Surveys

A total of 10 tracklines were surveyed in good to fair conditions during this reporting period. On 6 May 2010, tracklines 1 and 2 were surveyed. However, due to persistent low clouds, the survey had to be aborted after 30 km on line 3. On May 7<sup>th</sup>, track lines 3 to 10 were flown (Table 1). There were 16 sightings of cetaceans during the aerial surveys: bottlenose dolphins (*Tursiops truncatus*: 7 sightings), Atlantic spotted dolphins (*Stenella frontalis*: 7 sightings), sperm whales (*Physeter macrocephalus*: 1 sighting), and unidentified delphinids (1 sighting, Table 2, Figure 1). This is the first time sperm whales have been observed in the study area since the inception of aerial surveys in January 2009. A total of 77 sea turtles were recorded during aerial survey effort this reporting period: loggerhead sea turtles (n = 45), unidentified sea turtles (n = 31), and one leatherback sea turtle (Table 3, Figure 2).

#### Vessel Surveys

A new engine was installed in the *R/V Volute*, and the vessel is now ready to resume surveys.

## Onslow Bay Survey Activity (Task 5)

### Aerial Surveys

There were no aerial surveys conducted during this reporting period due to high winds off-shore causing increased Beaufort Sea States. The survey team did assist with vessel surveys during this reporting period.

### Vessel Surveys

Vessel surveys were conducted on 20 April 2010 which was actually during the previous reporting period, however to allow for data analysis the effort will be included in this survey period.

Two track lines were surveyed during the study period aboard the M/V *Sensation*, a 53' sport fishing vessel. Line 4 was surveyed on 20 April 2010 and line 3 was surveyed on 7 May 2010 (Table 4). Two groups of bottlenose dolphins (*Tursiops truncatus*), two groups of Atlantic spotted dolphins (*Stenella frontalis*), one group of unidentified dolphins, and ten Loggerhead sea turtles were sighted (Table 5). Locations of cetaceans and sea turtles sighted in Onslow Bay during vessel surveys are presented in Figure 3.

### Towed Passive Acoustics

The towed acoustic array was deployed from the *F/V Sensation* on the 7<sup>th</sup> of May, 2010, for 4.48 hours of simultaneous visual and acoustic survey. During that time, a total of 47 minutes of acoustic recordings were taken. Three acoustic detections were made that day without visual confirmation of the species despite circling back for one of the groups off-effort.

## Exercise Monitoring (Task 7)

**Table 1.** Aerial survey effort table for the JAX USWTR study region during April 24, 2010 – May 19, 2010.

Date	Line	Sea State	Kilometers Flown	HOBBS Hours
6-May-10	1	2-3	81.6	3.9
6-May-10	2	1-3	72.0	
6-May-10	3	2-3	30.7	
7-May-10	3	2-3	48.0	6.1
7-May-10	4	2-3	83.0	
7-May-10	5	2	84.9	
7-May-10	6	2	77.8	
7-May-10	7	2	82.7	
7-May-10	8	2	84.0	
7-May-10	9	1-2	84.9	
7-May-10	10	1-2	85.7	

**Table 2.** Cetacean sightings during aerial surveys in the JAX USWTR study region during April 24, 2010 – May 19, 2010.

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Common Name	Group Size
6-May-10	9:53	On	29.958342	-80.487387	1	<i>T. truncatus</i>	Bottlenose Dolphin	10
6-May-10	10:05	On	29.972346	-80.290129	1	<i>T. truncatus</i>	Bottlenose Dolphin	24
6-May-10	10:41	On	30.031996	-80.336320	2	<i>T. truncatus</i>	Bottlenose Dolphin	6
6-May-10	10:49	On	30.030748	-80.510834	2	<i>S. frontalis</i>	Atlantic Spotted Dolphin	40
6-May-10	13:42	On	30.096822	-80.544239	3	<i>S. frontalis</i>	Atlantic Spotted Dolphin	4
6-May-10	13:52	On	30.102411	-80.481820	3	<i>S. frontalis</i>	Atlantic Spotted Dolphin	4
7-May-10	10:00	On	30.148260	-80.148623	4	<i>P. macrocephalus</i>	Sperm Whale	2
7-May-10	10:10	On	30.167974	-80.229344	4	<i>S. frontalis</i>	Atlantic Spotted Dolphin	75
7-May-10	10:19	On	30.164865	-80.375852	4	<i>T. truncatus</i>	Bottlenose Dolphin	4
7-May-10	10:51	On	30.234612	-80.389831	5	<i>T. truncatus</i>	Bottlenose Dolphin	5
7-May-10	11:01	On	30.231191	-80.239313	5	<i>T. truncatus</i>	Bottlenose Dolphin	8
7-May-10	11:59	On	30.375496	-80.608868	7	Unid. Delphinid	Unid. Delphinid	3
7-May-10	12:48	On	30.439407	-80.575846	8	<i>S. frontalis</i>	Atlantic Spotted Dolphin	18
7-May-10	12:55	On	30.432984	-80.695540	8	<i>S. frontalis</i>	Atlantic Spotted Dolphin	17
7-May-10	14:39	On	30.496633	-80.267536	9	<i>T. truncatus</i>	Bottlenose Dolphin	5
7-May-10	15:23	On	30.566378	-80.289206	10	<i>S. frontalis</i>	Atlantic Spotted Dolphin	3

**Table 3.** Sea turtle sightings during aerial surveys in the JAX USWTR study region during April 24, 2010 – May 19, 2010.

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Common Name	Group Size
6-May-10	9:46	On	29.965177	-80.668963	1	Unid. Sea Turtle	Unid. Sea Turtle	1
6-May-10	9:50	On	29.965885	-80.522465	1	<i>C. caretta</i>	Loggerhead Sea Turtle	1
6-May-10	10:04	On	29.966334	-80.299699	1	Unid. Sea Turtle	Unid. Sea Turtle	1
6-May-10	10:46	On	30.031116	-80.454175	2	<i>C. caretta</i>	Loggerhead Sea Turtle	1
6-May-10	13:39	On	30.099887	-80.572043	3	<i>C. caretta</i>	Loggerhead Sea Turtle	1
6-May-10	13:40	On	30.099512	-80.565715	3	<i>C. caretta</i>	Loggerhead Sea Turtle	1
6-May-10	13:54	On	30.101082	-80.418631	3	<i>C. caretta</i>	Loggerhead Sea Turtle	1
6-May-10	13:56	On	30.100996	-80.343180	3	<i>C. caretta</i>	Loggerhead Sea Turtle	1
7-May-10	9:25	On	30.101754	-80.286554	3	<i>C. caretta</i>	Loggerhead Sea Turtle	1
7-May-10	10:15	On	30.165886	-80.286109	4	<i>D. coriacea</i>	Leatherback Sea Turtle	1
7-May-10	10:32	On	30.165829	-80.465372	4	<i>C. caretta</i>	Loggerhead Sea Turtle	1
7-May-10	10:32	On	30.166542	-80.443867	4	<i>C. caretta</i>	Loggerhead Sea Turtle	2
7-May-10	10:34	On	30.165508	-80.532059	4	Unid. Sea Turtle	Unid. Sea Turtle	1
7-May-10	10:35	On	30.165405	-80.563304	4	<i>C. caretta</i>	Loggerhead Sea Turtle	1
7-May-10	10:38	On	30.165221	-80.666783	4	<i>C. caretta</i>	Loggerhead Sea Turtle	1
7-May-10	10:44	On	30.233067	-80.615095	5	<i>C. caretta</i>	Loggerhead Sea Turtle	1
7-May-10	10:45	On	30.233375	-80.591664	5	Unid. Sea Turtle	Unid. Sea Turtle	1
7-May-10	10:46	On	30.233455	-80.537231	5	<i>C. caretta</i>	Loggerhead Sea Turtle	1
7-May-10	10:48	On	30.233389	-80.485648	5	<i>C. caretta</i>	Loggerhead Sea Turtle	1
7-May-10	10:48	On	30.233457	-80.461223	5	<i>C. caretta</i>	Loggerhead Sea Turtle	1
7-May-10	10:49	On	30.233446	-80.441127	5	<i>C. caretta</i>	Loggerhead Sea Turtle	2
7-May-10	10:50	On	30.233445	-80.417063	5	<i>C. caretta</i>	Loggerhead Sea Turtle	1
7-May-10	10:50	On	30.233379	-80.420766	5	<i>C. caretta</i>	Loggerhead Sea Turtle	1
7-May-10	10:59	On	30.233808	-80.292253	5	<i>C. caretta</i>	Loggerhead Sea Turtle	1
7-May-10	11:00	On	30.233489	-80.242494	5	<i>C. caretta</i>	Loggerhead Sea Turtle	1
7-May-10	11:33	On	30.299813	-80.208193	6	<i>C. caretta</i>	Loggerhead Sea Turtle	1
7-May-10	11:43	On	30.299471	-80.527219	6	<i>C. caretta</i>	Loggerhead Sea Turtle	1
7-May-10	11:44	On	30.299361	-80.563232	6	<i>C. caretta</i>	Loggerhead Sea Turtle	1
7-May-10	11:45	On	30.298997	-80.626740	6	<i>C. caretta</i>	Loggerhead Sea Turtle	2
7-May-10	12:03	On	30.366215	-80.554721	7	<i>C. caretta</i>	Loggerhead Sea Turtle	1
7-May-10	12:07	On	30.366723	-80.386513	7	<i>C. caretta</i>	Loggerhead Sea Turtle	1
7-May-10	12:08	On	30.366889	-80.357586	7	<i>C. caretta</i>	Loggerhead Sea Turtle	1
7-May-10	12:09	On	30.366819	-80.333428	7	<i>C. caretta</i>	Loggerhead Sea Turtle	1
7-May-10	12:40	On	30.433003	-80.336979	8	<i>C. caretta</i>	Loggerhead Sea Turtle	1
7-May-10	12:45	On	30.432697	-80.500829	8	<i>C. caretta</i>	Loggerhead Sea Turtle	1
7-May-10	14:28	On	30.500233	-80.618054	9	<i>C. caretta</i>	Loggerhead Sea Turtle	2
7-May-10	14:30	On	30.500817	-80.539733	9	<i>C. caretta</i>	Loggerhead Sea Turtle	1
7-May-10	14:33	On	30.500596	-80.449497	9	<i>C. caretta</i>	Loggerhead Sea Turtle	1
7-May-10	14:54	On	30.500558	-80.174878	9	Unid. Sea Turtle	Unid. Sea Turtle	2
7-May-10	14:57	On	30.500220	-80.055240	9	<i>C. caretta</i>	Loggerhead Sea Turtle	1
7-May-10	15:16	On	30.566161	-80.131508	10	<i>C. caretta</i>	Loggerhead Sea Turtle	1
7-May-10	15:16	On	30.566103	-80.128995	10	Unid. Sea Turtle	Unid. Sea Turtle	2
7-May-10	15:31	On	30.565963	-80.421856	10	Unid. Sea Turtle	Unid. Sea Turtle	1
7-May-10	15:33	On	30.565925	-80.500304	10	<i>C. caretta</i>	Loggerhead Sea Turtle	1
7-May-10	15:33	On	30.565990	-80.485165	10	Unid. Sea Turtle	Unid. Sea Turtle	2
7-May-10	15:33	On	30.566031	-80.482399	10	Unid. Sea Turtle	Unid. Sea Turtle	2
7-May-10	15:34	On	30.565911	-80.506358	10	<i>C. caretta</i>	Loggerhead Sea Turtle	2
7-May-10	15:34	On	30.565842	-80.528303	10	Unid. Sea Turtle	Unid. Sea Turtle	3
7-May-10	15:35	On	30.565793	-80.573770	10	Unid. Sea Turtle	Unid. Sea Turtle	3
7-May-10	15:35	On	30.565837	-80.539089	10	Unid. Sea Turtle	Unid. Sea Turtle	4
7-May-10	15:36	On	30.565856	-80.597138	10	<i>C. caretta</i>	Loggerhead Sea Turtle	1
7-May-10	15:37	On	30.565699	-80.632902	10	<i>C. caretta</i>	Loggerhead Sea Turtle	2
7-May-10	15:38	On	30.565552	-80.661221	10	Unid. Sea Turtle	Unid. Sea Turtle	4
7-May-10	15:38	On	30.565496	-80.685179	10	Unid. Sea Turtle	Unid. Sea Turtle	1
7-May-10	15:39	On	30.565429	-80.698184	10	Unid. Sea Turtle	Unid. Sea Turtle	3

