



NOAA Office of Ocean Exploration Quick Look Report

Expedition Title: Sonar mapping of biologically-engineered and other complex habitats at the shelf edge and upper slope of the South Atlantic Bight

Results (please check all disciplines in which this cruise collected data)	Details (please describe any novel discoveries in the discipline, answers such as "possible, awaiting data analysis" and "no apparent discoveries" are acceptable)
Bathymetric Mapping <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	(please note total area mapped and technology employed, e.g. multibeam, side scan, etc.) Approximately 54,000 ha (160 NM ² surveyed with multibeam sonar. Approximately 26,300 ha (80 NM ²) surveyed with side scan sonar.
New Species Discovered <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	(please note number, type, and significance ,i.e. radically new vs. slight adaptation of known species) None
Bio-prospecting <input type="checkbox"/> Yes <input type="checkbox"/> No	(please note number, type, and potential use of new compounds discovered) None
Habitat Range Extended <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	(please note species discovered in new habitats and how far from previous range were they found) None
Chemical Processes <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	(please note new or unusual chemical properties such as methane seeps, hypersaline pools, vents, etc. observed) None
Geologic Processes <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	(please note new or unusual geologic processes that may impact scientific understanding of the region) Mapped apparent ancient shorelines and faults.
Physical Processes <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	(please note new or unusual oceanographic processes that may impact scientific understanding of the region) ADCP and surface hydrographic data measured. Will be analyzed by cooperating scientists at the University of South Carolina. CTD casts taken for sound velocity corrections. Data will also be analyzed at USC.
Sub/ROV/AUV Dives <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	(please note name, type, and cumulative hours of bottom time for each platform / if available please provide average working time per dive for each platform / please note if new depth records were set)
New Technology <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	(please note any new tools developed for or during this cruise, also identify first use of an existing technology in a new application)
Maritime Cultural Heritage <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	(please note discoveries impacting knowledge of the past, i.e. number and type of shipwrecks)
Outreach <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	(please describe outreach channels, e.g. Web, port call, etc., used in this project) Cruise plans were presented at OE and COSEE-SE workshops for teachers, prior to the cruise. A press release was released prior to the cruise and we are working on a post-cruise press release.
Students Involved <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	(please note the number and level of students on the expedition) Two Ph.D. students from Scripps Institute of Oceanography were on the cruise.
Multidisciplinary <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	(please identify the formal disciplines represented in the science party) Geology, geophysics, ichthyology, fisheries, genomics.
Exploration of New Regions <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	(please note if the area of operations had been previously studied, if so please check no and approximate as slight, moderate or significant, the level of knowledge before the cruise) Some of the areas had been explored on OE submersible dives. Others had been sampled with fishery survey gear (fish traps, longlines).

Ocean Exploration Quick Look Report Required Elements

The Office of Ocean Exploration (OE) does not require a specific Quick Look Report format. Reports submitted under other requirements (e.g. Cruise Summary Report (CSR)) or Fisheries-Oceanography Coordinated Investigations (FOCI)) are acceptable. In all cases Quick Look Reports submitted to OE should contain the following elements:

Project title: Sonar mapping of biologically-engineered and other complex habitats at the shelf edge and upper slope of the South Atlantic Bight

Principal Investigator and institution: George R. Sedberry, South Carolina Department of Natural Resources

Expedition title: NF-06-10-OE

Expedition dates and itinerary: 19-30 Sep 2006. Survey shelf edge and slope sites off South Carolina and Georgia, including proposed Marine Protected Areas and important fishery habitats. Map habitats and biologically-engineered habitats such as worm reefs, coral mounds, grouper pits, tilefish burrows and triggerfish nests. Proceed from northernmost sites off Bulls Bay SC south along the shelf edge to shelf-edge sites off Beaufort SC, then offshore to Charleston Bump sites off Sapelo Island GA.

Chief Scientist and institution: George R. Sedberry, South Carolina Department of Natural Resources

Co-sponsors / partners / participating organizations: (a table of names and affiliations)

Cruise Participants:

Beal, Marion	South Carolina Department of Natural Resources
Gayes, Paul	Coastal Carolina University
Hill, Jenna	Scripps Institute of Oceanography
Johnstone, Liz	Scripps Institute of Oceanography
Philips, James	Coastal Carolina University
Sedberry, George	South Carolina Department of Natural Resources
Williams, Allison	South Carolina Department of Natural Resources
Collaborating Investigators (not on cruise):	
Coleman, Felicia	Florida State University
Koenig, Chris	Florida State University
Sautter, Leslie	College of Charleston
Scanlon, Kathy	United States Geological Survey

Vessel Identification: NOAA Ship *Nancy Foster*

Primary Equipment: multibeam sonar, EdgeTech sidescan sonar, EdgeTech chirp sonar.

Geographic area of operations: South Atlantic Bight (see map).

