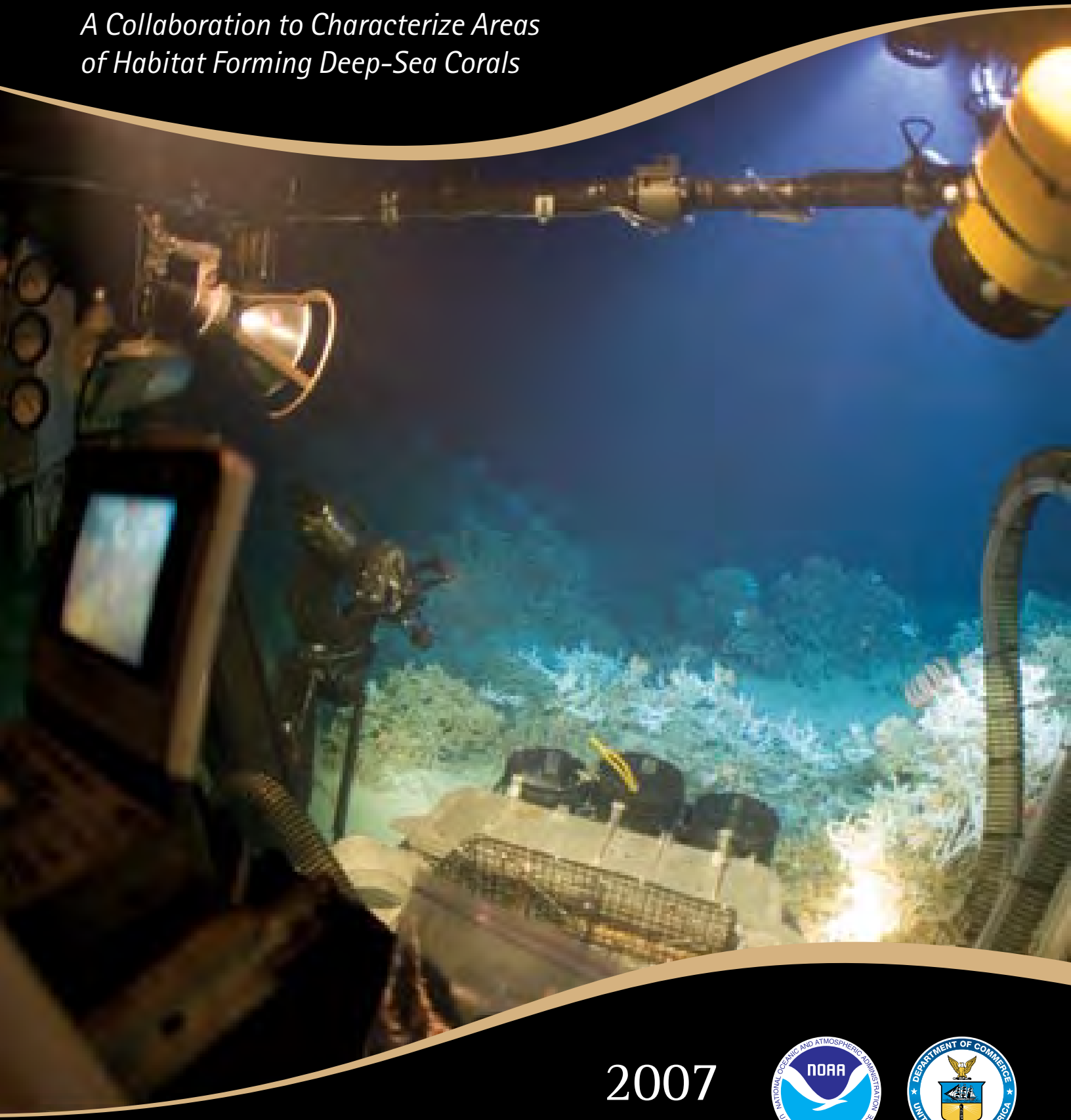
Southeastern United States Deep-Sea Corals (SEADESC) Initiative:

A Collaboration to Characterize Areas of Habitat Forming Deep-Sea Corals



2007

NOAA Technical Memorandum OAR OER 1

CITATION

Partyka, M.L., S.W. Ross, A.M. Quattrini, G.R. Sedberry, T.W. Birdsong, J. Potter, S. Gottfried. 2007. Southeastern United States Deep-Sea Corals (SEADESC) Initiative: A Collaborative Effort to Characterize Areas of Habitat-Forming Deep-Sea Corals. NOAA Technical Memorandum OAR OER 1. Silver Spring, MD. 176 pp.

ACKNOWLEDGEMENTS

The NOAA Office of Ocean Exploration (grants to lead principal investigators S.W. Ross and G.R. Sedberry) largely supported field work and some of the data analyses for this project. United States Geological Survey (through the State Partnership Program), Minerals Management Service, South Atlantic Fishery Management Council, and Environmental Defense contributed funds to help with analyses. We thank the NC State legislature for partial support. We thank the Friends of the NC Museum of Natural Sciences, especially Liz Baird and Stephanie Hollomon, for help in managing some project funding. We thank Betsy Bennett of the NC Museum of Natural Sciences for supporting the Ross et al. projects. Art Howard assisted the Ross et al. cruises with photography and videography support. USGS Florida Integrated Science Center provided some personnel and logistics support for many cruises (S.W. Ross et al. cruises). A-M Necaise and K. Roth assisted with some SEADESC analyses. We thank the SEADESC committee for their support and enthusiasm, and especially acknowledge Martha Nizinski, Doug Rader, and Andy Shepard for their support, including report reviews. We thank Harbor Branch Oceanographic Inst. ship, submersible and shore-based personnel for assisting with numerous cruises. We offer our special thanks to The DesignPond, in particular Michael James and Sheri Beauregard for their outstanding contributions to the design of this report.

FOR MORE INFORMATION

For more information about this report or to request a copy, please contact the NOAA Office of Ocean Exploration and Research, at 301-734-1010 or write to: NOAA Office of Ocean Exploration and Research, SSMC#3 10th Floor, 1315 East West Highway, Silver Spring, MD 20910. Copies may also be downloaded in total, at: *www.explore.noaa.gov*. Information about this report and project can also be obtained from S.W. Ross (see author's addresses)

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NOTE: The NOAA Ocean Exploration and Research Program (OER) resulted from the merger of the NOAA Office of Ocean Exploration (OE) and the National Undersea Research Program (NURP).

FRONT COVER IMAGE. View from inside the JSL submersible near the top of a deep-sea coral mound off Cape Lookout, North Carolina (JSLI-4893, 18 Oct 2005, depth about 370 m). Photo credit: Art Howard.

BACK COVER IMAGE. Section of the deep-sea scleractinian coral *Lophelia pertusa* collected off the southeastern United States by submersible. Photo credit: Art Howard

Southeastern United States Deep-Sea Corals (SEADESC) Initiative:

A Collaboration to Characterize Areas of Habitat Forming Deep-Sea Corals

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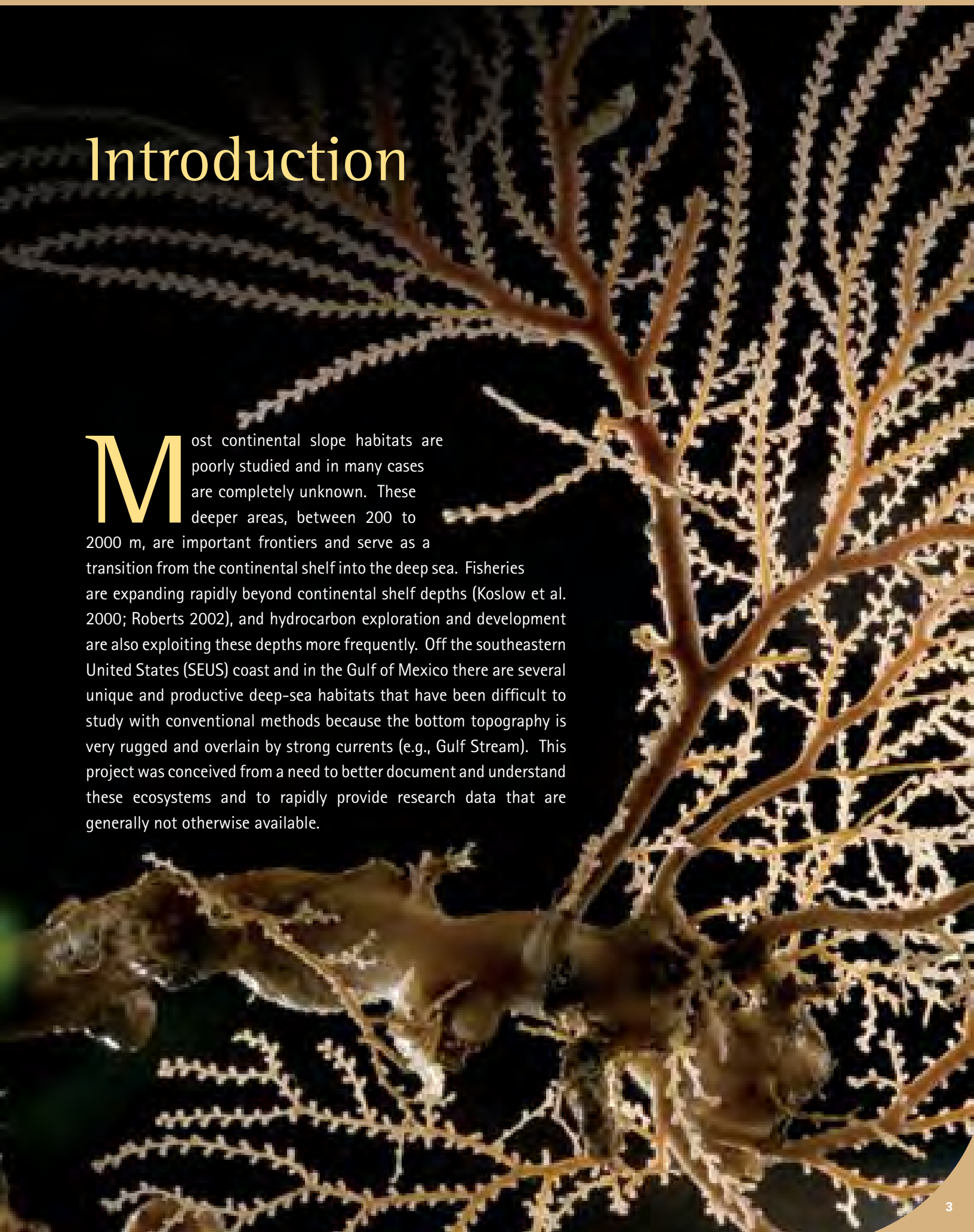
PAGE 3. The gorgonian, *Plumarella pourtalesii* (Primnoidae), is attached to a piece of *Lophelia pertusa*, collected at the Stetson Banks (JSL 4898, 21 Oct 2005, 618 m). Photo credit: Art Howard.

Introduction



Most continental slope habitats are poorly studied and in many cases are completely unknown. These deeper areas, between 200 to 2000 m, are important frontiers and serve as a transition from the continental shelf into the deep sea. Fisheries are expanding rapidly beyond continental shelf depths (Koslow et al. 2000; Roberts 2002), and hydrocarbon exploration and development are also exploiting these depths more frequently. Off the southeastern United States (SEUS) coast and in the Gulf of Mexico there are several unique and productive deep-sea habitats that have been difficult to study with conventional methods because the bottom topography is very rugged and overlain by strong currents (e.g., Gulf Stream). This project was conceived from a need to better document and understand these ecosystems and to rapidly provide research data that are generally not otherwise available.

Close-up of living (white) *Lophelia pertusa* growing alongside a *Madrepora oculata* hard coral (pink) at the Cape Lookout B site (JSLII-3429, 23 Aug 2003, 416 m). The urchin, *Echinus tylodes*, is on the top of the pink coral, and the small, slender pinkish arms mixed in with the dead (grey) coral are brittlestars (*Ophiacantha bidentata*). Photo credit: S.W. Ross et al.

Deep (cold water, aphotic) coral reef systems are receiving increasing attention worldwide. There is evidence that deep-sea corals are important fish habitat (Costello et al. 2005; Ross and Quattrini 2007), a repository of data on ocean climate and productivity (Adkins et al. 1998; Williams et al. 2006, in press), and are hotspots of increased biodiversity, including undescribed species. These high-profile features concentrate biotic resources and enhance local productivity in ways similar to seamounts (Rogers 1994; Koslow 1997). Deep reefs are more extensive and important than previously known (e.g., Roberts et al. 2006) and are facing a variety of threats (e.g., fishing, energy exploration, ocean acidification) (Rogers 1999; Koslow et al. 2000; Morgan et al. 2006). Locating, describing, and mapping deep corals and conducting basic biological studies in these habitats are global and regional priorities (McDonough and Puglise 2003; Roberts and Hirshfield 2003; Puglise et al. 2005).

The SEUS and Gulf of Mexico may have the most extensive deep coral areas in the U.S. (Hain and Corcoran 2004); however, these large regions are poorly explored (even considering recent expeditions). *Lophelia pertusa* is the dominant deep-sea reef-forming coral off the SEUS, found from North Carolina through the Gulf of Mexico > 200 m deep. Numerous other species of hard and soft corals also contribute to the deep reef systems in the SEUS and Gulf of Mexico (Brooke and Schroeder in press; Ross and Nizinski in press). On the SEUS continental slope, deep-sea coral habitats typically occur at depths between 370 and 870 m (Stetson et al. 1962; Paull et al. 2000; Popenoe and Manheim 2001;

Large living *Lophelia pertusa* bush at the Cape Lookout B site (JSLI-4695, 16 Jun 2004, 411 m). Note that the coral's extended polyps can be seen. A galatheoid crab, *Eumunida picta*, is perched near the center and below that is the urchin, *Echinus tylodes*. Hydroids and brittle stars (*Ophiacantha bidentata*) are also within the coral matrix. Photo credit: S.W. Ross et al.

Reed 2002; Reed and Ross 2005; Reed et al. 2006) and appear to be oases of marine life offering both food and shelter for a diverse and unique fauna of fishes and invertebrates.

The Southeastern United States Deep-Sea Corals (SEADESC) initiative began in 2004 to provide a means of rapidly delivering general, small-scale habitat composition data from deep-sea (> 200 m) habitats in the region. The scientific community needed a means of sharing data from ongoing studies without jeopardizing future publication capabilities, while management and education groups needed information more rapidly than normally provided through the scientific publication process. The intent of this project was to provide basic habitat and other information (e.g., project metadata, bottom photographs, dominant biota) to a variety of users in a timely fashion. The initial focus of SEADESC was on deep-sea coral habitats, and because the NOAA Office of Ocean Exploration (NOAA-OE) helped begin this effort and had funded several research missions related to deep coral habitats, deep coral projects funded by NOAA-OE were prioritized. Also, because of a strong interest in the project by the regional NOAA Undersea Research Center (NURC at UNC-Wilmington), a small test data set from shallower (< 200 m) Florida *Oculina* surveys was included. Since the focus of this report is on the SEUS slope deep-sea corals, the *Oculina* survey data are not included here, but will be included in future revisions. A SEADESC steering committee representing a variety of interests and skills (Appendix I) was formed to determine content, evaluate protocols, and generally guide the project. Subsequently, a core working group was established to accomplish data analyses and carry the project to the current stage. Multiple sources provided initial funding for the project (see Acknowledgements).

Close-up views such as this one from the North Cape Canaveral site (JSLI-4703, 20 Jun 2004, 749 m) often reveal a great variety of small filter feeders attached to the coral or rocky substrata. The large pinkish octocoral is in the family *Nephtheidae*. Photo credit: S.W. Ross et al.

General SEADESC Objectives

1. Characterize and map selected SEUS deep-sea coral areas based on projects funded by NOAA-OE from 2001-2004,
2. Develop methods to provide rapid access to deep-sea coral data as well as other related deep-sea ecosystem data to facilitate management decisions (e.g., HAPC designation, permitting, ecosystem-based management),
3. Facilitate ongoing and new scientific investigations on SEUS deep coral habitats,
4. Use products to help prioritize areas for future exploration,
5. Use SEADESC to help coordinate regional deep-sea coral management and research,
6. Facilitate education and outreach related to deep-sea corals.

Project Scope

The project's goal was to generate bottom habitat characterizations along with basic metadata from direct observations that are useful to a broad audience, have reasonable repeatability (with simplified, clearly defined habitat categories), and that could be generated quickly. This phase of SEADESC focused on projects

High diversity of animals is shown in this view of the bottom at the Cape Fear coral bank off North Carolina (JSLI-4896, 20 Oct 2005, 386 m). Living (white) and dead (grey) *Lophelia pertusa* coral forms the habitat which is occupied by a conger eel (upper center, *Conger oceanicus*), several species of anemones, squat lobsters (*Eumunida picta*), and urchins. Photo credit: S.W. Ross et al.

funded by NOAA-OE in the SEUS (see Fig. 1 for spatial coverage), which used a manned submersible (Johnson-Sea-Link, JSL; Harbor Branch Oceanographic Institution, HBOI) to make video observations of bottom habitats. Analyzing these data involved defining basic habitat categories, creating and correcting submersible tracks, developing video analysis protocols, developing a database for storage and manipulation of data, and generating summary dive and site forms (see Methods for details). The habitat categories developed here were somewhat general with only a moderate level of detail. Developing more detailed habitat classifications (e.g., Greene et al. 1999; Madden et al. 2005), while useful, was beyond the scope of this project and would have defeated the purpose of simple, rapid classification. Habitat definitions and protocols could be applied to other data collection efforts, and in the future, these could replace existing protocols for summarizing research data in near-real time or soon after collection.

This project differs from other efforts in several fundamental ways. First, the protocol emphasized direct observation and classification of bottom habitats with subsequent georeferencing of those observations. Second, this effort provided more bottom detail and positional accuracy than presented in previous projects. While time consuming, this data verification, often missing in other data syntheses, added significantly to the product's utility. Additionally, extensive project and individual observation metadata were embedded in a searchable database. Finally, the project was created to

be upgradeable, expandable, and Web (Internet) portable.

Applicability

The SEADESC committee and NOAA-OE recognized that the protocols, definitions, and analyses undertaken in this project could have wider applicability and serve a variety of oceanic sampling activities, beyond corals, the SEUS region, and the depth zone examined here. The products generated should be useful for research, management, and education activities. While this version is produced in a hardcopy format, these data forms and corresponding text can be made electronic and Web accessible, thus increasing the utility. New data can be incorporated as they are collected and analyzed. The research community can use the summaries to plan future investigations. SEADESC can provide previously unavailable information, such as a general review of the fauna, habitat types, and bottom appearance, including slope angle, profile, and substrata. This knowledge would facilitate choosing research locations as well as habitat based management.

SEADESC can provide various agencies with data necessary to help make management decisions and evaluate slope habitats along the SEUS. For example, the South Atlantic Fishery Management Council (SAFMC), the primary fishery management organization for SEUS marine waters, can use explicit habitat data and general resource data provided by SEADESC to help define Essential Fish Habitat (EFH) for the SAFMC's Fishery Ecosystem Plan and Fishery Management Plans. These data will contribute to the Council's Coral Fishery Management Plan, Deep Coral Research Plan, Deep Water Snapper Grouper FMP, designation of Coral Habitat Areas of Particular Concern (HAPCs), and future Marine Protected Area designations. SEADESC can also provide bottom habitat data required by the U.S. Department of Interior's Minerals Management Service, the federal agency charged with managing offshore mineral and energy resources. Although states in the region generally do not manage deep water resources, state agencies evaluate offshore activities (e.g., oil exploration) for their impacts on state resources and their consistency with the Coastal Zone Management Act. SEADESC bottom habitat data will be valuable in such evaluations undertaken by state agencies. ■

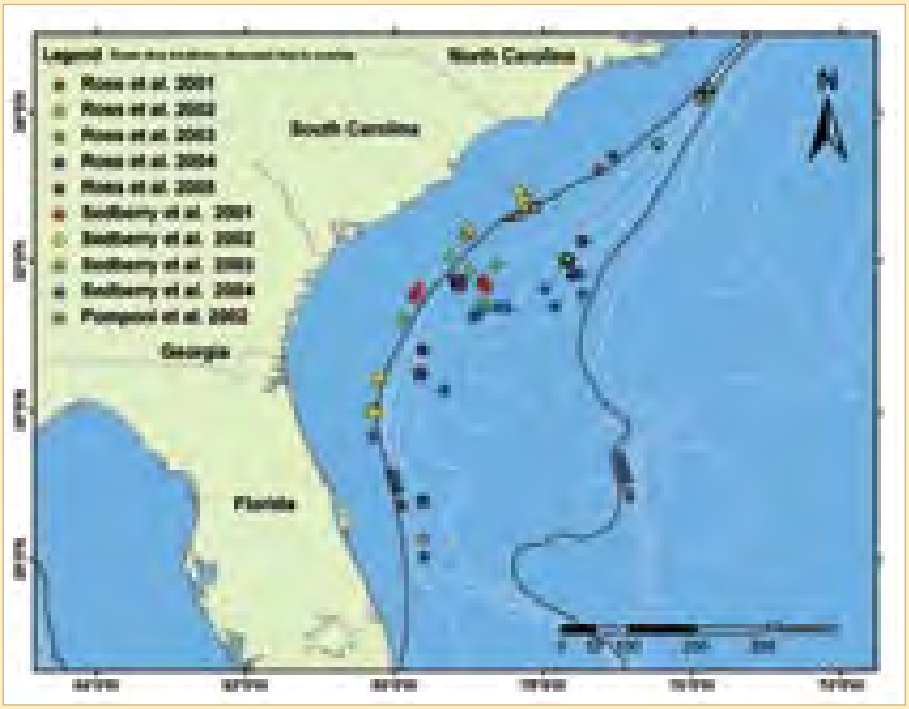


FIGURE 1. Plot of submersible stations from projects funded by NOAA-OE from 2001 through 2005 by Principal Investigator and project year. Data from the Ross et al. and Sedberry et al. projects deeper than 200 m through 2004 are presented in this report. More dives were made than are apparent in the figure due to symbol overlapping.

METHODS

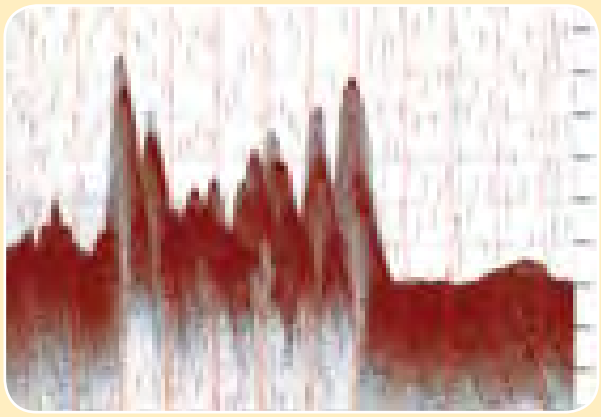
Archived submersible data were processed in two steps. First, submersible and ship data were processed to produce an accurate track map of the submersible's route along the bottom. Second, video data were analyzed to classify benthic habitats along the submersible's track. These steps are reviewed below.

Dive tracks

For various reasons, the data collected by the submersible and its support ship were at times inaccurate, incomplete, or inconsistently formatted. Before the tracks of each JSL dive could be mapped, these data required conversion and editing. Positional data available for each dive consisted of: 1) relative positions of the JSL based on the shipboard tracking system, and 2) JSL depth information collected with the JSL mounted CTD (SBE19+, 25) instrument. JSL bottom positions were logged on the support ship at irregular intervals, ranging from 4 sec to as much as 10 min. Data collected while the submersible was on bottom were imported into two separate MS Excel spreadsheets, a dive track spreadsheet from support ship data and a JSL CTD spreadsheet. Next, latitudes and longitudes were converted to decimal degrees, and all data outside the bounds of the recorded bottom time for the dive were removed. Erroneous JSL bottom position data were also removed and were determined as follows. With a maximum forward JSL speed of 1 kn (per HBOI) and a possible bottom current speed of 1 kn from the stern, the maximum distance that the JSL could travel in one second (2 kn speed) was 0.00001 degrees. To be conservative in data removal we doubled this distance (to 0.00002 degrees or 2.22 m) and used it as the maximum possible distance that could be covered in one second. The time difference between temporally adjacent bottom positions was determined from the location log and multiplied times this maximum JSL distance, yielding a maximum theoretical distance between each position. The actual logged distance between each adjacent (temporally) pair of positions was calculated and compared to the maximum theoretical distance for that pair. When actual distances were greater than the theoretical distance for that pair, the later position point was eliminated. Depth data (scan number and depth in meters) for the dive from the CTD spreadsheet were then imported into the dive track spreadsheet. The scan number was used as a proxy for time (sec) to calculate real-time. Depth data (from the CTD) were then paired with position data (from the dive track) based on real-time data collection. Finally, columns for habitat data, SEADESC habitat code, video time (see below) and image were added to the data set. Habitat data were added as videos were analyzed. This final dataset was saved in Excel (.xls) and then imported into a personal geodatabase (.mdb) created for each year of the project. Personal geodatabases are ESRI software based and use MS Access to store and organize spatial data. Using ESRI's ArcCatalog, these geodatabase tables were projected spatially and turned into XY feature classes, or shapefiles (.shp). These .shp files were added to a blank map in ESRI's ArcMap where they were further inspected for erroneous data points. Finally, the cleaned dive track shapefile was incorporated into ESRI's ArcScene, a 3-D

Launching of the Johnson-Sea-Link (JSL) 4-man submersible (2001). This is the primary tool used to collect benthic habitat data evaluated in this project. Photo credit: S.W. Ross et al.

PAGE 8. Support ship R/V Seward Johnson awaits the evening return of the JSL submersible from a deep coral mound dive (Oct 2005). Photo credit: Art Howard.



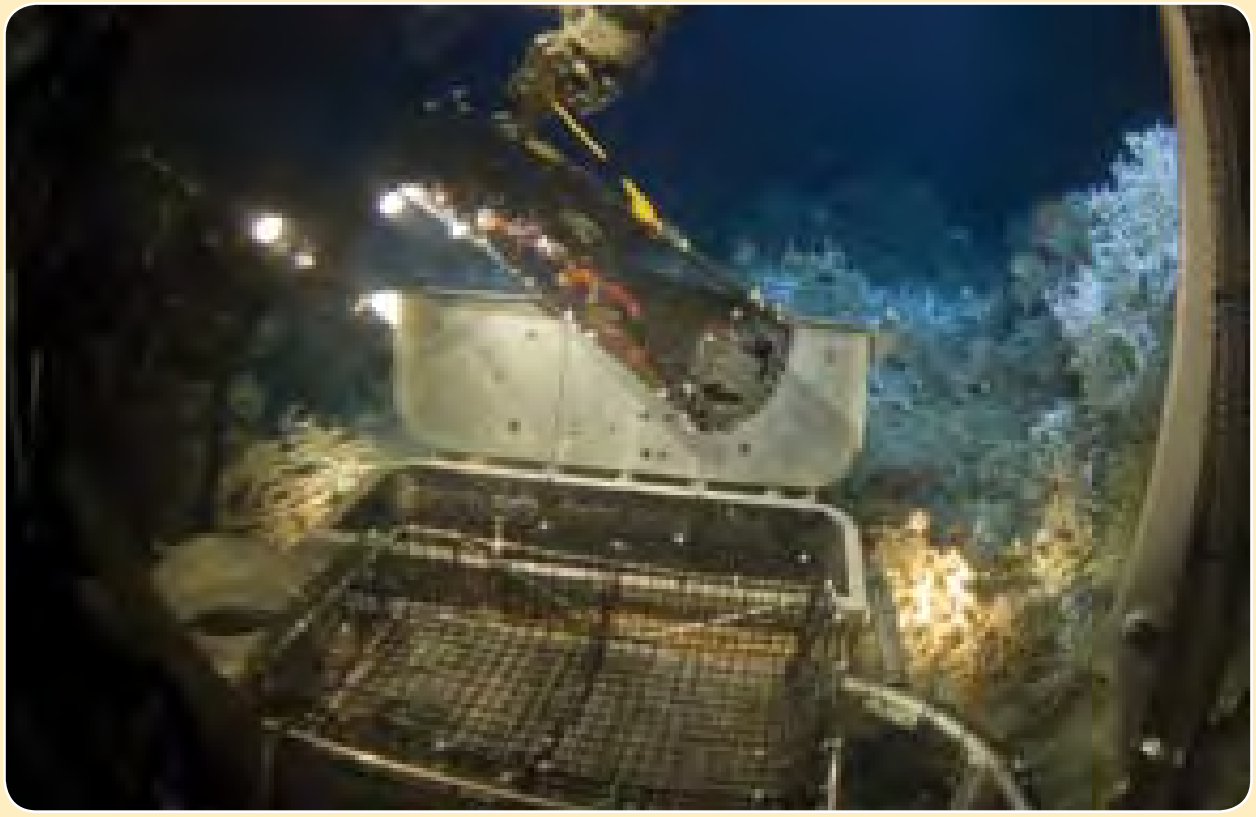
Single beam sonar image of the bottom illustrating the rugged nature of deep-sea coral mounds. Before submersible dives, each potential dive site was explored with single beam sonar. While single beam data are useful, multibeam sonar systems provide much better detail of the bottom.

mapping extension of ArcMap. The .shp files were projected into 3-D space with minimal vertical exaggeration and examined again for outlying data points not noticeable in 2-D views. Available bathymetry data, mostly unpublished and collected during these projects, were also edited and used to construct base maps for the dive areas.

SEADESC Habitat Classifications and Video Analysis

Video data were primarily acquired using an externally mounted camera on the JSL's bow. This was supplemented in many dives by video recorded with a handheld camera through the JSL's bow viewing dome. Additional video recorded on internal and external stern cameras were typically not used but were occasionally referenced. All original JSL video was recorded on mini DV (the majority), Hi-8, or HD media. Based on preliminary analysis of available imagery, thirteen habitat types were defined by the SEADESC committee

View from inside the JSL submersible sphere of pilot Tim Askew (Harbor Branch Oceanographic Institution) operating the JSL (Oct 2005). Photo credit: Art Howard.



View from inside the JSL submersible looking out onto a coral field at the Cape Lookout B site (JSLI-4893, 18 Oct 2005, 366 m). A trap containing squat lobsters (*Eumunida picta*) is being retrieved. Photo credit: Art Howard.

to generally describe substrate and habitats on and around deep coral banks throughout the SEUS (Appendix II). A SEADESC habitat photo guide (Appendix II) was created to help analysts classify habitats while viewing the dive videos. Each time the habitat changed, the time was recorded. Thus, habitat data could be incorporated into the dive track files. When the real time was not displayed on the video overlay, the running time on the DVD/mini DV counter was recorded. Running time was converted to real time using visual cues (e.g., collections) or audio commentary. When the video was too dark, out of focus, or the JSL was too high in the water column for positive habitat classification, no habitat data were recorded.

General observations on the habitat and associated fauna included in the database resulted from either the audio recordings of the scientists in the bow of the JSL or from the video analyst. Observations noted on dive summary forms included dominant fish and invertebrate species, types of attached macrofauna, general percentage of live versus dead coral, bottom profile, water clarity, and human disturbance (i.e., garbage). We emphasize that these were not exhaustive analyses, but were intended to provide a general, but accurate, impression of the bottom.

Still frame grabs were clipped from the video where corresponding location information was available. Stills were extracted and enhanced using Topaz Moment v2.1 and saved according to dive number, time segment and habitat. The stills that best exemplified the variety of habitat types seen during the dive were used in each dive summary form. During some dives, JSL location data were not logged because the tracking system failed. In these instances, still frame grabs (without accompanying positions) that displayed the best habitat views were used in the dive summary forms.

Database Development

Structure

The creation of the SEADESC database was an iterative process. The database (MS Access) framework was constructed to allow for data entry, organization and detailed querying by multiple users. All data were entered using forms that were developed within the database for each of the primary tables (see below). Because MS Access does not allow rich text characters (e.g., italics or superscripts) to be entered directly into tables, forms were required and rich text was stored as code in the associated tables.

Three primary tables were developed for summary dive data. The "Dive Data" table contained dive statistics such as start and end times/positions as well as min/max depths. The second table, the "Dive Overview" table, contained metadata about the project during which the dive took place, scientists participating in the dive, and the analysts responsible for habitat classifications. Path names for images and their rich text captions were also stored in this table (described below). A third table, "Dive Memos," was developed to store (in rich text format) the biological and physical environment synopses as well as additional comments for each dive.

Two primary site characterization tables were organized similarly, with one table ("Site Summary") providing detailed information on each of the dives contained in a site, and the other table ("Site Overview") storing image path names and site synopses (in rich text format). Auxiliary tables were also created to store Principal Investigator (PI) contact information, site names, research vessel names, project names and purposes, and literature cited. The auxiliary tables were sources, or lookup tables, for the primary tables.

Dive summary reports were created by querying the database. A query generated a report that displayed only the data corresponding to that specific dive. Specifically, a query was run on the three primary tables (dive data table, dive overview table, and dive memos table) for each dive. Similarly, two queries were run on the site summary and site overview tables to create the site characterization reports.

Several sections of Visual Basic (VB) code (Appendix IV) were incorporated into the database to insure proper loading of site and dive specific images and maps into the appropriate reports. These lines of code enabled the use of relative path names (pointing to where images were stored) for each image in the database. Storing the images outside of the database reduced its overall size, as opposed to imbedding images in the database as objects. Because these are relative path names, the database can be moved to a variety of locations and still function properly, as long as the images that are stored in the database remain in the same location relative to the database.

Text editing in MS Access has limitations, such that fonts cannot be mixed within a text box. Therefore, a specific Rich Text Editor/ActiveX control (RTF2©) was incorporated into the Access database. As mentioned earlier, all entry of rich text had to take place using forms. An additional section of code, as well as a module and a toolbar, were added to the database to enable this utility. The Active X control, the module, and toolbar must be installed on a user's computer in order to use the rich text editor.

Content

The dive summary forms contain more detailed information than that in the site characterization forms. While the majority of the data are self-explanatory, several categories require further clarification. The dive numbers are the sequential numbers assigned by HBOI to dives specific to JSL submersibles (I or II). Location names correspond to areas (defined by various investigators) where multiple dives took place. For sites represented by single dives, we used the site names assigned by the investigators.

All specimens collected were photographed on the ship. a. A bryozoan growing on dead *Lophelia pertusa*. b. A glass sponge (*Aphrocallistes beatrix*) also growing on dead *L. pertusa*. Photo credit: Art Howard.

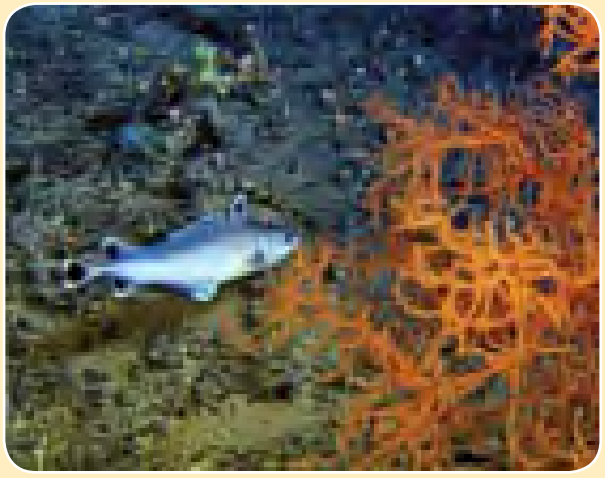
SEADESC analysts were responsible for video analysis, habitat classification and GIS mapping. The relevant work/literature section serves as an overview and is not intended as a thorough literature review for the area. Similarly, the biological environment section is a synopsis of information gathered by the SEADESC analyst during video processing, including additional information recorded in the JSL audio logs. Again, this section is not meant to be a comprehensive list of all biological observations during the dive. The physical environment section includes geological aspects of the area surveyed and faunal information related to habitat characteristics. The additional comments section contains information on data archiving and video quality as well as bottom collections and/or areas of particular interest. Images contained within the reports are representative of the dive area and may or may not include examples of each habitat seen during the course of a dive.

Site characterization forms summarize the observations from multiple dives conducted in a discrete area. The images used are the clearest examples of the variety of habitat types seen throughout the area over all dives. The habitat characterization maps display a broad view of habitats in relation to bathymetric features. They are not meant to give specific details about individual dives, since dive track profiles are included in the dive summary reports.

Drafts of dive and site summary sheets were sent to the lead Principal Investigators of the projects involved in those dives. They reviewed the sheets for accuracy and determined whether the data were appropriate for public release. ■

SITE OVERVIEWS

Many deep-sea coral study areas in the SEUS region have been named (e.g., Reed and Ross 2005; Reed et al. 2005, 2006), giving an impression of separated, discrete areas of coral habitat. However, coral habitats on the Blake Plateau are larger and more continuous than these names imply. More detailed mapping of the region combined with ground truthing will clarify habitat distributions and the extent to which discrete names are appropriate. For convenience we use names previously applied to sites with an understanding that these names may change. Most submersible dives included in this analysis were conducted at 10 sites that had somewhat arbitrary boundaries (Fig. 2). Some of these sites were also sampled in other studies (e.g., Pomponi et al.) not yet integrated into SEADESC. The sites vary in bottom topography, underlying geology, coral development, and depth; however, all sites occur under the Gulf Stream and experience strong bottom currents (see Appendix III).



Mixed habitat at the Stetson area composed of black corals (orange *Leiopathes* sp.), solitary cup corals and sponges on a rubble-covered bottom (JSLI-4699, 18 Jun 2004, 682 m). Fish in the center is *Laemonema melanurum,* a common species around deep coral habitats. Photo credit: S.W. Ross et al. (photo frame from HD video by Art Howard).

Figure 2. Ten areas (white boxes) on the southeastern US slope where submersible dives were grouped. These areas are summarized as Site Summaries for SEADESC purposes.

Off North Carolina, *Lophelia pertusa* forms what may be considered classic mounds and ridges. These appear to be a sediment/coral rubble matrix topped with almost monotypic stands of *L. pertusa* that may rise as much as 80-100 m off the seafloor. Although *Lophelia* is the dominant hard coral off North Carolina, other scleractinians contribute to these ecosystems, including the colonial corals *Madrepora oculata* and *Enallopsammia profunda*, and various solitary corals, sponges, and anemones are also abundant. The three North Carolina *Lophelia* mound systems are the northernmost coral banks in the SEUS and are similar to each other in physical attributes. Analysis of fish community data indicated that these banks are similar to each other but differ from deep reef communities to the south (Ross and Quattrini in review). These three areas are designated as Cape Lookout *Lophelia* Bank A, Cape Lookout *Lophelia* Bank B, and Cape Fear *Lophelia* Bank. There are almost no data published for the NC deep coral banks, and the NC sites have only been studied by Ross et al. (2000-present). See Ross and Nizinski (in press) and Ross and Quattrini 2007 for additional background on the North Carolina sites.

South of Cape Fear deep-sea coral habitat is more variable and occurs deeper than off North Carolina. Generally, the sediment/coral mounds (Popenoe and Manheim 2001) are topped with a variety of anthozoans. The abundant hard substrates (often having high profiles) of the Blake Plateau (Cape Fear to Cape Canaveral) also provide substantial substrate for *L. pertusa* and other anthozoans. Overall, species diversity of anthozoans and other associated sessile invertebrates (e.g., sponges, hydrozoans) increases south of Cape Fear. Some research data are available for this area, but historically most of it is geological (see Ross and Nizinski in press). South of North Carolina, most deep-sea coral expeditions concentrated around the area described by Stetson et al. (1962), referred to

PAGE 14. Large aggregates of encrusted dead and live coral (*Lophelia pertusa*) along the side of a mound at the Cape Lookout A site (JSLII-3432, 24 Aug 2003, 383 m). Note the conger eel (*Conger oceanicus*) protruding from the coral as well as numerous squat lobsters (*Eumunida picta*). Photo credit: S.W. Ross et al.

Beryx decadactylus (alphonsino) hovering in front of a *Lophelia pertusa* bush near the top of a coral mound at the Cape Lookout A site (JSLII-3431, 24 Aug 2003, 385 m). This is a prominent fish species on many coral mounds, often occurring in large numbers. Photo credit: S.W. Ross et al.

Mixed coral and sponge habitat on a relatively flat bottom at the Stetson area (JSLII-3419, 17 Aug 2003, 617 m). The white coral is living *Lophelia pertusa*, upon which sponges, zoanthids, and hydroids are attached. Photo credit: S.W. Ross et al.

as "Stetson Banks," two areas off GA ("Savannah Banks East and West"), the Charleston Bump (Sedberry 2001), a large area straddling the GA-FL border ("Jacksonville Banks") and several sites along the FL East coast (Cape Canaveral North and South) (Fig. 2).

The Stetson Bank is a large region of extremely rugged topography and diverse bottom types (Stetson et al. 1962, 1969; Reed 2002; Reed et al. 2006). There is a deep canyon on the eastern side of this system with abundant corals on its western rim. While the surface waters of Stetson Bank can be outside the main axis of the Gulf Stream, bottom currents are often quite strong. Many species of corals (e.g., *L. pertusa*, *Enallopsammia profunda*, *Leiopathes* spp., *Keratosis* spp.) and sponges are abundant on the hard substrates here. This is one of the deeper and more complex of the Blake Plateau deep-sea coral areas. In addition to previous studies, recent work in this area has been accomplished by Ross et al., Sedberry et al. and Pomponi et al. Fish fauna in the Stetson area was most similar to the Savannah West and Jacksonville areas (Ross and Quattrini in review).

Great diversity of invertebrates on coral habitat from a Cape Canaveral North site (JSLI-4702, 20 Jun 2004, 713 m). The substratum is mostly dead (grey) and living (white) *Lophelia pertusa* upon which sponges, zoanthids, octocorals, hydroids, and other species are attached. Photo credit: S.W. Ross et al. (photo frame from HD video by Art Howard).

The Savannah East site has only been surveyed by Sedberry et al. The area contains rugged hard bottoms (to 100 m of relief) as well as low profile to flat hard bottom. Rock types included manganese-phosphorite pavement and nodules, foramaniferan limestone, and calcareous mudstone. There seems to be less sediment cover here than the more inshore Savannah West habitats. Strong bottom currents were often observed in this area. Attached corals and other fauna exhibited considerable variation in density and distributions.

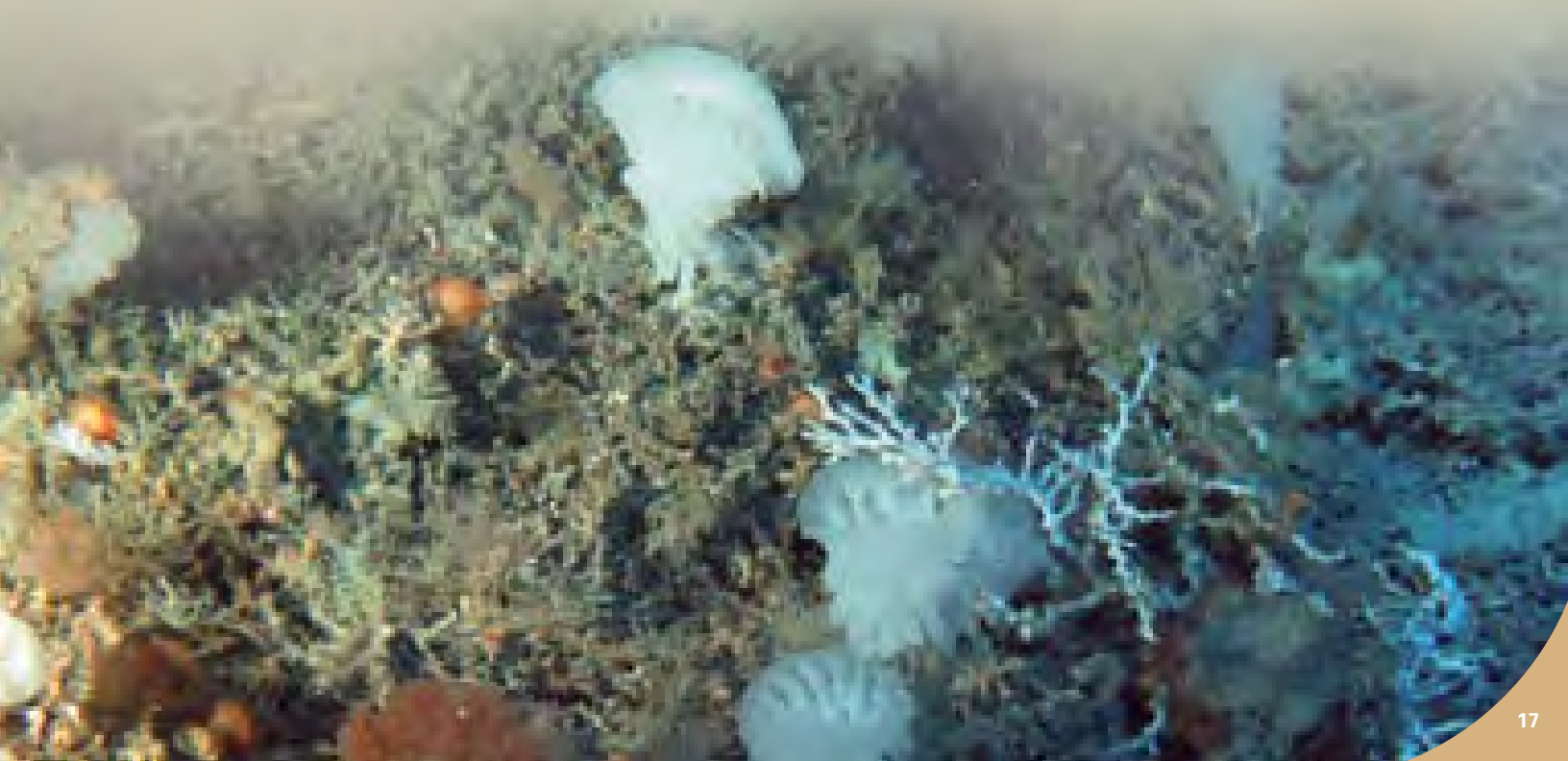
The Savannah West area comprises numerous mounds and ridges of varying topography, and appears to have a heavier sediment load compared to other sites (S.W. Ross et al. unpubl. data). Deep-sea corals occur in scattered patches that are often smaller than at other sites. The bottom is mostly covered with dead *Lophelia* (rubble and standing thickets), with scattered low-profile living corals (e.g., *Stylaster*, *Lophelia*) and sponges (Milliman et al. 1967; Reed 2002; Reed et al. 2006; S.W. Ross et al. unpubl. data).

The Charleston Bump is a large hard bottom feature known for its influence on Gulf Stream circulation (see various papers in Sedberry 2001). Bottom topography is often quite rugged (can be over 100 m of profile) and bottom currents are generally strong. Rock types in this area are similar to those at Savannah East. Vertical rock cliffs are present in some places. Sediment coverage is usually sparse. Coral and sponge communities vary, ranging from none to dense.

The Jacksonville area features a variety of bottom types. The northern portion of this sampling area is characterized by rock ledges with attached corals, and to the south the bottom is composed of *Lophelia* mounds with mixed soft corals and sponges. Topographic highs, most with coral development, are abundant and nearly continuous from the Jacksonville area to south of Cape Canaveral (Ayers and Pilkey 1981; Paull et al. 2000; Reed 2002; Reed et al. 2006).

The southernmost project sites, North Cape Canaveral and South Cape Canaveral, are composed of *L. pertusa* with mixed soft corals and sponges on tops of 20-60 m tall mounds/ridges, surrounded by sand and rubble. The invertebrate fauna in particular is quite diverse in this area. Fewer fish species were observed here than at other sites. Fish communities at the Cape Canaveral sites were most similar to each other, but different from the Jacksonville, Savannah West, Stetson and the North Carolina deep coral areas (Ross and Quattrini in review). ■

Small coral mound at the Jacksonville area, illustrating many attached invertebrates (glass sponges, anemones, hydroids, zoanthids) on dead (grey) and living (white) *Lophelia pertusa* (JSLI-4683, 10 Jun 2004, 565 m). Photo credit: S.W. Ross et al.



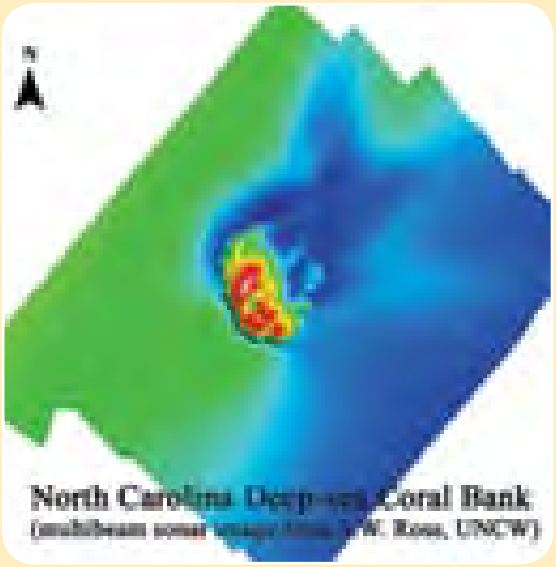
NEXT STEPS

Despite significant gains in our understanding of deep corals in U.S. waters it is clear that the task of documenting these important continental slope habitats is just beginning. Every cruise to these poorly known areas off of the SEUS document new species, new habitats, new ranges, and/or population "anomalies." With the information gathered through SEADESC and other field efforts not in this document, we are beginning to understand the tremendous extent of exploration and research remaining off the SEUS as well as in other parts of the deep U.S. EEZ.

At this time, relatively little funding is available to U.S. scientists for deep-coral related projects. We hope the new emphasis on deep-coral habitats in the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act will bring new opportunities to further explore and document these important ecosystems.

In the meantime, we can build and improve upon this initial phase of SEADESC. This phase of the project involved obtaining and organizing selected data, defining habitats, developing protocols, and developing the database. While the completed dive and site summaries are useful, they do not represent a logical end point for this effort. This project has the potential to evolve, adding data (e.g., new dives, bathymetry) and improving protocols. Below, we briefly summarize some possible next steps for SEADESC. This list may not be exhaustive, and additional relevant work can be identified. Some of these steps are relatively easy to accomplish within eight to ten months, while others may require one to two years. Additional funding is necessary to support this program to make progress in the following items.

- **Produce enhanced database versions:** If SEADESC data are provided in digital formats users can take advantage of database search functions and access videos, virtual fly-throughs, additional images and data.



Example of the kind of detail provided by ship-based multibeam sonar mapping of the coral mound off Cape Fear. More such data are needed and should be incorporated into the SEADESC track and habitat maps.

- **Refine protocols:** The analysis methods can be made more user-friendly or automated. Additional software exists that should be considered. Habitat definitions should be evaluated regularly by appropriate experts (e.g., SEADESC committee) and adjusted as needed.
- **Add other data to SEADESC:** A variety of high-quality data are available to add to this project. Such additions would greatly expand the temporal and spatial coverage for the project as well as increase its utility. Some examples include:
  - NOAA-OE SEUS deep coral projects (all areas, years, and PIs not included in this report)
  - *Oculina* area (FL east coast) data archived by NURC (UNCW)
  - Deep water SEUS multibeam sonar data (S.W. Ross, G.R. Sedberry)
  - NOAA-OE Gulf of Mexico and other area projects from all years
  - Data from other archives (NURC, various PIs other data, Alvin and NR-1 projects, USGS, etc.) in the SEUS and eventually other areas
  - Museum/literature coral locations and data (started in SEADESC but not completed)
- **SEADESC reports and protocols could replace existing at-sea data summary activities:** Expand and incorporate SEADESC into real-time at-sea applications, such as the NOAA-OE Cruise Information Management System (CIMS). ■

Map of the sample locations of four coral species from museum data bases (S.W. Ross, unpublished data). These types of data have variable utility and all such data should be carefully evaluated by examination of original collection data and specimens themselves. This should be done as part of SEADESC.

PAGE 18. Even general habitat classifications can be difficult and almost never meet the needs of all users. Habitat classification definitions and protocols for video evaluation should continue to be evaluated by experts. Photo is a view of mixed coral, sponge and rock habitat in the Stetson area (JSLI-4699, 18 Jun 2004, 670 m). Photo credit: S.W. Ross et al. (photo frame from HD video by Art Howard).

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APPENDIX I

SEADESC Steering Committee Members (2004-2006)

Timothy Birdsong (Chair): *NOAA Office of Ocean Exploration (NOAA-OE)*

Jeremy Potter: *NOAA-OE*

John McDonough: *NOAA-OE*

Steve W. Ross (Project Manager): *UNC-Wilmington and U.S. Geological Survey*

Melissa L. Partyka (Lead SEADESC Technician): *UNCW*

Andrea Quattrini: *UNCW*

George R. Sedberry: *SC Dept. Natural Resources, Marine Resources Research Inst.*

Andrew Shepard: *NOAA Undersea Research Center, UNCW*

Doug Rader: *Environmental Defense and South Atlantic Fishery Management Council*

Martha Nizinski: *NOAA Fisheries, Systematics Lab*

Tina Udouj: *Florida Fish and Wildlife Research Inst.*

Susan Gottfried: *NOAA National Coastal Data Development Center*

Betsy Gardner: *NOAA National Coastal Data Development Center*

Christina Ralph Schobernd: *College of Charleston, Grice Marine Lab*

Jessica Stephen: *SC Dept. Natural Resources, Marine Resources Research Inst.*

John Reed: *Harbor Branch Oceanographic Inst.*

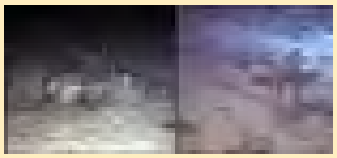
APPENDIX II
Habitat Classification Categories

SEADESC CONTINENTAL SLOPE GENERAL HABITAT TYPES

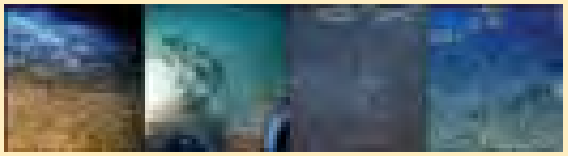
1 Soft Substrate (S): (sands, muds) unconsolidated, unlithified, >50% "unstructured," little to no vertical relief.

2 Soft Substrate/Rubble/Rock-barren (SRB): soft substrate with <50% rubble and/or rock, lacking (or with sparse) attached macrofauna, low relief.

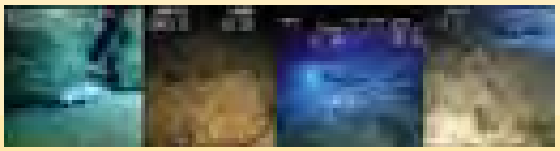
3 Soft Substrate/Rubble/Rock-with attached fauna (SRF): soft substrate with <50% rubble and/or rock, with significant attached macrofauna (corals, anemones, etc.), low relief.