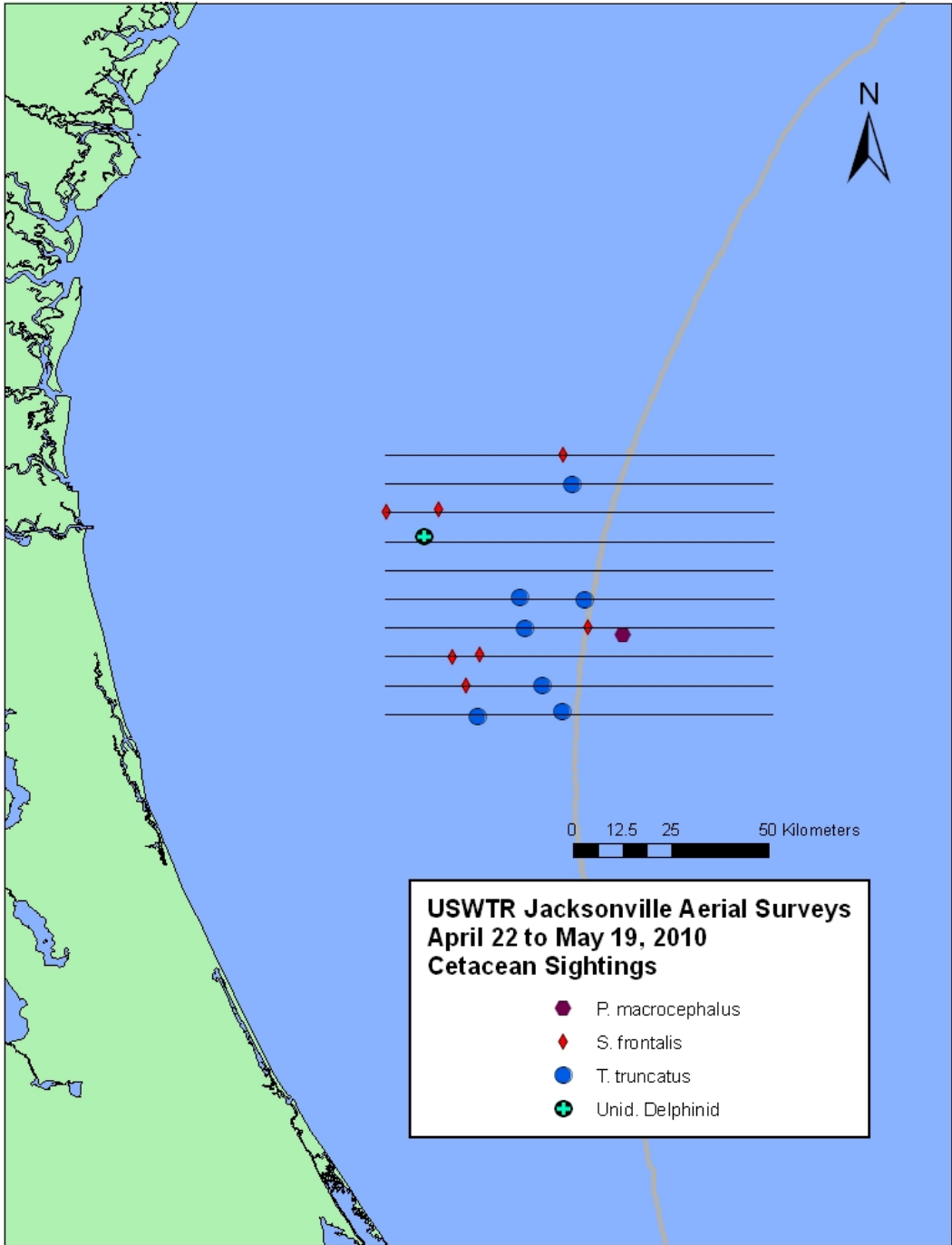


**Table 4.** Effort table for vessel surveys in the Onslow Bay USWTR study region April 20 2010 - May 19, 2010. Survey effort on May 7, 2010 began approximately 8 nautical miles (14.816 km) short of the offshore end of the line 3 due to poor weather conditions.

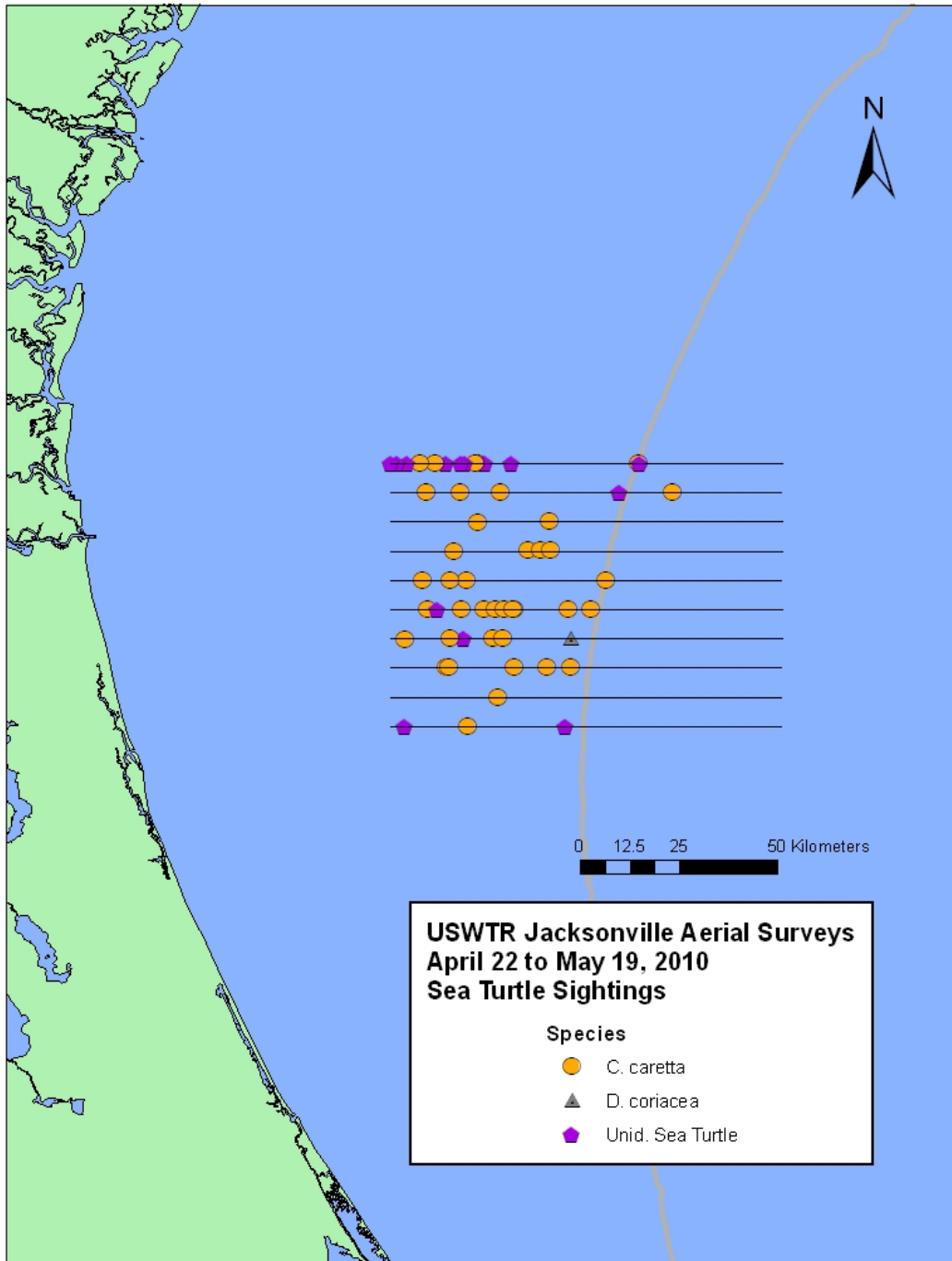
Date	Line	Sea State	Km Surveyed	Survey Time (hrs:min)	At Sea Time (hrs:min)	Platform
20-Apr-10	4	1 to 3	74.08	5:17	10:30	M/V Sensation
7-May-10	3	2 to 4	59.264	4:14	10:00	M/V Sensation

**Table 5.** Cetacean and sea turtle sightings during vessel surveys in the Onslow Bay USWTR study region April 20, 2010 – May 19, 2010.

