

**USACE Hopper Dredging Interactions with Sea Turtles
and Shortnose Sturgeon:
Fiscal Year 09 Annual Summary Report
For the South Atlantic Region
Of the USACE South Atlantic Division**

PREPARED BY:

**Dena D. Dickerson
Craig. T. Theriot**

**Sensitive Species Navigation Support Team
Wetlands and Coastal Ecology Branch
Environmental Laboratory
USACE Engineer Research & Development Center
Vicksburg, MS**

FINAL REPORT



BACKGROUND

This report summarizes data collected for dredging interactions with sea turtles during USACE hopper dredging operations throughout the South Atlantic Region in Fiscal Year (FY) 2009 (1 October 2008 through 30 September 2009). Data were collected by contracted observer companies as part of the Endangered Species Observer Program administered by the USACE Districts Jacksonville, Savannah, Charleston, and Wilmington as specified and mandated by the South Atlantic Regional Biological Opinion (SARBO) (issued by the Southeast Region National Marine Fisheries Service on 25 November 1991 and revised 25 August 1995 (Revision 1) and 25 September 1997 (Revision 2) and the USACE SARBO Management Protocol (USMP) (issued by the USACE South Atlantic Division in FY 2003). These data are for hopper (trailing-suction style) dredging projects only and do not include non-hopper (i.e. clamshell bucket, cutterhead) dredging projects. Non-hopper dredges are not monitored for sea turtle entrainments since the mechanical operation of these dredges has been identified as having minimal or no risk to sea turtles (SARBO). Hopper dredges were used instead of non-hopper dredges for the projects presented in this report due to factors related to crew/vessel safety, sea and weather conditions, project configurations, and productivity costs. This report provides a regional summary of hopper dredging-related incidental takes and trawling-related captures/relocations of sea turtles within the south Atlantic region of the USACE South Atlantic Division.

METHODS AND DATA SOURCES

Appendix A provides a map designating the 8 locations for the 11 USACE hopper dredging projects in the South Atlantic during FY 2009 by USACE District and geographic subregion. The USACE Districts Jacksonville, Savannah, Charleston, and Wilmington were responsible for implementing these hopper dredging projects and for complying with the environmental requirements designated by the SARBO and the USMP (i.e., use of deflectors, 100% observer coverage, relocation trawling). Due to potential differences in habitat use by sea turtles and differences in dredging environments, the South Atlantic region was divided into 2 subregions (South Atlantic (SA) and Central Atlantic (CA) for some data presented in this report. The dividing boundary for these two subregions is the coastal border between Georgia and South Carolina. These subregions are consistent with those presented in Dickerson et al. 2007 to allow continuity in data comparisons.

Data summarized in this report were compiled from individual project summary reports and the annual hopper dredging reports on sea turtle interactions for FY2009 submitted by the USACE SAD Districts Jacksonville, Savannah, Charleston, and Wilmington as well as the Endangered Species Observer Reports submitted by each of the contracted observer companies. Reports are electronically linked within the reference section of this document. These report, along with individual data profiles for each documented sea turtle incidental take, protocols for mitigation efforts and data collection, and links to the SARBO and USMP are archived for reference on the USACE Sea Turtle Data Warehouse website: (<http://el.erdc.usace.army.mil/seaturtles/>).

RESULTS

During FY 2009, 11 hopper dredging projects (all civil works (CW) channel/harbor maintenance and 1 beach re-nourishment) were conducted along the South Atlantic. A total of 11 sea turtles were incidentally taken during these projects (11 during CW dredging). Non capture sweep trawling was performed during 4 CW projects (two of those had pre-dredge sweeping performed). All summaries for these data are provided in the following appendices.

REFERENCES AND RESOURCES

USACE Sea Turtle Database Warehouse, (<http://el.erdc.usace.army.mil/seaturtles/>).

Dickerson, D., C. Theriot, M. Wolters, C. Slay, T. Bargo, W. Parks. 2007. “[Effectiveness of relocation trawling during hopper dredging for reducing incidental take of sea turtles](#),” In: *Proceedings of the World Dredging Congress XVIII, USACE ERDC Research Initiatives*. Central Dredging Association, 27 May-1 June 2007, Lake Buena Vista, Florida.