4 Rubble (R): >50% rubble (dead, unattached, broken pieces of rock or coral) cover, no rocks or ledges, lacking (or with sparse) attached macrofauna. Usually low relief.

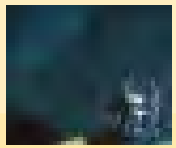


5 Rock/Ledges-barren (RLB): >50% rocks and/or ledges, lacking (or with sparse) attached macrofauna, variable relief.

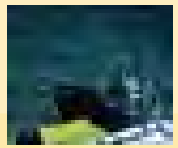


6 Rock/Ledges-with attached fauna (RLF): >50% rocks and/or ledges, with significant attached macrofauna, variable relief.

7 Pavement-barren (PB): fairly flat rock pavement, lacking (or with sparse) macrofauna

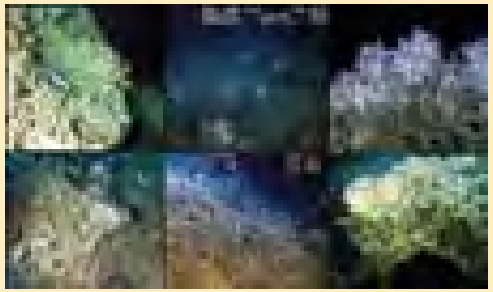


8 Pavement-with attached fauna (PF): fairly flat rock pavement, with significant attached macrofauna.



9 Mixed Hard Corals/Soft Corals/Sponges (M): Near equal mixtures of soft corals, sponges, and/or hard corals, or prevalent coverage of soft corals and/or sponges. Hard corals do not dominate this habitat. Rock/Ledges are largely lacking. Bottom may also have significant amounts of rubble. Usually low to moderate relief.

10 Hard Corals (HC): >50% live and/or dead coral cover, lacking (or with sparse) attached macrofauna. Corals are usually standing "twigs," "bushes," or "matrices." Rock/Ledges largely lacking. If possible, corals can be identified (to genus or species) and listed that way. Usually moderate to high relief.



11 Hard Corals-with attached fauna (HCF): >50% live and/or dead coral cover with prevalent attached macrofauna. Hard corals are the dominant substrate. Corals are usually standing "twigs," "bushes," or "matrices." Rock/Ledges largely lacking. If possible, corals can be identified (to genus or species) and listed that way. Usually moderate to high relief.

12 Tilefish (possible) Habitat (TH)-Consolidated soft bottom with visually identifiable burrows. Tilefish may or may not be present.

ACKNOWLEDGEMENTS

Habitat classifications on this poster were defined by the SEADESC committee. Photographs were provided by Steve W. Ross (UNCW/USGS), George Sedberry (SCDNR), and Andy Shepard (NURC/UNCW).

Poster finalized January 2006 (second edition)

13 Artificial Substrate (A)- Any artificial structure that provides habitat for fishes and/or invertebrates.

APPENDIX III

Site Characterization and Dive Summary Reports

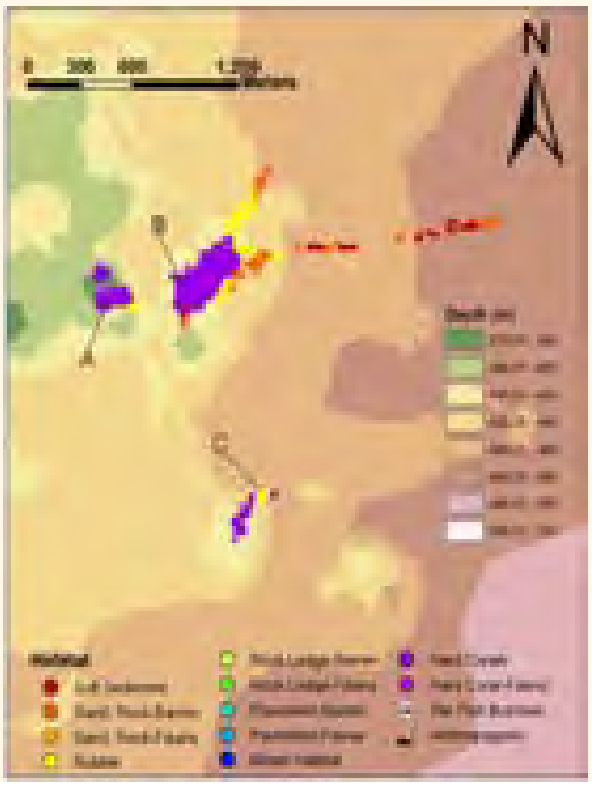
Site Characterization — *Cape Lookout Lophelia A*

OVERVIEW

Total Dives: 15 **Depth Range (m):** 367 to 470

GENERAL LOCATION

HABITAT CHARACTERIZATION MAP



DIVE SUMMARY FOR SITE

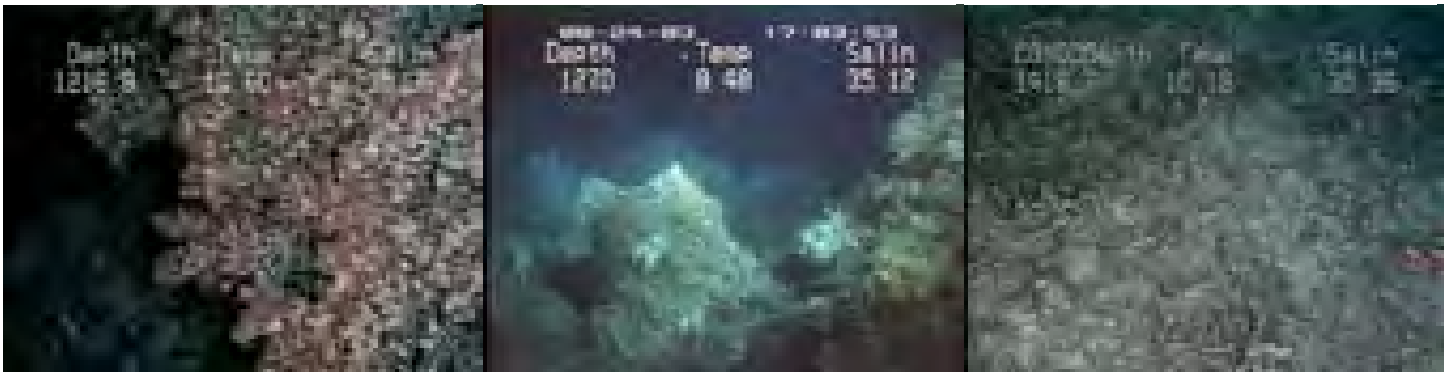
Dive Date	PI	Station	Method	Start-Time	End-Time	Start-Lat (N)	Start-Long (W)	End-Lat (N)	End-Long (W)
28-Jul-00	SW Ross	JSLI-4206	HOV	8:42	10:36	34° 19.633'	75° 46.330'	34° 19.447'	75° 47.246'
28-Jul-00	SW Ross	JSLI-4207	HOV	15:56	17:45	34° 19.569'	75° 47.134'	34° 19.430'	75° 47.287'
22-Sep-01	SW Ross	JSLI-4361	HOV	8:44	11:23	34° 19.680'	75° 47.370'	34° 19.690'	75° 47.530'
22-Sep-01	SW Ross	JSLI-4362	HOV	16:21	18:36	34° 19.425'	75° 47.488'	34° 19.418'	75° 47.507'
23-Sep-01	SW Ross	JSLI-4363	HOV	8:30	11:15	34° 19.423'	75° 47.453'	34° 19.412'	75° 47.497'
23-Sep-01	SW Ross	JSLI-4364	HOV	16:02	18:53	34° 18.840'	75° 47.013'	34° 18.765'	75° 47.130'
11-Aug-02	SW Ross	JSLII-3304	HOV	8:33	11:00	34° 19.710'	75° 47.043'	34° 19.510'	75° 46.207'
11-Aug-02	SW Ross	JSLII-3305	HOV	16:30	18:59	34° 19.460'	75° 47.198'	34° 19.477'	75° 47.200'
12-Aug-02	SW Ross	JSLII-3306	HOV	8:32	10:59	34° 19.400'	75° 47.200'	34° 19.452'	75° 47.251'
12-Aug-02	SW Ross	JSLII-3307	HOV	16:24	17:11	34° 19.485'	75° 47.452'	34° 19.499'	75° 47.545'
23-Aug-03	SW Ross	JSLII-3430	HOV	16:24	18:59	34° 19.366'	75° 47.334'	34° 19.404'	75° 47.249'
24-Aug-03	SW Ross	JSLII-3431	HOV	8:36	10:52	34° 19.517'	75° 47.044'	34° 19.421'	75° 47.237'
24-Aug-03	SW Ross	JSLII-3432	HOV	16:47	18:57	34° 19.427'	75° 47.158'	34° 19.482'	75° 47.213'
15-Jun-04	SW Ross	JSLI-4692	HOV	8:29	10:33	34° 19.428'	75° 47.172'	34° 19.444'	75° 47.218'
15-Jun-04	SW Ross	JSLI-4693	HOV	16:20	18:27	34° 19.436'	75° 47.140'	34° 19.512'	75° 47.148'

IMAGE GALLERY *** indicates image position is approximated**

Image A: Hard Coral-Fauna
34º 19.410' N, 75º 47.508' W

Image B: Hard Coral
34º 19.428' N, 75º 47.214' W

Image C: Rubble
34º 18.822' N, 75º 47.094' W



SITE OVERVIEW **AUTHOR** SW Ross **DATE COMPILED** 19-Dec-06

This coral bank system appears to be the northernmost deep coral ecosystem on the SEUS slope. Aside from a few maps and one photograph (Menzies et al. 1973) there are no published data from this coral mound area. The area was first surveyed by the R/V Eastward, but an examination of the Eastward station area in May 1983 (R/V Delaware II cruise, S.W. Ross, chief scientist), revealed no indication of hard bottom or coral. It is likely that the use of LORAN A for Eastward navigation lead to errors in the recorded position of their station, (coral bank area surveyed by Ross et al. is about 2-2.7 km away). However, the possibility that a reef does exist on or near the E-4937 station cannot be discounted without a more detailed survey of that location. The USGS side scan survey (EEZ-SCAN 87 Scientific Staff 1991) illustrated reefs in this area, and coordinates from that survey guided a cruise using the Navy's NR-1 nuclear research submersible (Sulak and Ross, unpubl. data) during 15-18 Nov 1993. However, navigation issues on this cruise placed positions from the NR-1 track off by about 1 km from the large mounds later located by Ross et al. (unpubl. data). A later ship sonar survey of the NR-1 positions did not yield obvious reef areas. Between summer 2000 and fall 2004 Ross et al. sampled this area extensively, throughout the water column, using a variety of methods. The primary method for collecting bottom data on the reef proper was the JSL research submersible (Harbor Branch Oceanographic Inst.). Fifteen dives were made on coral mounds in this area, and observations on the bottom totaled nearly 34 hours.

Data to date suggest that this area contains the most extensive coral mounds found off North Carolina; however, data are lacking to adequately judge overall sizes and aerial coverage. Ross et al. JSL dives in this area ranged from 367-470 m. Mean bottom temperatures ranged from 6.3 to 10.9 ºC, while mean bottom salinities were always around 35. There were several prominences capping this ridge system, creating rugged and diverse bathymetry. The main mound system rose to nearly 80 m over a distance of about 1 km, and in places exhibited slopes in excess of 50-60 degrees. These topographic highs accelerate bottom currents, as observed near the crests, which favor attached filter feeders. Sides and tops of these mounds were covered with extensive colonies of living *Lophelia pertusa*, though few other corals occur. Dead colonies and coral rubble interspersed with sand channels were also abundant on top of the mounds. Extensive coral rubble zones surrounded the bases of the mounds/ridges for a large distance (exact area not yet surveyed), and in places seemed to be quite thick. These mounds appear to be formed by successive coral growth, collapse, and sediment entrapment. There were some low profile, rocky substrates (type unknown) away from the mounds.

Fauna observed at this site were diverse. The coral matrix was densely packed with brittle stars (*Ophiacantha bidentata)*, various anemones, basket stars, and urchins (especially *Echinus* spp.). Dominant mobile invertebrates included galatheoids (especially *Eumunida picta*), *Rochinia crassa,* and *Bathynectes longispina*. On the coral habitats, mostly tops and sides of mounds/ridges, the most abundant fishes were *Laemonema melanurum, L. barbatulum, Beryx decadactylus, Conger oceanicus, Dysommina rugosa, Helicolenus dactylopterus, Hoplostethus occidentalis*, and *Scyliorhinus* spp.

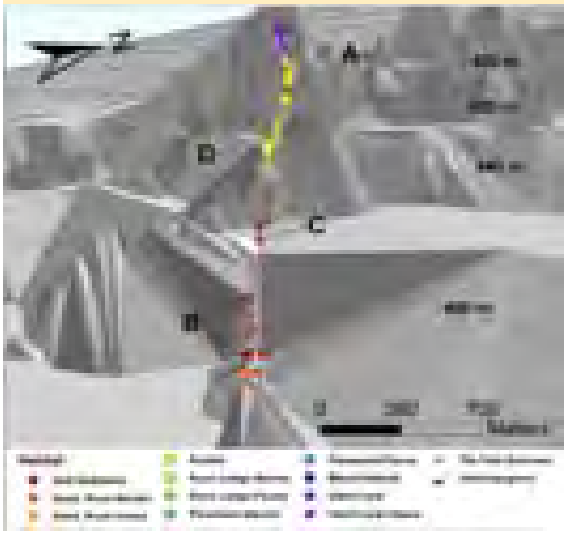
DIVE NUMBER: JSLI-4206 *STUDY AREA: Cape Lookout Lophelia A*

STATION OVERVIEW

Project	Slope Trophodynamics
Principal investigators	SW Ross[1] KJ Sulak
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Initial Lophelia community and habitat assessment off NC
Vessel	R/V Ed Link, Johnson Sea Link I Submersible
Science Divers	KJ Sulak (bow), SW Ross (stern)
External Video Tapes	1 Hi 8
Internal Video Tapes	1 mini DV
Digital Still Photos	0
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Hard copies of bow and stern audio logs
Acknowledgements	NC State Legislature, USGS, UNCW, NC Coastal Reserve
SEADESC Analyst	AM Quattrini, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

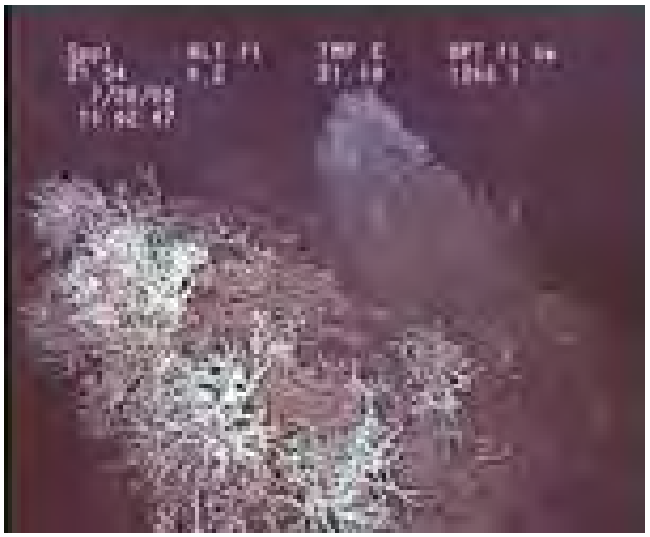
Dive Track:



DIVE DATA

Date	28-Jul-00
Minimum Bottom Depth (m)	385
Maximum Bottom Depth (m)	470
Start Bottom Time (EDT)	8:42
End Bottom End (EDT)	10:36
Starting Latitude (N)	34° 19.633'
Starting Longitude (W)	75° 46.330'
Ending Latitude (N)	34° 19.447'
Ending Longitude (W)	75° 47.246'
Surface Current (Kts)	3
Bottom Current (Kts)	

Image A: Hard Coral
34º 19.460' N, 75º 47.250' W



DIVE NUMBER: JSLI-4206 *STUDY AREA: Cape Lookout Lophelia A*

IMAGE GALLERY

*** indicates image position is approximated**

Image B: Sand/ Rubble/Rock-Barren
34º 19.600' N, 75º 46.440' W

Image C: Soft Substrate
34º 19.560' N, 75º 46.630' W

Image D: Rubble
34º 19.52' N, 75º 47.070' W

RELEVANT WORK AND/OR LITERATURE CITED

Uchupi (1967)
R/V Eastward training cruise 1966 (photo in Rowe and Menzies 1968 and Menzies et al. 1973)
NR-1 submersible cruise Nov 1993 (Sulak and Ross unpubl. data)
R/V Cape Hatteras cruises Aug 2001 & Sep 2006 (S.W. Ross, unpubl. data)
EEZ-SCAN 87 Scientific Staff (1991)
Reed and Ross (2005)
Ross and Nizinski (in press)

BIOLOGICAL ENVIRONMENT

Some species observed off reef, on scattered rubble, sand, and scattered rock bottom included: crabs, hermit crabs, *Fenestraja plutonia*, *Helicolenus dactylopterus*, and *Myxine glutinosa*. On a more dense coral rubble bottom, *Bathynectes longispina, Laemonema barbatulum*, urchins, glass sponges, and galatheoids (*Eumunida picta*) were observed. On the hard corals habitat, *Eumunida picta,* pencil urchins, *Rochinia crassa*, *Novodinia antillensis, Laemonema melanurum*, and *Hoplostethus occidentalis* were species most commonly observed.

PHYSICAL ENVIRONMENT

Five general habitat types were viewed during this dive: 1) off-reef, soft substrate habitat consisting of mostly coarse sand, 2) coarse sand with <50% *Lophelia pertusa* rubble, and at times scattered rock without attached macrofauna, 3) coarse sand/*Lophelia* rubble/rock with attached macrofauna, 4) a transition zone with a high percent (>50%) cover of *Lophelia* rubble, and 5) a hard coral area with dense dead and live *Lophelia*.

ADDITIONAL COMMENTS

This dive was captured on 1 Hi-8 and archived on 2 mini DVs and 1 DVD. While there was audio associated with the original Hi-8 tape, a playback error prevented this from recording to DV. The overall picture was grainy and the lighting was often too low to have a clear view of the habitat and/or organisms inhabiting the area. Additionally, the time/CTD overlay was intermittent.

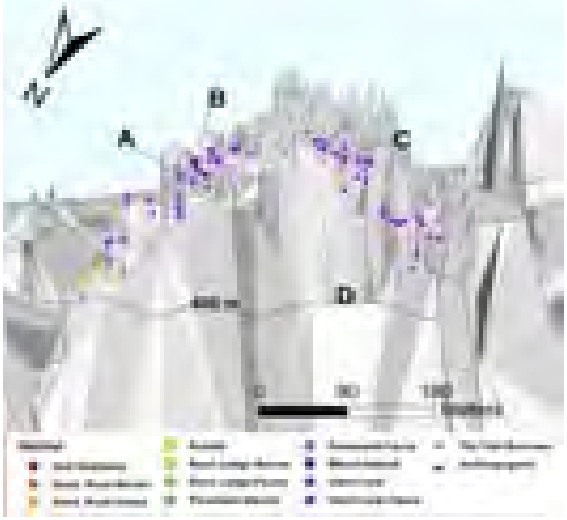
DIVE NUMBER: JSLI-4207 *STUDY AREA: Cape Lookout Lophelia A*

STATION OVERVIEW

Project	Slope Trophodynamics
Principal investigators	SW Ross[1] KJ Sulak
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Initial Lophelia community and habitat assessment off NC
Vessel	R/V Ed Link, Johnson Sea Link I Submersible
Science Divers	SW Ross (bow), D Weaver (stern)
External Video Tapes	1 Hi 8
Internal Video Tapes	I mini DV
Digital Still Photos	0
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Hard copies of bow and stern audio logs
Acknowledgements	NC State Legislature, USGS, UNCW, NC Coastal Reserve
SEADESC Analyst	AM Quattrini, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	28-Jul-00
Minimum Bottom Depth (m)	388
Maximum Bottom Depth (m)	418
Start Bottom Time (EDT)	15:56
End Bottom End (EDT)	17:45
Starting Latitude (N)	34° 19.569'
Starting Longitude (W)	75° 47.134'
Ending Latitude (N)	34° 19.430'
Ending Longitude (W)	75° 47.287'
Surface Current (Kts)	
Bottom Current (Kts)	

Image A: Hard Coral
34º 19.512' N, 75º 47.172' W

DIVE NUMBER: JSLI-4207 *STUDY AREA: Cape Lookout Lophelia A*

IMAGE GALLERY *** indicates image position is approximated**

Image B: Hard Coral
34º 19.506' N, 75º 47.184' W

Image C: Hard Coral
34º 19.452' N, 75º 47.238' W

Image D: Hard Coral
34º 19.428' N, 75º 47.292' W

RELEVANT WORK AND/OR LITERATURE CITED

Uchupi (1967)
R/V Eastward training cruise 1966 (photo in Rowe and Menzies 1968 and Menzies et al. 1973)
NR-1 submersible cruise Nov 1993 (Sulak and Ross unpubl. data)
R/V Cape Hatteras cruises Aug 2001 & Sep 2006 (S.W. Ross, unpubl. data)
EEZ-SCAN 87 Scientific Staff (1991)
Reed and Ross (2005)
Ross and Nizinski (in press)

BIOLOGICAL ENVIRONMENT

A wide diversity of both fishes and invertebrates were seen during this dive. Some of the most common fish species included *Hoplostethus occidentalis, Laemonema barbatulum, L. melanurum, Helicolenus dactylopterus* and a large number of unidentified mid-water fishes. Other less common, but still frequently observed species included *Scyliorhinus meadi, S. retifer, Cirrhigaleus asper* and *Conger oceanicus.* Rare species of note were *Lophiodes beroe, Synagrops* sp., *Beryx decadactylus* and *Zenopsis conchifera. Eumunida picta* was the most commonly observed mobile invertebrate followed closely by *Rochinia crassa*. Echinoderms such as brittle stars and spiny urchins were common on the reef, while basket stars were only seen occasionally. The reef was made up of dense mounds of *Lophelia pertusa*, about 30% of which was actually living. Only a couple hexactinellid sponges were observed.

PHYSICAL ENVIRONMENT

Two habitats were observed during this dive, rubble and hard coral. The hard coral areas were free of attached macrofauna and were typically densely concreted bushes of dead *L. pertusa* with or without living colonies at the extremities. Other areas of hard coral were more loosely aggregated thickets with a large number of interstices and lower overall relief. Spaces between coral patches varied from dense rubble fields to large sandy swashes. The rubble habitat often merged with the hard coral habitat in an area best described as a dense dead coral matrix.

ADDITIONAL COMMENTS

This dive was captured on 1 Hi-8 and archived on 2 mini DVs and 1 DVD. The overall picture was hazy and the lighting was at times too low to have a clear view of the habitat and/or organisms inhabiting the area. However, there is some good footage of sharks and conger eels.

DIVE NUMBER: JSLI-4361 *STUDY AREA: Cape Lookout Lophelia A*

STATION OVERVIEW

Project	Islands in the Stream 2001
Principal investigators	SW Ross[1] KJ Sulak, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Continued trophodynamic studies off North Carolina; mapping of deep coral banks and ecological studies of macroinvertebrates and fishes; educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link I Submersible
Science Divers	KJ Sulak (bow), SW Ross (stern)
External Video Tapes	3 mini DVs
Internal Video Tapes	2 mini DVs
Digital Still Photos	0
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Hard copy of bow audio log, no dive track recorded
Acknowledgements	NOAA-OE, USGS, UNCW, NC Coastal Reserve, NC Museum of Natural Sciences
SEADESC Analyst	AM Necaise, AM Quattrini, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:

DIVE DATA

Date	22-Sep-01
Minimum Bottom Depth (m)	384
Maximum Bottom Depth (m)	427
Start Bottom Time (EDT)	8:44
End Bottom End (EDT)	11:23
Starting Latitude (N)	34° 19.680'
Starting Longitude (W)	75° 47.370'
Ending Latitude (N)	34° 19.690'
Ending Longitude (W)	75° 47.530'
Surface Current (Kts)	
Bottom Current (Kts)	

Image A: Rubble
(No Position Available)

DIVE NUMBER: JSLI-4361 *STUDY AREA: Cape Lookout Lophelia A*

IMAGE GALLERY *** indicates image position is approximated**

Image B: Hard Coral
(No Position Available)

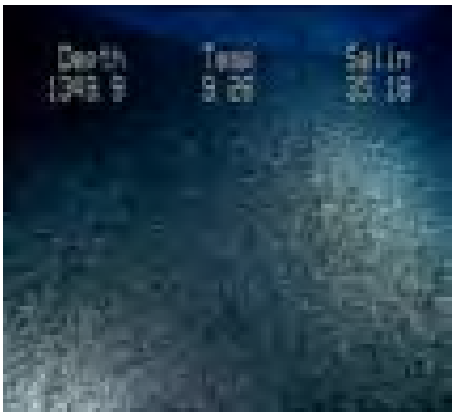


Image C: Hard Coral
(No Position Available)

Image D: Hard Coral
(No Position Available)

RELEVANT WORK AND/OR LITERATURE CITED

Uchupi (1967)
R/V Eastward training cruise 1966 (photo in Rowe and Menzies 1968 and Menzies et al. 1973)
NR-1 submersible cruise Nov 1993 (Sulak and Ross unpubl. data)
R/V Cape Hatteras cruises Aug 2001 & Sep 2006 (S.W. Ross, unpubl. data)
EEZ-SCAN 87 Scientific Staff (1991)
Reed and Ross (2005)
Ross and Nizinski (in press)

BIOLOGICAL ENVIRONMENT

The majority of the fish observed during the course of this dive were found over the rubble habitat near the beginning. Aside from large numbers of mid-water fish like myctophids and *Polyipnus clarus, Helicolenus dactylopterus* and *Laemonema barbatulum* were most common. *Nezumia aequalis* and two *Scyliorhinus* spp. were also seen in this habitat. *Trachyscorpia cristulata* and *Helicolenus dactylopterus*, as well as *Scyliorhinus* spp. and *S. retifer* were seen in small numbers over the hard coral habitat. Two species of codling were observed over the reef as well, *Laemonema melanurum,* and *L. barbatulum*. Mobile invertebrates included *Echinus* spp. and *Eumunida picta*.

PHYSICAL ENVIRONMENT

This dive began transecting over rubble habitat with low relief that transitioned into a dense dead coral matrix with small growths of living *Lophelia pertusa.* This region eventually gave way to a moderate-to-high-relief hard coral region with 10-15% live *Lophelia pertusa* growth. These larger mounds of coral were heavily cemented near the base and surrounded by dense layers of rubble.

ADDITIONAL COMMENTS

This dive was recorded to 3 mini DVs and archived on 3 DVDs. There was no CTD or time overlay for this video. Additionally there is no dive track data available so the habitat characterization could not be mapped.

DIVE NUMBER: JSLI-4362 *STUDY AREA: Cape Lookout Lophelia A*

STATION OVERVIEW

Project	Islands in the Stream 2001
Principal investigators	SW Ross[1] KJ Sulak, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Continued trophodynamic studies off North Carolina; mapping of deep coral banks and ecological studies of macroinvertebrates and fishes; educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link I Submersible
Science Divers	SW Ross (bow), M Randall (stern)
External Video Tapes	3 mini DVs
Internal Video Tapes	3 mini DVs
Digital Still Photos	0
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Hard copies of bow and stern audio logs
Acknowledgements	NOAA-OE, USGS, UNCW, NC Coastal Reserve, NC Museum of Natural Sciences
SEADESC Analyst	AM Necaise, AM Quattrini, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:

DIVE DATA

Date	22-Sep-01
Minimum Bottom Depth (m)	367
Maximum Bottom Depth (m)	399
Start Bottom Time (EDT)	16:21
End Bottom End (EDT)	18:36
Starting Latitude (N)	34° 19.425'
Starting Longitude (W)	75° 47.488'
Ending Latitude (N)	34° 19.418'
Ending Longitude (W)	75° 47.507'
Surface Current (Kts)	
Bottom Current (Kts)	

Image A: Hard Coral-Fauna
34º 19.404' N, 75º 47.508' W

DIVE NUMBER: JSLI-4362 *STUDY AREA: Cape Lookout Lophelia A*

IMAGE GALLERY

*** indicates image position is approximated**

Image B: Hard Coral
34º 19.422' N, 75º 47.478' W

Image C: Hard Coral
34º 19.416' N, 75º 47.508' W

Image D: Hard Coral
34º 19.410' N, 75º 47.514' W

RELEVANT WORK AND/OR LITERATURE CITED

Uchupi (1967)
R/V Eastward training cruise 1966 (photo in Rowe and Menzies 1968 and Menzies et al. 1973)
NR-1 submersible cruise Nov 1993 (Sulak and Ross unpubl. data)
R/V Cape Hatteras cruises Aug 2001 & Sep 2006 (S.W. Ross, unpubl. data)
EEZ-SCAN 87 Scientific Staff (1991)
Reed and Ross (2005)
Ross and Nizinski (in press)

BIOLOGICAL ENVIRONMENT

The entire dive took place over a dense *Lophelia pertusa* reef made up of standing bushes of heavily cemented, primarily dead, *Lophelia*. Only about 5-10% of the coral observed was living. Though the majority of the reef had little to no attached macrofauna, a region toward the end of the dive was marked for enormous numbers of orange anemones covering the dead *Lophelia* stands. The most common mobile invertebrates were *Eumunida picta* and brittle stars as well as pencil and spiny urchins. Flytrap anemones and basket stars were observed only occasionally. A large diversity, but low abundance, of fishes were identified during this dive. The most common species were *Helicolenus dactylopterus, Hemanthias aureorubens, Polyipnus clarus, Laemonema melanurum* and *L. barbatulum*. Other species witnessed during this dive included *Anthias woodsi, Conger oceanicus, Hoplostethus occidentalis,* and *Mobula hypostoma*.

PHYSICAL ENVIRONMENT

Habitats encountered during this dive were restricted to hard coral with and without attached macrofauna. Both varieties were dominated by moderate to high-relief coral bushes bearing less than 10% living material. These coral structures were often heavily cemented and filled in with sediment near the base. The overall landscape was one of rolling peaks and valleys with sandy patches often occurring between coral growths.

ADDITIONAL COMMENTS

The dive was recorded on 3 mini DVs, the first two of which had no audio track. These DVs were archived on 3 separate DVDs. All three DVs were without time or CTD data overlay. The majority of the footage was shot around the deployment of a crab trap with little submersible movement. There is interesting footage of a large mobulid ray swimming above the reef.

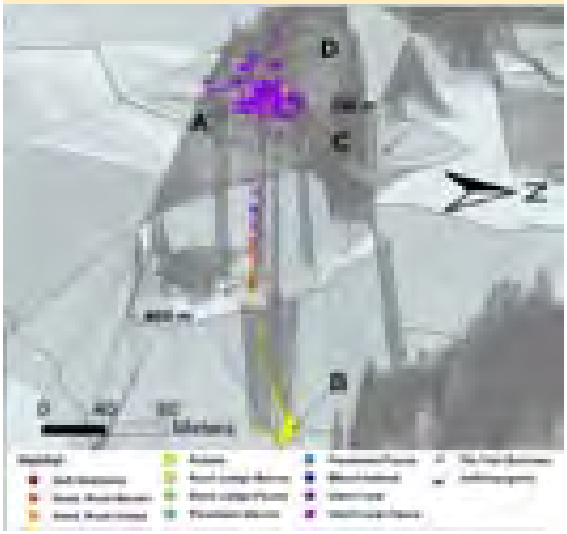
DIVE NUMBER: JSLI-4363 *STUDY AREA: Cape Lookout Lophelia A*

STATION OVERVIEW

Project	Islands in the Stream 2001
Principal investigators	SW Ross[1] KJ Sulak, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln. Wilmington NC 28409
Purpose	Continued trophodynamic studies off North Carolina; mapping of deep coral banks and ecological studies of macroinvertebrates and fishes; educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link I Submersible
Science Divers	SW Ross (bow), F Rohde (stern)
External Video Tapes	3 mini DVs
Internal Video Tapes	3 mini DVs
Digital Still Photos	0
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Hard copies of bow audio log
Acknowledgements	NOAA-OE, USGS, UNCW, NC Coastal Reserve, NC Museum of Natural Sciences
SEADESC Analyst	AM Necaise, AM Quattrini, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

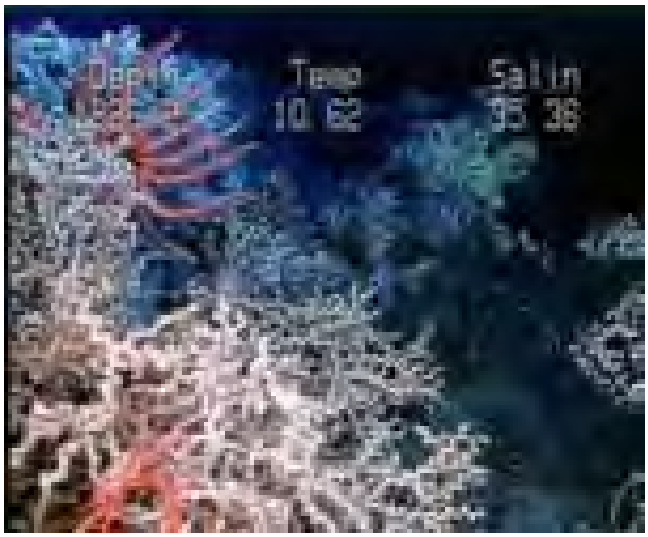
Dive Track:



DIVE DATA

Date	23-Sep-01
Minimum Bottom Depth (m)	370
Maximum Bottom Depth (m)	417
Start Bottom Time (EDT)	8:30
End Bottom End (EDT)	11:15
Starting Latitude (N)	34° 19.423'
Starting Longitude (W)	75° 47.453'
Ending Latitude (N)	34° 19.412'
Ending Longitude (W)	75° 47.497'
Surface Current (Kts)	
Bottom Current (Kts)	

Image A: Hard Coral
34º 19.404' N, 75º 47.502' W



DIVE NUMBER: JSLI-4363 *STUDY AREA: Cape Lookout Lophelia A*

IMAGE GALLERY *** indicates image position is approximated**

Image B: Rubble
34º 19.386' N, 75º 47.436' W

Image C: Hard Coral
34º 19.398' N, 75º 47.466' W

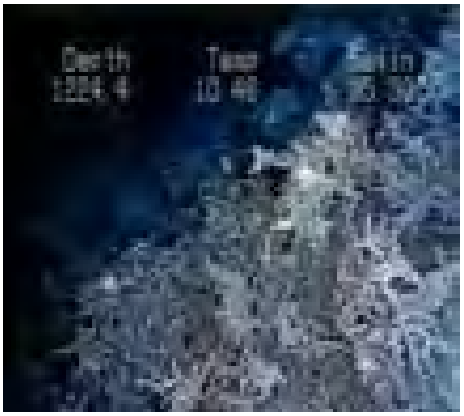


Image D: Hard Coral-Fauna
34º 19.410' N, 75º 47.508' W

RELEVANT WORK AND/OR LITERATURE CITED

Uchupi (1967)
R/V Eastward training cruise 1966 (photo in Rowe and Menzies 1968 and Menzies et al. 1973)
NR-1 submersible cruise Nov 1993 (Sulak and Ross unpubl. data)
R/V Cape Hatteras cruises Aug 2001 & Sep 2006 (S.W. Ross, unpubl. data)
EEZ-SCAN 87 Scientific Staff (1991)
Reed and Ross (2005)
Ross and Nizinski (in press)

BIOLOGICAL ENVIRONMENT

Video analysis of this dive began in mid-water with the identification of hundreds of myctophids and *Polyipnus clarus*, many of which were still visible just off of the bottom. *Laemonema barbatulum, L. melanurum, Scyliorhinus retifer* and *Nezumia* spp. were observed over the rubble field leading up to the main reef. The majority of the dive took place over dense *Lophelia pertusa* reef comprised of mostly dead coral mounds with a varying degree of live growth on the outer edges (~10%). Few fishes were observed during this dive, the most common species over the reef were *Laemonema melanurum, Helicolenus dactylopterus* and *Hoplostethus occidentalis*. Other species included *Conger oceanicus, Anthias woodsi,* and *Nettenchelys exoria*. *Eumunida picta*, spiny and pencil urchins, and brittle stars were the most common mobile invertebrates. Sessile invertebrates were sparse over much of the reef, though some small sponges, flytrap anemones and basket stars were scattered throughout the dive.

PHYSICAL ENVIRONMENT

Four habitats were encountered in varying degrees during this dive. This dive began over a relatively flat rubble field that graded into a dense dead coral matrix of cemented rubble and small patches of live *Lophelia*. The dive track continued up a steep (70-80º) slope leading to the top of a mound covered in dense, high-relief *Lophelia* bushes. This upper-most reef area was made up of a series of peaks and valleys with periodic sandy patches in between bushes. The majority of the dive was spent over hard coral habitat without attached fauna, but a brief period was spent over hard coral covered with dense colonies of orange anemones (Image D).

ADDITIONAL COMMENTS

This dive is contained on 3 mini DVs, both of which were of moderate to good quality with no time or CTD overlay. The mini DVs were archived on separate DVDs. The sub remained in the vicinity of a crab trap for the majority of the dive and there is good footage of numerous *E. picta* surrounding the trap.

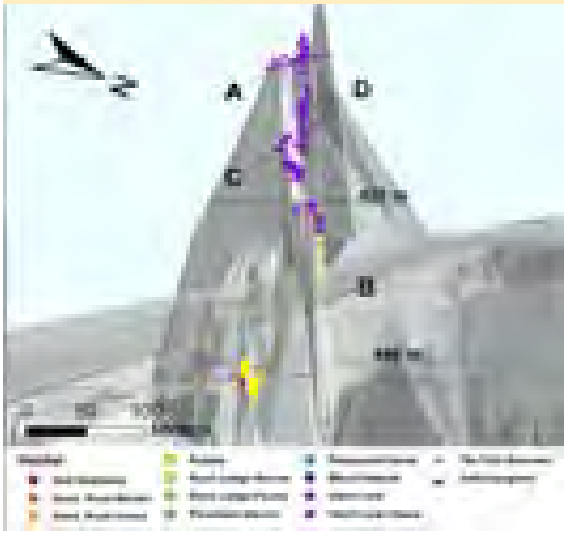
DIVE NUMBER: JSLI-4364 *STUDY AREA: Cape Lookout Lophelia A*

STATION OVERVIEW

Project	Islands in the Stream 2001
Principal investigators	SW Ross[1] KJ Sulak, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln. Wilmington NC 28409
Purpose	Continued trophodynamic studies off North Carolina; mapping of deep coral banks and ecological studies of macroinvertebrates and fishes; educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link I Submersible
Science Divers	J Caruso (bow), KJ Sulak (stern)
External Video Tapes	3 mini DVs
Internal Video Tapes	3 mini DVs
Digital Still Photos	0
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	No bow audio log, hard copy of stern audio log
Acknowledgements	NOAA-OE, USGS, UNCW, NC Coastal Reserve, NC Museum of Natural Sciences
SEADESC Analyst	AM Necaise, AM Quattrini, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	23-Sep-01
Minimum Bottom Depth (m)	398
Maximum Bottom Depth (m)	443
Start Bottom Time (EDT)	16:02
End Bottom End (EDT)	18:53
Starting Latitude (N)	34° 18.840'
Starting Longitude (W)	75° 47.013'
Ending Latitude (N)	34° 18.765'
Ending Longitude (W)	75° 47.130'
Surface Current (Kts)	
Bottom Current (Kts)	

Image A: Hard Coral
34º 18.762' N, 75º 47.124' W

DIVE NUMBER: JSLI-4364 *STUDY AREA: Cape Lookout Lophelia A*

IMAGE GALLERY *** indicates image position is approximated**

Image B: Rubble
34º 18.822' N, 75º 47.094' W

Image C: Hard Coral
34º 18.792' N, 75º 47.094' W

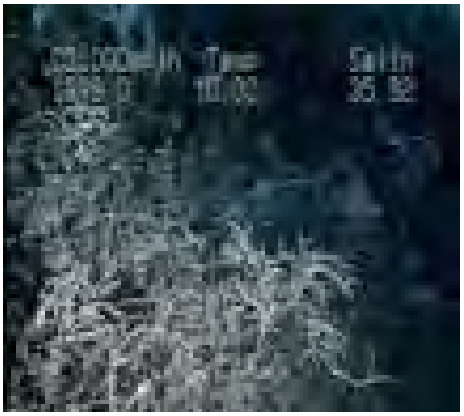


Image D: Hard Coral
34º 18.768' N, 75º 47.124' W

RELEVANT WORK AND/OR LITERATURE CITED

Uchupi (1967)
R/V Eastward training cruise 1966 (photo in Rowe and Menzies 1968 and Menzies et al. 1973)
NR-1 submersible cruise Nov 1993 (Sulak and Ross unpubl. data)
R/V Cape Hatteras cruises Aug 2001 & Sep 2006 (S.W. Ross, unpubl. data)
EEZ-SCAN 87 Scientific Staff (1991)
Reed and Ross (2005)
Ross and Nizinski (in press)

BIOLOGICAL ENVIRONMENT

A diversity of fishes were identified over both rubble and hard coral habitats during this dive. The most common species were found in both habitats and included *Laemonema melanurum, L. barbatulum* and *Scyliorhinus retifer. Trachyscorpia cristulata, Fenestraja plutonia* and *Helicolenus dactylopterus* were only seen over the rubble and low-relief dead coral matrix areas of the dive. *Dysommina rugosa, Conger oceanicus* and *Hoplostethus occidentalis* were observed within the prime reef area.

PHYSICAL ENVIRONMENT

This dive began over a flat rubble plain. The submersible transected to the main target up a relatively steep slope (~ 50º) covered in dense rubble and eventually a dense dead coral matrix of cemented rubble. The majority of the dive was spent over a large *Lophelia pertusa* reef without attached fauna covering a series of steep ridges and valleys. The reef in this area varied from other dives in that the coral branches were less robust, forming lacy thickets with large interstices. There was also a larger percentage of live coral growth. The valleys between the coral thickets were typically filled with a mixture of sand and rubble.

ADDITIONAL COMMENTS

This dive was contained in 3 mini DVs and archived on 3 DVDs. There was no time or CTD overlay for this dive. Most of the first DV was spent transecting to the target site. A lot of video time covers the attempts to rotenone and capture fish, so little time was spent filming the reef in wide angle. The internal video was used in a number of instances for fish identifications.

DIVE NUMBER: JSLII-3304 *STUDY AREA: Cape Lookout Lophelia A*

STATION OVERVIEW

Project	Islands in the Stream 2002
Principal investigators	SW Ross[1] KJ Sulak, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Mapping of deep coral banks, ecological studies of macroinvertebrates and fishes, and educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link II Submersible
Science Divers	A Howard (bow), KJ Sulak (stern)
External Video Tapes	3 mini DVs
Internal Video Tapes	0
Digital Still Photos	0
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	No bow audio log, copy of stern audio log
Acknowledgements	NOAA-OE, USGS, UNCW, NC Coastal Reserve, NC Museum of Natural Sciences
SEADESC Analyst	AM Necaise, ML Partyka
Date Compiled	11/16/2006

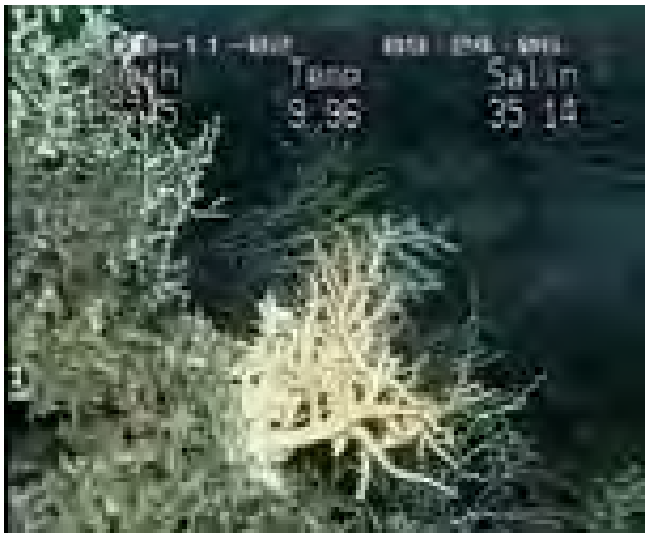
GENERAL LOCATION

Dive Track:

DIVE DATA

Date	11-Aug-02
Minimum Bottom Depth (m)	382
Maximum Bottom Depth (m)	448
Start Bottom Time (EDT)	8:33
End Bottom End (EDT)	11:00
Starting Latitude (N)	34° 19.710'
Starting Longitude (W)	75° 47.043'
Ending Latitude (N)	34° 19.510'
Ending Longitude (W)	75° 46.207'
Surface Current (Kts)	
Bottom Current (Kts)	

Image A: Hard Coral
34º 19.494' N, 75º 47.220' W



DIVE NUMBER: JSLII-3304 *STUDY AREA: Cape Lookout Lophelia A*

IMAGE GALLERY

*** indicates image position is approximated**

Image B: Rubble
34º 19.626' N, 75º 47.112' W

Image C: Hard Coral
34º 19.524' N, 75º 47.190' W

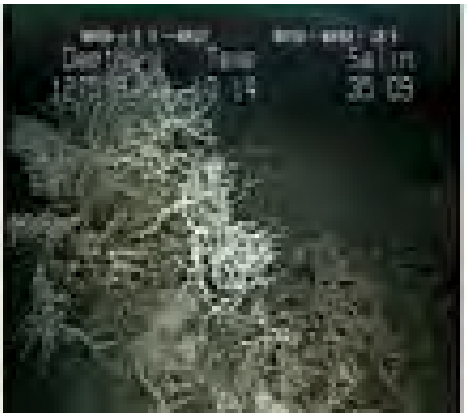


Image D: Sand/Rubble/Rock-Barren
34º 19.428' N, 75º 47.298' W

RELEVANT WORK AND/OR LITERATURE CITED

Uchupi (1967)
R/V Eastward training cruise 1966 (photo in Rowe and Menzies 1968 and Menzies et al. 1973)
NR-1 submersible cruise Nov 1993 (Sulak and Ross unpubl. data)
R/V Cape Hatteras cruises Aug 2001& Sep 2006 (S.W. Ross, unpubl. data)
EEZ-SCAN 87 Scientific Staff (1991)
Reed and Ross (2005)
Ross and Nizinski (in press)

BIOLOGICAL ENVIRONMENT

A high diversity and number of fish were observed during this dive, the majority of which were found over the initial rubble strewn area at the base of the mound. Fish species included *Myxine glutinosa, Fenestraja plutonia, Scyliorhinus retifer, Laemonema barbatulum*, *Hoplostethus occidentalis*, and an unidentified *Synagrops* species. A large diversity of mobile invertebrates were observed as well, such as *Rochinia crassa, Eumunida picta*, pencil urchins, brittle stars and basket stars. A squid and a large octopus were also seen during the dive. Though the reef was made up of *Lophelia pertusa* growth, there was a good sized colony of a *Madrepora* attached to *L. pertusa* rubble. No other corals or sponges were observed.

PHYSICAL ENVIRONMENT

This dive began over mixed sand/rubble/rock that transitioned to low-relief rubble. The flat plain rapidly transitioned to a steep slope (40-50º) covered in a mixture of dense dead coral matrices and moderate-relief *Lophelia* bushes. The apex of this mound consisted of rolling ridges covered in dense thickets of *Lophelia* growth (~30% living) with rubble and heavy sediment common in the valleys between. The area surrounding the reef was predominantly flat sand/rubble/rock without attached fauna.

ADDITIONAL COMMENTS

This dive was captured on 3 mini DVs and archived on 3 DVDs. The three DVs all had a grainy/hazy quality and a green color balance. There was also something that blurred a large portion of the internal lens on the camera, causing some of the video to look out of focus. The video recorded during transects was often dark, and stationary footage was often shot too closely to the reef, with numerous instances when the camera was actually touching the substrate.

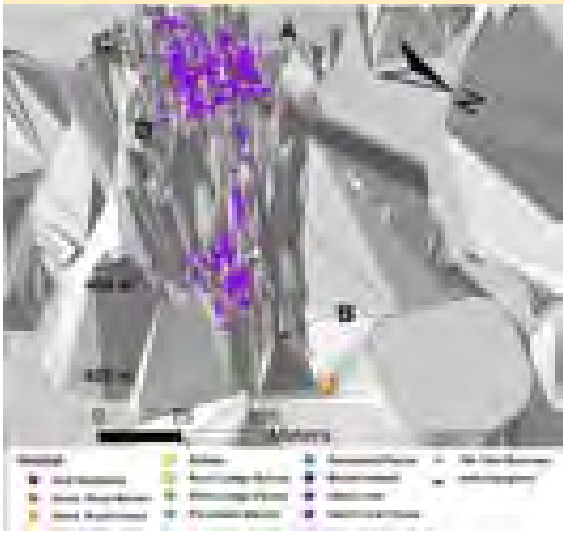
DIVE NUMBER: JSLII-3305 *STUDY AREA: Cape Lookout Lophelia A*

STATION OVERVIEW

Project	Islands in the Stream 2002
Principal investigators	SW Ross[1] KJ Sulak, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Mapping of deep coral banks, ecological studies of macroinvertebrates and fishes, and educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link II Submersible
Science Divers	M Nizinski (bow), SW Ross (stern)
External Video Tapes	2 mini DVs
Internal Video Tapes	3 mini DVs
Digital Still Photos	0
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Hard copies of bow and stern audio logs
Acknowledgements	NOAA-OE, USGS, UNCW, NC Coastal Reserve, NC Museum of Natural Sciences
SEADESC Analyst	AM Necaise, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	11-Aug-02
Minimum Bottom Depth (m)	381
Maximum Bottom Depth (m)	416
Start Bottom Time (EDT)	16:30
End Bottom End (EDT)	18:59
Starting Latitude (N)	34° 19.460'
Starting Longitude (W)	75° 47.198'
Ending Latitude (N)	34° 19.477'
Ending Longitude (W)	75° 47.200'
Surface Current (Kts)	
Bottom Current (Kts)	

Image A: Hard Coral
34° 19.428' N, 75° 47.208' W

DIVE NUMBER: JSLII-3305 *STUDY AREA: Cape Lookout Lophelia A*

IMAGE GALLERY *** indicates image position is approximated**

Image B: Soft Substrate
34° 19.362' N, 75° 47.274' W

Image C: Hard Coral
34° 19.434' N, 75° 47.232' W

Image D: Hard Coral
34° 19.440' N, 75° 47.244' W

RELEVANT WORK AND/OR LITERATURE CITED

Uchupi (1967)
R/V Eastward training cruise 1966 (photo in Rowe and Menzies 1968 and Menzies et al. 1973)
NR-1 submersible cruise Nov 1993 (Sulak and Ross unpubl. data)
R/V Cape Hatteras cruises Aug 2001& Sep 2006 (S.W. Ross, unpubl. data)
EEZ-SCAN 87 Scientific Staff (1991)
Reed and Ross (2005)
Ross and Nizinski (in press)

BIOLOGICAL ENVIRONMENT

Few fish were seen over the sand/rubble/rock and soft-sediment areas surrounding the main reef, and those that were, such as *Myxine glutinosa, Fenestraja plutonia*, and *Laemonema barbatulum*, were represented by one individual. The most common species found on the reef itself was *Hoplostethus occidentalis*, followed by *Laemonema melanurum* and *Conger oceanicus.* Other species observed in low numbers were *Helicolenus dactylopterus, Beryx decadactylus* (Image A), *Laemonema barbatulum* and a single *Cirrhigaleus asper.* The most common mobile invertebrates were *Eumunida picta* and *Rochinia crassa*. A single squid, a sea star and a few basket stars were also observed. The reef itself was made up of 20-40% living *Lophelia* that seemed to have much thinner, less robust, branches than observed elsewhere. There were no other corals or any sponges seen during this dive.

PHYSICAL ENVIRONMENT

This dive began over a mixed sediment/rubble area without attached fauna that graded into a rippled sandflat. This habitat changed abruptly at a very steep slope (~70%) covered with living and dead *Lophelia*. The reef in this area was made up of two varieties of coral growth: 1) thin branches of *Lophelia* that intersected in complicated thickets with large interstices, and 2) dense, heavily cemented bushes of dead *Lophelia* with few large interstices. Areas between coral growths were typically a mixture of sediment and coral rubble.

ADDITIONAL COMMENTS

This dive was captured on 2 mini DVs that were archived on 2 DVDs. The video had a grainy appearance and something on the internal lens of the camera obscured the view. The color balance was also off, making the footage seem green/yellow. There was a large amount of stationary footage that was filmed close to the reef during collections. There is some good footage of the collection of a *Cirrhigaleus asper*.