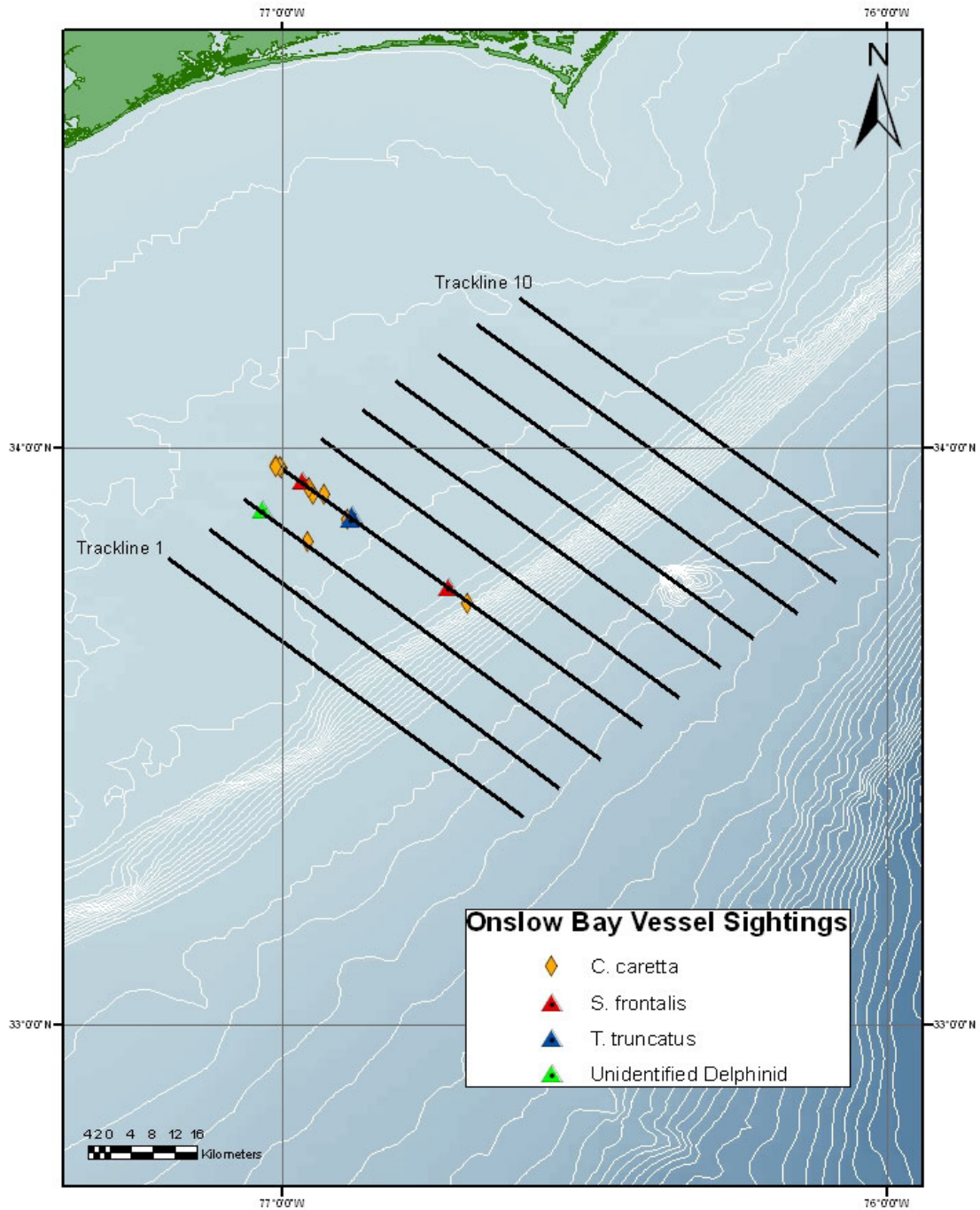
Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Common Name	Group Size
20-Apr-10	11:37	On	33.731211	-76.692660	4	<i>C. caretta</i>	Loggerhead sea turtle	1
20-Apr-10	11:50	On	33.758524	-76.724754	4	<i>S. frontalis</i>	Atlantic Spotted dolphin	6
20-Apr-10	13:08	On	33.883569	-76.883295	4	<i>T. truncatus</i>	Bottlenose dolphin	3
20-Apr-10	13:25	Off	33.876146	-76.891088	4	<i>C. caretta</i>	Loggerhead sea turtle	1
20-Apr-10	13:24	On	33.874849	-76.885402	4	<i>T. truncatus</i>	Bottlenose dolphin	6
20-Apr-10	13:58	On	33.918110	-76.928715	4	<i>C. caretta</i>	Loggerhead sea turtle	1
20-Apr-10	14:04	On	33.919320	-76.947476	4	<i>C. caretta</i>	Loggerhead sea turtle	1
20-Apr-10	14:08	On	33.931435	-76.954542	4	<i>C. caretta</i>	Loggerhead sea turtle	1
20-Apr-10	14:09	On	33.941647	-76.965374	4	<i>S. frontalis</i>	Atlantic Spotted dolphin	12
20-Apr-10	14:35	On	33.964580	-76.999233	4	<i>C. caretta</i>	Loggerhead sea turtle	2
20-Apr-10	14:38	On	33.969259	-77.008858	4	<i>C. caretta</i>	Loggerhead sea turtle	1
20-Apr-10	14:38	On	33.967444	-77.001737	4	<i>C. caretta</i>	Loggerhead sea turtle	1
20-Apr-10	14:40	On	33.967773	-77.009449	4	<i>C. caretta</i>	Loggerhead sea turtle	1
7-May-10	12:23	On	33.837161	-76.956916	3	<i>C. caretta</i>	Loggerhead sea turtle	1
7-May-10	13:17	Off	33.892583	-77.030339	3	Unidentified	Unidentified dolphin	2



**Figure 1.** The locations of cetaceans sighted during aerial surveys between April 24, 2010 – May 19, 2010 in the JAX USWTR study region.



**Figure 2.** The locations of sea turtles sighted during aerial surveys between April 24, 2010 – May 19, 2010 in the JAX USWTR study region.



**Figure 3.** Locations of cetaceans and sea turtles sighted during vessel surveys in Onslow Bay USWTR study region April 20, 2010 - May 19, 2010. Survey effort for line 3 began approximately 8 nautical miles (14.816 km) short of the offshore end of the line due to poor weather conditions.

## **Monitoring of Protected Species in the Proposed Onslow Bay and Jacksonville USWTRs**

Progress Report: May 24, 2010 through June 23, 2010

### **Planning (Task 1, 2 & 3)**

Jennifer Dunn (Duke Marine Lab), D. Ann Pabst and William McLellan (UNC Wilmington) participated in the planning meeting for future Navy Monitoring operation in San Diego, CA on June 17-18.

### **Purchasing (Task 1).**

No purchasing was conducted during the reporting period.

### **Travel (Task 1 & 3)**

On June 18<sup>th</sup> Ryan McAlarney traveled to Beaufort to assist the Duke team aboard the R/V Stellwagen in retrieving the two HARP's deployed in the Onslow Bay USWTR site.

### **JAX Survey activity (Task 2)**

#### Aerial Surveys

Thirty-six tracklines were flown in good to fair conditions during this reporting period (Table 1). The surveys were flown from June 4<sup>th</sup> through the 7<sup>th</sup> to cover exercises being conducted in the area as requested by the Navy. Cetacean sightings consisted of one encounter with short-finned pilot whales (*Globicephala macrorhynchus*) and three encounters with Atlantic-spotted dolphins (*Stenella frontalis*; Figure 1, Table 2). A total of 31 sea turtles were observed while on-effort during this month's aerial surveys: 25 loggerhead sea turtles (*Caretta caretta*), one leatherback sea turtle (*Dermochelys coriacea*), and five unidentified sea turtles (Figure 2, Table 3).

#### Vessel Surveys

A total of 6 vessel surveys were performed on the 20<sup>th</sup> and 23<sup>rd</sup> of May, and on the 10<sup>th</sup>, 12<sup>th</sup>, 14<sup>th</sup>, and 16<sup>th</sup> of June. Survey conditions ranged from excellent to fair (Table 4). There were eight on-effort cetacean sightings: Risso's dolphins (*Grampus griseus*: one encounter), bottlenose dolphins (*Tursiops truncatus*: five encounters) and Atlantic spotted dolphins (*S. frontalis*: two encounters). In addition, a group of 15 short-finned pilot whales (*G. macrorhynchus*) were observed prior to commencing survey on June 12<sup>th</sup>, and a single, unidentified dolphin spotted first by the boat captain on June 16<sup>th</sup> (Figure 3, Table 5). Eighteen loggerhead sea turtles (*C. caretta*) and three unidentified sea turtles were seen during vessel surveys this reporting period (Figure 3, Table 5).

#### Towed Passive Acoustics

The towed acoustic array was deployed during all vessel surveys. On May 20<sup>th</sup> the entire survey was recorded for later analysis while on May 23<sup>rd</sup> and June 16<sup>th</sup> recordings were only taken during visual sightings. The remaining surveys in June all had a dedicated observer and recordings were made during all suspected vocalizations. Additionally, the off-effort short-finned pilot whales (*G. macrorhynchus*) were recorded opportunistically. A total of 82 files encompassing 8 hours and 10 minutes were recorded.

## **Onslow Bay Survey Activity (Task 5)**

### Aerial Surveys

Two full sets of tracklines were flown this month with surveys being conducted over three consecutive days from the 16<sup>th</sup> to the 18<sup>th</sup> of June. Good survey conditions were present for each day with the majority of effort occurring in a Beaufort Sea State 1 or 2 (Table 6). On the first survey day six tracklines were flown resulting in a single sighting of a group of Atlantic spotted dolphins (*S. frontalis*) on line nine (Table 7 and Figure 4). The following day ten tracklines were covered with two groups of bottlenose dolphins (*T. truncatus*) encountered inside the range on line three and nine. The team documented one animal within the group on line nine that had a bright white coloration extending from behind the dorsal fin down the peduncle and laterally forward of the dorsal fin on both sides. Examination of the photos collected as well as comparison with images published in Rotstein *et al.* 2009 in the journal *Emerging Infectious Diseases* suggests that the discoloration could be evidence of the fungus *Lacazia loboi*. Symptoms of this fungal infection appear as raised gray to white nodules on the epidermis. As the paper states, there have been recorded cases of this disease occurring in offshore population of bottlenose dolphins off North Carolina. On the final day, June 18<sup>th</sup> three sightings of bottlenose dolphins were recorded, all offshore of the shelf break. Sea state conditions were the lowest of the three days with the majority occurring in a Beaufort sea state one. On all days a low number of sea turtles were observed with loggerheads (*C. caretta*) being the dominant species (Table 8 and Figure 4).

### Vessel Surveys

One track line was surveyed during the study period. Line 7 was surveyed on 16 June 2010 aboard the M/V *Cetus* (Table 9). One group of bottlenose dolphins (*T. truncatus*) and two groups of Atlantic spotted dolphins (*S. frontalis*) were sighted (Table 10). Locations of cetaceans sighted in Onslow Bay during vessel surveys are presented in Figure 5.

### Towed Passive Acoustics

The towed acoustic array was deployed from the R/V *Cetus* on the 16<sup>th</sup> of June, 2010, for 5.77 hours of simultaneous visual and acoustic survey. During that time, a total of 2.5 hours of acoustic recordings were taken. Three visual sightings occurred during the acquisition of acoustic data; one group was identified as bottlenose dolphins (*T. truncatus*) and the other two as Atlantic spotted dolphins (*S. frontalis*). Vocalizations including clicks and whistles were recorded. Three other acoustic detections were made that day without visual observation to confirm the species, although one acoustic detection most likely consisted of clicks from Risso's dolphins (*G. griseus*) and sperm whales (*Physeter macrocephalus*).

### **Onslow Bay HARPs**

The HARPs deployed in the Onslow Bay USWTR study area were retrieved on June 19<sup>th</sup> from the R/V *Stellwagen*. One of the recovered HARPs (the one at 335m depth) had data on all 16 disk drives and appeared to have finished recording sometime on April 20<sup>th</sup>. The other recovered HARP (the one at 171m) had data on only 10 ½ disks. It appears the battery voltage became too low around February 24<sup>th</sup> which resulted in the end of recording. All of the data logger boards and both hydrophones are being shipped to Scripps in order to update

them with a new compression code that should allow about twice the recording capacity with the same size disk drives. Due to the problem with the one HARP, they will also assess its boards to ensure they were not the cause of the battery drainage. Once Scripps ships these items back to us, we will redeploy the HARPs at the same locations as our last deployment.

