Boring Designation NTVC-06-16

DRILLING LOG

DIVISION	
INSTALLATION	
SHEET 1 OF 1 SHEETS	
1. PROJECT	North Topsail 2006 Vibracores North Topsail, North Carolina
2. BORING DESIGNATION	NTVC-06-16
LOCATION COORDINATES	X = 2,471,227 Y = 262,687
3. DRILLING AGENCY	
CONTRACTOR FILE NO.	
4. NAME OF DRILLER	Fred Kaub
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	0.0 Ft.
7. DEPTH DRILLED INTO ROCK	0.0 Ft.
8. TOTAL DEPTH OF BORING	21.0 Ft.
9. SIZE AND TYPE OF BIT	3.0 In.
10. COORDINATE SYSTEM/DATUM	North Carolina State Plane
HORIZONTAL	NAD 1983
VERTICAL	NAVD 88
11. MANUFACTURER'S DESIGNATION OF DRILL	☐ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	
DISTURBED	
UNDISTURBED (UD)	
13. TOTAL NUMBER CORE BOXES	
14. ELEVATION GROUND WATER	
15. DATE BORING	STARTED 09-28-06 17:27 / COMPLETED 09-28-06 17:32
16. ELEVATION TOP OF BORING	-37.9 Ft.
17. TOTAL RECOVERY FOR BORING	20.2 Ft.
18. SIGNATURE AND TITLE OF INSPECTOR	Ken Wilson

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	% REC.	BOX OR SAMPLE	REMARKS
-37.9	0.0					
-38.2	0.3		SAND, medium grained, quartz, some shell hash, trace shell fragments, trace silt, trace whole shell, (1.0"x1.0") rock fragment @ 0.2'; whole shell < 0.5"; shell fragments < 0.5", dark gray (5Y-4/1), (SW).		1	Sample #1, Depth = 0.2' Mean (mm): 0.71, Phi Sorting: 1.78 Shell Hash: 14%, Fines (230): 2.13% (SW)
-42.0	4.1		SAND, fine grained, quartz, little silt, trace shell fragments, trace shell hash, shell fragments < 0.5", olive gray (5Y-4/2), (SP-SM).		2	Sample #2, Depth = 2.0' Mean (mm): 0.18, Phi Sorting: 0.64 Shell Hash: 0%, Fines (230): 11.29% (SP-SM)
-47.1	9.2		SAND, fine grained, quartz, little rock fragments, little silt, trace shell fragments, trace shell hash, trace whole shell, shell fragments < 0.5"; (3.0"x3.0") rock fragment @ 6.3'; whole shell < 0.5", olive gray (5Y-5/2), (SM).		3	Sample #3, Depth = 5.5' Mean (mm): 0.25, Phi Sorting: 1.46 Shell Hash: 2%, Fines (230): 17.98% (SM)
-52.4	14.5		SAND, fine grained, quartz, trace shell fragments, trace shell hash, trace silt, shell fragments up to (1.5"x0.75"), very dark gray (5Y-3/1), (SP-SM).		4	Sample #4, Depth = 11.0' Mean (mm): 0.17, Phi Sorting: 0.71 Shell Hash: 1%, Fines (230): 8.64% (SP-SM)
-58.1	20.2		SAND, fine grained, quartz, little silt, trace shell fragments, trace shell hash, shell fragments up to (1.5"x0.75"), very dark gray (5Y-3/1), (SM).		5	Sample #5, Depth = 18.0' Mean (mm): 0.16, Phi Sorting: 0.50 Shell Hash: 0%, Fines (230): 12.11% (SM)
-58.9	21.0		No Recovery.			
			End of Boring			

0 5 10 15 20 25

FLORIDA DEP ROSS NORTH_TOPSAIL_2006.GPJ FL DEP ROSS.GDT 10/25/06

SAJ FORM 1836 **MODIFIED FOR THE FLORIDA DEP**
JUN 02 JUN 04

Boring Designation NTVC-06-17

DRILLING LOG

DIVISION	
INSTALLATION	
SHEET 1 OF 1 SHEETS	
1. PROJECT	North Topsail 2006 Vibracores North Topsail, North Carolina
2. BORING DESIGNATION	NTVC-06-17
LOCATION COORDINATES	X = 2,476,140 Y = 263,138
3. DRILLING AGENCY	
CONTRACTOR FILE NO.	
4. NAME OF DRILLER	Fred Kaub
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	0.0 Ft.
7. DEPTH DRILLED INTO ROCK	0.0 Ft.
8. TOTAL DEPTH OF BORING	20.0 Ft.
9. SIZE AND TYPE OF BIT	3.0 In.
10. COORDINATE SYSTEM/DATUM	North Carolina State Plane
HORIZONTAL	NAD 1983
VERTICAL	NAVD 88
11. MANUFACTURER'S DESIGNATION OF DRILL	☐ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	
DISTURBED	
UNDISTURBED (UD)	
13. TOTAL NUMBER CORE BOXES	
14. ELEVATION GROUND WATER	
15. DATE BORING	STARTED 09-29-06 08:44 / COMPLETED 09-29-06 08:51
16. ELEVATION TOP OF BORING	-38.6 Ft.
17. TOTAL RECOVERY FOR BORING	20 Ft.
18. SIGNATURE AND TITLE OF INSPECTOR	Ken Wilson

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	% REC.	BOX OR SAMPLE	REMARKS
-38.6	0.0					
-42.8	4.2		SAND, fine grained, quartz, little rock fragments, little silt, trace shell fragments, trace shell hash, rock fragments up to (1.5"x1.0"); shell fragments < 0.5", gray (5Y-5/1), (SM).		1	Sample #1, Depth = 1.0' Mean (mm): 0.20, Phi Sorting: 0.90 Shell Hash: 0%, Fines (230): 12.54% (SM)
-45.7	7.1		SAND, fine grained, quartz, little rock fragments, little silt, trace shell fragments, trace shell hash, rock fragments up to (3.0"x2.5"); shell fragments < 0.5", olive gray (5Y-5/2), (SW-SM).		2	Sample #2, Depth = 5.9' Mean (mm): 0.29, Phi Sorting: 1.76 Shell Hash: 0%, Fines (230): 10.18% (SW-SM)
-49.1	10.5		SAND, fine to medium grained, quartz, trace rock fragments, trace shell fragments, trace shell hash, trace silt, rock fragments up to (1.0"x1.0"); shell fragments < 0.5", gray (5Y-5/1), (SP-SM).		3	Sample #3, Depth = 8.0' Mean (mm): 0.21, Phi Sorting: 0.64 Shell Hash: 0%, Fines (230): 7.99% (SP-SM)
-54.6	16.0		SAND, fine grained, quartz, trace rock fragments, trace shell fragments, trace shell hash, trace silt, rock fragments up to (1.0"x1.0"); shell fragments < 0.5", gray (5Y-5/1), (SW-SM).		4	Sample #4, Depth = 13.0' Mean (mm): 0.22, Phi Sorting: 0.98 Shell Hash: 0%, Fines (230): 6.65% (SW-SM)
-58.6	20.0		SAND, fine grained, quartz, little silt, trace rock fragments, trace shell fragments, trace shell hash, rock fragments up to (1.0"x1.0"); shell fragments < 0.5", gray (5Y-5/1), (SM).		5	Sample #5, Depth = 19.0' Mean (mm): 0.27, Phi Sorting: 1.64 Shell Hash: 0%, Fines (230): 12.83% (SM)
			End of Boring			

0 5 10 15 20 25

FLORIDA DEP ROSS NORTH_TOPSAIL_2006.GPJ FL DEP ROSS.GDT 10/25/06

SAJ FORM 1836 **MODIFIED FOR THE FLORIDA DEP**
JUN 02 JUN 04

Boring Designation NTVC-06-18

DRILLING LOG

DIVISION	
INSTALLATION	
SHEET 1 OF 1 SHEETS	
1. PROJECT	North Topsail 2006 Vibracores North Topsail, North Carolina
2. BORING DESIGNATION	NTVC-06-18
LOCATION COORDINATES	X = 2,476,003 Y = 264,561
3. DRILLING AGENCY	
CONTRACTOR FILE NO.	
4. NAME OF DRILLER	Fred Kaub
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	0.0 Ft.
7. DEPTH DRILLED INTO ROCK	0.0 Ft.
8. TOTAL DEPTH OF BORING	20.0 Ft.
9. SIZE AND TYPE OF BIT	3.0 In.
10. COORDINATE SYSTEM/DATUM	North Carolina State Plane
HORIZONTAL	NAD 1983
VERTICAL	NAVD 88
11. MANUFACTURER'S DESIGNATION OF DRILL	☐ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	
DISTURBED	
UNDISTURBED (UD)	
13. TOTAL NUMBER CORE BOXES	
14. ELEVATION GROUND WATER	
15. DATE BORING	STARTED 09-29-06 09:42 / COMPLETED 09-29-06 09:45
16. ELEVATION TOP OF BORING	-37.8 Ft.
17. TOTAL RECOVERY FOR BORING	17.9 Ft.
18. SIGNATURE AND TITLE OF INSPECTOR	Ken Wilson

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	% REC.	BOX OR SAMPLE	REMARKS
-37.8	0.0					
-40.0	2.2		SAND, fine grained, quartz, little silt, trace shell hash, (1.0"x1.0") rock fragment @ 0.1', olive (5Y-5/3), (SW-SM).		1	Sample #1, Depth = 1.0' Mean (mm): 0.22, Phi Sorting: 1.45 Shell Hash: 3%, Fines (230): 9.55% (SW-SM)
-40.8	3.0		Gravely SAND, medium grained, little rock fragments, little silt, trace shell hash, rock fragments up to (2.5"x2.5"), olive gray (5Y-5/2), (GW-GM).		2	Sample #2, Depth = 2.6' Mean (mm): 0.51, Phi Sorting: 2.56 Shell Hash: 1%, Fines (230): 10.44% (SW-SM)
-45.3	7.5		SAND, fine grained, quartz, trace rock fragments, trace shell hash, trace silt, (3.5"x2.5") rock fragment @ 3.8', gray (5Y-5/1), (SP).		3	Sample #3, Depth = 6.0' Mean (mm): 0.19, Phi Sorting: 0.37 Shell Hash: 0%, Fines (230): 3.26% (SP)
-49.5	11.7		SAND, fine grained, quartz, little silt, trace rock fragments, trace shell hash, (1.0"x1.0") rock fragment @ 11.0', gray (5Y-5/1), (SM).		4	Sample #4, Depth = 9.0' Mean (mm): 0.20, Phi Sorting: 0.61 Shell Hash: 0%, Fines (230): 12.34% (SM)
-55.7	17.9		SAND, fine grained, quartz, little rock fragments, little silt, trace shell hash, rock fragments up to (2.5"x2.5"), gray (5Y-5/1), (GM).		5	Sample #5, Depth = 14.0' Mean (mm): 0.20, Phi Sorting: 0.92 Shell Hash: 1%, Fines (230): 17.13% (SM)
-57.8	20.0		No Recovery.			
			End of Boring			

0 5 10 15 20 25

FLORIDA DEP ROSS NORTH_TOPSAIL_2006.GPJ FL DEP ROSS.GDT 10/25/06

SAJ FORM 1836 JUN 02 **MODIFIED FOR THE FLORIDA DEP** JUN 04

APPENDIX 26

2006 CPE INDIVIDUAL VIBRACORE GRANULARMETRIC REPORTS OFFSHORE BORROW AREA (DIGITAL COPY ONLY)

APPENDIX 27

2006 CPE INDIVIDUAL VIBRACORE GRAIN SIZE DISTRIBUTION CURVES/HISTOGRAMS OFFSHORE BORROW AREA (DIGITAL COPY ONLY)

APPENDIX 28

2006 CPE VIBRACORE PHOTOGRAPHS OFFSHORE BORROW AREA

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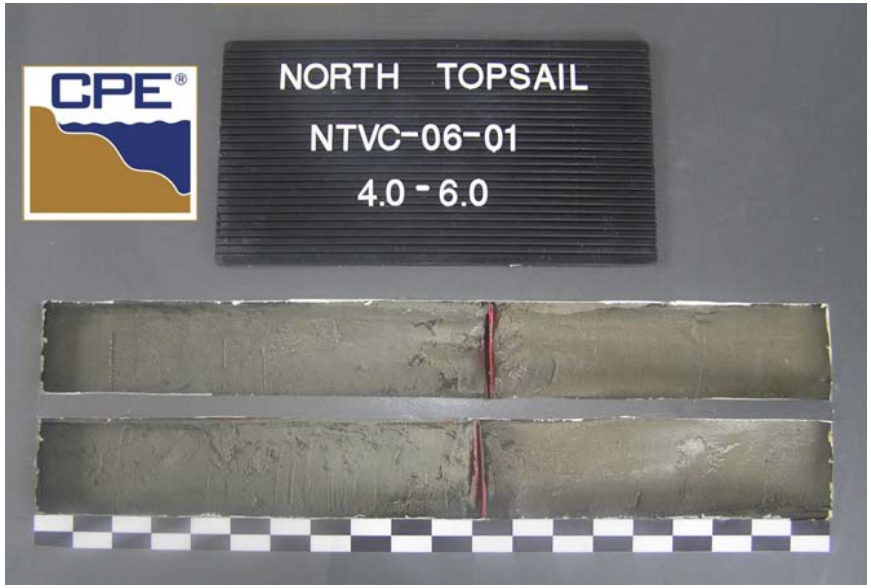
NTVC-06-01
0.0 - 2.0

CPE®
NORTH TOPSAIL
NTVC-06-01
2.0 - 4.0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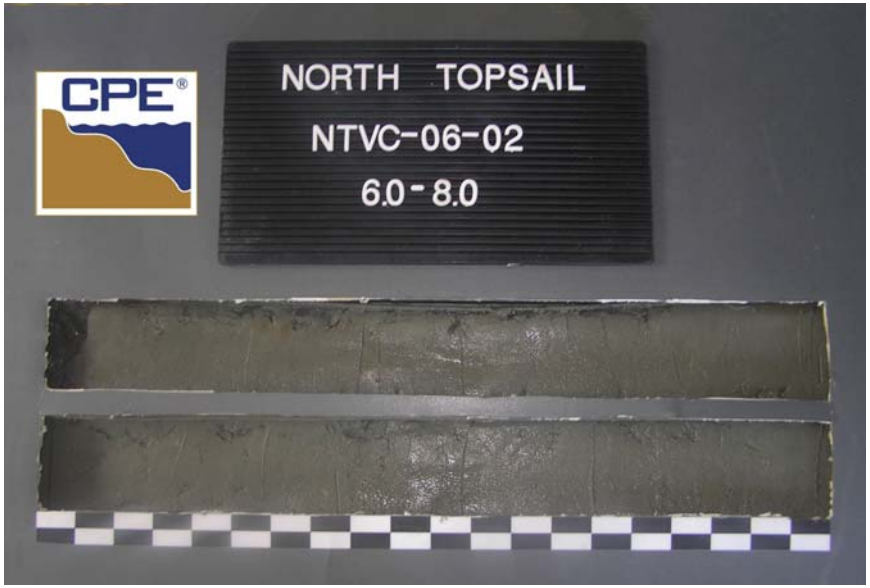
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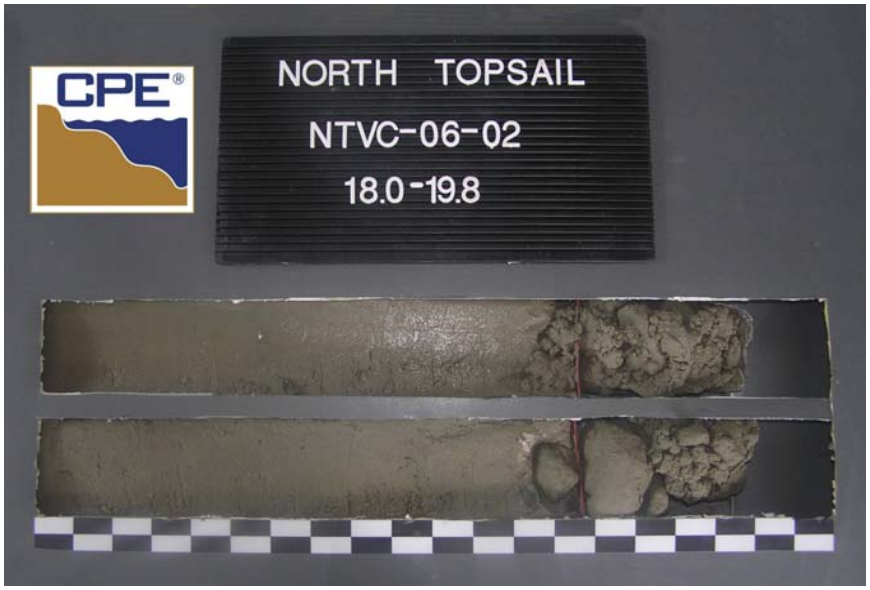
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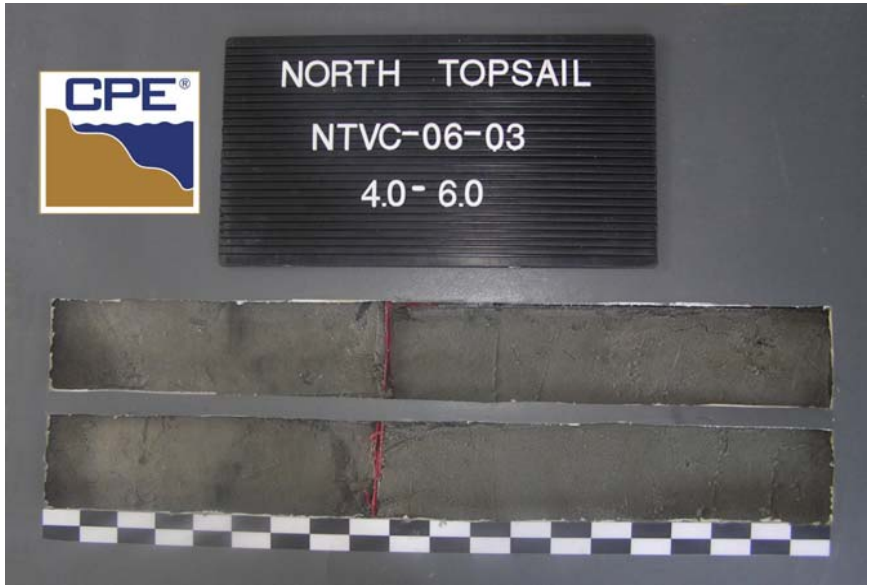
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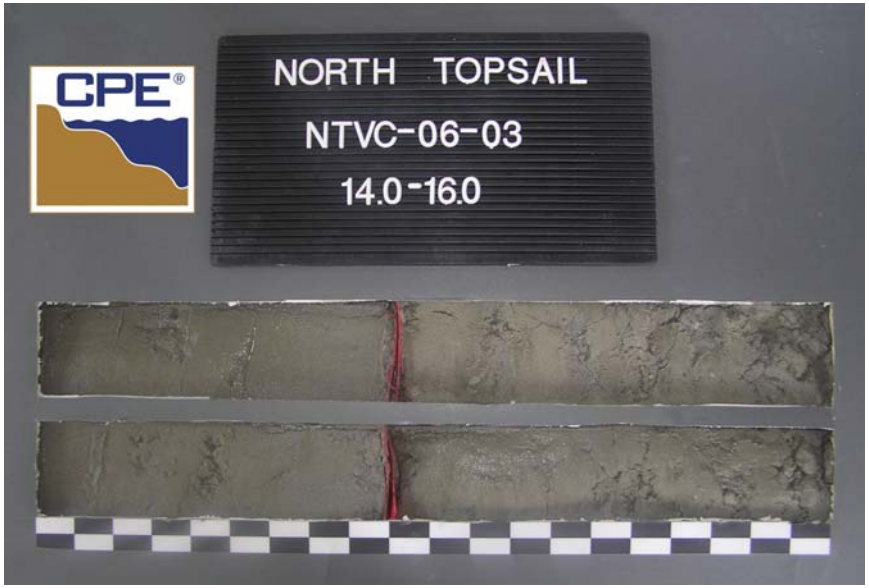
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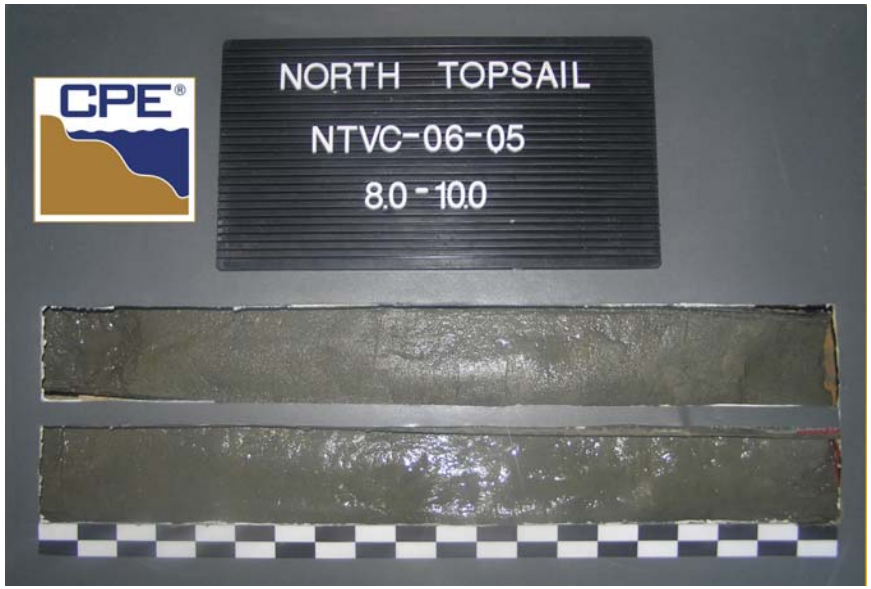
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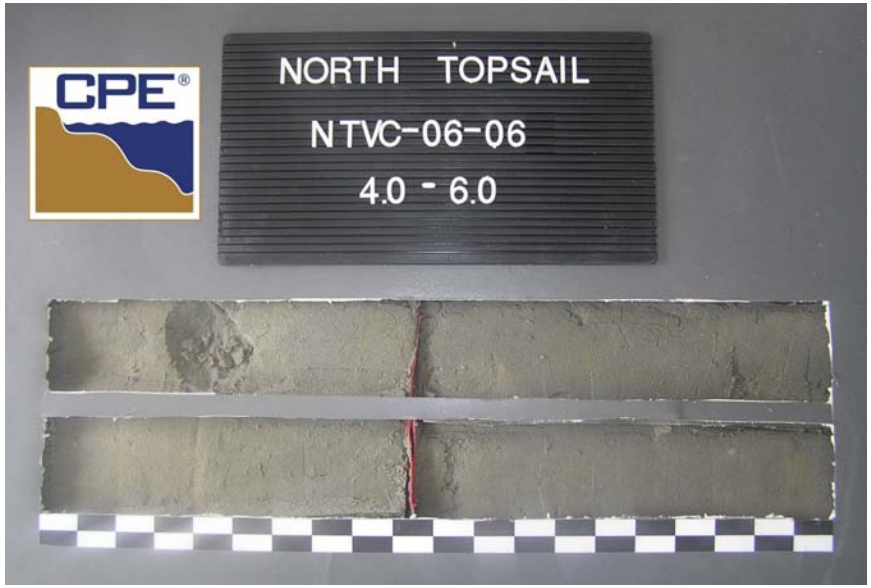
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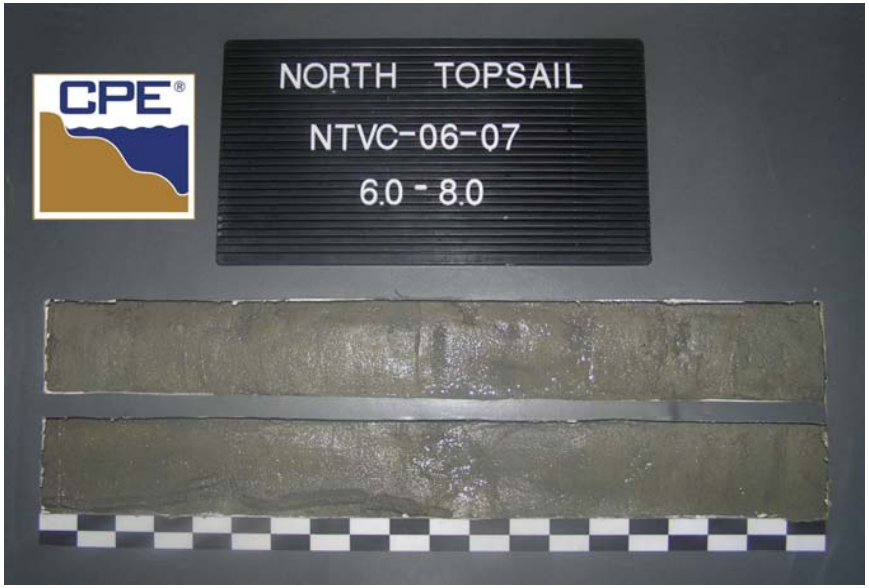
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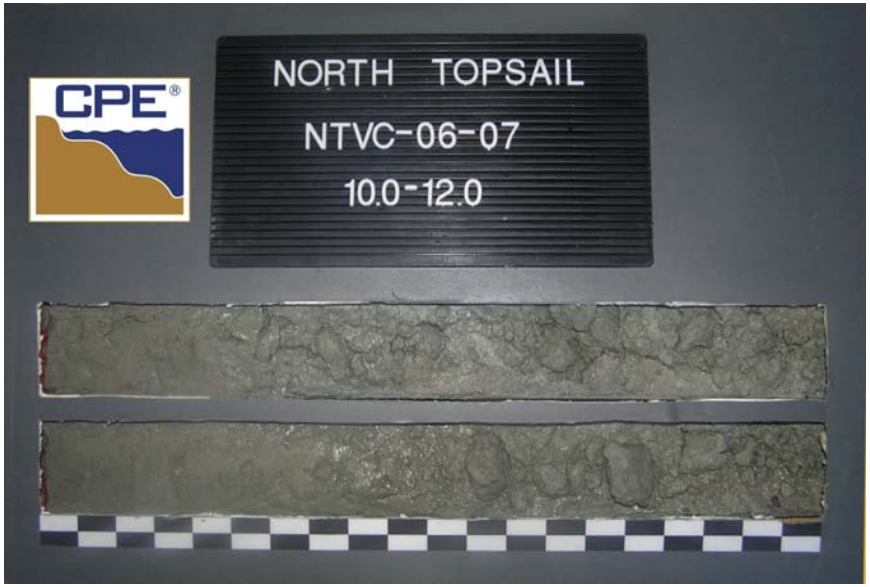
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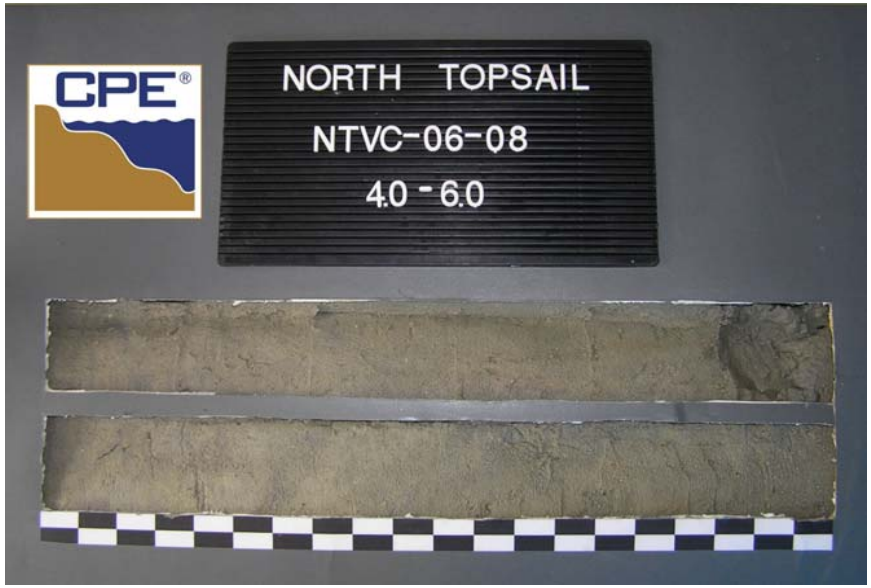
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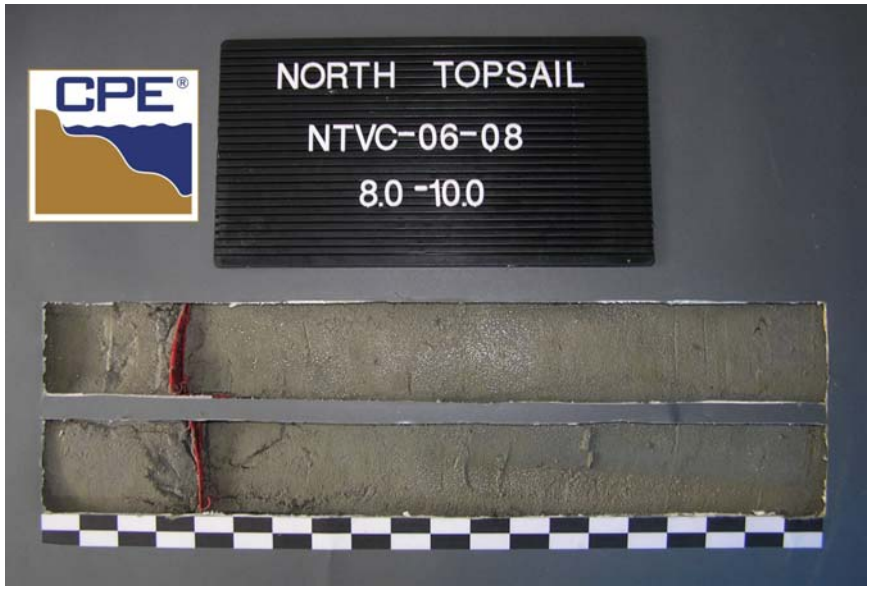
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NORTH TOPSAIL
NTVC-06-09
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CPE®
NORTH TOPSAIL
NTVC-06-09
2.0 - 4.0

