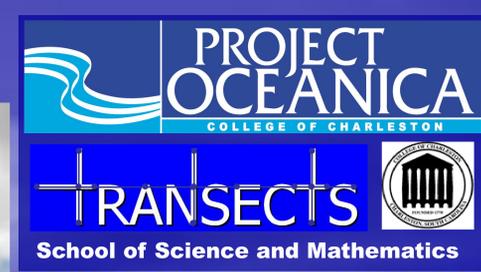


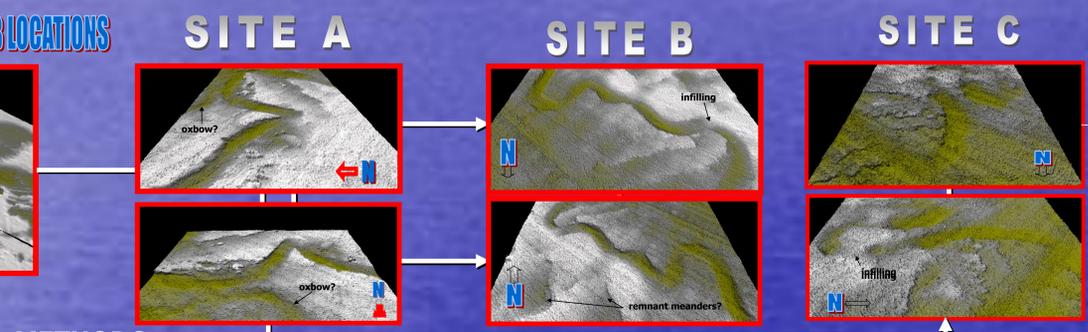
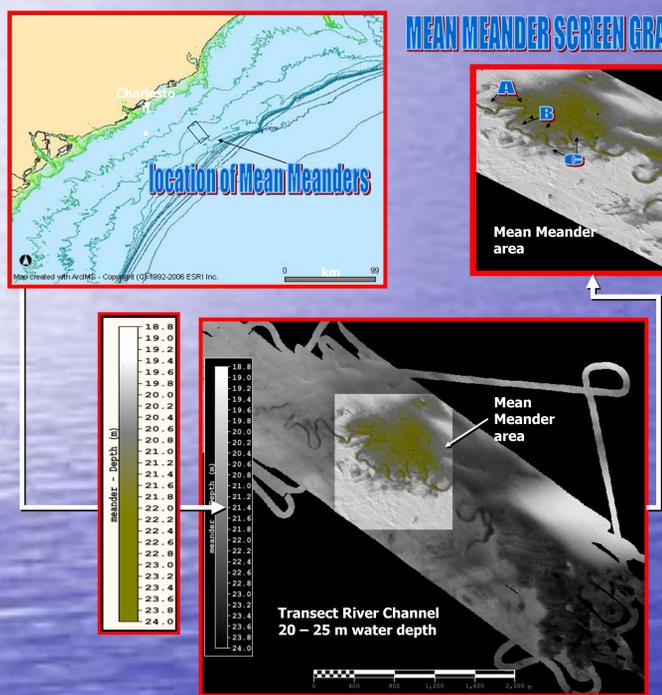
# ANALYSIS OF THE HIGHLY SINUOUS MEAN MEANDERS OF THE TRANSECTS RIVER CHANNEL

MEANY, Keith H. and SAUTTER, Leslie, Department of Geology and Environmental Geosciences, College of Charleston, Charleston, SC



## BACKGROUND

In November of 2006, a Multibeam mapping research cruise on the mid-continental shelf was conducted aboard the Nancy Foster. The investigation followed the 2004 College of Charleston Transect Programs discoveries, of what is now referred to as the Transect River Channel. The channel is incised into hardground in approximately 20 meters water depth off the Charleston, SC coast. We used CARIS HIPS/SIPS software along with the new sonar data to analyze the channel called Mean Meanders. The relative Distribution of Hardground and soft-substrate areas were evaluated using the Multibeam backscatter channel. The sedimentology of the highly sinuous Mean Meander was investigated using many sediment grab samples that were collected on the cruise. These investigations along with the video footage taken from the site helped to characterize the possible history of this benthic habitat.

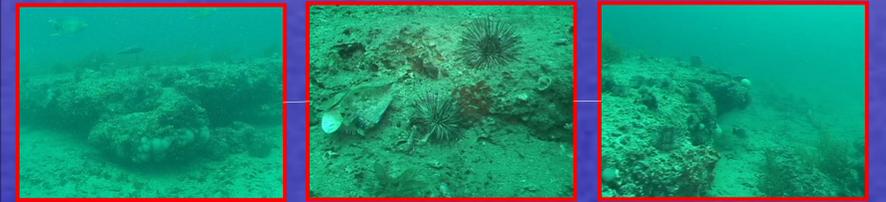


**SITE A:** The images of site A provide a view of a possible oxbow or remnant meander, along with a very sinuous and intact channel.

**SITE B:** These images show portions of the Mean Meander that appear to be infilling (white areas within channel). Possible remnant meanders can be seen in the bottom view, lower left.