**Exercise Monitoring (Task 7)**

Thirty-six tracklines were flown in good to fair conditions during this reporting period (Table 1). The surveys were flown from June 4<sup>th</sup> through the 7<sup>th</sup> to cover exercises being conducted in the area as requested by the Navy.

No injuries were sustained during the reporting period.

No problems were encountered that hampered the progress of monitoring efforts during the 4 reporting period.

**Table 1.** Aerial survey effort table for the JAX USWTR study region during May 24, 2010 through June 23, 2010.

Date	Line	Sea State	Kilometers Flown	HOBBS Hours
4-Jun-10	1	2 to 4	86.3	6.3
4-Jun-10	2	2 to 4	87.0	
4-Jun-10	3	2 to 4	86.1	
4-Jun-10	4	2 to 3	85.7	
4-Jun-10	5	2 to 3	86.3	
4-Jun-10	6	2 to 3	84.3	
4-Jun-10	7	2 to 4	85.6	
4-Jun-10	8	1 to 4	86.5	
4-Jun-10	9	1 to 3	85.1	
4-Jun-10	10	2 to 3	86.0	
5-Jun-10	10	3 to 4	86.5	5.3
5-Jun-10	9	3 to 4	75.0	
5-Jun-10	8	3 to 4	76.9	
5-Jun-10	7	2 to 4	73.8	
5-Jun-10	6	2 to 3	76.1	
5-Jun-10	5	2 to 3	85.6	
5-Jun-10	4	2	85.1	
5-Jun-10	3	2 to 3	86.1	
5-Jun-10	2	2 to 3	87.3	
5-Jun-10	1	2 to 3	84.2	
6-Jun-10	1	2 to 3	84.8	6.6
6-Jun-10	2	2 to 3	86.5	
6-Jun-10	3	2 to 3	86.4	
6-Jun-10	4	2 to 3	84.3	
6-Jun-10	5	2 to 3	69.4	
6-Jun-10	6	2 to 3	86.1	
6-Jun-10	7	2 to 3	76	
6-Jun-10	8	2 to 3	86.2	
6-Jun-10	9	2 to 3	86.1	
6-Jun-10	10	2 to 3	86.6	
7-Jun-10	10	3 - 4	80.84	3.4
7-Jun-10	9	3 - 4	85.34	
7-Jun-10	8	3 - 4	86.02	
7-Jun-10	7	3 - 4	86.16	
7-Jun-10	6	3 - 4	86.44	
7-Jun-10	5	3 - 4	86.75	



**Table 2.** Cetacean sightings during aerial surveys in the JAX USWTR study region during May 24, 2010 through June 23, 2010.

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Common Name	Group Size
4-Jun-10	10:14	On effort	30.162127	-79.958743	4	<i>G. macrorhynchus</i>	Short-finned Pilot Whale	14
5-Jun-10	11:30	On effort	30.172613	-80.579141	4	<i>S. frontalis</i>	Atlantic Spotted Dolphin	40
6-Jun-10	8:59	On effort	29.961922	-80.435265	1	<i>S. frontalis</i>	Atlantic Spotted Dolphin	10
6-Jun-10	10:40	On effort	30.147797	-80.621601	4	<i>S. frontalis</i>	Atlantic Spotted Dolphin	12

**Table 3** Sea turtle sightings during aerial surveys in the JAX USWTR study region during May 24, 2010 - June 23, 2010.

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Common Name	Group Size
4-Jun-10	9:46	On effort	30.102523	-80.514510	3	Unid. Sea Turtle	Unid. Sea Turtle	1
4-Jun-10	10:32	On effort	30.168068	-80.422343	4	<i>C. caretta</i>	Loggerhead Sea Turtle	1
4-Jun-10	10:37	On effort	30.166255	-80.589124	4	<i>C. caretta</i>	Loggerhead Sea Turtle	1
4-Jun-10	13:38	On effort	30.366644	-80.565255	7	<i>C. caretta</i>	Loggerhead Sea Turtle	1
4-Jun-10	14:34	On effort	30.500298	-80.500771	9	<i>C. caretta</i>	Loggerhead Sea Turtle	1
4-Jun-10	15:11	On effort	30.566360	-80.359100	10	Unid. Sea Turtle	Unid. Sea Turtle	1
4-Jun-10	15:12	On effort	30.566295	-80.423006	10	<i>C. caretta</i>	Loggerhead Sea Turtle	1
4-Jun-10	15:15	On effort	30.566087	-80.509882	10	<i>D. coriacea</i>	Leatherback Sea Turtle	1
5-Jun-10	11:20	On effort	30.231795	-80.617223	5	<i>C. caretta</i>	Loggerhead Sea Turtle	1
5-Jun-10	13:12	On effort	29.964643	-80.549199	1	<i>C. caretta</i>	Loggerhead Sea Turtle	1
5-Jun-10	13:14	On effort	29.964585	-80.605190	1	<i>C. caretta</i>	Loggerhead Sea Turtle	1
5-Jun-10	13:14	On effort	29.964566	-80.605058	1	<i>C. caretta</i>	Loggerhead Sea Turtle	1
6-Jun-10	9:46	On effort	30.030629	-80.634998	2	Unid. Sea Turtle	Unid. Sea Turtle	1
6-Jun-10	9:52	On effort	30.100435	-80.642929	3	<i>C. caretta</i>	Loggerhead Sea Turtle	1
6-Jun-10	9:53	On effort	30.100593	-80.601563	3	<i>C. caretta</i>	Loggerhead Sea Turtle	1
6-Jun-10	9:55	On effort	30.100951	-80.514581	3	<i>C. caretta</i>	Loggerhead Sea Turtle	2
6-Jun-10	9:58	On effort	30.101044	-80.387801	3	Unid. Sea Turtle	Unid. Sea Turtle	1
6-Jun-10	10:33	On effort	30.165782	-80.421135	4	<i>C. caretta</i>	Loggerhead Sea Turtle	2
6-Jun-10	10:34	On effort	30.165717	-80.445309	4	<i>C. caretta</i>	Loggerhead Sea Turtle	1
6-Jun-10	10:36	On effort	30.165588	-80.531980	4	<i>C. caretta</i>	Loggerhead Sea Turtle	1
6-Jun-10	10:37	On effort	30.165447	-80.562730	4	Unid. Sea Turtle	Unid. Sea Turtle	1
6-Jun-10	10:49	On effort	30.165678	-80.672380	4	<i>C. caretta</i>	Loggerhead Sea Turtle	1
6-Jun-10	11:37	On effort	30.299496	-80.484935	6	<i>C. caretta</i>	Loggerhead Sea Turtle	1
6-Jun-10	11:37	On effort	30.299996	-80.492729	6	<i>C. caretta</i>	Loggerhead Sea Turtle	1
6-Jun-10	11:40	On effort	30.304315	-80.598426	6	<i>C. caretta</i>	Loggerhead Sea Turtle	1
6-Jun-10	11:41	On effort	30.300370	-80.639157	6	<i>C. caretta</i>	Loggerhead Sea Turtle	1
6-Jun-10	13:38	On effort	30.366622	-80.290970	7	<i>C. caretta</i>	Loggerhead Sea Turtle	1
7-Jun-10	11:17	On effort	30.233158	-80.307193	5	<i>C. caretta</i>	Loggerhead Sea Turtle	1
7-Jun-10	11:19	On effort	30.233131	-80.391554	5	<i>C. caretta</i>	Loggerhead Sea Turtle	1

**Table 4.** Vessel survey effort table for the JAX USWTR study region during May 24, 2010 through June 23, 2010.

Date	Time	On/Off Effort	Latitude	Longitude	Track Number	Species	Common Name	Group Size
4-Jun-10	9:46	On effort	30.102523	-80.514510	3	Unid. Sea Turtle	Unid. Sea Turtle	1
4-Jun-10	10:32	On effort	30.168068	-80.422343	4	<i>C. caretta</i>	Loggerhead Sea Turtle	1
4-Jun-10	10:37	On effort	30.166255	-80.589124	4	<i>C. caretta</i>	Loggerhead Sea Turtle	1
4-Jun-10	13:38	On effort	30.366644	-80.565255	7	<i>C. caretta</i>	Loggerhead Sea Turtle	1
4-Jun-10	14:34	On effort	30.500298	-80.500771	9	<i>C. caretta</i>	Loggerhead Sea Turtle	1
4-Jun-10	15:11	On effort	30.566360	-80.359100	10	Unid. Sea Turtle	Unid. Sea Turtle	1
4-Jun-10	15:12	On effort	30.566295	-80.423006	10	<i>C. caretta</i>	Loggerhead Sea Turtle	1
4-Jun-10	15:15	On effort	30.566087	-80.509882	10	<i>D. coriacea</i>	Leatherback Sea Turtle	1
5-Jun-10	11:20	On effort	30.231795	-80.617223	5	<i>C. caretta</i>	Loggerhead Sea Turtle	1
5-Jun-10	13:12	On effort	29.964643	-80.549199	1	<i>C. caretta</i>	Loggerhead Sea Turtle	1
5-Jun-10	13:14	On effort	29.964585	-80.605190	1	<i>C. caretta</i>	Loggerhead Sea Turtle	1
5-Jun-10	13:14	On effort	29.964566	-80.605058	1	<i>C. caretta</i>	Loggerhead Sea Turtle	1
6-Jun-10	9:46	On effort	30.030629	-80.634998	2	Unid. Sea Turtle	Unid. Sea Turtle	1
6-Jun-10	9:52	On effort	30.100435	-80.642929	3	<i>C. caretta</i>	Loggerhead Sea Turtle	1
6-Jun-10	9:53	On effort	30.100593	-80.601563	3	<i>C. caretta</i>	Loggerhead Sea Turtle	1
6-Jun-10	9:55	On effort	30.100951	-80.514581	3	<i>C. caretta</i>	Loggerhead Sea Turtle	2
6-Jun-10	9:58	On effort	30.101044	-80.387801	3	Unid. Sea Turtle	Unid. Sea Turtle	1
6-Jun-10	10:33	On effort	30.165782	-80.421135	4	<i>C. caretta</i>	Loggerhead Sea Turtle	2
6-Jun-10	10:34	On effort	30.165717	-80.445309	4	<i>C. caretta</i>	Loggerhead Sea Turtle	1
6-Jun-10	10:36	On effort	30.165588	-80.531980	4	<i>C. caretta</i>	Loggerhead Sea Turtle	1
6-Jun-10	10:37	On effort	30.165447	-80.562730	4	Unid. Sea Turtle	Unid. Sea Turtle	1
6-Jun-10	10:49	On effort	30.165678	-80.672380	4	<i>C. caretta</i>	Loggerhead Sea Turtle	1
6-Jun-10	11:37	On effort	30.299496	-80.484935	6	<i>C. caretta</i>	Loggerhead Sea Turtle	1
6-Jun-10	11:37	On effort	30.299996	-80.492729	6	<i>C. caretta</i>	Loggerhead Sea Turtle	1
6-Jun-10	11:40	On effort	30.304315	-80.598426	6	<i>C. caretta</i>	Loggerhead Sea Turtle	1
6-Jun-10	11:41	On effort	30.300370	-80.639157	6	<i>C. caretta</i>	Loggerhead Sea Turtle	1
6-Jun-10	13:38	On effort	30.366622	-80.290970	7	<i>C. caretta</i>	Loggerhead Sea Turtle	1
7-Jun-10	11:17	On effort	30.233158	-80.307193	5	<i>C. caretta</i>	Loggerhead Sea Turtle	1
7-Jun-10	11:19	On effort	30.233131	-80.391554	5	<i>C. caretta</i>	Loggerhead Sea Turtle	1

**Table 5.** Cetacean and sea turtle sightings for vessel surveys in JAX study region during May 24, 2010 through June 23, 2010.