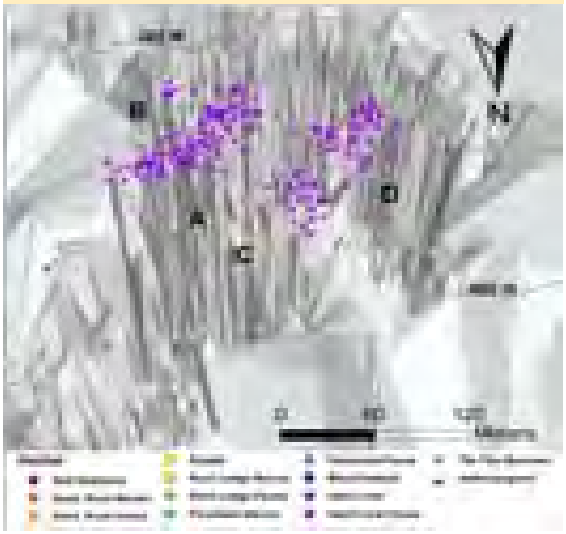
DIVE NUMBER: JSLII-3306 *STUDY AREA: Cape Lookout Lophelia A*

STATION OVERVIEW

Project	Islands in the Stream 2002
Principal investigators	SW Ross[1] KJ Sulak, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Mapping of deep coral banks, ecological studies of macroinvertebrates and fishes, and educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link II Submersible
Science Divers	KJ Sulak (bow), A Felker (stern)
External Video Tapes	3 mini DVs
Internal Video Tapes	3 mini DVs
Digital Still Photos	0
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Hard copies of bow and stern audio logs
Acknowledgements	NOAA-OE, USGS, UNCW, NC Coastal Reserve, NC Museum of Natural Sciences
SEADESC Analyst	AM Necaise, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	12-Aug-02
Minimum Bottom Depth (m)	381
Maximum Bottom Depth (m)	418
Start Bottom Time (EDT)	8:32
End Bottom End (EDT)	10:59
Starting Latitude (N)	34° 19.400'
Starting Longitude (W)	75° 47.200'
Ending Latitude (N)	34° 19.452'
Ending Longitude (W)	75° 47.251'
Surface Current (Kts)	
Bottom Current (Kts)	

Image A: Hard Coral
34° 19.476' N, 75° 47.196' W

DIVE NUMBER: JSLII-3306 *STUDY AREA: Cape Lookout Lophelia A*

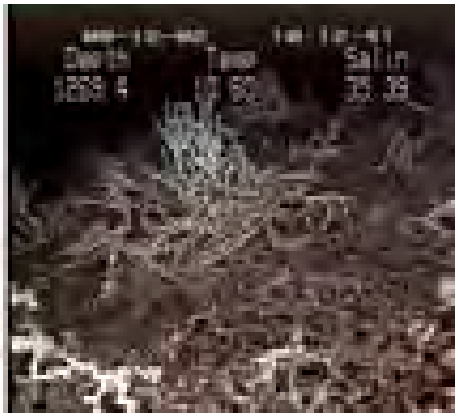
IMAGE GALLERY

*** indicates image position is approximated**

Image B: Hard Coral
34º 19.464' N, 75º 47.208' W

Image C: Hard Coral
34º 19.482' N, 75º 47.238' W

Image D: Hard Coral
34º 19.476' N, 75º 47.226' W



RELEVANT WORK AND/OR LITERATURE CITED

Uchupi (1967)
R/V Eastward training cruise 1966 (photo in Rowe and Menzies 1968 and Menzies et al. 1973)
NR-1 submersible cruise Nov 1993 (Sulak and Ross unpubl. data)
R/V Cape Hatteras cruises Aug 2001 & Sep 2006 (S.W. Ross, unpubl. data)
EEZ-SCAN 87 Scientific Staff (1991)
Reed and Ross (2005)
Ross and Nizinski (in press)

BIOLOGICAL ENVIRONMENT

An almost equal number of fishes were observed over the sandy rubble strewn area at the base of the mound as were seen on the main reef itself, though the species composition was much different. *Laemonema barbatulum* and *Helicolenus dactylopterus* were seen in moderate numbers over the rubble habitat surrounding the main reef, while *Merluccius albidus* and *Maurolicus weitzmani* were seen sparsely over sand habitat. The most common species found on the reef were *Hoplostethus occidentalis, L. barbatulum* and *L. melanurum*. Less frequently observed species included *Conger oceanicus*, *Helicolenus dactylopterus* and other scorpaenids. *Eumunida picta* were found in large numbers over the reef and the surrounding rubble; and next to brittle stars, they were the dominant mobile invertebrates in the area. A few *Rochinia crassa*, pencil and spiny urchins were also observed. Basket stars and hexactinellid sponges were the only sessile invertebrates seen, aside from the living growths of *Lophelia pertusa.*

PHYSICAL ENVIRONMENT

This dive reached bottom over a large, rippled sandflat that transitioned into rubble and eventually a dense dead matrix of cemented hard coral rubble. This latter habitat first appeared at the base of a steep slope (~70º) and was prevalent all across the slope, eventually leading to dense *Lophelia* bushes near the apex of the mound. Overall, there was little live *Lophelia* found in the area (<15%), and the bushes were heavily cemented with few large interstices. Spaces between the coral bushes were typically a mixture of sand and coral rubble.

ADDITIONAL COMMENTS

This dive was captured on 3 mini DVs and archived on 3 DVDs. There was a substance on the internal lens of the camera that obscured the view. Footage shot while stationary was often very shaky and out of focus. The first 30 minutes of bottom time were not included in the dive track.

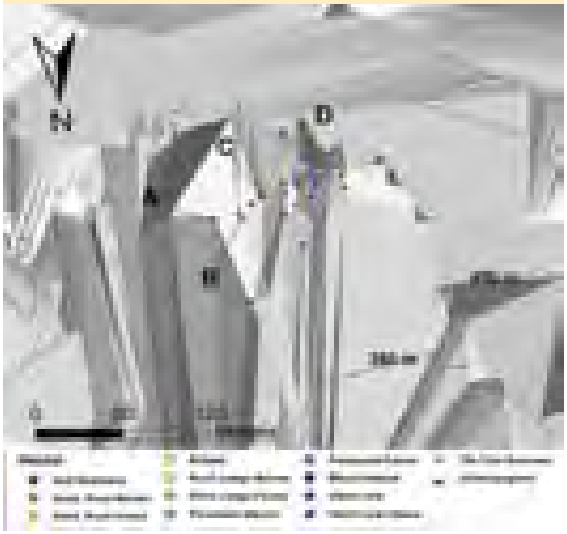
DIVE NUMBER: JSLII-3307 *STUDY AREA: Cape Lookout Lophelia A*

STATION OVERVIEW

Project	Islands in the Stream 2002
Principal investigators	SW Ross[1] KJ Sulak, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Mapping of deep coral banks, ecological studies of macroinvertebrates and fishes, and educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link II Submersible
Science Divers	SW Ross (bow), M Nizinski (stern)
External Video Tapes	1 mini DV
Internal Video Tapes	2 mini DVs
Digital Still Photos	0
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Hard copies of bow and stern audio logs
Acknowledgements	NOAA-OE, USGS, UNCW, NC Coastal Reserve, NC Museum of Natural Sciences
SEADESC Analyst	AM Necaise, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

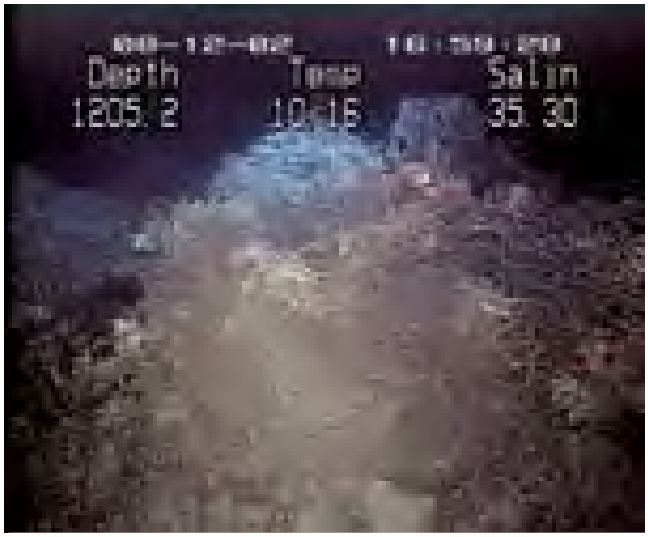
Dive Track:



DIVE DATA

Date	12-Aug-02
Minimum Bottom Depth (m)	367
Maximum Bottom Depth (m)	416
Start Bottom Time (EDT)	16:24
End Bottom End (EDT)	17:11
Starting Latitude (N)	34° 19.485'
Starting Longitude (W)	75° 47.452'
Ending Latitude (N)	34° 19.499'
Ending Longitude (W)	75° 47.545'
Surface Current (Kts)	
Bottom Current (Kts)	

Image A: Hard Coral
34º 19.470' N, 75º 47.526' W



DIVE NUMBER: JSLII-3307 *STUDY AREA: Cape Lookout Lophelia A*

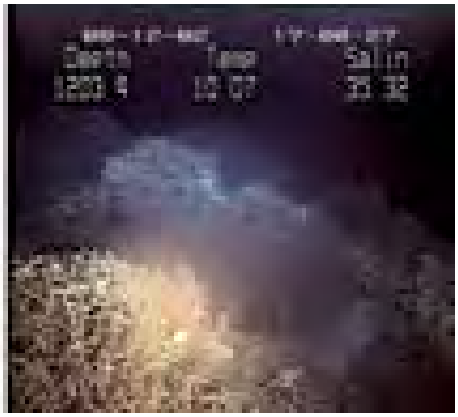
IMAGE GALLERY

*** indicates image position is approximated**

Image B: Rubble
34º 19.308' N, 75º 47.838' W *

Image C: Hard Coral
34º 19.458' N, 75º 47.538' W

Image D: Hard Coral
34º 19.458' N, 75º 47.550' W



RELEVANT WORK AND/OR LITERATURE CITED

Uchupi (1967)
R/V Eastward training cruise 1966 (photo in Rowe and Menzies 1968 and Menzies et al. 1973)
NR-1 submersible cruise Nov 1993 (Sulak and Ross unpubl. data)
R/V Cape Hatteras cruises Aug 2001& Sep 2006 (S.W. Ross, unpubl. data)
EEZ-SCAN 87 Scientific Staff (1991)
Reed and Ross (2005)
Ross and Nizinski (in press)

BIOLOGICAL ENVIRONMENT

Laemonema melanurum, L. barbatulum, Helicolenus dactylopterus and *Scyliorhinus retife*r were seen over the rubble strewn area surrounding the main reef. Only three species were seen on the reef itself, *Helicolenus dactylopterus, Beryx decadactylus* and *Hoplostethus occidentalis*. A large *Carcharhinus altimus* was seen swimming off of the reef as the sub began its ascent. *Eumunida picta* and brittle stars were the most common mobile invertebrates, followed by spiny urchins, flytrap anemones and basket stars. No other corals or sponges were observed during this short dive.

PHYSICAL ENVIRONMENT

This dive began over an area of both rubble and sand/rubble/rock without attached fauna. As the transect continued, the sub reached a steep slope (70-80º) covered in a dense dead coral rubble matrix with some small growths of live *Lophelia* (5-10%). The top of the mound was covered with moderate-to-high-relief coral bushes that were heavily cemented and had few large interstices. Areas between these bushes were typically mixtures of sand and coral rubble.

ADDITIONAL COMMENTS

The dive was captured on one mini DV and archived on one DVD. This dive was aborted after 45 minutes due to high current velocities. Additionally, the first 15 minutes of bottom time are not included in the dive track. The sub was often off the bottom and too far away from the reef to see clearly.

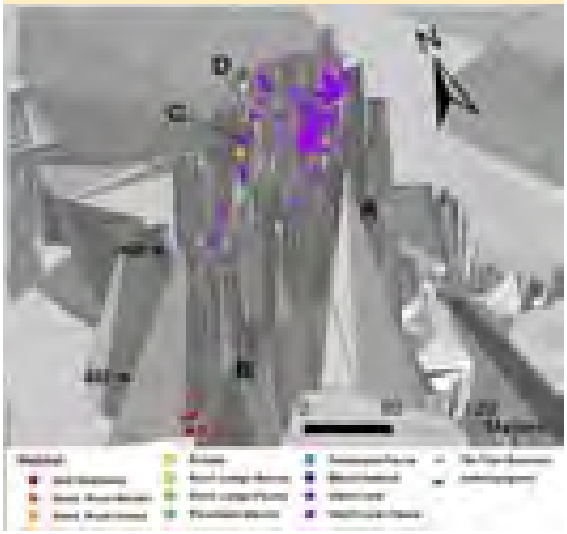
DIVE NUMBER: JSLII-3430 *STUDY AREA: Cape Lookout Lophelia A*

STATION OVERVIEW

Project	Life on the Edge 2003
Principal investigators	SW Ross[1] KJ Sulak, MS Nizinski, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Mapping of deep coral banks, ecological studies of macroinvertebrates and fishes, paleoclimate studies, coral genetics and educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link II Submersible
Science Divers	M Nizinski (bow), J Potter (stern)
External Video Tapes	3 mini DVs
Internal Video Tapes	0
Digital Still Photos	0
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Hard copies of bow and stern audio logs
Acknowledgements	NOAA-OE, NOAA Fisheries, USGS, UNCW, NC Museum of Natural Sciences
SEADESC Analyst	AM Necaise, AM Quattrini, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

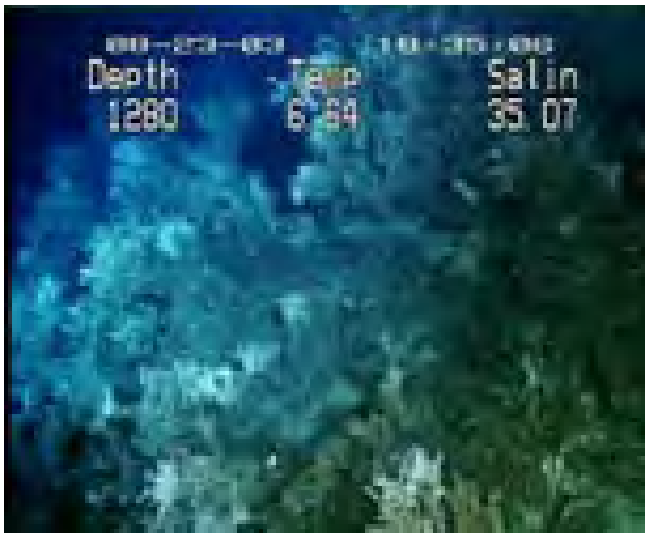
Dive Track:



DIVE DATA

Date	23-Aug-03
Minimum Bottom Depth (m)	384
Maximum Bottom Depth (m)	415
Start Bottom Time (EDT)	16:24
End Bottom End (EDT)	18:59
Starting Latitude (N)	34° 19.366'
Starting Longitude (W)	75° 47.334'
Ending Latitude (N)	34° 19.404'
Ending Longitude (W)	75° 47.249'
Surface Current (Kts)	
Bottom Current (Kts)	0.2

Image A: Hard Coral
34º 19.392' N, 75º 47.238' W



DIVE NUMBER: JSLII-3430 *STUDY AREA: Cape Lookout Lophelia A*

IMAGE GALLERY *** indicates image position is approximated**

Image B: Soft Substrate
34º 19.368' N, 75º 47.322' W

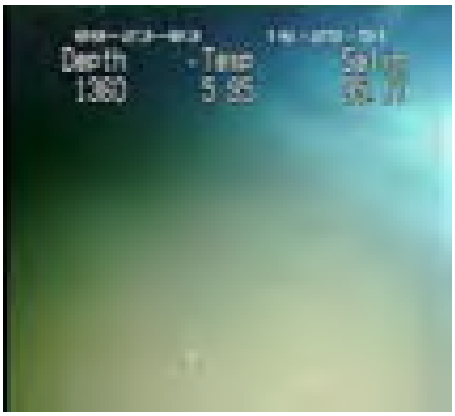
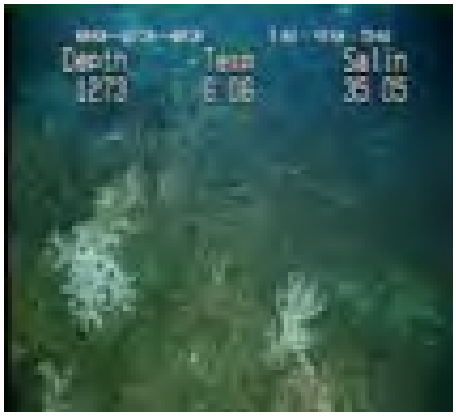


Image C: Hard Coral
34º 19.422' N, 75º 47.268' W

Image D: Hard Coral
34º 19.434' N, 75º 47.250' W



RELEVANT WORK AND/OR LITERATURE CITED

Uchupi (1967)
R/V Eastward training cruise 1966 (photo in Rowe and Menzies 1968 and Menzies et al. (1973)
NR-1 submersible cruise Nov 1993 (Sulak and Ross unpubl. data)
R/V Cape Hatteras cruises Aug 2001& Sep 2006 (S.W. Ross, unpubl. data)
EEZ-SCAN 87 Scientific Staff (1991)
Reed and Ross (2005)
Ross and Nizinski (in press)

BIOLOGICAL ENVIRONMENT

A large number of unidentified midwater fish, and several dozen *Polyipnus clarus,* constituted the most abundant species found during this dive. *Beryx decadactylus* were also common, followed by *Hoplostethus occidentalis, Helicolenus dactylopterus, Conger oceanicus, Laemonema melanurum* and *L. barbatulum*. Brittle stars and *Eumunida picta* were common throughout the area. Other mobile invertebrates included spiny urchins and *Chaceon* crabs. Other than *Lophelia*, the sessile invertebrates observed were limited to a few basket stars and occasional hexactinellid sponges. The extent of live *Lophelia* varied greatly, with portions of the dive having less than 5% living coral and others having >75%.

PHYSICAL ENVIRONMENT

This dive began over a low-relief sand flat that rapidly transitioned to dense hard coral habitat on a very steep slope (~ 70º). Most of the dive was spent alternating from a steep sloping reef with a dense dead coral matrix to a reef of moderate-to-high-relief. In these areas the coral often formed large bushes that were heavily cemented and had few interstices, making them appear almost solid.

ADDITIONAL COMMENTS

This dive was captured on 3 mini DVs and archived on 3 DVDs. The quality of the video footage varied with each DV. There was condensation on the internal lens, which at times obscured the view. All zoomed footage was very unsteady and difficult to view. The time/CTD overlay was intermittent throughout all three DVs. The third DV had the highest quality, with some good footage of *Eumunida picta* feeding.

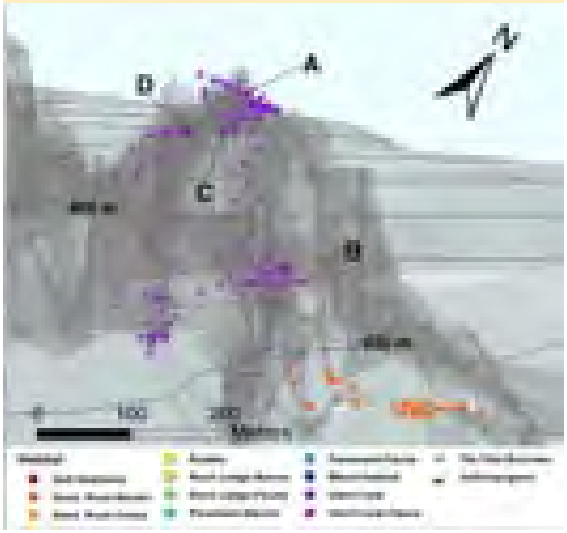
DIVE NUMBER: JSLII-3431 *STUDY AREA: Cape Lookout Lophelia A*

STATION OVERVIEW

Project	Life on the Edge 2003
Principal investigators	SW Ross[1] KJ Sulak, MS Nizinski, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Mapping of deep coral banks, ecological studies of macroinvertebrates and fishes, paleoclimate studies, coral genetics and educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link II Submersible
Science Divers	A Brooks (bow), T Casazza (stern)
External Video Tapes	3 mini DVs
Internal Video Tapes	1 mini DV
Digital Still Photos	201
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Hard copy of bow audio log
Acknowledgements	NOAA-OE, NOAA Fisheries, USGS, UNCW, NC Museum of Natural Sciences
SEADESC Analyst	AM Necaise, AM Quattrini, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	24-Aug-03
Minimum Bottom Depth (m)	382
Maximum Bottom Depth (m)	432
Start Bottom Time (EDT)	8:36
End Bottom End (EDT)	10:52
Starting Latitude (N)	34° 19.517'
Starting Longitude (W)	75° 47.044'
Ending Latitude (N)	34° 19.421'
Ending Longitude (W)	75° 47.237'
Surface Current (Kts)	
Bottom Current (Kts)	0.1

Image A: Hard Coral
34º 19.452' N, 75º 47.220' W

DIVE NUMBER: JSLII-3431 *STUDY AREA: Cape Lookout Lophelia A*

IMAGE GALLERY *** indicates image position is approximated**

Image B: Hard Coral
34º 19.458' N, 75º 47.178' W

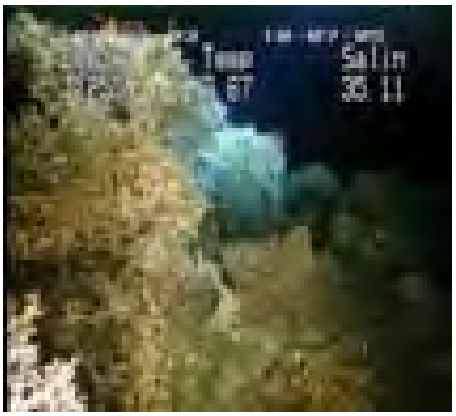


Image C: Hard Coral
34º 19.422' N, 75º 47.202' W

Image D: Hard Coral
34º 19.410' N, 75º 47.238' W

RELEVANT WORK AND/OR LITERATURE CITED

Uchupi (1967)
R/V Eastward training cruise 1966 (photo in Rowe and Menzies 1968 and Menzies et al. (1973)
NR-1 submersible cruise Nov 1993 (Sulak and Ross unpubl. data)
R/V Cape Hatteras cruises Aug 2001 & Sep 2006 (S.W. Ross, unpubl. data)
EEZ-SCAN 87 Scientific Staff (1991)
Reed and Ross (2005)
Ross and Nizinski (in press)

BIOLOGICAL ENVIRONMENT

A large variety of fish species were observed throughout this dive. The largest number of these were midwater fish such as *Polyipnus clarus*, most of which were seen at the beginning of the dive. *Laemonema barbatulum, Helicolenus dactylopterus, Myxine glutinosa* and *Fenestraja plutonia* were the most common bottom associated species in sand/rubble habitat. Over the hard coral habitat most fish were represented by only a few individuals, the most common species were *Beryx decadactylus, Conger oceanicus, Maurolicus weitzmani* and *Hoplostethus occidentalis*. *Laemonema melanurum, L. barbatulum, Helicolenus dactylopterus, Scyliorhinus meadi* and *Dysommina rugosa* were also observed in this area. Brittle stars and *Eumunida picta* were the most common mobile invertebrates, followed by spiny urchins and an octopus. *Lophelia pertusa* was the only hard coral present during this dive, the majority of which was dead. However, there was a small section of the reef that had nearly 40% live *Lophelia*. Other sessile invertebrates included basket stars and some primnoid corals near the end of the dive.

PHYSICAL ENVIRONMENT

The beginning of this dive took place over a low-relief habitat of sand/rubble/rock without attached fauna. This region transitioned into a low-relief hard coral area with a dense dead coral matrix and eventually into a moderate-to-high-relief hard coral reef. There were frequent large patches of sand between coral bushes. Most of the reef was made up of dead coral, but there were regions where large bushes of *Lophelia* contained >40% living coral covering a series of steep (~50º) slopes.

ADDITIONAL COMMENTS

This dive was recorded on 2 mini DVs and archived on 2 DVDs. There was no time/CTD overlay on the first DV. There was condensation on the inner camera lens, which at times obscured the view. The sub touched down a number of times creating dense clouds of sediment, and remained too far off the reef at others. The camera was often stuck directly into the underlying rubble for long stretches at a time. There was good footage of *Eumunida picta* feeding.

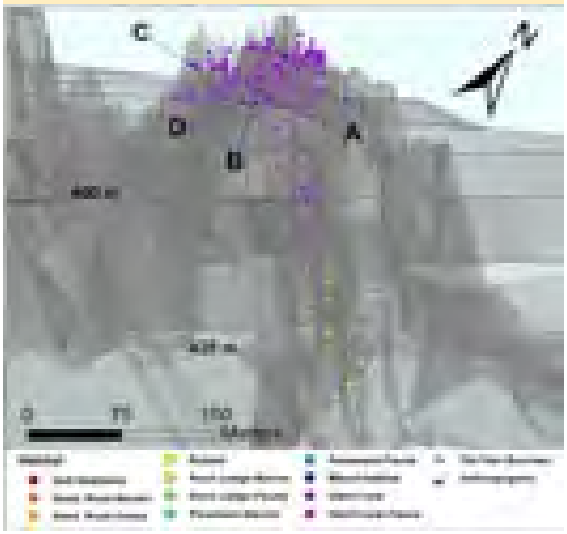
DIVE NUMBER: JSLII-3432 *STUDY AREA: Cape Lookout Lophelia A*

STATION OVERVIEW

Project	Life on the Edge 2003
Principal investigators	SW Ross[1] KJ Sulak, MS Nizinski, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Mapping of deep coral banks, ecological studies of macroinvertebrates and fishes, paleoclimate studies, coral genetics and educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link II Submersible
Science Divers	AM Necaise (bow), J Berg (stern)
External Video Tapes	3 mini DVs
Internal Video Tapes	1 mini DV
Digital Still Photos	84
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Hard copy of stern audio log
Acknowledgements	NOAA-OE, NOAA Fisheries, USGS, UNCW, NC Museum of Natural Sciences
SEADESC Analyst	AM Necaise, AM Quattrini, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

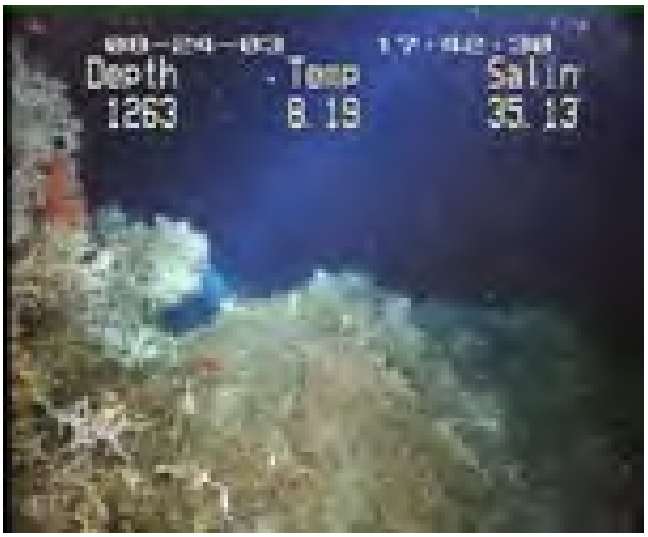
Dive Track:



DIVE DATA

Date	24-Aug-03
Minimum Bottom Depth (m)	381
Maximum Bottom Depth (m)	424
Start Bottom Time (EDT)	16:47
End Bottom End (EDT)	18:57
Starting Latitude (N)	34° 19.427'
Starting Longitude (W)	75° 47.158'
Ending Latitude (N)	34° 19.482'
Ending Longitude (W)	75° 47.213'
Surface Current (Kts)	1.1
Bottom Current (Kts)	0.5

Image A: Hard Coral
34º 19.446' N, 75º 47.232' W



DIVE NUMBER: JSLII-3432 *STUDY AREA: Cape Lookout Lophelia A*

IMAGE GALLERY *** indicates image position is approximated**

Image B: Hard Coral
34º 19.428' N, 75º 47.214' W

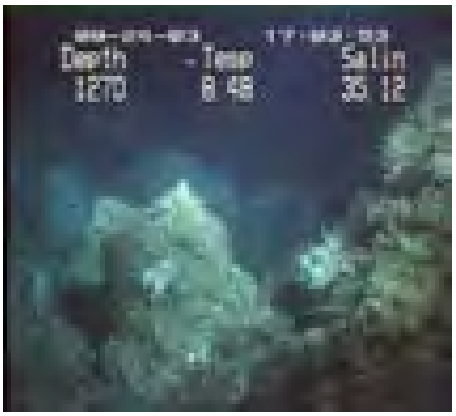


Image C: Hard Coral
34º 19.416' N, 75º 47.250' W

Image D: Hard Coral
34º 19.446' N, 75º 47.226' W

RELEVANT WORK AND/OR LITERATURE CITED

Uchupi (1967)
R/V Eastward training cruise 1966 (photo in Rowe and Menzies 1968 and Menzies et al. 1973)
NR-1 submersible cruise Nov 1993 (Sulak and Ross unpubl. data)
R/V Cape Hatteras cruises Aug 2001& Sep 2006 (S.W. Ross, unpubl. data)
EEZ-SCAN 87 Scientific Staff (1991)
Reed and Ross (2005)
Ross and Nizinski (in press)

BIOLOGICAL ENVIRONMENT

Beryx decadactylus and *Conger oceanicus* were observed over prime coral reef habitat and were the dominant species in the area. *Hoplostethus occidentalis, Laemonema melanurum* and *L. barbatulum* were also relatively common throughout the dive. Only a single *Helicolenus dactylopterus* was observed. The only mobile invertebrates observed were large numbers of brittle stars, *Eumunida picta* and a species of spiny urchin. Attached macrofauna were sparse in this area, limited to a few basket stars and occasional venus flytrap anemones. Though this area was dominated by an extensive *Lophelia pertusa* reef, the amount of living *Lophelia* varied from <10% to nearly 50%. There were no other corals or sponges observed during this dive.

PHYSICAL ENVIRONMENT

This dive took place almost exclusively over hard coral habitat without attached fauna. The hard coral habitat at the beginning of the dive consisted of a low-relief area of dense dead coral matrices and a few living pieces of *Lophelia*. This habitat eventually transitioned to a moderate-to-high-relief coral reef on a series of crests and slopes. The slopes were steep, 50-60º, and the valleys between were filled with a mixture of rubble and soft-sediment.

ADDITIONAL COMMENTS

This dive was captured on 3 mini DVs and saved on 3 DVDs for archiving; however, the third DV/DVD does not contain footage of the bottom, only the ascent. The time/CTD overlay was turned off intermittently during both the first and second DVs. At times the footage quality was reduced by condensation on the inner lens of the camera and frequent periods when the camera actually ran into the substrate completely blocking all views.

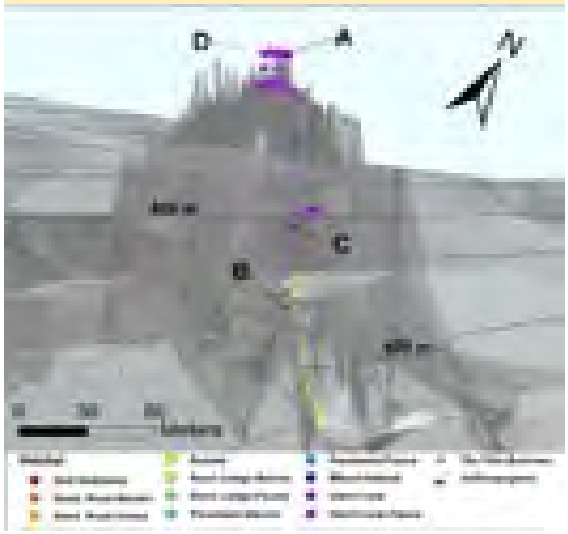
DIVE NUMBER: JSLI-4692 *STUDY AREA: Cape Lookout Lophelia A*

STATION OVERVIEW

Project	Life on the Edge 2004
Principal investigators	SW Ross[1] KJ Sulak, MS Nizinski, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Mapping of deep coral banks, ecological studies of macroinvertebrates and fishes, paleoclimate studies, coral genetics and educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link I Submersible
Science Divers	KJ Sulak (bow), B Williams (stern)
External Video Tapes	2 mini DVs, 1 HD
Internal Video Tapes	1 mini DV
Digital Still Photos	0
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Hard copies of bow and stern audio logs
Acknowledgements	NOAA-OE, NOAA Fisheries, USGS, UNCW, NC Museum of Natural Sciences
SEADESC Analyst	AM Necaise, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	15-Jun-04
Minimum Bottom Depth (m)	380
Maximum Bottom Depth (m)	426
Start Bottom Time (EDT)	8:29
End Bottom End (EDT)	10:33
Starting Latitude (N)	34° 19.428'
Starting Longitude (W)	75° 47.172'
Ending Latitude (N)	34° 19.444'
Ending Longitude (W)	75° 47.218'
Surface Current (Kts)	4.1
Bottom Current (Kts)	0.5

Image A: Hard Coral-Fauna
34º 19.452' N, 75º 47.202' W

DIVE NUMBER: JSLI-4692 *STUDY AREA: Cape Lookout Lophelia A*

IMAGE GALLERY *** indicates image position is approximated**

Image B: Rubble
34º 19.416' N, 75º 47.196' W

Image C: Hard Coral
34º 19.416' N, 75º 47.196' W

Image D: Hard Coral-Fauna
34º 19.428' N, 75º 47.214' W

RELEVANT WORK AND/OR LITERATURE CITED

Uchupi (1967)
R/V Eastward training cruise 1966 (photo in Rowe and Menzies 1968 and Menzies et al. 1973)
NR-1 submersible cruise Nov 1993 (Sulak and Ross unpubl. data)
R/V Cape Hatteras cruises Aug 2001 & Sep 2006 (S.W. Ross, unpubl. data)
EEZ-SCAN 87 Scientific Staff (1991)
Reed and Ross (2005)
Ross and Nizinski (in press)

BIOLOGICAL ENVIRONMENT

Few fishes and several invertebrates were observed during this dive. *Laemonema barbatulum* was present in the rubble areas. Few *Helicolenus dactylopterus* and one hagfish were present on the hard coral habitat. Brittle stars were very abundant over the surface of dead coral and occupying spaces in the hard coral mounds. A large school of squid was observed in the beginning of the dive at the base of the rubble covered slope. Other mobile invertebrates observed included pencil urchins, and *Eumunida picta*, which were common on the hard coral mounds. Attached sessile invertebrates included *Lophelia pertusa, Novodinia antillensis*, a few sponges, and anemones.

PHYSICAL ENVIRONMENT

In the beginning of the dive, a strong current was evident and visibility was poor. Two habitat types were observed: 1) coral rubble and 2) hard corals without fauna. Coral rubble uniformly covered a steep slope of ~60-70º. On top of the slope, *Lophelia pertusa* was present in large mounds (< 2m relief), which consisted of mostly dead coral with live scattered on top. Few macrofauna were attached to the hard corals.

ADDITIONAL COMMENTS

This dive was captured on 2 mini DVs and saved to 2 DVDs for archiving. The overall quality of this footage was fair-to-good, some of the wide angle views were dark and there was a moderate amount of marine snow.

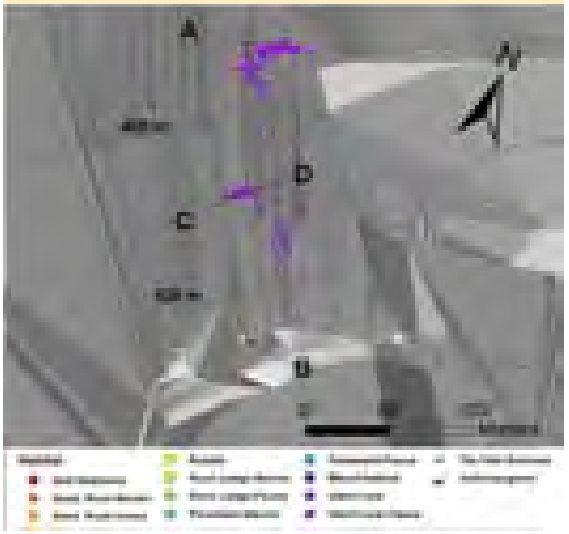
DIVE NUMBER: JSLI-4693 *STUDY AREA: Cape Lookout Lophelia A*

STATION OVERVIEW

Project	Life on the Edge 2004
Principal investigators	SW Ross[1] KJ Sulak, MS Nizinski, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Mapping of deep coral banks, ecological studies of macroinvertebrates and fishes, paleoclimate studies, coral genetics and educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link I submersible
Science Divers	SW Ross (bow), M Nizinski (stern)
External Video Tapes	2 mini DVs, 1 HD
Internal Video Tapes	4 mini DVs
Digital Still Photos	0
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Hard copy of stern audio log
Acknowledgements	NOAA-OE, NOAA Fisheries, USGS, UNCW, NC Museum of Natural Sciences
SEADESC Analyst	AM Necaise, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	15-Jun-04
Minimum Bottom Depth (m)	392
Maximum Bottom Depth (m)	431
Start Bottom Time (EDT)	16:20
End Bottom End (EDT)	18:27
Starting Latitude (N)	34° 19.436'
Starting Longitude (W)	75° 47.140'
Ending Latitude (N)	34° 19.512'
Ending Longitude (W)	75° 47.148'
Surface Current (Kts)	
Bottom Current (Kts)	0.7

Image A: Hard Coral
34º 19.512' N, 75º 47.178' W

DIVE NUMBER: JSLI-4693 *STUDY AREA: Cape Lookout Lophelia A*

IMAGE GALLERY *** indicates image position is approximated**

Image B: Rubble
34º 19.440' N, 75º 47.142' W

Image C: Hard Coral
34º 19.470' N, 75º 47.154' W

Image D: Hard Coral
34º 19.488' N, 75º 47.154' W

RELEVANT WORK AND/OR LITERATURE CITED

Uchupi (1967)
R/V Eastward training cruise 1966 (photo in Rowe and Menzies 1968 and Menzies et al. 1973)
NR-1 submersible cruise Nov 1993 (Sulak and Ross unpubl. data)
R/V Cape Hatteras cruises Aug 2001 & Sep 2006 (S.W. Ross, unpubl. data)
EEZ-SCAN 87 Scientific Staff (1991)
Reed and Ross (2005)
Ross and Nizinski (in press)

BIOLOGICAL ENVIRONMENT

Schools of mesopelagic fishes (Myctophidae and Sternoptychidae) and invertebrates (e.g., squid) were commonly encountered throughout all habitats during this dive. *Laemonema barbatulum* was observed on sand/coral rubble and rubble areas. In addition to *L. barbatulum*, the following species were observed on hard coral habitats: *Scyliorhinus* spp., *Laemonema melanurum*, and *Helicolenus dactylopterus*. Galatheoid crabs and brittle stars were abundant throughout this dive. Other observed invertebrates included *Lophelia pertusa*, urchins, and sea stars.

PHYSICAL ENVIRONMENT

Three habitat types observed during this dive included: 1) sand mixed with coral rubble, 2) coral rubble, and 3) hard corals. Attached macrofauna was lacking throughout the dive. Sand mixed with small amounts of coral rubble was the dominant substrate off reef. Sediment covered coral rubble was present on the base and face of the slope, and dense matrices of mostly dead *Lophelia pertusa* were present on the top of the slope. Closer to and at the top of the slope, a greater percentage of live *Lophelia* was present as small bushes or standing twigs.

ADDITIONAL COMMENTS

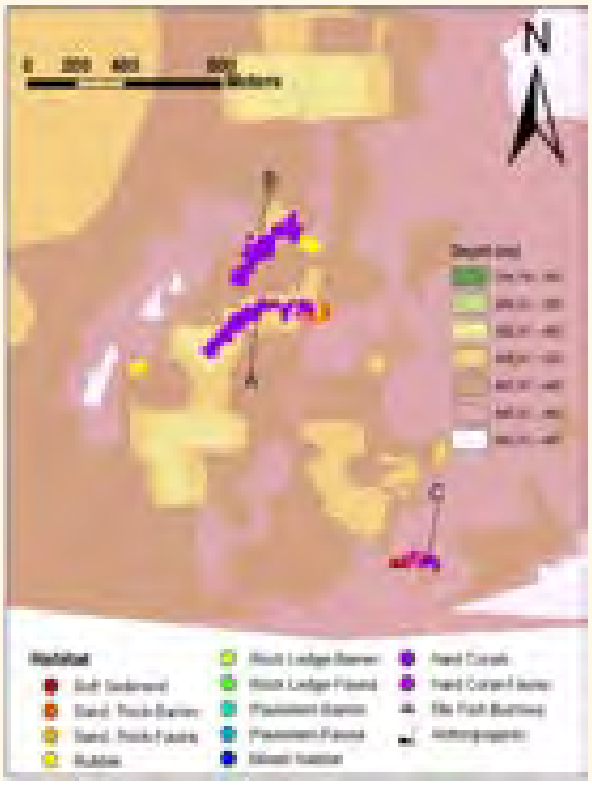
This dive was captured on 2 mini DVs and saved to 2 DVDs for archiving. The overall quality of this footage was fair-to-good. There was, however, a lot of particulate matter in the water column and currents were fairly strong. There was good footage of numerous squid over an area of hard coral habitat. The sub was stationary for the majority of the second DV.

OVERVIEW

Total Dives: 5 **Depth Range (m):** 387 to 450

GENERAL LOCATION

HABITAT CHARACTERIZATION MAP



DIVE SUMMARY FOR SITE

Dive Date	PI	Station	Method	Start-Time	End-Time	Start-Lat (N)	Start-Long (W)	End-Lat (N)	End-Long (W)
24-Sep-01	SW Ross	JSLI-4365	HOV	8:42	11:15	34° 11.344'	75° 53.795'	34° 11.406'	75° 53.743'
24-Sep-01	SW Ross	JSLI-4366	HOV	16:18	17:32	34° 10.754'	75° 53.507'	34° 10.765'	75° 53.370'
23-Aug-03	SW Ross	JSLII-3429	HOV	8:54	11:10	34° 11.151'	75° 54.028'	34° 11.421'	75° 53.753'
16-Jun-04	SW Ross	JSLI-4694	HOV	8:29	10:41	34° 11.277'	75° 53.618'	34° 11.284'	75° 53.788'
16-Jun-04	SW Ross	JSLI-4695	HOV	16:49	18:59	34° 11.406'	75° 53.647'	34° 11.411'	75° 53.739'

IMAGE GALLERY *** indicates image position is approximated**

Image A: Hard Coral
34º 11.394' N, 75º 53.778' W

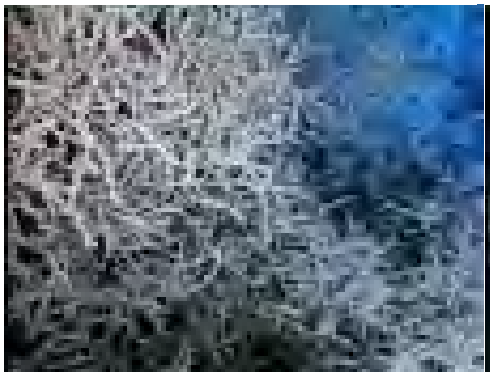


Image B: Hard Coral
34º 10.770' N, 75º 53.376' W *

Image C: Hard Coral
34º 11.250' N, 75º 53.802' W *

SITE OVERVIEW **AUTHOR** SW Ross **DATE COMPILED** 19-Dec-06

Except for a few maps, there are no published data from this coral mound. The USGS side scan survey (EEZ-SCAN 87 Scientific Staff 1991) illustrated reefs in this area, and coordinates from that survey guided the NR-1 nuclear research submersible cruise during 15-18 Nov 1993 (Sulak and Ross, unpubl. data). The same navigation issue with this cruise described in the Cape Lookout A summary was also apparent in this area. NR-1 stations were about 2-2.6 km from the major mounds located later by Ross et al. Between summer 2001 and fall 2006, Ross et al. (unpubl. data) sampled this area throughout the water column using a variety of methods. The JSL submersible was the primary method for collecting bottom data on the reef proper. Five dives were made on coral mounds in this area, and observations from these totaled about 10 hours.

These mounds may cover a similar area as those at Cape Lookout A, but again better mapping data are needed. Future mapping and data analyses may indicate that the Cape Lookout A and B banks should be combined into one area. Ross et al. JSL dives in this area ranged from 387-450 m. Mean bottom temperatures ranged from 5.8 to 10.5 ºC, and mean bottom salinities were always around 35. These mounds rise at least 60 m over a distance of at least 1 km. There is a small mound southeast of the main system, and in general these mounds were less dramatic than those at Cape Lookout A. They appeared to be of the same general construction as Bank A, built of coral rubble matrix that had trapped sediments. Extensive fields of coral rubble surrounded the area. Both living and dead corals (primarily *Lophelia pertusa*) were common on this bank, and some living bushes were quite large.

Fauna observed at this site were similar to that at Cape Lookout A. Brittle stars (*Ophiacantha bidentata*), various anemones, basket stars, and urchins (especially *Echinus* spp.) were common. Dominant mobile invertebrates included galatheoids (especially *Eumunida picta*), *Rochinia crassa,* and *Bathynectes longispina*. On the coral habitats, mostly tops and sides of mounds/ridges, the most abundant fishes were *Laemonema melanurum, L. barbatulum, Beryx decadactylus, Conger oceanicus, Dysommina rugosa, Helicolenus dactylopterus,* and *Hoplostethus occidentali*s.

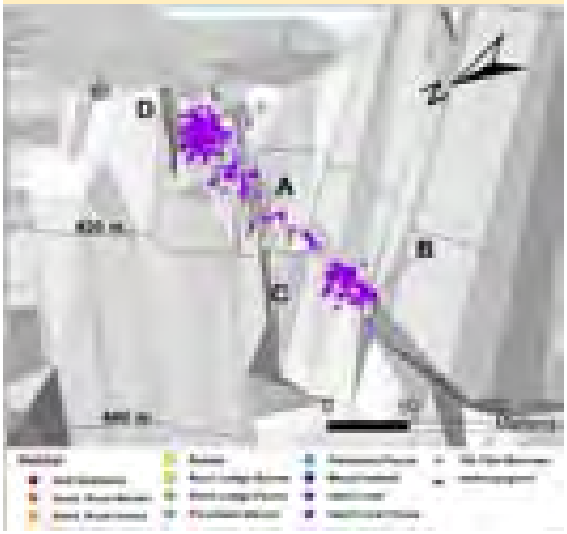
DIVE NUMBER: JSLI-4365 *STUDY AREA: Cape Lookout Lophelia B*

STATION OVERVIEW

Project	Islands in the Stream 2001
Principal investigators	SW Ross[1] KJ Sulak, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln. Wilmington NC 28409
Purpose	Continued trophodynamic studies off North Carolina; mapping of deep coral banks and ecological studies of macroinvertebrates and fishes; educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link I Submersible
Science Divers	KJ Sulak (bow), J Caruso (stern)
External Video Tapes	3 mini DVs
Internal Video Tapes	1 mini DV
Digital Still Photos	0
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Hard copies of bow and stern audio logs
Acknowledgements	NOAA-OE, USGS, UNCW, NC Coastal Reserve, NC Museum of Natural Sciences
SEADESC Analyst	AM Necaise, AM Quattrini, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	24-Sep-01
Minimum Bottom Depth (m)	410
Maximum Bottom Depth (m)	428
Start Bottom Time (EDT)	8:42
End Bottom End (EDT)	11:15
Starting Latitude (N)	34° 11.344'
Starting Longitude (W)	75° 53.795'
Ending Latitude (N)	34° 11.406'
Ending Longitude (W)	75° 53.743'
Surface Current (Kts)	
Bottom Current (Kts)	

Image A: Hard Coral
34º 11.394' N, 75º 53.778' W

DIVE NUMBER: JSLI-4365 *STUDY AREA: Cape Lookout Lophelia B*

IMAGE GALLERY

*** indicates image position is approximated**

Image B: Hard Coral
34º 11.334' N, 75º 53.796' W

Image C: Hard Coral
34º 11.352' N, 75º 53.802' W

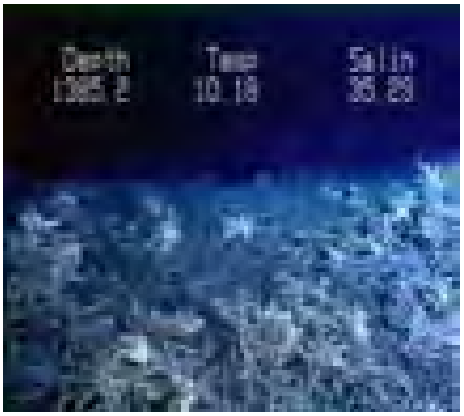


Image D: Hard Coral
34º 11.412' N, 75º 53.754' W

RELEVANT WORK AND/OR LITERATURE CITED

R/V Cape Hatteras cruises Aug 2001 & Sep 2006 (S.W. Ross, unpubl. data)
EEZ-SCAN 87 Scientific Staff (1991)
Reed and Ross (2005)
Ross and Nizinski (in press)

BIOLOGICAL ENVIRONMENT

A number of fishes were seen during this dive, though they were predominantly represented by three species, *Laemonema barbatulum, L. melanurum* and *Hoplostethus occidentalis.* The two species of *Laemonema* were common throughout the dive while *H. occidentalis* occurred more frequently in the high-relief *Lophelia* thicket areas of the dive. Other fishes seen included *Myxine glutinosa, Dysommina rugosa, Squalus cubensis, Cirrhigaleus asper* and notably *Carcharhinus altimus*. Mobile invertebrates common to this area included vast numbers of brittle stars, several spiny and pencil urchins, and a few spider crabs. The only sessile invertebrates observed were basket stars attached to some of the larger coral thickets and a number of small, ball-like sponges.

PHYSICAL ENVIRONMENT

This dive took place exclusively over hard coral habitat without attached fauna. The physical structure of this reef area varied from low relief areas of dense dead coral matrices to high-relief thickets with over 40% living *Lophelia pertusa.* A number of these thickets were heavily cemented at the bases making them seem quite dense while others were more loosely organized with numerous large interstices. Sandy areas with mixed rubble were common between the coral patches.

ADDITIONAL COMMENTS

This dive was recorded on 3 mini DVs, with no time or CTD overlay, and is archived on 3 DVDs. A large amount of footage was shot in very close proximity to the reef during attempts at capturing fish. There is some good footage of *Carcharhinus altimus* swimming over the reef.

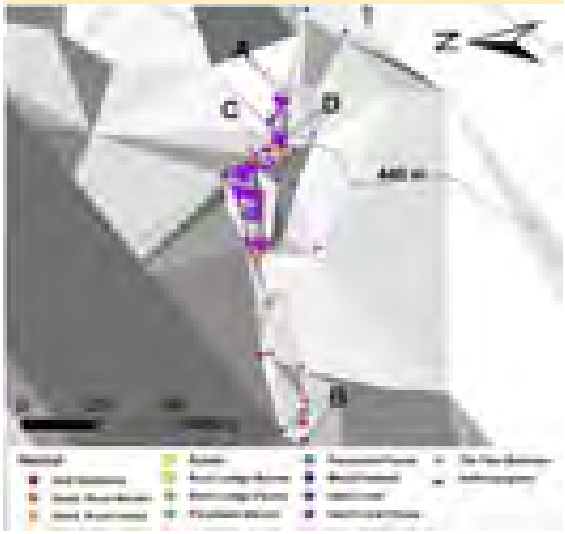
DIVE NUMBER: JSLI-4366 *STUDY AREA: Cape Lookout Lophelia B*

STATION OVERVIEW

Project	Islands in the Stream 2001
Principal investigators	SW Ross[1] KJ Sulak, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln. Wilmington NC 28409
Purpose	Continued trophodynamic studies off North Carolina; mapping of deep coral banks and ecological studies of macroinvertebrates and fishes; educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link I Submersible
Science Divers	G Dennis (bow), SW Ross (stern)
External Video Tapes	2 mini DVs
Internal Video Tapes	1 mini DV
Digital Still Photos	0
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Hard copy of bow audio log
Acknowledgements	NOAA-OE, USGS, UNCW, NC Coastal Reserve, NC Museum of Natural Sciences
SEADESC Analyst	AM Necaise, AM Quattrini, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	24-Sep-01
Minimum Bottom Depth (m)	438
Maximum Bottom Depth (m)	450
Start Bottom Time (EDT)	16:18
End Bottom End (EDT)	17:32
Starting Latitude (N)	34° 10.754'
Starting Longitude (W)	75° 53.507'
Ending Latitude (N)	34° 10.765'
Ending Longitude (W)	75° 53.370'
Surface Current (Kts)	
Bottom Current (Kts)	

Image A: Hard Coral
34º 10.770' N, 75º 53.376' W *

DIVE NUMBER: JSLI-4366 *STUDY AREA: Cape Lookout Lophelia B*

IMAGE GALLERY

*** indicates image position is approximated**

Image B: Soft Sediment
34º 10.758' N, 75º 53.460' W

Image C: Sand/Rubble/Rock-Barren
34º 10.770' N, 75º 53.406' W

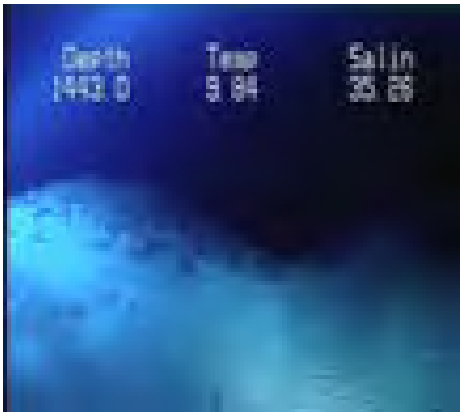


Image D: Hard Coral
34º 10.770' N. 75º 53.382' W

RELEVANT WORK AND/OR LITERATURE CITED

R/V Cape Hatteras cruises Aug 2001 & Sep 2006 (S.W. Ross, unpubl. data)
EEZ-SCAN 87 Scientific Staff (1991)
Reed and Ross (2005)
Ross and Nizinski (in press)

BIOLOGICAL ENVIRONMENT

The two species of fishes observed over soft-substrate habitat at the beginning of the dive were *Myxine glutinosa* and *Chlorophthalmus agassizi*. The most common species found over the hard coral habitat were *Laemonema barbatulum, L. melanurum* and *Helicolenus dactylopterus*. Other fishes observed in small numbers included *Nettenchelys exoria, Dysommina rugosa* and *Trachyscorpia cristulata*. Mobile invertebrates included a large number of *Rochinia crassa* over the sandy habitat as well as long worm tubes, while over the reef habitat there were occasional *Chaceon* and box crabs, spiny urchins and large numbers of brittle stars. Sessile invertebrates were limited to sparsely located flytrap anemones. No other corals or reef building sponges were observed during the dive.

PHYSICAL ENVIRONMENT

This dive begins over low-relief soft-sediment habitat. Scattered clumps of dead *Sargassum* were found across this habitat. Soft substrate transitioned into a narrow sand/rubble/rock area without attached fauna. This habitat changed abruptly into hard coral habitat of low to moderate relief. The remainder of the dive was spent over rolling dune-like mounds of sand capped by hard corals. The extent, relief and health of the coral was variable amongst the dunes. The small mounds encountered near the end of the dive had an increased percentage of live *Lophelia pertusa* up to 75% in some instances.

ADDITIONAL COMMENTS

This dive was covered over 2 mini DVs and converted to 2 DVDs for archiving. There was no time or CTD overlay during this dive. The dive was aborted shortly after the beginning of the second DV, and therefore, there was limited survey footage of the reef area. Footage was occasionally too dark for habitat classification. There was a lot of footage (~40 min) of attempts to rotenone and capture fish, which took up the majority of the first DV.