**SITE C:** Notice the infilling of the channels and the pattern of relief from north to south.

## DIVE PHOTOS COURTESY OF CHRIS STUBBS



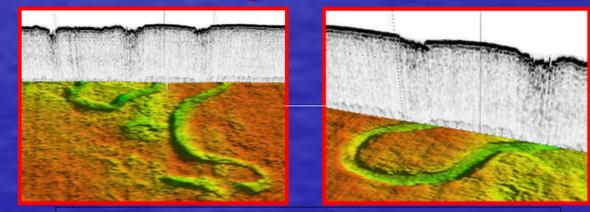
These were images taken during a SCUBA dive on the Harris Meander by Chris Stubbs. They show hardground outcrops that are home to various forms of sea life. (Location labeled on base map with a star in the Transect River Channel)

## METHODS

- Multibeam sonar collected aboard the NOAA Ship Nancy Foster
- Collection of sediment samples from sites of interest using the Smith-MacIntyre sediment grab sampler.
- CARIS HIPS/SIPS software used to clean and analyze bathymetric data.
- Drying and sieving of sediment samples for grain size analysis. Compositional analysis by L. Danese.
- Comparison with previous CHIRP sub-bottom profiles (Dr. Scott Harris) from Transect Program Leg 02
- Comparison with previous dive video, Transect Program Leg 03 (Chris Stubbs).

## HARRIS MEANDER WITH CHIRP PROFILE

Courtesy of SCOTT HARRIS

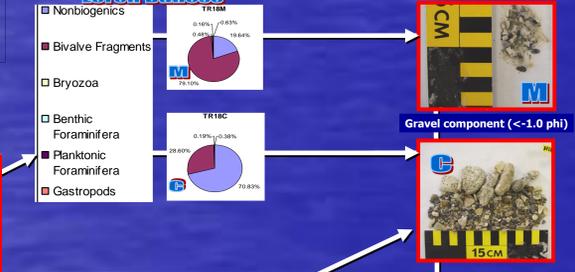


These images show a section of the Harris Meander sub-surface using a CHIRP data profile. These channels are clearly incised into the hardground. (Data provided by Scott Harries, Coastal Carolina University)

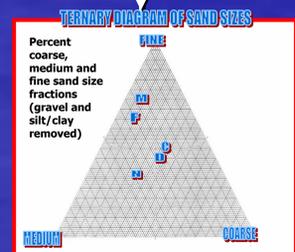
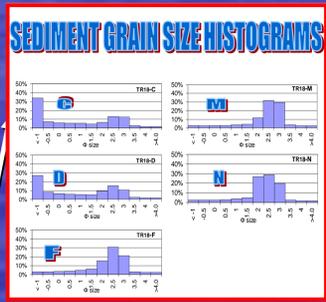
## RESULTS

- The Mean Meander is cut 1 to 1.5 meters into lithified hard ground, with channel widths varying from 15-25 m.
- Water depths are 20 – 22 m.
- The highly sinuous meander has a sinuosity index of 2.11, similar to the adjacent Harris Meander segment to the west.
- Meanders are located at mid-continental shelf with little relief.
- Much of the sediment has been winnowed, and areas along the meander show signs of scouring.
- Also much of the meander has visible infilling by migrating sediments.
- A possible oxbow is seen within the Mean Meander area.

## Composition Analysis by Loren Danese



Sediments collected all contain significant medium-to-fine sands. Samples C & D differ because they have a large amount of gravel-sized material. Sample C has several large and well rounded pebbles as well as large biogenic pieces. These pebbles may be remnant material from the relict stream, or eroded material from the hardground outcrops along the channel.



**Wentworth Scale**

Grain Diameter (mm)	Grain Size (U.S. Sieve No.)	Soil Class (Marine/Coastal)
< 0.075	-	CLAY
0.075 - 0.425	20 - 40	CLAY
0.425 - 0.600	40 - 60	CLAY
0.600 - 0.850	60 - 80	CLAY
0.850 - 1.180	80 - 100	CLAY
1.180 - 1.750	100 - 150	CLAY
1.750 - 2.500	150 - 200	CLAY
2.500 - 3.350	200 - 270	CLAY
3.350 - 4.750	270 - 375	CLAY
4.750 - 6.350	375 - 500	CLAY
6.350 - 8.500	500 - 660	CLAY
8.500 - 11.750	660 - 880	CLAY
11.750 - 16.000	880 - 1180	CLAY
16.000 - 21.250	1180 - 1580	CLAY
21.250 - 28.000	1580 - 2000	CLAY
28.000 - 37.500	2000 - 2700	CLAY
37.500 - 50.000	2700 - 3540	CLAY
50.000 - 67.500	3540 - 4750	CLAY
67.500 - 90.000	4750 - 6350	CLAY
90.000 - 120.000	6350 - 8500	CLAY
120.000 - 160.000	8500 - 11300	CLAY
160.000 - 210.000	11300 - 15000	CLAY
210.000 - 280.000	15000 - 20000	CLAY
280.000 - 375.000	20000 - 27000	CLAY
375.000 - 500.000	27000 - 35400	CLAY
500.000 - 675.000	35400 - 47500	CLAY
675.000 - 900.000	47500 - 63500	CLAY
900.000 - 1200.000	63500 - 85000	CLAY
1200.000 - 1600.000	85000 - 113000	CLAY
1600.000 - 2100.000	113000 - 150000	CLAY
2100.000 - 2800.000	150000 - 200000	CLAY
2800.000 - 3750.000	200000 - 270000	CLAY
3750.000 - 5000.000	270000 - 354000	CLAY
5000.000 - 6750.000	354000 - 475000	CLAY
6750.000 - 9000.000	475000 - 635000	CLAY
9000.000 - 12000.000	635000 - 850000	CLAY
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