Dickerson, D. D., M. S. Wolters, C. T. Theriot, C. Slay. 2005. “[Dredging impacts on sea turtles in the Southeastern USA: A historical review of protection](#),” In: *Proceedings of the World Dredging Conference XVII, Dredging in a Sensitive Environment*. Central Dredging Association, 27 September-1 October 2004, Hamburg, Germany.

[South Atlantic Regional Biological Opinion \(SARBO\). 1991.](#)

[South Atlantic Regional Biological Opinion \(SARBO\). 1995 revision.](#)

[South Atlantic Regional Biological Opinion \(SARBO\). 1997 revision.](#)

[USACE South Atlantic SARBO Management Protocol.](#)

FY 2009 Project Sea Turtle/Dredging Data Submitted by Endangered Species Observer Companies and USACE Districts (Archived at <http://el.erdc.usace.army.mil/seaturtles/>)

USACE Jacksonville District (FY 2009)

[Palm Beach Harbor Entrance Channel I](#) (REMSA, Inc.)

[Palm Beach Harbor](#), (East Coast Observers, Inc.)

[Ft. Pierce Beach Re-nourishment \(SPP\)](#) (East Coast Observers, Inc.)

[Kings Bay Entrance Channel](#) (REMSA, Inc.)

Charleston District

[Myrtle Beach Re-nourishment Project- Part 2](#) (Coastwise Consulting, Inc.)

Savannah District

[Brunswick Harbor Bar Channel](#), (Coastwise Consulting, Inc.)

[Brunswick Harbor Navigation Project – Bar Channel O&M](#), (Coastwise Consulting, Inc.)

Savannah Harbor Bar Channel, (Coastwise Consulting, Inc.)

Savannah Harbor O&M, (Coastwise Consulting, Inc.)

Wilmington Harbor

Morehead City Inner and Outer Bars, (REMSA, Inc.)

Wilmington Harbor Ocean Bar, (Coastwise Consulting, Inc.)

.

APPENDICES

Appendix A.....	Map of FY09 South Atlantic Region Hopper Dredging Projects
Appendix B-1.....	Incidental Take Limits Designated by the South Atlantic Region Biological Opinion
Appendix B-2.....	Documented Summary of Incidental Takes, Relocated Turtles, and Shortnose Sturgeon
Appendix C.....	Dredging Project Summary Data
Appendix D.....	Distribution of Sea Turtle Incidental Takes by Species
Appendix E.....	Hopper Dredge/Capture Trawler Related Sea Turtle Incidental Take Summary
Appendix F.....	Capture Relocation Trawling Summary Data
Appendix G.....	Dredging Project Summary Data by Subregion and USACE District
Appendix H.....	Capture Relocation Trawling Summary Data by Subregion and USACE District
Appendix I.....	Non-Capture Sweep Trawling Summary Data by District
Appendix J.....	CPUE Comparisons for Sea Turtle Dredge Takes and Capture Trawl Relocations
Appendix K.....	Distribution of Dredged Material Quantities by Geographic Subregion and USACE Districts
Appendix L.....	Distribution of Sea Turtle Takes by Month
Appendix M.....	Distribution of Dredge Days by Month
Appendix N.....	Non-Sea Turtle Species Incidental Takes or Noted Occurrences

APPENDIX A
FY09 South Atlantic Region Hopper Dredging Projects



South Atlantic (SA)

1. Palm Beach Harbor (SAJ)
2. Ft. Pierce Harbor (SAJ)
3. Kings Bay Harbor (SAJ)
4. Brunswick Harbor (SAS)
5. Savannah Harbor (SAS)

Central Atlantic (CA)

6. Charleston Harbor (SAC)
7. Wilmington Harbor (SAW)
8. Morehead City Harbor/Inner Bar (SAW)

Key

SAJ = USACE Jacksonville District

SAS = USACE Savannah District

SAC = USACE Charleston District

SAW = USACE Wilmington District

SA = South Atlantic

CA = Central Atlantic

APPENDIX B-1
Incidental Take Limits Designated by the
South Atlantic Region Biological Opinion

<i>FY09 Incidental Take Limits as stated in the South Atlantic Biological Opinion (1997) for Hopper Dredges</i>				
Loggerhead <i>(Caretta caretta)</i>	Green <i>(Chelonia mydas)</i>	Kemp's ridley <i>(Lepidochelys kempii)</i>	Hawksbill <i>(Eretmochelys imbricata)</i>	Shortnose Sturgeon <i>(Acipenser brevirostrum)</i>
35	7	7	2	5