Date	Time	On/Off Effort	Latitude	Longitude	Line	Species	Common Name	Group Size
20-May-10	14:12	On effort	30.506195	-80.295272	9	<i>S. frontalis</i>	Atlantic Spotted Dolphin	1
20-May-10	14:23	On effort	30.505725	-80.330123	9	<i>C. caretta</i>	Loggerhead Sea Turtle	1
20-May-10	15:01	On effort	30.509397	-80.450341	9	<i>C. caretta</i>	Loggerhead Sea Turtle	1
20-May-10	15:26	On effort	30.513175	-80.484023	9	<i>S. frontalis</i>	Atlantic Spotted Dolphin	16
20-May-10	15:45	On effort	30.510552	-80.542606	9	<i>C. caretta</i>	Loggerhead Sea Turtle	1
20-May-10	15:52	On effort	30.511185	-80.563626	9	<i>C. caretta</i>	Loggerhead Sea Turtle	1
20-May-10	15:56	On effort	30.511745	-80.579101	9	<i>C. caretta</i>	Loggerhead Sea Turtle	1
20-May-10	16:19	On effort	30.507112	-80.620221	9	<i>T. truncatus</i>	Bottlenose Dolphin	2
23-May-10	15:34	On effort	30.367712	-80.319432	7	<i>T. truncatus</i>	Bottlenose Dolphin	8
23-May-10	16:58	On effort	30.368032	-80.587025	7	<i>C. caretta</i>	Loggerhead Sea Turtle	13
23-May-10	17:03	On effort	30.368362	-80.603263	7	<i>C. caretta</i>	Loggerhead Sea Turtle	1
23-May-10	17:04	On effort	30.368954	-80.609633	7	<i>C. caretta</i>	Loggerhead Sea Turtle	1
10-Jun-10	12:22	Off effort	30.245583	-79.901683	N/A	<i>G. macrohynchus</i>	Short-finned Pilot Whale	15
10-Jun-10	15:18	On effort	30.243697	-80.367558	5	<i>C. caretta</i>	Loggerhead Sea Turtle	1
10-Jun-10	15:41	On effort	30.243932	-80.450660	5	<i>C. caretta</i>	Loggerhead Sea Turtle	1
10-Jun-10	15:45	On effort	30.243774	-80.465003	5	<i>C. caretta</i>	Loggerhead Sea Turtle	1
10-Jun-10	16:01	On effort	30.239685	-80.522905	5	<i>C. caretta</i>	Loggerhead Sea Turtle	1
10-Jun-10	16:05	On effort	30.238952	-80.535578	5	<i>C. caretta</i>	Loggerhead Sea Turtle	1
12-Jun-10	12:37	On effort	30.111181	-79.944292	3	<i>T. truncatus</i>	Bottlenose Dolphin	16
12-Jun-10	13:01	On effort	30.110376	-80.002467	3	<i>T. truncatus</i>	Bottlenose Dolphin	15
12-Jun-10	16:21	On effort	30.103611	-80.563661	3	<i>T. truncatus</i>	Bottlenose Dolphin	4
12-Jun-10	16:40	On effort	30.104279	-80.630623	3	Unid. Sea Turtle	Unid. Sea Turtle	1
12-Jun-10	16:40	On effort	30.104277	-80.634041	3	Unid. Sea Turtle	Unid. Sea Turtle	1
14-Jun-10	14:52	Off effort	29.974706	-80.405760	1	<i>C. caretta</i>	Loggerhead Sea Turtle	1
14-Jun-10	14:54	On effort	29.974656	-80.410498	1	<i>C. caretta</i>	Loggerhead Sea Turtle	1
14-Jun-10	16:01	On effort	29.971806	-80.643988	1	<i>C. caretta</i>	Loggerhead Sea Turtle	1
16-Jun-10	12:39	On effort	30.575563	-79.912951	10	<i>G. griseus</i>	Risso's Dolphin	8
16-Jun-10	16:23	On effort	30.575663	-80.533142	10	<i>C. caretta</i>	Loggerhead Sea Turtle	1
16-Jun-10	16:34	On effort	30.573075	-80.570085	10	<i>C. caretta</i>	Loggerhead Sea Turtle	1
16-Jun-10	16:59	Off effort	30.569375	-80.660116	10	Unid. Delphinid	Unid. Delphinid	1
16-Jun-10	17:13	On effort	30.568348	-80.683091	10	Unid. Sea Turtle	Unid. Sea Turtle	1

**Table 6.** Aerial survey effort table for the Onslow Bay USWTR study region during May 24, 2010 through June 23, 2010.

Date	Line	Sea State	Kilometers Flown	Hobbs Hours
16-Jun-10	5	1 to 2	74.2	3.7
16-Jun-10	6	1 to 2	74.1	
16-Jun-10	7	1 to 2	74.2	
16-Jun-10	8	2 to 3	74.8	
16-Jun-10	9	2 to 3	74.7	
16-Jun-10	10	2 to 3	72.9	
17-Jun-10	1	2 to 3	74.3	6.4
17-Jun-10	2	2 to 3	74.0	
17-Jun-10	3	2 to 3	71.8	
17-Jun-10	4	2	74.4	
17-Jun-10	5	2	74.1	
17-Jun-10	6	2	73.7	
17-Jun-10	7	2	74.3	
17-Jun-10	8	2	75.2	
17-Jun-10	9	2	74.5	
17-Jun-10	10	2	73.7	
18-Jun-10	4	1 to 3	73.5	2.9
18-Jun-10	3	1 to 2	73.5	
18-Jun-10	2	1 to 2	74.6	
18-Jun-10	1	1 to 2	72.9	

**Table 7.** Cetacean sightings during aerial surveys in the Onslow Bay USWTR study region during May 24, 2010 through June 23, 2010.

Date	Time	On / Off Effort	Latitude	Longitude	Track Number	Species	Common Name	Group Size
16-Jun-10	11:04	On	34.013141	-76.406738	9	<i>S. frontalis</i>	Atlantic Spotted Dolphin	55
17-Jun-10	10:07	On	33.574286	-76.630432	3	<i>T. truncatus</i>	Bottlenose Dolphin	21
17-Jun-10	14:37	On	33.871597	-76.208675	9	<i>T. truncatus</i>	Bottlenose Dolphin	13
18-Jun-10	9:20	On	33.637239	-76.561817	4	<i>T. truncatus</i>	Bottlenose Dolphin	8
18-Jun-10	9:38	On	33.556626	-76.603283	3	<i>T. truncatus</i>	Bottlenose Dolphin	32
18-Jun-10	10:36	On	33.430727	-76.703646	1	<i>T. truncatus</i>	Bottlenose Dolphin	25

**Table 8.** Sea turtle sightings during aerial surveys in the Onslow Bay USWTR study region during May 24, 2010 through June 23, 2010.

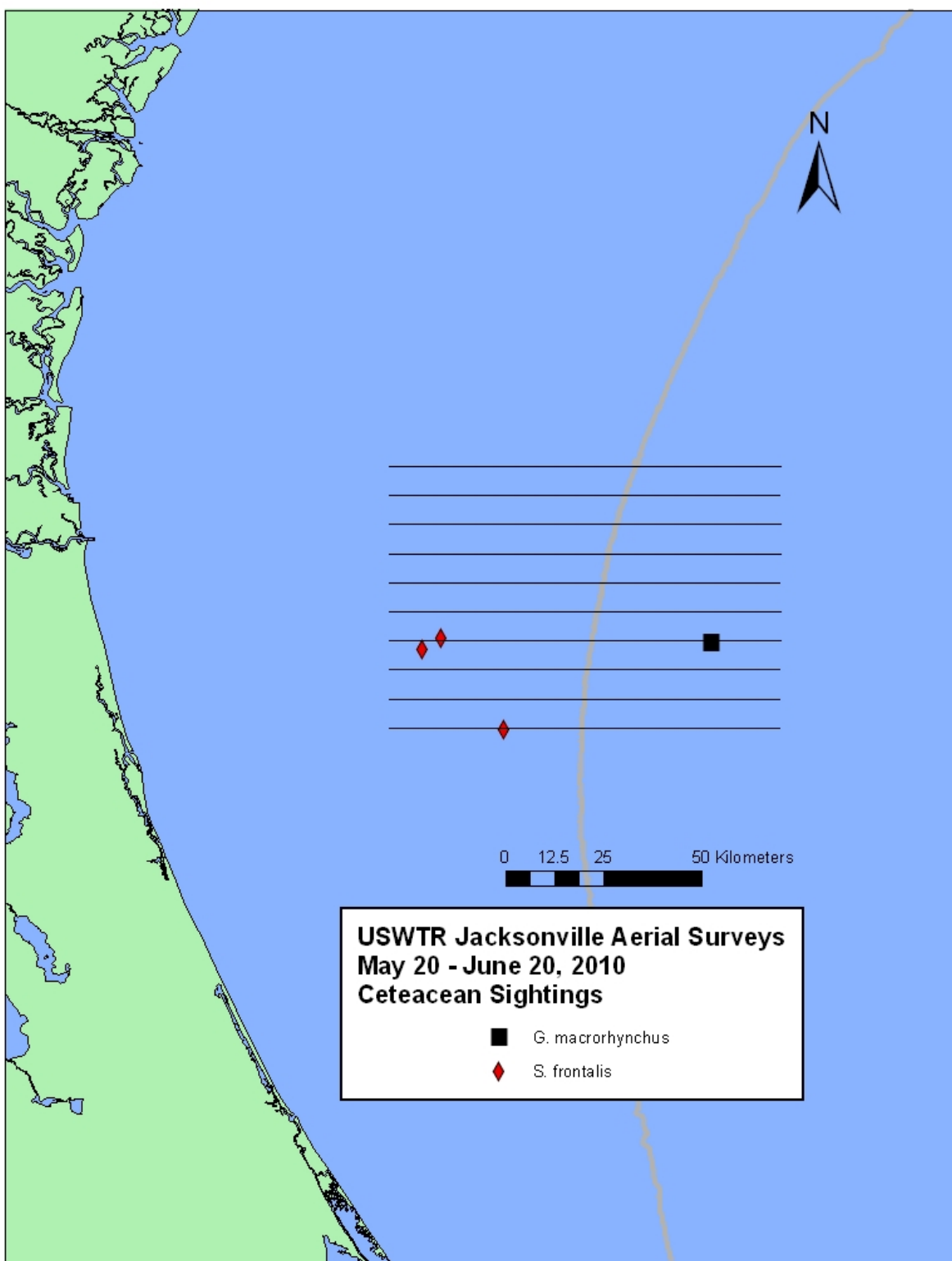
Date	Time	On / Off Effort	Latitude	Longitude	Line	Species	Common Name	Group Size
16-Jun-10	10:45	On Effort	34.061262	-76.601679	8	<i>C. caretta</i>	Loggerhead Sea Turtle	1
16-Jun-10	10:48	On Effort	34.13628	-76.700404	8	Unid. Sea Turtle	Unid. Sea Turtle	1
16-Jun-10	10:57	On Effort	34.161591	-76.591787	9	<i>C. caretta</i>	Loggerhead Sea Turtle	1
16-Jun-10	11:01	On Effort	34.06234	-76.462631	9	<i>C. caretta</i>	Loggerhead Sea Turtle	2
16-Jun-10	11:38	On Effort	34.142977	-76.447917	10	<i>C. caretta</i>	Loggerhead Sea Turtle	1
16-Jun-10	11:39	On Effort	34.158292	-76.467704	10	<i>C. caretta</i>	Loggerhead Sea Turtle	1
17-Jun-10	14:24	On Effort	34.088759	-76.497305	9	<i>C. caretta</i>	Loggerhead Sea Turtle	1
18-Jun-10	9:12	On Effort	33.722898	-76.674437	4	<i>C. caretta</i>	Loggerhead Sea Turtle	1
18-Jun-10	10:15	On Effort	33.699048	-76.909166	2	<i>C. caretta</i>	Loggerhead Sea Turtle	1
18-Jun-10	10:52	On Effort	33.617614	-76.941325	1	<i>C. caretta</i>	Loggerhead Sea Turtle	1
18-Jun-10	10:55	On Effort	33.684558	-77.029150	1	<i>C. caretta</i>	Loggerhead Sea Turtle	1

