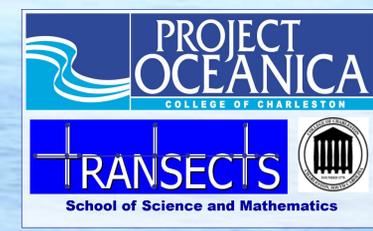
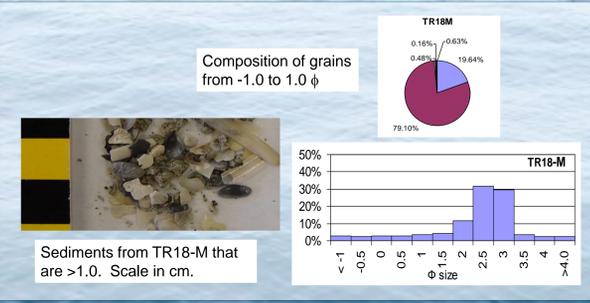


# BIOGENIC SEDIMENTS ASSOCIATED WITH TWO HARD-GROUND AREAS ALONG THE CHARLESTON TRANSECT



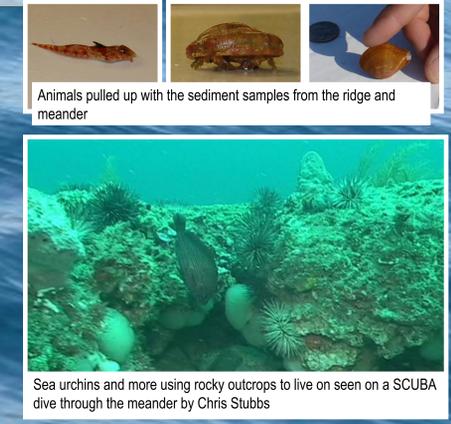
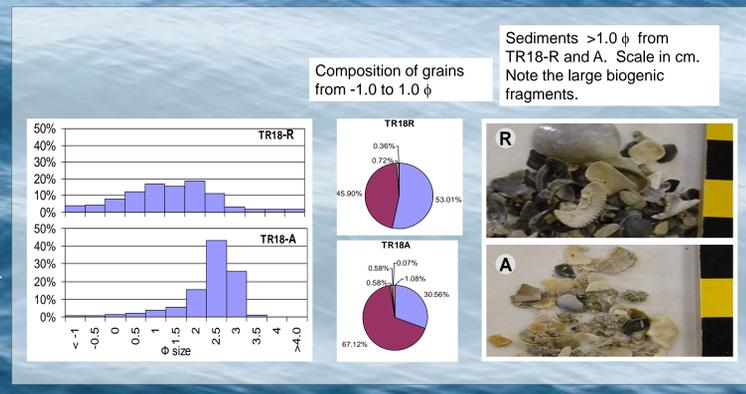
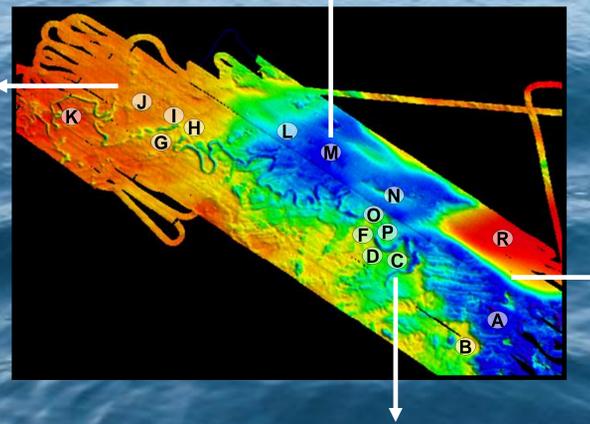
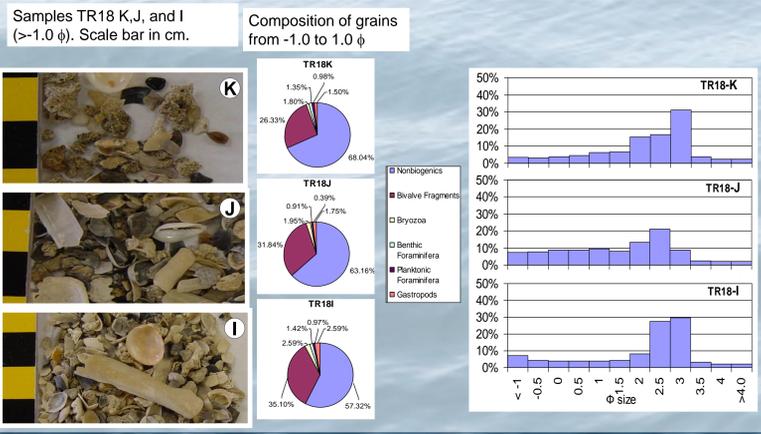
Loren DANESE, Ransom WHITE, and Leslie R. SAUTTER (Dept. of Geology and Environmental Geosciences, College of Charleston)