APPENDIX B-2
FY 2009 Documented Summary of Incidental Takes, Relocated Turtles, and
Shortnose Sturgeon

<i>FY09 Incidental Takes for the South Atlantic Region</i>				
Loggerhead <i>(Caretta caretta)</i>	Green <i>(Chelonia mydas)</i>	Kemp's ridley <i>(Lepidochelys kempii)</i>	Hawksbill <i>(Eretmochelys imbricata)</i>	Shortnose Sturgeon <i>(Acipenser brevirostrum)</i>
11	0	0	0	0

<i>FY09 Relocated Turtles and Sturgeon for South Atlantic Region</i> <i>Non relocated- Non Capture Sweep Trawling Performed</i>			
Sea Turtle Relocations	Sea Turtle (any species) Relocation Takes (injured or killed)	Shortnose Sturgeon Relocations	Shortnose Sturgeon Relocation Takes (injured or killed)
0	0	0	0

APPENDIX C
Dredging Project Summary Data
(FY09 South Atlantic Region Hopper Dredging)

District	Sub-region	Project	Project Type	Dredge	# Drag-heads	Dredge Dates**	Total Dredge Days**	Total Y ³ [^] Dredged***	Total M ³ [^] Dredged****	Observer Co.
SAJ	SA	Palm Beach Harbor Entrance Channel	M/C/OD	McFarland	2	6/1/09 – 6/1/09	1	15,000	11,468	REMSA
SAJ	SA	Palm Beach Harbor	M/C	Padre Island	2	8/19/09 – 8/28/09	10	42,235	32,291	ECO
SAJ	SA	Kings Bay Channel	M/C/OD	Liberty Island	2	2/10/09 - 2/17/09	8	260,000	198,784	REMSA
SAJ	SA	Ft. Pierce Beach Renourishment	O/BD	R.N. Weeks	2	5/06/09 – 5/20/09	15	180,000	137,620	ECO
SAJ	SA	Brunswick Harbor Bar Channel	M/C/OD	Dodge Island	2	1/09/09 – 2/22/09	45	1,916,354	1,465,158	CWC
SAJ	SA	Brunswick Harbor Navigation Project – Bar Channel O& M	M/C/OD	Dodge Island/ Padre Island	2/2	9/1/09 – 9/10/09; 9/1/09 – 9/10/09	10/10	200,974	153,656	CWC
SAS	SA	Savannah Harbor Bar Channel	M/C/OD	Dodge Island	2	2/23/09 – 3/7/09	13	261,780	200,145	CWC
SAS	SA	Savannah Harbor O&M	M/C/OD	Padre Island	2	9/11/09 – 9/16/09	6	100,159	76,577	CWC
SAC	CA	*Myrtle Beach Re-nourishment- Part 2	O/BD	Dodge Island/ Padre Island	2/2	10/01/08 - 1/07/09 10/01/08 - 1/08/08	99/100	1,525,481	1,166,314	CWC
SAW	CA	Morehead City Inner and Outer Bar	M/C/OD	McFarland	2	2/1/09 - 2/6/09; 2/16/09 - 4/5/09	55	621,561	475,217	REMSA
SAW	CA	Wilmington Harbor Ocean Bar	M/C/OD	Padre Island	2	1/10/09 – 2/17/09	39	948,477	725,163	CWC

M = Maintenance; ED = Emergency dredging; C = Channel sediment source; O = Offshore/non-channel sediment source; OD = Ocean disposal; BD = Beach disposal
ECO = East Coast Observers, Inc.; CWC = Coastwise Consultants, Inc.; REMSA = Research, Environmental & Management Support

*Data included only for projects that occurred in FY09. Project started work in FY08 but finished in FY09. Cubic yards not separated out by FY so yards are estimates.

**Project and dredge dates include non-dredging down time unless actual dredge days are reported with known breaks/down time.

***Dredge quantities (provided by USACE Districts) may be estimates or paid instead of actual amounts

[^]Y³ = Total Cubic Yards; M³ = Total Cubic Meters.