**Table 9.** Effort table for vessel surveys in the Onslow Bay USWTR study region May 24, 2010 through June 23, 2010.

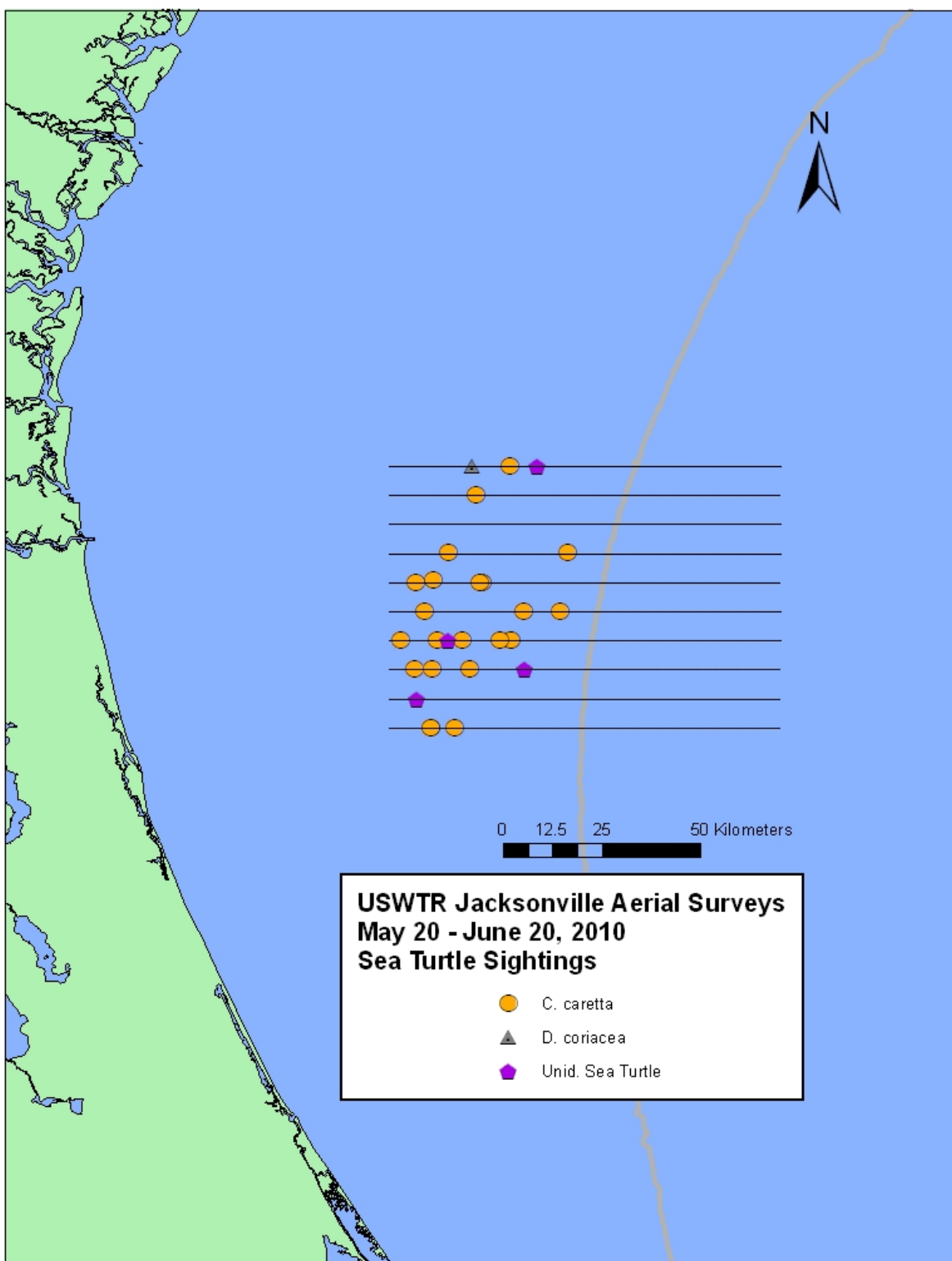
Date	Line	Sea State	Km Surveyed	Survey Time (hrs:min)	At Sea Time (hrs:min)	Platform
16-Jun-10	7	2-4	74.08	5:46	12:30	M/V <i>Cetus</i>

**Table 10.** Cetacean and sea turtle sightings during vessel surveys in the Onslow Bay USWTR study region May 24, 2010 through June 23, 2010.

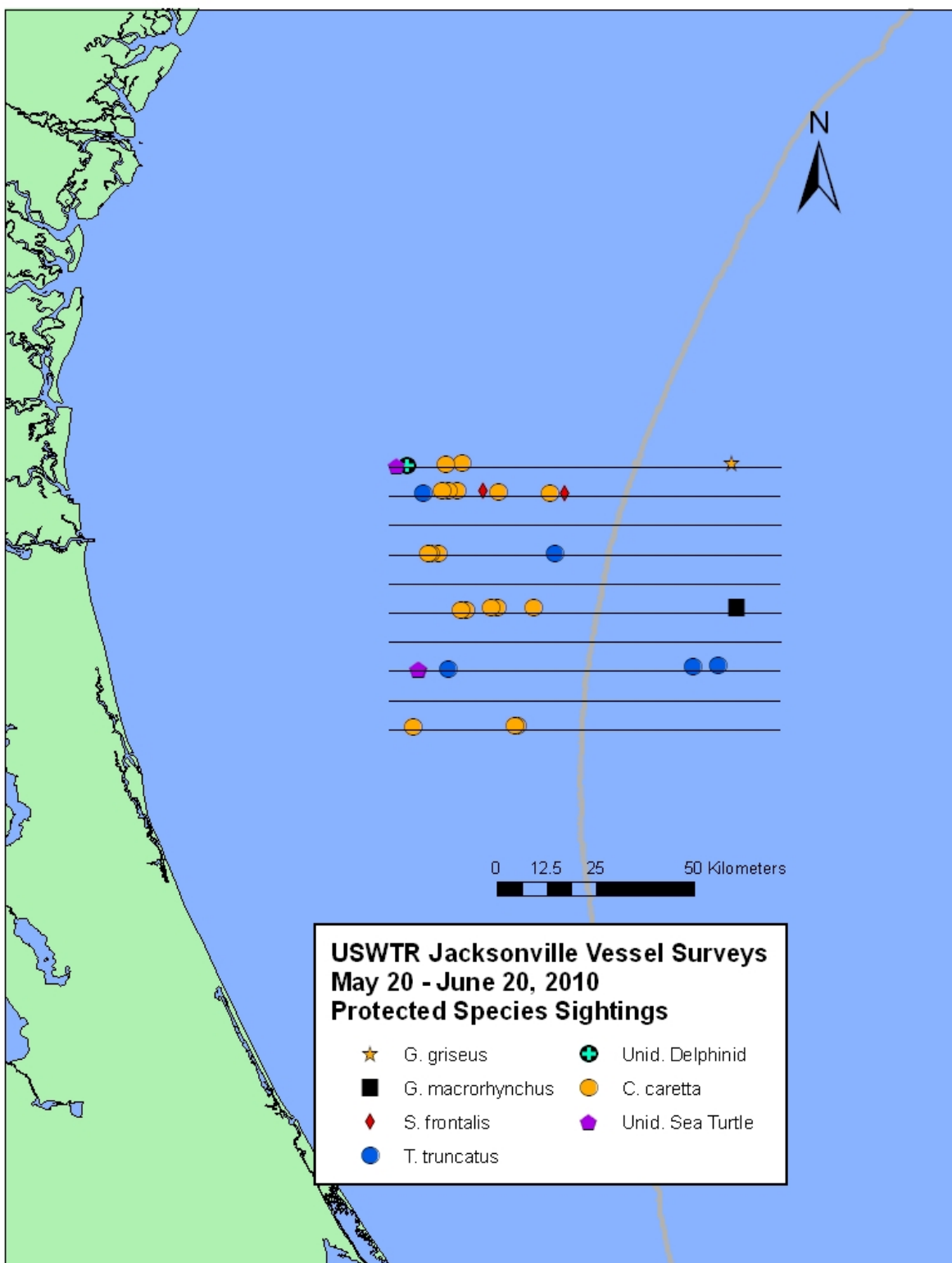
Date	Time	On / Off Effort	Latitude	Longitude	Track Number	Species	Common Name	Group Size
16-Jun-10	14:30	On	33.98965499	-76.6541519	7	<i>T. truncatus</i>	Bottlenose dolphin	2
16-Jun-10	15:21	On	34.06926266	-76.7442492	7	<i>S. frontalis</i>	Atlantic Spotted dolphin	8
16-Jun-10	15:56	On	34.07421701	-76.7452991	7	<i>S. frontalis</i>	Atlantic Spotted dolphin	14



**Figure 1.** The locations of cetaceans sighted while conducting aerial surveys during the May 24, 2010 through June 23, 2010 reporting period of the JAX USWTR study region.