DIVE NUMBER: JSLII-3429 *STUDY AREA: Cape Lookout Lophelia B*

STATION OVERVIEW

Project	Life on the Edge 2003
Principal investigators	SW Ross[1] KJ Sulak, MS Nizinski, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Mapping of deep coral banks, ecological studies of macroinvertebrates and fishes, paleoclimate studies, coral genetics and educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link II Submersible
Science Divers	KJ Sulak (bow), AM Quattrini (stern)
External Video Tapes	3 mini DVs
Internal Video Tapes	1 mini DV
Digital Still Photos	203
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Hard copy of bow audio log
Acknowledgements	NOAA-OE, NOAA Fisheries, USGS, UNCW, NC Museum of Natural Sciences
SEADESC Analyst	AM Necaise, AM Quattrini, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:

DIVE DATA

Date	23-Aug-03
Minimum Bottom Depth (m)	412
Maximum Bottom Depth (m)	450
Start Bottom Time (EDT)	8:54
End Bottom End (EDT)	11:10
Starting Latitude (N)	34° 11.151'
Starting Longitude (W)	75° 54.028'
Ending Latitude (N)	34° 11.421'
Ending Longitude (W)	75° 53.753'
Surface Current (Kts)	
Bottom Current (Kts)	0.1

Image A: Hard Coral
34º 11.406' N, 75º 53.754' W

DIVE NUMBER: JSLII-3429 *STUDY AREA: Cape Lookout Lophelia B*

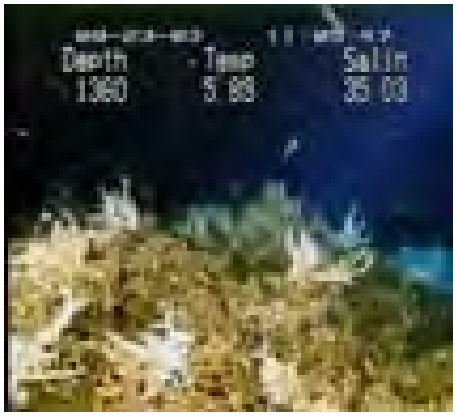
IMAGE GALLERY

*** indicates image position is approximated**

Image B: Hard Coral
34º 11.412' N, 75º 53.754' W

Image C: Hard Coral
34º 11.412' N, 75º 53.766' W

Image D: Hard Coral
34º 11.418' N, 75º 53.754' W *



RELEVANT WORK AND/OR LITERATURE CITED

R/V Cape Hatteras cruises Aug 2001& Sep 2006 (S.W. Ross, unpubl. data)
EEZ-SCAN 87 Scientific Staff (1991)
Reed and Ross (2005)
Ross and Nizinski (in press)

BIOLOGICAL ENVIRONMENT

The most common species observed during this dive were *Laemonema barbatulum, L. melanurum, Polyipnus clarus* and *Hoplostethus occidentalis*. Other species present included *Myxine glutinosa, Maurolicus weitzmani* and *Dysommina rugosa.* A tremendous number of amphipods and/or mysids were found in the water column over the reef throughout the second half of the dive. Next to these, the most common mobile invertebrates were spiny urchins, *Eumunida picta* and *Rochinia crassa*. Sessile invertebrates were less common, with only scattered anemones, basket stars and sparse living *Lophelia pertusa.*

PHYSICAL ENVIRONMENT

The dive began over a sloping rubble habitat, but the transition to the main hard coral reef was not recorded. The second DV began almost 100' shallower than the first DV ended. The second half of the dive covered a dense, complex *Lophelia* thicket of moderate-to-high-relief with large interstices. Most of the coral was dead with live coral only at the tips, though there were scattered large colonies of living *Lophelia*.

ADDITIONAL COMMENTS

This dive was recorded on 2 mini DVs and saved to 2 DVDs. The first DV contained only 5 minutes of very dark video. The second DV began a full hour after the first one ended. There was no internal bow video from which to recover the lost data. At times, the footage on the second DV was filmed too close, out of focus, too bright or pointing out into the water column. There was condensation on the inner lens of the camera that at times obscured the view.

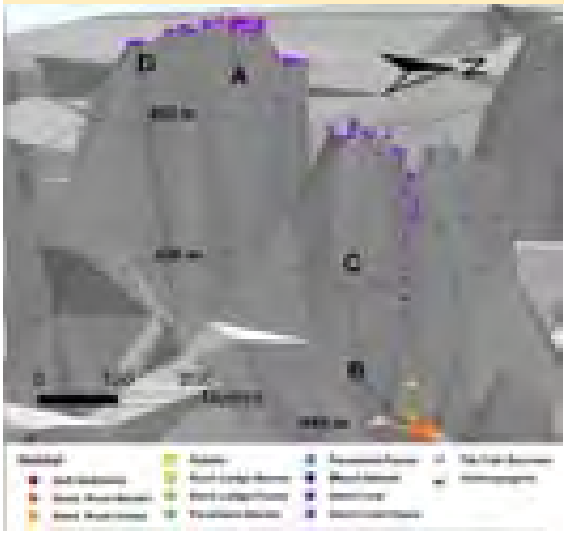
DIVE NUMBER: JSLI-4694 *STUDY AREA: Cape Lookout Lophelia B*

STATION OVERVIEW

Project	Life on the Edge 2004
Principal investigators	SW Ross[1] KJ Sulak, MS Nizinski, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Mapping of deep coral banks, ecological studies of macroinvertebrates and fishes, paleoclimate studies, coral genetics and educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link I Submersible
Science Divers	SW Ross (bow), TL Casazza (stern)
External Video Tapes	3 mini DVs, 2 HDs
Internal Video Tapes	3 mini DVs
Digital Still Photos	0
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Hard copy of stern audio log
Acknowledgements	NOAA-OE, NOAA Fisheries, USGS, UNCW, NC Museum of Natural Sciences
SEADESC Analyst	AM Necaise, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	16-Jun-04
Minimum Bottom Depth (m)	387
Maximum Bottom Depth (m)	440
Start Bottom Time (EDT)	8:29
End Bottom End (EDT)	10:41
Starting Latitude (N)	34° 11.277'
Starting Longitude (W)	75° 53.618'
Ending Latitude (N)	34° 11.284'
Ending Longitude (W)	75° 53.788'
Surface Current (Kts)	
Bottom Current (Kts)	0.6

Image A: Hard Coral
34º 11.250' N, 75º 53.802' W *

DIVE NUMBER: JSLI-4694 *STUDY AREA: Cape Lookout Lophelia B*

IMAGE GALLERY

*** indicates image position is approximated**

Image B: Sand/Rubble/Rock-Barren
34º 11.262' N, 75º 53.616' W *

Image C: Hard Coral
34º 11.274' N, 75º 53.640' W

Image D: Hard Coral
34º 11.232' N, 75º 53.826' W

RELEVANT WORK AND/OR LITERATURE CITED

R/V Cape Hatteras cruises Aug 2001 & Sep 2006 (S.W. Ross, unpubl. data)
EEZ-SCAN 87 Scientific Staff (1991)
Reed and Ross (2005)
Ross and Nizinski (in press)

BIOLOGICAL ENVIRONMENT

On the rubble and sand/rubble habitats, several *Laemonema barbatulum* and one squalid shark were observed. Invertebrates were not as common in these habitats as they were in the hard coral habitat. Brittle stars were the most abundant invertebrate in the hard coral (*Lophelia pertusa*) habitat area, covering the surface of and occupying all spaces in the dead coral matrices. Other invertebrates observed in the hard coral area were a few anemones, fly trap anemones, urchins, sea stars, squid, hexactinellid sponges, *Novodinia antillensis,* and *Eumunida picta.* Fishes were also more diverse in the hard coral habitat, and included *Conger oceanicus, Dysommina rugosa, Beryx decadactylus,* and *Hoplostethus occidentalis.*

PHYSICAL ENVIRONMENT

A strong current was present during most of this dive as the submersible traversed over three different habitat types: sand/coral rubble, coral rubble, and hard coral (*Lophelia pertusa*). Attached fauna was sparse throughout all habitats. Sand mixed with some coral rubble was on the base of a slope, whereas coral rubble was observed up slope. *Lophelia pertusa* was present near and at the top of the slope in large mounds that were densely packed and made up of mostly dead coral. Few (~10%) twigs and bushes of live coral were present throughout this area. Few anemones were sparsely attached to these dead coral mounds.

ADDITIONAL COMMENTS

This dive was recorded on 3 mini DVs and archived on 3 DVDs. The third DV has only 5 minutes of video. There is good footage of a *Conger oceanicus*.

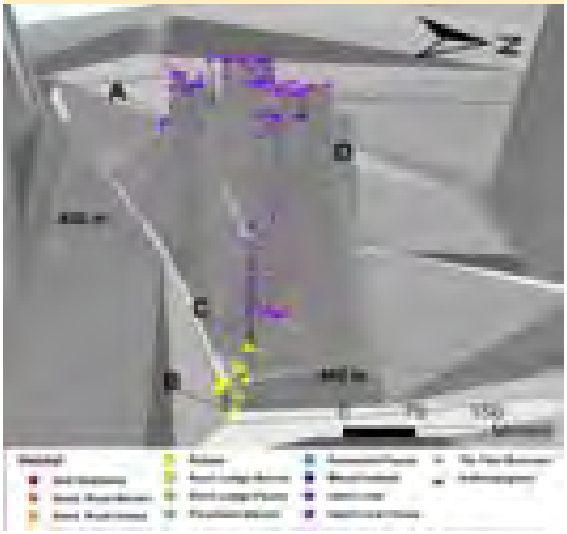
DIVE NUMBER: JSLI-4695 *STUDY AREA: Cape Lookout Lophelia B*

STATION OVERVIEW

Project	Life on the Edge 2004
Principal investigators	SW Ross[1] KJ Sulak, MS Nizinski, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Mapping of deep coral banks, ecological studies of macroinvertebrates and fishes, paleoclimate studies, coral genetics and educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link I Submersible
Science Divers	KJ Sulak (bow), C Morrison (stern)
External Video Tapes	2 mini DVs, 2 HDs
Internal Video Tapes	1 mini DVs
Digital Still Photos	30
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Hard copy of stern audio log
Acknowledgements	NOAA-OE, NOAA Fisheries, USGS, UNCW, NC Museum of Natural Sciences
SEADESC Analyst	AM Necaise, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	16-Jun-04
Minimum Bottom Depth (m)	407
Maximum Bottom Depth (m)	442
Start Bottom Time (EDT)	16:49
End Bottom End (EDT)	18:59
Starting Latitude (N)	34° 11.406'
Starting Longitude (W)	75° 53.647'
Ending Latitude (N)	34° 11.411'
Ending Longitude (W)	75° 53.739'
Surface Current (Kts)	
Bottom Current (Kts)	0.4

Image A: Hard Coral
34º 11.388' N, 75º 53.772' W

DIVE NUMBER: JSLI-4695 *STUDY AREA: Cape Lookout Lophelia B*

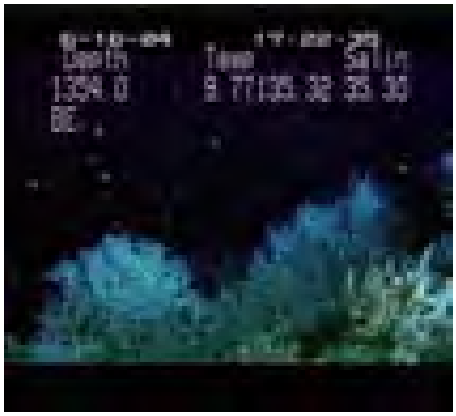
IMAGE GALLERY

*** indicates image position is approximated**

Image B: Rubble
34º 11.406' N, 75º 53.634' W *

Image C:Rubble
34º 11.000' N, 75º 53.670' W

Image D: Hard Coral
34º 11.454' N, 75º 53.688' W



RELEVANT WORK AND/OR LITERATURE CITED

R/V Cape Hatteras cruises Aug 2001 & Sep 2006 (S.W. Ross, unpubl. data)
EEZ-SCAN 87 Scientific Staff (1991)
Reed and Ross (2005)
Ross and Nizinski (in press)

BIOLOGICAL ENVIRONMENT

Several fishes and invertebrates were observed in coral rubble and hard coral habitats. *Nezumia aequalis, Helicolenus dactylopterus, Laemonema barbatulum, Chlorophthalmus agassizi* and a few pencil urchins were observed in the rubble zone. In the hard coral area, a few *Hoplostethus occidentalis, Beryx decadactylus,* and *Laemonema melanurum* were observed. Mobile invertebrates were common, including brittle stars, pencil urchins, *Eumunida picta*, sea stars, and *Echinus* spp. Sessile invertebrates included few *Novodinia antillensis* and anemones attached to *Lophelia pertusa.*

PHYSICAL ENVIRONMENT

Near the base of a large slope, coral rubble was the dominant substrate. As the submersible transected up slope, an extensive *L. pertusa* habitat was observed. On the face of the slope, *Lophelia* was mostly dead, with few standing twigs and bushes of live coral with low relief < 1 m. The submersible passed over the crests of several slopes, where mostly (50-90%) live *Lophelia* was found in large bushes with very high relief (up to 5 m). Sparse attached fauna was observed in both habitats.

ADDITIONAL COMMENTS

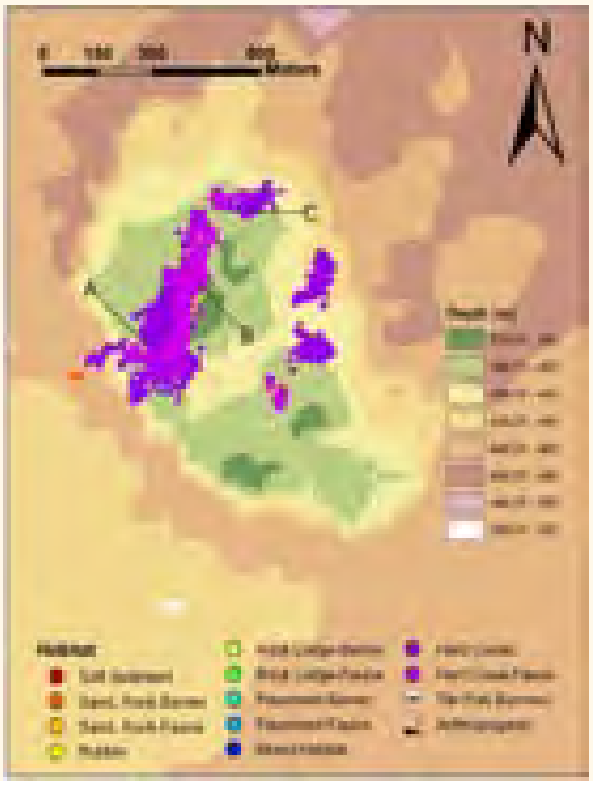
This dive was recorded on 2 mini DVs and archived on 2 DVDs. At times, video transects were underlit and the color balance was off for the majority of the dive giving a green cast to the footage. Most of the video on the second DV was close-up footage during submersible collections.

OVERVIEW

Total Dives: 7 **Depth Range (m):** 368 to 449

GENERAL LOCATION

HABITAT CHARACTERIZATION MAP



DIVE SUMMARY FOR SITE

Dive Date	PI	Station	Method	Start-Time	End-Time	Start-Lat (N)	Start-Long (W)	End-Lat (N)	End-Long (W)
13-Aug-02	SW Ross	JSLII-3308	HOV	8:29	10:58	33° 34.330'	76° 28.054'	33° 34.434'	76° 27.905'
21-Aug-03	SW Ross	JSLII-3425	HOV	8:21	10:47	33° 34.380'	76° 27.930'	33° 34.465'	76° 27.866'
21-Aug-03	SW Ross	JSLII-3426	HOV	16:36	19:03	33° 34.381'	76° 27.906'	33° 34.326'	76° 27.911'
22-Aug-03	SW Ross	JSLII-3427	HOV	8:33	10:51	33° 34.280'	76° 27.750'	33° 34.477'	76° 27.697'
22-Aug-03	SW Ross	JSLII-3428	HOV	16:11	18:17	33° 34.384'	76° 27.949'	33° 34.441'	76° 27.886'
17-Jun-04	SW Ross	JSLI-4696	HOV	8:31	10:25	33° 34.367'	76° 27.708'	33° 34.360'	76° 27.670'
17-Jun-04	SW Ross	JSLI-4697	HOV	16:42	18:24	33° 34.570'	76° 27.835'	33° 34.589'	76° 27.773'

IMAGE GALLERY *** indicates image position is approximated**

Image A: Hard Coral
33º 34.398' N, 76º 27.948' W

Image B: Hard Coral-Fauna
33º 34.422' N, 76º 27.882' W

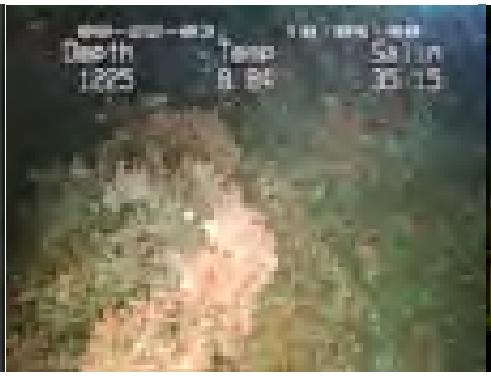


Image C: Hard Coral
33º 34.554' N, 76º 27.792' W

SITE OVERVIEW **AUTHOR** SW Ross **DATE COMPILED** 19-Dec-06

Aside from the map in EEZ-SCAN 87 Scientific Staff (1991) there are no published data from this coral mound and no indication that it was sampled before the studies initiated by Ross et al. (unpubl. data) from 2002-2004. Ross et al. located this bank using coordinates estimated from the USGS survey (EEZ-SCAN 87 Scientific Staff 1991). The JSL submersible was the primary method for collecting bottom data on the reef proper. Seven dives were made on coral mounds in this area, and observations from these totaled about 16 hours.

Sampling in this area was focused on a relatively small area, but data are lacking to accurately estimate the size and area covered by coral mounds or rubble zones. Unlike the Cape Lookout banks, this mound appears to be a single, large mound with a rugged, creviced top and sides. Ross et al. JSL dives in this area ranged from 368-449 m. Mean bottom temperatures ranged from 8.7 to 11.7 ºC, and mean bottom salinities were always near 35. This main mound rises nearly 80 m over a distance of about 0.4 km, and exhibits some of the most rugged habitat and vertical exaggeration of any area sampled. This mound system also appears to be of the same general construction as Cape Lookout banks A and B, being built of coral rubble matrix with trapped sediments. Both living and dead corals (*Lophelia pertusa*) were common on this bank, as were fields of coral rubble. In some areas, dead corals occurred as a thick matrix of large, low profile, compacted branches, thickets, bushes, and/or rubble.

Fauna observed at this site were similar to Cape Lookout A and B. Brittle stars (*Ophiacantha bidentata)*, various anemones, basket stars, and urchins (especially *Echinus* spp.) were common. In some areas, anemones were very abundant and almost blanketed the dead coral. Dominant mobile invertebrates included galatheoids (especially *Eumunida picta*), *Rochinia crassa*, and *Bathynectes longispina*. On the tops and sides of the mounds/ridges, the most abundant fishes were *Laemonema melanurum, L. barbatulum, Beryx decadactylus*, *Conger oceanicus, Nezumia sclerorhynchus, Polyprion americanus, Helicolenus dactylopterus,* and *Hoplostethus occidentalis.* This was the only North Carolina site where commercially valuable wreckfish (*Polyprion americanus*) were observed.

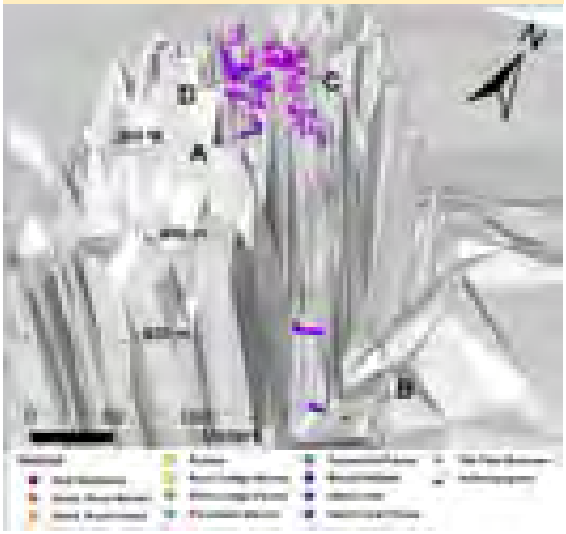
DIVE NUMBER: JSLII-3308 *STUDY AREA: Cape Fear Lophelia*

STATION OVERVIEW

Project	Islands in the Stream 2002
Principal investigators	SW Ross[1] KJ Sulak, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Mapping of deep coral banks, ecological studies of macroinvertebrates and fishes, and educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link II Submersible
Science Divers	SW Ross (bow), M Nizinski (stern)
External Video Tapes	2 mini DVs
Internal Video Tapes	4 mini DVs
Digital Still Photos	0
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Hard copies of bow and stern audio logs
Acknowledgements	NOAA-OE, USGS, UNCW, NC Coastal Reserve, NC Museum of Natural Sciences
SEADESC Analyst	AM Necaise, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	13-Aug-02
Minimum Bottom Depth (m)	368
Maximum Bottom Depth (m)	449
Start Bottom Time (EDT)	8:29
End Bottom End (EDT)	10:58
Starting Latitude (N)	33° 34.330'
Starting Longitude (W)	76° 28.054'
Ending Latitude (N)	33° 34.434'
Ending Longitude (W)	76° 27.905'
Surface Current (Kts)	
Bottom Current (Kts)	

Image A: Hard Coral
33º 34.398' N, 76º 27.948' W

DIVE NUMBER: JSLII-3308 *STUDY AREA: Cape Fear Lophelia*

IMAGE GALLERY *** indicates image position is approximated**

Image B: Sand/Rubble/Rock-Barren
33º 34.326' N, 76º 28.044' W

Image C: Hard Coral-Fauna
33º 34.344' N, 76º 27.906' W

Image D: Hard Coral-Fauna
33º 34.386' N, 76º 27.918' W

RELEVANT WORK AND/OR LITERATURE CITED

EEZ-SCAN 87 Scientific Staff (1991)
Reed and Ross (2005)
Ross and Nizinski (in press)

BIOLOGICAL ENVIRONMENT

A number of fishes were observed during the beginning of the dive, over low relief hard coral and scattered rubble substrata. The most common species in this area was *Laemonema barbatulum.* Also seen were *Helicolenus dactylopterus, Nezumia sclerorhynchus,* and *Polyprion americanus*. *Beryx decadactylus* were common over the high-relief reef area, with over 20 individuals seen in one location. Other species seen in low numbers over the reef were *Conger oceanicus, Helicolenus dactylopterus* and a number of other scorpaenids. A large number of mobile invertebrates were present on the reef, including *Eumunida picta, Bathynectes longispina*, spiny and pencil urchins and brittle stars. The number of sessile invertebrates observed varied, with some areas having only sparse flytrap anemones and small hydroids and others having a dense carpeting of small orange anemones that completely covered the underlying coral interspersed with flytrap anemones.

PHYSICAL ENVIRONMENT

This dive began at the base of a steep slope (~80º) on a sandy, rubble strewn area. The side of the slope was covered in dense coral rubble cemented into small mounds that graded into larger coral mounds of moderate-to-high-relief. The coral bushes near the top of the mound had a higher concentration of live *Lophelia pertusa* growth (~50%). Throughout the remainder of the dive, the habitat alternated between hard coral without attached fauna to hard coral with attached fauna. The underlying structure was typically the same in both of these habitats with rolling peaks of dense coral and valleys of sand and coral rubble.

ADDITIONAL COMMENTS

This dive was captured on 2 mini DVs and archived on 2 DVDs. The sub was frequently too far off the bottom to see the habitat clearly. Much of the wide-angle video was underlit and heavy particulates often caused backscattering of the light that was available. The video overlay was turned on and off periodically but the audio quality was good. Tthere was something on the internal lens of the camera that caused the images to seem out of focus.

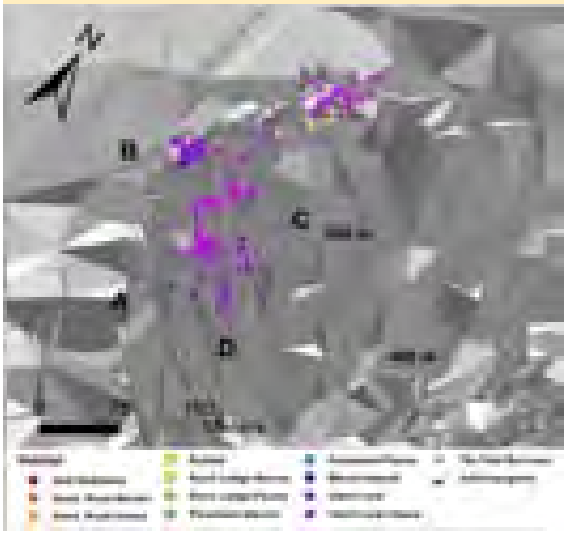
DIVE NUMBER: JSLII-3425 *STUDY AREA: Cape Fear Lophelia*

STATION OVERVIEW

Project	Life on the Edge 2003
Principal investigators	SW Ross[1] KJ Sulak, MS Nizinski, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Mapping of deep coral banks, ecological studies of macroinvertebrates and fishes, paleoclimate studies, coral genetics and educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link II Submersible
Science Divers	M Nizinski (bow), J Berg (stern)
External Video Tapes	3 mini DVs
Internal Video Tapes	1 mini DV
Digital Still Photos	0
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Hard copies of bow and stern audio logs
Acknowledgements	NOAA-OE, NOAA Fisheries, USGS, UNCW, NC Museum of Natural Sciences
SEADESC Analyst	AM Quattrini, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	21-Aug-03
Minimum Bottom Depth (m)	369
Maximum Bottom Depth (m)	394
Start Bottom Time (EDT)	8:21
End Bottom End (EDT)	10:47
Starting Latitude (N)	33° 34.380'
Starting Longitude (W)	76° 27.930'
Ending Latitude (N)	33° 34.465'
Ending Longitude (W)	76° 27.866'
Surface Current (Kts)	
Bottom Current (Kts)	0.5

Image A: Hard Coral
33º 34.314' N, 76º 27.900' W

DIVE NUMBER: JSLII-3425 *STUDY AREA: Cape Fear Lophelia*

IMAGE GALLERY

*** indicates image position is approximated**

Image B: Hard Coral-Fauna
33º 34.374' N, 76º 27.924' W

Image C: Hard Coral-Fauna
33º 34.350' N, 76º 27.882' W

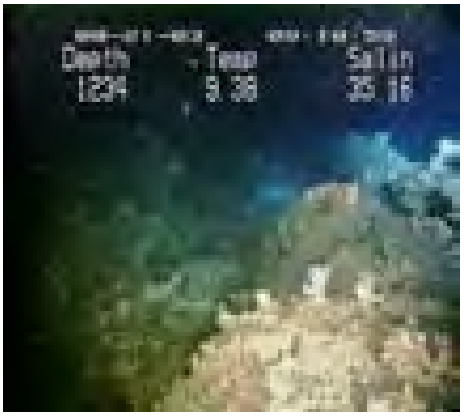
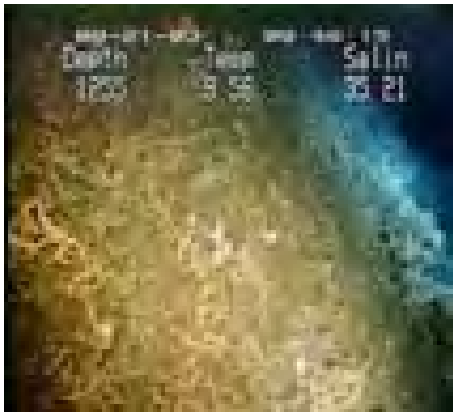


Image D: Hard Coral
33º 34.314' N, 76º 27.888' W



RELEVANT WORK AND/OR LITERATURE CITED

EEZ-SCAN 87 Scientific Staff (1991)
Reed and Ross (2005)
Ross and Nizinski (in press)

BIOLOGICAL ENVIRONMENT

A number of fish species were observed during this dive; the most common were *Polyprion americanus, Maurolicus weitzmani* and *Beryx decadactylus. Laemonema barbatulum, L. melanurum* and *Pontinus rathbuni* were also observed in low numbers. Mobile invertebrates were common throughout the dive. Brittle stars, pencil urchins, orange and flytrap anemones, and *Eumunida picta* were the most common. *Rochinia crassa*, basket stars and crinoids were also seen in moderate numbers in addition to a single, small octopus. *Lophelia pertusa* was the only hard coral observed in the area.

PHYSICAL ENVIRONMENT

The dive followed a series of steep slopes (~50º) covered in dense *Lophelia* and also crossed flat plateaus dominated by low-relief rubble. The hard coral habitats in this area generally varied between dense dead coral rubble matrices, to moderate-relief *Lophelia* bushes without attached fauna, to higher relief *Lophelia* bushes covered in dense anemone colonies. Many of the *Lophelia* growths formed intricate thickets of branching coral with large interstices.

ADDITIONAL COMMENTS

This dive was recorded on 3 mini DVs and archived on 3 DVDs. Condensation on the inner lens of the camera blurred the center of the view. Frequent overlighting of close footage, underlighting of wide-angle views, moderate amounts of marine snow and periodic static interference in the feed interfered with the quality of this video. There is, however, good footage of several different wreckfish, *Polyprion americanus.*

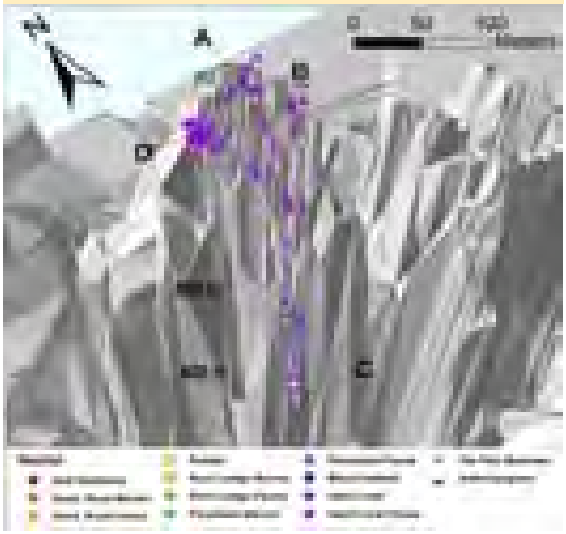
DIVE NUMBER: JSLII-3426 *STUDY AREA: Cape Fear Lophelia*

STATION OVERVIEW

Project	Life on the Edge 2003
Principal investigators	SW Ross[1] KJ Sulak, MS Nizinski, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Mapping of deep coral banks, ecological studies of macroinvertebrates and fishes, paleoclimate studies, coral genetics and educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link II Submersible
Science Divers	A Howard (bow), A Brooks (stern)
External Video Tapes	3 mini DVs
Internal Video Tapes	1 mini DV
Digital Still Photos	0
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	No bow audio log, hard copy of stern audio log
Acknowledgements	NOAA-OE, NOAA Fisheries, USGS, UNCW, NC Museum of Natural Sciences
SEADESC Analyst	AM Quattrini, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	21-Aug-03
Minimum Bottom Depth (m)	368
Maximum Bottom Depth (m)	431
Start Bottom Time (EDT)	16:36
End Bottom End (EDT)	19:03
Starting Latitude (N)	33° 34.381'
Starting Longitude (W)	76° 27.906'
Ending Latitude (N)	33° 34.326'
Ending Longitude (W)	76° 27.911'
Surface Current (Kts)	
Bottom Current (Kts)	0.1

Image A: Hard Coral-Fauna
33º 34.398' N, 76º 27.894' W

DIVE NUMBER: JSLII-3426 *STUDY AREA: Cape Fear Lophelia*

IMAGE GALLERY *** indicates image position is approximated**

Image B: Hard Coral-Fauna
33° 34.380' N, 76° 27.900' W

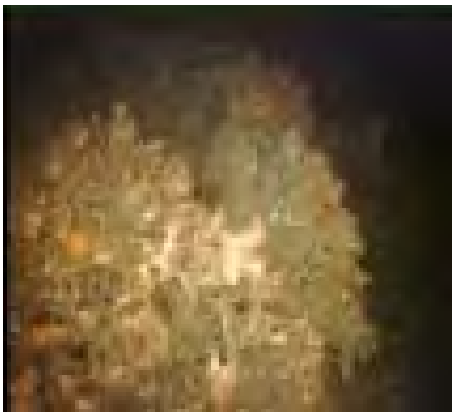


Image C: Hard Coral
33° 34.308' N, 76° 27.960' W

Image D: Hard Coral
33° 34.410' N, 76° 27.924' W *

RELEVANT WORK AND/OR LITERATURE CITED

EEZ-SCAN 87 Scientific Staff (1991)
Reed and Ross (2005)
Ross and Nizinski (in press)

BIOLOGICAL ENVIRONMENT

This dive took place over an extensive *Lophelia pertusa* reef. Of the fish species observed, the most common was *Beryx decadactylus*. *Laemonema melanurum, Helicolenus dactylopterus* and *Polyprion americanus* were also seen, though in lower numbers. *Eumunida picta* was the dominant mobile invertebrate observed. There were also a number of pencil urchins, several *Bathynectes longispina* and a single squid. Occurrence of sessile invertebrates varied throughout the dive. The areas designated as hard coral with attached fauna had a range of attached macrofauna, from several flytrap anemones on a single bush to dense carpets of orange anemones covering entire stands. Hard coral habitat without attached fauna occasionally had low concentrations of anemones and/or basket stars. The majority of the living *Lophelia* was found at the beginning of the dive where it made up ~75% of the reef.

PHYSICAL ENVIRONMENT

As noted above, this dive took place over hard coral habitat, which varied in relief and degree of attached macrofauna. The slope of the substrate also varied throughout, alternating between flat expanses and 45° slopes as the sub traveled across the top of this large feature. The underlying substrate, viewed between coral growths, was predominantly coral rubble mixed with soft-sediment.

ADDITIONAL COMMENTS

This dive was captured on 3 mini DVs and saved to 3 DVDs for archiving. There was no time/CTD overlay for any of these tapes and little audio, making it difficult to correlate video time to real time. The first DV began with the launch and included several minutes of the descent. There was condensation on the inner camera lens that caused blurriness in the center of the footage. There were also problems with color balancing and static interference in the feed. The second and third DVs were of better quality than the first.

DIVE NUMBER: JSLII-3427 *STUDY AREA: Cape Fear Lophelia*

STATION OVERVIEW

Project	Life on the Edge 2003
Principal investigators	SW Ross[1] KJ Sulak, MS Nizinski, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Mapping of deep coral banks, ecological studies of macroinvertebrates and fishes, paleoclimate studies, coral genetics and educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link II Submersible
Science Divers	KJ Sulak (bow), D Angell (stern)
External Video Tapes	3 mini DVs
Internal Video Tapes	1 mini DVs
Digital Still Photos	0
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Hard copies of bow and stern audio logs
Acknowledgements	NOAA-OE, NOAA Fisheries, USGS, UNCW, NC Museum of Natural Sciences
SEADESC Analyst	AM Quattrini, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:

DIVE DATA

Date	22-Aug-03
Minimum Bottom Depth (m)	380
Maximum Bottom Depth (m)	431
Start Bottom Time (EDT)	8:33
End Bottom End (EDT)	10:51
Starting Latitude (N)	33° 34.280'
Starting Longitude (W)	76° 27.750'
Ending Latitude (N)	33° 34.477'
Ending Longitude (W)	76° 27.697'
Surface Current (Kts)	
Bottom Current (Kts)	0.9

Image A: Hard Coral-Fauna
33º 34.308' N, 76º 27.744' W

DIVE NUMBER: JSLII-3427 *STUDY AREA: Cape Fear Lophelia*

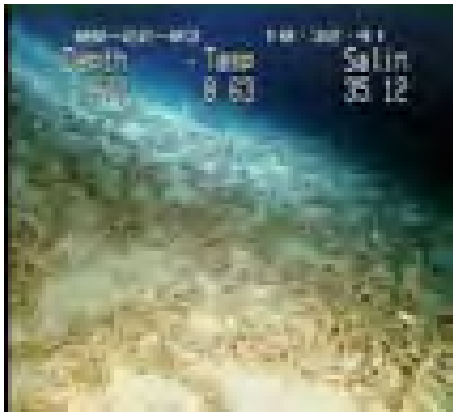
IMAGE GALLERY

*** indicates image position is approximated**

Image B: Rubble
33º 34.362' N, 76º 27.714' W

Image C: Hard Coral
33º 34.368' N, 76º 27.708' W

Image D: Hard Coral
33º 34.440' N, 76º 27.690' W



RELEVANT WORK AND/OR LITERATURE CITED

EEZ-SCAN 87 Scientific Staff (1991)
Reed and Ross (2005)
Ross and Nizinski (in press)

BIOLOGICAL ENVIRONMENT

The most abundant species observed during this dive was *Maurolicus weitzmani,* owing to a school of several hundred encountered half-way through the dive. Other common, though more dispersed species, were *Hoplostethus* and *Laemonema barbatulum*. Several other species were represented by only one or two individuals, such as *Helicolenus dactylopterus, Scyliorhinus retifer*, and *Polyipnus clarus*. Brittle stars were the most abundant mobile invertebrates observed during the dive. *Eumunida picta*, pencil urchins and spiny urchins were also observed, though in lower numbers. Though this dive took place over predominantly hard coral habitat, there was very little live *Lophelia* present (<10%). Numerous orange anemones covered the coral at the beginning of the dive (Images A & B), but were largely absent during the remainder of the dive.

PHYSICAL ENVIRONMENT

This dive took place over the top of this large feature, alternating between steep (~45º) slopes and flat plains. Most of the hard coral habitat in the area was low-to-moderate-relief with little living *Lophelia* (5-10%) and often consisting of dense dead coral matrices rather than bushes. The coral rubble in the rubble habitat had less structure than the dead coral matrices.

ADDITIONAL COMMENTS

This dive was recorded on 2 mini DVs and archived on 2 DVDs. Most of the footage was of habitat and fishes filmed in close up while the sub was stationary. At times, the view was out of focus, too dark, or blurred from condensation on the inner camera lens.

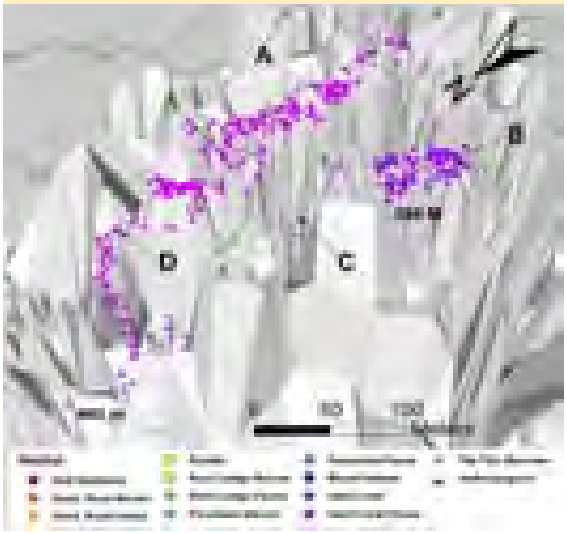
DIVE NUMBER: JSLII-3428 *STUDY AREA: Cape Fear Lophelia*

STATION OVERVIEW

Project	Life on the Edge 2003
Principal investigators	SW Ross[1] KJ Sulak, MS Nizinski, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Mapping of deep coral banks, ecological studies of macroinvertebrates and fishes, paleoclimate studies, coral genetics and educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link II Submersible
Science Divers	AM Necaise (bow), M Randall (stern)
External Video Tapes	2 mini DVs
Internal Video Tapes	0
Digital Still Photos	0
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Hard copy of stern audio log
Acknowledgements	NOAA-OE, NOAA Fisheries, USGS, UNCW, NC Museum of Natural Sciences
SEADESC Analyst	AM Necaise, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	22-Aug-03
Minimum Bottom Depth (m)	368
Maximum Bottom Depth (m)	397
Start Bottom Time (EDT)	16:11
End Bottom End (EDT)	18:17
Starting Latitude (N)	33° 34.384'
Starting Longitude (W)	76° 27.949'
Ending Latitude (N)	33° 34.441'
Ending Longitude (W)	76° 27.886'
Surface Current (Kts)	
Bottom Current (Kts)	0.7

Image A: Hard Coral-Fauna
33º 34.422' N, 76º 27.882' W

DIVE NUMBER: JSLII-3428 *STUDY AREA: Cape Fear Lophelia*

IMAGE GALLERY

*** indicates image position is approximated**

Image B: Hard Coral-Fauna
33º 34.374' N, 76º 27.936' W

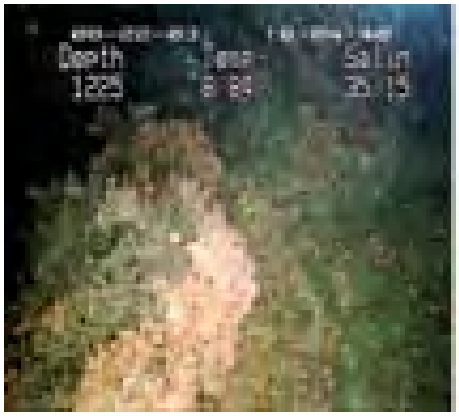


Image C: Hard Coral
33º 34.440' N, 76º 27.912' W

Image D: Hard Coral
33º 34.512' N, 76º 27.858' W

RELEVANT WORK AND/OR LITERATURE CITED

EEZ-SCAN 87 Scientific Staff (1991)
Reed and Ross (2005)
Ross and Nizinski (in press)

BIOLOGICAL ENVIRONMENT

A large variety of fish species were observed during this dive, though most were represented by only a few individuals. The most common were *Polyprion americanus, Laemonema melanurum* and *L. barbatulum*. Others seen included *Conger oceanicus, Nezumia sclerorhynchus, Scyliorhinus meadi* and *Helicolenus dactylopterus. Eumunida picta* was the most common mobile invertebrate, followed by unidentified spiny urchins. *Rochinia crassa* and *Chaceon* crabs were seen occasionally. Sessile attahed invertebrates were dominant in one portion of this dive, with orange and flytrap anemones forming dense carpets over the top of dead *Lophelia pertusa* reefs. In other areas small sponges and flytrap anemones were scattered across the reef in low numbers.

PHYSICAL ENVIRONMENT

This dive took place primarily along the top of this large feature, traveling down a steep (~45º) slope to a valley floor and up another similarly steep slope. The base of these slopes contained a dense dead coral matrix of low-relief that was covered with thousands of small orange anemones and large flytrap anemones. Most of the coral habitat encountered during this dive had almost no living *Lophelia* (<5%), though some areas near the beginning had large bushes of healthy *Lophelia* growth (>50%).

ADDITIONAL COMMENTS

This dive was captured on 2 mini DVs and archived on 2 DVDs. There was some kind of material on the inner camera lens that obscured some details and caused blurriness. Additionally, the first DV did not begin until after the sub had been on bottom for almost 15 minutes, and there was no internal video from which to recover these data. There was no time/CTD overlay for the majority of the dive, though it did come on for short periods that allowed for correlations to be made between video time and real time.

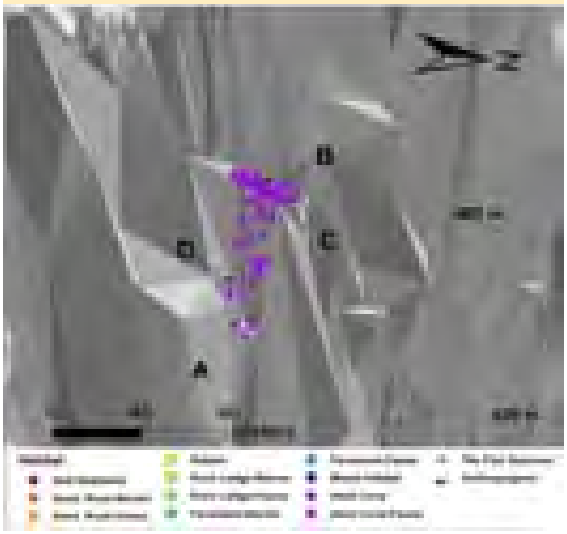
DIVE NUMBER: JSLI-4696 *STUDY AREA: Cape Fear Lophelia*

STATION OVERVIEW

Project	Life on the Edge 2004
Principal investigators	SW Ross[1] KJ Sulak, MS Nizinski, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Mapping of deep coral banks, ecological studies of macroinvertebrates and fishes, paleoclimate studies, coral genetics and educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link I Submersible
Science Divers	A Brooks (bow), M Nizinski (stern)
External Video Tapes	2 mini DVs, 1 HD
Internal Video Tapes	3 mini DVs
Digital Still Photos	0
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Copies of bow and stern audio logs
Acknowledgements	NOAA-OE, NOAA Fisheries, USGS, UNCW, NC Museum of Natural Sciences
SEADESC Analyst	AM Necaise, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	17-Jun-04
Minimum Bottom Depth (m)	389
Maximum Bottom Depth (m)	402
Start Bottom Time (EDT)	8:31
End Bottom End (EDT)	10:25
Starting Latitude (N)	33° 34.367'
Starting Longitude (W)	76° 27.708'
Ending Latitude (N)	33° 34.360'
Ending Longitude (W)	76° 27.670'
Surface Current (Kts)	
Bottom Current (Kts)	1.1

Image A: Hard Coral
33º 34.350' N, 76º 27.678' W

DIVE NUMBER: JSLI-4696 *STUDY AREA: Cape Fear Lophelia*

IMAGE GALLERY *** indicates image position is approximated**

Image B: Hard Coral
33º 34.368' N, 76º 27.702' W

Image C: Hard Coral
33º 34.368' N, 76º 27.684' W *

Image D: Hard Coral
33º 34.350' N, 76º 27.702' W

RELEVANT WORK AND/OR LITERATURE CITED

EEZ-SCAN 87 Scientific Staff (1991)
Reed and Ross (2005)
Ross and Nizinski (in press)

BIOLOGICAL ENVIRONMENT

Thousands of brittle stars covered the substrate (mostly dead *Lophelia pertusa*) in this area. In addition, *Echinus tylodes*, *Eumunida picta*, pencil urchins, fly trap anemones, and sea stars were observed. Only four individuals of three fish species were observed: *Laemonema barbatulum, Helicolenus dactylopterus,* and *Chaunax stigmaeus*.

PHYSICAL ENVIRONMENT

A strong current was evident on bottom and a lot of particulate matter was in the water column. A dense, dead, hard coral (*Lophelia pertusa*) matrix covered the slope and slope crests in this area. In some areas, there were small patches of thick layers of broken pieces of coral rubble interspersed with sand channels. In other areas, there were patches of dense, cemented coral rubble, which created a standing "matrix" of dead, hard coral. Throughout this area, there were standing twigs or small bushes of live *L. pertusa*; however, 95% of coral observed was dead.

ADDITIONAL COMMENTS

This dive was captured on 2 mini DVs and saved to 2 DVDs for archiving. The majority of both DVs contains zoomed footage with little perspective on the surrounding habitat. The submersible spent most of this dive in a stationary position, collecting specimens and videotaping in close-up mode.

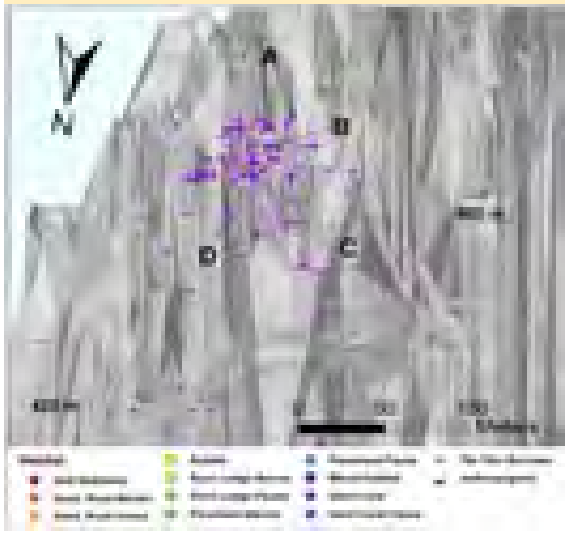
DIVE NUMBER: JSLI-4697 *STUDY AREA: Cape Fear Lophelia*

STATION OVERVIEW

Project	Life on the Edge 2004
Principal investigators	SW Ross[1] KJ Sulak, MS Nizinski, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Mapping of deep coral banks, ecological studies of macroinvertebrates and fishes, paleoclimate studies, coral genetics and educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link I Submersible
Science Divers	SW Ross (bow), AM Quattrini (stern)
External Video Tapes	2 mini DVs
Internal Video Tapes	3 mini DVs
Digital Still Photos	0
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	No stern audio log
Acknowledgements	NOAA-OE, NOAA Fisheries, USGS, UNCW, NC Museum of Natural Sciences
SEADESC Analyst	AM Necaise, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	17-Jun-04
Minimum Bottom Depth (m)	394
Maximum Bottom Depth (m)	411
Start Bottom Time (EDT)	16:42
End Bottom End (EDT)	18:24
Starting Latitude (N)	33° 34.570'
Starting Longitude (W)	76° 27.835'
Ending Latitude (N)	33° 34.589'
Ending Longitude (W)	76° 27.773'
Surface Current (Kts)	
Bottom Current (Kts)	0.7

Image A: Hard Coral
33º 34.560' N, 76º 27.798' W

DIVE NUMBER: JSLI-4697 *STUDY AREA: Cape Fear Lophelia*

IMAGE GALLERY

*** indicates image position is approximated**

Image B: Hard Coral
33º 34.554' N, 76º 27.792' W

Image C: Hard Coral
33º 34.560' N, 76º 27.798' W

Image D: Hard Coral
33º 33.566' N, 76º 27.786' W

RELEVANT WORK AND/OR LITERATURE CITED

EEZ-SCAN 87 Scientific Staff (1991)
Reed and Ross (2005)
Ross and Nizinski (in press)

BIOLOGICAL ENVIRONMENT

Brittle stars, *Echinus* spp., *Eumunida picta*, anemones, and hexactinellid sponges were abundant invertebrates observed in this *Lophelia pertusa* habitat. Fishes were uncommon; however, *Polyprion americanus* was most abundant. Other fishes observed included scorpaenids, *Laemonema barbatulum*, and *Chaunax stigmaeus.*

PHYSICAL ENVIRONMENT

The habitat observed during this dive was very similar to dive JSLI-4696. Overall, the habitat was standing dense, dead hard coral (*Lophelia pertusa*) matrix, mixed with patches of coral rubble and coarse sand. Small standing twigs and bushes of live *Lophelia pertusa* were also observed. Attached fauna were common and included small, pink anemones, fly trap anemones, and hexactinellid sponges. A strong current was apparent during this dive.

ADDITIONAL COMMENTS

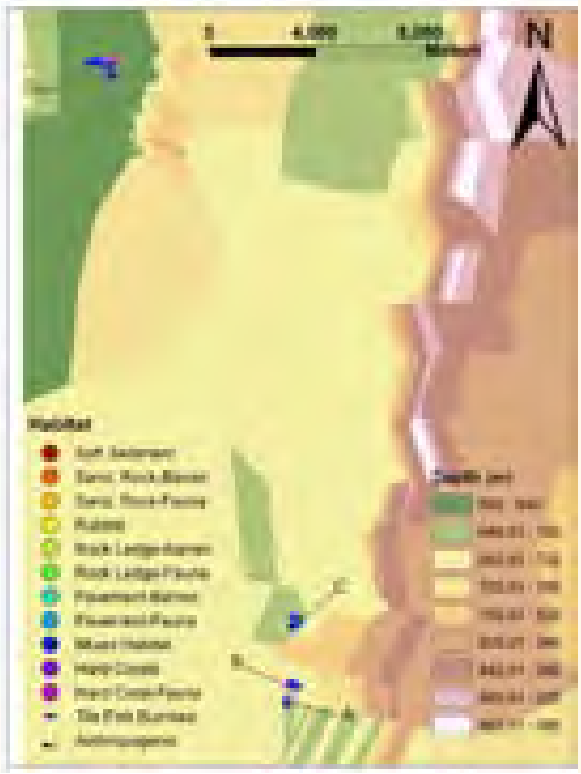
This dive was captured on 2 mini DVs and saved to 2 DVDs for archiving. At times, transects were underlit, there were long stretches of closely zoomed data, and there was interference from the video feed. The sub also frequently left the bottom, making habitat classifications difficult.

OVERVIEW

Total Dives: 5 **Depth Range (m):** 592 to 721

GENERAL LOCATION

HABITAT CHARACTERIZATION MAP



DIVE SUMMARY FOR SITE

Dive Date	PI	Station	Method	Start-Time	End-Time	Start-Lat (N)	Start-Long (W)	End-Lat (N)	End-Long (W)
17-Aug-03	SW Ross	JSLII-3419	HOV	8:40	10:51	32° 01.746'	77° 40.441'	32° 02.005'	77° 40.486'
17-Aug-03	SW Ross	JSLII-3420	HOV	16:18	18:24	32° 02.012'	77° 40.706'	32° 02.039'	77° 40.927'
13-Jun-04	SW Ross	JSLI-4689	HOV	8:37	10:37	31° 49.153'	77° 36.770'	31° 49.153'	77° 36.195'
18-Jun-04	SW Ross	JSLI-4698	HOV	9:42	11:31	31° 49.454'	77° 36.693'	31° 49.561'	77° 36.788'
18-Jun-04	SW Ross	JSLI-4699	HOV	16:59	19:09	31° 50.895'	77° 36.724'	31° 50.751'	77° 36.774'

IMAGE GALLERY *** indicates image position is approximated**

Image A: Hard Coral-Fauna
31º 49.212' N, 77º 36.804' W

Image B: Hard Coral-Fauna
31º 49.542' N, 77º 36.828' W

Image C: Mixed Habitat
31º 50.730' N, 77º 36.666' W

SITE OVERVIEW **AUTHOR** SW Ross, AM Quattrini **DATE COMPILED** 19-Dec-06

The Stetson area is a very large region of extremely diverse, rugged topography and bottom types. Many mounds and ridges were surveyed by depth sounder in 1956, 1957, 1959, and 1960 (Stetson et al. 1962). However, these features were not confirmed to support extensive coral habitat until they were dredged and photographed in 1961 (Stetson 1961; Stetson et al. 1969). Stetson et al. (1962) gave the first detailed accounting of SEUS coral banks in an area now called the 'Stetson Banks', confirming that the major hard corals were *L. pertusa* and *Enallopsammia* (=*Dendrophyllia*) *profunda*. They also reported species of *Bathypsammia*, *Caryophyllia*, and *Balanophyllia* as well as abundant alcyonarians. There is a deep canyon on the eastern side of this system with abundant corals on its western rim. While the surface waters of Stetson Bank can be outside the main Gulf Stream axis, bottom currents can be quite strong. This is one of the deeper and more interesting coral areas on the Blake Plateau and warrants further exploration.

Ross et al. completed five JSL dives in 2003-2004, surveying a depth range of 592-721 m. Mean temperatures ranged from 9.9 to 12.2 ºC, whereas salinities were constant around 35. Habitats observed included rock ledge, rubble, and hard coral, typically with attached fauna.