APPENDIX D
Distribution of Sea Turtle Incidental Takes by Species
(FY09 South Atlantic Region Hopper Dredging)

[illegible]

APPENDIX E
Hopper Dredge/Non-Capture Trawler-related Incidental Take Summary
(FY09 South Atlantic Region Hopper Dredging)

District	Sub-region	Project	Species	Take Date	Dredge Load #	Time Recovered	Lat	Long	Water Temp*	SI used?	Trawling used?
SAJ	SA	Kings Bay Channel	Cc	2/15/09	10	0700	30' 24.40	81' 21.10	12.5	Yes	No
			Cc	2/16/09	12	0700	30' 24.40	81' 21.10	12.5	Yes	No
SAC	CA	Myrtle Beach Re-nourishment- Part 2	Cc	11/20/08	575	1306	33' 37.38	78' 51.43	15.2	Yes	No
SAS	SA	Brunswick Harbor	Cc	1/11/09	9	1320	31' 04.96	81' 18.12	14.0	Yes	Yes+
			Cc	2/14/09	161	N/A	N/A	N/A	N/A	Yes	Yes+
SAS	SA	Brunswick Harbor (Summer Dredging)	Cc	9/03/09	23	2130	31' 05.09	81' 18.65	27.3	Yes	Yes+
			Cc	9/05/09	18	1840	31' 04.82	81' 17.91	27.0	Yes	Yes+
			Cc	9/08/09	37	0140	31' 04.60	81' 17.51	27.0	Yes	Yes+
			Cc	9/10/09	53	1200	31' 05.33	81' 18.78	27.7	Yes	Yes+
SAS	SA	Savannah Habor (Summer Dredging)	Cc	9/15/09	29	2118	31' 59.82	80' 47.11	27.0	Yes	Yes+
			Cc	9/15/09	30	0036	31' 59.64	80' 46.99	27.0	Yes	Yes+

Cc = Loggerhead (*Caretta caretta*); Cm = Green turtle (*Chelonia mydas*); Lk = Kemp's ridley (*Lepidochelys kemp*)
SI used? = Silent Inspector in use during dredging project?

* Method and location in water column for temperature data collection not identified in reports

⁺ Non-capture trawling performed. Open nets.

Observer recorded lat/long of turtle takes are either the beginning, middle, or end of the load. Usually the beginning of the load (Chris Slay from Coastwise Consulting).

APPENDIX F
Capture Relocation Trawling Summary Data
(FY09 South Atlantic Region Hopper Dredging)

[illegible]

APPENDIX G

Dredging Project Summary Data by Subregion and USACE District (FY09 South Atlantic Region Hopper Dredging)

Dredging Data Summary	Subregion		
	South Atlantic	Central Atlantic	TOTAL
Total Dredge Projects	8	3	11
Total Turtle Takes	10	1	11
Total Dredge Days	118	293	411
Total Turtle Takes/Days Dredged	0.0847	0.0034	0.0268
Total Cubic Yards	2,976,502	3,095,519	6,072,021
Total Cubic Meters	2,275,699	2,366,694	4,642,393
Total Turtle Takes/1000-y ³	0.00336	0.0003	0.00181
Total Turtle Takes/1000-m ³	0.00439	0.0004	0.00237

Dredging Summary Data	USACE District				
	Jacksonville	Savannah	Charleston	Wilmington	Total
Total Dredge Projects	4	4	1	2	11
Total Turtle Takes	2	8	1	0	11
Total Dredge Days	34	84	199	94	411
Total Turtle Takes/Days Dredged	0.588	0.0952	0.0050	0.000	0.0268
Total Cubic Yards	497,235	2,479,267	1,525,481	1,570,038	6,072,021
Total Cubic Meters	380,163	1,895,536	1,166,314	1,200,380	4,642,393
Total Turtle Takes/1000-y ³	0.00402	0.00323	0.00066	0.00000	0.00181
Total Turtle Takes/1000-m ³	0.00526	0.00422	0.00086	0.00000	0.00237

APPENDIX H

Relocation Trawling Summary Data by Subregion and USACE District (FY09 South Atlantic Region Hopper Dredging)