CPE®
NORTH TOPSAIL
NTVC-06-09
4.0 - 6.0

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NTVC-06-09
6.0 - 8.0

CPE®
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NTVC-06-09
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CPE®
NORTH TOPSAIL
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NORTH TOPSAIL
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18.0 - 20.0

CPE®
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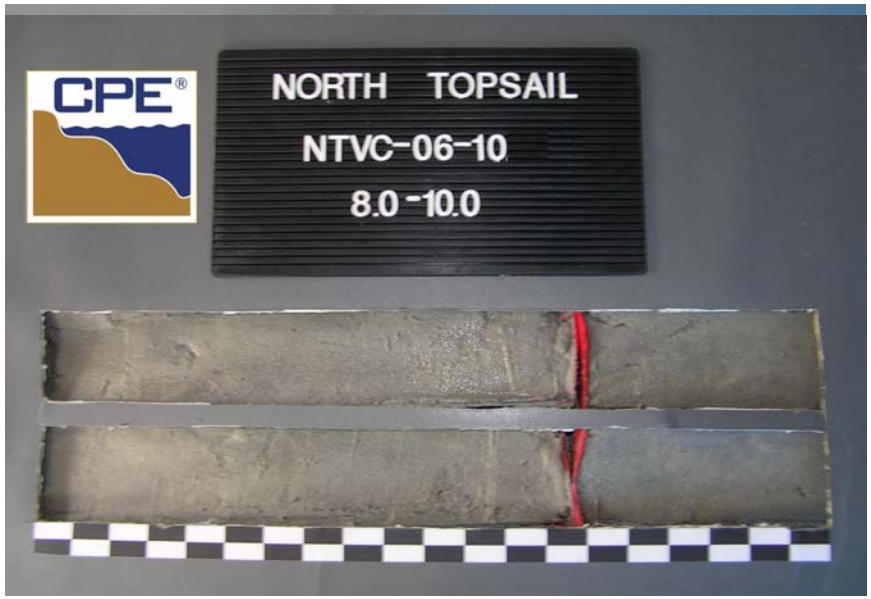
6.0 - 8.0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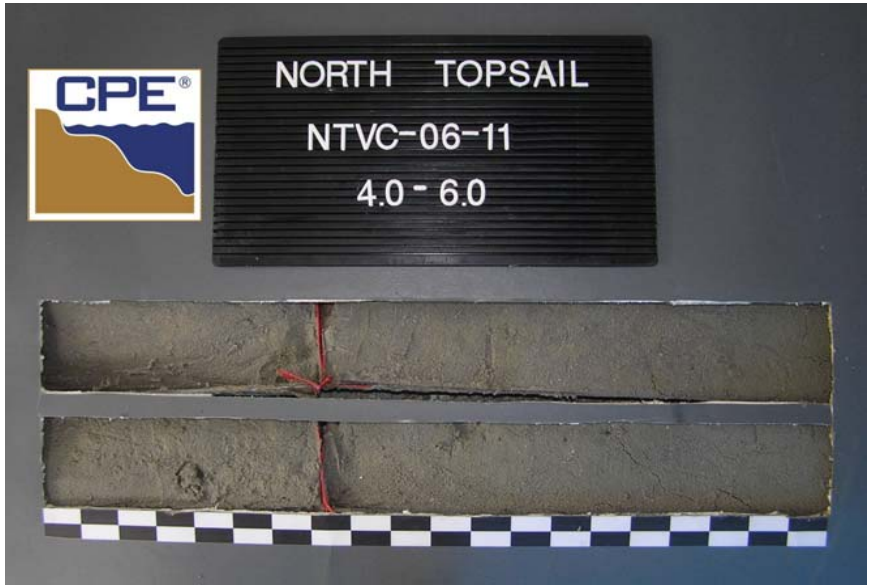
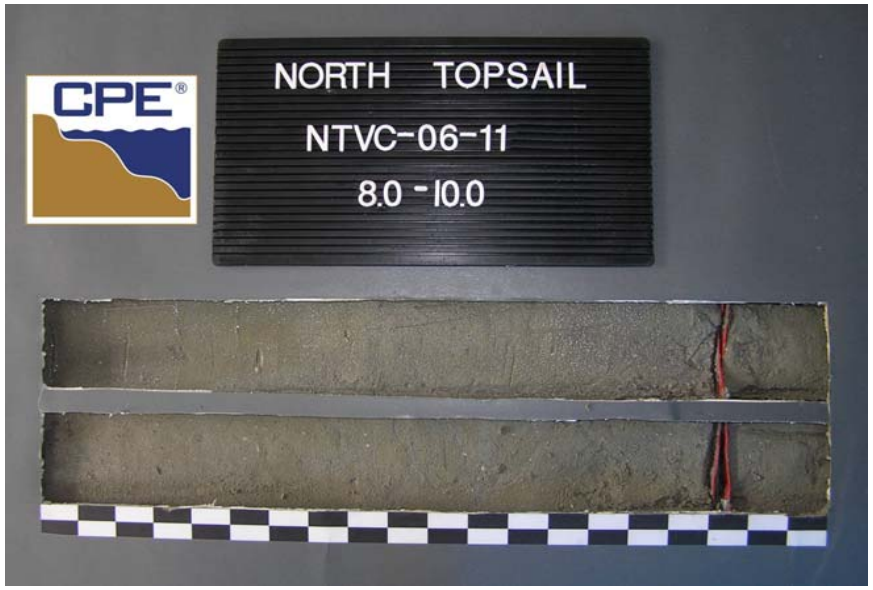
NORTH TOPSAIL
NTVC-06-11
2.0 - 4.0


CPE®
NORTH TOPSAIL
NTVC-06-11
4.0 - 6.0

CPE®
NORTH TOPSAIL
NTVC-06-11
6.0 - 8.0


CPE
NORTH TOPSAIL
NTVC-06-11
8.0 - 10.0

CPE
NORTH TOPSAIL
NTVC-06-11
10.0 - 12.0

CPE
NORTH TOPSAIL
NTVC-06-11
12.0 - 14.0

CPE
NORTH TOPSAIL
NTVC-06-11
14.0 - 16.0

CPE®
NORTH TOPSAIL
NTVC-06-11
16.0 - 18.0

CPE®
NORTH TOPSAIL
NTVC-06-11
18.0 - 19.8

CPE®
NORTH TOPSAIL
BEACH
NTVC-06-12
0.0' - 2.0'

CPE®
NORTH TOPSAIL
BEACH
NTVC-06-12
2.0' - 4.0'

CPE®
NORTH TOPSAIL
BEACH
NTVC-06-12
4.0' - 6.0'

CPE®
NORTH TOPSAIL
BEACH
NTVC-06-12
6.0' - 8.0'

CPE®
NORTH TOPSAIL
BEACH
NTVC-06-12
8.0' - 10.0'

CPE®
NORTH TOPSAIL
BEACH
NTVC-06-12
10.0' - 12.0'

CPE®
NORTH TOPSAIL
BEACH
NTVC-06-12
12.0' - 14.0'

CPE®
NORTH TOPSAIL
BEACH
NTVC-06-12
14.0' - 16.0'

CPE®
NORTH TOPSAIL
BEACH
NTVC-06-12
16.0' - 18.0'

CPE®
NORTH TOPSAIL
BEACH
NTVC-06-12
18.0' - 19.6'

NORTH TOPSAIL
BEACH
NTVC-06-13
0.0' - 2.0'

NORTH TOPSAIL
BEACH
NTVC-06-13
2.0' - 4.0'

NORTH TOPSAIL
BEACH
NTVC-06-13
4.0' - 6.0'

NORTH TOPSAIL
BEACH
NTVC-06-13
6.0' - 8.0'

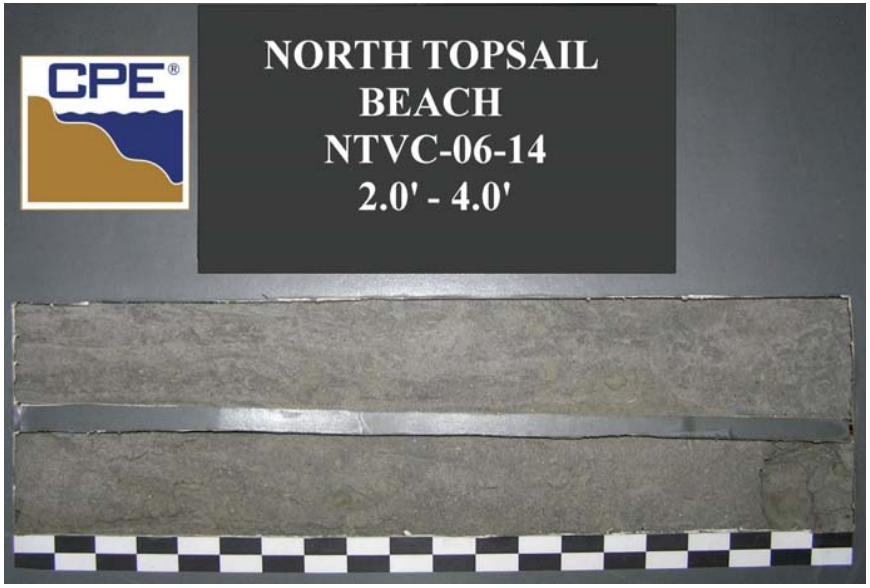
CPE
NORTH TOPSAIL
BEACH
NTVC-06-13
8.0' - 10.0'

CPE
NORTH TOPSAIL
BEACH
NTVC-06-13
10.0' - 12.0'

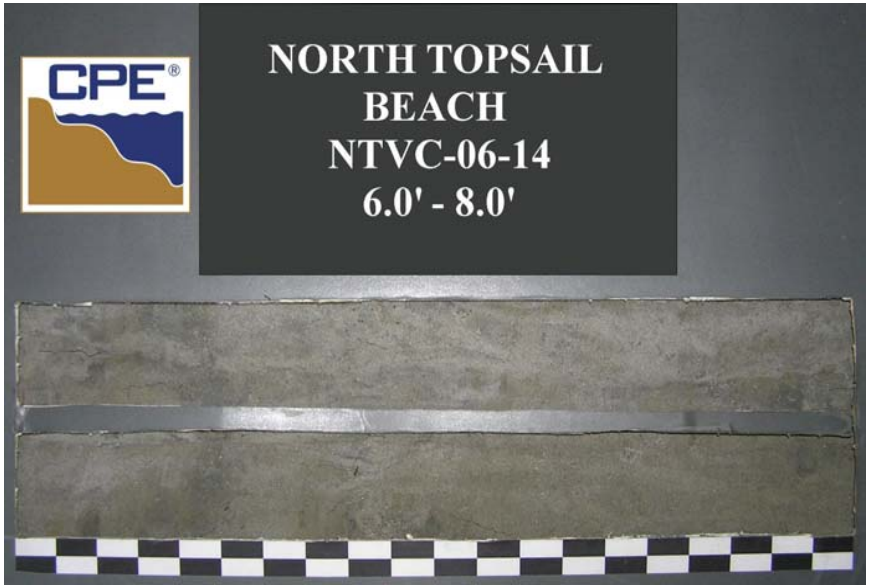
CPE
NORTH TOPSAIL
BEACH
NTVC-06-13
12.0' - 14.0'

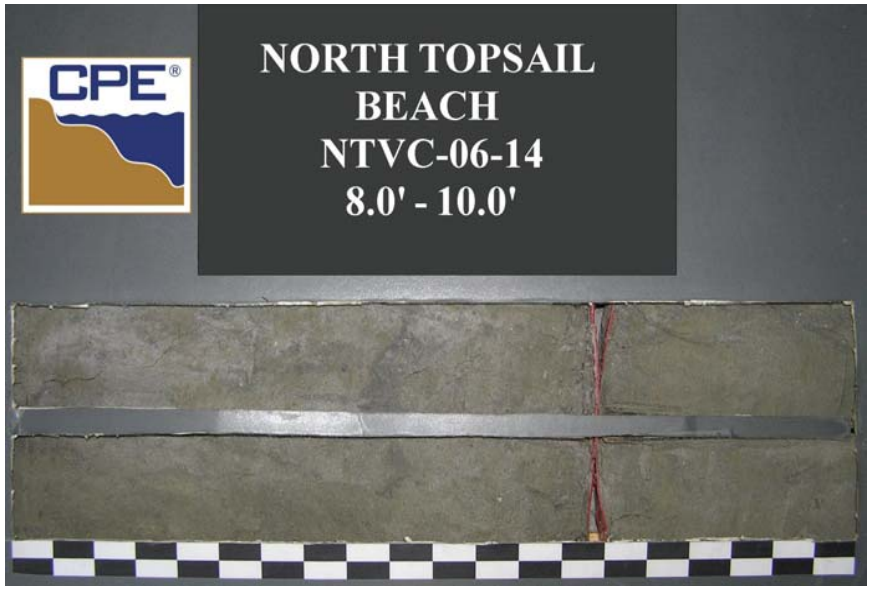
CPE
NORTH TOPSAIL
BEACH
NTVC-06-13
14.0' - 14.6'

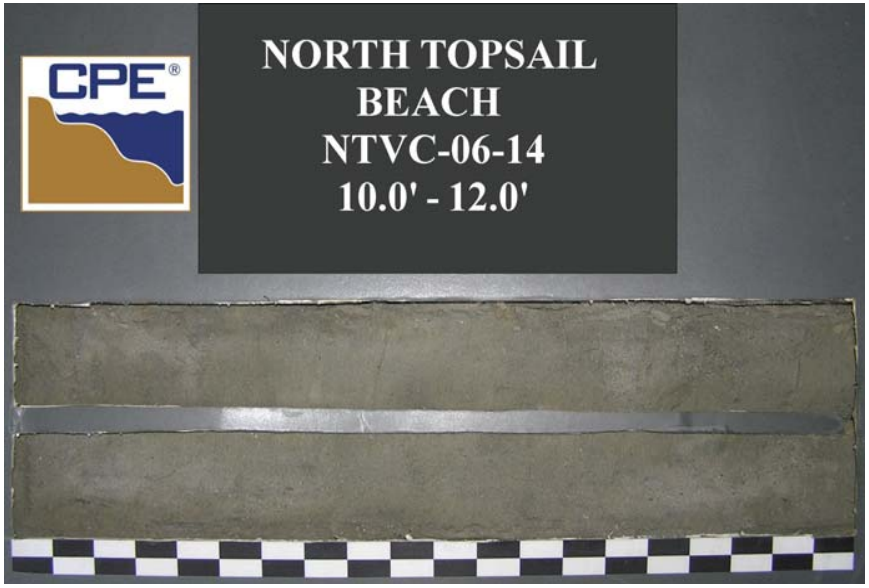
NORTH TOPSAIL
BEACH
NTVC-06-14
0.0' - 2.0'


NORTH TOPSAIL
BEACH
NTVC-06-14
2.0' - 4.0'

NORTH TOPSAIL
BEACH
NTVC-06-14
4.0' - 6.0'


NORTH TOPSAIL
BEACH
NTVC-06-14
6.0' - 8.0'

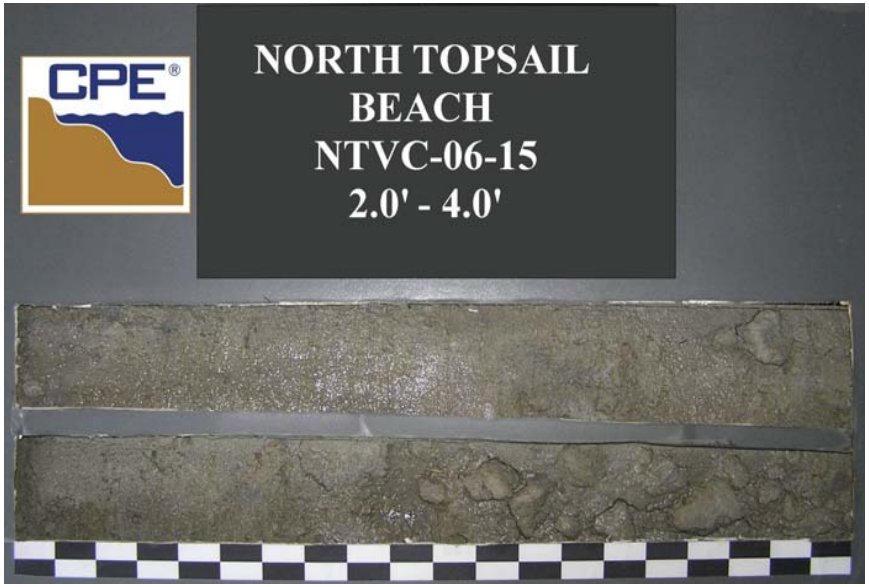

CPE®
NORTH TOPSAIL
BEACH
NTVC-06-14
8.0' - 10.0'

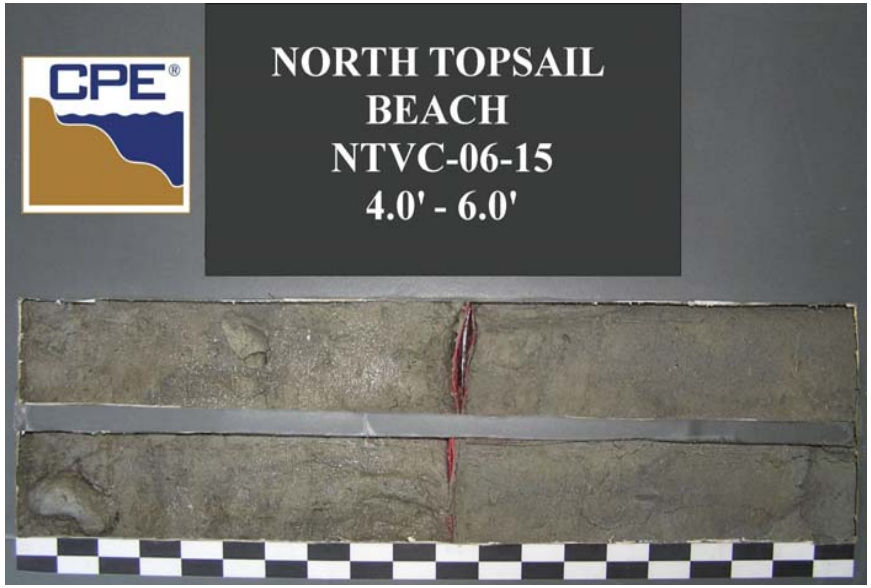

CPE®
NORTH TOPSAIL
BEACH
NTVC-06-14
10.0' - 12.0'

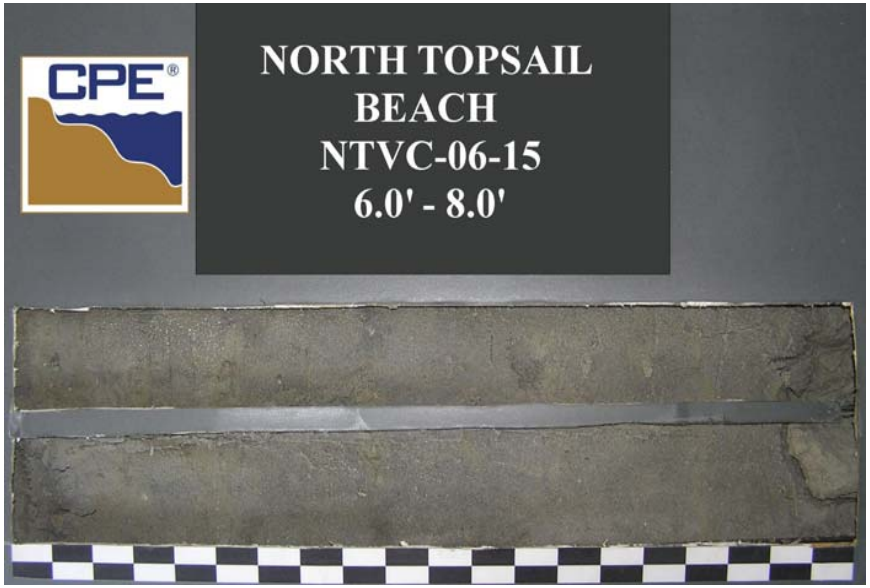
CPE®
NORTH TOPSAIL
BEACH
NTVC-06-14
12.0' - 14.0'

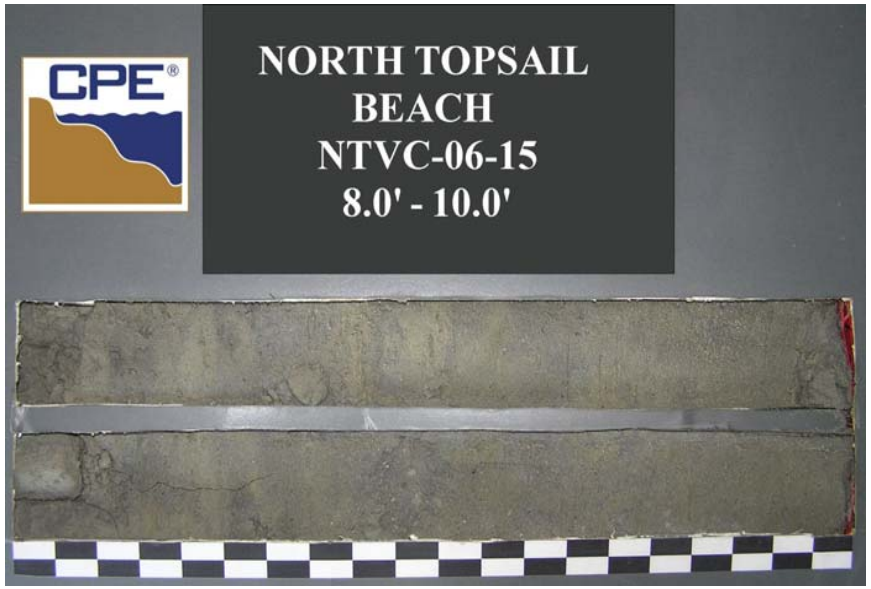
CPE®
NORTH TOPSAIL
BEACH
NTVC-06-14
14.0' - 14.6'

NORTH TOPSAIL
BEACH
NTVC-06-15
0.0' - 2.0'


NORTH TOPSAIL
BEACH
NTVC-06-15
2.0' - 4.0'


NORTH TOPSAIL
BEACH
NTVC-06-15
4.0' - 6.0'


NORTH TOPSAIL
BEACH
NTVC-06-15
6.0' - 8.0'


NORTH TOPSAIL
BEACH
NTVC-06-15
8.0' - 10.0'

NORTH TOPSAIL
BEACH
NTVC-06-15
10.0' - 12.0'

NORTH TOPSAIL
BEACH
NTVC-06-15
12.0' - 14.0'