Corals and other sessile invertebrates were diverse in the Stetson area, and much different from the North Carolina sites. Corals that commonly occurred included solitary colonies of *L. pertusa* and *E. profunda*, and *Leiopathes* spp., *Bathypathes* spp., *Plumerella* spp., other alcyonaceans, zoanthids, and solitary cup corals. These corals occurred primarily on the slopes and crests of ridges. Several species of sponges, hydroids, and anemones were also frequently observed. Generally sessile species were attached to hard substrate, small rock ledges, or on rubble and consolidated sand. This rubble-sand substrate may have overlain hard substrate; however, this was difficult to discern with certainty.

Mobile invertebrates were common in the Stetson area, and included galatheids, *Bathynectes longispina, Echinus tylodes* and a variety of sea stars. In the rock ledge, hard coral, and mixed habitats, abundant fishes included *Laemonema melanurum, Nezumia sclerorhynchus,* and *Trachyscorpia cristulata*. *Polyprion americanus* was observed in this area; however, this species was not common.

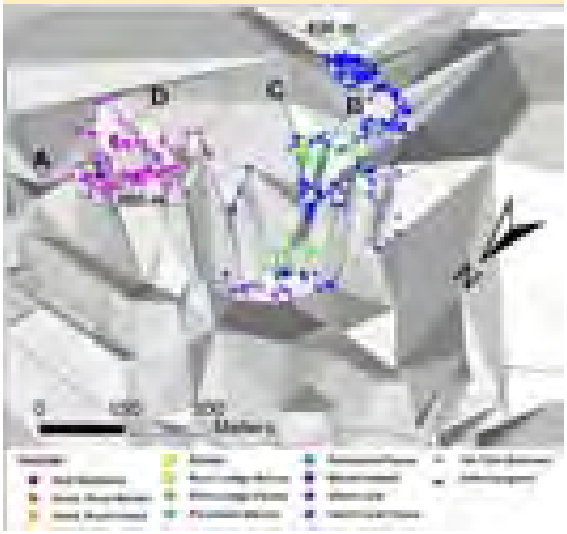
DIVE NUMBER: JSLII-3419 *STUDY AREA: Stetson Banks*

STATION OVERVIEW

Project	Life on the Edge 2003
Principal investigators	SW Ross[1] KJ Sulak, MS Nizinski, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Mapping of deep coral banks, ecological studies of macroinvertebrates and fishes, paleoclimate studies, coral genetics and educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link II Submersible
Science Divers	AM Quattrini (bow), KJ Sulak (stern)
External Video Tapes	3 mini DVs
Internal Video Tapes	1 mini DV
Digital Still Photos	72
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Hard copies of bow and stern audio logs
Acknowledgements	NOAA-OE, NOAA Fisheries, USGS, UNCW, NC Museum of Natural Sciences
SEADESC Analyst	AM Quattrini, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	17-Aug-03
Minimum Bottom Depth (m)	592
Maximum Bottom Depth (m)	622
Start Bottom Time (EDT)	8:40
End Bottom End (EDT)	10:51
Starting Latitude (N)	32° 01.746'
Starting Longitude (W)	77° 40.441'
Ending Latitude (N)	32° 02.005'
Ending Longitude (W)	77° 40.486'
Surface Current (Kts)	
Bottom Current (Kts)	0.7

Image A: Hard Coral-Fauna
32º 02.022' N, 77º 40.446' W

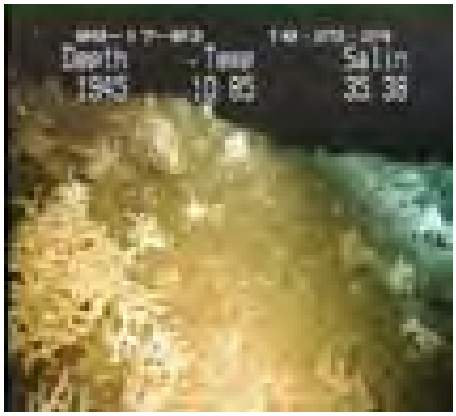
DIVE NUMBER: JSLII-3419 *STUDY AREA: Stetson Banks*

IMAGE GALLERY *** indicates image position is approximated**

Image B: Mixed Habitat
32º 01.812' N, 77º 40.512' W

Image C: Rock Ledge-Fauna
32º 01.890' N, 77º 40.500' W

Image D: Hard Coral-Fauna
32º 02.010' N, 77º 40.452' W



RELEVANT WORK AND/OR LITERATURE CITED

Stetson (1961)
Stetson et al. (1962)
EEZ-SCAN 87 Scientific Staff (1991)
Reed (2002)
Reed and Ross (2005)
Ross and Nizinski (in press)
Williams et al. (2006)
Williams et al. (in press)

BIOLOGICAL ENVIRONMENT

Only two species of fish were observed during this dive, *Nezumia sclerorhynchus* and *Laemonema melanurum*. Mobile invertebrates were found in low numbers; the most common were spiny and pancake urchins. *Eumunida picta* and *Bathynectes longispina* were present. The area was dominated by sessile invertebrates, at times forming a densely populated live bottom habitat consisting of hydroids, primnoids, plexaurids, isidids (*Acanella*), numerous dendrophyllids, hexactinellid sponges, *Stylaster* and *Lophelia pertusa*. The distinction between mixed habitat and hard coral habitat was determined by the amount of *Lophelia* present, though many of the same species were present in both areas.

PHYSICAL ENVIRONMENT

This dive began over a relatively flat region of sediment and rubble, covered with sparse fauna, grading into a more dense, though still low-relief, mixed coral habitat. Some low rock ledges encrusted with small hydroids and soft corals were observed. These ledges appeared to be heavily cemented rubble that had been undercut, rather than solid rock. Two-thirds of the way through the dive the habitat shifted dramatically with an abrupt embankment dropping away at a steep (~70º) angle. This slope was dominated by medium sized growths (>1m) of *Lophelia pertusa* that was surrounded and covered by macrofauna such as hydroids, small sponges and octocorals.

ADDITIONAL COMMENTS

This dive was captured on 3 mini DVs and archived on 3 DVDs. The center of the footage appears out of focus because of condensation on the inner lens of the camera. Video recorded during transects was occasionally filmed too closely and lit too brightly for perspective on the surrounding habitat.

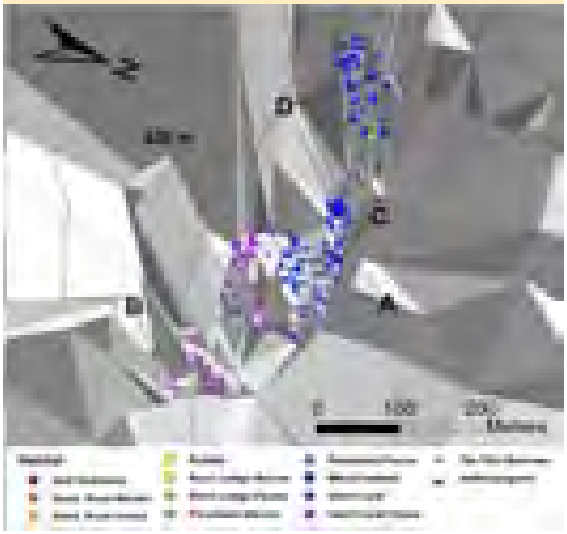
DIVE NUMBER: JSLII-3420 *STUDY AREA: Stetson Banks*

STATION OVERVIEW

Project	Life on the Edge 2003
Principal investigators	SW Ross[1] KJ Sulak, MS Nizinski, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Mapping of deep coral banks, ecological studies of macroinvertebrates and fishes, paleoclimate studies, coral genetics and educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link II Submersible
Science Divers	M Nizinski (bow), A Brooks (stern)
External Video Tapes	2 mini DVs
Internal Video Tapes	1 mini DV
Digital Still Photos	0
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Hard copies of bow and stern audio logs
Acknowledgements	NOAA-OE, NOAA Fisheries, USGS, UNCW, NC Museum of Natural Sciences
SEADESC Analyst	AM Quattrini, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	17-Aug-03
Minimum Bottom Depth (m)	624
Maximum Bottom Depth (m)	640
Start Bottom Time (EDT)	16:18
End Bottom End (EDT)	18:24
Starting Latitude (N)	32° 02.012'
Starting Longitude (W)	77° 40.706'
Ending Latitude (N)	32° 02.039'
Ending Longitude (W)	77° 40.927'
Surface Current (Kts)	
Bottom Current (Kts)	0.8

Image A: Mixed Habitat
32° 02.052' N, 77° 40.806' W

DIVE NUMBER: JSLII-3420 *STUDY AREA: Stetson Banks*

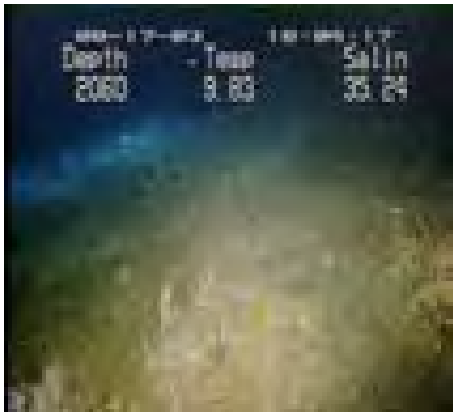
IMAGE GALLERY

*** indicates image position is approximated**

Image B: Hard Coral-Fauna
32º 01.980' N, 77º 40.704' W

Image C: Mixed Habitat
32º 02.052' N, 77º 40.818' W

Image D: Mixed Habitat
32º 02.022' N, 77º 40.914' W



RELEVANT WORK AND/OR LITERATURE CITED

Stetson (1961)
Stetson et al. (1962)
EEZ-SCAN 87 Scientific Staff (1991)
Reed (2002)
Reed and Ross (2005)
Ross and Nizinski (in press)
Williams et al. (2006)
Williams et al. (in press)

BIOLOGICAL ENVIRONMENT

Very few species of fish or mobile invertebrates were observed during this dive. The most common fish species were *Nezumia sclerorhynchus, Laemonema barbatulum, L. melanurum* and *Chlorophthalmus agassizi*. Of the mobile invertebrates, pancake and spiny urchins were the most common, while only a few *Bathynectes longispina* were observed. The sessile invertebrates were highly diverse and abundant in this area. The dominant groups in the area were hydroids, primnoids, dendrophyllids, hexactinellid sponges and small colonies of *Lophelia pertusa*.

PHYSICAL ENVIRONMENT

This dive followed a ridge with a precipitous drop on one side (70º slope) and a flat plateau on the other. The habitat in the area varied from hard coral to mixed to rock ledge, all of which had a dense coverage of attached macrofauna. The underlying substrate in these regions seemed to be dense coral rubble mixed with fine sediment. The rock ledge areas appeared to be made up of heavily cemented slabs of coral rubble that had been undercut, rather than solid rock.

ADDITIONAL COMMENTS

This dive was recorded on 2 mini DVs and archived on 2 DVDs. Condensation on the inner camera lens obscured the center of the viewing field. The lighting was occasionally too bright, making identification of habitat components difficult. Additionally, there is a 30 minute gap between the DVs and no internal bow video from which to recover those data.

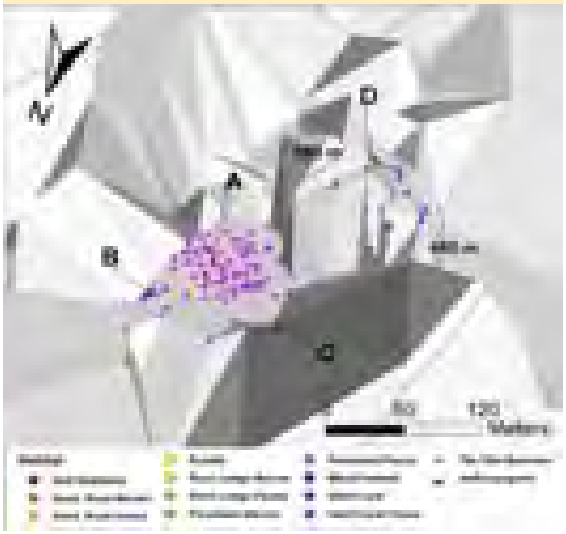
DIVE NUMBER: JSLI-4689 *STUDY AREA: Stetson Banks*

STATION OVERVIEW

Project	Life on the Edge 2004
Principal investigators	SW Ross[1] KJ Sulak, MS Nizinski, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Mapping of deep coral banks, ecological studies of macroinvertebrates and fishes, paleoclimate studies, coral genetics and educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link I Submersible
Science Divers	A Howard (bow), AM Quattrini (stern)
External Video Tapes	2 mini DVs
Internal Video Tapes	2 mini DVs
Digital Still Photos	13
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	No bow audio log, hard copy of stern audio log
Acknowledgements	NOAA-OE, NOAA Fisheries, USGS, UNCW, NC Museum of Natural Sciences
SEADESC Analyst	AM Quattrini, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	13-Jun-04
Minimum Bottom Depth (m)	666
Maximum Bottom Depth (m)	672
Start Bottom Time (EDT)	8:37
End Bottom End (EDT)	10:37
Starting Latitude (N)	31° 49.153'
Starting Longitude (W)	77° 36.770'
Ending Latitude (N)	31° 49.153'
Ending Longitude (W)	77° 36.195'
Surface Current (Kts)	
Bottom Current (Kts)	0.4

Image A: Hard Coral-Fauna
31º 49.212' N, 77º 36.804' W

DIVE NUMBER: JSLI-4689 *STUDY AREA: Stetson Banks*

IMAGE GALLERY *** indicates image position is approximated**

Image B: Hard Coral
31º 49.242' N, 77º 36.780' W

Image C: Hard Coral-Fauna
31º 49.248' N, 77º 36.846' W *

Image D: Mixed Habitat
31º 49.116' N, 77º 36.882' W *

RELEVANT WORK AND/OR LITERATURE CITED

Stetson (1961)
Stetson et al. (1962)
EEZ-SCAN 87 Scientific Staff (1991)
Reed (2002)
Reed and Ross (2005)
Reed et al. (2006)
Williams et al. (2006)
Williams et al. (in press)
Ross and Nizinski (in press)

BIOLOGICAL ENVIRONMENT

Very few fishes were observed on this dive. Largely, a hard coral area was observed, but only a few individuals were seen, including *Laemonema melanurum, Nezumia sclerorhynchus,* and *Nettenchelys exoria*. Invertebrates were diverse and common. White seastars, *Echinus tylodes*, a few galatheids, and *Bathynectes* spp. were observed in the hard coral habitat. Sessile invertebrate fauna included fly trap anemones, other anemones, alcyonaceans, and antipatharians.

PHYSICAL ENVIRONMENT

Habitat in the beginning of this dive was patchy, and included areas of coral rubble and hard corals with and without fauna. The rubble area was dense (90% cover) and had few branches of live *Lophelia pertusa.* The hard coral areas were mostly dead (~75%) *Lophelia* mounds (<2 m profile). At times, these hard coral areas were overgrown with attached fauna, including anemones and alcyonaceans.

ADDITIONAL COMMENTS

This dive was recorded on 2 mini DVs and saved on 2 DVDs for archiving. Much of the transect footage was underlit and a large amount of footage was spent zoomed in very closely. There were also problems with color-balancing and interruptions in the video feed.

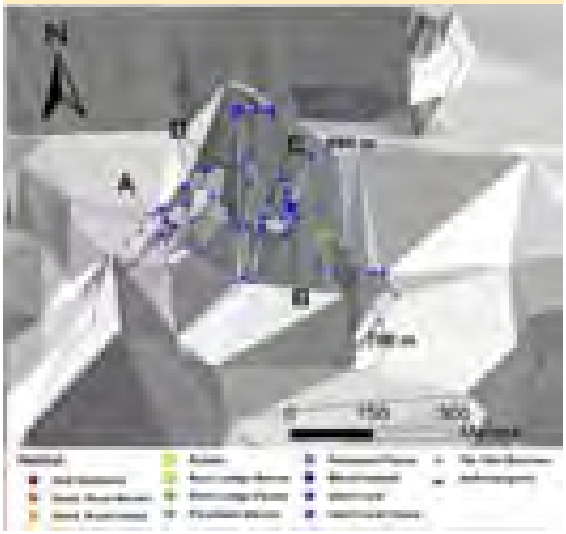
DIVE NUMBER: JSLI-4698 *STUDY AREA: Stetson Banks*

STATION OVERVIEW

Project	Life on the Edge 2004
Principal investigators	SW Ross[1] KJ Sulak, MS Nizinski, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Mapping of deep coral banks, ecological studies of macroinvertebrates and fishes, paleoclimate studies, coral genetics and educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link I Submersible
Science Divers	SW Ross (bow), G Yeargin (stern)
External Video Tapes	2 mini DVs, 2 HDs
Internal Video Tapes	4 mini DVs
Digital Still Photos	0
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Hard copy of stern audio log
Acknowledgements	NOAA-OE, NOAA Fisheries, USGS, UNCW, NC Museum of Natural Sciences
SEADESC Analyst	AM Necaise, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	18-Jun-04
Minimum Bottom Depth (m)	660
Maximum Bottom Depth (m)	703
Start Bottom Time (EDT)	9:42
End Bottom End (EDT)	11:31
Starting Latitude (N)	31° 49.454'
Starting Longitude (W)	77° 36.693'
Ending Latitude (N)	31° 49.561'
Ending Longitude (W)	77° 36.788'
Surface Current (Kts)	
Bottom Current (Kts)	

Image A: Hard Coral
31º 49.542' N, 77º 36.828' W

DIVE NUMBER: JSLI-4698 *STUDY AREA: Stetson Banks*

IMAGE GALLERY

*** indicates image position is approximated**

Image B: Mixed Habitat
31º 49.524' N, 77º 36.762' W

Image C: Mixed Habitat
31º 49.530' N, 77º 36.738' W

Image D: Mixed Habitat
(No Position Available)

RELEVANT WORK AND/OR LITERATURE CITED

Stetson (1961)
Stetson et al. (1962)
EEZ-SCAN 87 Scientific Staff (1991)
Reed (2002)
Reed and Ross (2005)
Reed et al. (2006)
Williams et al. (2006)
Williams et al. (in press)
Ross and Nizinski (in press)

BIOLOGICAL ENVIRONMENT

Several fishes were seen throughout this area. *Laemonema melanurum* was most abundant and observed throughout all habitats. Other fishes observed included *Nezumia sclerorhynchus* and *Trachyscorpia cristulata*. Sessile invertebrates were diverse and common and included several species of antipatharians, isidids, alcyonaceans, and scleractinians. Mobile invertebrates observed included galatheids and *Bathynectes longispina*.

PHYSICAL ENVIRONMENT

Four habitat types were observed during this dive: 1) mixed coral community, 2) rock ledges with attached fauna, 3) coral rubble, and 4) sand and coral rubble with attached fauna. Habitats in this entire area were patchy, and the four habitats were intermittently observed. The mixed community consisted of antipatharians, isidids, cup corals, alcyonaceans, and isolated colonies of *Lophelia pertusa* and *Enallopsammia* spp. Corals in this mixed community were attached to coral rubble and sand/coral rubble substrate, and this substrate was generally overlain with a crustose sediment layer. Rock ledges were of fairly low profile (< 1m) and also had mixtures of corals attached.

ADDITIONAL COMMENTS

This dive was captured on 2 mini DVs and archived on 2 DVDs. The video during transects was often underlit and the sub frequently left the bottom, but there is some good footage of *Laemonema melanurum* and of mixed habitat communities.

DIVE NUMBER: JSLI-4699 *STUDY AREA: Stetson Banks*

STATION OVERVIEW

Project	Life on the Edge 2004
Principal investigators	SW Ross[1] KJ Sulak, MS Nizinski, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Mapping of deep coral banks, ecological studies of macroinvertebrates and fishes, paleoclimate studies, coral genetics and educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link I Submersible
Science Divers	TL Casazza (bow) E Baird (stern)
External Video Tapes	3 mini DVs, 3 HDs
Internal Video Tapes	4 mini DVs
Digital Still Photos	0
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Hard copy of stern audio log
Acknowledgements	NOAA-OE, NOAA Fisheries, USGS, UNCW, NC Museum of Natural Sciences
SEADESC Analyst	AM Necaise, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:

DIVE DATA

Date	18-Jun-04
Minimum Bottom Depth (m)	658
Maximum Bottom Depth (m)	721
Start Bottom Time (EDT)	16:59
End Bottom End (EDT)	19:09
Starting Latitude (N)	31° 50.895'
Starting Longitude (W)	77° 36.724'
Ending Latitude (N)	31° 50.751'
Ending Longitude (W)	77° 36.774'
Surface Current (Kts)	
Bottom Current (Kts)	

Image A: Mixed Habitat
31º 50.736' N, 77º 36.654' W *

DIVE NUMBER: JSLI-4699 *STUDY AREA: Stetson Banks*

IMAGE GALLERY *** indicates image position is approximated**

Image B: Rubble
31º 50.850' N, 77º 36.624' W

Image C: Rock Ledge-Fauna
31º 50.724' N, 77º 36.654' W

Image D: Mixed Habitat
31º 50.730' N, 77º 36.666' W

RELEVANT WORK AND/OR LITERATURE CITED

Stetson (1961)
Stetson et al. (1962)
EEZ-SCAN 87 Scientific Staff (1991)
Reed (2002)
Reed and Ross (2005)
Reed et al. (2006)
Williams et al. (2006)
Williams et al. (in press)
Ross and Nizinski (in press)

BIOLOGICAL ENVIRONMENT

Laemonema melanurum and *Nezumia sclerorhynchus* were two commonly observed fish species in the area. Crinoids, urchins, fly trap anemones, *Bathynectes longispina*, sponges, and a diversity of corals were the invertebrates observed during the dive. Coral diversity included several species of antipatharians, scleractinians, alcyonaceans, and isidids.

PHYSICAL ENVIRONMENT

Habitats in this area were patchy. The following were observed during this dive: 1) coral rubble, 2) mixed coral community, and 3) rock ledges with attached fauna. In the rubble zone, there were few soft corals, isidids, fly trap anemones, and sponges. The mixed community consisted of a diversity of antipatharians, isidids, cup corals, alcyonaceans, sponges, and solitary colonies of *Lophelia pertusa* and *Enallopsammia* spp. The substrate of the mixed community was coral rubble and sand. These corals were also attached to rock ledges, which were low profile (< 1m).

ADDITIONAL COMMENTS

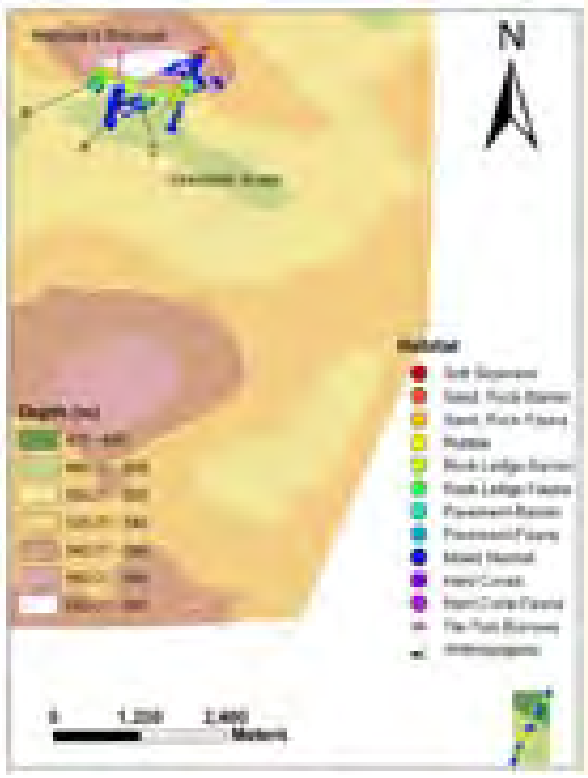
This dive was recorded on 3 mini DVs and saved to 3 DVDs for archiving. In the first DV, there was a lot of interruption in the video feed and underlit transect footage. The third DV contains footage of the ascent and sub recovery.

OVERVIEW

Total Dives: 7 **Depth Range (m):** 474 to 584

GENERAL LOCATION

HABITAT CHARACTERIZATION MAP



DIVE SUMMARY FOR SITE

Dive Date	PI	Station	Method	Start-Time	End-Time	Start-Lat (N)	Start-Long (W)	End-Lat (N)	End-Long (W)
27-Sep-01	GR Sedberry	JSLI-4368	HOV	8:41	11:07	31° 39.222'	78° 45.206'	31° 39.746'	78° 45.052'
28-Sep-01	GR Sedberry	JSLI-4369	HOV	8:41	11:01	31° 44.051'	78° 48.136'	31° 44.104'	78° 47.908'
28-Sep-01	GR Sedberry	JSLI-4370	HOV	16:01	18:36	31° 43.839'	78° 47.950'	31° 44.381'	78° 47.581'
03-Aug-03	GR Sedberry	JSLII-3406	HOV	16:28	18:09	31° 42.120'	78° 48.510'	31° 42.036'	78° 48.771'
06-Aug-03	GR Sedberry	JSLII-3408	HOV	8:52	11:17	31° 44.178'	78° 48.177'	31° 43.848'	78° 48.360'
06-Aug-03	GR Sedberry	JSLII-3409	HOV	16:35	19:00	31° 44.256'	78° 48.411'	31° 44.136'	78° 48.520'
13-Aug-03	GR Sedberry	JSLII-3418	HOV	8:39	10:41	31° 44.268'	78° 48.363'	31° 44.124'	78° 48.470'

IMAGE GALLERY *** indicates image position is approximated**

Image A: Rock Ledge-Barren
31° 44.154' N, 78° 48.210' W

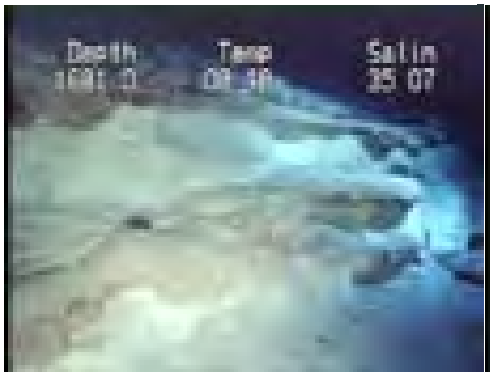


Image B: Rock Ledge-Fauna
31° 44.196' N, 78° 48.420' W

Image C: Mixed Habitat
31° 44.016' N, 78° 48.126' W

SITE OVERVIEW **AUTHOR** GR Sedberry **DATE COMPILED** 19-Dec-06

Dives 3418 and 3409 were in close proximity in a scoured out area below the main scarp on the Charleston Bump ("Wreckfish Scarp"). Dive 3408 was farther offshore and was actually in a depression on top of the scarp. These dive sites were referred to as "Neptune's Staircase" in NOAA-OE logs and web sites (http://oceanexplorer.noaa.gov/explorations/03bump/logs/aug13/aug13.html). Reconnaissance of rugged bottom topography in this area, using submersibles in 2001 and 2003, and sonar surveys in 2000-2003, revealed a diversity of bottom types, from flat hard bottom to rugged relief and near-vertical scarps. Both dives and sonar surveys indicated rugged bottom topography ranging from a few to over 100 m in relief. South of the dive sites, in the middle of the survey area, the bottom was relatively smooth and sloped gradually upward to rough bottom at the top of a system of scarps (Dive 3408) at about 430 m depth. Northward of this shallower area, the bottom dropped precipitously at a series of scarps ("Wreckfish Scarp"), to deep scour depressions at depths greater than 580 m. (Dives 3409 and 3418). The bottom encountered during these dives was nearly continuous hard substrate. The southern edge of this relatively flat area contained some high-relief bottom and wreckfish (*Polyprion americanus*) habitat, and a successful dive was completed near the smaller scarps where wreckfish occurred. In this area several large wreckfish, conger eels and some spectacular rock overhangs were encountered. Wreckfish were observed closely associated with high-relief rocky bottom, and none were observed over flat hard bottom. In flat areas, codlings (Moridae) and grenadiers (Macrouridae) were found. Individual codlings and grenadiers were often associated with small corals (*Lophelia* and *Stylaster*) that grew in evenly spaced clumps on the hard pavement. Chaunacid anglerfishes were also found in this habitat, and skates were occasionally observed.

Rock samples obtained indicated that there are at least three distinct rock types forming the sea floor in the area. These include manganese-phosphorite pavement and nodules, foraminiferan limestone and calcareous mudstone. The latter two types were found in an interbedded sequence on dives 3405, 3408, 3409 and 3418. This area had "stairstep" relief of about 20 m. The mudstone exhibited greater erosion in situ and was very chalky to the touch. The foraminiferan limestone was more resistant to the erosive forces of the strong bottom currents and produced overhangs and steeper-faced slopes. The result was a terraced, step-like sequence of alternating calcareous mudstones (the eroded terraces) and foraminiferan limestones (the 'stairs' at "Neptune's Staircase"). These rocks indicated the cyclical fluctuations over time of the alternating strength of the Gulf Stream, with the mudstone deposition only possible during low-energy flow regimes. In other places, the rocks formed nearly vertical cliffs; with alternating layers of the two carbonate rocks. Overhanging ledges occurred at times, and corals, anemones, and sponges grew on the underside of the overhangs. Overall, sessile benthic organisms were abundant on the foraminiferan limestone. Few, if any, organisms were observed attached to the mudstone, perhaps because of its low resistance to erosion. Manganese-phosphorite was found on most dives in this area; however, we encountered less than expected. This phosphorite occurred as broken pavement or scattered rubble, some of which was nodular in form; an intact pavement layer was never observed. One rock that was collected included a pavement layer on top of a limestone layer and a small piece of manganese-phosphate at the base. This rock is evidence that there was probably an interbedded manganese-phosphorite and limestone sequence nearby. Near the base of the 'staircase', we collected a single rock that contained two distinct layers of manganese-phosphorite, with foraminiferan limestone sandwiched between them. The manganese-phosphorite rocks appeared to have a different organisms inhabiting their surface, and densities were lower than on the limestone, although this has yet to be quantified. Only a few solitary anemones, sponges, ascidians and stony corals were found on collected rock specimens.

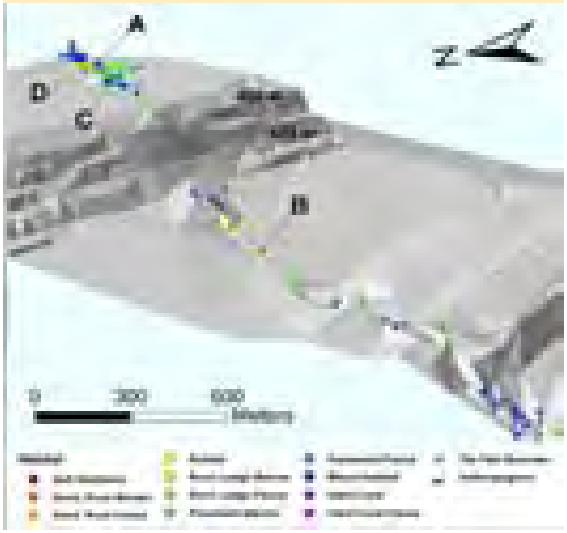
DIVE NUMBER: JSLI-4368 *STUDY AREA: Savannah Banks East*

STATION OVERVIEW

Project	Islands in the Stream 2001
Principal investigators	GR Sedberry[1]
PI Contact Info[1]	Marine Resources Research Institute, SCDNR P.O. Box 12559 Charleston SC 29422-2559
Purpose	To explore and describe habitats and associated fauna of high-relief features of the Charleston Bump
Vessel	R/V Seward Johnson, Johnson Sea Link I Submersible
Science Divers	GR Sedberry (bow), LR Sautter, (stern)
External Video Tapes	3 mini DVs
Internal Video Tapes	
Digital Still Photos	
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	
Acknowledgements	NOAA-OE
SEADESC Analyst	ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	27-Sep-01
Minimum Bottom Depth (m)	476
Maximum Bottom Depth (m)	489
Start Bottom Time (EDT)	8:41
End Bottom End (EDT)	11:07
Starting Latitude (N)	31° 39.222'
Starting Longitude (W)	78° 45.206'
Ending Latitude (N)	31° 39.746'
Ending Longitude (W)	78° 45.052'
Surface Current (Kts)	
Bottom Current (Kts)	1

Image A: Mixed Habitat
31° 39.648' N, 78° 45.090' W

DIVE NUMBER: JSLI-4368 *STUDY AREA: Savannah Banks East*

IMAGE GALLERY *** indicates image position is approximated**

Image B: Sand/Rubble/Rock-Fauna
31º 39.420' N, 78º 45.216' W

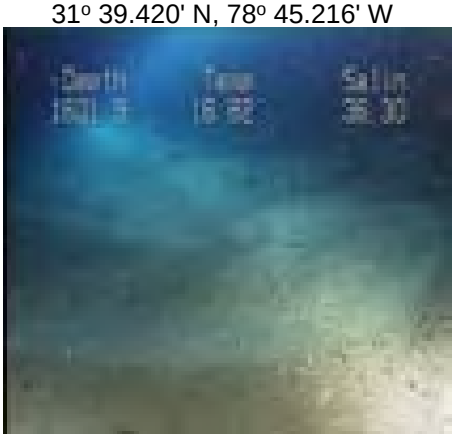


Image C: Rock Ledge-Fauna
31º 39.600' N, 78º 45.006' W

Image D: Rock Ledge-Fauna
31º 39.660' N, 78º 45.078' W

RELEVANT WORK AND/OR LITERATURE CITED

BIOLOGICAL ENVIRONMENT

The most common fishes observed during the course of this dive were *Helicolenus dactylopterus, Laemonema melanurum* and *Nezumia sclerorhynchus.* Mobile invertebrates were limited to *Bathynectes longispina* and a few basket stars. The macrofaunal community was variable throughout the dive. Some areas were dominated by small stony corals and a few large barrel sponges while other areas were covered in primnoids, isidids, hexactinellids and fanlike sponges.

PHYSICAL ENVIRONMENT

This dive was attempted on a 100-m scarp (Wreckfish Scarp), one of the main features of the Charleston Bump. However, the currents were very strong and the submersible landed on relatively flat bottom north of the scarp, and could not navigate towards it. Consequently, this dive took place over a relatively flat area with maximum slope of 20º. Three main habitats were encountered: mixed, sand/rubble/rock-fauna, and rock ledge-fauna. The characteristics of these habitats varied slightly throughout the dive. Mixed habitat was typically made up of small stony corals and a mixture of sponges and soft corals, all low-relief, with some rocks and occasional ledges. The rock ledge habitats were all low-relief and primarily made up of manganese. Both of these habitats had only a thin veneer of sediment overlying hard rock. The sand/rubble/rock habitat bordered the other two habitat types and was marked for an increased amount of soft sediment, occasionally forming dunes, and a thinning of attached macrofauna.

ADDITIONAL COMMENTS

This dive was recorded on 3 mini DVs with no time overlay. Real time and video time were correlated using CTD depth for the first half of the dive. The second half of the dive had no recorded CTD information, so correlations are nearest approximations. The video was turned off for an indeterminate amount of time during the second DV while attempts were made to attract fish with the sub lights turned off. There was a very strong current during this dive and a moderate amount of marine snow, which made identifications of small macrofauna difficult. However, when the sub was stopped the footage was very good.

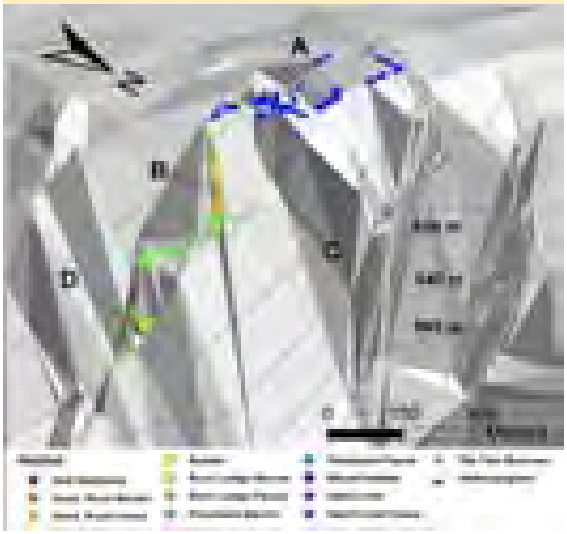
DIVE NUMBER: JSLI-4369 *STUDY AREA: Savannah Banks East*

STATION OVERVIEW

Project	Islands in the Stream 2001
Principal investigators	GR Sedberry[1]
PI Contact Info[1]	Marine Resources Research Institute, SCDNR P.O. Box 12559 Charleston SC 29422-2559
Purpose	To explore and describe habitats and associated fauna of high-relief features of the Charleston Bump
Vessel	R/V Seward Johnson, Johnson Sea Link I Submersible
Science Divers	DM Wyanski (bow), DB White (stern)
External Video Tapes	3 mini DVs
Internal Video Tapes	
Digital Still Photos	
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	
Acknowledgements	NOAA-OE
SEADESC Analyst	ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	28-Sep-01
Minimum Bottom Depth (m)	474
Maximum Bottom Depth (m)	520
Start Bottom Time (EDT)	8:41
End Bottom End (EDT)	11:01
Starting Latitude (N)	31° 44.051'
Starting Longitude (W)	78° 48.136'
Ending Latitude (N)	31° 44.104'
Ending Longitude (W)	78° 47.908'
Surface Current (Kts)	
Bottom Current (Kts)	1

Image A: Mixed Habitat
31º 44.016' N, 78º 48.126' W

DIVE NUMBER: JSLI-4369 *STUDY AREA: Savannah Banks East*

IMAGE GALLERY *** indicates image position is approximated**

Image B: Sand/Rubble/Rock-Fauna
31º 44.088' N, 78º 48.012' W

Image C: Rock Ledge-Fauna
31º 44.040' N, 78º 48.114' W

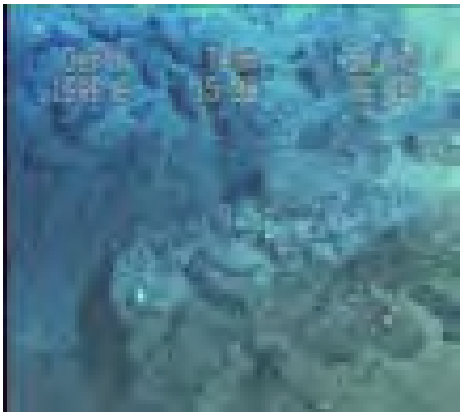


Image D: Sand/Rubble/Rock-Barren
31º 44.094' N, 78º 47.880' W

RELEVANT WORK AND/OR LITERATURE CITED

BIOLOGICAL ENVIRONMENT

A number of fish were observed during this dive, though the majority of them were two species, *Laemonema melanurum* and *L. barbatulum*. *Nezumia* spp. and *Helicolenus dactylopterus* were seen throughout the dive, and two *Polyprion americanus* were observed along a rock ledge habitat. There were few mobile invertebrates recorded during the dive; these included *Bathynectes longispina* and pencil urchins. Sessile invertebrates were diverse and the dominant life form observed. The most common attached fauna were *Lophelia pertusa*, *Corallium, Enallopsammia, Keratoisis*, primnoids, solitary cup corals, hexactinellid sponges, and encrusting sponges.

PHYSICAL ENVIRONMENT

This dive began over a gradually sloped, mixed habitat environment. The sub transected up a relatively steep slope (~ 30º) to reach the summit of the ridge and continue down its other face. The opposite side was considerably different, ranging from rock ledge habitat to sand/rubble/rock areas with and without attached fauna. The exposed rock ledges were typically manganese as were the many small rocks found scattered throughout the area.

ADDITIONAL COMMENTS

This dive was recorded on 3 mini DVs. There was no time overlay and little in the way of audio commentary by which to correlate real time and video time. There were a couple of interruptions in the footage that seemed to indicate a gap in time, adding to the difficulty of correlating real time and video time. At times, the lighting was low during transects and the video was shot too closely or was out of focus, however, it was still possible to classify habitats and identify fishes. The video contains nice footage of two *Polyprion americanus* along a rock ledge environment.

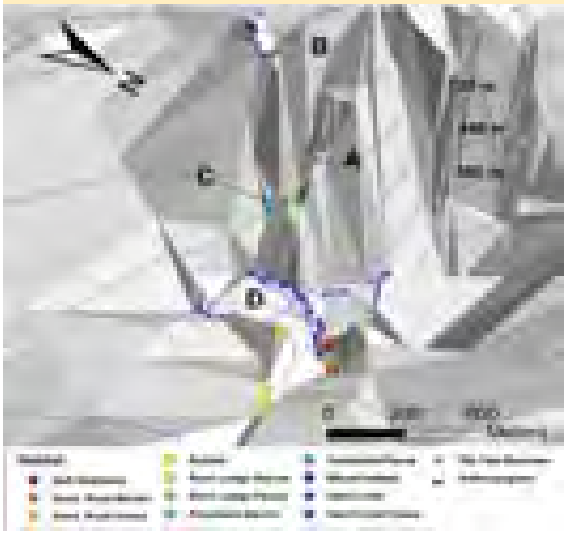
DIVE NUMBER: JSLI-4370 *STUDY AREA: Savannah Banks East*

STATION OVERVIEW

Project	Islands in the Stream 2001
Principal investigators	GR Sedberry[1]
PI Contact Info[1]	Marine Resources Research Institute, SCDNR P.O. Box 12559 Charleston SC 29422-2559
Purpose	To explore and describe habitats and associated fauna of high-relief features of the Charleston Bump
Vessel	R/V Seward Johnson, Johnson Sea Link I Submersible
Science Divers	P Harris (bow), C Livingston (stern)
External Video Tapes	3 mini DVs
Internal Video Tapes	
Digital Still Photos	
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	No audio associated with the video
Acknowledgements	NOAA-OE
SEADESC Analyst	ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	28-Sep-01
Minimum Bottom Depth (m)	484
Maximum Bottom Depth (m)	571
Start Bottom Time (EDT)	16:01
End Bottom End (EDT)	18:36
Starting Latitude (N)	31° 43.839'
Starting Longitude (W)	78° 47.950'
Ending Latitude (N)	31° 44.381'
Ending Longitude (W)	78° 47.581'
Surface Current (Kts)	
Bottom Current (Kts)	1

Image A: Rock Ledge-Fauna
31° 44.106' N, 78° 47.838' W

DIVE NUMBER: JSLI-4370 *STUDY AREA: Savannah Banks East*

IMAGE GALLERY *** indicates image position is approximated**

Image B: Mixed Habitat
31° 43.872' N, 78° 47.892' W

Image C: Pavement-Fauna
31° 44.088' N, 78° 47.766' W

Image D: Mixed Habitat
31° 44.280' N, 78° 47.736' W

RELEVANT WORK AND/OR LITERATURE CITED

BIOLOGICAL ENVIRONMENT

A large number of fish were seen during this dive, however, the majority of the species observed were represented by one or two individuals, such as *Synagrops* sp., *Helicolenus dactylopterus* and *Conger oceanicus*. In contrast, *Laemonema melanurum* were seen throughout the dive in high numbers. Mobile invertebrates were not common and were represented by *Eumunida picta, Bathynectes longispina,* spiny urchins and a sea star. Sessile invertebrates varied during the course of this dive. The beginning of the dive had a low-relief community of *Stylaster, Lophelia pertusa,* primnoids, solitary cup corals, small hexactinellid sponges and other encrusting species. In contrast, the mixed community found near the end of the dive was dominated by moderate-relief *Paramuricea* and *Swiftia* gorgonians, along with *Leiopathes* and *Keratoisis*. The understory was primarily hydrozoans, primnoids, solitary cup corals, and small sponges.

PHYSICAL ENVIRONMENT

This dive began over a gradually sloping mixed habitat area that transitioned to rock ledge with attached fauna. The majority of the ledges were low-relief and graded into pavement areas covered in a thin veneer of sediment. Beyond this rocky habitat was a large area of soft sediment habitat of thick, coarse sand.

ADDITIONAL COMMENTS

This dive was recorded on 3 mini DVs without time overlay or audio track. Correlations between video time and real time were made based on depth information. Much of the transect data were either underlit or filmed out of focus; however, there is good footage of several fish species. The sub also spent a lot of time hovering several feet off of the bottom, which often made habitat classifications difficult.

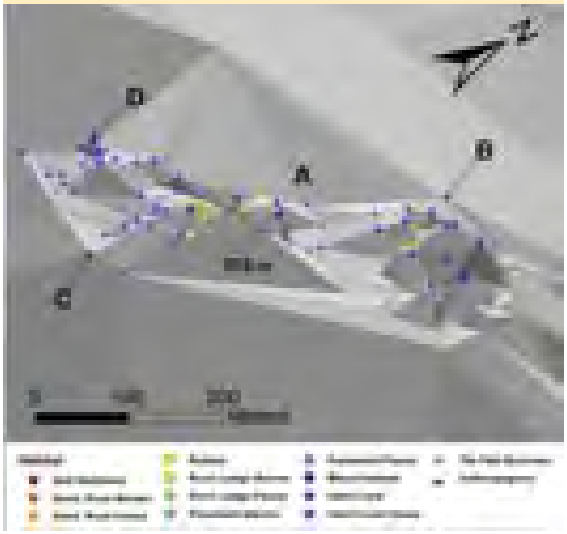
DIVE NUMBER: JSLII-3406 *STUDY AREA: Savannah Banks East*

STATION OVERVIEW

Project	Investigating the Charleston Bump 2003
Principal investigators	GR Sedberry[1] SE Stancyk
PI Contact Info[1]	Marine Resources Research Institute, SCDNR P.O. Box 12559 Charleston SC 29422-2559
Purpose	To explore and describe habitats and associated fauna of high-relief features of the Charleston Bump
Vessel	R/V Seward Johnson, Johnson Sea Link II Submersible
Science Divers	EL Werner (bow), SE Stancyk (stern)
External Video Tapes	2 mini DVs
Internal Video Tapes	
Digital Still Photos	
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	
Acknowledgements	NOAA-OE
SEADESC Analyst	ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	03-Aug-03
Minimum Bottom Depth (m)	552
Maximum Bottom Depth (m)	564
Start Bottom Time (EDT)	16:28
End Bottom End (EDT)	18:09
Starting Latitude (N)	31° 42.120'
Starting Longitude (W)	78° 48.510'
Ending Latitude (N)	31° 42.036'
Ending Longitude (W)	78° 48.771'
Surface Current (Kts)	
Bottom Current (Kts)	

Image A: Mixed Habitat
31° 42.066' N, 78° 48.696' W

DIVE NUMBER: JSLII-3406 *STUDY AREA: Savannah Banks East*

IMAGE GALLERY *** indicates image position is approximated**

Image B: Sand/Rubble/Rock-Fauna
31º 42.108' N, 78º 48.684' W

Image C: Mixed Habitat
31º 42.018' N, 78º 48.738' W

Image D: Mixed Habitat
31º 42.042' N, 78º 48.792' W

RELEVANT WORK AND/OR LITERATURE CITED

BIOLOGICAL ENVIRONMENT

Very few fishes or mobile invertebrates were captured in the footage for this dive. These included *Chlorophthalmus agassizi, Fenestraja plutonia* and *Laemonema melanurum*, as well a several pencil urchins. The sessile community, however, was quite diverse. Hard corals were represented by *Lophelia pertusa, Stylaster* and *Enallopsammia*. Small *Keratoisis* isidids were common as well as encrusting sponges and larger hexactinellid sponges. Ascidians were seen in high numbers near the end of the dive.

PHYSICAL ENVIRONMENT

This dive was attempted on the north face of the Wreckfish Scarp, but strong currents displaced the sub to the north, over flat bottom. The portion of this dive that was video taped took place over relatively flat terrain with a mixture of sand/rubble/rock habitat with attached fauna and mixed habitat. The mixed habitat areas were typically low-relief and made up of small hard corals, assorted sponges and a few soft corals. The underlying substrate was hardpan rock with a thin veneer of sediment. The other habitat encountered was marked for deeper sediment and a reduced macrofaunal community.

ADDITIONAL COMMENTS

This dive was recorded on 2 mini DVs, however, the first DV contains only 5 minutes of footage, which was filmed during the descent. The second DV begins an hour later. There is no time overlay on this video and no CTD overlay for the first 10 minutes. The overall quality of the footage is fair-to-mediocre. Most of the transect video was poorly lit and a good deal of the close footage was slightly out of focus. The inner lens of the camera was clouded over at the center of the viewing field. This second DV had only 40 minutes of footage. Fishes, crustaceans, sponges and sediment were collected.

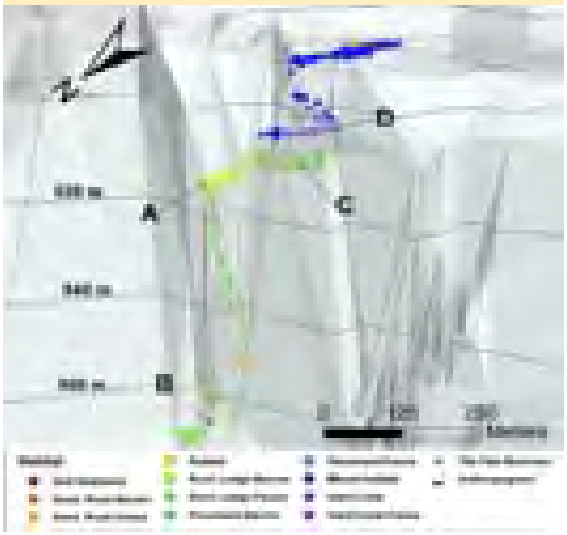
DIVE NUMBER: JSLII-3408 *STUDY AREA: Savannah Banks East*

STATION OVERVIEW

Project	Investigating the Charleston Bump 2003
Principal investigators	GR Sedberry[1] SE Stancyk
PI Contact Info[1]	Marine Resources Research Institute, SCDNR P.O. Box 12559 Charleston SC 29422-2559
Purpose	To explore and describe habitats and associated fauna of high-relief features of the Charleston Bump
Vessel	R/V Seward Johnson, Johnson Sea Link II Submersible
Science Divers	D Wyanski (bow), P Weinbach (stern)
External Video Tapes	3 mini DVs
Internal Video Tapes	0
Digital Still Photos	0
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	
Acknowledgements	NOAA-OE
SEADESC Analyst	ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	06-Aug-03
Minimum Bottom Depth (m)	490
Maximum Bottom Depth (m)	571
Start Bottom Time (EDT)	8:52
End Bottom End (EDT)	11:17
Starting Latitude (N)	31° 44.178'
Starting Longitude (W)	78° 48.177'
Ending Latitude (N)	31° 43.848'
Ending Longitude (W)	78° 48.360'
Surface Current (Kts)	
Bottom Current (Kts)	0

Image A: Rock Ledge-Barren
31° 44.154' N, 78° 48.210' W

DIVE NUMBER: JSLII-3408 *STUDY AREA: Savannah Banks East*

IMAGE GALLERY *** indicates image position is approximated**

Image B: Rock Ledge-Fauna
31º 44.184' N, 78º 48.216' W

Image C: Rock Ledge Fauna
31º 44.100' N, 78º 48.294' W

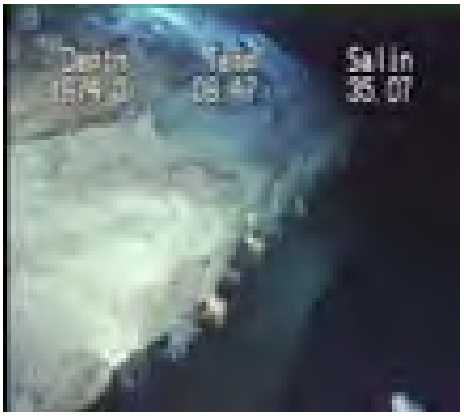
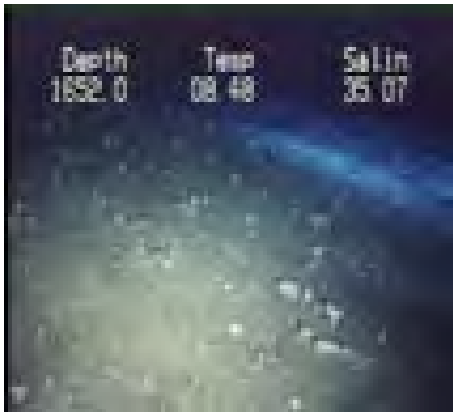


Image D: Mixed Habitat
31º 44.094' N, 78º 48.330' W



RELEVANT WORK AND/OR LITERATURE CITED

BIOLOGICAL ENVIRONMENT

Very few fish or mobile invertebrates were observed during the course of this dive. *Beryx decadactylus, Cirrhigaleus asper* and *Helicolenus dactylopterus* were the only fishes observed on tape. However, the audio commentary made note of a number of species that were never captured on film, such as *Polyprion americanus,* unidentified Macrouridae and *Laemonema* spp. The only mobile invertebrate observed on film was a single *Eumunida picta,* though another was noted on the audio track. Sessile invertebrates were very common and highly diverse. Hard corals were plentiful, though very small, and included *Stylaster, Enallopsammia* and *Lophelia pertusa.* Octocorals were represented by abundant *Keratoisis* bamboo corals and a few *Paramuricea*. A single large *Leiopathes* black coral was observed clinging to a rock ledge. Sponge density was highest near the end of the dive and was dominated by large fanlike varieties and other encrusting species. Venus flytrap anemones were also common along the rock ledge environment.

PHYSICAL ENVIRONMENT

The dive began along a multi-tiered rocky bluff along a 20-30º slope covered in small corals and sponges. The slope rapidly increased to ~70º with a heavy sediment layer and diverse macrofaunal cover. The central focus of the dive was a large (>60 m), rocky wall that included both barren rock ledges and ledges with large amounts of attached anemones and bamboo corals. The summit of this wall was a large flat plain of thin sediment over a hard bottom with a large diversity of attached macrofauna. Rocks collected during this dive included foraminiferan limestone and calcareous mudstone found in an interbedded sequence. This area had "stairstep" relief of about 20 m. The mudstone exhibited greater erosion in situ and was very chalky to the touch. The result was a terraced, step-like sequence of alternating calcareous mudstones (the eroded terraces) and foraminiferan limestone steps (named "Neptune's Staircase" by the investigators).

ADDITIONAL COMMENTS

This dive was captured on 3 mini DVs. There was no time overlay for this video so the audio commentary was used to correlate video time to real time. The first 30 minutes and last 10 minutes of the footage are spent in descent/ascent. The overall quality of the video was fair-to-good, though many of the transects were underlit. There is excellent footage of a large rocky outcrop and the associated fauna. There was a blurred spot at the center of the frame that caused some scenes to look out of focus.