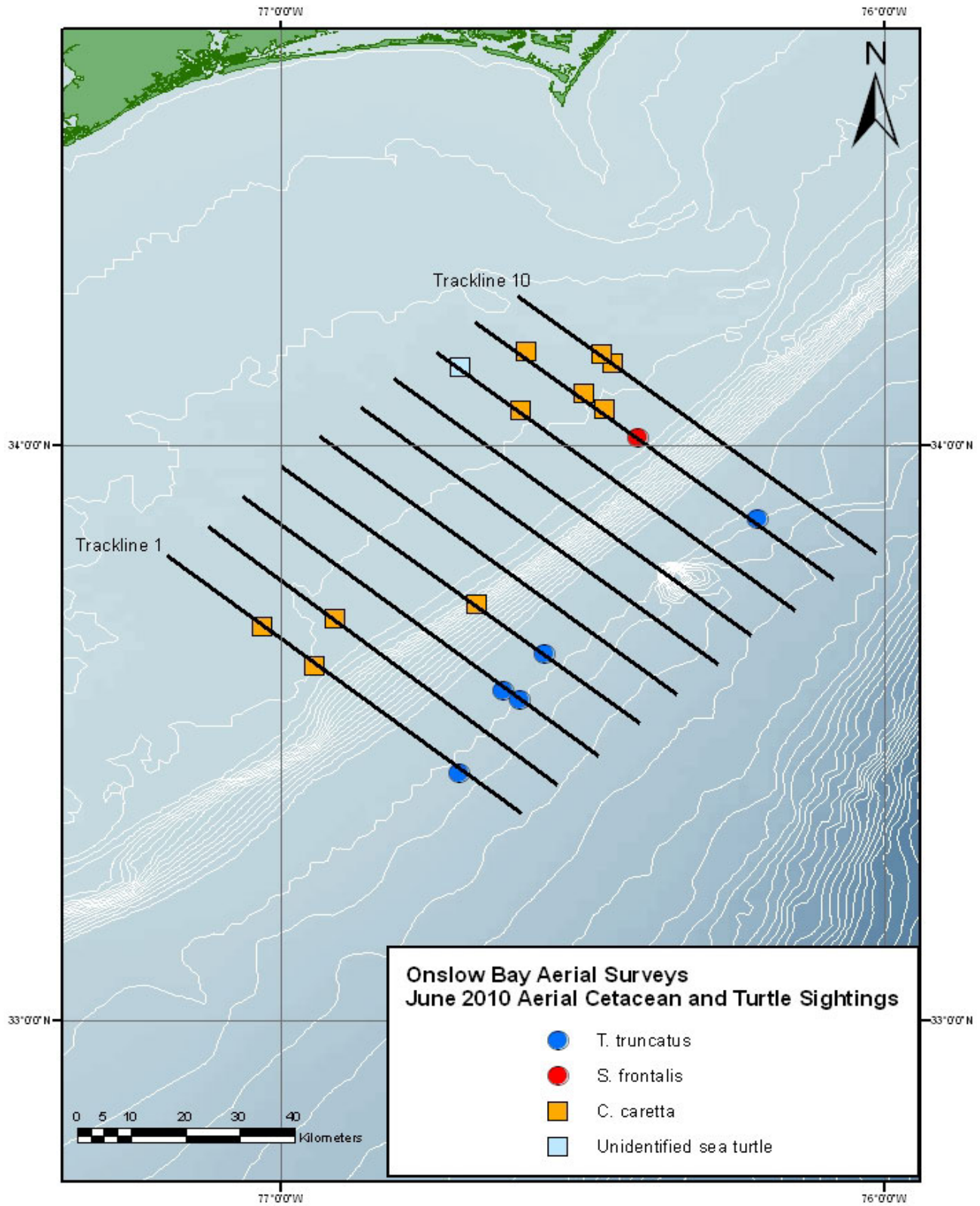


**Figure 2.** The locations of sea turtles sighted during aerial surveys between May 24, 2010 through June 23, 2010 in the JAX USWTR study region.

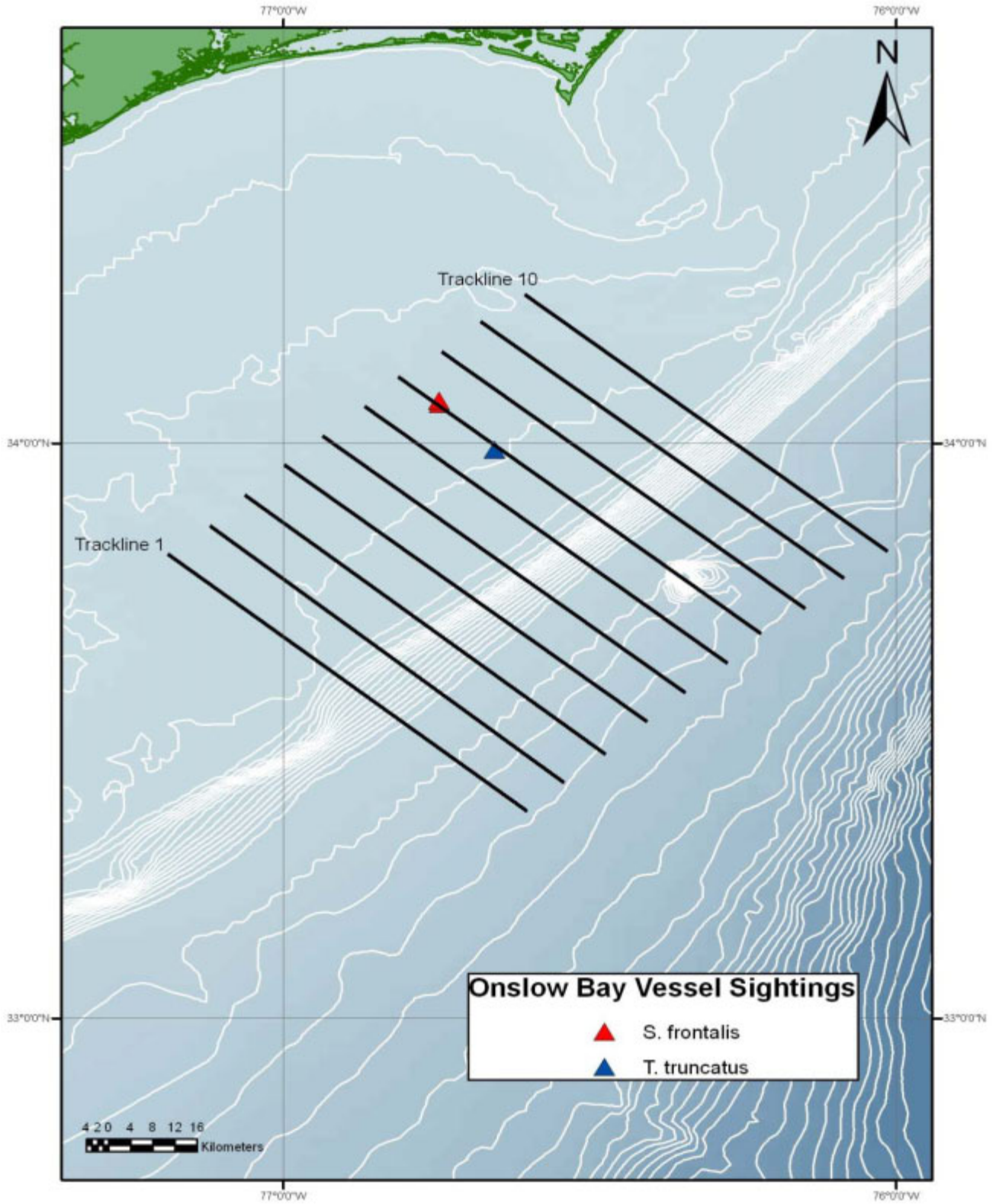


**Figure 3.** Cetaceans and sea turtles observed during vessel surveys of the JAX USWTR study region, May 24, 2010 through June 23, 2010





**Figure 4.** The locations of cetaceans and sea turtles sighted during aerial surveys from May 24, 2010 through June 23, 2010 of the Onslow Bay USWTR study region.



**Figure 5.** Locations of cetaceans and sea turtles sighted during vessel surveys on June 16, 2010 in the Onslow Bay USWTR study region.

## **Monitoring of Protected Species in the Proposed Onslow Bay and Jacksonville USWTRs**

Progress Report: June 24, 2010 through July 23, 2010

### **Planning (Task 1, 2 & 3)**

Discussions are ongoing in planning exercise monitoring operations for multiple Navy sites around the country.

### **Purchasing (Task 1)**

Research equipment was purchased for the survey vessel R/V Volute. In addition, office supplies were purchased for the Fernandina Beach office.

### **Travel (Task 1 & 3)**

Ann Pabst and William McLellan (UNCW) traveled to the Duke Marine Lab in Beaufort, NC to discuss winter survey effort in Onslow and JAX sites with Andy Read and Dave Johnston (Duke) and e2M administration.

### **JAX Survey activity (Task 2)**

#### Aerial Surveys

No aerial surveys were performed during the reporting period as all favorable weather days were used for vessel survey effort.

#### Vessel Surveys

A total of 3 vessel surveys were performed on the 6<sup>th</sup>, 8<sup>th</sup> and 12<sup>th</sup> of July. Survey conditions ranged from fair to good (Table 1). There were four on-effort cetacean sightings: Atlantic spotted dolphins (*Stenella frontalis*, two encounters), bottlenose dolphins (*Tursiops truncatus*, one encounter) and unidentified delphinids (one encounter). In addition, there were two off-effort sightings of *S. frontalis* (Figure 1, Table 2). A single loggerhead sea turtle (*Caretta caretta*) was also seen during the vessel surveys (Figure 1, Table 2).

#### Towed Passive Acoustics

The towed acoustic array was deployed during two vessel surveys. On July 6<sup>th</sup> the entire survey was performed with a dedicated acoustic monitor. On July 8<sup>th</sup> the array was deployed with a dedicated acoustic monitor, but after two hours and 30 minutes of surveying, the PAM computer began to experience technical difficulties. After some in situ troubleshooting it was determined that the issue could not be resolved in the field, and acoustic monitoring was discontinued. The PAM computer was removed from the R/V Volute at the end of the survey and taken to the lab for additional attempts to resolve the problem. On July 12<sup>th</sup> the acoustic array was deployed, and monitoring attempted, but technical issues with the computer persisted, and the survey was completed without the use of acoustic monitoring. Troubleshooting of the PAM computer continues and should be complete prior to the next vessel survey. A total of 20 files encompassing 1 hour and 5 minutes were recorded on July 6<sup>th</sup> and 8<sup>th</sup>.

## Onslow Bay Survey Activity (Task 5)

### Aerial Surveys

On July 8<sup>th</sup> a single day of survey effort was conducted that covered 10 tracklines (Table 3). Higher than forecasted winds and sea state resulted in poor survey conditions leading to no cetacean or sea turtle sightings during these flights. Observers did note a higher number of military vessels present in the range than had been observed the entire previous year. These activities correspond with an AFAST event being instituted for the Southeastern United States.

### Vessel Surveys

The inshore half of track line 5 was surveyed on 7 July 2010 aboard the M/V Sensation (Table 4). One group of Atlantic spotted dolphins (*S. frontalis*) was sighted (Table 5). Locations of cetaceans sighted in Onslow Bay during vessel surveys are presented in Figure 2.

### Towed Passive Acoustics

The towed acoustic array was deployed from the *F/V Sensation* on the 7th of July, 2010, for 3.15 hours of simultaneous visual and acoustic survey. During that time, a total of 19 minutes of acoustic recordings were taken. One visual sighting occurred during the acquisition of acoustic data; the group was identified as *S. frontalis*. Vocalizations including clicks and whistles were recorded.

## Onslow Bay HARPs

The data logger boards and hydrophones of the two Onslow Bay USWTR HARPs were updated with the new compression code at Scripps and sent back to Beaufort. We are now waiting on a weather window to redeploy the instruments. They will be redeployed in the same locations as our last deployment.