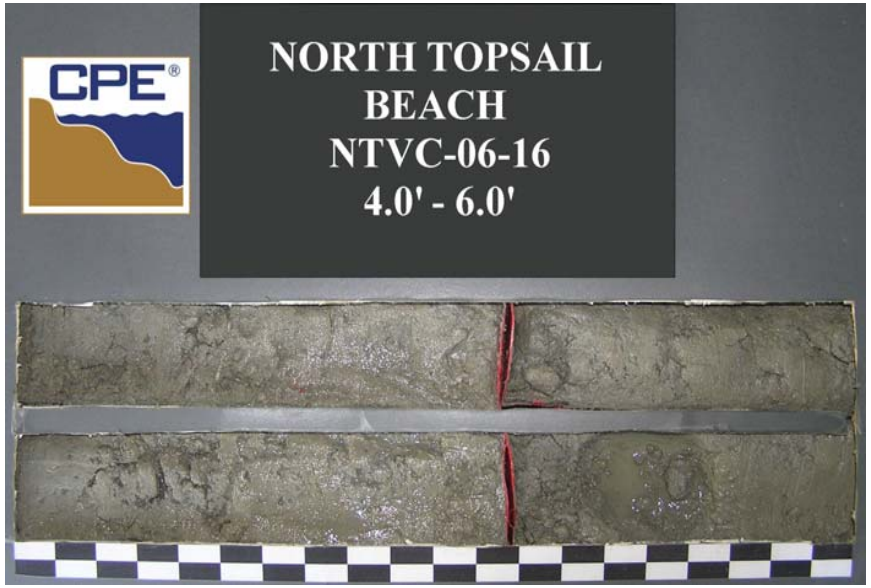
NORTH TOPSAIL
BEACH
NTVC-06-15
14.0' - 16.0'

CPE®
NORTH TOPSAIL
BEACH
NTVC-06-15
16.0' - 18.0'

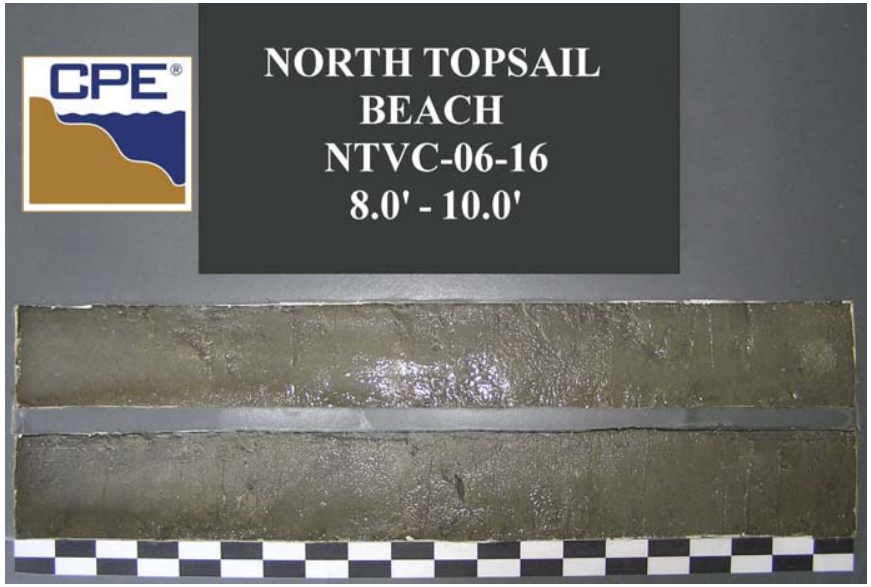
CPE®
NORTH TOPSAIL
BEACH
NTVC-06-15
18.0' - 20.0'

NORTH TOPSAIL
BEACH
NTVC-06-16
0.0' - 2.0'

NORTH TOPSAIL
BEACH
NTVC-06-16
2.0' - 4.0'


NORTH TOPSAIL
BEACH
NTVC-06-16
4.0' - 6.0'

NORTH TOPSAIL
BEACH
NTVC-06-16
6.0' - 8.0'


CPE
NORTH TOPSAIL
BEACH
NTVC-06-16
8.0' - 10.0'

CPE
NORTH TOPSAIL
BEACH
NTVC-06-16
10.0' - 12.0'

CPE
NORTH TOPSAIL
BEACH
NTVC-06-16
12.0' - 14.0'

CPE
NORTH TOPSAIL
BEACH
NTVC-06-16
14.0' - 16.0'

CPE®
NORTH TOPSAIL
BEACH
NTVC-06-16
16.0' - 18.0'

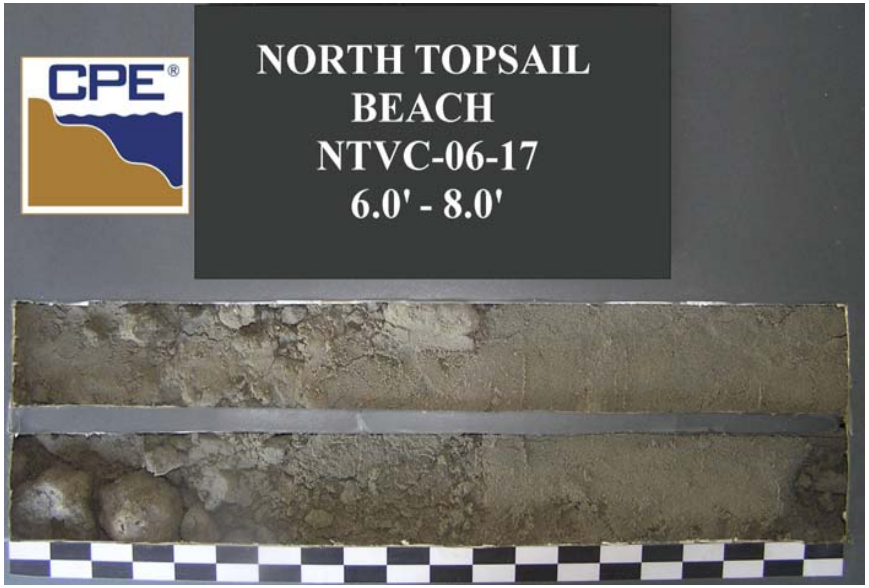
CPE®
NORTH TOPSAIL
BEACH
NTVC-06-16
18.0' - 20.0'

CPE®
NORTH TOPSAIL
BEACH
NTVC-06-16
20.0' - 20.2'

NORTH TOPSAIL
BEACH
NTVC-06-17
0.0' - 2.0'

NORTH TOPSAIL
BEACH
NTVC-06-17
2.0' - 4.0'

NORTH TOPSAIL
BEACH
NTVC-06-17
4.0' - 6.0'


NORTH TOPSAIL
BEACH
NTVC-06-17
6.0' - 8.0'

CPE
NORTH TOPSAIL
BEACH
NTVC-06-17
8.0' - 10.0'

CPE
NORTH TOPSAIL
BEACH
NTVC-06-17
10.0' - 12.0'

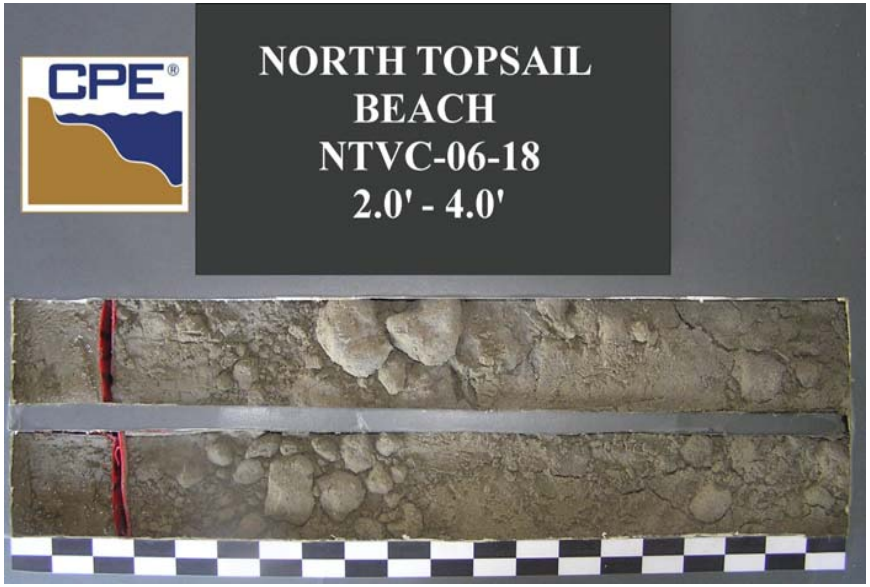
CPE
NORTH TOPSAIL
BEACH
NTVC-06-17
12.0' - 14.0'

CPE
NORTH TOPSAIL
BEACH
NTVC-06-17
14.0' - 16.0'

CPE®
NORTH TOPSAIL
BEACH
NTVC-06-17
16.0' - 18.0'

CPE®
NORTH TOPSAIL
BEACH
NTVC-06-17
18.0' - 20.0'

CPE®
NORTH TOPSAIL
BEACH
NTVC-06-18
0.0' - 2.0'


CPE®
NORTH TOPSAIL
BEACH
NTVC-06-18
2.0' - 4.0'

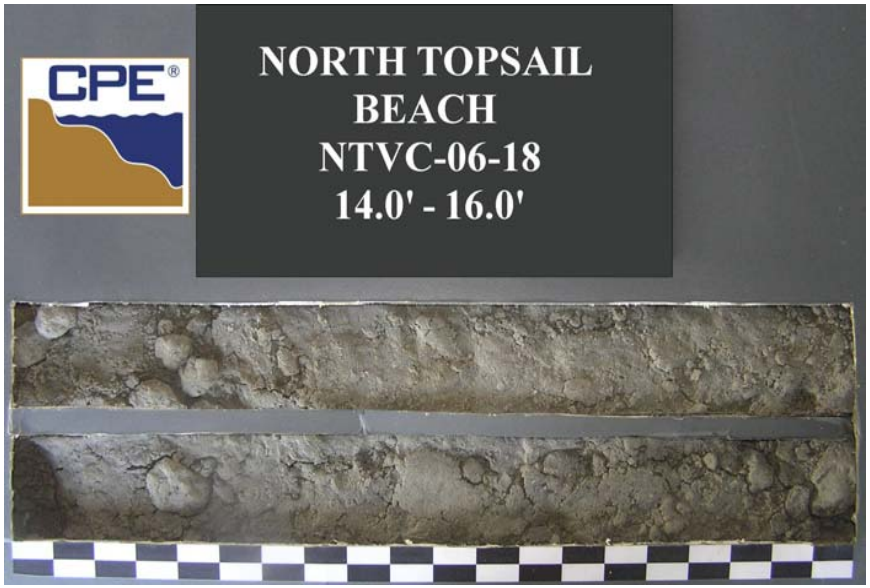
CPE®
NORTH TOPSAIL
BEACH
NTVC-06-18
4.0' - 6.0'

CPE®
NORTH TOPSAIL
BEACH
NTVC-06-18
6.0' - 8.0'

CPE
NORTH TOPSAIL
BEACH
NTVC-06-18
8.0' - 10.0'

CPE
NORTH TOPSAIL
BEACH
NTVC-06-18
10.0' - 12.0'

CPE
NORTH TOPSAIL
BEACH
NTVC-06-18
12.0' - 14.0'


CPE
NORTH TOPSAIL
BEACH
NTVC-06-18
14.0' - 16.0'

CPE®
NORTH TOPSAIL
BEACH
NTVC-06-18
16.0' - 17.4'

APPENDIX 29

2005 AND 2006 COMPOSITE VIBRACORE GRANULARMETRIC REPORTS OFFSHORE BORROW AREA (DIGITAL COPY ONLY)

APPENDIX 30

2005 AND 2006 COMPOSITE VIBRACORE GRAIN SIZE DISTRIBUTION CURVES/HISTOGRAMS OFFSHORE BORROW AREA (DIGITAL COPY ONLY)

APPENDIX 31

2005 SEISMIC RECORDS OFFSHORE BORROW AREA (DIGITAL COPY ONLY)

APPENDIX 32

2006 BEACH COMPOSITE SUMMARY TABLES

PROFILE LINE SUMMARY TABLE
NORTH TOPSAIL BEACH SAMPLES

PROFILE	MEAN (mm)	PHI MEAN	PHI SORTING	% SILT	% Carbonate
TB13	**0.24**	**2.04**	**0.83**	**1.24**	**20**
TB14	**0.22**	**2.18**	**0.63**	**0.88**	**20**
TB15	**0.25**	**1.99**	**1.01**	**1.10**	**30**
TB16	**0.23**	**2.09**	**0.91**	**0.81**	**30**
TB17	**0.22**	**2.17**	**0.93**	**2.26**	**40**
TB18	**0.21**	**2.25**	**0.74**	**2.15**	**20**
TB19	**0.23**	**2.10**	**0.93**	**1.04**	**10**
TB20	**0.23**	**2.09**	**1.09**	**1.96**	**20**
TB21	**0.23**	**2.14**	**1.07**	**1.09**	**30**
TB22	**0.25**	**2.00**	**1.21**	**1.39**	**30**
TB23	**0.21**	**2.27**	**0.98**	**2.74**	**30**
TB24	**0.23**	**2.09**	**0.62**	**1.37**	**30**
BEACH COMPOSITE	**0.23**	**2.13**	**0.94**	**1.50**	**25.83**

PROFILE LINE DATA TABLE
NORTH TOPSAIL BEACH SAMPLES

SAMPLE I. D.	MEAN (mm)	PHI MEAN	PHI SORTING	% SILT	CUMULATIVE PERCENT RETAINED (SIEVES EXPRESSED IN PHI)															
					GRAVEL			GRANULAR		SAND										FINES
					-4.25	-3.25	-2.25	-1.5	-1.0	-0.5	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	PAN
TB13	0.24	2.04	0.83	1.24	0.00	0.00	0.02	0.16	0.37	1.01	2.31	5.38	11.08	19.69	36.32	72.91	91.31	96.82	98.76	99.99
TB14	0.22	2.18	0.63	0.88	0.00	0.00	0.05	0.10	0.19	0.38	0.78	1.58	4.05	11.09	27.98	74.09	93.03	97.61	99.12	100.00
TB15	0.25	1.99	1.01	1.10	0.00	0.05	0.30	0.68	1.13	5.22	6.58	8.95	12.98	19.02	31.97	71.76	91.91	97.04	98.90	99.99
TB16	0.23	2.09	0.91	0.81	0.00	0.00	0.13	0.76	1.53	2.85	4.50	6.52	9.10	14.38	30.90	70.46	91.60	97.19	99.19	99.99
TB17	0.22	2.17	0.93	2.26	0.21	0.21	0.64	1.35	1.99	2.88	3.98	5.77	8.32	12.38	24.30	61.92	88.21	95.25	97.74	99.97
TB18	0.21	2.25	0.74	2.15	0.00	0.00	0.14	0.48	0.85	1.37	2.04	2.92	4.57	8.50	21.75	65.18	89.38	96.18	97.85	99.98
TB19	0.23	2.10	0.93	1.04	0.00	0.00	0.43	0.96	1.44	2.27	3.55	5.62	9.39	17.11	32.92	65.44	89.72	96.76	98.96	99.99
TB20	0.23	2.09	1.09	1.96	0.00	0.04	0.32	1.27	2.42	3.95	6.11	8.67	12.70	18.73	32.15	60.19	84.14	94.43	98.04	99.99
TB21	0.23	2.14	1.07	1.09	0.00	0.54	0.98	1.72	2.24	3.04	4.36	6.31	10.17	16.24	28.75	59.93	86.32	95.86	98.91	99.99
TB22	0.25	2.00	1.21	1.39	0.00	0.82	1.81	2.81	3.71	4.96	6.64	8.94	12.57	19.23	32.44	62.67	89.48	96.33	98.61	99.97
TB23	0.21	2.27	0.98	2.74	0.00	0.00	0.26	1.06	1.86	2.99	4.08	5.42	7.70	12.52	24.16	52.90	81.13	92.80	97.26	99.99
TB24	0.23	2.09	0.62	1.37	0.00	0.00	0.09	0.20	0.33	0.62	1.16	2.19	4.55	9.97	26.28	65.81	89.98	96.72	98.63	99.98
BEACH COMPOSITE	**0.23**	**2.13**	**0.94**	**1.50**	**0.02**	**0.14**	**0.43**	**0.96**	**1.50**	**2.63**	**3.84**	**5.69**	**8.93**	**14.90**	**29.16**	**65.27**	**88.85**	**96.08**	**98.50**	**99.99**

PROFILE LINE COMPOSITES - NORTH TOPSAIL BEACH SAMPLES (1 of 4)

SAMPLE I. D.	MEAN (mm)	PHI MEAN	PHI SORTING	% SILT	CUMULATIVE PERCENT RETAINED (SIEVES EXPRESSED IN PHI)															
					GRAVEL			GRANULAR		SAND										FINES
					-4.25	-3.25	-2.25	-1.5	-1.0	-0.5	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	PAN
TB13 Dune	0.22	2.16	0.50	0.33	0.00	0.00	0.00	0.00	0.00	0.16	0.44	1.28	2.74	6.68	27.13	82.21	96.85	99.37	99.67	99.98
TB13 Toe of Dune	0.26	1.95	0.57	0.83	0.00	0.00	0.00	0.00	0.12	0.28	0.66	1.63	5.31	16.43	45.84	88.72	97.74	99.02	99.17	100.00
TB13-Berm (+7.0)	0.33	1.62	0.69	1.10	0.00	0.00	0.00	0.00	0.05	0.48	1.97	6.70	17.62	37.89	67.31	92.58	98.57	98.85	98.91	100.00
TB13 (+5.0)	0.49	1.02	1.00	0.58	0.00	0.00	0.21	0.99	2.40	6.70	14.20	30.01	49.96	64.98	80.07	94.63	98.72	99.40	99.42	99.85
TB13-MHW (+2.1)	0.31	1.67	0.69	0.52	0.00	0.00	0.00	0.00	0.07	0.53	2.20	6.35	16.05	33.13	63.33	92.98	99.19	99.46	99.49	100.00
TB13-MSL (0.0)	0.31	1.71	0.65	0.01	0.00	0.00	0.00	0.00	0.01	0.09	0.79	4.64	15.94	33.36	59.87	93.75	99.78	99.96	99.99	100.00
TB13-MLW (-1.9)	0.27	1.87	0.65	1.22	0.00	0.00	0.00	0.02	0.03	0.19	1.53	5.18	11.54	19.92	44.34	90.55	98.45	98.75	98.78	100.00
TB13 (-6.0)	0.19	2.38	0.73	0.95	0.00	0.00	0.00	0.15	0.30	0.60	1.23	2.86	5.61	8.92	15.30	55.16	84.13	96.21	99.06	100.00
TB13 (-8.0)	0.19	2.37	0.72	1.02	0.00	0.00	0.00	0.17	0.26	0.66	1.31	2.48	4.83	9.02	18.98	52.11	86.15	96.34	98.98	100.00
TB13 (-12.0)	0.19	2.40	0.77	2.27	0.00	0.00	0.06	0.36	0.67	1.12	1.83	2.82	4.65	7.87	15.62	53.07	83.02	92.98	97.73	100.00
TB13 (-14.0)	0.19	2.40	0.77	2.71	0.00	0.00	0.00	0.10	0.42	1.21	2.11	3.18	4.61	6.74	13.35	58.81	80.23	91.50	97.28	100.00
TB13 (-18.0)	0.18	2.47	0.67	1.98	0.00	0.00	0.02	0.20	0.41	0.71	1.06	1.58	2.77	5.38	10.47	52.12	82.48	93.79	98.03	100.00
TB13 (-20.0)	0.17	2.53	0.63	2.59	0.00	0.00	0.00	0.03	0.11	0.33	0.68	1.19	2.43	5.62	10.50	41.13	81.79	92.97	97.43	100.00
TB13 COMPOSITE	**0.24**	**2.04**	**0.83**	**1.24**	**0.00**	**0.00**	**0.02**	**0.16**	**0.37**	**1.01**	**2.31**	**5.38**	**11.08**	**19.69**	**36.32**	**72.91**	**91.31**	**96.82**	**98.76**	**99.99**
TB14 Dune	0.20	2.33	0.35	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.16	13.88	73.59	96.41	99.46	99.79	99.99
TB14 Toe of Dune	0.23	2.10	0.50	0.40	0.00	0.00	0.00	0.07	0.17	0.27	0.71	1.71	3.63	7.56	28.06	90.06	97.81	99.37	99.60	100.00
TB14-Berm (+7.0)	0.30	1.73	0.66	0.40	0.00	0.00	0.00	0.09	0.18	0.44	1.79	4.96	12.79	30.58	60.66	92.88	99.27	99.56	99.61	100.00
TB14 (+3.0)	0.21	2.26	0.32	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.04	0.92	16.69	79.82	98.65	99.14	99.20	99.97
TB14-MHW (+2.1)	0.26	1.96	0.46	0.52	0.00	0.00	0.00	0.00	0.00	0.05	0.16	0.60	3.05	13.00	48.43	91.64	99.02	99.43	99.49	100.00
TB14-MSL (0.0)	0.26	1.92	0.43	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.05	1.42	15.41	54.25	93.57	99.42	99.62	99.64	100.00
TB14-MLW (-1.9)	0.29	1.77	0.57	1.38	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.15	8.17	36.32	58.40	90.15	98.27	98.61	98.62	100.00
TB14 (-6.0)	0.20	2.33	0.68	1.01	0.00	0.00	0.00	0.08	0.20	0.60	1.34	2.51	4.66	8.26	17.81	61.69	87.73	97.18	98.98	100.00
TB14 (-8.0)	0.20	2.31	0.64	0.32	0.00	0.00	0.00	0.00	0.08	0.26	0.73	1.74	4.06	8.30	19.74	66.90	88.57	97.15	99.68	100.00
TB14 (-12.0)	0.21	2.27	0.89	1.22	0.00	0.00	0.60	0.60	1.01	1.91	3.15	4.88	7.48	11.08	19.28	59.67	86.83	94.75	98.78	100.00
TB14 (-14.0)	0.19	2.37	0.62	0.79	0.00	0.00	0.00	0.20	0.34	0.56	0.93	1.64	2.94	5.15	12.54	65.36	88.34	96.13	99.20	100.00
TB14 (-18.0)	0.18	2.47	0.56	1.68	0.00	0.00	0.00	0.13	0.25	0.40	0.61	1.02	1.90	3.06	6.65	56.96	86.09	95.16	98.32	100.00
TB14 (-20.0)	0.17	2.55	0.61	2.32	0.00	0.00	0.01	0.15	0.27	0.45	0.76	1.25	2.54	4.39	7.31	40.87	83.03	93.42	97.68	100.00
TB14 COMPOSITE	**0.22**	**2.18**	**0.63**	**0.88**	**0.00**	**0.00**	**0.05**	**0.10**	**0.19**	**0.38**	**0.78**	**1.58**	**4.05**	**11.09**	**27.98**	**74.09**	**93.03**	**97.61**	**99.12**	**100.00**
TB15 Dune	0.21	2.27	0.35	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.03	0.12	1.50	17.79	78.33	98.30	99.66	99.78	99.98
TB15 Toe of Dune	0.23	2.10	0.53	0.48	0.00	0.00	0.00	0.00	0.00	0.03	0.15	0.56	2.76	11.81	34.74	82.48	95.98	99.05	99.52	100.00
TB15-Berm (+7.0)	0.22	2.21	0.36	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.08	0.32	2.48	21.40	85.44	97.91	99.69	99.92	100.00
TB15 (+3.0)	0.58	0.78	1.43	0.46	0.00	0.00	0.00	0.00	0.14	43.17	44.25	46.48	49.74	53.51	63.01	93.09	99.34	99.52	99.54	99.94
TB15-MHW (+2.1)	0.28	1.86	0.56	0.44	0.00	0.00	0.00	0.00	0.00	0.04	0.34	1.57	7.34	23.14	54.17	91.25	99.18	99.52	99.56	100.00
TB15-MSL (0.0)	0.29	1.81	0.62	0.90	0.00	0.00	0.00	0.00	0.00	0.02	0.24	2.43	12.05	28.54	53.30	90.52	98.81	99.09	99.11	100.00
TB15-MLW (-1.9)	0.29	1.78	0.86	0.89	0.00	0.00	0.00	0.07	0.24	1.12	4.78	12.10	19.64	26.11	42.43	86.20	98.55	99.06	99.10	100.00
TB15 (-6.0)	0.18	2.46	0.64	0.96	0.00	0.00	0.00	0.01	0.05	0.28	0.87	1.77	3.62	6.66	13.12	46.47	85.63	96.48	99.03	100.00
TB15 (-8.0)	0.70	0.52	1.27	1.06	0.00	0.71	2.73	6.43	11.23	18.96	29.17	43.66	62.71	79.37	88.31	94.49	97.57	98.58	98.95	100.00
TB15 (-12.0)	0.19	2.41	0.84	2.19	0.00	0.00	0.37	0.55	0.85	1.52	2.37	3.65	5.30	7.35	12.83	55.67	79.93	91.54	97.81	100.00
TB15 (-14.0)	0.19	2.42	0.93	1.87	0.00	0.00	0.81	1.73	2.15	2.69	3.21	3.84	4.71	5.83	10.32	50.63	81.01	92.94	98.13	100.00
TB15 (-18.0)	0.16	2.63	0.44	2.47	0.00	0.00	0.00	0.00	0.02	0.03	0.04	0.05	0.13	0.29	1.71	41.60	81.28	93.12	97.53	100.00
TB15 (-20.0)	0.16	2.65	0.45	2.31	0.00	0.00	0.00	0.00	0.02	0.03	0.10	0.18	0.33	0.64	2.43	36.71	81.28	93.24	97.68	100.00
TB15 COMPOSITE	**0.25**	**1.99**	**1.01**	**1.10**	**0.00**	**0.05**	**0.30**	**0.68**	**1.13**	**5.22**	**6.58**	**8.95**	**12.98**	**19.02**	**31.97**	**71.76**	**91.91**	**97.04**	**98.90**	**99.99**

PROFILE LINE COMPOSITES - NORTH TOPSAIL BEACH SAMPLES (2 of 4)