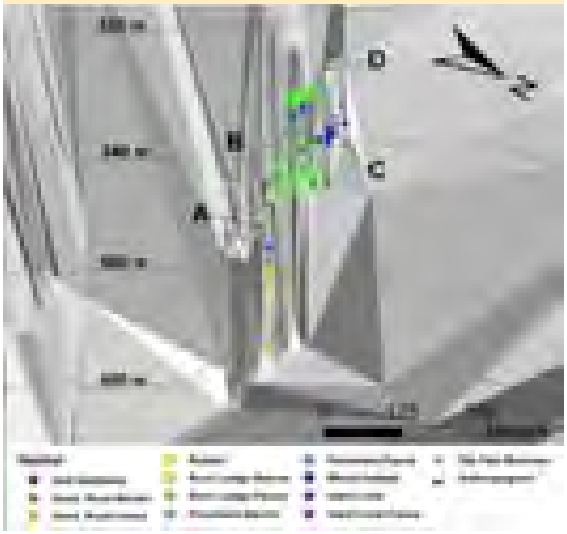
DIVE NUMBER: JSLII-3409 *STUDY AREA: Savannah Banks East*

STATION OVERVIEW

Project	Investigating the Charleston Bump 2003
Principal investigators	GR Sedberry[1] SE Stancyk
PI Contact Info[1]	Marine Resources Research Institute, SCDNR P.O. Box 12559 Charleston SC 29422-2559
Purpose	To explore and describe habitats and associated fauna of high-relief features of the Charleston Bump
Vessel	R/V Seward Johnson, Johnson Sea Link II Submersible
Science Divers	D Hooker (bow), R Styles (stern)
External Video Tapes	3 mini DVs
Internal Video Tapes	
Digital Still Photos	
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	
Acknowledgements	NOAA-OE
SEADESC Analyst	ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	06-Aug-03
Minimum Bottom Depth (m)	528
Maximum Bottom Depth (m)	573
Start Bottom Time (EDT)	16:35
End Bottom End (EDT)	19:00
Starting Latitude (N)	31° 44.256'
Starting Longitude (W)	78° 48.411'
Ending Latitude (N)	31° 44.136'
Ending Longitude (W)	78° 48.520'
Surface Current (Kts)	
Bottom Current (Kts)	0

Image A: Rock Ledge-Fauna
31° 44.196' N, 78° 48.450' W

DIVE NUMBER: JSLII-3409 *STUDY AREA: Savannah Banks East*

IMAGE GALLERY *** indicates image position is approximated**

Image B: Rock Ledge-Fauna
31º 44.226' N, 78º 48.432' W

Image C: Mixed Habitat
31º 44.172' N, 78º 48.486' W

Image D: Rock Ledge-Barren
31º 44.142' N, 78º 48.504' W

RELEVANT WORK AND/OR LITERATURE CITED

BIOLOGICAL ENVIRONMENT

There were very few fish observed during the course of this dive, and those observed were represented by single individuals. These included *Nezumia* sp., *Laemonema melanurum* and *Helicolenus dactylopterus*. Similarly, there were few mobile invertebrates observed. These included *Chaceon, Bathynectes longispina* and pencil urchins. There was, however, a high diversity of sessile invertebrates throughout the area. The most common of these were *Lophelia pertusa, Enallopsammia, Stylaster*, primnoids, hexactinellid and encrusting sponges. Rock ledge areas also had an abundance of venus flytrap anemones and *Keratoisis* bamboo corals.

PHYSICAL ENVIRONMENT

This dive began over a sandy, gently sloped bottom that gradually increased to ~40º. The slope was covered in thick sediment and dense sessile invertebrates. This habitat gave way to a rock ledge area that was dominated by a single enormous boulder several meters tall. The surrounding rock ledge habitat was of relatively low-relief. The dive was concluded over an area that alternated between pavement and rock ledge habitat with and without attached fauna. Rocks collected during this dive included foraminiferan limestone and calcareous mudstone found in an interbedded sequence.

ADDITIONAL COMMENTS

This dive was recorded on 3 mini DVs. There was no time overlay for this footage, so correlations between video time and real time were made using the audio commentary. Additionally, there was no dive track recorded for the last 30 minutes for the second DV or all of the third DV. The overall quality of the video was fair, with the majority of the transect footage being underlit. Both the descent and ascent were filmed in entirety. Sponges, coral, sea urchins, tunicates, rocks and sediment were collected.

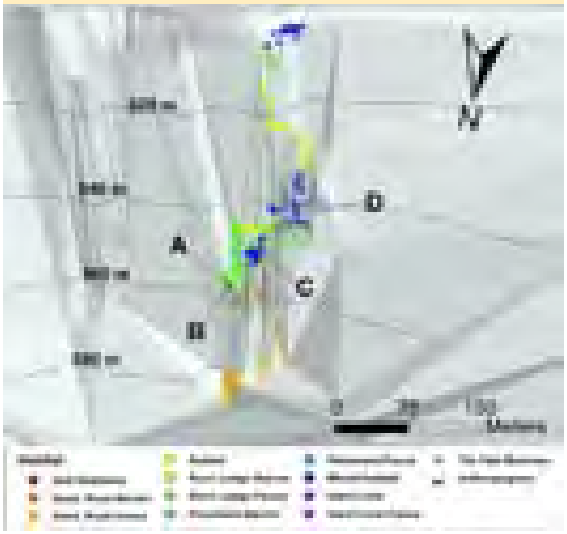
DIVE NUMBER: JSLII-3418 *STUDY AREA: Savannah Banks East*

STATION OVERVIEW

Project	Investigating the Charleston Bump 2003
Principal investigators	GR Sedberry[1] SE Stancyk
PI Contact Info[1]	Marine Resources Research Institute, SCDNR P.O. Box 12559 Charleston SC 29422-2559
Purpose	To explore and describe habitats and associated fauna of high-relief features of the Charleston Bump at a dive site called Neptune's Staircase.
Vessel	R/V Seward Johnson, Johnson Sea Link II Submersible
Science Divers	LR Sautter (bow), C Leverett (stern)
External Video Tapes	3 mini DVs
Internal Video Tapes	
Digital Still Photos	
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	
Acknowledgements	NOAA-OE
SEADESC Analyst	ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	13-Aug-03
Minimum Bottom Depth (m)	504
Maximum Bottom Depth (m)	584
Start Bottom Time (EDT)	8:39
End Bottom End (EDT)	10:41
Starting Latitude (N)	31° 44.268'
Starting Longitude (W)	78° 48.363'
Ending Latitude (N)	31° 44.124'
Ending Longitude (W)	78° 48.470'
Surface Current (Kts)	
Bottom Current (Kts)	1

Image A: Rock Ledge-Barren
31° 44.208' N, 78° 48.384 W

DIVE NUMBER: JSLII-3418 *STUDY AREA: Savannah Banks East*

IMAGE GALLERY *** indicates image position is approximated**

Image B: Rock Ledge-Fauna
31º 44.214' N, 78º 48.378' W

Image C: Rock Ledge-Fauna
31º 44.196' N, 78º 48.420' W

Image D: Mixed Habitat
31º 44.178' N, 78º 48.438' W

RELEVANT WORK AND/OR LITERATURE CITED

BIOLOGICAL ENVIRONMENT

A variety of fish were observed during this dive, though they were few in number. The most common were *Nezumia* sp. and *Laemonema melanurum*. Other noteworthy species included *Conger oceanicus*, *Beryx decadactylus* and *Polyprion americanus*. As with other dives in this area, mobile invertebrates were not common, but a variety were observed, such as *Eumunida picta, Bathynectes longispina, Chaceon* sp. as well as pencil and spiny urchins. The area was dominated by sessile invertebrates, particularly *Stylaster*, *Lophelia pertusa, Enallopsammia,* primnoids, *Keratoisis* sp., and encrusting sponges and hexactinellid sponges. There were also a number of venus flytrap anemones on rock ledges and occasional basket stars.

PHYSICAL ENVIRONMENT

This dive took place over a combination of habitat categories including rock ledge with and without fauna, mixed habitat and sand/rubble/rock with and without fauna. The central feature of this dive was a rock ledge area with both high and low-relief ledges. The surrounding area was typically flat or gently sloped with a dense community of sessile invertebrates. The underlying substrate was typically hardpan covered in a thin layer of sediment with a large number of manganese nodules scattered throughout. This site is just north of a high-relief (100 m) scarp. Rock samples indicated foraminiferan limestone and calcareous mudstone in an interbedded sequence, resulting in "stairstep" relief of about 20 m.

ADDITIONAL COMMENTS

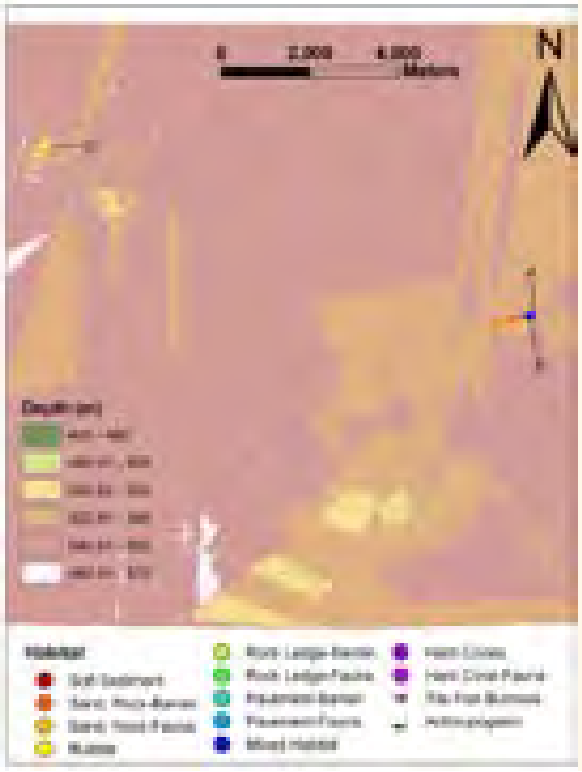
This dive was recorded on 3 mini DVs. There was no time overlay, so correlations between video time and real time were made using the audio commentary. The footage begins during the descent and includes the ascent as well. The first DV contains over 30 minutes of bottom footage before the initial bottom report was given. There was some very good footage of *Polyprion americanus*. A snail, crab, sea urchin, rocks and sediment were collected.

OVERVIEW

Total Dives: 2 **Depth Range (m):** 497 to 541

GENERAL LOCATION

HABITAT CHARACTERIZATION MAP



DIVE SUMMARY FOR SITE

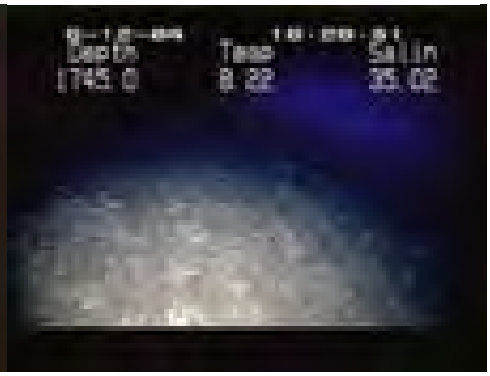
Dive Date	PI	Station	Method	Start-Time	End-Time	Start-Lat (N)	Start-Long (W)	End-Lat (N)	End-Long (W)
12-Jun-04	SW Ross	JSLI-4687	HOV	8:32	10:13	31° 44.357'	79° 06.088'	31° 44.523'	79° 05.660'
12-Jun-04	SW Ross	JSLI-4688	HOV	16:27	18:00	31° 46.451'	79° 11.695'	31° 46.564'	79° 11.595'

IMAGE GALLERY *** indicates image position is approximated**

Image A: Mixed Habitat
31º 44.520' N, 79º 05.634' W *

Image B: Mixed Habitat
31º 44.538' N, 79º 05.670' W

Image C: Rubble
31º 46.446' N, 79º 11.694' W *



SITE OVERVIEW **AUTHOR** SW Ross, AM Quattrini **DATE COMPILED** 19-Dec-06

One of the first direct observations in this area came from 1967 submersible dives using the DSRV Alvin, and two dives confirmed that *Enallopsammia* (=*Dendrophyllia*) and *Lophelia* occurred in certain areas (Milliman et al. 1967). Reed (2002) and Reed et al. (2006) summarized data from this area. Ross et al conducted two dives in this area during 2004. These dives surveyed a depth range of 497-541 m and transected mostly rubble fields (heavily covered with sediment), mixed habitat communities, and hard coral areas. Mean temperatures ranged from 8.2-9.1 ºC and salinities were around 35. Strong bottom currents were observed during the dives.

Deep corals occurred in scattered patches and were often less developed compared to other sites. In most areas during the Savannah dives, solitary colonies, either standing thickets or small bushes, of *Lophelia pertusa* were sparse along the slope and crest of the mounds; and the *Lophelia* was mostly dead. More often observed were solitary colonies of *Stylaster* spp., that appeared to be evenly spaced on the crests of the mounds. *Pseudodrifa* spp. could also be found at the Savannah site. Other sessile invertebrates observed included crinoids, large white 'fan' sponges, and hexactinellid sponges.

Mobile invertebrates were very rare in the Savannah area. Few *Bathynectes longispina*, urchins, seastars, and galatheids were observed. Mostly, these were found in mixed habitats that had a higher percentage of attached invertebrates compared to other Savannah habitats surveyed. Abundant fishes included *Laemonema melanurum, L. barbatulum, Nezumia sclerorhynchus*, and *Squalus cubensis*.

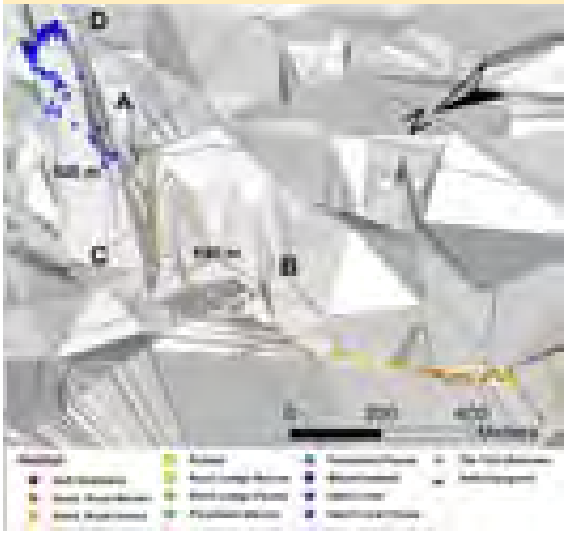
DIVE NUMBER: JSLI-4687 *STUDY AREA: Savannah Banks West*

STATION OVERVIEW

Project	Life on the Edge 2004
Principal investigators	SW Ross[1] KJ Sulak, MS Nizinski, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Mapping of deep coral banks, ecological studies of macroinvertebrates and fishes, paleoclimate studies, coral genetics and educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link I Submersible
Science Divers	SW Ross (bow), K Cartwright (stern)
External Video Tapes	2 mini DVs, 1 HD
Internal Video Tapes	3 mini DVs
Digital Still Photos	0
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Hard copy of stern audio log
Acknowledgements	NOAA-OE, NOAA Fisheries, USGS, UNCW, NC Museum of Natural Sciences
SEADESC Analyst	AM Quattrini, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	12-Jun-04
Minimum Bottom Depth (m)	497
Maximum Bottom Depth (m)	541
Start Bottom Time (EDT)	8:32
End Bottom End (EDT)	10:13
Starting Latitude (N)	31° 44.357'
Starting Longitude (W)	79° 06.088'
Ending Latitude (N)	31° 44.523'
Ending Longitude (W)	79° 05.660'
Surface Current (Kts)	
Bottom Current (Kts)	0.7

Image A: Mixed Habitat
31° 44.54' N, 79° 05.670' W

DIVE NUMBER: JSLI-4687 *STUDY AREA: Savannah Banks West*

IMAGE GALLERY

*** indicates image position is approximated**

Image B: Sand/Rubble/Rock-Barren
31º 44.490' N, 79º 05.862' W

Image C: Sand/Rubble/Rock-Barren
31º 44.508' N, 79º 05.742' W

Image D: Mixed Habitat
31º 44.520' N, 79º 05.634' W *

RELEVANT WORK AND/OR LITERATURE CITED

Milliman et al. (1967)
Ayers and Pilkey (1981)
EEZ-SCAN 87 Scientific Staff (1991)
Reed (2002)
Reed and Ross (2005)
Reed et al. (2006)
Ross and Nizinski (in press)

BIOLOGICAL ENVIRONMENT

Several fishes and invertebrates were observed during this dive. The most abundant fishes observed included *Nezumia sclerorhynchus, Laemonema barbatulum,* and *Laemonema melanurum.* Other species observed included *Fenestraja plutonia, Chlorophthalmus agassizi,* and *Trachyscorpia cristulata.* Galatheids were uncommon in this area. *Bathynectes* were more common and were seen throughout the mixed habitat. Other invertebrates observed included pencil urchins and starfish. No invertebrates were on the sand/rock/rubble substrate in the beginning of the dive. Sponges, *Lophelia pertusa*, and *Enallopsammia* were common sessile invertebrates.

PHYSICAL ENVIRONMENT

The substrate in the beginning of the dive was mostly coarse sand with few scattered small rocks and rock rubble. Mostly, fauna was absent in this area, except for a few patches of large, white sponges. The submersible then approached a mixed transitional habitat, which climbed a steep (70-80º) slope. This habitat did not have much coral development, just a few small twigs of live *Lophelia pertusa* and *Enallopsammia* on a coral rubble covered bottom. Also present in this mixed habitat were an abundance of glass sponges. Near the top of the slope, the mixed habitat became denser with greater relief (~ 1m). Sponges and live coral were more common; however, there were no large coral mounds present. Strong currents were apparent throughout this dive.

ADDITIONAL COMMENTS

This dive was recorded on 2 mini DVs and archived on 2 DVDs. The internal bow video was used throughout to supplement the external video when footage was too dark. The internal video was high quality.

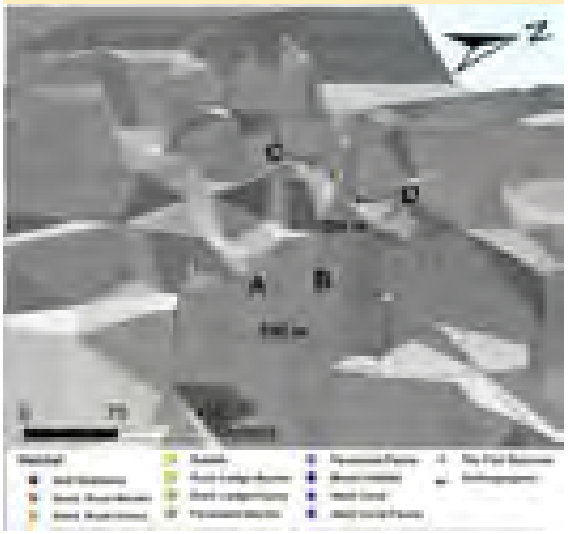
DIVE NUMBER: JSLI-4688 *STUDY AREA: Savannah Banks West*

STATION OVERVIEW

Project	Life on the Edge 2004
Principal investigators	SW Ross[1] KJ Sulak, MS Nizinski, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Mapping of deep coral banks, ecological studies of macroinvertebrates and fishes, paleoclimate studies, coral genetics and educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link I Submersible
Science Divers	M Nizinski (bow), B Williams (stern)
External Video Tapes	2 mini DVs
Internal Video Tapes	3 mini DVs
Digital Still Photos	0
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Hard copies of bow and stern audio logs
Acknowledgements	NOAA-OE, NOAA Fisheries, USGS, UNCW, NC Museum of Natural Sciences
SEADESC Analyst	AM Quattrini, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	12-Jun-04
Minimum Bottom Depth (m)	505
Maximum Bottom Depth (m)	532
Start Bottom Time (EDT)	16:27
End Bottom End (EDT)	18:00
Starting Latitude (N)	31° 46.451'
Starting Longitude (W)	79° 11.695'
Ending Latitude (N)	31° 46.564'
Ending Longitude (W)	79° 11.595'
Surface Current (Kts)	
Bottom Current (Kts)	0.9

Image A: Rubble
31º 46.446' N, 79º 11.694' W *

DIVE NUMBER: JSLI-4688 *STUDY AREA: Savannah Banks West*

IMAGE GALLERY

*** indicates image position is approximated**

Image B: Rubble
31º 46.590' N, 79º 11.574' W

Image C: Rubble
31º 46.554' N, 79º 11.598' W *

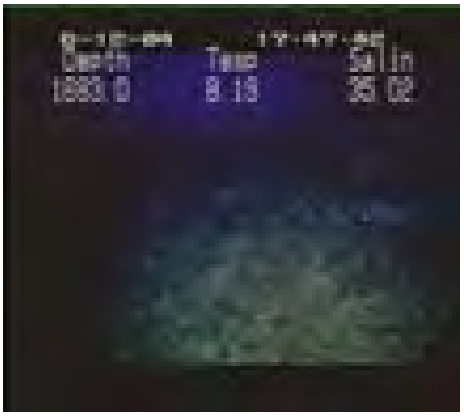
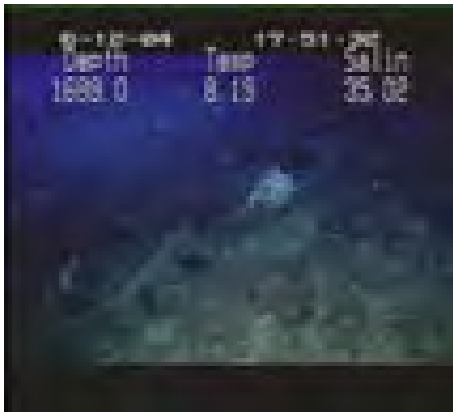


Image D: Rubble
31º 46.560' N, 79º 11.592' W *



RELEVANT WORK AND/OR LITERATURE CITED

Milliman et al. (1967)
Ayers and Pilkey (1981)
EEZ-SCAN 87 Scientific Staff (1991)
Reed (2002)
Reed and Ross (2005)
Ross and Nizinski (in press)

BIOLOGICAL ENVIRONMENT

Very few fishes were seen on this dive. A few *Squalus* spp., *Fenestraja plutonia, Laemonema melanurum,* and *Nezumia sclerorhynchus* were found throughout the transitional habitat. Additionally, few invertebrates such as brittle stars (under coral rubble), crinoids, alcyonaceans, sponges, and an octopus were observed.

PHYSICAL ENVIRONMENT

A strong current was evident on the bottom. Bottom slope was gradual (~20º). Habitats were patchy throughout this dive as substrate varied among coral rubble and hard corals with and without attached fauna. The coral rubble areas were generally covered with a layer of sediment, though a few solitary twigs of live hard corals, such as *Stylaster* and *Lophelia pertusa,* were present. Attached fauna also included crinoids and alcyonaceans. These rubble areas were interspersed with sand grooves. Hard coral areas were not extensive. Most of these areas were densely packed dead coral < 0.5 m in height, with sparse live *L. pertusa.*

ADDITIONAL COMMENTS

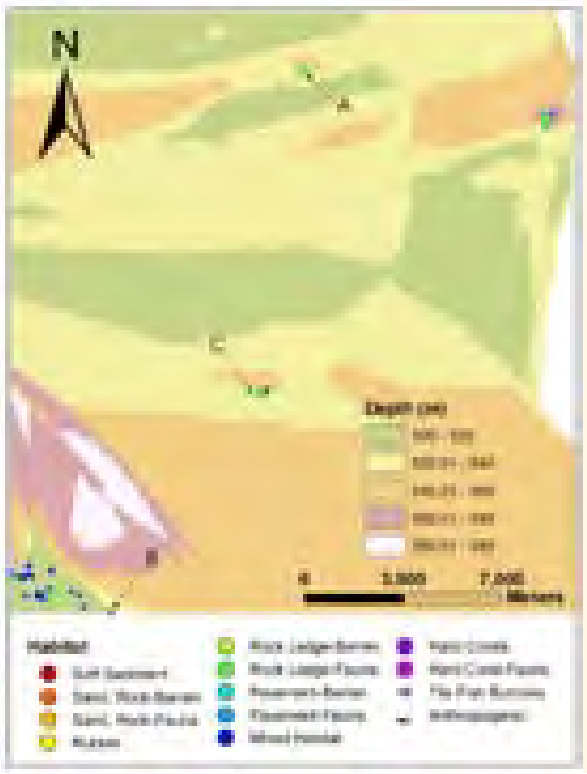
This dive was captured on 2 mini DVs, 1 HD and archived on 2 DVDs. Due to low lighting, the internal bow video was frequently used to help classify habitats and identify fauna. Additionally, there was no dive track associated with this dive so waypoints taken during the dive were used as spatial reference for habitats and images.

OVERVIEW

Total Dives: 7 **Depth Range (m):** 513 to 608

GENERAL LOCATION

HABITAT CHARACTERIZATION MAP



DIVE SUMMARY FOR SITE

Dive Date	PI	Station	Method	Start-Time	End-Time	Start-Lat (N)	Start-Long (W)	End-Lat (N)	End-Long (W)
11-Aug-03	GR Sedberry	JSLII-3414	HOV	11:42	12:38	31° 24.876'	78° 50.822'	31° 24.828'	78° 50.883'
11-Aug-03	GR Sedberry	JSLII-3415	HOV	16:58	18:11	31° 24.048'	78° 46.126'	31° 23.796'	78° 46.150'
12-Aug-03	GR Sedberry	JSLII-3416	HOV	8:32	10:30	31° 24.894'	78° 50.783'	31° 24.828'	78° 50.866'
12-Aug-03	GR Sedberry	JSLII-3417	HOV	16:13	17:42	31° 24.066'	78° 46.029'	31° 23.952'	78° 46.157'
21-Aug-04	GR Sedberry	JSLII-3460	HOV	14:35	14:55	31° 15.978'	78° 54.714'	31° 16.110'	78° 55.089'
22-Aug-04	GR Sedberry	JSLII-3461	HOV	13:23	16:08	31° 15.522'	78° 56.357'	31° 13.806'	78° 55.056'
22-Aug-04	GR Sedberry	JSLII-3462	HOV	8:38	11:09	31° 18.939'	78° 51.539'	31° 18.721'	78° 51.558'

IMAGE GALLERY *** indicates image position is approximated**

Image A: Rock Ledge-Fauna
31° 24.870' N, 78° 50.838' W

Image B: Mixed Habitat
31° 13.806' N, 78° 55.056' W

Image C: Rock Ledge-Fauna
31° 18.816' N, 78° 51.636' W

SITE OVERVIEW **AUTHOR** GR Sedberry **DATE COMPILED** 19-Dec-06

Submersible and sonar observations revealed a diversity of bottom types, from flat hard bottom to rugged relief and near-vertical scarps. Bottom topography ranged from few to over 100 m in relief. From the southern end of the survey area (about 31°15'N; near Dive Site 3461), the bottom sloped upward toward the north from depths of about 600 m. North of this area, from about 31°20' to 31°25' N, are a series of ridges with depths shoaling to ~510 m on top of the ridges and 550 m in the valleys between ridges (Dive Sites 3415-3417). These ridges were important wreckfish (*Polyprion americanus*) and red bream (*Beryx decadactylus*) habitat. To the north of the ridges, the bottom was relatively smooth and sloped gradually upward to rough bottom at the top of a system of scarps. The southern edge of this relatively flat area contained some high-relief bottom and wreckfish habitat. In flat areas, moras (Moridae) and grenadiers (Macrouridae) were found. Individual moras and grenadiers were often associated with small corals (*Lophelia* and *Stylaster*) that grew in evenly spaced clumps on the hard pavement. Demersal anglerfishes (Chaunacidae) were also found in this habitat. Skates were occasionally observed. Also recorded were red bream on the southern series of ridges (Dives 3414-3417). They, like wreckfish, were associated with high-relief rocky bottom and overhangs.

Rock samples obtained during dives on the Charleston Bump indicated that there are at least three distinct rock types forming the sea floor in the Charleston Bump area. These included manganese-phosphorite pavement and nodules, foraminiferan limestone and calcareous mudstone. The mudstone exhibited greater erosion in situ and was very chalky to the touch. The foraminiferan limestone was more resistant to the erosive forces of the strong bottom currents and produced overhangs and steeper-faced slopes where exposed. The result was a terraced, step-like sequence of alternating calcareous mudstones (the eroded terraces) and foraminiferan limestones (much like the 'stairs' at "Neptune's Staircase"). Sessile benthic organisms appeared to prefer the foraminiferan limestone as their anchoring substrate as they were found in abundance in places where limestone occurred. Few, if any, organisms were observed attached to the mudstone, perhaps because of its low resistance to erosion. Manganese-phosphorite was found on most Charleston Bump dives, as broken pavement or scattered rubble, some of which was nodular in form. The manganese-phosphorite rocks appeared to have a different group of organisms inhabiting their surface, and densities were lower than on the limestone, although this has not yet been quantified. Only a few solitary anemones, sponges, ascidians and stony corals were encountered on collected rock specimens.

In some places, the rocks formed nearly vertical cliffs with alternating layers of the two carbonate rocks (Dive 3461). Between these steep areas were narrow terraces, creating a stairway to depths well below 550 m. Overhanging ledges occurred at some intervals, and corals, anemones, and sponges grew on the protected underside of these overhangs. Near the center of this site (Dives 3414, 3416) there appeared to be large slabs of the foraminiferan limestone with high-density populations of corals and other invertebrates. Some of these slabs provided large overhanging sheltered habitats. A school of large red bream and wreckfish were observed under one long slab. Sediment samples were also collected on all dives. These samples were all very low in volume, as there was only a thin veneer of sediment available for sampling.

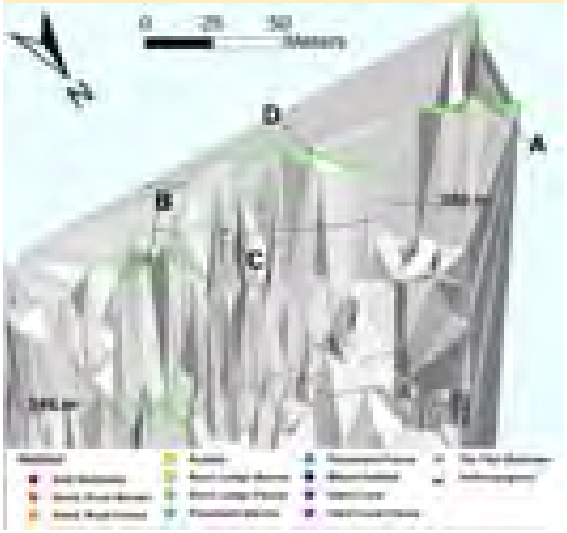
DIVE NUMBER: JSLII-3414 *STUDY AREA: Charleston Bump*

STATION OVERVIEW

Project	Investigating the Charleston Bump 2003
Principal investigators	GR Sedberry[1] SE Stancyk
PI Contact Info[1]	Marine Resources Research Institute, SCDNR P.O. Box 12559 Charleston SC 29422-2559
Purpose	To explore and describe habitats and associated fauna of high-relief features in the southern part of the Charleston Bump, in an area called Slab Garden.
Vessel	R/V Seward Johnson 2, Johnson Sea Link II Submersible
Science Divers	EL Werner (bow), LR Sautter (stern)
External Video Tapes	1 mini DV
Internal Video Tapes	
Digital Still Photos	
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Experiments deployed and retrieved on dive 3416
Acknowledgements	NOAA-OE
SEADESC Analyst	ML Partyka
Date Compiled	12/19/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	11-Aug-03
Minimum Bottom Depth (m)	532
Maximum Bottom Depth (m)	545
Start Bottom Time (EDT)	11:42
End Bottom End (EDT)	12:38
Starting Latitude (N)	31° 24.876'
Starting Longitude (W)	78° 50.822'
Ending Latitude (N)	31° 24.828'
Ending Longitude (W)	78° 50.883'
Surface Current (Kts)	
Bottom Current (Kts)	

Image A: Rock Ledge-Fauna
31° 24.810' N, 78° 50.886' W

DIVE NUMBER: JSLII-3414 *STUDY AREA: Charleston Bump*

IMAGE GALLERY

*** indicates image position is approximated**

Image B: Rock Ledge-Fauna
31º 24.852' N, 78º 50.826' W

Image C: Rock Ledge-Fauna
31º 24.864' N, 78º 50.826' W

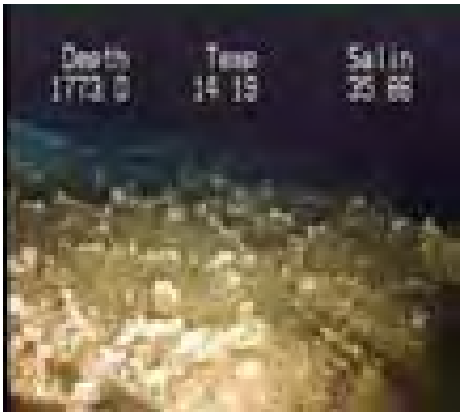


Image D: Rock Ledge-Fauna
31º 24.834' N, 78º 50.850' W

RELEVANT WORK AND/OR LITERATURE CITED

Popenoe and Manheim (2001)
Sedberry (2001)

BIOLOGICAL ENVIRONMENT

Few fish or mobile invertebrates were observed during the majority of this short dive, though several *Beryx decadactylus* were observed at the end of the dive along with a *Polyprion americanus* and numerous *Eumunida picta.* The sessile invertebrate community was both dense and diverse. The dominant species varied throughout the dive; however, certain groups were prevalent throughout such as isidids, primnoids, ascidians, hydroids and a wide array of sponges, hexactinellids and demosponges. Hard corals were represented by *Lophelia pertusa, Stylaster* and *Enallopsammia* and were found in greatest numbers in rock ledge habitat that had increased sediment and lower relief. Some antipatharians were present in high numbers for a portion of the dive.

PHYSICAL ENVIRONMENT

The dive began with the sub transecting over rock ledge habitat of low-to-moderate relief covered in dense macrofauna. The dive continued over a jagged rocky bottom that progressed from a thin veneer of sediment to deeper swales of sediment between features. The terminus of the dive covered a high-relief rock ledge habitat with numerous fishes and dense macrofauna.

ADDITIONAL COMMENTS

This dive was recorded on one mini DV. There was no time overlay so the audio commentary was used to correlate video time with real time. There was a large amount of footage of gear deployment and sample collections. The last 15-20 minutes of footage was excellent footage of both *Beryx decadactylus* and *Polyprion americanus.*

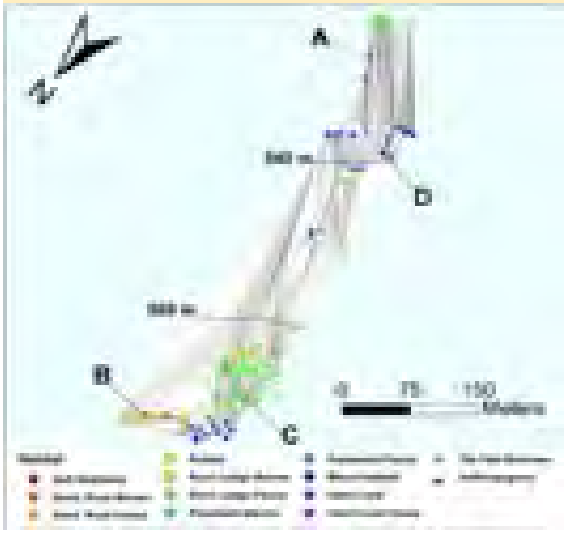
DIVE NUMBER: JSLII-3415 *STUDY AREA: Charleston Bump*

STATION OVERVIEW

Project	Investigating the Charleston Bump 2003
Principal investigators	GR Sedberry[1] SE Stancyk
PI Contact Info[1]	Marine Resources Research Institute, SCDNR P.O. Box 12559 Charleston SC 29422-2559
Purpose	To explore and describe habitats and associated fauna of high-relief features of the Charleston Bump
Vessel	R/V Seward Johnson 2, Johnson Sea Link II Submersible
Science Divers	SE Stancyk (bow), J McClelland (stern)
External Video Tapes	2 mini DVs
Internal Video Tapes	
Digital Still Photos	
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	
Acknowledgements	NOAA-OE
SEADESC Analyst	ML Partyka
Date Compiled	12/19/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	11-Aug-03
Minimum Bottom Depth (m)	520
Maximum Bottom Depth (m)	570
Start Bottom Time (EDT)	16:58
End Bottom End (EDT)	18:11
Starting Latitude (N)	31° 24.048'
Starting Longitude (W)	78° 46.126'
Ending Latitude (N)	31° 23.796'
Ending Longitude (W)	78° 46.150'
Surface Current (Kts)	
Bottom Current (Kts)	0.1

Image A: Rock Ledge-Fauna
31° 23.826' N, 78° 46.158' W

DIVE NUMBER: JSLII-3415 *STUDY AREA: Charleston Bump*

IMAGE GALLERY *** indicates image position is approximated**

Image B: Sand/Rubble/Rock-Fauna
31º 24.036' N, 78º 46.128' W

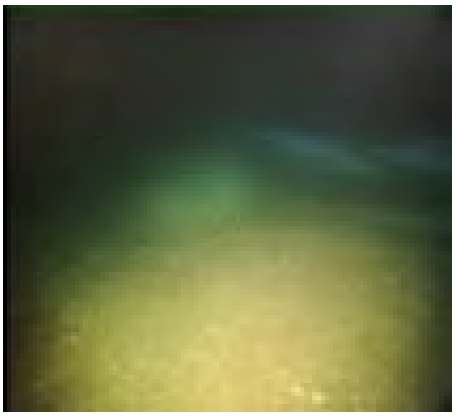


Image C: Rock Ledge-Fauna
31º 23.976' N, 78º 46.164' W

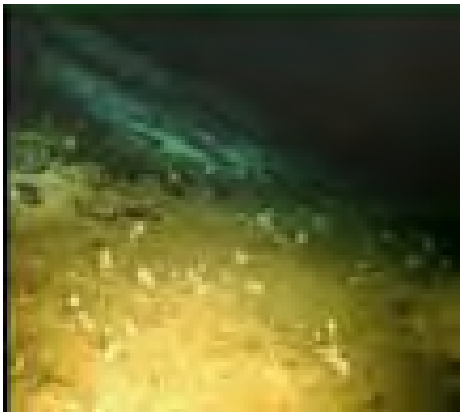
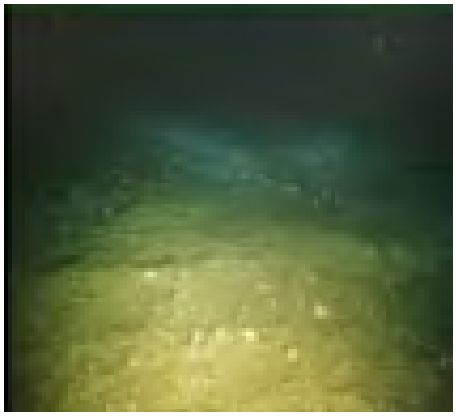


Image D: Mixed Habitat
31º 23.850' N, 78º 46.170' W



RELEVANT WORK AND/OR LITERATURE CITED

Popenoe and Manheim (2001)
Sedberry (2001)

BIOLOGICAL ENVIRONMENT

Very few fishes were observed on the video for this dive. Those identified included *Laemonema barbatulum* and *L. melanurum*. Mobile invertebrates were also uncommon though several shrimp were seen in one area along with sea stars and an unidentified galatheid crab. The macrofaunal community was also depauperate, though this may be to the poor quality of the video that prohibited clear views of the bottom. The dominant macrofauna were small stony corals, such as *Stylaster*, as well as small growths of *Lophelia pertusa* and *Enallopsammia* along with various hexactinellid sponges.

PHYSICAL ENVIRONMENT

Dive begins at the base of a moderate slope (~30º) in a hardbottom habitat covered in coarse sand and fine coral rubble. There were few macrofauna present other than scattered stony corals until the sub approached an upslope mixed habitat area. This mixed habitat area, dominated by low relief *Lophelia, Enallopsammia, Stylaster* and hexactinellids, was more depauperate than others encountered in this region. The dive progressed upslope encountering a range of habitats that were subtly differentiated by dominance of fauna and relief of rocky features, before reaching the top of the ridge. This region was predominantly rock ledge habitat with attached fauna.

ADDITIONAL COMMENTS

This dive was recorded on 2 mini DVs. There was no time or CTD overlay on this video so the audio commentary was used to correlate video time and real time. The overall quality of this footage was poor as the majority of it was filmed out of focus. The inner lens of the camera was cloudy which obscured the center of the view. A sponge, coral, rock and sediment were collected. Carrion traps deployed on this dive were retrieved on Dive 3417.

DIVE NUMBER: JSLII-3416 *STUDY AREA: Charleston Bump*

STATION OVERVIEW

Project	Investigating the Charleston Bump 2003
Principal investigators	GR Sedberry[1] SE Stancyk
PI Contact Info[1]	Marine Resources Research Institute, SCDNR P.O. Box 12559 Charleston SC 29422-2559
Purpose	To explore and describe habitats and associated fauna of high-relief features of a southern part of the Charleston Bump, in an area called "Slab Garden".
Vessel	R/V Seward Johnson 2, Johnson Sea Link II Submersible
Science Divers	R Styles (bow), D Hooker (stern)
External Video Tapes	3 mini DVs
Internal Video Tapes	
Digital Still Photos	
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Retrieved experiments deployed during dive 3414
Acknowledgements	NOAA-OE
SEADESC Analyst	ML Partyka
Date Compiled	12/19/2006

GENERAL LOCATION

Dive Track:

DIVE DATA

Date	12-Aug-03
Minimum Bottom Depth (m)	540
Maximum Bottom Depth (m)	555
Start Bottom Time (EDT)	8:32
End Bottom End (EDT)	10:30
Starting Latitude (N)	31° 24.894'
Starting Longitude (W)	78° 50.783'
Ending Latitude (N)	31° 24.828'
Ending Longitude (W)	78° 50.866'
Surface Current (Kts)	
Bottom Current (Kts)	

Image A: Rock Ledge-Fauna
31° 24.876' N, 78° 50.826' W

DIVE NUMBER: JSLII-3416 *STUDY AREA: Charleston Bump*

IMAGE GALLERY *** indicates image position is approximated**

Image B: Rock Ledge-Fauna
31º 24.894' N, 78º 50.790' W

Image C: Rock Ledge-Fauna
31º 24.870' N, 78º 50.838' W

Image D: Rock Ledge-Fauna
31º 24.870' N, 78º 50.838' W

RELEVANT WORK AND/OR LITERATURE CITED

Popenoe and Manheim (2001)
Sedberry (2001)

BIOLOGICAL ENVIRONMENT

Few fish were filmed during the course of this dive. Those observed included *Polyprion americanus, Beryx decadactylus* and *Conger oceanicus.* Mobile invertebrates were most common near the sites of gear retrieval and included *Bathynectes longispina*, numerous unidentified red shrimps, brittle stars, sea stars and pencil urchins. The macrofaunal community was relatively consistent throughout the dive and included primnoids, hexactinellids, small *Enallopsammia*, *Stylaster* with occasional antipatharians, *Paragorgia* and large ascidians.

PHYSICAL ENVIRONMENT

This dive began at the base of a gradually sloping (20-30º) rock slab habitat. There were a couple of places that the rock slabs gave way to low-relief mixed habitat and sand/rubble/rock habitat, but generally the area could be described as moderate-relief rock ledge habitat with varying degrees of attached macrofauna.

ADDITIONAL COMMENTS

This dive was recorded on 3 mini DVs of mediocre quality. The first DV began during the descent and then jumped to the bottom. Transects alternated between close up and wide angle views, often out of focus. A large amount of time was spent filming gear retrieval. Sediment, rocks, shrimp and crabs were collected. Experiments deployed on dive JSLII-3414 were recovered on this dive.

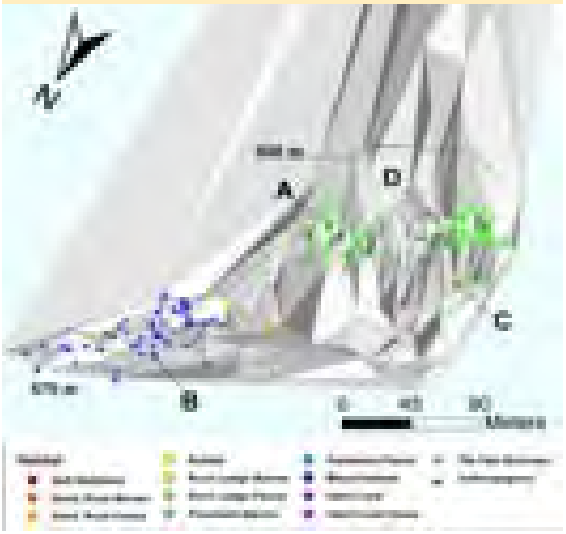
DIVE NUMBER: JSLII-3417 *STUDY AREA: Charleston Bump*

STATION OVERVIEW

Project	Investigating the Charleston Bump 2003
Principal investigators	GR Sedberry[1] SE Stancyk
PI Contact Info[1]	Marine Resources Research Institute, SCDNR P.O. Box 12559 Charleston SC 29422-2559
Purpose	To explore and describe habitats and associated fauna of high-relief features of the Charleston Bump
Vessel	R/V Seward Johnson 2, Johnson Sea Link II Submersible
Science Divers	J Loefer (bow), F Andrus (stern)
External Video Tapes	3 mini DVs
Internal Video Tapes	
Digital Still Photos	
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	
Acknowledgements	NOAA-OE
SEADESC Analyst	ML Partyka
Date Compiled	12/19/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	12-Aug-03
Minimum Bottom Depth (m)	564
Maximum Bottom Depth (m)	571
Start Bottom Time (EDT)	16:13
End Bottom End (EDT)	17:42
Starting Latitude (N)	31° 24.066'
Starting Longitude (W)	78° 46.029'
Ending Latitude (N)	31° 23.952'
Ending Longitude (W)	78° 46.157'
Surface Current (Kts)	
Bottom Current (Kts)	

Image A: Rock Ledge-Fauna
31° 23.988' N, 78° 46.146' W

DIVE NUMBER: JSLII-3417 *STUDY AREA: Charleston Bump*

IMAGE GALLERY

*** indicates image position is approximated**

Image B: Mixed Habitat
31º 24.042' N, 78º 46.074' W

Image C: Sand/Rubble/Rock-Barren
31º 23.970' N, 78º 46.176' W

Image D: Rock Ledge-Fauna
31º 23.940' N, 78º 46.170' W

RELEVANT WORK AND/OR LITERATURE CITED

Popenoe and Manheim (2001)
Sedberry (2001)

BIOLOGICAL ENVIRONMENT

There were few fishes observed during the course of this dive. Those recorded included *Squalus cubensis, Laemonema melanurum, Nezumia sclerorhynchus* and *Chaunax* spp. Mobile invertebrates included multiple shrimp, *Bathynectes longispina*, seastars, and a small snail. The macrofaunal community varied between areas and was often difficult to identify due to poor lighting and focus. However, numerous *Stylaster*, isidids, small colonies of *Lophelia pertusa, Enallopsammia*, cup corals, hexactinellids and fanlike sponges were seen in both mixed and rock ledge habitats.

PHYSICAL ENVIRONMENT

This dive took place in an area of commercial fisheries for wreckfish, which is characterized by a series of ridges and steep scarps. The dive began over a low sloping mixed habitat region with coarse sediments and scattered sponges and hard corals. The dive progressed up a 20-30º slope into a rock ledge habitat with attached fauna. This rocky habitat was typically low-relief (<1m) and was situated at the base of a larger slope that was explored during dive JSLII-3415.

ADDITIONAL COMMENTS

This dive was recorded on 2 mini DVs. The video began during the descent and quickly changed scenes to the bottom with no digital overlay. For the remainder of the dive the overlay was turned on and off. Additionally the video feed frequently cut out and the footage was typically too dark and out of focus for clear habitat descriptions. There was no CTD data recorded for the last 18 minutes of bottom time. Coral, seastar, snail, shrimp, crab, fishes and sediment were collected.

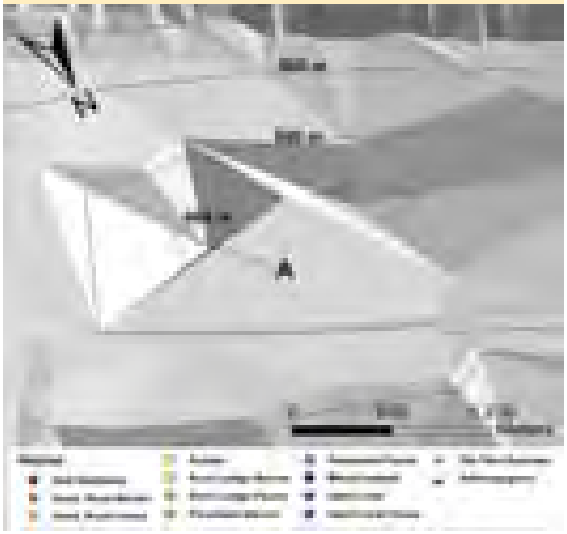
DIVE NUMBER: JSLII-3460 *STUDY AREA: Charleston Bump*

STATION OVERVIEW

Project	Estuary to the Abyss 2004
Principal investigators	GR Sedberry[1]
PI Contact Info[1]	Marine Resources Research Institute, SCDNR P.O. Box 12559 Charleston SC 29422-2559
Purpose	To investigate cliff and associated sponges reported by Popenoe and Manheim (2001).
Vessel	R/V Seward Johnson 2, Johnson Sea Link II Submersible
Science Divers	GR Sedberry (bow), C Ralph (stern)
External Video Tapes	1 mini DV
Internal Video Tapes	
Digital Still Photos	
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Dive aborted due to nav errors. Sediment sampled.
Acknowledgements	NOAA-OE
SEADESC Analyst	ML Partyka
Date Compiled	12/19/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	21-Aug-04
Minimum Bottom Depth (m)	606
Maximum Bottom Depth (m)	608
Start Bottom Time (EDT)	14:35
End Bottom End (EDT)	14:55
Starting Latitude (N)	31° 15.978'
Starting Longitude (W)	78° 54.714'
Ending Latitude (N)	31° 16.110'
Ending Longitude (W)	78° 55.089'
Surface Current (Kts)	
Bottom Current (Kts)	

Image A: Sand/Rubble/Rock-Fauna
31° 15.168' N, 78° 55.920' W*

DIVE NUMBER: JSLII-3460 *STUDY AREA: Charleston Bump*

IMAGE GALLERY *** indicates image position is approximated**

RELEVANT WORK AND/OR LITERATURE CITED

Popenoe and Manheim (2001)
Sedberry (2001)

BIOLOGICAL ENVIRONMENT

Due to the short time spent on the bottom during this dive, very few mobile organisms were observed. These included a squalid shark and a number of brittle stars. The sessile community was made up of primnoid corals, *Leiopathes* black coral, multiple sponges and a group of stalked crinoids. *Laemonema* sp. and *Polymixia* sp. were observed by science divers though were not captured on video.

PHYSICAL ENVIRONMENT

The physical habitat consisted of a relatively flat terrain made up of hard-pan with a thin veneer of sandy sediments.

ADDITIONAL COMMENTS

This dive was recorded on one mini DV with about 20 minutes of footage. The dive was aborted due to a failure with the tracking system so available positions may be inaccurate. The video footage quality was reduced by frequent cutting in and out and condensation on the inner camera lens. Also, the CTD/Time display was set outside the frame of a standard television and readable only on a computer.

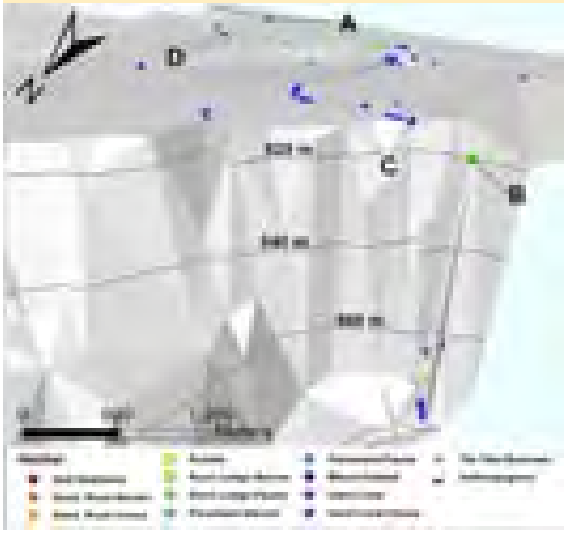
DIVE NUMBER: JSLII-3461 *STUDY AREA: Charleston Bump*

STATION OVERVIEW

Project	Estuary to the Abyss 2004
Principal investigators	GR Sedberry[1]
PI Contact Info[1]	Marine Resources Research Institute, SCDNR P.O. Box 12559 Charleston SC 29422-2559
Purpose	To investigate a sponge-lined cliff reported by Popenone and Manheim (2001).
Vessel	R/V Seward Johnson 2, Johnson Sea Link II Submersible
Science Divers	LR Sautter (bow), S Griffin (stern)
External Video Tapes	3 mini DVs
Internal Video Tapes	
Digital Still Photos	
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	
Acknowledgements	NOAA-OE
SEADESC Analyst	ML Partyka
Date Compiled	12/19/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	22-Aug-04
Minimum Bottom Depth (m)	513
Maximum Bottom Depth (m)	581
Start Bottom Time (EDT)	13:23
End Bottom End (EDT)	16:08
Starting Latitude (N)	31° 15.522'
Starting Longitude (W)	78° 56.357'
Ending Latitude (N)	31° 13.806'
Ending Longitude (W)	78° 55.056'
Surface Current (Kts)	
Bottom Current (Kts)	0.7

Image A: Mixed Habitat
31° 13.806' N, 78° 55.056' W

DIVE NUMBER: JSLII-3461 *STUDY AREA: Charleston Bump*

IMAGE GALLERY

*** indicates image position is approximated**

Image B: Rock Ledge-Fauna
31º 15.390' N, 78º 56.316' W

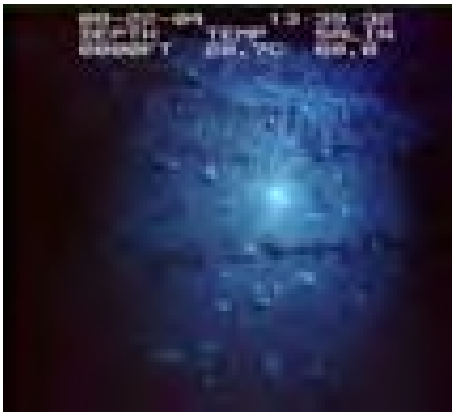
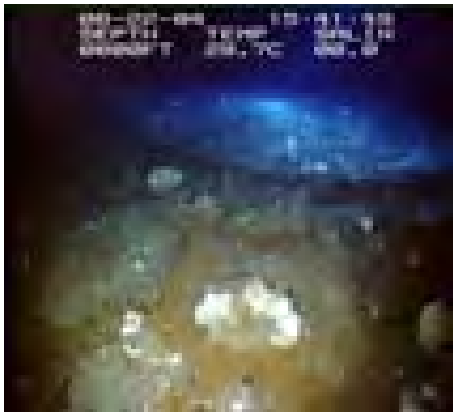


Image C: Mixed Habitat
31º 15.426' N, 78º 56.244' W

Image D: Mixed Habitat
31º 15.078' N, 78º 55.098' W



RELEVANT WORK AND/OR LITERATURE CITED

Popenoe and Manheim (2001)
Sedberry (2001)

BIOLOGICAL ENVIRONMENT

Numerous fishes were observed during the course of this dive including *Laemonema melanurum*, *Nezumia sclerorhynchus*, *Polyprion americanus, Squalus* spp. and *Scyliorhinus retifer*. Mobile invertebrates were less common. These included pencil urchins, spiny orange urchins, sea stars, a slip shell and an octopus. The sessile invertebrate community was both diverse and densely populated. Hard and soft corals, such as *Stylaster*, cup corals, primnoids, whip corals and isidids dominated most of the area. A variety of sponges and anemones were abundant. A large black coral completely covered in colonial anthozoans was also observed.