**Background:** In November, 2006, sediment grab samples were collected using a Smith-MacIntyre grab sampler on the continental shelf off Charleston, SC, aboard the NOAA ship Nancy Foster. Two areas located on the mid-shelf and shelf-edge were studied, both of which included hard ground features surrounded by sand mega-ripples. The mid-shelf area (water depths of 20-25 m) is the site of the Transect River Channel, a meandering river channel etched into the underlying hardground. The shelf-edge site is Doc's Rocks, a rocky outcrop of ledges in 50 m of water. Both of these areas were discovered during the College of Charleston's Transect Program in 2004 and are potentially important areas of high benthic diversity and fish habitat. Previous studies showed that sediments across the shelf to depths of 50 m consist primarily of medium to fine sands, and 90% of the sediment is lithogenic (Cushman). Samples collected in 2006 will supplement previous collections to further characterize these important seafloor habitats. Compositional analysis includes classification of biogenic material in the coarse size fraction which are greater than 500 microns (-1.0 to 1.0  $\phi$ ).



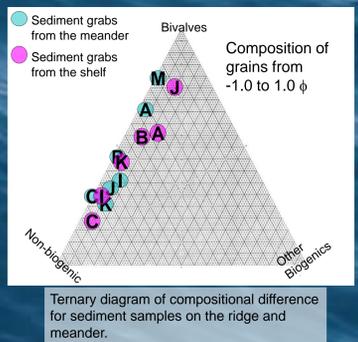
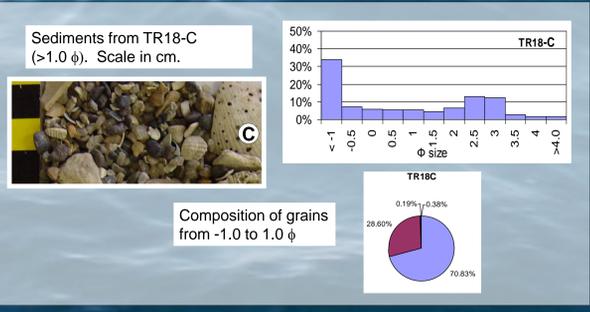
**River Channel Sediment Results:**

- The very end of the meander (TR18- C) varied in that it contained a large amount of very coarse authigenic and phosphorite grains
- The probable sand ridge (TR18- R) has a coarser mean than the other samples
- The deeper areas (TR18- A, M) are composed mostly of bivalve fragments
- The north western region of the meander (TR18- I, J, K) consists mostly of lithogenic grains but the one closest to the meander contains more biogenic sediments than the others
- The ternary diagram shows no apparent distinction between composition of the ridge versus the meander



**Methods:**

- Sediment samples were collected aboard the Nancy Foster using a Smith-MacIntyre grab sampler
- Samples were mixed, photographed, and stored in bags for laboratory analysis
- Samples were dried in an oven and sieved using a Ro-Tap Testing Sieve Shaker
- Each size fraction was weighed, and % weight was calculated
- Samples TR12- A, B, C, I, J, K and TR18- A, C, I, J, K, M, R were analyzed for microfossil content.
- Size fractions -1.0 to 1.0 $\phi$  were split using a quantitative splitter
- Percent non-biogenic, bivalve fragments, bryozoans, planktonic foraminifera, benthic foraminifera, and gastropods were calculated and microfossil assemblage was determined.