SAMPLE I. D.	MEAN (mm)	PHI MEAN	PHI SORTING	% SILT	CUMULATIVE PERCENT RETAINED (SIEVES EXPRESSED IN PHI)															
					GRAVEL			GRANULAR		SAND										FINES
					-4.25	-3.25	-2.25	-1.5	-1.0	-0.5	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	PAN
TB16 Dune	0.23	2.10	0.45	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	1.12	9.14	36.91	84.69	98.23	99.69	99.85	100.00
TB16 Toe of Dune	0.23	2.11	0.40	0.22	0.00	0.00	0.00	0.05	0.05	0.07	0.08	0.14	0.72	5.20	33.39	88.48	97.99	99.52	99.78	100.00
TB16-Berm (+7.0)	0.23	2.11	0.44	0.11	0.00	0.00	0.00	0.00	0.00	0.02	0.04	0.13	0.93	6.71	35.86	87.16	97.28	99.42	99.89	100.00
TB16 (+4.0)	0.20	2.29	0.35	0.46	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.05	0.12	1.12	15.22	78.24	97.57	99.20	99.54	99.93
TB16-MHW (+2.1)	0.30	1.74	0.79	0.05	0.00	0.00	0.00	0.07	0.56	1.67	4.25	8.84	15.95	27.55	52.30	90.73	99.36	99.86	99.95	100.00
TB16-MSL (0.0)	0.25	1.99	0.42	0.59	0.00	0.00	0.00	0.00	0.00	0.01	0.04	0.14	1.06	10.55	49.03	91.27	98.98	99.36	99.40	100.00
TB16-MLW (-1.9)	0.28	1.85	0.98	1.08	0.00	0.00	0.49	2.06	3.24	5.34	7.35	8.90	11.11	17.66	35.98	85.00	98.20	98.82	98.90	100.00
TB16 (-6.0)	0.57	0.81	1.44	0.39	0.00	0.00	0.41	4.83	10.95	20.63	32.22	44.97	56.28	63.87	70.22	83.22	96.62	99.17	99.61	100.00
TB16 (-8.0)	0.26	1.97	1.07	0.91	0.00	0.00	0.54	0.94	1.69	3.41	6.22	10.64	16.58	23.77	34.72	67.91	89.32	97.09	99.09	100.00
TB16 (-12.0)	0.21	2.28	1.03	1.47	0.00	0.00	0.27	1.00	1.78	3.50	5.25	7.14	9.71	13.25	20.35	52.19	81.16	93.50	98.54	100.00
TB16 (-14.0)	0.17	2.53	0.82	1.79	0.00	0.00	0.00	0.95	1.51	2.18	2.59	3.03	3.70	4.88	8.74	42.09	78.39	91.72	98.21	100.00
TB16 (-18.0)	0.16	2.66	0.50	1.11	0.00	0.00	0.00	0.00	0.04	0.11	0.17	0.25	0.37	1.92	4.50	34.32	79.54	93.79	98.90	100.00
TB16 (-20.0)	0.16	2.68	0.50	2.24	0.00	0.00	0.00	0.00	0.01	0.09	0.20	0.38	0.61	1.39	4.43	30.74	78.18	92.31	97.76	100.00
TB16 COMPOSITE	**0.23**	**2.09**	**0.91**	**0.81**	**0.00**	**0.00**	**0.13**	**0.76**	**1.53**	**2.85**	**4.50**	**6.52**	**9.10**	**14.38**	**30.90**	**70.46**	**91.60**	**97.19**	**99.19**	**99.99**
TB17 Dune	0.21	2.27	0.39	0.34	0.00	0.00	0.00	0.00	0.00	0.02	0.09	0.20	0.46	1.78	18.94	76.62	96.83	99.30	99.66	99.67
TB17 Toe of Dune	0.23	2.12	0.43	0.13	0.00	0.00	0.00	0.00	0.00	0.03	0.04	0.08	0.73	5.68	35.66	85.89	97.58	99.57	99.87	100.00
TB17-Berm (+7.0)	0.23	2.12	0.43	13.92	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.07	0.63	4.90	30.74	74.04	84.12	85.83	86.09	100.00
TB17 (+3.0)	0.20	2.32	0.29	1.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.25	8.43	76.79	97.84	98.66	98.74	99.91
TB17-MHW (+2.1)	0.25	2.01	0.58	0.24	0.00	0.00	0.00	0.00	0.00	0.01	0.07	1.07	6.47	18.63	39.39	83.17	98.47	99.66	99.76	100.00
TB17-MSL (0.0)	0.35	1.53	0.87	0.79	0.00	0.00	0.00	0.07	0.30	1.26	4.58	14.60	28.17	42.90	61.01	88.96	98.79	99.18	99.21	100.00
TB17-MLW (-1.9)	0.57	0.82	1.48	0.53	2.72	2.72	5.84	10.13	14.31	20.42	27.60	36.49	45.36	54.01	65.80	87.95	98.68	99.42	99.48	100.00
TB17 (-6.0)	0.19	2.43	0.85	0.70	0.00	0.00	0.26	1.05	1.81	2.68	3.45	4.02	4.74	6.20	11.49	43.71	85.71	96.97	99.30	100.00
TB17 (-8.0)	0.19	2.43	0.85	0.70	0.00	0.00	0.26	1.05	1.81	2.68	3.45	4.02	4.74	6.20	11.49	43.71	85.71	96.97	99.30	100.00
TB17 (-12.0)	0.18	2.48	1.01	1.76	0.00	0.00	1.15	1.91	2.65	3.47	4.09	4.62	5.29	6.33	10.05	39.52	77.89	92.12	98.27	100.00
TB17 (-14.0)	0.19	2.41	1.08	1.99	0.00	0.00	0.85	2.55	3.49	4.45	5.08	5.71	6.37	7.51	11.43	45.18	77.40	91.62	98.00	100.00
TB17 (-18.0)	0.15	2.70	0.62	3.56	0.00	0.00	0.00	0.24	0.48	0.71	0.93	1.15	1.40	1.81	3.66	30.41	72.25	88.98	96.45	100.00
TB17 (-20.0)	0.16	2.61	0.78	3.50	0.00	0.00	0.00	0.52	1.05	1.72	2.39	2.99	3.72	4.67	7.85	28.95	75.50	90.03	96.48	100.00
TB17 COMPOSITE	**0.22**	**2.17**	**0.93**	**2.26**	**0.21**	**0.21**	**0.64**	**1.35**	**1.99**	**2.88**	**3.98**	**5.77**	**8.32**	**12.38**	**24.30**	**61.92**	**88.21**	**95.25**	**97.74**	**99.97**
TB18 Dune	0.21	2.25	0.46	0.45	0.00	0.00	0.00	0.00	0.04	0.10	0.20	0.40	1.12	4.45	21.68	76.98	95.21	98.91	99.55	99.80
T18 Toe of Dune	0.22	2.18	0.41	0.03	0.00	0.00	0.00	0.00	0.00	0.02	0.06	0.11	0.48	3.72	27.68	84.79	97.04	99.49	99.97	100.00
TB18-Berm (+7.0)	0.23	2.13	0.52	0.25	0.00	0.00	0.00	0.00	0.00	0.03	0.08	0.23	2.17	9.69	35.14	80.65	95.12	99.12	99.75	100.00
TB18 (+4.1)	0.23	2.15	0.40	0.96	0.00	0.00	0.00	0.00	0.01	0.04	0.07	0.14	0.62	4.81	29.57	83.94	98.23	98.95	99.04	99.97
TB18-MHW (+2.1)	0.20	2.31	0.36	0.11	0.00	0.00	0.00	0.00	0.03	0.03	0.07	0.08	0.15	0.72	13.25	76.72	96.41	99.41	99.88	100.00
TB18-MSL (0.0)	0.19	2.38	0.31	0.85	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.04	0.07	0.25	5.37	69.66	96.72	99.06	99.16	100.00
TB18-MLW (-1.9)	0.21	2.27	0.67	0.99	0.00	0.00	0.00	0.20	0.46	0.77	1.37	2.36	4.39	9.08	20.87	63.63	91.61	97.97	99.02	100.00
TB18 (-6.0)	0.17	2.53	0.79	1.05	0.00	0.00	0.00	0.51	1.02	1.70	2.48	3.42	4.72	6.63	11.25	33.35	80.93	96.01	98.94	100.00
TB18 (-8.0)	0.17	2.52	0.88	0.76	0.00	0.00	0.47	0.94	1.48	2.16	2.95	3.85	5.07	7.00	11.68	34.85	78.70	95.27	99.25	100.00
TB18 (-12.0)	0.19	2.38	1.09	0.87	0.00	0.00	0.52	1.75	3.10	4.27	5.55	6.98	9.02	11.88	16.44	37.07	78.81	94.93	99.13	100.00
TB18 (-14.0)	0.18	2.44	0.94	2.42	0.00	0.00	0.00	0.35	1.04	2.26	3.73	5.66	7.95	10.59	15.64	39.29	77.28	91.22	97.58	100.00
TB18(-18)	0.31	1.70	0.94	18.47	0.00	0.00	0.22	0.56	1.17	2.64	5.00	8.39	15.00	27.07	43.36	69.74	79.55	81.07	81.53	100.00
TB18(-20.0)	0.27	1.89	0.87	0.77	0.00	0.00	0.61	1.93	2.65	3.77	4.93	6.25	8.70	14.58	30.86	96.65	96.36	98.96	99.23	100.00
TB18 COMPOSITE	**0.21**	**2.25**	**0.74**	**2.15**	**0.00**	**0.00**	**0.14**	**0.48**	**0.85**	**1.37**	**2.04**	**2.92**	**4.57**	**8.50**	**21.75**	**65.18**	**89.38**	**96.18**	**97.85**	**99.98**

PROFILE LINE COMPOSITES - NORTH TOPSAIL BEACH SAMPLES (3 of 4)

SAMPLE I. D.	MEAN (mm)	PHI MEAN	PHI SORTING	% SILT	CUMULATIVE PERCENT RETAINED (SIEVES EXPRESSED IN PHI)															
					GRAVEL			GRANULAR		SAND										FINES
					-4.25	-3.25	-2.25	-1.5	-1.0	-0.5	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	PAN
TB19 Dune	0.21	2.28	0.36	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.81	18.85	76.91	97.44	99.37	99.58	99.97
TB19 Toe of Dune	0.26	1.92	1.03	0.04	0.00	0.00	0.39	1.56	2.56	4.58	7.32	9.87	12.26	19.24	39.48	77.57	91.85	98.76	99.96	100.00
TB19-Berm (+7.0)	0.23	2.13	0.50	0.31	0.00	0.00	0.00	0.00	0.00	0.05	0.12	0.51	2.22	9.05	34.31	81.28	97.09	99.16	99.71	100.00
TB19 (4.5)	0.23	2.10	0.53	0.86	0.00	0.00	0.00	0.00	0.01	0.24	0.72	1.32	3.14	9.88	32.40	82.56	97.44	98.82	99.14	99.90
TB19-MHW (+2.1)	0.21	2.25	0.52	0.30	0.00	0.00	0.00	0.00	0.03	0.14	0.38	0.90	2.47	7.31	22.77	69.27	96.34	99.61	99.71	100.00
TB19-MSL (0.0)	0.37	1.42	1.16	0.83	0.00	0.00	1.01	3.35	4.75	7.18	11.68	18.73	27.96	41.11	60.88	86.83	98.44	99.13	99.17	100.00
TB19-MLW (-1.9)	0.30	1.75	0.72	0.82	0.00	0.00	0.00	0.35	0.64	1.18	2.11	4.63	12.10	31.24	58.34	88.59	98.50	99.11	99.18	100.00
TB19 (-6.0)	0.18	2.50	0.68	0.97	0.00	0.00	0.00	0.10	0.28	0.55	0.95	1.50	2.96	6.93	15.75	40.40	82.12	95.59	99.03	100.00
TB19 (-8.0)	0.43	1.22	1.38	1.09	0.00	0.00	3.40	5.39	7.49	10.57	14.77	22.52	37.03	56.16	68.56	79.17	93.76	98.19	98.91	100.00
TB19 (-12.0)	0.16	2.61	0.74	2.08	0.00	0.00	0.00	0.08	0.26	0.55	1.02	1.86	3.64	6.74	12.41	33.35	72.62	89.84	97.90	100.00
TB19 (-14.0)	0.18	2.49	0.86	1.79	0.00	0.00	0.29	0.72	1.03	1.57	2.19	3.21	5.04	8.64	15.01	39.71	77.42	92.07	98.23	100.00
TB19 (-18.0)	0.16	2.66	0.72	2.35	0.00	0.00	0.29	0.42	0.57	0.80	1.06	1.48	2.22	4.38	9.97	27.73	72.68	91.02	97.65	100.00
TB19 (-20.0)	0.25	2.02	0.91	1.61	0.00	0.00	0.16	0.45	1.10	2.17	3.86	6.54	11.05	20.88	39.27	67.35	90.66	97.24	98.37	100.00
TB19 COMPOSITE	**0.23**	**2.10**	**0.93**	**1.04**	**0.00**	**0.00**	**0.43**	**0.96**	**1.44**	**2.27**	**3.55**	**5.62**	**9.39**	**17.11**	**32.92**	**65.44**	**89.72**	**96.76**	**98.96**	**99.99**
TB20 Dune	0.26	1.93	0.93	1.56	0.00	0.58	0.58	0.76	1.27	2.08	3.39	6.54	12.32	21.83	40.52	74.05	94.52	97.85	98.44	99.99
TB20 Toe of Dune	0.23	2.15	0.44	0.36	0.00	0.00	0.00	0.03	0.04	0.05	0.07	0.14	0.55	6.18	31.74	83.52	96.94	99.24	99.64	100.00
TB20-Berm (+7.0)	0.21	2.23	0.47	0.28	0.00	0.00	0.00	0.00	0.00	0.02	0.04	0.17	1.06	7.24	25.71	71.78	97.62	99.66	99.71	100.00
TB20 (+3)	0.23	2.10	0.37	1.22	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.11	0.42	3.48	35.46	88.56	98.24	98.71	98.78	99.91
TB20-MHW (+2.1)	0.25	1.99	0.64	0.42	0.00	0.00	0.00	0.00	0.03	0.15	0.85	2.74	8.04	19.15	39.86	81.94	98.50	99.45	99.59	100.00
TB20-MSL (0.0)	0.37	1.44	0.98	0.79	0.00	0.00	0.15	0.97	1.82	3.77	8.36	15.94	30.01	45.43	64.68	88.51	98.70	99.21	99.22	100.00
TB20-MLW (-1.9)	0.41	1.29	1.30	1.14	0.00	0.00	0.69	4.41	7.84	12.17	17.54	22.88	32.08	44.54	60.14	84.93	98.12	98.82	98.85	100.00
TB20 (-6.0)	0.72	0.48	1.58	0.46	0.00	0.00	2.18	9.00	18.27	29.80	43.94	56.07	66.15	70.76	73.88	81.36	96.21	98.96	99.55	100.00
TB20 (-8.0)	0.18	2.44	0.97	1.87	0.00	0.00	0.15	0.61	1.07	1.75	2.93	4.56	7.98	13.11	20.49	41.04	72.59	90.04	98.15	100.00
TB20 (-12.0)	0.15	2.78	0.90	3.91	0.00	0.00	0.37	0.57	0.89	1.21	1.78	2.64	4.26	6.55	10.23	23.25	56.26	77.60	96.11	100.00
TB20 (-14.0)	0.14	2.79	0.46	3.61	0.00	0.00	0.00	0.00	0.00	0.02	0.07	0.20	0.43	0.91	2.71	21.48	66.24	92.73	96.39	100.00
TB20 (-18.0)	0.14	2.81	0.54	4.45	0.00	0.00	0.00	0.11	0.19	0.22	0.32	0.47	0.93	1.87	5.21	18.97	60.46	91.46	95.56	100.00
TB20 (-20.0)	0.14	2.81	0.60	5.43	0.00	0.00	0.00	0.03	0.05	0.07	0.14	0.26	0.81	2.40	7.34	23.02	59.39	83.83	94.56	100.00
TB20 COMPOSITE	**0.23**	**2.09**	**1.09**	**1.96**	**0.00**	**0.04**	**0.32**	**1.27**	**2.42**	**3.95**	**6.11**	**8.67**	**12.70**	**18.73**	**32.15**	**60.19**	**84.14**	**94.43**	**98.04**	**99.99**
TB21 Dune	0.26	1.93	0.45	0.47	0.00	0.00	0.00	0.00	0.01	0.01	0.03	0.18	1.53	14.65	56.14	90.82	98.81	99.47	99.53	99.95
TB21 Toe of Dune	0.20	2.32	0.40	0.29	0.00	0.00	0.01	0.01	0.03	0.07	0.15	0.25	0.64	2.45	12.49	72.78	96.49	99.60	99.71	100.00
TB21-Berm (+7.0)	0.21	2.22	0.47	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.08	0.75	6.66	26.46	75.43	96.66	99.08	99.59	100.00
TB21 (+3)	0.19	2.37	0.36	1.18	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.03	0.04	0.55	9.96	69.35	95.56	98.04	98.82	99.93
TB21-MHW (+2.1)	0.19	2.42	0.35	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.44	7.41	63.36	95.15	99.77	99.98	100.00
TB21-MSL (0.0)	0.36	1.49	0.86	0.75	0.00	0.00	0.21	0.56	0.81	1.59	4.05	10.58	27.89	48.24	67.96	89.06	98.52	99.19	99.24	100.00
TB21-MLW (-1.9)	0.71	0.49	1.50	0.54	0.00	1.09	5.43	12.29	16.88	23.52	33.02	44.26	58.20	70.80	82.81	94.20	99.10	99.41	99.45	100.00
TB21 (-6.0)	0.20	2.33	1.31	1.12	0.00	1.88	2.32	3.06	3.75	4.82	6.14	7.53	9.53	12.09	17.06	35.06	78.63	93.64	98.87	100.00
TB21 (-8.0)	0.16	2.64	0.91	0.21	0.00	0.00	0.17	0.37	0.66	1.06	1.78	2.90	7.49	10.31	15.17	29.50	65.09	86.19	99.80	100.00
TB21 (-12.0)	0.19	2.38	1.31	2.77	0.00	2.25	2.35	3.18	3.53	3.98	4.77	5.90	8.38	11.79	17.09	35.47	72.81	89.27	97.22	100.00
TB21 (-14.0)	0.19	2.40	1.23	2.36	0.00	1.75	2.28	2.69	2.96	3.46	4.27	5.46	7.96	11.80	17.51	32.86	72.39	94.84	97.65	100.00
TB21 (-18.0)	0.19	2.38	0.67	1.87	0.00	0.00	0.00	0.06	0.16	0.32	0.60	1.32	3.23	9.09	22.17	51.65	83.44	97.11	98.13	100.00
TB21 (-20.0)	0.18	2.49	0.88	2.11	0.00	0.00	0.00	0.17	0.28	0.72	1.84	3.47	6.54	12.22	21.51	39.58	69.56	90.56	97.88	100.00
TB21 COMPOSITE	**0.23**	**2.14**	**1.07**	**1.09**	**0.00**	**0.54**	**0.98**	**1.72**	**2.24**	**3.04**	**4.36**	**6.31**	**10.17**	**16.24**	**28.75**	**59.93**	**86.32**	**95.86**	**98.91**	**99.99**

PROFILE LINE COMPOSITES - NORTH TOPSAIL BEACH SAMPLES (4 of 4)

SAMPLE I. D.	MEAN (mm)	PHI MEAN	PHI SORTING	% SILT	CUMULATIVE PERCENT RETAINED (SIEVES EXPRESSED IN PHI)															
					GRAVEL			GRANULAR		SAND										FINES
					-4.25	-3.25	-2.25	-1.5	-1.0	-0.5	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	PAN
TB22 Dune	0.25	2.02	0.83	1.19	0.00	0.00	0.00	0.14	0.54	1.48	3.33	7.21	11.93	18.85	32.97	71.24	96.22	97.96	98.81	99.81
TB22 Toe of Dune	0.19	2.39	0.31	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.15	5.36	70.01	96.49	99.62	99.74	100.00
TB22-Berm (+7.0)	0.18	2.44	0.38	0.13	0.00	0.00	0.00	0.00	0.02	0.02	0.03	0.07	0.23	1.37	7.92	57.19	95.39	99.44	99.87	100.00
TB22 (+3)	0.22	2.18	0.66	1.65	0.00	0.84	0.84	0.84	0.84	0.86	0.93	0.95	1.12	3.36	23.31	77.39	97.24	98.24	98.35	99.75
TB22-MHW (+2.1)	0.22	2.19	0.50	0.32	0.00	0.00	0.00	0.07	0.12	0.15	0.31	0.65	2.09	7.01	27.53	75.51	97.78	99.64	99.69	100.00
TB22-MSL (0.0)	0.28	1.83	0.58	0.99	0.00	0.00	0.00	0.00	0.00	0.03	0.09	0.31	5.78	31.07	61.22	84.86	97.84	98.91	99.01	100.00
TB22-MLW (-1.9)	0.42	1.24	1.04	0.74	0.00	0.00	0.00	0.77	1.87	4.74	12.25	24.07	41.52	56.69	71.68	86.89	97.94	99.26	99.28	100.00
TB22 (-6.0)	0.28	1.86	1.55	1.22	0.00	0.00	1.29	4.57	7.82	11.52	14.80	18.64	23.46	30.22	38.30	51.41	76.02	92.52	98.79	100.00
TB22 (-8.0)	0.23	2.09	1.59	1.79	0.00	0.00	3.74	6.32	8.22	10.07	12.08	14.33	17.11	20.73	25.41	37.31	74.40	91.01	98.20	100.00
TB22 (-12.0)	0.21	2.27	1.67	1.85	0.00	3.80	5.07	6.97	7.79	8.54	9.21	9.92	10.90	12.49	15.10	26.32	73.65	91.38	98.13	100.00
TB22 (-14.0)	0.17	2.59	0.71	1.83	0.00	0.00	0.00	0.11	0.50	1.02	1.54	2.24	3.36	6.11	10.80	28.35	80.05	93.14	98.17	100.00
TB22 (-18.0)	0.22	2.20	0.66	1.76	0.00	0.00	0.00	0.07	0.17	0.33	0.63	1.29	3.19	10.28	36.02	66.29	89.40	96.65	98.24	100.00
TB22(-20.0)	0.65	0.63	2.00	4.36	0.00	5.96	12.59	16.65	20.39	25.68	31.07	36.51	42.70	51.59	66.08	81.96	90.77	94.53	95.64	100.00
TB22 COMPOSITE	**0.25**	**2.00**	**1.21**	**1.39**	**0.00**	**0.82**	**1.81**	**2.81**	**3.71**	**4.96**	**6.64**	**8.94**	**12.57**	**19.23**	**32.44**	**62.67**	**89.48**	**96.33**	**98.61**	**99.97**
TB23 Dune	0.19	2.39	0.41	0.62	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.12	0.36	0.79	11.01	66.38	92.72	98.43	99.38	99.81
TB23 Toe of Dune	0.22	2.18	0.54	0.22	0.00	0.00	0.00	0.00	0.01	0.02	0.11	0.59	3.14	7.59	29.74	77.95	94.39	98.87	99.78	100.00
TB23-Berm (+7.0)	0.22	2.20	0.48	0.22	0.00	0.00	0.00	0.00	0.01	0.02	0.14	0.29	1.19	6.44	28.05	77.39	96.57	99.12	99.77	100.00
TB23 (+3)	0.19	2.39	0.33	1.31	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.02	0.30	8.71	63.50	96.59	98.55	98.69	100.00
TB23-MHW (+2.1)	0.23	2.10	0.52	0.36	0.00	0.00	0.00	0.00	0.00	0.03	0.13	0.48	2.41	12.03	36.55	79.66	97.54	99.55	99.65	100.00
TB23-MSL (0.0)	0.30	1.74	0.68	0.59	0.00	0.00	0.00	0.00	0.01	0.15	0.81	3.87	13.25	35.81	61.47	86.52	98.42	99.36	99.40	100.00
TB23-MLW (-1.9)	0.66	0.59	1.56	0.51	0.00	0.00	2.38	9.94	18.15	29.48	38.89	47.24	55.27	63.56	73.80	88.41	98.11	99.42	99.49	100.00
TB23 (-6.0)	0.18	2.48	0.96	0.77	0.00	0.00	0.24	1.09	2.05	3.23	4.29	5.35	6.50	8.31	12.65	33.71	78.92	94.68	99.24	100.00
TB23 (-8.0)	0.15	2.76	0.89	2.87	0.00	0.00	0.31	1.07	1.30	1.72	2.37	3.37	4.49	5.89	8.31	17.06	58.84	86.67	97.14	100.00
TB23 (-12.0)	0.16	2.60	1.03	4.13	0.00	0.00	0.19	1.19	1.80	2.68	3.75	5.11	6.90	9.26	13.80	28.49	61.65	84.34	95.85	100.00
TB23 (-14.0)	0.14	2.81	0.75	7.22	0.00	0.00	0.22	0.47	0.66	0.95	1.34	1.77	2.37	3.42	6.24	17.64	57.85	81.74	92.78	100.00
TB23 (-18.0)	0.14	2.84	0.54	8.92	0.00	0.00	0.00	0.00	0.01	0.09	0.17	0.35	0.70	1.84	5.86	14.76	59.61	82.61	91.09	100.00
TB23 (-20.0)	0.17	2.58	0.80	7.82	0.00	0.00	0.00	0.05	0.20	0.51	1.05	1.91	3.46	7.52	17.90	36.25	63.50	83.04	92.18	100.00
TB23 COMPOSITE	**0.21**	**2.27**	**0.98**	**2.74**	**0.00**	**0.00**	**0.26**	**1.06**	**1.86**	**2.99**	**4.08**	**5.42**	**7.70**	**12.52**	**24.16**	**52.90**	**81.13**	**92.80**	**97.26**	**99.99**
TB24 Dune	0.17	2.52	0.40	0.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.18	5.95	50.96	89.52	97.38	99.28	100.00
TB24 Toe of Dune	0.35	1.52	0.94	0.55	0.00	0.00	1.08	1.77	2.51	3.84	5.89	9.90	18.84	39.93	69.73	91.11	98.25	99.28	99.45	100.00
TB24 Base scarp	0.25	2.01	0.52	1.23	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.24	2.27	7.51	52.97	90.84	93.12	96.07	98.77	99.75
TB24-Berm (+7.0)	0.16	2.63	0.51	0.49	0.00	0.00	0.00	0.00	0.02	0.02	0.05	0.06	0.14	0.56	6.29	46.76	75.61	94.34	99.51	100.00
TB24-MHW (+2.1)	0.21	2.22	0.46	0.42	0.00	0.00	0.00	0.00	0.01	0.04	0.10	0.30	1.19	4.64	23.86	80.40	95.09	98.94	99.57	100.00
TB24-MSL (0.0)	0.19	2.38	0.36	0.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.05	0.35	9.33	70.37	93.90	98.50	99.22	100.00
TB24-MLW (-1.9)	0.24	2.07	0.58	1.08	0.00	0.00	0.00	0.15	0.31	0.67	1.35	2.39	4.31	9.86	33.51	83.36	97.51	98.80	98.91	100.00
TB24 (-6.0)	0.21	2.25	0.75	1.64	0.00	0.00	0.07	0.19	0.57	1.24	2.23	3.80	6.48	10.85	20.09	60.42	91.17	97.46	98.37	100.00
TB24 (-8.0)	0.21	2.25	0.57	2.21	0.00	0.00	0.00	0.05	0.14	0.32	0.69	1.33	2.64	6.70	21.85	69.48	92.34	97.04	97.79	100.00
TB24 (-12.0)	0.29	1.78	0.87	1.61	0.00	0.00	0.00	0.11	0.18	0.96	2.94	7.39	17.06	34.36	56.90	78.04	92.00	97.21	98.40	100.00
TB24 (-14.0)	0.19	2.40	0.60	1.49	0.00	0.00	0.00	0.03	0.11	0.28	0.52	0.92	1.82	5.04	17.42	58.40	85.70	95.27	98.50	100.00
TB24 (-18.0)	0.18	2.51	0.63	3.08	0.00	0.00	0.04	0.22	0.27	0.40	0.67	1.10	2.25	5.11	12.42	40.28	83.62	93.61	96.92	100.00
TB24 (-20.0)	0.17	2.57	0.61	2.43	0.00	0.00	0.02	0.12	0.16	0.33	0.61	1.05	2.04	4.54	11.38	35.12	81.85	93.52	97.56	100.00
TB24 COMPOSITE	**0.23**	**2.09**	**0.62**	**1.37**	**0.00**	**0.00**	**0.09**	**0.20**	**0.33**	**0.62**	**1.16**	**2.19**	**4.55**	**9.97**	**26.28**	**65.81**	**89.98**	**96.72**	**98.63**	**99.98**
BEACH COMPOSITE	**0.23**	**2.13**	**0.94**	**1.50**	**0.02**	**0.14**	**0.43**	**0.96**	**1.50**	**2.63**	**3.84**	**5.69**	**8.93**	**14.90**	**29.16**	**65.27**	**88.85**	**96.08**	**98.50**	**99.99**