Relocation Trawling Summary Data	Subregion		
	South Atlantic	Central Atlantic	TOTAL
Total Trawl Projects	1	N/A	1
Total Turtles Relocated	0	N/A	0
Total Trawl Days	4	N/A	4
Total Tows	81	N/A	81
Total Turtles Trawled/Total Days	0.0000	N/A	0.0000
Total Turtles Trawled/Total Tows	0.0000	N/A	0.0000
Average Tows per day	20.25	N/A	20.25

Relocation Trawling Summary Data	USACE District				
	Jacksonville	Savannah	Charleston	Wilmington	Total
Total Trawl Projects	N/A	1	N/A	N/A	1
Total Turtles Relocated	N/A	0	N/A	N/A	0
Total Trawl Days	N/A	4	N/A	N/A	4
Total Tows	N/A	81	N/A	N/A	81
Total Turtles Trawled/Total Days	N/A	0.0000	N/A	N/A	0.0000
Total Turtles Trawled/Total Tows	N/A	0.0000	N/A	N/A	0.0000
Average Tows per day	N/A	20.25	N/A	N/A	20.25

N/A = No relocation trawling performed.

APPENDIX I

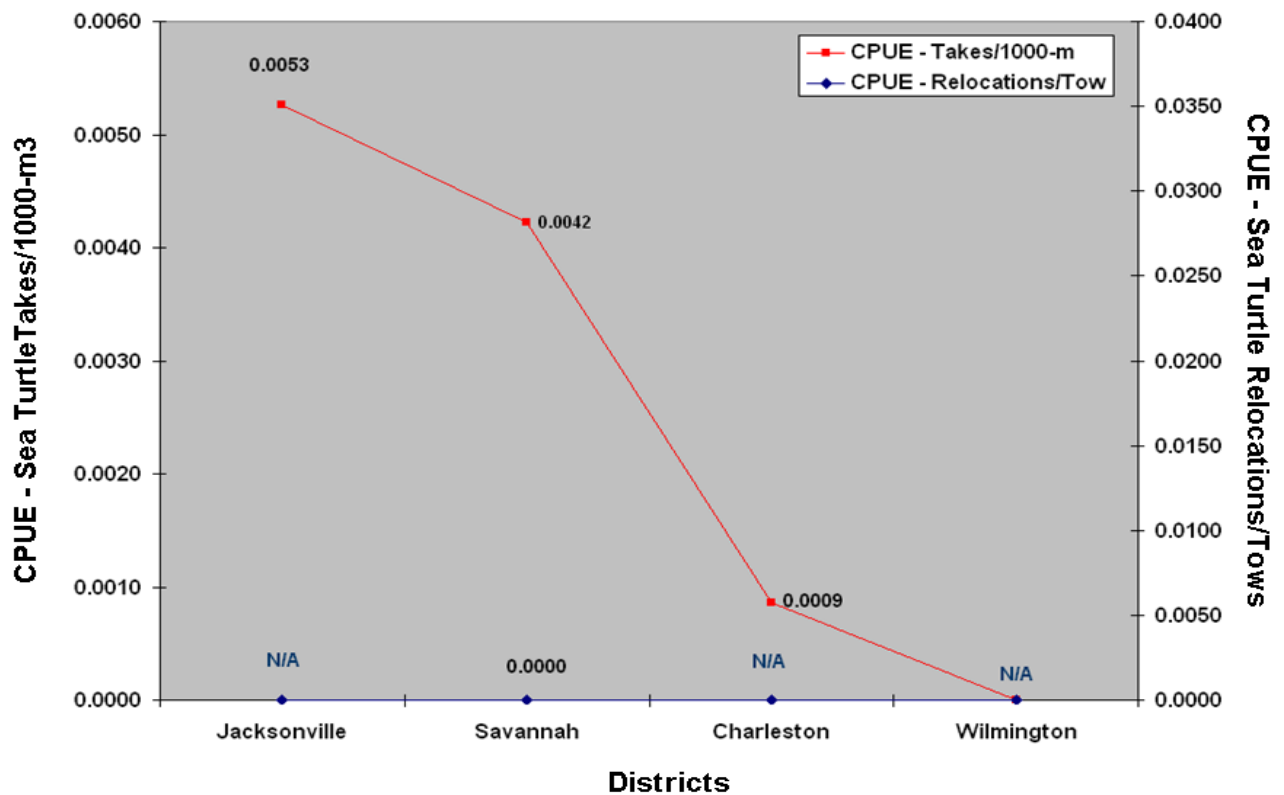
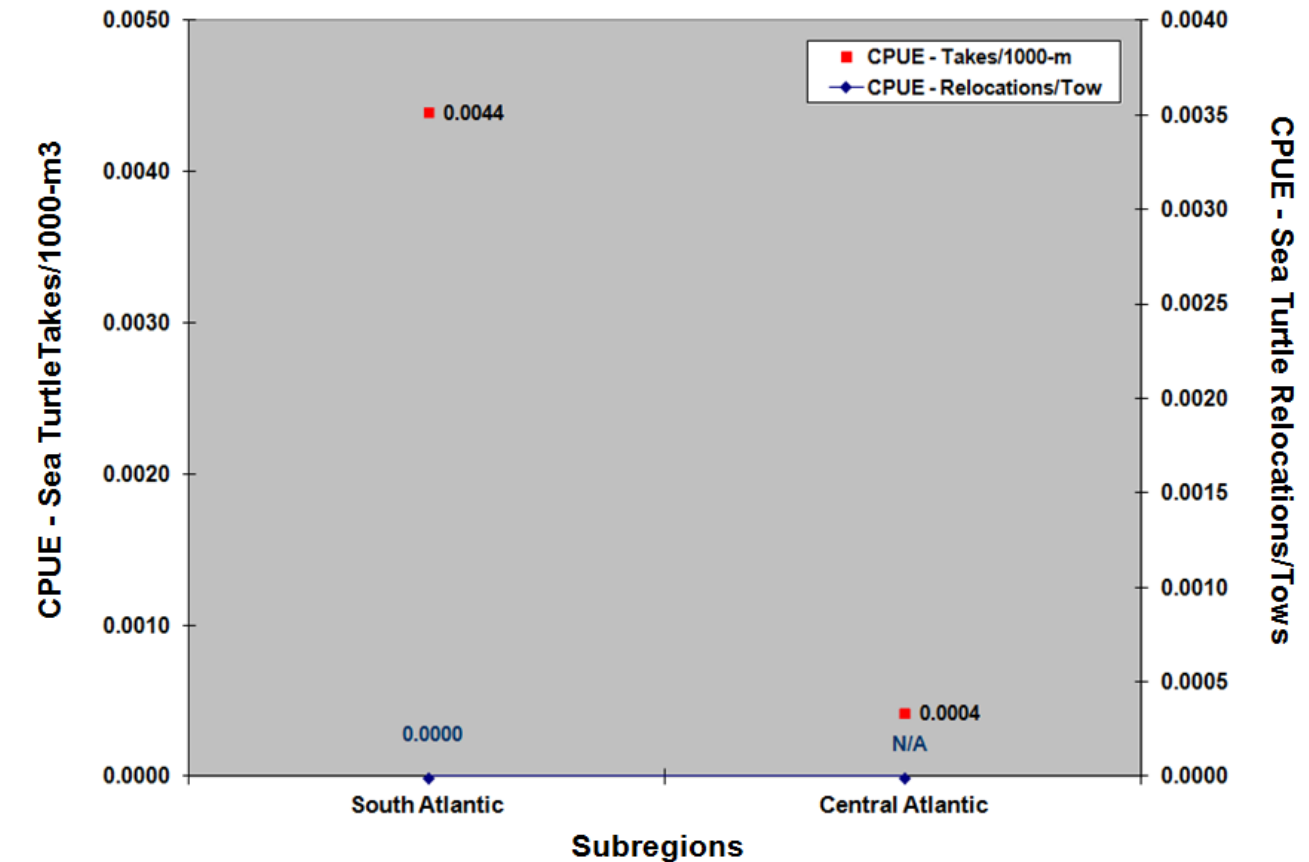
Non-Capture Sweep Trawling Summary Data by District (FY09 South Atlantic Region Hopper Dredging)

Relocation Trawling Summary Data	USACE District				
	Jacksonville	Savannah	Charleston	Wilmington	Total
Total Sweep Projects	1	3	N/A	N/A	4
Total Sweep Days	2	61	N/A	N/A	63
Total Tows	N/A	664	N/A	N/A	664
Total Sweeps	N/A	586	N/A	N/A	586