Summary of Expedition Objectives:

The following objectives were met:

1. Use multibeam sonar to map bottom topography in areas that are important fish habitats and spawning grounds, as determined from historical fishery-independent sampling, commercial landings and ongoing complementary studies already funded by NOAA.
2. Use side-scan sonar to map smaller features (particularly features excavated by fishes), such as low mounds built by tube worms, coral mounds, solution holes, and other small-scale features.
3. Develop educational materials from the research.

Milestones Achieved:

In spite of mechanical delays and weather problems, we successfully mapped fish and coral habitat in three distinct features of the outer shelf and slope. These included shelf-edge reefs where many fishes spawn and where worm and coral mounds are found, upper slope reefs where deep groupers live, and the southern ridge of the Charleston Bump, where deep corals and wreckfish live. Sonar maps of shelf-edge reefs revealed an extensive cusped reef at about 50 m, with "capex" of wider reef habitat stretching seaward from the cusps. Additional reefs with a shoreward-facing scarp were found offshore of the main shelf-edge reef. Extensive areas of rough bottom with deep-cut channels and low pinnacles were found on the upper slope around 200 m depth. This rough bottom supports populations of snowy grouper, blueline tilefish and blackbelly rosefish. Additional high-relief (100+ m scarps) was mapped with multibeam sonar on the southern end of the Charleston Bump (400-600 m). This

area supports fisheries for wreckfish, barrellfish and red bream. It is suspected of being an important deep coral habitat, but we could not survey it with side scan sonar because of the depth.

Sample log entries:

Date	EDT	Block No.	Line No.	MB Line No.	Grid Line No.	HyPack Line No.	Depth	Comments
19-Aug-06	2359	1	001_2006_0819			202_0005		120 & 410 Khz on side scan
20-Aug-06	0147	1	002_2006_0820					.5-6 Khz on chirp
20-Aug-06	1400	1	012_2006_0820	12	19			UW for 19; CTD delay
21-Aug-06	1356	1	030_2006_0821	30				Start
21-Aug-06	1817	2						CTD-1; Block 2
21-Aug-06	1846	2						600-m wide swath (3:1) for multibeam
21-Aug-06	1913	2	033_2006_0821	33	9			Begin line
21-Aug-06	2314	2	034_2006_0821	34				Line in progress
22-Aug-06		2	044_2006_0822	44				Line in progress; too rough to chirp
22-Aug-06	1453	2	045_2006_0822	45				half way from 44 to 45
22-Aug-06	2003	2	048_2006_0822	48				
23-Aug-06	1203	3						CTD: 21o23'23.44"; 78o54'3.99"
23-Aug-06	1317	3						chirp in water
23-Aug-06	1348	3						side scan in water
23-Aug-06	2106	3	061_2006_0823	61	7			Start (4 knots; up from 3.5) NE-SW 10-mile lines
24-Aug-06	1031	3-4	066_2006_0824	66				10-mile line NE-SW through 3-4
24-Aug-06	1908	3						CDT 75 m; switch from side scan to chirp
25-Aug-06	0014	3-4	078_2006_0825	78	16			dip line 16
25-Aug-06	0100	3-4	079_2006_0825	79	14			dip line 14
25-Aug-06	1011	3-4	086_2006_0825	86	10			back on strike lines; line 10
25-Aug-06	1135	3-4	086_2006_0825	87	3			lining up on strike line 3; will pull chirp prior to
25-Aug-06	1220	3-4	086_2006_0825	87	3			side scan in water; approaching line 3
25-Aug-06	1245	3-4	086_2006_0825	87	3			start line
25-Aug-06	1839	4-3	089_206_0825	89	12			start logging multibeam in turn to 12
25-Aug-06	2155	3-4	090_2006_0825	90	20			Start deep end
26-Aug-06	0108	3-4	091_2006_0826	91	22			Turn and start
26-Aug-06	1102	3-4	097_2006_0826	97				end line
26-Aug-06	1103	3=4	098_2006_0826	98	21			Start 98
26-Aug-06	1539	3-4	100_2006_0826	100				Break off of Line 2 gap fill; U/W for CDT
27-Aug-06	1850	4-5	110_2006_0827	110	20			start 20
28-Aug-06	1448	4-5						u/W for Block 8 on Charleston Bump
28-Aug-06	2302	8	122_2006_0828	122	27		542	Bump Block--Block 8; start logging on HyPack
29-Aug-06	0027	8	123_2006_0829	123	26		550	N to S line
29-Aug-06	0205	8	124_2006_0829	124	25		553	S to N
29-Aug-06	0337	8	125_2006_0829	125	24		572	N to S line; cut over early
29-Aug-06	1033	8	127_2006_0829	127	20			N to S; forgot to restart logging?
29-Aug-06	2146	8	135_2006_0829	135	12		560	N to S. Last line, then U/W for Charleston due to