PHYSICAL ENVIRONMENT

This dive began in a dense, low-relief (<1m) mixed habitat community covered in a combination of coral rubble and fine sediments. Initial rock ledge habitats encountered were made up of low-relief, large managenese slabs which gave way to a towering wall. The entire wall was covered in a dense community of sponges and soft corals. The top of the wall was a flat, mixed habitat plateau with a combination of oxidized sediments, hard-pan rock and manganese slabs.

ADDITIONAL COMMENTS

This dive was recorded on 3 mini DVs. While the water-quality was excellent, most of the footage was underlit, making identifications of macrofauna difficult. The CTD data overlay was incorrect throughout the dive, though the data collected was correct. There was also condensation on the inner camera lens that often blurred and obscured portions of the view. Sediment, rocks, a sponge and crinoids were collected.

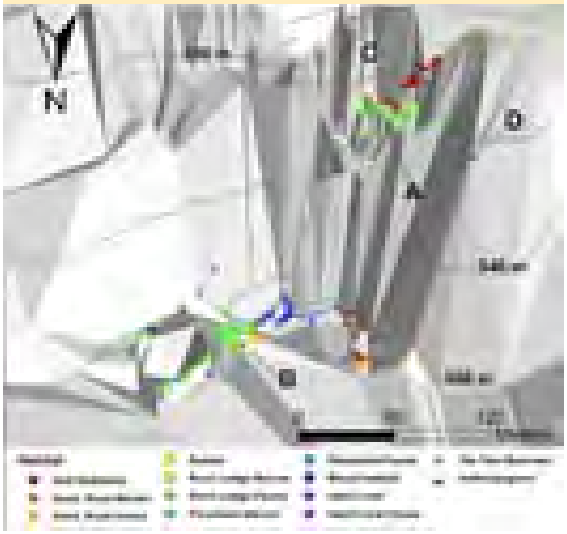
DIVE NUMBER: JSLII-3462 *STUDY AREA: Charleston Bump*

STATION OVERVIEW

Project	Estuary to the Abyss 2004
Principal investigators	GR Sedberry[1]
PI Contact Info[1]	Marine Resources Research Institute, SCDNR P.O. Box 12559 Charleston SC 29422-2559
Purpose	Explore Wreckfish Cave on the Charleston Bump. Caves and wreckfish had been previously reported by Popenoe and Manheim (2001).
Vessel	R/V Seward Johnson 2, Johnson Sea Link II Submersible
Science Divers	R King (bow), C Fiore (stern)
External Video Tapes	1 mini DV
Internal Video Tapes	
Digital Still Photos	
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	
Acknowledgements	NOAA-OE
SEADESC Analyst	ML Partyka
Date Compiled	12/19/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	22-Aug-04
Minimum Bottom Depth (m)	523
Maximum Bottom Depth (m)	552
Start Bottom Time (EDT)	8:38
End Bottom End (EDT)	11:09
Starting Latitude (N)	31° 18.939'
Starting Longitude (W)	78° 51.539'
Ending Latitude (N)	31° 18.721'
Ending Longitude (W)	78° 51.558'
Surface Current (Kts)	
Bottom Current (Kts)	

Image A: Rock Ledge-Fauna
31° 18.816' N, 78° 51.636' W

DIVE NUMBER: JSLII-3462 *STUDY AREA: Charleston Bump*

IMAGE GALLERY *** indicates image position is approximated**

Image B: Rock Ledge-Fauna
31º 18.912' N, 78º 51.564' W

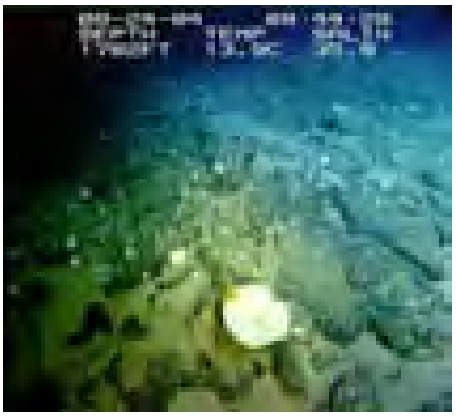


Image C: Soft Substrate
31º 18.822' N, 78º 51.654' W

Image D: Rock Ledge-Fauna
31º 18.852' N, 78º 51.666' W

RELEVANT WORK AND/OR LITERATURE CITED

Popenoe and Manheim (2001)
Sedberry (2001)

BIOLOGICAL ENVIRONMENT

There were a variety of fishes observed during this dive, though all were seen in low numbers. These included *Helicolenus dactylopterus, Laemonema melanurum, L. barbatulum* and *Polyprion americanus.* All of these fishes were seen in rock ledge habitats. There were fewer mobile marine invertebrates such as squid, large red shrimp and sea stars. The sessile invertebrates were diverse and patchy throughout the dive. Mixed habitat areas and the plateau above the large wall were covered in small stony corals, a variety of sponges, hydroids, fly trap anemones, primnoids, small isidid bamboo corals and occasional *Leiopathes* and *Paramuricea* corals. Other rock ledge habitats were predominantly small stony corals with a few sponges.

PHYSICAL ENVIRONMENT

The dive began over a mixed habitat area with a mixture of hard-pan bottom and sandy sediments giving way to a rough, broken rock ledge habitat covered in small hard corals and sponges. Large sand dunes, lined with chunks of rubble and manganese slabs, led to the base of an enormous rock feature. This wall was almost barren of fauna along its face and completely covered in fauna along its uppermost ledge. In a number of places, the face of the wall was broken into deep caverns and crevices. The plateau of the feature was mostly mixed habitat covering a hard-pan, rocky area with a thin veneer of sediment.

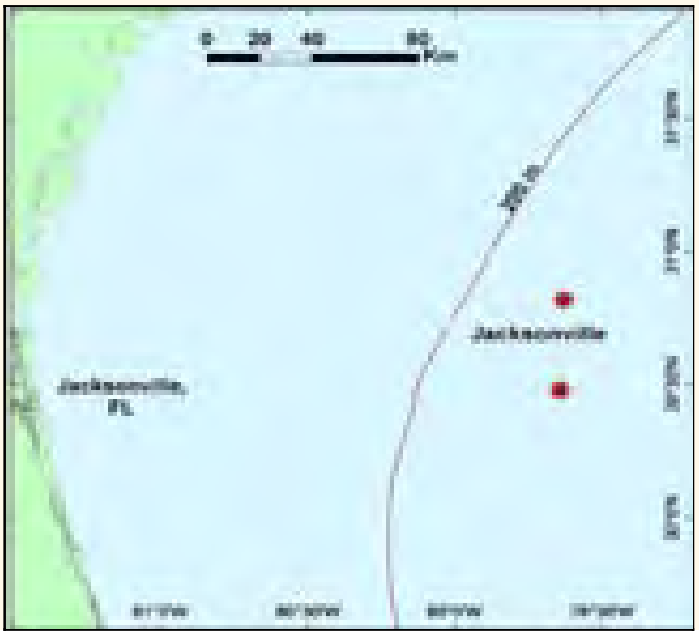
ADDITIONAL COMMENTS

This dive was recorded onto one DV, which excludes approximately 90 minutes of the dive. Though the footage was quite grainy and a little underlit there is excellent footage of a large limestone wall.

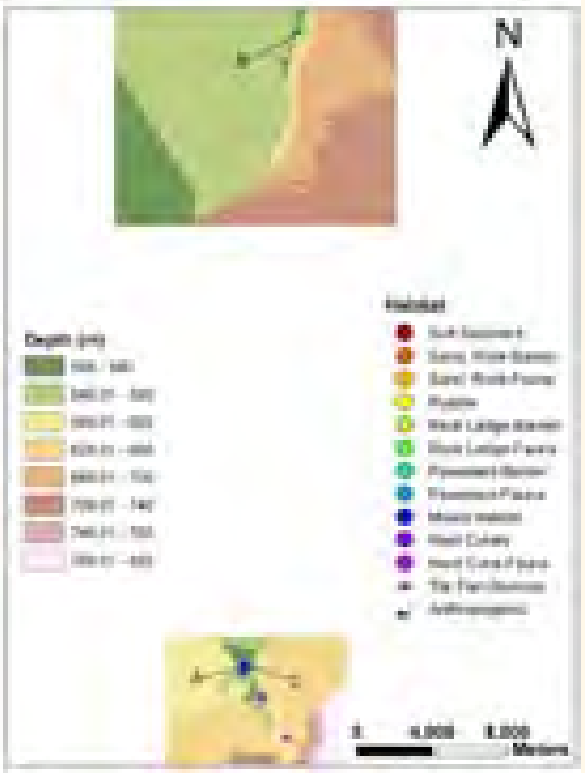
OVERVIEW

Total Dives: 6 **Depth Range (m):** 543 to 674

GENERAL LOCATION



HABITAT CHARACTERIZATION MAP



DIVE SUMMARY FOR SITE

Dive Date	PI	Station	Method	Start-Time	End-Time	Start-Lat (N)	Start-Long (W)	End-Lat (N)	End-Long (W)
10-Jun-04	SW Ross	JSLI-4683	HOV	8:32	10:55	30° 31.047'	79° 39.621'	30° 30.974'	79° 39.725'
10-Jun-04	SW Ross	JSLI-4684	HOV	16:37	18:43	30° 30.939'	79° 39.621'	30° 30.842'	79° 39.624'
11-Jun-04	SW Ross	JSLI-4685	HOV	8:45	11:00	30° 48.811'	79° 37.809'	30° 48.696'	79° 37.934'
11-Jun-04	SW Ross	JSLI-4686	HOV	17:02	18:55	30° 30.132'	79° 39.087'	30° 30.098'	79° 39.184'
19-Jun-04	SW Ross	JSLI-4700	HOV	9:37	11:07	30° 30.756'	79° 39.679'	30° 30.847'	79° 39.603'
19-Jun-04	SW Ross	JSLI-4701	HOV	17:04	18:43	30° 28.944'	79° 38.500'	30° 28.933'	79° 38.379'

IMAGE GALLERY *** indicates image position is approximated**

Image A: Rock Ledge-Fauna
30º 30.750' N, 79º 39.696' W

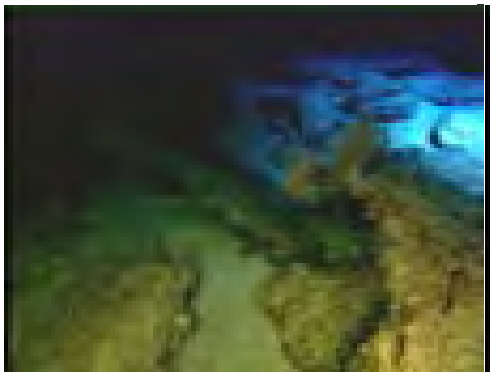


Image B: Rock Ledge-Fauna
30º 48.755' N, 79º 37.944' W

Image C: Mixed Habitat
30º 30.935' N, 79º 39.740' W

SITE OVERVIEW **AUTHOR** AM Quattrini, ML Partyka **DATE COMPILED** 19-Dec-06

Paull et al. (2000) surveyed deep coral habitats off the Florida-Georgia border and suggested that such habitat was very common. Dating indicated that some mounds may range from 18,000 to 33,000 years old (Paull et al. 2000). Additional studies have indicated that topographic highs, most having corals, are very abundant from the Jacksonville area to just south of Cape Canaveral (see also Reed et al. 2005, 2006).

Six JSL dives were completed by Ross et al. in 2004 in this area, with depths ranging from 543-674 m. Mean bottom temperatures ranged from 7.4-10.5 ºC, and salinities were always around 35. Bottom types in this area exhibited high variability and diversity. Many sites surveyed in the Jacksonville area were composed of moderate profile rock ledges to which corals were attached, especially in the northern portion of this region. Substrata in other areas consisted of mixed coral and sponge communities, hard corals with varying amounts of attached fauna, or dead coral rubble.

Faunal diversity was quite high in this region. A diverse assemblage of sessile invertebrates was observed throughout the area. Mobile invertebrates were common during some of the dives and virtually absent in others. The most common species were *Eumunida picta, Chaceon* sp., and *Bathynectes longispina.* The most abundant fishes were *Laemonema melanurum, L. barbatulum*, *Nezumia sclerorhynchus*, and *Trachyscorpia cristulata.* These species were observed mostly in reef habitats that consisted of dense, mixed invertebrate communities or rock ledges with attached fauna.

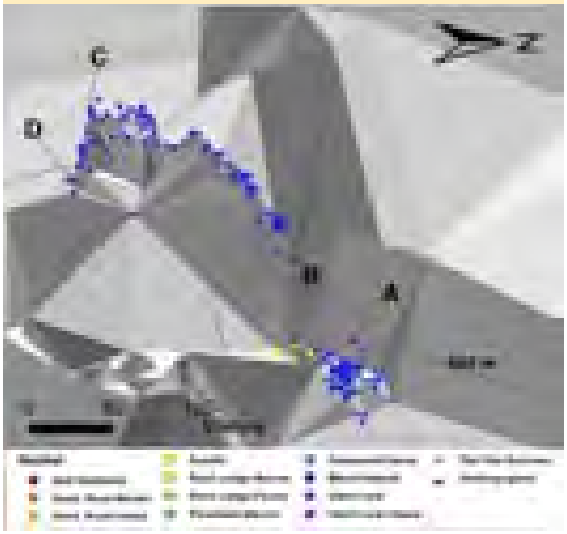
DIVE NUMBER: JSLI-4683 *STUDY AREA: Jacksonville*

STATION OVERVIEW

Project	Life on the Edge 2004
Principal investigators	SW Ross[1] KJ Sulak, MS Nizinski, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Mapping of deep coral banks, ecological studies of macroinvertebrates and fishes, paleoclimate studies, coral genetics and educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link I Submersible
Science Divers	KJ Sulak (bow), E Baird (stern)
External Video Tapes	3 mini DVs, 1 HD
Internal Video Tapes	2 mini DVs
Digital Still Photos	14
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Hard copies of bow and stern audio logs
Acknowledgements	NOAA-OE, NOAA Fisheries, USGS, UNCW, NC Museum of Natural Sciences
SEADESC Analyst	AM Quattrini, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	10-Jun-04
Minimum Bottom Depth (m)	543
Maximum Bottom Depth (m)	581
Start Bottom Time (EDT)	8:32
End Bottom End (EDT)	10:55
Starting Latitude (N)	30° 31.047'
Starting Longitude (W)	79° 39.621'
Ending Latitude (N)	30° 30.974'
Ending Longitude (W)	79° 39.725'
Surface Current (Kts)	
Bottom Current (Kts)	0.5

Image A: Mixed Habitat
30º 31.046' N, 79º 39.646' W

DIVE NUMBER: JSLI-4683 *STUDY AREA: Jacksonville*

IMAGE GALLERY

*** indicates image position is approximated**

Image B: Rubble
30º 31.026' N, 79º 39.646' W

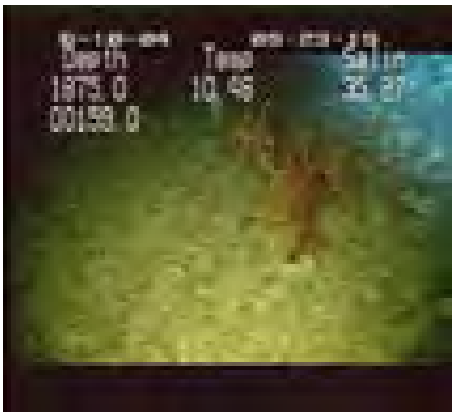


Image C: Mixed Habitat
30º 30.935' N, 79º 39.740' W

Image D: Mixed Habitat
30º 30.935' N, 79º 39.740' W

RELEVANT WORK AND/OR LITERATURE CITED

Ayers and Pilkey (1981)
EEZ-SCAN 87 Scientific Staff (1991)
Paull et al. (2000)
Reed (2002)
Reed and Ross (2005)
Williams et al. (2006)
Reed et al. (2006)
Ross and Nizinski (in press)
Williams et al. (in press)

BIOLOGICAL ENVIRONMENT

Relatively few fishes were documented during this dive, and those seen were typically in low numbers. The exception to this was *Nezumia sclerorhynchus*, which was common. Other observed species included *Laemonema melanurum, L. barbatulum*, *Trachyscorpia cristulata*, and notably an *Odontaspis ferox*. Mobile invertebrates were limited to an abundance of galatheoid crabs on the reef. Sessile invertebrates were more diverse with a number of anemones, hexactinellid and sulfur sponges, antipatharians, isidids and small growths of *Lophelia pertusa.*

PHYSICAL ENVIRONMENT

Three habitat types were observed on this dive. In the beginning of the dive, the habitat included a mixed community of abundant sulfur sponges, hexactinellid sponges, and *L. pertusa* on a rubble and sand covered bottom. A transitional area of rubble habitat was then traversed. Substrate was >75% rubble and included areas both with and without attached fauna (few soft corals and crinoids). One small area was dominated by hard coral (*L. pertusa*) with attached fauna. Mixed habitat was then seen on the remainder of the dive, and included mostly a prime reef area with an abundance of anemones, hexactinellid sponges, soft corals, and antipatharians.

ADDITIONAL COMMENTS

This dive was captured on 3 mini DVs and 1HD and archived on 3 DVDs. At times the transects were underlit and the close footage was out of focus. The color balance was also off, giving a very green/yellow cast to the video.

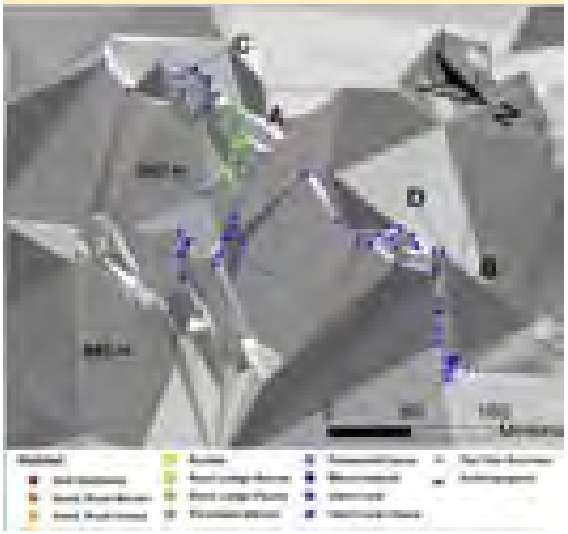
DIVE NUMBER: JSLI-4684 *STUDY AREA: Jacksonville*

STATION OVERVIEW

Project	Life on the Edge 2004
Principal investigators	SW Ross[1] KJ Sulak, MS Nizinski, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Mapping of deep coral banks, ecological studies of macroinvertebrates and fishes, paleoclimate studies, coral genetics and educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link I Submersible
Science Divers	M Nizinski (bow), SW Ross (stern)
External Video Tapes	2 mini DVs, 1 HD
Internal Video Tapes	3 mini DVs
Digital Still Photos	0
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	No bow audio log, hard copy of stern audio log
Acknowledgements	NOAA-OE, NOAA Fisheries, USGS, UNCW, NC Museum of Natural Sciences
SEADESC Analyst	AM Quattrini, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	10-Jun-04
Minimum Bottom Depth (m)	548
Maximum Bottom Depth (m)	571
Start Bottom Time (EDT)	16:37
End Bottom End (EDT)	18:43
Starting Latitude (N)	30° 30.939'
Starting Longitude (W)	79° 39.621'
Ending Latitude (N)	30° 30.842'
Ending Longitude (W)	79° 39.624'
Surface Current (Kts)	
Bottom Current (Kts)	0.5

Image A: Rock Ledge-Fauna
30º 30.803' N, 79º 39.741' W

DIVE NUMBER: JSLI-4684 *STUDY AREA: Jacksonville*

IMAGE GALLERY

*** indicates image position is approximated**

Image B: Mixed Habitat
30º 30.947' N, 79º 39.614' W

Image C: Hard Coral-Fauna
30º 30.808' N, 79º 39.760' W *

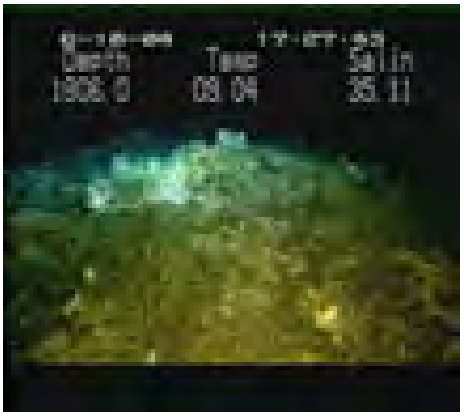
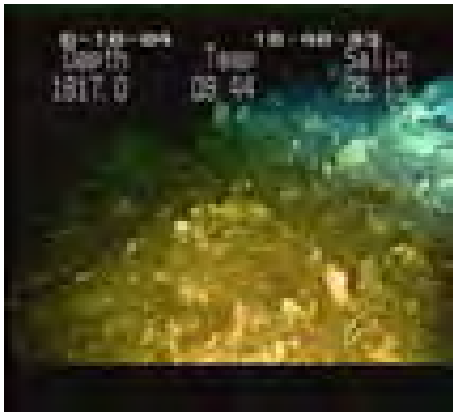


Image D: Mixed Habitat
30º 30.955' N, 79º 39.641' W



RELEVANT WORK AND/OR LITERATURE CITED

Ayers and Pilkey (1981)
EEZ-SCAN 87 Scientific Staff (1991)
Paull et al. (2000)
Reed (2002)
Reed and Ross (2005)
Williams et al. (2006)
Reed et al. (2006)
Ross and Nizinski (in press)
Williams et al. (in press)

BIOLOGICAL ENVIRONMENT

Few fish species were seen during this dive. Those observed included *Laemonema melanurum*, *Trachyscorpia cristulata*, *L. barbatulum*, and *Nezumia sclerorhynchus,* which was the most common. *Eumunida picta* were abundant and observed on dead branches of *Lophelia pertusa* and *L. pertusa* rubble. Few other mobile invertebrates were observed. Sessile invertebrates were diverse, and included antipatharians, isidids, anemones, starburst corals, sponges, *L. pertusa, Madrepora,* and *Stylaster*.

PHYSICAL ENVIRONMENT

Habitats observed during this dive were diverse and patchy. Four main habitat types were observed: rubble, mixed, hard coral, and rock ledge. All substrata included varying degrees of attached fauna. Coral rubble areas had few antipatharians attached. Mixed habitat was a rubble substrate with an abundant coverage of attached fauna, including a diversity of antipatharians, sponges, live *L. pertusa,* and *Madrepora*. Large broken slabs of rock with many crevices and burrows were observed. Attached to these ledges were large "coral trees" (antipatharians and isidids) and a few sponges. Hard coral areas were dominated mostly by dead coral with attached fauna.

ADDITIONAL COMMENTS

This dive was captured on 2 mini DVs, 1 HD and archived on 2 DVDs. The color balance was off for the majority of the dive, causing a green/yellow cast to the video. A number of the transects were filmed very closely or were underlit preventing habitat classification in some areas.

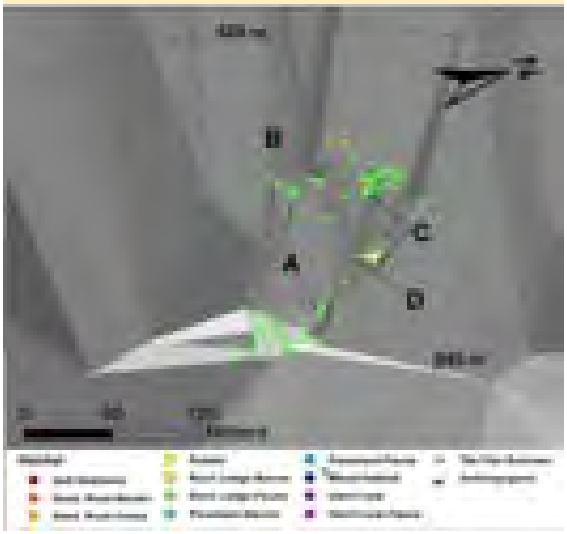
DIVE NUMBER: JSLI-4685 *STUDY AREA: Jacksonville*

STATION OVERVIEW

Project	Life on the Edge 2004
Principal investigators	SW Ross[1] KJ Sulak, MS Nizinski, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Mapping of deep coral banks, ecological studies of macroinvertebrates and fishes, paleoclimate studies, coral genetics and educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link I Submersible
Science Divers	SW Ross (bow), C Morrison (stern)
External Video Tapes	3 mini DVs
Internal Video Tapes	3 mini DVs
Digital Still Photos	0
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Hard copies of bow and stern audio logs
Acknowledgements	NOAA-OE, NOAA Fisheries, USGS, UNCW, NC Museum of Natural Sciences
SEADESC Analyst	AM Quattrini, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	11-Jun-04
Minimum Bottom Depth (m)	626
Maximum Bottom Depth (m)	652
Start Bottom Time (EDT)	8:45
End Bottom End (EDT)	11:00
Starting Latitude (N)	30° 48.811'
Starting Longitude (W)	79° 37.809'
Ending Latitude (N)	30° 48.696'
Ending Longitude (W)	79° 37.934'
Surface Current (Kts)	
Bottom Current (Kts)	0.2

Image A: Rock Ledge-Fauna
30º 48.730' N, 79º 37.922' W

DIVE NUMBER: JSLI-4685 *STUDY AREA: Jacksonville*

IMAGE GALLERY

*** indicates image position is approximated**

Image B: Rock Ledge-Fauna
30º 48.755' N, 79º 37.944' W

Image C: Rock Ledge-Fauna
30º 48.756' N, 79º 37.926' W

Image D: Rock Ledge-Barren
30º 48.738' N, 79º 37.944' W

RELEVANT WORK AND/OR LITERATURE CITED

Ayers and Pilkey (1981)
EEZ-SCAN 87 Scientific Staff (1991)
Paull et al. (2000)
Reed (2002)
Reed and Ross (2005)
Williams et al. (2006)
Reed et al. (2006)
Ross and Nizinski (in press)
Williams et al. (in press)

BIOLOGICAL ENVIRONMENT

Several fish species were observed during this dive, including *Nezumia sclerorhynchus, Synaphobranchus* spp., *Trachyscorpia cristulata, Hoplostethus occidentalis*, and *Laemonema melanurum*. Also, a chimaerid and *Dibranchus atlanticus* were observed on sand/rubble bottom. Mobile invertebrates observed during this dive included *Chaceon* crabs, unidentified shrimps, and galatheoids. Sessile invertebrates included antipatharians, crinoids, isidids, and *Lophelia pertusa.*

PHYSICAL ENVIRONMENT

This dive started off reef over a sand/coral rubble bottom with no attached fauna. A transitional area was then encountered, which included patches of various habitats, such as rubble, sand/coral rubble with attached fauna, and rock ledges with attached fauna. The majority of the dive was spent on rugged, rock ledges with barren and attached fauna areas. Rock ledges were covered with sand and coral rubble, and the attached fauna was confined mostly to the tops of ledges. Attached fauna included abundant antipatharians and isidids and sparse living *L. pertusa*.

ADDITIONAL COMMENTS

This dive was recorded on 3 mini DVs and saved to 3 DVDs for archiving. There was some interference with the video feed that caused fuzziness to the footage.

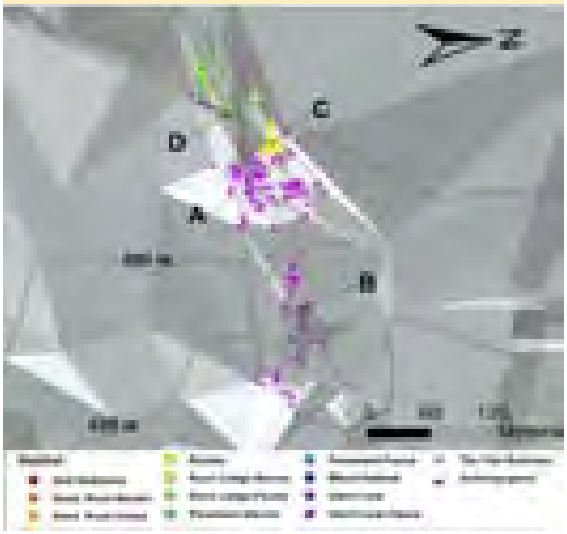
DIVE NUMBER: JSLI-4686 *STUDY AREA: Jacksonville*

STATION OVERVIEW

Project	Life on the Edge 2004
Principal investigators	SW Ross[1] KJ Sulak, MS Nizinski, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Mapping of deep coral banks, ecological studies of macroinvertebrates and fishes, paleoclimate studies, coral genetics and educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link I Submersible
Science Divers	E Baird (bow), A Brooks (stern)
External Video Tapes	2 mini DVs
Internal Video Tapes	3 mini DVs
Digital Still Photos	0
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Hard copies of bow and stern audio logs
Acknowledgements	NOAA-OE, NOAA Fisheries, USGS, UNCW, NC Museum of Natural Sciences
SEADESC Analyst	AM Quattrini, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	11-Jun-04
Minimum Bottom Depth (m)	591
Maximum Bottom Depth (m)	638
Start Bottom Time (EDT)	17:02
End Bottom End (EDT)	18:55
Starting Latitude (N)	30° 30.132'
Starting Longitude (W)	79° 39.087'
Ending Latitude (N)	30° 30.098'
Ending Longitude (W)	79° 39.184'
Surface Current (Kts)	
Bottom Current (Kts)	0.8

Image A: Hard Coral-Fauna
30º 30.084' N, 79º 39.216' W

DIVE NUMBER: JSLI-4686 *STUDY AREA: Jacksonville*

IMAGE GALLERY *** indicates image position is approximated**

Image B: Hard Coral-Fauna
30º 30.120' N, 79º 39.126' W

Image C: Rubble
30º 30.090' N, 79º 39.204' W

Image D: Rock Ledge-Fauna
30º 30.084' N. 79º 39.216' W

RELEVANT WORK AND/OR LITERATURE CITED

Ayers and Pilkey (1981)
EEZ-SCAN 87 Scientific Staff (1991)
Paull et al. (2000)
Reed (2002)
Reed and Ross (2005)
Williams et al. (2006)
Reed et al. (2006)
Ross and Nizinski (in press)
Williams et al. (in press)

BIOLOGICAL ENVIRONMENT

Nezumia sclerorhynchus and *Laemonema melanurum* were the two most common fish species observed during this dive. Of mobile invertebrates, *Eumunida picta* was fairly abundant. Other mobile invertebrates seen included pancake urchins, *Bathynectes* sp., and *Chaceon* sp. Sessile invertebrates were abundant and included a diversity of hexactinellid sponges, scleractinian corals, anemones, crinoids, antipatharians, and isidids.

PHYSICAL ENVIRONMENT

This dive began on a large slope of prime reef habitat dominated by hard corals. This area was composed of a thick matrix of dead *Lophelia pertusa* with relief <2m. Live hard corals were also present and included ~30% live *L. pertusa* and *Madrepora oculata*. Associated with the hard corals was a diversity of attached fauna, such as anemones, antipatharians, and hexactinellid sponges. A coral rubble zone with little to no attached fauna (glass sponges) connected the hard coral habitat with a prime-reef rock ledge area. Rock ledges had attached fauna, including large antipatharians and isidids; however, fauna was less extensive than the hard coral area.

ADDITIONAL COMMENTS

This dive was captured on 2 mini DVs and saved to 2 DVDs for archiving. The internal bow video was used for classification and fish identification when the external video was too dark.

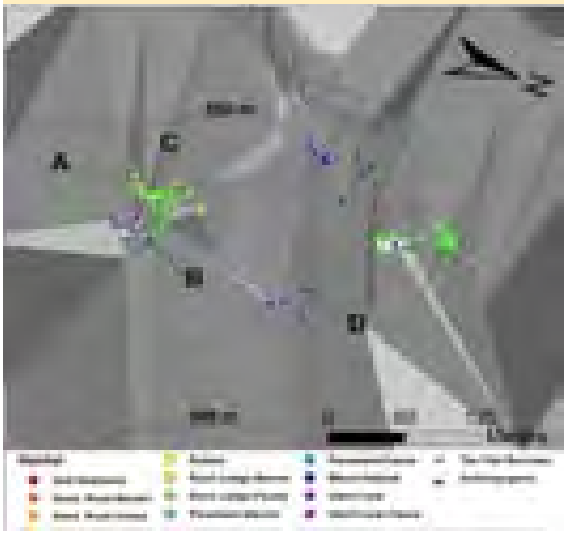
DIVE NUMBER: JSLI-4700 *STUDY AREA: Jacksonville*

STATION OVERVIEW

Project	Life on the Edge 2004
Principal investigators	SW Ross[1] KJ Sulak, MS Nizinski, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Mapping of deep coral banks, ecological studies of macroinvertebrates and fishes, paleoclimate studies, coral genetics and educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link I Submersible
Science Divers	M Nizinski (bow), K Cartwright (stern)
External Video Tapes	1 mini DV, 2 HDs
Internal Video Tapes	2 mini DVs
Digital Still Photos	0
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Hard copies of bow and stern audio logs
Acknowledgements	NOAA-OE, NOAA Fisheries, USGS, UNCW, NC Museum of Natural Sciences
SEADESC Analyst	AM Necaise, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

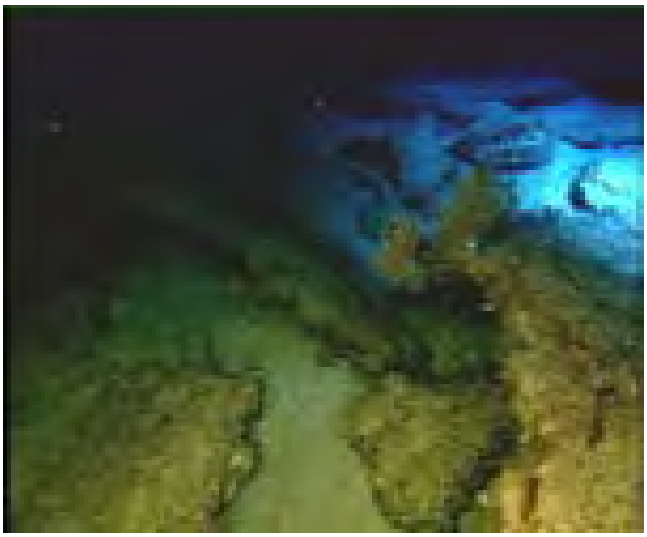
Dive Track:



DIVE DATA

Date	19-Jun-04
Minimum Bottom Depth (m)	558
Maximum Bottom Depth (m)	568
Start Bottom Time (EDT)	9:37
End Bottom End (EDT)	11:07
Starting Latitude (N)	30° 30.756'
Starting Longitude (W)	79° 39.679'
Ending Latitude (N)	30° 30.847'
Ending Longitude (W)	79° 39.603'
Surface Current (Kts)	
Bottom Current (Kts)	

Image A: Rock Ledge-Fauna
30º 30.750' N, 79º 39.696' W



DIVE NUMBER: JSLI-4700 *STUDY AREA: Jacksonville*

IMAGE GALLERY *** indicates image position is approximated**

Image B: Rock Ledge-Fauna
30º 30.750' N, 79º 39.666' W

Image C: Rubble
30º 30.762' N, 79º 39.684' W

Image D: Mixed Habitat
30º 30.798' N, 79º 39.612' W *

RELEVANT WORK AND/OR LITERATURE CITED

Ayers and Pilkey (1981)
EEZ-SCAN 87 Scientific Staff (1991)
Paull et al. (2000)
Reed (2002)
Reed and Ross (2005)
Williams et al. (2006)
Reed et al. (2006)
Ross and Nizinski (in press)
Williams et al. (in press)

BIOLOGICAL ENVIRONMENT

Fish species seen during this dive included *Laemonema melanurum*, *Nezumia sclerorhynchus, Trachyscorpia cristulata*, and *Sternoptyx* sp. *Nezumia sclerorhynchus* and *L. melanurum* were the most common though still relatively rare. *Eumunida picta* were common and observed on dead *Lophelia pertusa* and coral rubble. Other mobile invertebrates observed included *Bathynectes longispina* and *Chaceon* sp. Sessile invertebrates were diverse, and included antipatharians, isidids, anemones, starburst corals, sponges, and small patches of *L. pertusa, Madrepora,* and *Stylaster.*

PHYSICAL ENVIRONMENT

Four distinct habitat types were observed during this dive: rubble, mixed, rock ledge with attached fauna and rock ledge without attached fauna. The areas containing coral rubble were found predominantly at the base of the slope over which the dive took place. While some stretches of coral rubble were completely devoid of attached fauna, others had scattered hydroids, small sponges and occasional pieces of live *L. pertusa*. Complex communities of hexactinellid sponges, hydroids, isidids, antipatharians, *Madrepora, Stylaster, L. pertusa,* and other unidentified corals were common in mixed habitat areas. The majority of the dive took place over rock ledge habitat with and without attached fauna. The attached fauna found along the rock ledges ranged from large antipatharians and isidids to dense assemblages of small sponges, hydroids, small isidids, and growths of *L. pertusa.*

ADDITIONAL COMMENTS

This dive was captured on a combination of mini DV and HD video. The first half of the dive was only recorded on HD video and does not have a time/CTD overlay.

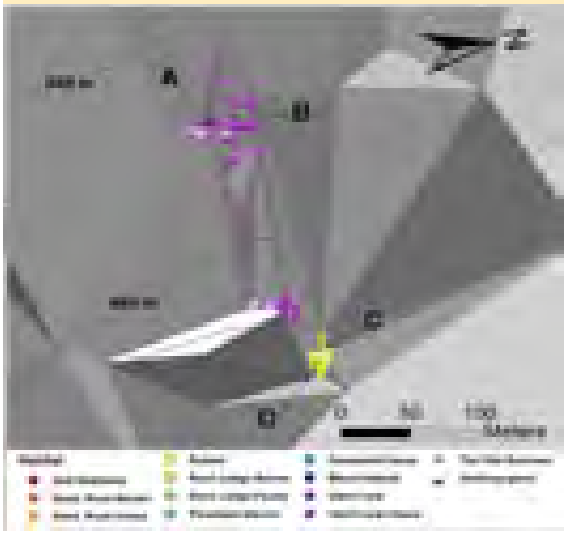
DIVE NUMBER: JSLI-4701 *STUDY AREA: Jacksonville*

STATION OVERVIEW

Project	Life on the Edge 2004
Principal investigators	SW Ross[1] KJ Sulak, MS Nizinski, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Mapping of deep coral banks, ecological studies of macroinvertebrates and fishes, paleoclimate studies, coral genetics and educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link I Submersible
Science Divers	J Potter (stern)
External Video Tapes	2 mini DVs, 2 HDs
Internal Video Tapes	0
Digital Still Photos	10
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Training dive, hard copy stern audio log
Acknowledgements	NOAA-OE, NOAA Fisheries, USGS, UNCW, NC Museum of Natural Sciences
SEADESC Analyst	AM Necaise, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	19-Jun-04
Minimum Bottom Depth (m)	645
Maximum Bottom Depth (m)	674
Start Bottom Time (EDT)	17:04
End Bottom End (EDT)	18:43
Starting Latitude (N)	30° 28.944'
Starting Longitude (W)	79° 38.500'
Ending Latitude (N)	30° 28.933'
Ending Longitude (W)	79° 38.379'
Surface Current (Kts)	
Bottom Current (Kts)	

Image A: Hard Coral-Fauna
30° 28.944' N, 79° 38.496' W *

DIVE NUMBER: JSLI-4701 *STUDY AREA: Jacksonville*

IMAGE GALLERY *** indicates image position is approximated**

Image B: Hard Coral-Fauna
30º 28.962' N, 79º 38.496' W

Image C: Rubble
30º 28.938' N, 79º 38.400' W

Image D: Rubble
30º 28.914' N, 79º 38.394' W

RELEVANT WORK AND/OR LITERATURE CITED

Ayers and Pilkey (1981)
EEZ-SCAN 87 Scientific Staff (1991)
Paull et al. (2000)
Reed (2002)
Reed and Ross (2005)
Williams et al. (2006)
Reed et al. (2006)
Ross and Nizinski (in press)
Williams et al. (in press)

BIOLOGICAL ENVIRONMENT

Few species of fishes were observed during this dive, and were represented by very few individuals. The most common species was *Nezumia sclerorhynchus*. Other species included single individuals of *Dactylobatus armatus* (Image C), *Synaphobranchus* spp., and *Laemonema melanurum*. Mobile invertebrates included *Eumunida picta*, *Chaceon* spp., *Bathynectes longispina*, brittle stars, spiny and pencil urchins. The dominant coral in the area was *Lophelia pertusa,* though small isidids and *Madrepora* were also observed. Other sessile invertebrates included hexactinellid sponges, large venus flytrap anemones, hydroids and solitary cup corals.

PHYSICAL ENVIRONMENT

This dive took place over a relatively steep, 50-60°, slope. Two major habitat categories were observed, rubble and hard coral. The areas of hard coral habitat could be further differentiated into areas with attached fauna and areas without attached fauna. The areas of hard coral without attached fauna tended to have a lower abundance of live *L. pertusa* (<25%) and a higher occurrence of large pieces of cemented coral rubble. The areas that contained a large percentage of live *L. pertusa* were of high relief (>1m) and tended to have numerous attached fauna, including anemones, hydroids, sponges, and small isidids. The rubble habitat, with few attached fauna, was primarily restricted to the base of the slope.

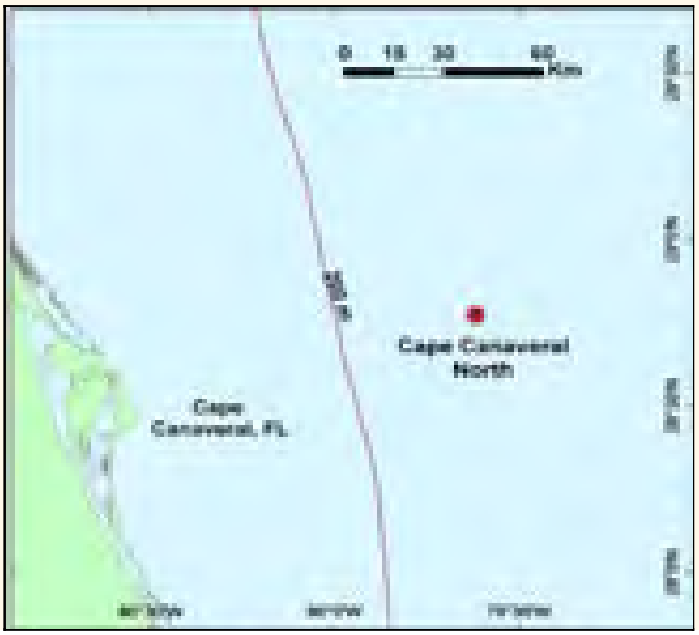
ADDITIONAL COMMENTS

This dive was recorded on 2 mini DVs and saved to 2 DVDs for archiving. There was no time overlay during this dive. At times there was some video feed interference. A large number of collections took place during the dive so the sub was stationary most of the time.

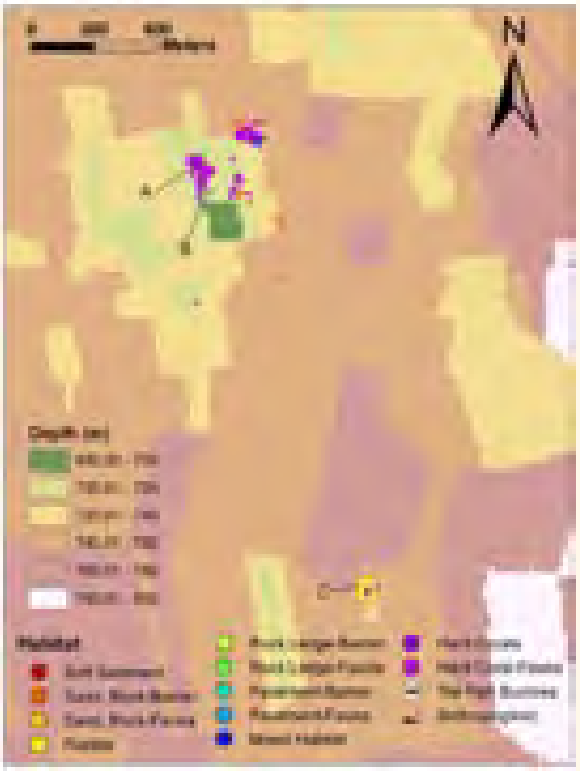
OVERVIEW

Total Dives: 4 **Depth Range (m):** 709 to 783

GENERAL LOCATION



HABITAT CHARACTERIZATION MAP



DIVE SUMMARY FOR SITE

Dive Date	PI	Station	Method	Start-Time	End-Time	Start-Lat (N)	Start-Long (W)	End-Lat (N)	End-Long (W)
09-Jun-04	SW Ross	JSLI-4681	HOV	9:10	11:12	28° 47.546'	79° 37.191'	28° 47.600'	79° 37.311'
09-Jun-04	SW Ross	JSLI-4682	HOV	17:06	19:08	28° 47.756'	79° 37.304'	28° 47.749'	79° 37.240'
20-Jun-04	SW Ross	JSLI-4702	HOV	8:38	10:42	28° 47.699'	79° 37.398'	28° 47.605'	79° 37.380'
20-Jun-04	SW Ross	JSLI-4703	HOV	17:08	18:52	28° 46.621'	79° 36.957'	28° 46.622'	79° 36.958'

IMAGE GALLERY *** indicates image position is approximated**

Image A: Hard Coral-Fauna
28° 47.682' N, 79° 37.404' W *

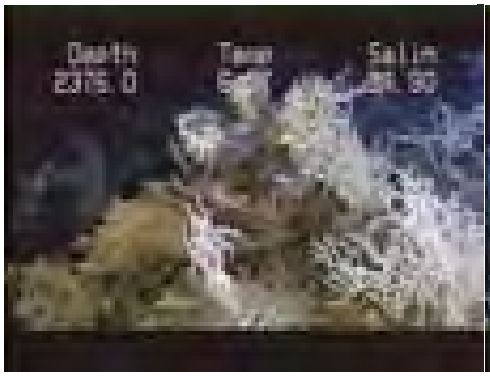


Image B: Hard Coral
28° 47.670' N, 79° 37.398' W

Image C: Rubble
28° 46.614' N, 79° 36.972' W

SITE OVERVIEW **AUTHOR** ML Partyka, AM Quattrini **DATE COMPILED** 19-Dec-06

The reefs in the Cape Canaveral area (North and South) are sediment mounds, with *Lophelia pertusa* growth at the crests and varying degrees of rubble and encrusted sand on the slopes and surrounding bases. These *Lophelia* mounds were first documented in 1982 by a CORD ROV dive, and later several mounds in the area were mapped and surveyed (Reed 2002, Reed et al. 2006, Ross et al. unpubl. data). *Lophelia* reefs in the Canaveral area are some of the deepest reported along the southeastern United States (from Florida to North Carolina) and are the deepest surveyed in the present study. Besides *Lophelia*, other hard corals including *Enallopsammia profunda*, *Madrepora oculata*, and stylasterines have been reported from the Canaveral area (Reed et al. 2006).

The target for the dives in the Canaveral North area was a series of moderately sized mounds (20-60 m) approximately 50 miles off the coast of Cape Canaveral, FL. Ross et al. conducted four dives (4681, 4682, 4702, 4703) at this site in 2004 with a depth range of 709-783 m. While the majority of these dives reached the crests of these mounds, dive 4682 took place entirely at the base of one feature. Mean bottom temperatures were 6.6-6.8 °C, and mean salinities were 34.9.

Hard coral with and without fauna were the dominant habitats in this area. Small coral features were scattered across mounds ~60 m in relief. The bases of these mounds were surrounded by coral rubble and combinations of crusty sand, rubble and rock. The majority of coral encountered was dead *Lophelia pertusa,* though during dive 4702 a lush area of living coral was observed.

Species composition of both fishes and mobile invertebrates was fairly consistent across each of the four dives conducted at this site, but the fish fauna appeared to be depauperate compared to the northern study areas. *Synaphobranchus* spp. was the most common species followed by *Nezumia sclerorhynchus* and *Fenestraja plutonia*. All three of these fishes were most common off the prime reef area in rubble/sand areas. Other species less frequently observed included *Trachyscorpia cristulata* and *Laemonema melanurum*. A number of species of galatheid crabs were observed during dive 4702 in areas of healthy coral growth. Otherwise mobile invertebrates were limited to pancake urchins and *Echinus tylodes*. Sessile invertebrates were diverse and abundant throughout this area. Crinoids and antipatharians were seen frequently in rubble habitat. Various corals such as alcyonaceans, antipatharians and *Madrepora oculata* were found in association with living and dead stands of *Lophelia*, along with hexactinellid sponges, primnoids and a variety of hydroids.

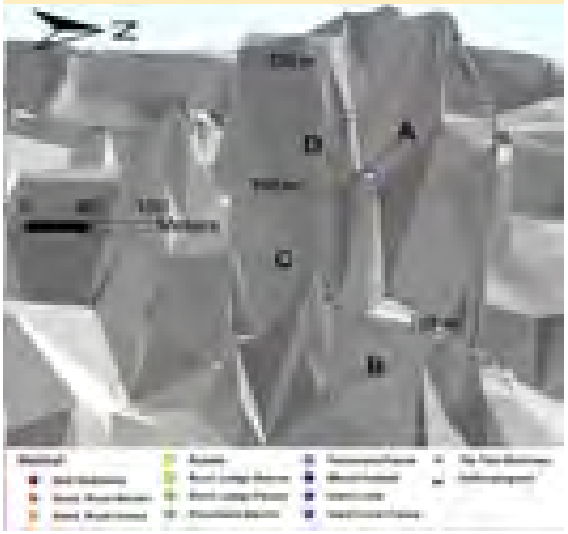
DIVE NUMBER: JSLI-4681 *STUDY AREA: Cape Canaveral North*

STATION OVERVIEW

Project	Life on the Edge 2004
Principal investigators	SW Ross[1] KJ Sulak, MS Nizinski, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Mapping of deep coral banks, ecological studies of macroinvertebrates and fishes, paleoclimate studies, coral genetics and educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link I Submersible
Science Divers	SW Ross (bow), KJ Sulak (stern)
External Video Tapes	2 mini DVs, 1 HD
Internal Video Tapes	3 mini DVs
Digital Still Photos	0
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Hard copies of bow and stern audio logs
Acknowledgements	NOAA-OE, NOAA Fisheries, USGS, UNCW, NC Museum of Natural Sciences
SEADESC Analyst	AM Quattrini, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	09-Jun-04
Minimum Bottom Depth (m)	709
Maximum Bottom Depth (m)	783
Start Bottom Time (EDT)	9:10
End Bottom End (EDT)	11:12
Starting Latitude (N)	28° 47.546'
Starting Longitude (W)	79° 37.191'
Ending Latitude (N)	28° 47.600'
Ending Longitude (W)	79° 37.311'
Surface Current (Kts)	3
Bottom Current (Kts)	

Image A: Hard Coral-Fauna
28º 47.624' N, 79º 37.298' W

DIVE NUMBER: JSLI-4681 *STUDY AREA: Cape Canaveral North*

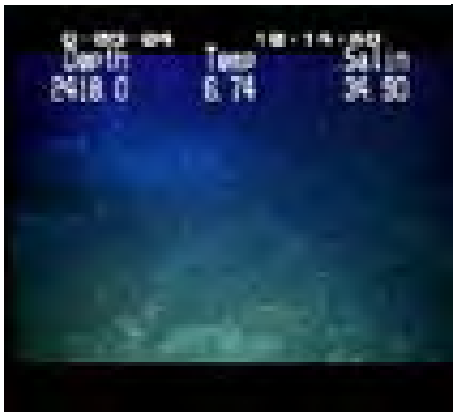
IMAGE GALLERY

*** indicates image position is approximated**

Image B: Sand/Rubble/Rock-Barren
28º 47.601' N, 79º 37.291' W

Image C: Sand/Rubble/Rock-Barren
28º 47.585' N, 79º 37.262' W *

Image D: Hard Coral
28º 47.622' N, 79º 37.300' W



RELEVANT WORK AND/OR LITERATURE CITED

EEZ-SCAN 87 Scientific Staff (1991)
Reed (2002)
Reed and Ross (2005)
Reed et al. (2006)
Ross and Nizinski (in press)

BIOLOGICAL ENVIRONMENT

Very few species of fish or invertebrates were seen during this dive. *Synaphobranchus* spp. dominated this area and was seen primarily over flat sediment/rubble habitat. Other species included *Fenestraja plutonia, Nezumia sclerorhynchus,* and *Laemonema melanurum*. There were a large number of sessile invertebrates in the area, such as anemones, hexactinellid sponges, antipatharians and *Madrepora* corals. No galatheid crabs were seen during this dive. Living *Lophelia pertusa* was found in scattered small patches as well as occasional large thickets.

PHYSICAL ENVIRONMENT

The habitats observed during this dive were generally of three types: 1) primarily low relief area with a combination of fine rubble and 'crunchy' sediment layers, 2) small patches of live and dead hard corals, primarily *L. pertusa* with attached soft corals and sponges, and 3) hard coral stands composed of >50% dead coral, often surrounded by large glass sponges.

ADDITIONAL COMMENTS

This dive was captured on 2 mini DVs and 1 HD and archived on 2 DVDs. Internal video footage from the bow was used to compensate for missing data during the last 30 minutes of the dive. The overall video quality was mediocre-to-fair, owing largely to low lighting during transects and moderate marine snow.