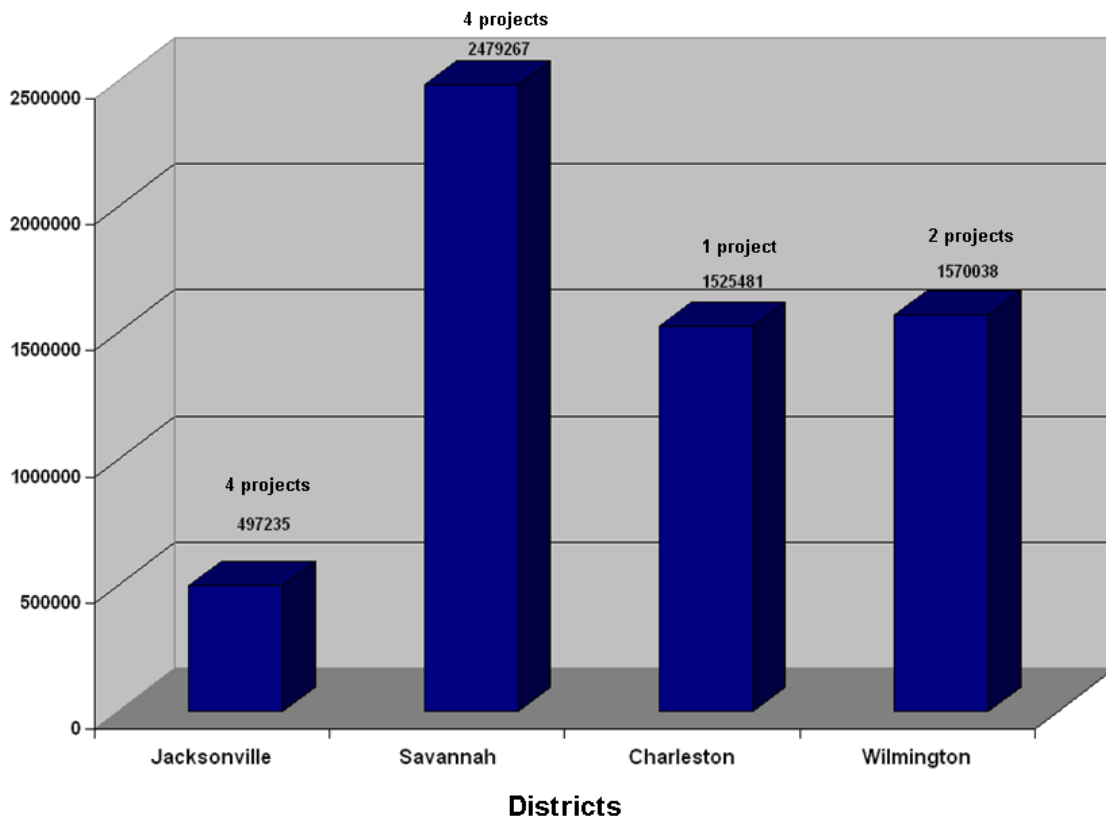
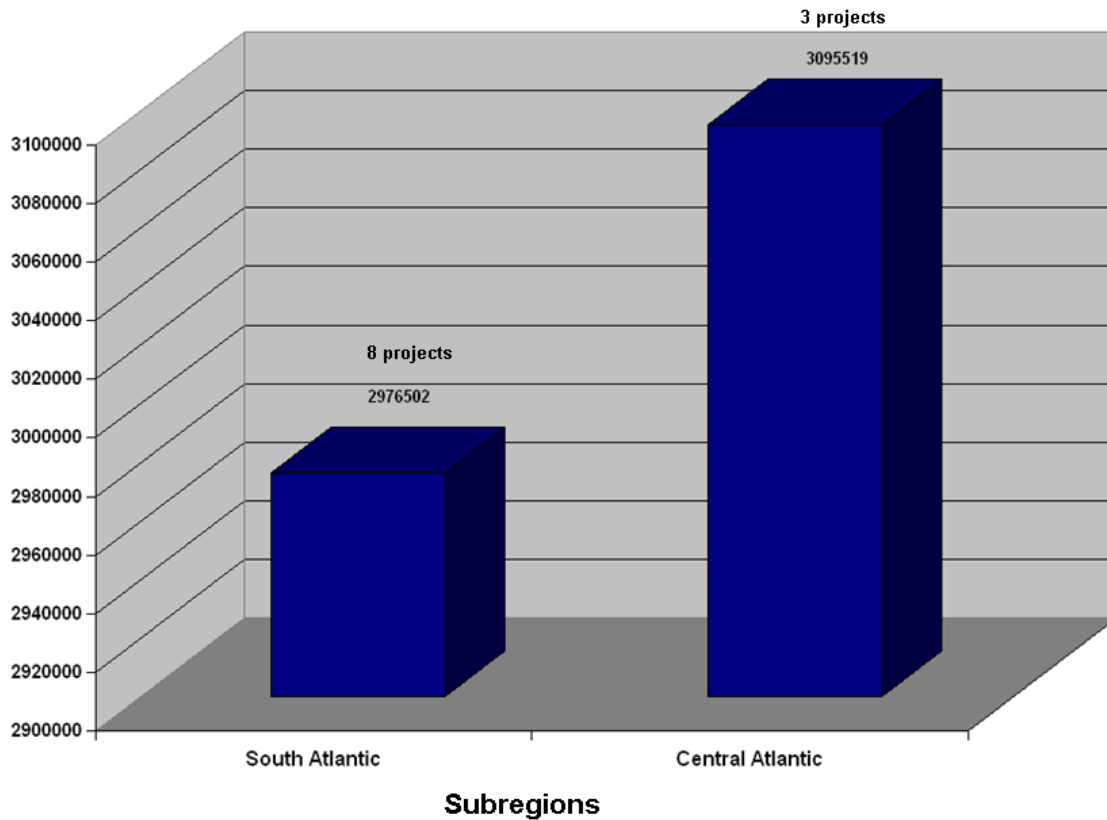
Kings Bay towed for 24.5 hrs over 2 days, 1 tow