ELEVATION COMPOSITES - NORTH TOPSAIL BEACH SAMPLES (1 of 4)

SAMPLE I. D.	MEAN (mm)	PHI MEAN	PHI SORTING	% SILT	CUMULATIVE PERCENT RETAINED (SIEVES EXPRESSED IN PHI)															
					GRAVEL			GRANULAR		SAND										FINES
					-4.25	-3.25	-2.25	-1.5	-1.0	-0.5	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	PAN
TB13 Dune	0.22	2.16	0.50	0.33	0.00	0.00	0.00	0.00	0.00	0.16	0.44	1.28	2.74	6.68	27.13	82.21	96.85	99.37	99.67	99.98
TB14 Dune	0.20	2.33	0.35	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.16	13.88	73.59	96.41	99.46	99.79	99.99
TB15 Dune	0.21	2.27	0.35	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.03	0.12	1.50	17.79	78.33	98.30	99.66	99.78	99.98
TB16 Dune	0.23	2.10	0.45	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.16	1.12	9.14	36.91	84.69	98.23	99.69	99.85	100.00
TB17 Dune	0.21	2.27	0.39	0.34	0.00	0.00	0.00	0.00	0.00	0.02	0.09	0.20	0.46	1.78	18.94	76.62	96.83	99.30	99.66	99.67
TB18 Dune	0.21	2.25	0.46	0.45	0.00	0.00	0.00	0.00	0.04	0.10	0.20	0.40	1.12	4.45	21.68	76.98	95.21	98.91	99.55	99.80
TB19 Dune	0.21	2.28	0.36	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.81	18.85	76.91	97.44	99.37	99.58	99.97
TB20 Dune	0.26	1.93	0.93	1.56	0.00	0.58	0.58	0.76	1.27	2.08	3.39	6.54	12.32	21.83	40.52	74.05	94.52	97.85	98.44	99.99
TB21 Dune	0.26	1.93	0.45	0.47	0.00	0.00	0.00	0.00	0.01	0.01	0.03	0.18	1.53	14.65	56.14	90.82	98.81	99.47	99.53	99.95
TB22 Dune	0.25	2.02	0.83	1.19	0.00	0.00	0.00	0.14	0.54	1.48	3.33	7.21	11.93	18.85	32.97	71.24	96.22	97.96	98.81	99.81
TB23 Dune	0.19	2.39	0.41	0.62	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.12	0.36	0.79	11.01	66.38	92.72	98.43	99.38	99.81
TB24 Dune	0.17	2.52	0.40	0.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.18	5.95	50.96	89.52	97.38	99.28	100.00
DUNE COMPOSITE	**0.22**	**2.20**	**0.55**	**0.56**	**0.00**	**0.05**	**0.05**	**0.08**	**0.16**	**0.32**	**0.63**	**1.35**	**2.65**	**6.74**	**25.15**	**75.23**	**95.92**	**98.90**	**99.44**	**99.91**
TB13 Toe of Dune	0.26	1.95	0.57	0.83	0.00	0.00	0.00	0.00	0.12	0.28	0.66	1.63	5.31	16.43	45.84	88.72	97.74	99.02	99.17	100.00
TB14 Toe of Dune	0.23	2.10	0.50	0.40	0.00	0.00	0.00	0.07	0.17	0.27	0.71	1.71	3.63	7.56	28.06	90.06	97.81	99.37	99.60	100.00
TB15 Toe of Dune	0.23	2.10	0.53	0.48	0.00	0.00	0.00	0.00	0.00	0.03	0.15	0.56	2.76	11.81	34.74	82.48	95.98	99.05	99.52	100.00
TB16 Toe of Dune	0.23	2.11	0.40	0.22	0.00	0.00	0.00	0.05	0.05	0.07	0.08	0.14	0.72	5.20	33.39	88.48	97.99	99.52	99.78	100.00
TB17 Toe of Dune	0.23	2.12	0.43	0.13	0.00	0.00	0.00	0.00	0.00	0.03	0.04	0.08	0.73	5.68	35.66	85.89	97.58	99.57	99.87	100.00
T18 Toe of Dune	0.22	2.18	0.41	0.03	0.00	0.00	0.00	0.00	0.00	0.02	0.06	0.11	0.48	3.72	27.68	84.79	97.04	99.49	99.97	100.00
TB19 Toe of Dune	0.26	1.92	1.03	0.04	0.00	0.00	0.39	1.56	2.56	4.58	7.32	9.87	12.26	19.24	39.48	77.57	91.85	98.76	99.96	100.00
TB20 Toe of Dune	0.23	2.15	0.44	0.36	0.00	0.00	0.00	0.03	0.04	0.05	0.07	0.14	0.55	6.18	31.74	83.52	96.94	99.24	99.64	100.00
TB21 Toe of Dune	0.20	2.32	0.40	0.29	0.00	0.00	0.01	0.01	0.03	0.07	0.15	0.25	0.64	2.45	12.49	72.78	96.49	99.60	99.71	100.00
TB22 Toe of Dune	0.19	2.39	0.31	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.15	5.36	70.01	96.49	99.62	99.74	100.00
TB23 Toe of Dune	0.22	2.18	0.54	0.22	0.00	0.00	0.00	0.00	0.01	0.02	0.11	0.59	3.14	7.59	29.74	77.95	94.39	98.87	99.78	100.00
TB24 Toe of Dune	0.35	1.52	0.94	0.55	0.00	0.00	1.08	1.77	2.51	3.84	5.89	9.90	18.84	39.93	69.73	91.11	98.25	99.28	99.45	100.00
TOE OF DUNE COMPOSITE	**0.23**	**2.09**	**0.62**	**0.32**	**0.00**	**0.00**	**0.12**	**0.29**	**0.46**	**0.77**	**1.27**	**2.08**	**4.09**	**10.50**	**32.83**	**82.78**	**96.55**	**99.28**	**99.68**	**100.00**
TB13-Berm (+7.0)	0.33	1.62	0.69	1.10	0.00	0.00	0.00	0.00	0.05	0.48	1.97	6.70	17.62	37.89	67.31	92.58	98.57	98.85	98.91	100.00
TB14-Berm (+7.0)	0.30	1.73	0.66	0.40	0.00	0.00	0.00	0.09	0.18	0.44	1.79	4.96	12.79	30.58	60.66	92.88	99.27	99.56	99.61	100.00
TB15-Berm (+7.0)	0.22	2.21	0.36	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.08	0.32	2.48	21.40	85.44	97.91	99.69	99.92	100.00
TB16-Berm (+7.0)	0.23	2.11	0.44	0.11	0.00	0.00	0.00	0.00	0.00	0.02	0.04	0.13	0.93	6.71	35.86	87.16	97.28	99.42	99.89	100.00
TB17-Berm (+7.0)	0.23	2.12	0.43	13.92	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.07	0.63	4.90	30.74	74.04	84.12	85.83	86.09	100.00
TB18-Berm (+7.0)	0.23	2.13	0.52	0.25	0.00	0.00	0.00	0.00	0.00	0.03	0.08	0.23	2.17	9.69	35.14	80.65	95.12	99.12	99.75	100.00
TB19-Berm (+7.0)	0.23	2.13	0.50	0.31	0.00	0.00	0.00	0.00	0.00	0.05	0.12	0.51	2.22	9.05	34.31	81.28	97.09	99.16	99.71	100.00
TB20-Berm (+7.0)	0.21	2.23	0.47	0.28	0.00	0.00	0.00	0.00	0.00	0.02	0.04	0.17	1.06	7.24	25.71	71.78	97.62	99.66	99.71	100.00
TB21-Berm (+7.0)	0.21	2.22	0.47	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.08	0.75	6.66	26.46	75.43	96.66	99.08	99.59	100.00
TB22-Berm (+7.0)	0.18	2.44	0.38	0.13	0.00	0.00	0.00	0.00	0.02	0.02	0.03	0.07	0.23	1.37	7.92	57.19	95.39	99.44	99.87	100.00
TB23-Berm (+7.0)	0.22	2.20	0.48	0.22	0.00	0.00	0.00	0.00	0.01	0.02	0.14	0.29	1.19	6.44	28.05	77.39	96.57	99.12	99.77	100.00
TB24-Berm (+7.0)	0.16	2.63	0.51	0.49	0.00	0.00	0.00	0.00	0.02	0.02	0.05	0.06	0.14	0.56	6.29	46.76	75.61	94.34	99.51	100.00
BERM COMPOSITE	**0.23**	**2.15**	**0.56**	**1.47**	**0.00**	**0.00**	**0.00**	**0.01**	**0.02**	**0.09**	**0.36**	**1.11**	**3.34**	**10.30**	**31.65**	**76.88**	**94.27**	**97.77**	**98.53**	**100.00**
TB13-MHW (+2.1)	0.31	1.67	0.69	0.52	0.00	0.00	0.00	0.00	0.07	0.53	2.20	6.35	16.05	33.13	63.33	92.98	99.19	99.46	99.49	100.00
TB14-MHW (+2.1)	0.26	1.96	0.46	0.52	0.00	0.00	0.00	0.00	0.00	0.05	0.16	0.60	3.05	13.00	48.43	91.64	99.02	99.43	99.49	100.00
TB15-MHW (+2.1)	0.28	1.86	0.56	0.44	0.00	0.00	0.00	0.00	0.00	0.04	0.34	1.57	7.34	23.14	54.17	91.25	99.18	99.52	99.56	100.00
TB16-MHW (+2.1)	0.30	1.74	0.79	0.05	0.00	0.00	0.00	0.07	0.56	1.67	4.25	8.84	15.95	27.55	52.30	90.73	99.36	99.86	99.95	100.00
TB17-MHW (+2.1)	0.25	2.01	0.58	0.24	0.00	0.00	0.00	0.00	0.00	0.01	0.07	1.07	6.47	18.63	39.39	83.17	98.47	99.66	99.76	100.00
TB18-MHW (+2.1)	0.20	2.31	0.36	0.11	0.00	0.00	0.00	0.00	0.03	0.03	0.07	0.08	0.15	0.72	13.25	76.72	96.41	99.41	99.88	100.00
TB19-MHW (+2.1)	0.21	2.25	0.52	0.30	0.00	0.00	0.00	0.00	0.03	0.14	0.38	0.90	2.47	7.31	22.77	69.27	96.34	99.61	99.71	100.00
TB20-MHW (+2.1)	0.25	1.99	0.64	0.42	0.00	0.00	0.00	0.00	0.03	0.15	0.85	2.74	8.04	19.15	39.86	81.94	98.50	99.45	99.59	100.00
TB21-MHW (+2.1)	0.19	2.42	0.35	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.44	7.41	63.36	95.15	99.77	99.98	100.00
TB22-MHW (+2.1)	0.22	2.19	0.50	0.32	0.00	0.00	0.00	0.07	0.12	0.15	0.31	0.65	2.09	7.01	27.53	75.51	97.78	99.64	99.69	100.00
TB23-MHW (+2.1)	0.23	2.10	0.52	0.36	0.00	0.00	0.00	0.00	0.00	0.03	0.13	0.48	2.41	12.03	36.55	79.66	97.54	99.55	99.65	100.00
TB24-MHW (+2.1)	0.21	2.22	0.46	0.42	0.00	0.00	0.00	0.00	0.01	0.04	0.10	0.30	1.19	4.64	23.86	80.40	95.09	98.94	99.57	100.00
MHW COMPOSITE	**0.24**	**2.06**	**0.59**	**0.31**	**0.00**	**0.00**	**0.00**	**0.01**	**0.07**	**0.24**	**0.74**	**1.97**	**5.44**	**13.90**	**35.74**	**81.39**	**97.67**	**99.52**	**99.69**	**100.00**

ELEVATION COMPOSITES - NORTH TOPSAIL BEACH SAMPLES (2 of 4)

SAMPLE I. D.	MEAN (mm)	PHI MEAN	PHI SORTING	% SILT	CUMULATIVE PERCENT RETAINED (SIEVES EXPRESSED IN PHI)															
					GRAVEL			GRANULAR		SAND										FINES
					-4.25	-3.25	-2.25	-1.5	-1.0	-0.5	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	PAN
TB13 (+5.0)	0.49	1.02	1.00	0.58	0.00	0.00	0.21	0.99	2.40	6.70	14.20	30.01	49.96	64.98	80.07	94.63	98.72	99.40	99.42	99.85
TB14 (+3.0)	0.21	2.26	0.32	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.04	0.92	16.69	79.82	98.65	99.14	99.20	99.97
TB15 (+3.0)	0.58	0.78	1.43	0.46	0.00	0.00	0.00	0.00	0.14	43.17	44.25	46.48	49.74	53.51	63.01	93.09	99.34	99.52	99.54	99.94
TB16 (+4.0)	0.20	2.29	0.35	0.46	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.05	0.12	1.12	15.22	78.24	97.57	99.20	99.54	99.93
TB17 (+3.0)	0.20	2.32	0.29	1.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.25	8.43	76.79	97.84	98.66	98.74	99.91
TB18 (+4.1)	0.23	2.15	0.40	0.96	0.00	0.00	0.00	0.00	0.01	0.04	0.07	0.14	0.62	4.81	29.57	83.94	98.23	98.95	99.04	99.97
TB19 (4.5)	0.23	2.10	0.53	0.86	0.00	0.00	0.00	0.00	0.01	0.24	0.72	1.32	3.14	9.88	32.40	82.56	97.44	98.82	99.14	99.90
TB20 (+3)	0.23	2.10	0.37	1.22	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.11	0.42	3.48	35.46	88.56	98.24	98.71	98.78	99.91
TB21 (+3)	0.19	2.37	0.36	1.18	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.03	0.04	0.55	9.96	69.35	95.56	98.04	98.82	99.93
TB22 (+3)	0.22	2.18	0.66	1.65	0.00	0.84	0.84	0.84	0.84	0.86	0.93	0.95	1.12	3.36	23.31	77.39	97.24	98.24	98.35	99.75
TB23 (+3)	0.19	2.39	0.33	1.31	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.02	0.30	8.71	63.50	96.59	98.55	98.69	100.00
TB24 Base scarp	0.25	2.01	0.52	1.23	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.24	2.27	7.51	52.97	90.84	93.12	96.07	98.77	99.75
+3.0 ft COMPOSITE	**0.25**	**2.00**	**0.82**	**1.00**	**0.00**	**0.07**	**0.09**	**0.15**	**0.28**	**4.25**	**5.03**	**6.61**	**8.96**	**12.56**	**31.32**	**81.56**	**97.38**	**98.61**	**99.00**	**99.90**
TB13-MSL (0.0)	0.31	1.71	0.65	0.01	0.00	0.00	0.00	0.00	0.01	0.09	0.79	4.64	15.94	33.36	59.87	93.75	99.78	99.96	99.99	100.00
TB14-MSL (0.0)	0.26	1.92	0.43	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.05	1.42	15.41	54.25	93.57	99.42	99.62	99.64	100.00
TB15-MSL (0.0)	0.29	1.81	0.62	0.90	0.00	0.00	0.00	0.00	0.00	0.02	0.24	2.43	12.05	28.54	53.30	90.52	98.81	99.09	99.11	100.00
TB16-MSL (0.0)	0.25	1.99	0.42	0.59	0.00	0.00	0.00	0.00	0.00	0.01	0.04	0.14	1.06	10.55	49.03	91.27	98.98	99.36	99.40	100.00
TB17-MSL (0.0)	0.35	1.53	0.87	0.79	0.00	0.00	0.00	0.07	0.30	1.26	4.58	14.60	28.17	42.90	61.01	88.96	98.79	99.18	99.21	100.00
TB18-MSL (0.0)	0.19	2.38	0.31	0.85	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.04	0.07	0.25	5.37	69.66	96.72	99.06	99.16	100.00
TB19-MSL (0.0)	0.37	1.42	1.16	0.83	0.00	0.00	1.01	3.35	4.75	7.18	11.68	18.73	27.96	41.11	60.88	86.83	98.44	99.13	99.17	100.00
TB20-MSL (0.0)	0.37	1.44	0.98	0.79	0.00	0.00	0.15	0.97	1.82	3.77	8.36	15.94	30.01	45.43	64.68	88.51	98.70	99.21	99.22	100.00
TB21-MSL (0.0)	0.36	1.49	0.86	0.75	0.00	0.00	0.21	0.56	0.81	1.59	4.05	10.58	27.89	48.24	67.96	89.06	98.52	99.19	99.24	100.00
TB22-MSL (0.0)	0.28	1.83	0.58	0.99	0.00	0.00	0.00	0.00	0.00	0.03	0.09	0.31	5.78	31.07	61.22	84.86	97.84	98.91	99.01	100.00
TB23-MSL (0.0)	0.30	1.74	0.68	0.59	0.00	0.00	0.00	0.00	0.01	0.15	0.81	3.87	13.25	35.81	61.47	86.52	98.42	99.36	99.40	100.00
TB24-MSL (0.0)	0.19	2.38	0.36	0.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.05	0.35	9.33	70.37	93.90	98.50	99.22	100.00
MSL COMPOSITE	**0.29**	**1.80**	**0.77**	**0.69**	**0.00**	**0.00**	**0.11**	**0.41**	**0.64**	**1.18**	**2.55**	**5.94**	**13.64**	**27.75**	**50.70**	**86.16**	**98.19**	**99.21**	**99.31**	**100.00**
TB13-MLW (-1.9)	0.27	1.87	0.65	1.22	0.00	0.00	0.00	0.02	0.03	0.19	1.53	5.18	11.54	19.92	44.34	90.55	98.45	98.75	98.78	100.00
TB14-MLW (-1.9)	0.29	1.77	0.57	1.38	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.15	8.17	36.32	58.40	90.15	98.27	98.61	98.62	100.00
TB15-MLW (-1.9)	0.29	1.78	0.86	0.89	0.00	0.00	0.00	0.07	0.24	1.12	4.78	12.10	19.64	26.11	42.43	86.20	98.55	99.06	99.10	100.00
TB16-MLW (-1.9)	0.28	1.85	0.98	1.08	0.00	0.00	0.49	2.06	3.24	5.34	7.35	8.90	11.11	17.66	35.98	85.00	98.20	98.82	98.90	100.00
TB17-MLW (-1.9)	0.57	0.82	1.48	0.53	2.72	2.72	5.84	10.13	14.31	20.42	27.60	36.49	45.36	54.01	65.80	87.95	98.68	99.42	99.48	100.00
TB18-MLW (-1.9)	0.21	2.27	0.67	0.99	0.00	0.00	0.00	0.20	0.46	0.77	1.37	2.36	4.39	9.08	20.87	63.63	91.61	97.97	99.02	100.00
TB19-MLW (-1.9)	0.30	1.75	0.72	0.82	0.00	0.00	0.00	0.35	0.64	1.18	2.11	4.63	12.10	31.24	58.34	88.59	98.50	99.11	99.18	100.00
TB20-MLW (-1.9)	0.41	1.29	1.30	1.14	0.00	0.00	0.69	4.41	7.84	12.17	17.54	22.88	32.08	44.54	60.14	84.93	98.12	98.82	98.85	100.00
TB21-MLW (-1.9)	0.71	0.49	1.50	0.54	0.00	1.09	5.43	12.29	16.88	23.52	33.02	44.26	58.20	70.80	82.81	94.20	99.10	99.41	99.45	100.00
TB22-MLW (-1.9)	0.42	1.24	1.04	0.74	0.00	0.00	0.00	0.77	1.87	4.74	12.25	24.07	41.52	56.69	71.68	86.89	97.94	99.26	99.28	100.00
TB23-MLW (-1.9)	0.66	0.59	1.56	0.51	0.00	0.00	2.38	9.94	18.15	29.48	38.89	47.24	55.27	63.56	73.80	88.41	98.11	99.42	99.49	100.00
TB24-MLW (-1.9)	0.24	2.07	0.58	1.08	0.00	0.00	0.00	0.15	0.31	0.67	1.35	2.39	4.31	9.86	33.51	83.36	97.51	98.80	98.91	100.00
MLW COMPOSITE	**0.36**	**1.48**	**1.19**	**0.91**	**0.23**	**0.32**	**1.24**	**3.36**	**5.33**	**8.30**	**12.32**	**17.55**	**25.31**	**36.65**	**54.01**	**85.82**	**97.75**	**98.95**	**99.09**	**100.00**
TB13 (-6.0)	0.19	2.38	0.73	0.95	0.00	0.00	0.00	0.15	0.30	0.60	1.23	2.86	5.61	8.92	15.30	55.16	84.13	96.21	99.06	100.00
TB14 (-6.0)	0.20	2.33	0.68	1.01	0.00	0.00	0.00	0.08	0.20	0.60	1.34	2.51	4.66	8.26	17.81	61.69	87.73	97.18	98.98	100.00
TB15 (-6.0)	0.18	2.46	0.64	0.96	0.00	0.00	0.00	0.01	0.05	0.28	0.87	1.77	3.62	6.66	13.12	46.47	85.63	96.48	99.03	100.00
TB16 (-6.0)	0.57	0.81	1.44	0.39	0.00	0.00	0.41	4.83	10.95	20.63	32.22	44.97	56.28	63.87	70.22	83.22	96.62	99.17	99.61	100.00
TB17 (-6.0)	0.19	2.43	0.85	0.70	0.00	0.00	0.26	1.05	1.81	2.68	3.45	4.02	4.74	6.20	11.49	43.71	85.71	96.97	99.30	100.00
TB18 (-6.0)	0.17	2.53	0.79	1.05	0.00	0.00	0.00	0.51	1.02	1.70	2.48	3.42	4.72	6.63	11.25	33.35	80.93	96.01	98.94	100.00
TB19 (-6.0)	0.18	2.50	0.68	0.97	0.00	0.00	0.00	0.10	0.28	0.55	0.95	1.50	2.96	6.93	15.75	40.40	82.12	95.59	99.03	100.00
TB20 (-6.0)	0.72	0.48	1.58	0.46	0.00	0.00	2.18	9.00	18.27	29.80	43.94	56.07	66.15	70.76	73.88	81.36	96.21	98.96	99.55	100.00
TB21 (-6.0)	0.20	2.33	1.31	1.12	0.00	1.88	2.32	3.06	3.75	4.82	6.14	7.53	9.53	12.09	17.06	35.06	78.63	93.64	98.87	100.00
TB22 (-6.0)	0.28	1.86	1.55	1.22	0.00	0.00	1.29	4.57	7.82	11.52	14.80	18.64	23.46	30.22	38.30	51.41	76.02	92.52	98.79	100.00
TB23 (-6.0)	0.18	2.48	0.96	0.77	0.00	0.00	0.24	1.09	2.05	3.23	4.29	5.35	6.50	8.31	12.65	33.71	78.92	94.68	99.24	100.00
TB24 (-6.0)	0.21	2.25	0.75	1.64	0.00	0.00	0.07	0.19	0.57	1.24	2.23	3.80	6.48	10.85	20.09	60.42	91.17	97.46	98.37	100.00
-6.0 ft COMPOSITE	**0.24**	**2.07**	**1.25**	**0.94**	**0.00**	**0.16**	**0.56**	**2.05**	**3.92**	**6.47**	**9.49**	**12.70**	**16.23**	**19.98**	**26.41**	**52.16**	**85.32**	**96.24**	**99.06**	**100.00**

ELEVATION COMPOSITES - NORTH TOPSAIL BEACH SAMPLES (3 of 4)