## Exercise Monitoring (Task 7)

No exercise monitoring was conducted during the reporting period.

No injuries were sustained during this reporting period.

**Table 1.** Vessel survey effort table for the JAX USWTR study region during June 24, 2010 through July 23, 2010.

Date	Line	Sea State	Kilometers Surveyed	Survey Time (Hrs:min)	Total Time at Sea (Hrs:min)
6-Jul-10	8	2-4	60.61	4:21	13:39
8-Jul-10	6	2-3	83.22	5:00	14:45
12-Jul-10	4	2-3	79.71	4:22	12:21

**Table 2.** Cetacean and sea turtle sightings for vessel surveys in JAX study region during June 24, 2010 through July 23, 2010.

Date	Time	On/off effort	Latitude	Longitude	Line	Species	Common Name	Group Size
06-Jul-10	15:06	On effort	30.459210	-80.384780	8	<i>C. caretta</i>	Loggerhead Sea Turtle	1
06-Jul-10	15:59	On effort	30.457817	-80.521895	8	<i>T. truncatus</i>	Bottlenose Dolphin	7
06-Jul-10	16:21	Off effort	30.448217	-80.562863	8	<i>S. frontalis</i>	Atlantic Spotted Dolphin	15
08-Jul-10	15:24	On effort	30.298120	-80.374713	6	<i>S. frontalis</i>	Atlantic Spotted Dolphin	10
08-Jul-10	16:18	On effort	30.300952	-80.464900	6	<i>S. frontalis</i>	Atlantic Spotted Dolphin	8
08-Jul-10	17:23	On effort	30.305677	-80.656960	6	Unid. delphinid	Unid. Delphind	2
12-Jul-10	15:26	Off effort	30.150446	-80.390450	4	<i>S. frontalis</i>	Atlantic Spotted Dolphin	17

**Table 3.** Aerial survey effort table for the Onslow Bay USWTR study region during June 24, 2010 through July 23, 2010.

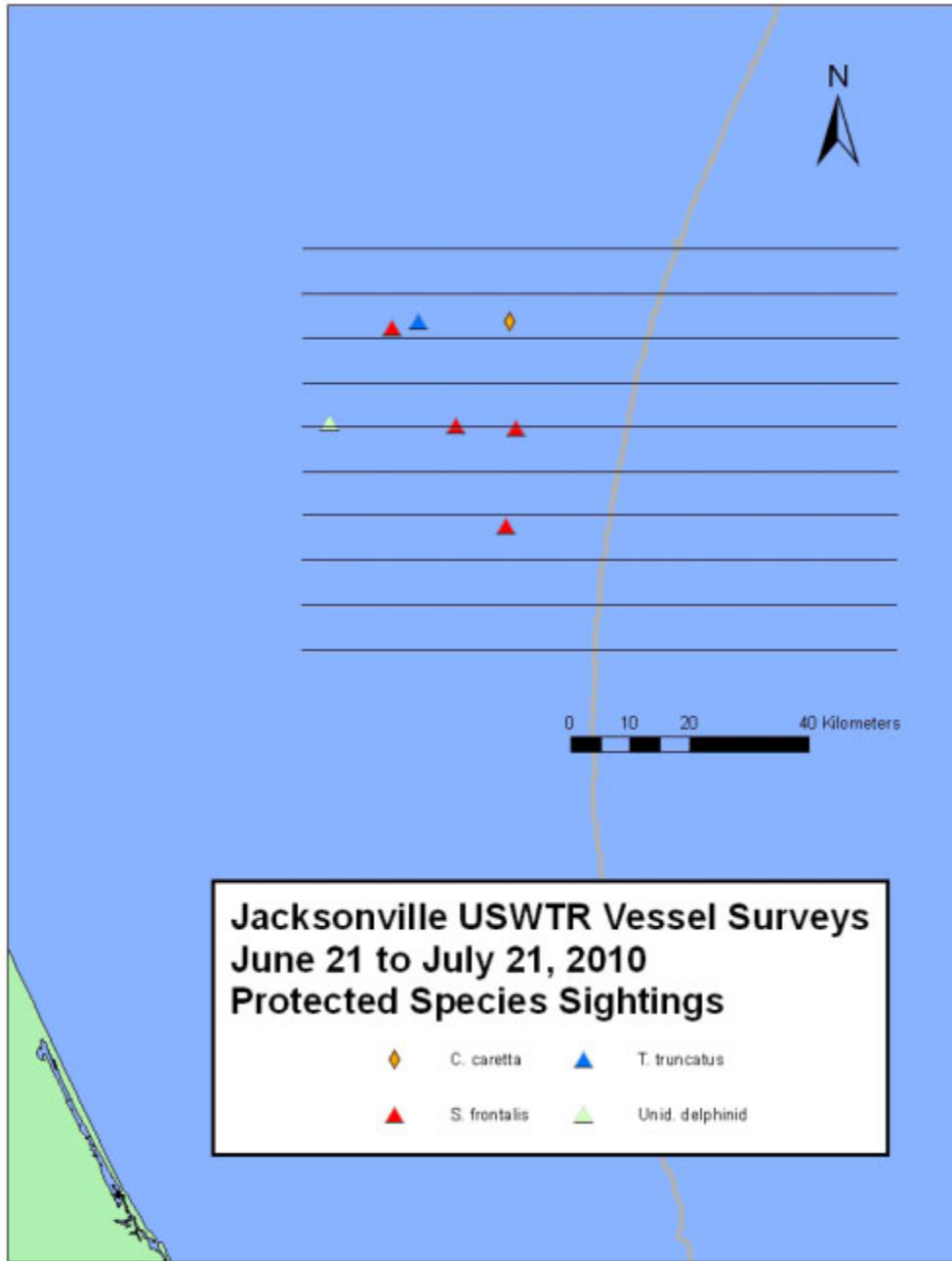
Date	Line	Sea State	Kilometers Flown	Hobbs Hours
8-Jul-10	1	3	74.5	6.1
8-Jul-10	2	3	74.2	
8-Jul-10	3	3	74.7	
8-Jul-10	4	2 to 3	74.6	
8-Jul-10	5	2 to 3	74.5	
8-Jul-10	6	2 to 3	73.9	
8-Jul-10	7	2 to 4	74.5	
8-Jul-10	8	2 to 4	74.8	
8-Jul-10	9	2 to 4	73.1	
8-Jul-10	10	2 to 4	74.0	

**Table 4.** Effort table for vessel surveys in the Onslow Bay USWTR study region June 24 through July 23, 2010.

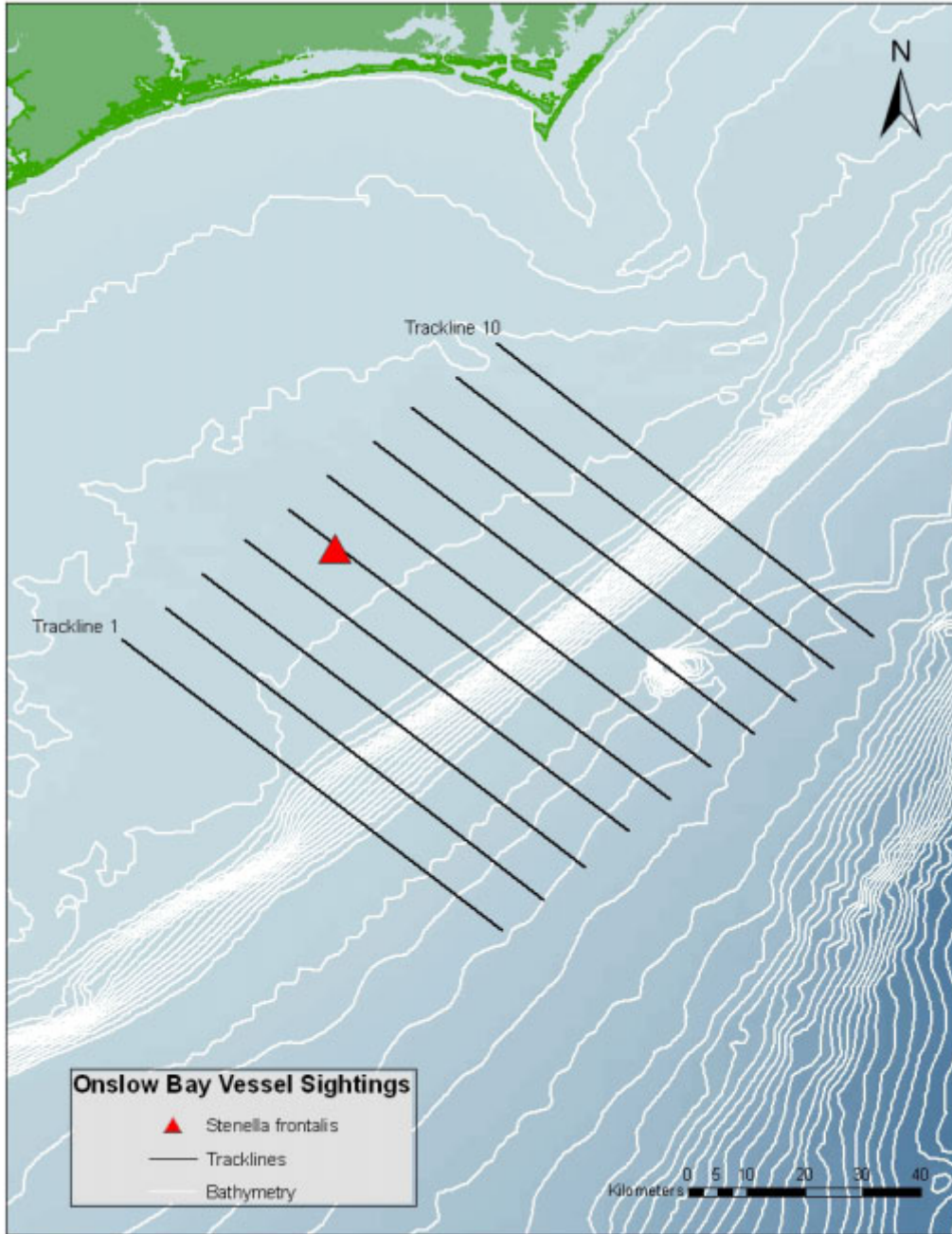
Date	Line	Sea State	Km Surveyed	Survey Time (hrs:min)	At Sea Time (hrs:min)	Platform
7-Jul-10	5 (inshore)	3-4	37.04	5:20	10:15	M/V Sensation

**Table 5.** Cetacean and sea turtle sightings during vessel surveys in the Onslow Bay USWTR study region June 24, 2010 through July 23, 2010.

Date	Time	On / Off Effort	Latitude	Longitude	Track Number	Species	Common Name	Group Size
7-Jul-10	11:11	On	33.953800	-76.860470	5	<i>S. frontalis</i>	Atlantic spotted dolphin	2



**Figure 1.** Cetaceans and sea turtles observed during vessel surveys of the JAX USWTR study region, June 24, 2010 through July 23, 2010



**Figure 2.** Locations of cetaceans and sea turtles sighted during vessel surveys from June 24, 2010 through July 23, 2010 of the Onslow Bay USWTR study region.