APPENDIX J

Catch per Unit Effort Comparisons for Sea Turtle Dredge Takes and Trawl Relocations by Subregion and USACE District (FY09 South Atlantic Region Hopper Dredging)



APPENDIX K
Distribution of Dredged Material Quantities (Cubic Yards) by Geographic Subregion and USACE Districts
(FY09 South Atlantic Region Hopper Dredging)



APPENDIX L
Distribution of Sea Turtle Takes by Month
(FY09 South Atlantic Region Hopper Dredging)

[illegible]

APPENDIX M
Distribution of Project Dredge Days by Month
(FY09 South Atlantic Region Hopper Dredging)

[illegible]

APPENDIX N
Non-Sea Turtle Species Incidental Takes or Noted Occurrences
(FY09 South Atlantic Region Hopper Dredging)

Species	Project	Observations/Remarks
Sturgeon	Savannah Harbor	Atlantic Sturgeon taken by dredge Dodge Island Load #42, March 2, 2009. TL 111 cm, dead.
Whales/Manatees	Morehead City Wilmington Harbor Brunswick Harbor	-1 Humpback sighted -1 to 3 Right Whales sighted -Whales reported in project area on dailies but no numbers
Dolphin	Palm Beach Harbor Morehead City Savannah Harbor Bar Brunswick Harbor Brunswick Nav (summer) Savannah Harbor O&M (summer)	-Few sightings -Many sightings -Some sightings -Some sightings dailies -~30 sightings by Dodge Island and ~18 sightings by Padre -~20 sightings by dredge
Shark	Morehead City Wilmington Harbor Savannah Harbor Bar Brunswick Harbor Brunswick Harbor Nav (summer)	-22 Spiny dogfish and 7 Smooth dogfish -~54 dogfish and 6 unidentified shark reported and other daily reports just mention shark -18 just labeled shark, 1 noted as dogfish -2 mentioned as shark and 1 as dogfish -1 Sharpnose reported by Dodge Island

Horseshoe Crab	Palm Beach Harbor Fort Pierce Beach Morehead City Wilmington Harbor Savannah Harbor Bar Brunswick Harbor Brunswick Harbor Nav(summer) Savannah Harbor O&M (summer)	-41 reported taken by dredge -1 reported taken by dredge --~600 reported taken by dredge --~44 reported and other daily reports just said HS crab. --~1651 reported taken by dredge --~1362 reported by dredge --~70 reported by Dodge Island and just mentioned on Padre no #'s --~298 reported by dredge