Multibeam sonar data collected, Nov. 9–11, 2006 aboard the NOAA Ship Nancy Foster reveal several interesting bathymetric features. The survey area, located 30 km off the coast of Charleston, South Carolina at water depths between 20–25 m, was first discovered by undergraduate students in the 2004 College of Charleston Transact Program. The submerged meandering channel extends over 4 km in a NW–SE trend perpendicular to the shoreline with water depths ranging from 19 to 25 m. The depths and widths of the channels vary throughout the section: northwestern portions are 10 m deep and 18–22 m wide, whereas the southeastern channel features are 12–24 m deep and 29–31 m wide. In addition to this paleo-channel, a series of linear features, with lengths as great as 500 m, were discovered in the southeastern region of the survey area which lay adjacent to a massive sand body in the SE. Overall, this area could be interpreted as features formed along an ancient coastline when sea level was approximately 20 m lower than present. It is possible that the shore-line features formed from a paleo-sea level that existed during the Younger Dryas period of 11,000 ybp. The goals of this study are to utilize these bathymetric features to identify distinct regions within the survey area based on geomorphologic characteristics, as well as to determine areas that should be revisited.

RESULTS
The survey area was divided into four distinct regions based on the geomorphology from multibeam sonar, previous photographic data (Stubbins et al., 2007) and sediment analyses (Danese et al., 2007).

**REGION 1** includes the extent of the Transact Meanders, trending NW–SE along the shoreward side of the survey area, with water depths ranging 19–24 m and relief ranging 0.5–1.5 m. The region contains sedimentary deposits consisting mostly of gravel and sediment of varying sizes, scattered throughout the area. In addition to this, the region contains several distinct areas that were analyzed for their geomorphic characteristics, as well as to determine areas that should be revisited.

**REGION 2** includes the linear features located in the southeastern portion of the survey area which trend NW–SE and have lengths as great as 500 m. To date, no sedimentary data are available for Region 2.

**REGION 3** contains the massive sand body found in the southeastern portion of the survey area which is composed mostly of gravel and sand. The sand body is a very flat feature with low relief (Hainstock et al., 2007) and contains the shallowest areas (19 m) within the survey area.

**REGION 4** is characterized by low-laying basins located in the northwestern and southeastern portions of the survey area, each of which has depths as great as 25 m. Sediment grains from this region contain mostly biogenic material comprising of bioclastic fragments.

**BACKGROUND**
- Multibeam sonar mapping of the survey area performed during the 2006 research cruise onboard the NOAA Ship Nancy Foster revealed several distinct bathymetric features:
  1. A submarine meandering channel trending NW–SE along the entire survey region (the Transact Meanders), with varying sedimentology (Danese et al., 2007)
  2. A series of linear features found in the southeastern portion of the survey area which is composed of medium to fine-grained sand
  3. A massive sand body in the far southeastern section of the survey area, composed mostly of poorly sorted medium to coarse-grained sand (Danese et al., 2007)
  4. Deeper regions which are composed mostly of bioclastic fragments (Danese et al., 2007).
- During previous studies it was suggested that the survey area marks the paleo-coastline of South Carolina during the last sea level low stand approximately 11,000 ybp (the Younger Dryas Period) (Stubbins et al., 2007).
- Sediment samples from the Transact Meanders, the massive sand body, and the deeper areas of the survey site were analyzed in order to further characterize previous and current geological and biological characteristics of the region (Danese et al., 2007).
- The survey area was further analyzed by video data collected from ROV and SCUBA divers (Stubbins et al., 2007).

**METHODS**
- Raw multibeam sonar data were acquired using Simrad EM1002 aboard the NOAA Ship Nancy Foster.
- Data were cleaned and processed using software CARIS HIPS 6.1.
- New multibeam data, coupled with previous sediment studies (Danese et al., 2007) from the survey area, were analyzed to determine possible origins of the submarine features.

**REFERENCES AND ACKNOWLEDGEMENTS**
- Danese et al. (2007)
- Harris et al. (2007)
- Murphy (2007)
- Stubbins (2007)
- Hainstock et al. (2007) - School of Science and Math Poster Session, College of Charleston
- CARIS, Inc., for software; NOAA Ship Nancy Foster, Josh Mode for assisting with instruction.

**DISCUSSION**
- Multibeam data, surveyed on the continental shelf 30 km off the Charleston coast, reveal distinct features which suggest this region likely marks the approximate paleo-shoreline during the Younger Dryas (11,000 ybp) when sea level was 20–25 m below its modern position.
- The Transact Meanders area was characterized by dividing the survey area into four distinct regions (4), based on bathymetric features and sediment collected and analyzed by Danese et al. (2007). These four regions provide a geologic background for determining the modern environments and habitat characteristics.
- Region 2, which contains the extensive linear features believed to be dune (sand) waves (Murphy, 2007), is a region that was not analyzed for its sedimentary characteristics. The exposure of this feature suggests it could represent outcrops of underlying rock layers. Region 2 is one that should be further analyzed, through both sediment sampling and various forms of acoustic sounding, to determine the origins of these linear features.

**Figures**
- Figure 1: Outline of four distinct areas of the survey region.
- Figure 2: Linear features along multiple channel features.
- Figure 3: Multibeam sonar data collected, Nov. 9–11, 2006 aboard the NOAA Ship Nancy Foster reveal several interesting bathymetric features.
- Figure 4: Multibeam sonar features identified in the southeastern portion of the survey area.