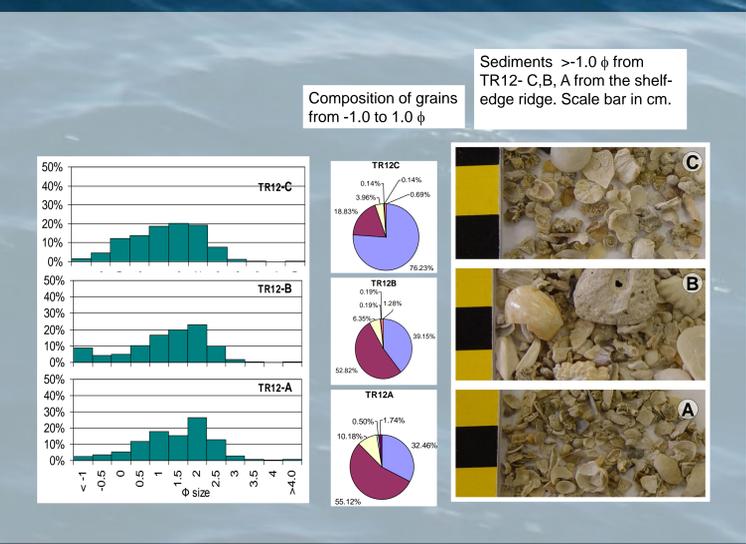
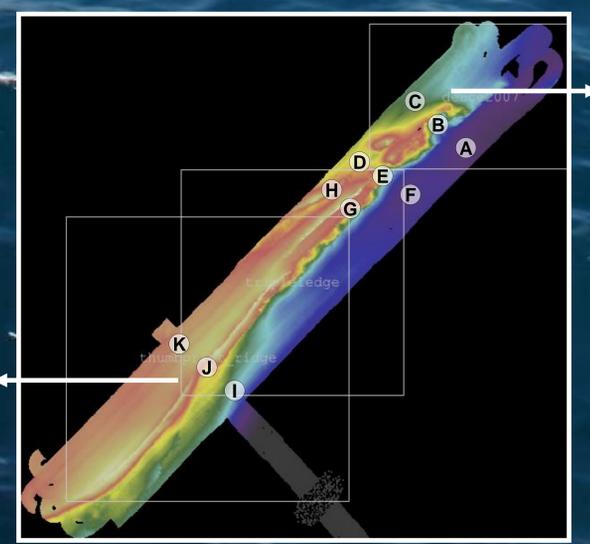
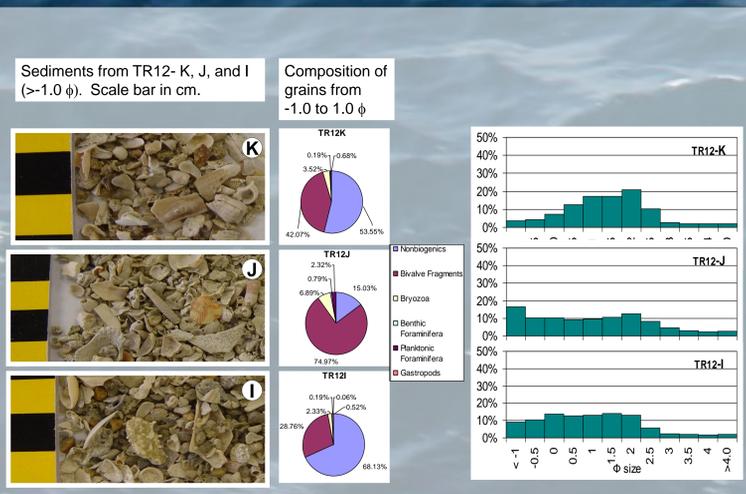


**Acknowledgements:** Dan Boles, CARIS, Scott Harris, Nancy Foster and crew, NOAA Coastal Services Center, DNR, Chris Stubbs

**References:** CUSHMAN, Adriane and SAUTTER, Leslie. An analysis of microfossil assemblages across the continental shelf off the coast of Charleston, SC

**Shelf-Edge Sediment Results:**

- Both samples from the seaward northeastern side of the ridge (TR12- A, B) have a similar composition and grain size distribution.
- The southern and landward side of the ridge (TR12- K) also shares this similar grain distribution but not composition
- Both samples from the southern seaward end of the ridge (TR12- I, J) have a similar grain size distribution.
- The northern landward side of the ridge (TR12- C) has a very different composition than the others analyzed in that it is mostly made up of non-biogenic grains.
- The southern end of the ridge (TR12- J) has the highest percentage of bivalves.



**Analysis:**

- There are rocky outcrops along the meander that are conducive to life.
- The basins must be areas where marine life thrives currently or where it has been deposited.
- The landward side of the ridge is a smooth area with not much life.
- There is an increase in life and habitable area as the ridge drops off and exposes rock.
- Grain size analysis differs from the results found by Adriane Cushman due to the fact that she analyzed all grain sizes found, whereas this study only took the coarse grain sizes into account.
- More bivalve fragments were found in this analysis suggesting that the bulk of the biogenics are found in the coarse material.