SAMPLE I. D.	MEAN (mm)	PHI MEAN	PHI SORTING	% SILT	CUMULATIVE PERCENT RETAINED (SIEVES EXPRESSED IN PHI)															
					GRAVEL			GRANULAR		SAND										FINES
					-4.25	-3.25	-2.25	-1.5	-1.0	-0.5	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	PAN
TB13 (-8.0)	0.19	2.37	0.72	1.02	0.00	0.00	0.00	0.17	0.26	0.66	1.31	2.48	4.83	9.02	18.98	52.11	86.15	96.34	98.98	100.00
TB14 (-8.0)	0.20	2.31	0.64	0.32	0.00	0.00	0.00	0.00	0.08	0.26	0.73	1.74	4.06	8.30	19.74	66.90	88.57	97.15	99.68	100.00
TB15 (-8.0)	0.70	0.52	1.27	1.06	0.00	0.71	2.73	6.43	11.23	18.96	29.17	43.66	62.71	79.37	88.31	94.49	97.57	98.58	98.95	100.00
TB16 (-8.0)	0.26	1.97	1.07	0.91	0.00	0.00	0.54	0.94	1.69	3.41	6.22	10.64	16.58	23.77	34.72	67.91	89.32	97.09	99.09	100.00
TB17 (-8.0)	0.19	2.43	0.85	0.70	0.00	0.00	0.26	1.05	1.81	2.68	3.45	4.02	4.74	6.20	11.49	43.71	85.71	96.97	99.30	100.00
TB18 (-8.0)	0.17	2.52	0.88	0.76	0.00	0.00	0.47	0.94	1.48	2.16	2.95	3.85	5.07	7.00	11.68	34.85	78.70	95.27	99.25	100.00
TB19 (-8.0)	0.43	1.22	1.38	1.09	0.00	0.00	3.40	5.39	7.49	10.57	14.77	22.52	37.03	56.16	68.56	79.17	93.76	98.19	98.91	100.00
TB20 (-8.0)	0.18	2.44	0.97	1.87	0.00	0.00	0.15	0.61	1.07	1.75	2.93	4.56	7.98	13.11	20.49	41.04	72.59	90.04	98.15	100.00
TB21 (-8.0)	0.16	2.64	0.91	0.21	0.00	0.00	0.17	0.37	0.66	1.06	1.78	2.90	7.49	10.31	15.17	29.50	65.09	86.19	99.80	100.00
TB22 (-8.0)	0.23	2.09	1.59	1.79	0.00	0.00	3.74	6.32	8.22	10.07	12.08	14.33	17.11	20.73	25.41	37.31	74.40	91.01	98.20	100.00
TB23 (-8.0)	0.15	2.76	0.89	2.87	0.00	0.00	0.31	1.07	1.30	1.72	2.37	3.37	4.49	5.89	8.31	17.06	58.84	86.67	97.14	100.00
TB24 (-8.0)	0.21	2.25	0.57	2.21	0.00	0.00	0.00	0.05	0.14	0.32	0.69	1.33	2.64	6.70	21.85	69.48	92.34	97.04	97.79	100.00
-8.0 ft COMPOSITE	**0.23**	**2.13**	**1.19**	**1.23**	**0.00**	**0.06**	**0.98**	**1.95**	**2.95**	**4.47**	**6.54**	**9.62**	**14.56**	**20.55**	**28.73**	**52.79**	**81.92**	**94.21**	**98.77**	**100.00**
TB13 (-12.0)	0.19	2.40	0.77	2.27	0.00	0.00	0.06	0.36	0.67	1.12	1.83	2.82	4.65	7.87	15.62	53.07	83.02	92.98	97.73	100.00
TB14 (-12.0)	0.21	2.27	0.89	1.22	0.00	0.00	0.60	0.60	1.01	1.91	3.15	4.88	7.48	11.08	19.28	59.67	86.83	94.75	98.78	100.00
TB15 (-12.0)	0.19	2.41	0.84	2.19	0.00	0.00	0.37	0.55	0.85	1.52	2.37	3.65	5.30	7.35	12.83	55.67	79.93	91.54	97.81	100.00
TB16 (-12.0)	0.21	2.28	1.03	1.47	0.00	0.00	0.27	1.00	1.78	3.50	5.25	7.14	9.71	13.25	20.35	52.19	81.16	93.50	98.54	100.00
TB17 (-12.0)	0.18	2.48	1.01	1.76	0.00	0.00	1.15	1.91	2.65	3.47	4.09	4.62	5.29	6.33	10.05	39.52	77.89	92.12	98.27	100.00
TB18 (-12.0)	0.19	2.38	1.09	0.87	0.00	0.00	0.52	1.75	3.10	4.27	5.55	6.98	9.02	11.88	16.44	37.07	78.81	94.93	99.13	100.00
TB19 (-12.0)	0.16	2.61	0.74	2.08	0.00	0.00	0.00	0.08	0.26	0.55	1.02	1.86	3.64	6.74	12.41	33.35	72.62	89.84	97.90	100.00
TB20 (-12.0)	0.15	2.78	0.90	3.91	0.00	0.00	0.37	0.57	0.89	1.21	1.78	2.64	4.26	6.55	10.23	23.25	56.26	77.60	96.11	100.00
TB21 (-12.0)	0.19	2.38	1.31	2.77	0.00	2.25	2.35	3.18	3.53	3.98	4.77	5.90	8.38	11.79	17.09	35.47	72.81	89.27	97.22	100.00
TB22 (-12.0)	0.21	2.27	1.67	1.85	0.00	3.80	5.07	6.97	7.79	8.54	9.21	9.92	10.90	12.49	15.10	26.32	73.65	91.38	98.13	100.00
TB23 (-12.0)	0.16	2.60	1.03	4.13	0.00	0.00	0.19	1.19	1.80	2.68	3.75	5.11	6.90	9.26	13.80	28.49	61.65	84.34	95.85	100.00
TB24 (-12.0)	0.29	1.78	0.87	1.61	0.00	0.00	0.00	0.11	0.18	0.96	2.94	7.39	17.06	34.36	56.90	78.04	92.00	97.21	98.40	100.00
-12.0 ft COMPOSITE	**0.19**	**2.39**	**1.07**	**2.18**	**0.00**	**0.50**	**0.91**	**1.52**	**2.04**	**2.81**	**3.81**	**5.24**	**7.72**	**11.58**	**18.34**	**43.51**	**76.38**	**90.79**	**97.82**	**100.00**
TB13 (-14.0)	0.19	2.40	0.77	2.71	0.00	0.00	0.00	0.10	0.42	1.21	2.11	3.18	4.61	6.74	13.35	58.81	80.23	91.50	97.28	100.00
TB14 (-14.0)	0.19	2.37	0.62	0.79	0.00	0.00	0.00	0.20	0.34	0.56	0.93	1.64	2.94	5.15	12.54	65.36	88.34	96.13	99.20	100.00
TB15 (-14.0)	0.19	2.42	0.93	1.87	0.00	0.00	0.81	1.73	2.15	2.69	3.21	3.84	4.71	5.83	10.32	50.63	81.01	92.94	98.13	100.00
TB16 (-14.0)	0.17	2.53	0.82	1.79	0.00	0.00	0.00	0.95	1.51	2.18	2.59	3.03	3.70	4.88	8.74	42.09	78.39	91.72	98.21	100.00
TB17 (-14.0)	0.19	2.41	1.08	1.99	0.00	0.00	0.85	2.55	3.49	4.45	5.08	5.71	6.37	7.51	11.43	45.18	77.40	91.62	98.00	100.00
TB18 (-14.0)	0.18	2.44	0.94	2.42	0.00	0.00	0.00	0.35	1.04	2.26	3.73	5.66	7.95	10.59	15.64	39.29	77.28	91.22	97.58	100.00
TB19 (-14.0)	0.18	2.49	0.86	1.79	0.00	0.00	0.29	0.72	1.03	1.57	2.19	3.21	5.04	8.64	15.01	39.71	77.42	92.07	98.23	100.00
TB20 (-14.0)	0.14	2.79	0.46	3.61	0.00	0.00	0.00	0.00	0.00	0.02	0.07	0.20	0.43	0.91	2.71	21.48	66.24	92.73	96.39	100.00
TB21 (-14.0)	0.19	2.40	1.23	2.36	0.00	1.75	2.28	2.69	2.96	3.46	4.27	5.46	7.96	11.80	17.51	32.86	72.39	94.84	97.65	100.00
TB22 (-14.0)	0.17	2.59	0.71	1.83	0.00	0.00	0.00	0.11	0.50	1.02	1.54	2.24	3.36	6.11	10.80	28.35	80.05	93.14	98.17	100.00
TB23 (-14.0)	0.14	2.81	0.75	7.22	0.00	0.00	0.22	0.47	0.66	0.95	1.34	1.77	2.37	3.42	6.24	17.64	57.85	81.74	92.78	100.00
TB24 (-14.0)	0.19	2.40	0.60	1.49	0.00	0.00	0.00	0.03	0.11	0.28	0.52	0.92	1.82	5.04	17.42	58.40	85.70	95.27	98.50	100.00
-14.0 ft COMPOSITE	**0.18**	**2.50**	**0.85**	**2.49**	**0.00**	**0.15**	**0.37**	**0.82**	**1.18**	**1.72**	**2.30**	**3.07**	**4.27**	**6.39**	**11.81**	**41.65**	**76.86**	**92.08**	**97.51**	**100.00**
TB13 (-18.0)	0.18	2.47	0.67	1.98	0.00	0.00	0.02	0.20	0.41	0.71	1.06	1.58	2.77	5.38	10.47	52.12	82.48	93.79	98.03	100.00
TB14 (-18.0)	0.18	2.47	0.56	1.68	0.00	0.00	0.00	0.13	0.25	0.40	0.61	1.02	1.90	3.06	6.65	56.96	86.09	95.16	98.32	100.00
TB15 (-18.0)	0.16	2.63	0.44	2.47	0.00	0.00	0.00	0.00	0.02	0.03	0.04	0.05	0.13	0.29	1.71	41.60	81.28	93.12	97.53	100.00
TB16 (-18.0)	0.16	2.66	0.50	1.11	0.00	0.00	0.00	0.00	0.04	0.11	0.17	0.25	0.37	1.92	4.50	34.32	79.54	93.79	98.90	100.00
TB17 (-18.0)	0.15	2.70	0.62	3.56	0.00	0.00	0.00	0.24	0.48	0.71	0.93	1.15	1.40	1.81	3.66	30.41	72.25	88.98	96.45	100.00
TB18(-18.0)	0.31	1.70	0.94	18.47	0.00	0.00	0.22	0.56	1.17	2.64	5.00	8.39	15.00	27.07	43.36	69.74	79.55	81.07	81.53	100.00
TB19 (-18.0)	0.16	2.66	0.72	2.35	0.00	0.00	0.29	0.42	0.57	0.80	1.06	1.48	2.22	4.38	9.97	27.73	72.68	91.02	97.65	100.00
TB20 (-18.0)	0.14	2.81	0.54	4.45	0.00	0.00	0.00	0.11	0.19	0.22	0.32	0.47	0.93	1.87	5.21	18.97	60.46	91.46	95.56	100.00
TB21 (-18.0)	0.19	2.38	0.67	1.87	0.00	0.00	0.00	0.06	0.16	0.32	0.60	1.32	3.23	9.09	22.17	51.65	83.44	97.11	98.13	100.00
TB22 (-18.0)	0.22	2.20	0.66	1.76	0.00	0.00	0.00	0.07	0.17	0.33	0.63	1.29	3.19	10.28	36.02	66.29	89.40	96.65	98.24	100.00
TB23 (-18.0)	0.14	2.84	0.54	8.92	0.00	0.00	0.00	0.00	0.01	0.09	0.17	0.35	0.70	1.84	5.86	14.76	59.61	82.61	91.09	100.00
TB24 (-18.0)	0.18	2.51	0.63	3.08	0.00	0.00	0.04	0.22	0.27	0.40	0.67	1.10	2.25	5.11	12.42	40.28	83.62	93.61	96.92	100.00
-18.0 ft COMPOSITE	**0.18**	**2.51**	**0.69**	**4.31**	**0.00**	**0.00**	**0.05**	**0.17**	**0.31**	**0.56**	**0.94**	**1.54**	**2.84**	**6.01**	**13.50**	**42.07**	**77.53**	**91.53**	**95.69**	**100.00**

ELEVATION COMPOSITES - NORTH TOPSAIL BEACH SAMPLES (4 of 4)

SAMPLE I. D.	MEAN (mm)	PHI MEAN	PHI SORTING	% SILT	CUMULATIVE PERCENT RETAINED (SIEVES EXPRESSED IN PHI)															
					GRAVEL			GRANULAR		SAND										FINES
					-4.25	-3.25	-2.25	-1.5	-1.0	-0.5	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	PAN
TB13 (-20.0)	0.17	2.53	0.63	2.59	0.00	0.00	0.00	0.03	0.11	0.33	0.68	1.19	2.43	5.62	10.50	41.13	81.79	92.97	97.43	100.00
TB14 (-20.0)	0.17	2.55	0.61	2.32	0.00	0.00	0.01	0.15	0.27	0.45	0.76	1.25	2.54	4.39	7.31	40.87	83.03	93.42	97.68	100.00
TB15 (-20.0)	0.16	2.65	0.45	2.31	0.00	0.00	0.00	0.00	0.02	0.03	0.10	0.18	0.33	0.64	2.43	36.71	81.28	93.24	97.68	100.00
TB16 (-20.0)	0.16	2.68	0.50	2.24	0.00	0.00	0.00	0.00	0.01	0.09	0.20	0.38	0.61	1.39	4.43	30.74	78.18	92.31	97.76	100.00
TB17 (-20.0)	0.16	2.61	0.78	3.50	0.00	0.00	0.00	0.52	1.05	1.72	2.39	2.99	3.72	4.67	7.85	28.95	75.50	90.03	96.48	100.00
TB18(-20.0)	0.27	1.89	0.87	0.77	0.00	0.00	0.61	1.93	2.65	3.77	4.93	6.25	8.70	14.58	30.86	96.65	96.36	98.96	99.23	100.00
TB19 (-20.0)	0.25	2.02	0.91	1.61	0.00	0.00	0.16	0.45	1.10	2.17	3.86	6.54	11.05	20.88	39.27	67.35	90.66	97.24	98.37	100.00
TB20 (-20.0)	0.14	2.81	0.60	5.43	0.00	0.00	0.00	0.03	0.05	0.07	0.14	0.26	0.81	2.40	7.34	23.02	59.39	83.83	94.56	100.00
TB21 (-20.0)	0.18	2.49	0.88	2.11	0.00	0.00	0.00	0.17	0.28	0.72	1.84	3.47	6.54	12.22	21.51	39.58	69.56	90.56	97.88	100.00
TB22(-20.0)	0.65	0.63	2.00	4.36	0.00	5.96	12.59	16.65	20.39	25.68	31.07	36.51	42.70	51.59	66.08	81.96	90.77	94.53	95.64	100.00
TB23 (-20.0)	0.17	2.58	0.80	7.82	0.00	0.00	0.00	0.05	0.20	0.51	1.05	1.91	3.46	7.52	17.90	36.25	63.50	83.04	92.18	100.00
TB24 (-20.0)	0.17	2.57	0.61	2.43	0.00	0.00	0.02	0.12	0.16	0.33	0.61	1.05	2.04	4.54	11.38	35.12	81.85	93.52	97.56	100.00
-20.0 ft COMPOSITE	**0.20**	**2.34**	**1.06**	**3.13**	**0.00**	**0.50**	**1.12**	**1.68**	**2.19**	**2.99**	**3.97**	**5.16**	**7.08**	**10.87**	**18.90**	**46.53**	**79.32**	**91.97**	**96.87**	**100.00**

PERCENTAGE OF MATERIAL BY SEDIMENT GRAIN SIZE CATEGORY
NORTH TOPSAIL BEACH (1 of 4)

SAMPLE I. D.	FINE % (<0.0625mm)	SAND % (0.0625mm-2.00mm)	GRANULAR % (2mm-4.76mm)	GRAVEL % (4.76mm-76mm)
TB13 Dune	0.33	99.67	0.00	0.00
TB13 Toe of Dune	0.83	99.05	0.12	0.00
TB13-Berm (+7.0)	1.10	98.86	0.05	0.00
TB13 (+5.0)	0.58	97.02	2.19	0.21
TB13-MHW (+2.1)	0.52	99.42	0.07	0.00
TB13-MSL 0	0.01	99.98	0.01	0.00
TB13-MLW (-1.9)	1.22	98.75	0.03	0.00
TB13 (-6.0)	0.95	98.75	0.30	0.00
TB13 (-8.0)	1.02	98.72	0.26	0.00
TB13 (-12.0)	2.27	97.06	0.61	0.06
TB13 (-14.0)	2.71	96.86	0.42	0.00
TB13 (-18.0)	1.98	97.62	0.39	0.02
TB13 (-20.0)	2.59	97.32	0.11	0.00
TB13 COMPOSITE	**1.24**	**98.39**	**0.35**	**0.02**
TB14 Dune	0.21	99.79	0.00	0.00
TB14 Toe of Dune	0.40	99.43	0.17	0.00
TB14-Berm (+7.0)	0.40	99.43	0.18	0.00
TB14 (+3.0)	0.80	99.20	0.00	0.00
TB14-MHW (+2.1)	0.52	99.49	0.00	0.00
TB14-MSL 0	0.36	99.64	0.00	0.00
TB14-MLW (-1.9)	1.38	98.62	0.00	0.00
TB14 (-6.0)	1.01	98.79	0.20	0.00
TB14 (-8.0)	0.32	99.60	0.08	0.00
TB14 (-12.0)	1.22	97.77	0.41	0.60
TB14 (-14.0)	0.79	98.86	0.34	0.00
TB14 (-18.0)	1.68	98.06	0.25	0.00
TB14 (-20.0)	2.32	97.40	0.26	0.01
TB14 COMPOSITE	**0.88**	**98.93**	**0.15**	**0.05**
TB15 Dune	0.22	99.78	0.00	0.00
TB15 Toe of Dune	0.48	99.52	0.00	0.00
TB15-Berm (+7.0)	0.08	99.92	0.00	0.00
TB15 (+3.0)	0.46	99.40	0.14	0.00
TB15-MHW (+2.1)	0.44	99.56	0.00	0.00
TB15-MSL 0	0.90	99.11	0.00	0.00
TB15-MLW (-1.9)	0.89	98.87	0.24	0.00
TB15 (-6.0)	0.96	98.97	0.05	0.00
TB15 (-8.0)	1.06	87.72	8.50	2.73
TB15 (-12.0)	2.19	96.97	0.47	0.37
TB15 (-14.0)	1.87	95.98	1.34	0.81
TB15 (-18.0)	2.47	97.50	0.02	0.00
TB15 (-20.0)	2.31	97.66	0.02	0.00
TB15 COMPOSITE	**1.10**	**97.77**	**0.83**	**0.30**

PERCENTAGE OF MATERIAL BY SEDIMENT GRAIN SIZE CATEGORY
NORTH TOPSAIL BEACH (2 of 4)

SAMPLE I. D.	FINE % (<0.0625mm)	SAND % (0.0625mm-2.00mm)	GRANULAR % (2mm-4.76mm)	GRAVEL % (4.76mm-76mm)
TB16 Dune	0.15	99.85	0.00	0.00
TB16 Toe of Dune	0.22	99.73	0.05	0.00
TB16-Berm (+7.0)	0.11	99.89	0.00	0.00
TB16 (+4)	0.46	99.54	0.00	0.00
TB16-MHW (+2.1)	0.05	99.39	0.56	0.00
TB16-MSL 0	0.59	99.40	0.00	0.00
TB16-MLW (-1.9)	1.08	95.66	2.75	0.49
TB16 (-6.0)	0.39	88.66	10.55	0.41
TB16 (-8.0)	0.91	97.40	1.15	0.54
TB16 (-12.0)	1.47	96.76	1.51	0.27
TB16 (-14.0)	1.79	96.69	1.51	0.00
TB16 (-18.0)	1.11	98.86	0.04	0.00
TB16 (-20.0)	2.24	97.74	0.01	0.00
TB16 COMPOSITE	**0.81**	**97.66**	**1.39**	**0.13**
TB17 Dune	0.34	99.66	0.00	0.00
TB17 Toe of Dune	0.13	99.87	0.00	0.00
TB17-Berm (+7.0)	13.92	86.09	0.00	0.00
TB17 (+3.0)	1.26	98.74	0.00	0.00
TB17-MHW (+2.1)	0.24	99.76	0.00	0.00
TB17-MSL 0	0.79	98.91	0.30	0.00
TB17-MLW (-1.9)	0.53	85.18	8.47	5.84
TB17 (-6.0)	0.70	97.49	1.55	0.26
TB17 (-8.0)	0.70	97.49	1.55	0.26
TB17 (-12.0)	1.76	95.62	1.50	1.15
TB17 (-14.0)	1.99	94.51	2.64	0.85
TB17 (-18.0)	3.56	95.97	0.48	0.00
TB17 (-20.0)	3.50	95.43	1.05	0.00
TB17 COMPOSITE	**2.26**	**95.75**	**1.35**	**0.64**
TB18 Dune	0.45	99.51	0.04	0.00
TB18 Toe of Dune	0.03	99.97	0.00	0.00
TB18-Berm (+7.0)	0.25	99.75	0.00	0.00
TB18 (+4.1)	0.96	99.03	0.01	0.00
TB18-MHW (+2.1)	0.11	99.85	0.03	0.00
TB18-MSL 0	0.85	99.16	0.00	0.00
TB18-MLW (-1.9)	0.99	98.56	0.46	0.00
TB18 (-6.0)	1.05	97.92	1.02	0.00
TB18 (-8.0)	0.76	97.78	1.01	0.47
TB18 (-12.0)	0.87	96.03	2.58	0.52
TB18 (-14.0)	2.42	96.54	1.04	0.00
TB18 (-18.0)	18.47	80.36	0.95	0.22
TB18 (-20.0)	0.77	96.58	2.04	0.61
TB18 COMPOSITE	**2.15**	**97.00**	**0.71**	**0.14**

PERCENTAGE OF MATERIAL BY SEDIMENT GRAIN SIZE CATEGORY
NORTH TOPSAIL BEACH (3 of 4)

SAMPLE I. D.	FINE % (<0.0625mm)	SAND % (0.0625mm-2.00mm)	GRANULAR % (2mm-4.76mm)	GRAVEL % (4.76mm-76mm)
TB19 Dune	0.42	99.58	0.00	0.00
TB19 Toe of Dune	0.04	97.40	2.18	0.39
TB19-Berm (+7.0)	0.31	99.71	0.00	0.00
TB19 (+4.5)	0.86	99.13	0.01	0.00
TB19-MHW (+2.1)	0.30	99.67	0.03	0.00
TB19-MSL 0	0.83	94.42	3.75	1.01
TB19-MLW (-1.9)	0.82	98.54	0.64	0.00
TB19 (-6.0)	0.97	98.75	0.28	0.00
TB19 (-8.0)	1.09	91.42	4.08	3.40
TB19 (-12.0)	2.08	97.65	0.26	0.00
TB19 (-14.0)	1.79	97.19	0.74	0.29
TB19 (-18.0)	2.35	97.08	0.29	0.29
TB19 (-20.0)	1.61	97.27	0.94	0.16
TB19 COMPOSITE	**1.04**	**97.52**	**1.01**	**0.43**
TB20 Dune	1.56	97.17	0.69	0.58
TB20 Toe of Dune	0.36	99.60	0.04	0.00
TB20-Berm (+7.0)	0.28	99.71	0.00	0.00
TB20 (+3.0)	1.22	98.78	0.00	0.00
TB20-MHW (+2.1)	0.42	99.56	0.03	0.00
TB20-MSL 0	0.79	97.40	1.67	0.15
TB20-MLW (-1.9)	1.14	91.01	7.15	0.69
TB20 (-6.0)	0.46	81.28	16.09	2.18
TB20 (-8.0)	1.87	97.08	0.92	0.15
TB20 (-12.0)	3.91	95.22	0.52	0.37
TB20 (-14.0)	3.61	96.39	0.00	0.00
TB20 (-18.0)	4.45	95.37	0.19	0.00
TB20 (-20.0)	5.43	94.51	0.05	0.00
TB20 COMPOSITE	**1.96**	**95.62**	**2.10**	**0.32**
TB21 Dune	0.47	99.52	0.01	0.00
TB21 Toe of Dune	0.29	99.68	0.03	0.01
TB21-Berm (+7.0)	0.42	99.59	0.00	0.00
TB21 (+3.0)	1.18	98.82	0.00	0.00
TB21-MHW (+2.1)	0.02	99.98	0.00	0.00
TB21-MSL 0	0.75	98.43	0.60	0.21
TB21-MLW (-1.9)	0.54	82.57	11.45	5.43
TB21 (-6.0)	1.12	95.12	1.42	2.32
TB21 (-8.0)	0.21	99.14	0.49	0.17
TB21 (-12.0)	2.77	93.68	1.18	2.35
TB21 (-14.0)	2.36	94.69	0.68	2.28
TB21 (-18.0)	1.87	97.97	0.16	0.00
TB21 (-20.0)	2.11	97.60	0.28	0.00
TB21 COMPOSITE	**1.09**	**96.68**	**1.25**	**0.98**

PERCENTAGE OF MATERIAL BY SEDIMENT GRAIN SIZE CATEGORY
NORTH TOPSAIL BEACH (4 of 4)

SAMPLE I. D.	FINE % (<0.0625mm)	SAND % (0.0625mm-2.00mm)	GRANULAR % (2mm-4.76mm)	GRAVEL % (4.76mm-76mm)
TB22 Dune	1.19	98.27	0.54	0.00
TB22 Toe of Dune	0.26	99.74	0.00	0.00
TB22-Berm (+7.0)	0.13	99.85	0.02	0.00
TB22 (+3.0)	1.65	97.51	0.00	0.84
TB22-MHW (+2.1)	0.32	99.56	0.12	0.00
TB22-MSL 0	0.99	99.01	0.00	0.00
TB22-MLW (-1.9)	0.74	97.41	1.87	0.00
TB22 (-6.0)	1.22	90.97	6.53	1.29
TB22 (-8.0)	1.79	89.98	4.48	3.74
TB22 (-12.0)	1.85	90.34	2.72	5.07
TB22 (-14.0)	1.83	97.67	0.50	0.00
TB22 (-18.0)	1.76	98.07	0.17	0.00
TB22 (-20.0)	4.36	75.26	7.79	12.59
TB22 COMPOSITE	**1.39**	**94.90**	**1.90**	**1.81**
TB23 Dune	0.62	99.38	0.00	0.00
TB23 Toe of Dune	0.22	99.77	0.01	0.00
TB23-Berm (+7.0)	0.22	99.76	0.01	0.00
TB23 (+3.0)	1.31	98.69	0.00	0.00
TB23-MHW (+2.1)	0.36	99.65	0.00	0.00
TB23-MSL 0	0.59	99.39	0.01	0.00
TB23-MLW (-1.9)	0.51	81.34	15.77	2.38
TB23 (-6.0)	0.77	97.19	1.81	0.24
TB23 (-8.0)	2.87	95.83	1.00	0.31
TB23 (-12.0)	4.13	94.05	1.61	0.19
TB23 (-14.0)	7.22	92.12	0.44	0.22
TB23 (-18.0)	8.92	91.08	0.01	0.00
TB23 (-20.0)	7.82	91.98	0.20	0.00
TB23 COMPOSITE	**2.74**	**95.40**	**1.60**	**0.26**
TB24 Dune	0.72	99.28	0.00	0.00
TB24 Toe of Dune	0.55	96.94	1.44	1.08
TB24 Base Scarp	1.23	98.77	0.00	0.00
TB24-Berm (+7.0)	0.49	99.49	0.02	0.00
TB24-MHW (+2.1)	0.42	99.56	0.01	0.00
TB24-MSL 0	0.77	99.22	0.00	0.00
TB24-MLW (-1.9)	1.08	98.61	0.31	0.00
TB24 (-6.0)	1.64	97.80	0.50	0.07
TB24 (-8.0)	2.21	97.65	0.14	0.00
TB24 (-12.0)	1.61	98.22	0.18	0.00
TB24 (-14.0)	1.49	98.39	0.11	0.00
TB24 (-18.0)	3.08	96.65	0.23	0.04
TB24 (-20.0)	2.43	97.40	0.14	0.02
TB24 COMPOSITE	**1.36**	**98.31**	**0.24**	**0.09**
TOTAL BEACH COMPOSITE	**1.50**	**96.99**	**1.07**	**0.43**

APPENDIX 33

2006 CPE INDIVIDUAL BEACH GRANULARMETRIC REPORTS (DIGITAL COPY ONLY)

APPENDIX 34

2006 CPE INDIVIDUAL BEACH GRAIN SIZE DISTRIBUTION CURVES/HISTOGRAMS (DIGITAL COPY ONLY)

APPENDIX 35

2006 COMPOSITE BEACH GRANULARMETRIC REPORTS (DIGITAL COPY ONLY)

APPENDIX 36

2006 COMPOSITE BEACH GRAIN SIZE DISTRIBUTION CURVES/HISTOGRAMS (DIGITAL COPY ONLY)

APPENDIX D

Nearshore Sidescan Sonar Mapping Report

APPENDIX D

Nearshore Sidescan Sonar Mapping Report

NORTH TOPSAIL BEACH SHORELINE PROTECTION PROJECT: NEARSHORE SIDESCAN SONAR MAPPING REPORT

Prepared For:

The Town of North Topsail Beach

Prepared By:
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Kenneth Willson, Coastal Geologist

Coastal Planning & Engineering, Inc.
Boca Raton, Florida

November 2006

NORTH TOPSAIL BEACH SHORELINE PROTECTION PROJECT:
NEARSHORE SIDESCAN SONAR MAPPING REPORT

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1 2004 Sidescan Mapping of Hardbottom
2 2006 Sidescan Mapping of Hardbottom

NORTH TOPSAIL BEACH SHORELINE PROTECTION PROJECT: NEARSHORE SIDESCAN SONAR MAPPING REPORT

Coastal Planning & Engineering, Inc. (CPE) was contracted by North Topsail Beach in November 2004 to conduct a sidescan sonar survey and perform ground truthing dives to identify nearshore hardbottom resources offshore the northern 7.25 mile coast of North Topsail Beach. Subsequently, the Town contracted CPE to conduct a similar survey for the southern 3.85 mile coast. The southern section of the Town was thus added to the beach nourishment project in June 2006. The survey area extended from the New River Inlet ebb-tidal shoal (station 1160+00), south to the Surf City/North Topsail Beach border (station 580+00) (Figure 1). The sidescan data covered the seafloor from the shoreline to approximately 2,200 feet offshore.