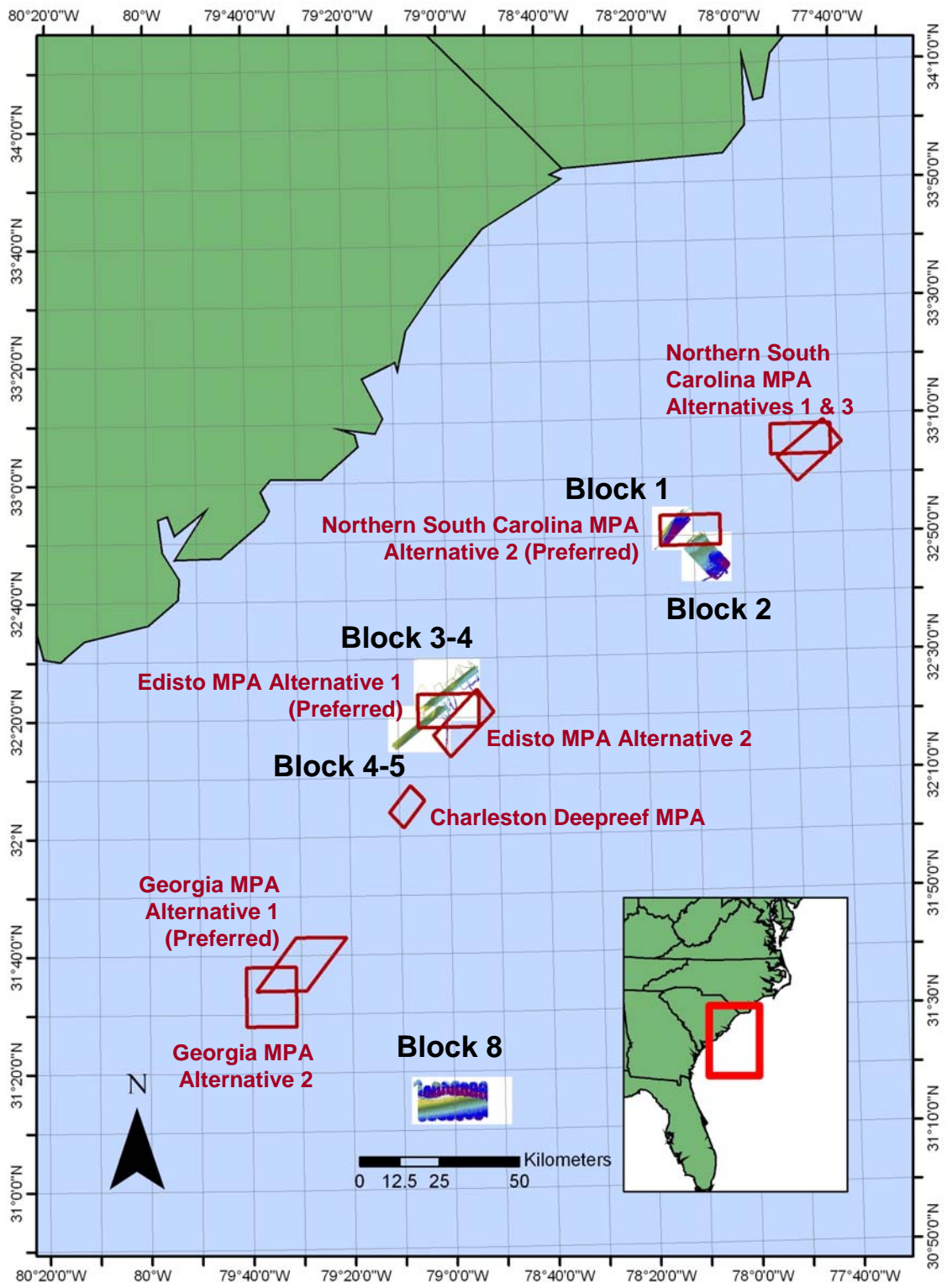
Summary of Digital Data Collected: Approximately 100 GB of multibeam sonar data collected. An additional 100 GB of side scan and chirp sonar data were collected.

Summary of outreach and educational activities: A press release describing the mission was promulgated and published by newspapers in South Carolina (Charleston and Georgetown). Educational materials are being incorporated into presentation materials to be used by the investigators in public outreach programs.

Thoughts for the Future: Additional sonar mapping is needed, and should be ground-truthed with visual observations (ROV). A dedicated hydrographic survey ship could accomplish more mapping that can be done from multipurpose vessels.

Summary of Expedition Operations: See map and summary table that follows:

Date	Comments
18-Aug-06	Mobilize
19-Aug-06	U/W & Survey Block 1
20-Aug-06	Survey Block 1
21-Aug-06	Survey Block 2
22-Aug-06	Survey Block 2
23-Aug-06	Survey Block 3
24-Aug-06	Survey Blocks 3-4
25-Aug-06	Survey Blocks 3-4
26-Aug-06	Survey Blocks 3-4-5
27-Aug-06	Survey Blocks 4-5
28-Aug-06	Survey Blocks 4-5, 8
29-Aug-06	Survey Block 8, U/W for Charleston
30-Aug-06	Arrive Charleston, demobilize



Map showing areas surveyed (white blocks with color sonar images) and proposed MPAs