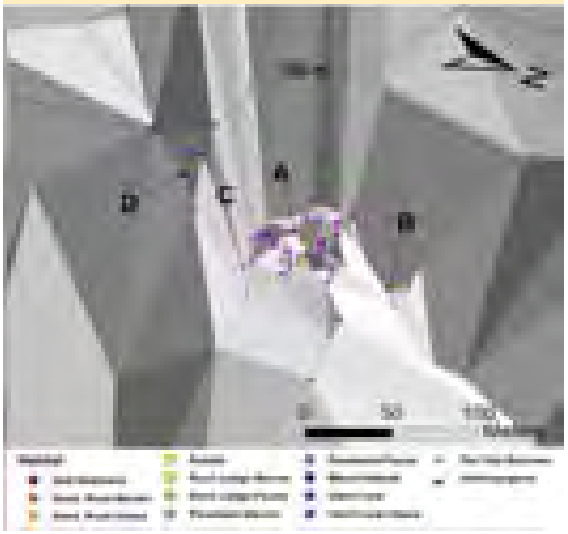
DIVE NUMBER: JSLI-4682 *STUDY AREA: Cape Canaveral North*

STATION OVERVIEW

Project	Life on the Edge 2004
Principal investigators	SW Ross[1] KJ Sulak, MS Nizinski, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Mapping of deep coral banks, ecological studies of macroinvertebrates and fishes, paleoclimate studies, coral genetics and educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link I Submersible
Science Divers	KJ Sulak (bow), M Nizinski (stern)
External Video Tapes	2 mini DVs, 1 HD
Internal Video Tapes	2 mini DVs
Digital Still Photos	0
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Hard copies of bow and stern audio logs
Acknowledgements	NOAA-OE, NOAA Fisheries, USGS, UNCW, NC Museum of Natural Sciences
SEADESC Analyst	Am Quattrini, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	09-Jun-04
Minimum Bottom Depth (m)	760
Maximum Bottom Depth (m)	773
Start Bottom Time (EDT)	17:06
End Bottom End (EDT)	19:08
Starting Latitude (N)	28° 47.756'
Starting Longitude (W)	79° 37.304'
Ending Latitude (N)	28° 47.749'
Ending Longitude (W)	79° 37.240'
Surface Current (Kts)	
Bottom Current (Kts)	0.4

Image A: Hard Coral-Fauna
28° 47.746' N, 79° 37.277' W

DIVE NUMBER: JSLI-4682 *STUDY AREA: Cape Canaveral North*

IMAGE GALLERY

*** indicates image position is approximated**

Image B: Sand/Rubble/Rock-Barren
28° 47.783' N, 79° 37.286' W

Image C: Hard Coral-Fauna
28° 47.744' N, 79° 37.266' W

Image D: Mixed Habitat
28° 47.742' N, 79° 37.232' W

RELEVANT WORK AND/OR LITERATURE CITED

EEZ-SCAN 87 Scientific Staff (1991)
Reed (2002)
Reed and Ross (2005)
Reed et al. (2006)
Ross and Nizinski (in press)

BIOLOGICAL ENVIRONMENT

Few species of invertebrates or fish were seen during this dive. The dominant fish species was *Synaphobranchus* spp. Other species included *Fenestraja plutonia, Nezumia sclerorhynchus, Trachyscorpia cristulata*, and a chimaerid. Mobile invertebrates included a number of unidentified red shrimp and several pancake urchins. Though there were some live *Lophelia pertusa* growths, the majority of the sessile invertebrate community was composed of antipatharians and hexactinellid sponges.

PHYSICAL ENVIRONMENT

The substrate surrounding the reef structure was primarily a mixture of sand and coral rubble with a crusty sediment layer. It was difficult to distinguish between the strictly sediment habitat category and that of sand/rubble/rock. The reef structure in the area was confined to isolated islands of hard corals and encrusting fauna.

ADDITIONAL COMMENTS

This dive was recorded on 2 mini DVs and 1 HD and saved to 2 DVDs for archiving. The transects were often dark and moderate marine snow made much of the habitat difficult to observe. There was some technical difficulty during the recording of the second DV that caused the recording to be intermittent.

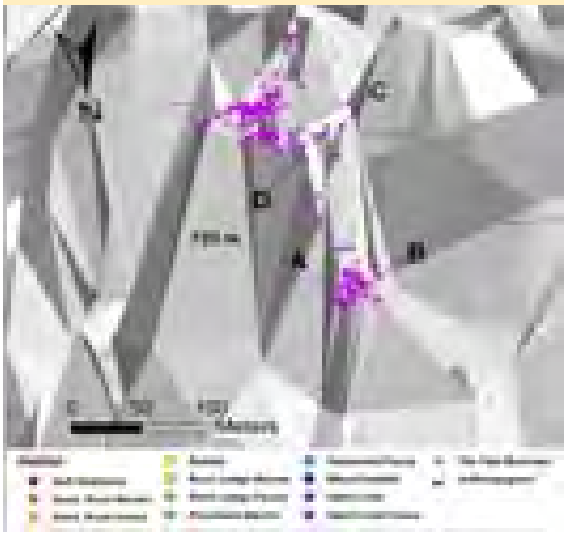
DIVE NUMBER: JSLI-4702 *STUDY AREA: Cape Canaveral North*

STATION OVERVIEW

Project	Life on the Edge 2004
Principal investigators	SW Ross[1] KJ Sulak, MS Nizinski, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Mapping of deep coral banks, ecological studies of macroinvertebrates and fishes, paleoclimate studies, coral genetics and educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link I Submersible
Science Divers	A Howard (bow), E Baird (stern)
External Video Tapes	3 mini DVs, 3 HDs
Internal Video Tapes	1 mini DV
Digital Still Photos	0
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	No bow audio log, hard copy of stern audio log
Acknowledgements	NOAA-OE, NOAA Fisheries, USGS, UNCW, NC Museum of Natural Sciences
SEADESC Analyst	AM Quattrini, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	20-Jun-04
Minimum Bottom Depth (m)	709
Maximum Bottom Depth (m)	738
Start Bottom Time (EDT)	8:38
End Bottom End (EDT)	10:42
Starting Latitude (N)	28° 47.699'
Starting Longitude (W)	79° 37.398'
Ending Latitude (N)	28° 47.605'
Ending Longitude (W)	79° 37.380'
Surface Current (Kts)	
Bottom Current (Kts)	0.4

Image A: Hard Coral-Fauna
28° 47.682' N, 79° 37.404' W *

DIVE NUMBER: JSLI-4702 *STUDY AREA: Cape Canaveral North*

IMAGE GALLERY

*** indicates image position is approximated**

Image B: Hard Coral-Fauna
28º 47.694' N, 79º 37.398' W

Image C: Hard Coral
28º 47.670' N, 79º 37.398' W

Image D: Hard Coral
28º 47.670' N, 79º 37.374' W

RELEVANT WORK AND/OR LITERATURE CITED

EEZ-SCAN 87 Scientific Staff (1991)
Reed (2002)
Reed and Ross (2005)
Reed et al. (2006)
Ross and Nizinski (in press)

BIOLOGICAL ENVIRONMENT

Synaphobranchus spp. was the most abundant fish species observed during this dive. Relatively few other fishes were observed. Pencil urchins were abundant throughout this dive and were observed on sponges, rubble, and hard corals. Other mobile invertebrates observed included several galatheoid species and *Echinus tylodes*. Sessile invertebrates were diverse, and included alcyonaceans, antipatharians, sponges, and hydroids.

PHYSICAL ENVIRONMENT

Hard coral habitat, with and without attached fauna, was the dominant habitat observed during this dive. These areas were mostly small mounds, with <2 m profile, of mostly (~60%) live *Lophelia pertusa*. In some areas, hard corals were covered with attached fauna, including hexactinellid sponges, large white sponges, alcyonaceans, and hydroids. Coral rubble was another substrate observed during the dive on slope faces, and one stretch of this habitat had attached starburst corals.

ADDITIONAL COMMENTS

This dive was recorded on 3 mini DVs and archived on 3 DVDs. The overall video quality varied between DVs. The first DV contains a large amount of close footage with little perspective. The remaining 2 DVs were frequently underlit during transects but were still of good quality. There was no time overlay for any of this dive, so audio transmissions were used to correlate these data with real time.

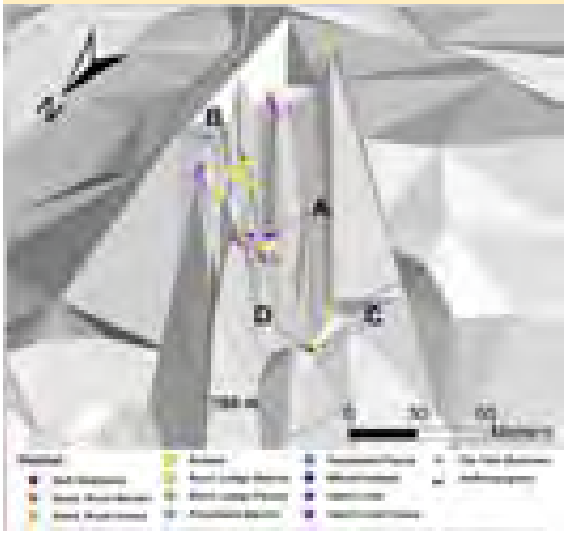
DIVE NUMBER: JSLI-4703 *STUDY AREA: Cape Canaveral North*

STATION OVERVIEW

Project	Life on the Edge 2004
Principal investigators	SW Ross[1] KJ Sulak, MS Nizinski, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Mapping of deep coral banks, ecological studies of macroinvertebrates and fishes, paleoclimate studies, coral genetics and educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link I Submersible
Science Divers	A Brooks (stern)
External Video Tapes	2 mini DVs, 1 HD
Internal Video Tapes	1 mini DV
Digital Still Photos	0
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Training dive, hard copy of stern audio log
Acknowledgements	NOAA-OE, NOAA Fisheries, USGS, UNCW, NC Museum of Natural Sciences
SEADESC Analyst	AM Quattrini, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	20-Jun-04
Minimum Bottom Depth (m)	741
Maximum Bottom Depth (m)	755
Start Bottom Time (EDT)	17:08
End Bottom End (EDT)	18:52
Starting Latitude (N)	28° 46.621'
Starting Longitude (W)	79° 36.957'
Ending Latitude (N)	28° 46.622'
Ending Longitude (W)	79° 36.958'
Surface Current (Kts)	
Bottom Current (Kts)	0.4

Image A: Hard Coral-Fauna
28° 46.626' N, 79° 36.960' W *

DIVE NUMBER: JSLI-4703 *STUDY AREA: Cape Canaveral North*

IMAGE GALLERY

*** indicates image position is approximated**

Image B: Rubble
28º 46.620' N, 79º 36.954' W

Image C: Rubble
28º 46.614' N, 79º 36.972' W

Image D: Rubble
28º 46.620' N, 79º 36.972' W

RELEVANT WORK AND/OR LITERATURE CITED

EEZ-SCAN 87 Scientific Staff (1991)
Reed (2002)
Reed and Ross (2005)
Reed et al. (2006)
Ross and Nizinski (in press)

BIOLOGICAL ENVIRONMENT

Few fishes and invertebrates were observed. Fishes observed on rubble habitat included *Synaphobranchus* spp., *Fenestraja plutonia* (Image D), and *Trachyscorpia cristulata*. Few *Synaphobranchus* spp. and *Nezumia* spp. were seen in the hard coral habitat. Crinoids were abundant throughout the dive, and mostly on rubble bottom. A few pancake urchins and no galatheid crabs were observed during this dive. Sessile invertebrates were also common, but not diverse. Sessile invertebrates included small antipatharians, alcyonaceans, *Lophelia pertusa*, and hexactinellid sponges.

PHYSICAL ENVIRONMENT

Habitats seen on this dive included coral rubble and hard coral with attached fauna. Coral rubble was the dominant habitat type during this dive. The bottom had many valleys and crests covered with ~75% rubble. During the middle of the dive, a patch of hard coral was encountered, which was composed mostly of dead *Lophelia pertusa* with attached alcyonaceans. For the remainder of the dive, the submersible transected patches of coral rubble with and without attached fauna and hard coral with fauna.

ADDITIONAL COMMENTS

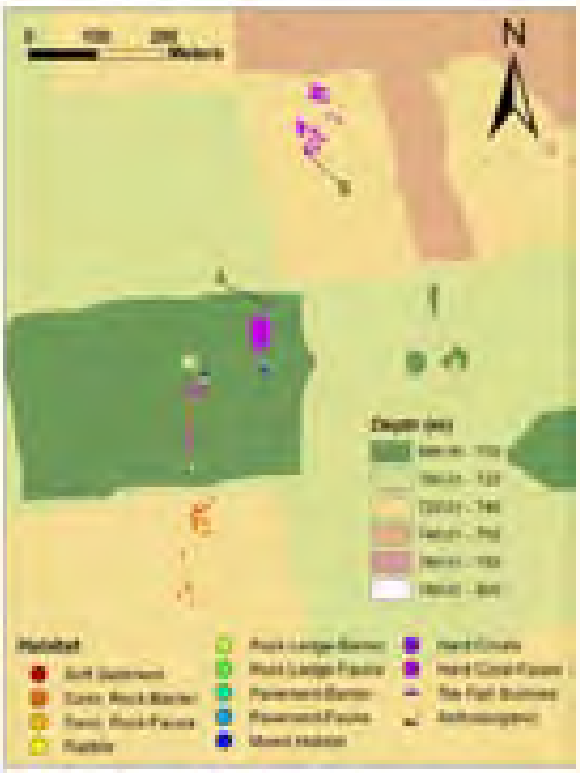
This dive was captured on 2 mini DVs and archived on 2 DVDs. There was a large amount of footage shot at very close range with little perspective during this dive. Additionally, at times there were interruptions in the video feed that created blank spaces and static.

OVERVIEW

Total Dives: 2 **Depth Range (m):** 679 to 745

GENERAL LOCATION

HABITAT CHARACTERIZATION MAP



DIVE SUMMARY FOR SITE

Dive Date	PI	Station	Method	Start-Time	End-Time	Start-Lat (N)	Start-Long (W)	End-Lat (N)	End-Long (W)
21-Jun-04	SW Ross	JSLI-4704	HOV	8:37	10:41	28° 02.636'	79° 36.823'	28° 02.532'	79° 36.751'
21-Jun-04	SW Ross	JSLI-4705	HOV	17:18	19:08	28° 02.159'	79° 36.837'	28° 02.377'	79° 36.784'

IMAGE GALLERY *** indicates image position is approximated**

Image A: Hard Coral-Fauna
28º 02.388' N, 79º 36.774' W

Image B: Hard Coral
28º 02.508' N, 79º 36.738' W *

Image C: Rubble
(No Position Available)

SITE OVERVIEW **AUTHOR** ML Partyka, AM Quattrini **DATE COMPILED** 08-Jan-07

The target of the dives in the Canaveral South area was a broad feature approximately 40 m in relief, 60 miles southeast of Cape Canaveral, FL. Ross et al. conducted two dives at this location in 2004. The dives surveyed coral mounds in 679-745 m depth. The side of the feature was made up of a series of ridges covered with mostly dead *Lophelia pertusa* interspersed with shallow valleys of sand and coral rubble. Most of the *Lophelia* encountered was dead and encrusted with a large variety of sessile invertebrates. Mean bottom temperatures were 6.3 ºC during each dive, and mean salinities were 34.9.

The fish and invertebrate fauna at this site was similar to the North Cape Canaveral site. *Synaphobranchus* spp. and *Nezumia sclerorhynchus* were the most common species in the area, followed by *Laemonema melanurum, Fenestraja plutonia* (only seen off reef), and *Trachyscorpia cristulata,*. Mobile invertebrates were rare and represented by pancake urchins, pencil urchins and a few small galatheids. The sessile invertebrate community was much more diverse. Hard coral habitat was frequently covered with hydroids, various sponges, alcyonaceans, anemones, antipatharians and isidids.

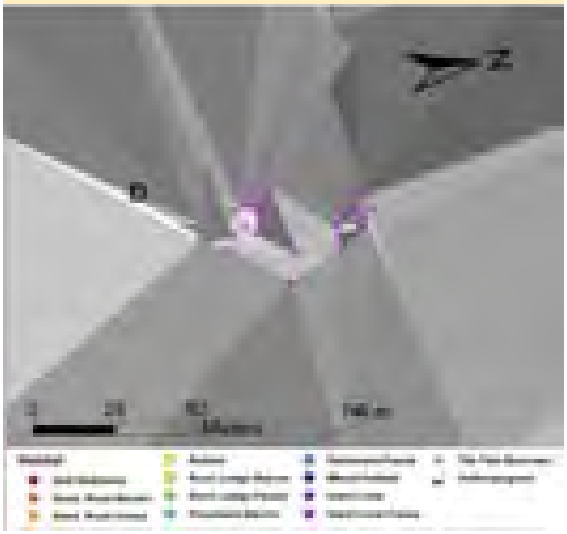
DIVE NUMBER: JSLI-4704 *STUDY AREA: Cape Canaveral South*

STATION OVERVIEW

Project	Life on the Edge 2004
Principal investigators	SW Ross[1] KJ Sulak, MS Nizinski, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Mapping of deep coral banks, ecological studies of macroinvertebrates and fishes, paleoclimate studies, coral genetics and educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link I Submersible
Science Divers	KJ Sulak (bow), C Morrison (stern)
External Video Tapes	2 mini DVs, 2 HDs
Internal Video Tapes	1 mini DV
Digital Still Photos	30
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Hard copy of stern audio log
Acknowledgements	NOAA-OE, NOAA Fisheries, USGS, UNCW, NC Museum of Natural Sciences
SEADESC Analyst	AM Quattrini, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	21-Jun-04
Minimum Bottom Depth (m)	735
Maximum Bottom Depth (m)	745
Start Bottom Time (EDT)	8:37
End Bottom End (EDT)	10:41
Starting Latitude (N)	28° 02.636'
Starting Longitude (W)	79° 36.823'
Ending Latitude (N)	28° 02.532'
Ending Longitude (W)	79° 36.751'
Surface Current (Kts)	
Bottom Current (Kts)	0.7

Image A: Hard Coral-Fauna
(No Position Available)

DIVE NUMBER: JSLI-4704 *STUDY AREA: Cape Canaveral South*

IMAGE GALLERY

*** indicates image position is approximated**

Image B: Sand/Rubble/Rock-Barren
(No Position Available)

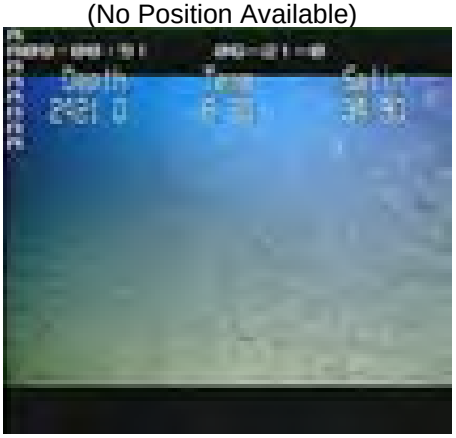


Image C: Rubble
(No Position Available)

Image D: Hard Coral
28º 02.508' N, 79º 36.738' W *

RELEVANT WORK AND/OR LITERATURE CITED

EEZ-SCAN 87 Scientific Staff (1991)
Reed (2002)
Reed and Ross (2005)
Reed et al. (2006)
Ross and Nizinski (in press)

BIOLOGICAL ENVIRONMENT

Five fish species were seen during this dive on coral rubble and hard coral habitat areas. *Synaphobranchus* spp., *Nezumia sclerorhynchus*, and *Laemonema melanurum* were the most common species. Pancake urchins were the only noticeable mobile invertebrates seen during this dive. Sessile invertebrates were patchy, but included alcyonaceans, hexactinellid sponges, vase sponges, large white sponges, hydroids, *Lophelia pertusa, Stylaster*, antipatharians, and isidids.

PHYSICAL ENVIRONMENT

The submersible transected over patches of various habitat types, including hard corals with and without attached fauna, coral rubble, and sand/coral rubble areas without attached fauna. Hard corals (*Lophelia pertusa*) with attached fauna was the dominant habitat type observed. Mostly, *Lophelia pertusa* was dead (75-90%) and densely packed, with relief generally < 1m; occasionally relief was near 2 m in height. Usually at the bases of the hard coral areas, there was a large patch of sand. Attached fauna associated with hard corals included hydroids, alcyonaceans, isidids, sponges, and antipatharians.

ADDITIONAL COMMENTS

This dive was captured on 2 mini DVs and saved on 2 DVDs for archiving. Heavy marine snow was encountered during this dive. Some static interference in the video feed occurred throughout. The second DV had frequent interruptions in the video feed and there was frequent footage of the water column. The majority of this dive track was missing, so no position information was available for a number of the habitat images.

DIVE NUMBER: JSLI-4705 *STUDY AREA: Cape Canaveral South*

STATION OVERVIEW

Project	Life on the Edge 2004
Principal investigators	SW Ross[1] KJ Sulak, MS Nizinski, E Baird
PI Contact Info[1]	Center for Marine Science, 5600 Marvin Moss Ln., Wilmington, NC 28409
Purpose	Mapping of deep coral banks, ecological studies of macroinvertebrates and fishes, paleoclimate studies, coral genetics and educational outreach
Vessel	R/V Seward Johnson, Johnson Sea Link I Submersible
Science Divers	SW Ross (bow), M Niziniski (stern)
External Video Tapes	2 mini DVs, 2 HDs
Internal Video Tapes	2 mini DVs
Digital Still Photos	0
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Hard copy of stern audio log
Acknowledgements	NOAA-OE, NOAA Fisheries, USGS, UNCW, NC Museum of Natural Sciences
SEADESC Analyst	AM Quattrini, ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:

DIVE DATA

Date	21-Jun-04
Minimum Bottom Depth (m)	679
Maximum Bottom Depth (m)	725
Start Bottom Time (EDT)	17:18
End Bottom End (EDT)	19:08
Starting Latitude (N)	28° 02.159'
Starting Longitude (W)	79° 36.837'
Ending Latitude (N)	28° 02.377'
Ending Longitude (W)	79° 36.784'
Surface Current (Kts)	
Bottom Current (Kts)	1.1

Image A: Hard Coral
28º 02.388' N, 79º 36.774' W

DIVE NUMBER: JSLI-4705 *STUDY AREA: Cape Canaveral South*

IMAGE GALLERY

*** indicates image position is approximated**

Image B: Sand/Rubble/Rock-Barren
28º 02.232' N, 79º 36.822' W

Image C: Hard Coral-Fauna
28º 02.334' N, 79º 36.774' W *

Image D: Hard Coral
28º 02.376' N, 79º 36.786' W

RELEVANT WORK AND/OR LITERATURE CITED

EEZ-SCAN 87 Scientific Staff (1991)
Reed (2002)
Reed and Ross (2005)
Reed et al. (2006)
Ross and Nizinski (in press)

BIOLOGICAL ENVIRONMENT

Several fish and invertebrate species were observed during this dive. Only *Fenestraja plutonia* was observed off reef. *Synaphobranchus* spp., *Laemonema melanurum,* and scorpaenids were observed in rubble and hard coral habitats. One *Chaceon* sp., a few pencil urchins, and several small galatheoids were observed throughout the dive. Sessile invertebrates included a diversity of sponges, alcyonaceans, *Lophelia pertusa*, antipatharians, hydroids, and isidids.

PHYSICAL ENVIRONMENT

This area consisted of a series of valleys and ridges with patches of coral rubble, hard corals (*Lophelia pertusa*), and sand mixed with coral rubble. The faces of the ridges were covered with coral rubble with attached fauna. Tops of ridges were dominated by hard corals with varying degrees of live *L. pertusa* (10-40%) and attached fauna, relief <2 m. Associated attached fauna included large white sponges, few large antipatharians, alcyonaceans, isidids, hydroids, and hexactinellid sponges. Substrate in the valleys was mostly sand with small amounts of coral rubble and no attached fauna.

ADDITIONAL COMMENTS

This dive was captured on 2 mini DVs and saved to 2 DVDs for archiving. There was a large amount of marine snow, which made habitat classification difficult in the beginning of the dive. Garbage was also observed on the bottom.

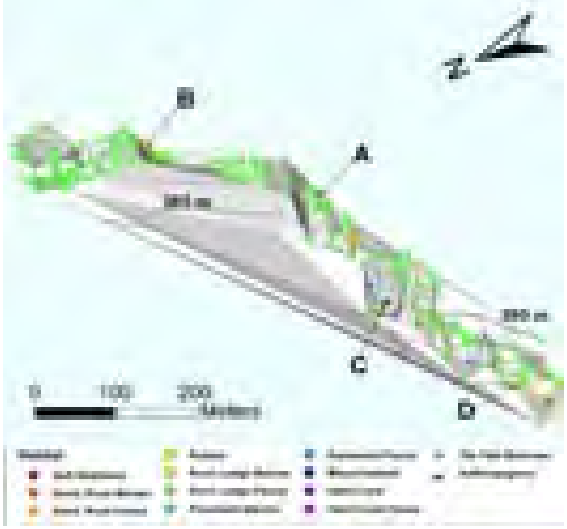
DIVE NUMBER: JSLII-3412 *STUDY AREA: Sherwood Valley*

STATION OVERVIEW

Project	Investigating the Charleston Bump 2003
Principal investigators	GR Sedberry[1] SE Stancyk
PI Contact Info[1]	Marine Resources Research Institute, SCDNR P.O. Box 12559 Charleston SC 29422-2559
Purpose	To explore and describe habitats and associated fauna of high-relief features of the Charleston Bump at a dive site called Sherwood Valley
Vessel	R/V Seward Johnson 2, Johnson Sea Link II Submersible
Science Divers	J Potter (bow), J McClelland (stern)
External Video Tapes	3 mini DVs
Internal Video Tapes	
Digital Still Photos	
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	
Acknowledgements	NOAA-OE
SEADESC Analyst	ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

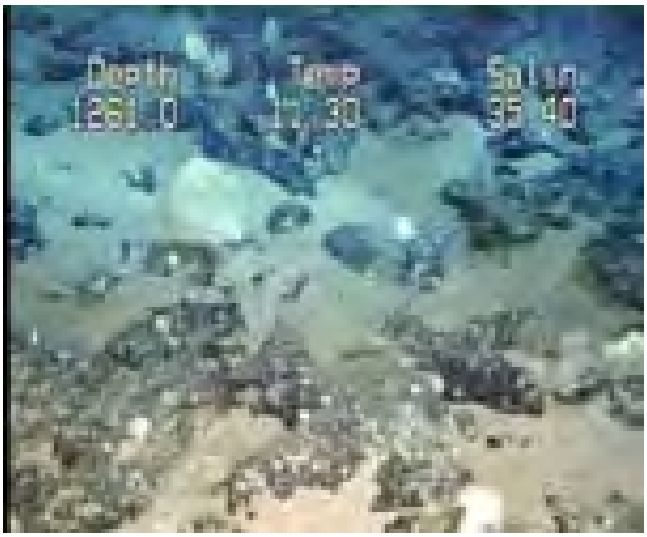
Dive Track:



DIVE DATA

Date	08-Aug-03
Minimum Bottom Depth (m)	382
Maximum Bottom Depth (m)	392
Start Bottom Time (EDT)	15:49
End Bottom End (EDT)	17:53
Starting Latitude (N)	31° 57.552'
Starting Longitude (W)	78° 37.703'
Ending Latitude (N)	31° 57.330'
Ending Longitude (W)	78° 37.964'
Surface Current (Kts)	
Bottom Current (Kts)	0.7

Image A: Rock Ledge-Fauna
31° 57.408' N, 78° 37.830' W



DIVE NUMBER: JSLII-3412 *STUDY AREA: Sherwood Valley*

IMAGE GALLERY *** indicates image position is approximated**

Image B: Sand/Rubble/Rock-Fauna
31º 57.486' N, 78º 37.746' W

Image C: Mixed Habitat
31º 57.390' N, 78º 37.872' W

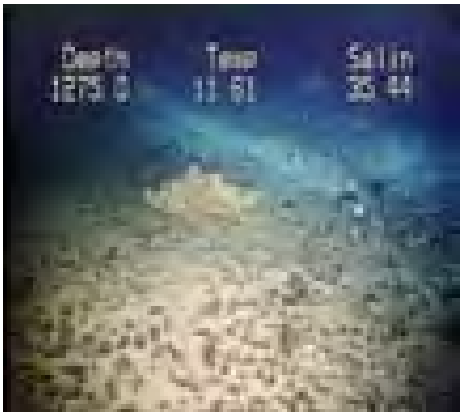


Image D: Rock Ledge-Fauna
31º 57.330' N, 78º 37.932' W

RELEVANT WORK AND/OR LITERATURE CITED

BIOLOGICAL ENVIRONMENT

A large number of fishes were seen during the course of this dive. The most common included *Laemonema melanurum, L. barbatulum, Helicolenus dactylopterus* and *Squalus cubensis.* Others observed were *Polyprion americanus* and *Cirrhigaleus asper*. There were also a large number of mobile invertebrates encountered, including *Eumunida picta,* pencil urchins, brittle stars and large basket stars. The macrofaunal community was also diverse and abundant. Various sponges, primnoids, hydroids, isidids, cup corals and flytrap anemones dominated the area. Black corals, *Lophelia pertusa, Paramuricea,* and hexactinellids were also common.

PHYSICAL ENVIRONMENT

Three habitat types were observed during this dive: 1) sand/rubble/rock with fauna, 2) mixed habitat, and 3) rock ledge with fauna. The latter was the most common and was present in a variety of forms from low-relief jagged rocks to moderate-relief rock ledges to higher-relief rocky walls. The sand/rubble/rock distinction was given to the area with large amounts of sediment covering the generally rocky substrate. The mixed habitat area was noted for a diverse moderate-relief macrofaunal community on a flat, rocky substrate.

ADDITIONAL COMMENTS

This dive was recorded on 3 mini DVs. The entire descent, ascent and recovery are covered with this footage. There was no time overlay so a combination of audio comments and CTD depth information were used to correlate video time with real time. The transects were usually evenly lit but at times out of focus. Additionally, the inner lens of the camera was cloudy near the center of the frame.

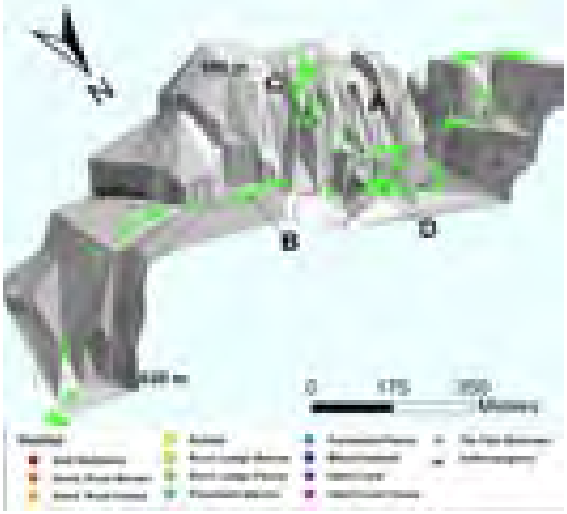
DIVE NUMBER: JSLII-3463 *STUDY AREA: Barrelfish Cliff*

STATION OVERVIEW

Project	Estuary to the Abyss 2004
Principal investigators	GR Sedberry[1]
PI Contact Info[1]	Marine Resources Research Institute, SCDNR P.O. Box 12559 Charleston SC 29422-2559
Purpose	To map, explore and describe habitats along portions of an offshore transect, while characterizing changes in biota relative to distance from shore.
Vessel	R/V Seward Johnson 2, Johnson Sea Link II Submersible
Science Divers	JD Dubick (bow), K Filer (stern)
External Video Tapes	3 mini DVs
Internal Video Tapes	
Digital Still Photos	
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	Collected sponges, seastars.
Acknowledgements	NOAA-OE
SEADESC Analyst	ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	24-Aug-04
Minimum Bottom Depth (m)	550
Maximum Bottom Depth (m)	623
Start Bottom Time (EDT)	16:53
End Bottom End (EDT)	19:13
Starting Latitude (N)	31° 23.226'
Starting Longitude (W)	78° 35.780'
Ending Latitude (N)	31° 23.130'
Ending Longitude (W)	78° 36.382'
Surface Current (Kts)	
Bottom Current (Kts)	0.5

Image A: Rock Ledge-Fauna
31° 23.142' N, 78° 36.156' W

DIVE NUMBER: JSLII-3463 *STUDY AREA: Barrelfish Cliff*

IMAGE GALLERY *** indicates image position is approximated**

Image B: Rock Ledge-Fauna
31º 23.166' N, 78º 35.994' W

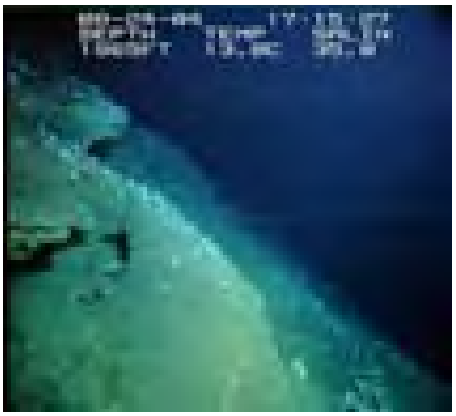


Image C: Rock Ledge-Fauna
31º 23.148' N, 78º 36.096' W

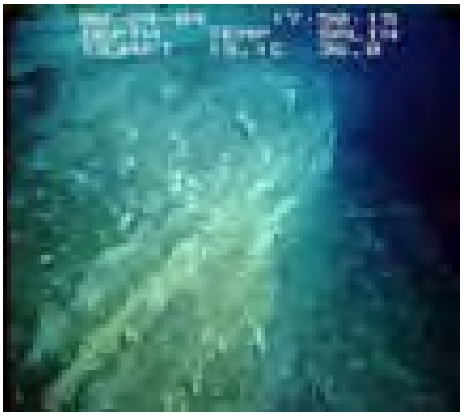
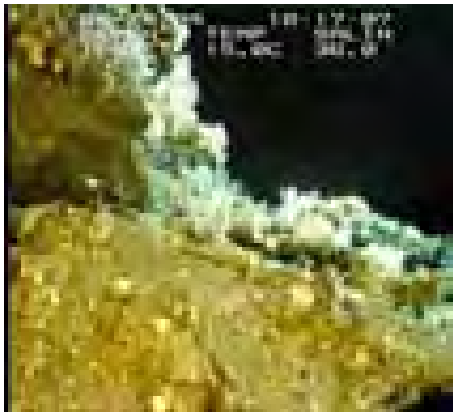


Image D: Rock Ledge-Fauna
31º 23.148' N, 78º 36.162' W



RELEVANT WORK AND/OR LITERATURE CITED

BIOLOGICAL ENVIRONMENT

Few fishes were observed during this dive, the majority of which were encountered during the second half of the dive. *Beryx decadactylus* were the most common, followed by *Polyprion americanus* and *Chaunax* spp. A single species of sea star was the only mobile marine invertebrate captured on this video. The sessile invertebrate community, however, was both diverse and densely populated. The most common macrofauna were cup-shaped sponges, fan-shaped sponges, *Stylaster* and numerous hydrozoans.

PHYSICAL ENVIRONMENT

This dive took place along an extensive, high-relief, rocky scarp. The surface of the scarp varied from moderately sloped (~40º) jagged exposures of rock to sheer-faced walls with few overhangs to enormous slabs of rock with deep caverns and large overhangs. The entire area was covered by a dense cover of attached macrofauna that varied little in composition throughout the course of the dive. Dense piles of coraline rubble and coarse sands were present at the base of some ledges while other areas appeared to be scoured clean.

ADDITIONAL COMMENTS

This dive was recorded on 3 mini DVs. The footage for this dive was of fair-to-mediocre quality owing to the fact that there was dried material on the inner camera lens, frequent video interference and static and the camera was often left out of focus during the long transects. However, the video was adequate to view and classify the available habitat throughout the dive. Sponges and seastars were collected.

DIVE NUMBER: JSLII-3465 *STUDY AREA: Stetson Banks South*

STATION OVERVIEW

Project	Estuary to the Abyss 2004
Principal investigators	GR Sedberry[1]
PI Contact Info[1]	Marine Resources Research Institute, SCDNR P.O. Box 12559 Charleston SC 29422-2559
Purpose	To map, explore and describe habitats along portions of an offshore transect, while characterizing changes in biota relative to distance from shore.
Vessel	R/V Seward Johnson 2, Johnson Sea Link II Submersible
Science Divers	J Stephen (bow), P Mikell (stern)
External Video Tapes	2 mini DVs
Internal Video Tapes	
Digital Still Photos	
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	
Acknowledgements	NOAA-OE
SEADESC Analyst	ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:

DIVE DATA

Date	25-Aug-04
Minimum Bottom Depth (m)	740
Maximum Bottom Depth (m)	786
Start Bottom Time (EDT)	17:10
End Bottom End (EDT)	19:15
Starting Latitude (N)	31° 23.886'
Starting Longitude (W)	77° 51.067'
Ending Latitude (N)	31° 24.174'
Ending Longitude (W)	77° 50.872'
Surface Current (Kts)	
Bottom Current (Kts)	

Image A: Mixed Habitat
31º 23.898' N, 77º 51.096' W

DIVE NUMBER: JSLII-3465 *STUDY AREA: Stetson Banks South*

IMAGE GALLERY

*** indicates image position is approximated**

Image B: Rubble
31º 23.922' N, 77º 51.018' W

Image C: Hard Coral-Barren
31º 23.970' N, 77º 50.958' W

Image D: Mixed Habitat
31º 24.096' N, 77º 50.874' W

RELEVANT WORK AND/OR LITERATURE CITED

Popenoe and Manheim (2001)

BIOLOGICAL ENVIRONMENT

A number of fishes were seen during the course of this dive, though the majority of them were represented by single individuals. Some of the species observed included *Nezumia sclerorhynchus, Nettenchelys exoria, Merluccius albidus, Hoplostethus occidentalis* and *Trachyscorpia cristulata.* Mobile invertebrates were limited and represented by pancake urchins, brittle stars and a large red shrimp seen swimming across the bottom. Small macrofauna were difficult to see when the sub was not stationary, however higher-relief fauna like bamboo and black corals were more easily distinguished. Only one large sponge was seen during the course of this dive.

PHYSICAL ENVIRONMENT

This dive began in a rubble strewn habitat along a shallow ridge-line. Transects continued up a steep slope (50-60º) over a mixed habitat with a dense layer of coral rubble with some small living corals and attached fauna. The top of the ridge was covered with a thick dead coral matrix with less than 5% living coral. The dive proceeded down the slope and over a relatively flat area with a series of small ridges and rises alternating between low-relief mixed habitats and expanses of coral rubble with sparsely attached fauna. The dive continued to another steep rise (~70º) covered in dense dead coral, primarily *Lophelia pertusa*, with attached macrofauna at its summit.

ADDITIONAL COMMENTS

This dive was recorded on two mini DVs. The majority of this video was underlit and filmed too far off the bottom for easy habitat identification and description. Additionally, there was condensation on the inner lens of the camera that further obscured the view. Crinoids, sediment, coral, rocks, and sponges were collected.

DIVE NUMBER: JSLII-3466 *STUDY AREA: Sandy Tongue*

STATION OVERVIEW

Project	Estuary to the Abyss 2004
Principal investigators	GR Sedberry[1]
PI Contact Info[1]	Marine Resources Research Institute, SCDNR P.O. Box 12559 Charleston SC 29422-2559
Purpose	To map, explore and describe habitats along portions of an offshore transect, while characterizing changes in biota relative to distance from shore.
Vessel	R/V Seward Johnson 2, Johnson Sea Link II Submersible
Science Divers	S Meister (bow), Z Schobernd (stern)
External Video Tapes	3 mini DVs
Internal Video Tapes	
Digital Still Photos	
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	
Acknowledgements	NOAA-OE
SEADESC Analyst	ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:

DIVE DATA

Date	26-Aug-04
Minimum Bottom Depth (m)	871
Maximum Bottom Depth (m)	876
Start Bottom Time (EDT)	8:40
End Bottom End (EDT)	11:00
Starting Latitude (N)	31° 33.324'
Starting Longitude (W)	77° 29.366'
Ending Latitude (N)	31° 33.750'
Ending Longitude (W)	77° 29.175'
Surface Current (Kts)	
Bottom Current (Kts)	0.3

Image A: Soft Substrate
31º 33.426' N, 77º 29.310' W

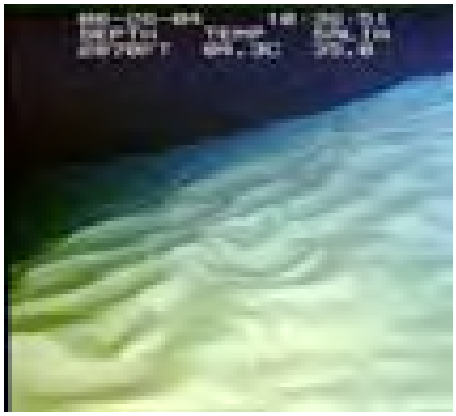
DIVE NUMBER: JSLII-3466 *STUDY AREA: Sandy Tongue*

IMAGE GALLERY *** indicates image position is approximated**

Image B: Soft Substrate
31º 33.636' N, 77º 29.256' W

Image C: Soft Substrate
31º 33.636' N, 77º 29.256' W

Image D: Soft Substrate
31º 33.690' N, 77º 29.178' W



RELEVANT WORK AND/OR LITERATURE CITED

Popenoe and Manheim (2001)

BIOLOGICAL ENVIRONMENT

A large number and diversity of fishes were recorded during this dive. The most common species were *Synaphobranchus affinis, Physiculus* spp. and an unidentified eel. Other species included *Chlorophthalmus agassizi, Nezumia sclerorhynchus, Fenestraja plutonia*, *Centroscyllium fabricii* and an unidentified shark possibly of the family Chlamydoselachidae. Mobile invertebrates were less common but included *Chaceon* crabs and small red shrimp. A single large white anemone and a single venus flytrap anemone were the only attached macrofauna observed on this sandy habitat.

PHYSICAL ENVIRONMENT

The entire dive took place over a series of rolling sand dunes, 2-3 meters in relief, with a rippled surface. The sands making up these dunes were of fine to medium coarseness and bright white in color. In some areas the sediment was covered with a thin film of brownish-green material and the occasional piece of *Sargassum*.

ADDITIONAL COMMENTS

This dive was recorded on 3 mini DVs. There was condensation on the inner lens of the camera, which obscured the details of some species. The footage also had an overall grainy quality and was mostly filmed with low-light. An eel, other fishes, an anemone, sand and a crab were collected.

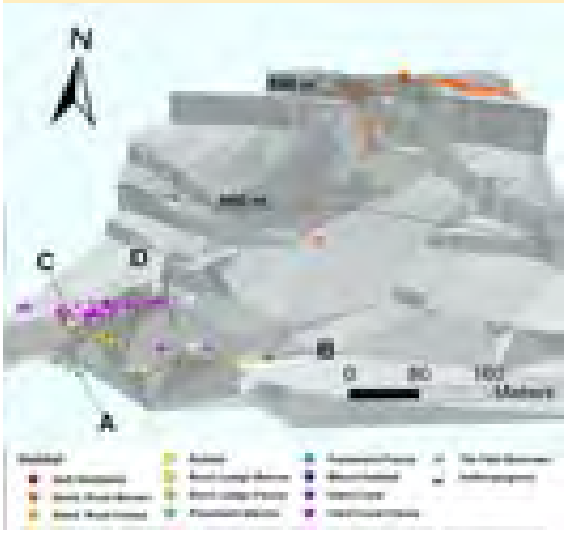
DIVE NUMBER: JSLII-3467 *STUDY AREA: Deep Flats*

STATION OVERVIEW

Project	Estuary to the Abyss 2004
Principal investigators	GR Sedberry[1]
PI Contact Info[1]	Marine Resources Research Institute, SCDNR P.O. Box 12559 Charleston SC 29422-2559
Purpose	To map, explore and describe habitats along portions of an offshore transect, while characterizing changes in biota relative to distance from shore.
Vessel	R/V Seward Johnson 2, Johnson Sea Link II Submersible
Science Divers	J Loefer (bow), K Bryan (stern)
External Video Tapes	2 mini DVs
Internal Video Tapes	
Digital Still Photos	
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	
Acknowledgements	NOAA-OE
SEADESC Analyst	ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	26-Aug-04
Minimum Bottom Depth (m)	887
Maximum Bottom Depth (m)	908
Start Bottom Time (EDT)	16:42
End Bottom End (EDT)	18:17
Starting Latitude (N)	31° 49.686'
Starting Longitude (W)	77° 31.142'
Ending Latitude (N)	31° 49.464'
Ending Longitude (W)	77° 31.311'
Surface Current (Kts)	
Bottom Current (Kts)	

Image A: Rock Ledge-Fauna
31º 49.500' N, 77º 31.386' W

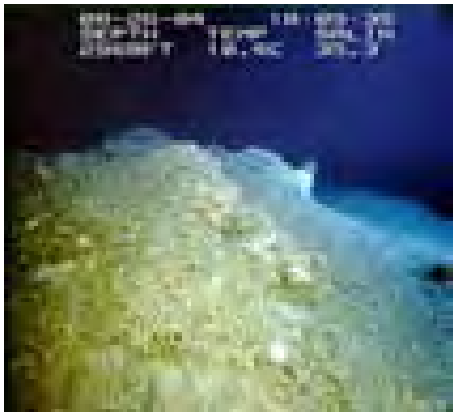
DIVE NUMBER: JSLII-3467 *STUDY AREA: Deep Flats*

IMAGE GALLERY *** indicates image position is approximated**

Image B: Rubble
31º 49.476' N, 77º 31.266' W

Image C: Rock Ledge-Barren
31º 49.488' N, 77º 31.368' W

Image D: Hard Coral-Fauna
31º 49.470' N, 77º 31.320' W



RELEVANT WORK AND/OR LITERATURE CITED

BIOLOGICAL ENVIRONMENT

A large number and variety of fishes were observed during the course of this dive. The most common were *Synaphobranchus affinis* and *Centroscyllium fabricii.* These were typically observed in association with the soft substrate habitat encountered at the beginning of the dive. Other species included *Myxine glutinosa, Nezumia sclerorhynchus* and *Chlorophthalmus agassizi*. These species were seen in a variety of habitats throughout the dive. Mobile invertebrates were represented by a large number of urchins in the soft substrate and rubble areas, abundant brittle stars in rubble and coraline habitats as well as a large red stone crab. Attached macrofauna were scarce for the majority of the dive but were found in high concentrations attached to the rocky coral substrate at the end of the dive. These included small cup corals and sponges, hydroids, *Stylaster*, and soft corals. No large sponges or gorgonians were observed during this dive.

PHYSICAL ENVIRONMENT

The majority of the dive was spent on a gently sloped plain of soft sediments mixed with dense rubble with very little relief. A large rock outcrop and a densely consolidated dead coral mound were encountered near the end of the dive and were of moderate relief (1-3 m). The hard coral habitat was defined by a dense matrix of consolidated dead coral rubble with very little living coral (<5%). Most of the rubble appeared to be from *Lophelia pertusa.*

ADDITIONAL COMMENTS

This dive was recorded on 2 mini DVs of fair quality. The footage was generally grainy and underlit, but habitat was easily distinguished as were a number of the fauna encountered throughout the dive. Sediment, coral, an eel, other fishes, and rocks were collected.

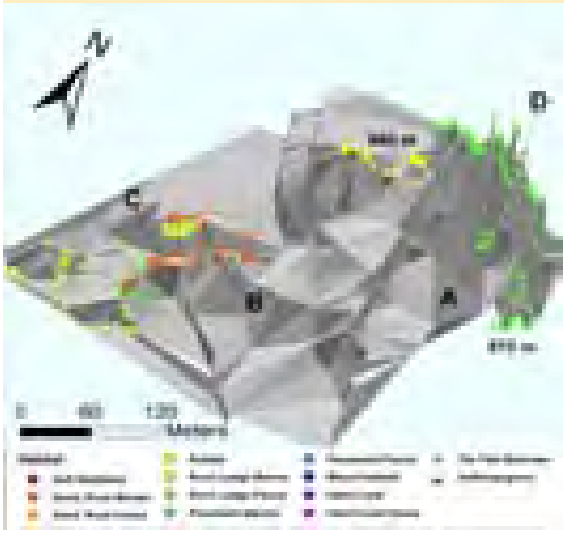
DIVE NUMBER: JSLII-3470 *STUDY AREA: Cutthroat Cliff*

STATION OVERVIEW

Project	Estuary to the Abyss 2004
Principal investigators	GR Sedberry[1]
PI Contact Info[1]	Marine Resources Research Institute, SCDNR P.O. Box 12559 Charleston SC 29422-2559
Purpose	To map, explore and describe habitats along portions of an offshore transect, while characterizing changes in biota relative to distance from shore.
Vessel	R/V Seward Johnson 2, Johnson Sea Link II Submersible
Science Divers	GR Sedberry (bow), R King (stern)
External Video Tapes	2 mini DVs
Internal Video Tapes	
Digital Still Photos	
Positioning System	dGPS
CTD File	☑
Specimens Collected	☑
Other	
Acknowledgements	NOAA-OE
SEADESC Analyst	ML Partyka
Date Compiled	11/16/2006

GENERAL LOCATION

Dive Track:



DIVE DATA

Date	30-Aug-04
Minimum Bottom Depth (m)	857
Maximum Bottom Depth (m)	874
Start Bottom Time (EDT)	8:38
End Bottom End (EDT)	10:29
Starting Latitude (N)	30° 17.052'
Starting Longitude (W)	79° 20.255'
Ending Latitude (N)	30° 17.124'
Ending Longitude (W)	79° 20.154'
Surface Current (Kts)	
Bottom Current (Kts)	0.2

Image A: Rock Ledge-Fauna
30º 17.106' N, 79º 20.148' W

DIVE NUMBER: JSLII-3470 *STUDY AREA: Cutthroat Cliff*

IMAGE GALLERY *** indicates image position is approximated**

Image B: Sand/Rubble/Rock-Barren
30º 17.034' N, 79º 20.226' W

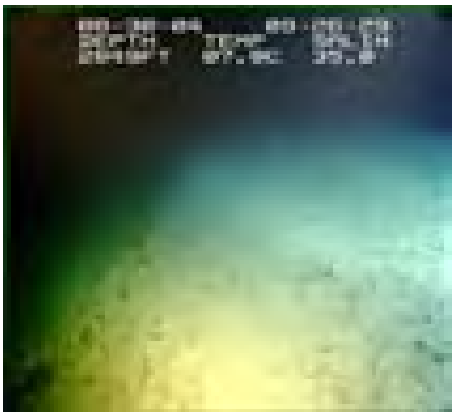
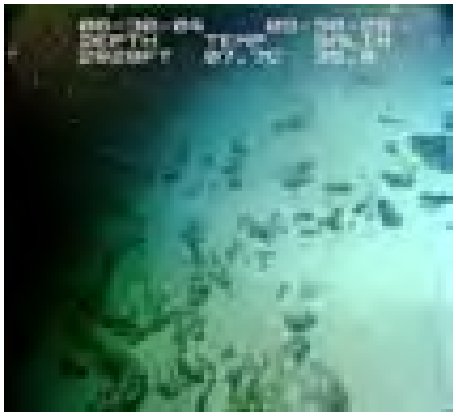


Image C: Rock Ledge-Fauna
30º 17.142' N, 79º 20.154' W

Image D: Rock Ledge-Barren
30º 17.154' N, 79º 20.160' W



RELEVANT WORK AND/OR LITERATURE CITED

Harasewych and Sedberry (2006)

BIOLOGICAL ENVIRONMENT

Few species of fishes or mobile invertebrates were observed during the course of this dive. The eel *Synaphobranchus affinis* was common and seen regularly throughout the course of this dive. Other species such as *Laemonema barbatulum* and an unidentified cusk eel were only seen occasionally. Pancake urchins were the most common mobile marine invertebrates observed in the area, although one rocky outcrop was covered in small gastropods. The macrofaunal community was relatively depauperate during most of the dive with a few species of sponge and small stands of *Enallopsammia* coral. The rock ledge habitat at the end of the dive had a more diverse population of attached fauna including large *Keratoisis* bamboo corals, *Parantipathes* and *Bathypathes* black corals, stalked crinoids and various sponges.

PHYSICAL ENVIRONMENT

This dive began in a sand/rubble/rock habitat with very little slope and/or relief with some large rocks. This habitat gave way to an expanded area of exposed rock substrate with and without attached macrofauna. Though the rock surface was jagged and of moderate-relief, there were very few actual rock ledges. There was also a large flat plain covered in dense coral and stone rubble mixed with fine sediments. The dive concluded at the edge of a steep slope (~45º) covered in soft sediment with areas of exposed bedrock jutting out as ledges. The attached macrofauna of this habitat was dominated by large *Keratoisis* bamboo corals and small growths of *Enallopsammia* hard corals.

ADDITIONAL COMMENTS

This dive was recorded on 2 mini DVs. There was condensation on the inner lens of the camera and the video feed was very grainy. The lighting and focus, however, were adequate for both habitat and species identifications. Sand, a sponge, snails, coral, a crinoid and fishes were collected.

APPENDIX IV

Visual Basic Code used in SEADESC Database

Class Object Code

```
Private Sub Detail_Print(Cancel As Integer, PrintCount As Integer)
    Me!txtImageNote = DisplayImage(Me!ImageFrame, Me!txtImageName)
    Me!txtImageNote1 = DisplayImage(Me!ImageFrame1, Me!txtImagetrack)
    Me!txtImageNote2 = DisplayImage(Me!ImageFrame2, Me!txtImageA)
    Me!txtImageNote3 = DisplayImage(Me!ImageFrame3, Me!txtImageB)
    Me!txtImageNote4 = DisplayImage(Me!ImageFrame4, Me!txtImageC)
    Me!txtImageNote5 = DisplayImage(Me!ImageFrame5, Me!txtImageD)

    'txtImageNote is an unbound text control that links the imageframe control'
    'to the image path in the underlying query/table'

End Sub
```

Module

```
Public Function DisplayImage(ctlImageControl As Control, strImagePath As Variant) As String
On Error GoTo Err_DisplayImage

Dim strResult As String
Dim strDatabasePath As String
Dim intSlashLocation As Integer

With ctlImageControl
    If IsNull(strImagePath) Then
        .Visible = False
        strResult = "No image name specified."
    Else
        If InStr(1, strImagePath, "\") = 0 Then
            ' Path is relative
            strDatabasePath = CurrentProject.FullName
            intSlashLocation = InStrRev(strDatabasePath, "\", Len(strDatabasePath))
            strDatabasePath = Left(strDatabasePath, intSlashLocation)
            strImagePath = strDatabasePath & strImagePath
        End If
        .Visible = True
        .Picture = strImagePath
        strResult = "Image found and displayed."
    End If
End With

Exit_DisplayImage:
    DisplayImage = strResult
    Exit Function

Err_DisplayImage:
    Select Case Err.Number
        Case 2220       ' Can't find the picture.
            ctlImageControl.Visible = False
            strResult = "Can't find image in the specified name."
            Resume Exit_DisplayImage:
        Case Else       ' Some other error.
            MsgBox Err.Number & " " & Err.Description
            strResult = "An error occurred displaying image."
            Resume Exit_DisplayImage:
    End Select
End Function
```

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