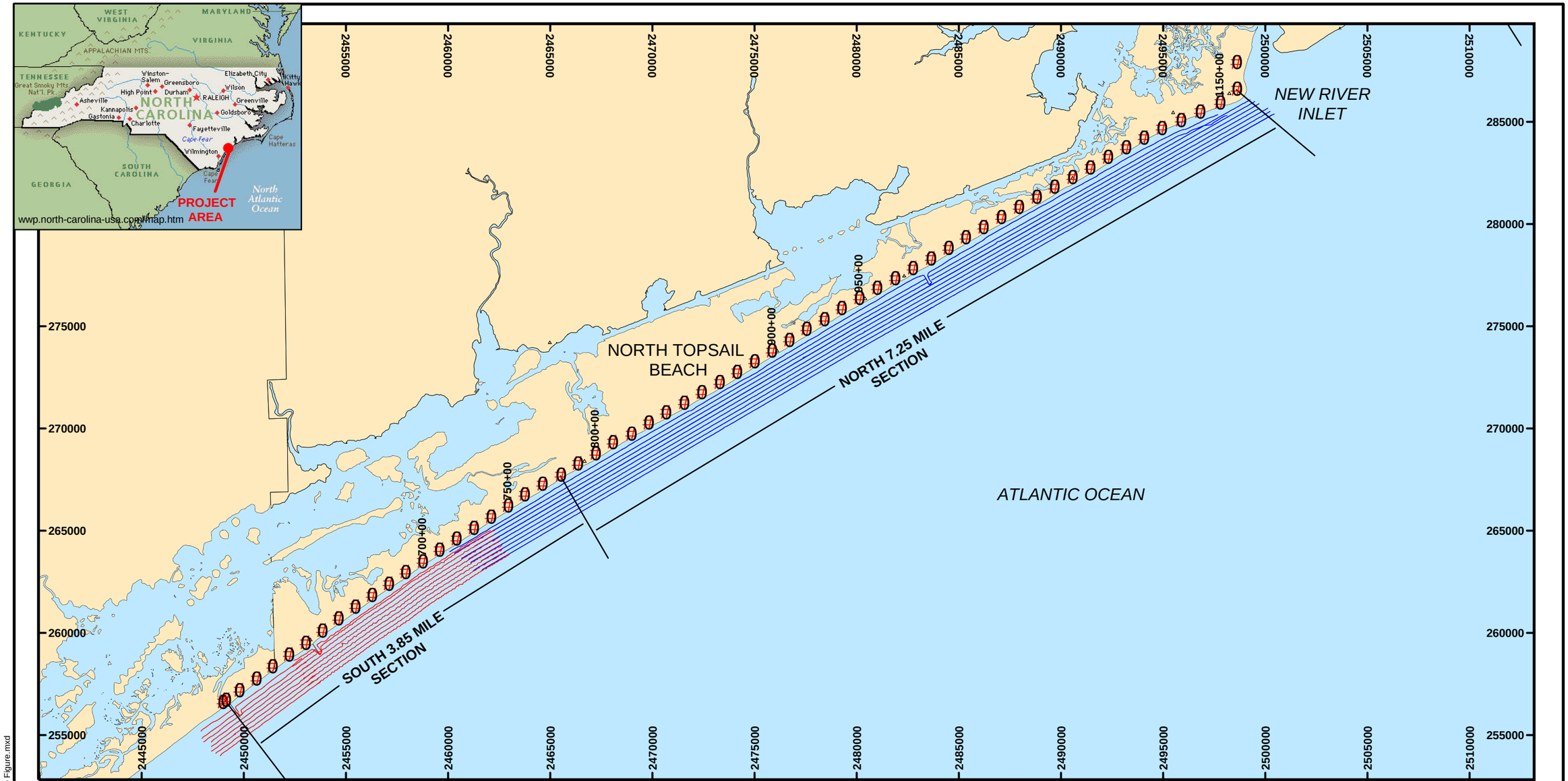
I. INTRODUCTION

The surface of the inner continental shelf of southeast North Carolina is characterized by exposure of lithified Oligocene siltstones and limestones covered by relatively thin layers of Holocene sediments (Snyder *et al*., 1994; Willson and Cleary, 2003). Because exposed hardbottoms (rock outcrops) may provide benthic habitat that could be adversely affected during dredging and pipeline placement operations, it is essential to map their spatial occurrence in order to design projects that avoid and minimize effects to natural resources.

II. STUDY AREA GEOLOGY AND GEOMORPHOLOGY

The 326 mile coastline of North Carolina is separated by Cape Lookout into two distinct provinces. The southern province extends from Cape Lookout to Cape Fear. The embayment located between the two Capes is Onslow Bay, which is underlain by Miocene to Pleistocene age rock units (Snyder *et al*., 1982; Snyder *et al*., 1994; Cleary *et al*., 1996; Willson and Cleary, 2003). These units are composed of material associated with the Carolina Platform, which underlies the region between Myrtle Beach, South Carolina and Cape Fear, North Carolina. This structural platform was diastrophically uplifted, which resulted in the truncation of surficial rock units by the migrating shoreface. Consequently, an erosional topography exists throughout Onslow Bay with only a thin veneer of sediment and widespread exposure of rock outcroppings across the shoreface.

The North Topsail Beach coastal area is a submarine headland that forms a small seaward bulge in the coastline of central Onslow Bay (Riggs *et al*., 1996). This shoreline protrusion is produced by the Oligocene Silverdale Formation (Fm.), an indurated moldic limestone and calcareous-cemented quartz sandstone unit. The Silverdale Fm. is exposed at or slightly below sea level in the mouth of the New River estuary and as a series of bathymetric ridges on the inner shelf (Crowson, 1980). These prominent submarine rock features were mapped as a series of rock ridges that occur seaward of the lower shoreface (Crowson, 1980). The submarine ridges, which have steep landward-facing scarps but smooth surfaces that dip gently seaward from the beach, display up to five (5) meters of



NOTES

1. COORDINATES SHOWN HEREON ARE IN FEET BASED ON THE NORTH CAROLINA STATE PLANE COORDINATE SYSTEM, NORTH AMERICAN DATUM (NAD 1983)

LEGEND

- USACE BASELINE STATIONS
- PROJECT LIMITS
- SURVEY TRACKLINES FOR AUGUST 2006
- SURVEY TRACKLINES FOR NOVEMBER 2004

0 2,500 5,000 Feet

TITLE:

NORTH TOPSAIL BEACH NEARSHORE SIDESCAN SONAR SURVEY AREA

COASTAL PLANNING & ENGINEERING, INC
2481 NW BOCA RATON BLVD.
BOCA RATON, FL 33431
PH. (561) 391-8102
FAX.(561) 391-9116

DATE: 10/30/06	BY: KTW	COMM NO: 4600.44	FIGURE 1

G:\North Carolina\46000\MXD\Sidescan Report\Trackline Figure.mxd

relief above the surrounding ravinement surface. The ridges rise locally to about 5 m below Mean Sea Level (MSL), higher than the elevation of the lower shoreface, which is probably high enough to cause major refraction of storm waves and currents and possibly affect the patterns of erosion and deposition on adjacent beaches (Cleary and Hosier, 1987). The rock ridges continue under Onslow Beach and into the back-barrier estuarine system. Similar ridges pass beneath Topsail Island and into the back-barrier estuarine system (Clark *et al*., 1986) where the rock structures appear to be related to the occurrence and orientation of Pleistocene barrier island systems.

The Oligocene submarine headland (Silverdale Formation) divides the coastal barriers into coastal compartments that have different orientations and shoreface dynamics. The northern section of Onslow Beach is characterized by a cuspate shoreline geometry with wide beaches, a recurved accretionary beach ridge, a nearly continuous high dune ridge, and shoreline accretion rates that average about six (6) feet per year (Cleary and Hosier, 1987). In contrast, the southern segment is characterized by a narrow shoreface with abundant rock gravel on the beach, a single discontinuous scarped foredune ridge, presence of major overwash terraces, and current erosion rates up to 18 ft per year. The gravels (occasionally up to boulder clast size), is derived from the rock scarps and lower shoreface and delivered to the beach during storms.

III. REMOTE SENSING SURVEY METHODOLOGY

Northern 7.25 Mile Survey

CPE geologists and hydrographic surveyors conducted a nearshore sidescan survey off of the northern 7.25 miles of North Topsail Beach on November 17, 18, and 19, 2004. The following equipment was used during the survey:

- Differential Global Positioning System (DGPS) – Trimble GPS and U.S. Coast Guard Navigation Beacon (Provides accurate positioning of the survey vessel).
- Navigation/Survey Integration System – Hypack Inc.'s "HYPACK MAX®" (Integrates DGPS data with data collected during the survey).
- EdgeTech's DF 1000 Sidescan Sonar System (SSS). – The SSS consists of a dual frequency (100/400 kHz) digital sidescan sonar tow fish, Digital Control Unit (DCU), and tow cable.
- CodaOctopus GeoSurvey DA50® data acquisition system.

These systems are described below:

Navigation System

The ability to establish accurate geographic positioning of geologic data sets and features within acoustic data sets are essential to hardbottom resources surveys. The navigation and positioning system used during the survey was a Trimble Differential Global Positioning System (DGPS) that was interfaced to Hypack Inc.'s HYPACK MAX®. A Pro Beacon receiver provided differential GPS correction from the U.S. Coast Guard

Navigational Beacon located at New Bern, North Carolina (Table 1). The DGPS initially receives the civilian signal from the global positioning system (GPS) NAVSTAR satellites. The locator automatically acquires and simultaneously tracks the NAVSTAR satellites, while receiving precisely measured code phase and Doppler phase shifts, which enables the receiver to compute the position and velocity of the vessel. The receiver then determines the time, latitude, longitude, height, and velocity ten times per second. The GPS accuracy, with differential correction used in this study, provides for a position accuracy of one (1) to four (4) ft, which is within the accuracy needed for geotechnical investigations. The U.S. Army Corps of Engineers (USACE) test of the U.S. Coast Guard beacons found an accuracy of at least 5 feet approximately 94% of the time.

Site Name	NEW BERN, NC
Status	Operational
RBn Antenna Location	35-10.5N, 77-2.92W
REFSTA Antenna Location (A)	35-10.50876N, 77-3.00149W
REFSTA Antenna Location (B)	35-10.4983N, 77-2.98893W
REFSTA RTCM SC-104 ID (A)	196
REFSTA RTCM SC-104 ID (B)	197
REFSTA Firmware Version	RD00-1C19
Broadcast Site ID	771
Transmit Frequency (KHz)	294
Transmit Rate (bps)	100
Signal Strength	75 uV at 140 NM

Table 1. U.S. Coast Guard (USCG) DGPS Site Status and Operating Parameters (From USCG Navigation Center)

Survey Integration via Hypack Inc.'s HYPACK MAX®

Navigational and sidescan sonar systems were interfaced with an onboard computer, and the data integrated in real time using Hypack, Inc.'s HYPACK MAX®, a state-of-the-art navigation and hydrographic surveying system. Online screen graphic displays include the pre-plotted survey lines, the updated boat track across the survey area, adjustable left/right indicator, as well as other positioning information such as boat speed, quality of fix, and line bearing. All data are recorded on the computer's hard disk and transferred to an external hard drive each day during the survey to back-up raw survey data. After post-processing, the navigation data (locational) is stored in the HYPACK MAX® system then exported to a *.dxf* file and imported into ESRI® ArcMap™ 9.1 in order to create a GIS shapefile for analysis and report preparation.

Nearshore Sidescan Sonar Survey

An EdgeTech DF 1000 sidescan sonar system was used to verify the unconsolidated sediment surface and to map hardbottom features within the nearshore zone. Hardbottom features were classified as high or low relief, isolated rock outcrops or by an equivalent descriptor. The DF 1000 uses modern microelectronic technology and digital data transmission to provide a convenient portable system for collecting high resolution

images of the seafloor. The sonar package included the Model DF 1000 digital underwater towfish with high speed digital data uplink, with the ability to blend 100/500 kHz data using Edgetech's Data Fusion™ technology. The package also includes the lightweight Kevlar single coax cable, and Digital Control Unit (DCU) which interfaces between the sidescan tow fish and the topside acquisition system.

The sidescan was towed at a position and depth to ensure isolation from sources of interference and for optimum record quality. The digital sidescan data was merged with positioning data (DGPS via HYPACK MAX®), video displayed, and recorded to the acquisition computer's hard disk for post processing and/or replay. At the end of the survey day all data was transferred to a USB memory stick and/or portable hard drive to back-up raw survey data. Hardcopy records were produced during data acquisition. The position of the sensor relative to the DGPS antenna was documented to ensure proper positioning of the data. The survey was conducted in such a manner to achieve total bottom coverage (200%) within the survey area.

The CodaOctopus Coda Mosaic software program was used to post-process the sidescan sonar data in a geographical framework and to mosaic the data. The geo-encoded sonar imagery data was collected as a **.cod* file. The *cod* files were then converted to **.xtf* files for archival purposes and the **.cod* files were used for post processing in the Coda Mosaic software. The **.cod* files were processed, by confirming proper bottom tracking and correcting any gaps in the bottom track for each line. The sidescan data files were then corrected for slant range. Video gain and time variable gain (TVG) settings were adjusted to maximize the image quality. The files were then merged together into a mosaic within the Coda software and exported in the form of geo-referenced sidescan mosaics (geo-tiff files). Morphological features observed in the sonar displays within the Coda Mosaic software were digitized in ESRI® ArcMap™ 9.1, and saved as **.shp* files.

CPE geologists conducted a nearshore sidescan survey off of the southern 3.85 miles of North Topsail Beach in August, 2006. The following equipment was used during the survey:

Southern 3.85 Mile Survey

The same navigation and survey integration systems used for the northern 7.25 miles were used for this survey; however, a different sidescan sonar system was used which is described below.

Nearshore Sidescan Sonar Survey

An EdgeTech 4200 FS sidescan sonar system was used to verify the unconsolidated sediment surface and to map potential and/or probable hardbottom features within the nearshore zone. Hardbottom features were classified as high or low relief, isolated rock outcrops or by an equivalent descriptor. The 4200 FS uses full-spectrum chirp technology to deliver wide-band, high-energy pulses coupled with high resolution and superb signal to noise ratio echo data. The sonar package included the 566P portable

configuration topside unit with laptop computer running the Discover® acquisition software and a 120/410 kHz dual frequency towfish running in high definition mode.

The sidescan was towed at an optimum position and depth to ensure isolation from sources of interference and for optimum record quality. The digital sidescan data was merged with positioning data (DGPS via HYPACK MAX®), video displayed, and recorded to the acquisition computer's hard disk for post processing and/or replay. At the end of the survey day all data was transferred to a USB memory stick and/or portable hard drive to back-up raw survey data. Hardcopy records were produced later during editing. The position of the sensor relative to the DGPS antenna was documented to ensure proper positioning of the data. The survey was conducted in such a manner to achieve total bottom coverage (200%) within the survey area. Dual frequency provided a differential aid to interpretation.

The Chesapeake Technology, Inc. SonarWiz.MAP® software program was used to post-process the sidescan sonar data in a geographical framework for target interpretation and delineation. The geo-encoded sonar imagery data was collected as a **.jsf* file. The **.jsf* files were then converted to *.*.xtf* files for post processing using the EdgeTech Discover® software. The **.xtf* file was then imported into SonarWiz.MAP® to be processed, merged, and exported in the form of geo-referenced sidescan mosaics (geo-tiff files). Morphological features observed in the sonar displays and records were digitized in SonarWiz.MAP®, edited in ESRI® ArcMap™ 9.1, and saved as *.shp* files.

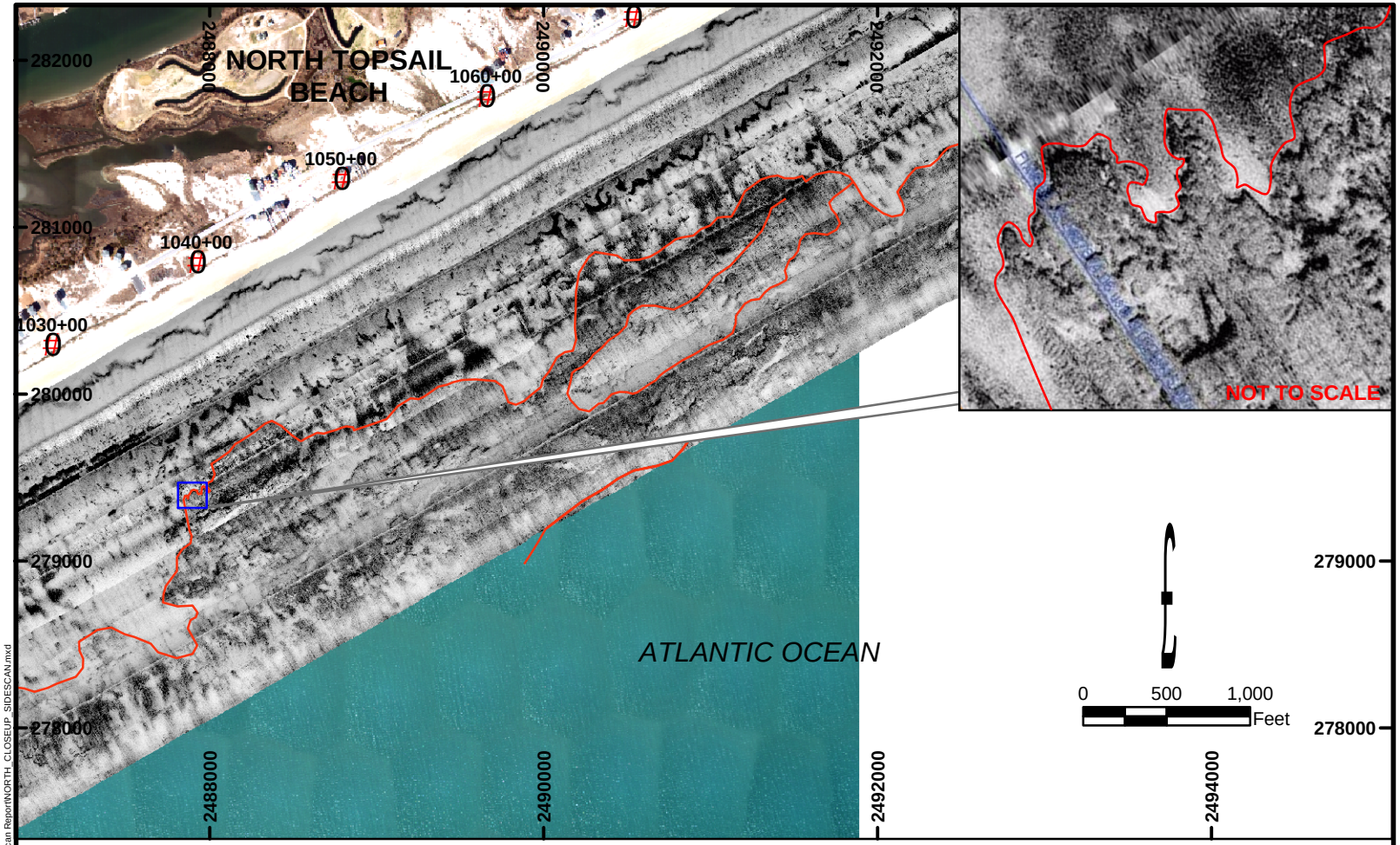
IV. REMOTE SENSING SURVEY RESULTS

The objective of this investigation was to identify and map the extent of potential hardbottom resources, or other features outcropping along the seafloor of the project study area. Areas with a sidescan sonar signature that indicated the presence of potential and/or probable hardbottom resources were mapped and classified based on their potential.

The results of the sidescan mapping of hardbottom for the 2004 north 7.25 mile section are shown in Appendix 1. Sidescan interpretation showed several potential and/or probable hardbottom resource areas. Figure 2 shows an area mapped as hardbottom based on the sonar signature exhibited.

The results of the sidescan mapping of hardbottom for the 2006 south 3.85 mile section are shown in Appendix 2. This data was collected with a higher resolution sidescan system than the initial survey of the northern 7.25 miles of the study area. Sonar signatures indicated several scattered target areas of potential and/or probable hardbottom resources (Figure 3).

The results of this sonar mapping indicate potential and/or probable hardbottom resources throughout the survey area.



NOTES

1. COORDINATES SHOWN HEREON ARE IN FEET BASED ON THE NORTH CAROLINA STATE PLANE COORDINATE SYSTEM, NORTH AMERICAN DATUM (NAD 1983)
2. AERIAL PHOTOGRAPHS FROM APRIL, 2005.
3. SIDESCAN MOSAIC DATA COLLECTED IN NOVEMBER, 2004 BY CPE.

LEGEND

USACE BASELINE STATIONS

POTENTIAL HARDBOTTOM AREAS

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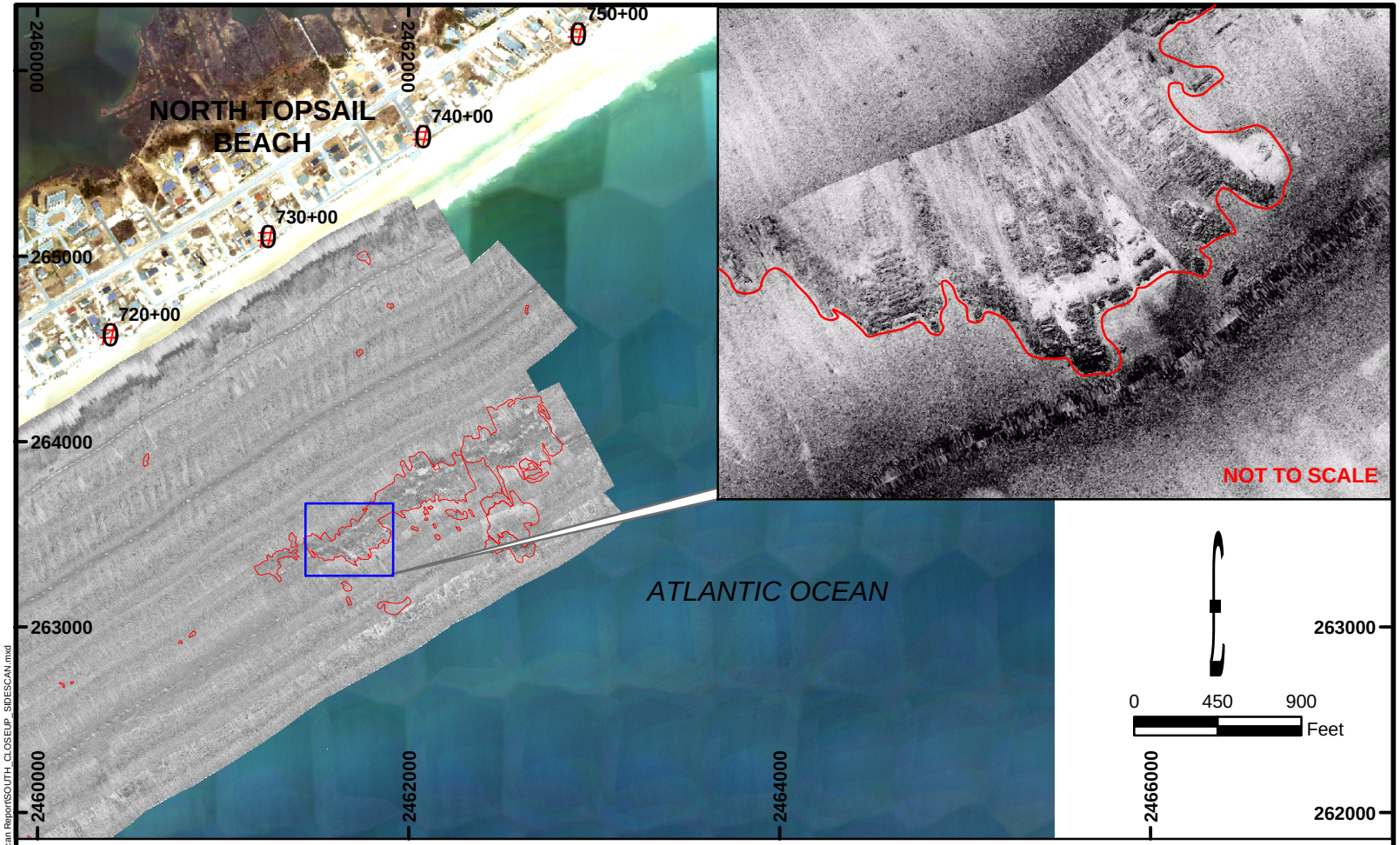

NOTES

1. COORDINATES SHOWN HEREON ARE IN FEET BASED ON THE NORTH CAROLINA STATE PLANE COORDINATE SYSTEM, NORTH AMERICAN DATUM (NAD 1983)
2. AERIAL PHOTOGRAPHS FROM APRIL, 2005.
3. SIDESCAN MOSAIC DATA COLLECTED IN AUGUST, 2006 BY CPE.

LEGEND

USACE BASELINE STATIONS

POTENTIAL HARDBOTTOM AREAS

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Final Considerations

Approximately 11.15 miles of nearshore seafloor along the North Topsail Beach shoreline were surveyed using sidescan sonar in order to map potential and/or hardbottom resources. The resulting hardbottom interpretations were mapped in a GIS database and are presented in Appendices 1 and 2. These hardbottom interpretations were then transferred to CPE marine biologists to conduct ground-truth investigations. The results of these *in situ* investigations and characterization studies are described in Section 4 of the Preliminary Draft Environmental Impact Statement (EIS).

LITERATURE CITED

Clark, P.; Cleary, W.J., and Laws, R.A., 1986. A late Pleistocene bay-barrier system: Topsail Sound, North Carolina. Geological Society of America, Abstracts with Programs, 18(3), p.215.

Cleary, W.J. and Hosier, P.E., 1987. Onslow Beach N.C. :morphology and stratigraphy, *In*: Draus, N.C. (ed.), *Coastal Sediments '87*. New York, NY, American Society of Civil Engineers, p. 1745-1759.

Cleary, W.J., Riggs, S.R., Marcy, D.C., and Snyder, S.W., 1996. The influence of inherited geological framework upon a hardbottom-dominated shoreface on a high-energy shelf: Onslow Bay, North Carolina, USA. *In*: M. De Batist and P. Jacobs (eds.), *Geology of Siliciclastic Shelf Seas*, Geological Society Special Publication, 117, 249-266.

Crowson, R.A. 1980. Nearshore rock exposures and their relationship to modern shelf sedimentation, Onslow Bay, North Carolina. Greenville, North Carolina: East Carolina University, Master's Thesis, 128p.

Riggs, S.R., Snyder, S.W., Hine, A.C., and Mearns, D.L., 1996. Hardbottom morphology and relationship to the geologic framework: Mid-Atlantic continental shelf: Journal of Sedimentary Research, V. 66, p. 830-846.

Snyder, S.W., Hoffman, C.W., and Riggs, S.R. 1994. Seismic stratigraphic framework of the inner continental shelf: Mason Inlet to New Inlet, North Carolina. *North Carolina Geological Survey, Bulletin*, 97, 61 p.

Snyder, S.W., Hine, A.C., and Riggs, S.R., 1982. Miocene seismic stratigraphy, structural framework, and sea-level cyclicity, North Carolina continental shelf. Southeastern Geology, 23(4), 247-266

U.S. Coast Guard Navigational Center. http://www.navcen.uscg.gov/ADO/DgpsSelectStatus.asp

Willson, K.W., and Cleary, W.J. 2003. Targeting offshore sand resources for high hazard zones along southeastern North Carolina, USA. Proceedings of the International Conference on Coastal Sediments 2003 (Clearwater Beach, FL), CD-ROM.

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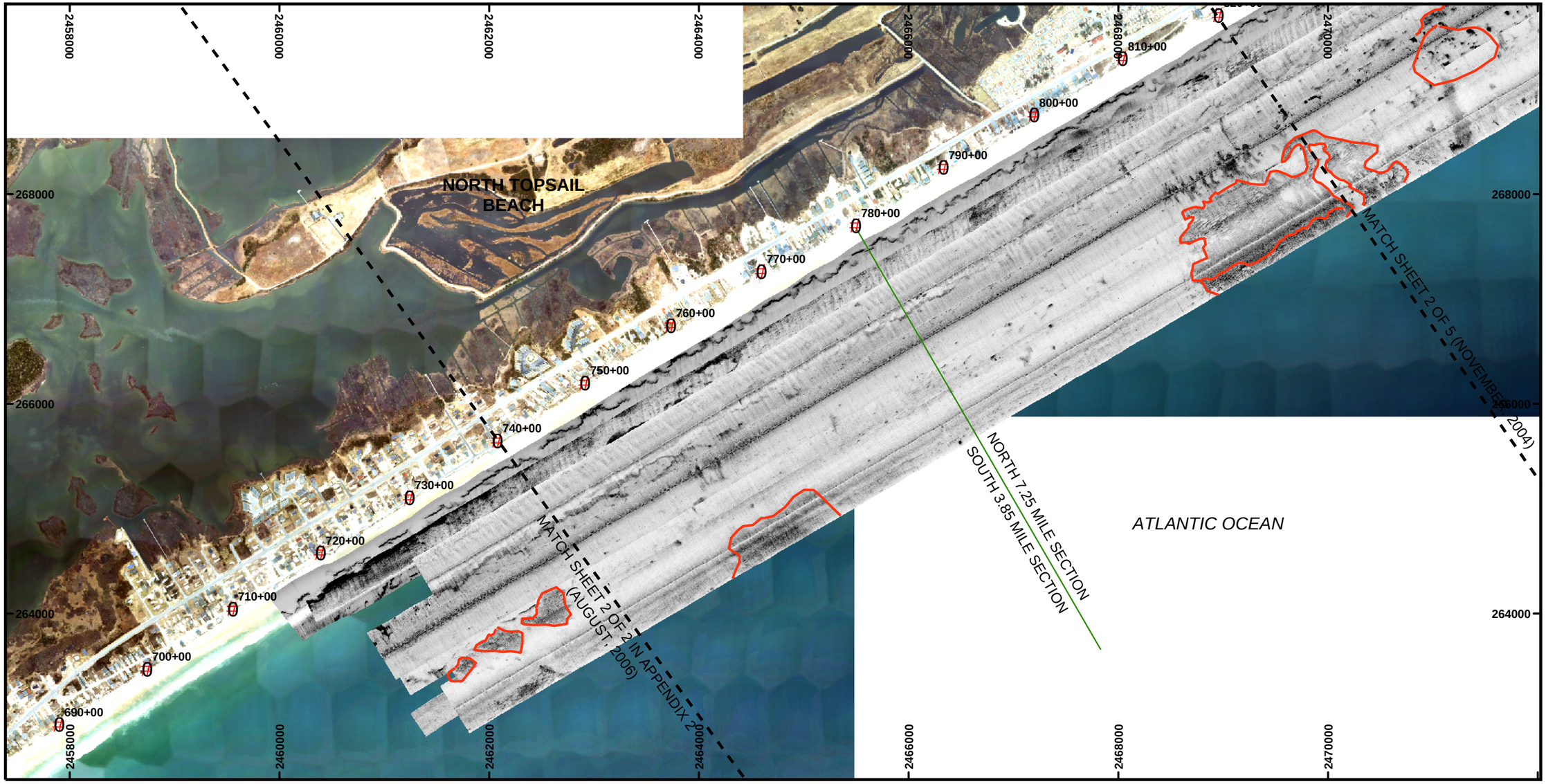
APPENDIX 1

2004 SIDESCAN MAPPING OF HARDBOTTOM



NOTES

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2. AERIAL PHOTOGRAPHS FROM APRIL, 2005.
3. SIDESCAN MOSAIC DATA COLLECTED IN NOVEMBER, 2004 BY CPE.

LEGEND

- USACE BASELINE STATIONS
- PROJECT LIMITS
- POTENTIAL HARDBOTTOM AREAS

0 500 1,000 Feet

TITLE:

NORTH TOPSAIL BEACH NORTH 7.25 MILE SIDESCAN SONAR MOSAIC

COASTAL PLANNING & ENGINEERING, INC
2481 NW BOCA RATON BLVD.
BOCA RATON, FL 33431
PH. (561) 391-8102
FAX.(561) 391-9116

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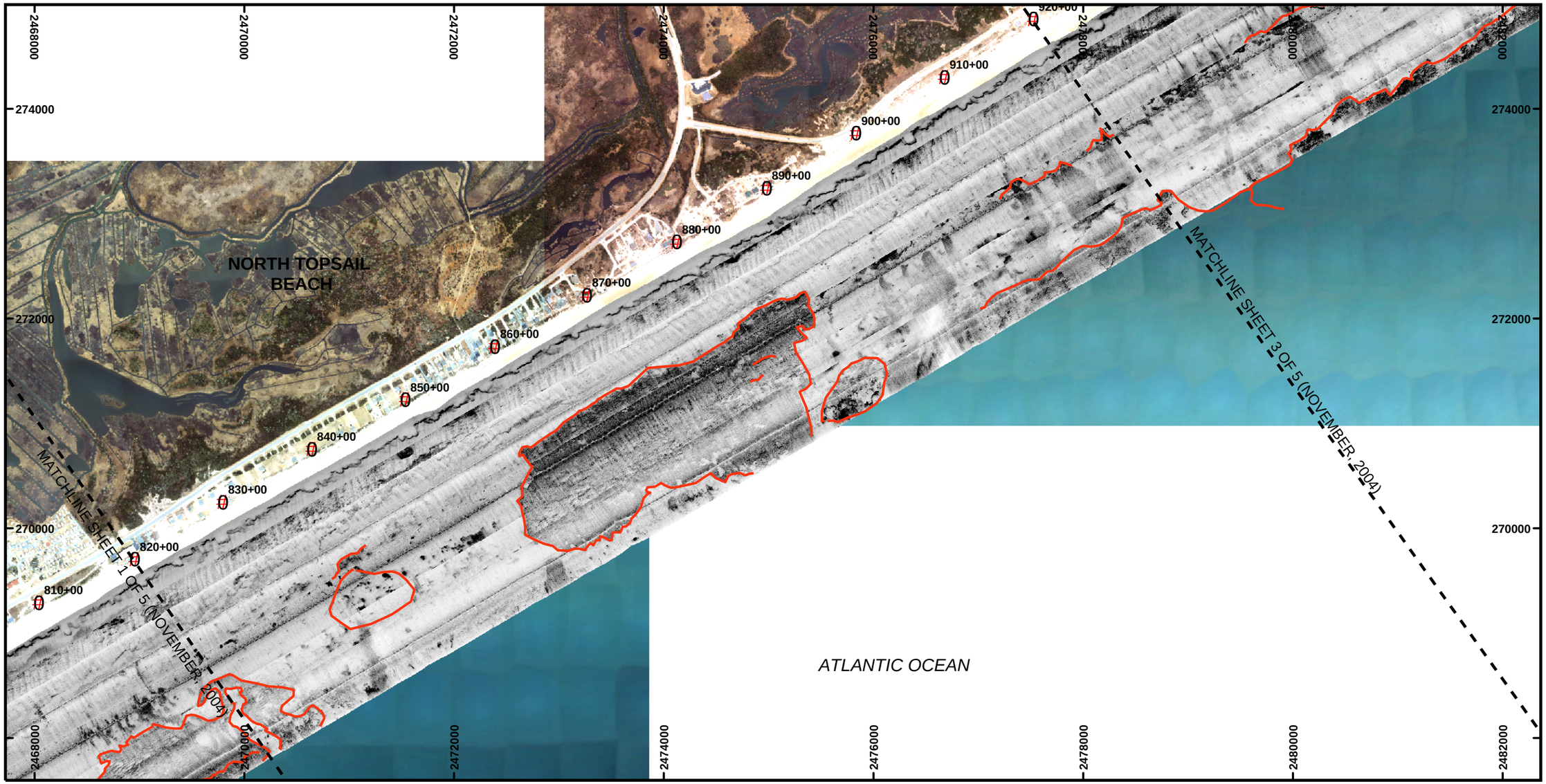

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LEGEND

PROJECT LIMITS

POTENTIAL HARDBOTTOM AREAS

USACE BASELINE STATIONS

0 500 1,000 Feet

TITLE:

NORTH TOPSAIL BEACH NORTH 7.25 MILE SIDESCAN SONAR MOSAIC

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LEGEND

- USACE BASELINE STATIONS
- PROJECT LIMITS
- POTENTIAL HARDBOTTOM AREAS

0 500 1,000 Feet

TITLE:

NORTH TOPSAIL BEACH NORTH 7.25 MILE SIDESCAN SONAR MOSAIC

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LEGEND

- USACE BASELINE STATIONS
- PROJECT LIMITS
- POTENTIAL HARDBOTTOM AREAS

0 500 1,000 Feet

TITLE:

NORTH TOPSAIL BEACH
NORTH 7.25 MILE
SIDESCAN SONAR MOSAIC

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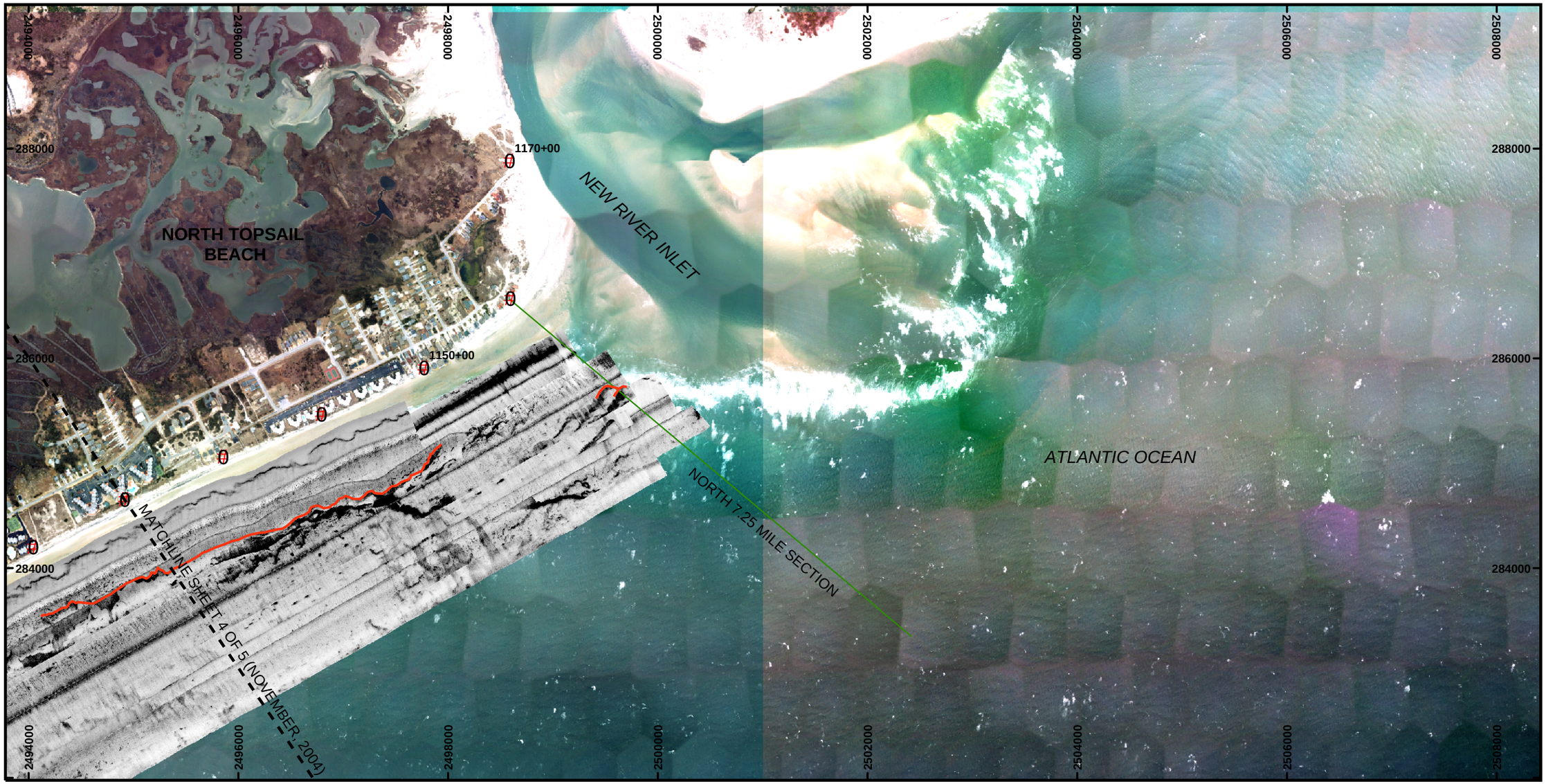

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LEGEND

- USACE BASELINE STATIONS
- PROJECT LIMITS
- POTENTIAL HARDBOTTOM AREAS

0 500 1,000 Feet

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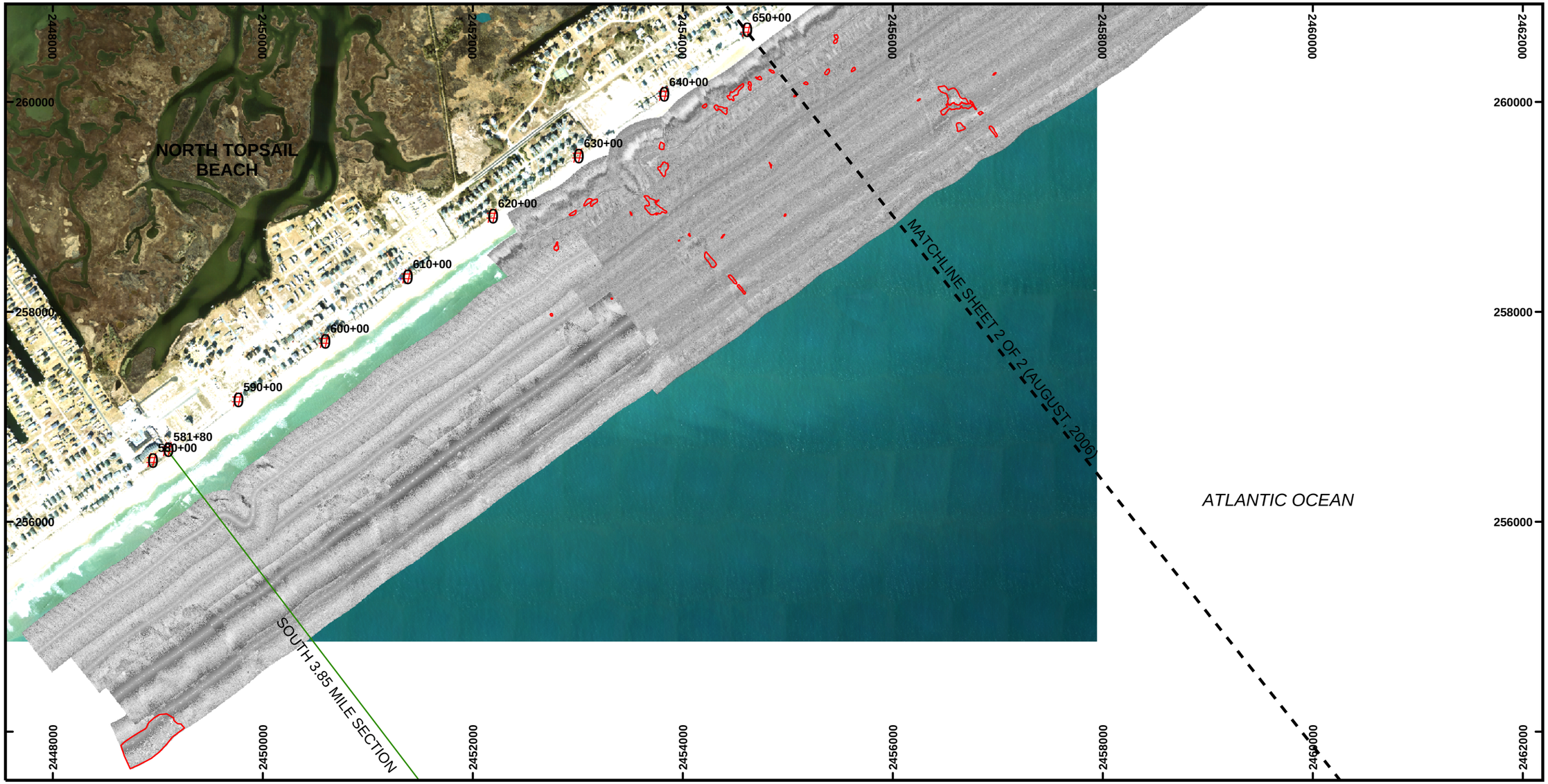
APPENDIX 2

2006 SIDESCAN MAPPING OF HARDBOTTOM



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LEGEND

USACE BASELINE STATIONS

PROJECT LIMITS

POTENTIAL HARDBOTTOM AREAS

0 500 1,000 Feet

TITLE:

NORTH TOPSAIL BEACH SOUTH 3.85 MILE SIDESCAN SONAR MOSAIC

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PH. (561) 391-8102
FAX.(561) 391-9116

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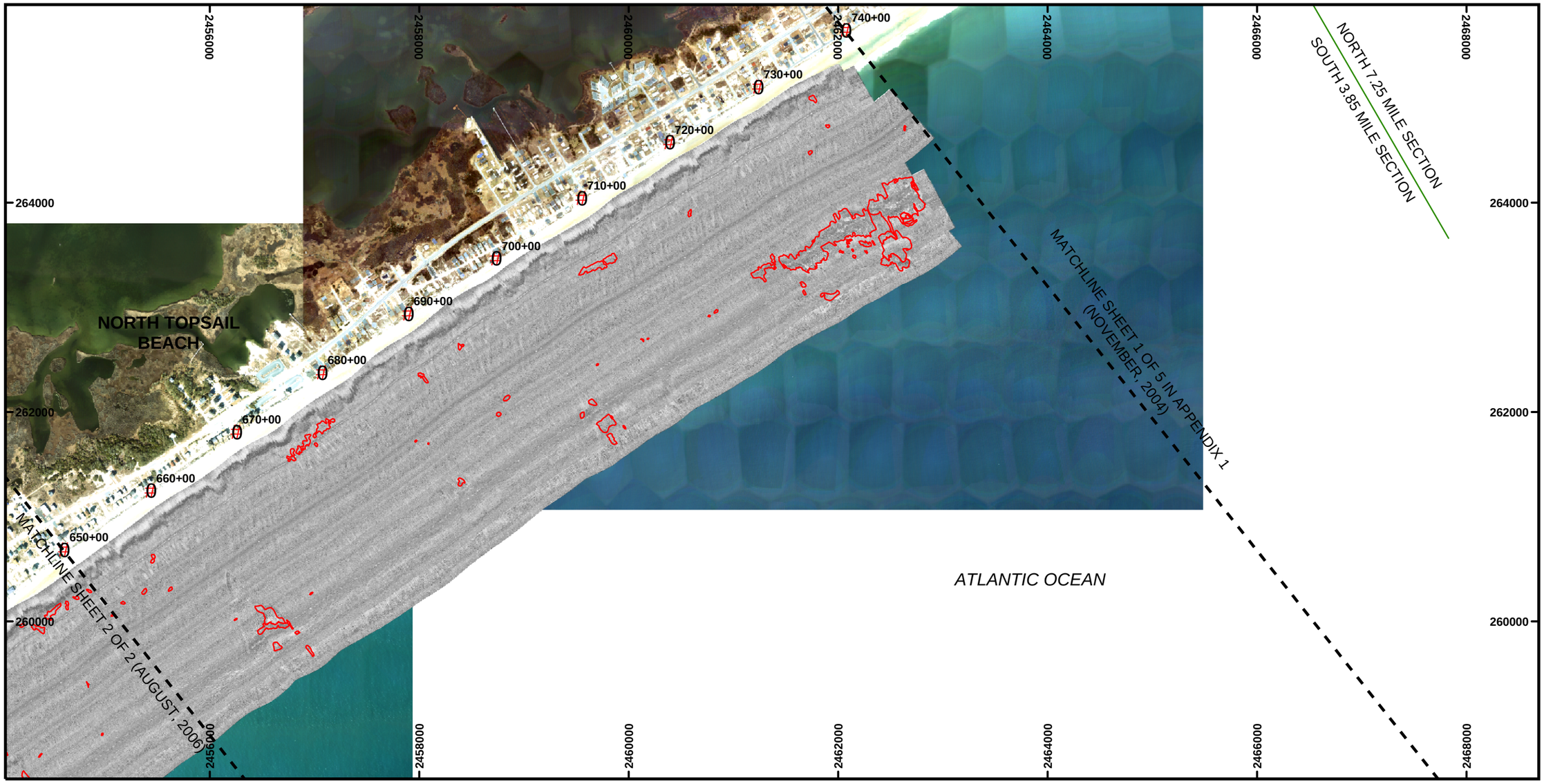

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LEGEND

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- PROJECT LIMITS
- POTENTIAL HARDBOTTOM AREAS

0 500 1,000 Feet

TITLE:

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